2A Briefs

While both affirmative speakers may use and should know the evidence on their case, this collection of evidence is gathered specifically for second affirmative speakers. After the negative team addresses areas of your case, refer to this section for evidence to help build your defense, particularly in the 2AC of the round.

AFFIRMATIVE FUNDING SOURCES 3

AFFIRMATIVE RESPONSE TO TOPICAL COUNTERPLANS 7

1. 2A EVIDENCE: AQUACULTURE 9
2. 2A EVIDENCE: ARCTIC OFFSHORE OIL BAN 23
3. 2A EVIDENCE: ASIAN CARP 37
4. 2A EVIDENCE: CHESAPEAKE BAY NUTRIENT AND SEDIMENT TRADING COMMISSION 53
5. 2A EVIDENCE: CORAL REEF PROTECTION 67
6. 2A EVIDENCE: CUBAN OIL DEVELOPMENT 81
7. 2A EVIDENCE: FISHING ITQs 89
8. 2A EVIDENCE: HYDROKINETIC 99
9. 2A EVIDENCE: ICE BREAKERS 109
10. 2A EVIDENCE: LAW OF THE SEA 121
11. 2A EVIDENCE: NAVY SONAR 133
12. 2A EVIDENCE: OFFSHORE OIL BAN 139
13. 2A EVIDENCE: OLIVINE GEOENGINEERING 155

AFFIRMATIVE FUNDING SOURCES

Cut Head Start = $8 billion/year with no benefit

Lindsey Burke and Dr. David B. Muhlhausen 2013. (Burke - Will Skillman fellow in education policy at The Heritage Foundation; bachelor's degree in politics from Hollins University in Roanoke, Va., and a master of teaching degree in foreign language education from the University of Va. Muhlhausen – PhD in public policy from the University of Maryland-Baltimore County ; served on the staff for the Senate Judiciary Committee) Head Start Impact Evaluation Report Finally Released 10 Jan 2013 <http://www.heritage.org/research/reports/2013/01/head-start-impact-evaluation-report-finally-released>

Since 1965, taxpayers have spent more than $180 billion on Head Start.[1] Yet, over the decades, this Great Society relic has failed to improve academic outcomes for the children it was designed to help. The third-grade follow-up evaluation is the latest in a growing body of evidence that should urge policymakers to seriously consider Head Start’s future.

Head Start and Performance

The timing of the release raises questions about whether HHS was trying to bury the findings in the report, which shows, among other outcomes, that by third grade, the $8 billion Head Start program had little to no impact on cognitive, social-emotional, health, or parenting practices of participants. On a few measures, access to Head Start had harmful effects on children.

Cut “No Child Left Behind”: $25 billion/year

Jennifer Marshall 2012. (master’s degree in statecraft and world politics from the Washington-based Institute of World Politics and a bachelor’s degree in French from Wheaton College; certified teacher; Director of Domestic Policy Studies at The Heritage Foundation) 9 Jan 2012 <http://blog.heritage.org/2012/01/09/a-decade-after-no-child-left-behind-time-for-a-right-turn-in-education/>

Eight legislative generations before NCLB, Washington first ventured into local school policy with the Elementary and Secondary Education Act of 1965 (ESEA). The 31-page, $1 billion Great Society program funded low-income districts in an effort to close the achievement gap between needy students and their peers. Nearly a half-century later, the situation is little improved. What has changed is the federal role. ESEA is the centerpiece of that role, the largest—though not the only—federal law applying to K-12 education. After eight reauthorizations, the law is now known as No Child Left Behind. It runs 600 pages and carries an annual price tag to taxpayers of about $25 billion.

Small reduction in size of the Army & Marine Corps: $80 billion over 10 years

Dr. Michael O’Hanlon 2013. (Ph.D. from Princeton is in public and international affairs; Director of Research, Foreign Policy, Brookings Institution) “A Moderate Plan for Additional Defense Budget Cuts” Feb 2013 <http://www.brookings.edu/~/media/research/files/papers/2013/1/defense%20budget%20cuts%20ohanlon/defense%20budget%20cuts%20ohanlon.pdf>

The size of the active-duty Army and Marine Corps could be reduced modestly below their 1990s levels (to say 450,000 soldiers and 160,000 Marines); current plans are to keep them slightly above those levels. Ten-year savings relative to the administration’s existing plans could reach about $80 billion.

Cancel new ballistic missile submarines, refurbish existing Trident subs, and convert Livermore Lab: $20 billion over 10 years

Dr. Michael O’Hanlon 2013. (Ph.D. from Princeton is in public and international affairs; Director of Research, Foreign Policy, Brookings Institution) “A Moderate Plan for Additional Defense Budget Cuts” Feb 2013 <http://www.brookings.edu/~/media/research/files/papers/2013/1/defense%20budget%20cuts%20ohanlon/defense%20budget%20cuts%20ohanlon.pdf>

Rather than design a new submarine to carry ballistic missiles, the Navy might simply refurbish the existing Trident submarine or reopen that production line. That and other nuclear force economies, including the conversion of Lawrence Livermore National Laboratories away from the nuclear weapons design business, could yield $20 billion in ten-year savings in the national defense budget.

Rebase submarines at Guam: $1 billion/year

Dr. Michael O’Hanlon 2013. (Ph.D. from Princeton is in public and international affairs; Director of Research, Foreign Policy, Brookings Institution) “A Moderate Plan for Additional Defense Budget Cuts” Feb 2013 <http://www.brookings.edu/~/media/research/files/papers/2013/1/defense%20budget%20cuts%20ohanlon/defense%20budget%20cuts%20ohanlon.pdf>

An additional way to get more out of a smaller fleet is to homeport more ships near the theaters where they operate. That helps reduce time wasted in transit. Indeed, about a decade ago, the Navy started down this path in another important way, basing attack submarines on Guam. But the Navy can go well beyond the idea of stationing six submarines there; in fact there is room to add at least five more. The average number of mission days for a submarine stationed on Guam might be about 100 a year, roughly three times what a submarine stationed in the continental United States can muster. Adding five more submarines to Guam would allow a reduction of up to 10 attack submarines in the fleet in theory. In practice, to keep an attrition reserve, reducing by five submarines would be more prudent, with annual average savings of something approaching $1 billion.

Reduce nuclear weapons research: $2.5 billion/year

Dr. Michael O’Hanlon 2013. (Ph.D. from Princeton is in public and international affairs; Director of Research, Foreign Policy, Brookings Institution) “A Moderate Plan for Additional Defense Budget Cuts” Feb 2013 <http://www.brookings.edu/~/media/research/files/papers/2013/1/defense%20budget%20cuts%20ohanlon/defense%20budget%20cuts%20ohanlon.pdf>

The Department of Energy’s nuclear weapons assets could be scaled back as well. One of the country’s two main weapons laboratories, Lawrence Livermore in northern California, would gradually leave the nuclear weapons business for the most part, while keeping very active in other areas of modern science. No dedicated new facility to make the plutonium “pits” at the heart of most weapons would be needed either, since the existing small facility at Los Alamos could be used as the arsenal continued to shrink in the years ahead, and since the pits are holding up very well. In the shorter term, the $10 billion effort to refurbish the B61 bomb could be scaled back by half or more. That program seeks to modify a grand total of just over 300 warheads of several different variants—an inefficient way to sustain future arsenal reliability. Annual savings of all the above would total about $2.5 billion.

Eliminate military bands (music, marching bands, etc): $200 million/year

Dr. Michael O’Hanlon 2013. (Ph.D. from Princeton is in public and international affairs; Director of Research, Foreign Policy, Brookings Institution) “A Moderate Plan for Additional Defense Budget Cuts” Feb 2013 <http://www.brookings.edu/~/media/research/files/papers/2013/1/defense%20budget%20cuts%20ohanlon/defense%20budget%20cuts%20ohanlon.pdf>

It is also time, with respect and admiration for their service, to scale back military bands. Yes, military morale is important and bands help. But today’s deployed military has, in most cases, direct TV and hot food and air conditioning—not to say that life is easy abroad, only that the nature of amenities and morale boosters has changed. And where troops in the field do not have such things because of their remote locations or dangerous circumstances, bands will have a hard time venturing in any case. Roughly $200 million a year can be saved in this way.

AFFIRMATIVE RESPONSE TO TOPICAL COUNTERPLANS

Topical Counterplans turn the Negative into an Affirmative, according to the definition of Team Policy debate given by the Stoa debate league on their official website.

Stoa Team Policy Debate Rules 2011. Link can be found here: http://www.stoausa.org/team-policy-debate. Rules posted by Stoa League President Van Schalin. <https://docs.google.com/viewer?a=v&pid=sites&srcid=c3RvYXVzYS5vcmd8c3RvYXVzYXxneDo2ODczYzI1ZDI3YzM4OGYw>

IV.) The Team Policy Debate Round

A Team Policy debate round consists of two teams - an Affirmative team and Negative team. It is the job of the affirmative team to uphold the resolution. If the affirmative is successful, they win, and the judge should vote for the resolution. If the affirmative fails to do so, the negative team wins, and the judge should vote accordingly. Arguments are presented by the debaters and supported and clarified with related information including logic, definitions and evidence. A judge or judges preside(s) over the round, and a timer is provided whenever possible. In those cases where a multi-judge panel is provided, the round may not begin until all judges are present in the room.

Notice 2 key issues from this quote:

**1)** “It is the job of the affirmative team to uphold the resolution.” Note that it is the resolution, not the specific details of the AFF plan, that determines who is the Affirmative team in the round.The team that upholds the resolution is the Affirmative team.Conclusion: If both teams are upholding the resolution, there are 2 Affirmative teams, so no matter who wins, the Judge should vote Affirmative.This also implies that in the case where the AFF upholds the resolution and the NEG does as well, it’s an automatic win for the AFF.If the voting criterion is whether the AFF upholds the resolution, and they do it, then they win, period.

**2)** “The judge should vote for the resolution.” Notice that the Stoa debate league rules specifically state that the Judge is voting for the resolution.Negatives who argue that the “plan becomes the resolution” as in parametric theory, are creating a contradiction.If that were the case, then there are hundreds of resolutions, given that teams may run hundreds of plans.But this text refers to “the” singular “resolution.”There is only one resolution that the Judge can vote for or against: the one voted by the Stoa membership.That’s what the Judge is voting for or against, so the debate is about the resolution and the vote is about the resolution.AFF plans justify the resolution, they do not “become” the resolution.They show why the resolution is true and should be accepted by the Judge.

**Conclusion**: Stoa rules out parametric theory by stating that the debate round is to be judged based on whether the Affirmative team is able to “uphold the resolution” or not.It is not to be judged on whose plan is better, in the case where 2 competing plans are offered.This doesn’t rule out counterplans, but it rules out both teams running plans that uphold the resolution.If the AFF upholds the resolution, according to Stoa debate league rules, then the AFF wins.Negatives who want to Counterplan must defeat the resolution as well as provide an alternative superior to the AFF plan in order to meet this criterion.

2A EVIDENCE: AQUACULTURE

SIGNIFICANCE

Offshore aquaculture is expanding exponentially

Michael Sutton 2009 (Vice President of the Monterey Bay Aquarium in California; member of the California state Fish and Game Commission) statement to the oversight hearing, 9 Sept 2009 testimony before the House Natural Resources Committee Subcommittee on Insular Affairs, Oceans and Wildlife <http://www.gpo.gov/fdsys/pkg/CHRG-111hhrg52311/html/CHRG-111hhrg52311.htm>

Like it or not, aquaculture is growing exponentially and is on track to surpass wild fisheries as a source of most of our seafood by the end of this year, in fact. And that means we are seeing the same phenomenon in our oceans as we saw on land years ago. Farming is replacing hunting as the primary source of our food supply. In our oceans, fish farming is beginning to replace fishing as the source of our seafood. Now, this industry is growing so fast around the world that inland and coastal fish farming is no longer enough. The industry is already expanding offshore.

Open ocean waters are the most likely venue for any major expansion of US marine aquaculture: Focus will shift away from coastal waters

Analysis: States only control 3 miles of coastline – beyond that, it’s Federal jurisdiction, so there will be a growing need for federal management. “Let the states do it” will not be an option

Pew Charitable Trusts Marine Aquaculture Task Force 2007. (organized by researchers from the Woods Hole Oceanographic Institution, an independent panel of leaders from scientific, policymaking, business, and conservation institutions; task force chairman was retired US Navy Rear Admiral Richard Pittenger: retired in 2004 as Vice President for Marine Operations and Arctic Research Coordinator for Woods Hole Oceanographic Institution) Sustainable Marine Aquaculture:Fulfilling The Promise; Managing The Risks, January 2007 <http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Protecting_ocean_life/Sustainable_Marine_Aquaculture_final_1_07.pdf>

The U.S. produces aquaculture products worth about $1 billion annually, but the Department of Commerce has called for the development of a domestic industry worth $5 billion by 2025. Although current U.S. production is dominated by pond-raised catfish, technological advances in recent decades have led to a dramatic increase in the production of farmed salmon. Several other marine finfish species are raised in small amounts in U.S. waters and research is being conducted on several more. Marine species—mostly salmon, bivalve mollusks, and shrimp—now constitute about 10 percent of domestic production, but contribute 20 percent of the value of the crop. With the growth of aquaculture have come environmental impacts, particularly as technology has opened new areas to aquaculture and allowed for increasingly intensive farming methods. Environmental effects from aquaculture include water pollution, introduction of nonnative species, genetic effects on wild populations of fish and shellfish from escapes of farmed animals or their gametes, and concerns about the increasing use of wild forage fish for aquaculture feeds. Historically, culture of marine species has been done in situ in coastal waters. However, with the dramatic increase in coastal development in the United States in recent decades, clean water and suitable sites for coastal aquaculture are at a premium. As a result, many experts see open ocean waters as the most likely venue for any major expansion of U.S. marine aquaculture.

INHERENCY

NOAA aquaculture policies are not enough: We need Congress to enact binding national standards

Dr. George Leonard 2011. (director of Ocean Conservancy's Aquaculture Program; Ph. D. in marine ecology and evolutionary biology) “NOAA Aquaculture Policy Puts Future of Fish at Risk” 10 June 2011 <http://tocdev.pub30.convio.net/news-room/aquaculture/noaa-aquaculture-policy-puts.html>

"Lastly, while NOAA's new policy recognizes some new policy developments, it is blind to others that have huge ramifications for our future seafood supply. NOAA rightly intends to integrate aquaculture with President Obama's National Ocean Policy and coastal and marine spatial planning. But the agency's policy is strangely silent on the current controversy surrounding the Food and Drug Administration's potential approval of the first genetically engineered animal for human consumption – an engineered version of farmed salmon. Given the extreme risk to oceans that genetically engineered fish pose, it is unacceptable that ocean farming of genetically engineered fish is not categorically excluded in the agency's new policy. "Clearly a national debate is needed on the future of our seafood supply - including what, if any, role should be played by genetically engineered fish and fish farming in the ocean. Binding national standards – that can only emanate from Congress – is what is ultimately needed"

Even if the states are doing it, we need Federal regulations to coordinate with the states

Pew Charitable Trusts Marine Aquaculture Task Force 2007. (organized by researchers from the Woods Hole Oceanographic Institution, an independent panel of leaders from scientific, policymaking, business, and conservation institutions; task force chairman was retired US Navy Rear Admiral Richard Pittenger: retired in 2004 as Vice President for Marine Operations and Arctic Research Coordinator for Woods Hole Oceanographic Institution) Sustainable Marine Aquaculture:Fulfilling The Promise; Managing The Risks, January 2007 <http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Protecting_ocean_life/Sustainable_Marine_Aquaculture_final_1_07.pdf>

Given known risks to marine ecosystems from aquaculture and the important commercial and recreational uses that depend on ocean space and resources, Congress should enact legislation specifying standards to protect the health and integrity of marine ecosystems in advance of significant federal permitting for marine aquaculture facilities. Establishing a sound, comprehensive governance framework for marine aquaculture at the federal level will protect the public interest in healthy marine ecosystems and provide for meaningful coordination with the states, in whose waters the majority of aquaculture occurs.

MSA not sufficient to regulate aquaculture (MSA=Magnuson-Stevens Fishery Conservation & Management Act)

Dr. George Leonard 2009. (director of Ocean Conservancy's Aquaculture Program; Ph. D. in marine ecology and evolutionary biology) 9 Sept 2009 testimony before the House Natural Resources Committee Subcommittee on Insular Affairs, Oceans and Wildlife <http://tocdev.pub30.convio.net/news-room/aquaculture/oc-testifies-offshore-aqua.html>

In the Gulf of Mexico, the previous administration contorted the Magnuson-Stevens Fishery Conservation and Management Act (MSA) to justify the development of a legally-dubious (and oxymoronic) "Aquaculture Fishery Management Plan" (FMP) through the Gulf Fishery Management Council. This plan would dramatically expand open-ocean aquaculture in the federal waters of the Gulf of Mexico. Last week, the Secretary of Commerce refused to take definitive action on the FMP, giving tacit approval to the plan. But Congress designed the MSA to regulate the capture of wild fish, not to create and regulate fish farming. The MSA includes neither the key safeguards nor regulatory tools and approaches necessary to ensure that aquaculture is developed and managed to be ecologically sustainable. Furthermore, this piecemeal approach entirely bypasses the high-level consideration of serious policy questions relating to open-ocean aquaculture that is needed before the Nation decides how to proceed.

Now is the time: Increasing pressure means we need to get an aquaculture framework in place now.

Michael Sutton 2009 (Vice President of the Monterey Bay Aquarium in California; member of the California state Fish and Game Commission) statement to the oversight hearing, 9 Sept 2009 testimony before the House Natural Resources Committee Subcommittee on Insular Affairs, Oceans and Wildlife <http://www.gpo.gov/fdsys/pkg/CHRG-111hhrg52311/html/CHRG-111hhrg52311.htm>

As aquaculture continues to grow across the globe, industry pressure for the development of offshore fish farming in U.S. waters likely will accelerate. Congress has the rare opportunity--and responsibility--to construct an entirely new regulatory framework to effectively manage a nascent industry in U.S. waters. Based on the potential significant risks to the ocean and coastal environment from aquaculture operations, this framework must place a high priority on the protection of wild fish and ecosystems. It must include clear and comprehensive standards to guide industry development, and adopt a precautionary and adaptive-management approach to scaling up aquaculture operations in U.S. waters. Following the example set by California, the federal program should support industry growth in a way that ensures the continued integrity of the overall ocean ecosystem and economy.

Now is the key time to develop national offshore aquaculture rules – before it really takes off

Michael Sutton 2009 (Vice President of the Monterey Bay Aquarium in California; member of the California state Fish and Game Commission) statement to the oversight hearing, 9 Sept 2009 testimony before the House Natural Resources Committee Subcommittee on Insular Affairs, Oceans and Wildlife <http://www.gpo.gov/fdsys/pkg/CHRG-111hhrg52311/html/CHRG-111hhrg52311.htm>

Today, as our aquaculture industry considers expansion into offshore waters, we have a terrific opportunity to develop an effective regulatory regime from the outset. That is, our government in a good position to create a framework for the orderly and environmentally-responsible development of marine aquaculture in U.S. waters. We also have the opportunity to learn from our past and forego allowing aquaculture to follow the ``boom and bust'' history of our marine fisheries. Now is the time to establish a national offshore aquaculture policy and set of clear and concise national standards to support marine fish farming that is environmentally sustainable.

Scientific uncertainty creates need for aquaculture environmental safeguards

Madeleine Bordallo 2009. (delegate from Guam in the US House of Representatives; chair of the Subcommittee on Insular Affairs, Oceans and Wildlife of the House Committee on Natural Resources) statement to the oversight hearing, 9 Sept 2009 <http://www.gpo.gov/fdsys/pkg/CHRG-111hhrg52311/html/CHRG-111hhrg52311.htm>

Offshore aquaculture, or the propagation and the rearing of marine species in the U.S. Exclusive Economic Zone, could increase domestic seafood production, as well as provide new employment opportunities for coastal communities that currently rely on declining wild fisheries. However, offshore aquaculture is a young and untested industry, and has the potential to harm the marine environment and native fish populations, as well as conflict with other ocean uses. Given the scientific uncertainty over the potential impacts from offshore aquaculture, a comprehensive national offshore aquaculture regulatory framework with stringent environmental standards is needed to provide the certainty and the environmental safeguards necessary to sustainably guide this use in Federal waters.

Aquaculture is going to grow fast, so we need to get Federal regulations in place now

Michael Sutton 2009 (Vice President of the Monterey Bay Aquarium in California; member of the California state Fish and Game Commission) statement to the oversight hearing, 9 Sept 2009 testimony before the House Natural Resources Committee Subcommittee on Insular Affairs, Oceans and Wildlife <http://www.gpo.gov/fdsys/pkg/CHRG-111hhrg52311/html/CHRG-111hhrg52311.htm>

We can't count on greater catches or increased catches from the ocean. It seems clear that aquaculture is a global megatrend. We are going to be living with aquaculture whether we like it or not from all over the world for many years to come. And the fact is that it is growing so fast that any increase in our seafood supply is likely to come from aquaculture. In my mind that means that is all the more reason to make sure we get this right and we develop a Federal regime that is comprehensive, integrated, and results in a sustainable industry rather than one that simply peaks and goes bust as we have seen in our fisheries.

HARMS / RISKS

Aquaculture has multiple environmental risks: We need to do it right, not fast

Dr Carl Safina 2009. (PhD ecology from Rutgers Univ.; director of the Blue Ocean Institute) Summer 2009, University of Texas at Dallas, “A Future for U.S. Fisheries, ISSUES IN SCIENCE AND TECHNOLOGY, <http://www.issues.org/25.4/safina.html>

***Sustainable aquaculture***. During the past quarter-century, many nations have turned increasingly to aquaculture to supplement or even replace conventional commercial fishing. Although not at the head of this effort, the United States offers various forms of assistance and incentives to aid the development of the industry. But fish farming is not a panacea. Some operations raise unsustainable monocultures of fish, shrimp, and other aquatic species. Some destroy natural habitats such as marshes that are vital to wild fish. Some transfer pathogens to wild populations. Some pollute natural waters with food, feces, or pesticides necessary to control disease in overcrowded ponds and pens. As the nation expands fish farming, doing it right should trump doing it fast.

Aquaculture risks: 1) habitat alteration; 2) pollution; 3) pesticides & drugs; 4) escapes; 5) exotic species; 6) disease spread; 7) use of wild fish for feed

Michael Sutton 2009 (Vice President of the Monterey Bay Aquarium in California; member of the California state Fish and Game Commission) statement to the oversight hearing, 9 Sept 2009 testimony before the House Natural Resources Committee Subcommittee on Insular Affairs, Oceans and Wildlife <http://www.gpo.gov/fdsys/pkg/CHRG-111hhrg52311/html/CHRG-111hhrg52311.htm>

The ecological risks associated with aquaculture vary according to the production system: Open-water cages or net pen farms rank as a ``high'', or ``very high'' risk for seven key ecological risks, including habitat alteration or destruction, pollution and eutrophication, contamination with pesticides and other drugs, genetic risks of escaped culture animals, introduction of exotic species, spread of disease to wild species, and use of wild fish for feed (Leung and Dudgeon, 2008).

Aquaculture risks: 1) escapes; 2) diseases & parasites; 3) nutrient & habitat impacts ; 4) impacts on predators ; 5) drugs & chemicals ; 6) pressure on wild fish stocks ; 7) socio-economic impacts

Dr. George Leonard 2009. (director of Ocean Conservancy's Aquaculture Program; Ph. D. in marine ecology and evolutionary biology) 9 Sept 2009 testimony before the House Natural Resources Committee Subcommittee on Insular Affairs, Oceans and Wildlife <http://tocdev.pub30.convio.net/news-room/aquaculture/oc-testifies-offshore-aqua.html>

 A large body of peer reviewed scientific research has been published on many of the impacts of aquaculture, including the severe environmental and socioeconomic consequences that have stemmed from developing an industry without proper precautions in place. Below, I summarize the ecological and socioeconomic impacts of primary concern:  
**1. Escapes:** Aquaculture is known to be a major vector for exotic species introduction, causing concern over the ecological impacts that escaped species can have on wild species. Whether they are native or exotic, escaped farmed fish can negatively impact the environment and wild populations of fish. For example, it is well known that farmed salmon regularly escape from net pens, negatively impacting wild salmon through competition and interbreeding.  
**2. Diseases and Parasites:** It is well documented that intensive fish culture, particularly of non-native species, has been involved in the introduction and/or amplification of pathogens and disease in wild fish populations. The most striking example concerns the dramatic consequences of the spread of parasitic sea lice from salmon farms to wild salmon but disease outbreaks in other fish grown in open net pens around the world appear to be common as well.  
**3. Nutrient and Habitat Impacts:** By design, wastes from open net pen systems are released untreated directly into nearby bodies of water, and this can have negative impacts on the surrounding environment. Dissolved nutrients (from excess feed as well as fish excretion) flow freely beyond the farm site while particulate matter often settles directly to the bottom where it can substantially alter both the chemistry and biodiversity of the farm's benthic habitats. New and emerging science suggests the adage "dilution is the solution to pollution" in open ocean-environments is an oversimplification and not justified by science.  
**4. Impacts on Predator Populations:** The presence of large numbers of captive fish held in high density naturally attracts predators such as birds, sharks and marine mammals. Techniques to keep some of these predators at bay often impact their natural behavior and pose entanglement and drowning risks. Some predators that have become habituated to the presence of net pens, and hence a threat to human safety, have been killed by fish farmers.  
**5. Impacts of Drugs and Chemicals:** Aquaculture often uses a variety of chemicals including antibiotics, pesticides, fungcides, and antifoulants. In some aquaculture systems, use of antibiotics has resulted in bacterial resistance in the environment and influenced antibiotic resistance in humans. Probable human carcinogens in fish feed (most notably PCBs, dioxins, and other organohalogens) have been shown to result in potentially unsafe concentrations in high trophic-level farmed fish. Dietary guidelines recommend limited human consumption to avoid deleterious health effects.  
**6. Increased Fishing Pressure on Wild Fish Stocks:** Feed for many of the "carnivorous" species likely to be farmed in open-ocean environments contains very high percentages of fishmeal and fish oil derived from wild-caught forage fish. As a result, these species consume two to five times as much wild fish as they produce in farmed product. As global aquaculture has grown dramatically over the past two decades, the total demand for fishmeal and fish oil for use in aquaculture feeds has expanded. If the farming of carnivorous fish continues to grow at its current rate, the demand for fish oil will outstrip world supply within a decade, while a similar result is expected for fish meal by 2050. This will likely impose additional pressure on wild forage fish stocks with the potential to undermine marine food webs by removing key prey species on which economically and environmentally important wild species depend. Separating fish farming from its reliance on wild fish must occur if aquaculture is to be considered a sustainable means to increase seafood supply.  
**7. Socioeconomic Impact on Fishermen and Fishing-Dependent Communities:** Beyond the environmental risks and human health issues, it is well known that farmed fish compete with wild fish in the marketplace. The increase in farmed salmon in the late 1990's drove down the price of wild salmon to levels that made it difficult for fishermen to stay in business. While price declines may be good for consumers, they can have a range of direct and indirect negative environmental and economic impacts, including industry consolidation, overproduction and elevated fishing pressure on wild fish stocks to compensate for reduced profit margins.

Disease transmission: We need to take preventive measures now to avoid transmission of diseases from farmed fish into wild populations

Pew Charitable Trusts Marine Aquaculture Task Force 2007. (organized by researchers from the Woods Hole Oceanographic Institution, an independent panel of leaders from scientific, policymaking, business, and conservation institutions; task force chairman was retired US Navy Rear Admiral Richard Pittenger: retired in 2004 as Vice President for Marine Operations and Arctic Research Coordinator for Woods Hole Oceanographic Institution) Sustainable Marine Aquaculture:Fulfilling The Promise; Managing The Risks, January 2007 <http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Protecting_ocean_life/Sustainable_Marine_Aquaculture_final_1_07.pdf>

In a recent study of the increase in diseases in ocean organisms, Harvell et al. (2004) suggest that aquaculture is likely a source of new pathogens entering wild populations in the ocean. Assessing the role of aquaculture and other modes of introduction of pathogens in the ocean is difficult, however, because of the paucity of information on the presence and distribution of pathogens in aquatic ecosystems. For example, very little is known about the distribution and role of pathogens in wild populations of fish (Blazer and LaPatra 2002). In contrast to aquaculture systems, where diseased fish are easily observed and diagnosed, sick fish in the wild are rarely observed. Additionally, since so little is known about diseases in wild populations it is often difficult to determine whether diseases have been introduced, by aquaculture or other means, to wild populations of organisms. The transmission of disease between wild animals and farm animals is unequivocally known. Although it is a more recent phenomenon, the transfer of disease between wild aquatic organisms and farmed aquatic organisms is also known. While there has been little research into the mechanisms of transfer, the severity of impacts, or even the nature and prevalence of pathogens in the marine environment, there are several examples of transmission of pathogens from farmed aquatic organisms to marine wildlife. As marine aquaculture expands in terms of both volume and location, a risk-averse approach is to implement management and regulatory strategies to avoid problems before they become crises. These preventative measures are more effective in the long term in protecting the environment and the economic interests of the industry.

Aquaculture introduces diseases to native wild species – damage can be unpredictable and irreversible

Michael Sutton 2009 (Vice President of the Monterey Bay Aquarium in California; member of the California state Fish and Game Commission) statement to the oversight hearing, 9 Sept 2009 testimony before the House Natural Resources Committee Subcommittee on Insular Affairs, Oceans and Wildlife <http://www.gpo.gov/fdsys/pkg/CHRG-111hhrg52311/html/CHRG-111hhrg52311.htm>

The importation of gametes, eggs, fry or breeding stocks for aquaculture have been responsible for the introduction of non-native pathogens and parasites (e.g. Briggs et al, 2005), and for the amplification and retransmission of native pathogens and parasites occurring naturally in the environment (Krkosek, 2007). Commercially devastating viral, bacterial and parasitic pathogens associated with a wide variety of aquaculture species have been introduced across the globe and have infected native wild populations (Kibenge et al, 2009). In California, for example, the South African sabellid worm was introduced through the importation of abalone stock for aquaculture. The worm stunted the growth of cultured abalone and spread to the wild where it also impacted black turban snails. Researchers at the University of California, Santa Barbara had to remove more than a million infected snails in Southern California to eradicate the worm from the wild. This represents a rare example of the successful extermination of an invasive species; usually the ecological and socioeconomic impacts of invasive species introductions are unpredictable and irreversible.

Examples of disease spread by aquaculture: British Columbia and Chile

Michael Sutton 2009 (Vice President of the Monterey Bay Aquarium in California; member of the California state Fish and Game Commission) statement to the oversight hearing, 9 Sept 2009 testimony before the House Natural Resources Committee Subcommittee on Insular Affairs, Oceans and Wildlife <http://www.gpo.gov/fdsys/pkg/CHRG-111hhrg52311/html/CHRG-111hhrg52311.htm>

In British Columbia, native sea lice have infected salmon farms and spread to wild fish in the same area. This caused high mortality rates in wild Pink and Chum salmon, threatening to eradicate some local stocks within generations if current levels of disease transmissions continue (Krkosek, 2007). The entire Chilean salmon farming industry, once the world's dominant salmon aquaculture producer and the leading exporter to the United States, has been crippled by the spread of a viral disease known as Infectious Salmon Anemia.

Escape of farmed native-species fish can damage the local wild fish population through genetic cross-breeding

Michael Sutton 2009 (Vice President of the Monterey Bay Aquarium in California; member of the California state Fish and Game Commission) statement to the oversight hearing, 9 Sept 2009 testimony before the House Natural Resources Committee Subcommittee on Insular Affairs, Oceans and Wildlife <http://www.gpo.gov/fdsys/pkg/CHRG-111hhrg52311/html/CHRG-111hhrg52311.htm>

Native farmed fish can also be genetically distinct from wild members of the same species due to domestication and selective breeding. The escape of native but genetically different farmed fish is associated with a variety of ecological impacts; for example, interbreeding with reproductively compatible populations in the wild can result in loss of adaptation in natural populations, introgression of new genetic material into species' gene pools and, in the extreme case, loss of locally adapted populations (Hallerman, 2008; McGinnity et al, 2003).

Risks from concentrated aquacultural waste materials

Michael Sutton 2009 (Vice President of the Monterey Bay Aquarium in California; member of the California state Fish and Game Commission) statement to the oversight hearing, 9 Sept 2009 testimony before the House Natural Resources Committee Subcommittee on Insular Affairs, Oceans and Wildlife <http://www.gpo.gov/fdsys/pkg/CHRG-111hhrg52311/html/CHRG-111hhrg52311.htm>

Like terrestrial farm animals, aquatic animals--when raised in high numbers and dense concentrations--produce substantial quantities of waste (Islam, 2005). Due to economies of scale and the logistical challenges of operating some distance offshore, open-ocean fish farms are likely to be substantial in size. In California, for example, Hubbs-SeaWorld Research Institute in San Diego is proposing to produce 3,000 tons of farmed fish annually in offshore pens. A production biomass of 3,000 tons not only represents a substantial number of individual fish (about 2 million 1.5 kg fish), but also requires more than double this amount in feed. The nitrogen and phosphorous-rich effluent resulting from the incomplete digestion of feed by farmed fish represents a substantial point source of pollution. Open net-pen production systems rely on the free ecosystem service provided by water currents and the surrounding environment to disperse, dilute, and break down farm wastes. The direct impacts of soluble and particulate wastes on offshore habitats are poorly understood. In addition, uneaten feeds usually attract other species outside the nets, causing unnatural aggregations of predators (e.g., sharks), and a subsequent need to control those predators (sometimes through lethal measures) for human safety. Therefore, effluent effects of open-ocean net pens should not be assumed to be negligible solely on the basis of dilution.

Carnivorous farmed fish consume more wild-caught fish meat than they produce

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While many of the dominant aquaculture species produced globally can be cultured in freshwater ponds without the artificial feeding (e.g. carp, tilapia and catfish), offshore aquaculture in U.S. waters likely will be dominated by high-value species such as tuna and striped bass that are carnivorous (fish-eating) by nature. These species typically require a diet high in protein and often high in fat (Naylor et al, 2000). Fishmeal and fish oil are the two ingredients most commonly used to meet these nutritional requirements. Scientists estimate that aquaculture annually consumes the equivalent of more than 16 million tons of wild fish; marine finfish require approximately twice as much wild-caught fish in the form of feed as they produce (Tacon and Metian, 2008). Some argue that even at this ratio, the conversion efficiency of wild forage fish to farmed fish is more efficient than the same farmed species of fish feeding and growing in the wild. But this argument ignores the other invaluable services provided by a functioning natural ecosystem in which these forage fish--such as sardines, herring, and anchovies--play a central role, namely the transfer of energy to recreational and commercial fish and wildlife and the stability of marine food webs to disturbances and climate change. If removed from their natural ecosystems to feed aquaculture species, forage fish no longer play these functions and much of their nutritional content is wasted in the conversion to farmed species.

New trend toward carnivore aquaculture threatens ocean environment

Dr. George Leonard 2009. (director of Ocean Conservancy's Aquaculture Program; Ph. D. in marine ecology and evolutionary biology) 9 Sept 2009 testimony before the House Natural Resources Committee Subcommittee on Insular Affairs, Oceans and Wildlife <http://tocdev.pub30.convio.net/news-room/aquaculture/oc-testifies-offshore-aqua.html>

Much of the world's farmed fish are herbivores, often raised in closed containment systems, posing limited environmental risks. However, a smaller but rapidly growing sector includes species high in the food chain, grown in large net pens in ocean waters. These farms pose much larger threats to the ocean in part because net pens are open systems through which water flows freely, directly affecting the surrounding ecosystem. At present the United States is a relatively small contributor to global aquaculture production. However, some in industry and government are seeking to foster the growth of domestic open-ocean aquaculture; and recent developments in California and the Gulf of Mexico have pushed that goal far closer to reality.

Carnivorous fish farming overexploits wild fish stocks to feed the farmed fish

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Existing ranching operations rely almost exclusively on bait fish, such as sardines and anchovies, for feed. Indeed, virtually the entire Pacific sardine catch (California's largest volume fishery) goes to feed penned tunas in Mexico and Australia. But the conversion of sardines and other small pelagic fishes into ranched tuna and other species is typically very inefficient. It takes between 7 and 25 pounds of wild bait fish to grow one pound of ranched bluefin tuna, and ranching increases fishing pressure on these feed fisheries (Zertuche-Gonzalez et al, 2008). Unlike the global trade in fishmeal and oil, fishing pressure to supply fresh wild fish for tuna ranching is typically concentrated locally in the region of the ranching operation. Overexploitation of the fisheries used to feed the pens can cause the collapse of the ranching operations themselves.

Capture-based aquaculture leads to fisheries collapse

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Capture-based aquaculture, also known as ``ranching'', relies on the collection of wild juvenile or adult fish for fattening in sea cages similar to offshore feedlots. For example, entire schools of bluefin tuna are captured by purse seines and transferred to net pens in Mexico and Australia where they are fed sardines and fattened for export. The capture of wild fish for ranching inevitably maintains or increases fishing pressure on wild fish stocks, both on the farmed species and the small fishes caught for feed. Today, ranching in coastal or offshore sea cages is only commercially viable for high-value species such as tuna, which are typically already heavily overfished (e.g., bluefin tuna). Because the wild-caught fish are not landed, their capture may not be recorded as catches or be taken into account in fishery statistics and management. Contrary to the notion that fish farming relieves pressure on wild stocks, capture-based aquaculture that catches juveniles before they are able to reproduce is one of the most effective paths to commercial fishery collapse.

Example: Lack of regulations led to calamity in Chile’s fish farms

Dr. George Leonard 2009. (director of Ocean Conservancy's Aquaculture Program; Ph. D. in marine ecology and evolutionary biology) 9 Sept 2009 testimony before the House Natural Resources Committee Subcommittee on Insular Affairs, Oceans and Wildlife <http://tocdev.pub30.convio.net/news-room/aquaculture/oc-testifies-offshore-aqua.html>

Congress has a unique opportunity and a public responsibility - to craft a national vision that will foster "a race to the top," precisely at a time when past missteps by other countries have created a "race to the bottom" that they have come to regret. This is no more evident than in Chile, a country that until recently was the world's largest producer of farmed salmon. Without a sufficiently precautionary national plan, Chile increased its production of farmed Atlantic salmon by 2,200% from 1991 to 2006. But by 2007, with too many farms located too close together, disease began to spread rapidly through the industry. Just two years later, there has been over a 50% decline in salmon production and revenue for the industry and over 7,500 direct jobs have been lost. Only after the salmon industry was decimated by the spread of this disease did Chilean authorities take the first steps toward developing a national framework to manage farms via "neighborhoods" to break the disease cycle by limiting both farm-level and regional fish production. If they had approached the development of the salmon farming industry more cautiously from the beginning they may have averted this calamity.

SOLVENCY

Properly regulated aquaculture can produce seafood responsibly. Unsafe aquaculture will have serious adverse consequences

Dr. George Leonard 2009. (director of Ocean Conservancy's Aquaculture Program; Ph. D. in marine ecology and evolutionary biology) 9 Sept 2009 testimony before the House Natural Resources Committee Subcommittee on Insular Affairs, Oceans and Wildlife <http://tocdev.pub30.convio.net/news-room/aquaculture/oc-testifies-offshore-aqua.html>

To date, advocates for domestic open-ocean aquaculture have paid insufficient attention to the significant risks that would accompany the growth of such an industry. A large body of peer-reviewed scientific literature has identified a host of environmental risks and impacts that accompany the farming of fish in open net pen systems. International experience also presents us with a cautionary tale that we ignore at our peril. While much of our understanding to date comes from salmon farming, data from other farmed species suggest these risks are universal and likely to apply to cod, halibut, sablefish, tuna and other species that could be raised in U.S. waters. However, if we proceed with caution, placing a high priority on the protection of wild fish and ecosystems, and let science-based principles guide us, open-ocean aquaculture may be able to play a role in responsible U.S. seafood production. But if done without proper protections in place, open-ocean aquaculture is likely to have serious adverse consequences for human health, ocean ecosystems and coastal communities.

Precautionary approach allows sustainability

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The precautionary approach, it is a simple concept. It means that in cases of uncertainty we err on the side of conservation, not exploitation. So what that means in terms of offshore aquaculture is that the burden should be on those who would like to develop offshore aquaculture to demonstrate that it is not going to harm native ecosystems, fisheries in the area, and so forth. I think the benefits of a precautionary approach are pretty clear. We have seen the opposite of that in our fisheries for so many years in many parts of the country, we have seen anti-precaution, we have seen fishing levels that encourage depletion rather than sustainability. We cannot afford to do that kind of boom and bust cycle in aquaculture, we have to get it right from the beginning. And, of course, that is much easier to do when you are starting fresh without an industry in place, it is much easier to regulate from the outset from a precautionary perspective than to try to regulate an existing industry and make changes. So Congress has a terrific opportunity here as we have in California to make sure we get this right, to employ a precautionary approach from the beginning so that the industry develops in a sustainable manner rather than trying to engineer that after the fact.

National regulatory approach helps promote US aquaculture industry and reverse job losses

Dr. James W. Balsiger 2009 (Ph.D., Acting Assistant Administrator for Fisheries, National Oceanic and Atmospheric Administration) statement to the oversight hearing, 9 Sept 2009 <http://www.gpo.gov/fdsys/pkg/CHRG-111hhrg52311/html/CHRG-111hhrg52311.htm>

In the absence of a national approach that enables sustainable domestic aquaculture, the United States likely will continue to increase imports from foreign sources which may not have similar conservation regulations, as well as suffer the continued loss of jobs and livelihoods that have made our coastal communities unique. Promoting and enabling sustainable aquaculture here at home makes good sense.

The California Sustainable Oceans Act is a good model for Federal aquaculture risk management

Michael Sutton 2009 (Vice President of the Monterey Bay Aquarium in California; member of the California state Fish and Game Commission) statement to the oversight hearing, 9 Sept 2009 testimony before the House Natural Resources Committee Subcommittee on Insular Affairs, Oceans and Wildlife <http://www.gpo.gov/fdsys/pkg/CHRG-111hhrg52311/html/CHRG-111hhrg52311.htm>

Aquaculture has a number of associated environmental risks that are enumerated in the written testimony prepared for this hearing. Dr. Leonard has provided a poster here, and he is going to talk about this later outlining these risks. For now, suffice it to say that these risks pose serious potential threats to our oceans and coasts. Congress's foremost job in developing a comprehensive regime to manage offshore fish farming is to consider and manage these risks. That is what we have done in California. In 2006 we enacted a state law known as the Sustainable Oceans Act in anticipation of aquaculture development in state waters. California thus became the first jurisdiction in the United States to set standards and implement a comprehensive management regime for marine aquaculture. The law in California requires a programmatic environmental impact review prior to the development of any offshore fish farming, and that review is currently underway, and we expect it to be completed by the end of this year. Congress should impose a similar requirement for a programmatic environmental impact statement on a regional basis before authorizing offshore aquaculture in Federal waters. Many provisions of our Sustainable Oceans Act can serve as useful precursors for Federal legislation. For example, California bans the farming of nonindigenous species in the oceans, such as Atlantic salmon. It is one thing to farm exotic species like tilapia and barramundi on land, where we can control escapes and so forth, but we cannot afford to have exotic species introduced into our ocean waters.

Federal government should use the California aquaculture standards

Michael Sutton 2009 (Vice President of the Monterey Bay Aquarium in California; member of the California state Fish and Game Commission) statement to the oversight hearing, 9 Sept 2009 testimony before the House Natural Resources Committee Subcommittee on Insular Affairs, Oceans and Wildlife <http://www.gpo.gov/fdsys/pkg/CHRG-111hhrg52311/html/CHRG-111hhrg52311.htm>

National standards for offshore aquaculture in federal waters should address the full suite of potential ecosystem impacts of these activities. The comprehensive standards and criteria included in California's Sustainable Oceans Act should be used to guide the development of the federal program; federal standards should be at least as protective as those codified in SB 201, and set the following goals:

Prohibit the production of non-native species in offshore facilities.

Prevent escapes of farmed species.

Prevent the introduction, incubation, and spread of disease, pathogens, and parasites.

Minimize the impact of nutrient discharges to the maximum extent practicable by mandating specific, measurable limits.

Forestall negative impacts on native fish and wildlife, and their use of marine habitats.

Avoid contributing to the overexploitation of forage fish or disruption of marine ecosystems.

These and other environmental standards should be incorporated into a programmatic review of the federal regulatory framework to evaluate the potential effects of this framework on a large and comprehensive scale. This review should include the same requirements prescribed in SB 201, and result in a greater understanding of the cumulative impacts of aquaculture operations, the development of a common set of best management practices, a streamlined permitting process, and the identification of the most appropriate places to locate aquaculture operations.

The California Sustainable Oceans Act - details

National Sea Grant Law Center 2006. (attorneys participating in education programs and conferences; The Sea Grant Law Center and Mississippi-Alabama Sea Grant Legal program are funded by a grant from the U.S. Department of Commerce administered through the Mississippi-Alabama Sea Grant Consortium. Matching funds are contributed by the State of Mississippi, the Legal Program, and the University of Mississippi ) California Enacts Sustainable Oceans Act, Aug 2006 <http://nsglc.olemiss.edu/Advisory/CAAquaculture.pdf>

Programmatic Environmental Impact Report

S.B. 201 adds § 15008 to the Cal. Fish and Game Code to require the Department, in consultation with the Aquaculture Development Committee, to prepare programmatic environmental impact reports for existing and potential commercial aquaculture operations in both coastal and inland waters, but only if funds are appropriated to the Department for this purpose and matching funds are provided by the aquaculture industry. If the Department prepares the report, it must provide a framework for managing marine finfish aquaculture in an environmentally sustainable manner that considers the following factors:

Appropriate areas for siting operations to avoid adverse impacts;

Effects on marine ecosystems, commercial and recreational fishing, and other uses;

Effects on other plant and animal species;

Effects on the use of chemical and biological products and pollutants and nutrient wastes on human health and the marine environment;

Effects of interactions with marine mammals and birds;

Cumulative effects of a number of similar operations;

Effects of feed, fish meal, and fish oil on marine ecosystems;

Effects of escaped fish on wild fish and the marine environment; and

Design of facilities and farming practices to avoid adverse environmental impacts.

Aquaculture Leases

S.B. 201 amends Cal. Fish and Game Code § 15400 to authorize the California Fish and Game Commission to lease state water bottoms or the water column for marine finfish aquaculture. Water bottom leases will be awarded to the highest responsible bidder, as long as the bid meets or exceeds the annual rent established by the Commission (which shall not be less than $2.00 per acre). The initial lease term may not exceed ten years. A lease may be renewed for additional periods not to exceed five years.

The Commission may only issue a lease once it determines that the lease is in the public interest following a public hearing. All leases must meet the following standards:

The site must be appropriate for marine finfish aquaculture;

The lease shall not unreasonably interfere with fishing or public trust values or unreasonably disrupt wildlife or harm the environment;

The operation must minimize the use of fish meal and fish oil;

Use and amounts of all drugs, chemicals, and antibiotics shall be minimized;

Lessees shall establish best management practices, approved by the Commission, which include a regular monitoring, reporting, and site inspection program.

All farmed fish must be marked, tagged, or otherwise identified as belonging to the lessee in a manner determined appropriate by the Commission, unless the Commission determines that identifying farmed fish is unnecessary for protecting wild fish stocks, the marine environment, or other ocean uses;

All facilities and operations shall be designed to prevent the escape of farmed fish and to withstand severe weather conditions and marine accidents.

Upon termination of a lease, all structures shall be removed at the lessee’s expense and the area shall be restored to its original condition. (Cal. Fish and Game Code § 15409). The Commission shall require financial assurances, in the form of surety bonds, irrevocable letters of credit, trust funds, etc., to ensure that restoration is performed to its satisfaction. Aquaculture lessees shall be responsible for damages caused by their operations, including reimbursement for any costs for natural resource damage assessment.

Water Quality Monitoring

Lessees will be required to meet all applicable requirements imposed by the Board and regional water quality control boards and prevent discharges to the maximum extent possible. Monitoring and testing of water quality will be required on a regular basis and all reports must be kept on file and available for public review. Lessees must submit baseline benthic habitat and community assessments of the proposed lease site to the applicable water quality control board prior to the issuances of the lease. The lessee must monitor the benthic habitat and community during the operation of the lease.

Exceptions

The lease requirement does not apply to (1) the artificial propagation, rearing, and stocking projects for the purposes of recovery, restoration, or enhancement of native fish stocks carried out under a scientific collection or research permit or the California Ocean Resources Enhancement Program; or (2) nonprofit hatcheries and artificial propagation projects operated by, or on behalf of, licensed commercial or sport fishermen for the purpose of recovery, restoration, or enhancement of California’s native marine fish populations if

A restoration or enhancement plan is submitted to, and approved by the Commission, which provides for the monitoring and protecting the benthic habitat; prevention of pollution; and prevention of adverse impacts on wild fish stocks from disease, parasites, and genetic alterations.

Federal government can regulate aquaculture in state waters: Corps of Engineers and EPA have jurisdiction

Thomas R. Head 2003. (attorney with Balch & Bingham LLP in Birmingham, Alabama) Fishy Business—Regulating Aquaculture Operations in the United States <http://www.balch.com/files/Publication/47d3f292-e868-4f9b-9ae5-8a10032b43eb/Presentation/PublicationAttachment/a83c0a25-f681-4ad2-8aab-00aae4ba0086/Fishy%20Business%20-%20THead.pdf> (brackets added)

Currently, most fish farms in the United States operate in inland or coastal waters. The primary federal agencies directly regulating these facilities are the Corps of Engineers and EPA. The Corps requires a permit under Section 10 of the RHA [Rivers & Harbors Act] for the building or placement of any structure in waters of the United States that could obstruct navigation, including wharves, piers, booms, and jetties. Section 10 gives the Corps considerable discretion in deciding whether to issue a permit. The Corps has broadly interpreted its authority to allow it to consider impacts on navigation as well as any other factors affecting the public interest, including the effects and cumulative impacts on water quality, recreational activities, fish and other wildlife, pollution, economic factors, safety, and aesthetics. Nevertheless, because of the discretionary nature of the Corps’ authority, the practical effects of the Corps permitting process on environmental impacts of fish farms are limited. On the other hand, EPA can afford significant protection to receiving waters by directly regulating discharges from aquaculture operations pursuant to its jurisdiction under the CWA. [Clean Water Act]

2A EVIDENCE: ARCTIC OFFSHORE OIL BAN

INHERENCY

No safety improvements: Drilling was allowed to continue after the BP disaster with hardly any safety improvements

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

In little over a year, offshore drilling has largely returned to pre-spill conditions. Government and industry have justified this by claiming that new safety measures allow offshore drilling to be done in a safe and responsible way. Unfortunately, this claim does not stand up to scrutiny. Having compiled and analyzed all of the new safety measures implemented since the Deepwater Horizon spill to determine what effect, if any, they would have on the safety of offshore drilling, Oceana has found that, contrary to claims by the government and industry, new safety measures will only marginally increase the drilling safety. Consequently, the risk of large spills remains largely the same as it was prior to the Deepwater Horizon.

Congress enacted no new legislation in response to the BP spill

Kiley Kroh and Michael Conathan 2012. (Kroh - Associate Director for Ocean Communications at Center for American Progress. Conathan - Director of Ocean Policy at Center for American Progress; former staff member for the Senate Committee on Commerce, Science, and Transportation’s Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard; master’s degree in marine affairs from the Univ of Rhode Island) 19 Apr 2012 “The Lasting Impact of Deepwater Horizon” <http://www.americanprogress.org/issues/green/news/2012/04/19/11409/the-lasting-impact-of-deepwater-horizon/>

Two years ago the United States spent 89 days battling the single-biggest offshore oil spill in our nation’s history. But Congress hasn’t enacted a single piece of legislation in response. Ample proposals were put forward to restore the Gulf, reinforce offshore drilling safety standards, and raise the liability limit for oil companies in violation of drilling safety rules, which is currently at an outrageously low $75 million.

Obama Administration policy says offshore drilling is safe

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

Just a few months after the worst offshore oil spill in world history was finally plugged, the Obama administration lifted its short-lived offshore drilling moratorium that was imposed during the spill. It did this on the premise that permits would be issued only if offshore drilling could be done safely. So by granting the first new permit, the Administration signaled that new practices had made this previously disaster-prone industry safe.

Oil industry prioritizes profits over safety: millions spent on lobbying but not on safety

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

The choice of expenditures by the offshore oil and gas industry is also telling: millions are spent on lobbying for increased access, while little to no improvements have been made since the Deepwater Horizon to spill cleanup and response technologies that date back decades.64 All of these pieces of evidence lead to one conclusion: the offshore oil and gas industry has not changed its safety culture, continuing to prioritize profits over safety, and consequently offshore drilling remains a risky practice.

New rules would not have prevented Deepwater Horizon spill and do not protect against future ones

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

Looking carefully at what went wrong on the Deepwater Horizon allows an assessment of the efficacy of the new safety rules. Would the new rules prevent the same errors from being made, or the same technological failures from occurring? What about errors that may not have occurred in the case of the 2010 spill, but could be the cause of the next spill? While it’s impossible to anticipate other things that may go wrong, our analysis shows that while the new rules may increase safety to some degree, they likely would not have prevented the last major oil spill, and similarly do not adequately protect against future ones.

5 reasons offshore drilling safety regulations fail

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

A major limitation with the new safety measures is the fact that there are systemic underlying problems in the regulation of offshore drilling that undermine the effectiveness of the new measures. Consider these findings: **BOEMRE Can Grant “Departures”, or Exemptions, from Regulations.** Departures have been granted generously in the past. In the case of the Deepwater Horizon, MMS granted BP 12 departures, including one that dealt with the placement of a cement plug and may have contributed to the blowout. As long as departures can override safety requirements, the new measures can be rendered useless. **Economic Incentives Make Violating Rules Lucrative Because Penalties are Ridiculously Small.** The financial imbalance between civil penalties and operating costs often leads to rule-breaking, corner-cutting, and cost-cutting measures being taken. While operating costs for offshore rigs can be roughly $1,000,000 per day, fines for violations are capped at $40,000 per violation per day and most violations do not even incur fines. Given this situation, it is easy to see why violations are so frequent. Many rules were broken and actions taken to cut costs and save time on the rig before the BP oil spill, which highlights the incentives that exist for rule-breaking. As long as rule-breaking pays, new rules cannot protect us from a spill. **Blowout Preventers Continue to Have Critical Deficiencies.** A third party investigation commissioned by the Department of the Interior found that the Deepwater Horizon’s blind shear rams designed to cut through and block the pipe in the case of a blowout were unable to do so because the pipe buckled when the well blew out. Since the blowout preventer on the Deepwater Horizon is a standard design, a similar problem could occur on any well in a blowout scenario. The new safety requirements do not address this deficiency, leaving the failure of blowout preventers as a possible outcome in the case of future blowouts. **Oversight and Inspection Levels are Paltry Relative to the Scale of Drilling Operations.** Ensuring the efficacy of many of the new rules would require much more oversight than currently exists. While BOEMRE has attempted to strengthen its inspection and oversight capabilities, funding levels remain far below what would be needed to, in the BOEMRE director’s own words, “do the job the public deserves.”1 Consequently, inspection rates remain anemic, undermining regulatory compliance by reducing the odds that violations will be observed. Anemic inspection rates also limit real-time monitoring of operations by inspectors, a crucial need to avert disasters as problems are difficult to foresee even a few days before they occur, as illustrated on the Deepwater Horizon. **Industry’s Safety Culture Has Not Changed Sufficiently.** The National Commission called for “sweeping reforms” and a “fundamental transformation” in the industry’s safety culture.2 Unfortunately, the industry has failed to make such a transformation, and instead remains on a similar course to the one it was on prior to the spill. A look at the many flaws in the well containment systems the industry frequently touts, and the industry’s continued lobbying for expedited permitting and limited safety measures demonstrates this point.

BOEMRE [ Bureau of Offshore Energy Management, Regulation and Enforcement ] approves drilling even when oil companies make impossible cleanup capability claims

Impact: Negates the ability to reduce drilling risks

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

To give just one example, many oil companies have claimed their capacity to mechanically recover oil from water via skimming exceeds 100,000 barrels per day. A particularly egregious case, BOEMRE approved a plan by Shell wherein Shell claimed its recovery rate via mechanical skimming would be 606,000 barrels per day. Contrary to these claims, oil companies cannot recover 100,000, let alone 600,000, barrels of oil per day from Gulf waters via skimming. During the Deepwater Horizon spill, when every available skimming vessel, including retrofitted fishing boats, was utilized, the National Oceanic and Atmospheric Administration estimates that a paltry 1,800 barrels of oil per day was recovered via skimming, or 300 times less than Shell’s claimed capability. No technological breakthroughs have occurred since the Deepwater Horizon that would suggest skimming capabilities are any different today. Even so, BOEMRE accepted Shell’s application, and many others like it, that contained this egregious claim, betraying the intent of recent NTLs and ultimately negating their potential to alleviate the risks associated with offshore drilling.

“Notices to Lessees” (NTLs) – Not effective

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

New Notices to Lessees (“NTLs”) Have Been Ineffective  
As part of its reaction to the BP spill, BOEMRE issued two Notices to Lessees, or “NTLs”, which merely clarify or reinforce existing regulations. The two NTLs clarify the new information that Exploration Plans must include to help BOEMRE evaluate drilling risks. For example, companies must report their assessments of what a worst case spill would look like, how long spill response would take, how much oil could be cleaned up in the event of a spill, and the like. However, BOEMRE has failed to use this information to guard against spills and improve offshore safety because of two problems. No quantitative standards by which to gauge the newly required information have been established, so applications are approved based on their completeness rather than their potential environmental impact. BOEMRE has continued MMS's practice of rubberstamping plans and permits, approving those that contain patently inaccurate information and extreme exaggerations. Despite these problems, based on the number and speed of approvals, it appears that BOEMRE has no intention of denying drilling permits, no matter how egregious.

Training & Maintenance Regulations – won’t improve safety

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

Training and Maintenance Regulations Won’t Substantially Improve Safety. BOEMRE’s inspection capabilities are not sufficient to guarantee operators adhere to training requirements and that maintenance is conducted as required. Perverse financial incentives also can undermine training and maintenance programs. Blowout preventer maintenance requirements won’t address the underlying deficiencies in their functionality.

Testing Requirements – unlikely to prevent major spills

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

Testing Requirements Are Unlikely to Prevent Major Spills. The efficacy of testing requirements is undermined by the systemic problems described above such as perverse economic incentives to skip or ignore tests to save time, deficiencies in blowout preventers, and BOEMRE’s woefully inadequate inspection program. In addition, testing methods often do not mimic the real world conditions that would exist during a spill, particularly for blowout preventers. There is also no requirement to ensure that blind shear rams can shear tool joints, and they generally can not.

Well Design and Equipment Rules – won’t work

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

Well Design and Equipment Rules Are Too Weak to Prevent Accidents. The new regulations for well design and equipment, while promising, fall prey to the systemic problems described above. Notably, BOEMRE’s oversight is not sufficient to ensure that the rules are being followed. Also, civil penalties are too low to deter rule-breaking. New well design and equipment rules are themselves flawed as well, which further undercuts their effectiveness.

“Safety Case” Plan – fails to prevent spills

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

**The Similar “Safety Case” Approach is Also Flawed.** The “safety case” approach used elsewhere in the world, including in the North Sea, is similar to SEMS. However, "safety case" does not prevent serious oil spills. One analysis showed a regular spill frequency of about one spill per week in the North Sea, in spite of the “safety case” approach being used, based on self reported data. The actual number of spills may be even higher. In addition, the recent large spill by Shell in the North Sea clearly demonstrates the fallibility of the “safety case” approach.

“Stop Work” Policies – not effective

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

**“Stop Work” Policies Don’t Work.** The use of a “Stop Work Authority,” which grants any employee the right to stop work if he or she perceives a danger, also will not greatly change spill risks because these policies already exist. On the Deepwater Horizon, each company (BP, Transocean, and Halliburton) had “stop work” policies in place, yet no employee invoked his or her authority to stop work despite many indications that there was a problem. This may be due to fear of reprisal, something that is difficult to address through regulations.

“ Flow Barriers” – not effective due to Operator Error

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

**Potential for Operator Error Remains –** If effective barriers to flow were correctly installed, these could in fact protect against blowouts. However, the requirements for two barriers to flow can easily be undermined by operator error. This problem is illustrated by the Deepwater Horizon disaster, where a cement job, a common barrier to flow, was compromised by numerous operator errors. With limited funds for inspection and oversight, and perverse economics that incentive project speed over safety, it is likely that not all barriers will be properly installed.

“SEMS” – won’t work, failed in the past

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

Safety and Environmental Management Systems (“SEMS”) are Unlikely to Alleviate Drilling Risks SEMS requires operators to proactively identify, analyze, and manage safety, environmental hazards, and impacts at all stages of offshore resource development. Like the Interim Drilling Safety Rule, the benefit of SEMS on offshore safety is undercut by overarching regulatory problems as well as by flaws in SEMS itself. BP Had Similar Policies in Place Prior to Spill. Many BP policies, such as its “Management of Change” process, that were in place on the Deepwater Horizon the day of the blowout mirrored aspects of SEMS, yet they did not prevent the spill. Rather, employees failed to follow the policies, and in some cases cut corners to lower costs without formally assessing risks, even though BP‟s policies required such an assessment. While these policies were implemented voluntarily, anemic inspection rates and paltry financial penalties for violations make it likely that offshore workers will similarly ignore SEMS requirements when profits are at stake. SEMS Has Failed to Protect Against Spills in the Past. SEMS is not a new concept and most operators have used it in the past. But in years when SEMS adoption was as high as 98%, large spills and other violations still occurred as frequently as in recent years.

Physically impossible to fully contain large ocean oil spills

Dr Jeffrey Short 2010. (Ph.D., Fisheries Biology, University of Alaska; retired after 31 years as research chemist at National Oceanic & Atmospheric Administration) 9 June 2010 Oral Testimony to the Energy & Environment Subcommittee, US House of Representatives Committee on Science, Space & Technology <http://oceana.org/en/our-work/stop-ocean-pollution/oil-pollution/learn-act/the-facts-dr-jeffrey-short>

Major spills always encourage people to think about better ways to clean them up. These ideas usually focus on better skimmers and oil collection devices at sea, better dispersants, and better biological treatments to degrade oil that impacts beaches and marshes. These ideas are welcome and should be encouraged through a more focused and sustained federal research enterprise. But as noted in a consensus statement of oil spill researchers convened in Baton Rouge a couple of weeks ago to evaluate dispersant use on the Deepwater Horizon blowout, once a spill exceeds a certain threshold, and we’re way past it with the Deepwater Horizon, it is simply not possible to fully contain it no matter what you do. The reason is not because we lack effective technologies for skimming, dispersing or degrading oil. It’s because we lack the ability to apply them at the scale required.

Even with new technologies, sea clean-up options can never get more than a small fraction of the spilled oil

Dr Jeffrey Short 2010. (Ph.D., Fisheries Biology, University of Alaska; retired after 31 years as research chemist at National Oceanic & Atmospheric Administration) 9 June 2010 written statement to the Energy & Environment Subcommittee, US House of Representatives Committee on Science, Space & Technology <http://oceana.org/en/our-work/stop-ocean-pollution/oil-pollution/learn-act/the-facts-dr-jeffrey-short>

Even when used in combination effectively, response options at sea usually cannot be applied to more than a small fraction of the oil discharged during a large-scale release. The reason has more to do with the difficulty of bringing the necessary resources for applying these mitigation methods at the scale required than with limitations inherent to the methods themselves. All three at-sea response options require mild weather conditions and daylight, which all but guarantees they will not be able to be applied to much of the oil. New response technologies that are brought forward generally face the same challenges of delivering them on the scale, duration and at the rate needed to make a material difference during a large-scale release, and are therefore less effective than it might seem. Hence, most of the oil from large scale releases either drifts out to the open ocean where it slowly weathers to form tarballs that eventually sink to the deep ocean seafloor, or else impacts shorelines, where additional measures may be brought to bear to mitigate impacts.

Containment impossible. It is physically impossible to fully contain a large oil spill or its impacts

Dr Jeffrey Short 2010. (Ph.D., Fisheries Biology, University of Alaska; retired after 31 years as research chemist at National Oceanic & Atmospheric Administration) 9 June 2010 written statement to the Energy & Environment Subcommittee, US House of Representatives Committee on Science, Space & Technology <http://oceana.org/en/our-work/stop-ocean-pollution/oil-pollution/learn-act/the-facts-dr-jeffrey-short> (brackets added)

The fundamental problem becomes one of keeping track of all the oil parcels moving ever farther away from each other in a big ocean, and having the resources to identify and deliver the right combination of response options in a timely manner before loosing track of the oil again. At some point this challenge becomes hopeless beyond some size threshold. It is for these and related reasons that a scientific panel recently convened to review dispersant use for the Deepwater Horizon blowout concluded that “No combination of response actions can fully contain oil or mitigate impacts from a spill the size and complexity of the DWH [Deepwater Horizon] incident” (Coastal Response Research Center 2010).

HARMS

Arctic drilling can never be made safe: Unique animals are at risk of extinction

Rebecca Noblin 2012. (JD from Harvard Law School; Alaska director at the Center for Biological Diversity) quoted by Center for Biological Diversity, 30 Aug 2012 “ Obama Ignores Huge Dangers in Approving Arctic Drilling Permit for Shell” <http://www.biologicaldiversity.org/news/press_releases/2012/arctic-drilling-08-30-2012.html>

“While opposition to Shell’s drilling plans has resulted in significant safety improvements, Arctic drilling can never really be safe. The president is putting America’s natural heritage on the line just to add to Shell’s bottom line,” Noblin said. “Make no mistake: Once we’ve ruined the Arctic for wildlife, we’ll never get it back. The unique animals that evolved over millions of years to survive in this frozen wilderness — and nowhere else — will be condemned to extinction.”

Arctic offshore drilling could have catastrophic environmental and economic consequences

US Dept of the Interior 2013. REVIEW OF SHELL’S 2012 ALASKA OFFSHORE OIL AND GAS EXPLORATION PROGRAM, MARCH 8, 2013 <http://www.doi.gov/news/pressreleases/loader.cfm?csModule=security/getfile&pageid=348469>

As detailed in this report, the past drilling season offers lessons for Shell, other companies interested in offshore Arctic exploration, and government regulators. The stakes are high in the Arctic. The oil and gas resources in the Alaskan Arctic are potentially world class, and exploring for them requires years of planning and enormous up front capital expenditures. The risks are substantial and unique as well. As Shell’s experience last year makes clear, the waters off Alaska present myriad challenges and dangers during every phase of an offshore operation. A significant accident or spill in the remote and inhospitable Alaskan Arctic could have catastrophic consequences on fragile ecosystems and the people who depend on the ocean for subsistence.

Oil spills kill marine birds and mammals

National Research Council of the National Academy of Sciences 2003. Oil in the Sea III: Inputs, Fates, and Effects, <http://www.nap.edu/openbook.php?record_id=10388&page=29>

Marine birds and mammals may be especially vulnerable to oil spills if their habitats or prey become contaminated. In addition to acute effects such as high mortality, chronic, low-level exposures to hydrocarbons may affect survival and reproductive performance of seabirds and some marine mammals. Sublethal effects of oil on seabirds include reduced reproductive success and physiological impairment, including increased vulnerability to stress (reviewed in Hunt, 1987; Fry and Addiego, 1987, 1988; Briggs et al., 1996). In contrast, in marine mammals, sublethal exposure to petroleum hydrocarbons has been shown to cause minimal damage to pinnipeds and cetaceans (e.g., Geraci, 1990; St. Aubin, 1990), although sea otters appear to be more sensitive (Geraci and Williams, 1990; Monson et al., 2000). Oil can also indirectly affect the survival or reproductive success of marine birds and mammals by affecting the distribution, abundance, or availability of prey.

Even low concentrations of oil kill fish

National Research Council of the National Academy of Sciences 2003. Oil in the Sea III: Inputs, Fates, and Effects, <http://www.nap.edu/openbook.php?record_id=10388&page=127> (brackets added)

Several studies have demonstrated the potential for oil residuals on beach sediments to have significant toxic effects on fish eggs and embryos. Heintz et al. (1999) reported embryo mortality of pink salmon with laboratory exposure to aqueous total PAH [Polycyclic Aromatic Hydrocarbons] concentrations as low as 1 ppb [part per billion] total PAH derived from artificially weathered Alaska North Slope crude oil. This is consistent with the field observations of Bue et al. (1996) of embryo mortality of pink salmon in streams traversing oiled beaches following the spill from the Exxon Valdez. Carls et al. (1999) exposed Pacific herring eggs for 16 days to weathered Alaska North Slope crude oil and observed that exposure to initial aqueous concentrations as low as 0.7 ppb PAH caused developmental malformations, genetic damage, mortality, decreased size at hatching, and impaired swimming. Concentrations as low as 0.4 ppb caused premature hatching and yolk-sac edema. Exposure to less weathered oil produced similar results but at higher exposure concentrations (9.1 ppb). Other investigators have observed developmental effects on fish and invertebrates exposed to low concentrations of petroleum hydrocarbons (Capuzzo et al., 1988).

Oil spills kill marine life

Dr. Mary Annette Rose 2009. (Ed.D., assistant professor in the Department of Technology at Ball State University) The Environmental Impacts of Offshore Oil Drilling, THE TECHNOLOGY TEACHER, Feb 2009 (brackets added) <http://www2.tec.ilstu.edu/students/tec_304/Rose%20Oil%20Drilling.pdf>

While natural seepages contribute more hydrocarbons to the marine environment by volume, the quick influx and concentration of oil during a spill makes them especially harmful to localized marine organisms and communities. Plants and animals that become coated in oil perish from mechanical smothering, birds die from hypothermia as their feathers lose their waterproofing, turtles die after ingesting oil-coated food, and animals become disoriented and exhibit other behavior changes after breathing volatile organic compounds. When emitted into the marine environment, oil, produced water, and drilling muds may adversely impact an entire population by disrupting its food chain and reproductive cycle. Marine estuaries are especially susceptible, as hydrocarbons and other toxins tend to persist in the sediments where eggs and young often begin life.

Oil spills threaten human health by direct contact with hazardous chemicals and eating contaminated fish

Dr. Mary Annette Rose 2009. (Ed.D., assistant professor in the Department of Technology at Ball State University) The Environmental Impacts of Offshore Oil Drilling, THE TECHNOLOGY TEACHER, Feb 2009 (brackets added) <http://www2.tec.ilstu.edu/students/tec_304/Rose%20Oil%20Drilling.pdf>

Workers, victims of oil spills, and rescue workers are exposed to a host of chemical hazards. When people come in dermal contact with drilling fluids, muds, and cuttings, they can experience dermatitis; as exposure increases, impacts can include hypokalemia, renal toxicity, and cardiovascular and neuromuscular effects (ATSDR, 2007). Exposure to volatile aromatic hydrocarbons (e.g., benzene) results in respiratory distress and unconsciousness. Long term exposure can cause anemia, leukemia, reproductive problems, and developmental disorders (ATSDR, 2007). Exposure to fine particulate matter, nitrogen oxides, sulphur, and dozens of hydrocarbons (e.g., PAH) emitted from diesel and gasoline engines, is linked to a variety of health impacts, including asthma attacks, cancer, endocrine disruption, and cardiopulmonary ailments. Because toxins bioaccumulate in fish, people who eat fish and shellfish from affected waters may experience nervous system effects, such as impairment of peripheral vision and seizure. Children and fetuses are especially vulnerable; exposure to toxins impairs physical and cognitive development.

BP Oil spill caused huge economic impact: Economic and health claims total $7-8 billion

Reuters news service 2013. (Jonathan Stempel, journalist) 1 Apr 2013 “Patrick Juneau, BP Spill Claims Administrator, Urges Dismissal Of Company's Lawsuit” Patrick Juneau, BP Spill Claims Administrator, Urges Dismissal Of Company's Lawsuit

BP had last month urged U.S. District Judge Carl Barbier in New Orleans to issue an emergency order to stop court-appointed administrator Patrick Juneau from paying out "absurd" amounts based on inflated or fictitious claims. The oil company originally expected the March 2012 class-action settlement to resolve economic and health claims by more than 100,000 individuals and businesses to cost $7.8 billion. But damages are not capped, and BP's estimate of the cost grew to $8.5 billion by year end. It said Juneau's methods give him too much leeway to boost payouts, potentially by billions of dollars, and make payments for damage that never took place. In Monday court filings, lawyers for Juneau said he deserves judicial immunity from being sued over his work, saying this immunity encourages "principled and fearless decision making" without the threat of interference from unhappy litigants.

Total financial impact of Deepwater Horizon spill = $42-$70 billion plus $13 billion in lost tax revenue

Kiley Kroh, Michael Conathan, Emma Huvos 2012. (Kroh - Associate Director for Ocean Communications at Center for American Progress. Conathan - Director of Ocean Policy at Center for American Progress; former staff member for the Senate Committee on Commerce, Science, and Transportation’s Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard; master’s degree in marine affairs from the Univ of Rhode Island.) Putting a Freeze on Arctic Ocean Drilling Feb 2012 <http://www.americanprogress.org/issues/2012/02/pdf/arcticreport.pdf>

Even with the resources and infrastructure in place at the time of the spill, plus the extraordinary mobilization of people and equipment to the region, the damage to the Gulf Coast was catastrophic. Nearly 5 million barrels of oil leaked from the Macondo well, contaminating 665 miles of coastline and necessitating the use of 1.8 million gallons of dispersant, 13.5 million feet of boom, and 411 in-situ burns to contain the spill. The final price tag will be astronomical. BP has said the total bill for the oil spill will be $42 billion, while some analysts have projected a worst-case scenario price tag in excess of $70 billion. The spill came at a cost to the unsuspecting American taxpayer, as well. The oil giant was able to cut its 2010 tax bill by almost $13 billion by writing off its losses due to the spill.

“Cleanup creates jobs” – Response: Cleanup benefits are only temporary and cause more problems. Shoreline communities are torn apart

Dr Jeffrey Short 2010. (Ph.D., Fisheries Biology, University of Alaska; retired after 31 years as research chemist at National Oceanic & Atmospheric Administration) 9 June 2010 written statement to the Energy & Environment Subcommittee, US House of Representatives Committee on Science, Space & Technology <http://oceana.org/en/our-work/stop-ocean-pollution/oil-pollution/learn-act/the-facts-dr-jeffrey-short>

Oil spill cleanup efforts may provide a temporary boon to local economies by providing a source of additional income, which may be especially welcome by those livelihoods are jeopardized by fishery closures, product contamination or oil-related declines in tourism. However, these benefits are typically short-lived, and may create additional adverse social impacts. Selective participation in cleanup efforts may create winners and losers within the same communities, engendering resentments that can seriously damage the character and social fabric of these communities. Protracted lawsuits typically add to individual and community stress. In extreme cases, where some members of a community are financially ruined while others are enriched, the result may be considerably increased incidences of domestic violence, substance abuse, violent crime and suicide, as was documented in communities affected by the 1989 Exxon Valdez spill (Russell et al. 1996).

SOLVENCY / ADVOCACY

Opening the Arctic for offshore oil drilling is a big mistake: Drilling is risky, cleanup is impossible

Rebecca Noblin 2012. (JD from Harvard Law School; Alaska director at the Center for Biological Diversity) quoted by Center for Biological Diversity, 30 Aug 2012 “ Obama Ignores Huge Dangers in Approving Arctic Drilling Permit for Shell” <http://www.biologicaldiversity.org/news/press_releases/2012/arctic-drilling-08-30-2012.html>

“By opening the Arctic to offshore oil drilling, President Obama has made a monumental mistake that puts human life, wildlife and the environment in terrible danger. The harsh and frozen conditions of the Arctic make drilling risky, and an oil spill would be impossible to clean up,” said Rebecca Noblin, Alaska director at the Center for Biological Diversity.

We need to put a hold on Arctic oil drilling

Frances Beinecke 2013. (President, Natural Resources Defense Council; master's degree from the Yale School of Forestry and Environmental Studies; appointed by Pres. Obama to the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling) After Shell Fiasco, Oil Companies Acknowledge Hazards of Arctic Drilling 29 Mar 2013 <http://switchboard.nrdc.org/blogs/fbeinecke/after_shell_fiasco_oil_compani.html>

Now it’s time for the Obama Administration to put this risky and dangerous drilling on hold immediately. It should not make any new decisions until it has completed a more thorough review of all drilling operations in the Arctic. Nominee for Secretary of the Interior Sally Jewell should prioritize this and ensure the Interior Department does not make the same mistakes again. Shell’s track record reveals the dangers of reckless action in the Arctic. We must protect this wild ocean before a major disaster occurs.

DISADVANTAGE RESPONSES

New Outer Continental Shelf drilling would have insignificant impact on oil prices

Ellycia Harrould-Kolieb, Jacqueline Savitz, Dr. Jeffrey Short and Marianne Veach 2009. (Harrould-Kolieb - Master of Environment from the University of Melbourne, Australia. Savitz - master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Short - Ph.D., Fisheries Biology, University of Alaska ; research chemist at National Oceanic & Atmospheric Administration. Veach – climate change intern at Oceana) March 2009 TOXIC LEGACY: LONG-TERM EFFECTS OF OFFSHORE OIL ON WILDLIFE & PUBLIC HEALTH <http://oceana.org/sites/default/files/reports/Toxic_Legacy_FINAL.pdf>

Economic analyses that clearly showed additional oil drilling from the U.S. outer continental shelf would have almost no impact on gasoline prices, and even less on the country’s dependence on foreign oil, were seemingly ignored. In the process, two layers of protection for our coasts and oceans were removed. First, an Executive moratorium originally enacted by President George H.W. Bush, and expanded to Bristol Bay, Alaska by President Clinton, was lifted. Next, a long-standing moratorium created by Congress was allowed to expire, leaving most of our oceans and coasts vulnerable to oil development. Together, these restrictions had prevented oil production and coastal industrialization on much of the outer continental shelf and protected coastal areas for more than 25 years until the rush to drill took hold during the 2008 elections. At the same time, large swaths of the Chukchi and Beaufort Seas, which were not covered by the moratoria or other protections, have been made available to oil companies for leasing and exploration. But the hard economic facts remain. The Energy Information Agency reports that the outer continental shelf area previously covered by moratoria could produce no more than one percent of the United States’ daily needs, even on days when it is at peak production, an amount projected to have an insignificant impact on the price of oil.

Increased Outer Continental Shelf (OCS) drilling would have no significant impact on oil prices

US Energy Information Administration 2007. “Impacts of Increased Access to Oil and Natural Gas Resources in the Lower 48 Federal Outer Continental Shelf” <http://www.eia.gov/oiaf/aeo/otheranalysis/ongr.html>

The projections in the OCS access case indicate that access to the Pacific, Atlantic, and eastern Gulf regions would not have a significant impact on domestic crude oil and natural gas production or prices before 2030. Leasing would begin no sooner than 2012, and production would not be expected to start before 2017. Total domestic production of crude oil from 2012 through 2030 in the OCS access case is projected to be 1.6 percent higher than in the reference case, and 3 percent higher in 2030 alone, at 5.6 million barrels per day. For the lower 48 OCS, annual crude oil production in 2030 is projected to be 7 percent higher—2.4 million barrels per day in the OCS access case compared with 2.2 million barrels per day in the reference case (Figure 20). Because oil prices are determined on the international market, however, any impact on average wellhead prices is expected to be insignificant.

Oil prices have very small effect on the economy

Dr. Lutz Kilian 2009. (Ph.D. in Economics; prof. of economics at University of Michigan) Oil Price Volatility: Origins and Effects, December 1, 2009 <http://www.wto.org/english/res_e/reser_e/ersd201002_e.pdf>

The second problem is that, to the extent that oil prices affect domestic output, under standard assumptions their impact should be bounded by the cost share of oil in domestic production, which is known to be very small. For example, for the United States, the ratio of imported and domestically produced crude oil in GDP has been fluctuating between 1 and 5 percent (see Edelstein and Kilian 2007). Thus, if oil price shocks are viewed as cost shocks for the oil-importing economy, their effect by construction cannot be very large. Indeed, Backus and Crucini (2000) have demonstrated that standard production-based general equilibrium models of the transmission of oil price shocks are not capable of explaining large fluctuations in real GDP. This type of result came as a surprise to many researchers who expected oil price shocks to be a major determinant of the business cycle.

Imports don’t determine US oil prices because prices are based on global markets

Dr. Keith Crane, Dr. Andreas Goldthau, Dr. Michael Toman, Dr. Thomas Light, Dr. Stuart E. Johnson, Alireza Nader, Dr. Angel Rabasa, Harun Dogo 2009. (Crane - Ph.D. economics, Indiana Univ. Johnson - Ph.D. physics, Mass. Institute of Technology. Goldthau – PhD politics, Freie University, Berlin. Toman - Ph.D. in economics, Univ of Rochester. Light – PhD economics, Cornell Univ. Nader - Masters degree in international affairs, George Washington Univ. Rabasa –Ph.D. history, Harvard Univ. Dogo - Ph.D. candidate in policy analysis, Pardee RAND Graduate School; M.S. in defense analysis, Naval Postgraduate School) Imported Oil and U.S. National Security <http://www.rand.org/content/dam/rand/pubs/monographs/2009/RAND_MG838.pdf>

The gap between U.S. production and consumption is so large that eliminating it would entail extraordinarily costly changes to patterns of consumption and production of fuels. Moreover, even if total U.S. imports were cut sharply, the price of oil in the United States would still be determined by global, not national, shifts in supply and demand. A large, extended reduction in the global supply of oil would trigger a sharp rise in the price of oil and lead to a sharp fall in economic output in the United States, no matter how much or how little oil the United States imports.

Doesn’t matter where oil comes from: It’s a global market

Dr. Keith Crane, Dr. Andreas Goldthau, Dr. Michael Toman, Dr. Thomas Light, Dr. Stuart E. Johnson, Alireza Nader, Dr. Angel Rabasa, Harun Dogo 2009. (Crane - Ph.D. economics, Indiana Univ. Johnson - Ph.D. physics, Mass. Institute of Technology. Goldthau – PhD politics, Freie University, Berlin. Toman - Ph.D. in economics, Univ of Rochester. Light – PhD economics, Cornell Univ. Nader - Masters degree in international affairs, George Washington Univ. Rabasa –Ph.D. history, Harvard Univ. Dogo - Ph.D. candidate in policy analysis, Pardee RAND Graduate School; M.S. in defense analysis, Naval Postgraduate School) Imported Oil and U.S. National Security <http://www.rand.org/content/dam/rand/pubs/monographs/2009/RAND_MG838.pdf>

The fungibility of oil has implications for energy security whose importance cannot be overstated: From an economic perspective, where the United States acquires its oil has become irrelevant. Disruptions of supplies or jumps in demand anywhere in the world will be distributed across the world market. Conversely, attempts by foreign suppliers to target supply reductions toward specific importers cannot succeed because oil will be sold on through the markets to the highest bidder, whoever that may be.

Reduced Mid East oil revenues would not hurt Al Qaeda

Dr. Keith Crane, Dr. Andreas Goldthau, Dr. Michael Toman, Dr. Thomas Light, Dr. Stuart E. Johnson, Alireza Nader, Dr. Angel Rabasa, Harun Dogo 2009. (Crane - Ph.D. economics, Indiana Univ. Johnson - Ph.D. physics, Mass. Institute of Technology. Goldthau – PhD politics, Freie University, Berlin. Toman - Ph.D. in economics, Univ of Rochester. Light – PhD economics, Cornell Univ. Nader - Masters degree in international affairs, George Washington Univ. Rabasa –Ph.D. history, Harvard Univ. Dogo - Ph.D. candidate in policy analysis, Pardee RAND Graduate School; M.S. in defense analysis, Naval Postgraduate School) Imported Oil and U.S. National Security <http://www.rand.org/content/dam/rand/pubs/monographs/2009/RAND_MG838.pdf>

The importance of donations from individuals and charities in oil-rich Middle Eastern states for financing al Qaeda and its affiliates has declined as terrorist groups have increasingly turned to crime to finance their attacks. Moreover, the costs of perpetrating a terrorist attack are so small ($15,000 to $500,000) that even a substantial fall in Middle Eastern oil revenues would not affect al Qaeda’s ability to raise sufficient funds to finance its operations.

Oil revenues have no bearing on terrorists’ ability to finance their operations

Dr. Keith Crane, Dr. Andreas Goldthau, Dr. Michael Toman, Dr. Thomas Light, Dr. Stuart E. Johnson, Alireza Nader, Dr. Angel Rabasa, Harun Dogo 2009. (Crane - Ph.D. economics, Indiana Univ. Johnson - Ph.D. physics, Mass. Institute of Technology. Goldthau – PhD politics, Freie University, Berlin. Toman - Ph.D. in economics, Univ of Rochester. Light – PhD economics, Cornell Univ. Nader - Masters degree in international affairs, George Washington Univ. Rabasa –Ph.D. history, Harvard Univ. Dogo - Ph.D. candidate in policy analysis, Pardee RAND Graduate School; M.S. in defense analysis, Naval Postgraduate School) Imported Oil and U.S. National Security <http://www.rand.org/content/dam/rand/pubs/monographs/2009/RAND_MG838.pdf>

Unfortunately, launching a terrorist attack is cheap. The bombings in London and Madrid cost in the thousands, not millions, of dollars. Because of pressure from governments around the world, al Qaeda and its ilk have found it more difficult to rely on donations for their activities. Consequently, al Qaeda and its affiliates have diversified their funding sources to the countries in which they operate or turned to criminal activities for a larger share of their revenues. The terrorists on whom the United States is most focused on pursing have become much less reliant on donations from individuals and charities in oil-rich states. Increases in oil revenues have no bearing on their ability to finance operations.

Oil isn’t necessary for rogue states, and most oil-exporters are not hostile to the US

Dr. Keith Crane, Dr. Andreas Goldthau, Dr. Michael Toman, Dr. Thomas Light, Dr. Stuart E. Johnson, Alireza Nader, Dr. Angel Rabasa, Harun Dogo 2009. (Crane - Ph.D. economics, Indiana Univ. Johnson - Ph.D. physics, Mass. Institute of Technology. Goldthau – PhD politics, Freie University, Berlin. Toman - Ph.D. in economics, Univ of Rochester. Light – PhD economics, Cornell Univ. Nader - Masters degree in international affairs, George Washington Univ. Rabasa –Ph.D. history, Harvard Univ. Dogo - Ph.D. candidate in policy analysis, Pardee RAND Graduate School; M.S. in defense analysis, Naval Postgraduate School) Imported Oil and U.S. National Security <http://www.rand.org/content/dam/rand/pubs/monographs/2009/RAND_MG838.pdf>

Oil exports are not a necessary condition for financing rogue states. North Korea is an oil importer but has built nuclear weapons. In the 1990s, when under the rule of the Taliban, Afghanistan, another oil importer, became a sanctuary for al Qaeda. In the 1990s, before it began exporting oil in large quantities, Sudan harbored Osama bin Laden. Most major oil exporters—for example, Canada, the largest supplier of oil to the United States—are not hostile to the United States.

Risks High: The toxic effects of offshore oil are bad

Benefits Low: Renewables can replace offshore oil and it doesn’t reduce foreign oil dependency

Ellycia Harrould-Kolieb, Jacqueline Savitz, Dr. Jeffrey Short and Marianne Veach 2009. (Harrould-Kolieb - Master of Environment from the University of Melbourne, Australia. Savitz - master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Short - Ph.D., Fisheries Biology, University of Alaska ; research chemist at National Oceanic & Atmospheric Administration. Veach – climate change intern at Oceana) March 2009 TOXIC LEGACY: LONG-TERM EFFECTS OF OFFSHORE OIL ON WILDLIFE & PUBLIC HEALTH <http://oceana.org/sites/default/files/reports/Toxic_Legacy_FINAL.pdf>

This report clearly shows the broad array of impacts that result from oil in the marine environment. These risks to marine life, human health and coastal economies are more likely to occur if there is expanded oil drilling on the outer continental shelf. The toxic effects of oil on marine life will be problematic even without a major spill. However, any spill will intensify those effects and take a toll on coastal communities and coastal economies. Most importantly, continuing our reliance on oil will worsen the already severe problems associated with climate change and ocean acidification, including their direct effects on marine life. Renewable energy, energy efficiency and electric transportation alternatives can eliminate the need for oil. In fact, alternative energy sources, such as offshore wind can supply our electricity needs in full. Meanwhile, oil production on the outer continental shelf will not come close to meeting the United States’ oil demand nor will it reduce foreign oil dependency.

SOURCE INDICTMENT

American Petroleum Institute

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

**American Petroleum Institute (“API”) is an Unacceptable Licenser of Third Parties –** Many new well design and equipment regulations must be verified by an independent third party, but BOEMRE recognizes API-licensed organizations as independent third parties. API, a lobbying organization made up of oil and gas companies, lobbies for increasing drilling and relaxing permit review and safety measures. Using API as the arbiter of whether safety requirements are followed provides little in the way of guarantees.

2A EVIDENCE: ASIAN CARP

TOPICALITY

Great Lakes are part of the “marine environment,” according to the US Federal Government

Office of Ocean and Coastal Resource Management, NOAA Ocean Service 2011. “Snapshot of Great Lakes MPAs“ March 2011 <http://marineprotectedareas.noaa.gov/pdf/helpful-resources/greatlakes_mpa_snapshot.pdf>

What is a Marine Protected Area? Executive Order 13158 (see below) defines an MPA as “any area of the marine environment (including the Great Lakes) that has been reserved by federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein.” Key terms within the definition -- area, marine, reserved, lasting, and protection -- are defined in the Framework for the National System of Marine Protected Areas of the United States of America.

MINOR REPAIR RESPONSE

Anything less than full separation of the Chicago Area Waterway System (CAWS) will not prevent invasive species from spreading

Andy Buchsbaum, Glynnis Collins, Joel Brammeier, Jennifer Nalbone, Thomas Cmar, & Cheryl Mendoza 2011. (Buchsbaum – Regional Executive Director, National Wildlife Federation. Collins – Exec. Director, Prairie Rivers Network. Brammeier – President, Alliance for the Great Lakes. Nalbone – Director of Navigation and Invasive Species, Great Lakes United. Cmar – Midwest Program Attorney, Natural Resources Defense Council. Mendoza – Assoc. Director, Freshwater Future) Great Lakes and Mississippi River Interbasin Study (GLMRIS) Comments March 31, 2011 <http://www.nwf.org/~/media/PDFs/Regional/Great-Lakes/GLMRIS_CommentsFINAL.pdf> (brackets added)

It is obvious that physical separation prevents transfer of all aquatic organisms via aquatic connections, and that Congressionally mandated goal could be met by placing the divide at one of many alternative locations, each having very different costs and impacts. For example some locations may minimize the impacts on freight transport but complicate adjustments to wastewater infrastructure. Other locations may offer an ideal site for intermodal terminals that offset disruption of barge traffic by facilitating connections to the CREATE project‘s new rail network. Other possibilities that fall short of closing the aquatic connection (e.g. a chemically, radiologically or biologically-induced “dead zone”) might theoretically be capable of preventing 2-way spread of all species of ANS [aquatic nuisance species] including micro-organisms, but it is difficult to imagine how they might be implemented in practice, or operate during floods, etc. **Implement the preferred option in a manner that minimizes the cumulative risk of ANS transfer during the construction period.** All options that do not involve physical separation of the watersheds will have efficacy less than 100% and therefore merely postpone rather than prevent transfer of AIS [aquatic invasive species] through the CAWS.

“Reducing the Risk” is not enough – we have to absolutely prevent invasive species from the Great Lakes

Andy Buchsbaum, Glynnis Collins, Joel Brammeier, Jennifer Nalbone, Thomas Cmar, & Cheryl Mendoza 2011. (Buchsbaum – Regional Executive Director, National Wildlife Federation. Collins – Exec. Director, Prairie Rivers Network. Brammeier – President, Alliance for the Great Lakes. Nalbone – Director of Navigation and Invasive Species, Great Lakes United. Cmar – Midwest Program Attorney, Natural Resources Defense Council. Mendoza – Assoc. Director, Freshwater Future) Great Lakes and Mississippi River Interbasin Study (GLMRIS) Comments March 31, 2011 <http://www.nwf.org/~/media/PDFs/Regional/Great-Lakes/GLMRIS_CommentsFINAL.pdf> (first brackets added; other brackets and ellipses in original)

Only preventing the transfer of ANS [aquatic nuisance species] will effectively address the harm caused by invasive species. They can have, and already have had devastating impacts on the economy and ecology of the Great Lakes regions. Merely reducing the risk of invasive species spread is inadequate. The nature of the risk posed by ANS is different than the risk to water quality posed by other pollutants. Unlike nutrients and chemicals, ANS ―can reproduce and increase over time, persist indefinitely and spread over large regions. “[V]ery large, widespread and long-term impacts could potentially result from the discharge of a small number of individual organisms—in some cases as few as a single mated pair, or in the case of asexually-reproducing species, a single individual.” An example is the seaweed Caulerpa taxifolia, which has invaded “thousands of acres in the Mediterranean Sea and . . . two bays in California . . . [and which] consists of a single clone, and thus derives from a single individual.” Eliminating the spread of ANS is therefore the only option that would be sure to protect both basins.

INHERENCY

History of the man-made connection between Lake Michigan and the Mississippi River system – opened the way for transfer of invasive species

Attorneys General of Michigan, Wisconsin, Minnesota, Ohio, and Pennsylvania 2010. Brief filed 19 July 2010 in the case of STATE OF MICHIGAN, STATE OF WISCONSIN, STATE OF MINNESOTA, STATE OF OHIO, and COMMONWEALTH OF PENNSYLVANIA v. UNITED STATES ARMY CORPS OF ENGINEERS and METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO, US District Court, Northern District of Illinois <http://www.michigan.gov/documents/ag/Complaint_328189_7.pdf> (brackets added)

More than 100 years ago, Chicago area sewage and industrial waste discharged into the Chicago River flowed directly into Lake Michigan, polluting water intakes for Chicago's municipal water supply. 13. To address that problem, Illinois enacted laws creating the [Metropolitan Water Reclamation] District [of Greater Chicago] and providing for construction of a new canal, what is now known as the Chicago Sanitary and Ship Canal (Canal), connecting the Chicago River to the Illinois River and the Mississippi River Basin. 14. The District also constructed and operated facilities to reverse the natural flow of the Chicago River away from Lake Michigan, using water diverted from Lake Michigan to dilute and flush its wastes downstream and ultimately into the Mississippi River Basin. 15. This man-made connection of the Great Lakes Basin with the Mississippi River Basin, and the reversal of the natural flow of water (the diversion project), solved Chicago's immediate problem of contaminated water supplies, but simultaneously sowed the seeds of the present dispute by allowing fish and other biota, including invasive species, to migrate between the Great Lakes Basin and the Mississippi River Basin.

Prevention is key: Once they arrive, Asian Carp are difficult to stop

CHRISTIAN SCIENCE MONITOR 2012. (journalist Trevor Quirk) 27 Feb 2012 “Why Asian carp are such a threat” <http://www.csmonitor.com/Science/2012/0227/Why-Asian-carp-are-such-a-threat> (brackets added)

Then there's the Asian carp's fecundity. Female Bighead carp, for example, can carry up to 1 million eggs in a lifetime, much more than most native fish. They also reproduce rapidly, says [regional director for the Fish and Wildlife Service in Minneapolis, Charlie] Wooley. Once introduced, the Asian carp is difficult to stop.

Army Corps of Engineers is using an electric pulse device – but it’s not enough to keep the carp out of Lake Michigan

Associated Press 2010. (journalist John Flesher; has covered the Great Lakes since 1989) 11 Feb 2010 “Feds Pass on Surest Solution to Asian Carp Advance” <http://www.newsmax.com/US/US-Asian-Carp-Great/2010/02/11/id/349698>

Army Corps of Engineers officials are putting their faith in the two-tiered electric barrier in the Chicago Sanitary and Ship Canal about 25 miles from Lake Michigan, to which they will add a third section this year. It emits pulses to scare off the carp or knock them unconscious if they don't turn back. No carp have been found above the barrier, although biologists have detected their DNA in numerous spots past it and even within the lake itself. "While we're all talking," Lodge said, "the fish are swimming." That almost certainly means at least some carp have eluded the device and reached the lake. The government's plan aims to keep their number low enough to prevent them from breeding. The problem is that no one knows how many carp need to make it into the lake to establish a foothold that can't be turned back.

US Army Corps of Engineers “risk reduction” strategy takes too long and diverts resources away from genuine solutions

Andy Buchsbaum, Glynnis Collins, Joel Brammeier, Jennifer Nalbone, Thomas Cmar, & Cheryl Mendoza 2011. (Buchsbaum – Regional Executive Director, National Wildlife Federation. Collins – Exec. Director, Prairie Rivers Network. Brammeier – President, Alliance for the Great Lakes. Nalbone – Director of Navigation and Invasive Species, Great Lakes United. Cmar – Midwest Program Attorney, Natural Resources Defense Council. Mendoza – Assoc. Director, Freshwater Future) Great Lakes and Mississippi River Interbasin Study (GLMRIS) Comments March 31, 2011 <http://www.nwf.org/~/media/PDFs/Regional/Great-Lakes/GLMRIS_CommentsFINAL.pdf> (brackets added)

The GLMRIS [Great Lakes and Mississippi River Interbasin Study ] study was authorized by the U.S. Congress in 2007 to ―prevent rather than ―reduce the risk of aquatic invasive species movement between the Great Lakes and Mississippi River Basin. Risk reduction is not a credible strategy to prevent ANS movement through the CAWS or any of the other aquatic connections. Risk reduction and mitigation activities have been authorized and funded separately from GLMRIS, to deal with immediate threats associated with the open aquatic connections, and the long term threats associated with overland pathways. Expanding the scope of GLMRIS to address risk reduction will divert resources from quickly determining how to achieve prevention;

Dispersal Barrier System won’t stop Asian Carp migration into Lake Michigan

Attorneys General of Michigan, Wisconsin, Minnesota, Ohio, and Pennsylvania 2010. Brief filed 19 July 2010 in the case of STATE OF MICHIGAN, STATE OF WISCONSIN, STATE OF MINNESOTA, STATE OF OHIO, and COMMONWEALTH OF PENNSYLVANIA v. UNITED STATES ARMY CORPS OF ENGINEERS and METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO, US District Court, Northern District of Illinois <http://www.michigan.gov/documents/ag/Complaint_328189_7.pdf> (brackets added)

Information available to the District and the Corps demonstrates that even when completed, the Dispersal Barrier System cannot prevent the migration of bighead and silver carp through the Canal into Lake Michigan. Among other things: (a) The Dispersal Barrier System is experimental. (b) The Corps has acknowledged that the Barrier can be by-passed through the movement of water from carp-infested waters of the immediately adjacent Des Plaines River and Illinois and Michigan Canal, by means of flooding or cross- connections. While the Corps is currently planning to construct fences on a strip of land between those waterways to reduce those risks, they have yet been completed. (c) eDNA collected for the Corps indicates that Asian carp are present at multiple locations lakeward of the Barrier System, in the Canal, the Calumet-Sag Channel, the North Shore Channel, the Calumet River, and in Calumet Harbor in Lake Michigan. (d) On June 22, 2010, one bighead carp was caught in Calumet Lake lakeward of the Dispersal Barrier System.

Don’t need “more study” of Great Lakes/Mississippi invasive species: We already know the risks, and further study will undermine the goal of prevention

Andy Buchsbaum, Glynnis Collins, Joel Brammeier, Jennifer Nalbone, Thomas Cmar, & Cheryl Mendoza 2011. (Buchsbaum – Regional Executive Director, National Wildlife Federation. Collins – Exec. Director, Prairie Rivers Network. Brammeier – President, Alliance for the Great Lakes. Nalbone – Director of Navigation and Invasive Species, Great Lakes United. Cmar – Midwest Program Attorney, Natural Resources Defense Council. Mendoza – Assoc. Director, Freshwater Future) Great Lakes and Mississippi River Interbasin Study (GLMRIS) Comments March 31, 2011 <http://www.nwf.org/~/media/PDFs/Regional/Great-Lakes/GLMRIS_CommentsFINAL.pdf> (brackets added)

While it is important to consider the various species that might pose a particular risk of Great Lakes-Mississippi River Basin transfer via the CAWS [Chicago Area Waterway System], it is important to recognize that given the various life stages of potential species of concern (e.g. eggs, veligers, juveniles, depending on species), any type of hydrological connection between the basins presents a finite risk of transfer. Thus, we do not believe that an additional, full-blown assessment of relative risks of movement is necessary, and ask that GLMRIS [Great Lakes and Mississippi River Interbasin Study] should instead focus on identifying ways to prevent the interbasin transfer of all known ANS [aquatic nuisance species] via the CAWS [Chicago Area Waterway System], as well as types of ANS (already identified in other assessments) that could conceivably pose invasion risks in the future. It seems obvious that diverting time and effort studying relative risks of ANS movement through the CAWS will undermine the goal of achieving prevention in the most timely and least costly manner.

If Asian carp get into Lake Michigan, they could spread throughout the Great Lakes

Andy Buchsbaum, Glynnis Collins, Joel Brammeier, Jennifer Nalbone, Thomas Cmar, & Cheryl Mendoza 2011. (Buchsbaum – Regional Executive Director, National Wildlife Federation. Collins – Exec. Director, Prairie Rivers Network. Brammeier – President, Alliance for the Great Lakes. Nalbone – Director of Navigation and Invasive Species, Great Lakes United. Cmar – Midwest Program Attorney, Natural Resources Defense Council. Mendoza – Assoc. Director, Freshwater Future) Great Lakes and Mississippi River Interbasin Study (GLMRIS) Comments March 31, 2011 <http://www.nwf.org/~/media/PDFs/Regional/Great-Lakes/GLMRIS_CommentsFINAL.pdf> (brackets added)

While it is clear that the risk of invasion by Asian carp into Lake Michigan is high, it is also clear that there is significant potential for broad establishment in the Great Lakes Basin. A broad assessment utilizing environmental niche modeling found that the region in general could support all four of the Asian carp species of concern. Based upon general understanding of the species‘ life history, bighead and silver carp would likely need specific riverine conditions to spawn; yet research has shown that 22 tributaries in the upper four Great Lakes could offer suitable spawning habitat (i.e., undammed stretches for at least 100km) for the species. Recent research using bioenergetics modeling indicated limited supplies of plankton in the open waters, but adequate supplies in many bays, coastal wetlands, and embayments in the Great Lakes would have sufficient food sources (in particular plankton) to support growth of bighead and silver carp. These potential locations include some of the most productive fisheries in the Great Lakes, including Western Lake Erie, where an extensive recreational fishery for fish such as walleye and yellow perch has existed for decades.

eDNA samples show Asian carp are starting to get into Lake Michigan

Attorneys General of Michigan, Wisconsin, Minnesota, Ohio, and Pennsylvania 2010. Brief filed 19 July 2010 in the case of STATE OF MICHIGAN, STATE OF WISCONSIN, STATE OF MINNESOTA, STATE OF OHIO, and COMMONWEALTH OF PENNSYLVANIA v.UNITED STATES ARMY CORPS OF ENGINEERS and METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO, US District Court, Northern District of Illinois <http://www.michigan.gov/documents/ag/Complaint_328189_7.pdf> (brackets in original)

A series of eDNA sample results from the Des Plaines River, the Canal, and other connecting waterways indicate that Asian carp are present in the Canal north (above and upstream) of the Lockport Lock, in the North Shore Channel, in the Calumet-Sag Channel in the vicinity of the O'Brien Lock, in the Calumet River and in Calumet Harbor which is in Lake Michigan itself. 36. In December, 2009, a bighead carp was recovered from the Canal north of the Lockport Lock. 37. In June, 2010, a bighead carp was recovered from Lake Calumet, north of the O'Brien Lock and Dam and approximately six miles from Lake Michigan.

Definition of eDNA study

Attorneys General of Michigan, Wisconsin, Minnesota, Ohio, and Pennsylvania 2010. Brief filed 19 July 2010 in the case of STATE OF MICHIGAN, STATE OF WISCONSIN, STATE OF MINNESOTA, STATE OF OHIO, and COMMONWEALTH OF PENNSYLVANIA v.UNITED STATES ARMY CORPS OF ENGINEERS and METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO, US District Court, Northern District of Illinois <http://www.michigan.gov/documents/ag/Complaint_328189_7.pdf>

Beginning in 2009, the Corps undertook a program of environmental surveillance for silver and bighead carp using environmental DNA (eDNA) methods developed by the University of Notre Dame. In this method, samples of water are collected, filtered, and their contents analyzed for the presence of genetic material that has been emitted or secreted by those species.

eDNA studies are accurate

Attorneys General of Michigan, Wisconsin, Minnesota, Ohio, and Pennsylvania 2010. Brief filed 19 July 2010 in the case of STATE OF MICHIGAN, STATE OF WISCONSIN, STATE OF MINNESOTA, STATE OF OHIO, and COMMONWEALTH OF PENNSYLVANIA v.UNITED STATES ARMY CORPS OF ENGINEERS and METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO, US District Court, Northern District of Illinois <http://www.michigan.gov/documents/ag/Complaint_328189_7.pdf> (brackets in original)

In their Summary, the Quality Assurance team confirmed that the genetic markers utilized by the eDNA testing method detected only the target fish species, endorsed the eDNA testing field and laboratory protocols, acknowledged that the methods used during testing minimized the possibility of reporting false positive results, and concluded: "Our team believes that the eDNA method [the Corps is] using is sufficiently reliable and robust in reporting a pattern of detection that should be considered actionable in a management context. We have a high degree of confidence in the basic PCR method [the Corps is] using for detecting Silver and Bighead carp environmental DNA."

HARMS

Asian carp are growing exponentially, harm recreational & commercial fishing, injure boaters and damage property

Attorneys General of Michigan, Wisconsin, Minnesota, Ohio, and Pennsylvania 2010. Brief filed 19 July 2010 in the case of STATE OF MICHIGAN, STATE OF WISCONSIN, STATE OF MINNESOTA, STATE OF OHIO, and COMMONWEALTH OF PENNSYLVANIA v.UNITED STATES ARMY CORPS OF ENGINEERS and METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO, US District Court, Northern District of Illinois <http://www.michigan.gov/documents/ag/Complaint_328189_7.pdf>

Since their escape from ponds in the lower Mississippi River basin, both silver and bighead carp populations increased exponentially. They have rapidly migrated through, and become established in, rivers in the Mississippi River Basin, including the Illinois River. 29. By aggressively consuming available nutrient sources, silver and bighead carp have substantially disrupted and in some areas largely displaced native fish populations in these rivers, impairing recreational and commercial fishing. 30. Because of their large size and extreme jumping behavior, silver carp have injured boaters and caused property damage, thus impairing recreational boating.

Asian carp could have a significant economic impact on Great Lakes fisheries

Attorneys General of Michigan, Wisconsin, Minnesota, Ohio, and Pennsylvania 2010. Brief filed 19 July 2010 in the case of STATE OF MICHIGAN, STATE OF WISCONSIN, STATE OF MINNESOTA, STATE OF OHIO, and COMMONWEALTH OF PENNSYLVANIA v.UNITED STATES ARMY CORPS OF ENGINEERS and METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO, US District Court, Northern District of Illinois <http://www.michigan.gov/documents/ag/Complaint_328189_7.pdf>

Asian carp could have a devastating effect on the Great Lakes ecosystem and a significant economic impact on the $7 billion fishery. Once in Lake Michigan, this invasive species could access many new tributaries connected to the Great Lakes. These fish aggressively compete with native commercial and sport fish for food. They are well suited to the water temperature, food supply, and lack of predators of the Great Lakes and could quickly become the dominant species. Once in the lake, it would be very difficult to control them.

Asian carp migration into Lake Michigan is grave environmental and economic threat

Army Corps admits: Asian Carp in Lake Michigan = ecological and economic disaster

Attorneys General of Michigan, Wisconsin, Minnesota, Ohio, and Pennsylvania 2010. Brief filed 19 July 2010 in the case of STATE OF MICHIGAN, STATE OF WISCONSIN, STATE OF MINNESOTA, STATE OF OHIO, and COMMONWEALTH OF PENNSYLVANIA v.UNITED STATES ARMY CORPS OF ENGINEERS and METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO, US District Court, Northern District of Illinois <http://www.michigan.gov/documents/ag/Complaint_328189_7.pdf>

38. The migration of Asian carp, through the Canal and connecting waters into Lake Michigan, presents a grave threat of environmental and economic harm to all of the Great Lakes, as recognized by the Corps, the United States Fish and Wildlife Service (USFWS), and the State of Illinois, through its Department of Natural Resources (Illinois DNR). 39. For example, the Corps has acknowledged: Asian carp have the potential to damage the Great Lakes and confluent large riverine ecosystems by disrupting the complex food web of the system and damage to the sport fishing industry. Two species of Asian carp, bighead carp (Hypophthalmichthys nobilis) and silver carp (H. molitrix), have become well established in the Mississippi and Illinois River systems exhibiting exponential population growth in recent years. Certain life history traits have enabled bighead and silver carp to achieve massive population numbers soon after establishing. Currently, the Illinois River is estimated to have the largest population of bighead and silver carp in the world. The prevention of an interbasin transfer of bighead and silver carp from the Illinois River to Lake Michigan is paramount in avoiding ecological and economic disaster.

Asian Carp devastate fisheries

Fisheries & Oceans Canada, 2006. (Government of Canada, agency responsible for marine conservation) article date is 2006, web page was last modified 22 April 2013 “Will Asian Carp Invade Canada?” <http://www.dfo-mpo.gc.ca/science/Publications/article/2006/01-01-2006-eng.htm>

Too large for most predators to attack, the Asian carps roam and feed to their heart's content. In the lower Mississippi, the grass, bighead, and silver carps have taken over, now making up most of the aquatic biomass. They have devastated sport and commercial fisheries, displacing other species and destroying nets and gear.

Risk of carp impact on the Great Lakes is too big to accept

Associated Press 2010. (journalist John Flesher; has covered the Great Lakes since 1989) 11 Feb 2010 “Feds Pass on Surest Solution to Asian Carp Advance” <http://www.newsmax.com/US/US-Asian-Carp-Great/2010/02/11/id/349698>

The carp have already infested parts of the Mississippi and Illinois rivers, driving away many native fish. Silver carp are known to hurtle from the water at the sound of passing motors and slam into boaters with bone-breaking force. While scientists differ on whether the carp would thrive in the Great Lakes, which are colder, deeper and ecologically different than rivers, many say the risk is too great to take any chances. "None of us know for certain what their impact would be," University of Notre Dame biologist David Lodge told a House subcommittee this week. "There's only one way to find out, and I don't think any of us want that."

Ecosystem destruction: Asian carp leave a trail of destruction by consuming all the food in the ecosystem – leaving nothing for other fish

CHRISTIAN SCIENCE MONITOR 2012. (journalist Trevor Quirk) 27 Feb 2012 “Why Asian carp are such a threat” <http://www.csmonitor.com/Science/2012/0227/Why-Asian-carp-are-such-a-threat>

In the Mississippi and other American waterways, Asian carp "have left a trail of tremendous destruction," says Charlie Wooley, deputy regional director for the Fish and Wildlife Service, Minneapolis. Wooley says the carp's previous activity in other environments demonstrates its ability to "literally take over an ecosystem." Wooley told the Monitor of the carp's two major threats. The first is a food problem. Asian carp don't eat other fish, but because of their voracious appetites (consuming up to a third of their body weight per day) they could easily out-compete native fish that rely on specific sources of food. Each type of carp prefers a different food – varying from grass to plankton to snails and mussels –making their attack on the ecosystem somewhat multi-pronged. Moreover, these sources lie at the bottom of Great Lakes' food chain. Changes at the foundation tend to reverberate through the entire ecosystem.

Invasive species in the Great Lakes cause big economic cost

US Fish & Wildlife Service, Aquatic Nuisance Task Force 2012. “Aquatic Nuisance Species Task Force Strategic Plan (2013 – 2017)” <http://www.anstaskforce.gov/Documents/ANSTF%20Strategic%20Plan%202013-2017.pdf> (brackets added)

Over the past 200 years, more than 50,000 non-native plant and animal species have become established in the United States. Approximately one in seven has become invasive, with damage and control costs estimated at more than $120 billion per year - a cost higher than the total of all other natural disasters combined . Zebra and quagga mussels (Dreissena polymorpha, D. rostriformis bugensis) alone cause one billion dollars per year in damages. Another 100 million is spent annually in the United States to control nonnative aquatic weeds. In two California lagoons, more than $5 million was spent in the first 3 years of an ongoing eradication program for the seaweed Caulerpa taxifolia. As a final example, the Great Lakes States invested over $26.7 million toward prevention and control of aquatic invasive species in just 2 years, of which almost $900,000 was committed to Asian carp control efforts. These numbers are likely underestimated as they do not consider ecosystem health or the aesthetic value of nature, which can influence tourism and recreational revenue. Estimating the economic impact associated with ANS [aquatic nuisance species] is further confounded as monetary values are difficult to estimate for the extinction of species or loss of native biodiversity and ecosystem services.

Invasive species cause great damage in the Great Lakes

National Centers for Coastal Ocean Science, last updated in 2013. (research office of the NOAA National Ocean Service) “Forecasting Spread and Bioeconomic Impacts of Aquatic Invasive Species from Multiple Pathways to Improve Management and Policy in Great Lakes“ last updated 17 May 2013 <http://coastalscience.noaa.gov/projects/detail?key=149>

The many established invasive species have caused great damage in the Great Lakes. It has been estimated that dreissinid (zebra and quagga) mussels have cost the power industry over $3.1 billion between 1993 and 1999. Dreissinid mussels have also caused major disruption of food chains leading to the decline of important salmon fisheries in both Lakes Michigan and Huron.

If a small number of Asian carp get established in the Great Lakes, the impact will be severe

American Sportfishing Association 2013. (recreational fishing trade association) “The Advancing Threat of Asian Carp” <http://www.keepamericafishing.org/action/article_glum/the_advancing_threat_of_asian_carp1> (brackets added)

The Canadian Department of Fisheries and Oceans, with the help of the Great Lakes Fishery Commission, released a major, peer-reviewed study in July [2012], assessing the potential risk of Asian carp to the Great Lakes. The study concluded that that a small number of Asian carp can establish a population, and if Asian carp do become established in the Great Lakes, their impact would be severe. Suitable habitat exists in all five Great Lakes, though Lakes Erie and Ontario, and many embayments throughout the system, would be particularly hard-hit.

“No Asian carp yet in Lake Michigan” – Response: 1 was caught past the Disposal Barrier System, in a place where there is no further barrier between itself and Lake Michigan

Attorneys General of Michigan, Wisconsin, Minnesota, Ohio, and Pennsylvania 2010. Brief filed 19 July 2010 in the case of STATE OF MICHIGAN, STATE OF WISCONSIN, STATE OF MINNESOTA, STATE OF OHIO, and COMMONWEALTH OF PENNSYLVANIA v.UNITED STATES ARMY CORPS OF ENGINEERS and METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO, US District Court, Northern District of Illinois <http://www.michigan.gov/documents/ag/Complaint_328189_7.pdf>

Despite the Corps' and the District's repeated suggestions in recent months that eDNA data failed to establish the presence of Asian carp in the CAWS north of the Dispersal Barrier System and that the non-detection of Asian carp in previous conventional (netting and electrofishing) monitoring efforts somehow proved that no Asian carp were present lakeward of the Barrier, indisputable confirmation of the presence of Asian carp came on June 23, 2010 when the RCC announced that it had caught a live Bighead carp as a result of one of its netting operations in Lake Calumet immediately north and lakeward of the O'Brien Lock and approximately six miles from Lake Michigan. Notably, there are no physical barriers between the location where the carp was caught and Lake Michigan.

SOLVENCY / ADVOCACY / ADVANTAGES

Plan Advocate: Attorney General of the State of Michigan. We need to physically separate carp-infected waterways from Lake Michigan

Attorneys General of Michigan, Wisconsin, Minnesota, Ohio, and Pennsylvania 2010. Brief filed 19 July 2010 in the case of STATE OF MICHIGAN, STATE OF WISCONSIN, STATE OF MINNESOTA, STATE OF OHIO, and COMMONWEALTH OF PENNSYLVANIA v.UNITED STATES ARMY CORPS OF ENGINEERS and METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO, US District Court, Northern District of Illinois <http://www.michigan.gov/documents/ag/Complaint_328189_7.pdf>

Since the Corps announced, in November, 2009, that Asian carp eDNA had been detected in the CAWS lakeward of the Dispersal Barrier System, the Plaintiff States and other interested parties have repeatedly urged the Defendants to promptly take additional, comprehensive action to minimize the risk that Asian carp will migrate through the CAWS into Lake Michigan. Those requests have included, but are not limited to the following: (a) In a letter dated December 2, 2009, the Attorney General of the State of Michigan asked the Corps, the District and Illinois to take immediate, coordinated action to abate the threat, including, among other things, continued applications of fish poison and changes in lock and water control operations to prevent the passage of fish into Lake Michigan. Michigan also requested that the Corps, in coordination with State and local officials develop and implement plans to physically separate the carp-infected waterways from Lake Michigan.

Michigan Attorney General advocates the plan and gives specific details on how it would work

Attorneys General of Michigan, Wisconsin, Minnesota, Ohio, and Pennsylvania 2010. Brief filed 19 July 2010 in the case of STATE OF MICHIGAN, STATE OF WISCONSIN, STATE OF MINNESOTA, STATE OF OHIO, and COMMONWEALTH OF PENNSYLVANIA v.UNITED STATES ARMY CORPS OF ENGINEERS and METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO, US District Court, Northern District of Illinois <http://www.michigan.gov/documents/ag/Complaint_328189_7.pdf>

Michigan sought to compel the Corps and the District to immediately take all available measures within their respective control, consistent with the protection of public health and safety, to prevent the migration of Asian carp into Lake Michigan, including, but not limited to: (i) closing and ceasing operation of the locks at the O'Brien Lock and Dam and Chicago Controlling Works; (ii) limiting the opening of sluice gates; (iii) installing interim barriers in the Little Calumet and River; and (iv) eradicating Asian carp in the CAWS. Michigan also requested a permanent injunction requiring the Corps and the District to expeditiously develop and implement plans to permanently and physically separate carp-infested waters of the Illinois waterway from the Great Lakes.

Plan Advocates: the states of Michigan, Wisconsin, Minnesota, Ohio & Pennsylvania

Notes: Understand the context of this card. Judge Tharp is not stating his opinion about the plan. He is summarizing the position taken by the 5 states and stating that they advocate the plan. Judge Tharp himself ultimately decided against them in his ruling, but for reasons of law, not policy. He judged that status quo law did not require closure of the waterway, but he does not advocate for or against whether it would be a good idea to do it. Even if it’s a good policy, current law doesn’t mandate it – thus, we need the AFF plan.

Federal Judge John J. Tharp Jr. 2012. (federal district judge for the Eastern Division of Illinois) MEMORANDUM OPINION AND ORDER in the case of STATE OF MICHIGAN, STATE OF WISCONSIN, STATE OF MINNESOTA, STATE OF OHIO, and COMMONWEALTH OF PENNSYLVANIA v. United States Army Corps of Engineers and Metropolitan Water Reclamation District of Greater Chicago (a case also commonly known as Michigan v. US Army Corps of Engineers) 3 Dec 2012 downloaded from: <http://elr.info/litigation/43/20254/michigan-v-united-states-army-corps-engineers>

Many organizations, including the Corps, are actively working to stop Asian carp from migrating into the Great Lakes watershed. The plaintiffs acknowledge that the defendants and others are taking steps to prevent Asian carp from reaching Lake Michigan, but they argue that the defendants are not doing enough. They attribute the looming disaster to the man-made hydrologic connection of the Chicago Area Waterway System (“CAWS”) and Lake Michigan and maintain that nothing short of severing that connection will adequately mitigate the threat of carp infiltration of the lake. The “central and ultimate relief sought” by their complaint is a permanent injunction requiring hydrologic separation of these bodies of water.

Asian Carp threat justifies immediate action by the Army Corps of Engineers to separate the two watersheds

Andy Buchsbaum, Glynnis Collins, Joel Brammeier, Jennifer Nalbone, Thomas Cmar, & Cheryl Mendoza 2011. (Buchsbaum – Regional Executive Director, National Wildlife Federation. Collins – Exec. Director, Prairie Rivers Network. Brammeier – President, Alliance for the Great Lakes. Nalbone – Director of Navigation and Invasive Species, Great Lakes United. Cmar – Midwest Program Attorney, Natural Resources Defense Council. Mendoza – Assoc. Director, Freshwater Future) Great Lakes and Mississippi River Interbasin Study (GLMRIS) Comments March 31, 2011 <http://www.nwf.org/~/media/PDFs/Regional/Great-Lakes/GLMRIS_CommentsFINAL.pdf> (brackets added)

The obvious and critical threat of Asian carp establishing in the Great Lakes is a reason for urgent action. The Corps should study and provide a solution for the CAWS [Chicago Area Waterway System] as the first priority, and where needed, act on other aquatic pathways, based on the greatest likelihood of invasion. If necessary, the Army Corps should consider a phased approach to separating the two watersheds, prioritizing measures to prevent Asian carp migration while still taking steps that will lead to permanent prevention of all movement of aquatic invasive species in both directions. Most importantly, the Army Corps should not assume that no steps toward separation in the CAWS can be taken until all water quality issues associated with re-reversal of the Chicago River are addressed. Rather, the Corps should consider whether a physical barrier that would block movement of Asian carp can be constructed that does not require immediate re-reversal of the River – such as by pumping water over the barrier to allow downstream flow to continue – as an initial phase of a plan to create the progressive improvements of infrastructure in the CAWS that will be necessary to separate the two watersheds;

Significant economic benefits to separating the watersheds

Andy Buchsbaum, Glynnis Collins, Joel Brammeier, Jennifer Nalbone, Thomas Cmar, & Cheryl Mendoza 2011. (Buchsbaum – Regional Executive Director, National Wildlife Federation. Collins – Exec. Director, Prairie Rivers Network. Brammeier – President, Alliance for the Great Lakes. Nalbone – Director of Navigation and Invasive Species, Great Lakes United. Cmar – Midwest Program Attorney, Natural Resources Defense Council. Mendoza – Assoc. Director, Freshwater Future) Great Lakes and Mississippi River Interbasin Study (GLMRIS) Comments March 31, 2011 <http://www.nwf.org/~/media/PDFs/Regional/Great-Lakes/GLMRIS_CommentsFINAL.pdf> (brackets added)

Consider the significant benefits to freight transportation might be achieved by separating the watersheds at one of the four locations where the CREATE project‘s new rail network will cross the CSSC. Two of these locations are about 3 miles upstream of the Stickney WRP and another is a similar distance downstream. Obviously the upstream locations would require only minor alterations of the Stickney plant, while the downstream location would necessitate pumping effluent over the divide into the CSSC, investing in advanced treatment technology to send it to the Lake. The costs of sending it to the Lake, of course, might be offset by the economic benefits of diverting a substantial fraction of Chicago‘s Lake Michigan allocation to other uses. Options that present such opportunities for synergistic benefits may not be the least costly alternative. However the incremental cost may leverage huge benefits to the region at large. Even if the potential benefits are difficult to quantify, they could be considered along with other difficult-to-quantify social, environmental and cultural impacts.

“Expert Panel says closure won’t solve” – Response: The Army Corps’ Expert Panel actually proves the need for the plan

Attorneys General of Michigan, Wisconsin, Minnesota, Ohio, and Pennsylvania 2010. Brief filed 19 July 2010 in the case of STATE OF MICHIGAN, STATE OF WISCONSIN, STATE OF MINNESOTA, STATE OF OHIO, and COMMONWEALTH OF PENNSYLVANIA v.UNITED STATES ARMY CORPS OF ENGINEERS and METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO, US District Court, Northern District of Illinois <http://www.michigan.gov/documents/ag/Complaint_328189_7.pdf>

In sum, the responses of the Expert Panel to the Corps' questions actually suggest that continuing the current operation of locks presents an "unacceptable" risk that Asian carp will become established in the Great Lakes. Moreover, at least some panel members found that so long as the locks were closed, the risk of Asian carp establishment would be reduced. It was only by arbitrarily limiting the alternatives the Panel was allowed to consider to intermittent, short term lock closure, that the Corps could even attempt to claim that lock closure would not achieve any reduction in risk.

“Expert Panel says closure won’t solve” – Response: The Army Corps’ Expert wasn’t given the total closure option to consider

Attorneys General of Michigan, Wisconsin, Minnesota, Ohio, and Pennsylvania 2010. Brief filed 19 July 2010 in the case of STATE OF MICHIGAN, STATE OF WISCONSIN, STATE OF MINNESOTA, STATE OF OHIO, and COMMONWEALTH OF PENNSYLVANIA v.UNITED STATES ARMY CORPS OF ENGINEERS and METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO, US District Court, Northern District of Illinois <http://www.michigan.gov/documents/ag/Complaint_328189_7.pdf>

Further, the Report indicates that the Corps then re-defined an even narrower set of alternatives that were not presented to the Expert Panel. Each of those three alternatives was further constrained by the Corps pre-determined assumption that navigation through the locks must continue with minimal disruption, and that any consideration of more extended lock closure must be indefinitely deferred pending further evaluation of the impacts of lock closure (p. 51-52), presumably as part of the long-term "Great Lakes and Mississippi River Inter-Basin Study" even an interim version of which pertaining to the CAWS is not scheduled until 2012.

DISADVANTAGE RESPONSES

Economic benefits will outweigh the costs

Great Lakes Commission 2012 (chaired by James Tierney, assistant commissioner for water resources at the New York State Department of Environmental Conservation, is an interstate compact agency established under state and U.S. federal law ; consists of governors’ appointees, state legislators and agency officials from its eight member states) “Restoring the Natural Divide – Separating the Great Lakes and Mississippi River Basins in the Chicago Area Waterway System” January 2012 (brackets added) <http://www.glc.org/caws/pdf/CAWS-PublicSummary-mediumres.pdf>

Separation could generate significant benefits for the Chicago region and the Great Lakes and Mississippi River basins as a whole, with the potential for between $1.4 billion to $9.5 billion in long-term savings from avoided AIS [aquatic invasive species] control costs and damages alone, as well as improved water quality, strengthened flood protection, and modernized shipping facilities. While the separation costs will be incurred over a limited timeframe, the benefits will be enjoyed indefinitely. Without separation, new AIS will likely pass through the CAWS, with the potential to cause significant economic and environmental damage.

Minor inconvenience: Closing the locks would not have significant negative economic impact

Dr. John C. Taylor 2010. (PhD; Associate Professor of Supply Chain Management and Director of Supply Chain Programs in the Department of Marketing and Supply Chain Management at Wayne State Univ.) “Chicago Waterway System Ecological Separation: The Logistics and Transportation Related Cost Impact of Waterway Barriers - Appendix to State of Michigan vs. State of Illinois and the Metropolitan Sanitary District of Greater Chicago et al” February 2010 <http://www.greatlakeslaw.org/files/mich_carp_renewed_appendix.pdf>

For the reasons detailed in that Report, it is my professional opinion that the documents submitted by the United States and Illinois to this Court, referenced in paragraph 8 above, have seriously exaggerated the economic and transportation impacts associated with closure of portions of the Chicago Waterway System at the Chicago and O'Brien Locks requested by the State of Michigan. Key facts supporting that conclusion may be summarized as follows:  
a. Only approximately seven million tons of cargo per year would be affected and some of this would incur relatively minor inconvenience.  
b. That affected volume represents less than one percent of all the freight traffic in the Chicago Region and only thirty percent of the total Port of Chicago traffic.  
c. The affected barge traffic is the equivalent of two daily loaded rail unit trains in a region that has approximately 500 daily freight trains.  
d. Truck traffic in Chicago would increase less than 1/10 of one percent.  
e. Most of the affected cargo would continue to move on the inland waterway system, through the Lockport Locks, but would have to stop a few miles short of its former destination.  
f. Most of the claimed environmental, air quality, safety, and energy benefits associated with barge transportation would continue since most of the barge traffic would continue.  
g. Some of the affected cargo traffic may require transfer to another mode of transportation such as rail, truck, or pipeline at transload locations. Such transfers are the norm in an intermodal transportation system (e.g., grain moves by truck to an elevator, by rail to a port, and by barge to an end user to an export location). Indeed, much of the traffic in the inland waterway system already uses several modes.  
h. The suggestion that other modes of transportation are not available is incorrect. Virtually all of the major shippers have direct or proximity access to both rail and highway. The assertion that there are not enough rail cars or trucks to handle the traffic is also very wrong. There is more than sufficient capacity to handle seven million tons annually and it could readily be provided.  
i. We conservatively estimate that, if barriers are established at the O'Brien and Chicago Locks, transportation and handling costs would increase by less than $70 million annually in a Chicago metropolitan area economy of $521 billion.  
j. There would be more cargo-related jobs, not less, associated with closures at the O'Brien and Chicago Locks. There likely would be some loss of barge jobs, but these would be more than replaced by truck, rail, and pipeline jobs needed for transload and transfer movements of the affected cargo. That is why there would be additional transportation costs.

Army Corps of Engineers and State of Illinois claims of economic devastation are wrong: Closure of the locks would affect only miniscule economic activity.

Dr. John C. Taylor 2010. (PhD; Associate Professor of Supply Chain Management and Director of Supply Chain Programs in the Department of Marketing and Supply Chain Management at Wayne State Univ.) “Chicago Waterway System Ecological Separation: The Logistics and Transportation Related Cost Impact of Waterway Barriers - Appendix to State of Michigan vs. State of Illinois and the Metropolitan Sanitary District of Greater Chicago et al” February 2010 <http://www.greatlakeslaw.org/files/mich_carp_renewed_appendix.pdf>

In sum, waterway closure at the Chicago and O'Brien Locks would have a localized impact on already declining commercial cargo traffic that comprises only a tiny fraction of economic activity in the metropolitan Chicago area. The conservatively estimated additional transportation and logistical costs of shifting a portion of the existing barge traffic to other modes of transportation along a small portion of its route is far less than that suggested by the Corps and Illinois, and is orders of magnitude less than the estimated economic impact of sport and commercial fishing in the Great Lakes.  
  
p. The claim that "even a temporary closure of the locks will devastate the local economy and Illinois' role in the regional, national and global economy..." (Ill. Opposition p. 10 and Ill. App. 50a) cannot reasonably be supported.

Closing the waterways would result in between $64 million (Taylor & Roach study) to $77 million (TTI study) in added transportation costs – much less than the Corps of Engineers estimates

Dr. John C. Taylor and James L. Roach 2010. (Taylor - PhD; Associate Professor of Supply Chain Management and Director of Supply Chain Programs in the Department of Marketing and Supply Chain Management at Wayne State Univ . Roach - transportation consultant specializing in freight and passenger planning, infrastructure and strategic issues; formerly worked for the Michigan Department of Transportation ) Chicago Waterway System Ecological Separation: The Logistics and Transportation Related Cost Impact of Waterway Barriers 2 Feb 2010 <http://www.greatlakeslaw.org/files/mich_carp_renewed_appendix.pdf>

The authors of this report calculated that the proposed barriers would result in additional annual transportation costs of $64-69 million. This amounts to additional costs of $9.12-$9.90 per ton. This compares with a US Army Corps of Engineers estimate of $190 million for the O’Brie**n Lock and $2 million annually** for the Chicago Lock (App72-73a). The Corps estimates are based on” the cost difference between the existing waterway routing and the least cost overland alternative.” (App72a). This results in an additional cost of $27 per ton. By comparison, a recent report done by the Texas Transportation Institute (TTI) for the National Waterways Association and the US Maritime Administrations states:“In 2005, inland waterways maintained by the US Army Corps of Engineers (Corps) handled over 624 million tons of freight (274 billion ton miles) valued at over $70 billion resulting in an average transportation cost savings of $11/ton (as compared to other modes).” 11Underline addedThe results of our approach were reasonably comparable to the TTI study. We showed about $9-10/ ton of additional cost while they showed $11/ton for 2005. It is understood that these are not strictly comparable kinds of assessments. Interestingly, the use of the TTI estimate would result in additional costs of $77 million which is only slightly higher then our figures.

HOW MUCH DOES THE PLAN COST?

The “Mid System Alternative” separation plan costs maximum $4.27 billion

Great Lakes Commission 2012 (chaired by James Tierney, assistant commissioner for water resources at the New York State Dept of Environmental Conservation, is an interstate compact agency established under state and U.S. federal law) “Restoring the Natural Divide” January 2012 <http://www.glc.org/caws/pdf/CAWS-PublicSummary-mediumres.pdf>

Down River Alternative  
This alternative includes a single barrier between the confluence of the Chicago Sanitary and Ship Canal and the Cal-Sag Channel and the Lockport Lock. This has the advantage of requiring only one barrier. However, it has significant impacts on water quality, transportation and flood management.  
Separation barriers: $109 million  
Flood management: $2.98 billion  
Water quality: $290 million to $5.85 billion  
Transportation: $560 million  
Timeline: Phase I: One-way barrier with flood water bypass (lake to river) and all transportation improvements completed by 2022.  
Phase II: Two-way barrier completed by 2029  
Total Investment: $3.94 - $9.5 billion  
Mid-System Alternative  
This alternative includes four barriers, one each on the South Branch of the Chicago River just upstream of Bubbly Creek, north of T.J. O’Brien Lock on the Calumet River, and on the Grand Calumet and Little Calumet rivers. This alternative poses the fewest challenges for stormwater management, flood management and transportation compared to the other two alternatives.  
Separation barriers: $140 million  
Flood management: $1.89 billion  
Water quality: $180 million to $1.2 billion  
Transportation: $1.04 billion  
Timeline: Phase I: One-way barrier with flood water bypass (lake to river) and all transportation improvements completed by 2022.  
Phase II: Two-way barrier completed by 2029  
Total Investment: $3.26 - $4.27 billion  
Near Lake Alternative  
This alternative requires five barriers, one each north of the North Side Wastewater Treatment Plant (WWTP) on the North Shore Channel, at the mouth of the Chicago River, at the mouth of the Calumet River, and on the Grand Calumet and Little Calumet rivers. It poses significant challenges for flood management and transportation.  
Separation barriers: $140 million  
Flood management: $3.82 billion  
Water quality: $120 million  
Transportation: $5.45 billion  
Timeline: Chicago River barriers completed by 2029 (with completion of TARP) Calumet River barriers completed by 2026 (with completion of new port facilities)  
Total Investment: $9.54 billion

Cut Head Start = $8 billion/year with no benefit

Lindsey Burke and Dr. David B. Muhlhausen 2013. (Burke - Will Skillman fellow in education policy at The Heritage Foundation; bachelor's degree in politics from Hollins University in Roanoke, Va., and a master of teaching degree in foreign language education from the University of Va. Muhlhausen – PhD in public policy from the University of Maryland-Baltimore County ; served on the staff for the Senate Judiciary Committee) Head Start Impact Evaluation Report Finally Released 10 Jan 2013 <http://www.heritage.org/research/reports/2013/01/head-start-impact-evaluation-report-finally-released>

Since 1965, taxpayers have spent more than $180 billion on Head Start.[1] Yet, over the decades, this Great Society relic has failed to improve academic outcomes for the children it was designed to help. The third-grade follow-up evaluation is the latest in a growing body of evidence that should urge policymakers to seriously consider Head Start’s future.

Head Start and Performance

The timing of the release raises questions about whether HHS was trying to bury the findings in the report, which shows, among other outcomes, that by third grade, the $8 billion Head Start program had little to no impact on cognitive, social-emotional, health, or parenting practices of participants. On a few measures, access to Head Start had harmful effects on children.

2A EVIDENCE: CHESAPEAKE BAY NUTRIENT AND SEDIMENT TRADING COMMISSION

BACKGROUND

The Chesapeake Bay watershed area: 6 states + DC. Rivers flow down and empty into the Chesapeake Bay

[this card only names 5 of the states; the 6th one is Delaware]

Millions of pounds of nitrogen & phosphorus enter the Bay despite widespread efforts

Chesapeake Bay Commission and RTI International 2012. (CBC is an organization set up by the legislatures of Maryland, Virginia and Pennsylvania that coordinates efforts to improve the Chesapeake Bay – they commissioned and published this study; the study was written by George Van Houtven, Ross Loomis, Justin Baker, Robert Beach, Sara Casey of RTI International, an independent, nonprofit institute that provides research, development, and technical services to government and commercial clients worldwide) Nutrient Credit Trading for the Chesapeake bay - An Economic Study MAY 2012 <http://www.chesbay.us/Publications/nutrient-trading-2012.pdf>

As shown in Figure 2-1, the Chesapeake Bay watershed includes portions of six states plus the District of Columbia. It can also be geographically subdivided into eight major river basins, whose waters drain into the Bay. The two largest basins are the Susquehanna River Basin, which includes portions of New York, Pennsylvania, and Maryland, and the Potomac River Basin, which includes portions of Maryland, Virginia, West Virginia, Pennsylvania, and Washington, D.C. Three of the basins are located entirely within a single state—the Rappahannock and York River Basins in Virginia, and the Patuxent River Basin in Maryland. The millions of pounds of nitrogen and phosphorus that flow into the Bay each year originate from a wide variety of sources throughout the watershed. Loads from all of these sources occur despite the widespread use of technologies and practices designed to limit the flow of pollution.

How the Bay gets polluted: Runoff from human activities on land expands algae growth, leading to “dead zones”

Dr. Margaret Mulholland & Dr Richard Zimmerman 2005. (both are PhDs with Department of Ocean, Earth & Atmospheric Sciences, Old Dominion University) Nutrients in Chesapeake Bay, what’s all the fuss? Spring 2005 <http://sci.odu.edu/oceanography/news/srping05news.pdf>

Human activities – food production, sewage disposal, and land use changes - have raised the concentrations of plant nutrients, particularly nitrogen and phosphorus, to unhealthy levels in the Chesapeake Bay and its watershed. In natural systems, these nutrients are in relatively short supply. So we add them to our cultivated crops and gardens to increase productivity and keep them healthy. However, too much fertilizer can damage the plants we care about and promote the growth of pesky weeds, particularly in the absence of cultivation. That is how nutrient pollution has transformed the Chesapeake Bay: We now have a waterway dominated by weeds that threaten the viability of the resources we value. These nutrients have caused explosive growth of algae in large blooms across the Bay. Decomposition of the dying algae consumes the water’s oxygen supply, creating large dead zones, particularly in the smaller tributaries and main stem of the upper Bay.

INHERENCY

We need new strategies to deal with Chesapeake Bay pollution

Chesapeake Bay Commission and RTI International 2012. (CBC is an organization set up by the legislatures of Maryland, Virginia and Pennsylvania that coordinates efforts to improve the Chesapeake Bay – they commissioned and published this study; the study was written by George Van Houtven, Ross Loomis, Justin Baker, Robert Beach, Sara Casey of RTI International, an independent, nonprofit institute that provides research, development, and technical services to government and commercial clients worldwide) Nutrient Credit Trading for the Chesapeake bay - An Economic Study MAY 2012 <http://www.chesbay.us/Publications/nutrient-trading-2012.pdf>

The Chesapeake Bay is particularly vulnerable to nutrient overload because it drains an area of over 64,000 square miles and averages a mere 21 feet in depth. All of the rivers, streams, and drainage systems located within this watershed eventually discharge their water into the Bay. According to the U.S. Environmental Protection Agency (EPA), during a year with average rainfall, this water carries with it over 250 million pounds of nitrogen and almost 20 million pounds of phosphorus. These nutrients come from a wide variety of sources, including sewage treatment plants, industrial facilities, runoff from agricultural fields and urban areas, and even air pollution. With the human population in the watershed expected to grow by over 2 million people over the next 20 years (Ref. 1), new strategies will be necessary to manage and reduce nutrient loads from all sources in order to restore and protect the health of the Bay ecosystem.

EPA established TMDL – Total Maximum Daily Load – to limit nitrogen, phosphorus and sediment

Chesapeake Bay Commission and RTI International 2012. (CBC is an organization set up by the legislatures of Maryland, Virginia and Pennsylvania that coordinates efforts to improve the Chesapeake Bay – they commissioned and published this study; the study was written by George Van Houtven, Ross Loomis, Justin Baker, Robert Beach, Sara Casey of RTI International, an independent, nonprofit institute that provides research, development, and technical services to government and commercial clients worldwide) Nutrient Credit Trading for the Chesapeake bay - An Economic Study MAY 2012 <http://www.chesbay.us/Publications/nutrient-trading-2012.pdf>

In response to these pollution problems, and pursuant to the requirements of the federal Clean Water Act, EPA established a Total Maximum Daily Load (TMDL) for the Chesapeake Bay in December 2010. This “nutrient diet” sets load limits (to be achieved by 2025) on the annual amount of nitrogen, phosphorus, and sediment that may enter the Bay from each of its main tributaries. These load limits were developed in partnership with the states located in the watershed— Delaware, Maryland, New York, Pennsylvania, Virginia, and West Virginia—as well as the District of Columbia, the Chesapeake Bay Commission, and the EPA. As part of the TMDL, these jurisdictions are responsible for developing and implementing Watershed Implementation Plans (WIPs) that specify how each jurisdiction will reduce nutrient and sediment pollution to meet its specific load allocation of the TMDL.

We need to reduce the cost of meeting the TMDL goals

Chesapeake Bay Commission and RTI International 2012. (CBC is an organization set up by the legislatures of Maryland, Virginia and Pennsylvania that coordinates efforts to improve the Chesapeake Bay – they commissioned and published this study; the study was written by George Van Houtven, Ross Loomis, Justin Baker, Robert Beach, Sara Casey of RTI International, an independent, nonprofit institute that provides research, development, and technical services to government and commercial clients worldwide) Nutrient Credit Trading for the Chesapeake bay - An Economic Study MAY 2012 <http://www.chesbay.us/Publications/nutrient-trading-2012.pdf>

Reducing nutrient loads in the watershed is essential for restoring the Bay, which is the largest and most productive estuarine ecosystem in the United States; however, achieving these reductions will not come without a price. Installing control technologies and implementing practices that reduce nutrient pollution require both economic resources and investments. Although the total costs required to meet the TMDL goals cannot currently be defined precisely—due in part to the extensive mix of potential implementation tools and strategies—at least two things are certain: 1) the costs of these activities will, in the end, be borne by a host of sources: households, farms, businesses as well as federal, state and local governments, and 2) there is a need to place a high priority on developing and implementing strategies that reduce these costs.

“Chesapeake Bay States already have trading” – Response: CBC/RTI evidence is specific to the additional gains to be found in establishing a consistent uniform system across the entire region

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Although these state-specific programs provide an important backdrop for our analysis, it is important to emphasize that it is not the purpose of this report to model or predict the results of the individual states’ nutrient trading programs. Rather, we examine the potential cost-saving implications of a more simplified, generic, and uniform trading approach applied across the entire watershed.

“4 States already have trading” – Response: Baywide trading would reduce pollution more cost-effectively than state systems in status quo

Cy Jones, Evan Branosky, Mindy Selman, Dr. Michelle Perez 2010. (Jones - MS in Environmental Engineering Univ of Iowa; leads Water Quality Trading Initiative for the Chesapeake Bay watershed at World Resources Institute. Branosky - B.S. in agricultural science from Rutgers Univ; masters in environmental policy U. of Maryland. Selman – masters degree Sustainable Development and Conservation Biology from U. of Maryland. Perez – PhD in environmental policy from the U. of Maryland School of Public Policy) How Nutrient Trading Could Help Restore the Chesapeake Bay Feb 2010 World Resources Institute <http://pdf.wri.org/working_papers/how_nutrient_trading_could_help_restore_the_chesapeake_bay.pdf>

The bill would establish a baywide nutrient trading market for the Chesapeake Bay watershed (Figure 1), allowing credits to be exchanged across state lines and among the watershed’s nine major river basins. A baywide nutrient trading market would build on the existing and pending state-level nutrient trading programs in Maryland, Pennsylvania, Virginia, and West Virginia. A baywide nutrient trading market could help states and sectors more cost-effectively achieve court-ordered nutrient pollution limits called Total Maximum Daily Loads (TMDLs) that are being developed by the EPA. These TMDLs will set limits on nutrient loads to the bay and its tributaries for the agricultural, wastewater, municipal stormwater, and other sectors.

“States already trade” – Response: Trading across state lines would result in much greater savings.

In the Potomac Basin: In-state trading = 32% savings compared to no trading / Interstate trading = 61% savings compared to no trading

Chesapeake Bay Commission and RTI International 2012. (CBC is an organization set up by the legislatures of Maryland, Virginia and Pennsylvania that coordinates efforts to improve the Chesapeake Bay – they commissioned and published this study; the study was written by George Van Houtven, Ross Loomis, Justin Baker, Robert Beach, Sara Casey of RTI International, an independent, nonprofit institute that provides research, development, and technical services to government and commercial clients worldwide) Nutrient Credit Trading for the Chesapeake bay - An Economic Study MAY 2012 <http://www.chesbay.us/Publications/nutrient-trading-2012.pdf> (brackets added)

In percentage terms, the Potomac River Basin, which includes four states plus the District of Columbia, benefits the most from allowing point and nonpoint sources to trade nutrient credits across state lines. Under the SigPS-AgrNPS [significant point source + agricultural non-point source] trading scenario, the potential costs savings are estimated to be 61% relative to the No-Trading scenario in the Potomac Basin. Although not shown in the figure, the savings in the Potomac Basin are only 32% when trading is not allowed across state lines (i.e., the In-Basin-State scenario).

“States already trade” – Response: Overall 35% more savings if trading occurs across the entire region compared to state-level

Chesapeake Bay Commission and RTI International 2012. (CBC is an organization set up by the legislatures of Maryland, Virginia and Pennsylvania that coordinates efforts to improve the Chesapeake Bay – they commissioned and published this study; the study was written by George Van Houtven, Ross Loomis, Justin Baker, Robert Beach, Sara Casey of RTI International, an independent, nonprofit institute that provides research, development, and technical services to government and commercial clients worldwide) Nutrient Credit Trading for the Chesapeake bay - An Economic Study MAY 2012 <http://www.chesbay.us/Publications/nutrient-trading-2012.pdf> (brackets added)

The potential cost savings also increase as the geographic scope of trading activity increases. For example, in our trading scenarios involving SigPS and agricultural nonpoint sources, we find that potential savings increase by about 35% when the geographic scope is increased from basin-state level to the entire watershed. This increment is not as large as when agricultural nonpoint sources are included in the trading scenario, but it is still substantial.

Maryland has costly restrictions on trading in-state

Chesapeake Bay Commission and RTI International 2012. (CBC is an organization set up by the legislatures of Maryland, Virginia and Pennsylvania that coordinates efforts to improve the Chesapeake Bay – they commissioned and published this study; the study was written by George Van Houtven, Ross Loomis, Justin Baker, Robert Beach, Sara Casey of RTI International, an independent, nonprofit institute that provides research, development, and technical services to government and commercial clients worldwide) Nutrient Credit Trading for the Chesapeake bay - An Economic Study MAY 2012 <http://www.chesbay.us/Publications/nutrient-trading-2012.pdf> (brackets added)

The analysis assumes that, under the trading scenarios, SigPS [significant point sources] have the option to not upgrade their treatment technologies from 2010 levels and regulated urban sources have the option not to install new stormwater BMPs [best management practices]. Instead, they can buy credits from other sources to meet their load reduction requirements. In practice, other regulatory requirements (e.g., state-specific statutory requirements) may disallow this “status quo” option, thus lowering the potential cost savings from trading. Maryland, for example, currently does not allow either source to trade in this manner. However, it is important to note that, if these other requirements are the reason for SigPS to upgrade their treatment technology and for urban areas to install BMPs, then the costs of these upgrades and BMPs should not be attributed to the Chesapeake Bay TMDL (i.e., the costs of the No-Trading scenario in our analysis would also be lower).

MINOR REPAIR RESPONSES

“Let the states do it” – Response: States will have issues if the credits are purchased in one state and used in another

Environmental policy workshop at the School of Public Policy of the University of Maryland 2012. (Melanie Foley, Jeremy Hanson, Giuliana Kunkel, Fernando Saltiel, and Laura Vykol – Masters Degree candidates. Supervised by Prof. Robert H. Nelson, School of Public Policy, Univ of Maryland) Oct 2012 SAVING THE CHESAPEAKE BAY TMDL: THE CRITICAL ROLE OF NUTRIENT OFFSETS <http://www.chesapeakebay.net/channel_files/19062/660_--_environmental_workshop_report,_final,_spring_2012.pdf>

When the issue is whether offsets must be acquired within the same state (but potentially from different river basins), it becomes less a matter of social equity and state politics. The acquirer of an offset may have to spend a considerable amount of money for this purpose. If the money is spent in a different state, it might be seen as a transfer of funds and jobs from one state to another. In addition, if the money is spent to generate offsets in a separate river basin, the water quality benefits that result from the offsetting action would not only be in a different river basin but also in a different state. Maryland might, for example, be willing to see one Maryland river basin improved to the detriment of another river basin (as long as the harm is not too large), if this produces significant cost savings and the other river basin is also in Maryland. If the other improved river basin is say in Virginia, however, the resulting overall Bay cost savings might count for less in the view of Maryland policy officials.

“Let the states do it” – Response: Interstate sales of cleanup credits would be more efficient

Environmental policy workshop at the School of Public Policy of the University of Maryland 2012. (Melanie Foley, Jeremy Hanson, Giuliana Kunkel, Fernando Saltiel, and Laura Vykol – Masters Degree candidates. Supervised by Prof. Robert H. Nelson, School of Public Policy, Univ of Maryland) Oct 2012 SAVING THE CHESAPEAKE BAY TMDL: THE CRITICAL ROLE OF NUTRIENT OFFSETS <http://www.chesapeakebay.net/channel_files/19062/660_--_environmental_workshop_report,_final,_spring_2012.pdf>

As noted, the greatest cost savings in terms of the cleanup of Chesapeake Bay would come from allowing offsets to be generated anywhere in the Bay watershed. High priority areas for nutrient reductions such as the Susquehanna River might receive more attention by allowing out-of-state purchases of offsets. It might also be argued that this would serve overall social equity. The greatest benefits of the Bay cleanup will be realized by the residents of Maryland and Virginia. Yet, the most cost effective ways of cleaning up the Bay may require that many nutrient reductions be made in Pennsylvania, even though many Pennsylvania residents live far from the Bay. One way that Maryland could reduce the Bay cleanup costs to Pennsylvania would be by allowing Maryland nutrient polluters to purchase their offsets in Pennsylvania. It might be argued that this would more closely align the location of benefits and costs. As the greatest beneficiaries of Bay cleanup, perhaps Maryland should also pay the greatest costs, a goal that could be served by an appropriately designed offset policy.

“Let the states do it” – Response: States cannot enter into interstate agreements without the consent of Congress – so we need a federal plan

US Constitution, Article 1 Section 10 Clause 3

No State shall, without the Consent of Congress, lay any Duty of Tonnage, keep Troops, or Ships of War in time of Peace, enter into any Agreement or Compact with another State, or with a foreign Power, or engage in War, unless actually invaded, or in such imminent Danger as will not admit of delay.

SIGNIFICANCE

Nutrient overload causes major problems in the Chesapeake Bay

Chesapeake Bay Commission and RTI International 2012. (CBC is an organization set up by the legislatures of Maryland, Virginia and Pennsylvania that coordinates efforts to improve the Chesapeake Bay – they commissioned and published this study; the study was written by George Van Houtven, Ross Loomis, Justin Baker, Robert Beach, Sara Casey of RTI International, an independent, nonprofit institute that provides research, development, and technical services to government and commercial clients worldwide) Nutrient Credit Trading for the Chesapeake bay - An Economic Study MAY 2012 <http://www.chesbay.us/Publications/nutrient-trading-2012.pdf> (brackets added)

The Chesapeake Bay ecosystem is under stress. Among an onslaught of pressures, the primary cause of this stress is the overabundance of nutrients flowing into its rivers, streams, and estuaries. The two main nutrients—nitrogen and phosphorus—are naturally occurring substances that are essential for living organisms. However, large amounts of these nutrients, most often generated by human activity, result in excess algae growth. This excess algae depletes oxygen from the water, blocks sunlight for underwater plants, and upsets the functioning of a healthy aquatic ecosystem.\* The Chesapeake Bay is particularly vulnerable to nutrient overload because it drains an area of over 64,000 square miles and averages a mere 21 feet in depth. All of the rivers, streams, and drainage systems located within this watershed eventually discharge their water into the Bay. According to the U.S. Environmental Protection Agency (EPA), during a year with average rainfall, this water carries with it over 250 million pounds of nitrogen and almost 20 million pounds of phosphorus.

Decline in fishing = substantial losses to Maryland and Virginia economy

Chesapeake Bay Foundation 2012. ( non-profit organization devoted to the restoration and protection of the Chesapeake Bay) May 2012 The Economic Argument for Cleaning Up the Chesapeake Bay and its Rivers <http://www.cbf.org/document.doc?id=591>

The economic losses associated with the decline in fisheries resources in the Bay are substantial. Between 1994 and 2004, the value of Virginia’s seafood harvest decreased by 30 percent with Maryland’s commercial landings exhibiting a similar decline during that time. Jobs declined as well. In 1974 there were 136 oyster shucking houses, today only about half a dozen remain.

Striped bass are recovering, but other fish species are declining in the Chesapeake Bay

Columbia University, MPA in Environmental Science and Policy Summer Workshop 2012. (research project under the direction of Dr. Howard Apsan, **Ph.D.**, **University Director Environmental, Health, Safety and Risk Management** at **The City University of New York)** Policy Analysis of H.R. 258 The Chesapeake Bay Accountability and Recovery Act of 2011 <http://mpaenvironment.ei.columbia.edu/sitefiles/file/Summer%2012%20reports/Workshop%202012%20-%20Final%20Report%20-%20HR%20258%20-%20FINAL%20VERSION.pdf>

Due to their economic importance in the region, the Chesapeake Bay Program focuses on American shad, striped bass, and juvenile menhaden as three indicator fish species affected by the pollution entering the bay, in addition to overfishing. Preliminary scientific data indicates a potential decline in numbers for juvenile Menhaden, an important keystone species in the Bay, due to these activities (CPB 2012d). Striped bass numbers have rebounded significantly after a three-year moratorium in the 1980s, but American shad populations remain low due to human influences in the Bay watershed (CBP 2012c).

Oysters are in trouble in the Chesapeake: $4 billion impact on Maryland and Virginia economy

Chesapeake Bay Foundation 2012. ( non-profit organization devoted to the restoration and protection of the Chesapeake Bay) May 2012 The Economic Argument for Cleaning Up the Chesapeake Bay and its Rivers <http://www.cbf.org/document.doc?id=591>

Extended periods of zero-oxygen conditions can be fatal to oysters. In addition, recent studies have indicated that low oxygen levels can stress the oysters’ immune systems, making them more susceptible to disease. Pollution has also resulted in the closure of shellfish beds to commercial harvesting. Threats from sewage and bacteria forced Maryland and Virginia to close or restrict oyster harvesting in 223,864 acres of the Bay and its tributaries in 2008, about eight percent of the total shellfish beds. The decline of the Bay oyster over the last 30 years has meant a loss of more than $4 billion for Maryland and Virginia.

Costs taxpayers: Federal government gives disaster relief to fisheries that fail in the Chesapeake Bay

Chesapeake Bay Foundation 2012. ( non-profit organization devoted to the restoration and protection of the Chesapeake Bay) May 2012 The Economic Argument for Cleaning Up the Chesapeake Bay and its Rivers <http://www.cbf.org/document.doc?id=591>

As a result of the low population level, in 2008, Maryland and Virginia issued severe crabbing restrictions, in an attempt to restore the population. These restrictions placed severe economic hardship on Chesapeake Bay crabbers. In response, members of Congress from Maryland and Virginia requested federal disaster relief for Bay crab fishermen. In September 2008, the Secretary of Commerce determined that the Chesapeake Bay soft shell blue crab fishery had undergone a commercial failure as defined under the Magnuson-Stevens Fishery Conservation and Management Act (16 USC § 1861). In January 2009, the Department of Commerce allocated $10 million of disaster relief to each state.

“Overfishing is the problem” – Response: Even after solving for overfishing, we have to solve for pollution and resulting oxygen levels to get rockfish population recovery

Chesapeake Bay Foundation 2012. ( non-profit organization devoted to the restoration and protection of the Chesapeake Bay) May 2012 The Economic Argument for Cleaning Up the Chesapeake Bay and its Rivers <http://www.cbf.org/document.doc?id=591> (brackets added)

Faced with a catastrophic collapse in the fishery, Maryland banned commercial and recreational fishing for rockfish in its portion of the Bay from 1985-90, and Virginia followed suit with a one-year moratorium in 1989. The dramatic decline of the population was due to several factors, including heavy overfishing and low dissolved oxygen in many parts of the Bay. Today, the rockfish population is at its highest in decades because of tight catch restrictions. However, scientists are concerned about high prevalence of the usually fatal wasting disease Mycobacteriosis. The fishes’ current susceptibility to it appears to come from environmental stress generated by poor water quality and limited availability of preferred prey. Studies by Lipton and Hicks have estimated the impact of dissolved oxygen on rockfish catch rates in the Chesapeake Bay, as well as the impact of higher catch rates on the value of a fishing day. They found that a 2.4 mg/L [milligrams per liter] improvement in dissolved oxygen could increase striped bass catch rates by 95 percent.

SOLVENCY

Increasing nutrient trading from in-state to region-wide + including agricultural non-point sources yields big cost savings over the Status Quo

Note: Agricultural non-point source = general runoff of fertilizer and manure from farms in the area. Point-source means a particular industrial location that produces a significant quantity of discharge by itself

Chesapeake Bay Commission and RTI International 2012. (CBC is an organization set up by the legislatures of Maryland, Virginia and Pennsylvania that coordinates efforts to improve the Chesapeake Bay – they commissioned and published this study; the study was written by George Van Houtven, Ross Loomis, Justin Baker, Robert Beach, Sara Casey of RTI International, an independent, nonprofit institute that provides research, development, and technical services to government and commercial clients worldwide) Nutrient Credit Trading for the Chesapeake bay - An Economic Study MAY 2012 <http://www.chesbay.us/Publications/nutrient-trading-2012.pdf> (brackets added)

Expanding trading further from in-basin to watershed-wide increases the estimated potential cost savings another 5 percentage points to 49% of the No-Trading costs—a 35% increase in cost-savings over the In-Basin State scenario. The results in Figure 9-3 also indicate that expanding the geographic scope of trading has less of an upward impact on potential cost savings than expanding participation to include agricultural sources. For example, expanding from In-Basin-State trading to Watershed-wide trading increases the potential cost savings by 8 to 13 percentage points, whereas going from SigPS-Only [significant point-source] to SigPS-AgrNPS [significant point source + agricultural non-point source] trading increases the potential savings by 16 to 21 percentage points.

Nutrient trading allows cost-effective pollution reduction, creates revenue opportunities for farmers

Cy Jones, Evan Branosky, Mindy Selman, Dr. Michelle Perez 2010. (Jones - MS in Environmental Engineering Univ of Iowa; leads Water Quality Trading Initiative for the Chesapeake Bay watershed at World Resources Institute. Branosky - B.S. in agricultural science from Rutgers Univ; masters in environmental policy U. of Maryland. Selman – masters degree Sustainable Development and Conservation Biology from U. of Maryland. Perez – PhD in environmental policy from the U. of Maryland School of Public Policy) How Nutrient Trading Could Help Restore the Chesapeake Bay Feb 2010 World Resources Institute <http://pdf.wri.org/working_papers/how_nutrient_trading_could_help_restore_the_chesapeake_bay.pdf>

The proposed “Chesapeake Clean Water and Ecosystem Restoration Act of 2009” (H.R. 3852/S. 1816) would provide signiﬁcant new resources and new approaches to help restore the bay. Nutrient trading is one such approach. In a nutrient trading market, sources that reduce their nutrient runoff or discharges below target levels can sell their surplus reductions or “credits” to other sources. This approach allows those that can reduce nutrients at low cost to sell credits to those facing higher-cost nutrient reduction options. Nutrient trading, therefore, could allow sources of pollution such as WWTPs and municipal stormwater programs to meet their pollution targets in a cost-effective manner and could create new revenue opportunities for farmers, entrepreneurs, and others who implement low-cost pollution reduction practices.

Example scenario of how nutrient trading works and saves money

Cy Jones, Evan Branosky, Mindy Selman, Dr. Michelle Perez 2010. (Jones - MS in Environmental Engineering Univ of Iowa; leads Water Quality Trading Initiative for the Chesapeake Bay watershed at World Resources Institute. Branosky - B.S. in agricultural science from Rutgers Univ; masters in environmental policy U. of Maryland. Selman – masters degree Sustainable Development and Conservation Biology from U. of Maryland. Perez – PhD in environmental policy from the U. of Maryland School of Public Policy) How Nutrient Trading Could Help Restore the Chesapeake Bay Feb 2010 World Resources Institute <http://www.docstoc.com/docs/136345792/nutrient-trading-2012>

The potential costs savings from nutrient trading are illustrated in Figure 3-1 with an example involving two nutrient sources. Under the TMDL, the first source (Facility A) is required to reduce nitrogen loads to the Bay by an extra 10,000 lbs per year, but installing additional treatment technology to meet this requirement costs $200,000 per year. The second source (Facility B) is not required to further reduce its nitrogen loads, but it could achieve an additional 10,000 pound reduction for $120,000 per year. If Facility A purchases the reductions (i.e., credits) from Facility B, the cost of achieving the 10,000 lb reduction would be reduced by $80,000 per year. In other words, the total cost savings would be $80,000 per year.

How nutrient trading works: flexibility for achieving goals and reduced cost

Chesapeake Bay Commission and RTI International 2012. (CBC is an organization set up by the legislatures of Maryland, Virginia and Pennsylvania that coordinates efforts to improve the Chesapeake Bay – they commissioned and published this study; the study was written by George Van Houtven, Ross Loomis, Justin Baker, Robert Beach, Sara Casey of RTI International, an independent, nonprofit institute that provides research, development, and technical services to government and commercial clients worldwide) Nutrient Credit Trading for the Chesapeake bay - An Economic Study MAY 2012 <http://www.chesbay.us/Publications/nutrient-trading-2012.pdf>

Nutrient trading has emerged as one promising strategy for meeting nutrient load limits in a more cost-effective way. Under this market-based approach, certain nutrient sources, such as municipal and industrial wastewater discharge facilities, are given more flexibility for how they achieve their individual load limits. In essence, they are given two options: 1) implement pollution control practices on site, or 2) purchase the load reductions from other sources that reduce loads by more than their requirement.\* In either case, the end result is the achievement of the necessary pollution reductions. However, the second option—nutrient credit trading—will likely be chosen if the other source is able to provide and sell the load reduction for a lower cost than the first option and the purchased reduction is certain and verifiable.

Pollution credit trading has worked in the past: The 1990 Clean Air Act sulfur dioxide emissions program reduced compliance costs by 43%-55%

Cy Jones, Evan Branosky, Mindy Selman, Dr. Michelle Perez 2010. (Jones - MS in Environmental Engineering Univ of Iowa; leads Water Quality Trading Initiative for the Chesapeake Bay watershed at World Resources Institute. Branosky - B.S. in agricultural science from Rutgers Univ; masters in environmental policy U. of Maryland. Selman – masters degree Sustainable Development and Conservation Biology from U. of Maryland. Perez – PhD in environmental policy from the U. of Maryland School of Public Policy) How Nutrient Trading Could Help Restore the Chesapeake Bay Feb 2010 World Resources Institute <http://pdf.wri.org/working_papers/how_nutrient_trading_could_help_restore_the_chesapeake_bay.pdf>

The cost-effectiveness of pollution-credit trading has been demonstrated. Trading has lowered the cost for achieving several air and water pollution goals. The 1990 Clean Air Act Amendments established an interstate trading program for sulfur dioxide emissions that allows power plants facing higher pollution reduction costs to purchase reductions from power plants facing lower pollution reduction costs. The program has reduced the cost of compliance by 43 to 55 percent compared to achieving the required reductions without trading (California Market Advisory Committee, 2007).

“How much will the plan cost?” Less than $2.4 billion. A similar bill (HR5509) was introduced in Congress in 2010 that proposed what our plan does plus more (it also included a US Dept of Agriculture pilot program). The Congressional Budget Office (CBO) studied it and estimated that the Nutrient Trading Commission + USDA Pilot Program would cost $2.4 billion. Since we’re not doing the USDA program, our plan costs less than that.

Congressional Budget Office 2010. “H.R. 5509 Chesapeake Bay Program Reauthorization and Improvement Act “ 6 Oct 2010 <http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/119xx/doc11933/hr5509.pdf>

H.R. 5509 also would establish the Chesapeake Bay Nutrient and Sediment Trading Commission to oversee and administer a trading program for certain point and nonpoint sources of nutrients and sediment in Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the District of Columbia. Finally, enacting this legislation would require the U.S. Department of Agriculture (USDA) to establish a pilot program for creating environmental service markets (that is, markets for carbon storage, flood control, and other projects that do not typically compensate farmers and landowners). Assuming appropriation of the necessary amounts, CBO estimates that implementing this legislation would cost $2.4 billion over the 2011-2015 period.

ADVANTAGES

Trading creates efficiencies and reduces pollution in a more cost-effective manner

Cy Jones, Evan Branosky, Mindy Selman, Dr. Michelle Perez 2010. (Jones - MS in Environmental Engineering Univ of Iowa; leads Water Quality Trading Initiative for the Chesapeake Bay watershed at World Resources Institute. Branosky - B.S. in agricultural science from Rutgers Univ; masters in environmental policy U. of Maryland. Selman – masters degree Sustainable Development and Conservation Biology from U. of Maryland. Perez – PhD in environmental policy from the U. of Maryland School of Public Policy) How Nutrient Trading Could Help Restore the Chesapeake Bay Feb 2010 World Resources Institute <http://pdf.wri.org/working_papers/how_nutrient_trading_could_help_restore_the_chesapeake_bay.pdf>

Trading could create revenue opportunities and reduce costs. The opportunity for nutrient trading arises because large differences in the cost to reduce a pound of nitrogen exist among various sectors and practices (Figure 2). In a trading market, sources that can reduce nutrients at low cost have an economic incentive to make reductions below target levels and then sell the credits to those facing higher costs. Trading therefore creates new revenue opportunities for farmers, entrepreneurs, and others who can generate nutrient credits. At the same time, trading allows those WWTPs and municipal stormwater programs that face higher nutrient reduction costs to save money by purchasing credits to meet a portion of their nutrient reduction obligations. As a result, trading could help achieve overall nutrient reductions in the Chesapeake Bay watershed in a more cost-effective manner.

Nutrient trading = substantial reduction in Chesapeake Bay cleanup cost

Chesapeake Bay Commission and RTI International 2012. (CBC is an organization set up by the legislatures of Maryland, Virginia and Pennsylvania that coordinates efforts to improve the Chesapeake Bay – they commissioned and published this study; the study was written by George Van Houtven, Ross Loomis, Justin Baker, Robert Beach, Sara Casey of RTI International, an independent, nonprofit institute that provides research, development, and technical services to government and commercial clients worldwide) Nutrient Credit Trading for the Chesapeake bay - An Economic Study MAY 2012 <http://www.chesbay.us/Publications/nutrient-trading-2012.pdf> (brackets added)

The results of this study indicate that nutrient trading offers the potential to significantly reduce the costs of achieving the TMDL water quality goals for the Chesapeake Bay. If trading is successful in shifting nutrient reduction and control activities toward the most cost-effective alternatives, then the annual costs of the TMDL could be substantially reduced. For example, compared to a scenario without trading, we estimate that the costs of meeting TMDL load reduction targets for SigPS [significant point source dischargers] could potentially be reduced by as much as 36% if these sources were allowed to trade with other SigPS and with agricultural nonpoint sources located in the same basin and state.

Nitrogen Credit Trading generates millions of dollars in farm revenue

Cy Jones, Evan Branosky, Mindy Selman, Dr. Michelle Perez 2010. (Jones - MS in Environmental Engineering Univ of Iowa; leads Water Quality Trading Initiative for the Chesapeake Bay watershed at World Resources Institute. Branosky - B.S. in agricultural science from Rutgers Univ; masters in environmental policy U. of Maryland. Selman – masters degree Sustainable Development and Conservation Biology from U. of Maryland. Perez – PhD in environmental policy from the U. of Maryland School of Public Policy) How Nutrient Trading Could Help Restore the Chesapeake Bay Feb 2010 World Resources Institute <http://pdf.wri.org/working_papers/how_nutrient_trading_could_help_restore_the_chesapeake_bay.pdf>

A baywide nutrient trading market could generate economic beneﬁts for the region’s agricultural sector. Nitrogen credit trading could generate $45-$300 million per year in revenue, an amount comparable to current agriculture conservation cost-share programs in the bay. Farmers could earn additional revenue if they sell nutrient credits generated by implementing practices that reduce fertilizer or manure runoff beyond baseline levels (Box 1). Preliminary scenario analyses suggest that the potential annual revenue from selling nitrogen credits in a baywide nutrient trading market could be comparable to the amount of public funds for agriculture conservation cost-share programs in the Chesapeake Bay (Figure 4). A trading market could generate an estimated $45 million to $300 million per year, the amount varying with average credit price and the number of credits sold (see Tables 1 and 2 for details underlying the scenarios). In comparison, the combined state and federal cost-share funds for farms in the Chesapeake Bay watershed was approximately $180 million in ﬁscal year 2009.

60% reduction in pollution mitigation costs for waste-water treatment plants

Cy Jones, Evan Branosky, Mindy Selman, Dr. Michelle Perez 2010. (Jones - MS in Environmental Engineering Univ of Iowa; leads Water Quality Trading Initiative for the Chesapeake Bay watershed at World Resources Institute. Branosky - B.S. in agricultural science from Rutgers Univ; masters in environmental policy U. of Maryland. Selman – masters degree Sustainable Development and Conservation Biology from U. of Maryland. Perez – PhD in environmental policy from the U. of Maryland School of Public Policy) How Nutrient Trading Could Help Restore the Chesapeake Bay Feb 2010 World Resources Institute <http://pdf.wri.org/working_papers/how_nutrient_trading_could_help_restore_the_chesapeake_bay.pdf>

Nutrient trading could yield nearly 60 percent cost savings for those WWTPs facing expensive upgrades. WWTPs within the bay watershed face a range of costs to remove nitrogen through treatment process upgrades. Some plants face low costs, some high. WWTPs facing high costs could meet some or all of their obligations less expensively and more rapidly by purchasing credits from farms, entrepreneurs, or other WWTPs that have lower nutrient reduction costs. A WRI analysis of 109 WWTPs in Maryland and Virginia (comparable data from other states was not available) ranging in design capacity from 0.1 to 180 million gallons per day found that 40 plants face treatment process upgrade costs greater than an assumed credit price of $20 per pound of nitrogen (scenario 2). The weighted average annualized upgrade cost of these 40 plants is $47 per pound. Thus, if the credit price were $20 per pound, then purchasing credits would save WWTPs facing similar upgrade costs 57 percent relative to implementing treatment process upgrades (Figure 7). To the degree that the Maryland and Virginia WWTPs are reasonably representative of WWTPs in the bay states in terms of planning, design, and construction costs, this savings rate is indicative of the potential size of savings for other, similarly high-cost WWTPs in the region.

Lower water utility bills. Trading could benefit water utility customers

Cy Jones, Evan Branosky, Mindy Selman, Dr. Michelle Perez 2010. (Jones - MS in Environmental Engineering Univ of Iowa; leads Water Quality Trading Initiative for the Chesapeake Bay watershed at World Resources Institute. Branosky - B.S. in agricultural science from Rutgers Univ; masters in environmental policy U. of Maryland. Selman – masters degree Sustainable Development and Conservation Biology from U. of Maryland. Perez – PhD in environmental policy from the U. of Maryland School of Public Policy) How Nutrient Trading Could Help Restore the Chesapeake Bay Feb 2010 World Resources Institute <http://pdf.wri.org/working_papers/how_nutrient_trading_could_help_restore_the_chesapeake_bay.pdf> (brackets added)

Trading could beneﬁt water utility ratepayers. Ratepayers would save money on their utility bills when public-owned WWTPs [waste water treatment plants] meet nutrient reduction obligations at lower cost through nutrient trading.

Text of Section 117A of HR4153 (introduced in 112th Congress 2011-2012 but not passed)

<http://thomas.loc.gov/cgi-bin/query/F?c112:1:./temp/~c112PKhdhD:e30336>:

H.R.4153 Chesapeake Bay Program Reauthorization and Improvement Act (Introduced in House - IH)`SEC. 117A. CHESAPEAKE BAY NUTRIENT AND SEDIMENT TRADING COMMISSION.

`(a) Definitions- In this section:

`(1) COMMISSION- The term `Commission' means the Chesapeake Bay Nutrient and Sediment Trading Commission established in subsection (b).

`(2) CHESAPEAKE BAY STATE- The term `Chesapeake Bay State' means Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the District of Columbia.

`(3) CHESAPEAKE EXECUTIVE COUNCIL- The term `Chesapeake Executive Council' means the signatories to the Chesapeake Bay Agreement.

`(4) CHESAPEAKE BAY AGREEMENT- The term `Chesapeake Bay Agreement' means the formal, voluntary agreements executed to achieve the goal of restoring and protecting the Chesapeake Bay ecosystem and the living resources of the Chesapeake Bay ecosystem and signed by the Chesapeake Executive Council.

`(b) Establishment of Commission; Purpose-

`(1) IN GENERAL- There is established a Chesapeake Bay Nutrient and Sediment Trading Commission to oversee and administer a nitrogen, phosphorus, and sediment trading program for the Chesapeake Bay States to ensure credits are generated to attract market participants and facilitate trading mechanisms among and within such States to meet water quality goals.

`(2) INDEPENDENT ESTABLISHMENT- The Commission shall be an independent establishment, as defined in section 104 of title 5, United States Code.

`(3) LOCATION- The Commission shall be housed at the Office of the Chesapeake Bay Program directed by the Chesapeake Executive Council in accordance with the Chesapeake Bay Agreement.

`(c) Duties-

`(1) CREDITS FOR WATER QUALITY TRADING- In consultation with market developers, Chesapeake Bay States, and appropriate Federal agencies, the Commission shall develop a system to facilitate and generate credits for interstate water quality trading among and within the Chesapeake Bay States.

`(2) WATER QUALITY TRADING REGISTRY- The Commission shall obtain information from the Administrator, the Secretary of Agriculture, and other Federal agencies to operate and oversee a registry for interstate water quality trading in the Chesapeake Bay States.

`(3) TRADE RECORDKEEPING- The Commission shall develop and maintain a system to record specific interstate water quality trades among and within the Chesapeake Bay States.

`(4) POINT SOURCE AND NONPOINT SOURCE TRADES- In consultation with market developers and appropriate Federal agencies, the Commission shall develop a system to allow for trading to occur between point sources and nonpoint sources, and any combination thereof, among and within the Chesapeake Bay States.

`(5) CONSISTENCY WITH STATE PROGRAM- The Commission shall not establish or operate a program that conflicts with or modifies a State program for intrastate trading.

`(6) DEADLINE; PUBLICATION- Not later than 2 years after the date of enactment of the Chesapeake Bay Program Reauthorization and Improvement Act, the Commission shall promulgate rules for interstate water quality trading among and within the Chesapeake Bay States, and shall publish such rules in the Federal Register.

`(d) Use of Technical Guidelines- The Commission shall rely on the Administrator to provide technical guidelines under section 117(m) and the Secretary of Agriculture to provide technical guidelines under section 1245(b) of the Food Security Act of 1985.

`(e) Members of Commission-

`(1) COMPOSITION- The Commission shall consist of five members, of which--

`(A) one member shall be appointed by the Secretary of Agriculture;

`(B) one member shall be appointed by the Administrator; and

`(C) three members shall be appointed jointly by the Administrator and the Secretary of Agriculture from among persons nominated by the Governors of each of the signatory States of the Chesapeake Bay Agreement.

`(2) SPECIAL CONSIDERATIONS- Of the members of the Commission--

`(A) one member shall be a representative of the general public;

`(B) not more than two of the members may have similar professional experience or expertise in the same field;

`(C) at least one of the members shall be experienced in a market-based pollutant trading mechanism; and

`(D) not more than three of the members may be of the same political party.

`(3) TERMS- The members of the Commission shall serve a term of five years and may be reappointed.

`(4) CHAIRPERSON- The members of the Commission shall designate one of the members to serve as chairperson.

`(5) MEETINGS- The Commission shall meet at the call of the chairperson or a majority of its members, and shall hold public meetings at intervals as are necessary to carry out the functions of the Commission, but not less frequently than 2 times per year.

`(f) Officers and Staff- The Commission may appoint, employ, fix the pay of, and provide other allowances and benefits for such officers and employees of the Commission as the members determine to be appropriate.

`(g) Relationship With Other Entities-

`(1) LIAISONS-

`(A) COMMISSION LIAISONS-

`(i) IN GENERAL- The Commission shall, in cooperation with the Administrator and the Secretary of Agriculture, maintain--

`(I) a liaison between the Commission and the Environmental Protection Agency; and

`(II) a liaison between the Commission and the Department of Agriculture.

`(ii) EFFECTIVE MAINTENANCE- The Administrator and Secretary of Agriculture shall take such steps as may be necessary to enable the Commission to obtain information and utilize such services and facilities of the Environmental Protection Agency and Department of Agriculture as may be necessary in order to maintain effectively such liaisons.

`(B) AGENCY LIAISON OFFICERS- The Administrator and Secretary of Agriculture shall each appoint a liaison officer, who shall be an employee of the Environmental Protection Agency and the Department of Agriculture, respectively, for the purpose of communicating with the liaison maintained under subparagraph (A) and the Commission.

`(C) ATTENDANCE- The Commission shall allow the liaisons and liaison officers to attend and observe all deliberations and proceedings of the Commission.

`(2) MAINTENANCE OF COMMUNICATIONS- The Commission shall maintain communications with the Chesapeake Executive Council and the Chesapeake Bay States for the purposes of--

`(A) keeping such entities fully informed of Commission activities that relate to the responsibilities of those entities;

`(B) seeking views of those entities on such activities; and

`(C) consultation with such entities regarding the relationships between Commission activities and the jurisdiction of such entities.

`(h) Duration- The Commission shall terminate on September 30, 2018.'.

2A EVIDENCE: CORAL REEF PROTECTION

DEFINITIONS

Coral Triangle:

Lauretta Burke, Kathleen Reytar, Mark Spalding and Allison Perry 2012. Burke - M.A. in Environment and Resource Policy from the George Washington University and an M.A. in Geography from the University of California, Santa Barbara. Reytar - Master of Environmental Science & Management from the Bren School at the University of California, Santa Barbara. Spalding - Senior Marine Scientist with The Nature Conservancy’s Global Marine Team and works out of the Dept of Zoology at the Univ of Cambridge. Perry - Postdoctoral Fellow with The World Fish Center) Reefs at Risk Revisited in the Coral Triangle <http://pdf.wri.org/reefs_at_risk_revisited_coral_triangle.pdf>

Spanning the marine waters of Indonesia, Malaysia, Papua New Guinea, the Philippines, Solomon Islands, and Timor-Leste, the Coral Triangle is the global heart of coral reefs. This magnificent area, often called the “Amazon of the Seas*,”* contains nearly 30 percent of the world’s coral reefs and 75 percent of all known coral species.

Coral Triangle Initiative

Coral Triangle Iniative- official website, undated, but obviously written in 2007 or later. <http://www.coraltriangleinitiative.org/>

The Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF) is a multilateral partnership of six countries formed in 2007 to address the urgent threats facing the coastal and marine resources of one of the most biologically diverse and ecologically rich regions on earth. CTI-CFF is managed through a Secretariat based in Jakarta, Indonesia.

MPA: Marine Protected Area

National Oceanic & Atmospheric Administration, last revised 2012. “MPA Definition” last revised 26 May 2012 <http://www.mpa.gov/aboutmpas/definition/>

**What is a Marine Protected Area?** Some people interpret marine protected areas (MPAs) to mean areas closed to all human activities. Others interpret them as special areas established for conservation, but also allowing recreational and, sometimes, commercial use, much like national parks. In reality, "marine protected area" is a term that encompasses a variety of conservation and management methods in the United States. In practice, MPAs are defined areas where natural and/or cultural resources are given greater protection than the surrounding waters. In the U.S., MPAs span a range of habitats including the open ocean, coastal areas, inter-tidal zones, estuaries, and the Great Lakes. They also vary widely in purpose, legal authorities, agencies, management approaches, level of protection, and restrictions on human uses.

SIGNIFICANCE

Coral Triangle key to marine biodiversity

Stuart J Green, Dr. Alan T White, Dr. Patrick Christie, Stacey Kilarski, Anna Blesilda T Meneses, Dr. Giselle Samonte-Tan, Dr. Leah Bunce Karrer, Dr. Helen Fox, Stuart Campbell, and John D Claussen 2011. (White – PhD, President of the Coastal Conservation and Education Foundation Inc, Cebu City, Philippines. Christie – PhD; Associate Professor University of Washington School of Marine Affairs. Meneses – M.S., Coordinator of the Marine Protected Area Project of the Coastal Conservation and Education Foundation Inc., Cebu City, Philippines. Kilarski - Marine Technician, Global Marine Initiative, The Nature Conservancy. Samonte-Tan – PhD; Director for Social Science Research and Outreach of Conservation International. Karrer – PhD; Senior Director, Marine Management Area Science. Conservation International. Fox – PhD in coral research; Marine Conservation Biologist and a Senior Program Officer for the Conservation Science Program of World Wildlife Fund. Campbell – masters degree in Environmental Science. Claussen - Director of the Conservation and Community Investment Forum (CCIF) and a Partner with Starling Resources; almost 10 years experience managing economic development and conservation finance programs throughout Asia ) Emerging marine protected area networks in the coral triangle: Lessons and way forward, CONSERVATION & SOCIETY Vol 9 Issue 3 <http://www.conservationandsociety.org/article.asp?issn=0972-4923;year=2011;volume=9;issue=3;spage=173;epage=188;aulast=Green>

The Coral Triangle is located along the equator where the Indian Ocean and Western Pacific Ocean meet [Figure 1]. This region consists of portions of the waters and coastal regions of six countries: Indonesia, Malaysia, the Philippines, Timor-Leste (East Timor), Papua New Guinea (PNG) and the Solomon Islands. The Coral Triangle is the global epicentre of marine biodiversity and is considered a global priority for marine conservation (Allen 2000; Roberts et al. 2002; Allen and Adrim 2003; Bellwood et al. 2005). It contains over 75% of the estimated 600 coral species (Veron 2000), more than 30% of the world's coral reefs, over 3,000 species of fish, and the greatest extent of mangrove forests of any region.

Coral Triangle reefs support the livelihoods of 126 million people

Stuart J Green, Dr. Alan T White, Dr. Patrick Christie, Stacey Kilarski, Anna Blesilda T Meneses, Dr. Giselle Samonte-Tan, Dr. Leah Bunce Karrer, Dr. Helen Fox, Stuart Campbell, and John D Claussen 2011.( White – PhD, President of the Coastal Conservation and Education Foundation Inc, Cebu City, Philippines. Christie – PhD; Associate Professor University of Washington School of Marine Affairs. Meneses – M.S., Coordinator of the Marine Protected Area Project of the Coastal Conservation and Education Foundation Inc., Cebu City, Philippines. Kilarski - Marine Technician, Global Marine Initiative, The Nature Conservancy. Samonte-Tan – PhD; Director for Social Science Research and Outreach of Conservation International. Karrer – PhD; Senior Director, Marine Management Area Science. Conservation International. Fox – PhD in coral research; Marine Conservation Biologist and a Senior Program Officer for the Conservation Science Program of World Wildlife Fund. Campbell – masters degree in Environmental Science. Claussen - Director of the Conservation and Community Investment Forum; almost 10 years experience managing economic development and conservation finance programs throughout Asia ) Emerging marine protected area networks in the coral triangle: Lessons and way forward, CONSERVATION & SOCIETY Vol 9 Issue 3 <http://www.conservationandsociety.org/article.asp?issn=0972-4923;year=2011;volume=9;issue=3;spage=173;epage=188;aulast=Green>

The Coral Triangle covers an expanse of 5.7 million sq. km or 1.6% of the world's oceans, and has a population of 360 million people. Estimates suggest that the reefs in the Coral Triangle support the livelihoods of 126 million people and the protein needs of millions more (The Nature Conservancy 2007). This area's rich marine biodiversity that disperses the largest number of marine species of different taxonomic groups warrants protection (Veron 2000). Indonesia and the Philippines hold 77% of the region's coral reefs and nearly 80% of all the threatened reefs (Burke *et al.* 2002).

Coral degradation has significant economic impact on the Philippines

Stuart J Green, Dr. Alan T White, Dr. Patrick Christie, Stacey Kilarski, Anna Blesilda T Meneses, Dr. Giselle Samonte-Tan, Dr. Leah Bunce Karrer, Dr. Helen Fox, Stuart Campbell, and John D Claussen 2011. (White – PhD, President of the Coastal Conservation and Education Foundation Inc, Cebu City, Philippines. Christie – PhD; Associate Professor University of Washington School of Marine Affairs. Meneses – M.S., Coordinator of the Marine Protected Area Project of the Coastal Conservation and Education Foundation Inc., Cebu City, Philippines. Kilarski - Marine Technician, Global Marine Initiative, The Nature Conservancy. Samonte-Tan – PhD; Director for Social Science Research and Outreach of Conservation International. Karrer – PhD; Senior Director, Marine Management Area Science. Conservation International. Fox – PhD in coral research; Marine Conservation Biologist and a Senior Program Officer for the Conservation Science Program of World Wildlife Fund. Campbell – masters degree in Environmental Science. Claussen - Director of the Conservation and Community Investment Forum; almost 10 years experience managing economic development and conservation finance programs throughout Asia ) Emerging marine protected area networks in the coral triangle: Lessons and way forward, CONSERVATION & SOCIETY Vol 9 Issue 3 <http://www.conservationandsociety.org/article.asp?issn=0972-4923;year=2011;volume=9;issue=3;spage=173;epage=188;aulast=Green>

The Philippines consists of 7,107 islands. With a total coastline of 36,289 km, the country's coastal and marine waters are characterised by extensive coral reefs, seagrass beds and dense mangrove forests (World Bank 2005). The annual economic benefits from the Philippines' coastal ecosystems were estimated at USD 3.5 billion in 1998 (White & Cruz-Trinidad 1998; World Bank 2005). The economic costs of environmental degradation of these resources are significant. It is estimated that 1 sq. km of healthy coral reef generates an average of USD 50,000 from fishing and tourism alone (White & Cruz-Trinidad 1998). As a whole, the Philippine coral reefs contribute at least USD 1.4 billion annually to the economy or 1.4% of gross domestic product (World Bank 2005).

Coral Triangle has the majority of the world’s coral reef population

Australian Government, Dept of Sustainability, Environment, Water, Population and Communities 2013. “Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI)” last updated 25 Mar 2013 <http://www.environment.gov.au/coasts/international/cti/>

There is broad scientific consensus that the Coral Triangle represents a global epicentre of marine biodiversity. Spanning just 1.6 per cent of the planet's oceans, within the Coral Triangle region are 76 per cent of all known coral species, 37 per cent of all known coral reef fish species, 53 per cent of the world's coral reefs, the greatest extent of mangrove forests in the world, and spawning and juvenile growth areas for tuna and other globally-significant commercial fish species.

Economic Benefit: Coral protects shorelines

Lauretta Burke, Kathleen Reytar, Mark Spalding and Allison Perry 2012. Burke - M.A. in Environment and Resource Policy from the George Washington University and an M.A. in Geography from the University of California, Santa Barbara. Reytar - Master of Environmental Science & Management from the Bren School at the University of California, Santa Barbara. Spalding - Senior Marine Scientist with The Nature Conservancy’s Global Marine Team and works out of the Dept of Zoology at the Univ of Cambridge. Perry - Postdoctoral Fellow with The World Fish Center) Reefs at Risk Revisited in the Coral Triangle <http://pdf.wri.org/reefs_at_risk_revisited_coral_triangle.pdf>

*Shoreline protection.* Beyond their biological value, the physical structures of coral reefs protect an estimated 150,000 km of shoreline in more than 100 countries and territories.31 Reefs dissipate wave energy, reducing routine erosion and lessening inundation and wave damage during storms. This function protects human settlements, infrastructure, and valuable coastal ecosystems such as seagrass meadows and mangrove forests. Some countries— especially low-lying atolls such as the Maldives, Kiribati, Tuvalu, and the Marshall Islands, as well as the Carteret Islands in Papua New Guinea and many other small islands throughout the Coral Triangle—have been built entirely by coral reefs and would not exist but for their protective fringe. Across the Coral Triangle Region, about 45 percent of shorelines are protected by coral reefs. The proportion of protected shoreline is highest in Solomon Islands (70 percent) and the Philippines (65 percent). The annual net economic benefits of shoreline protection from reefs was estimated at $387 million for Indonesia and $400 million for the Philippines in 2000 (converted to US$ 2010) . These values are likely much higher today due to increased development, and hence increased numbers of coastal properties at risk.

Economic Benefit: Coral reefs are vital to tourism

Lauretta Burke, Kathleen Reytar, Mark Spalding and Allison Perry 2012. Burke - M.A. in Environment and Resource Policy from the George Washington University and an M.A. in Geography from the University of California, Santa Barbara. Reytar - Master of Environmental Science & Management from the Bren School at the University of California, Santa Barbara. Spalding - Senior Marine Scientist with The Nature Conservancy’s Global Marine Team and works out of the Dept of Zoology at the Univ of Cambridge. Perry - Postdoctoral Fellow with The World Fish Center) Reefs at Risk Revisited in the Coral Triangle <http://pdf.wri.org/reefs_at_risk_revisited_coral_triangle.pdf>

*Tourism.* Coral reefs are vital to tourism interests in many tropical countries. They attract divers, snorkelers, and recreational fishers, and also provide much of the white sand for beaches. Globally, more than 100 countries and territories benefit from tourism associated with coral reefs. Tourism contributes more than 15 percent of GDP in more than 20 of these countries.

Medical benefits: Coral reefs provide life-saving medicines

Lauretta Burke, Kathleen Reytar, Mark Spalding and Allison Perry 2012. Burke - M.A. in Environment and Resource Policy from the George Washington University and an M.A. in Geography from the University of California, Santa Barbara. Reytar - Master of Environmental Science & Management from the Bren School at the University of California, Santa Barbara. Spalding - Senior Marine Scientist with The Nature Conservancy’s Global Marine Team and works out of the Dept of Zoology at the Univ of Cambridge. Perry - Postdoctoral Fellow with The World Fish Center) Reefs at Risk Revisited in the Coral Triangle <http://pdf.wri.org/reefs_at_risk_revisited_coral_triangle.pdf>

*Treatments for disease.* Many reef-dwelling species have developed complex chemical compounds, such as venoms and chemical defenses, to aid their survival in these highly competitive habitats. Many such compounds have the potential to form the basis of life-saving pharmaceuticals. Explorations into the medical application of reef-related compounds to date include treatments for cancer, HIV, malaria, and other diseases. Since only a small portion of reef life has been sampled, there is still vast potential for new pharmaceutically valuable discoveries.

INHERENCY

Coral Triangle MPAs are not well managed

Stuart J Green, Dr. Alan T White, Dr. Patrick Christie, Stacey Kilarski, Anna Blesilda T Meneses, Dr. Giselle Samonte-Tan, Dr. Leah Bunce Karrer, Dr. Helen Fox, Stuart Campbell, and John D Claussen 2011. (White – PhD, President of the Coastal Conservation and Education Foundation Inc, Cebu City, Philippines. Christie – PhD; Associate Professor University of Washington School of Marine Affairs. Meneses – M.S., Coordinator of the Marine Protected Area Project of the Coastal Conservation and Education Foundation Inc., Cebu City, Philippines. Kilarski - Marine Technician, Global Marine Initiative, The Nature Conservancy. Samonte-Tan – PhD; Director for Social Science Research and Outreach of Conservation International. Karrer – PhD; Senior Director, Marine Management Area Science. Conservation International. Fox – PhD in coral research; Marine Conservation Biologist and a Senior Program Officer for the Conservation Science Program of World Wildlife Fund. Campbell – masters degree in Environmental Science. Claussen - Director of the Conservation and Community Investment Forum; almost 10 years experience managing economic development and conservation finance programs throughout Asia ) Emerging marine protected area networks in the coral triangle: Lessons and way forward, CONSERVATION & SOCIETY Vol 9 Issue 3 <http://www.conservationandsociety.org/article.asp?issn=0972-4923;year=2011;volume=9;issue=3;spage=173;epage=188;aulast=Green>

Important strategies to address major management issues in this complex region include: reducing fishing pressure, preventing habitat destruction, providing alternative sources of income, and addressing broader coastal development issues (Lowry *et al*. 2009). There is also a growing realisation that maintaining high biodiversity levels and pristine coastal areas is vital to attract and sustain tourism and to maintain healthy populations of fish for food security. MPAs have existed for more than 30 years in parts of the Coral Triangle (Philippines, Malaysia and Indonesia) and more recently in the Solomon Islands, Papua New Guinea and East Timor. Unfortunately, the establishment of MPAs is rarely followed by good management and enforcement (Burke *et al.* 2002), meaning that the number of MPAs and their area of coverage are misleading indicators of effective conservation (Mora *et al.* 2006).

Less than 20% of Indonesian MPAs are meeting their objectives

Stuart J Green, Dr. Alan T White, Dr. Patrick Christie, Stacey Kilarski, Anna Blesilda T Meneses, Dr. Giselle Samonte-Tan, Dr. Leah Bunce Karrer, Dr. Helen Fox, Stuart Campbell, and John D Claussen 2011. (White – PhD, President of the Coastal Conservation and Education Foundation Inc, Cebu City, Philippines. Christie – PhD; Associate Professor University of Washington School of Marine Affairs. Meneses – M.S., Coordinator of the Marine Protected Area Project of the Coastal Conservation and Education Foundation Inc., Cebu City, Philippines. Kilarski - Marine Technician, Global Marine Initiative, The Nature Conservancy. Samonte-Tan – PhD; Director for Social Science Research and Outreach of Conservation International. Karrer – PhD; Senior Director, Marine Management Area Science. Conservation International. Fox – PhD in coral research; Marine Conservation Biologist and a Senior Program Officer for the Conservation Science Program of World Wildlife Fund. Campbell – masters degree in Environmental Science. Claussen - Director of the Conservation and Community Investment Forum; almost 10 years experience managing economic development and conservation finance programs throughout Asia ) Emerging marine protected area networks in the coral triangle: Lessons and way forward, CONSERVATION & SOCIETY Vol 9 Issue 3 <http://www.conservationandsociety.org/article.asp?issn=0972-4923;year=2011;volume=9;issue=3;spage=173;epage=188;aulast=Green>

Indonesia has established 114 MPAs, 38 of which contain coral reefs as the dominant habitat (World Fish Center 2007). Legally designated MPAs currently cover almost 70,000 sq. km (Pet-Soede 2006). Most of Indonesia's MPAs are combined terrestrial and marine parks, administered by the Ministry of Forestry (MOF), many of which were gazetted during the 1980s. Recently, the Ministry of Marine Affairs and Fisheries has taken over the administration and establishment of new marine (sub-tidal) protected areas and the district/regency/city (*Kabupaten* or *Kota*) now has jurisdiction out to 3 nautical miles. In addition, under the recent decentralisation, provinces have jurisdiction between 3 and 12 nautical miles offshore. A benefit of the decentralisation is that national marine parks are finding a common support framework where both national and district governments work together to improve management. The increased authority of the district and city governments is also assisting with the establishment and management of local MPAs that are not strictly under the national agencies. Nevertheless, it is estimated that less than 20% of Indonesian MPAs (national and local) are meeting their objectives (World Fish Center 2007; United Nations Environment Programme-World Conservation Monitoring Centre 2008).

Outside Australia, less than 1% of reefs are in no-take MPAs

Lauretta Burke, Kathleen Reytar, Mark Spalding, and Allison Perry 2011. (Burke - M.A. in Environment and Resource Policy from the George Washington University and an M.A. in Geography from the University of California, Santa Barbara. Reytar - Master of Environmental Science & Management from the Bren School at the University of California, Santa Barbara. Spalding - Senior Marine Scientist with The Nature Conservancy’s Global Marine Team and works out of the Dept of Zoology at the Univ of Cambridge. Perry - Postdoctoral Fellow with The World Fish Center) “Reefs at Risk Revisited” World Resources Institute <http://pdf.wri.org/reefs_at_risk_revisited.pdf>

The most dramatic influence of MPAs have been observed within no-take areas where all extractive activities are controlled. At the present time there is no complete data set describing which MPAs, or parts of MPAs, are no-take zones. However, an earlier (2008) review was able to assess more than 30 percent of the world’s MPAs, covering (then) 65 percent of total area protected. From this subset we are aware of 241 coral reef MPAs with total or partial no-take coverage, which includes about 12,150 sq km (4.9 percent) of the world’s coral reefs. Such statistics are once again heavily influenced by Australia: outside of Australia only 1,920 sq km of reefs (less than 1 percent) are in no-take areas.

Insufficient funding hampers MPA effectiveness in the Coral Triangle

Stuart J Green, Dr. Alan T White, Dr. Patrick Christie, Stacey Kilarski, Anna Blesilda T Meneses, Dr. Giselle Samonte-Tan, Dr. Leah Bunce Karrer, Dr. Helen Fox, Stuart Campbell, and John D Claussen 2011. (White – PhD, President of the Coastal Conservation and Education Foundation Inc, Cebu City, Philippines. Christie – PhD; Associate Professor University of Washington School of Marine Affairs. Meneses – M.S., Coordinator of the Marine Protected Area Project of the Coastal Conservation and Education Foundation Inc., Cebu City, Philippines. Kilarski - Marine Technician, Global Marine Initiative, The Nature Conservancy. Samonte-Tan – PhD; Director for Social Science Research and Outreach of Conservation International. Karrer – PhD; Senior Director, Marine Management Area Science. Conservation International. Fox – PhD in coral research; Marine Conservation Biologist and a Senior Program Officer for the Conservation Science Program of World Wildlife Fund. Campbell – masters degree in Environmental Science. Claussen - Director of the Conservation and Community Investment Forum (CCIF) and a Partner with Starling Resources; almost 10 years experience managing economic development and conservation finance programs throughout Asia ) Emerging marine protected area networks in the coral triangle: Lessons and way forward, CONSERVATION & SOCIETY Vol 9 Issue 3 <http://www.conservationandsociety.org/article.asp?issn=0972-4923;year=2011;volume=9;issue=3;spage=173;epage=188;aulast=Green>

The survey results brought considerable attention to sustainable financing of start-up and operational costs of MPAs as a significant factor related to their management effectiveness. In all sites, budgets were limiting and the financial requirements for MPA management (especially long-term) were rarely planned from the outset. Sustainable financing was mostly viewed as an 'add-on' consideration, long after the planning phase and only when it was clear that existing funding sources were running out. It was noted that if financial requirements are not clear up front, it becomes increasingly difficult to secure long-term commitments from funders who otherwise are not aware of these financial requirements. Insufficient long-term funding hampers enforcement and surveillance capacity (Evans & Russ 2004; Lundquist & Granek 2005). In a worldwide survey of MPAs, only 16% of respondents reported that current levels of funding were adequate for effective conservation (Balmford *et al*. 2004). However, in the Coral Triangle MPAs, many do not yet have fully functional management plans in place to ensure that objectives can be met, let alone clear financial plans or strategies to cover the operational costs. Thus, obtaining sustainable financing to support management is difficult without functioning management plans in place.

Coral Triangle MPAs lack scientific and management knowledge, and sustainable financing

Stuart J Green, Dr. Alan T White, Dr. Patrick Christie, Stacey Kilarski, Anna Blesilda T Meneses, Dr. Giselle Samonte-Tan, Dr. Leah Bunce Karrer, Dr. Helen Fox, Stuart Campbell, and John D Claussen 2011. (White – PhD, President of the Coastal Conservation and Education Foundation Inc, Cebu City, Philippines. Christie – PhD; Associate Professor University of Washington School of Marine Affairs. Meneses – M.S., Coordinator of the Marine Protected Area Project of the Coastal Conservation and Education Foundation Inc., Cebu City, Philippines. Kilarski - Marine Technician, Global Marine Initiative, The Nature Conservancy. Samonte-Tan – PhD; Director for Social Science Research and Outreach of Conservation International. Karrer – PhD; Senior Director, Marine Management Area Science. Conservation International. Fox – PhD in coral research; Marine Conservation Biologist and a Senior Program Officer for the Conservation Science Program of World Wildlife Fund. Campbell – masters degree in Environmental Science. Claussen - Director of the Conservation and Community Investment Forum (CCIF) and a Partner with Starling Resources; almost 10 years experience managing economic development and conservation finance programs throughout Asia ) Emerging marine protected area networks in the coral triangle: Lessons and way forward, CONSERVATION & SOCIETY Vol 9 Issue 3 <http://www.conservationandsociety.org/article.asp?issn=0972-4923;year=2011;volume=9;issue=3;spage=173;epage=188;aulast=Green>

This study conducted in 2008 documents the status of selected MPAs and MPA networks in Indonesia, Philippines and Papua New Guinea, to better understand development and their level of success in the Coral Triangle. Findings reveal that substantial gaps exist between the theory and practice of creating functional MPA networks. Across these sites, biophysical and social science knowledge, required to build functional and effective MPAs or MPA networks, lagged behind substantially. Aspects that appeared to require the most attention to improve MPA network effectiveness included essential management systems, institutional arrangements, governance and sustainable financing.

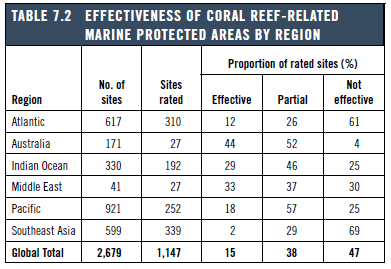
Unsustainable fishing is the major cause of reef damage in the Coral Triangle

Lauretta Burke, Kathleen Reytar, Mark Spalding and Allison Perry 2012. Burke - M.A. in Environment and Resource Policy from the George Washington University and an M.A. in Geography from the University of California, Santa Barbara. Reytar - Master of Environmental Science & Management from the Bren School at the University of California, Santa Barbara. Spalding - Senior Marine Scientist with The Nature Conservancy’s Global Marine Team and works out of the Dept of Zoology at the Univ of Cambridge. Perry - Postdoctoral Fellow with The World Fish Center) Reefs at Risk Revisited in the Coral Triangle <http://pdf.wri.org/reefs_at_risk_revisited_coral_triangle.pdf>

Unsustainable fishing is the most pervasive of all local threats to coral reefs across the Coral Triangle Region. Nearly 85 percent of reefs are threatened by overfishing and/or destructive fishing, with 50 percent considered highly threatened. Destructive fishing alone threatens nearly 60 percent of the region’s reefs (map 2.1). Virtually all reefs in the Philippines, Malaysia, and Timor-Leste are rated as threatened by unsustainable fishing.

Effectiveness of Coral Reef-Related MPAs

Lauretta Burke, Kathleen Reytar, Mark Spalding, and Allison Perry 2011. (Burke - M.A. in Environment and Resource Policy from the George Washington University and an M.A. in Geography from the University of California, Santa Barbara. Reytar - Master of Environmental Science & Management from the Bren School at the University of California, Santa Barbara. Spalding - Senior Marine Scientist with The Nature Conservancy’s Global Marine Team and works out of the Dept of Zoology at the Univ of Cambridge. Perry - Postdoctoral Fellow with The World Fish Center) “Reefs at Risk Revisited” World Resources Institute <http://pdf.wri.org/reefs_at_risk_revisited.pdf>



SOLVENCY

How much does the Plan cost – Coral Triangle?

Cost of properly funding MPAs in the Triangle would be $210-400 million spread over 10 years

Prof. Julian Clifton 2009. (Assistant Professor at the University of Western Australia’s Oceans Institute), 2009, “Comment: Science, funding and participation: key issues for marine protected areas networks and the Coral Triangle Initiative,” Environmental Conservation 36(2), p. 91-96, <http://opwall.com/wp-content/uploads/Clifton-science2009.pdf>

“Estimates indicate that an inflation-corrected figure of around US$ 210 million in 2009 terms would be required to adequately fund the 14 existing MPAs within the Coral Triangle region over a 10-year period (Merkl *et al*. 2003). Park management authorities were the principal data sources used in deriving these estimates, which may underestimate the extent of cost-effective contributions that could be made by local communities and non-governmental organizations (NGOs) under a more collaborative model of park management. Bearing this in mind, it is reasonable to assume that this total estimate could be doubled to reflect the additional MPAs being considered as part of the CTI. The cost of funding the MPA network activities envisaged in the Regional Plan of Action alone could, therefore, amount to US$ 400 million over the next decade, far exceeding the US$ 120 million thus far pledged to the programme as a whole following the Manado World Oceans Conference (Jakarta Post 2009*a).* “

How much does the Plan cost – MPAs?

Status Quo spends $6 billion globally. It would cost $12.5 billion to cover 20% of the total surface of the sea by MPAs, which is way more than the AFF plan does (we only cover US areas that have coral)

Dr. Camilo Mora & Dr. Peter F. Sale 2011. (Mora - PhD in Biology from the University of Windsor with a dissertation titled ‘Importance of Dispersal in Reef Fishes’ and Associate Professor at the Univesrity of Hawaii, Manoa. Sale - PhD in ecology and management of coral reefs and tropical costal management) July 28, 2011, “Ongoing global biodiversity loss and the need to move beyond protected areas: a review of the technical and practical shortcomings of protected areas on land and sea,” Marine Ecology Progress Series, http://www.int-res.com/articles/theme/m434p251.pdf (brackets added; yr–1 is the scientific notation of “per year”; the “US” in front of the $12.5 billion and other amounts means the total is estimated in US currency, not any implication about the US government ) (brackets added)

The global funds expended in establishing and managing PAs [protected areas] are estimated at US$6 billion [per year] yr–1 (James et al. 1999a), despite a major shortfall relative to the actual requirements for effective management. In developing countries, the deficit for effective management of PAs ranges from 66 to 74% (Bruner et al. 2004), while for MPAs worldwide the current deficit is estimated at ~44.8% (Balmford et al. 2004). Troublingly, increasing the coverage of PAs to cover 20% of the world’s seas would cost on the order of an additional US$12.5 billion yr–1 [per year] (Balmford et al. 2004), and an additional US$10.6 billion would be required to cover 15% of the land (James et al. 2001).

MPAs should be expanded to protect coral reefs

Lauretta Burke, Kathleen Reytar, Mark Spalding, and Allison Perry 2011. (Burke - M.A. in Environment and Resource Policy from the George Washington University and an M.A. in Geography from the University of California, Santa Barbara. Reytar - Master of Environmental Science & Management from the Bren School at the University of California, Santa Barbara. Spalding - Senior Marine Scientist with The Nature Conservancy’s Global Marine Team and works out of the Dept of Zoology at the Univ of Cambridge. Perry - Postdoctoral Fellow with The World Fish Center) “Reefs at Risk Revisited” World Resources Institute <http://pdf.wri.org/reefs_at_risk_revisited.pdf>

Expand MPAs to maximize benefits.Increasing the area of coral reefs that are located inside MPAs (especially inside designated no-take zones that prohibit fishing) helps protect fish habitats and replenish depleted stocks. Expansion of MPAs should reflect a regional perspective, recognizing the interdependence of reef communities and the transboundary nature of many reef threats. When locating new MPAs, planners should consider biodiversity, resilience to disturbances, connectivity, and other characteristics that may maximize the benefits of protection. The development of MPA networks, or of very large-zoned MPAs, utilizing ecological and socioeconomic knowledge can create systems that are considerably more effective in supporting productivity and resisting or recovering from stress, than sites declared without such planning. MPAs are currently underutilized in areas where human pressures are greatest. A key priority for governments should be to accelerate MPA or equivalent local management designations in such places, in collaboration with local stakeholders.

We need large MPAs or networks of MPAs to maintain healthy reef populations

Lauretta Burke, Kathleen Reytar, Mark Spalding, and Allison Perry 2011. (Burke - M.A. in Environment and Resource Policy from the George Washington University and an M.A. in Geography from the University of California, Santa Barbara. Reytar - Master of Environmental Science & Management from the Bren School at the University of California, Santa Barbara. Spalding - Senior Marine Scientist with The Nature Conservancy’s Global Marine Team and works out of the Dept of Zoology at the Univ of Cambridge. Perry - Postdoctoral Fellow with The World Fish Center) “Reefs at Risk Revisited” World Resources Institute <http://pdf.wri.org/reefs_at_risk_revisited.pdf>

The effectiveness of individual MPAs can be greatly enhanced if they exist in a broad framework of protection covering wide areas or multiple sites. This may be achieved through very large MPAs (often zoned), or through the development of networks of sites that enable the maintenance of healthy reef populations at multiple locations. Such large-scale approaches provide some security against impacts or losses at individual sites and support the movement of adults and of eggs and larvae between locations. Applying both social and ecological knowledge to the development of MPA systems or networks can increase such benefits, both through incorporating human needs and pressures, and by ensuring that biodiversity is fully covered, and that natural movements can be maintained or maximized.

Governments should donate money to help improve MPAs: More likely to succeed when better funded

Lauretta Burke, Kathleen Reytar, Mark Spalding, and Allison Perry 2011. (Burke - M.A. in Environment and Resource Policy from the George Washington University and an M.A. in Geography from the University of California, Santa Barbara. Reytar - Master of Environmental Science & Management from the Bren School at the University of California, Santa Barbara. Spalding - Senior Marine Scientist with The Nature Conservancy’s Global Marine Team and works out of the Dept of Zoology at the Univ of Cambridge. Perry - Postdoctoral Fellow with The World Fish Center) “Reefs at Risk Revisited” World Resources Institute <http://pdf.wri.org/reefs_at_risk_revisited.pdf>

MPAs require day-to-day management and enforcement to effectively protect reef resources, yet many exist only on paper and lack the economic resources and staff for effective management. Governments, donors, NGOs, and the private sector should provide financial and political support to help MPAs build needed capacity, both in terms of equipment (e.g., boats and fuel) and adequately trained staff. MPAs are more likely to be successful in the long term if they are financially self-sustaining, with a diverse revenue structure, and many will require further support to achieve this aim.

MPA improved quality of life in Solomon Islands village

Lauretta Burke, Kathleen Reytar, Mark Spalding and Allison Perry 2012. Burke - M.A. in Environment and Resource Policy from the George Washington University and an M.A. in Geography from the University of California, Santa Barbara. Reytar - Master of Environmental Science & Management from the Bren School at the University of California, Santa Barbara. Spalding - Senior Marine Scientist with The Nature Conservancy’s Global Marine Team and works out of the Dept of Zoology at the Univ of Cambridge. Perry - Postdoctoral Fellow with The World Fish Center) Reefs at Risk Revisited in the Coral Triangle <http://pdf.wri.org/reefs_at_risk_revisited_coral_triangle.pdf>

The Arnavon Community Marine Conservation Area, located between the main islands of Choiseul and Santa Isabel in the western Solomon Islands, is a 158-sq-km MPA that includes the three small Arnavon Islands and more than 18 sq km of coral reefs. It is co-managed by three local communities—Kia, Wagina, and Katupika—and the provincial government, with support from The Nature Conservancy. Approximately 2,200 people live within the three communities that manage the MPA. In the nearly 15 years since its establishment, the MPA has dramatically improved the lives of residents of the three managing communities compared to communities elsewhere in Solomon Islands. A recent survey of community members found that household incomes are more than double that of other communities, due largely to the diversification of employment opportunities beyond fishing, which include MPA patrols, vegetable farming, and custom handcrafts. Trade and communication between the three culturally diverse communities have increased as village leaders work together on the MPA management committee. Moreover, the committee framework has empowered more villagers, especially women, to have an active role in community meetings and a more direct dialogue with the provincial government, which has strengthened government support for fisheries and local health care. While the MPA has not completely eliminated poverty among these communities and there have been challenges in sustaining consistent incomes from alternative livelihoods, villagers have noticed a clear improvement in their quality of life over the past 15 years because of the MPA.

Small isolated MPAs are not as effective as large networks of MPAs

Lauretta Burke, Kathleen Reytar, Mark Spalding, and Allison Perry 2011. (Burke - M.A. in Environment and Resource Policy from the George Washington University and an M.A. in Geography from the University of California, Santa Barbara. Reytar - Master of Environmental Science & Management from the Bren School at the University of California, Santa Barbara. Spalding - Senior Marine Scientist with The Nature Conservancy’s Global Marine Team and works out of the Dept of Zoology at the Univ of Cambridge. Perry - Postdoctoral Fellow with The World Fish Center) “Reefs at Risk Revisited” World Resources Institute <http://pdf.wri.org/reefs_at_risk_revisited.pdf>

Small, isolated MPAs are less likely to promote resilience than networks of MPAs, which would ideally include some large areas. MPA networks should include representation of all reef zones and habitats to reasonable extents. Furthermore, they must protect critical areas, such as fish spawning areas or bleaching-resistant areas. The networks should also be designed to utilize connectivity, so that replenishment following impacts can be maximized. Finally, it is critical to establish effective management to reduce or eliminate other threats that would otherwise hinder recovery.

MPA’s valuable tool for protecting coral

Stuart J Green, Dr. Alan T White, Dr. Patrick Christie, Stacey Kilarski, Anna Blesilda T Meneses, Dr. Giselle Samonte-Tan, Dr. Leah Bunce Karrer, Dr. Helen Fox, Stuart Campbell, and John D Claussen 2011. (White – PhD, President of the Coastal Conservation and Education Foundation Inc, Cebu City, Philippines. Christie – PhD; Associate Professor University of Washington School of Marine Affairs. Meneses – M.S., Coordinator of the Marine Protected Area Project of the Coastal Conservation and Education Foundation Inc., Cebu City, Philippines. Kilarski - Marine Technician, Global Marine Initiative, The Nature Conservancy. Samonte-Tan – PhD; Director for Social Science Research and Outreach of Conservation International. Karrer – PhD; Senior Director, Marine Management Area Science. Conservation International. Fox – PhD in coral research; Marine Conservation Biologist and a Senior Program Officer for the Conservation Science Program of World Wildlife Fund. Campbell – masters degree in Environmental Science. Claussen - Director of the Conservation and Community Investment Forum (CCIF) and a Partner with Starling Resources; almost 10 years experience managing economic development and conservation finance programs throughout Asia ) Emerging marine protected area networks in the coral triangle: Lessons and way forward, CONSERVATION & SOCIETY Vol 9 Issue 3 <http://www.conservationandsociety.org/article.asp?issn=0972-4923;year=2011;volume=9;issue=3;spage=173;epage=188;aulast=Green>

Marine protected areas (MPAs) and MPA networks are valuable tools for protecting coral reef habitats and managing near-shore fisheries, while playing an essential role in the overall conservation of marine biodiversity. In addition, MPAs and their networks are often the core strategy for larger scale and more integrated forms of marine resource management that can lead to ecosystem-based management regimes for seascapes and eco-regions.

Coral Triangle Support Program (CTSP) builds & strengthens MPAs

US Agency for International Development 2010. (foreign aid agency of the US State Department) CORAL TRIANGLE SUPPORT PARTNERSHIP (CTSP) PROJECT-PHILIPPINES (ethical disclosure about the date: The web site was “last updated” in April, 2013, but the material in this article is from no earlier than 2010 and appears not to have been updated after 2010, based on internal references to past and future events) <http://philippines.usaid.gov/programs/energy-environment/coral-triangle-support-partnership-project-philippines>

**Marine Protected Areas (MPAs) and MPA Network.** CTSP extends technical trainings and logistical support to LGUs and MPA management boards to improve the management of existing MPAs in the priority geographies. The identification and declaration of new MPAs are biologically important areas to the LRF (e.g., spawning aggregation sites), and in the case of Lubang Island in the Verde Island Passage, on “climate smart” MPAs. These MPAs are in various stages of identification and delineation, while 1,000 hectares of new MPAs have been declared in Lubang Island on April 2010.

2A EVIDENCE: CUBAN OIL DEVELOPMENT

INHERENCY

US technology is needed, but blocked by export controls

Jeff Franks 2008. (journalist), 12 June 2008, REUTERS NEWS SERVICE, “Cuban oil production could be a catalyst for a change in relations with U.S.,” NEW YORK TIMES, <http://www.nytimes.com/2008/06/12/business/worldbusiness/12iht-cubaoil.4.13670441.html?pagewanted=all&_r=0>

The Cuban field lies as much as six miles, or 9.7 kilometers, below the sea surface, depths at which U.S. production technology is superior, said a Cuban oil expert, Jonathan Benjamin-Alvarado, at the University of Nebraska-Omaha. "Cuba and none of the present partners have that capability without accessing American technology, and therein lies the rub," he said. "U.S. export controls forbid them to transfer that technology to Cuba."

Cuba embargo puts billions of dollars of oil business off limits to US companies

Jeff Franks 2008. (journalist), 12 June 2008, REUTERS NEWS SERVICE, “Cuban oil production could be a catalyst for a change in relations with U.S.,” NEW YORK TIMES, <http://www.nytimes.com/2008/06/12/business/worldbusiness/12iht-cubaoil.4.13670441.html?pagewanted=all&_r=0>

In a rare confluence of circumstances, oil could grease the wheels for the two bitter enemies to come together in the middle of the Florida Straits out of mutual need, experts say. Getting there would require a sea change in US policy -- namely putting a major hole in the US trade embargo imposed against Cuba in 1962 to topple Fidel Castro's communist government. If the embargo stays as is, a nearby source of oil will be off-limits to the energy-thirsty United States and the American oil industry will miss out on billions of dollars of business.

Status Quo efforts aren’t enough to protect against oil spill in Cuban waters

Daniel J. Whittle, J.D. 2011. (Senior Attorney and Cuba Program Director, Environmental Defense Fund) "North American Offshore Energy: Mexico and Canada Boundary Treaties and New Drilling by Cuba and Bahamas" testimony before the House Committee on Natural Resources, Subcommittee on Energy and Mineral Resources <http://democrats.naturalresources.house.gov/sites/democrats.naturalresources.house.gov/files/content/files/2011-11-02_HRG_EMR_Testimony_Whittle.pdf>

The Treasury and Commerce Departments have also signaled that they are prepared to issue more specific licenses to private companies in the US with the capacity to respond to, contain, and clean up oil spills. At least one US company, Clean Caribbean and Americas, already has Treasury and Commerce approvals to provide oil spill response services in Cuba. The Department of Interior has also reportedly had productive discussions with the Spanish company Repsol over its future drilling in Cuban waters and has apparently secured the company’s pledge to adhere to US environmental and safety standards. These positive steps, however, fall far short of those needed and pale in comparison to those the Administration taken to strengthen and expand cooperation with Mexico. As a result, the United States remains unprepared to effectively assist in the prevention, containment, or clean-up of a major oil spill in Cuban waters.

Recent Cuban oil drilling failures don’t mean the environmental threat has passed: it is as relevant as ever today

Emily A. Peterson, Daniel J. Whittle, J.D., and Dr. Douglas N. Rader, Ph.D. 2012. (Whittle - Senior Attorney and Cuba Program Director, Environmental Defense Fund. Rader – chief oceans scientist, Environmental Defense Fund) “Bridging the Gulf: Finding Common Ground on Environmental and Safety Preparedness for Offshore Oil and Gas in Cuba” <http://thecubaneconomy.com/articles/tag/petroleum/>

To some, the outcome of three failed wells out of three attempts in Cuban waters may suggest that the threat of a catastrophic offshore spill impacting U.S. waters and the shared ecosystems of the Gulf of Mexico is now moot. To the contrary, the issue is salient now more than ever. Cuba has an existing near-coastal oil industry on its north coast near Matanzas, a near- single-source dependency on imported petroleum from Venezuela, and has exhibited continued strong interest in developing its own offshore capacity. Several additional foreign oil companies are slated to conduct exploratory deepwater drilling in Cuba at least through 2013.

ADVANTAGES – ENVIRONMENT / OIL SPILLS

Lack of cooperation leaves the US vulnerable to oil spills in Cuban waters

Daniel J. Whittle, J.D. 2011. (Senior Attorney and Cuba Program Director, Environmental Defense Fund) "North American Offshore Energy: Mexico and Canada Boundary Treaties and New Drilling by Cuba and Bahamas" testimony before the House Committee on Natural Resources, Subcommittee on Energy and Mineral Resources <http://democrats.naturalresources.house.gov/sites/democrats.naturalresources.house.gov/files/content/files/2011-11-02_HRG_EMR_Testimony_Whittle.pdf>

This lack of dialogue, cooperation, and joint planning between government agencies leaves the United States especially vulnerable to future oil spills in Cuban waters. Florida and other states along the east coast as far as North Carolina would be threatened by a major oil spill in Cuba. Therefore, as outlined below, the Administration should take immediate steps to initiate negotiations with the Cuban government to ensure that sufficient environmental and safety safeguards are in place before drilling begins later this year. In addition, the Administration should pre-approve categories of private companies to send personnel and equipment to Cuba in the event of an oil spill that threatens US waters.

Sanctions threaten environment by blocking oil disaster response

Erika Bolstad 2012. (journalist) 10 May 2012 “Cuba embargo could threaten oil-drilling safety, expert says <http://www.mcclatchydc.com/2012/05/10/148433/cuba-embargo-could-threaten-oil.html#storylink=cpy>

Lee Hunt, the former president of the International Association of Drilling Contractors, warned that Cold War-era economic sanctions threaten not only Florida’s economy and environment but that of Cuba, too, in the event of a major disaster on the scale of 2010’s Deepwater Horizon oil spill. The worst-case scenario is "state-sponsored chaos at a disaster site," Hunt said during an event sponsored by the Center for International Policy, a Washington think tank that advocates for a foreign policy based on human rights. The U.S. Coast Guard has extensive response plans, as does the state of Florida. But Hunt said he would give prevention efforts an "F" grade. He likened the work to stocking body bags for a plane crash – but not training pilots to fly safely or to maintain aircraft properly.

Cuban oil spill would do big damage in the US

OIL & GAS JOURNAL 2012. (Nick Snow, Washington Editor) 21 May 2012 Cuba drilling continues as US groups press spill response need <http://www.ogj.com/articles/print/vol-110/issue-5b/general-interest/cuba-drilling-continues-as-us-groups-press-spill-response-need.html>

This matters because a Cuban offshore oil spill potentially could do more damage than the Macondo well spill, Reilly warned. Currents off Cuba more directly threaten US coasts, and marine habitats there support US fishing, he explained. "Baby fish in Cuba become adult fish in Florida," Whittle said. "We need to work with Cubans to better understand what's downstream." Noting that the National Oceanic and Atmospheric Administration recently developed models showing which US coastal areas would be damaged by a Cuban offshore oil spill, Whittle said USCG also is leading multilateral discussions and working with US coastal states, and Cuban scientists have met with their counterparts from the Bahamas in highly technical discussion under the International Maritime Organization's aegis.

US embargo hampers response to oil spill.

90% of Cuban oil spill could end up in US waters

Robin Yapp 2011. (journalist) 29 May 2011 US could lift Cuba embargo after oil discovery, THE TELEGRAPH <http://www.telegraph.co.uk/news/worldnews/centralamericaandthecaribbean/cuba/8544870/US-could-lift-Cuba-embargo-after-oil-discovery.html>

Jorge Pinon, visiting research fellow with Florida International University's Cuban Research Insitute, warned: "The US embargo means Repsol can't pick up the phone to Washington. Any equipment to help in a problem would have to come from the UK or Norway or somewhere else." Repsol will drill at least one and possibly as many as five wells in waters of similar depth to those where an explosion on BP's Deepwater Horizon rig caused eleven deaths and led to an environmental catastrophe. In the event of a further disaster, as much as 90 per cent of any spill could end up in US waters.

US should pre-authorize oil services companies to respond to Cuban oil spills

Daniel J. Whittle, J.D. 2011. (Senior Attorney and Cuba Program Director, Environmental Defense Fund) "North American Offshore Energy: Mexico and Canada Boundary Treaties and New Drilling by Cuba and Bahamas" testimony before the House Committee on Natural Resources, Subcommittee on Energy and Mineral Resources <http://democrats.naturalresources.house.gov/sites/democrats.naturalresources.house.gov/files/content/files/2011-11-02_HRG_EMR_Testimony_Whittle.pdf>

First and foremost, the Administration should take steps now to ensure that US-based companies are pre-authorized to assist in preventing and containing major oil spills in Cuban waters. Specifically, the US Department of Treasury should adopt a new general license that provides authority to any qualified oil services company in the United States to send personnel to Cuba in response to a request from Cuba, Repsol or any other oil company conducting operations in Cuban waters; likewise, the US Department of Commerce should pre-approve the export of vessels, equipment, and supplies needed for containment and response. This would allow Repsol and other foreign oil companies to contract with US oil service companies in advance of drilling. This is particularly important because of the proximity to Cuba of US firms with the requisite deep water drilling and advanced response, technical, and planning capabilities, in contrast to the distance between Cuba and other countries, such as the UK, Norway or Brazil, with state-of-the-art deep water oil development experience.

ADVANTAGES – VENEZUELA

Note: This was included in an earlier version of this case when it was done for another debate league. It could still be valid if you include the card below that says Chavez’s policies of repression are still continuing in Venezuela and if you keep up on current events to ensure that the Cuban teacher/doctor trade for oil is still ongoing in the Status Quo at the time you want to run the case. The advantage is a bit surprising because it occurs as a side-effect in Venezuela, which is not a direct party involved in the Plan. You could also run it as an add-on Advantage in the 2AC if you have time left over.

A. Link: Cuba trades teachers and doctors for subsidized Venezuelan oil

Pierre Bertrand 2012. (journalist) International Business Times, 14 Feb 2012 “Reversal of Fortune: Venezuela Could Be Biggest Beneficiary of New Cuban Oil “http://www.ibtimes.com/reversal-fortune-venezuela-could-be-biggest-beneficiary-new-cuban-oil-410554

Cuba now refines about 50,000 barrels of oil a day, about a third of its requirements. Venezuela makes up the difference for free, said Jorge Pinon, the former president of Amoco Oil Latin America and an expert on the Cuban oil industry. Pinon now is a research fellow at the Center for International Energy and Environmental Policy at the University of Texas. Instead of cash, Cuba pays back its Latin American neighbor by sending doctors, teachers and other skilled labor in a sort of international bartering system, Pinon said in an interview.

B. Link: Oil success will allow Cuba to move away from dependence on Venezuela

David LaGosse 2012. (journalist) National Geographic News, 19 Nov 2012 Cuba's Oil Quest to Continue, Despite Deepwater Disappointment <http://news.nationalgeographic.com/news/energy/2012/11/121119-cuba-oil-quest/>

In addition to the environmental risks of Cuba going it alone, there are the political risks. Piñon, at the University of Texas, said success in deepwater could have helped Cuba spring free of Venezuela's influence as the time nears for the Castro brothers to give up power. Raúl Castro, who took over in 2008 for ailing brother Fidel, now 86, is himself 81 years old. At a potentially crucial time of transition, the influence of Venezuela's outspoken leftist president Hugo Chávez could thwart moves by Cuba away from its state-dominated economy or toward warmer relations with the United States, said Piñon.

C. Chavez is dead, but his policies continue in Venezuela.

Associated Press 2013. Cuba avoids oil cutoff for now as Chavez ally narrowly wins Venezuela presidential election <http://articles.washingtonpost.com/2013-04-15/world/38545552_1_nicolas-maduro-federal-communications-commission-president-raul-castro>

Cubans were relieved Monday by the announcement that the late leader Hugo Chavez’s hand-picked successor had been elected Venezuela’s new president, apparently allowing their country to dodge a threatened cutoff of billions of dollars in subsidized oil. Cuban President Raul Castro sent a congratulatory message to Nicolas Maduro, who is seen as an ideological ally who will want to continue the countries’ special relationship as he serves out the remainder of Chavez’s six-year term.

D. The Impact: Reduced Repression in Venezuela. The Chavez agenda of repression would be reduced without Cuban doctors and teachers

Dr. Eugenio Yánez 2007. (PhD in Economics; former professor at University of Havana) CUBA-VENEZUELA: INTERDEPENDENCE AND INFLUENCE <http://www6.miami.edu/iccas/Docs/September-2007.pdf>

Furthermore, the growth of Chávez’s agenda relies on the Cuban regime. Without the highly sophisticated repressive techniques and personnel that Cubans have placed at his disposal, it would be extremely difficult for him to permanently dissolve democratic institutions in Venezuela and establish himself as “caudillo” or military dictator. The Bolivarian Chavista movement does not rely solely on the Cuban doctors, teachers, and social workers in Venezuela. They can be considered the tip of the iceberg and, certainly, if they were expelled from the country, it would leave the Chavista government without a support mechanism to ensure its popularity throughout the nation.

Cuban oil development can reduce dependence on Venezuela

OIL & GAS JOURNAL 2012. (Nick Snow, Washington Editor) 21 May 2012 Cuba drilling continues as US groups press spill response need <http://www.ogj.com/articles/print/vol-110/issue-5b/general-interest/cuba-drilling-continues-as-us-groups-press-spill-response-need.html>

With Cuba on the cusp of its first offshore oil production, opportunities escalate along with the risks, according to Jonathan Benjamin-Alvarado, a University of Nebraska political science professor specializing in foreign policy, international development, and security. The extent to which Cuba develops its own resources will make it less dependent on Venezuela, and many in the country see potential for it to become a major refining and transportation center, he indicated.

Cuba would suffer if Chavez’s opponents take power – Venezuelan aid is the single biggest factor supporting Cuban economy

THE ECONOMIST 2011. If Hugo goes 7 July 2011 <http://www.economist.com/node/18928494>

In addition, Mr Chávez is putting up money for infrastructure projects on the island, such as the expansion of an oil refinery at Cienfuegos. Venezuela is also Cuba's top trading partner. Venezuelan aid has been the biggest single factor in helping the communist island emerge from the catastrophic slump that followed the demise of its previous sponsor, the Soviet Union, in 1991. Adult Cubans remember the early 1990s as a traumatic time of food and fuel shortages. Might such penury return? Were Mr Chávez's opponents to take power in Venezuela, they would almost certainly cut aid to Cuba, not least since they face pressing needs at home. Cubans could expect widespread shortages. But things would not be quite as bad as in 1991. Then Cuba had become dependent on selling sugar to the Soviet Union at an inflated price. Now the economy is more diversified: the island is producing more oil; and tourism, nickel and remittances from Cuban-Americans have all become important sources of foreign exchange.

Cuban dependence on Venezuela is a deep vulnerability

WALL STREET JOURNAL 2012. (Nicolas Casey, Journalist) 22 June 2012 “For Cuba, Chávez's Health Is a Vital Statistic <http://online.wsj.com/article/SB10001424052702303879604577412190274916840.html>

In more than a decade of friendship between Mr. Chávez and Cuba's rulers, Venezuela has sent cash and oil subsidies worth billions of dollars a year. Those handouts could come under threat without Mr. Chávez in power to back them—showing how the flip side of Venezuelan largesse is a deep potential Cuban vulnerability.

If anything happens to Venezuela’s aid, it’s economic disaster for Cuba

WALL STREET JOURNAL 2012. (Nicolas Casey, Journalist) 22 June 2012 “For Cuba, Chávez's Health Is a Vital Statistic <http://online.wsj.com/article/SB10001424052702303879604577412190274916840.html> (brackets added)

The extreme situation has drawn comparisons to Cuba's relationship with the Soviet Union, which underwrote the Cuban economy for decades until its sudden collapse in 1989. What followed was what Cubans call the "Special Period" of the 1990s, during which the Cuban economy contracted 35% in three years, leading to rationing of food and electricity. Cuba is on more solid footing than it was then. But it still faces the U.S. economic embargo, and economists say the ending of Venezuelan largess would be a massive blow. "This could be a disaster," Mr. Mesa-Lago [professor emeritus at the University of Pittsburgh] said. "If this help stops, industry is paralyzed, transportation is paralyzed—and you'll see the effects in everything from electricity to sugar mills."

ADVANTAGES – ECONOMY/OIL PRICES

Embargo hurts the US: We need oil from Cuba

Jeff Franks 2008. (journalist), 12 June 2008, REUTERS NEWS SERVICE, “Cuban oil production could be a catalyst for a change in relations with U.S.,” NEW YORK TIMES, <http://www.nytimes.com/2008/06/12/business/worldbusiness/12iht-cubaoil.4.13670441.html?pagewanted=all&_r=0>

But Kirby Jones, a consultant on Cuban business and founder of the U.S.-Cuba Trade Association in Washington, and who is against the embargo, said a big Cuba oil find would change the political equation. "This is the first time that maintaining the embargo actually costs the United States something," he said. "And we need oil. We need it from wherever we can get it, and in this case it's 50 miles off our coast." An odd fact is that Cuba will be drilling 50 miles from the Florida Keys, or more than twice as close as U.S. companies can get because of regulations protecting Florida's coast. Representative Jeff Flake, an Arizona Republican who has introduced bills in Congress to lift the embargo for oil companies, said the environmental argument might be crucial because there was much concern in Florida about potential oil spills.

Oil price spikes cause great economic damage

The Economist 2011 (respected British news magazine) March 3, 2011 “The price of fear” THE ECONOMIST <http://www.economist.com/node/18285768>

Nonetheless, whether driven by demand or supply, a large enough spike in the price of oil can do great damage. Economists call such abrupt responses “non-linearities” and they suggest that when the price rises fast enough, consumers and businesses trim their spending and investment plans. This is often because prices are driven by other factors that hurt confidence, such as wide unrest in the Middle East. If another Arab government were toppled, pushing the oil price over $150, the economic impact would almost certainly be larger than the 0.5% to 1% of GDP that simple extrapolation suggests. Higher oil prices hurt the US economy

Oil prices hurt the US and world economy

Dr. Shiu-Sheng Chen & Kai-Wei Hsu 2012. (Chen - PhD economics; professor of economics at National Taiwan University; Hsu - economics department, National Taiwan University) Reverse Globalization: Does High Oil Price Volatility Discourage International Trade? Jan 2012, <http://mpra.ub.uni-muenchen.de/36182/1/MPRA_paper_36182.pdf>

It has been shown that the dramatic rise in oil prices during the 1970s was associated with subsequent economic downturns. Although there is some debate as to whether oil price shocks are the main cause of recessions, Hamilton (2009b) asserts that the latest surge in oil prices between June 2007 and June 2008 was an important factor that contributed to the economic recession that began in the US in 2007:Q4. Moreover, a number of recent studies show that oil price shocks have significant effects on a variety of domestic economic activities. An increase in oil prices has a significant negative impact on GDP growth and contributes to a higher inflation rate for most countries (see Hamilton (2009a), Cologni and Manera (2008), and Lardic and Mignon (2008)). Finally, Ordonez et al. (2011) show that the oil price shock is an important driving force of the cyclical labor adjustments in the US labor market, and the job-finding probability is the main transmission mechanism of such a shock.

SOLVENCY

Cuba would welcome US investment

Michael Janofsky 2006. (journalist), 9 May 2006, “Cuba irks U.S. with plans for oil drilling,” NEW YORK TIMES, <http://www.nytimes.com/2006/05/09/world/americas/09iht-cuba.html> (brackets added)

At a recent trade conference in Mexico City arranged by [founder of the U.S. Cuba Trade Association, Kirby] Jones, Cuban officials invited U.S. oil companies to bid for the other leases on the Cuban side of the Florida Strait even though drilling in Cuban waters would violate the U.S. trade embargo against Cuba.

Cuba wants US investment in developing its energy resources

Dr. Jonathan Benjamin-Alvarado 2006. (PhD, Professor of Political Science at University of Nebraska at Omaha ) Report for the Cuban Research Institute, Florida International University, “The Current Status and Future Prospects for Oil Exploration in Cuba: A Special,” <http://cri.fiu.edu/research/commissioned-reports/oil-cuba-alvarado.pdf>

It suffices to say that the requisite investment and assistance will have a distinct American tinge to it, inasmuch as American corporations, U.S. government agencies, and international Cuban officials welcome US energy investment financial institutions, of which the U.S. is a major contributor, will play important roles in the funding of the effort to revitalize the Cuban energy sector. Cuban officials are not averse and perhaps would prefer that the U.S. be its major partner in this effort owing to the fact that most if not all of the cutting-edge technology in energy, oil and gas comes from the United States.

US energy companies are welcome in Cuba

Carolyn Whelan (business journalist), 7 March 2007, FORTUNE magazine, “Castro's revenge: The Cuban oil rush,” <http://money.cnn.com/magazines/fortune/fortune_archive/2007/03/19/8402339/index.htm>

And Cuban officials say U.S. companies would receive the same treatment as others. "American energy companies and investment are welcome in our country," says Ernesto Plasencia, Cuba's commercial attaché in Washington, D.C.

US oil companies are interested in investing in Cuba

Dr Jonathan Benjamin-Alvadaro 2010. (PhD, Professor of Political Science at University of Nebraska at Omaha ) Report for the Cuban Research Institute, Florida International University, Brookings Institution book, “Cuba’s Energy Future: Strategic Approaches to Cooperation” <http://books.google.fr/books?id=7jNs2P2Z9NYC&pg=PA127&lpg=PA127&dq=%22by+licensing+American+oil+companies+to+participate+in+the+development+of+Cuba%E2%80%99s+energy+resources.+%22&source=bl&ots=HyrSpfHfHJ&sig=QCSlA9_Xg21EfaqSCbRv1ZDuWaQ&hl=en&sa=X&ei=m0DPUZL8CInFPfvdgcAE&redir_esc=y#v=onepage&q=%22by%20licensing%20American%20oil%20companies%20to%20participate%20in%20the%20development%20of%20Cuba%E2%80%99s%20energy%20resources.%20%22&f=false>

Recent history shows that Cuba possesses the potential to be a strong regional trade partner in the area of energy and infrastructure development. It might be premature for U.S. firms to begin opening branch offices along Avenida Quinta in the Miramar district of Havana, but it is rational to consider the benefits that would be drawn from the expansion of trade and cooperation between Cuba and the United States in energy development. There will be obvious limitations on such investment opportunities because of the *empresa mixta* joint-venture model that the Cuban government employs, but as previously stated, international oil companies are not averse to adjusting their investment models to specific market conditions, and in the case of Cuba it would be no different. In fact, there has been no lack of interest on the part of American international oil firms in developing a Cuban market.

No doubt Cuba has oil – but it’s in deep waters

Associated Press 2012. (Peter Orsi, journalist) “Cuba oil dreams on hold as drill rig set to depart “ 13 Nov 2012 <http://www.businessweek.com/ap/2012-11-13/cuba-oil-dreams-on-hold-as-drill-rig-set-to-depart>

Oil's existence off Cuba is not in doubt. Russian company Zarubezhneft is contracted to use a different rig to drill in shallower waters off Cayo Coco, a key Cuban tourist destination, later this month. But the more promising deposits lie in the deep waters of the west.

Cuba has 5 billion barrels of oil

Jeff Franks 2008. (journalist), 12 June 2008, REUTERS NEWS SERVICE, “Cuban oil production could be a catalyst for a change in relations with U.S.,” NEW YORK TIMES, <http://www.nytimes.com/2008/06/12/business/worldbusiness/12iht-cubaoil.4.13670441.html?pagewanted=all&_r=0>

The U.S. Geological Survey has estimated the Cuban field holds at least five billion barrels of recoverable oil and 10 trillion cubic feet, or 280 billion cubic meters, of natural gas. In a few years, Cuba could be producing 525,000 barrels of oil a day, enough to make it energy independent and perhaps even an oil exporter, said Jorge Piñón, a former oil company executive who is now a researcher at the University of Miami. Cuba currently consumes 145,000 barrels of oil daily, of which 92,000 barrels come from Venezuela, though that would most certainly rise if the embargo were lifted.

Billions of barrels of oil available if restrictions are lifted

Interpress Service News Agency 2006. (Patricia Grogg, journalist) 3 Oct 2006, CUBA-US: Embargo's Boomerang Effect <http://ipsnews.net/news.asp?idnews=34976>

Energy is another good business that Havana says U.S. companies are missing out on, because they are forbidden to participate in prospecting for oil on Cuba's undersea platform in the Gulf of Mexico, only 137 kilometres from Florida. The platform to the north of Cuba has an estimated potential of between one billion and 9.3 billion barrels of crude and between 1.9 trillion and 22 trillion cubic feet of natural gas. These estimates in the Cuban foreign ministry's report are attributed to the U.S. Geological Survey (USGS), which said "the possibilities of success are of the order of 95 percent." In 1999 Cuba opened up to tender 112,000 square kilometres of its waters in the Gulf of Mexico, divided into 51 blocks, for foreign exploration aimed at eventual exploitation.

DISADVANTAGE RESPONSES

Net Benefit: Not-doing oil development hurts U.S. more than Cuba

Vicki Huddleston 2008, (Visiting Fellow, Foreign Policy, Brookings Institution; expert on Latin America and Africa. A career member of the Foreign Service, she served as U.S. Ambassador to Mali and Madagascar, acting U.S. ambassador to Ethiopia and Chief of the American Interests section in Cuba) June 2008, Who Will Help Cuba Exploit its Offshore Oil Wealth? [www.brookings.edu/opinions/2008/0616\_cuba\_oil\_huddleston.aspx](http://www.brookings.edu/opinions/2008/0616_cuba_oil_huddleston.aspx)

Critics will argue that allowing American companies to become involved in exploiting Cuba's oil is a concession to an autocratic government. But excluding American companies will not prevent others from doing so nor change the Cuban leadership. Rather, it will simply exclude us from a new source of oil and possibly heighten the risk to the environment. As the competition for oil grows, our isolationist policy may become more costly to us than to Cuba.

“Trade helps Castro” – Response: Commercial engagement undermines Castro

Dan Griswold 2005(Director of the Center for Trade Policy Studies at the Cato Institute in Washington, DC; has authored or co-authored major studies on globalization, trade and immigration; has authored articles for the Wall Street Journal, the Los Angeles Times, the Financial Times; has testified before congressional committees and federal agencies on trade and immigration issues.) 12 Oct 2005, Four Decades of Failure: The U.S. Embargo against Cuba, At the James A. Baker III Institute Program, Cuba and the United States in the 21st Century, Rice University, Houston, Texas, [www.freetrade.org/bios/griswold.html](http://www.freetrade.org/bios/griswold.html)

Lifting or modifying the embargo would not be a victory for Fidel Castro or his oppressive regime. It would be an overdue acknowledgement that the four-and-a-half decade embargo has failed, and that commercial engagement is the best way to encourage more open societies abroad. The U.S. government can and should continue to criticize the Cuban government's abuse of human rights in the U.N. and elsewhere, while allowing expanding trade and tourism to undermine Castro's authority from below.

2A EVIDENCE: FISHING ITQs

DEFINITIONS

How ITQs work: Buy and sell the right to catch a certain number of fish

Dr. Jonathan Harris and Dr. Anne-Marie Codur 2008 (Harris – PhD; former Adjunct Associate Professor of International Economics at Tufts University's Fletcher School of Law and Diplomacy. Codur - PhD economics; specialist in sustainable development), Global Development and Environment Institute, 2008, "Economics of fisheries," Encyclopedia of Earth, Environmental Information Coalition, National Council for Science and the Environment, [www.eoearth.org/article/Economics\_of\_fisheries](http://www.eoearth.org/article/Economics_of_fisheries)

A possible policy response is the use of individual transferable quotas (ITQ’s). Like transferable emissions permits, ITQ’s impose a maximum limit on the quantity of fish that can be taken. Anyone purchasing such a permit can catch and sell a certain number of fish – or can sell the permit, and fishing rights, to someone else.

Marine Environment:

National Oceanic & Atmospheric Administration, revised in 2010. National Marine Protected Areas Center, Glossary (brackets in original) last revised 12 Feb 2010 <http://www.mpa.gov/glossary.html>

**Marine Environment (U.S.):** (a) ocean or coastal waters (note: coastal waters may include intertidal areas, bays, or estuaries); (b) an area of the Great Lakes or their connecting waters; (c) an area of lands under ocean or coastal waters or the Great Lakes or their connecting waters; or (d) a combination of the above.

INHERENCY

Current TAC policy creates a mad scramble

Prof. Rebecca Bratspies 2009 (CPR Member Scholar; Associate Professor of Law, CUNY School of Law, New York) 10 July 2009, “Privatize the Seas? If Only Solving Overfishing Were so Easy” <http://www.progressivereform.org/CPRBlog.cfm?idBlog=63218838-F816-5CDF-B5A53CF9FF4402FB>

Today, fisheries managers set a "total allowable catch" (TAC) for open-access fisheries. A fishery is open until that TAC is reached. Not surprisingly, there is often a mad scramble to capture as large a share of fish as quickly as possible. Sometimes fisheries, like the pre-ITQ Alaskan halibut fishery, are only open for a few days, or even a few hours.

The Magnuson-Stevens Act. This Act regulates and subsidizes US fishing

Dr H. Sterling Burnett 2007. (PhD; former member of the Environment and Natural Resources Task Force in the Texas Comptroller's e-Texas commission, board of directors of the Dallas Woods and Water Conservation Club, and advisor for the American Legislative Exchange Council's Natural Resources Task Force ) 26 Feb 2007, “Ocean Fisheries: Common Heritage or Tragic Commons?” National Center for Policy Analysis, <http://www.ncpa.org/pub/ba581>

America's primary response to overfishing was the 1976 Magnuson-Stevens Fisheries Conservation and Management Act, which created 200-mile coastal-water economic zones open only to Americans. It also established eight regional councils to formulate and implement fishery regulations to allow fisheries to recover, ensuring their availability for future generations. Each council drafts management plans that restrict the size of boats; the types of nets and/or traps; the length and timing of the fishing season; the areas open to fishing; and the amount of particular species that can be kept. The problem with these regulations, however, is that they do not affect the incentives for fishers to overfish. Pursuing their economic self-interest, fishers evade them:  
Prevented from fishing on some days, they make a greater effort on days fishing is allowed.  
Forced to use smaller boats, they use more of them, and when forced to use smaller nets, they use those nets more often.  
Forced to limit the number of fish they can bring back to harbor, they throw the smallest ones overboard before their return; in U.S. waters, 2.3 billion pounds of dead fish are thrown back into the ocean every year.  
Making matters worse, in order to alleviate the financial harm fishermen suffered from regulations, the government provided more subsidies, tax breaks and price supports.

2007 Magnuson-Stevens reforms not enough: Must have incentives to conserve

Dr H. Sterling Burnett 2007. (PhD; former member of the Environment and Natural Resources Task Force in the Texas Comptroller's e-Texas commission, board of directors of the Dallas Woods and Water Conservation Club, and advisor for the American Legislative Exchange Council's Natural Resources Task Force ) 26 Feb 2007, “Ocean Fisheries: Common Heritage or Tragic Commons?” National Center for Policy Analysis, <http://www.ncpa.org/pub/ba581>

On January 12, 2007, President Bush signed a revised Magnuson-Stevens Act. Under the amended Act, once a fish stock is found to be depleted, overfishing must end within two-and-a-half years. Unfortunately, the Act does not address the key problem: the incentives for fishers to overfish. In order to use marine resources in a sustainable fashion, fishers must be given incentives to conserve.

Lack of ownership causes overexploitation of common resources

Mollie Lee 2006 (JD from Yale Law School) 1 Nov 2006, YALE LAW JOURNAL, “Environmental economics: a market failure approach to the commerce clause” <http://www.yalelawjournal.org/pdf/116-2/Lee.pdf>

Commons problems arise when it is difficult or impossible to deny access to a resource. The classic commons contains desirable natural resources and is an open access area, available for use by all. Commons are vulnerable to overexploitation because individuals have no way to capture the benefits of measured extraction and therefore are likely to destroy the resource by using it at unsustainable levels. For instance, over-fishing can destroy the population of commercially valuable fish in a given area. Because no fisherman owns a specific piece of the ocean, any one fisherman’s attempt to conserve fish would be defeated by competition from other fishermen, who would take the remaining fish. As H. Scott Gordon explained in 1954, “Wealth that is free for all is valued by none because he who is foolhardy enough to wait for its proper time of use will only find that it has been taken by another.”

Quotas and licenses won’t solve: Incentive to overfish and deplete the resources

Dr. Jonathan Harris and Dr. Anne-Marie Codur 2008 (Harris – PhD; former Adjunct Associate Professor of International Economics at Tufts University's Fletcher School of Law and Diplomacy. Codur - PhD economics; specialist in sustainable development), Global Development and Environment Institute, 2008, "Economics of fisheries," Encyclopedia of Earth, Environmental Information Coalition, National Council for Science and the Environment, [www.eoearth.org/article/Economics\_of\_fisheries](http://www.eoearth.org/article/Economics_of_fisheries)

But under the 1982 Law of the Sea, agreed to under United Nations auspices, nations can claim territorial rights to many important offshore fisheries. They can then limit access to these fisheries by requiring fishing licenses. Fishing licenses can be sold for a set fee, or a limited number can be sold at auction. In effect, this establishes a price for access to the resource. Notice that we can also view this as internalizing a negative externality. Each fisher now has to pay a price for the effect that one extra boat has in depleting the resource. The economic signal sent by this price will result in fewer people entering the fishery. This approach, however, will not necessarily solve the problem of over-investment. Once a boat owner has paid for a license, there will be an incentive to obtain the maximum catch by adding new equipment such as sonar devices to track fish, bigger nets, and more powerful engines to travel further. There will also be an incentive to spend as much time as possible at sea, to get the maximum return for the investment in the license and equipment. If all fishers do this, the depletion problem might remain just as bad.

The “Tragedy of the Commons”: Lack of ownership = race to catch as much as possible

Prof. Robert N. Stavins 2009 ( Business and Government, Director of the Harvard Environmental Economics Program, and Chairman of the Environment and Natural Resources Faculty Group at Harvard University’s John F. Kennedy School of Government), 1 Apr 2009, “Using markets to make fisheries sustainable,” <http://www.grist.org/article/2009-04-01-markets-fisheries-sustainable/>

These individuals and companies are no more greedy than the rest of us, but because no one holds title to fish stocks in the open ocean, everyone races to catch as much as possible. Each fisherman receives the full benefit of aggressive fishing (that is, a larger catch), but none pay the full cost (an imperiled fishery for everyone). One fisherman’s choices have an effect on other fishermen (of this generation and the next), but in an open-access fishery—unlike a privately-held copper mine, for example—these impacts are not taken into account. What is individually rational adds up to collective foolishness, as the shared resource is over-exploited. This is the “tragedy of the commons.”

Current federal fisheries management is an expensive failure

Dr Carl Safina 2009. (PhD ecology from Rutgers Univ.; director of the Blue Ocean Institute) Summer 2009, University of Texas at Dallas, “A Future for U.S. Fisheries, ISSUES IN SCIENCE AND TECHNOLOGY, <http://www.issues.org/25.4/safina.html>

Starting with the bad news, the federal government’s fisheries management remains primitive, simplistic, and, in important cases, ineffectual, despite a fund of knowledge and conceptual tools that could be applied. In many regions—New England and the Pacific Northwest, among others—failed management costs more than the receipts from fisheries. This does not suggest that management should be given up as a lost cause, leaving the industry in a free-for-all, although this strategy might, in fact, be cheaper and not much less effective.

FAILURES

Lost income for fishing families and communities

Dr Carl Safina 2009. (PhD ecology from Rutgers Univ.; director of the Blue Ocean Institute) Summer 2009, University of Texas at Dallas, “A Future for U.S. Fisheries, ISSUES IN SCIENCE AND TECHNOLOGY, <http://www.issues.org/25.4/safina.html>

The nation must confront another reality as well. So many fisheries are so depleted that the only way to restore them will be to change the basic posture of regulations and management programs to one of recovery. Most fish populations could recover within a decade, even with some commercial fishing. But continuing to bump along at today’s depleted levels robs fishing families and communities of income and risks resource collapse.

North Carolina fish stocks are in trouble due to “tragedy of the commons”

Jon Sanders 2012. (Director of Regulatory Studies at the John Locke Foundation; former adjunct instructor in economics at North Carolina State University; masters degree in economics ) 2 May 2012 Catch Shares: A Potential Tool to Undo a Tragedy of the Commons in NC Fisheries <http://www.johnlocke.org/acrobat/spotlights/CatchShares.pdf>

North Carolina currently is experiencing a tragedy of the commons with respect to its offshore fish stocks. The N.C. Division of Marine Fisheries’ 2011 Stock Status Report lists 12 groups of fish as viable or recovering, 13 groups as stocks for which there are concerns, and seven that are depleted. Statuses for another seven stocks are unknown. While red drum and monkfish are considered to be recovering stocks, overfished stocks include southern flounder, snowy grouper, red porgy, red snapper, red grouper, spotted seatrout, and several species of shark. Landings of shad, spot, and weakfish were at very low levels. Harvest of river herring in the Albemarle Sound was prohibited, the bay scallion season wasn’t opened in 2011, and possession of Atlantic sturgeon was banned. Furthermore, according to the CapLog Group, the number of days available to North Carolina fishermen for com­mercial harvest of golden tilefish has decreased by almost 80 percent over the past five years. The days available for vermillion snapper have fallen by 45 percent since 2008.

Ocean fisheries are in decline – they all could collapse in 40 years

Prof. Daniel K. Benjamin 2008. (PhD economics, teaches at Clemson Univ.; senior fellow, Property & Environment Research Center) Dec 2008, “Save the Fisheries,” <http://www.perc.org/articles/article1102.php>

The world’s ocean fisheries are in decline. Since 1950, nearly 30 percent of all fisheries have collapsed, and some scientists project that in 40 years, all of the world’s fisheries could collapse. The problem, it is widely agreed, is a failure of humans to manage fisheries in a way that is consistent with both maximum economic benefit and longterm survival of ocean fish stocks.

Economic inefficiency

UN Food & Agriculture Organization (FAO) 2008. 9 Oct 2008, “US$50 billion lost by marine fishing each year,” <http://www.fao.org/newsroom/en/news/2008/1000931/index.html>

According to the report the bulk of losses occur in two main ways. First, depleted fish stocks mean that there are fewer fish to catch, and therefore the cost of finding and catching them is greater than it might be. Second, fleet overcapacity means that the economic benefits of fishing are dissipated due to redundant investment and operating costs.

SOLVENCY

ITQs transform fishermen from predators to stewards and policemen of the resource

THE ECONOMIST 2008 (respected British news magazine) 18 Sept 2008, “Economies of scales,” <http://www.economist.com/opinion/displaystory.cfm?story_id=12262197>

By giving fishermen a long-term interest in the health of the fishery, individual transferable quotas (ITQs) have transformed fishermen from rapacious predators into stewards and policemen of the resource. The tragedy of the commons is resolved when individuals own a defined and guaranteed share of a resource, a share that they can trade. This means that they can increase the amount of fish they catch not by using brute strength and fishing effort, but by buying additional shares or improving the fishery’s health and hence increasing its overall size.

ITQs use economic efficiency to achieve ecological sustainability

Dr. Jonathan Harris and Dr. Anne-Marie Codur 2008 (Harris – PhD; former Adjunct Associate Professor of International Economics at Tufts University's Fletcher School of Law and Diplomacy. Codur - PhD economics; specialist in sustainable development), Global Development and Environment Institute, 2008, "Economics of fisheries," Encyclopedia of Earth, Environmental Information Coalition, National Council for Science and the Environment, [www.eoearth.org/article/Economics\_of\_fisheries](http://www.eoearth.org/article/Economics_of_fisheries)

Assuming the quota limits can be enforced, the total catch from the fishery will not exceed a certain predetermined level. To determine the maximum sustainable yield level, policy-makers will need to consult marine biologists, who can estimate the sustainable level of fish population. Once ecological sustainability has been assured in this way, the permit market will promote economic efficiency – those who can fish most effectively will be able to outbid others to acquire the ITQ’s.

If ITQs had been implemented in 1970, fisheries collapse would have been cut by 2/3 today

Prof. Daniel K. Benjamin 2008. (PhD economics, teaches at Clemson Univ.; senior fellow, Property & Environment Research Center) Dec 2008, “Save the Fisheries,” <http://www.perc.org/articles/article1102.php>

The authors estimate that had ITQs been implemented in all fisheries beginning in 1970, the incidence of past collapse among fisheries would have been cut by two-thirds. Moreover, instead of watching fisheries collapse today, we would be seeing them getting healthier, even as they were supporting fishers and nourishing consumers. Most importantly, it appears that the power of ITQs to prevent and even reverse fishery collapse applies to species and ecosystems throughout the world.

Must remove subsidies and use property rights: Worked in 17 countries that have tried it

Dr H. Sterling Burnett 2007 (PhD; former member of the Environment and Natural Resources Task Force in the Texas Comptroller's e-Texas commission, board of directors of the Dallas Woods and Water Conservation Club, and advisor for the American Legislative Exchange Council's Natural Resources Task Force ) 26 Feb 2007, “Ocean Fisheries: Common Heritage or Tragic Commons?” National Center for Policy Analysis, <http://www.ncpa.org/pub/ba581>

Even if subsidies are removed, the remaining fishermen will still have incentives to "race to fish" as long as they are competing for access to a resource they cannot own. Therefore, the second step is to replace the current command-and-control regulations with a system of property rights. To the extent feasible, government should treat fish in the same way it treats livestock - as private property. Privatization of marine resources has worked where it has been tried. Since the early 1980s, 17 countries have introduced some form of property rights, and in each case fish stocks and fishers' profits have improved significantly. One of the most popular approaches is creating tradable rights, or individual transferable quotas (ITQs), which entitle fishermen to a certain portion of the catch, often based on their past catch amounts. They can take or trade their quota, up to a government-set total allowable cap on the fish catch. For example:  
After introducing ITQs to Iceland's herring fisheries, the number of fishing vessels fell from 200 in 1980 to 30 by 1995; catches have fallen to sustainable levels, even as their value has risen dramatically.  
In 1984, Australia's blue fin tuna fisheries were near collapse; today they are the most profitable tuna fisheries in the Pacific, and property rights are used to manage 15 species.  
In 1986, New Zealand introduced ITQs to manage 30 species of fish, including blue fin tuna, abalone and lobster, each of which has recovered from near collapse.

Tradable shares solved fishing race and improved safety when tried with Alaskan halibut

Dr Carl Safina 2009. (PhD ecology from Rutgers Univ.; director of the Blue Ocean Institute) Summer 2009, University of Texas at Dallas, “A Future for U.S. Fisheries, ISSUES IN SCIENCE AND TECHNOLOGY, <http://www.issues.org/25.4/safina.html>

The impact of tradable catch shares can be seen in experiences in several regions. In Alaska, where fisheries managers once kept a tight cap on the halibut catch, the fishing season shrank to two days annually because there were so many competing boats. After managers introduced tradable catch shares, the number of boats fell precipitously and the season effectively expanded to whenever the fishers wanted to work toward filling their shares. Safety improved markedly, and the halibut population remained robust.

Fishing rights promote economic efficiency and social responsibility

UN Food & Agriculture Organization 2008 (FAO), 9 Oct 2008, “US$50 billion lost by marine fishing each year,” <http://www.fao.org/newsroom/en/news/2008/1000931/index.html>

Strengthened fishing rights can provide fishers and fishing communities with incentives to fish in an economically efficient and socially responsible manner. Phasing out subsidies that enhance redundant fishing capacity and harvesting effort will improve efficiency.

Ending subsidies would eliminate incentives for inefficient fishing operations

Dr H. Sterling Burnett 2007. (PhD; former member of the Environment and Natural Resources Task Force in the Texas Comptroller's e-Texas commission, board of directors of the Dallas Woods and Water Conservation Club, and advisor for the American Legislative Exchange Council's Natural Resources Task Force ) 26 Feb 2007, “Ocean Fisheries: Common Heritage or Tragic Commons?” National Center for Policy Analysis, <http://www.ncpa.org/pub/ba581>

Needed Policy: End Subsidies and Tax Breaks. The first step is to end subsidies and tax breaks that encourage overinvestment in commercial fisheries. Government should stop subsidizing fishermen's purchases of boats, fuel and other equipment. In addition, the government should end price supports that artificially increase the market value of fish. Ending subsidies would eliminate the incentive for inefficient businesses to keep building boats and hiring deck hands, and give them an incentive to operate more efficiently or look for employment elsewhere. It would help already efficient fishermen by reducing the number of less efficient competitors and by allowing them to expand their operations.

ITQs produce dramatic improvement in the health of threatened fisheries

THE ECONOMIST 2008 (respected British news magazine) 18 Sept 2008, “Economies of scales,” <http://www.economist.com/opinion/displaystory.cfm?story_id=12262197>

Yet the powerful logic in favour of market-based mechanisms has been ignored, partly because the evidence has largely been anecdotal. Now a study of the world’s 121 fisheries managed by individual transferable quotas (ITQs), one form of market-based mechanism, has shown that they are dramatically healthier than the rest of the world’s fisheries (see article). The ITQ system halves the chance of a fishery collapsing. By giving fishermen a long-term interest in the health of the fishery, ITQs have transformed fishermen from rapacious predators into stewards and policemen of the resource. The tragedy of the commons is resolved when individuals own a defined (and guaranteed) share of a resource, a share that they can trade. This means that they can increase the amount of fish they catch not by using brute strength and fishing effort, but by buying additional shares or improving the fishery’s health and hence increasing its overall size.

Tradable permits solved race to fish for Alaskan halibut, improved market conditions, made halibut stocks more sustainable

Gregg Easterbrook 2009 (senior editor) July/Aug 2009, THE ATLANTIC, “Privatize the Seas,” <http://www.theatlantic.com/doc/200907/ideas-seas>

A few years ago at the Double Musky Inn in Girdwood, Alaska, I had a halibut dinner so delicious, I can still taste that fish. Good restaurant? Yes, but even better fishery management. About a decade ago, the Alaskan halibut catch was switched from a system of “catch all you can” in a very short period, to a system of tradeable permits. Now halibut season does not happen over a few chaotic days marred by colliding boats and overlapping lines, followed by freezing of the fish and a price bust as everything hits the market at once. Instead, fishermen holding an assured right, which they won on the free market (to bid for a permit, go to www.alaskabroker.com), spread their work over many months. Thus halibut coming to the market are just-caught fresh, and the price of fish is less likely to soar and plunge. And halibut stocks, spared a concentrated onslaught of fishing boats, are more sustainable.

Moving fisheries from an overused common resource into private ownership fixes the tragedy of the commons.

Jon Sanders 2012. (Director of Regulatory Studies at the John Locke Foundation; former adjunct instructor in economics at North Carolina State University; masters degree in economics ) 2 May 2012 Catch Shares: A Potential Tool to Undo a Tragedy of the Commons in NC Fisheries <http://www.johnlocke.org/acrobat/spotlights/CatchShares.pdf>

A prominent example (one that Hardin himself discussed2) of a tragedy of the commons is fisheries. Dr. Roy Cor­dato described the difference between a commons approach to a fishery and private ownership (using the example of a catfish pond):  
Common ownership fosters a use it or lose it mentality. A classic example is fish in the ocean. If fishing trawlers come across a large school of fish, their incentive will be to capture as many of those fish as possible. If they don’t take them someone else will. This can be contrasted, for example, with the owner of a commercial catfish pond. The incentives in this case are to culti­vate the stock; take the largest fish and leave the smaller ones to grow to a more valuable size; to make sure that the fish are well fed and the water is kept clean and well oxygenated, etc. There is no concern that if you don’t take the fish today someone else will. And if the resource, in this case catfish, is misused, then it is the owner that will have to bear the costs.

The Motu Study: New Zealand ITQs increased profitability of fisheries

Iain Murray and Roger Abbott 2012. (Murray -Vice President for Strategy and the Director of the Center for Economic Freedom at the Competitive Enterprise Institute; BA and MA from the University of Oxford, an MBA from the University of London and the Diploma of Imperial College of Science, Technology and Medicine. Abbott - former CEI Research Associate.) “Give a Man a Fish - The Case for a Property Rights Approach to Fisheries Management” 17 May 2012 NPOINT, (ellipses and brackets in original) <http://cei.org/sites/default/files/Iain%20Murray%20and%20Roger%20Abbott%20-%20Give%20a%20Man%20a%20Fish.pdf>

The New Zealand ITQ system behaves as a functioning market should, as confirmed by a 2002 analysis by Motu, a New Zealand-based think tank. The Motu study finds that the markets for quotas are very active, “with more than 120,000 leases and 30,000 sales of quotas as of the end of the 1998 fishing year—an annual average of about 8,700 leases and 2,000.” The reforms mentioned above led to an increase in transactions: “[T]he total number of leases has risen…from 2,000 in 1986 to 14,500 in 1998.” Moreover, the study found that, “[T]he value of fish is positively associated with quota prices, as evident by the result that the elasticity of the quota type with respect to the fish export price is positive and statistically significant in both lease and sale price equations. … Controlling for other factors, there is evidence of increased profitability of the included fisheries since the establishment of the ITQ system.”

Iceland Example: ITQs made fishing more profitable and helped Iceland’s economy

Prof. Ragnar Arnason 2008 (prof. of Economics; Univ. of Iceland) Iceland’s ITQ system creates new wealth, ELECTRONIC JOURNAL OF SUSTAINABLE DEVELOPMENT <http://www.icelandcrash.com/ragnararna.pdf>

Icelandic ITQs have become very valuable compared to other measures of the Icelandic economy. This value predominantly represents new wealth for the Icelandic economy. Before the introduction of the ITQ-system, the profitability of the fisheries was poor. Even more importantly, future profits of the fishery could not be captured in a marketable asset. The evidence strongly indicates that the new capital embedded in ITQs has, via financial intermediation, been multiplied and found its way into other industries. Many of these industries have been extremely successful, thus greatly adding to the initial economic impact of ITQs on the fisheries themselves. The new wealth embedded in the ITQs was created by the relatively simple expedient of defining private property rights in the extraction from common pool fish stocks. In other words, the introduction of the ITQ system constituted a certain, albeit limited, shift from collective to private ownership in fish resources. By creating a new form of capital, the ITQ-system in Iceland has greatly increased marketable wealth and, thus, seems to have contributed substantially to the country’s rapid economic growth.

Iceland Example: ITQs solved economic waste and created economic growth

Prof. Ragnar Arnason 2008 (prof. of Economics; Univ. of Iceland) Iceland’s ITQ system creates new wealth, ELECTRONIC JOURNAL OF SUSTAINABLE DEVELOPMENT <http://www.icelandcrash.com/ragnararna.pdf>

Under the common property arrangement, fishermen are effectively forced to engage in wasteful competition with each other for shares in the obtainable catch. The waste manifests itself as excessive fishing capital, excessive fishing effort and depressed stocks of fish. Fishermen suffer low and decreasing incomes (Gordon 1954). The general population suffers rising fish prices, and environmental degradation. For governments, it is a source of seemingly endless trouble. One result is that, with a few exceptions, the world’s fisheries are not making a profit. If anything, they are losing a great deal of money and can only continue to exist through public subsidies (Garcia and Newton 1997). The economic waste in global fisheries, in the form of lost profits, probably amounts to about US$50 billion annually (Arnason 2006).

Tradable permits make fishing safer

Dr Carl Safina 2009. (PhD ecology from Rutgers Univ.; director of the Blue Ocean Institute) Summer 2009, University of Texas at Dallas, “A Future for U.S. Fisheries, ISSUES IN SCIENCE AND TECHNOLOGY, <http://www.issues.org/25.4/safina.html> (In context, he’s talking about tradable fishing quotas)

By significantly reducing competition that breeds a race for fish, this approach offers several benefits. For one, it makes for safer fishing. Fishers who own shares know that they have the whole season to fill their quota regardless of what other boats are catching, so they are less likely to feel forced to head out in dangerous weather.

Privatization = Higher incomes for fishermen

Dr H. Sterling Burnett 2007. PhD (former member of the Environment and Natural Resources Task Force in the Texas Comptroller's e-Texas commission, board of directors of the Dallas Woods and Water Conservation Club, and advisor for the American Legislative Exchange Council's Natural Resources Task Force ) 26 Feb 2007, “Ocean Fisheries: Common Heritage or Tragic Commons?” National Center for Policy Analysis, <http://www.ncpa.org/pub/ba581>

The United States extended property rights to Atlantic blue fin tuna, mid-Atlantic surf clams, Alaskan halibut and sablefish, and South Atlantic wreckfish; all four fisheries now have smaller fishing fleets, higher incomes for fishermen and larger, healthier fish stocks. Conclusion.Before the fisheries councils fully implement the revised Magnuson-Stevens Act, Congress should revisit the issue and fundamentally change the status of fish populations. When fishermen no longer have perverse incentives to deplete fish stocks, experience shows populations should rebound. Fisheries must no longer be seen as a commons to be plundered in a "race to fish," but rather as property to be conserved, enhanced and protected.

Costello & Gaines Study: ITQs halt the collapse of fisheries

THE ECONOMIST 2008 (respected British news magazine), 18 Sept 2008, [www.economist.com/PrinterFriendly.cfm?story\_id=12253181](http://www.economist.com/PrinterFriendly.cfm?story_id=12253181)

Christopher Costello and Steven Gaines (the biologist) of the University of California and John Lynham of the University of Hawaii assembled a database of the world’s commercial fisheries, their catches and whether or not they were managed with ITQs. As these fisheries were not chosen at random and without having any experimental control, they borrowed techniques from medical literature—known as propensity-score matching and fixed-effects estimation—to support their analysis. The first method compared fisheries that are similar in all respects other than the use of ITQs; the second averaged the impact of ITQs over many fisheries and examined what happened after the quotas were introduced. Whichever way they analysed the data, they found that ITQs halted the collapse of fisheries (and according to one analysis even reversed the trend). The overall finding was that fisheries that were managed with ITQs were half as likely to collapse as those that were not.

Difference between IFQs and ITQs: who gets the initial leases

Iain Murray and Roger Abbott 2012. (Murray -Vice President for Strategy and the Director of the Center for Economic Freedom at the Competitive Enterprise Institute; BA and MA from the University of Oxford, an MBA from the University of London and the Diploma of Imperial College of Science, Technology and Medicine. Abbott - former CEI Research Associate.) “Give a Man a Fish - The Case for a Property Rights Approach to Fisheries Management” 17 May 2012 NPOINT, <http://cei.org/sites/default/files/Iain%20Murray%20and%20Roger%20Abbott%20-%20Give%20a%20Man%20a%20Fish.pdf>

Followers of the Discovery Channel series, “The Deadliest Catch,” might remember that in the first season of the show the activities of the crab fishers were more frenetic—and more dangerous, hence the show’s title—than in subsequent seasons. That is because Alaskan crab fisheries have moved to an Individual Fishing Quota (IFQ) system. IFQs resemble ITQs but leases are initially allocated to owners and skippers. Previously, regulation had moved inexorably to an open but short fishing season, which led to large numbers of boats all attempting to catch as many crabs as they could while the fishing window was open. In 2005, this “derby” system was abandoned in favor of an IFQ system, with established owners and captains being allocated quotas.

2A EVIDENCE: HYDROKINETIC

TOPICALITY

Ocean renewable energy is a resource

Todd J. Griset 2010. (J.D., attorney with Preti Flaherty’s Energy and Telecommunications Group) HARNESSING THE OCEAN’S POWER: OPPORTUNITIES IN RENEWABLE OCEAN ENERGY RESOURCES , OCEAN AND COASTAL LAW JOURNAL <http://mainelaw.maine.edu/academics/oclj/pdf/vol16_2/vol16_oclj_395.pdf>

Oil and natural gas are not the only energy resources held by our oceans; the Earth’s oceans contain vast stores of energy, much of which can be harnessed to create usable power in the form of electricity. Beyond these hydrocarbon mineral resources, the ocean offers great potential for the extraction of renewable energy.

BACKGROUND / DEFINITIONS

Total electricity generation in the US = 3.95 billion megawatt-hours/year

Todd J. Griset 2010. (J.D., attorney with Preti Flaherty’s Energy and Telecommunications Group) HARNESSING THE OCEAN’S POWER: OPPORTUNITIES IN RENEWABLE OCEAN ENERGY RESOURCES , OCEAN AND COASTAL LAW JOURNAL <http://mainelaw.maine.edu/academics/oclj/pdf/vol16_2/vol16_oclj_395.pdf>

Energy is a major industry in the United States, with over one third of total energy consumption taking the form of electric power. The United States generates a significant amount of electricity. In 2009, net generation totaled 3,950 million megawatt-hours (MWh).

INHERENCY

Current regulations make projects prohibitively expensive, without adding any environmental benefit

Amanda Righi 2011. (J.D. candidate, University of Washington School of Law, Class of 2012 ) WASHINGTON JOURNAL OF ENVIRONMENTAL LAW & POLICY. “ROUGH SEAS FOR RENEWABLE ENERGY: ADDRESSING REGULATORY OVERLAP FOR HYDROKINETIC PROJECTS ON THE OUTER CONTINENTAL SHELF » <http://digital.law.washington.edu/dspace-law/bitstream/handle/1773.1/1044/1WJELP079.pdf?sequence=4>

NEPA is a powerful tool for protecting the environment and helping federal agencies understand the environmental impact of major federal actions. Environmental analysis under NEPA is fundamental to habitat, species and ecosystem protection. Unfortunately, current regulations requiring multiple environmental reviews make the process financially prohibitive for renewable energy project developers, without providing any measurable benefits for the marine environment. Furthermore, multiple EIS’s muddle the public comment process, making it time consuming and confusing for interested stakeholders, thereby frustrating NEPA’s public outreach goals.

7 Federal agencies and 13 statutes regulate hydrokinetic projects

Amanda Righi 2011. (J.D. candidate, University of Washington School of Law, Class of 2012 ) WASHINGTON JOURNAL OF ENVIRONMENTAL LAW & POLICY. “ROUGH SEAS FOR RENEWABLE ENERGY: ADDRESSING REGULATORY OVERLAP FOR HYDROKINETIC PROJECTS ON THE OUTER CONTINENTAL SHELF » <http://digital.law.washington.edu/dspace-law/bitstream/handle/1773.1/1044/1WJELP079.pdf?sequence=4>

Seven federal agencies share jurisdiction over hydrokinetic licensing on the OCS. In most federal actions, NEPA fosters inter-agency cooperation, but jurisdictional disputes impair collaboration for environmental review of hydrokinetic energy projects. Also, multiple NEPA and other environmental reviews are required to satisfy the statutory requirements of the multiple agencies with jurisdiction over the OCS. Responsibility for approving hydrokinetic projects is split between the BOEM and FERC. BOEM provides leases for projects wholly or partially located on the OCS, pursuant to the Outer Continental Shelf Lands Act and the Energy Policy Act of 2005. Under the Federal Power Act, FERC is responsible for licensing hydropower projects, including hydrokinetic projects in both federal and state waters. Other state and federal agencies, relying on thirteen statutes, also provide reviews, permits and concurrences for hydrokinetic projects.

Regulatory uncertainty blocks ocean energy development

Carolyn Elefant 2002. (attorney) “Proposed Strategies for Addressing Regulatory Uncertainty in Ocean Energy Development in the United States” 19 Nov 2002 <http://www.energypulse.net/centers/article/article_display.cfm?a_id=79>

Why Regulatory Uncertainty, if Left Unresolved, Will Present Problems The problem of regulatory uncertainty, if left unresolved, will stand as a major impediment to ocean energy development and commercialization for the reasons listed below: • Questions about which agency has authority to license ocean energy projects can contribute to turf wars amongst agencies and lead to a duplicative and confusing application process where a developer must submit several permit applications and possibly be subject to competing conditions for operation and mitigating impacts. Overlap between agencies thus leads to increased development costs and delay. • Opponents of ocean energy projects can use regulatory uncertainty to their advantage to oppose a project by arguing that a particular regulatory agency lacks jurisdiction over the project. Jurisdictional questions can be taken all the way to the courts which could agree with project opponents and conclude that an agency lacked jurisdiction, thereby rendering the entire permit process a waste. • Lack of regulatory standards makes it impossible to predict whether and on what terms a permit will issue which complicates the estimation of project costs. Such unpredictability may also deter future private investors from funding projects.

Memorandum of Understanding (MOU) didn’t solve

Amanda Righi 2011. (J.D. candidate, University of Washington School of Law, Class of 2012 ) WASHINGTON JOURNAL OF ENVIRONMENTAL LAW & POLICY. “ROUGH SEAS FOR RENEWABLE ENERGY: ADDRESSING REGULATORY OVERLAP FOR HYDROKINETIC PROJECTS ON THE OUTER CONTINENTAL SHELF » <http://digital.law.washington.edu/dspace-law/bitstream/handle/1773.1/1044/1WJELP079.pdf?sequence=4>

To resolve the jurisdictional dispute, FERC and the Department of Interior entered into a Memorandum of Understanding (MOU) to clarify their roles regarding renewable energy projects on the OCS. The MOU gave BOEM exclusive jurisdiction over all aspects of non-hydrokinetic projects. FERC maintains jurisdiction to issue licenses for hydrokinetic projects on the OCS after BOEM issues a lease, easement, and right-of-way (ROW) for a particular project. Though the MOU resolved the jurisdictional dispute, it did not provide methods for coordinating the required environmental reviews. Each agency is responsible for conducting analyses under NEPA, ESA, MMPA and Magunson-Stevens Fisheries Act for their respective actions.

BOEM issues 30-year leases, takes 3-5 years to approve and 2 separate NEPA reviews

Amanda Righi 2011. (J.D. candidate, University of Washington School of Law, Class of 2012 ) WASHINGTON JOURNAL OF ENVIRONMENTAL LAW & POLICY. “ROUGH SEAS FOR RENEWABLE ENERGY: ADDRESSING REGULATORY OVERLAP FOR HYDROKINETIC PROJECTS ON THE OUTER CONTINENTAL SHELF » <http://digital.law.washington.edu/dspace-law/bitstream/handle/1773.1/1044/1WJELP079.pdf?sequence=4>

BOEM is responsible for issuing commercial competitive leases and easements for ROWs on the OCS for hydrokinetic projects. To produce and sell energy, hydrokinetic project developers must secure a commercial lease from BOEM, a three to five year process with two separate NEPA reviews. A commercial lease lasts up to thirty years, provides rights to produce and sell energy, and provides access to one or more easements for energy transmission to the grid.

…But then FERC has to approve it after BOEM

Amanda Righi 2011. (J.D. candidate, University of Washington School of Law, Class of 2012 ) WASHINGTON JOURNAL OF ENVIRONMENTAL LAW & POLICY. “ROUGH SEAS FOR RENEWABLE ENERGY: ADDRESSING REGULATORY OVERLAP FOR HYDROKINETIC PROJECTS ON THE OUTER CONTINENTAL SHELF » <http://digital.law.washington.edu/dspace-law/bitstream/handle/1773.1/1044/1WJELP079.pdf?sequence=4>

After a project developer receives a lease from BOEM, the developer must obtain a license from FERC. FERC has not developed new rules and regulations to govern hydrokinetic projects, relying instead on its authority under the Federal Power Act (FPA) to create exemptions for test projects and a pilot licensing process to encourage new technologies.

Vague procedures result in multiple Environmental Impact Statements to satisfy 2 different agencies

Amanda Righi 2011. (J.D. candidate, University of Washington School of Law, Class of 2012 ) WASHINGTON JOURNAL OF ENVIRONMENTAL LAW & POLICY. “ROUGH SEAS FOR RENEWABLE ENERGY: ADDRESSING REGULATORY OVERLAP FOR HYDROKINETIC PROJECTS ON THE OUTER CONTINENTAL SHELF » <http://digital.law.washington.edu/dspace-law/bitstream/handle/1773.1/1044/1WJELP079.pdf?sequence=4>

The Memorandum of Understanding (MOU) and the corresponding guidance documents between BOEM and FERC state that these federal agencies will cooperate to the greatest extent possible. BOEM and FERC assigned authority for leasing and easements to BOEM, and licensing to FERC, and resolved their jurisdictional dispute. Each agency agrees to perform NEPA analyses for their portion of the permitting process. Under the MOU, FERC commits to withhold licenses until BOEM approves a project lease and conversely, BOEM will include lease terms requiring a FERC license prior to project construction and operation. The MOU also gives BOEM the ability to attach required lease terms for the final FERC license. Finally, the MOU does not expand the authority of either agency and does not create a legal obligation. However, this agreement does not provide any procedures or assurance that FERC and BOEM will coordinate leasing and licensing NEPA analyses and is therefore likely to be ineffective in creating efficiencies. A review of other MOUs between federal agencies reveals the pitfalls of leaving coordination functions undefined. The MOU, while well-intentioned, lacks the specific procedures and processes to carry out its intended goals and is too vague to effectively streamline the multiple statutorily required environmental reviews. In order to satisfy its statutory obligations under the ESA, MMPA and the Magnuson-Stevens Act, the NMFS will likely require additional EIS’s to supplement those required by BOEM and FERC.

Duplicative NEPA analyses create delays with no environmental benefits

Amanda Righi 2011. (J.D. candidate, University of Washington School of Law, Class of 2012 ) WASHINGTON JOURNAL OF ENVIRONMENTAL LAW & POLICY. “ROUGH SEAS FOR RENEWABLE ENERGY: ADDRESSING REGULATORY OVERLAP FOR HYDROKINETIC PROJECTS ON THE OUTER CONTINENTAL SHELF » <http://digital.law.washington.edu/dspace-law/bitstream/handle/1773.1/1044/1WJELP079.pdf?sequence=4>

NEPA provides meaningful and necessary review of the environmental impacts of a project on the human environment. However, under current regulations for hydrokinetic projects on the OCS, the time and funding necessary for multiple environmental analyses reduces the feasibility of such projects. In the face of increased NEPA litigation, federal agencies spend additional time and money to ensure that NEPA documentation survives challenge in court. Simultaneously, reduced federal agency budgets make it increasingly difficult to meet NEPA mandates. Duplicative NEPA analyses only exacerbate this problem, often resulting in permitting delays and increased costs without providing additional benefits for the natural environment.

Overlapping responsibilities result in duplicative efforts and longer delays. But the extra studies provide no environmental benefit

Amanda Righi 2011. (J.D. candidate, University of Washington School of Law, Class of 2012 ) WASHINGTON JOURNAL OF ENVIRONMENTAL LAW & POLICY. “ROUGH SEAS FOR RENEWABLE ENERGY: ADDRESSING REGULATORY OVERLAP FOR HYDROKINETIC PROJECTS ON THE OUTER CONTINENTAL SHELF » <http://digital.law.washington.edu/dspace-law/bitstream/handle/1773.1/1044/1WJELP079.pdf?sequence=4>

The Council on Environmental Quality (CEQ), responsible for implementing NEPA, recognizes coordination between NEPA and the ESA as a major hurdle to efficient implementation of the environmental reviews required for federal agency concurrence. Other federal agencies and implementing partners also attest that overlapping environmental statutory responsibilities tend to result in duplicative analyses. Though federal natural resource agencies, such as the NMFS, may rely on EIS’s completed by BOEM and FERC, the uncertain environmental effects of hydrokinetic projects will lead to additional environmental analysis. However, as noted by Mr. Collar above, additional studies will not provide the certainty required under the ESA, MMPA and the Magnuson-Stevens Fisheries Act. Scientific uncertainty, exacerbated by the “best available science” requirement, the lack of baseline data and the inflexibility of the applicable statutes, mandates additional EIS’s that lengthen the permitting process without providing additional environmental protection.

Agencies are not cooperating on streamlining environmental review of renewable energy on the OCS

Amanda Righi 2011. (J.D. candidate, University of Washington School of Law, Class of 2012 ) WASHINGTON JOURNAL OF ENVIRONMENTAL LAW & POLICY. “ROUGH SEAS FOR RENEWABLE ENERGY: ADDRESSING REGULATORY OVERLAP FOR HYDROKINETIC PROJECTS ON THE OUTER CONTINENTAL SHELF » <http://digital.law.washington.edu/dspace-law/bitstream/handle/1773.1/1044/1WJELP079.pdf?sequence=4>

Even though BOEM has promulgated specific rules relating to renewable energy on the OCS, the agencies have not produced joint regulations or guidance on how they will collaborate to ensure streamlined environmental review. Each agency relies on separate processes and gives inexplicit assurances that they will collaborate on projects, but with no concrete framework to achieve this.

Federal regulation of ocean renewable power projects lacks holistic regulatory scheme

Todd J. Griset 2010. (J.D., attorney with Preti Flaherty’s Energy and Telecommunications Group) HARNESSING THE OCEAN’S POWER: OPPORTUNITIES IN RENEWABLE OCEAN ENERGY RESOURCES , OCEAN AND COASTAL LAW JOURNAL <http://mainelaw.maine.edu/academics/oclj/pdf/vol16_2/vol16_oclj_395.pdf>

The history of federal regulation of ocean renewable power projects has involved regulation and assertions of jurisdiction by a wide variety of federal agencies. Depending on the technologies involved in a given project, as well as the proposed location of the project, project developers have been required to seek out a variety of permits from numerous federal agencies. Indeed, federal law governing which agencies may issue permits for ocean renewable energy projects has been variable and inconsistent over time. This has led to regulatory uncertainty, which in turn has imposed increased costs, a decreased ability of project developers to secure project financing, and an overall chilling effect on the development of the nation’s marine renewable power resources. While the current regulatory status quo is more favorable to project development than previous regimes were, federal regulation of renewable ocean energy production continues to lack a holistic regulatory scheme.

Regulatory delays result in lack of investment and block hydrokinetic technology development

Jerome B. Johnson and Dominique J. Pride, Alaska Center for Energy & Power 2010. (an applied energy research program based at the University of Alaska) River, Tidal, and Ocean Current Hydrokinetic Energy Technologies: Status and Future Opportunities in Alaska 1 Nov 2010 <http://www.uaf.edu/files/acep/2010_11_1_State_of_the_Art_Hydrokinetic_Final.pdf>

An important factor in determining the success or failure of realizing the potential of hydrokinetic energy is the regulatory framework that governs hydrokinetic systems. Long time frames to achieve regulatory approvals can result in a lack of investment in hydrokinetic systems with consequent retardation of needed technology development. The FERC has a leading role in regulating hydrokinetic (and other) energy through the Federal Power Act (FPA) authorization. Permits from the FERC give an individual firm the exclusive right to study and eventually utilize the hydrokinetic potential of a reach of river or marine region for which the permit applies. Figure 7 shows the locations of FERC permits for Alaskan projects.

“Regulations have been streamlined already” – Response: But not enough; regulatory complexity is still not optimal for cost-effective development

Todd J. Griset 2010. (J.D., attorney with Preti Flaherty’s Energy and Telecommunications Group) HARNESSING THE OCEAN’S POWER: OPPORTUNITIES IN RENEWABLE OCEAN ENERGY RESOURCES , OCEAN AND COASTAL LAW JOURNAL <http://mainelaw.maine.edu/academics/oclj/pdf/vol16_2/vol16_oclj_395.pdf>

A developer of an offshore renewable energy project faces a relatively complex patchwork of legal regimes. Although this regulatory structure has recently been partially clarified and streamlined, the determination of which substantive and procedural regulations apply remains dependent on where the project will be located. Even after this regulatory reform, the complexity of the regulatory regimes applicable to renewable energy projects may not prove optimal for the cost-effective development of such resources.

SOLVENCY

Hydrokinetic technology could provide 10% of total US power supply, but it faces complex government regulatory procedures

Chad Marriott, John McKinsey, Michael O’Connell, Cherise Oram 2011. (attorneys) THE LAW OF MARINE AND HYDROKINETIC ENERGY – Siting and Permitting Marine and Hydrokinetic Energy Projects <http://www.stoel.com/webfiles/LawofMarine.pdf>

Marine and hydrokinetic energy projects have the potential to produce significant amounts of clean and renewable power. If fully developed, new hydrokinetic technologies could double the amount of hydropower production in the United States from just below 10 percent to close to 20 percent of the national supply. Like many projects in protected coastal and riverine environments, however, these projects require a developer to navigate complex governmental permitting requirements and procedures. Ocean and tidal projects, in particular, will face challenges not raised by traditional hydropower and new in-river technologies.

Streamlined regulatory framework would enable ocean energy projects

Todd J. Griset 2010. (J.D., attorney with Preti Flaherty’s Energy and Telecommunications Group) HARNESSING THE OCEAN’S POWER: OPPORTUNITIES IN RENEWABLE OCEAN ENERGY RESOURCES , OCEAN AND COASTAL LAW JOURNAL <http://mainelaw.maine.edu/academics/oclj/pdf/vol16_2/vol16_oclj_395.pdf>

Congressional action could further streamline the regulatory framework applicable to renewable ocean energy projects. Providing a stable structure for the development of the oceans’ renewable energy potential would reduce the capital cost required to develop a given project. By providing a clear and consistent legal path for project developers to follow, such legislation would enable the best ocean energy projects to become more cost-competitive.

Simplified regulatory process will allow hydrokinetic projects to move forward safely

Amanda Righi 2011. (J.D. candidate, University of Washington School of Law, Class of 2012 ) WASHINGTON JOURNAL OF ENVIRONMENTAL LAW & POLICY. “ROUGH SEAS FOR RENEWABLE ENERGY: ADDRESSING REGULATORY OVERLAP FOR HYDROKINETIC PROJECTS ON THE OUTER CONTINENTAL SHELF » <http://digital.law.washington.edu/dspace-law/bitstream/handle/1773.1/1044/1WJELP079.pdf?sequence=4>

A simplified regulatory process will provide project developers with the certainty to move forward with commercial-scale projects in an environmentally safe manner. The public will benefit from an efficient comment and review process and, in the long term, increased availability of renewable energy with a reduced carbon footprint. Finally, and most importantly, a streamlined process will protect species and habitat, encourage renewable energy, and contribute to climate change mitigation.

Tidal in-stream energy has great potential, but none are active today

Todd J. Griset 2010. (J.D., attorney with Preti Flaherty’s Energy and Telecommunications Group) HARNESSING THE OCEAN’S POWER: OPPORTUNITIES IN RENEWABLE OCEAN ENERGY RESOURCES , OCEAN AND COASTAL LAW JOURNAL <http://mainelaw.maine.edu/academics/oclj/pdf/vol16_2/vol16_oclj_395.pdf>

Tidal in-stream energy conversion devices generate power without impoundments, generally with blades similar to windmills or revolving doors. A preliminary evaluation of the potential tidal in-stream generation capacity in only part of the nation’s coastlines suggests an average annual power potential of at least 1,600 megawatts. In-stream tidal energy conversion has great potential, but is not widely deployed in the United States; indeed, commercial-scale projects do not exist.

“They need subsidies to work” – Response: They’re getting subsidies already

Melissa Mahony 2010. (journalist) « Ocean and hydrokinetic energy get $37 million in federal funds” 10 Sept 2010 <http://www.smartplanet.com/blog/intelligent-energy/ocean-and-hydrokinetic-energy-get-37-million-in-federal-funds/2671>

Just over a week after the United Kingdom became home to Wave Hub, the world’s largest wave power testing site, the Department of Energy issued their biggest batch of funding yet for harnessing energy from various U.S. waterways. The $37 million in government grants cover 27 projects intending to generate power from rivers, tides, waves, vortexes, currents and thermal gradients. Spanning many different technologies and locations, some of the projects are in their infancy while others might be powering American homes in the next few years.

“They need subsidies to work” – Response: They’re getting subsidies from Dept of Energy already

US Dept of Energy, Wind & Water Power Technologies Office 2012. MARINE AND HYDROKINETIC ENERGY PROJECTS (Ethical disclosure about the date: The article is undated but references events that took place in November 2012 and refers to 2013 as the future) <http://www1.eere.energy.gov/water/pdfs/mhk_projects_2013.pdf> (brackets added)

The Water Power Program provided nearly $100 million in funding for MHK [Marine HydroKinetic] projects from FY 2008 to FY 2012, with numerous projects operating over multiple years. The Water Power Program has already realized significant returns on the federal investment to date and anticipates significant key accomplishments in the years to come.

Costs will come down over time

Jerome B. Johnson and Dominique J. Pride, Alaska Center for Energy & Power 2010. (an applied energy research program based at the University of Alaska) River, Tidal, and Ocean Current Hydrokinetic Energy Technologies: Status and Future Opportunities in Alaska 1 Nov 2010 <http://www.uaf.edu/files/acep/2010_11_1_State_of_the_Art_Hydrokinetic_Final.pdf>

As a technology becomes more mature, cost decreases may be achieved through learning-by-doing; research, development, and demonstration innovations; improved communication between involved parties; product standardization; and the redesign and scale alteration of a product (Junginger et al., 2005). In economics, this concept is referred to as an experience curve, which “analyzes cost development of a product or technology as a function of cumulative production” (Junginger et al., 2005, p. 133). Experience curves have been applied to other energy technologies, including photovoltaic panels, combined-cycle gas turbines, and carbon sequestration technologies (Junginger et al., 2005). It is reasonable to assume that hydrokinetic turbines will follow a similar experience curve as that of wind technologies, with decreasing costs as cumulative production increases.

Ocean wave energy could provide 6% of the nation’s electricity

Todd J. Griset 2010. (J.D., attorney with Preti Flaherty’s Energy and Telecommunications Group) HARNESSING THE OCEAN’S POWER: OPPORTUNITIES IN RENEWABLE OCEAN ENERGY RESOURCES , OCEAN AND COASTAL LAW JOURNAL <http://mainelaw.maine.edu/academics/oclj/pdf/vol16_2/vol16_oclj_395.pdf>

In addition to the energy embodied in water flowing due to tides and currents, power can be extracted from moving water in the form of waves. Looking strictly at coastal regions with a mean wave power density greater than 10 kilowatts per meter, the United States may have a total wave power flux of 2,100 terawatt-hours per year. This figure is more than half of the entire United States electric power industry’s recent annual generation. Unfortunately, practical considerations significantly limit the ability to extract usable power from wave energy. For example, more than half of this estimated total wave power flux falls on the southern coast of Alaska and the Aleutian island chain, areas generally remote from significant load centers. Given current electricity transmission technology and cost, the remoteness of this portion of the nation’s wave energy resource makes its commercial-scale development unlikely. Furthermore, wave power devices fall short of 100 percent efficiency. However, extracting just 15 percent of this total flux and converting the power to electricity with an efficiency of 80 percent would yield 252 terawatt-hours per year, about 6 percent of the nation’s current electricity consumption. As of February 2011, FERC had issued ten preliminary permits for marine wave hydrokinetic projects with a total projected capacity of 3,446 megawatts. Although wave energy is an immature technology, the sheer magnitude of energy embodied in waves nevertheless offers great potential as a future electricity resource.

Hydrokinetic technology could provide 10% of the nation’s electricity supply if fully developed

Jon Wellinghoff, James Pederson, and David Morenoff 2008. ( Wellinghoff is a Commissioner of the Federal Energy Regulatory Commission ; J.D. degree from Antioch School of Law. Pederson - Legal and Policy Advisor to Commissioner Wellinghofff; J.D. degree from University of Baltimore Law School Morenoff - Legal and Policy Advisor to Commissioner Wellinghoff; J.D. degree from Harvard Law School. ) FACILITATING HYDROKINETIC ENERGY DEVELOPMENT THROUGH REGULATORY INNOVATION, ENERGY LAW JOURNAL <http://www.oceanrenewable.com/wp-content/uploads/2009/01/ferchydrokinetic.pdf>

Hydrokinetic energy is a promising candidate for augmenting the nation’s needed supply of carbon-free energy sources. It could provide a new supply of clean, domestic, renewable energy, much of which would be located close to the load centers of our major cities on the coasts and inland waterways. It has taken over 100 years to develop the 97,000 megawatts (MW) of hydropower capacity in the United States, which constitutes ten percent of the country’s electricity supply. According to some estimates, hydrokinetic technologies have the potential, if fully developed, to double the amount of hydropower production to twenty percent of the national supply.

Hydrokinetic research is well-financed and accelerating

Dexter Gauntlett & Peter Asmus 2012. (Gauntlett - Industry Analyst. Asmus - Senior Analyst; with Pike Research, a consulting/research firm specializing in clean-energy technologies) Research Report: Hydrokinetic and Ocean Energy <http://www.oregonwave.org/wp-content/uploads/HYDRO-12-Executive-Summary.pdf>

While grid-connected devices are in the water today, most second-generation technologies (the focus of this report) exist only at test centers, although often generating electricity for the grid at these berths. The one exception is a large South Korean tidal barrage project based on conventional turbines. According to the Carbon Trust, there are more than 100 MHK technologies being researched by various organizations, including some impressive university-industry partnerships. Sophisticated and well-financed testing centers are accelerating R&D activities and, as the focus now moves to commercialization, studying the potential environmental and other impacts of deploying hundreds of devices and transmission lines in areas that are frequented by fisherman, transport vessels, and marine life. Countries that have strong marine resources, such as the United Kingdom, United States, Australia, South Korea, Spain, and Portugal, have committed to supporting the industry in some capacity – with the United Kingdom being the clear leader.

Hydrokinetics have little or no aesthetic impact (they don’t mess up the view or make things ugly)

Derek Bertsch 2010 (JD candidate at University of South Dakota School of Law ) Hydrokinetic Energy: Trying to Navigate the Energy and Water Law Framework to Develop New Renewable Energy Technology (ethical disclosure about the date: The article is undated but refers internally to dates that indicate it was written in 2010) <http://www.elizabethburleson.com/HydrokineticEnergyDerekBertsch.pdf>

Hydrokinetic energy is also an attractive energy source because of how hydrokinetic projects have little to no effect on the local aesthetics. Generally, most of the mechanical components of the various hydrokinetic devices are located underwater. Also, offshore wave energy projects would have “device markings that would only be seen from shore on exceptionally clear days,” because the Coast Guard only requires the projects to display markings visible for one nautical mile.

ADVANTAGES

250 million metric tons of carbon dioxide per year eliminated

Derek Bertsch 2010 (JD candidate at University of South Dakota School of Law ) Hydrokinetic Energy: Trying to Navigate the Energy and Water Law Framework to Develop New Renewable Energy Technology (ethical disclosure about the date: The article is undated but refers internally to dates that indicate it was written in 2010) <http://www.elizabethburleson.com/HydrokineticEnergyDerekBertsch.pdf>

Companies that are interested in developing hydrokinetic energy projects are attracted to the many benefits this type of technology exhibits. First, hydrokinetic projects are renewable and emission-free. The United States could avoid emitting 250 million metric tons of carbon dioxide per year if hydrokinetic energy represented 9% of the United States’ electric consumption, displacing energy generated by fossil fuel power plants. The Electric Power Research Institute estimates that hydrokinetic resources could provide about 10% of today’s electric consumption in the United States.

Hydrokinetic energy benefits include: Energy independence, reduced greenhouse gases, fewer over-land transmission lines

Amanda Righi 2011. (J.D. candidate, University of Washington School of Law, Class of 2012 ) WASHINGTON JOURNAL OF ENVIRONMENTAL LAW & POLICY. “ROUGH SEAS FOR RENEWABLE ENERGY: ADDRESSING REGULATORY OVERLAP FOR HYDROKINETIC PROJECTS ON THE OUTER CONTINENTAL SHELF » <http://digital.law.washington.edu/dspace-law/bitstream/handle/1773.1/1044/1WJELP079.pdf?sequence=4>

Hydrokinetic energy harnesses the power of the oceans and generates renewable energy with a low carbon footprint. A vibrant hydrokinetic energy industry can increase energy independence, diversify our energy resource base, reduce greenhouse gas (GHG) emissions and provide a power source near coastal population centers, avoiding the need for extensive over-land transmission lines.

Hydrokinetics replace fossil fuel generated electricity

Derek Bertsch 2010 (JD candidate at University of South Dakota School of Law ) Hydrokinetic Energy: Trying to Navigate the Energy and Water Law Framework to Develop New Renewable Energy Technology (ethical disclosure about the date: The article is undated but refers internally to dates that indicate it was written in 2010) <http://www.elizabethburleson.com/HydrokineticEnergyDerekBertsch.pdf>

Unlike the intermittent nature of other renewable energy sources, the sources of hydrokinetic energy are generally predictable and unaffected by weather variability. Wave patterns can be accurately forecast several days in advance, and tides “will always reoccur every twelve hours and twenty-five minutes,” because they are connected to the moon’s gravitational pull. Both wave and tidal energy can provide base load power, displacing the need for backup fossil fuel power plants. River currents, on the other hand, are known to fluctuate seasonally and are susceptible to wet and dry years, making it difficult to predict in-stream flow from year to year.

Easy to integrate hydrokinetic power into the grid

Derek Bertsch 2010 (JD candidate at University of South Dakota School of Law ) Hydrokinetic Energy: Trying to Navigate the Energy and Water Law Framework to Develop New Renewable Energy Technology (ethical disclosure about the date: The article is undated but refers internally to dates that indicate it was written in 2010) <http://www.elizabethburleson.com/HydrokineticEnergyDerekBertsch.pdf>

The greatest benefit of hydrokinetic energy may be how it is capable of being installed wherever energy is needed. Many high-demand urban centers are located near moving water. This allows for the easy integration of hydrokinetic power into the existing grid without having to distribute the energy through miles of transmission lines that lose a portion of the energy along the way.

How “adaptive management” works in the context of hydrokinetic energy development

US Dept of Energy 2009. Report to Congress on the Potential Environmental Effects of Marine and Hydrokinetic Energy Technologies Dec 2009 <http://www1.eere.energy.gov/water/pdfs/doe_eisa_633b.pdf>

In the context of marine and hydrokinetic energy technologies, adaptive management is a systematic process by which the potential environmental impacts of installation and operation could be evaluated against quantified environmental performance goals during project monitoring. Early information about undesirable outcomes can lead to the implementation of minimization or mitigation actions which are subsequently re-evaluated. An adaptive management process is particularly valuable in the early stages of technology development, when many of the potential environmental effects are unknown for individual units, much less for the eventual build-out of large numbers of units. There is widespread realization of the possible benefits of incorporating an adaptive management approach in the development and monitoring of these new technologies.

DISAD RESPONSES

No evidence hydrokinetic will cause any significant environmental impacts

Pew Center on Global Climate Change / Center for Climate and Energy Solutions 2011. (independent, nonpartisan, nonprofit organization working to advance strong policy and action to address the twin challenges of energy and climate change ) “Hydrokinetic Electric Power Generation“ Aug 2011 <http://www.c2es.org/docUploads/HydrokineticElectricPowerGeneration_0.pdf>

The pilot demonstration projects currently in operation are providing valuable data that regulators and resource agencies need to understand environmental impacts. Attention is focused on the questions of harm to fish and other marine life, detrimental changes to currents and sediment transfer, site impacts from installation and decommissioning, conflicts with other uses of the water body, and intrusive visual appearance. In 2009, the U.S. Department of Energy (DOE) delivered a comprehensive report on environmental impacts of hydrokinetic power generation to Congress. The report stated there is no conclusive evidence that hydrokinetic technologies will cause significant environmental impacts on acquatic environments, fish and fish habitats, ecological relationships, and other marine and freshwater resources.

Marine energy projects help local fish populations by limiting fishing in the area

US Dept of Energy 2009. Report to Congress on the Potential Environmental Effects of Marine and Hydrokinetic Energy Technologies Dec 2009 <http://www1.eere.energy.gov/water/pdfs/doe_eisa_633b.pdf>

Renewable energy projects may also have benefits to some aquatic habitats and populations. The presence of a marine energy conversion project will likely limit most fishing activities and other access in the immediate area. Bottom trawling can disrupt habitats, and benthic communities in areas that are heavily fished tend to be less complex and productive than in areas that are not fished in that way (Kaiser et al. 2000; Jennings et al. 2001). Blyth et al. (2004) found that cessation of towed-gear fishing resulted in significantly greater total species richness and biomass of benthic communities compared to sites that were still fished.

2A EVIDENCE: ICE BREAKERS

INHERENCY

Coast Guard cannot fulfill its missions with current aging fleet of icebreakers

Stephen L. Caldwell 2011. (Director: Homeland Security and Justice, with Government Accountability Office (GAO)) 1 Dec 2011 Testimony Before the Subcommittee on Coast Guard and Maritime Transportation, Committee on Transportation and Infrastructure, House of Representatives <http://www.gao.gov/assets/590/586575.html> (brackets in original)

The most significant issue facing the Coast Guard’s icebreaker fleet is the growing obsolescence of these vessels and the resulting capability gap caused by their increasingly limited operations. In 2010, Coast Guard officials reported challenges fulfilling the agency’s statutory icebreaking mission. Since then, at least three reports—by the DHS Inspector General and Coast Guard contractors—have further identified the Coast Guard’s challenges to meeting its current and future icebreaking mission requirements in the Arctic with its existing polar icebreaker fleet. Prior GAO work and these reports also identify budgetary challenges the agency faces in acquiring new icebreakers. Given these issues and the current budgetary climate, it is unlikely that the Coast Guard will be able to fund the acquisition of new icebreakers through its own budget, or through alternative financing options. Thus, it is unlikely that the Coast Guard will be able to expand the U.S. icebreaker fleet to meet its statutory requirements, and it may be a significant challenge for it to just maintain its existing level of icebreaking capabilities due to its aging fleet.

*Polar Star* icebreaker is old and its condition is shaky

Ronald O'Rourke 2013. (Specialist in Naval Affairs at Congressional Research Service) 25 April 2013 Coast Guard Polar Icebreaker Modernization: Background and Issues for Congress <http://www.fas.org/sgp/crs/weapons/RL34391.pdf>

Polar Star was commissioned into service on January 19, 1976, and consequently is now several years beyond its intended 30-year service life. Due to worn out electric motors and other problems, the Coast Guard placed the ship in caretaker status on July 1, 2006. Congress in FY2009 and FY2010 provided funding to repair Polar Star and return it to service for 7 to 10 years; the repair work, which reportedly cost about $57 million, was completed, and the ship was reactivated on December 14, 2012. The ship is to undergo testing during the summer of 2013, and be ready for operations in FY2014. Although the repair work on the ship was intended to give it another 7 to 10 years of service, an August 30, 2010, press report quoted the Commandant of the Coast Guard, Admiral Robert Papp, as saying, “We’re getting her back into service, but it’s a little uncertain to me how many more years we can get out of her in her current condition, even after we do the engine repairs.”

*Polar Sea* icebreaker is disabled

Ronald O'Rourke 2013. (Specialist in Naval Affairs at Congressional Research Service) 25 April 2013 Coast Guard Polar Icebreaker Modernization: Background and Issues for Congress <http://www.fas.org/sgp/crs/weapons/RL34391.pdf>

Polar Sea was commissioned into service on February 23, 1978, and consequently is also beyond its originally intended 30-year service life. In 2006, the Coast Guard completed a rehabilitation project that extended the ship’s expected service life to 2014. On June 25, 2010, however, the Coast Guard announced that Polar Sea had suffered an unexpected engine casualty, and the ship was unavailable for operation after that. The Coast Guard placed Polar Sea in commissioned, inactive status on October 14, 2011. The Coast Guard transferred certain major equipment from Polar Sea to Polar Star to facilitate Polar Star’s return to service.

One new icebreaker would be insufficient

Prof. Anita K. Jones 2006. (Professor at Univ Of Virginia and Chair, Committee on the Assessment of U.S. Coast Guard Polar Icebreaker Roles and Future Needs, Polar Research Board, Transportation Research Board, The National Academies) testimony Before the Subcommittee on Coast Guard and Maritime Transportation Committee on Transportation and Infrastructure, U.S. House of Representatives 26 Sept 2006 “POLAR ICEBREAKERS IN A CHANGING WORLD: AN ASSESSMENT OF U.S. NEEDS” <http://www7.nationalacademies.org/ocga/testimony/Polar_Icebreakers_in_a_Changing_World.asp>

One new polar icebreaker is insufficient for several logical reasons. First, a single ship cannot be in more than one location at one time. No matter how technologically advanced or efficiently operated, a single polar icebreaker can be operational (on station) in the polar regions for only a portion of any year. An icebreaker requires regular maintenance and technical support from shipyards and industrial facilities, must re-provision regularly, and needs to effect periodic crew change-outs. These functions cannot be conducted practically or economically “in the ice” and therefore require transit time to and from polar operating areas. A single icebreaker, therefore, could not meet any reasonable standard of active and influential presence, and reliable, at-will access throughout the polar regions.

Summary of US icebreaker capabilities

Ronald O'Rourke 2013. (Specialist in Naval Affairs at Congressional Research Service) 25 April 2013 Coast Guard Polar Icebreaker Modernization: Background and Issues for Congress <http://www.fas.org/sgp/crs/weapons/RL34391.pdf>

In summary, the U.S. polar icebreaking fleet currently includes • two heavy polar icebreakers (Polar Star and Polar Sea), one of which is operational, that are designed to perform missions in either polar area, including the challenging McMurdo resupply mission; • one medium polar icebreaker (Healy) that that is used primarily for scientific research in the Arctic; and • one ship (Palmer) that is used for scientific research in the Antarctic.

2013 budget has $8 million to initiate survey and design of a new icebreaker

2014 proposed budget proposes awarding a construction contract for 1 ship within the next 4 years

Ronald O'Rourke 2013. (Specialist in Naval Affairs at Congressional Research Service) 25 April 2013 Coast Guard Polar Icebreaker Modernization: Background and Issues for Congress <http://www.fas.org/sgp/crs/weapons/RL34391.pdf>

The Coast Guard’s proposed FY2013 budget submission requested $8 million in FY2013 acquisition funding to initiate survey and design activities for a new polar icebreaker, and projected an additional $852 million for acquiring the ship in FY2014-FY2017, including $120 million in FY2014. The Coast Guard’s FY2013 budget anticipated awarding a construction contract for the ship “within the next five years” and taking delivery on the ship “within a decade.” The project to design and build a polar icebreaker was a new acquisition project initiated in the FY2013 budget. The Coast Guard’s proposed FY2014 budget requests $2 million to continue survey and design activities for a new Coast Guard polar icebreaker, or $118 million less than the $120 million that was projected for FY2014 under the FY2013 budget. The proposed FY2014 budget anticipates awarding a construction contract for the ship “within the next four years.”

Extending existing ships is expensive: around ½ the cost of building a new one, and lacking the new capabilities a new ship would have

Ronald O'Rourke 2013. (Specialist in Naval Affairs at Congressional Research Service) 25 April 2013 Coast Guard Polar Icebreaker Modernization: Background and Issues for Congress <http://www.fas.org/sgp/crs/weapons/RL34391.pdf>

Regarding relative costs, as discussed in the “Background” section, the Coast Guard estimates that new icebreakers with a 30-year design life might cost $800 million to $925 million per ship in 2008 dollars, while a 25-year service life extension of Polar Star and Polar Sea might cost about $400 million per ship in 2008 dollars. (As mentioned earlier, an August 30, 2010, press report stated that the Commandant of the Coast Guard, Admiral Robert Papp, estimated the cost of extending the lives of Polar Star and Polar Sea at about $500 million per ship.) These estimates, however, should be compared with caution: the estimate for building new ships depends in part on the capabilities that were assumed for those ships, and estimates for service-life extension work can be very uncertain due to the potential for discovering new things about a ship’s condition once the ship is opened up for service-life-extension work. Regarding capabilities provided by each option, the new-construction option would provide entirely new ships with extensive use of new technology, while the service-life-extension option would provide ships that, although modernized and reconditioned, would not be entirely new and would likely make less extensive use of new technologies. Among other things, new-construction ships might be able to make more extensive use of new technologies for reducing crew size, which is a significant factor in a ship’s life cycle operating and support costs.

“Contract out a charter boat to resupply Antarctica” – Response: Charter is not sufficient

Prof. Anita K. Jones 2006. (Professor at Univ Of Virginia and Chair, Committee on the Assessment of U.S. Coast Guard Polar Icebreaker Roles and Future Needs, Polar Research Board, Transportation Research Board, The National Academies) testimony Before the Subcommittee on Coast Guard and Maritime Transportation Committee on Transportation and Infrastructure, U.S. House of Representatives 26 Sept 2006 “POLAR ICEBREAKERS IN A CHANGING WORLD: AN ASSESSMENT OF U.S. NEEDS” <http://www7.nationalacademies.org/ocga/testimony/Polar_Icebreakers_in_a_Changing_World.asp>

While there is ongoing discussion of the possibility of being able to store enough fuel and supplies to skip a resupply in a given year, the fact remains that the United States will need the ability to break a channel and resupply McMurdo Station by ship in any given year. This reality requires reliably-controlled icebreaker capability that can be assured over decades. Annual charter—commercial or from another nation—provides insufficient assurance of successful resupply for the long term.

“Overhaul existing icebreakers and extend their life” – Response: Building new ones is wiser

Prof. Anita K. Jones 2006. (Professor at Univ Of Virginia and Chair, Committee on the Assessment of U.S. Coast Guard Polar Icebreaker Roles and Future Needs, Polar Research Board, Transportation Research Board, The National Academies) testimony Before the Subcommittee on Coast Guard and Maritime Transportation Committee on Transportation and Infrastructure, U.S. House of Representatives 26 Sept 2006 “POLAR ICEBREAKERS IN A CHANGING WORLD: AN ASSESSMENT OF U.S. NEEDS” <http://www7.nationalacademies.org/ocga/testimony/Polar_Icebreakers_in_a_Changing_World.asp>

The benefits of constructing a new ship were compared to overhauling and extending the life of POLAR STAR or POLAR SEA. A so-called service life extension program (SLEP) involves wholesale replacement of the propulsion plant and auxiliary, control and habitation support systems. While the cost of a new hull could be avoided, the retrofit of most systems would be costly and limited by the constraints of the existing hull. The Committee recommends new construction for several reasons. There is effective, new technology, particularly new hull designs that could not be retrofitted to an existing ship. The hull and ship interior structure limit retrofit design choices, thus diminishing capability. We estimate that a SLEP would likely cost at a minimum more than half of a new construction cost. Some SLEP programs have overrun their budgets and have cost as much as construction of a new ship. A newly designed ship would also meet more stringent environmental standards than the current ships.

Coast Guard cannot meet mission requirements – and ALL icebreaking capability will be lost by 2029

Stephen L. Caldwell 2011. (Director: Homeland Security and Justice, with Government Accountability Office (GAO)) 1 Dec 2011 Testimony Before the Subcommittee on Coast Guard and Maritime Transportation, Committee on Transportation and Infrastructure, House of Representatives <http://www.gao.gov/assets/590/586575.html> (brackets in original)

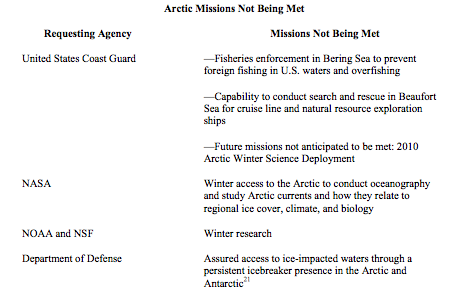
The DHS Office of the Inspector General (OIG) reported that the Coast Guard and other U.S. agencies are unable to meet their current Arctic mission requirements with existing icebreaking resources. This January 2011 report noted that the Coast Guard's icebreaking resources are unlikely to meet future demands as well, in part because the agency has not followed its life cycle replacement plan, which requires replacement of icebreaking ships after 30 years of service. Further, between fiscal year 2006 and fiscal year 2009, the National Science Foundation (NSF) had budgetary authority over the Coast Guard's icebreaker fleet. Among other things, the Inspector General reported that this funding arrangement resulted in deferred maintenance on the icebreakers, which has affected their long-term operability. The report concludes that without funding for new icebreakers or major service life extensions of existing ones, the U.S. will lose all polar icebreaking capabilities by 2029.

RISKS

Missions Unfulfilled: List of missions that cannot be done with current icebreaking capabilities

Dept of Homeland Security 2011. Office of Inspector General Report, Jan 2011, quoted by Ronald O'Rourke (Specialist in Naval Affairs at Congressional Research Service) 25 April 2013 Coast Guard Polar Icebreaker Modernization: Background and Issues for Congress <http://www.fas.org/sgp/crs/weapons/RL34391.pdf> (brackets in original)

The Coast Guard’s icebreaking resources are unlikely to meet future demands. [The table below] outlines the missions that Coast Guard is unable to meet in the Arctic with its current icebreaking resources.



Melting sea ice increases icebreaking requirements: More sea lanes to patrol

Jacqueline Klimas with NAVY TIMES 2012. (journalist) Coast Guard asks to buy new Arctic icebreaker 24 May 2012 <http://www.navytimes.com/article/20120324/NEWS/203240313/Coast-Guard-asks-to-buy-new-Arctic-icebreaker>

Rising global temperatures and melting sea ice are opening the ` of a new large icebreaker. Such a ship could cost $1 billion.

New Arctic sea routes increase Coast Guard requirements in the region

Stephen L. Caldwell 2011. (Director: Homeland Security and Justice, with Government Accountability Office (GAO)) 1 Dec 2011 Testimony Before the Subcommittee on Coast Guard and Maritime Transportation, Committee on Transportation and Infrastructure, House of Representatives <http://www.gao.gov/assets/590/586575.html> (brackets in original)

The retreat of sea ice, combined with an expected increase in human activity--shipping traffic and oil and gas exploration--has increased the strategic interest that the United States and other nations have in the Arctic region. For example, in 2011, northern shipping routes opened during the summer months, which permitted more than 40 vessels to transit between June and October 2011. As a result of these and other anticipated changes in the Arctic, the Coast Guard is expected to face increasing responsibilities in the waters off of Alaska's 44,000 miles of coast. In addition, the United States has developed national-level policies that guide the actions of the Coast Guard and other stakeholders. These policies indicate that the United States has an enduring interest in working collaboratively with other nations to address the emerging challenges arising from the effects of climate change and globalization in the Arctic, and they identify Arctic national security needs including protecting the environment, managing resources, and supporting scientific research.

Increased economic activity in the Arctic increases the need for US presence in Arctic waters

Prof. Anita K. Jones 2006. (Professor at Univ Of Virginia and Chair, Committee on the Assessment of U.S. Coast Guard Polar Icebreaker Roles and Future Needs, Polar Research Board, Transportation Research Board, The National Academies) testimony Before the Subcommittee on Coast Guard and Maritime Transportation Committee on Transportation and Infrastructure, U.S. House of Representatives 26 Sept 2006 “POLAR ICEBREAKERS IN A CHANGING WORLD: AN ASSESSMENT OF U.S. NEEDS” <http://www7.nationalacademies.org/ocga/testimony/Polar_Icebreakers_in_a_Changing_World.asp>

Economic activity is predicted to increase and move northward as a result of sea ice retreat. Those deploying fishing fleets, cruise ships, mining and the associated ore transit ships, as well as petroleum recovery and tanker ship transport anticipate increased operations in the region. When current orders for ice-strengthened tankers have been filled, the world wide fleet of these vessels will double in number. Ice retreat increases the cost-effectiveness of using the Northern Sea Route (primarily north of Russia) and the Northwest Passage (primarily north of Canada) for transporting petroleum, ore, and cargo. Both routes include U.S. Arctic waters. The potential for increased human activity in northern latitudes will likely increase the need for the United States to assert a more active and influential presence in the Arctic to protect not only its territorial interests, but also to project its presence as a world power concerned with the security, economic, scientific and international political issues of the region.

Increased activity in the Arctic means icebreakers will play critical role

National Academy of Sciences, Polar Research Board 2007. Polar Icebreakers in a Changing World: An Assessment of U.S. Needs <http://www.nap.edu/openbook.php?record_id=11753&page=1>

In the Arctic, economic activity is expected to increase as the southern extent of the Arctic summer ice pack thins, providing opportunity for ice-capable ships to travel through these regions. Greater human activity will increase the need for the United States to assert a more active and influential presence in the Arctic to protect not only its territorial interests, but also its presence as a world power concerned with the security, economic, scientific, and international political issues of the region. Icebreakers will play a critical role in supporting U.S. interests because the sea-ice margin does not retreat uniformly or predictably, which may create difficult ice conditions in these waters.

Warmer Arctic climate increases ice collision risk in shipping routes

Stephen L. Caldwell 2011. (Director: Homeland Security and Justice, with Government Accountability Office (GAO)) 1 Dec 2011 Testimony Before the Subcommittee on Coast Guard and Maritime Transportation, Committee on Transportation and Infrastructure, House of Representatives <http://www.gao.gov/assets/590/586575.html> (brackets in original)

Scientific research and projections of the changes taking place in the Arctic vary, but there is a general consensus that Arctic sea ice is diminishing and some scientists have projected that the Arctic will be ice-diminished for periods of time in the summer by as soon as 2040.[Footnote 6] As recently as September 2011, scientists at the U.S. National Snow and Ice Data Center reported that the annual Arctic minimum sea ice extent for 2011 was the second lowest in the satellite record, and 938,000 square miles less than the 1979 to 2000 average annual minimum. These environmental changes in the Arctic are making maritime transit more feasible and are increasing the likelihood of human activity including tourism, oil and gas extraction, commercial shipping, and fishing in the region.[Footnote 7] Despite these changes, however, several enduring characteristics still provide challenges to surface navigation in the Arctic, including large amounts of winter ice and increased movement of ice from spring to fall. Increased movement of sea ice makes its location less predictable, which is likely to increase the risk for ships to become trapped or damaged by ice impacts.

Diminished icebreaking capability = Antarctic station resupply missions vulnerable to failure

National Academy of Sciences, Polar Research Board 2007. Polar Icebreakers in a Changing World: An Assessment of U.S. Needs <http://www.nap.edu/openbook.php?record_id=11753&page=23>

Until recently, the two Polar class icebreakers (sometimes together and sometimes separately depending on ice conditions) were used to break open a channel for resupply. However, more challenging ice conditions and the deteriorating status of the Polar class ships now adds uncertainty and risk of failure to the operation. The National Science Foundation (NSF) is concerned that the lack of reliable icebreaking support may make it increasingly difficult to maintain the permanent stations and associated science programs.

Reliable icebreaking capability is key to sustaining US interests in Antarctica

National Academy of Sciences, Polar Research Board 2007. Polar Icebreakers in a Changing World: An Assessment of U.S. Needs <http://www.nap.edu/openbook.php?record_id=11753&page=23>

In the Antarctic, multiple national policy statements and Presidential Decision Directives have reaffirmed the importance of an “active and influential” U.S. presence in Antarctica and U.S. leadership in the Antarctic Treaty governance process. The U.S. presence at McMurdo and South Pole Stations cannot be ensured without reliable icebreaking support to allow resupply of fuel, food, and cargo. At some point in the near future it may be possible to store enough fuel and supplies to skip a resupply in a given year, but even then the United States will need the ability to break a channel and resupply McMurdo Station by ship in most years. Reliably controlled icebreaker capability that can be ensured over decades is therefore vital to U.S. interests in the Antarctic.

US Antarctic research relies on icebreakers, and missions are vulnerable to failure

Prof. Anita K. Jones 2006. (Professor at Univ Of Virginia and Chair, Committee on the Assessment of U.S. Coast Guard Polar Icebreaker Roles and Future Needs, Polar Research Board, Transportation Research Board, The National Academies) testimony Before the Subcommittee on Coast Guard and Maritime Transportation Committee on Transportation and Infrastructure, U.S. House of Representatives 26 Sept 2006 “POLAR ICEBREAKERS IN A CHANGING WORLD: AN ASSESSMENT OF U.S. NEEDS” <http://www7.nationalacademies.org/ocga/testimony/Polar_Icebreakers_in_a_Changing_World.asp>

The U.S. research presence in Antarctica currently relies on ship-borne resupply with the majority of fuel and cargo for the U.S. Antarctic Program delivered to McMurdo Station by tanker and container ship. Fuel and supplies are ferried from McMurdo to the South Pole Station and remote field sites by aircraft or overland traverse. Multiple studies over the years have repeatedly confirmed that the safest and most cost-effective means of transporting the necessary quantities of fuel and cargo to McMurdo Station is by ship. Presently two ice-strengthened ships chartered by the Military Sealift Command transport cargo and fuel and remove refuse. These ships *require* icebreakers to open a shipping channel through the shore-fast ice to McMurdo Station, which has been up to 80 miles long, and to provide close escort to and from the ice pier. During the past six years, the break-in through McMurdo Sound has become increasingly more challenging. Until 2006, large icebergs in the Ross Sea have blocked wind and currents from clearing the ice from McMurdo Sound, and the blockage has increased the amount of harder, thicker, multi-year ice in the Sound. The last six seasons have generally required two icebreakers to break and groom the channel and escort the transport ships through the channel. For the past couple of years, because the condition of the POLAR STAR and POLAR SEA has required increased maintenance as they near the end of their service lives, the National Science Foundation contracted the services of the Russian icebreaker KRASIN. Approximately the same age as POLAR STAR, KRASIN assisted the POLAR STAR in 2005 and in early 2006 conducted the break-in alone but broke a propeller blade (which a U.S. Navy diving and salvage team could not repair) before escorting the tanker and container ship through difficult ice conditions. The POLAR STAR was dispatched from Seattle, where it was in stand-by status. The KRASIN was able to escort the tanker to the pier, and when re-fueling of the McMurdo tank farm commenced, only five days of fuel remained. These events highlight the difficult ice conditions, the aging condition of the two U.S. icebreakers powerful enough to perform the McMurdo break-in, and the condition of icebreakers that can be chartered on the open market. These circumstances make future resupply missions vulnerable to failure.

SOLVENCY / ADVOCACY

Coast Guard needs 6+4 to fulfill all missions: 6 new heavy icebreakers + 4 medium icebreakers

Stephen L. Caldwell 2011. (Director: Homeland Security and Justice, with Government Accountability Office (GAO)) 1 Dec 2011 Testimony Before the Subcommittee on Coast Guard and Maritime Transportation, Committee on Transportation and Infrastructure, House of Representatives <http://www.gao.gov/assets/590/586575.html> (brackets in original)

High Latitude Study.[Footnote 28] This report included a separate and broader analysis of the Coast Guard's icebreaker needs, while the findings of the first two reports were limited to an analysis of the existing Coast Guard polar class icebreakers. The Coast Guard provided the Study to Congress in July 2011. It found that the common and dominant contributor to the significant mission impacts in the Arctic discussed above is the gap in polar icebreaking capability, and that the existing icebreaker fleet is insufficient to meet the Coast Guard's statutory mission requirements in both the Arctic and Antarctic, even if two new icebreakers are built. To fulfill these mission requirements, the study found that the Coast Guard needs a minimum of six icebreakers (three heavy and three medium icebreakers). Further, if Navy presence requirements are taken into account, the Coast Guard would require three additional heavy icebreakers and one additional medium icebreaker for a total of ten icebreakers (six heavy and four medium icebreakers).

Increased economic activity in the Arctic justifies increased US icebreaker capability

Prof. Anita K. Jones 2006. (Professor at Univ Of Virginia and Chair, Committee on the Assessment of U.S. Coast Guard Polar Icebreaker Roles and Future Needs, Polar Research Board, Transportation Research Board, The National Academies) testimony Before the Subcommittee on Coast Guard and Maritime Transportation Committee on Transportation and Infrastructure, U.S. House of Representatives 26 Sept 2006 “POLAR ICEBREAKERS IN A CHANGING WORLD: AN ASSESSMENT OF U.S. NEEDS” <http://www7.nationalacademies.org/ocga/testimony/Polar_Icebreakers_in_a_Changing_World.asp>

The growing human presence and increased economic activity in the Arctic will be best served by reinstating patrols in U.S. coastal waters and increasing U.S. presence in international waters of the north. To assert U.S. interests in the Arctic, the nation needs to be able to access various sites throughout the region at various times of the year, reliably and at will. While the southern extent of the Arctic ice pack is thinning and becoming less extensive during the summer, there is no question that polar icebreakers will be required for many decades for egress to much of the Arctic basin. Ice conditions in the U.S. Arctic are among the most variable and occasionally challenging through the circum-Arctic. National interests require icebreakers that can navigate the most formidable ice conditions encountered in the Arctic.

New icebreaker ships cost $784 million each if you buy 6 total ($4.7 billion for six ships)

Ronald O'Rourke 2013. (Specialist in Naval Affairs at Congressional Research Service) 25 April 2013 Coast Guard Polar Icebreaker Modernization: Background and Issues for Congress (brackets in original) http://www.fas.org/sgp/crs/weapons/RL34391.pdf

The High Latitude Study provided to Congress in July 2011 states that the above figure of $800 million to $925 million in 2008 dollars equates to $900 million to $1,041 million in 2012 dollars. The study provides the following estimates, in 2012 dollars, of the acquisition costs for new polar icebreakers:  
• $856 million for 1 ship;  
• $1,663 million for 2 ships—an average of about $832 million each;  
• $2,439 million for 3 ships—an average of $813 million each;  
• $3,207 million for 4 ships—an average of about $802 million each;  
• $3,961 million for 5 ships—an average of about $792 million each; and  
• $4,704 million for 6 ships—an average of $784 million each.

Cut Head Start = $8 billion/year with no benefit

Lindsey Burke and Dr. David B. Muhlhausen 2013. (Burke - Will Skillman fellow in education policy at Heritage Foundation; bachelor's degree in politics from Hollins Univ in Roanoke, Va.; master of teaching degree in foreign language education from Univ of Va. Muhlhausen – PhD in public policy from Univ of Maryland-Baltimore County ; served on the staff for the Senate Judiciary Committee) Head Start Impact Evaluation Report Finally Released 10 Jan 2013 <http://www.heritage.org/research/reports/2013/01/head-start-impact-evaluation-report-finally-released>

Since 1965, taxpayers have spent more than $180 billion on Head Start.[1] Yet, over the decades, this Great Society relic has failed to improve academic outcomes for the children it was designed to help. The third-grade follow-up evaluation is the latest in a growing body of evidence that should urge policymakers to seriously consider Head Start’s future.  
  
Head Start and Performance  
  
The timing of the release raises questions about whether HHS was trying to bury the findings in the report, which shows, among other outcomes, that by third grade, the $8 billion Head Start program had little to no impact on cognitive, social-emotional, health, or parenting practices of participants. On a few measures, access to Head Start had harmful effects on children.

ADVANTAGES

Heavy icebreaking capability required to protect US national interests in the polar regions

Prof. Anita K. Jones 2006. (Professor at Univ Of Virginia and Chair, Committee on the Assessment of U.S. Coast Guard Polar Icebreaker Roles and Future Needs, Polar Research Board, Transportation Research Board, The National Academies) testimony Before the Subcommittee on Coast Guard and Maritime Transportation Committee on Transportation and Infrastructure, U.S. House of Representatives 26 Sept 2006 “POLAR ICEBREAKERS IN A CHANGING WORLD: AN ASSESSMENT OF U.S. NEEDS” <http://www7.nationalacademies.org/ocga/testimony/Polar_Icebreakers_in_a_Changing_World.asp>

Projecting an active and influential presence in the polar regions requires that the United States be able to access polar sites at various times of the year to accomplish multiple missions, reliably and at will. Air borne, space borne and submarine assets can only partially address these missions. The presence of surface ships in ice-covered waters is necessitated by geopolitics. In recent correspondence to this Committee, the Department of State, Department of Defense, and Department of Homeland Security further validated that icebreaking capability is necessary to protect national interests in the polar regions. Thus, the United States requires ships that can assure access through thick multi-year ice in the northern and southern polar regions. Based on these broad missions, the Committee believes that the core of the icebreaking fleet must be the multi-mission ships operated by the U.S. Coast Guard, a military organization.

US Antarctic presence maintains peaceful use of the region and promotes scientific research

Prof. Anita K. Jones 2006. (Professor at Univ Of Virginia and Chair, Committee on the Assessment of U.S. Coast Guard Polar Icebreaker Roles and Future Needs, Polar Research Board, Transportation Research Board, The National Academies) testimony Before the Subcommittee on Coast Guard and Maritime Transportation Committee on Transportation and Infrastructure, U.S. House of Representatives 26 Sept 2006 “POLAR ICEBREAKERS IN A CHANGING WORLD: AN ASSESSMENT OF U.S. NEEDS” <http://www7.nationalacademies.org/ocga/testimony/Polar_Icebreakers_in_a_Changing_World.asp>

The United States has enduring national and strategic interests in the Arctic and Antarctic and the importance these regions is growing with time. In the north, the United States has territory and citizens above the Arctic Circle, creating significant national interests. In the south, the United States maintains three year-round scientific stations to assert U.S. presence and assure U.S. leadership among the nations that are signatories to the Antarctic Treaty. The United States uses that leadership to ensure that the Antarctic Treaty area, comprised of all land and waters below 60 degrees south latitude, are preserved for peaceful purposes and scientific research.

US presence is key to upholding the Antarctic Treaty

Prof. Anita K. Jones 2006. (Professor at Univ Of Virginia and Chair, Committee on the Assessment of U.S. Coast Guard Polar Icebreaker Roles and Future Needs, Polar Research Board, Transportation Research Board, The National Academies) testimony Before the Subcommittee on Coast Guard and Maritime Transportation Committee on Transportation and Infrastructure, U.S. House of Representatives 26 Sept 2006 “POLAR ICEBREAKERS IN A CHANGING WORLD: AN ASSESSMENT OF U.S. NEEDS” <http://www7.nationalacademies.org/ocga/testimony/Polar_Icebreakers_in_a_Changing_World.asp>

Multiple national policy statements and Presidential Decision Directives have reaffirmed the importance of an “active and influential” U.S. presence in Antarctica in support of U.S. leadership in the Antarctic Treaty governance process and as a geopolitical statement of U.S. world wide interests. The United States is committed to preserving Antarctica exclusively for peaceful purposes, furthering scientific knowledge, and preserving and protecting one of the most pristine environments on the globe. The U.S. presence in Antarctica is principally established by the year-round occupation of three stations: McMurdo, Palmer, and South Pole. This presence secures the United States’ influential role in the Treaty's decision-making system and maintains the political and legal balance necessary to protect the U.S. position on Antarctic sovereignty. Many view the permanent year-round presence of the United States as a major deterrent to those countries that might otherwise wish to exercise their overlapping territorial claims. Thus, scientific activity in the Antarctic is an instrument of foreign policy.

Icebreakers are essential to polar research

Prof. Anita K. Jones 2006. (Professor at Univ Of Virginia and Chair, Committee on the Assessment of U.S. Coast Guard Polar Icebreaker Roles and Future Needs, Polar Research Board, Transportation Research Board, The National Academies) testimony Before the Subcommittee on Coast Guard and Maritime Transportation Committee on Transportation and Infrastructure, U.S. House of Representatives 26 Sept 2006 “POLAR ICEBREAKERS IN A CHANGING WORLD: AN ASSESSMENT OF U.S. NEEDS” <http://www7.nationalacademies.org/ocga/testimony/Polar_Icebreakers_in_a_Changing_World.asp>

The health and continued vitality of polar research is intimately linked to the availability of the appropriate infrastructure and logistical support to allow scientists to work in these harsh environments. Access to the polar regions is essential if the United States is to continue to be a leader in polar science. To operate reliably and safely in these regions necessitates a national ice-breaking capability. Icebreakers enable resupply to land-based stations and field camps in the south. Availability of polar icebreakers with greater icebreaking capability would enable important new research in the southern ocean in locations where ice is thick. While other assets and platforms such as airplanes and space-borne sensors are useful tools, surface ground-truth and *in situ* sampling will not be replaced in the near future. Because there are no land sites in the central Arctic, an icebreaker is an essential platform to support sustained scientific measurements in the Arctic Ocean. The availability of adequate ice-breaking capabilities will be essential to advancing research in both polar regions.

Polar research is critical to US national interests – creates significant advances in science, engineering and climate

National Academy of Sciences, Polar Research Board 2007. Polar Icebreakers in a Changing World: An Assessment of U.S. Needs <http://www.nap.edu/openbook.php?record_id=11753&page=39>

Because science and engineering research in the polar regions is critical to U.S. national interests, its relevance and impact continue to increase. The Arctic and Antarctic provide natural laboratories where extreme environments and geographically unique settings enable research on fundamental phenomena and processes not feasible or possible elsewhere (NSF, 2005). Significant advances in many scientific disciplines and engineering applications have resulted from polar research and many of these discoveries have provided critical knowledge of direct benefit to society (Box 4.1). As global climate has garnered worldwide attention, the polar regions have been found to react acutely to fluctuations in climate and temperature. Since ice tends to reflect solar radiation and water absorbs it, melting in the polar regions can exert a strong influence on both atmospheric climate and ocean circulation. Huge reservoirs of water are held in massive ice sheets and glaciers; substantial release may create major climate and social dislocations. Thus, research in these regions plays a pivotal role in the global Earth system exerting influences of critical importance.

Specific list of scientific discoveries from polar research

National Academy of Sciences, Polar Research Board 2007. Polar Icebreakers in a Changing World: An Assessment of U.S. Needs <http://www.nap.edu/openbook.php?record_id=11753&page=40>

The presence and cause of the “ozone hole”  
The molecular and genetic mechanisms of living systems for coping with freezing conditions  
The Southern Ocean’s role in driving the deep ocean “conveyor belt”  
Characterization of climate and effects in both the Arctic and the Antarctic  
Biological isolation as a fundamental force in the evolution of life  
A record of past climate changes in ice cores and sedimentary sequences  
Unique views of our universe and clues to its formation  
Organic pollutant transport to polar food webs and persistence  
The slowest spreading center and thinnest oceanic crust on Earth  
Subglacial environments and hydrological systems beneath ice sheets  
Paleo outbursts of subglacial waters as a geomorphologic agent of change  
Meteorological observations critical to weather prediction

Scientific research benefit justifies the cost of icebreakers

National Academy of Sciences, Polar Research Board 2007. Polar Icebreakers in a Changing World: An Assessment of U.S. Needs <http://www.nap.edu/openbook.php?record_id=11753&page=40>

Essential to these operations is access through and operation ice-covered oceans and coastal seas. The support of polar research requires ships of various icebreaking capabilities, including those that are the subject of this report. This chapter highlights some of the major research themes being pursued in polar science, demonstrating the value provided by this work to the nation. A glimpse of where this science will go in the future is also provided. The scientific value justifies the significant investment needed for polar research to continue and indeed flourish over the next several decades. Simply put, access to the polar regions is fundamentally important if the United States is to continue to be a leader in polar science. Icebreakers are a key part of the necessary infrastructure: They are needed to conduct science in Arctic waters and to open a channel to allow resupply of McMurdo Station (and, in turn, South Pole Station and inland sites) in Antarctica.

2A EVIDENCE: LAW OF THE SEA

TOPICALITY

Law of the Sea is key to development of maritime natural resources

R. Bruce Josten 2012 (Executive Vice President, Government Affairs, U.S. Chamber of Commerce) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

Failure for the United States to approve the Law of the Sea Treaty will be a strategic disadvantage to not just American industry, but to the nation at large. Unlike most other treaties, I think it’s important to remember this will form the basis of maritime law regardless of whether or not the United States joins officially. By ratifying this treaty, we become a mission of the Commission on Limits of the Continental Shelf, not just a part of the treaty; and it’s that body that will ultimately determine the validity of each country’s claims to these extensions off the continental shelf and ensure exploration for needed natural resources. This is an essential action that’s needed to protect the interests of our American industry and the development and use of these resources.

INHERENCY

“Existing customary international law works fine” – Response: Not any more. New trends are challenging customary law

Prof. John Nagl 2012. (PhD; professor at the US Naval Academy; Non-Resident senior fellow and former president, Center for a New American Security) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

As Heather just noted, the United States has protected its maritime interests for many, many years without ratifying the Law of the Sea. For more than 30 years we’ve enjoyed the protections afforded by customary international law, in large part because countries around the world have recognized those customary practices as the appropriate rules of the road at sea. But this approach of relying only on customary practice is ever more risky and will increasingly peril U.S. national security interests. The rise of modern navies, from Asia to South America, is giving countries a greater reason and a greater capability to challenge existing maritime norms and redefine them in ways that protect their own national interests, even at the expense of important, long-standing maritime rules, such as the freedom of navigation at sea. And this is nowhere more apparent than in the South China Sea, where today, China’s outsized claim to the entire South China Sea region flies in the face of both customary international law and the Law of the Sea Treaty. Moreover, China, Thailand and other countries are reinterpreting customary international law, even the laws enshrined in the Law of the Sea Convention, in ways that run counter to long-standing interpretation and, more importantly for our purposes, to American national interests.

“Companies can already exploit international waters” – Response: They are reluctant to do it without clear legal authority provided by Law of the Sea

Prof. John Nagl 2012. (PhD; professor at the US Naval Academy; Non-Resident senior fellow and former president, Center for a New American Security) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

We need to encourage the private sector to develop these resources. Our failure to ratify the Law of the Sea has had a chilling effect on commercial resource exploration and exploitation. Many of the companies, as we discussed this morning, have been reluctant to operate beyond the 200-mile nautical economic exclusion zone due to lack of formal legal protections that would require them to assume more risk than they need to. We can’t afford to keep these roadblocks in place.

“US companies can claim minerals without Law of the Sea” – Response: They can’t be sure of property rights to their claims unless we have the treaty

Andrew Langer 2012. (BA in International Relations; Masters in Public Admin from Troy State Univ; President of the Institute for Liberty. Note: Langer and his organization formerly opposed Law of the Sea, but changed their position in late 2012 after more research) 28 Nov 2012 The Case for Ratification of the Law of the Sea Treaty <http://www.realclearpolitics.com/articles/2012/11/28/the_case_for_ratification_of_the_law_of_the_sea_treaty_116272-full.html>

**Myth:** U.S. companies can explore mineral claims without ratifying the treaty and joining the ISA. **Fact:** False. This is the issue of property rights, which is of tantamount importance in forging political stability and global prosperity. Right now, U.S. business’ mineral claims are imperiled because of our inability to participate in the International Seabed Authority. If other nations can lay claim to these regions, and have the lawful backing of the treaty and the ISA, then our businesses can legally be forced off these claims. U.S. businesses cannot subject themselves to a potential taking scenario where once that have developed a resource, it is taken by China or Russia.

SOLVENCY / ADVOCACY

Advocacy: Everyone in the military advocates ratifying Law of the Sea

Prof. John Nagl 2012. (PhD; professor at the US Naval Academy; Non-Resident senior fellow and former president, Center for a New American Security) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

As Senator Warner noted, I’m now a professor at the U.S. Naval Academy. My remarks today are informed by the work of my friends in the Department of Leadership, Ethics and Law at the Naval Academy and by the good work of Will Rogers – that is his real name – (laughter) – who at the Center – who’s right over here – who at the Center for a New American Security, because the old American security just wasn’t good enough, recently published a paper titled “Security at Sea: The Case for Ratifying the Law of the Sea Convention.” My remarks are informed by all of the work of those friends of mine. But of course, nothing I say is the official opinion of the Navy, although I have yet to meet anyone in the armed forces of the United States of America who does not strongly endorse the passage and the ratification of this convention.

“Law of the Sea not effective” – Response: It would be more effective if the US joined

Zenonas Tziarras 2012. (Junior Research Scholar, Strategy International; PhD Candidate, International Politics, Univ of Warwick) The Law of the Sea Convention, the Eastern Mediterranean, and Clinton’s Testimony, Oct 2012 <http://www.academia.edu/2054703/The_Law_of_the_Sea_Convention_the_Eastern_Mediterranean_and_Clintons_Testimony>

Generally speaking, an immediate consequence of an American ratification would be the further legitimization of the Convention as the US is a very important actor on the international political chessboard which could play a significant role in the implementation of the Law of the Sea and the resolution of various maritime disputes all over the world, through mediation. Further, were the US to ratify UNCLOS III, other countries could follow. That would lead to the better functionality of the Convention and perhaps the minimization of frictions over maritime borders internationally.

ADVANTAGES

US Security and National Interests. By joining the treaty, we can block international attempts to undercut US interests

Leon Panetta 2012. (Secretary of Defense) Keynote Address, 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

Let me give you some reasons why this treaty is essential to a strong national security. First, as the world’s pre-eminent maritime power – and we are, and we will remain so – this country has one of the largest coastlines and extended continental shelves in the world. We have more to gain from accession to the convention than almost any other country because of the interests we have from our coastline, from our oceans and from our intercontinental shelves.By moving off of the sidelines, where we are now, and sitting at the table of nations that have ceded to this treaty, we can defend our interests, we can lead the discussions, and we would be able to influence those treaty bodies that develop and interpret the Law of the Sea. If we’re not there, then they’ll do it and we won’t have a voice. In that way, we could ensure that our rights are not whittled away by the excessive claims and erroneous interpretation of others. And that’s what’s happening now. It would give us the credibility to support and promote the peaceful resolution of disputes within a rules-based order.

Legal access to the sea is better than just asserting it through physical presence

Gen. Martin E. Dempsey 2012. (Chairman of the Joint Chiefs of Staff; US Army general; highest ranking military officer in the US) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

Second, the convention secures legitimate global freedom of access for our armed forces. Today we rely on customary international law and assert it through our physical presence: warships and aircraft transiting and challenging illegal restrictions. Some say this alone is sufficient. But it plays into the hands of foreign states that over time want to bend customary law to restrict movement on the oceans, and it puts our warships and aircraft on point to constantly challenge their claims. Now, we’re strong enough for this role. We can and will continue to defend our interests, and we’ll do that with force when necessary. But we can also be smart. We can leverage law to mitigate the need for physical assertion. Under the Law of the Sea Convention, we can be both, that is, both strong and smart.

Law of the Sea would help us block other nations trying to reshape the rules and provide a framework for solving international disagreements

Prof. John Nagl 2012. (PhD; professor at the US Naval Academy; Non-Resident senior fellow and former president, Center for a New American Security) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

Ratifying this treaty will help the United States counter efforts by rising powers seeking to reshape the rules that have been so beneficial to the global economy and to U.S. national security, and will strengthen those provisions in the Law of the Sea that codify customary international law and continue to protect U.S. interests. By becoming a full party to the treaty, the United States can avail itself of a legitimate and recognized framework for adjudicating disagreements that will enable the United States to sustain access to the global commons, including fora like the Law of the Sea Tribunal.

Our diplomatic efforts to resolve international sea navigation controversies would be aided by ratification

Leon Panetta 2012. (Secretary of Defense) Keynote Address, 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

The United States has long declared our interests and our respect for international law, for freedom of navigation, for the peaceful resolution of disputes. We have demonstrated our commitment to those interests through our consistent presence and engagement in these critical maritime regions. By not acceding to the convention, we give up the strongest legal footing for our actions. We potentially undercut our credibility in a number of Asia-focused multilateral venues, just as we’re pushing for a rules-based order in the region and the peaceful resolution of maritime and territorial disputes. We’re doing that in the South China Sea and elsewhere. How can we argue – how can we argue that other nations must abide by international rules when we haven’t officially accepted those rules ourselves? Another hot spot is the Strait of Hormuz. The strait remains a vital sea lane of communications to us and our partners. And we are determined to preserve freedom of transit there in the face of Iranian threats to impose a blockade. U.S. accession to the convention would help strengthen worldwide transit passage rights under international law and would further isolate Iran as one of the few remaining nonparties to the convention.

US communication cable companies are at a competitive disadvantage without the LOS Convention

John Ryan 2012. (Chief Legal Officer, Level 3 Communications, Inc.) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

Second, the convention includes meaningful dispute resolution procedures that are – that relate to the operation and implementation of subsea cables. Under the treaty, parties that have access to the treaty have access to compulsory dispute resolution procedures that protect submarine cable operators against onerous and unreasonable permitting or coastal states who refuse to allow the installation of subsea cable facilities. That dispute resolution provisions are one of the principle benefits of the U.S. accepting the treaty. And it is one that U.S. companies do not currently enjoy while many of our competitors overseas do.

Telecom Business Opportunities.

John Ryan 2012. (Chief Legal Officer, Level 3 Communications, Inc.) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

We strongly support ratification of the treaty for three primary reasons. First, the convention improves protection for international submarine cables. Since Level 3 and other telecommunications providers project the demand for Internet services will continue to explode, it is essential to protect this critically important global network infrastructure from damage or disruption. When it breaks, you need to fix it fast. Any uncertainty in protecting the infrastructure puts the U.S. and U.S.-based companies at a competitive disadvantage relative to our competitors who are members of the convention. And that uncertainty inhibits economic growth and investment.

Law of the Sea is key to US Arctic policy – we are abandoning Arctic leadership without it

Heather Conley 2012. (Senior Fellow and Director, Europe Program, Center for Strategic and International Studies) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

For the Arctic, in a continuation of American leadership in this region, the answer begins with the Law of the Sea Treaty. As many of you know, the Arctic region is a frozen ocean, which is rapidly thawing, surrounded by a coastal states – five Arctic coastal states. Therefore the Arctic is governed internationally by the Law of the Sea Treaty. So our second question is do we want to lead or do we want to be left behind? Do we want to follow Russia, Norway, Denmark and Canada in submitting scientific claims to explore, protect and potentially exploit resources beyond our outer continental shelf? Today we are abdicating our leadership as Russia is submitting its second round of scientific claims to the Lomonsov Ridge, an undersea mountain chain that goes under the North Pole, at the very end of this year, a critical issue for our – extending our continental shelf.

Arctic oil, gas and mineral resources and jobs developing them are missed without the LOS

Heather Conley 2012. (Senior Fellow and Director, Europe Program, Center for Strategic and International Studies) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

Does the U.S. want to lead in the creation of new jobs and new opportunities to gain energy independence? As the first panel, I think, in very clear ways illustrated, we have enormous amounts of economic opportunity to explore in our American Arctic. According to the U.S. Geological Survey, the Arctic could hold up to 12 percent of the world’s undiscovered oil resources and 30 percent of natural gas resources. As was mentioned, the mineral resources – America’s largest iron ore mine is Alaska. Rare earth potentially could be there – nickel, all the critical elements of a 21st century economy. But today we cannot tap into those resources that lie beyond our exclusive economic zone. This summer, Shell Oil will likely drill in the Beauford and Chukchi Seas. According to one study that was conducted in Alaska, nearly 55,000 jobs could be created. Drilling on Alaska’s outer continental shelf could make Alaska the eighth largest oil producer in the world before Nigeria, Libya, potentially Norway. How much economic activity do we want to forgo? How many jobs do we not want to create? As the most significant maritime power in the world, will we be able to maintain freedom of navigation in international waters as they become ice-free? Increasingly, as the polar icecap recedes, we are seeing new shipping opportunities through the Northern Sea route. The Bering Strait will become an increased area of traffic. And we have to make sure that the United States can secure our homeland and protect the citizens of Alaska as we – you see this increase in human and commercial activity. We also must preserve our missile defense architecture, again, prevent – ensure freedom of navigation and prevent any acts of terrorism that could come from a thawing Arctic. But I can’t answer any of these questions today, because I don’t know how long it will take us to ratify the Law of the Sea Treaty. But with each passing day that we do not ratify, we place America’s national security in the north and our economic vitality at risk.

We need LOS to stop other countries from taking over the Arctic

Prof. John Nagl 2012. (PhD; professor at the US Naval Academy; Non-Resident senior fellow and former president, Center for a New American Security) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

Without ratifying the Law of the Sea, the United States is ill-positioned to lay claim to the strategic energy and mineral reserves on its extended continental shelf on the Arctic, and we can’t even challenge claims that other countries make to the U.N. Convention on the Limits of the Continental Shelf, even if those claims conflict with U.S. ones, because we’re not even at the table. Many countries like Russia are preparing to submit claims to the commission. We can’t lose out on our ability to lay sovereign claims to the extended continental shelf by not being party to the treaty. We can’t continue to operate from a position of weakness rather than strength.

US is losing access to oil and minerals by not ratifying Law of the Sea: Russia and China are getting it all

Andrew Langer 2012. (BA in International Relations; Masters in Public Admin from Troy State Univ; President of the Institute for Liberty. Note: Langer and his organization formerly opposed Law of the Sea, but changed their position in late 2012 after more research) 28 Nov 2012 The Case for Ratification of the Law of the Sea Treaty <http://www.realclearpolitics.com/articles/2012/11/28/the_case_for_ratification_of_the_law_of_the_sea_treaty_116272-full.html>

I am tired of losing out to China and Russia on the world stage. By not ratifying LOTS, the U.S. loses access to resources that lie in undersea regions that are outside of the current U.S. sphere of legal access – much in the same way that China and Russia are accessing oil that we have prevented ourselves from going after, now China and Russia are accessing vast amounts of rare earth minerals, and other critical minerals, that are essential to our economy and national security.

Ratifying Law of the Sea = Massive economic growth and job creation

Andrew Langer 2012. (BA in International Relations; Masters in Public Admin from Troy State Univ; President of the Institute for Liberty. Note: Langer and his organization formerly opposed Law of the Sea, but changed their position in late 2012 after more research) 28 Nov 2012 The Case for Ratification of the Law of the Sea Treaty <http://www.realclearpolitics.com/articles/2012/11/28/the_case_for_ratification_of_the_law_of_the_sea_treaty_116272-full.html>

Over 160 nations have ratified the Law of the Sea Treaty during the past 20 years. The U.S. now stands alone with Iran, Venezuela, North Korea and sad smattering of third world and disreputable nations in turning our backs on the greatest opportunity for wealth creation available on the globe today. In doing so, the U.S. is not losing jobs and economic opportunity to BRIC nations and the rest of the world, we are surrendering them. The Senate still has time to act to ratify LOTS and to set things right. This is the most important economic agenda item the Congress can take up – and they can still do it before the end of the year. With one vote, the United States Senate has the power to unleash staggering economic growth and jobs creation.

LOS = oil and gas resources, increased federal revenues, stronger national security and new jobs

Prof. John Nagl 2012. (PhD; professor at the US Naval Academy; Non-Resident senior fellow and former president, Center for a New American Security) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

Ratifying the Law of the Sea would also enable the United States to lay sovereign claim to deep-sea oil and natural gas resources on our extended continental shelf. And I thought the first panel did a great job of talking to the jobs, the job potential, the tax revenues that can accrue to the United States and further strengthen our national security. Our last chairman said that the national debt is our biggest national security problem; we’ve got to find ways to get a hold of that. There is – there are dollars for the taking that companies simply can’t make the risk profile work given the – our failure to ratify the Law of the Sea.

LOS Convention would give us access to seabed minerals worth $1 trillion in 4 sites alone

Professor John Norton Moore 2012. (Professor of Law, Univ of Virginia School of Law) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

This convention unequivocally protects United States navigational freedom, the movement of our commerce, the movement of our United States Navy. In addition to that, the United States ended up with the largest area of resource jurisdiction of any nation in the world. With the 200-mile economic zone and the extended continental shelf, it more than doubles the entire land mass of the United States of America in the extension of resource jurisdiction – more than any other nation in the world. In addition to that, there are critically important resources and strategic minerals in the deep ocean. One of the absolute bottom-line needs of the United States that we told others is we had to have assured access to those copper, nickel, cobalt and manganese and rare earth in those nodules in the deep ocean floor. We won a mechanism to give us private property rights in four sites that were the best in the world, that reflected the work that Lockheed and many others had done, the United States spending more than any other country in the world in its industry developing those sites. We believe today that just looking at the aggregate value of the mineral resources in those sites that are very much at risk in this question of moving forward on advice and consent, it’s about a trillion dollars.

DISAD RESPONSES

No restrictions on ability to collect intelligence nor on military operations

Leon Panetta 2012. (Secretary of Defense) Keynote Address, 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

There are some who claim that accession to the convention will restrict our military’s operations and activities or limit our ability to collect intelligence on territorial seas. And again, quite simply, they are very wrong. The convention in no way – in no way harms our intelligence collection activities or constrains our military operations, nor will our military activities be subject to review or scrutiny by any international court or tribunal. On the contrary, U.S. accession to the convention preserves our freedom of navigation and over flight rights as bedrock treaty law, the firmest possible legal foundation for those activities.

“Hurts US military” – Response: Navy leaders support LOS.

Professor John Norton Moore 2012. (Professor of Law, Univ of Virginia School of Law) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

The second argument you hear sometimes is that somehow, this will interfere with our military or our naval interests, security interests of the United States. Again, nothing could be further from the truth. I’m happy to say that for the most part, the opponents have largely dropped these arguments after it’s become absolutely embarrassingly clear to them that every single one of the chiefs have always supported it, that all of the (SEACs ?) supported it, that all of the chiefs of naval operations have supported it, that every commander in chief of the United States have supported it of both political parties, and this is one that’s absolutely a no-brainer. The Navy was the strongest group that worked with me on a day-to-day basis at winning everything we needed in this negotiation on the security side.

“Lose sovereignty” – Response: Law of the Sea improves protection of US sovereign rights

Admiral Robert Papp 2012. (Commandant of the US Coast Guard) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

We live in a maritime world. We rely up on the sea for commerce. Ninety percent of our trade for this country comes by sea. The convention is the international legal framework on the usage of the oceans. We face a dynamic strategic environment, and preserving the freedom of navigation on the sea and protecting U.S. maritime sovereignty remains key to our U.S. interests. Joining the convention will lock in vital navigation rights that ensure the mobility of Coast Guard cutters, Navy warships and other U.S. vessels and aircraft, and will protect America’s sovereign rights over offshore resources that the Coast Guard is charged with protecting on behalf of the American people.

“Hurts sovereignty” – Response: LOS improves US sovereignty

Prof. John Nagl 2012. (PhD; professor at the US Naval Academy; Non-Resident senior fellow and former president, Center for a New American Security) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

While ratifying the Law of the Sea won’t address every challenge the U.S. will confront at sea, it will substantially improve our ability to protect our global interests by providing a stronger legal foundation for our maritime activities and by helping to shape and enforce international norms and legal authorities. Perhaps just as importantly, ratifying the treaty will protect and enhance U.S. sovereignty by allowing the United States to make sovereign claims to the natural resources that lie in the seabed on the extended continental shelf.

“Hurts US sovereignty” – Response: Completely false. Actually, it’s a massive increase in US sovereignty

Professor John Norton Moore 2012. (Professor of Law, Univ of Virginia School of Law) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

And one argument that you hear over and over is somehow the United States is losing its sovereignty. Nothing could be further from the truth. This is 180 degrees off. The United States has not a single article in this convention that is removing an ounce of sovereignty of the United States. And we’ve already seen that what it’s really doing is massively increasing the area of sovereign rights of the United States in resources in an area larger than the Louisiana Purchase and the acquisition of Alaska combined. This is a staggering increase.

“Puts taxes on US businesses” – Response: It charges royalties on new wealth that will be discovered, in exchange for property rights to that wealth.

Andrew Langer 2012. (BA in International Relations; Masters in Public Admin from Troy State Univ; President of the Institute for Liberty. Note: Langer and his organization formerly opposed Law of the Sea, but changed their position in late 2012 after more research) 28 Nov 2012 The Case for Ratification of the Law of the Sea Treaty <http://www.realclearpolitics.com/articles/2012/11/28/the_case_for_ratification_of_the_law_of_the_sea_treaty_116272-full.html>

**Myth:** Ratifying the treaty will create a tax on US businesses.  
**Fact:** Wrong. The treaty creates U.S. property rights for vast mineral and oil wealth. The ISA simply grants permits to countries to mine and drill for resources thereby giving companies and countries title – something vital to the very foundation of property rights. One cannot hold a property right if one does not first have title. Once title is granted and resource development takes place, certain Reagan amendments go into effect. Ronald Reagan fought for certain mineral rights for the U.S. and he got them in the 1994 amendments to the treaty. That’s why Reagan’s former Chief of Staff, James Baker, supports ratifying the LOTS. Just as with any other resource development project, there is a royalty schedule: no royalty payments of any kind for the first five years of resource development and after five years the royalties cap at 7%.

“International revenue sharing is bad” – Response: It’s only 2.3%, for resources we wouldn’t have at all if we didn’t join the treaty – a fantastic bargain

Professor John Norton Moore 2012. (Professor of Law, Univ of Virginia School of Law) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

Now finally, let me just add very briefly, one of the newer arguments is a concern about revenue sharing on the extended continental shelf, that is, revenue sharing that over the life of a 12-year well would be about an average of about 2.3 percent of the value of production at that site from the well. Now, why did we agree to that? We agreed to that because this was an unbelievable bargain. The United States was able to get the entire extended continental shelf of the United States going out over 600 miles off Alaska into the Arctic, for example, and what’s the price we paid for that? 2.3 percent of the minerals? I suggest to you that’s a little bit better deal than the acquisition of Alaska. And I personally feel very proud that I was able to do that for the United States in this negotiation. The arguments against it would simply mean that the United States industry will not go out, as they told you earlier today, to develop the extended continental shelf. If they won’t develop the extended continental shelf, we won’t get the tax revenues, we won’t get the development. In essence, the arguments here are that we ought to forget about the 98 percent of the value of all those resources because of the 2.3 percent revenue sharing that we would be paying to get international recognition.

“International revenue sharing bad” – Response: US has a veto on where the money is spent

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And by the way, it gets better than that, because it isn’t just our paying the 2.3 percent; the Russians are going to pay the 2.3 percent and the Canadians are going to pay the 2.3 percent and everybody else that has an extended continental margin. And we, ladies and gentleman, are the only country in the world that has a permanent veto over where those funds get distributed to other countries in the world. If you’d like, you can think about it as an extension of the United States AID budget. So I think it’s a pretty good deal all around in relation to where we’re going.

“Redistribution of wealth” – Response: US would have an absolute veto on any distributions

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Right now, Russia, China and 161 other countries are eligible to exploit global resources, enrich their nations, fill the ISA [International Seabed Authority] coffers with royalties, and then direct ISA expenditures around the world. Once the U.S. ratifies the treaty, we would be granted 100% veto power as to how all ISA resources from all countries are allocated. That is why Condoleezza Rice endorses the treaty – the U.S. pays up to 7% for just our country, but we get veto power over 100% of the ISA coffers for every royalty from every country. That means zero global mineral and oil wealth payments from anywhere in the world going to rouge states. The only way the U.S. can accomplish this is by ratifying the Law of the Sea Treaty and taking our seat at the ISA.

“Strengthens our enemies” – Response: US absence from Law of the Sea is what strengthens our enemies. If we join, we can weaken them

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**Myth:** Ratifying the treaty will give aid and comfort to U.S. enemies.  
 F**act:** The opposite is true. Ratifying LOTS and joining the ISA will strengthen national security. By NOT ratifying the treaty, Russia, China and other U.S. adversaries are in control of the ISA and they control where ISA funds flow. Conversely, if the U.S. ratifies LOTS, then the U.S. will have 100%, unilateral veto power over all ISA funding and can prevent resources from flowing to America’s enemies. That is why every single Republican Secretary of State dating back to the treaty’s inception supports ratification – from Henry Kissinger forward.

“Big UN bureaucracy” – Response: LOS Treaty creates no new bureaucracy

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**Myth:** Ratifying the Law of the Sea Treaty will create a United Nations bureaucracy.  
**Fact:** Not true. Ratifying the LOTS creates nothing. Ratifying the treaty will give the United States a seat on the already-formed International Seabed Authority. The International Seabed Authority has existed for over 20 years. The ISA is the international authority that grants exploration and mining and drilling permits to all nations. The ISA also creates clear, legally binding, protocols for ships while navigating foreign waters. This is long established, current international law.

“UN is bad” – Response: It isn’t about the UN, it’s about US foreign policy

Heather Conley 2012. (Senior Fellow and Director, Europe Program, Center for Strategic and International Studies) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

Now throughout this presentation, I have not uttered once the words “United Nations.” And while I fully respect the diversity of views in this country about the United Nations, this really isn’t about the U.N. It is about us. It is about how the United States wishes to lead in the 21st century, be that in the Arctic, in the South China Sea or anywhere where our maritime interests are at stake. For the past 30 years, we have been able to maintain our leadership without ratifying the Law of the Sea Treaty. We’ve accepted it as customary international law. We have continued to 24negotiate the treaty’s terms in our favor, as Deputy Secretary Negroponte said. But we’ve been able to stand back. This is no longer the case. The status quo is no longer sufficient. Other states are using the law of the sea to their full advantage. And by our continued inaction, we are losing strategic advantage in the Arctic.

All of Pres. Reagan’s objections to the treaty were renegotiated and resolved

Professor John Norton Moore 2012. (Professor of Law, Univ of Virginia School of Law) 9 May 2012 Pew Charitable Trusts and Atlantic Council Forum on Law of the Sea <http://ratifythetreatynow.org/sites/default/files/pdf/May%209-Transcript-Highlights.pdf>

So the United States has done extremely well. Other countries in the world that participated in the negotiation with me – they’ll come up to me and say, what in the world is going on? You won more than any other nation in the world. Absolutely, unequivocally, everything the United States wanted, you got, including the renegotiation of all of Ronald Reagan’s conditions. What’s going on? Why are you not moving forward?

“Environmentalist Agenda” – Response: Anti-environmentalists love Law of the Sea

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**Myth:** This treaty is an environmentalist ploy.  
**Fact:** False. This treaty is backed by the US military; by the mining, oil and gas industries; by manufacturers; by the defense industry; and, by every living Republican Secretary of State and by every Republican president – essentially, this treaty is backed by everyone the environmentalist community loathes, sues and pickets. The supporters of this treaty are amongst the most vocal critics of so-called “global warming” and have fought the Kyoto Protocol tooth and nail. This treaty is about trillions of dollars of US wealth creation, hundreds of thousands of American jobs, and about the national security benefits that arise from the 100% veto power the U.S. gains over all other nations via ratification.

2A EVIDENCE: NAVY SONAR

BACKGROUND / HISTORY

Navy won a Supreme Court case that lifted injunctions requiring them to follow sonar safety restrictions

California Coastal Commission 2013. (California state regulatory agency) Staff Report:Regular Calendar, Feb 2013 Project Description: California portion of Hawaii-Southern California Training and Testing Program –Continuation of and modifications to Navy training and testing activities <http://documents.coastal.ca.gov/reports/2013/3/F9a-3-2013.pdf>

As noted above, litigation arose over the first of the above-described projects, with the Commission challenging the Navy under the CZMA, and environmental groups led by the Natural Resources Defense Council (“NRDC”) challenging the Navy under the Marine Mammal Protection Act (MMPA), the CZMA, the National Environmental Policy Act (NEPA), and the Endangered Species Act (ESA). Over a seven-month period from mid-2007 to early 2008, the Federal District Court and Ninth Circuit Court of Appeals considered more than half-a-dozen orders, mostly related to NRDC’s motion for a preliminary injunction. At the end of that period, the result of these lower court actions was the issuance of a preliminary injunction requiring that the Navy comply with a set of mitigation measures, consisting of: (1) imposing a 12-mile “exclusion zone” from the coastline; (2) using lookouts to conduct additional monitoring for marine mammals; (3) restricting the use of “helicopter-dipping” sonar; (4) limiting the use of mid-frequency active (MFA) sonar in geographic “choke points”; (5) shutting down MFA sonar when a marine mammal is spotted within 2,200 yards of a vessel; and (6) powering down MFA sonar by 6 decibels (dB) during significant surface ducting conditions. Within days following the district court’s issuance of its revised injunction, the Navy: (1) sought (and received) an exemption from the President under the CZMA2; and (2) sought (and received) an emergency authorization from the Council on Environmental Quality (“CEQ”) for “alternative NEPA arrangements”. The Navy moved to vacate the district court’s preliminary injunction in light of these actions, but on February 4, 2008, the district court refused to do so, and the Court of Appeals affirmed, finding, among other things, that the plaintiffs were likely to succeed on the merits of their claims, but focusing solely on the NEPA claims. In Winter v. Natural Res. Def. Council, Inc., 129 S. Ct. 365 (2008), the U.S. Supreme Court reversed the lower court rulings and vacated the preliminary injunction. The Supreme Court’s ruling did not address the merits of the NEPA claims but only addressed the standard for issuance of a preliminary injunction, the application of that standard to the facts of this case, and the appropriate remedy under NEPA. The ruling did not address CZMA grounds.

INHERENCY

Navy does not agree to sonar restrictions and does not agree that there’s a problem with marine mammals

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In light of these concerns, during its previous two reviews of Navy SOCAL offshore testing and training, the Commission adopted conditions intended to increase protection for marine mammals, seeking, among other things, larger preclusion areas, avoidance of biologically sensitive areas, and lowering of maximum sound levels under low-visibility conditions. As noted above (page 12), the Navy historically has not agreed to a number of the Commission’s conditions and has maintained that its mitigation and monitoring measures are adequate to protect marine mammals (and other species). The Navy’s position has been that the lack of documented population-level effects, combined with its monitoring results (reported annually), which have not documented significant adverse marine mammal reactions to its activities, support its conclusion that its activities are consistent with Section 30230 of the Coastal Act. The Commission and the Navy have also historically disagreed over the number of marine mammal species that can be considered coastal zone resources. The Navy has historically agreed to past Commission’s requestsfor additional surveillance, passive and aerial monitoring, stranding reporting, and retrieval of inert mine shapes (where feasible).

HARMS

“Animals move away from the sound” – Response: Yes, that’s part of the problem.

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If animals are moving away from the source while engaged in biologically significant behaviors such as feeding or mating, then those reactions would in and of themselves be considered overt adverse reactions caused by the sonar. Therefore, the Commission is even more convinced than it was five years ago by the currently available data that that additional avoidance, monitoring, and mitigation measures are necessary to enable it to find the proposed increased training and testing measures consistent with the requirements of Section 30230.

Navy sonar kills whales

Alicia Schaffner 2008. (JD candidate, Roger Williams Univ. School of Law) National Security vs. Whales: The Navy and the Natural Resources Defense Counsel Battle Their Way to the Supreme Court , Dec 2008, Sea Grant Law and Policy Journal, Vol. 1, No. 2 <http://nsglc.olemiss.edu/SGLPJ/Vol1No2/Schaffner.pdf>

In March 2000, seventeen cetaceans stranded over the course of two days in the Bahamas’ Northeast and Northwest Providence Channels. The multi-species mass stranding included Blainville’s beaked whales, Cuvier’s beaked whales, and Minke whales. Ten of these whales survived and returned to the ocean, but the other seven did not. Necropsies revealed that the cetaceans had sustained acoustic or impulse trauma evidenced by the presence of hemorrhaging in the brain and auditory system. The Navy was conducting sonar tests nearby around the time of the stranding and its reports indicate that the stranding was caused by mid-frequency sonar. Since the stranding, the original population of beaked whales in this area has disappeared. They may have been killed or permanently displaced because of the sonar testing.

Numerous historical examples of marine mammals harmed by sonar

Alicia Schaffner 2008. (JD candidate, Roger Williams Univ. School of Law) National Security vs. Whales: The Navy and the Natural Resources Defense Counsel Battle Their Way to the Supreme Court , Dec 2008, Sea Grant Law and Policy Journal, Vol. 1, No. 2 <http://nsglc.olemiss.edu/SGLPJ/Vol1No2/Schaffner.pdf>

Marine mammal strandings in the vicinity of underwater sonar testing were first documented in the 1960s. Since then, the problem seems to have worsened and several mass strandings have coincided with sonar activities. In addition to the 2000 Bahamian stranding, a mass stranding of approximately 200 melon-headed whales in July 2004 in the Hawaiian Islands was linked to the naval exercise RIMPAC ‘04. That month, researchers also discovered a large concentration of whale strandings near Yokosuka, a major U.S. Navy base off the Pacific coast of Japan. In January 2005, in the Outer Banks of North Carolina, thirty-four pilot whales, two pygmy sperm whales, and one minke whale beached themselves. This stranding correlated with a Navy sonar exercise. These exercises were completed in order to ensure that military strike groups were adequately prepared to deploy and work proficiently at sea to aid in the fight on terrorism. Post-mortem tissue scans showed hemorrhaging in the pygmy sperm whale and pilot whale that was consistent with other stranding events.

Noise kills marine mammals

California Coastal Commission 2013. (California state regulatory agency) Staff Report:Regular Calendar, Feb 2013 Project Description: California portion of Hawaii-Southern California Training and Testing Program –Continuation of and modifications to Navy training and testing activities <http://documents.coastal.ca.gov/reports/2013/3/F9a-3-2013.pdf>

The Commission has been consistent for almost two decades in expressing concerns over the effects of anthropogenic sounds on the marine environment, particularly on marine mammals. As noted in its December 13, 2005, comments to the Marine Mammal Commission’s Advisory Committee on Acoustic Impacts on Marine Mammals, the Commission stated:  
  
Anthropogenic noise is a recognized, but largely unregulated, form of ocean pollution that can deafen, disturb, injure, and kill marine life. Many species of marine mammals are known to be highly sensitive to sound and rely upon sound to navigate, find food, locate mates, avoid predators, and communicate with one another. A combination of noise sources, including shipping, oil and gas exploration and production, dredging, construction, and military activities, has resulted in dramatic increases in noise levels throughout the oceans. Over the last ten years, a growing body of evidence has shown that some forms of ocean noise can kill, injure, and deafen whales and other marine mammals. In particular, a sequence of marine mammal strandings and mortalities has been linked to exposure to mid-frequency sonar. There is also evidence that some affected animals do not strand but die at sea. This has increased public concern about the effects of anthropogenic noise on marine mammals, which has been acknowledged in a variety of domestic and international fora.

Whales beaching, caused by sonar

Hilary Maybaum 2009. (B.A. degree in Biology and Marine Science from Boston University, and an M.S. degree in Oceanography from the University of Hawaii; masters thesis on the effects of sonar on humpback whales) <http://www.iescience.com/blog/2009/12/sonar-and-strandings/>

In 2005, a group of scientists studied a mass stranding of beaked whales off the Canary Islands and found lesions apparently induced by mid-frequency sonar sounds. Previously, other scientists had suggested a link between mass stranding of beaked whales and mid-frequency sonar, but were unable to establish a causal relationship. This particular stranding event of 14 whales occurred about four hours after the onset of an international naval sonar exercise conducted between the coast of Fuerteventura Island and 40 km offshore.

Past studies underestimated the damage: We know now that marine mammals are more sensitive to sound than previously thought

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The numbers of “harassments” shown in all the above tables are significantly larger than those included in previous Navy SOCAL consistency determinations, for several reasons. The primary reason is because both the Navy and NMFS have refined the threshold levels they are using in their analyses in light of research results and studies published since the Commission’s last (2008) review. Overall, the current level of scientific understanding suggests that marine mammals are more sensitive to lower sound levels than previously thought. In addition, the numbers increase because the Navy has proposed increases in several activities that it estimates would result in harassments. For example, mid-frequency sonar hours, and in particular, “MF1” Source Class, which includes the loudest of the mid-frequency sonars (e.g., AN/SQS-53 and AN/SQS-60), would increase significantly, as shown in the following table.

Additional species, beyond the 10 identified by the Navy, live in the affected coastal zone

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Further support for the Commission’s position that additional species – beyond the ten identified by the Navy – spend portions of their life cycle in the coastal zone is provided in Exhibits 6-7, which include the results from past NOAA oceanographic marine mammal surveys (and, for Cuvier’s beaked whales, the results of Navy tracking and academic research). These surveys document the fact that virtually all of the marine mammal species identified by the Navy as present in the SOCAL area are also present within the coastal zone at some point in their life cycle, and certainly at least “occasionally.” Regarding the length of time a species must be present within the coastal zone to be considered a coastal resource, the Commission is in agreement that occasional observed or recorded presence is sufficient to establish this standard. Due to the significant challenges associated with wildlife observation in the marine environment (i.e. the cost of surveys, the short period of time most species are observable at the surface, the large areas, variable climactic and weather conditions, etc.) marine mammal surveyors typically assume that the number of animals successfully observed represent a small fraction of the actual number that are likely present. As such, the Commission considers even infrequent and seemingly rare sightings of particular marine wildlife species within the coastal zone as verification of that species’ status as a coastal resource.

Navy claims of no impact from military sonar are wrong

California Coastal Commission 2013. (California state regulatory agency) Staff Report:Regular Calendar, Feb 2013 Project Description: California portion of Hawaii-Southern California Training and Testing Program –Continuation of and modifications to Navy training and testing activities <http://documents.coastal.ca.gov/reports/2013/3/F9a-3-2013.pdf>

Despite these modeled numbers, and the large number of “takes” requested in the Navy’s application to the National Marine Fisheries Service (NMFS), the Navy concludes that the activities would not result in population-level effects to any species, and would be consistent with Coastal Act Section 30230. The Commission staff does not believe that the Navy’s conclusions are supported by the evidence. A recent beaked whale study calls into the question the Navy’s conclusion with respect to beaked whales in southern California, and in any event, for all the affected marine mammals, it is simply impossible to establish whether population level effects have been occurring, or would occur with the proposed increased training and testing levels, in part due to the fact that the Navy has been using this technology in this area consistently for the past 40 years. The Navy’s conclusion, based on its monitoring, of a “lack of observable effects” is also called into question by recent studies designed to more comprehensively measure marine mammal reactions to military sonar and military-like sonar sounds, conducted in areas where the Navy trains such as SOCAL and the Bahamas. To date the studies have documented marine mammal reactions at sound levels far below the exposures the louder sources would generate. Also, if, as the Navy assumes in its modeling estimates, animals are moving away from the source, such movements would themselves be obvious effects, and significant, if they occurred while the animals were engaged in biologically significant behaviors such as feeding or mating.

SOLVENCY

Navy has been given a map of Beaked Whale hot spots

John Pickrell 2004. (journalist) NATIONAL GEOGRAPHIC NEWS, 31 Mar 2004 “U.S. Navy Sonar May Harm Killer Whales, Expert Says” <http://news.nationalgeographic.com/news/2004/03/0331_040331_whalesincrisis_2.html>

Roger Gentry, an expert on marine mammal acoustics at the U.S. National Oceanic and Atmospheric Administration in Silver Spring, Maryland, said researchers were unable to confirm whether the damage was sustained when the beaked whales came ashore, or whether it was caused by the sonar itself. But scientists did confirm that the strandings were likely to be linked to the sonar, Gentry said. Gentry and others have provided the U.S. Navy with a map of beaked whale global hot spots to help mitigate further beaching incidents.

Zoning marine hot spots protects against noise stress – better than the alternatives

Dr. L.S. Weilgart 2006. (PhD in whale acoustic communication; research associate with Department of Biology, Dalhousie University, Halifax, Nova Scotia) Managing Noise through Marine Protected Areas around Global Hot Spots <http://whitelab.biology.dal.ca/lw/publications/2.%20Weilgart%202006.%20Managing%20noise%20PAs..pdf>

The tools are becoming increasingly available to identify “hot spots” for cetaceans as well as other species, and to map the oceanic features necessary to establish a global network of MPAs. Zoning, including buffer zones, can be useful in designing MPAs to protect against stressors such as noise. Alternatives to MPAs such as diverting shipping lanes and area/time closures for noise sources and other threats can provide protection for cetaceans while avoiding the more cumbersome process of establishing MPAs. However, these are probably best used as interim measures, as they may not carry the same legislative weight as MPAs and their protection may not be far-ranging enough to safeguard the ecosystem.

New evidence since 2008 shows the need for additional safety measures

California Coastal Commission 2013. (California state regulatory agency) Staff Report:Regular Calendar, Feb 2013 Project Description: California portion of Hawaii-Southern California Training and Testing Program –Continuation of and modifications to Navy training and testing activities <http://documents.coastal.ca.gov/reports/2013/3/F9a-3-2013.pdf>

Thus, even more compelling evidence is available now than it was in 2008 to establish the need for additional avoidance, monitoring, and mitigation measures, in order find the proposed increased training and testing activities consistent with the requirements of Section 30230. Regardless of whether population-level effects are occurring (or would occur from the proposed increases), the Coastal Act’s marine resource protection policy (Section 30230) also requires enhancement (and where feasible restoration) of the overall marine environment, as well as special protection for areas and species of special biological or economic significance. In the past these requirements have led the Commission to determine that they necessitate the avoidance of the use of very loud active acoustic sources in biologically important and sensitive areas, in particular areas of high, or seasonally high, concentrations of marine mammals. The staff is recommending that the Commission find that, for the activities to be consistent with Section 30230, conditions are needed to: (1) establish larger shutdown areas (up to 2 km) when marine mammals or other species are detected; (2) avoid use of mid-frequency sonar in sensitive areas, which would include Marine Protected Areas and Marine Sanctuaries, seasonal blue and gray whale areas and migration corridors, near-shore areas, and any biologically sensitive area NMFS may designate at a future date; (3) reduce sound under low-visibility conditions; (4) limit typical vessel speeds in sensitive areas to 10 knots (unless higher speeds are necessary for training); (5) improve observer effectiveness training; and (6) implement a contingency plan for use of near-shore explosives, in the event further mortalities (than the March 2011 incident discussed herein) occur. If the Navy were to agree to these conditions, the staff believes the Commission could find the activities consistent with Section 30230.

2A EVIDENCE: OFFSHORE OIL BAN

INHERENCY

Drillers are busy again in the Gulf of Mexico

Kiley Kroh and Michael Conathan 2012. (Kroh - Associate Director for Ocean Communications at Center for American Progress. Conathan - Director of Ocean Policy at Center for American Progress; former staff member for the Senate Committee on Commerce, Science, and Transportation’s Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard; master’s degree in marine affairs from the Univ of Rhode Island) 19 Apr 2012 “The Lasting Impact of Deepwater Horizon” <http://www.americanprogress.org/issues/green/news/2012/04/19/11409/the-lasting-impact-of-deepwater-horizon/>

The regional oil and gas industry hasn’t skipped a beat despite claims from Big Oil and drilling advocates in Congress that the moratorium on deepwater drilling imposed in the wake of the spill devastated the Gulf economy. The New Orleans Times-Picayune found that oil-fueled economies in the Houma area are humming along just fine. And according to a recent Reuters analysis, Gulf drillers will be busier this year than at any point since the spill, adding eight new deepwater rigs and bringing the total count to 29, just shy of pre-spill levels.

Deep water drilling is inherently dangerous

Dr. Joel Wood 2012. (Senior Research Economist with the Centre for Environmental Studies at the Fraser Institute.; Ph.D. in economics from the University of Guelph, Canada ) “Lifting the Moratorium “ Oct 2012 <http://www.fraserinstitute.org/uploadedfiles/fraser-ca/Content/research-news/research/publications/lifting-the-moratorium-offshore-oil-drilling-in-BC.pdf>

Water depth is a significant issue. Muehlenbachs et al., (2011) analyze the relationship between incident reports from offshore drilling and water depth. Their results suggest that between 1996 and 2010, the probability of incidents (such as blowouts, fires, injuries, and pollution) occurring in the US Gulf of Mexico increases with water depth (Muehlenbachs et al., 2011). Drilling in the Queen Charlotte Basin would be at water depths of 200 to 400 meters (Strong et al., 2002). According to the results of Muehlenbachs et al., (2011) in the US Gulf of Mexico these water depths have annual prob­abilities of a reported incident of around 10% to around 30%. In comparison, the Deepwater Horizon rig was drilling in significantly deeper water (around 1,500 meters). The Muehlenbachs et al., (2011) results suggest that drilling at this greater depth comes with a 70% annual probability of a reported incident.

Congress enacted no new legislation in response to the BP spill

Kiley Kroh and Michael Conathan 2012. (Kroh - Associate Director for Ocean Communications at Center for American Progress. Conathan - Director of Ocean Policy at Center for American Progress; former staff member for the Senate Committee on Commerce, Science, and Transportation’s Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard; master’s degree in marine affairs from the Univ of Rhode Island) 19 Apr 2012 “The Lasting Impact of Deepwater Horizon” <http://www.americanprogress.org/issues/green/news/2012/04/19/11409/the-lasting-impact-of-deepwater-horizon/>

Two years ago the United States spent 89 days battling the single-biggest offshore oil spill in our nation’s history. But Congress hasn’t enacted a single piece of legislation in response. Ample proposals were put forward to restore the Gulf, reinforce offshore drilling safety standards, and raise the liability limit for oil companies in violation of drilling safety rules, which is currently at an outrageously low $75 million.

Obama Administration policy says offshore drilling is safe

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

Just a few months after the worst offshore oil spill in world history was finally plugged, the Obama administration lifted its short-lived offshore drilling moratorium that was imposed during the spill. It did this on the premise that permits would be issued only if offshore drilling could be done safely. So by granting the first new permit, the Administration signaled that new practices had made this previously disaster-prone industry safe.

Oil industry prioritizes profits over safety: millions spent on lobbying but not on safety

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

The choice of expenditures by the offshore oil and gas industry is also telling: millions are spent on lobbying for increased access, while little to no improvements have been made since the Deepwater Horizon to spill cleanup and response technologies that date back decades.64 All of these pieces of evidence lead to one conclusion: the offshore oil and gas industry has not changed its safety culture, continuing to prioritize profits over safety, and consequently offshore drilling remains a risky practice.

New rules would not have prevented Deepwater Horizon spill and do not protect against future ones

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

Looking carefully at what went wrong on the Deepwater Horizon allows an assessment of the efficacy of the new safety rules. Would the new rules prevent the same errors from being made, or the same technological failures from occurring? What about errors that may not have occurred in the case of the 2010 spill, but could be the cause of the next spill? While it’s impossible to anticipate other things that may go wrong, our analysis shows that while the new rules may increase safety to some degree, they likely would not have prevented the last major oil spill, and similarly do not adequately protect against future ones.

5 reasons offshore drilling safety regulations fail

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

A major limitation with the new safety measures is the fact that there are systemic underlying problems in the regulation of offshore drilling that undermine the effectiveness of the new measures. Consider these findings: **BOEMRE Can Grant “Departures”, or Exemptions, from Regulations.** Departures have been granted generously in the past. In the case of the Deepwater Horizon, MMS granted BP 12 departures, including one that dealt with the placement of a cement plug and may have contributed to the blowout. As long as departures can override safety requirements, the new measures can be rendered useless. **Economic Incentives Make Violating Rules Lucrative Because Penalties are Ridiculously Small.** The financial imbalance between civil penalties and operating costs often leads to rule-breaking, corner-cutting, and cost-cutting measures being taken. While operating costs for offshore rigs can be roughly $1,000,000 per day, fines for violations are capped at $40,000 per violation per day and most violations do not even incur fines. Given this situation, it is easy to see why violations are so frequent. Many rules were broken and actions taken to cut costs and save time on the rig before the BP oil spill, which highlights the incentives that exist for rule-breaking. As long as rule-breaking pays, new rules cannot protect us from a spill. **Blowout Preventers Continue to Have Critical Deficiencies.** A third party investigation commissioned by the Department of the Interior found that the Deepwater Horizon’s blind shear rams designed to cut through and block the pipe in the case of a blowout were unable to do so because the pipe buckled when the well blew out. Since the blowout preventer on the Deepwater Horizon is a standard design, a similar problem could occur on any well in a blowout scenario. The new safety requirements do not address this deficiency, leaving the failure of blowout preventers as a possible outcome in the case of future blowouts. **Oversight and Inspection Levels are Paltry Relative to the Scale of Drilling Operations.** Ensuring the efficacy of many of the new rules would require much more oversight than currently exists. While BOEMRE has attempted to strengthen its inspection and oversight capabilities, funding levels remain far below what would be needed to, in the BOEMRE director’s own words, “do the job the public deserves.”1 Consequently, inspection rates remain anemic, undermining regulatory compliance by reducing the odds that violations will be observed. Anemic inspection rates also limit real-time monitoring of operations by inspectors, a crucial need to avert disasters as problems are difficult to foresee even a few days before they occur, as illustrated on the Deepwater Horizon. **Industry’s Safety Culture Has Not Changed Sufficiently.** The National Commission called for “sweeping reforms” and a “fundamental transformation” in the industry’s safety culture.2 Unfortunately, the industry has failed to make such a transformation, and instead remains on a similar course to the one it was on prior to the spill. A look at the many flaws in the well containment systems the industry frequently touts, and the industry’s continued lobbying for expedited permitting and limited safety measures demonstrates this point.

BOEMRE [ Bureau of Offshore Energy Management, Regulation and Enforcement ] approves drilling even when oil companies make impossible cleanup capability claims

Impact: Negates the ability to reduce drilling risks

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

To give just one example, many oil companies have claimed their capacity to mechanically recover oil from water via skimming exceeds 100,000 barrels per day. A particularly egregious case, BOEMRE approved a plan by Shell wherein Shell claimed its recovery rate via mechanical skimming would be 606,000 barrels per day. Contrary to these claims, oil companies cannot recover 100,000, let alone 600,000, barrels of oil per day from Gulf waters via skimming. During the Deepwater Horizon spill, when every available skimming vessel, including retrofitted fishing boats, was utilized, the National Oceanic and Atmospheric Administration estimates that a paltry 1,800 barrels of oil per day was recovered via skimming, or 300 times less than Shell’s claimed capability. No technological breakthroughs have occurred since the Deepwater Horizon that would suggest skimming capabilities are any different today. Even so, BOEMRE accepted Shell’s application, and many others like it, that contained this egregious claim, betraying the intent of recent NTLs and ultimately negating their potential to alleviate the risks associated with offshore drilling.

“Notices to Lessees” (NTLs) – Not effective

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

New Notices to Lessees (“NTLs”) Have Been Ineffective As part of its reaction to the BP spill, BOEMRE issued two Notices to Lessees, or “NTLs”, which merely clarify or reinforce existing regulations. The two NTLs clarify the new information that Exploration Plans must include to help BOEMRE evaluate drilling risks. For example, companies must report their assessments of what a worst case spill would look like, how long spill response would take, how much oil could be cleaned up in the event of a spill, and the like. However, BOEMRE has failed to use this information to guard against spills and improve offshore safety because of two problems. No quantitative standards by which to gauge the newly required information have been established, so applications are approved based on their completeness rather than their potential environmental impact. BOEMRE has continued MMS's practice of rubberstamping plans and permits, approving those that contain patently inaccurate information and extreme exaggerations. Despite these problems, based on the number and speed of approvals, it appears that BOEMRE has no intention of denying drilling permits, no matter how egregious.

Training & Maintenance Regulations – won’t improve safety

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

Training and Maintenance Regulations Won’t Substantially Improve Safety. BOEMRE’s inspection capabilities are not sufficient to guarantee operators adhere to training requirements and that maintenance is conducted as required. Perverse financial incentives also can undermine training and maintenance programs. Blowout preventer maintenance requirements won’t address the underlying deficiencies in their functionality.

Testing Requirements – unlikely to prevent major spills

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

Testing Requirements Are Unlikely to Prevent Major Spills. The efficacy of testing requirements is undermined by the systemic problems described above such as perverse economic incentives to skip or ignore tests to save time, deficiencies in blowout preventers, and BOEMRE’s woefully inadequate inspection program. In addition, testing methods often do not mimic the real world conditions that would exist during a spill, particularly for blowout preventers. There is also no requirement to ensure that blind shear rams can shear tool joints, and they generally can not.

Well Design and Equipment Rules – won’t work

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

Well Design and Equipment Rules Are Too Weak to Prevent Accidents. The new regulations for well design and equipment, while promising, fall prey to the systemic problems described above. Notably, BOEMRE‟s oversight is not sufficient to ensure that the rules are being followed. Also, civil penalties are too low to deter rule-breaking. New well design and equipment rules are themselves flawed as well, which further undercuts their effectiveness.

“Safety Case” Plan – fails to prevent spills

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

**The Similar “Safety Case” Approach is Also Flawed.** The “safety case” approach used elsewhere in the world, including in the North Sea, is similar to SEMS. However, "safety case" does not prevent serious oil spills. One analysis showed a regular spill frequency of about one spill per week in the North Sea, in spite of the “safety case” approach being used, based on self reported data. The actual number of spills may be even higher. In addition, the recent large spill by Shell in the North Sea clearly demonstrates the fallibility of the “safety case” approach.

“Stop Work” Policies – not effective

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

**“Stop Work” Policies Don’t Work.** The use of a “Stop Work Authority,” which grants any employee the right to stop work if he or she perceives a danger, also will not greatly change spill risks because these policies already exist. On the Deepwater Horizon, each company (BP, Transocean, and Halliburton) had “stop work” policies in place, yet no employee invoked his or her authority to stop work despite many indications that there was a problem. This may be due to fear of reprisal, something that is difficult to address through regulations.

“ Flow Barriers” – not effective due to Operator Error

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

**Potential for Operator Error Remains –** If effective barriers to flow were correctly installed, these could in fact protect against blowouts. However, the requirements for two barriers to flow can easily be undermined by operator error. This problem is illustrated by the Deepwater Horizon disaster, where a cement job, a common barrier to flow, was compromised by numerous operator errors. With limited funds for inspection and oversight, and perverse economics that incentive project speed over safety, it is likely that not all barriers will be properly installed.

“SEMS” – won’t work, failed in the past

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

Safety and Environmental Management Systems (“SEMS”) are Unlikely to Alleviate Drilling Risks  
SEMS requires operators to proactively identify, analyze, and manage safety, environmental hazards, and impacts at all stages of offshore resource development. Like the Interim Drilling Safety Rule, the benefit of SEMS on offshore safety is undercut by overarching regulatory problems as well as by flaws in SEMS itself.  
BP Had Similar Policies in Place Prior to Spill. Many BP policies, such as its “Management of Change” process, that were in place on the Deepwater Horizon the day of the blowout mirrored aspects of SEMS, yet they did not prevent the spill. Rather, employees failed to follow the policies, and in some cases cut corners to lower costs without formally assessing risks, even though BP‟s policies required such an assessment. While these policies were implemented voluntarily, anemic inspection rates and paltry financial penalties for violations make it likely that offshore workers will similarly ignore SEMS requirements when profits are at stake.  
SEMS Has Failed to Protect Against Spills in the Past. SEMS is not a new concept and most operators have used it in the past. But in years when SEMS adoption was as high as 98%, large spills and other violations still occurred as frequently as in recent years.

Physically impossible to fully contain large ocean oil spills

Dr Jeffrey Short 2010. (Ph.D., Fisheries Biology, University of Alaska; retired after 31 years as research chemist at National Oceanic & Atmospheric Administration) 9 June 2010 Oral Testimony to the Energy & Environment Subcommittee, US House of Representatives Committee on Science, Space & Technology <http://oceana.org/en/our-work/stop-ocean-pollution/oil-pollution/learn-act/the-facts-dr-jeffrey-short>

Major spills always encourage people to think about better ways to clean them up. These ideas usually focus on better skimmers and oil collection devices at sea, better dispersants, and better biological treatments to degrade oil that impacts beaches and marshes. These ideas are welcome and should be encouraged through a more focused and sustained federal research enterprise. But as noted in a consensus statement of oil spill researchers convened in Baton Rouge a couple of weeks ago to evaluate dispersant use on the Deepwater Horizon blowout, once a spill exceeds a certain threshold, and we’re way past it with the Deepwater Horizon, it is simply not possible to fully contain it no matter what you do. The reason is not because we lack effective technologies for skimming, dispersing or degrading oil. It’s because we lack the ability to apply them at the scale required.

Even with new technologies, sea clean-up options can never get more than a small fraction of the spilled oil

Dr Jeffrey Short 2010. (Ph.D., Fisheries Biology, University of Alaska; retired after 31 years as research chemist at National Oceanic & Atmospheric Administration) 9 June 2010 written statement to the Energy & Environment Subcommittee, US House of Representatives Committee on Science, Space & Technology <http://oceana.org/en/our-work/stop-ocean-pollution/oil-pollution/learn-act/the-facts-dr-jeffrey-short>

Even when used in combination effectively, response options at sea usually cannot be applied to more than a small fraction of the oil discharged during a large-scale release. The reason has more to do with the difficulty of bringing the necessary resources for applying these mitigation methods at the scale required than with limitations inherent to the methods themselves. All three at-sea response options require mild weather conditions and daylight, which all but guarantees they will not be able to be applied to much of the oil. New response technologies that are brought forward generally face the same challenges of delivering them on the scale, duration and at the rate needed to make a material difference during a large-scale release, and are therefore less effective than it might seem. Hence, most of the oil from large scale releases either drifts out to the open ocean where it slowly weathers to form tarballs that eventually sink to the deep ocean seafloor, or else impacts shorelines, where additional measures may be brought to bear to mitigate impacts.

Containment impossible. It is physically impossible to fully contain a large oil spill or its impacts

Dr Jeffrey Short 2010. (Ph.D., Fisheries Biology, University of Alaska; retired after 31 years as research chemist at National Oceanic & Atmospheric Administration) 9 June 2010 written statement to the Energy & Environment Subcommittee, US House of Representatives Committee on Science, Space & Technology <http://oceana.org/en/our-work/stop-ocean-pollution/oil-pollution/learn-act/the-facts-dr-jeffrey-short> (brackets added)

The fundamental problem becomes one of keeping track of all the oil parcels moving ever farther away from each other in a big ocean, and having the resources to identify and deliver the right combination of response options in a timely manner before loosing track of the oil again. At some point this challenge becomes hopeless beyond some size threshold. It is for these and related reasons that a scientific panel recently convened to review dispersant use for the Deepwater Horizon blowout concluded that “No combination of response actions can fully contain oil or mitigate impacts from a spill the size and complexity of the DWH [Deepwater Horizon] incident” (Coastal Response Research Center 2010).

Hurricanes wreck oil platforms and spill oil into the Gulf of Mexico

Dr. Mary Annette Rose 2009. (Ed.D., assistant professor in the Department of Technology at Ball State University) The Environmental Impacts of Offshore Oil Drilling, THE TECHNOLOGY TEACHER, Feb 2009 (brackets added) <http://www2.tec.ilstu.edu/students/tec_304/Rose%20Oil%20Drilling.pdf>

Today, there are nearly 4,000 active platforms in the OCS [Outer Continental Shelf] (MMS, 2008a). MMS [Department of Interior’s Minerals Management Service] (2006) indicates that 115 platforms were destroyed and 600 offshore pipelines were damaged by Hurricanes Katrina and Rita in 2005. For these hurricanes, “124 spills were reported with a total volume of roughly 17,700 barrels of total petroleum products, of which about 13,200 barrels were crude oil and condensate from platforms, rigs, and pipelines, and 4,500 barrels were refined products from platforms and rigs” (Det Norske Veritas, 2007, p. 27). In 2008, 60 platforms were destroyed during Hurricanes Gustav and Ike (MMS, 2008b); data on oil spills and damage to pipelines has not yet been released.

HARMS

Oil spills kill marine birds and mammals

National Research Council of the National Academy of Sciences 2003. Oil in the Sea III: Inputs, Fates, and Effects, <http://www.nap.edu/openbook.php?record_id=10388&page=29>

Marine birds and mammals may be especially vulnerable to oil spills if their habitats or prey become contaminated. In addition to acute effects such as high mortality, chronic, low-level exposures to hydrocarbons may affect survival and reproductive performance of seabirds and some marine mammals. Sublethal effects of oil on seabirds include reduced reproductive success and physiological impairment, including increased vulnerability to stress (reviewed in Hunt, 1987; Fry and Addiego, 1987, 1988; Briggs et al., 1996). In contrast, in marine mammals, sublethal exposure to petroleum hydrocarbons has been shown to cause minimal damage to pinnipeds and cetaceans (e.g., Geraci, 1990; St. Aubin, 1990), although sea otters appear to be more sensitive (Geraci and Williams, 1990; Monson et al., 2000). Oil can also indirectly affect the survival or reproductive success of marine birds and mammals by affecting the distribution, abundance, or availability of prey.

Even low concentrations of oil kill fish

National Research Council of the National Academy of Sciences 2003. Oil in the Sea III: Inputs, Fates, and Effects, <http://www.nap.edu/openbook.php?record_id=10388&page=127> (brackets added)

Several studies have demonstrated the potential for oil residuals on beach sediments to have significant toxic effects on fish eggs and embryos. Heintz et al. (1999) reported embryo mortality of pink salmon with laboratory exposure to aqueous total PAH [Polycyclic Aromatic Hydrocarbons] concentrations as low as 1 ppb [part per billion] total PAH derived from artificially weathered Alaska North Slope crude oil. This is consistent with the field observations of Bue et al. (1996) of embryo mortality of pink salmon in streams traversing oiled beaches following the spill from the Exxon Valdez. Carls et al. (1999) exposed Pacific herring eggs for 16 days to weathered Alaska North Slope crude oil and observed that exposure to initial aqueous concentrations as low as 0.7 ppb PAH caused developmental malformations, genetic damage, mortality, decreased size at hatching, and impaired swimming. Concentrations as low as 0.4 ppb caused premature hatching and yolk-sac edema. Exposure to less weathered oil produced similar results but at higher exposure concentrations (9.1 ppb). Other investigators have observed developmental effects on fish and invertebrates exposed to low concentrations of petroleum hydrocarbons (Capuzzo et al., 1988).

Oil spills kill marine life

Dr. Mary Annette Rose 2009. (Ed.D., assistant professor in the Department of Technology at Ball State University) The Environmental Impacts of Offshore Oil Drilling, THE TECHNOLOGY TEACHER, Feb 2009 (brackets added) <http://www2.tec.ilstu.edu/students/tec_304/Rose%20Oil%20Drilling.pdf>

While natural seepages contribute more hydrocarbons to the marine environment by volume, the quick influx and concentration of oil during a spill makes them especially harmful to localized marine organisms and communities. Plants and animals that become coated in oil perish from mechanical smothering, birds die from hypothermia as their feathers lose their waterproofing, turtles die after ingesting oil-coated food, and animals become disoriented and exhibit other behavior changes after breathing volatile organic compounds. When emitted into the marine environment, oil, produced water, and drilling muds may adversely impact an entire population by disrupting its food chain and reproductive cycle. Marine estuaries are especially susceptible, as hydrocarbons and other toxins tend to persist in the sediments where eggs and young often begin life.

Oil spills threaten human health by direct contact with hazardous chemicals and eating contaminated fish

Dr. Mary Annette Rose 2009. (Ed.D., assistant professor in the Department of Technology at Ball State University) The Environmental Impacts of Offshore Oil Drilling, THE TECHNOLOGY TEACHER, Feb 2009 (brackets added) <http://www2.tec.ilstu.edu/students/tec_304/Rose%20Oil%20Drilling.pdf>

Workers, victims of oil spills, and rescue workers are exposed to a host of chemical hazards. When people come in dermal contact with drilling fluids, muds, and cuttings, they can experience dermatitis; as exposure increases, impacts can include hypokalemia, renal toxicity, and cardiovascular and neuromuscular effects (ATSDR, 2007). Exposure to volatile aromatic hydrocarbons (e.g., benzene) results in respiratory distress and unconsciousness. Long term exposure can cause anemia, leukemia, reproductive problems, and developmental disorders (ATSDR, 2007). Exposure to fine particulate matter, nitrogen oxides, sulphur, and dozens of hydrocarbons (e.g., PAH) emitted from diesel and gasoline engines, is linked to a variety of health impacts, including asthma attacks, cancer, endocrine disruption, and cardiopulmonary ailments. Because toxins bioaccumulate in fish, people who eat fish and shellfish from affected waters may experience nervous system effects, such as impairment of peripheral vision and seizure. Children and fetuses are especially vulnerable; exposure to toxins impairs physical and cognitive development.

Arctic offshore drilling could have catastrophic environmental and economic consequences

US Dept of the Interior 2013. REVIEW OF SHELL’S 2012 ALASKA OFFSHORE OIL AND GAS EXPLORATION PROGRAM, MARCH 8, 2013 <http://www.doi.gov/news/pressreleases/loader.cfm?csModule=security/getfile&pageid=348469>

As detailed in this report, the past drilling season offers lessons for Shell, other companies interested in offshore Arctic exploration, and government regulators. The stakes are high in the Arctic. The oil and gas resources in the Alaskan Arctic are potentially world class, and exploring for them requires years of planning and enormous up front capital expenditures. The risks are substantial and unique as well. As Shell’s experience last year makes clear, the waters off Alaska present myriad challenges and dangers during every phase of an offshore operation. A significant accident or spill in the remote and inhospitable Alaskan Arctic could have catastrophic consequences on fragile ecosystems and the people who depend on the ocean for subsistence.

BP Oil spill caused huge economic impact: Economic and health claims total $7-8 billion

Reuters news service 2013. (Jonathan Stempel, journalist) 1 Apr 2013 “Patrick Juneau, BP Spill Claims Administrator, Urges Dismissal Of Company's Lawsuit” Patrick Juneau, BP Spill Claims Administrator, Urges Dismissal Of Company's Lawsuit

BP had last month urged U.S. District Judge Carl Barbier in New Orleans to issue an emergency order to stop court-appointed administrator Patrick Juneau from paying out "absurd" amounts based on inflated or fictitious claims. The oil company originally expected the March 2012 class-action settlement to resolve economic and health claims by more than 100,000 individuals and businesses to cost $7.8 billion. But damages are not capped, and BP's estimate of the cost grew to $8.5 billion by year end. It said Juneau's methods give him too much leeway to boost payouts, potentially by billions of dollars, and make payments for damage that never took place. In Monday court filings, lawyers for Juneau said he deserves judicial immunity from being sued over his work, saying this immunity encourages "principled and fearless decision making" without the threat of interference from unhappy litigants.

Total financial impact of Deepwater Horizon spill = $42-$70 billion plus $13 billion in lost tax revenue

Kiley Kroh, Michael Conathan, Emma Huvos 2012. (Kroh - Associate Director for Ocean Communications at Center for American Progress. Conathan - Director of Ocean Policy at Center for American Progress; former staff member for the Senate Committee on Commerce, Science, and Transportation’s Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard; master’s degree in marine affairs from the Univ of Rhode Island.) Putting a Freeze on Arctic Ocean Drilling Feb 2012 <http://www.americanprogress.org/issues/2012/02/pdf/arcticreport.pdf>

Even with the resources and infrastructure in place at the time of the spill, plus the extraordinary mobilization of people and equipment to the region, the damage to the Gulf Coast was catastrophic. Nearly 5 million barrels of oil leaked from the Macondo well, contaminating 665 miles of coastline and necessitating the use of 1.8 million gallons of dispersant, 13.5 million feet of boom, and 411 in-situ burns to contain the spill. The final price tag will be astronomical. BP has said the total bill for the oil spill will be $42 billion, while some analysts have projected a worst-case scenario price tag in excess of $70 billion. The spill came at a cost to the unsuspecting American taxpayer, as well. The oil giant was able to cut its 2010 tax bill by almost $13 billion by writing off its losses due to the spill.

SOLVENCY / ADVOCACY

Stopping offshore drilling is the only way to avert disastrous oil spills

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

Ultimately, offshore drilling will always pose a grave threat to humans and the environment. Only by stopping offshore drilling entirely will we be able to avert disastrous spills and significant economic and environmental harm. Fortunately, the need for offshore drilling in the Gulf of Mexico can be entirely eliminated by 2020 according to a previous report by Oceana, entitled *Breaking the Habit*. In that report, we show how reasonable action in four oil-consuming sectors, namely electricity generation, heating, shipping, and light-duty vehicle transportation, can reduce the nation's oil consumption by 1,900,000 barrels of oil per day by 2020, or more than the projected production of oil from the Gulf of Mexico in that year.

DISADVANTAGE RESPONSES

New Outer Continental Shelf drilling would have insignificant impact on oil prices

Ellycia Harrould-Kolieb, Jacqueline Savitz, Dr. Jeffrey Short and Marianne Veach 2009. (Harrould-Kolieb - Master of Environment from the University of Melbourne, Australia. Savitz - master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Short - Ph.D., Fisheries Biology, University of Alaska ; research chemist at National Oceanic & Atmospheric Administration. Veach – climate change intern at Oceana) March 2009 TOXIC LEGACY: LONG-TERM EFFECTS OF OFFSHORE OIL ON WILDLIFE & PUBLIC HEALTH <http://oceana.org/sites/default/files/reports/Toxic_Legacy_FINAL.pdf>

Economic analyses that clearly showed additional oil drilling from the U.S. outer continental shelf would have almost no impact on gasoline prices, and even less on the country’s dependence on foreign oil, were seemingly ignored. In the process, two layers of protection for our coasts and oceans were removed. First, an Executive moratorium originally enacted by President George H.W. Bush, and expanded to Bristol Bay, Alaska by President Clinton, was lifted. Next, a long-standing moratorium created by Congress was allowed to expire, leaving most of our oceans and coasts vulnerable to oil development. Together, these restrictions had prevented oil production and coastal industrialization on much of the outer continental shelf and protected coastal areas for more than 25 years until the rush to drill took hold during the 2008 elections. At the same time, large swaths of the Chukchi and Beaufort Seas, which were not covered by the moratoria or other protections, have been made available to oil companies for leasing and exploration. But the hard economic facts remain. The Energy Information Agency reports that the outer continental shelf area previously covered by moratoria could produce no more than one percent of the United States’ daily needs, even on days when it is at peak production, an amount projected to have an insignificant impact on the price of oil.

Increased Outer Continental Shelf (OCS) drilling would have no significant impact on oil prices

US Energy Information Administration 2007. “Impacts of Increased Access to Oil and Natural Gas Resources in the Lower 48 Federal Outer Continental Shelf” <http://www.eia.gov/oiaf/aeo/otheranalysis/ongr.html>

The projections in the OCS access case indicate that access to the Pacific, Atlantic, and eastern Gulf regions would not have a significant impact on domestic crude oil and natural gas production or prices before 2030. Leasing would begin no sooner than 2012, and production would not be expected to start before 2017. Total domestic production of crude oil from 2012 through 2030 in the OCS access case is projected to be 1.6 percent higher than in the reference case, and 3 percent higher in 2030 alone, at 5.6 million barrels per day. For the lower 48 OCS, annual crude oil production in 2030 is projected to be 7 percent higher—2.4 million barrels per day in the OCS access case compared with 2.2 million barrels per day in the reference case (Figure 20). Because oil prices are determined on the international market, however, any impact on average wellhead prices is expected to be insignificant.

Oil prices have very small effect on the economy

Dr. Lutz Kilian 2009. (Ph.D. in Economics; prof. of economics at University of Michigan) Oil Price Volatility: Origins and Effects, December 1, 2009 <http://www.wto.org/english/res_e/reser_e/ersd201002_e.pdf>

The second problem is that, to the extent that oil prices affect domestic output, under standard assumptions their impact should be bounded by the cost share of oil in domestic production, which is known to be very small. For example, for the United States, the ratio of imported and domestically produced crude oil in GDP has been fluctuating between 1 and 5 percent (see Edelstein and Kilian 2007). Thus, if oil price shocks are viewed as cost shocks for the oil-importing economy, their effect by construction cannot be very large. Indeed, Backus and Crucini (2000) have demonstrated that standard production-based general equilibrium models of the transmission of oil price shocks are not capable of explaining large fluctuations in real GDP. This type of result came as a surprise to many researchers who expected oil price shocks to be a major determinant of the business cycle.

Imports don’t determine US oil prices because prices are based on global markets

Dr. Keith Crane, Dr. Andreas Goldthau, Dr. Michael Toman, Dr. Thomas Light, Dr. Stuart E. Johnson, Alireza Nader, Dr. Angel Rabasa, Harun Dogo 2009. (Crane - Ph.D. economics, Indiana Univ. Johnson - Ph.D. physics, Mass. Institute of Technology. Goldthau – PhD politics, Freie University, Berlin. Toman - Ph.D. in economics, Univ of Rochester. Light – PhD economics, Cornell Univ. Nader - Masters degree in international affairs, George Washington Univ. Rabasa –Ph.D. history, Harvard Univ. Dogo - Ph.D. candidate in policy analysis, Pardee RAND Graduate School; M.S. in defense analysis, Naval Postgraduate School) Imported Oil and U.S. National Security <http://www.rand.org/content/dam/rand/pubs/monographs/2009/RAND_MG838.pdf>

The gap between U.S. production and consumption is so large that eliminating it would entail extraordinarily costly changes to patterns of consumption and production of fuels. Moreover, even if total U.S. imports were cut sharply, the price of oil in the United States would still be determined by global, not national, shifts in supply and demand. A large, extended reduction in the global supply of oil would trigger a sharp rise in the price of oil and lead to a sharp fall in economic output in the United States, no matter how much or how little oil the United States imports.

Doesn’t matter where oil comes from: It’s a global market

Dr. Keith Crane, Dr. Andreas Goldthau, Dr. Michael Toman, Dr. Thomas Light, Dr. Stuart E. Johnson, Alireza Nader, Dr. Angel Rabasa, Harun Dogo 2009. (Crane - Ph.D. economics, Indiana Univ. Johnson - Ph.D. physics, Mass. Institute of Technology. Goldthau – PhD politics, Freie University, Berlin. Toman - Ph.D. in economics, Univ of Rochester. Light – PhD economics, Cornell Univ. Nader - Masters degree in international affairs, George Washington Univ. Rabasa –Ph.D. history, Harvard Univ. Dogo - Ph.D. candidate in policy analysis, Pardee RAND Graduate School; M.S. in defense analysis, Naval Postgraduate School) Imported Oil and U.S. National Security <http://www.rand.org/content/dam/rand/pubs/monographs/2009/RAND_MG838.pdf>

The fungibility of oil has implications for energy security whose importance cannot be overstated: From an economic perspective, where the United States acquires its oil has become irrelevant. Disruptions of supplies or jumps in demand anywhere in the world will be distributed across the world market. Conversely, attempts by foreign suppliers to target supply reductions toward specific importers cannot succeed because oil will be sold on through the markets to the highest bidder, whoever that may be.

Reduced Mid East oil revenues would not hurt Al Qaeda

Dr. Keith Crane, Dr. Andreas Goldthau, Dr. Michael Toman, Dr. Thomas Light, Dr. Stuart E. Johnson, Alireza Nader, Dr. Angel Rabasa, Harun Dogo 2009. (Crane - Ph.D. economics, Indiana Univ. Johnson - Ph.D. physics, Mass. Institute of Technology. Goldthau – PhD politics, Freie University, Berlin. Toman - Ph.D. in economics, Univ of Rochester. Light – PhD economics, Cornell Univ. Nader - Masters degree in international affairs, George Washington Univ. Rabasa –Ph.D. history, Harvard Univ. Dogo - Ph.D. candidate in policy analysis, Pardee RAND Graduate School; M.S. in defense analysis, Naval Postgraduate School) Imported Oil and U.S. National Security <http://www.rand.org/content/dam/rand/pubs/monographs/2009/RAND_MG838.pdf>

The importance of donations from individuals and charities in oil-rich Middle Eastern states for financing al Qaeda and its affiliates has declined as terrorist groups have increasingly turned to crime to finance their attacks. Moreover, the costs of perpetrating a terrorist attack are so small ($15,000 to $500,000) that even a substantial fall in Middle Eastern oil revenues would not affect al Qaeda’s ability to raise sufficient funds to finance its operations.

Oil revenues have no bearing on terrorists’ ability to finance their operations

Dr. Keith Crane, Dr. Andreas Goldthau, Dr. Michael Toman, Dr. Thomas Light, Dr. Stuart E. Johnson, Alireza Nader, Dr. Angel Rabasa, Harun Dogo 2009. (Crane - Ph.D. economics, Indiana Univ. Johnson - Ph.D. physics, Mass. Institute of Technology. Goldthau – PhD politics, Freie University, Berlin. Toman - Ph.D. in economics, Univ of Rochester. Light – PhD economics, Cornell Univ. Nader - Masters degree in international affairs, George Washington Univ. Rabasa –Ph.D. history, Harvard Univ. Dogo - Ph.D. candidate in policy analysis, Pardee RAND Graduate School; M.S. in defense analysis, Naval Postgraduate School) Imported Oil and U.S. National Security <http://www.rand.org/content/dam/rand/pubs/monographs/2009/RAND_MG838.pdf>

Unfortunately, launching a terrorist attack is cheap. The bombings in London and Madrid cost in the thousands, not millions, of dollars. Because of pressure from governments around the world, al Qaeda and its ilk have found it more difficult to rely on donations for their activities. Consequently, al Qaeda and its affiliates have diversified their funding sources to the countries in which they operate or turned to criminal activities for a larger share of their revenues. The terrorists on whom the United States is most focused on pursing have become much less reliant on donations from individuals and charities in oil-rich states. Increases in oil revenues have no bearing on their ability to finance operations.

Oil isn’t necessary for rogue states, and most oil-exporters are not hostile to the US

Dr. Keith Crane, Dr. Andreas Goldthau, Dr. Michael Toman, Dr. Thomas Light, Dr. Stuart E. Johnson, Alireza Nader, Dr. Angel Rabasa, Harun Dogo 2009. (Crane - Ph.D. economics, Indiana Univ. Johnson - Ph.D. physics, Mass. Institute of Technology. Goldthau – PhD politics, Freie University, Berlin. Toman - Ph.D. in economics, Univ of Rochester. Light – PhD economics, Cornell Univ. Nader - Masters degree in international affairs, George Washington Univ. Rabasa –Ph.D. history, Harvard Univ. Dogo - Ph.D. candidate in policy analysis, Pardee RAND Graduate School; M.S. in defense analysis, Naval Postgraduate School) Imported Oil and U.S. National Security <http://www.rand.org/content/dam/rand/pubs/monographs/2009/RAND_MG838.pdf>

Oil exports are not a necessary condition for financing rogue states. North Korea is an oil importer but has built nuclear weapons. In the 1990s, when under the rule of the Taliban, Afghanistan, another oil importer, became a sanctuary for al Qaeda. In the 1990s, before it began exporting oil in large quantities, Sudan harbored Osama bin Laden. Most major oil exporters—for example, Canada, the largest supplier of oil to the United States—are not hostile to the United States.

Risks High: The toxic effects of offshore oil are bad

Benefits Low: Renewables can replace offshore oil and it doesn’t reduce foreign oil dependency

Ellycia Harrould-Kolieb, Jacqueline Savitz, Dr. Jeffrey Short and Marianne Veach 2009. (Harrould-Kolieb - Master of Environment from the University of Melbourne, Australia. Savitz - master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Short - Ph.D., Fisheries Biology, University of Alaska ; research chemist at National Oceanic & Atmospheric Administration. Veach – climate change intern at Oceana) March 2009 TOXIC LEGACY: LONG-TERM EFFECTS OF OFFSHORE OIL ON WILDLIFE & PUBLIC HEALTH <http://oceana.org/sites/default/files/reports/Toxic_Legacy_FINAL.pdf>

This report clearly shows the broad array of impacts that result from oil in the marine environment. These risks to marine life, human health and coastal economies are more likely to occur if there is expanded oil drilling on the outer continental shelf. The toxic effects of oil on marine life will be problematic even without a major spill. However, any spill will intensify those effects and take a toll on coastal communities and coastal economies. Most importantly, continuing our reliance on oil will worsen the already severe problems associated with climate change and ocean acidification, including their direct effects on marine life. Renewable energy, energy efficiency and electric transportation alternatives can eliminate the need for oil. In fact, alternative energy sources, such as offshore wind can supply our electricity needs in full. Meanwhile, oil production on the outer continental shelf will not come close to meeting the United States’ oil demand nor will it reduce foreign oil dependency.

SOURCE INDICTMENT

American Petroleum Institute

Michael Craig & Jacqueline Savitz 2011. (Craig - Energy Analyst at *Oceana*; Policy Fellow at Americans for Energy Leadership. Savitz - Deputy Vice President, U.S. Campaigns at Oceana; former Executive Director of Coast Alliance; master's degree in environmental science with emphasis in toxicology from the University of Maryland, Chesapeake Biological Laboratory; bachelor's degree in marine science and biology from the University of Miami, Fla. Oceana - largest international organization focused solely on ocean conservation, protecting marine ecosystems and endangered species) “False Sense of Safety - Safety Measures Will Not Make Offshore Drilling Safe” Oct 2011 <http://oceana.org/sites/default/files/reports/OffshoreSafetyReport_Oceana_10-18-11.pdf>

**American Petroleum Institute (“API”) is an Unacceptable Licenser of Third Parties –** Many new well design and equipment regulations must be verified by an independent third party, but BOEMRE recognizes API-licensed organizations as independent third parties. API, a lobbying organization made up of oil and gas companies, lobbies for increasing drilling and relaxing permit review and safety measures. Using API as the arbiter of whether safety requirements are followed provides little in the way of guarantees.

2A EVIDENCE: OLIVINE GEOENGINEERING

INHERENCY

The future is bleak. It’s essential we reverse atmospheric CO2, but the Status Quo won’t do it

Dr. Jennie C. Stephens & Dr. David W. Keith 2008. ( Stephens – PhD; assoc. professor of Environmental Science and Policy Program, Department of International Development, Community, and Environment, Clark University. Keith – PhD; professor in Department of Chemical and Petroleum Engineering, University of Calgary) Assessing geochemical carbon management , CLIMATIC CHANGE Published online: 24 June 2008 <http://wordpress.clarku.edu/jstephens/files/2012/04/Stephens-Keith-2008.pdf>

Although stabilizing atmospheric CO2 is recognized as essential to mitigating the risks associated with climate change (IPCC 2001, 2007), the magnitude of emission reductions required has so paralyzed public policy that coordinated and effective measures to reduce CO2 emissions remain elusive. The challenge of reversing the rising atmospheric CO2 concentrations for climate change mitigation is increasing with the rapid growth of fossil-fuel-based, CO2-emitting energy technology infrastructure throughout the world. Despite the many options for transitioning to low or no-carbon emitting technologies (Holdren 2006; Pacala and Socolow 2004), the rate of emissions growth continues to accelerate and there is little objective evidence that such a transition is underway (Canadell et al. 2007; Raupach et al. 2007).

No matter how much the Status Quo is doing, we still need to explore all plausible ways to remove CO2 from the atmosphere.

Dr. Jennie C. Stephens & Dr. David W. Keith 2008. ( Stephens – PhD; assoc. professor of Environmental Science and Policy Program, Department of International Development, Community, and Environment, Clark University. Keith – PhD; professor in Department of Chemical and Petroleum Engineering, University of Calgary) Assessing geochemical carbon management , CLIMATIC CHANGE Published online: 24 June 2008 <http://wordpress.clarku.edu/jstephens/files/2012/04/Stephens-Keith-2008.pdf>

Prudent action requires a systematic exploration of all plausible avenues toward reducing the concentrations of CO2 in the atmosphere. In addition to increasing energy production from renewable sources, switching to low-carbon-intensity fuels, improving energy efﬁciency, and promoting energy conservation, capturing CO2 and storing the associated carbon in a reservoir other than the atmosphere has potential for cost-competitive large-scale reductions of atmospheric CO2 (Anderson and Newell 2004; Herzog 2001; IPCC 2005; Parson and Keith 1998).

Hawaii CO2 measurements are the gold standard

WASHINGTON POST 2013. (journalists Brian Vastag and Jason Samenow) 10 May 2013 Carbon dioxide levels hit troubling milestone, scientists say <http://www.washingtonpost.com/national/health-science/atmospheric-carbon-dioxide-levels-hit-worrisome-milestone/2013/05/10/7cfe450c-b9a4-11e2-b94c-b684dda07add_story.html> (brackets in original)

Airborne concentrations of carbon dioxide vary by season and location on Earth. But the measurements from the Mauna Loa monitor, which is run by Scripps, are considered the gold standard. Concentrations there are plotted on the iconic Keeling Curve, named after scientist Charles David Keeling, who initiated the measurements in 1958. At that time, the carbon dioxide level was 316 parts per million.

Danger Zone: Nobody knows what the bright line is for atmospheric carbon, but we are for sure in dangerous territory.

National Public Radio quoting Dr. Ralph Keeling 2013. (Keeling – PhD from Harvard; Professor at Scripps Institution of Oceanography) 'Dangerous Territory': Carbon Dioxide Levels Reach Milestone (journalist Richard Harris) 10 May 2013 <http://www.npr.org/2013/05/10/182029983/dangerous-territory-carbon-dioxide-levels-reach-iconic-high>

There is no bright line between a "safe" and "dangerous" amount of carbon dioxide in the atmosphere, Keeling says, "but certainly I'm among those who think if we wanted to be prudent about this we shouldn't have let it go over 350, so we're already into dangerous territory."

The federal government is funding carbon capture & storage (CCS), pouring money into a carbon reduction strategy that will never work. Even the Congressional Budget Office admitted in 2012:

Congressional Budget Office 2012. CBO Releases Report on Federal Efforts to Reduce the Cost of Capturing and Storing Carbon Dioxide 28 June 2012 <http://www.cbo.gov/publication/43360>

No CCS-equipped coal-fired power plants have been built on a commercial scale because any electricity generated by such plants would be much more expensive than electricity produced by conventional coal-burning plants: Engineers’ estimates indicate that electricity generated by the first CCS-equipped commercial-scale plants would initially be about 75 percent more costly than electricity generated by conventional coal-fired plants. Since 2005, lawmakers have provided the Department of Energy with about $6.9 billion to develop CCS technology, demonstrate its commercial feasibility, and reduce the cost of electricity generated by CCS-equipped plants. In the absence of a significant technological breakthrough, it seems clear that a large amount of new CCS capacity—installed either at new plants or, through retrofitting, at existing plants—would be needed to reduce costs substantially. Such an investment seems unlikely in the foreseeable future and it might not occur even if the technology became more competitive economically. Unless the federal government adopts policies that encourage or require utilities to generate electricity with fewer greenhouse gas emissions, the projected high cost of using CCS technology means that the government’s current program for developing CCS is unlikely to do much to support widespread use of the technology.

Status Quo research (physical and biological approaches) focuses on short-term solutions. Geochemical has potential for high value over a longer time frame

Dr. Jennie C. Stephens & Dr. David W. Keith 2008. ( Stephens – PhD; assoc. professor of Environmental Science and Policy Program, Department of International Development, Community, and Environment, Clark University. Keith – PhD; professor in Department of Chemical and Petroleum Engineering, University of Calgary) Assessing geochemical carbon management , CLIMATIC CHANGE Published online: 24 June 2008 <http://wordpress.clarku.edu/jstephens/files/2012/04/Stephens-Keith-2008.pdf>

Although there has been some research focused on chemical (or geochemical) approaches to carbon storage, these approaches have received less attention than either physical or biological approaches, and the limited funding previously available for research on geochemical approaches has decreased in recent years. While both physical and biological approaches to carbon storage provide more feasible near-term (within the next decade) options for carbon storage than geochemical approaches, sustained research on geochemical approaches to carbon storage has potential for high societal value over a longer time-frame.

Congress has spent $6.9 billion since 2005 on Carbon Capture & Storage (CCS)

Congressional Budget Office 2012. “Federal Efforts to Reduce the Cost of Capturing and Storing Carbon Dioxide” June 2012 <http://www.cbo.gov/sites/default/files/cbofiles/attachments/43357-06-28CarbonCapture.pdf>

Since 2005, lawmakers have provided DOE with about $6.9 billion to develop and demonstrate the commercial feasibility of technologies that would allow coal-burning power plants to generate electricity without emitting CO2 into the atmosphere. Instead, the CO2 would be removed from a plant’s exhaust stream, compressed into a liquid, and stored underground indefinitely. Collectively, those processes are usually called carbon capture and storage.

Federal CCS funding is $0.4 billion (four hundred million) dollars per year + $2.2 billion for 5 CCS plants

Congressional Budget Office 2012. “Federal Efforts to Reduce the Cost of Capturing and Storing Carbon Dioxide” June 2012 <http://www.cbo.gov/sites/default/files/cbofiles/attachments/43357-06-28CarbonCapture.pdf>

The programs to develop and promote CCS technology —the CCS Demonstrations Program and the Carbon Capture and Storage and Power Systems Program—are overseen by DOE’s Office of Fossil Energy. That office received about $0.4 billion for its coal programs in 2012 and similar amounts in most of the previous several years (see Table 2). It also received a large infusion of funds from the American Recovery and Reinvestment Act of 2009, which provided $3.4 billion for DOE’s CCS efforts (bringing total funding in 2009 for that purpose to $4.1 billion). Much of the money appropriated for CCS remains unspent, however, in part because of the normal time lags in designing and building large projects but also because private investors have canceled several projects for which the federal government was planning to provide some funding. Full-Scale Demonstration Projects. DOE is participating in five of the six full-scale CCS demonstration projects currently being planned and built in the United States (see Table 1). As of April 2012, DOE had committed $2.2 billion to the construction of those plants; private parties are contributing roughly $10 billion, although that amount does not take into account tax advantages and other considerations from state and local governments.

Don’t need federal spending on CCS demonstration projects

Congressional Budget Office 2012. “Federal Efforts to Reduce the Cost of Capturing and Storing Carbon Dioxide” June 2012 <http://www.cbo.gov/sites/default/files/cbofiles/attachments/43357-06-28CarbonCapture.pdf>

One option for increasing the effectiveness of federal spending on CCS technology would be to limit that support to research and development and withdraw it from more-costly demonstration projects. Concentrating federal resources on R&D would focus DOE’s efforts on activities for which the rationale for spending by the federal government is the strongest—that is, in bringing scientists and engineers together to perform research that is removed from specific commercial applications. R&D is also an area in which the federal record of success is long, compared with many failed federal attempts to commercialize earlier fossil energy technologies.

We can cancel federal spending on CCS, both on research and demonstration projects

Congressional Budget Office 2012. “Federal Efforts to Reduce the Cost of Capturing and Storing Carbon Dioxide” June 2012 <http://www.cbo.gov/sites/default/files/cbofiles/attachments/43357-06-28CarbonCapture.pdf>

Given the limits on DOE’s ability to lower the costs of CCS through its currently planned activities, lawmakers could substantially reduce or discontinue funding for both developing and demonstrating the technology. If little coal-fired generation capacity was being built in the United States, lawmakers might decide that the development of technologies such as CCS would have little effect on either reducing CO2 emissions or preserving the nation’s ability to use coal-fired power plants in the future. Moreover, even if DOE’s cost reduction target was attained, coal-fired plants with CCS would not be competitive with plants that lacked the technology unless policies were adopted that imposed costs on carbon emissions.

HARMS / RISKS

Rising temperatures will persist in the future and will have significant impacts on human and animal health

National Climate Assessment Development Advisory Committee 2013. (NCADAC is part of the US Global Change Research Program, an organization of representatives of 13 federal agencies collaborating on climate change research. For this study, the authors were: Convening Lead Authors: Scott Doney, Woods Hole Oceanographic Institution; Andrew A. Rosenberg, Union of Concerned Scientists. Lead Authors: Michael Alexander, National Oceanic and Atmospheric Administration; Francisco Chavez, Monterey Bay Aquarium Research Institute; Catherine Drew Harvell, Cornell University; Gretchen Hoffman, University of California Santa Barbara; Michael Orbach, Duke University; Mary Ruckelshaus, Natural Capital Project) Oceans and Marine Resources 11 Jan 2013 <http://ncadac.globalchange.gov/download/NCAJan11-2013-publicreviewdraft-chap24-oceans.pdf>

1.The rise in ocean temperature over the last century will persist into the future, with continued large impacts on climate, ocean circulation, chemistry, and ecosystems. 2. The ocean currently absorbs about a quarter of human-caused carbon dioxide emissions to the atmosphere, leading to ocean acidification that will alter marine ecosystems in dramatic yet uncertain ways. 3. Significant habitat loss will continue to occur due to climate change, in particular for Arctic and coral reef ecosystems, while expansions of habitat in other areas and for other species will occur. These changes will consequently alter the distribution, abundance, and productivity of many marine species. 4. Rising sea surface temperatures have been linked with increasing levels and ranges of diseases of humans and marine life,such as corals, abalones, oysters, fishes, and marine mammals.

Risk of catastrophic impacts if steps are not taken to reduce Earth’s temperature

Prof. Charles Greene 2010. (Director, Ocean Resources and Ecosystems Program, Department of Earth and Atmospheric Sciences, Cornell University) quoted in SCIENCE DAILY, 23 Mar 2010 “World Has Underestimated Climate-Change Effects, Expert Argues “ <http://www.sciencedaily.com/releases/2010/03/100322232229.htm>

"Even if all man-made greenhouse gas emissions were stopped tomorrow and carbon-dioxide levels stabilized at today's concentration, by the end of this century the global average temperature would increase by about 4.3 degrees Fahrenheit, or about 2.4 degrees centigrade above pre-industrial levels, which is significantly above the level which scientists and policymakers agree is a threshold for dangerous climate change," Greene said. "Of course, greenhouse gas emissions will not stop tomorrow, so the actual temperature increase will likely be significantly larger, resulting in potentially catastrophic impacts to society unless other steps are taken to reduce the Earth's temperature.”

We must deal with the risks of climate change and ocean acidification

Prof. Charles H. Greene, D. James Baker & Daniel H. Miller 2010. (Greene - Director, Ocean Resources and Ecosystems Program, Department of Earth and Atmospheric Sciences, Cornell University. Baker – Director, Global Carbon Measurement Program, The William J Clinton Foundation. Miller – Managing Director, The Roda Group, Berkely CA.) OCEANOGRAPHY Vol 23 No 1, March 2010 “A Very Inconvenient Truth,” (brackets added) <http://www.tos.org/oceanography/archive/23-1_greene.pdf>

For policymakers, there are two important messages to take home from the recent scientific findings that have emerged since the IPCC FAR. First, the climate system is less resilient to GHG [greenhouse gas] forcing than we previously thought (Alison et al., 2009; Sokolov et al., 2009). Greater climate sensitivity to GHG forcing makes the system less resistant to warming, while the ocean’s thermal inertia makes that warming essentially irreversible for the next thousand years. Second, there is convincing evidence that the committed warming in the pipeline will not only exceed the European Union’s 2.0°C threshold for dangerous climate change by the end of the century, it may have already exceeded the tipping point for destabilizing Earth’s cryosphere. These new scientific findings, combined with the risks associated with ocean acidification (Doney et al., 2009), which are not even addressed here, fundamentally transform the current debate on climate mitigation and adaptation policies.

Imminent climate threats create catastrophic risk to human society

Charles H. Greene, D. James Baker & Daniel H. Miller 2010. (Greene - Director, Ocean Resources and Ecosystems Program, Department of Earth and Atmospheric Sciences, Cornell University. Baker – Director, Global Carbon Measurement Program, The William J Clinton Foundation. Miller – Managing Director, The Roda Group, Berkely CA.) OCEANOGRAPHY Vol 23 No 1, March 2010 “A Very Inconvenient Truth,” (brackets added) <http://www.tos.org/oceanography/archive/23-1_greene.pdf>

A sea-level rise during the twenty-first century comparable to that reported for the last interglacial period would be catastrophic to human society. However, the Greenland and West Antarctic ice sheets are only two among a number of tipping elements that are considered at risk from climate warming during the next few centuries (Lenton et al., 2007). A tipping element is a large-scale component of the Earth system that has the potential to rapidly change state in response to small perturbations that exceed some critical threshold—its tipping point. Society is especially vulnerable to these most imminent threats.

SOLVENCY

“Energy to mine, crush and transport the olivine creates more CO2” – Response: Only about 4% offset from the CO2 captured

Dr. R.D. Schuilling & Prof. P.L. DeBoer 2010. (Schuiling – PhD; professor in Department of Earth Sciences - Geochemistry Faculty of Geosciences Utrecht University DeBoer – professor with Sedimentology Research Group, University of Utrecht, Netherlands) International Journal of Greenhouse Gas Control, Coastal spreading of olivine to control atmospheric CO2 concentrations: A critical analysis of viability. Comment: Nature and laboratory models are different <http://www.greensand.nl/content/user/1/files/%2B%2BArticle%20Olaf-Poppe%20op%20Hangx%20en%20Spiers.pdf>

The energy penalty, i.e., the CO2 produced by the extra fuel to be burnt for mining, grinding, transport and distribution of olivine is about 4% of the amount of CO2 captured. Estimates about the energy penalty of CCS (a Faustian Bargain? Spreng et al., 2007) differ, and upstream and downstream consumption, and energy costs of infrastructure are not generally included in such estimates.

Ocean alkalinity and CO2 storage should get more research as a long-term way to reduce atmospheric carbon

Dr. Jennie C. Stephens & Dr. David W. Keith 2008. ( Stephens – PhD; assoc. professor of Environmental Science and Policy Program, Department of International Development, Community, and Environment, Clark University. Keith – PhD; professor in Department of Chemical and Petroleum Engineering, University of Calgary) Assessing geochemical carbon management , CLIMATIC CHANGE Published online: 24 June 2008 <http://wordpress.clarku.edu/jstephens/files/2012/04/Stephens-Keith-2008.pdf>

Increasing the alkalinity of the surface oceans to increase the ocean’s carbon storage capacity is an approach that is worthy of more research for two critical reasons: (1) this approach relies on the ocean’s natural CO2 uptake mechanism so non-point sources of CO2 could be incorporated and (2) the costly CO2 capture process would not be required. In addition, ocean alkalinity addition could simultaneously mitigate against ocean acidiﬁcation. In some respects, addition of alkalinity to the oceans serves as a kind of long timescale method of remediation rather than a means of geoengineering; a means to reduce the climatic and geochemical impacts of anthropogenic CO2 on century to millennial time scales. Although the geochemical carbon management approaches reviewed here appear unlikely to contribute substantially to the imminent need for reducing atmospheric concentrations within the next decade or two, sustaining research in these alternative approaches is prudent as we continue upon a dangerous and uncertain path of increasing atmospheric CO2 concentrations.

There’s enough mineral supply to compensate for all the CO2 from fossil fuel burning

Dr. Jennie C. Stephens & Dr. David W. Keith 2008. ( Stephens – PhD; assoc. professor of Environmental Science and Policy Program, Department of International Development, Community, and Environment, Clark University. Keith – PhD; professor in Department of Chemical and Petroleum Engineering, University of Calgary) Assessing geochemical carbon management , CLIMATIC CHANGE Published online: 24 June 2008 <http://wordpress.clarku.edu/jstephens/files/2012/04/Stephens-Keith-2008.pdf>

Ca and Mg silicate minerals are abundant; calcium and magnesium each make up about 2% (in molar percent abundance) of the earth’s continental crust. Deposits of Ca and Mg silicates greatly exceed quantities of fossil fuels so enhanced weathering of these minerals could, theoretically, compensate for all the CO2 entering the atmosphere from the burning of fossil fuels.

Costs and economics of olivine mining

Dr. R.D. Schuiling and Oliver Tickell 2010. (Schuiling – PhD; professor in Department of Earth Sciences - Geochemistry Faculty of Geosciences Utrecht University. Tickell - environmental journalist) Olivine against climate change and ocean acidification (ethical disclosure about the date: the article is undated, but references footnotes of documents published in 2010, and none later than that.) <http://www.innovationconcepts.eu/res/literatuurSchuiling/olivineagainstclimatechange23.pdf>

The proposed scale of olivine mining is large but within the range of modern mining operations. The largest open pit mine (the famous copper mine at Bingham, Utah in the USA, opened in 1904) for example has an excavated volume of 25 km3 As well as spreading on land, olivine grains can also be applied in the tidal zone along seacoasts. As the olivine grains are abraded in the surf, they will rapidly capture CO2, also contributing to the restoration of the pH in the oceans while adding bicarbonate to the sea water – required for the healthy, normal growth of corals such as Australia’s Great Barrier Reef. Crushed olivine in bulk from a small mine in Greenland costs 23 € / ton in the port of Rotterdam. It is expected that the cost of olivine will drop below 15 € / ton for large mines in low-wage countries and limited transport distances. The cost per ton of CO2 will then be around 10 €/ton, as one metric ton of olivine captures 1.25 tons of CO2. This compares very favorably with the cost of CO2 capture by CCS, which is 60 to 90 € / ton according to a recent report by McKinsey & Company (2008). The total CO2 expenditure of the whole olivine operation (mining, milling and transport) has been calculated to be 4% of the amount of CO2 that is captured by that olivine (Koornneef & Nieuwlaar, in prep.). The cost of mining, milling and grinding of 1 ton of rock in large scale mining is estimated by Steen and Borg (2002) to be about 6 Euro/ton. If average transport costs can be limited to a similar amount, the price per ton of CO2 will drop to 10 Euro or slightly less.

Olivine weathering is a natural process – it can work long-term to reduce CO2

Dr. R.D. Schuilling & Prof. P.L. DeBoer 2010. (Schuiling – PhD; professor in Department of Earth Sciences - Geochemistry Faculty of Geosciences Utrecht University DeBoer – professor with Sedimentology Research Group, University of Utrecht, Netherlands) International Journal of Greenhouse Gas Control, Coastal spreading of olivine to control atmospheric CO2 concentrations: A critical analysis of viability. Comment: Nature and laboratory models are different <http://www.greensand.nl/content/user/1/files/%2B%2BArticle%20Olaf-Poppe%20op%20Hangx%20en%20Spiers.pdf>

Olivine weathering is a natural process that takes time, years to decades when applied to suitable environments. Contrary to CCS, the effect is not instantaneous, but in the course of the coming decades in which society will continue to produce CO2 and to be threatened by continued greenhouse warming, the annual addition of large volumes of olivine to suitable environments will counteract the rise of CO2 level of the atmosphere and the acidiﬁcation of ocean waters.

We need to move toward geoengineering approaches to reduce atmospheric CO2

Prof. Charles H. Greene, D. James Baker & Daniel H. Miller 2010. (Greene - Director, Ocean Resources and Ecosystems Program, Department of Earth and Atmospheric Sciences, Cornell University. Baker – Director, Global Carbon Measurement Program, The William J Clinton Foundation. Miller – Managing Director, The Roda Group, Berkely CA.) OCEANOGRAPHY Vol 23 No 1, March 2010 “A Very Inconvenient Truth,” <http://www.tos.org/oceanography/archive/23-1_greene.pdf>

A number of climate scientists have argued convincingly that the current CO2 concentration of ~ 389 ppm may already have committed society to dangerous climate change by the end of the century (Hansen et al., 2008; reviewed by Monastersky, 2009). Even if that threshold has not been surpassed yet, it is difficult to conceive of society reducing its GHG emissions in time to prevent such a hazardous commitment (Keith, 2009). If society is to avoid dangerous climate change, then the policy debate must transition from discussions of mitigation strategies focused almost exclusively on reducing GHG emissions (e.g.,IPCC, 2007b) to discussions of mixed strategies that include combinations of reducing GHG emissions and employing geoengineering approaches that extract CO2 from the atmosphere and/or reduce the level of incoming solar radiation reaching Earth’s surface (Schneider, 2008; Jones, 2009; Keith, 2009; Morton, 2009). This opinion is consistent with conclusions drawn in a recent report released by the Royal Society entitled, Geoengineering the Climate: Science, Governance and Uncertainty (Royal Society, 2009).

Scientific explanation of how olivine captures CO2: It puts the CO2 into limestone and dolomite rock formations in the sea

Note: In the equation below, Mg2SiO4 is olivine. The equation explains that olivine + carbon dioxide + water produces magnesium + carbonates + silicic acid. The carbonates (HCO) turn into limestone or dolomite in the sea, locking the carbon in a rock formation and keeping it out of the atmosphere.

Dr. R.D. Schuiling and Oliver Tickell 2010. (Schuiling – PhD; professor in Department of Earth Sciences - Geochemistry Faculty of Geosciences Utrecht University. Tickell - environmental journalist) Olivine against climate change and ocean acidification (ethical disclosure about the date: the article is undated, but references footnotes of documents published in 2010, and none later than that.) <http://www.innovationconcepts.eu/res/literatuurSchuiling/olivineagainstclimatechange23.pdf>

The world public is desperately looking for safe and cost-effective solutions to counteract climate change by reducing the CO2 levels of the atmosphere. The solution proposed here is not new, but is literally as old as the world, namely to use olivine or similar rocks not in a technology, but in the way it works in nature. Weathering of calcium and / or magnesium silicate rock has kept the CO2 content of the atmosphere within reasonable bounds throughout geological history. Weathering is the neutralization of an acid (usually carbonic acid) by rocks, turning CO2 into the innocuous bicarbonate ion in solution. For the abundantly available magnesium-silicate olivine, the reaction is as follows:  
  
Mg2SiO4 + 4 CO2 + 4 H2O  2 Mg2+ + 4 HCO3- + H4SiO4These bicarbonate solutions are carried by rivers to the sea, where they are ultimately deposited as limestones and dolomites. These carbonate sediments form the ultimate sink for CO2. They contain 1,500 times more CO2 than the amounts of CO2 in biomass, atmosphere and dissolved CO2 in the oceans combined (Table 1).

Scientific details on how olivine can be dispersed by ships in the ocean to reduce atmospheric carbon

100 large ships could distribute 1 petagram (1 billion tons) of olivine per year

Putting olivine in ballast water could distribute 0.9 billion tons/year

Dr. Peter Köhler PhD, Jesse F Abrams, Christoph Völker, Judith Hauck and Dieter A Wolf-Gladrow 2013. (research scientists at Alfred Wegener Institute for Polar & Marine Research, Bremerhaven, Germany) ENVIRONMENTAL RESEARCH LETTERS Vol 8 No 1, published 23 Jan 2013 Geoengineering impact of open ocean dissolution of olivine on atmospheric CO2, surface ocean pH and marine biology <http://iopscience.iop.org/1748-9326/8/1/014009/article> (brackets added; “Pg” = petagram = 1 billion tons)

In conclusion, our study provides a general picture of the intended and some of the unintended effects of open ocean dissolution of olivine on atmospheric CO2, surface ocean pH, and marine biology. Most challenging is the necessity to grind olivine to grain sizes of the order of 1 μm to enable dissolution before sinking out of the surface mixed layer. This size limitation is also of relevance for wind dispersed olivine distributed on land. Energy consumption for grinding will reduce the CO2 sequestration efficiency significantly. It needs about 100 large dedicated ships to distribute 1 Pg of olivine per year over a large ocean surface area. Alternatively, the distribution of olivine in ballast water of the fleet of commercial ships is an option which has the potential to distribute up to 0.9 Pg of olivine per year. Additionally, most shipping tracks lie in regions favourable for olivine dissolution. There are two cumulative mechanisms which contribute to the sequestration of carbon with the majority (~92%) caused by ocean chemistry changes due to alkalinity input and a minority (~8%) by the changes in species composition and the biological carbon pumps due to silicic acid input. Marine biology might be further influenced by the input of trace metals, e.g. Fe [iron] or Ni [nickel], and reduced light availability connected with the olivine dissolution.

Don’t have to build dedicated fleet of ships – can use existing ships already on their normal commercial routes

Dr. Peter Köhler PhD, Jesse F Abrams, Christoph Völker, Judith Hauck and Dieter A Wolf-Gladrow 2013. (research scientists at Alfred Wegener Institute for Polar & Marine Research, Bremerhaven, Germany) ENVIRONMENTAL RESEARCH LETTERS Vol 8 No 1, published 23 Jan 2013 Geoengineering impact of open ocean dissolution of olivine on atmospheric CO2, surface ocean pH and marine biology <http://iopscience.iop.org/1748-9326/8/1/014009/article> (brackets added; “Pg” = petagram = 1 billion tons)

The dependences of the dissolution on both SST and mixed layer depth (ﬁgure 3(c)) also show that olivine dissolution is only feasible in the latitudinal band between 40N and 40S, and additionally in the areas of deep water production in the northern North Atlantic. However, the regions favourable for olivine dissolution largely overlap with commercial shipping tracks, especially in the Atlantic (ﬁgures 3(d), S3 available at stacks.iop.org/ERL/8/014009/mmedia) making a distribution scheme based on ships of opportunities a possible option.

Ocean distribution of olivine could reduce 9% of man-made CO2 from the atmosphere

Dr. Peter Köhler PhD, Jesse F Abrams, Christoph Völker, Judith Hauck and Dieter A Wolf-Gladrow 2013. (research scientists at Alfred Wegener Institute for Polar & Marine Research, Bremerhaven, Germany) ENVIRONMENTAL RESEARCH LETTERS Vol 8 No 1, published 23 Jan 2013 Geoengineering impact of open ocean dissolution of olivine on atmospheric CO2, surface ocean pH and marine biology (brackets added) <http://iopscience.iop.org/1748-9326/8/1/014009/article> (a “petagram” is 1 billion tons)

An upper limit for the open ocean distribution of olivine is difﬁcult to estimate, but such a limit certainly depends on shipping capacities, exploitation of olivine, and low distribution rates to prevent particle aggregation. In our STANDARD scenario (3 Pg [petagrams] of olivine dissolution per year) about 9% of the anthropogenic CO2 emissions would be compensated.

Olivine is abundantly available and, applied to the ocean, it removes carbon from the atmosphere

Dr. Peter Köhler PhD, Jesse F Abrams, Christoph Völker, Judith Hauck and Dieter A Wolf-Gladrow 2013. (research scientists at Alfred Wegener Institute for Polar & Marine Research, Bremerhaven, Germany) ENVIRONMENTAL RESEARCH LETTERS Vol 8 No 1, published 23 Jan 2013 Geoengineering impact of open ocean dissolution of olivine on atmospheric CO2, surface ocean pH and marine biology (brackets added. The reason for Mg or Fe in the equation is that there are 2 forms of olivine, one with Magnesium, one with Iron. Both are interchangeable for the equation and achieve carbon reduction.) <http://iopscience.iop.org/1748-9326/8/1/014009/article>

Olivine dissolution is part of the natural silicate weathering process, which reduced atmospheric CO2 over geological timescales in the past (Berner 1990). Olivine (Mg2SiO4) is an abundantly available magnesium silicate which weathers according to the reaction (Schuiling and Krijgsman 2006)  
  
The abundance of Mg [magnesium] compared to Fe [iron] depends on the rock, but is about 90% in the well abundant dunite (Deer et al 1992). This net dissolution reaction suggests that 1 mole of olivine would sequester 4 moles of CO2, equivalent to sequestration rates of 0.34 g C per g olivine. It has been shown that those are theoretical upper limits, and the effect of the ocean's carbon chemistry lead to 20% smaller sequestration rates (Köhler et al 2010). The dissolution of one mole of olivine leads in the surface ocean to an increase in total alkalinity by 4 moles and in silicic acid (H4SiO4) by one mole, the latter is a limiting nutrient for diatoms in large sections of the world's oceans (Nelson et al 1995, Dugdale and Wilkerson 1998, Ragueneau et al 2006).



Linear reduction in atmospheric carbon. Dissolving olivine in the oceans reduces ocean acidity and increases absorption of CO2. Linear means the more olivine we use, the more carbon we save

Dr. Peter Köhler PhD, Jesse F Abrams, Christoph Völker, Judith Hauck and Dieter A Wolf-Gladrow 2013. (research scientists at Alfred Wegener Institute for Polar & Marine Research, Bremerhaven, Germany) ENVIRONMENTAL RESEARCH LETTERS Vol 8 No 1, published 23 Jan 2013 Geoengineering impact of open ocean dissolution of olivine on atmospheric CO2, surface ocean pH and marine biology (brackets added; net primary production is the rate at which the full metabolism of phytoplankton produces biomass. pH is a measure of acidity/alkalinity. Higher pH = lower acid = more alkaline. A “petagram” is 1015 grams, or 1 billion metric tons) <http://iopscience.iop.org/1748-9326/8/1/014009/article>

Olivine dissolution leads to a fairly uniform increase in sea surface pH (ﬁgure S4(b) available at stacks.iop.org/ERL/8/014009/mmedia) counteracting the ongoing acidiﬁcation of the surface ocean to some extent. Mean sea surface pH is increased after ten years of olivine dissolution by 0.007 (ﬁgure 1(d)), which is to 85% caused by the rise in alkalinity and only to the minor 15% by changes in the marine biology. Changes in carbon uptake, NPP [net primary production], export production of organic matter and CaCO3, and pH saturate after a few years (ﬁgures 1(a), (b), (d)), which makes longer simulations unnecessary. The increase in oceanic carbon uptake with respect to the amount of olivine input is almost linear, with 1, 3, and 10 Pg [petagrams] of olivine addition leading to 0.29, 0.28, and 0.27 Pg [petagrams] C[arbon] per Pg [petagram] olivine, respectively (ﬁgure 1(c)).

Geochemical approaches have benefits over other carbon reduction strategies: Less infrastructure, fewer limitations, no leakage risks, and better time frame

Dr. Jennie C. Stephens & Dr. David W. Keith 2008. ( Stephens – PhD; assoc. professor of Environmental Science and Policy Program, Department of International Development, Community, and Environment, Clark University. Keith – PhD; professor in Department of Chemical and Petroleum Engineering, University of Calgary) Assessing geochemical carbon management , CLIMATIC CHANGE Published online: 24 June 2008 <http://wordpress.clarku.edu/jstephens/files/2012/04/Stephens-Keith-2008.pdf>

Major current limitations of geochemical approaches to carbon management (reviewed in more detail below) include negative environmental impacts resulting from large scale material requirements and high costs resulting from the difﬁculty of accelerating the slow kinetics of geochemical reactions (Gerdemann et al. 2007). Despite these critical limitations, geochemical approaches have unique potential to contribute to CO2 reductions in ways that neither physical nor biological carbon storage can by allowing for the direct removal of CO2 from the atmosphere with minimal requirements for integrating with existing infrastructure. In addition geochemical approaches to carbon management also have potential to bypass several crucial limitations associated with both physical and biological approaches to carbon storage; these include, for physical storage, leakage from underground reservoirs and uneven distribution of storage reservoirs, and, for biological storage, short decade scale timeframe and ecologically precarious monoculture plantations.

Olivine is better than CCS

Dr. R.D. Schuiling and Oliver Tickell 2010. (Schuiling – PhD; professor in Department of Earth Sciences - Geochemistry Faculty of Geosciences Utrecht University. Tickell - environmental journalist) Olivine against climate change and ocean acidification (ethical disclosure about the date: the article is undated, but references footnotes of documents published in 2010, and none later than that.) <http://www.innovationconcepts.eu/res/literatuurSchuiling/olivineagainstclimatechange23.pdf>

In order to capture CO2 from such point sources, it has been widely proposed to construct ‘Carbon Capture and Storage’ facilities at power stations, cement factories and other concentrated sources of CO2. These CCS facilities would chemically remove CO2 from the exhaust gas stream and pump it into underground reservoirs such as depleted gas fields and saline aquifers. However there are concerns as to:  
− the high cost of operating CCS;  
− the additional fuel that needs to be burnt for a given electrical output;  
− the security of these reservoirs in the long term.  
Sequestration of CO2 as oceanic bicarbonate and carbonate rock is far more dependable and can be achieved, our calculations suggest, at considerably lower cost

Even if it isn’t cost effective now, ocean alkalinity is worthy of research funding

Dr. Jennie C. Stephens & Dr. David W. Keith 2008. ( Stephens – PhD; assoc. professor of Environmental Science and Policy Program, Department of International Development, Community, and Environment, Clark University. Keith – PhD; professor in Department of Chemical and Petroleum Engineering, University of Calgary) Assessing geochemical carbon management , CLIMATIC CHANGE Published online: 24 June 2008 <http://wordpress.clarku.edu/jstephens/files/2012/04/Stephens-Keith-2008.pdf>

Notwithstanding these potential advantages no practical method now exists for adding alkalinity to the ocean at reasonable cost and there are serious environmental implications of manipulating the marine system in this way. Two central challenges stand in the way of a practical method: (1) the development of cost effective and environmentally benign methods of extracting cations from silicate minerals, and (2) the development of an effective ocean dispersion mechanism with sufﬁcient dilution that the alkalinity does not adversely affect the local environment. There does not appear to be an inherent physical barrier to designing cost and energy efﬁcient systems for adding alkalinity to the oceans, so we suggest that such methods merit funding as a low-probability, high-payoff research area.

“Too expensive / carbon intensive to grind up olivine dust” – Response: maybe, but with more research we could solve it

Dr. Jennie C. Stephens & Dr. David W. Keith 2008. ( Stephens – PhD; assoc. professor of Environmental Science and Policy Program, Department of International Development, Community, and Environment, Clark University. Keith – PhD; professor in Department of Chemical and Petroleum Engineering, University of Calgary) Assessing geochemical carbon management , CLIMATIC CHANGE Published online: 24 June 2008 <http://wordpress.clarku.edu/jstephens/files/2012/04/Stephens-Keith-2008.pdf>

At the pH of seawater, the kinetics of olivine dissolution are so slow that even 50μm particles would experience only partial dissolution over the time it would take to sink through the ocean depth (Hanchen et al. 2006). Alkalinity addition would be completely uneconomic with such a low dissolution efﬁciency. The process could be improved either by pretreatment that increases the reaction rate or by ﬁner pulverization. As particle size is decreased, the energy required for grinding increases and the sink rate decreases, decreasing the required reaction rates and therefore decreasing the energy required for the thermal pretreating necessary to achieve the desired reaction rate. Using current grinding technologies, ﬁner pulverization alone will not succeed because the energy and ﬁnancial costs of grinding increase much faster than the surface-area-to-volume ratio. Research on pretreatment would build on prior research directed at accelerating mineral carbonation in an industrial setting in which a CO2 stream would be reacted with a magnesium silicates. This work has focused on combinations of ﬁne grinding and heat treatment to accelerate the reaction of magnesium silicates with CO2. Recent mineral carbonation studies have demonstrated that reaction rates for 75 micron particles of olivine and serpentine can be accelerated using heat treatment and elevated reaction temperatures (Gerdemann et al. 2007; O’Connor et al. 2002, 2004c). Although the required energy inputs for heat pretreatment are still several times too large to achieve industrial carbonation at reasonable costs, it seems promising to pursue similar methods to explore the possibility of reduced energy inputs while achieving much lower reaction rates needed for dissolution of small particles dispersed in the ocean. The regime to be explored for pretreatment for ocean dissolution is very different from that examined by current mineral carbonation studies which are aiming to achieve reaction times on the order of hours. Moreover, the industrial mineral carbonation studies must address simultaneous dissolution and carbonation which is a more difﬁcult process than simple oceanic dissolution because the formation of carbonates forms coatings that hinder further dissolution. In summary, there is ample room to improve the economics of alkalinity addition by building on current research directed at industrial mineral carbonation to optimize the trade off between use of pretreatment and ﬁner pulverization.

DISADVANTAGE RESPONSES

“Masking DA: Distracts us from emission reductions” – Response: Emission reductions alone won’t be enough – we need Geoengineering “in addition to” emission reductions.

Masking Turn: focus on emission reductions distracts us from reducing carbon already in the atmosphere

Prof. Charles H. Greene 2010. (Cornell professor of earth and atmospheric sciences) quoted in SCIENCE NEWS 23 March 2010 “World Has Underestimated Climate-Change Effects, Expert Argues” <http://www.sciencedaily.com/releases/2010/03/100322232229.htm>

"Reducing greenhouse gas emissions alone is unlikely to mitigate the risks of dangerous climate change. Society should significantly expand research into geoengineering solutions that remove and sequester greenhouse gases already in the atmosphere. Geoengineering solutions must be in addition to, not replace, dramatic emission reductions if society is to avoid the most dangerous impacts from climate change."

“Hypoxia / Dead Zones” – Response: Olivine has only small impact on hypoxia

Dr. Peter Köhler PhD, Jesse F Abrams, Christoph Völker, Judith Hauck and Dieter A Wolf-Gladrow 2013. (research scientists at Alfred Wegener Institute for Polar & Marine Research, Bremerhaven, Germany) ENVIRONMENTAL RESEARCH LETTERS Vol 8 No 1, published 23 Jan 2013 Geoengineering impact of open ocean dissolution of olivine on atmospheric CO2, surface ocean pH and marine biology (brackets added) <http://iopscience.iop.org/1748-9326/8/1/014009/article>

Our work shows that open ocean dissolution of olivine is ocean fertilization (Lampitt et al 2008). It might also affect oxygen concentration below the surface if more organic matter is respired there. Nowadays 5% of the ocean volume has hypoxic conditions located in the highly productive equatorial upwelling regions (Matear and Elliott 2004, Lampitt et al 2008, Deutsch et al 2011). One study (Deutsch et al 2011) indicates that low-O2 waters are prone to further expansion, with the increase in anoxic water generally conﬁned to intermediate waters of the equatorial Indian and Paciﬁc. The olivine dissolution leads to regionally relatively large impacts of up to +/- [plus or minus] 30% in diatom and non-diatom NPP patterns (ﬁgures S5(a), (b) available at stacks.iop.org/ERL/8/014009/mmedia), but our simulations show less than a 10% change in regional export production of organic matter (ﬁgures S5(c), (d) available at stacks.iop.org/ERL/8/014009/mmedia). In the upwelling regions export production increases by only a few per cent suggesting that the expansion of hypoxic regions due to olivine dissolution might be small.

“Iron in the ocean is bad” – Response: Iron is good - it reduces atmospheric CO2

Reuters News Service 2012. (journalist Alister Doyle) 18 July 2012 “Fertilizing oceans with iron dust helps sink carbon: study“ <http://www.reuters.com/article/2012/07/18/us-climate-oceans-idUSBRE86H1EE20120718>

Dumping iron in the seas can help transfer carbon from the atmosphere and bury it on the ocean floor for centuries, helping to fight climate change, according to a study released on Wednesday. The report, by an international team of experts, provided a boost for the disputed use of such ocean fertilization for combating global warming. But it failed to answer questions over possible damage to marine life. When dumped into the ocean, the iron can spur growth of tiny plants that carry heat-trapping carbon to the ocean floor when they die, the study said. Scientists dumped seven metric tonnes (7.7 tons) of iron sulphate, a vital nutrient for marine plants, into the Southern Ocean in 2004. At least half of the heat-trapping carbon in the resulting bloom of diatoms, a type of algae, sank below 1,000 meters (3,300 ft).

ADVOCACY / SOURCE INDICTMENTS

“Dr Wolf-Gladrow says olivine isn’t cost-efficient and we shouldn’t do it” – Response: Actually he says we should prioritize reducing emissions first, but then he says small-scale olivine usage could be good

Ian Steadman 2013. (journalist) 22 Jan 2013 “Study: olivine in the oceans is not an effective carbon sink” WIRED UK, <http://www.wired.co.uk/news/archive/2013-01/22/geoengineering-oceans-olivine>

However, Wolf-Gladrow is sceptical that humanity should rely on geoengineering as a main tool to fight against climate change. He told us: "It's a controversial debate. I would prefer other solutions. Germany is going a good way, around 25 percent of energy is renewable. So if I had to invest money, I would put it into renewables. But it's important to know the options. At the end, when we cut down CO2 emissions, how do we take the CO2 out of the atmosphere that's already been released? One way would be to use olivine in smaller amounts."

“Hangx and Spiers say it won’t work” – Response: But they admit that terrestrial spreading of olivine might work and is worthy of more research

Suzanne Hangx, Dr. Christopher J. Spiers 2009. (Hangx – master’s degree candidate in geology at Utrecht University, Netherlands. Spiers – PhD; professor in the Faculty of Geosciences, Utrecht University .) Coastal spreading of olivine to control atmospheric CO2 concentrations: A critical analysis of viability, International Journal of Greenhouse Gas Control, published Aug 2009 <http://www.innovationconcepts.eu/res/literatuurGPV/2009hangxspiersolivine.pdf>

We have shown above that coastal weathering is relatively slow and largely impractical. However, terrestrial spreading has several possible advantages over coastal spreading of olivine, as soils generally have a lower pH, typically around pH 4 and are rich in organic acids. These factors could potentially enhance olivine dissolution rates by a total of perhaps two orders of magnitude compared to dissolution in seawater (cf. Fig. 1). In addition, terrestrial spreading of olivine in (sub)tropical areas would beneﬁt from the higher temperatures, which will enhance dissolution rates further (up to 600 times at 40 8C compared to 25 8C). On the other hand, evaporation effects may lead to magnesite or hydromagnesite formation (reactions (1a) and (2) instead of (3)) reducing CO2 uptake rates by up to a factor of 2. This all means that reaction rates for olivine spread on land in the tropics could be up to 200–600 times faster than for beaches. Though terrestrial spreading of olivine will encounter similar transport and infrastructural problems to coastal spreading, and while the possible impact upon agriculture, environment, ecology and human or animal health (ﬁne olivine) remains to be clariﬁed, it is inherently more promising and deserves further research