**National Speech & Debate Association**

*Policy Debate – 2014-2015 – Update – 10/26/14*

Resolved: The United States federal government should substantially increase its non-military exploration and/or development of the Earth’s oceans.

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**\*\*\*ICEBREAKERS AFFIRMATIVE – UPDATES\*\*\***

**1AC – Methane Adv – Renewables Scenario (1/2)**

**Methane extraction decimates renewable energy leadership**

**EM 12** (Environmental Magazine, “Unleashing the Methane Monster,” November 12, 2012, http://www.emagazine.com/daily-news/unleashing-the-methane-monster)

Environmental groups are already voicing concern about the possible impacts of unleashing deeply stored methane, a global warming gas that has more than 20 times the heat-trapping potential of carbon dioxide although it does not linger in the atmosphere as long. They note that the Arctic is already under serious threat from climate change impacts , with permanent ice cover declining by 9% each decade, accelerating global warming overall as less snow and ice allow the earth to absorb more sunlight. Creating a more robust drilling infrastructure in this sensitive region could have many unintended consequences, critics argue. It also directs further reliance and research dollars into fossil fuels as opposed to advancing cleaner, safer renewable energy alternatives. “Finding new ways to produce fossil fuels doesn’t change the fact that we can’t transfer to the atmosphere all the carbon in the fuels we already have without causing catastrophic climate disruption,” Dan Lashof, a climate analyst with the Natural Resources Defense Council, told msnbc.com. Brendan Cummings of the Center for Biological Diversity noted the dangers inherent in methane extraction in the Arctic to the AP, saying: “Any exploration activities designed to extract methane hydrates run the risk of unintended consequences, of unleashing the monster.”

**Global warfare**

**Klarevas, 9** — professor at the Center for Global Affairs at New York University (Louis, “Securing American Primacy While Tackling Climate Change: Toward a National Strategy of Greengemony”, 12/15/2009, http://www.huffingtonpost.com/louis-klarevas/securing-american-primacy\_b\_393223.html)

\*\*\*gendered language modified

As national leaders from around the world are gathering in Copenhagen, Denmark, to attend the United Nations Climate Change Conference, the time is ripe to re-assess America's current energy policies - but within the larger framework of how a new approach on the environment will stave off global warming and shore up American primacy. **By not addressing climate change** more aggressively and creatively, **the U**nited **S**tates **is squandering** an opportunity to secure its **global primacy** for the next few generations to come. To do this, though, the U.S. must rely on innovation to help the world escape the coming environmental meltdown. Developing the key technologies that will save the planet from global warming will allow the U.S. to outmaneuver potential great power rivals seeking to replace it as the international system's hegemon. But the greening of American strategy must occur soon. The U.S., however, seems to be stuck in time, unable to move beyond oil-centric geo-politics in any meaningful way. Often, the gridlock is portrayed as a partisan difference, with Republicans resisting action and Democrats pleading for action. This, though, is an unfair characterization as there are numerous proactive Republicans and quite a few reticent Democrats. The real divide is instead one between realists and liberals. Students of realpolitik, which still heavily guides American foreign policy, largely discount environmental issues as they are not seen as advancing national interests in a way that generates relative power advantages vis-à-vis the other major powers in the system: Russia, China, Japan, India, and the European Union. Liberals, on the other hand, have recognized that global warming might very well become the greatest challenge ever faced by (hu)mankind. As such, their thinking often eschews narrowly defined national interests for the greater global good. This, though, ruffles elected officials whose sworn obligation is, above all, to protect and promote American national interests. What both sides need to understand is that by becoming a lean, mean, green fighting machine, the U.S. can actually bring together liberals and realists to advance a collective interest which benefits every nation, while at the same time, securing America's global primacy well into the future. To do so, the U.S. must re-invent itself as not just your traditional hegemon, but as history's first ever green hegemon. Hegemons are countries that dominate the international system - bailing out other countries in times of global crisis, establishing and maintaining the most important international institutions, and covering the costs that result from free-riding and cheating global obligations. Since 1945, that role has been the purview of the United States. Immediately after World War II, Europe and Asia laid in ruin, the

**1AC – Methane Adv – Renewables Scenario (2/2)**

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global economy required resuscitation, the countries of the free world needed security guarantees, and the entire system longed for a multilateral forum where global concerns could be addressed. The U.S., emerging the least scathed by the systemic crisis of fascism's rise, stepped up to the challenge and established the postwar (and current) liberal order. But don't let the world "liberal" fool you. While many nations benefited from America's new-found hegemony, the U.S. was driven largely by "realist" selfish national interests. The liberal order first and foremost benefited the U.S. With the U.S. becoming bogged down in places like Afghanistan and Iraq, running a record national debt, and failing to shore up the dollar, the future of American hegemony now seems to be facing a serious contest: potential rivals - acting like sharks smelling blood in the water - wish to challenge the U.S. on a variety of fronts. This has led numerous commentators to forecast the U.S.'s imminent fall from grace. Not all hope is lost however. With the impending systemic crisis of global warming on the horizon, the U.S. again finds itself in a position to address a transnational problem in a way that will benefit both the international community collectively and the U.S. selfishly. The current problem is two-fold. First, the competition for oil is fueling animosities between the major powers. The geopolitics of oil has already emboldened Russia in its 'near abroad' and China in far-off places like Africa and Latin America. As oil is a limited natural resource, a nasty zero-sum contest could be looming on the horizon for the U.S. and its major power rivals - a contest which threatens American primacy and global stability. Second, converting fossil fuels like oil to run national economies is producing irreversible harm in the form of carbon dioxide emissions. So long as the global economy remains oil-dependent, greenhouse gases will continue to rise. Experts are predicting as much as a 60% increase in carbon dioxide emissions in the next twenty-five years. That likely means more devastating water shortages, droughts, forest fires, floods, and storms. In other words, if global competition for access to energy resources does not undermine international security, global warming will. And in either case, oil will be a culprit for the instability. Oil arguably has been the most precious energy resource of the last half-century. But "black gold" is so 20th century. The key resource for this century will be green gold - clean, environmentally-friendly energy like wind, solar, and hydrogen power. Climate change leaves no alternative. And the sooner we realize this, the better off we will be. What Washington must do in order to avoid the traps of petropolitics is to convert the U.S. into the world's first-ever green hegemon. For starters, the federal government must drastically increase investment in energy and environmental research and development (E&E R&D). This will require a serious sacrifice, committing upwards of $40 billion annually to E&E R&D - a far cry from the few billion dollars currently being spent. By promoting a new national project, the U.S. could develop new technologies that will assure it does not drown in a pool of oil. Some solutions are already well known, such as raising fuel standards for automobiles; improving public transportation networks; and expanding nuclear and wind power sources. Others, however, have not progressed much beyond the drawing board: batteries that can store massive amounts of solar (and possibly even wind) power; efficient and cost-effective photovoltaic cells, crop-fuels, and hydrogen-based fuels; and even fusion. Such innovations will not only provide alternatives to oil, they will also give the U.S. an edge in the global competition for hegemony. If the U.S. is able to produce technologies that allow modern, globalized societies to escape the oil trap, those nations will eventually have no choice but to adopt such technologies. And this **will give the U.S. a tremendous economic boom, while** simultaneously **providing it with means of leverage that can** be employed to **keep** potential **foes in check**. The bottom-line is that the U.S. needs to become green energy dominant as opposed to black energy independent - and the best approach for achieving this is to promote a national strategy of greengemony.

**2AC – Methane Adv – XT: Crushes Renewables**

**Extraction expansion trades-off with green tech efforts --- perpetuates reliance on fossil fuels**

**Kharecha 08** (Pushker Kharecha, Climate Scientist, NASA Goddard Institute for Space Studies, Colombia University Earth Institute, “Japan’s Arctic Methane Hydrate Haul Raises Environmental Fears,” April 14, 2008, http://www.odac-info.org/node/1780)

These basic facts, along with the well-established fact that a significant fraction of anthropogenic CO2 emissions will remain in the atmosphere for many centuries, make it abundantly clear that widespread extraction and use of even a seemingly small fraction of the world’s methane hydrates would be extremely undesirable from a global climate perspective, if such use results in further unconstrained emissions of CO2 (or methane). Thus, the recent buzz about Japan’s methane hydrate exploration is certainly cause for concern. However, in the interest of basic fairness and avoidance of premature finger-pointing, it should be noted that my own country’s government has made no secret of its plans to make methane hydrates a commercially viable fuel source within the next decade, see reference . Whether or not this is a feasible goal remains to be seen. However, given the worldwide dependence on fossil fuels, the impending ‘peaks’ in global conventional oil and natural gas production, and the massive fuel potential of hydrates, it seems very likely that more and more countries (and energy companies) will be tempted to pursue similar goals as the American and Japanese governments (e.g., see reference ). Several recent studies by James Hansen, myself, and our colleagues have concluded that unconventional fossil fuels such as methane hydrates can only be burned if the resulting greenhouse gases are prevented from entering the atmosphere (see Implications of "peak oil" for atmospheric CO2 and climate and Target atmospheric CO2: Where should humanity aim? ). A major concern is that fuel derived from methane hydrates would most likely be used to substitute for dwindling oil and gas. But since most CO2 emissions from current oil and gas use are not amenable to capture and sequestration (because these fuels are used mainly in vehicles, homes, etc.), any hydrate-derived fuels must be used differently in the future. One possible way to resolve this would be to use these fuels only at power plants that employ carbon capture and sequestration, with the resulting electricity being used to power plug-in hybrid cars. In a broader sense though, the pursuit of methane hydrates as fuels seems like a step backward, since it would only entail continuing reliance on finite, nonrenewable fossil energy. Given that the world must inevitably move beyond such resources, it would make far more sense to focus near-term efforts on large-scale development of truly ‘green’, carbon-negative technologies.

**2AC – Methane Adv – AT: Impact Turn – Overview**

**Framing issue --- relative risk means you should err affirmative --- they only need to be wrong once to trigger the impact --- precautionary principle and intervening actors flips try or die framing because we can find another more environmentally friendly way to deal with potential methane releases**

**This is particularly true in the context of drilling --- low risk that they aren’t 100% perfect just once triggers the impact**

**Carlisle 11** (Tamsin Carlisle, journalist, the National, “The Drilling Danger of Releasing Giant Bubbles of Methane Gas,” the National, March 27, 2011, http://www.thenational.ae/thenationalconversation/industry-insights/energy/the-drilling-danger-of-releasing-giant-bubbles-of-methane-gas)

The "burps of death" are what can ensue when drillers mess with the planet's least accessible stores of natural gas. The trouble with gas hydrates, as those ice-like deposits in the Arctic and under ocean beds are known, is that they lock up high concentrations of methane in a notoriously unstable crystalline lattice. Change the temperature and pressure just a bit, and the whole thing collapses, releasing giant bubbles of potentially explosive methane gas in a fit of geological indigestion. Some scientists theorise that a global firestorm resulting from one such outburst may have barbecued the dinosaurs. Another ancient oceanic burp, which did not ignite, may have triggered an equally lethal spurt of global warming linked to mass extinctions.

**Financial bias also makes a lot of sense in this specific context because it functions as a solvency filter that magnifies our link turn --- their authors, including the DOE, have a huge incentive to lie about safety and effectiveness --- this not only puts their evidence in a spotlight of skepticism but also makes our link turns far more likely because greed and subsequent expansion of an entire industry from the plan makes accidents significantly more likely**

**GVC 12** (GVConsulting, comprehensive consulting firm, “Indigenous Solidarity for Arctic Protection,” Alaska Inter-Tribal Council Statement of Indigenous Solidarity for Arctic Protection, September 14, 2012, http://gregoryvickrey.com/tag/drilling/)

There was a reason why the Cancún set of “agreements” was nothing more than an agreement to do nothing. Melting permafrost and venting methane hydrates – the greatest accelerating threat to all life on Earth – are seen to those blinded by stupidity, greed and psychopathic tendencies as nothing less than the ultimate climate wealth jackpot with global warming having opened up the Arctic. Burn baby burn. Keep raping and pillaging our Earth to burn ever more earth-locked hydrocarbons as we apparently have not suffered enough to learn. And as we continue to burn the fossil fuels, burn with them the dreams of the children of those most vulnerable whose lives will be annihilated for short-term monetary wealth. The insanity is breathtaking. **Lying hundreds of metres below the sea and deeper still below sediments, frozen methane** gas **is exceedingly difficult and extremely dangerous to extract as the pressure is enormous.** If Japan “succeeds,” it will have a massive impact, equivalent to the use of shale gas now being witnessed in the United States.

**2AC – Methane Adv – AT: Impact Turn – XT: Warming**

**Triggers warming even if it’s safe**

**Joling 12** (Dan Joling, “Alaska's Methane Hydrate Resource Sparks Debate Over Energy And Climate Change,” Huffington Post, November 11, 2012, http://www.huffingtonpost.com/2012/11/11/methane-hydrate-alaska-north-slope-climate-change\_n\_2113828.html)

"Any exploration activities designed to extract methane hydrates run the risk of unintended consequences, of unleashing the monster," he said. **Even if methane is extracted safely, burning it will add to climate warming,** he said.

**Methane is the key internal link --- new release would make rapid warming irreversible**

**Pentland 08** (William Pentland, “Energy’s Most Dangerous Game,” Forbes, September 2, 2008, http://www.forbes.com/2008/08/29/energy-methane-hydrates-biz-energy-cx\_wp\_0902gashydrates.html)

A mass release of methane into the sea and atmosphere could have catastrophic consequences on the pace of climate change. More than 50 million years ago, undersea landslides resulted in the release of methane gas from methane hydrate, which contributed to global warming that lasted tens of thousands of years. **"Methane hydrate was a key cause of the global warming that led to one of the largest extinctions in** the **earth's history,"** Ryo Matsumoto, a professor at the University of Tokyo who has spent 20 years researching the subject, told Bloomberg in December.

**2AC – Methane Adv – AT: Impact Turn – Extraction Fails**

**Only a risk of aff offense --- extraction fails --- several warrants**

**a) Depth and seabed sloping**

**Harris 09** (William Harris, contributing writer, How Stuff Works, freelance writer, BA in biology, Virginia Tech, MA in science education, Florida State University, “How Frozen Fuel Works,” 2009, http://science.howstuffworks.com/environmental/green-tech/energy-production/frozen-fuel4.htm)

The potential rewards of releasing methane from gas hydrate fields must be balanced with the risks. And the risks are significant. Let's start first with challenges facing mining companies and their workers. Most methane hydrate deposits are located in seafloor sediments. That means drilling rigs must be able to reach down through more than 1,600 feet (500 meters) of water and then, because hydrates are generally located far underground, another several thousand feet before they can begin extraction. Hydrates also tend to form along the lower margins of continental slopes, where the seabed falls away from the relatively shallow shelf toward the abyss. **The roughly sloping seafloor makes it difficult to run pipeline.**

**b) Hydrate instability, leaks, and inefficiency**

**Harris 09** (William Harris, contributing writer, How Stuff Works, freelance writer, BA in biology, Virginia Tech, MA in science education, Florida State University, “How Frozen Fuel Works,” 2009, http://science.howstuffworks.com/environmental/green-tech/energy-production/frozen-fuel4.htm)

Even if you can situate a rig safely, methane hydrate is unstable once it's removed from the high pressures and low temperatures of the deep sea. Methane begins to escape even as it's being transported to the surface. Unless there's a way to prevent this leakage of natural gas, **extraction** won't be efficient. It **will be** a bit **like hauling up well water using a pail riddled with holes.**

**2AC – Methane Adv – AT: Impact Turn – Solves Release**

**Underwater landslides are inevitable even with “safe” extraction --- the terminal impact is the same amount of aggregate methane release --- only our evidence cites consensus**

**Pentland 08** (William Pentland, “Energy’s Most Dangerous Game,” Forbes, September 2, 2008, http://www.forbes.com/2008/08/29/energy-methane-hydrates-biz-energy-cx\_wp\_0902gashydrates.html)

The paradox is that while gas can be extracted from methane hydrates, doing so poses potentially catastrophic risks. Methane hydrates are frozen water molecules that trap methane gas molecules in a crystalline, lattice-like structure known as a hydrate. Unlike normal ice, hydrate ice literally burns--light a match and it goes up in flames. As temperatures rise or pressure rates fall, the hydrate disintegrates and the water releases the gas. A substantial amount of evidence suggests that weakening the lattice-like structure of gas hydrates has triggered underwater landslides on the continental margin. In other words, **the extraction process,** if done improperly, **could cause sudden disruptions on the ocean floor,** reducing ocean pressure rates and **releasing methane gas** from hydrates.

**2AC – Methane Adv – AT: Impact Turn – AT: CO2 Trapping**

**Sequestering link turn is wrong --- burning massively outweighs their internal link and trapping is temporary --- no net reduction**

**Moeller 12** (Holly Moeller, Ecology and Evolution, Stanford University, Chemistry and Biology, Rutgers University, “Blowing Hot Air: The Methane Hydrate Delusion,” Science 2.0, May 10, 2012, http://www.science20.com/seeing\_green/blowing\_hot\_air\_methane\_hydrate\_delusion-89822)

As an added bonus, methane extraction traps CO2. The latest technology pumps the most notorious greenhouse gas into the ground, where it replaces methane in the ice matrix. The displaced methane is then pumped to the surface and – in the DoE’s (and, undoubtedly, ConocoPhillips’) vision – down pipelines to heat homes in the Lower 48. Plus, argue supporters, climate change projections indicate that rising temperatures may release much of that methane anyway. If the permafrost thaws or the ocean warms, vast tracts of icy clathrates could melt, outgassing methane – which has 20 times the warming potential of CO2 – into the atmosphere, further accelerating climate change. This is one of the most feared positive feedback loops known to climate scientists. So wouldn’t it be nice if we could turn some of that methane into carbon dioxide ahead of time? I don’t think so. Burning fossil fuels – oil, coal, and natural gas – put us into our tenuous climatic position in the first place. Any CO2 we sequester during methane hydrate extraction will quickly be replaced through burning of the extracted methane. And the CO2 trap is only temporary: warmer polar temperatures will free it as surely as the presently trapped methane scientists are so concerned about.

**2AC – Methane Adv – AT: Impact Turn – AT: Natural Degassing (1/2)**

**Expert consensus votes aff --- only scenario for degassing is through accelerated warming --- this is triggered only by the plan as status quo hydrates are stabilizing --- at worst, they still cause massive tsunamis --- impacted by the 1AC**

**Harris 09** (William Harris, contributing writer, How Stuff Works, freelance writer, BA in biology, Virginia Tech, MA in science education, Florida State University, “How Frozen Fuel Works,” 2009, http://science.howstuffworks.com/environmental/green-tech/energy-production/frozen-fuel4.htm)

Believe it or not, this leakage may be the least of the worries. Many geologists suspect that gas hydrates play an important role in stabilizing the seafloor. **Drilling** in these oceanic deposits **could destabilize the seabed, causing vast swaths of sediment to slide** for miles down the continental slope. Evidence suggests that such underwater landslides have occurred in the past (see sidebar), with devastating consequences. The movement of so much sediment would certainly trigger massive tsunamis similar to those seen in the Indian Ocean tsunami of December 2004. But perhaps the biggest concern is how methane hydrate mining could affect global warming. Scientists already know that hydrate deposits naturally release small amounts of methane. The gas works itself skyward -- either bubbling up through permafrost or ocean water -- until it's released into the atmosphere. Once methane is in the atmosphere, it becomes a greenhouse gas even more efficient than carbon dioxide at trapping solar radiation. Some experts fear that drilling in hydrate deposits could cause catastrophic releases of methane that would greatly accelerate global warming.

**More ev --- extinction**

**Sid-Ahmed 05** (Mohamed, “The post-earthquake world.” Al-Ahram Weekly Online. Jan 6-12, 2005. http://weekly.ahram.org.eg/2005/724/op3.htm)

The earthquake that struck deep under the Indian Ocean was the strongest in over a century. What is still more critical is that what we have witnessed so far is only the beginning of the catastrophe. According to a spokesman from the World Health organisation, "there is certainly a chance that we could have as many dying from communicable diseases as from the tsunamis". The logistics of providing the survivors with clean water, vaccines and medicines are formidable, and, with many thousands of bodies lying unburied, epidemics spread by waterborne diseases are expected to claim many thousands of victims. There is also the possibility of seismic activity elsewhere in the world because disturbances in the inner structure of the earth's crust have occurred and there are no means to foresee how they will unfold. Will they build up into still broader disarray and eventually move our planet out of its orbit around the sun? Moreover, even if we can avoid the worse possible scenario, how can we contain the earthquake's effects ecologically, meteorologically, economically and socially? The contradiction between Man and Nature has reached unprecedented heights, forcing us to re-examine our understanding of the existing world system. US President George W Bush has announced the creation of an international alliance between the US, Japan, India, Australia and any other nation wishing to join that will work to help the stricken region overcome the huge problems it is facing in the wake of the tsunamis. Actually, the implications of the disaster are not only regional but global, not to say cosmic. Is it possible to mobilise all the inhabitants of our planet to the extent and at the speed necessary to avert similar disasters in future? How to engender the required state of emergency, that is, a different type of inter-human relations which rise to the level of the challenge before contradictions between the various sections of the world community make that collective effort unrealisable? The human species has never been exposed to a natural upheaval of this magnitude within living memory. What happened in South Asia is the ecological equivalent of 9/11. Ecological problems like global warming and climatic disturbances in general threaten to make our natural habitat unfit for human life. **The extinction of the species has become a very real possibility,** whether by our own hand or **as a result of natural disasters** of a much greater magnitude than the Indian Ocean earthquake and the killer waves it

**2AC – Methane Adv – AT: Impact Turn – AT: Natural Degassing (2/2)**

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spawned. Human civilisation has developed in the hope that Man will be able to reach welfare and prosperity on earth for everybody. But now things seem to be moving in the opposite direction, exposing planet Earth to the end of its role as a nurturing place for human life. Today, human conflicts have become less of a threat than the confrontation between Man and Nature. At least they are less likely to bring about the end of the human species. The reactions of Nature as a result of its exposure to the onslaughts of human societies have become more important in determining the fate of the human species than any harm it can inflict on itself. Until recently, the threat Nature represented was perceived as likely to arise only in the long run, related for instance to how global warming would affect life on our planet. Such a threat could take decades, even centuries, to reach a critical level. This perception has changed following the devastating earthquake and **tsunamis** that hit the coastal regions of South Asia and, less violently, of East Africa, on 26 December. This cataclysmic event **has** underscored the vulnerability of our world before the wrath of Nature and shaken the sanguine belief that the end of the world is a long way away. Gone are the days when we could comfort ourselves with the notion that the extinction of the human race will not occur before a long-term future that will only materialise after millions of years and not affect us directly in any way. We are now **forced** to live with **the possibility of an imminent demise of humankind.**

**2AC – Methane Adv – Arctic Ecosystems Add-On**

**Methane extraction devastates sensitive Arctic ecosystems**

**Moeller 12** (Holly Moeller, Ecology and Evolution, Stanford University, Chemistry and Biology, Rutgers University, “Blowing Hot Air: The Methane Hydrate Delusion,” Science 2.0, May 10, 2012, http://www.science20.com/seeing\_green/blowing\_hot\_air\_methane\_hydrate\_delusion-89822)

Methane hydrates, no matter how vast their supply seems, are just another nonrenewable resource. A boom in gas production will add years – maybe decades – to the difficult but necessary transition to renewable energy sources. And in the meantime, we’ll be doing plenty of damage to our environment both globally – through additional greenhouse gas emissions – and locally – by drilling in sensitive ecosystems. In the last decade, we’ve fought plenty of environmental battles over how and where to drill for oil. We’ve seen the consequences – Deepwater Horizon and the Gulf of Mexico 2010 spill, for example – of pushing our technological limits towards harder and harder to reach deposits. And now we want to grasp at something even more risky, at mineral formations that, when destabilized, cause explosions and landslides.

**Extinction**

**WWF 10** (World Wildlife Fund, “Drilling for Oil in the Arctic: Too Soon, Too Risky,” Nuka Research and Planning Group, LLC, December 1, 2010, http://assets.worldwildlife.org/publications/393/files/original/Drilling\_for\_Oil\_in\_the\_Arctic\_Too\_Soon\_Too\_Risky.pdf?1345753131)

Planetary Keystone The Arctic and the subarctic regions surrounding it are important for many reasons. One is their enormous biological diversity: a kaleidoscopic array of land and seascapes supporting millions of migrating birds and charismatic species such as polar bears, walruses, narwhals and sea otters. Economics is another: Alaskan fisheries are among the richest in the world. Their $2.2 billion in annual catch fills the frozen food sections and seafood counters of supermarkets across the nation. However, there is another reason why the Arctic is not just important, but among the most important places on the face of the Earth. A keystone species is generally defined as one whose removal from an ecosystem triggers a cascade of changes affecting other species in that ecosystem. The same can be said of the Arctic in relation to the rest of the world. With feedback mechanisms that affect ocean currents and influence climate patterns, the Arctic functions like a global thermostat. **Heat balance, ocean circulation patterns and the carbon cycle are all related to its** regulatory and carbon storage **functions.** Disrupt these functions and we effect far-reaching changes in the conditions under which life has existed on Earth for thousands of years. In the context of climate change, the Arctic is a keystone ecosystem for the entire planet.

**2AC – AT: Mapping DA**

**Gazprom leads to methane drilling --- the 1AC methane advantage is an impact turn to the DA**

**Light 12** (Malcom PhD. UCLA “ A Proposal for the Prevention of Arctic Methane Induced Catastrophic Global Climate Change by Extraction of Methane from beneath the Permafrost/ Arctic Methane Hydrates and its Storage and Sale as a Subsidized "Green Gas" Energy Source” http://arctic-news.blogspot.com/2012/05/proposal-to-extract-store-and-sell.html)

Because of the massive size of the methane hydrate "Green Gas" reserves in the Arctic (equivalent to more than 700 million giant gas fields; Halbouty 2001) the process of methane extraction could last over hundreds of years and supply fuel for a safe "Green Gas" electricity generation future during the long transition of the Earth to a complete green powered economy. New technologies will come in designing and mass producing drilling platforms for the Arctic shallow shelf and slope regions, in mass producing specific LNG tankers for methane, in designing and developing the gas pipeline infrastructure to transport the gas and converting all existing coal and oil electric power stations to natural gas. Gazprom is constructing large drilling platforms for working in the Arctic in shallow water where the methane hydrate threat is large (Gazprom, 2011). Where possible jack-up rigs may be preferable as they can sit on the sea floor in case there is a blow - out, but the use of rigs with both a floating and jack up capability is to be preferred. Where undersea pipelines are laid down they must be run parallel to the trend of and some distance away from the major strike - slip faults cutting the Gakkel Ridge because these faults are active and could cause severe damage to undersea structures.

**\*\*\*ICEBREAKERS NEGATIVE – UPDATES\*\*\***

**1NC – Methane Adv – Impact Turns (1/6)**

**Expanding unregulated, unchecked US access to Arctic mining is good --- the plan disrupts our ability to out-compete other Arctic exploitation which decks our access to methane extraction and rare-earth elements**

**Hobson 12** (Margaret Kriz Hobson, Environment and Energy reporter, “Aging Infrastructure Adds to Woes of Alaska-Bound Fuel Tanker,” Greenwire, E&E Publishing, LLC, January 10, 2012, http://www.eenews.net/public/Greenwire/2012/01/10/1)

But Alaska has no deepwater offshore port or on-shore harbor along its western or North Slope shores. As a result, the United States is ill-equipped to police the Arctic's domestic and international waters, to service the international ship traffic or offer help during weather-related crises, such as Nome's sudden ice storm. "We're way behind the curve on Arctic infrastructure," said Alaska Democrat Mark Begich, who chairs the Senate Oceans, Atmosphere, Fisheries and Coast Guard Subcommittee. "While other nations are recognizing the opportunities -- and responsibilities -- in the changing Arctic, the United States has not. We've talked about it, studied it and held hearings, but Congress has not committed the resources to actually building it." Other Arctic nations are charting northern shipping routes that could save time and fuel costs. The nations are also focusing on development of new frontiers for oil, gas and mineral extraction. Canada and Russia are planning new Arctic harbors or are expanding their existing facilities. Under a joint venture with South Korea, Canada plans to ship liquefied natural gas to the Far East. Now, Alaskan and federal officials are taking a hard look at whether to build at least one deepwater port in the U.S. Arctic. Late last year, Alaska state officials and the Army Corps of Engineers began a three-year, $3 million study to consider where and how to build a marine facility that would cement the United States' role in the Arctic energy and shipping industries. The study will examine potential locations to site floating, man-made ports that could be anchored several miles offshore to serve as terminals for sea-bound traffic or drilling ships. **They will** also **look for** shoreline **sites that could be dredged and expanded to allow easier access to cargo ships and provide a safe harbor for long-haul tankers** and tourist ships. The Army Corps-state study will search state shores from Nunivak Island near Alaska's southwestern coast, along the state's zigzagging western shore line, to the frigid North Slope. A steering committee of business, scientific and government experts, recruited to advise the study team, will begin meeting later this month. By the end of the year, the group hopes to narrow down the list of deepwater port candidates, said Don Fore, a U.S. Army Corps of Engineers-Alaska project manager who is heading the study. Once a site is selected, the financing, planning, design and construction could take 20 years to complete. Industry officials privately estimate that the cost of the project could climb to $1 billion. Alaska officials see the port as an opportunity to attract new business and provide jobs. "The state has requested that we look at deepwater ports essentially for the purpose of extracting minerals," Fore said. Commercial interests are already anticipating greater access to the Arctic. This summer, Royal Dutch Shell PLC hopes to begin sinking exploratory oil wells in Alaska's Chukchi Sea. **Mining firms are considering capitalizing on the massive** coal reserves in northwestern Alaska, as well as the copper and **rare-earth mineral resources.** More than ever before, Alaska business leaders are taking a serious look at the business plan for building a deepwater port or harbor along the state's northwest shores, said James Hemsath, deputy director for project development and asset management at the Alaska Industrial Development and Export Authority, a state financing corporation. "It's a little more real" for many reasons, Hemsath said. "Mines that were not economic are now becoming economic because of changes in technology, changes in commodity prices. People are more concerned about search and rescue and the ability to support offshore drilling. Those are all starting to line up.

**1NC – Methane Adv – Impact Turns (2/6)**

**New Department of Energy tests prove hydrate mining works**

**DOE 12** (Department of Energy, “U.S. and Japan Complete Successful Field Trial of Methane Hydrate Production Technologies,” May 5 2012, http://energy.gov/articles/us-and-japan-complete-successful-field-trial-methane-hydrate-production-technologies)

WASHINGTON, DC – U.S. Energy Secretary Steven Chu announced today the completion of a successful, unprecedented test of technology in the North Slope of Alaska that was able to safely extract a steady flow of natural gas from methane hydrates – a vast, entirely untapped resource that holds enormous potential for U.S. economic and energy security. Building upon this initial, small-scale test, the Department is launching a new research effort to conduct a long-term production test in the Arctic as well as research to test additional technologies that could be used to locate, characterize and safely extract methane hydrates on a larger scale in the U.S. Gulf Coast.

**Massive Arctic methane hydrate blowout is inevitable --- mining stabilizes the hydrates and solves extinction --- now is key**

**Light 12** (Malcolm P.R. Light, Center for Polar Observation and Modeling, University of London, polar climate modeling and methane hydrates in the permafrost and submarine Arctic, “Charting Mankind’s Arctic Methane Emission Exponential Expressway to Total Extinction in the Next 50 Years,” Arctic News, August 10, 2012, http://arctic-news.blogspot.com/2012/08/charting-mankinds-expressway-to-extinction.html)

**If left alone** the subsea **Arctic methane hydrates will explosively destabilize on their own due to global warming and produce a massive** Arctic wide **methane “blowout” that will lead to** humanity’s **total extinction,** probably before the middle of this century (Light 2012 a, b and c). AIRS atmospheric methane concentration data between 2008 and 2012 (Yurganov 2012) show that the Arctic has already entered the early stages of a subsea methane “blowout” so we need to step in as soon as we can (e.g. 2015) to prevent it escalating any further (Light 2012c). The Arctic Natural Gas Extraction, Liquefaction & Sales (ANGELS) Proposal aims to reduce the threat of large, abrupt releases of methane in the Arctic, by extracting methane from Arctic methane hydrates prone to destabilization (Light, 2012c). After the Arctic sea ice has gone (probably around 2015) we propose that a large consortium of oil and gas companies/governments set up drilling platforms near the regions of maximum subsea methane emissions and drill a whole series of shallow directional production drill holes into the subsea subpermafrost “free methane” reservoir in order to depressurize it in a controlled manner (Light 2012c). This methane will be produced to the surface, liquefied, stored and transported on LNG tankers as a “green energy” source to all nations, totally replacing oil and coal as the major energy source (Light 2012c). The subsea methane reserves are so large that they can supply the entire earth’s energy needs for several hundreds of years (Light 2012c). By sufficiently depressurizing the Arctic subsea subpermafrost methane it will be possible to draw down Arctic ocean water through the old eruption sites and fracture systems and destabilize the methane hydrates in a controlled way thus shutting down the entire Arctic subsea methane blowout (Light 2012c).

**1NC – Methane Adv – Impact Turns (3/6)**

**Mining controls the magnitude of the impact to methane leaks --- it’s key to limit emissions**

**Cohen 10** (Dave Cohen, MBA, Chemical Engineering, Chief Executive Officer of Northern Orion Resources Senior Vice President of Miramar Mining Corporation Chairman of Enterprise Energy Resources Ltd, “Methane Hydrates,” Energy Bulletin, February 11, 2010, http://www.energybulletin.net/node/51517)

Well, of course, this makes sense. We wouldn't want to inadvertently disturb a big patch of methane hydrates, which might lead to the release of a shitload of gas into the water column, which would eventually lead to its bubbling out of the sea and into the atmosphere. You see, if the methane in ocean floor hydrates gets loose, that's much, much worse than if we successfully capture it, pipe it somewhere and burn it. In this latter case, we only get the carbon emissions from burning the "pure" natural gas (CH4), not the full-blown greenhouse effects of unadulterated methane in the atmosphere, which converts to CO2 over time there—it's 25 times more potent per molecule [as a greenhouse gas] than carbon dioxide on a 100-year basis. Methane hydrates are stable under low temperatures and high pressures. So, I guess you could say that by capturing & burning the natural gas in ocean floor hydrates, we would be actually saving the planet from the future ruin we might incur if the deep oceans were to warm sufficiently—due to the burning of fossil fuels like natural gas—to cause natural degassing.

**Chinese monopoly on the market now makes global cyber fronts vulnerable to attack --- makes global warfare inevitable**

**Anthony 11** (12/30, Lead Editor at Ziff Davis Inc. Graduated from the University of Essex, Columnist, Editor at AOL News, “Rare earth crisis: Innovate, or be crushed by China”http://www.extremetech.com/extreme/111029-rare-earth-crisis-innovate-or-be-crushed-by-china/2)

The rare earth apocalypse The doomsday event that everyone is praying will never come to pass, but which every Western nation is currently planning for, is the eventual cut-off of Chinese rare earth exports. Last year, 97% of the world’s rare earth metals were produced in China — but over the last few years, the Chinese government has been shutting down mines, ostensibly to save what resources it has, and also reducing the amount of rare earth that can be exported. Last year, China produced some 130,000 tons of rare earths, but export restrictions meant that only 35,000 tons were sent to other countries. As a result, **demand outside China now outstrips supply** by some 40,000 tons per year, and — as expected — many countries are now stockpiling the reserves that they have. Almost every Western country is now digging around in their backyard for rare earth-rich mud and sand, but it’ll probably be too little too late — and anyway, due to geochemistry, there’s no guarantee that explorers and assayers will find what they’re looking for. The price of rare earths are already going up, and so are the non-Chinese-made gadgets and gizmos that use them. Exacerbating the issue yet further, as technology grows more advanced, our reliance on the strange and magical properties of rare earths increases — and China, with the world’s largest workforce and a fire hose of rare earths, is perfectly poised to become the only real producer of solar power photovoltaic cells, computer chips, and more. In short, **China has the world by the short hairs, and when combined with a hotting-up cyber front, it’s not hard to see how this situation might devolve into World War III.** The alternate, ecological point of view, is that we’re simply living beyond the planet’s means. Either way, strategic and logistic planning to make the most of scarce metals and minerals is now one of the most important tasks that face governments and corporations. Even if large rare earth deposits are found soon, or we start recycling our gadgets in a big way, the only real solution is to somehow lessen our reliance on a finite resource. Just like oil and energy, this will probably require drastic technological leaps. Instead of reducing the amount of tantalum used in capacitors, or indium in LCD displays, we will probably have to discover completely different ways of storing energy or displaying images. My money’s on graphene.

**1NC – Methane Adv – Impact Turns (4/6)**

**Also makes element wars and China war inevitable**

**Commiso 10** (Katharine Comisso, contributing writer for New Scientist, “Is This the Start of Element Wars?” September 2010, http://www.newscientist.com/blogs/shortsharpscience/2010/09/is-this-the-start-of-the-eleme.html)

China has just 37 percent of the world's estimated reserves of rare Earth elements (REEs), but a whopping 97 per cent of world production of REEs now comes from China; only a few other countries have REEs on their territory, but environmental and cost issues have so far made mining REES unattractive; the biggest threat may come from the availability of elements needed in agriculture, most particularly phosphorus Warnings have already been raised about water wars (“Water tensions, if not yet water wars, are here,” 15 April 2008 HSNW). Now **the prospect of “element wars” is becoming more real.** Chinese customs officials are blocking shipments to Japan of rare earth elements (REEs) and companies have been informally told not to export them, Says the New York Times. The move puts more pressure on relations already tested by the capture of a Chinese fishing boat captain in disputed waters earlier this month. The captain was finally released on Friday, says the Financial Times, but the ban on exports appears to remain in place. The ruckus comes amid mounting concern over the supply of REEs from China (“China restricts rare-earth metals export, so Japanese devise an alternatives,” 15 September 2010 HSNW). The country has been imposing export quotas for some time, perhaps in an effort to preserve stockpiles to meet growing demand at home, and also to process the raw materials itself. Katharine Comisso writes in New Scientist that REEs have uses in electronics, medicine, and defense. They find their way into everything from computer hard drives to catalytic converters, wind turbines to hybrid cars, sunglasses to lasers. At present China has an almost complete monopoly on mining REEs. Despite having just 37 percent of the world’s estimated reserves, a whopping 97 per cent of world production now comes from China, according to a British Geological Survey (pdf). Comisso notes that this is making the United States uneasy. The House of Representatives reviewed a bill last week that could end the U.S. dependency on China. The United States has its own rare earth mine at Mountain Pass in California, but it was closed in 2002 because of environmental issues (but see “Boeing helps search for rare earth metals in U.S.,” 22 September 2010 HSNW). REEs are not the only type of element over which we can expect to see trouble. Three years ago New Scientist reported on the alarming rate at which some of the world’s reserves of rare metals are being used up. The report examined how long our supplies of various metals will last and where they are located. “The Earth clearly has insufficient resources for the global population to live as those the West do, and if wealthy countries do not change their ways, that can only end in bitter quarrels,” Comisso writes. Disputes about diminishing essential elements may come to “dominate relations between countries,” according to the chief executive of the U.K.’s Royal Society of Chemistry, Richard Pike.

**1NC – Methane Adv – Impact Turns (5/6)**

**Domestic sites won’t be sufficient and precedent short circuits potential barriers to resource conflict**

**Schwartz 10** (Ariel Schwartz, “The New Resource Wars: What if China Stops Exporting Rare Elements?” Sept. 23, fastcompany)

Earlier this week, China halted all shipments of rare earth metals to Japan after the country detained a Chinese fishing trawler captain on a boat in contested water. This was a political act designed to strongarm Japan into releasing the captain (he is still in custody). And it sets a scary precedent--China mines 93% of all rare earth metals. What happens if China stops exporting rare earth metals altogether? We're becoming more and more reliant on rare earth metals, a collection of 17 chemical elements found in the Earth's crust. The metals actually aren't that rare, but they're only found in high concentrations in a few sites in China, the U.S., and Australia. Even if China doesn't halt exports, demand for rare earth metals is on track to outstrip supply by 40,000 metric tons per year in the next few years. A lack of supply could mean high prices for some of the technology that we value most, including electric car motors, wind turbines, solar panels (they're found in the glass), lithium-ion batteries, lasers, and optical-fiber communication systems. As it stands, the U.S. looks to Japan to manufacture most components containing rare earth metals. But that may change soon. According to the New York Times, the House of Representatives is scheduled to review a bill this week that could subsidize America's rare earth industry, which is centered around a mine in Mountain Pass, California. The rare earth mine--one of the largest in the world--has been closed since 2002 due to lack of demand, but Molycorp Minerals is now trying to raise the $500 million needed to reopen the site. Even if the site reopens, the U.S. and Europe will still probably rely on Asia for much of their rare earth needs--China has been mining large quantities of rare earth metals for decades, and has more experience using them for industrial applications. **The next resource war,** then, **may be over the materials** used in the clean energy technologies that were supposed to help us transition away from reliance on unstable regimes.

**China war causes great power nuclear war**

**White, 12** — professor of strategic studies at ANU and a visiting fellow at the Lowy Institute (Hugh, “The China Choice: A Bold Vision for U.S.-China Relations”, 8/17/12, http://thediplomat.com/2012/08/17/the-china-choice-a-bold-vision-for-u-s-china-relations/)

Even if China may not become strong enough to dominate Asia itself, it is already strong enough to prevent the U.S. maintaining primacy. If America tries to perpetuate the status quo, there is a very real risk of an escalating contest which neither side could win, and which could very easily flare into a major, and perhaps catastrophic, war. The main reason for America to seek an accommodation with China is to reduce the risk of such a catastrophe. Many people will disagree. Some of them think that the relationship with China is working fine, and that accommodation – or further accommodation – is unnecessary. They think that Washington is committed to a good relationship with Beijing, and that China will be satisfied with the kind of relationship America is offering now. I think this is too optimistic. The relationship today can manage day-to-day stresses, but is not robust enough to withstand real problems. Some people cite the Chen case earlier this year as proof that the relationship is strong, but the fact that such a minor issue can cause such anxieties about the future of the world’s most important bilateral relationship surely points the other way. The U.S.-China relationship is probably going to have to face much greater stresses in future, and it is not at all clear that it is strong enough to withstand them. Furthermore, the relationship seems to be getting weaker rather than stronger over time, so the risk of a rupture grows. The present fabric of the relationship is weak and getting weaker because China’s and America’s ambitions in Asia over coming decades are inherently incompatible. It is important to my argument to explain why this should be so. Those who think that America is already accommodating China have perhaps not really registered what is at stake here. For the past 40 years the Asian strategic order, and the U.S.-China relationship, have been based on a conception of American leadership which places all other countries in Asia in a clearly subordinate position. American policy today precludes any substantial change in this status quo over the coming decades. This was made clear by Barack Obama in his speech in Canberra in November of last year. American optimism about the future of the relationship therefore depends on the hope that China will find this acceptable. It is often said that America’s policy towards China today is not containment. But Washington clearly does

**1NC – Methane Adv – Impact Turns (6/6)**

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resist any substantial expansion of China’s influence at the expense of U.S. primacy. So if it’s not containment, that can only be because China is not seeking such an expansion. That seems to be wishful thinking. China accepted American primacy when America was many times richer and stronger than China. Now that the balance of relative power has changed, China’s ambitions have expanded. It would be very surprising if they hadn’t. Moreover those ambitions go very deep, fuelled by nationalism. There is no reason to assume that China is not just as committed to changing the status quo to increase its influence as America is to preserving the status quo to maintain its influence. So there is no reason to assume that China will just back down, and more than America will. This means that, unless America is willing to withdraw from Asia, it does face a choice between accommodating China or competing with it. Some people – like Professor Aaron Friedberg of Princeton – see the probability of rivalry but argue against seeking an accommodation with China because they think the costs of accommodation would be higher than those of rivalry. This may turn out to be true, because it partly depends on how much we would have to concede to China to reach an accommodation. But those who argue that we should not even seek an accommodation must assume that the costs of any possible deal with Beijing would outweigh the costs of rivalry. That view seems to me to imply a very serious underestimation of the kind of rivalry we might be talking about and where it might lead. As a rival, China is already the most formidable country America has every faced, because it is economically stronger relative to America than any country has been in over a century. **A war with China would be hard to contain,** and could swiftly become bigger than anything since the Second World War, dwarfing Vietnam and Korea. **There would be a real chance of escalation to nuclear exchanges** from which U.S. cities might not be spared. These risks must weigh very seriously in any policy debate. It is hard to argue that they do not justify at least exploring the possibility of accommodation with China.

**Resource wars also cause extinction**

**Woolridge, 9** — Former Officer in the US Army Medical Service Corps (Frosty, “America Galloping Toward Its Greatest Crisis in the 21st Century”, The Examiner, 5/22/2009, http://www.examiner.com/examiner/x-3515-Denver-Political-Issues-Examiner~y2009m5d22-America-galloping-toward-its-greatest-crisis-in-the-21st-century)

“It is clear that most politicians and most citizens do not recognize that returning to “more of the same” is a recipe for promoting the first collapse of a global civilization. The required changes in energy technology, which would benefit not only the environment but also national security, public health, and the economy, would demand a World War II type mobilization -- and even that might not prevent a global climate disaster. Without transitioning away from use of fossil fuels, humanity will move further into an era of resource wars (remember, Africom has been added to the Pentagon’s structure -- and China has noticed), clearly with intent to protect US “interests” in petroleum reserves. The consequences of more resource wars, many likely triggered over water supplies stressed by climate disruption, are likely to include increased unrest in poor nations, a proliferation of weapons of mass destruction, widening inequity within and between nations, and in the worst (and not unlikely) case, a nuclear war ending civilization.

**2NC – Methane Adv – AT: Extraction Bad**

**Key distinction --- we both agree that methane release is bad but that release is inevitable --- status quo warming makes methane release inevitable --- only mining can contain and trap the release and control the scale of release --- that means even if they win some leakage, only we control an extinction level event --- that’s Light and Cohen**

**Here’s more evidence --- status quo thaw and ocean warming makes it try or die for mining**

**Moeller 12** (Holly Moeller, Ecology and Evolution, Stanford University, Chemistry and Biology, Rutgers University, “Blowing Hot Air: The Methane Hydrate Delusion,” Science 2.0, May 10, 2012, http://www.science20.com/seeing\_green/blowing\_hot\_air\_methane\_hydrate\_delusion-89822)

As an added bonus, methane extraction traps CO2. The latest technology pumps the most notorious greenhouse gas into the ground, where it replaces methane in the ice matrix. The displaced methane is then pumped to the surface and – in the DoE’s (and, undoubtedly, ConocoPhillips’) vision – down pipelines to heat homes in the Lower 48. Plus, argue supporters, climate change projections indicate that rising temperatures may release much of that methane anyway. If the permafrost thaws or the ocean warms, vast tracts of icy clathrates could melt, outgassing methane – which has 20 times the warming potential of CO2 – into the atmosphere, further accelerating climate change. This is one of the most feared positive feedback loops known to climate scientists.

**They’re offense is wrong --- prefer qualified authors over scared staff writers --- DOE tests prove it’s safe and effective which answers their only warrant**

**Other Arctic scramble for LNG makes the impact inevitable --- disrupts ocean methane too --- that’s Hobson**

**2NC – Methane Adv – AT: Warming Impact (1/2)**

**Warming’s inevitable in the status quo and is already occurring --- no impact uniqueness --- that’s Light**

**Plan solves it --- bigger internal link**

**Moeller 12** (Holly Moeller, Ecology and Evolution, Stanford University, Chemistry and Biology, Rutgers University, “Blowing Hot Air: The Methane Hydrate Delusion,” Science 2.0, May 10, 2012, http://www.science20.com/seeing\_green/blowing\_hot\_air\_methane\_hydrate\_delusion-89822)

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**Breaking Chinese monopoly on rare earth metals is critical to successfully transition to WWS energy --- solves and turns their warming impacts**

**Jacobson 09** (Mark Z. Jacobson, professor of civil and environmental engineering, director, Atmosphere and Energy Program, Stanford University, “A Plan to Power 100 Percent of the Planet with Renewables,” Scientific American, October 26, 2009, http://www.scientificamerican.com/article.cfm?id=a-path-to-sustainable-energy-by-2030&print=true)

Is it feasible to transform the world’s energy systems? Could it be accomplished in two decades? The answers depend on the technologies chosen, the availability of critical materials, and economic and political factors. Clean Technologies Only Renewable energy comes from enticing sources: wind, which also produces waves; water, which includes hydroelectric, tidal and geothermal energy (water heated by hot underground rock); and sun, which includes photovoltaics and solar power plants that focus sunlight to heat a fluid that drives a turbine to generate electricity. Our plan includes only technologies that work or are close to working today on a large scale, rather than those that may exist 20 or 30 years from now. To ensure that our system remains clean, we consider only technologies that have near-zero emissions of greenhouse gases and air pollutants over their entire life cycle, including construction, operation and decommissioning. For example, when burned in vehicles, even the most ecologically acceptable sources of ethanol create air pollution that will cause the same mortality level as when gasoline is burned. Nuclear power results in up to 25 times more carbon emissions than wind energy, when reactor construction and uranium refining and transport are considered. Carbon capture and sequestration technology can reduce carbon dioxide emissions from coal-fired power plants but will increase air pollutants and will extend all the other deleterious effects of coal mining, transport and processing, because more coal must be burned to power the capture and storage steps. Similarly, we consider only technologies that do not present significant waste disposal or terrorism risks. In our plan, **WWS will** supply electric power for heating and transportation—industries that will **have to revamp if the world has any hope of slowing climate change.** We have assumed that most fossil-fuel heating (as well as ovens and stoves) can be replaced by electric systems and that most fossil-fuel transportation can be replaced by battery and fuel-cell vehicles. Hydrogen, produced by using WWS electricity to split water (electrolysis), would power fuel cells and be burned in airplanes and by industry. Plenty of Supply Today the maximum power consumed worldwide at any given moment is about 12.5 trillion watts (terawatts, or TW), according to the U.S. Energy Information Administration. The agency projects that in 2030 the world will require 16.9 TW of power as global population and living standards rise, with about 2.8 TW in the U.S. The mix of sources is similar to today’s, heavily

**2NC – Methane Adv – AT: Warming Impact (2/2)**

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dependent on fossil fuels. If, however, the planet were powered entirely by WWS, with no fossil-fuel or biomass combustion, an intriguing savings would occur. Global power demand would be only 11.5 TW, and U.S. demand would be 1.8 TW. That decline occurs because, in most cases, electrification is a more efficient way to use energy. For example, only 17 to 20 percent of the energy in gasoline is used to move a vehicle (the rest is wasted as heat), whereas 75 to 86 percent of the electricity delivered to an electric vehicle goes into motion. Even if demand did rise to 16.9 TW, WWS sources could provide far more power. Detailed studies by us and others indicate that energy from the wind, worldwide, is about 1,700 TW. Solar, alone, offers 6,500 TW. Of course, wind and sun out in the open seas, over high mountains and across protected regions would not be available. If we subtract these and low-wind areas not likely to be developed, we are still left with 40 to 85 TW for wind and 580 TW for solar, each far beyond future human demand. Yet currently we generate only 0.02 TW of wind power and 0.008 TW of solar. These sources hold an incredible amount of untapped potential. The other WWS technologies will help create a flexible range of options. Although all the sources can expand greatly, for practical reasons, wave power can be extracted only near coastal areas. Many geothermal sources are too deep to be tapped economically. And even though hydroelectric power now exceeds all other WWS sources, most of the suitable large reservoirs are already in use. The Plan: Power Plants Required Clearly, enough renewable energy exists. How, then, would we transition to a new infrastructure to provide the world with 11.5 TW? We have chosen a mix of technologies emphasizing wind and solar, with about 9 percent of demand met by mature water-related methods. (Other combinations of wind and solar could be as successful.) Wind supplies 51 percent of the demand, provided by 3.8 million large wind turbines (each rated at five megawatts) worldwide. Although that quantity may sound enormous, it is interesting to note that the world manufactures 73 million cars and light trucks every year. Another 40 percent of the power comes from photovoltaics and concentrated solar plants, with about 30 percent of the photovoltaic output from rooftop panels on homes and commercial buildings. About 89,000 photovoltaic and concentrated solar power plants, averaging 300 megawatts apiece, would be needed. Our mix also includes 900 hydroelectric stations worldwide, 70 percent of which are already in place. Only about 0.8 percent of the wind base is installed today. The worldwide footprint of the 3.8 million turbines would be less than 50 square kilometers (smaller than Manhattan). When the needed spacing between them is figured, they would occupy about 1 percent of the earth’s land, but the empty space among turbines could be used for agriculture or ranching or as open land or ocean. The nonrooftop photovoltaics and concentrated solar plants would occupy about 0.33 percent of the planet’s land. Building such an extensive infrastructure will take time. But so did the current power plant network. And remember that if we stick with fossil fuels, demand by 2030 will rise to 16.9 TW, requiring about 13,000 large new coal plants, which themselves would occupy a lot more land, as would the mining to supply them. The Materials Hurdle The scale of the WWS infrastructure is not a barrier. **But a few materials needed to build it could be scarce or subject to price manipulation.** Enough concrete and steel exist for the millions of wind turbines, and both those commodities are fully recyclable. The most problematic materials may be **rare-earth metals** such as neodymium used in turbine gearboxes. Although the metals are not in short supply, the low-cost sources are concentrated in China, so countries such as the U.S. could be trading dependence on Middle Eastern oil for dependence on Far Eastern metals. Manufacturers are moving toward gearless turbines, however, so that limitation may become moot.

**1NC – Arctic Environment DA (1/2)**

**The plan disrupts Arctic species --- icebreaking devastates critical functions**

**AMSA 09** (Arctic Marine Shipping Assessment, “Environmental Considerations and Impacts,” US Arctic Research Commission, 2009, http://www.arctic.gov/publications/AMSA/environmental.pdf)

Icebreakers and Disturbance All icebreaking operations, whether by independent commercial icebreaking ships or government icebreaker escort, can potentially cause disturbances to wildlife and local communities both through the noise they create and the trail of open water left astern. Compared to other vessels, icebreakers produce louder and more variable sounds. This is because of the episodic nature of the icebreaking, which involves ramming forward into the ice and then reversing to begin the process again. Some icebreakers are equipped with bubbler systems to aid in clearing ice from the vessel’s path and these can create an additional noise source. Noise from bubbler systems and propeller cavitation associated with icebreaker movement has the potential to **alter animal behavior** and to **disrupt** the **hearing** ability **and vocalization of marine mammals.**

**This uniquely collapses the Arctic ecosystem and keystone species**

**AMSA 09** (Arctic Marine Shipping Assessment, “Environmental Considerations and Impacts,” US Arctic Research Commission, 2009, http://www.arctic.gov/publications/AMSA/environmental.pdf)

For most marine vertebrates, making, hearing and processing sounds serve critical biological functions. These include communication, foraging, reproduction, navigation and predator-avoidance. In particular, toothed whales have developed sophisticated biosonar capabilities to help them feed and navigate; large baleen whales have developed long-range communication systems using sound in reproductive and social interaction; and pinnipeds (i.e., seals, sea lion, walrus, etc.) make and listen to sounds for critical communicative functions. Many fish utilize sounds in mating and other social interactions. The **introduction of noise** into the environment **can adversely affect** the ability of **marine life** to use sound in various ways **and** can **induce** alteration of behavior; **reduction of communication** ranges for social interactions, foraging, and predator avoidance; **and** temporary or **permanent compromise of** the auditory or other **systems.** In extreme cases, too much **noise can lead to** habitat avoidance or even **death.** Noise can also affect physiological functions and cause more generalized stress. Determining when impacts of noise exposure from any source become biologically significant to a species is often difficult. Nevertheless, this is an area where additional research is ongoing and needed in key areas.

**1NC – Arctic Environment DA (2/2)**

**Extinction**

**WWF 10** (World Wildlife Fund, “Drilling for Oil in the Arctic: Too Soon, Too Risky,” Nuka Research and Planning Group, LLC, December 1, 2010, http://assets.worldwildlife.org/publications/393/files/original/Drilling\_for\_Oil\_in\_the\_Arctic\_Too\_Soon\_Too\_Risky.pdf?1345753131)

Planetary Keystone The Arctic and the subarctic regions surrounding it are important for many reasons. One is their enormous biological diversity: a kaleidoscopic array of land and seascapes supporting millions of migrating birds and charismatic species such as polar bears, walruses, narwhals and sea otters. Economics is another: Alaskan fisheries are among the richest in the world. Their $2.2 billion in annual catch fills the frozen food sections and seafood counters of supermarkets across the nation. However, there is another reason why the Arctic is not just important, but among the most important places on the face of the Earth. A keystone species is generally defined as one whose removal from an ecosystem triggers a cascade of changes affecting other species in that ecosystem. The same can be said of the Arctic in relation to the rest of the world. With feedback mechanisms that affect ocean currents and influence climate patterns, the Arctic functions like a global thermostat. Heat balance, ocean circulation patterns and the carbon cycle are all related to its regulatory and carbon storage functions. Disrupt these functions and we effect far-reaching changes in the conditions **under which life has existed** on Earth for thousands of years. In the context of climate change, **the Arctic is a keystone ecosystem for the entire planet.**

**2NC – Polar Bears Impact**

**Icebreakers cause artificial water channels and icebreaking --- this is fundamentally critical habitat disruption**

**AMSA 09** (Arctic Marine Shipping Assessment, “Environmental Considerations and Impacts,” US Arctic Research Commission, 2009, http://www.arctic.gov/publications/AMSA/environmental.pdf)

The opening of channels through the ice by icebreaking vessels can impact Arctic residents and alter animal behavior. Open water channels take time to freeze and this can disrupt the movements of animals and people over the ice. In many areas of the Arctic in winter, the only naturally occurring ice openings are polynyas caused by winds or ocean currents. Artificially opened water channels can be problematic for marine mammals and other species, which confuse them for polynyas and can get trapped too far from the ice edge as the channel eventually refreezes.

**The scenario is unique --- melting sea ice puts polar bears and other animals at the brink of destruction --- the plan crosses the threshold**

**AMSA 09** (Arctic Marine Shipping Assessment, “Environmental Considerations and Impacts,” US Arctic Research Commission, 2009, http://www.arctic.gov/publications/AMSA/environmental.pdf)

Ice-dependent marine mammals in this region, such as polar bear, walrus and seals, already stressed due to sea ice retreat, may be at increased risk from any additional ship-sourced stressors or contamination, as populations will become increasingly concentrated around retreating sea ice.

**Polar bears are rebounding now but are still endangered --- protecting them is a moral duty**

**AP 03** (Animal Port, “Endangered Animal Polar Bears,” 2003, http://www.animalport.com/endangered-animals/polar-bears.html)

Canada, United States, Norway, Denmark, and former USSR convened an International Agreement on the Conservation of Polar Bears and their habitat in 1973. It has restricted the hunting of polar bears. World Wildlife Federation (WWF) is a worldwide organization for the conservation of wildlife. It is a leader in the conservation of polar bears. It has started an adoption program to save the endangered animals. The cumulative effect of man's progress has resulted in the endangerment of the planet earth. Destruction in the past happened due to ignorance. But, today, when we aware of its negative consequences, it is our responsibility to correct it. We have the capability and the responsibility to make changes because we will be responsible for what we deliver to our next generation. Therefore, **it is important to save the endangered** animals **polar bears,** and conserve the wildlife. With our commitment and a little effort, we can make a meaningful difference in the lives of endangered animals. Moreover, **it is our moral duty** to preserve our planet earth.

**2NC – Seals Impact**

**The plan devastates seal populations**

**AMSA 09** (Arctic Marine Shipping Assessment, “Environmental Considerations and Impacts,” US Arctic Research Commission, 2009, http://www.arctic.gov/publications/AMSA/environmental.pdf)

Specific adverse impacts associated with shipping activity that are of the most concern in the Canadian Arctic include the discharge of pollutants into the marine environment and the disruption or disturbance of migratory patterns of wildlife that would, in turn, impact indigenous hunting activity. In this region, icebreakers leave behind open water channels that may disrupt the movements of wildlife and people traveling on the ice. Icebreakers or other ships traveling through ice-covered waters where seals are whelping can impact nearby seals through flooding dens and wetting baby seals with their wakes. Marine mammals are known to congregate in shallow bays and migrate through the Canadian Arctic Archipelago. As shipping traffic increases in this region there will be increased potential for conflict between ships and marine mammals in narrow and geographically restrictive areas. Other ship impacts outlined in this section such as noise impacts, introduction of invasive species and ship emissions are also of concern.

**They’re endangered species --- populations are protected now but further icebreaking causes massive seal pup deaths**

**Berwyn 12** (Bob Berwyn, Editor of Summit County Citizens Voice, “Global Warming: Citing Shrinking Sea Ice, Feds List Several Arctic Seal Species as Threatened and Endangered,” December 24, 2012, http://summitcountyvoice.com/2012/12/24/global-warming-citing-shrinking-sea-ice-feds-list-several-arctic-seal-species-as-threatened-and-endangered/)

Ringed seals give birth and nurse their pups in snow caves built on sea ice. Global warming is reducing the amount of snowpack on the ice, causing snow caves to collapse and leaving pups **vulnerable to death** from freezing temperatures and predators. Bearded seals, named for their distinctively thick whiskers, give birth and nurse their pups on pack ice over shallow waters where their bottom-dwelling food is abundant. The rapid **loss of** pack **ice jeopardizes their ability to raise** their **young and find food.** Both ringed seals and bearded seals rely on sea ice for extended periods during molting, and bearded seals live on sea ice during critical months for breeding, whelping, and nursing. Sea ice is projected to shrink both in extent and duration, with bearded seals finding inadequate ice even if they move north. This summer Arctic sea-ice extent hit a new record low, falling to half its average size. At that pace summer sea ice across the Arctic is likely to disappear entirely in the next 10 to 20 years, while the seals’ winter sea-ice habitat in the Bering Sea off Alaska is projected to decline at least 40 percent by 2050. The listing decision provides Endangered Species Act protections to all populations of the ringed seal and the Pacific subspecies of the bearded seal, which inhabits Alaska and parts of Russia and Canada. The Act will provide a safety net for these seals that includes habitat protections, recovery planning and, most importantly, a prohibition on federal actions that could jeopardize the seals. Listing of the seals will not affect subsistence harvest by Alaska natives, which is exempted from the law’s provisions.

**2NC – Bowhead Whales Impact**

**Icebreaking leads to bowhead whale migration disruption**

**AMSA 09** (Arctic Marine Shipping Assessment, “Environmental Considerations and Impacts,” US Arctic Research Commission, 2009, http://www.arctic.gov/publications/AMSA/environmental.pdf)

The western Arctic stock of bowhead whales seasonally migrates through the Bering Strait, Chukchi and Beaufort seas. In the Bering Strait, they are physically constricted to a relatively small corridor, exposing them to increased interactions with vessels transiting this area during spring and fall. Bowhead whale migration could also potentially be disrupted by icebreakers. Whales could move further offshore following the open leads created by icebreaking vessels, putting them out of reach of coastal whaling communities. Any disruption of the spring and fall hunts, or any injury or mortality to bowheads would be considered a major issue to coastal Alaskan and Siberian communities.

**This devastates the Inupiat culture --- bowheads are key**

**AWL 12** (Alaska Wilderness League, “America’s Arctic Ocean: A Home to Polar Bears,” http://www.alaskawild.org/our-issues/offshore-campaign/)

The Beaufort and Chukchi Seas, the Arctic waters north of Alaska, are sometimes known as America’s ‘Polar Bear Seas’ – and for good reason. One of the most unique marine ecosystems in the world, these waters are home to the entire population of U.S. polar bears and have consequently been designated critical habitat. Many of America’s most beloved sea animals thrive here, including the endangered bowhead whale, walrus, seals and countless birds. This marine wildlife, especially the bowhead whale, is vital to the survival of the subsistence culture of the Inupiat people of Alaska’s North Slope.

**Cultural protection is a fundamental right of the Inupiat --- this cannot be violated**

**Sweeney 05** (Tara MacLean Sweeney, Anchorage Times, “Inupiat Views Ignored in ANWR Debate,” Arctic National Wildlife Refuge, 2005, http://www.anwr.org/features/players/inupiat.htm)

I want to make it clear to you here, and to those who are opposed to the development of the ANWR Coastal Plain, that ANWR is in the land of the Inupiat and we have a right to do what is best for us. This land and its wildlife are our sacred cultural trust. We will never allow it to be harmed for so long as we have the ability to protect it. But we also believe it was given to us to use to provide for our families and our future. Safe exploration and development is one of those uses.

**2NC – Ocean Acidification Impact**

**The plan massively increases ocean acidification**

**Wright 10** (Bruce Wright is senior scientist for the Aleutian Pribilof Islands Association, Steve Sumida, director of programs for Pribilof Aleuts Inc., “Shipping Pollution a Danger Around Bering Sea,” Fall/Winter 2010, Northern Notes, International Arctic Social Sciences Association, Polar Prince, http://www.polarprince.com/0-19362-shipping-pollution-a-danger-around-bering-sea.html)

We do know increased shipping activity and lack of emission controls over sulfur will contribute to the serious problem of ocean acidification and nutrient enrichment in the North Pacific Ocean through significant increases of nitrogen and sulfur deposits.

**Extinction**

**Romm 12** (Joe Romm is a Fellow at American Progress and is the editor of Climate Progress, “Science: Ocean Acidifying So Fast It Threatens Humanity’s Ability to Feed Itself,” 3/2/2012, http://thinkprogress.org/romm/2012/03/02/436193/science-ocean-acidifying-so-fast-it-threatens-humanity-ability-to-feed-itself/?utm\_source=feedburner&utm\_medium=email&utm\_campaign=Feed%3A+climateprogre)

The world’s oceans may be turning acidic faster today from human carbon emissions than they did during four major extinctions in the last 300 million years, when natural pulses of carbon sent global temperatures soaring, says a new study in Science. The study is the first of its kind to survey the geologic record for evidence of ocean acidification over this vast time period. “What we’re doing today really stands out,” said lead author Bärbel Hönisch, a paleoceanographer at Columbia University’s Lamont-Doherty Earth Observatory. “We know that life during past ocean acidification events was not wiped out—new species evolved to replace those that died off. But if industrial carbon emissions continue at the current pace, we may lose organisms we care about—coral reefs, oysters, salmon.” That’s the news release from a major 21-author Science paper, “The Geological Record of Ocean Acidification” (subs. req’d). We knew from a 2010 Nature Geoscience study that the oceans are now acidifying 10 times faster today than 55 million years ago when a mass extinction of marine species occurred. But this study looked back over 300 million and found that “the unprecedented rapidity of CO2 release currently taking place” has put marine life at risk in a frighteningly unique way: … the current rate of (mainly fossil fuel) CO2 release stands out as capable of driving a combination and magnitude of ocean geochemical changes potentially unparalleled in at least the last ~300 My of Earth history, raising the possibility that **we are entering an unknown territory of marine ecosystem change.** That is to say, it’s not just that acidifying oceans spell marine biological meltdown “by end of century” as a 2010 Geological Society study put it. We are also warming the ocean and decreasing dissolved oxygen concentration. **That is a recipe for mass extinction.**

**2NC – Caribou/Bering Fish Stocks Impact (1/2)**

**The plan devastates the caribou population which have critical cultural roles --- it also drastically reduces Bering Sea fish stocks**

**Wright 10** (Bruce Wright is senior scientist for the Aleutian Pribilof Islands Association, Steve Sumida, director of programs for Pribilof Aleuts Inc., “Shipping Pollution a Danger Around Bering Sea,” Fall/Winter 2010, Northern Notes, International Arctic Social Sciences Association, Polar Prince, http://www.polarprince.com/0-19362-shipping-pollution-a-danger-around-bering-sea.html)

Researchers with a U.S. Forest Service study conducted in Southeast Alaska found evidence of sulfur emissions impacting lichen communities. The authors concluded that the main source of sulfur and nitrogen found in lichens is likely the burning of fossil fuels by cruise ships. Lichen are an important food source for caribou and there is a probability that **large vessel emissions are damaging lichens and impacting the** southern Alaska Peninsula **caribou herd,** which is **an important food source to local** subsistence-based **cultures.** This herd has been decreasing in size, has poor calf survival and low pregnancy rates which has resulted in the current ban on caribou hunting in this region. One can only imagine the effects these emissions are having on the dwindling Bering Sea fishing stocks.

**Don’t gamble with their livelihood and culture --- protecting the Caribou Herds is our obligation to prevent a repeat of the past**

**Solomon 03** (Jonathan Solomon, Chair Gwich'in in Steering Committee Legislative hearing on H.r. 39, March 12th 2003, http://www.louisdb.org/documents/hearings/108/house/house-hearing-108-85583.html)

The Gwich'in Steering Committee respectfully requests the Senate Budget Committee to protect The Sacred Place Where Life Begins--the Arctic National Wildlife Refuge. The people of the Gwich'in Nation are strongly opposed to the inclusion of any revenues derived from activities related to drilling or exploration for oil or gas in the Arctic National Wildlife Refuge in the Fiscal Year 1904 Budget being considered by the House's Budget Committee. Please note that on Tuesday, March 11, 1824, the Bureau of Indian Affairs (BIA) was created under the Department of War (later became the Department of Defense). In 1849, the BIA went under the auspices of the Home Department (later became the Department of Interior). The policy of this nation toward the first nations was annihilation and later became a policy of assimilation. Today, **there is** an **opportunity not to repeat history and not to gamble with the lives and culture of the Gwich'in people, and** to **protect** an area we have long held sacred to insure the survival of **the** Porcupine **Caribou Herd.** The recent National Academy of Sciences (NAS) report spoke to many of the concerns our elders warned us about and that we have long voiced. Oil development on the North Slope of Alaska has resulted in serious cultural, spiritual, social and environmental impacts to the Inupiat. The caribou meat of the Central Arctic Herd is now peculiar in color and taste. The caribou do not calve where development occurs. Fortunately, for the Central Arctic Herd they could move south within a 100-mile area. The Porcupine Caribou Herd would have no place else to go due to the narrow strip of land within a 40-mile area where they calve in the refuge between the ocean and the mountains. Oil development in Alaska comes with a huge price tag to Alaska Natives as shown by the Cumulative Impacts of Oil and Gas Drilling on the North Slope of Alaska NAS report to the remaining effects of the Exxon Valdez disaster. The Gwich'in Nation wants to insure that for generations to come the Porcupine Caribou Herd's future is protected. As Gwich'in this is a human rights issue. We have relied on for thousands of years on the caribou and the caribou continues to be a critical element of our culture. May the Creator grant you all wisdom as you make your decisions.

**2NC – Caribou/Bering Fish Stocks Impact (2/2)**

**Bering Sea fish stocks are key --- spills over globally**

**WWF 10** (World Wildlife Fund, “Arctic,” 2010, http://worldwildlife.org/places/arctic)

The Bering Sea is one of the most productive marine regions in the world, a global “fish basket” that feeds people around the planet. Pollock, salmon and other fish also feed marine wildlife, such as Steller sea lions, northern fur seals, bears, seabirds and eagles. Fishing underpins a centuries-old way of life for many Arctic indigenous cultures. WWF combats bycatch and illegal, unreported, and unregulated fishing as part of the “Fish Forever” initiative. We also engage governments and communities to address threats to the Bering Sea ecosystem and ensure the durability of key fish species.

**Kills billions**

**Normile 02** (Dennis Normile, “Poor to Feel Pinch of Rising Fish Prices,” Science, Vol. 298, No. 5596, pg. 1154, November 8, 2002, http://www.sciencemag.org/content/298/5596/1154.full)

TOKYO— The first major attempt to project global supply and demand for fish has confirmed what many have long suspected: Rising prices are likely to drive fish out of the reach of growing numbers of poor people who rely on the sea for their protein. But, with several fisheries on the verge of collapse, some analysts believe that the study's dire projections—presented last week at the launching of a global research initiative on fisheries science and policy—might in fact be too rosy. The analysis, by agricultural economists in Penang, Malaysia, and in Washington, D.C., models fish supply and demand to 2020. Under the most likely scenario, it says, prices for salmon and other high-value fish would rise 15%, and prices for low-end fish such as milkfish and carp would increase by 6%. Fish meal prices, it estimates, would jump 18% to satisfy rising demand for feed for cultured, carnivorous high-value fish (below). “The consequences [of current trends] could be dire, depending on whether supply gains are feasible,” says Mahfuzuddin Ahmed, a co-author of the study, which was done by the Penang-based WorldFish Center and the Washington, D.C.-based International Food Policy Research Institute. But a continuation of those gains—which have produced a sixfold rise in total fish catch since the 1950s—is doubtful, says his boss, center director Meryl Williams, because three-quarters of the current catch comes from fish stocks that are already overfished, if not depleted. “Those [who study] the population dynamics of fisheries would probably be pessimistic” about supplies, she says. Fish now account for about 7% of the total food supply, according to the center, and are the primary source of protein for roughly one-sixth of the world's population. Yet fish consumption is generally overlooked in food supply models, which focus primarily on cereals and legumes. Scientists hope to correct that oversight with Fish for All, an initiative to develop science-based policy alternatives for world fisheries. Scientists, environmentalists, and industry representatives from 40 countries gathered in Penang last week for a meeting to launch the effort, led by the WorldFish Center, formerly known as the International Center for Living Aquatic Resources. Both the fish center and the policy institute are part of the World Bank-funded Consultative Group on International Agricultural Research.

**2NC – AT: Ecosystems Resilient**

**Arctic is the lynchpin keystone ecosystem and uniquely spills over --- the magnitude of the internal link means you default to specificity because every ecosystem is obviously different --- that’s WWF**

**No resiliency --- natural resiliency doesn’t apply to human-induced problems like the plan**

**EAC 02** (The Environmental Advisory Council of the Swedish Government, researchers from the international scientific network Resilience Alliance, “Resilience and Sustainable Development: A report for the Swedish Environmental Advisory Council”)

There is increasing evidence that ecosystems seldom respond to gradual change in a gradual way. Lakes often appear to be unaffected by increased nutrient concentrations until a critical threshold is passed and the water shifts abruptly from clear to turbid. Submerged plants suddenly disappear and animal and plant diversity is reduced – an undesired state from both a biological and economic point of view. Substantially lower nutrient levels than those at which the collapse of the vegetation occurred are required to restore the system. The economic and social intervention involved in a restoration is complex and expensive, and sometimes even impossible. Studies of rangelands, forests, and oceans also show that human-induced loss of resilience can make an ecosystem vulnerable to random events like storms or ﬁre that the system could earlier cope with. An ecosystem with low resilience can often seem to be unaffected and continue to generate resources and ecosystem services until a disturbance causes it to exceed a critical threshold. Even a minor disturbance can cause a shift to a less desirable state that is difﬁcult, expensive, or even impossible to reverse.

**2NC – Biodiversity – Impact Framing**

**Invisible threshold means don’t gamble with species loss**

**Warner 94** (Paul Warner, American University, Dept of International Politics and Foreign Policy, August, Politics and Life Sciences, p. 177)

Massive extinction of species is dangerous, then, because one cannot predict which species are expendable to the system as a whole. As Philip Hoose remarks, "Plants and animals cannot tell us what they mean to each other." One can never be sure which species holds up fundamental biological relationships in the planetary ecosystem. And, because removing species is an irreversible act, it may be too late to save the system after the extinction of key plants or animals. According to the U.S. National Research Council, "The ramifications of an ecological change of this magnitude [vast extinction of species] are so far reaching that no one on earth will escape them." **Trifling with** the "lives" of **species is like playing Russian roulette, with our collective future as the stakes.**

**2NC – Biodiversity – Moral Obligation**

**Loss of biodiversity must be morally rejected --- it seethes with evil**

**Watson 06** – President & Founder of the Sea Shepherd Conservation Society, 9-17-6 (Paul, “The Politics of Extinction,” \_\_http://www.eco-action.org/dt/beerswil.html)

Gone forever are the European elephant, lion and tiger. The Labrador duck, giant auk, Carolina parakeet will never again grace this planet of ours. Lost for all time are the Atlantic grey whales, the Biscayan right whales and the Stellar sea cow. Our children will never look upon the California condor in the wild or watch the Palos Verde blue butterfly dart from flower to flower. Extinction is a difficult concept to fully appreciate. What has been is no more and never shall be again. It would take another creation and billions of years to recreate the passenger pigeon. It is the loss of billions of years of evolutionary programming. It is the destruction of beauty, the obliteration of truth, the removal of uniqueness, the scarring of the sacred web of life To be responsible for an extinction is to commit blasphemy against the divine. **It is the greatest of all possible crimes,** more evil than murder, more appalling than genocide, more monstrous than even the apparent unlimited perversities of the human mind. To be responsible for the complete and utter destruction of a unique and sacred life form is arrogance that seethes with evil, for the very opposite of evil is live. It is no accident that these two words spell out each other in reverse.

**Moral obligation to protect biodiversity**

**Cote 94** (Sherrie Marie Cote, “The Manatee: Facing Imminent Extinction,” Florida Journal of International Law, 189, Spring 1994)

It is our responsibility, as tenants on the global commons, to prevent that which is within our power to prevent. As Senator Alan Cranston once said: The death of a species is profound, for it means nature has lost one of its components, which played a role in the inter-relationship of life on earth. Here the cycle of birth and death ends. Here there is no life, no chance to begin again - simply a void. To cause the extinction of a species, whether by commission or omission, is unqualifiedly evil. The prevention of this extinction ... must be a tenet among [hu]man's **moral responsibilities.** n86 show how we are all connected."

2NC – Biodiversity – Disease Impact (1/2)

**Biodiversity loss breeds infectious diseases and prevents new vaccines**

**Henderson 06** – Science Editor of The Times – “Why we need all the species” The Times June 10, 2006 Lexis

The world is enduring a crisis of biodiversity. The rate at which species are disappearing is such that some scientists describe it as a mass extinction, comparable in scale to the event that wiped out the dinosaurs. The potential loss of so many animals and plants -more than 16,000 species are threatened alarms nature lovers, but some cynics ask why humanity should be concerned. The extinction of the thick-lipped pebble snail is bad news for that species, but what does it matter to us? One answer was set out this week in the journal Public Library of Science Medicine. A research team, led by Andy Dobson of Princeton University, has shown how declining biodiversity can have a direct impact on human health. Lyme disease in the US is a case in point. Caused by spirochaete bacteria, this can cause arthritis, headaches, facial paralysis and heart problems. It is transmitted by tick bites and the danger it poses to humans is heavily influenced by local ecology. Some animal hosts of Lyme disease are much better at passing the disease to ticks, and thence to people, than others. White-footed mice transmit it 90 per cent of the time, compared with 15 per cent for grey squirrels. The mice tend to thrive in small wooded areas where there are few predators or competitors. In these habitats, which tend to be close to towns where pressure on wildlife is greatest, the ticks have to bite something. The **reduced biodiversity means they bite more mice and pick up the disease.** Human infection rates rise as a result. Thus reduced biodiversity makes more people ill. The same is true of West Nile disease, a virus that has recently spread to the US. This is carried by birds and is spread to humans by mosquito bites, and some species are more dangerous reservoirs of infection than others. The birds that are most likely to pass it on to the insect vectors -including sparrows and robins - are those that flourish in urban habitats, just where humans have the greatest chance of being bitten. In wilder habitats, bird diversity is higher, the potential source of infection is diluted and people are better protected. Like Lyme disease and West Nile disease, most **emerging human infections** have their origins in animals. Their **spread is** almost **always abetted when nature's variety narrows.** The existence of large numbers of species, some of which can harbour deadly pathogens without transmitting them to people, acts as a protective buffer. Healthy biodiversity lengthens the odds of a close encounter that puts humans in danger. This is most obvious with vector-borne illnesses but not confined to them: at last year's inaugural International Conference on Health and Biodiversity, scientists suggested that species loss may have "facilitated" the advance of H5N1 bird flu. The benefits of biodiversity do not end here. Many drugs originate from plants. There are millions more species yet to be investigated by science that constitute a vast **unexploited pharmacoepia,** which **will be lost to medicine if allowed to die out.**

**Extinction**

**Darling 12** (Astrobiologist Dirk Schulze-Makuch and British astronomer David Darling, Seattle's Big Blog, “9 Strange Ways the World Really Might End,” http://blog.seattlepi.com/thebigblog/2012/03/18/9-strange-ways-the-world-really-might-end/?fb\_xd\_fragment, Washington State University)

Our body is in constant competition with a dizzying array of viruses, bacteria, and parasites, many of which treat us simply as a source of food or a vehicle for reproduction. What’s troubling is that these microbes can mutate and evolve at fantastic speed – the more so thanks to the burgeoning human population – confronting our bodies with new dangers every year. HIV, Ebola, bird flu, and antibiotic-resistant “super bugs” are just a few of the pathogenic threats to humanity that have surfaced over the past few decades. Our soaring numbers, ubiquitous international travel, and the increasing use of chemicals and biological agents without full knowledge of their consequences, have increased the risk of unstoppable pandemics arising from mutant viruses and their ilk. Bubonic plague, the Black Death, and the Spanish Flu are vivid examples from history of how microbial agents can decimate populations. But the consequences aren’t limited to a high body count. When the death toll gets high enough, it can

**2NC – Biodiversity – Disease Impact (2/2)**

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disrupt the very fabric of society. According to U.S. government studies, if a global pandemic affecting at least half the world’s population were to strike today, health professionals wouldn’t be able to cope with the vast numbers of sick and succumbing people. The result of so many deaths would have serious implications for the infrastructure, food supply, and security of 21st century man. While an untreatable **pandemic could strike suddenly and** potentially **bring civilization to its knees in weeks** or months, degenerative diseases might do so over longer periods. The most common degenerative disease is cancer. Every second men and every third women in the western world will be diagnosed with this disease in their lifetime. Degeneration of our environment through the release of toxins and wastes, air pollution, and intake of unhealthy foods is making this problem worse. If cancer, or some other form of degenerative disease, were to become even more commonplace and strike before reproduction, or become infectious (as seen in the transmitted facial cancer of the Tasmanian Devil, a carnivorous marsupial in Australia) the very survival of our species could be threatened.

**2NC – Biodiversity – Poverty Impact**

**Biodiversity loss adversely affects those in poverty --- significantly increases their vulnerability**

**IIED 06** (International Institute for environment and Development, Irish Aid, Ireland, Department of Foreign Affairs, “Biodiversity and Poverty Reduction,” 2006, http://www.irishaid.gov.ie/media/irishaid/allwebsitemedia/20newsandpublications/publicationpdfsenglish/environment-keysheet-3-bio-diversity.pdf)

Biodiversity matters to development because:

> Biodiversity underpins the ‘ecosystem goods’ (for example food and fuel) and ‘services’ (e.g. climate regulation, water supply) upon which society depends.

**> Poor people** are **most directly dependent** on these goods and services, and therefore are **most affected by the loss of biodiversity;**

> Biodiversity loss undermines the food security, nutrition and health of the **rural poor** and increases their vulnerability to external shocks.

**1NC – Mapping DA (1/4)**

**Russia’s hinging its geo-economic influence on the Arctic now but the plan leads to US territorial control**

**Cohen 08** (Ariel Cohen, Senior Research Fellow for Russian and Eurasian Studies at Heritage, PhD at Tufts University, “The New Cold War: Reviving the U.S. Presence in the Arctic”, http://s3.amazonaws.com/thf\_media/2008/pdf/bg2202.pdf)

The Arctic is quickly reemerging as a strategic area where vital U.S. interests are at stake. The geopolitical and geo-economic importance of the Arctic region is rising rapidly, and its mineral wealth will likely transform the region into a booming economic frontier in the 21st century. The Arctic coasts and continental shelf are esti- mated to hold large deposits of oil, natural gas, methane hydrate (natural gas) clusters, and large quantities of valuable minerals. With the shrinking of the polar ice cap, extended navigation through the Northwest Passage along the northern coast of North America may soon become possible with the help of icebreakers. Similarly, Rus- sia is seeking to make the Northern Sea Route along the northern coast of Eurasia navigable for consid- erably longer periods of the year. Opening these shorter routes will significantly cut the time and costs of shipping. Despite the Arctic’s strategic location and vast resources, the U.S. has largely ignored this region. The United States needs to develop a comprehen- sive policy for the Arctic, including diplomatic, naval, military, and economic policy components. This should include swiftly mapping U.S. territorial claims to determine their extent and to defend against claims by other countries. With oil and gas prices recently at historic highs in a tight supply and demand environment, the rich hydrocarbon resources in the Arctic may bring some relief to consumers. These resources, especially the hydrocarbons, also have the potential to significantly enhance the economy and the energy security of North America and the world. Russian Ambitions. Russia recognizes the mul- tifaceted potential of the Arctic and is moving rapidly to assert its national interests. Moscow has submitted a claim to the U.N. Convention on the Law of the Sea to an area of 460,000 square miles— the size of Germany, France, and Italy combined. The Kremlin is pursuing its interests by projecting military power into the region and by using diplo- matic instruments such as the Law of the Sea Treaty. Russia made a show of planting its flag on the Arctic seabed in August 2007 and has resumed strategic bomber flights over the Arctic for the first time since the end of the Cold War. While paying lip service to international law, Russia’s ambitious actions hearken back to 19th- century statecraft rather than the 21st-century law- based policy and appear to indicate that the Kremlin believes that credible displays of power will settle conflicting territorial claims. By comparison, the West’s posture toward the Arctic has been irresolute and inadequate. This needs to change. Reestablishing the U.S. Arctic Presence. The United States should not rely on the findings of other nations that are mapping the Arctic floor. **Timely mapping results are necessary to defending and asserting U.S. rights in** bilateral and **multilateral fora.** The U.S. needs to increase its efforts to map the floor of the Arctic Ocean to determine the extent of the U.S. Outer Continental Shelf (OCS) and **ascertain** the extent of legitimate **U.S. claims to territory** beyond its 200-nautical-mile exclusive economic zone. To accomplish this, the U.S. needs to upgrade its icebreaker fleet. The U.S. should also continue to cooperate and advance its interests with other Arctic nations through venues such as the recent Arctic Ocean Conference in Ilulissat, Greenland. Specifically, the United States should: • Create an interagency task force on the Arctic bringing together the Departments of Defense, State, Interior, and Energy to develop the overall U.S. policy toward the region. The U.S. should use diplomatic, military, and economic means to maintain its sovereignty in the Arctic, including establishing a Joint Task Force–Arctic Region Command, headed by a Coast Guard flag officer. The U.S. should also establish an Arctic Coast Guard Forum modeled after the successful Northern Pacific Coast Guard Forum. • Accelerate the acquisition of icebreakers to support the timely mapping of the Arctic OCS and the Arctic in general to advance U.S. national interests. The U.S. needs to swiftly map U.S. claims on the OCS and areas adjacent to Alaska to preserve its sovereign territorial rights. Timely mapping will be important as the other Arctic nations submit their claims within the 10-year window. The U.S. should not rely on mapping from other countries to advance its claims or to defend against the claims of other countries.

**1NC – Mapping DA (2/4)**

**This collapses Russia’s territory grab**

**Cohen 10** (Ariel Cohen, Senior Research Fellow for Russian and Eurasian Studies and International Energy Policy, The Kathryn and Shelby Cullom Davis Institute for International Studies, PhD, “From Russian Competition to Natural Resources Access: Recasting U.S. Arctic Policy”, http://www.heritage.org/research/reports/2010/06/from-russian-competition-to-natural-resources-access-recasting-us-arctic-policy)

The United States needs to elevate the Arctic to a higher geopolitical priority and fully commit to implementing the Arctic Region Policy. The Arctic Interagency Policy Committee (AIPC) should have full responsibility for Arctic policy coordination, although it should not allow environmental and climate change issues to dominate the agenda. To advance U.S. sovereign territorial rights in the High North, the area inside the Arctic Circle, Congress should allocate funding to acquire additional icebreakers and to increase the number of Coast Guard forward operating locations (FOLs) on the North Slope and in western Alaska. In the international realm, the U.S. should expand dialogue with members of the Arctic Council, including Russia, on cooperating in the High North through the Arctic Policy Group (APG). However, the U.S. should **oppose Russia’s territory grab** without joining the U.N. Convention on the Law of the Sea (UNCLOS), also called the Law of the Sea Treaty (LOST). The U.S. should raise the Arctic as a priority on NATO’s agenda and explore an agreement with Canada on joint management of navigation, security, and commercial exploitation of hydrocarbons in the Northwest Passage. Finally, Congress should authorize expanded oil exploration and production in the Arctic National Wildlife Refuge (ANWR) and other promising Arctic areas to increase the national energy supply.

**This collapses Russia’s economy --- Gazprom is key**

**Fin 12** (Al writer for oilprice, an energy news site that contributes energy analysis to Business Insider and Forbes. “http://oilprice.com/Energy/Natural-Gas/Gazproms-Future-Dependent-on-Arctic-Energy-Riches.html”)

The continued existence of Russia as a transcontinental power depends on its ability to leverage vast energy wealth into political stability and power. Without energy wealth, Russia begins to disintegrate. A giant new gas field north of the Arctic Circle provides some hope for Russia's future. Gazprom’s mammoth tax payments bolster the Russian economy, allowing the Kremlin to dole out subsidies and keep a lid on popular discontent. At the same time, **Gazprom faces challenges that threaten** not just its dominance of the world’s natural gas market, but also **the stability of Russia itself.**, the emergence of U.S. shale gas and the rise of liquefied natural gas super tankers are transforming the global gas market, providing alternatives to Russian supply. The company’s close association with the Kremlin, historically an asset and a hindrance, may invite greater scrutiny as domestic opposition to Putin’s rule grows. European clients and parliaments are contesting Gazprom’s continental influence with greater solidarity than ever before. A recent Morgan Stanley (MS) report determined that these tests may “leave Gazprom running a very different business,” diminished in scale and profitability and less favoured at home. That’s why so much is riding on Bovanenkovo. Beneath two feet of permafrost on the distant Yamal Peninsula, 1,500 miles northeast of Moscow, Bovanenkovo holds nearly five trillion cubic meters of gas. The field will begin delivering gas in July and for the next 35 years could on its own produce enough to meet 25 percent of European demand. Bovanenkovo affords the Kremlin peace of mind, although the price tag for its development—upward of $100 billion—allows Gazprom little margin for error. \_BW The emergence of abundant tight gas reserves in North America, South America, China, the Levant, parts of Europe, and Southeast Asia suggests that in the not-too-distant future, reduced demand is likely to shake global gas markets even further. Russia will be forced to move to gas to liquids (GTL) production in order to convert its less valued gas into more valued liquids. Gazprom performs many functions traditionally reserved for the state, including funding public works projects directly from its budget. It’s the only Russian company that is compelled to pay its tax bill monthly, since this revenue makes up the single largest portion of Russian gross domestic product (10 percent) and is critical to the basic workings of government. Gazprom is less a company than a public trust, one that enjoys special advantages in

**1NC – Mapping DA (3/4)**

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exchange for fulfilling official wishes. ...Europe’s dependence on Gazprom for natural gas gives the Kremlin power to leave millions in the cold should it choose to do so (as it did to Ukraine after pricing disputes in 2006 and 2009). A deep freeze in Russia this winter has increased domestic demand for fuel, producing a shortfall in natural gas supply to Europe. Over the last year, as European customers have been squeezed by surging gas prices (generating Gazprom’s record earnings), some of Gazprom’s Western clients have demanded arbitration. European Union antitrust investigators stormed Gazprom offices in Germany and the Czech Republic, seizing contracts. (Gazprom insists its contracts adhere to international law.) And officials in Brussels are debating the Third Energy Package, anti-monopoly legislation focused squarely on Gazprom’s ability both to transport and sell gas in the territory of the EU. ...Czarist-era geologists discovered gas on the Yamal Peninsula just before the 1917 Russian Revolution, though they didn’t possess the wherewithal to extract it. Through the years, the litany of upheaval that is Russia’s burden prevented the exploitation of such an asset. Engineers discovered the Bovanenkovo field in 1971, three years after the death of Vadim Bovanenko, a geophysicist who had served as the head of Yamal Oil and Gas Exploration, an arm of the gas ministry. But it was only under Putin that workers were finally able to begin building infrastructure at Bovanenkovo in 2007. The date for initial gas delivery was postponed on several occasions, causing observers to wonder if the project would ever be realized. The start-up date was then pushed up to July 2012, sparking a new round of questions. Did Gazprom foresee a spike in European demand? Were Nadym’s gas fields in far worse shape than anyone had imagined? It’s hard to know why Gazprom behaves the way it does. Company executives aren’t known for sharing information. Several Gazprom officials replied politely to my interview requests but provided little revelatory insight. Sharing profits, however, is part of being a national champion. In the last year, Gazprom has slashed investments and more than doubled dividends, increasing the yield of the Russian stock market and padding state coffers. As Putin prepares to reassume the presidency for what could be another 12 years, his ruling United Russia party increasingly turns to Gazprom, less to wield power abroad than to shore up support at home. In October, Gazprom absorbed a selective doubling of the tax levied for the extraction of mineral resources, which will result in $10 billion of lost profits this year. This money will help balance the Russian budget and pay for popular social programs. \_BW **Gazprom is a central pillar of Putin's power.** But globally, the gas industry is changing, moving on to new technologies and new sources of natural gas. If Russia is unable to keep up, it will be left behind once again. That would be dangerous for the wounded bear, currently struggling with low morale, capital flight, and demographic collapse. The potential conflict between China and Russia over the mineral wealth of Eastern Siberia looms larger in the distance with every weakening that Moscow experiences.

**Russian economic decline causes nuclear war**

**Filger, 9** (Sheldon, author and blogger for the Huffington Post, “Russian Economy Faces Disastrous Free Fall Contraction”, http://www.globaleconomiccrisis.com/blog/archives/356)

**In Russia,** historically, **economic** health **and** political **stability are intertwined** to a degree that is rarely encountered in other major industrialized economies. It was the economic stagnation of the former Soviet Union that led to its political downfall. Similarly, Medvedev and Putin, both intimately acquainted with their nation's history, are unquestionably alarmed at the prospect that Russia's economic crisis will endanger the nation's political stability, achieved at great cost after years of chaos following the demise of the Soviet Union. Already, strikes and protests are occurring among rank and file workers facing unemployment or non-payment of their salaries. Recent polling demonstrates that the once supreme popularity ratings of Putin and Medvedev are eroding rapidly. Beyond the political elites are the financial oligarchs, who have been forced to deleverage, even unloading their yachts and executive jets in a desperate attempt to raise cash. Should the Russian economy deteriorate to the point where economic collapse is not out of the question, the impact will go far beyond the obvious accelerant such an outcome would be for the Global Economic Crisis. There is a geopolitical dimension that is even more relevant then the economic context. Despite its economic vulnerabilities and perceived decline from superpower status, Russia remains one of only two nations on earth with a nuclear arsenal of sufficient scope and capability to destroy the world as we know it. For that reason, it is not only President Medvedev and Prime

**1NC – Mapping DA (4/4)**

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Minister Putin who will be lying awake at nights over the prospect that a national economic crisis can transform itself into a virulent and destabilizing social and political upheaval. It just may be possible that U.S. President Barack Obama's national security team has already briefed him about the consequences of a major economic meltdown in Russia for the peace of the world. After all, the most recent national intelligence estimates put out by the U.S. intelligence community have already concluded that the Global Economic Crisis represents the greatest national security threat to the United States, due to its facilitating political instability in the world. During the years Boris Yeltsin ruled Russia, security forces responsible for guarding the nation's nuclear arsenal went without pay for months at a time, leading to fears that **desperate personnel would** illicitly **sell nuclear weapons to terrorist organizations**. If the current economic crisis in Russia were to deteriorate much further, how secure would the Russian nuclear arsenal remain? It may be that the financial impact of the Global Economic Crisis is its least dangerous consequence.

**2NC – Link Wall (1/3)**

**Plan crushes Russia’s ability to control the Arctic --- deters them from entering and impedes their access --- even if they only redraw borders, they’d just redraw them to only give land to the U.S. and its allies --- we have zero incentive to give Russia resources**

**We have to win a very low risk of a link because Russia is so dependent on Gazprom and is putting all of their eggs into the Arctic basket**

**Mapping causes territory gerrymandering which crowds Russia out of the field --- collapses their geo-economic influence and also leads to US control of Northwest Passage**

**Cohen 11** (Ariel, Senior Research Fellow for Russian and Eurasian Studies @ Heritage, PhD @ Tufts U, “RUSSIA IN THE ARCTIC: CHALLENGES TO U.S. ENERGYAND GEOPOLITICS IN THE HIGH NORTH”, RUSSIA IN THE ARCTIC, Strategic Studies Institute Monograph, July 2011, http://www.strategicstudiesinstitute.army.mil/pdffiles/PUB1073.pdf)

Yet to protect its rights, the United States needs to know how far its claims stretch into the Arctic Ocean. The new U.S. strategy urges the United States to take “all the actions necessary to establish the outer limit of the continental shelf appertaining to the United States.” 29 The United States requires a modern flotilla of icebreakers to conduct mapping and to establish U.S. claims. Yet, a prominent Arctic expert argued be- fore the U.S. Congress that the new policy does not outline funding allocations for acquisition of the new icebreakers.30 The U.S. Coast Guard currently has only three icebreakers, of which only the Healy (commis- sioned in 2000) is relatively new. The other two ice- breakers, while heavier than the Healy and thus ca- pable of breaking through thicker ice, are at the end of their design service life after operating for about 30 years. Yet even if the United States begins allocat- ing funds now, it will be 8 to 10 years before a new icebreaker can enter service. Moreover, no money has been allocated to build a new-generation heavy ice- breaker.31 A 2008 mapping expedition undertaken by the ice- breaker Healy in the Chukchi Sea focused on surveying an area 400 to 600 miles north of Alaska cost about $1.2 million—a pittance compared to the billions of dollars of Arctic natural resources at stake. The sur- vey indicated that the foot, or lowest part of the Alaskan continental shelf, stretches more than 100 miles beyond what was previously thought, thus expanding the U.S. claim.32 The United States has been mapping the bottom of the Arctic Ocean and the OCS since 2003.33 **Mapping is essential to determining** the extent of the U.S. OCS and discovering whether the **U**nited **S**tates has any **legitimate claims to territory** beyond its 200-nautical- mile exclusive economic zone. According to the U.S. Department of State, the United States had made five Arctic cruises since 2003, and the Obama administra- tion is continuing the multiyear effort to map the Arc- tic seabed.34 The United States and Canada have joined efforts in mapping missions to determine the boundary of each country’s Arctic continental shelves.35 The activi- ties are part of the multiyear, multiagency effort un- dertaken by the U.S. Extended Continental Shelf Proj- ect, led by the Departmentof State, with vice co-chairs from the Department of the Interior and the National Oceanic Atmospheric Administration (NOAA). The joint 2009 continental Shelf Survey mission, which lasted from August 7 to September 16, 2009, marks the second year of such cooperative endeavors.36 More such activities are planned for 2010.37 Mapping is important for resolving any conflict- ing claims by other Arctic nations. For example, the United States and Canada have likely claimed some of the same parts of the continental shelf.38 Canada and Russia occupy 75 percent of the Arctic Ocean’s coast- line. They each claim that the channels between their Arctic islands and coasts are their “internal waters,” and that if a foreign vessel needs to pass, it requires authorization. The position of the United States is that the Northern Sea Route and Northwest Passage are “international straits.”39 Mapping data will help to determine whether Russian claims conflict with U.S. and Canadian claims.

**2NC – Link Wall (2/3)**

**That externally guarantees a domestic nuclear terror attack --- US control usurps**

**Davis 08** (Jeff Davis, “Securing the Northwest Passage,” November 6, 2008, http://www.embassymag.ca/page/view/securing\_northwest\_passage-11-6-2008)

However, some influential Americans see the possibility that America's position on the ownership of the Northwest Passage could change. Among them is former American ambassador to Canada Paul Cellucci, who addressed the issue at the annual conference of the Canadian Defence and Foreign Affairs Institute, held in Ottawa last week. Mr. Cellucci said he thinks the United States should recognize Canada's ownership of arctic waters so Canada can effectively interdict ships in the Northwest Passage, something it could not easily do in an international strait. "I've concluded it's in the security interest of the United States of America to recognize the Canadians' claims to these waters," he said. "If in fact this becomes a major shipping lane, and if in fact some terrorist organizations wants to get a weapon of mass destruction into North America, they could well try to do it by ship. "I personally want the Canadians to be able to stop those ships in Canadian waters to make sure they can protect the security of the people of Canada and the U.S.," Mr. Cellucci continued. This opinion was echoed in the Senate report: "If the Passage were considered an international strait (as the United States claims it to be)...**the Passage could** potentially **be used for** illegal activities, such as drug smuggling, illegal immigration, **trafficking or even imports of w**eapons of **m**ass **d**estruction. "Put simply, **U.S. security interests would be better protected if the U**nited **S**tates **recognized Canada's sovereignty** and control."

**Domestic strike leads to global nuclear war**

**Speice, 6** (Patrick, JD Candidate, 47 Wm and Mary L. Rev. 1427, February, Lexis)

Terrorist groups could acquire a nuclear weapon by a number of methods, including "steal[ing] one intact from the stockpile of a country possessing such weapons, or ... [being] sold or given one by [\*1438] such a country, or [buying or stealing] one from another subnational group that had obtained it in one of these ways." 40 Equally threatening, however, is the risk that terrorists will steal or purchase fissile material and construct a nuclear device on their own. Very little material is necessary to construct a highly destructive nuclear weapon. 41 Although nuclear devices are extraordinarily complex, the technical barriers to constructing a workable weapon are not significant. 42 Moreover, the sheer number of methods that could be used to deliver a nuclear device into the United States makes it incredibly likely that terrorists could successfully employ a nuclear weapon once it was built. 43 Accordingly, supply-side controls that are aimed at preventing terrorists from acquiring nuclear material in the first place are the most effective means of countering the risk of nuclear terrorism. 44 Moreover, the end of the Cold War eliminated the rationale for maintaining a large military-industrial complex in Russia, and the nuclear cities were closed. 45 This resulted in at least 35,000 nuclear scientists becoming unemployed in an economy that was collapsing. 46 Although the economy has stabilized somewhat, there [\*1439] are still at least 20,000 former scientists who are unemployed or underpaid and who are too young to retire, 47 raising the chilling prospect that these scientists will be tempted to sell their nuclear knowledge, or steal nuclear material to sell, to states or terrorist organizations with nuclear ambitions. 48 The potential consequences of the unchecked spread of nuclear knowledge and material to terrorist groups that seek to cause mass destruction in the United States are truly horrifying. A terrorist attack with a nuclear weapon would be devastating in terms of immediate human and economic losses. n49 Moreover, there would be immense political pressure in the United States to discover the perpetrators and retaliate with nuclear weapons, **massively increasing** the number of **casualties and** potentially **triggering a full-scale nuclear conflict**. n50 In addition to the threat posed by terrorists, leakage of nuclear knowledge and material from Russia will reduce the barriers that states with nuclear ambitions face and may trigger widespread proliferation of nuclear weapons. n51 This proliferation will increase the risk of nuclear attacks against the United States [\*1440] or its allies by hostile states, n52 as well as increase the likelihood that regional conflicts will draw in the United States and escalate to the use of nuclear weapons.

**2NC – Link Wall (3/3)**

**Our links are unique --- Russia’s locking in control through territorial bids but the plan blocks this transition**

**Frolov 07** (Vladimir, former director of the National Laboratory for Foreign Policy, a Moscow-based think tank, now serves as President of LEFF GROUP, his own government and public communications company. He received his first degree from the Moscow Defense Institute of Foreign Languages and earned a Ph.D. in political science from the Moscow Diplomatic Academy. Mr. Frolov had a distinguished career in the Foreign Service, including postings at the Russian Embassy in Washington D.C. before serving as the Deputy Staff Director of the State Duma Committee on Foreign Affairs and Counsel to the Deputy Chief of the Presidential Administration for Foreign Policy. He is married with two children. Mr. Frolov coordinates the Russia Profile Experts’ Panel as well as contributing comments and articles about Russia’s foreign policy, “The Coming Conflict in the Arctic Russia and US to Square Off Over Arctic Energy Reserves”, http://www.globalresearch.ca/the-coming-conflict-in-the-arctic/6344)

The latest findings are likely to prompt Russia to lodge another bid at the UN to secure its rights over the Arctic sea shelf. If no other power challenges Russia’s claim, it will likely go through unchallenged. **But Washington seems to have a different view and is seeking to block the anticipated Russian bid.** On May 16, 2007, Senator Richard Lugar (R-Indiana), the ranking Republican on the Senate Foreign Relations Committee, made a statement encouraging the Senate to ratify the Law of the Sea Convention, as the Bush Administration wants. The Reagan administration negotiated the Convention, but the Senate refused to ratify it for fear that it would unduly limit the U.S. freedom of action on the high seas.

**Empirically true --- US will attempt to block Russia’s energy claims but the plan provides them the key mechanism**

**Frolov 07** (Vladimir, former director of the National Laboratory for Foreign Policy, a Moscow-based think tank, now serves as President of LEFF GROUP, his own government and public communications company. He received his first degree from the Moscow Defense Institute of Foreign Languages and earned a Ph.D. in political science from the Moscow Diplomatic Academy. Mr. Frolov had a distinguished career in the Foreign Service, including postings at the Russian Embassy in Washington D.C. before serving as the Deputy Staff Director of the State Duma Committee on Foreign Affairs and Counsel to the Deputy Chief of the Presidential Administration for Foreign Policy. He is married with two children. Mr. Frolov coordinates the Russia Profile Experts’ Panel as well as contributing comments and articles about Russia’s foreign policy, “The Coming Conflict in the Arctic Russia and US to Square Off Over Arctic Energy Reserves”, http://www.globalresearch.ca/the-coming-conflict-in-the-arctic/6344)

The United States has been jealous of Russia’s attempts to project its dominance in the energy sector and has sought to limit opportunities for Russia to control export routes and energy deposits outside Russia’s territory. But the Arctic shelf is something that Russia has traditionally regarded as its own. For decades, international powers have pressed no claims to Russia’s Arctic sector for obvious reasons of remoteness and inhospitability, but no longer. Now, as the world’s major economic powers brace for the battle for the last barrel of oil, it is not surprising that the United States would seek to intrude on Russia’s home turf. It is obvious that Moscow would try to resist this U.S. intrusion and would view any U.S. efforts to block Russia’s claim to its Arctic sector as unfriendly and overtly provocative. Furthermore, such a policy would actually help the Kremlin justify its hardline position. It would certainly prove right Moscow’s assertion that U.S. policy towards Russia is really driven by the desire to get guaranteed and privileged access to Russia’s energy resources.

**2NC – Russia-China War Impact**

**Even if they win their Russian economy defense, they’ve still conceded the warrant in the Fin evidence that forcing Russia’s attention away from the Arctic leads to border wars with China over energy**

**That goes nuclear**

**Sharavin, 1** (Alexander, Director of the Institute of Political and Military Analysis and former Russian Military Officer, 10-3, Defense and Security, lexis)

Chinese propaganda has constantly been showing us skyscrapers in free trade zones in southeastern China. It should not be forgotten, however, that some 250 to 300 million people live there, i.e. at most a quarter of China's population. A billion Chinese people are still living in misery. For them, even the living standards of a backwater Russian town remain inaccessibly high. They have absolutely nothing to lose. There is every prerequisite for "the final throw to the north." The strength of the Chinese People's Liberation Army (CPLA) has been growing quicker than the Chinese economy. A decade ago the CPLA was equipped with inferior copies of Russian arms from late 1950s to the early 1960s. However, through its own efforts Russia has nearly managed to liquidate its most significant technological advantage. Thanks to our zeal, from antique MiG-21 fighters of the earliest modifications and S-75 air defense missile systems the Chinese antiaircraft defense forces have adopted Su-27 fighters and S-300 air defense missile systems. China's air defense forces have received Tor systems instead of anti-aircraft guns which could have been used during World War II. The shock air force of our "eastern brethren" will in the near future replace antique Tu-16 and Il-28 airplanes with Su-30 fighters, which are not yet available to the Russian Armed Forces! Russia may face the "wonderful" prospect of combating the Chinese army, which, if full mobilization is called, is comparable in size with Russia's entire population, which also has nuclear weapons (even tactical weapons become strategic if states have common borders) and would be absolutely insensitive to losses (even a loss of a few million of the servicemen would be acceptable for China). Such a war would be more horrible than the World War II. It would require from our state maximal tension, universal mobilization and complete accumulation of the army military hardware, up to the last tank or a plane, in a single direction (we would have to forget such "trifles" like Talebs and Basaev, but this does not guarantee success either). **Massive nuclear strikes** on basic military forces and cities of China **would** finally **be the only way out**, what would exhaust Russia's armament completely. We have not got another set of intercontinental ballistic missiles and submarine-based missiles, whereas the general forces would be extremely exhausted in the border combats. In the long run, even if the aggression would be stopped after the majority of the Chinese are killed, our country would be absolutely unprotected against the "Chechen" and the "Balkan" variants both, and even against the first frost of a possiblenuclear winter**.**

**2NC – XT: Key To Russian Economy**

**Arctic development is key --- it’s critical to export throughput**

**Østhagen 12** (Andreas Osthagen, an analyst for the Norwegian/EU Arctic policy on Arctic Oil and Gas. Holds a Master of Science degree in Politics and Government from the London School of Economics and a B.A. in Political Economy from the Norwegian University of Science and Technology. He is currently working as an advisor at the North Norway European Office in Brussels, while also taking part in the Arctic research programme 'Geopolitics in the High North' through his affiliation with the Norwegian Institute for Defence Studies (IFS). “http://www.thearcticinstitute.org/2012/03/to-drill-or-not-to-drill-arctic.html”)

On the other hand, the Arctic states perceive the development of Arctic resources as integral to their own economies. Russia is dependent on huge oil and gas exports to sustain its economic growth, as gas exports to Europe constitute the backbone of the current Russian economy. **These exports will dwindle if new Arctic fields are not put into production.** Norway is in a similar situation, albeit to a lesser extent. Norway relies on petroleum exports, but the Arctic is not the only region of production, and neither is the oil and gas percentage of the GDP as high as in Russia [9]. Greenland is currently completely dependent on economic transfers from Denmark, and hope to develop economic independence through exploiting the potential for its Arctic petroleum activities [10]. The Alaskan state government and the Canadian Prime Minister Harper’s government are also pushing for oil and gas companies to invest in national Arctic offshore projects, boosting sluggish regional economies.

**The Russian government can’t function without Gazprom**

**Business Week** **12** (Business Week 2/9/12, http://mobile.businessweek.com/magazine/gazproms-empire-at-the-end-of-the-earth-02092012.html?section=magazine)

Gazprom performs many functions traditionally reserved for the state, including funding public works projects directly from its budget. It’s the only Russian company that is compelled to pay its tax bill monthly, since this revenue makes up the single largest portion of Russian gross domestic product (10 percent) and is critical to the basic workings of government. Gazprom is less a company than a public trust, one that enjoys special advantages in exchange for fulfilling official wishes.

**2NC – AT: Russian Economy Collapse Now**

**Russia economy still strong due to Gazprom**

**Business Week, 12** (Business Week, “Gazproms Turmoil from Rivals to Pieces to an EU Probe”, http://www.businessweek.com/articles/2012-09-07/gazproms-turmoil-from-rivals-to-prices-to-an-eu-probe)

Gazprom **remains** a formidable contender, with **18 percent of global gas reserves**, annual sales of more than $150 billion, and the Kremlin as its majority shareholder. One likely target for expansion is Asia Gazprom and Japanese companies plan to build a lng facility

**Russian economy strong due to oil profits**

**Higgins 12** (Tim, staff writer for Bloomberg, “GM CEO Says Russia Growth Helps Make Up For Europe Losses”, Bloomberg, http://www.bloomberg.com/news/2012-06-22/gm-ceo-says-russia-growth-helps-make-up-for-europe-losses.html)

the Russian auto market, driven by improving economic conditions fueled by the oil and **gas industries**, will grow 7 percent this year and reach 3 million units in the near future, Hanna global auto leaders, said. It’s now the second-largest market in Europe behind Germany. There was a lot of turmoil post-bankruptcy. The decision was made prior to the reconstitution of the board and we changed directions. Everything I’ve seen and heard so far, was, ‘OK, that’s past. Past is not prologue. You don’t have this uncertainty that you see even in the United States.”

**Russia’s economy is strong**

**CNBC 12** (CNBC, 9/11/12, http://www.cnbc.com/id/48983329)

The World Bank reported that inflation in Russia had reached its lowest point for two decades debt is10 percent of GDP compared to the U.S. where it has reached 100 percent Putin has taken measures to attract investment. Russia’s entry into the WTO was also a crucial step that will continue to drive structural reforms the euro crisis is barely being felt in Moscow. You’ve got a very cheap market, robust macro story, earnings growth

**2NC – AT: Russia Economy Resilient (1/2)**

**Conceded Gazprom is key to Putin Power and internal stability --- trigger the impact regardless of their econ defense**

**Arnold 12** (Richard associate professor of political science Muskingum University “Is Russia Stable Without Putin?” Eurasia Daily Monitor Volume: 9 Issue: 34, Jamestown Foundation)

Judging from the posts left on nationalist websites – some of which are hosted outside the country due to the Kremlin’s clampdown on these organizations and enforcement of article 282 (prohibiting incitement of national, racial or religious enmity) of the Russian constitution, which began at the end of 2010 (Sova report, 2011) – the extreme nationalists have decided to put aside their differences with the liberals and the left in the name of getting rid of “the corrupt junta of Putin” (http://dpni.org/articles/novostnaya/29030/). It should be stressed that this may not result in a decrease in skinhead attacks on ethnic minorities, as most skinhead groups are not aligned with any formal organization. This temporary halt to hostilities or ceasefire has been mirrored by the leader of the so-called “Caucasus Emirate” Doku Umarov’s pledge to stop attacking Russian civilians for the duration of the protests (http://www.independent.co.uk/news/world/europe/chechen-terror-leader-halts-civilian-attacks-6358877.html). Given that the terrorist campaign of Chechen and now Islamist rebels has been continuous since the Moscow apartment bombings of 1999, Umarov’s statement is extremely significant. This coalescence of diametrically opposed groups around a common goal is remarkable in post-Soviet politics. Looking further down the line, however, the alliance of liberals, communists and nationalists appears to be solely a marriage of convenience that will not last beyond the honeymoon of Putin’s departure. It is unknown what might happen to a Russia without Putin. In an open letter to Nezavisimaya Gazeta on January 23, Vladimir Putin warned that the protests against the fraudulent elections of December 4 and the slogans of the protestors such as “stop feeding the Caucasus” could lead Russia to follow the same fate as the Soviet Union. Some commentators have seen in this an attempt by Putin to scare the protestors into supporting him. Yet the threat of **secession remains a possibility,** especially given Russian nationalists’ desire to introduce laws protecting ethnic Russians – 80 percent of the population – within Russia. The extreme nationalists have reacted hopefully to this, with Alexander Belov seeing in the protests to remove Putin the chance to finish the state-building project begun with the fall of the Soviet Union and create an ethnic state for Russians (http://dpni.org/articles/novosti\_\_d/28502/). With 59 percent of respondents either strongly or moderately in favor of the phrase “Russia for Russians” in November 2011, there is also widespread support for ideas like these within Russia (http://www.levada.ru/15-12-2011/rossiyane-ob-obstanovke-na-severnom-kavkaze-natsionalizme-politike-i-finansirovanii-regio). Such laws would almost certainly be deleterious for the future of the Russian Federation as a single country. At a minimum, discriminatory laws would further radicalize separatists in the North Caucasus. Indeed, that may even be part of Umarov’s calculus in calling a ceasefire to the terrorist campaign. It is also possible that under any kind of genuine democracy in Russia, the North Caucasus would vote to secede along the lines of the “Velvet Divorce” in 1993. Further afield, Putin’s fears that more than the integrity of Russia’s south would be a stake are not altogether fanciful. Tatarstan and the Far East are obvious candidates for separatism and such forces there would be buoyed by separation in the North Caucasus and discriminatory laws from Moscow. It is also clear, however, that the extreme nationalists would not welcome such separation. Indeed, Dmitry Demushkin stated in an interview with Interfax on January 23 that “Russian nationalists will never support the separation of Russia, supporting conversely the wellbeing of Russians – the preservation of the natural native nations, living on the territory of our country” (www.demushkin.com/content/news). Such rhetoric should not be taken lightly. Over the last 12 years, extreme nationalists and Neo-Nazis have been acting as virtual paramilitaries who claim to be defending indigenous Russian culture and “the white race,” by sending recruits through military training programs and attacking ethnic minorities on an almost daily basis. Despite increased police attention to such crimes, there were at least five incidences of violent assault in December 2011 alone (http://www.sova-center.ru/en/xenophobia/news-releases/2012/01/d23381/). How much worse such violence would be in a potentially anarchic situation where the police are not prosecuting crimes is hard to say. While it may be alarmist to raise the specter of Civil War at this stage, **no-one should take this** scenario of **Civil War off the table.**

**2NC – AT: Russia Economy Resilient (2/2)**

**1998 and 2008 crises proves that the economy isn’t resilient**

**Economic Times 08** (“Russia seen shrugging off market collapse,” Sep 21, Lexis)

Buoyed by vast oil wealth, Russia is shrugging off its worst market meltdown in a decade, emerging with its booming economy almost intact, analysts say. The Russian stock market last week saw its sharpest falls since the catastrophic economic collapse of 1998 after suffering the toxic combination of global financial turmoil, falling commodity prices and a local credit crunch. But with oil prices still almost ten times higher than a decade ago, economists see Russia emerging with a relatively mild hangover. The collapse was a "reality check, not a derailment, because the government had the money to fix it," said Chris Weafer, chief strategist at Moscow investment bank Uralsib. "The Kremlin's confidence has not been shaken." The government suspended trading on Wednesday after sharp drops of over 10 percent that left the benchmark RTS down 57 percent from an all-time high achieved in May. After a series of ineffectual appeals for calm, the Kremlin put its money on the table, pledging over 60 billion dollars (over 40 billion euros) to prop up prices. When the RTS reopened Friday, shares surged over 22 percent, recovering the week's losses. The crash has exposed flaws in the financial system, analysts said, but oil wealth has allowed the Kremlin to smooth over the cracks and avoid a repeat of the 1998 financial crisis, when a sovereign debt default caused a collapse of the ruble, all but wiping out the country's middle class. This time around, with oil prices around 100 dollars a barrel -- around 10 times higher than in 1998 -- Russia's prospects could not look more different, said Ronald Smith, chief strategist at Moscow's Alfa-Bank. "If you compare it to 1998, the outlook for the economy is fundamentally good," he said. "We will come out of this with growth that is maybe slower than we had... but relatively high."

**2NC – AT: EU Independence Uniqueness**

**The EU will remain dependent on Russian gas – its strategies will fail as long as Russia holds the gas supply card**

**Alic 9/12/12** (Jen Alic, geopolitical analyst, co-founder of ISA Intel, and the former editor-in-chief of ISN Security Watch, 9/12/12, “Europe has had enough, but can it stand up to Gazprom?”, Christian Science Monitor, http://www.csmonitor.com/Environment/Energy-Voices/2012/0912/Europe-has-had-enough-but-can-it-stand-up-to-Gazprom)

It has strengthened its grip on Europe further due to the fact that it owns the one-way gas pipelines into the region and forces buyers into long-term contracts in which prices are tied to oil. (See also: OPEC has Probably Deceived Us About the Size of its Oil Reserves.) The EU has tried numerous tactics to loosen the Gazprom grip, including the implementation of new energy policies designed to separate supply from delivery and by seeking new pipelines that could deliver gas from elsewhere. While the EU’s alternative pipeline dreams have largely **failed** so far, it is eyeing developments now in Northern Iraq, where Turkey is courting the Kurds to build a new pipeline that could eventually deliver gas to EU markets. But **this is a long way, and** possibly **a war, off**. Having failed so far in the area of alternative suppliers, the EU is now moving the front lines of the battle to the legal field, targeting unfair competition, which it stands a better, but still only minimal, chance of changing the rules of the game. The probe into Gazprom is looking at three things: Gazprom’s attempts to hinder the free flow of gas across the EU; its purposeful blocking of diversification efforts; unfair pricing and contractual arrangements. Specifically, the EU says Gazprom has implemented a strategy to segment national markets by preventing gas exports and limiting delivery options, as well as by obligating buyers to use Gazprom infrastructure. Most significantly to the consumer, Gazprom’s pricing policies, which fix gas prices to oil prices, mean that European consumers see no benefit from the natural gas revolution in the US, which has increased global supplies and reduced prices on the open market. Will the EU be able to actually levy fines for unfair competition and unravel the monopoly? Not unless it plays as dirty as Gazprom, which will simply cut off supplies and the circulation of those European countries that used to be in its back yard. Eastern and Central Europe will be the ones to pay the price for the European Union’s battle.

**Gazprom will retain solid market share in Europe despite regulatory pressure**

**S&P 9/13/12** (Standard and Poor rating agency, TEXT-S&P summary: OAO Gazprom, Reuters, 9/13/12, http://in.reuters.com/article/2012/09/13/idINWLA322620120913)

Gazprom faces regulatory pressures from the European Commission. Still, the presence of take-or-pay provisions, existing pipeline infrastructure and low costs of traditional gas should in our view help Gazprom retain a solid market share in Europe

**Russia doesn’t need the European market – it’s selling to Asia**

**New York Times 12** (New York Times 9/9/12, “Russia and Japan in Agreement on Natural Gas Deal,” http://www.nytimes.com/2012/09/09/world/europe/russia-and-japan-move-forward-on-natural-gas-deal.html)

Gazprom signed an accord with Japan to move forward with construction of a natural gas terminal here that would multiply its business ties in the Far East. Gazprom already sells natural gas to Japan, but another major deal would further reduce Russia’s reliance on Europe as its primary market within the next few years, sales by Gazprom to Asia would exceed its sales in Europe

**2NC – AT: Putin Collapse Now**

**Putin is on the brink --- only the plan tips him over**

**NYT 12** (New York Times, 03/05/2012, http://topics.nytimes.com/top/reference/timestopics/people/p/vladimir\_v\_putin/index.html)

But after a decade of political quiet, opposition to Mr. Putin had been galvanized by widespread anger over his decision to push aside President Dmitri Medvedev, his handpicked successor. (Under the new plan, Mr. Medvedev was to become prime minister.) In parliamentary elections in December 2011, Mr. Putin’s United Russia party suffered surprisingly steep losses, barely reaching a 50 percent majority. The December elections were widely dismissed as fraudulent, and a series of demonstrations followed, drawing tens of thousands of protesters into the streets of Moscow. Mr. Putin accused the United States, particularly Secretary of State Hillary Rodham Clinton, of serving as instigators. Already Gearing Up for a Fourth Term? During an interview released on March 2, 2012, Mr. Putin said that he may run for president for a fourth time in 2018, which would lengthen his term as Russia’s paramount leader to 24 years. “It would be normal, if things are going well, and people want it,” Mr. Putin said in an interview with the editors of six foreign newspapers. “And if people don’t want it and things aren’t going well, and a person clings to his chair and doesn’t want to give it away, and if, on top of that, he violates the law — that would not be normal.” “But I don’t know whether I want to remain for more than 20 years,” he continued. “I have not yet made this decision for myself.” Mr. Putin came across as confident that he would not face destabilizing dissent after the March 4 election, despite a series of antigovernment protests that snowballed after parliamentary polls in December 2011. He said the government had no plans to crack down on demonstrators, and that “on the contrary, Medvedev has just introduced an entire package of laws to parliament which would liberalize our political system.” Assassination Plot Uncovered In late February 2012, Russian television reported that the Ukrainian and Russian intelligence services had acted jointly to thwart an assassination attempt against him. A report by the state-controlled broadcaster Channel One said that two would-be assassins were arrested in the Ukrainian city of Odessa, after surviving an explosion inside an apartment there; a third man died in the blast. Authorities said that the apartment’s inhabitants had been dispatched to the city by the Chechen terrorist leader Doku Umarov, Channel One reported. There was confusion about the date of the arrests in the case. Channel One said the suspects were arrested on Jan. 4, but a statement released by the Ukrainian security services said the arrests were made on Feb. 4. One survivor told authorities that there was a plan to attack strategic sites in Moscow and then to stage an attack on Mr. Putin, according to the report. Mr. Putin’s spokesman, Dmitri S. Peskov, said that an assassination attempt had been in the works, as did a spokeswoman for Ukraine’s security service. A spokesman for Russia’s Federal Security Service would not comment. Facing a Russia That’s Changed Though Mr. Putin seemed assured of a convincing victory in the presidential election, the emerging threat to his rule had slid beneath the surface. But it will follow him across the six years of his third presidential term, as he will be forced to respond to a populace beginning to demand more of a stake in the governing of Russia.

\*\*\*ENVIRONMENT DA\*\*\*

1NC – Biodiversity DA (1/2)

**Momentum toward conservation but it’s fragile – acknowledgement is key**

(Grantly **Galland et al 12,** Grantly Galland is a PhD candidate at the Center for Marine Biodiversity and Conservation, Scripps Institution of Oceanography, at the University of California at San Diego, Ellycia Harrould-Kolieb is a PhD student in the department of resource management and geography at the Melbourne School of Land and Environment, and Dorothee Herr is assistant to the deputy head of the Global Marine Program for the International Union for Conservation of Nature, “The Ocean and Climate Change Policy,” Climate Policy, 2012, http://search.proquest.com.proxy.lib.umich.edu/docview/1321407777/fulltextPDF?accountid=14667)

4. How can the ocean be considered more signiﬁcantly? There are good reasons why the ocean’s role in climate regulation, value as a carbon sink, and importance as a source of food and income for hundreds of millions of people around the world should receive more attention during the negotiation and implementation of climate policy. Achieving this result is a two-step process: B Researching and designing policies that deal with ocean–climate issues. B Injecting appropriate language into the laws and agreements at the highest levels of national and international climate change negotiation. One could argue that the ﬁrst step is well under way, if not complete. Ocean researchers and advocates already have a good idea of what policies could successfully manage oceanic carbon stores, preserve marine and coastal ecosystems, and support the continued provision of ecosystem services. For example, in ‘Blue Carbon Policy Framework’ (Herr et al., 2011), several policy opportunities to include oceanic carbon storage more signiﬁcantly in international, regional, and national climate change mitigation strategies are discussed. Potential threats to the marine environment (e.g. shifting ecosystem ranges and changes to ocean chemistry) in the absence of mitigation policies are also well known (see above). As already mentioned, however, there has been little progress on the second, and practically more difﬁcult, step of convincing those at the negotiation table to consider language involving the ocean. COP decisions, as well as national legislation, are often necessarily general in order to ensure that they are applicable to a wide range of stakeholders and to avoid limiting the effectiveness of implementing agencies. Therefore, it can be difﬁcult to obtain support for speciﬁc issues. Even the general acknowledgement of an issue as important, however, can inspire a reaction, and the assignment of an issue to a working group, subsidiary body, or committee leads to signiﬁcant and timely analysis and action (again, forest management is an example).

**(insert specific link)**

1NC – Biodiversity DA (2/2)

**Extinction—there’s an invisible threshold and it is irreversible**

**Diner 94** (Major David N., Judge Advocate General's Corps – United States Army, “The Army and The Endangered Species Act: Who's Endangering Whom?”, Military Law Review, Winter, 143 Mil. L. Rev. 161, Lexis)

The prime reason is the world's survival. Like all animal life, humans live off of other species. At some point, the number of species could decline to the point at which the ecosystem fails, and then humans also would become extinct. No one knows how many [\*171]  species the world needs to support human life, and to find out -- byallowing certain species to become extinct -- would not be sound policy. In addition to food, species offer many direct and indirect benefits to mankind. [68](http://www.truthnews.net/world/2004080046.htm?_m=15aac6482af89f930a3e32f7a8def8da&csvc=le&cform=byCitation&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLbVlW-zSkAA&_md5=37ae2564ed6a714dcd205b0ee5431e9a" \l "n68" \t "_self) 2.Ecological Value. -- Ecological value is the value that species have in maintaining the environment. Pest, [69](http://www.nasa.gov/pdf/490945main_10-10_TFPD.pdf?_m=15aac6482af89f930a3e32f7a8def8da&csvc=le&cform=byCitation&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLbVlW-zSkAA&_md5=37ae2564ed6a714dcd205b0ee5431e9a" \l "n69" \t "_self) erosion, and flood control are prime benefits certain species provide to man. Plants and animals also provide additional ecological services-- pollution control, [70](http://www.nasa.gov/pdf/432577main_Earth_Science_R1.pdf?_m=15aac6482af89f930a3e32f7a8def8da&csvc=le&cform=byCitation&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLbVlW-zSkAA&_md5=37ae2564ed6a714dcd205b0ee5431e9a" \l "n70" \t "_self)oxygen production, sewage treatment, and biodegradation.[71](http://www.wired.com/science/discoveries/news/2003/05/58966?_m=15aac6482af89f930a3e32f7a8def8da&csvc=le&cform=byCitation&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLbVlW-zSkAA&_md5=37ae2564ed6a714dcd205b0ee5431e9a" \l "n71" \t "_self) 3.Scientific and Utilitarian Value. -- Scientific value is the use of species for research into the physical processes of the world. [72](http://www.lexis.com/research/retrieve?_m=15aac6482af89f930a3e32f7a8def8da&csvc=le&cform=byCitation&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLbVlW-zSkAA&_md5=37ae2564ed6a714dcd205b0ee5431e9a" \l "n72" \t "_self) Without plants and animals, a large portion of basic scientific research would be impossible. Utilitarian value is the direct utility humans draw from plants and animals. [73](http://www.lexis.com/research/retrieve?_m=15aac6482af89f930a3e32f7a8def8da&csvc=le&cform=byCitation&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLbVlW-zSkAA&_md5=37ae2564ed6a714dcd205b0ee5431e9a" \l "n73" \t "_self) Only a fraction of the  [\*172]  earth's species have been examined, and mankind may someday desperately need the species that it is exterminating today. To accept that the snail darter, harelip sucker, or Dismal Swamp southeastern shrew [74](http://www.lexis.com/research/retrieve?_m=15aac6482af89f930a3e32f7a8def8da&csvc=le&cform=byCitation&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLbVlW-zSkAA&_md5=37ae2564ed6a714dcd205b0ee5431e9a" \l "n74" \t "_self) could save mankind may be difficult for some. Many, if not most, species are useless to man in a direct utilitarian sense. Nonetheless, they may be critical in an indirect role, because their extirpations could affect a directly useful species negatively. In a closely interconnected ecosystem, the loss of a species affects other species dependent on it. [75](http://www.lexis.com/research/retrieve?_m=15aac6482af89f930a3e32f7a8def8da&csvc=le&cform=byCitation&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLbVlW-zSkAA&_md5=37ae2564ed6a714dcd205b0ee5431e9a" \l "n75" \t "_self) Moreover, as the number of species decline, the effect of each new extinction on the remaining species increases dramatically. [76](http://www.lexis.com/research/retrieve?_m=15aac6482af89f930a3e32f7a8def8da&csvc=le&cform=byCitation&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLbVlW-zSkAA&_md5=37ae2564ed6a714dcd205b0ee5431e9a" \l "n76" \t "_self) 4.Biological Diversity. -- The main premise of species preservation is that diversity is better than simplicity. [77](http://www.lexis.com/research/retrieve?_m=15aac6482af89f930a3e32f7a8def8da&csvc=le&cform=byCitation&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLbVlW-zSkAA&_md5=37ae2564ed6a714dcd205b0ee5431e9a" \l "n77" \t "_self)As the current mass extinction has progressed, the world's biological diversity generally has decreased. This trend occurs within ecosystems by reducing the number of species, and within species by reducing the number of individuals. Both trends carry serious future implications. [78](http://www.lexis.com/research/retrieve?_m=15aac6482af89f930a3e32f7a8def8da&csvc=le&cform=byCitation&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLbVlW-zSkAA&_md5=37ae2564ed6a714dcd205b0ee5431e9a" \l "n78" \t "_self) [\*173]  Biologicallydiverse ecosystems are characterized by a large number of specialist species, filling narrow ecological niches. These ecosystems inherently are more stable than less diverse systems. "The more complex the ecosystem, the more successfully it can resist a stress. . . . [l]ike a net, in which each knot is connected to others by several strands, such a fabric can resist collapse better than a simple, unbranched circle of threads -- which if cut anywhere breaks down as a whole." [79](http://www.lexis.com/research/retrieve?_m=15aac6482af89f930a3e32f7a8def8da&csvc=le&cform=byCitation&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLbVlW-zSkAA&_md5=37ae2564ed6a714dcd205b0ee5431e9a" \l "n79" \t "_self) By causing widespread extinctions, humans have artificially simplified many ecosystems. As biologic simplicity increases, so does the risk of ecosystem failure. The spreading Sahara Desert in Africa, and the dustbowl conditions of the 1930s in the United States are relatively mild examples of what might be expected if this trend continues. Theoretically, each new animal or plant extinction, with all its dimly perceived and intertwined affects, could cause total ecosystem collapse and human extinction. Each new extinction increases the risk of disaster. Like a mechanic removing, one by one, the rivets from an aircraft's wings, n80 mankind may be edging closer to the abyss.

2NC – Link – Desalination (1/4)

**Desalinization kills the environment**

**Scientific American 09** "The Impacts of Relying on Desalination for Water." Scientific American Global RSS. N.p., n.d. Web. 24 June 2014. <http://www.scientificamerican.com/article/the-impacts-of-relying-on-desalination/> The leading source and authority for science, technology information and policy for a general audience “The Impacts of Relying on Desalination for Water“(Merkley)

Due to its high cost, energy intensiveness and overall ecological footprint, most environmental advocates view desalinization (or desalination)‚ the conversion of salty ocean water into fresh water‚ as a last resort for providing fresh water to needy populations. Sourcing fresh water from streams, rivers, lakes and underground aquifers and adhering to strict water conservation measures are much more viable for both economic and environmental reasons in most situations, although some desert regions with thirsty and growing populations may not have many such options. The relationship between desalinization and climate change is complex. Global warming has increased droughts around the world and turned formerly verdant landscapes into near deserts. Some long held fresh water sources are simply no longer reliably available to hundreds of millions of people around the world. Meanwhile, expanding populations in desert areas are putting intense pressure on existing fresh water supplies, forcing communities to turn to desalinization as the most expedient way to satisfy their collective thirst. But the process of desalinization burns up many more fossil fuels than sourcing the equivalent amount of fresh water from fresh water bodies. As such, the very proliferation of desalinization plants around the world‚ some 13,000 already supply fresh water in 120 nations, primarily in the Middle East, North Africa and Caribbean, is both a reaction to and one of many contributors to global warming. Beyond the links to climate problems, marine biologists warn that widespread desalinization could take a heavy toll on ocean biodiversity; as such facilities' intake pipes essentially vacuum up and inadvertently kill millions of plankton, fish eggs, fish larvae and other microbial organisms that constitute the base layer of the marine food chain. And, according to Jeffrey Graham of the Scripps Institute of Oceanography's Center for Marine Biotechnology and Biomedicine, the salty sludge leftover after desalinization for every gallon of freshwater produced, another gallon of doubly concentrated salt water must be disposed of can wreak havoc on marine ecosystems if dumped willy-nilly offshore. For some desalinization operations, says Graham, it is thought that the disappearance of some organisms from discharge areas may be related to the salty outflow. Of course, as supplies of fresh water dwindle, the economic cost of desalinization‚ especially in coastal areas with easy access to ocean water‚ begins to look competitive with traditional water sourcing. To date there are about 300 desalinization plants in the United States, with 120 in Florida and less than 40 each in Texas and California. Some 20 additional plants are planned for the coast of California in the coming years, unless environmentalists extolling the virtues of conservation and wielding low-flow shower heads and toilets prevail.

2NC – Link – Desalination (2/4)

**Desalination in oceans devastates ecosystems – Poseidon Resources proves**

**Boxall 13** – Bettina, reporter for LA Times, "Proposed desalination plant could harm ocean environment, report says," 11/10, http://articles.latimes.com/2013/nov/10/local/la-me-desal-huntington-20131111

Poseidon Resources, a small, privately held company based in Stamford, Conn., first proposed the Huntington Beach desalter, and a similar one now under construction in Carlsbad in San Diego County, in 1998. Both would be the largest seawater-to-drinking-water operations in the country, each producing enough purified water every year to supply roughly 100,000 households. Poseidon intended to avoid the expense and environmental problems of building and operating ocean intake and discharge systems by locating its facilities next to power stations and tapping into the huge volumes of seawater used to cool the generating equipment. But that strategy ran into hurdles in 2010 when the State Water Resources Control Board directed most coastal generating stations to phase out seawater cooling, which every year kills massive amounts of plankton at the bottom of the marine food web along with billions of fish eggs and larvae. When the AES Huntington Beach Generating Station on Pacific Coast Highway switches to a different cooling system within the next five years, Poseidon's proposed plant would continue using the power operation's offshore outfall and open ocean intake pipe, pulling in about 127 million gallons of coastal water every day. The commission staff estimates that would annually suck in more than 80 million fish larvae, eggs and invertebrates along 100 miles of the Southern California coast, including a number of Marine Protected Areas. Poseidon could largely avoid such harm, the staff says, by constructing intakes, called infiltration galleries, just below the ocean floor that imperceptibly draw seawater through a few feet of sand into perforated pipes, keeping out the tiny organisms that form the foundation of marine life. Company officials argue that infiltration galleries have been used only by much smaller desalination plants around the world and are unproven and prohibitively expensive for operations the size of Huntington Beach. If the commission adopts the staff recommendations, it would kill the Huntington Beach project and set "a terrible precedent that would have a chilling effect on seawater desalination in California," said Poseidon Vice President Scott Maloni. Far from being environmentally benign, he said subsurface intakes would require the excavation of more than 60 acres of seabed as well as the installation of beach pumping equipment, and would use more energy than an open ocean intake. The commission staff also says Poseidon needs to cut salinity levels of the brine that is left over from the desalting process and dumped back into the ocean. Poseidon intends to dilute the hyper-saline brine with a portion of the intake water. But the staff contends the diluted discharge would still be salty enough to hurt marine life.

2NC – Link – Desalination (3/4)

**Variety of adverse side effects on marine ecosystems, especially invertebrates**

**Lattemann 5** – Sabine, Diplom (MSc) Marine Environmental Science Carl von Ossietzky University Oldenburg, Germany Thesis: Marine Impacts of Seawater Desalination Plants; Postgraduate Diploma in Marine Science Otago University, Dunedin, New Zealand Thesis: Development of a teaching unit for the New Zealand Marine Studies Centre on the ENSO phenomenon; Vordiplom (BSc) Marine Environmental Science Carl von Ossietzky University Oldenburg, Germany, “Potential Impacts of Seawater Desalination,” 2005, http://www.paua.de/Impacts.htm

Salinity, temperature and density Salinity is increased in the waste stream of all processes, but elevated temperature values are characteristic of distillation plant effluents only. The RO brine has a higher density than seawater as a result of its increased salinity and will mostly affect benthic communities, while distillation plant discharges tend to float on the surface and interfere with productivity in the pelagic community. The positive buoyancy of distillation plant discharges is mostly due to the discharge of large volumes of cooling water, which are blended with the brine. 5 back to top Deaeration and oxygen scavengers With increasing temperature and salinity, oxygen becomes less soluble in seawater. However, oxygen levels are deliberately reduced in distillation plants by physical deaeration and addition of oxygen scavengers like sodium bisulfite to inhibit corrosion. Oxygen depletion is also a problem of the RO brine, as sodium bisulfite is commonly used as a neutralizing agent for chlorine. The lack of dissolved oxygen could be toxic to marine organisms and aeration is recommended prior to oceanic discharge. Chlorine One major pollutant of distillation processes is chlorine, which is added to the desalination plant feedwater to prevent biofouling on heat exchanger surfaces. In RO plants, chlorine is also a common biocide but modern plants often operate on polyamide membranes, which are sensitive to oxidizing chemicals such as chlorine. Neutralization is typically required before the feedwater enters the RO unit and it can be assumed that the brine is free from chlorine, too. Chlorine is a strong oxidant and highly effective biocide. Residual levels in the discharge may therefore be toxic to marine life in the discharge site. The use of chlorine also leads to the formation of oxidation by-products such as halogenated organics. These compounds are usually rather persistent in the marine environment and sufficient evidence exists that some of them are carcinogenic to animals. Due to environmental and health problems caused by residual chlorine and disinfection by-products, several alternative pretreatment methods have been considered to replace chlorine in desalination plants. Alternative biocides include for example ozone and monochloramine, while disinfection with ultraviolet light may be used instead of biocides to eliminate micro-organisms. Heavy metals The waste brine often contains low amounts of heavy metals that pass into solution when the plant's interior surfaces corrode. Brine metal composition depends on the use of different construction materials in distillation and reverse osmosis plants: Copper contamination is a major problem of distillation plants, as copper-nickel alloys are common materials for heat exchanger surfaces. In contrast, non-metal equipment and stainless steels are typically used in RO plants. The RO brine may therefore contain traces of iron, nickel, chromium and molybdenum, but contamination levels are generally low. Heavy metals tend to enrich in suspended material and finally in sediments, so that areas of restricted water exchange and soft bottom habitats could be affected by heavy metal accumulation. Many benthic invertebrates feed on this suspended or deposited material, with the risk that metals are enriched in their bodies and passed on to higher trophic levels. It is therefore recommended that limits are established for heavy metal concentrations in the brine discharges. Antiscalants Scaling on heat exchanger surfaces, inside tubes, or on RO membranes impairs plant performance. Antiscalants are commonly added to the feedwater in both distillation and RO plants to prevent scale formation. The main representatives of antiscalants are organic, carboxylic-rich polymers such as polyacrylic acid and polymaleic acid. Acids and polyphosphates are still in use at a limited scale but on the retreat. As antiscalants have a low toxicity, the acute environmental risk associated with their release into the marine environment is relatively low. Due to a poor degradability, however, dispersal and relatively long residence times must be expected, during which interference with element cycles of trace metals is a possible risk. Coagulants and coagulant aids Coagulants like ferric- or aluminum chloride are used to improve filtration of suspended material from the RO feedwater. Coagulant aids (organic substances with high molecular masses that bridge particles further together) and pH control are supplementary methods to enhance coagulation. The filter backwash can be discharged to the sea, as toxic effects are not expected by coagulants and coagulant aids. However, possible impacts such as reduced primary production or burial of sessile organisms by increased turbidity in the discharge should be anticipated. For impact mitigation, the backwash could be diluted, e.g. by continuous blending with the brine, or alternatively it could be removed from the filters and transported to a landfill. Antifoaming agents To reduce foaming in distillation plants, antifoaming agents like polyglycols are added to the feedwater, which are not toxic but poorly biodegradable. Adverse effects are not to be expected with regard to a low dosage level and sufficient dilution following discharge. Cleaning chemicals Cleaning intervals have to be established for each desalination plant individually and are typically three to six months depending on the quality of the plant's feedwater. In RO plants, alkaline cleaning solutions (pH 11-12) are used for removal of silt deposits and biofilms, whereas acidified solutions (pH 2-3) remove metal oxides and scales. Further chemicals are often added to improve the cleaning process of RO membranes, such as detergents, oxidants, complexing agents or biocides for membrane disinfection. In distillation plants, cleaning is typically very simple: Copper-nickel heat exchanger surfaces are washed with acidified warm seawater to remove alkaline scales. The acidic solution often contains a chemical inhibitor which is added to protect the plant from corrosion. Most of the named cleaning and disinfection chemicals may be hazardous to aquatic life, so that disposal to the ocean should be strictly regulated. Neutralization of the extremely alkaline or acidic solutions and treatment of additional cleaning agents is recommended before discharge to the ocean to remove any potential toxicity.

2NC – Link – Desalination (4/4)

**Ocean desal plants suck in billions of fish and organisms**

**Food & Water Watch 9** – nonprofit consumer organization that works to ensure clean water and safe food, “Desalination: An Ocean of Problems,” February, http://documents.foodandwaterwatch.org/doc/Desal-Feb2009.pdf

Ocean desalination plants can wreak havoc on marine life and commercial fisheries. Many proposed coastal plants rely on power plants to pull in ocean water. These power plants use outdated “once-through cooling water intake structures” that cool the plants by pulling in large quanti-ties of seawater. Desalination plants located next to these facilities take a portion of the outgoing water from these systems for their water supply. The problem here is that these structures suck in a lot more than seawater — they also bring marine life that dies in the machinery. According to EPA, these intake structures kill at least 3.4 billion fish and other organisms annually. Larger organisms are trapped against the intake screens, and smaller ones, such as fish eggs and larvae, are drawn through the intake screens and destroyed in the cooling sys-tem.

2NC – Link – Drilling (1/4)

**Drilling causes spills, chemicals, seismic testing, and destroy wetlands and marshes**

**Southern Environmental Law Center, 2014** (“Defending Our Southern Coasts” 5/16/2014 <http://www.southernenvironment.org/cases-and-projects/offshore-oil-drilling>)

Risks of Oil Drilling In February 2014, the Bureau of Ocean Energy Management released its final environmental impact statement on the plan to open up the Atlantic coast to seismic surveys for oil and gas. The head of the agency anticipates that applications to conduct seismic testing could be received by the end of the year. Not only are the air gun blasts used in seismic testing harmful to marine life such as the critically endangered North American right whale, allowing seismic testing opens the door to risky oil drilling—under the same lax assessments of risks and precautions that led to the BP Deepwater Horizon oil spill in the Gulf of Mexico. Despite the BP oil spill in the Gulf, the federal regulatory agency and oil companies continue operations based on their same claims that there is no significant risk of, or thus impacts from, such oil spills. SELC challenged the agency's cursory environmental review as illegal and irresponsible in light of the BP blowout and oil spill, and its harmful impacts in the Gulf of Mexico. In December 2011, SELC filed suit challenging the agency’s continued sales of oil and gas leases in the Gulf, which still are conducted without adequate environmental analysis and without regard for lessons learned from the BP disaster. Coastal Riches for Wildlife and People The beautiful and biologically rich coastal areas off Virginia, North Carolina, South Carolina, Georgia, and our Gulf Coast feature some of the most productive estuaries in the country, including the Chesapeake Bay, the Pamlico Sound, the ACE Basin, and Mobile Bay. Our coasts attract millions of tourists, anglers, and other visitors each year and provide important breeding and feeding habitat for rare migratory birds, turtles, and whales. Tourism and fishing—both commercial and recreational—are the economic backbone of hundreds of communities along our coasts. In 2008 alone, the four Atlantic states yielded $262.8 million in commercial fish landings. Problematic Infrastructure The environmental impacts of offshore drilling and its accompanying infrastructure and refineries onshore were well known even before Gulf disaster. Ocean rigs routinely spill and leak oil—and sometimes blow out. Chemicals used to operate oil and gas wells also pollute the marine environment. Moreover, oil spills and other contamination from onshore refineries, pipelines, and associated infrastructure would spoil valuable wetland and marsh ecosystems that provide multiple benefits for Southern communities, including flood control and protection from storms, clean water, and essential habitat for fisheries that sustain our economies and cultures.

**Drilling puts oceans at risk – spills**

PE 14 (Pacific Environment, “Fossil Fuels”, Pacific Environemnt: Protecting the Living Environment of the Pacific Rim, 2/20/2014, 7/3/14, http://pacificenvironment.org/energy-fossil-fuels)

The most obvious environmental impact from the oil and gas industry is the burning of oil, which releases several smog- causing pollutants and greenhouse gases that contribute to global warming. However, the act of exploration and drilling for oil and gas also poses a major threat to fragile ecosystems throughout the world. In recent years, we have seen oil spills destroy communities, soil beaches, and kill countless numbers of birds, marine mammals, fish, and other wildlife. Though it happened over two decades ago, the Exxon Valdez spill continues to affect the ecology of Alaska. Worse yet, we still do not know the full extent of the damage from the 2010 Deepwater Horizon oil spill in the Gulf of Mexico. Despite these disasters, as our energy demands continue to grow, we continue seeking oil and gas offshore, putting coastal communities, wildlife, and ecosystems at great risk.

2NC – Link – Drilling (2/4)

**Offshore drilling pollutes the oceans**

Oceana 12 (the largest international organization focused solely on ocean conservation, “Impacts of Offshore Drilling”, OCEANA.ORG, 2012 http://oceana.org/en/our-work/stop-ocean-pollution/oil-pollution/learn-act/impacts-of-offshore-drilling)

Offshore drilling operations create various forms of pollution that have considerable negative effects on marine and other wildlife. These include drilling muds, brine wastes, deck runoff water and flowline and pipeline leaks. Catastrophic spills and blowouts are also a threat from offshore drilling operations. These operations also pose a threat to human health, especially to oil platform workers themselves. Drilling muds and produced water are disposed of daily by offshore rigs. Offshore rigs can dump tons of drilling fluid, metal cuttings, including toxic metals, such as lead chromium and mercury, as well as carcinogens, such as benzene, into the ocean. Effects of Drilling Muds Drilling muds are used for the lubrication and cooling of the drill bit and pipe. The muds also remove the cuttings that come from the bottom of the oil well and help prevent blowouts by acting as a sealant. There are different types of drilling muds used in oil drilling operations, but all release toxic chemicals that can affect marine life. One drilling platform normally drills between seventy and one hundred wells and discharges more than 90,000 metric tons of drilling fluids and metal cuttings into the ocean. Effects of Produced Water Produced water is fluid trapped underground and brought up with oil and gas. It makes up about 20 percent of the waste associated with offshore drilling. Produced waters usually have an oil content of 30 to 40 parts per million. As a result, the nearly 2 billion gallons of produced water released into the Cook Inlet in Alaska each year contain about 70,000 gallons of oil. Effects of Exploration Factors other than pollutants can affect marine wildlife as well. Exploration for offshore oil involves firing air guns which send a strong shock across the seabed that can decrease fish catch, damage the hearing capacity of various marine species and may lead to marine mammal strandings. More drilling muds and fluids are discharged into the ocean during exploratory drilling than in developmental drilling because exploratory wells are generally deeper, drilled slower and are larger in diameter. The drilling waste, including metal cuttings, from exploratory drilling are generally dumped in the ocean, rather than being brought back up to the platform. Effects of Offshore Oil Rigs Offshore oil rigs may also attract seabirds at night due to their lighting and flaring and because fish aggregate near them. Bird mortality has been associated with physical collisions with the rigs, as well as incineration by the flare and oil from leaks. This process of flaring involves the burning off of fossil fuels which produces black carbon. Black carbon contributes to climate change as it is a potent warmer both in the atmosphere and when deposited on snow and ice. Drilling activity around oil rigs is suspected of contributing to elevated levels of mercury in Gulf of Mexico fish.

2NC – Link – Drilling (3/4)

**Transporting after fracking contaminates everything**

**CBD No Date** (Center for Biological Diversity, “Fracking Threatens California’s Wildlife”, Center for Biological Diversity, No date, http://www.biologicaldiversity.org/campaigns/california\_fracking/wildlife.html)

Fracking in California poses serious risks to the state’s wildlife. Endangered species like California condors, San Joaquin kit foxes and blunt-nosed leopard lizards live in places where fracking is likely to expand, and these animals face direct and indirect harm. Fracking comes with intense industrial development, including multi-well pads and massive truck traffic. That’s because, unlike a pool of oil that can be accessed by a single well, shale formations are typically fractured in many places to extract fossil fuels, requiring multiple routes for trucks, adding habitat disturbance for wildlife and more pollution. Fracking is already common in other parts of the country. Research and reports from those areas suggest links between fracking and a wide range of threats to wildlife and domestic animals like horses, cats and dogs. Among the most serious: Fish kills in Pennsylvania have been associated with the contamination of streams, creeks and wetlands by fracking fluid. Farmers, pet owners and veterinarians in five states — Colorado, Louisiana, Ohio, Pennsylvania, and Texas — have reported deaths, serious illnesses and reproductive problems among wildlife, as well as horses, cattle, cats and dogs exposed to fracking infrastructure or wastewater. Withdrawing water from streams and rivers for fracking can threaten fisheries. Birds and other wildlife have been poisoned by chemical-laced water in wastewater ponds and tanks used to dispose of fracking fluids. Equipment used to withdraw water for fracking activity has been implicated in the introduction of invasive species into creeks and rivers, causing fish kills. Sensitive bird species and other wildlife can be affected by drilling noise, truck trips and other effects from gas drilling pads — one study found that a single drilling station can affect 30 acres of forest. Effects on wildlife include degradation of habitat and interference with migration and reproduction. The diversity of species in streams close to fracking activity in Pennsylvania was found to be reduced, even though drilling was done in accordance with all current state rules. Wastewater ponds resulting from gas extraction provide breeding grounds for mosquitoes that can transmit diseases such as the deadly West Nile Virus to wild birds. In California, oil and gas companies are fracking in several counties with West Nile virus activity, including Kern County, which has had a human case. The six California counties in which fracking is likely to expand are home to about 100 plants and animals on the endangered species list. These species are already struggling against extinction — fracking would only compound their troubles.

2NC – Link – Drilling (4/4)

**Oil Drilling risks spills – coating, ingestion, and toxicity kill marine life**

Galil and Herut 11 (Bella S. Galil Senior Scientist@ National Institute of Oceanography Ph.D. 1983, Tel Aviv University, Israel ANDBarak Herut Senior Scientist@ National Institute of Oceanography Ph.D. 1992, Hebrew University of Jerusalem, Israel At IOLR since 1991 “Marine environmental issues of deep-sea oil and gas exploration and exploitation activities off the coast of Israel“ . IOLR (Israel Oceanographic and Limnological Research) Report H15/2011 <http://www.sviva.gov.il/subjectsEnv/SeaAndShore/MonitoringandResearch/> SeaResearchMedEilat/Documents/IOL\_deep\_sea\_drilling\_Israel2011\_1.pdf)

Oil is released from a variety of sources during exploration and production activities. Most oil entering the marine environmental from such activities is in produced water, but deck and machinery space drainage may also contain small quantities of oil. Dropout of oil when flaring during well te sting and well work-overs is another potential source of oil from offshore activities, but is generally considered insignificant. Another potential source of o il is accidental release during drilling, the operation of offshore installations and from shipping. Oil does not affect all components of marine ecosystems equally; some are more vulnerable to physical impacts, others to chemical toxicity and some are relatively resilient to both. The key effects of oil are: • Coating : Oil in large quantities may coat the fe athers of seabirds and fur of some marine mammals. This reduces their ability to provide buoyancy and insulation, leading to increased mortality. • Ingesting : Mammals and turtles may ingest oil with food and thereby be exposed to potential toxic effects. When preening oiled feathers, birds may also ingest oil with attendant toxic effects. There is evidence to suggest that some tissue hydrocarbons may reduce breeding success in birds and mammals. • Toxicity : Fish eggs and larvae are more susceptible to toxic effects of oil than are adults. Adult fish may accumulate hydrocarbons in their tissues that may affect their health and also taint their flesh. Toxic components in crude oil include Polycyclic Aromatic Hydrocarbons (PAHs), phenols, naphthalene, phenanthrene and pyrenes. PAHs can also be mutagenic and carcinogenic. Invertebrates vary greatly in their sensitivity to oil. Corals are among the most sensitive. Shellfish may accumulate oil residues with attendant secondary effects, particularly relating to health. Though individual planktonic organisms can experien ce toxic effects from oil in water, the very high turnover of plankton populations means that the plankton is relatively unaffected by oil.

2NC – Link – Drilling – Arctic (1/3)

**Arctic drilling is awful**

**Schmidt 12** (Charles W. July. Offshore Exploration to Commence in the Arctic: Can Shell’s Oil-Spill Response Plans Keep Up?”. MS, science writer for Discover Magazine, Science, and Nature Medicine. http://ehp.niehs.nih.gov/120-a194/)

Access to the Alaska OCS has been blocked in recent years mainly by lawyers representing Alaska Natives, who argue that apart from its ecological consequences, offshore drilling could hurt the traditional livelihoods, health, and well-being of these local residents. The Inupiat people have hunted bowhead whales and other marine species in Arctic waters for well over 2,000 years, and half their caloric intake comes from subsistence sources of meat.9 Health studies of the native population have associated the oil industry’s expansion in the North Slope to disruption of the traditional subsistence lifestyle, **contributing to rising rates of type 2 diabetes, metabolic problems from changing diets, substance abuse, suicide, and asthma.**9¶ A second drill rig engaged in Beaufort Sea exploration—the Kulluk—could begin drilling a relief well in the Chukchi within a week should attempts to kill a worst-case blowout fail.¶ Meanwhile, during fall migration bowhead whales have been documented to travel up to 18 miles to avoid sounds they don’t like,10 potentially putting them beyond safe reach of a hunt that is crucial to the Inupiat’s cultural identity. “For every additional mile a whaler has to travel, there’s more potential for injury or a potentially catastrophic event,” says Thomas Lohman, an environmental resource specialist in the North Slope Borough11 Department of Wildlife Management.¶ The 2011 exploration season was blocked in part by Alaska Native health concerns having to do with Shell’s air permits sought from the U.S. Environmental Protection Agency (EPA).12 In that case, lawyers argued successfully **that ships in the offshore drilling fleet—particularly icebreakers—would emit excessive amounts of nitrogen oxides, respiratory irritants linked with heart disease.** (That issue has been resolved by Shell and the EPA, and final air permits for the Kulluk and Noble Discoverer rigs were issued in October 2011 and February 2012, respectively.13,14) According to Smith, Shell will deploy best-available pollution-control technology on its drill rigs, and all its aircraft in the region will use ultra-low-sulfur diesel fuel, which substantially cuts emissions of nitrogen oxides and particulate matter.15¶ Lohman concedes that Shell has worked hard and spent a lot of money to address local concerns. “There’s more of a partnership and dialogue now with the company than there used to be,” he says. “But what comes up again and again when you talk to local communities is the oil-spill scenario. People worry what will happen to their food supply if things really get out of control.”

2NC – Link – Drilling – Arctic (2/3)

**Arctic development leads to offshore drilling,**

(Kira **Zalan ’13**, “A Rush to Expand Oil Drilling in the Arctic,” US News and World Report, 12/5/13, http://www.usnews.com/news/articles/2013/12/05/a-rush-to-expand-oil-drilling-in-the-arctic-)

Human activity in the Arctic is growing fast, as rising global temperatures have led the frozen polar region to warm faster than expected and become increasingly ice free for longer periods of time. In the last few years, six of the eight Arctic littoral countries - the United States, Russia, Norway, Canada, Denmark and Iceland - have granted energy companies offshore oil and gas exploration licenses. According to the U.S. Energy Information Administration, the Arctic could hold about 22 percent of the world's undiscovered oil and natural gas resources. And in addition to the estimated boost to energy production, shipping companies are exploring the potential for polar navigation routes to save transit time. In September, a Chinese container ship made headlines by reaching Europe's Rotterdam port 15 days sooner than it would have through the common route of the Suez Canal, which connects the Mediterranean Sea and the Red Sea. Experts warn that the lack of infrastructure and regulatory framework opens the door for conflict and potentially devastating accidents. In the U.S., observers are pressing the Obama administration to urgently develop a more specific national strategy and to take more control internationally. In two years, the U.S. will lead the Arctic Council, an intergovernmental forum of regional governments and peoples. "The Arctic is evolving more rapidly than our policies can keep up with," says Heather Conley, senior fellow and director of the Europe Program at the Center for Strategic and International Studies. In May, President Obama released a national strategy, basically reaffirming the previous administration's 2009 presidential directive on the Arctic, says Conley. The strategy assigns federal agencies to seven areas of focus - national and homeland security, international governance, border resolution, scientific cooperation, maritime transportation, economic and energy promotion, and environmental protection. "What we need now is really a strategy that goes to the next level, details how we're going to achieve those objectives and [identifies] the funding resources necessary to achieve those directives. [It should also ensure] some accountability for how those agencies achieve those objectives," says Conley. Last month, Secretary of Defense Chuck Hagel unveiled the Pentagon's own strategy, outlining agency-specific objectives based on the White House plan. Still, experts say, the DOD's strategy lacked specifics and budgetary resources, particularly in developing the Arctic's infrastructure. "The Defense Department has a lot of capacity [such as charting and marine communications]," says Mark Rosen, a maritime law expert and senior legal adviser at CNA Corporation, a research nonprofit. "There could be mechanisms put in place where DOD can do this but get reimbursed by some of the energy companies for some of the costs." Rosen recently co-authored a policy paper, identifying gaps in Arctic governance for the Arctic Security Initiative, a project at Stanford University's Hoover Institution. The report outlines specific recommendations to usher economic development in the region and highlights a need for legally binding agreements between Arctic countries that would establish an enforceable regulatory regime. "If a serious incident involving a ship or oil rig were to occur today, it is quite likely that there would be insufficient assets to respond to that emergency, clean up the mess, and compensate those who are injured," the report reads. Establishing material and training requirements, as well as strict liability and minimum insurance limits, would help regulate international vessel activity, according to the report. But not everyone is convinced the rush to the region is warranted or desirable. Despite recent news events, polar routes are not exactly commercially viable, says Jean-Paul Rodrigue, professor at Hofstra University's Department of Global Studies and Geography. The harsh Arctic conditions and lack of infrastructure means the costs are high and the benefits marginal, he notes. Indeed, the Kulluk incident demonstrates this point. Royal Dutch Shell reportedly spent more than $5 billion on its Arctic drilling operation, brought in an armada of 20 vessels to support the two oil rigs, and coordinated more than one thousand flights. In the end, the company wasn't able to complete even one well after being delayed by Arctic conditions. For environmental groups, the harsh environment and potential for accidents are reasons to avoid industrialization of the Arctic altogether. To Gustavo Ampugnani, Arctic team leader at Greenpeace, last year's Shell incident demonstrated that industry is not equipped to exploit the region safely. "Even with normal weather conditions for the Arctic, the company suffered a lot of mishaps and setbacks," says Ampugnani, referring to a documented list of problems Shell encountered even before the storm grounded the Kulluk during transit. There were approximately 143,000 gallons of diesel and 12,000 gallons of other petroleum products aboard the rig, according to the U.S. Coast Guard. "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," warned a Department of the Interior review of Shell's program.

2NC – Link – Drilling – Arctic (3/3)

**Arctic drilling destroys the environment**

(Bobby **Magill ’14**, science writer focusing on energy and climate, “Melting Sea Ice Makes Arctic Drilling a Risky Business,” Climate Central, 2/4/14, http://www.climatecentral.org/news/melting-sea-ice-makes-arctic-drilling-a-risky-business-17018)

Sea ice melting partly because of human-caused climate change could open previously inaccessible Arctic Ocean waters to expanded oil drilling, but the risks of drilling there will be extremely high. As sea ice melts in the Arctic, the oil and gas industry has expressed new interest in drilling offshore and is expected to invest roughly $100 billion there by 2023, according to a new paper from the Woodrow Wilson Center, a Washington-based think tank. The paper highlights an agreement between ExxonMobil and Russian oil company Rosneft, which have planned to jointly explore for oil in the Kara Sea off the Arctic coast of Siberia. The paper was discussed in a Wilson Center webcast — the day before oil giant Royal Dutch Shell announced that it would suspend its Alaska offshore operations for 2014 and possibly withdraw from the region entirely. U.S. Geological Survey estimates show that the Arctic may harbor 1,670 trillion cubic feet of natural gas and 13 percent of the Earth’s undiscovered crude oil, which adds up to about 90 billion barrels, according to the paper. Drilling has occurred in the region since 1968, when ARCO and Standard Oil began drilling near Prudhoe Bay at the far northern edge of Alaska. About 412 billion barrels of undiscovered crude are suspected to be eventually found in the Arctic, about 75 percent of which are in deep water off the coasts of Alaska, Canada, Russia and Greenland, all harboring up to 1 billion barrels of recoverable oil. But the paper says developing that crude oil is extremely hazardous because of strong ocean currents, severe storms and floating ice. Seismic oil exploration in those conditions is nearly impossible if the sea ice is too thick. “Climate change has played an important role” in expanding access to that untapped store of oil and natural gas, according to the paper. Melting sea ice opening more of Arctic waters for drilling doesn’t mean drilling for oil there is a risk-free enterprise. The costs of drilling in hazardous areas have increased since the BP Deepwater Horizon oil spill in the Gulf of Mexico, and only the best-funded international oil companies have the expertise and the resources to operate there, according to the paper. Government regulators and environmentalists have been forceful with their concern about the hazards of drilling in the Arctic, saying that the costs of cleaning an oil spill in icy conditions and the effect on the Arctic ecosystem would be extreme. Energy companies fear that regulators in North America will place new restrictions on drilling in high-risk places, increasing the costs of operating there.

2NC – Link – Offshore Wind (1/3)

**Wind farms disrupt marine ecosystems  
Moore 12** “Nature Report: Threatening Turbines Raise Concerns” by [Richard Moore](http://www.valleycentral.com/about/bio.aspx?id=624) Posted: 03.26.2012 at 5:40 AM Richard Moore hosts "The Nature Report" every Monday and Wednesday.

An environmental impact statement or EIS has been ordered by the United States Army Corps of Engineers to assess the potential impact of a massive wind turbine industrial complex proposed by Baryonyx Corporation just offshore from South Padre Island in 41,000 acres of Gulf of Mexico waters leased from the state of Texas. Thus far, no offshore wind farms have been built in the United States and many citizens believe that offshore from South Padre is the worst place in the country to erect hundreds of huge turbines fearing they will kill birds and cause extensive damage to the marine environment. According to the United States Fish and Wildlife Service, poorly sited wind turbines kill approximately 440,000 birds each year, and this is undoubtedly a gross underestimate as the industry is largely self-regulated. Recent radar studies of bird migration along the lower Texas coast reveals it to be perhaps the most important migratory corridor in the world, and many of these birds fly directly across the Gulf of Mexico. In addition to threatening the 300 million dollar a year nature tourism industry in the Rio Grande Valley, the proposed offshore turbines also have recreational fishermen and shrimp boat owners alarmed. Walt Kittelberger, the president of the Lower Laguna Madre Foundation said, "Offshore it will have up to 25 square miles of area, and what is important for all the fishermen, whether they are commercial fishermen, shrimpers or just people who like to go out on their boats is that these things create what are called exclusion zones, where you cannot travel thru them." Carlton Reyes, the president of the Brownsville Port Isabel Shrimp Producers Association said, "Our concerns have to do with hazards to navigation and the potential loss of fishing area." If you would like to attend a public hearing and voice your concerns or support for the proposed offshore wind turbine project a meeting is set for Wednesday March 28th beginning at 6 pm at the Holiday Inn on North Expressway in Brownsville.

2NC – Link – Offshore Wind (2/3)

**Infrasound from wind farms damage marine animals ability to survive**

**Buxton 06** “Low Frequency Noise and Infrasound” Ivan Buxton 2006, <http://docs.wind-watch.org/buxton-infrasoundandlandbasedanimals.doc> Writer for wind watch (Merkley)

Sources of infrasound and LFN are many and varied with constant new additions. Some are controversial for reasons including noise emissions. Wind turbine generators were raised as a noise concern some years ago. Yet only recently have reports been released by the wind industry with results of desktop studies and none seem to have been conducted on wild animals at wind farms. A UK press release in 2005 suggested blame for the death of baby seals was due to mother seals aborting their pups through disturbance from pile driving for foundations for off shore wind turbines. Elsewhere some studies have shown that sea mammals, fish, birds and animals exposed to excessive LFN and infrasound has caused them harm. The hearing abilities of creatures other than man are difficult to determine. Even with sea mammals where studies have been concentrated because of fears surrounding noise created by human activities, only relatively little research exists into the range of hearing. Whales, dolphins and porpoise have all shown signs of distress from exposure to varying levels of noise at low frequencies and from a variety of sources. Research has shown fish ears are damaged by noise from repeated use of under water air guns and behavioural studies determined the fish became disoriented and consequently were vulnerable. There are a great number of articles that include reference to the effects of infrasound upon humans. The frequency ranges are recorded in many of these and the overall result always appears to depend upon the exposure time when coupled with the dB and Hz levels. A few seconds is all it takes at very low Hz and high dB levels before severe problems arise. Even at a level of dB normally found comfortable for listening to music for example, if the Hz level is low then a significant adverse reaction has been reported. There is reason to suppose that similar effects would also occur with wild animals if exposed to the sounds for long enough periods. The presumption must be that as soon as they felt uncomfortable they would move away from the zone of discomfort. A term more properly described as, disturbance and displacement, which in the case of protected species would be contrary to appropriate legislation. The concerns of the effects of infrasound are clearly real whether they are upon humans, marine life or land based and freshwater creatures and in extreme cases the results of high levels of exposure could be lethal. Even relatively low levels can be debilitating and create disturbance. Laboratory studies upon animals have been revi]ewed with quite chilling results, as it clear that deformities, damage and impairment occur to the subjects with regularity. Admittedly the animals were contained and subjected to exposure times of several hours per day at moderate to high intensity levels of LFN and infrasound. Yet fish and aquatic creatures contained in ponds and lakes would certainly be unable to escape whatever the level of sound intensity or duration of exposure. Other experiments signify that indirect consequences can arise from exposure to LFN due to the masking effect. Sounds from wind turbines are believed to have disguised the danger of rotating blades and caused the death of large numbers of birds. A report concluded that birds probably couldn’t hear the noise of the blades as well as humans can and would be unable to see them because of motion smear.

2NC – Link – Offshore Wind (3/3)

**Construction of wind farms damage the environment**

**Mann and Teilmann 13** “Environmental impact of wind energy” J Mann1 and J Teilmann2 28 May 2013 <http://iopscience.iop.org/1748-9326/8/3/035001/pdf/1748-9326_8_3_035001.pdf> Department of Wind Energy, Technical University of Denmark (Merkley)

The most disturbing effect may be the ramming of wind monopile foundations into the seabed. This creates some of the loudest sounds emitted and may be heard by these animals hundreds of kilometers away in deeper waters and are strong enough to cause physical damage at short ranges. A study on the first German offshore wind farm showed that fewer animals were detected up to 25 km from the ramming site and that the displacement period (up to 6 days) was positively correlated to the duration of the ramming (Dahne¨ et al  [201](#page4)3). This is somewhat consistent with the only two similar studies by Tougaard et al ( [200](#page4)9) and Brandt et al ( [201](#page4)1) studying the effect of ramming in the two Danish wind farms in the North Sea. Both Scheidat et al ( [201](#page4)1) and Teilmann and Carstensen ( [201](#page4)2) have studied the effect on harbor porpoises over several years in two of the first large scale offshore wind farms in the world. Both studies did observations both before and after the installation of the turbines using acoustic data loggers placed on the sea bottom inside and outside the wind farm. Scheidat et al ( [201](#page4)1) found a significant increase of 160% in the presence of porpoises 1–2 years after the wind farm was in normal operation, compared to the baseline period (the construction period was not studied). It was suggested that this could be caused by less ship traffic and more food due to the ban of fishery inside the wind farm. Teilmann and Carstensen ( [201](#page4)2) studied the Nysted Offshore Wind Farm before, during and after the construction of the 72 gravity foundation wind turbines. A significant negative effect was found with 89% fewer porpoises inside the wind farm during construction and 71% fewer 10 years later compared to the baseline values. Although there are indications of a slight recovery, this is in clear contrast to the results from the Netherlands indicating that other factors interact with the farms and the ecosystems in highly unpredictable ways. Whether it is the longer construction time of the gravity foundations, differences in underwater noise levels, or difference in motivation to be in the area despite disturbing effects from the wind farm, that cause this difference is still to be studied

2NC – Link – Wave Power (1/2)

**The magnetic fields of the wave power generators damage marine animals’ ability to survive**

**Mahoney 10** “Animal magnetism: how wave, tidal energy devices affect sea life” <http://www.smartplanet.com/blog/intelligent-energy/animal-magnetism-how-wave-tidal-energy-devices-affect-sea-life/> By [Melissa Mahony](http://www.smartplanet.com/meet-the-team/melissa.mahony/) Contributing Editor Melissa Mahony has written for Scientific American Mind, Audubon Magazine, Plenty Magazine and LiveScience. Formerly, she was an editor at Wildlife Conservation magazine. She holds degrees from Boston College and New York University's Science, Health, and Environmental Reporting Program. She is based in New York. September 2010 (Merkley)

As more projects go to sea for renewable energy sources, questions of how wave and tidal power devices might affect marine life are bound to surface. This week at the "[Oceans 2010](http://www.oceans10mtsieeeseattle.org/)" conference in Seattle, scientists from the [Pacific Northwest National Laboratory (PNNL)](http://www.pnl.gov/) are discussing how they're looking into some of them. I've written earlier about efforts to see whether [noise might safely dissuade whales from swimming into wave power buoys](http://www.smartplanet.com/business/blog/intelligent-energy/whales-and-wave-power-bringing-the-noise-to-avoid-collisions/1532/) off Oregon's coast. The focus of these researchers is electromagnetic fields. Many marine species—sea turtles, crabs, sharks, skates, salmon and other fish—rely on Earth's magnetic fields for migrating or searching for food. The many iterations of wave, tidal and hydrokinetic power devices, and the cables that bring the electricity they generate to shore, produce similar electromagnetic fields. PNNL's Jeff Ward, a marine ecologist, says in a [statement](http://www.sciencedaily.com/releases/2010/09/100920101149.htm): We really don't know if the animals will be affected or not. There's surprisingly little comprehensive research to say for sure. Much of the data that does exist has been conducted in other parts of the world, such as [Sweden](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VMY-4XTWVFB-3&_user=10&_coverDate=05%2F31%2F2010&_rdoc=1&_fmt=high&_orig=search&_origin=search&_sort=d&_docanchor=&view=c&_searchStrId=1468071099&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=ce95c93954bfb73a4a5116f41c9616ef&searchtype=a), with other sets of sea creatures. To determine how magnetic fields influence animals in American waters, the scientists will place two Helmholtz coils (right), consisting of 200 pounds of copper each, next to aquariums holding different marine species. In their two-year long study, which began over the summer, they will turn the coils on and off at varying intervals and strengths, and observe how the species react. According to the researchers, the 0.1 to 3 milliTeslas of magnetic flux that the coils can produce is relatively small compared to other studies on electromagnetic fields and sea life. How this compares to fields given off by the energy devices was not given, but understanding the influence of even slight changes in electromagnetic fields on the animals is important. Some of the circumstances and behaviors the study will investigate are: The ability of juvenile Coho salmon to spot and avoid predators The Dungeness crab's ability to quickly flick its antennules to detect odors Whether the electromagnetic fields repel or attract certain species How hydrokinetic devices in rivers affect freshwater wildlife ([Oak Ridge National Laboratory](http://www.ornl.gov/)) The affect of electromagnetic fields on crabs ([Northwest National Marine Renewable Energy Center](http://depts.washington.edu/nnmrec/)) If the species studied do exhibit changes in their behavior, future research may expand out of the lab and into the sea where pilot projects are underway.

**Wave power damages the environment**

**Ma 08** <http://seattletimes.com/html/localnews/2008399727_oceanenergy17m.html> ” Concerns emerge about environmental effects of wave-energy technology” 2008, Michelle Ma: Talent Acquisition Manager China at DSM China, Harbin University (Merkley)

Developers also plan to monitor the project for effects on wildlife and shoreline habitat, keeping an eye on federally listed species such as the marbled murrelet, a small bird that dives for food. Finavera doesn't intend to continue the project after its five-year license expires. Still, if the company can negotiate a purchasing agreement with the Clallam County Public Utility District, homes in the area could use the wave-generated power while the project is in the water, Clark said. The Makah Nation wants to see what effect the project might have on the environment before deciding whether wave energy is a viable long-term option, said Ryland Bowechop, tourism and economic-development planner for the tribe. The buoys would sit just offshore from the tribal headquarters in Neah Bay. "We are always concerned because our livelihood is the ocean," Bowechop said. Concerns linger The environmental effects of wave and tidal energy are largely unknown and require more studies, dozens of scientists concluded after meeting a year ago at OSU's Hatfield Marine Science Center in Newport, Ore. The group was concerned that electromagnetic cables on the ocean floor could affect sea life, and that buoys could interfere with whale and fish migration. Large buoys might actually attract more fish, but the marine ecosystem could be altered if more predators move in. Buoys also could disrupt natural currents and change how sediment is moved. Shorelines might be affected as energy is taken from the waves. Even if environmental concerns are checked, costs to extract the power remain high. Wave energy costs at least 20 cents per kilowatt hour to generate, compared with 4 cents per kilowatt hour for wind power, said Annette von Jouanne, leader of OSU's wave-energy program. Wind energy used to be much more expensive 20 years ago. In comparison, coal-generated power costs about 5 cents per kilowatt hour, and power from dams can be as low as 3 cents, said Roger Bedard,

2NC – Link – Wave Power (2/2)

**Wave energy damages the environment**

**Howell 10** By KATIE HOWELL of [Greenwire](http://www.greenwire.com/" \t "_blank) Published: February 24, 2010 “Wave Technologies Could Harm Marine Resources -- DOE Study” <http://www.nytimes.com/gwire/2010/02/24/24greenwire-wave-technologies-could-harm-marine-resources-95837.html> Energy reporter for [Greenwire](http://www.eenews.net/gw/" \t "_blank), an online news service that covers the environment and energy policy. (Merkley)  
Energy technologies that tap waves and tides could disrupt marine resources, the Energy Department found in a recent study. Marine and hydrokinetic technologies that capture energy from waves, tides and currents are poised to make a significant contribution to U.S. power supplies, but there is little known about their environmental impacts, the [study](http://www1.eere.energy.gov/windandhydro/pdfs/doe_eisa_633b.pdf)(pdf) says. "There are well over 100 conceptual designs for converting the energy of waves, river and tidal currents and ocean temperature differences into electricity," the Office of Energy Efficiency and Renewable Energy report says. "However, because the concepts are new, few devices have been deployed and tested in rivers and oceans. Even fewer environmental studies of these technologies have been carried out, and thus potential environmental effects remain mostly speculative." But those effects could be significant. The report suggests projects could displace bottom-dwelling plants and animals or change their habitats by altering water flows and waves. And noise generated during installation and operation of energy conversion devices could interfere with communications of marine animals.

2NC – Impact Uniqueness (1/7)

**Marine diversity is fragile and on the brink now**

**Mattison 14**, BA in sculpture and marine ecology at Skidmore College with coursework at James Cook University in Australia. She then spent a year as a fellow at the Harvard Ceramics Program before completing an MA in Environmental Studies at Brown University “Marine Diversity is as Fragile as Glass,” http://mission-blue.org/2014/03/marine-diversity-is-as-fragile-as-glass/

Preservation techniques and marine exploration have advanced over the years, Cornell’s Blaschka collection fell into disuse only to be resurrected by Professor C. Drew Harvell – Associate Director for Environment at the Atkinson Center for a Sustainable Future at Cornell and Curator of the Cornell Collection of Blaschka Invertebrate Models – and restored by a glassworker named Elizabeth Brill in the last few decades. Glass Octopus vulgaris being restored at The Corning Museum of Glass. © David O. Brown. Glass Octopus vulgaris being restored by glassworker Elizabeth Brill in Corning, NY. © David O. Brown. Today, as our oceans warm and acidify and fish stocks dwindle as a result of a panoply of human-caused threats, the Blaschkas’ exquisite work is resurfacing as a stark reminder of the fragile beauty of marine life is what we stand to lose. “Marine diversity is as fragile as glass,” says Dr. Harvell. For the past 25 years, Dr. Harvell has worked to painstakingly salvage over 200 of the glass models, and now she feels it’s time to use them to spread a message of inspiration and hope for conservation. A lot has happened in the oceans in the last 150 years… We do a lot of research on climate warming impacts on coral reefs. There’s been an average of 30% change in the acidification of the oceans and that’s just average. And of http://mission-blue.org/2014/03/marine-diversity-is-as-fragile-as-glass/course there’s the changes in coastal pollution as well. Things are changing so fast that I don’t know for how much longer we’ll be able to find living representatives of the Blaschka invertebrates. – Dr. Drew Harvell1 Dr. C. Drew Harvell is curator of the Blaschka Glass Invertebrates collection at Cornell. © Jeffery DelViscio Dr. Drew Harvell is curator of the Blaschka Glass Invertebrates collection at Cornell. © Jeffery DelViscio Dr. Harvell has joined forces with marine filmmaker and former Cousteau expedition team member David O. Brown to travel the globe and document living examples of the species the Blaschkas used as references for their work in a voyage called Fragile Legacy. Harvell and Brown are traveling the globe from Cornell and the Corning Museum of Glass to the Mediterranean; Hawaii; Shoals Marine Laboratory in Maine; Wales; Friday Harbor in Washington; and Indonesia – part of the Coral Triangle Hope Spot – to retrace the Blaschkas’ sources of inspiration from over 150 years ago in today’s oceans while highlighting the sweeping changes that have taken place. This ambitious journey is already well underway, and Harvell and Brown have documented species in nearly all of those locations. Their efforts will culminate in a book by Dr. Harvell and a film about their voyage by Mr. Brown. By telling this story, Harvell and Brown are merging science, art, history and marine conservation to give the Blaschka collection a contemporary voice for ocean awareness and stewardship. Harvell and Brown are a perfect team for this mission, with thousands of hours of experience in and under water throughout their careers. Dr. Harvell has worked as a marine biologist for nearly three decades and conducts research in Indonesia and Hawaii concerning ecosystem services, overfishing impacts and the health of coral reefs within and outside marine protected areas (MPAs). David Brown spent seven years with the Cousteaus during their Rediscovery of the World project before becoming an independent marine filmmaker and teaming up with Dr. Harvell. Both Harvell and Brown have documented distinct changes in marine biodiversity and ecosystem health over the years that will be reflected in the Fragile Legacy film and book – each a time capsule to create then-and-now comparisons of species richness since the Blaschkas created their collection. By using the Blaschkas’ work as a lens to highlight the wonders of biodiversity, this project aims to spark viewers’ and readers’ curiosity about undersea habitats and how our activities – namely seafood and fossil fuel choices – affect their health. Dr. C. Drew Harvell diving on a volcanic reef wall in Indonesia. © David O. Brown. Dr. C. Drew Harvell diving on a volcanic reef wall in Indonesia. © David O. Brown. By telling a story of parallels between the fragility of the glass and the fragility of the organisms, this project is sure to draw the interest of a wide audience. While the miraculous forms and colors of living marine invertebrates may captivate some readers and viewers, others will surely be drawn to the exceptional craftsmanship of the Blaschkas’ glasswork. Dr. Harvell ties the whole story together by working on both fronts to conserve – both the living creatures and the invaluable glass models – in a dual role that adds a personal component to the story and makes it undeniably inspiring. She says, “I really spend a lot of my time imagining what the Blaschkas would have thought of this. They would be so happy to know that their collection is continuing to educate and inspire people.” Filmmaker David O. Brown taking underwater photos for Fragile Legacy. © C. Drew Harvell. Filmmaker David O. Brown taking underwater photos for Fragile Legacy. © C. Drew Harvell. The Fragile Legacy film, which actor Ted Danson of Oceana has already agreed to narrate, will “provide a high definition chronicle of marine invertebrate life in this millennium, providing perspective on which among these amazing organisms remain in the sea.”2 That sort of wakeup call couldn’t come at a better time. Signs of human impacts are everywhere – from overfishing in the Mediterranean to dynamited reefs in Indonesia and climate change in Hawaii. Brown finds it ironic that Leopold Blaschka only became enchanted by the glass-like forms of marine invertebrates when stranded under sail without the capacity for fossil fuel propulsion 160 years ago, while in turn it is fossil fuel propulsion that has begun to completely alter the chemistry of the oceans in the meantime. Overfishing – another major threat addressed in this story – has made it difficult for Harvell and Brown to locate many species of cephalopod outside of seafood markets while many of the jellyfish species are overly abundant due to lack of predators. Moreover, many of the nudibranchs, anemones and jellyfish that Harvell and Brown are searching for as living examples of the Blaschkas’ work have never been assessed for their status on the IUCN Red List of threatened and endangered species; we don’t even know how many are still out there or which ones are in trouble. I’m captivated by the magic of sessile invertebrates like corals, sponges and sea squirts — creatures vital to the ecosystem yet too often overlooked in favor of more visible animals like sharks and whales. – Dr. Drew Harvell3 Harvell and Brown have many reasons for hope despite discouraging findings. In the regions where they have been able to explore marine protected areas such as Indonesia, Hawaii and the Mediterranean, the pair has found powerful evidence that these zones of restricted use protect habitat and biodiversity. The Mediterranean, from where many of the Blaschka animals were drawn, has suffered major blows from overfishing, pollution and general overuse by humans but even there it’s possible to find glimmers of vibrancy within MPAs. Across the globe in Indonesia – the heart of coral reef biodiversity within the Coral Triangle Hope Spot – MPAs are also showing promising results by protecting many species from overfishing and dynamite and cyanide fishing. I’ve always maintained that MPAs are it… the closest thing to a universal solution there is for the ocean. – David O. Brown Finding hope amid threats will be a thread running throughout the Fragile Legacy film and book. As Brown puts it, “Hope lies in human ingenuity and human creativity.” The idea that nature is so creative as to invent these exquisite and tiny organisms parallels the idea that humans who appreciate that ingenuity can innovate to preserve and restore vital habitats to support them. After all, as Dr. Sylvia Earle says, “You have to love something before you are moved to save it.” Art – and the Blaschka collection as seen through Fragile Legacy in particular – can inspire us to care about, love and save the ocean. By giving the Blaschka collection a voice, Fragile Legacy will remind us all to take the time to slow down like Leopold Blaschka did when he was stranded at sea and appreciate the delicate beauty of marine life and our impacts on it – as well as the power of humans to celebrate it through art and inspire the global community to protect it. Dr. C. Drew Harvell holding a live nudibranch specimen before releasing it in Indonesia in November 2013. © David O. Brown As fragile as the Blaschka collection is, the animals it represents are little more than water, marvelously organized into glowing, translucent living things. As irreplaceable as the glass replicas are, the species upon which they are based are the product of millennia of evolution, carrying genetic information that, if lost, can never be retrieved. As different as today’s ocean is from that of a century ago, there is scientific consensus that the change has just begun. The sea is warming, and the very chemistry that enables many of these animals to exist is being fundamentally changed.

2NC – Impact Uniqueness (2/7)

**Oceans on the brink – overfishing, pollution and energy exploration**

**Eastern Tribune** 6/26/**14** (The Eastern Tribune is a global online newspaper published from Chicago“Oceans to collapse as overfishing and pollution increase” Eastern Tribune, 6/26/14, http://www.theeasterntribune.com/story/6251/collapse-of-ocean-nearing-as-overfishing-and-pollution-increases/#sthash.7rrRfcp2.dpuf)

NEW YORK: Oceans were facing the biggest threat in the world and requires immediate action. According to the reports of the Global Ocean Commission (GOC), the Ocean needs to be saved from the overfishing and pollution. However, the committee also mentioned that the action required should be immediate and should be implemented within five years. The committee said that Oceans are in heave of danger due to the high seas fishing and pollution. The committee that is comprised of many politicians said the energy exploration in the high seas is also a dangerous practice and can cause collapse of the ocean. United States, European Union, China and Japan and other six countries are responsible for unregulated and illegal fishing in the high seas. The high seas is the area which is outside the area of National Coastal Zone, and according to the GOC, it covers almost half of the globe. If reports are to be believed then every year, some 10 million fishes are caught, worth around $16 million. David Miliband, former British Foreign Secretary said, “The oceans are a failed state. A previously virgin area has been turned into a plundered part of the planet.” He also co-chairs the GOC. President Barack Obama recently had taken some sincere steps to create the largest water sanctuary of the world. Jose Maria Figueres, who also co-chairs the commission, said, “The Ocean provides 50 percent of our oxygen and fixes 25 percent of global carbon emissions. Our food chain begins in that 70 percent of the planet.” Sensing the importance of the issue, the committee is going to take all the measures so that the collapse of the Ocean can be restricted.

2NC – Impact Uniqueness (3/7)

Decline needs to stop – anything else pushes it past the brink

IPSO 13 (The International Programme on the State of the Ocean in conjunction with IUCN: The International Union for Conservation of Nature, “Press Release Greater , Faster, Closer Latest Review Of Science Reveals Ocean In Critical State From Cumulative Impacts” 10/3/13 http://www.stateoftheocean.org/pdfs/IPSO-PR-2013-FINAL.pdf)

Professor Alex Rogers of Somerville College, Oxford, and Scientific Director of IPSO said : “The health of the ocean is spiraling downwards far more rapidly than we had thought . We are seeing greater change, happening faster, and the effects are more imminent than previously anticipated. The situation should be of the gravest concern to everyone since everyone will be affected by changes in the ability of the ocean to support life on Earth.” The findings , published in the peer review journal Marine Pollution Bulletin, are part of an ongoing assessment process overseen by IPSO, which bring s together scientists from a range of marine disciplines. The body’s previous 2011 report, which warned of the threat of ‘globally significant’ extinctions of marine specie s, received global media attention an d has been cited in hearings at the United Nations , US Senate and European Parliament as well as the UK Parliament , Among the latest assessments of factors affecting ocean health , the panel identified the following areas as of greatest cause for concern:De - oxygenation : the evidence is accumulating that the oxygen inventory of the ocean is progressively declining. Predictions for ocean oxygen content suggest a decline of between 1% and 7% by 2100. This is occurring in two way s: the broad trend of decreasing oxygen levels in tropical oceans and areas of the North Pacific over the last 50 years; and the dramatic increase in coastal hypoxia (low oxygen) associated with eutrophication. The former is caused by global warming, the second by increased nutrient runoff from agriculture and sewage. • Acidification : If current levels of CO 2 release continue we can expect extremely serious consequences for ocean life , and in turn food and coastal protection ; at CO 2 concentrations of 450 - 500 ppm (projected in 2030 - 2050) erosion will exceed calcification in the coral reef building process, resulting in the extinction of some species and decline in biodiversity overall . • Warming : As made clear by the IPCC, the ocean is taking the brunt of warming in the climate system, with direct and well - documented physical and biogeochemical consequences. The impacts which continued warming is projected to have in the decades to 2050 include: reduced seasonal ice zones, including th e disappearance of Arctic summer sea ice by ca. 2037; increasing stratification of ocean layers, leading to oxygen depletion; increased venting of the GHG methane from the Arctic seabed (a factor not considered by the IPCC) ; and increased incidence of anox ic and hypoxic (low oxygen) even t s . • The ‘ deadly trio’ of the above three stressors - acidification, warming and deoxygenation - is seriously effecting how productive and efficient the ocean is, as temperatures, chemistry, surface stratification, nutrient and oxygen supply are all implicated, meaning that many organisms will find themselves in unsuitable environments. These impa cts will have cascading consequences for marine biology, including altered food web dynamics and the expansion of pathogens. • Continued overfishing is serving to further undermine the resilience of ocean systems, and contrary to some claims, despite some i mprovements largely in developed regions, fisheries management is still failing to halt the decline of key species and damage to the ecosystems on which marine life depends. In 2012 the UN FAO determined that 70% of world fish populations are unsustainably exploited, of which 30% have biomass collapsed to less than 10% of unfished levels. A recent global assessment of compliance with Article 7 (fishery management) of the 1995 FAO Code of Conduct for Responsible Fisheries, awarded 60% of countries a “fail” g rade, and saw no country identified as being overall “good

2NC – Impact Uniqueness (4/7)

**Absent changes extinctions cascade**

**Black 11** (Richard Black is the Environment Correspondent for BBC news, “World's oceans in 'shocking' decline” BBC, June 20, 2011, http://www.bbc.com/news/science-environment-13796479)

Fast changes "The rate of change is vastly exceeding what we were expecting even a couple of years ago," said Ove Hoegh-Guldberg, a coral specialist from the University of Queensland in Australia. "So if you look at almost everything, whether it's fisheries in temperate zones or coral reefs or Arctic sea ice, all of this is undergoing changes, but at a much faster rate than we had thought." But more worrying than this, the team noted, are the ways in which different issues act synergistically to increase threats to marine life. Some pollutants, for example, stick to the surfaces of tiny plastic particles that are now found in the ocean bed. This increases the amounts of these pollutants that are consumed by bottom-feeding fish. Plastic particles also assist the transport of algae from place to place, increasing the occurrence of toxic algal blooms - which are also caused by the influx of nutrient-rich pollution from agricultural land. In a wider sense, ocean acidification, warming, local pollution and overfishing are acting together to increase the threat to coral reefs - so much so that three-quarters of the world's reefs are at risk of severe decline. Carbon deposits Life on Earth has gone through five "mass extinction events" caused by events such as asteroid impacts; and it is often said that humanity's combined impact is causing a sixth such event. The IPSO report concludes that it is too early to say definitively. But the trends are such that it is likely to happen, they say - and far faster than any of the previous five. "What we're seeing at the moment is unprecedented in the fossil record - the environmental changes are much more rapid," Professor Rogers told BBC News. "We've still got most of the world's biodiversity, but the actual rate of extinction is much higher [than in past events] - and what we face is certainly a globally significant extinction event." The report also notes that previous mass extinction events have been associated with trends being observed now - disturbances of the carbon cycle, and acidification and hypoxia (depletion of oxygen) of seawater. Levels of CO2 being absorbed by the oceans are already far greater than during the great extinction of marine species 55 million years ago (during the Paleocene-Eocene Thermal Maximum), it concludes. Blue planet The report's conclusions will be presented at UN headquarters in New York this week, when government delegates begin discussions on reforming governance of the oceans. IPSO's immediate recommendations include: stopping exploitative fishing now, with special emphasis on the high seas where currently there is little effective regulation mapping and then reducing the input of pollutants including plastics, agricultural fertilisers and human waste making sharp reductions in greenhouse gas emissions. Carbon dioxide levels are now so high, it says, that ways of pulling the gas out of the atmosphere need to be researched urgently - but not using techniques, such as iron fertilisation, that lead to more CO2 entering the oceans. "We have to bring down CO2 emissions to zero within about 20 years," Professor Hoegh-Guldberg told BBC News. "If we don't do that, we're going to see steady acidification of the seas, heat events that are wiping out things like kelp forests and coral reefs, and we'll see a very different ocean." Another of the report's authors, Dan Laffoley, marine chair of the World Commission on Protected Areas and an adviser to the International Union for the Conservation of Nature (IUCN), admitted the challenges were vast. "But unlike previous generations, we know what now needs to happen," he said. "The time to protect the blue heart of our planet is now."

2NC – Impact Uniqueness (5/7)

**Now is key- Ocean oxygen levels, acidification, and overfishing are worsening at unprecedented rates**

**Huffington Post 13** (Christian Cotroneo “Ocean Acidification: State Of Seas In 'Fast Decline' According To Report “Huffington Post, 10/4/14, http://www.huffingtonpost.ca/2013/10/04/ocean-acidification-state\_n\_4044759.html)

The sea is singing a sad song these days. Last month, a UN-sponsored panel expressed "extreme confidence" that the world is in the throes of climate change — a situation that sees oceans bear much of the brunt. And now, a review from an international team of the world's leading scientists suggests emerging dead zones may be stirring up mass extinctions in the world's oceans. “We have been taking the ocean for granted," a study from the International Programme on the State of the Ocean (IPSO) claims. "It has been shielding us from the worst effects of accelerating climate change by absorbing excess CO2 from the atmosphere. “Whilst terrestrial temperature increases may be experiencing a pause, the ocean continues to warm regardless." The alleged culprit? A global phenomenon whose existence is still too widely denied — despite a raft of reports indicating otherwise. Climate change. More specifically, the report's authors — a non-governmental group of scientists — suggest the burning of fossil fuels has ramped up carbon dioxide emissions. By heating the atmosphere, these greenhouse gases have continued to heat the oceans, while boosting acidity to unprecedented levels. In doing so, the IPSO report suggests, commercial fish stocks are being pushed to the Earth's poles, while other marine species face extinction. “The health of the ocean is spiraling downwards far more rapidly than we had thought," Alex Rogers, a professor in the UK and IPSO's scientific director said. "We are seeing greater change, happening faster, and the effects are more imminent than previously anticipated. The situation should be of the gravest concern to everyone since everyone will be affected by changes in the ability of the ocean to support life on Earth." As reported in National Geographic, heat-trapping carbon dioxide has raised the average global temperature by 0.6 degrees Celsius over the past century — a rate that oceans have not kept pace with. Instead, the world's seas have heated by 0.1 degrees Celsius — a change mostly affecting areas from the surface to a depth of some 700 metres. In other words, where marine life typically flourishes. In its review, IPSO pointed out several areas of imminent concern: The oceans are running out of air. By 2100, researchers predict oxygen content will dwindle by anywhere from 1 per cent to seven percent — a deadly combination of global warming and runoff from sewage and agriculture. In fact, Scientific American points out dead zones -- stretches of water that don't have enough oxygen to support fish -- is likely caused by surges in chemical nutrients (read: agricultural run-offs). These added nutrients spike algae blooms, which in turn soak up all the oxygen. Acid levels are surging. Carbon dioxide concentrations are expected to rise over the next 30 to 50 years with grave consequences for ocean life. In fact, the IPSO report states ocean acidity has reached a 300-million-year high. Ocean warming will abide. In fact, it shoulders much of the burden that is global warming. And that spells ebbing ice levels, even less oxygen and increasingly unlivable conditions for sea life. Oh, and thanks for all the over-fishing. Really. The report stressed that the world governments have severely mismanaged this issue to the point where species that are vital to the ocean's food chain may be in irreversible decline "What these latest reports make absolutely clear is that deferring action will increase costs in the future and lead to even greater, perhaps irreversible, losses," Dan Laffoley, a professor and member of the International Union for Conservation of Nature, the worldest largest and oldest environmental organization. "The UN climate report confirmed that the ocean is bearing the brunt of human-induced changes to our planet. These findings give us more cause for alarm — but also a roadmap for action. We must use it."

2NC – Impact Uniqueness (6/7)

**Oceans dying now – causes extinction**

TOJ, 05/05/2014 (The Old Speak Journal citing Captain Paul Watson (a Canadian environmental activist, who founded the Sea Shepherd Conservation Society, a direct action group focused on marine conservation), “The Pacific Ocean Has Become Acidic Enough to Dissolve Sea Snails’ Shells: Acidification Is Happening Sooner & On A Larger Scale Than Scientists Predicted; Coastal Biomes Under Threat”, The Oldspeak Journal, 05/05/2014, http://theoldspeakjournal.wordpress.com/2014/05/05/the-pacific-ocean-has-become-acidic-enough-to-dissolve-sea-snails-shells-acidification-is-happening-sooner-on-a-larger-scale-than-scientists-predicted-coastal-biomes-under/)

“It’s happening now. I’m not speculating about the distant future. The first crack in our global life support system is widening now and we are about to experience our first major systems failure….We are on the threshold of the first major eco-system collapse of the Homocene…What the great majority of people do not understand is this: unless we stop the degradation of our oceans, marine ecological systems will begin collapsing and when enough of them fail, the oceans will die… And if the oceans die, then civilization collapses and we all die… It’s as simple as that.” -Captain Paul Watson “It really is that simple. The degradation of our oceans is not stopping, it is in fact accelerating. The Pacific Ocean will continue to be transformed into a radioactive acid bath. Marine ecological systems will continue to collapse, and that will be that. We’re fucked. There is no fixing this. There is no avoiding extinction.” –OSJ

2NC – Impact Uniqueness (7/7)

**The oceans are on the brink—turns resource wars and instability**

Prupis, 06/24/2014 (Nadia Prupis, Staff writer at Common Dreams, “Report: World’s Oceans On Brink of Collapse”, Intellihub, 06/24/2014, http://www.intellihub.com/report-worlds-oceans-brink-collapse/)

The world’s oceans face irreparable damage from climate change and overfishing, with a five-year window for intervention, an environmental panel said Tuesday. Neglecting the health of the oceans could have devastating effects on the world’s food supply, clean air, and climate stability, among other factors. The Global Oceans Commission, an environmental group formed by the Pew Charitable Trust, released a report (PDF) addressing the declining marine ecosystems around the world and outlining an eight-step “rescue package” to restore growth and prevent future damage to the seas. The 18-month study proposes increased governance of the oceans, including limiting oil and gas exploration, capping subsidies for commercial fishing, and creating marine protected areas (MPAs) to guard against pollution, particularly from plastics. “A healthy ocean is a key to our well-being,” said Jose Maria Figueres, co-chair and former president of Costa Rica. “Unless we turn the tide on ocean decline within five years, the international community should consider turning the high seas into an off-limits regeneration zone until its condition is restored.” Government subsidies for high seas fishing total at least $30 billion a year and are carried out by just ten countries, the report said. About 60 percent of such subsidies encourage unsustainable practices like the fuel-hungry “bottom trawling” of ocean floors — funds that could be rerouted to conservation efforts or employment in coastal areas. Meanwhile, environmental nonprofits and governmental bodies are starting to recognize the insufficient protections offered by systems like the UN Convention on the Law of the Sea (UNCLOS), which aims to regulate portions of the ocean but cannot actually enforce any laws. The report includes a proposal to ratify the UNCLOS, increasing and extending its oversight to 64 percent of the ocean which is currently outside of national jurisdiction. “Without proper governance, a minority will continue to abuse the freedom of the high seas, plunder the riches that lie beneath the waves, take more than a fair share, and benefit at the expense of the rest of us, especially the poorest,” said Trevor Manuel, co-chair of the commission and former minister of finance of South Africa. Failure to reverse the decline of the ocean’s ecosystems would be an “unforgivable betrayal of current and future generations,” said David Miliband, co-chair and former British foreign secretary

2NC – Impact – Oceans Key (1/4)

**Ocean decline will cause mass extinction absent action- CO2 emmisions, fisheries and chemical run-offs are creating deadzones**

**Harrabin 13** (Roger Harrabin is BBC’s Environment analyst, Visiting Fellow at Green Templeton College, Oxford and an Associate Press Fellow at Wolfson College, Cambridge, “Health of oceans 'declining fast'” BBC, 10/3/13,http://www.bbc.com/news/science-environment-24369244)

A review from the International Programme on the State of the Ocean (IPSO), warns that the oceans are facing multiple threats. They are being heated by climate change, turned slowly less alkaline by absorbing CO2, and suffering from overfishing and pollution. The report warns that dead zones formed by fertiliser run-off are a problem. It says conditions are ripe for the sort of mass extinction event that has afflicted the oceans in the past. It says: “We have been taking the ocean for granted. It has been shielding us from the worst effects of accelerating climate change by absorbing excess CO2 from the atmosphere. “Whilst terrestrial temperature increases may be experiencing a pause, the ocean continues to warm regardless. For the most part, however, the public and policymakers are failing to recognise - or choosing to ignore - the severity of the situation.” It says the cocktail of threats facing the ocean is more powerful than the individual problems themselves. Coral reefs, for instance, are suffering from the higher temperatures and the effects of acidification whilst also being weakened by bad fishing practices, pollution, siltation and toxic algal blooms. Atmospheric threshold IPSO, funded by charitable foundations, is publishing a set of five papers based on workshops in 2011 and 2012 in partnership with the International Union for Conservation of Nature (IUCN’s) World Commission on Protected Areas. The reports call for world governments to halt CO2 increase at 450ppm. Any higher, they say, will cause massive acidification later in the century as the CO2 is absorbed into the sea. It urges much more focused fisheries management, and a priority list for tackling the key groups of chemicals that cause most harm. It wants the governments to negotiate a new agreement for the sustainable fishing in the high oceans to be policed by a new global high seas enforcement agency. The IUCN’s Prof Dan Laffoley said: "What these latest reports make absolutely clear is that deferring action will increase costs in the future and lead to even greater, perhaps irreversible, losses. "The UN climate report confirmed that the ocean is bearing the brunt of human-induced changes to our planet. These findings give us more cause for alarm – but also a roadmap for action. We must use it." 'Extinction risk' The co-coordinator, Prof Alex Rogers from Oxford University has been asked to advise the UN's own oceans assessment but he told BBC News he had led the IPSO initiative because: "It’s important to have something which is completely independent in any way from state influence and to say things which experts in the field felt was really needed to be said." He said concern had grown over the past year thanks to papers signalling that past extinctions had involved warming seas, acidification and low oxygen levels. All are on the rise today. He agreed there was debate on whether fisheries are recovering by better management following examples in the US and Europe, but said it seemed clear that globally they were not. He also admitted a debate about whether overall climate change would increase the amount of fish produced in the sea. Melting sea ice would increase fisheries near the poles whilst stratification of warmer waters in the tropics would reduce mixing of nutrients and lead to lower production, he said. He said dead zones globally appeared to be increasing although this may reflect increased reporting. "On ocean acidification, we are seeing effects that no-one predicted like the inability of fish to detect their environments properly. It’s clear that it will affect many species. We really do have to get a grip on what’s going on in the oceans," he said.

2NC – Impact – Oceans Key (2/4)

**Ocean decline causes extinction- synergistic effects create rapid transformation of ecosystems**

**Jackson 08** (Jeremy B. C. Jackson Postdoctoral Fellowship in Biology , McGill University, Ph.D. in Medical Genetics (2005), University of British Columbia, Marine ecologist, paleontologist and a professor at the Scripps Institution of Oceanography in La Jolla, Senior Scientist Emeritus at the Smithsonian Tropical Research Institute in the Republic of Panama. “Ecological extinction and evolution in the brave new ocean” Proceedings of the National Academy of Sciences (PNAS) vol. 105 Supplement 1, 8/12/08, <http://www.pnas.org/content/105/Supplement_1/11458.full?tab=author-info>)

The great mass extinctions of the fossil record were a major creative force that provided entirely new kinds of opportunities for the subsequent explosive evolution and diversification of surviving clades. Today, the synergistic effects of human impacts are laying the groundwork for a comparably great Anthropocene mass extinction in the oceans with unknown ecological and evolutionary consequences. Synergistic effects of habitat destruction, overfishing, introduced species, warming, acidification, toxins, and massive runoff of nutrients are transforming once complex ecosystems like coral reefs and kelp forests into monotonous level bottoms, transforming clear and productive coastal seas into anoxic dead zones, and transforming complex food webs topped by big animals into simplified, microbially dominated ecosystems with boom and bust cycles of toxic dinoflagellate blooms, jellyfish, and disease. Rates of change are increasingly fast and nonlinear with sudden phase shifts to novel alternative community states. We can only guess at the kinds of organisms that will benefit from this mayhem that is radically altering the selective seascape far beyond the consequences of fishing or warming alone. The prospects are especially bleak for animals and plants compared with metabolically flexible microbes and algae. Halting and ultimately reversing these trends will require rapid and fundamental changes in fisheries, agricultural practice, and the emissions of greenhouse gases on a global scale.

2NC – Impact – Oceans Key (3/4)

**Marine ecosystems are critical to the survival of all life on earth.**

**Craig 03** (Robin Kundis Craig, Associate Professor of Law, Indiana University School of Law, 34 McGeorge L. Rev. 155)

Biodiversity and ecosystem function arguments for conserving marine ecosystems also exist, just as they do for terrestrial ecosystems, but these arguments have thus far rarely been raised in political debates. For example, besides significant tourism values - the most economically valuable ecosystem service coral reefs provide, worldwide - coral reefs protect against storms and dampen other environmental fluctuations, services worth more than ten times the reefs' value for food production. n856 Waste treatment is another significant, non-extractive ecosystem function that intact coral reef ecosystems provide. n857 More generally, "ocean ecosystems play a major role in the global geochemical cycling of all the elements that represent the basic building blocks of living organisms, carbon, nitrogen, oxygen, phosphorus, and sulfur, as well as other less abundant but necessary elements." n858 In a very real and direct sense, therefore, human degradation of marine ecosystems impairs the planet's ability to support life. Maintaining biodiversity is often critical to maintaining the functions of marine ecosystems**.** Current evidence shows that, in general, an ecosystem's ability to keep functioning in the face of disturbance is strongly dependent on its biodiversity, "indicating that more diverse ecosystems are more stable." n859 Coral reef ecosystems are particularly dependent on their biodiversity. [\*265] Most ecologists agree that the complexity of interactions and degree of interrelatedness among component species is higher on coral reefs than in any other marine environment. This implies that the ecosystem functioning that produces the most highly valued components is also complex and that many otherwise insignificant species have strong effects on sustaining the rest of the reef system. n860 Thus, maintaining and restoring the biodiversity of marine ecosystems is critical to maintaining and restoring the ecosystem services that they provide. Non-use biodiversity values for marine ecosystems have been calculated in the wake of marine disasters, like the Exxon Valdez oil spill in Alaska. n861 Similar calculations could derive preservation values for marine wilderness. However, economic value, or economic value equivalents, should not be "the sole or even primary justification for conservation of ocean ecosystems. Ethical arguments also have considerable force and merit." n862 At the forefront of such arguments should be a recognition of how little we know about the sea - and about the actual effect of human activities on marine ecosystems. The United States has traditionally failed to protect marine ecosystems because it was difficult to detect anthropogenic harm to the oceans, but we now know that such harm is occurring - even though we are not completely sure about causation or about how to fix every problem. Ecosystems like the NWHI coral reef ecosystem should inspire lawmakers and policymakers to admit that most of the time we really do not know what we are doing to the sea and hence should be preserving marine wilderness whenever we can - especially when the United States has within its territory relatively pristine marine ecosystems that may be unique in the world. We may not know much about the sea, but we do know this much: if we kill the ocean we kill ourselves, and we will take most of the biosphere with us. The Black Sea is almost dead, n863 its once-complex and productive ecosystem almost entirely replaced by a monoculture of comb jellies, "starving out fish and dolphins, emptying fishermen's nets, and converting the web of life into brainless, wraith-like blobs of jelly." n864 More importantly, the Black Sea is not necessarily unique. The Black Sea is a microcosm of what is happening to the ocean systems at large. The stresses piled up: overfishing, oil spills, industrial discharges, nutrient pollution, wetlands destruction, the introduction of an alien species. The sea weakened, slowly at first, then collapsed with [\*266] shocking suddenness. The lessons of this tragedy should not be lost to the rest of us, because much of what happened here is being repeated all over the world. The ecological stresses imposed on the Black Sea were not unique to communism. Nor, sadly, was the failure of governments to respond to the emerging crisis. n865 Oxygen-starved "dead zones" appear with increasing frequency off the coasts of major cities and major rivers, forcing marine animals to flee and killing all that cannot. n866 Ethics as well as enlightened self-interest thus suggest that the United States should protect fully-functioning marine ecosystems wherever possible - even if a few fishers go out of business as a result.

2NC – Impact – Oceans Key (4/4)

**Destruction of ocean environment will cause extinction**

**Sielen, 13** Senior Fellow for International Environmental Policy at the Center for Marine Biodiversity and Conservation at the Scripps Institution of Oceanography (Nov/Dec 2013, Alan B., Foreign Affairs, “The Devolution of the Seas: The Consequences of Oceanic Destruction,” <http://www.foreignaffairs.com/articles/140164/alan-b-sielen/the-devolution-of-the-seas>,)

Of all the threats looming over the planet today, one of the most alarming is the seemingly inexorable descent of the world’s oceans into ecological perdition. Over the last several decades, human activities have so altered the basic chemistry of the seas that they are now experiencing evolution in reverse: a return to the barren primeval waters of hundreds of millions of years ago. A visitor to the oceans at the dawn of time would have found an underwater world that was mostly lifeless. Eventually, around 3.5 billion years ago, basic organisms began to emerge from the primordial ooze. This microbial soup of algae and bacteria needed little oxygen to survive. Worms, jellyfish, and toxic fireweed ruled the deep. In time, these simple organisms began to evolve into higher life forms, resulting in the wondrously rich diversity of fish, corals, whales, and other sea life one associates with the oceans today. Yet that sea life is now in peril. Over the last 50 years -- a mere blink in geologic time -- humanity has come perilously close to reversing the almost miraculous biological abundance of the deep. Pollution, overfishing, the destruction of habitats, and climate change are emptying the oceans and enabling the lowest forms of life to regain their dominance. The oceanographer Jeremy Jackson calls it “the rise of slime”: the transformation of once complex oceanic ecosystems featuring intricate food webs with large animals into simplistic systems dominated by microbes, jellyfish, and disease. In effect, humans are eliminating the lions and tigers of the seas to make room for the cockroaches and rats. The prospect of vanishing whales, polar bears, bluefin tuna, sea turtles, and wild coasts should be worrying enough on its own. But the disruption of entire ecosystems threatens our very survival, since it is the healthy functioning of these diverse systems that sustains life on earth. Destruction on this level will cost humans dearly in terms of food, jobs, health, and quality of life. It also violates the unspoken promise passed from one generation to the next of a better future.

\*\*\*AFF ANSWERS TO ENVIRONMENT DA\*\*\*

2AC – Environment Resilient

**No impact – humans and the environment are adaptable**

**Doremus, 2000** – Professor of Law at UC Davis

(Holly, Washington & Lee Law Review, “The Rhetoric and Reality of Nature Protection: Toward a New Discourse,” Winter 2000, 57 Wash & Lee L. Rev. 11)

In recent years, this discourse frequently has taken the form of the ecological horror story. That too is no mystery. The ecological horror story is unquestionably an attention-getter, especially in the hands of skilled writers [\*46] like Carson and the Ehrlichs. The image of the airplane earth, its wings wobbling as rivet after rivet is carelessly popped out, is difficult to ignore. The apocalyptic depiction of an impending crisis of potentially dire proportions is designed to spur the political community to quick action. Furthermore, this story suggests a goal that appeals to many nature lovers: that virtually everything must be protected. To reinforce this suggestion, tellers of the ecological horror story often imply that the relative importance of various rivets to the ecological plane cannot be determined. They offer reams of data and dozens of anecdotes demonstrating the unexpected value of apparently useless parts of nature. The moth that saved Australia from prickly pear invasion, the scrubby Pacific yew, and the downright unattractive leech are among the uncharismatic flora and fauna who star in these anecdotes. n211 The moral is obvious: because we cannot be sure which rivets are holding the plane together, saving them all is the only sensible course.

Notwithstanding its attractions, the material discourse in general, and the ecological horror story in particular, are not likely to generate policies that will satisfy nature lovers. The ecological horror story implies that there is no reason to protect nature until catastrophe looms. The Ehrlichs' rivet-popper account, for example, presents species simply as the (fungible) hardware holding together the ecosystem. If we could be reasonably certain that a particular rivet was not needed to prevent a crash, the rivet-popper story suggests that we would lose very little by pulling it out. Many environmentalists, though, would disagree. n212 Reluctant to concede such losses, tellers of the ecological horror story highlight how close a catastrophe might be, and how little we know about what actions might trigger one. But the apocalyptic vision is less credible today than it seemed in the 1970s. Although it is clear that the earth is experiencing a mass wave of extinctions, n213 the complete elimination of life on earth seems unlikely.n214 Life is remarkably robust. Nor is human extinction probable any time soon. Homo sapiens is adaptable to nearly any environment. Even if the world of the future includes far fewer species, it likely will hold people. n215 One response to this credibility problem tones the story down a bit, arguing not that humans will go extinct but that ecological disruption will bring economies, and consequently civilizations, to their knees. n216 But this too may be overstating the case. Most ecosystem functions are performed by multiple species. This functional redundancy means that a high proportion of species can be lost without precipitating a collapse. n217

1AR – Environment Resilient (1/3)

**No impact to biodiversity**

**Sagoff 97**Mark, Senior Research Scholar – Institute for Philosophy and Public policy in School of Public Affairs – U. Maryland, William and Mary Law Review, “INSTITUTE OF BILL OF RIGHTS LAW SYMPOSIUM DEFINING TAKINGS: PRIVATE PROPERTY AND THE FUTURE OF GOVERNMENT REGULATION: MUDDLE OR MUDDLE THROUGH? TAKINGS JURISPRUDENCE MEETS THE ENDANGERED SPECIES ACT”, 38 Wm and Mary L. Rev. 825, March, L/N

Note – Colin Tudge - Research Fellow at the Centre for Philosophy at the London School of Economics. Frmr Zoological Society of London: Scientific Fellow and tons of other positions. PhD. Read zoology at Cambridge.

Simon Levin = Moffet Professor of Biology, Princeton. 2007 American Institute of Biological Sciences Distinguished Scientist Award 2008 Istituto Veneto di Scienze Lettere ed Arti 2009 Honorary Doctorate of Science, Michigan State University 2010 Eminent Ecologist Award, Ecological Society of America 2010 Margalef Prize in Ecology, etc… PhD

Although one may agree with ecologists such as Ehrlich and Raven that the earth stands on **the brink of** an episode of **massive extinction, it may not follow** from this grim fact **that human** being**s will suffer** as a result. On the contrary, skeptics such as science writer Colin Tudge have challenged biologists to explain **why we need more than a tenth of the 10 to 100 million species that grace the earth**. Noting that "cultivated systems often out-produce wild systems by 100-fold or more," Tudge declared that "the argument that humans need the variety of other species is, when you think about it, a theological one." n343 Tudge observed that "the elimination of all but a tiny minority **of our fellow creatures does not affect the material well-being of humans** one iota."n344 This skeptic challenged ecologists to list more than 10,000 species (other than unthreatened microbes) that are essential to ecosystem productivity or functioning. n345 "**The human species could survive just as well** if 99.9% of our fellow creatures went extinct, provided only that we retained the appropriate 0.1% that we need." n346   [\*906]   The monumental Global Biodiversity Assessment ("the Assessment") identified two positions with respect to redundancy of species. "At one extreme is the idea that each species is unique and important, such that its removal or loss will have demonstrable consequences to the functioning of the community or ecosystem." n347 The authors of the Assessment, a panel of eminent ecologists, endorsed this position, saying it is "unlikely that there is much, if any, ecological redundancy in communities over time scales of decades to centuries, the time period over which environmental policy should operate." n348 These eminent ecologists rejected the opposing view, "the notion that species overlap in function to a sufficient degree that removal or loss of a species will be compensated by others, with negligible overall consequences to the community or ecosystem." n349  Other biologists believe, however, that species are so fabulously redundant in the ecological functions they perform that the life-support systems and processes of the planet and ecological processes in general will function perfectly well with fewer of them, certainly fewer than the millions and millions we can expect to remain **even if** **every threatened organism becomes extinct**. n350 Even the kind of sparse and miserable world depicted in the movie Blade Runner could provide a "sustainable" context for the human economy as long as people forgot their aesthetic and moral commitment to the glory and beauty of the natural world. n351 The Assessment makes this point. "Although any ecosystem contains hundreds to thousands of species interacting among themselves and their physical environment, the emerging consensus is that the system is driven by a small number of . . . biotic variables on whose interactions the balance of species are, in a sense, carried along." n352   [\*907]   To make up your mind on the question of the functional redundancy of species, consider an endangered species of bird, plant, or insect and ask how the ecosystem would fare in its absence. The fact that the creature is endangered suggests an answer: it is already in limbo as far as ecosystem processes are concerned. What crucial ecological services does the black-capped vireo, for example, serve? Are any of the species threatened with extinction necessary to the provision of any ecosystem service on which humans depend? If so, which ones are they?  Ecosystems and the species that compose them have changed, dramatically, continually, and totally in virtually every part of the United States. There is little ecological similarity, for example, between New England today and the land where the Pilgrims died. n353 In view of the constant reconfiguration of the biota, **one may wonder why Americans have not suffered more as a result of ecological catastrophes**. The cast of

1AR – Environment Resilient (2/3)

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species in nearly every environment changes constantly-local extinction is commonplace in nature-but the crops still grow. Somehow, it seems, property values keep going up on Martha's Vineyard in spite of the tragic disappearance of the heath hen.  One might argue that the sheer number and variety of creatures available to any ecosystem buffers that system against stress. Accordingly, we should be concerned if the "library" of creatures ready, willing, and able to colonize ecosystems gets too small. (Advances in genetic engineering may well permit us to write a large number of additions to that "library.") In the United States as in many other parts of the world, however, the number of species has been increasing dramatically, not decreasing, as a result of human activity. This is because the hordes of exotic species coming into ecosystems in the United States far exceed the number of species that are becoming extinct. Indeed, introductions may outnumber extinctions by more than ten to one, so that the United States is becoming more and more species-rich all the time largely as a result of human action. n354 [\*908] Peter Vitousek and colleagues estimate that over 1000 non-native plants grow in California alone; in Hawaii there are 861; in Florida, 1210. n355 In Florida more than 1000 non-native insects, 23 species of mammals, and about 11 exotic birds have established themselves. n356 Anyone who waters a lawn or hoes a garden knows how many weeds desire to grow there, how many birds and bugs visit the yard, and how many fungi, creepy-crawlies, and other odd life forms show forth when it rains. All belong to nature, from wherever they might hail, but not many homeowners would claim that there are too few of them. Now, not all exotic species provide ecosystem services; indeed, some may be disruptive or have no instrumental value. n357 This also may be true, of course, of native species as well, especially because all exotics are native somewhere. Certain exotic species, however, such as Kentucky blue grass, establish an area's sense of identity and place; others, such as the green crabs showing up around Martha's Vineyard, are nuisances. n358 Consider an analogy [\*909] with human migration. Everyone knows that after a generation or two, immigrants to this country are hard to distinguish from everyone else. The vast majority of Americans did not evolve here, as it were, from hominids; most of us "came over" at one time or another. This is true of many of our fellow species as well, and they may fit in here just as well as we do. It is possible to distinguish exotic species from native ones for a period of time, just as we can distinguish immigrants from native-born Americans, but as the centuries roll by, species, like people, fit into the landscape or the society, changing and often enriching it. Shall we have a rule that a species had to come over on the Mayflower, as so many did, to count as "truly" American? Plainly not. When, then, is the cutoff date? Insofar as we are concerned with the absolute numbers of "rivets" holding ecosystems together, extinction seems not to pose a general problem because a far greater number of kinds of mammals, insects, fish, plants, and other creatures thrive on land and in water in America today than in prelapsarian times. n359 The Ecological Society of America has urged managers to maintain biological diversity as a critical component in strengthening ecosystems against disturbance. n360 Yet as Simon Levin observed, "much of the detail about species composition will be irrelevant in terms of influences on ecosystem properties." n361 [\*910] He added: "For net primary productivity, as is likely to be the case for any system property, **biodiversity matters only up to a point**; above a certain level, increasing biodiversity is likely to make **little difference**." n362 What about the use of plants and animals in agriculture? There is no scarcity foreseeable. "Of an estimated 80,000 types of plants [we] know to be edible," a U.S. Department of the Interior document says, "only about 150 are extensively cultivated." n363 About twenty species, not one of which is endangered, provide ninety percent of the food the world takes from plants. n364 Any new food has to take "shelf space" or "market share" from one that is now produced. Corporations also find it difficult to create demand for a new product; for example, people are not inclined to eat paw-paws, even though they are delicious. It is hard enough to get people to eat their broccoli and lima beans. It is harder still to develop consumer demand for new foods. This may be the reason the Kraft Corporation does not prospect in remote places for rare and unusual plants and animals to add to the world's diet. Of the roughly 235,000 flowering plants and 325,000 nonflowering plants (including mosses, lichens, and seaweeds) available, farmers ignore virtually all of them in favor of a very few that are profitable. n365 To be sure, any of the more than 600,000 species of plants could have an application in agriculture, but would they be preferable to the species that are now dominant? Has anyone found any consumer demand for any of these half-million or more plants to replace rice or wheat in the human diet? There are reasons that farmers cultivate rice, wheat, and corn rather than, say, Furbish's lousewort. There are many kinds of louseworts, so named because these weeds were thought to cause lice in sheep. How many does agriculture really require? [\*911] The species on which agriculture relies are domesticated, not naturally occurring; they are developed by artificial not natural selection; they might not be able to survive in the wild. n366 This argument is not intended to deny the religious, aesthetic, cultural, and moral reasons that command us to respect and protect the natural world. These spiritual and ethical values should evoke action, of course, but we should also recognize that they are spiritual and ethical values. We should recognize that ecosystems and all that dwell therein compel our moral respect, our aesthetic appreciation, and our spiritual veneration; we should clearly seek to achieve the goals of the ESA. There is no reason to assume, however, that these goals have anything to do with human well-being or welfare as economists understand that term. These are ethical goals, in other words, not economic ones. Protecting the marsh may be the right thing to do for moral, cultural, and spiritual reasons. We should do it-but someone will have to pay the costs. In the narrow sense of promoting human welfare, protecting nature often represents a net "cost," not a net "benefit." It is largely for moral, not economic, reasons-ethical, not prudential, reasons- that we care about all our fellow creatures. They are valuable as objects of love not as objects of use. What is good for   [\*912]  the marsh may be good in itself even if it is not, in the economic sense, good for mankind. The most valuable things are quite useless.

1AR – Environment Resilient (3/3)

**No impact to biodiversity – previous mass extinctions prove**

**National Geographic no date** (“Mass Extinctions, What Causes Animal Die Offs?,” National Geographic, Date Provided by the Wayback Machine, 2010, science.nationalgeographic.com, Available Online: https://science.nationalgeographic.com/prehistoric-world/mass-extinction,)

More than 90 percent of all organisms that have ever lived on Earth are extinct. As new species evolve to fit ever changing ecological niches, older species fade away. But [the rate](##) of extinction is far from constant. At least a handful of times in the last 500 million years, 50 to more than 90 percent of all species on Earth have disappeared in a geological blink of the eye. Though these mass extinctions are deadly events, they open up the planet for new life-forms to emerge. Dinosaurs appeared after one of the biggest mass extinction events on Earth, the Permian-Triassic extinction about 250 million years ago. The most studied mass extinction, between the Cretaceous and Paleogene periods about 65 million years ago, killed off the dinosaurs and made room for mammals to rapidly diversify and evolve.

**Marine ecosystems are resilient — no system collapse**

**Kennedy 2 —** Victor Kennedy, PhD Environmental Science and Dir. Cooperative Oxford Lab (“Coastal and Marine Ecosystems and Global Climate Change,” Pew Center on Global Climate Change, Available Online: <http://www.c2es.org/docUploads/marine_ecosystems.pdf>, Accessed: 09/02/2013)

There is evidence that marine organisms and ecosystems are resilient to environmental change. Steele (1991) hypothesized that the biological components of marine systems are tightly coupled to physical factors, allowing them to respond quickly to rapid environmental change and thus rendering them ecologically adaptable. Some species also have wide genetic variability throughout their range, which may allow for adaptation to climate change.

2AC – Alt Causes

**Aff isn’t key-alt causes and it’s a drop in the bucket,**

(Thomas **Goreau ’13**, biogeochemist and marine biologist, PhD in biochemistry from Harvard, President of the Global Coral Reef Alliance, *Innovative Methods of Marine Ecosystem Restoration*, “Chapter 2: Innovative Methods of Marine Ecosystem Restoration: An Introduction,” CRC Press, 2013, http://www.crcnetbase.com.proxy.lib.umich.edu/doi/pdfplus/10.1201/b14314-3)

This book, the first publication of innovative new methods to reverse the major threats now destroying our ocean planet’s biodiversity and productivity, offers a ray of hope in an increasingly gloomy crisis. Here you will find new methods to greatly increase the settlement, growth, survival, and resistance to stress of marine ecosystems, fisheries, and eroding shorelines; to maintain biodiversity and productivity where it would be lost; to rapidly restore them in devastated places where there has been no natural recovery; and to create new methods for sustainable and biodiverse mariculture. If these proven technologies were applied on the scale that was needed, our major marine resource problems now spiraling downward could be reversed for a better future. Reversing these negative trends is the critical issue for this century if we are to maintain and nurture our renewable marine resources. The accelerating crisis in the oceans is now widely known: impending mass extinction of coral-reef ecosystems from global warming and pollution; the crash of one fishery after another from overharvesting; disappearing species; the conversion of oceans from sinks of CO2 to sources; the impending billion or so people who will be flooded from coastal homes to become global sea-level-rise refugees, with whole nations disappearing beneath the waves; and more. Reversing these looming catastrophes cannot be solved by the conventional solution to all marine management problems: marine-protected areas (MPAs) that exclude fishermen. The widely touted claims that these ecosystems are “resilient” and “will bounce back all by themselves,” thanks to the sagacity of their managers, is in fact almost never observed in practice because most MPAs are intrinsically incapable of reversing the root causes of the major threats that are laying waste our habitats. Every coral reef MPA is full of dead or dying corals that no local management can prevent. But so strong is the lobby of governments, funding agencies, and big international nongovernmental organizations (BINGOs) for MPAs that their failure cannot be admitted. Active restoration solutions are rejected out of hand, because to admit their need would be an admission that money has been wasted and that existing policies are futile and will fail even more in the future as global warming, sea-level rise, and pollution escalate. These man-made threats are based in our unwise overexploitation and disruption of the natural mechanisms that regulate our atmosphere, ecosystems, soils, water, and climate. While it is a wonderfully praiseworthy task to protect the few healthy marine ecosystems that still survive, if they cannot be protected from the real causes of mass mortality, they will die anyway, perhaps only a little later. And if we don’t restore the vast majority of the ecosystems that we have already destroyed or severely damaged, where will future fisheries come from? We are often told that restoration is pointless, because we can’t possibly restore it all. We answer that “we certainly can’t restore it all, but if we don’t restore all that we can, what else will we leave for future generations?”

1AR – Alt Causes (1/4)

**Warming collapsing ocean ecosystems now**

**Shah 14** (Anup, writer for Global Issues, Climate Change Affects Biodiversity, <http://www.globalissues.org/article/172/climate-change-affects-biodiversity>, 1/19/14)

The link between climate change and biodiversity has long been established. Although throughout Earth’s history the climate has always changed with ecosystems and species coming and going, rapid climate change affects ecosystems and species ability to adapt and so biodiversity loss increases. From a human perspective, the rapid climate change and accelerating biodiversity loss risks human security (e.g. a major change in the food chain upon which we depend, water sources may change, recede or disappear, medicines and other resources we rely on may be harder to obtain as the plants and forna they are derived from may reduce or disappear, etc.). The UN’s Global Biodiversity Outlook 3, in May 2010, summarized some concerns that climate change will have on ecosystems: Climate change is already having an impact on biodiversity, and is projected to become a progressively more significant threat in the coming decades. Loss of Arctic sea ice threatens biodiversity across an entire biome and beyond. The related pressure of ocean acidification, resulting from higher concentrations of carbon dioxide in the atmosphere, is also already being observed. Ecosystems are already showing negative impacts under current levels of climate change … which is modest compared to future projected changes…. In addition to warming temperatures, more frequent extreme weather events and changing patterns of rainfall and drought can be expected to have significant impacts on biodiversity. — Secretariat of the Convention on Biological Diversity (2010), Global Biodiversity Outlook 3, May, 2010, p.56 Some species may benefit from climate change (including, from a human perspective, an increases in diseases and pests) but the rapid nature of the change suggests that most species will not find it as beneficial as most will not be able to adapt.

**Whaling**

**COLLINS 14** (Katie, writer for Wired Science, Whales are the engineers of our ocean ecosystems, <http://www.wired.co.uk/news/archive/2014-07/03/whales-ecosystem-engineers>, 7/3/14)

Thanks to marine biologists around the world we now know that the gentle giants of our oceans have a powerful and positive impact on our underwater ecosystems. It has long been presumed that whales are so rare that their effect on our oceans is negligible. Not so, according to new research published in the journal Frontiers in Ecology and the Environment, which has taken into account several decades of whale-related data and found that their influence can be seen in the global carbon storage and the health of commercial fisheries. In the past fishermen have often taken taken the view that whales, which after all have massive metabolic demands, are their competition. It turns out, however, that a prevalence of whales actually encourages the development of more robust fisheries. It's estimated that the dramatic decline in whale numbers, primarily due to industrial whaling, has seen their numbers decline between 66 and 90 percent, but there are signs of recovery, which could well have a dramatically positive impact on the health of ocean ecosystems overall. "Future changes in the structure and function of the world's oceans can be expected with the restoration of great whale population," write the researchers in the study's abstract.

1AR – Alt Causes (2/4)

**Declining fish size**

**Rietta 14** (commentator at Pucci Foods ocean blog citing a recent study, conducted by fisheries scientists with the University of Aberdeen, Rising Ocean Temperatures: Smaller Fish Will Impact Fisheries and Ecosystems Unless Humans Learn to Adapt, <http://puccifoods.com/pucciseafood-new/blog/ocean-temperatures-rise-smaller-fish-will-impact-fisheries-ecosystems-unless-humans-learn-adapt/>, 3/3/14)

There may be serious negative effects on entire ecosystems that come with decreasing fish size. Everything in the ocean food web is connected – if fish on a lower trophic level become smaller, they will naturally yield fewer nutrients for organisms higher up on the energy chain. These animals could be predatory fish or sharks that are already suffering from the same depleted oxygen levels, or marine mammals that need to sustain massive amounts of energy to survive. They will be compelled to eat more of the smaller fish – lending to a decline in population – or switch their food source to something else. Ripple effects could be seen far and wide in many different ocean ecosystems. Organisms have an amazing ability to adapt and evolve to survive. But much more time is needed to keep things in balance. These fish are being forced to adapt too quickly to changing conditions – entire ecosystems need at least thousands of years to properly evolve. Right now human activity is forcing monumental changes over a span of decades.

**Increased ocean temperatures**

**Rietta 14** (commentator at Pucci Foods ocean blog citing a recent study, conducted by fisheries scientists with the University of Aberdeen, Rising Ocean Temperatures: Smaller Fish Will Impact Fisheries and Ecosystems Unless Humans Learn to Adapt, <http://puccifoods.com/pucciseafood-new/blog/ocean-temperatures-rise-smaller-fish-will-impact-fisheries-ecosystems-unless-humans-learn-adapt/>, 3/3/14)

This study took place on fish data from the North Sea, but what about other areas? Although scientists predict that different regions will show quite a bit of variation, we have seen a global increase in sea surface temperatures. We must wonder how other animals are likely to be affected. If all our oceans are warming, then we must believe that they will all begin losing the capacity to hold oxygen. Organisms rely on this oxygen – it would be akin to our atmospheric being sucked away, so that humans were forced to survive on less oxygen. Imagine a world where it is hard for our lungs to gather enough oxygen to fuel the movement of our bodies. Just walking down the street would become a tremendously difficult task. Fish and invertebrates would surely lose the energy needed to find food, shelter and mates. Coral reefs are especially sensitive to environmental conditions, with higher temperatures causing coral bleaching and eventual death. Coral reefs are home to 25% of life in the oceans with biodiversity levels on par with terrestrial rainforests. Coral reefs provide millions of people with food and jobs in fishing and ecotourism. Their disappearance would have grave implications for the future.

1AR – Alt Causes (3/4)

**Caribbean Reefs will disappear in 20 years- increased pressures and lack of grazers**

**Seattle Times 7/7/14** (“Study: Caribbean coral reefs will be lost within 20 years” Seattle times 7/7/14 <http://seattletimes.com/html/outdoors/2024012938_caribbeanreefs> disappearingxml.html)

Most Caribbean coral reefs will disappear within the next 20 years unless action is taken to protect them, primarily due to the decline of grazers such as sea urchins and parrotfish, a new report has warned. A comprehensive analysis by 90 experts of more than 35,000 surveys conducted at nearly 100 Caribbean locations since 1970 shows that the region’s corals have declined by more than 50 percent. But restoring key fish populations and improving protection from overfishing and pollution could help the reefs recover and make them more resilient to the impacts of climate change, according to the study from the Global Coral Reef Monitoring Network, the International Union for Conservation of Nature (IUCN) and the U.N.’s Environment Program. While climate change and the resulting ocean acidification and coral bleaching does pose a major threat to the region, the report — Status and Trends of Caribbean Coral Reefs: 1970-2012 — found that local pressures such as tourism, overfishing and pollution posed the biggest problems. And these factors have made the loss of the two main grazer species, the parrotfish and sea urchin, the key driver of coral decline in the Caribbean. Grazers are important fish in the marine ecosystem as they eat the algae that can smother corals. An unidentified disease led to a mass mortality of the sea urchin in 1983 and overfishing throughout the 20th century has brought the parrotfish population to the brink of extinction in some regions, according to the report. Reefs where parrotfish are not protected have suffered significant declines, including Jamaica, the entire Florida reef tract from Miami to Key West, and the U.S. Virgin Islands. At the same time, the report showed that some of the healthiest Caribbean coral reefs are those that are home to big populations of grazing parrotfish. These include the U.S. Flower Garden Banks national marine sanctuary in the northern Gulf of Mexico, Bermuda and Bonaire — all of which have restricted or banned fishing practices that harm parrotfish.

1AR – Alt Causes (4/4)

**Fishery Management is failing- Positive trends come from developed countries’ skewed databases which are only 20% of all fish catches**

**Cheung and Pitcher 13** (William W.L Cheung PhD in Resource Management and Environmental Studies Assistant Professor at the UBC Fisheries Centre AND Tony J. Pitcher founding director of the Fisheries Centre at the University of British Columbia, where he is currently a professor of fisherie “Fisheries: Hope or despair?” Marine Pollution Bulletin 2013 Bulletinhttp://www.stateoftheocean.org/pdfs/Pitcher-Cheung.pdf)

A recent review of the main types of fishery management sug- gests that most of the ‘silver bullet’ approaches of a single type of management system (such as ‘property rights’, ‘MPAs’ or ‘co-man- agement’) will not work well, and only combined management ap- proaches (ecosystem and restoration-based) perform best ( Pitcher and Lam, 2010 ). However, despite many calls for its implementa- tion (e.g., Hall and Mainprize, 2005 ), there has been a widespread failure among the principal fishing countries to adopt the key fea- tures of ecosystem-based fishery management ( Pitcher et al., 2008a,b ). Nevertheless, there are some signs that the management of some fisheries in the developed world is improving. For exam- ple, countries with higher Code compliance scores showed improvement in status between 1995 and 2005, according to an ecosystem health index ( Coll et al., 2012 ). Unfortunately, countries with poor Code compliance had not changed, or had got slightly worse. Poor governance in managing fisheries in developing coun- tries is a hard problem to tackle: for many small-scale fisheries in developing countries it is impractical to collect any data. In such situations, it has been suggested that basic elements of ‘primary fisheries management’ represent a practical solution ( Cochrane et al., 2011 ). Is the current status in sustainability of fisheries better than had previously been thought? Analysis of stock assessment data from over 350 stocks by Worm et al. (2009) suggested that improved management had led to increased biomass and that fishery stocks were recovering. However, the analysis was based on fish popula- tions that have conventional stock assessment procedures held in a public database (the ‘‘Ram Myers legacy database’’: Ricard et al., 2012 ). These fish stocks, however, comprise only 16% of the annual world fish catch (only about 8% without just one stock, the US North Pacific pollock), and moreover, most of them are from North America and Europe ( Worm and Branch, 2012 ). As one might ex- pect for fisheries where costly modern stock assessment is carried out, these fisheries are largely in countries of the developed world with the top 15% of fishery management quality scores ( Mora et al., 2009 ). They all have a relatively high UN Human Development In- dex and are at the upper end of the range of compliance with the UN Code of Conduct for Responsible Fisheries (see Fig. 2 : Pitcher et al., 2009 ). In these assessed fisheries, biomass lies at about 32% of estimated unfished biomass, or about 90% of the MSY level ( Worm and Branch, 2012 ). Moreover, Froese et al. (2012) argue that these assessed stocks are a fundamentally biased subset of all fished stocks in that they represent high value, resilient stocks that have survived fishing for decades, or centuries of fishing in the case of some European ecosystems. While there is indeed some evidence of small improvements to fisheries management in the developed world ( Coll et al., 2012 ), over 80% of the world’s fish are caught elsewhere ( Pomeroy and Andrew, 2011 ) and so this does not support a message of confi- dence. In fact, a statistical analysis of the status of the majority of world fisheries ( Costello et al., 2012 ) using a multiple regression model to predict status (B/Bmsy) for unassessed fisheries, confirms that, although fisheries for which stock assessment is available are mostly in a reasonable shape, serious depletions are the norm world-wide. This argues against Worm and Branch’s (2012) sug- gestion that unassessed fisheries may ‘‘probably harbor higher but declining fish biomass’’. Moreover, recent analysis suggests that catch per effort is still declining ( Watson et al., 2012 ). This evi- dence suggests that the global picture is indeed alarming.

2AC – Reserves Solve

**Ecosystem reserves solve**

**Marvin, 12** – reporter for the Stanford University News (Karen K, “Marine Reserves Enhance Resilience to Climatic Impacts & Aid in Ecosystem Recovery”, SciTech Daily, 7/20/12, http://scitechdaily.com/marine-reserves-enhance-resilience-to-climatic-impacts-aid-in-ecosystem-recovery/)

A new study from scientists at Stanford University and the Monterey Bay Aquarium reveals scientific evidence suggesting that marine reserves enhance resilience to climatic impacts, helping ecosystems bounce back after environmental disasters.

For years, scientists, fishers and government regulators could only speculate that marine reserves, pockets of ocean that are off limits to fishing, could help entire ecosystems bounce back after an environmental disaster. But scientific evidence has emerged that supports what was once just an educated guess. The new study was published July 18 in PLoS ONE.

The study revealed that after a mass mortality of marine life in the waters off Baja California, Mexico, egg production of pink abalones in the marine reserves increased 40 percent while being cut in half in fished areas. Further, the study found that a significant amount of larvae spilled over into unprotected areas open to fishing, which helped them rebound more quickly.

The study, which began in 2006, used data from abalone fishing areas around Isla Natividad, Mexico, including new marine reserves that were hard hit in both 2009 and 2010 by hypoxic events, episodes of low dissolved oxygen in seawater that weaken and kill marine life. The study, “Evidence That Marine Reserves Enhance Resilience to Climatic Impacts,” was authored by a team of scientists led by Professor Fiorenza “Fio” Micheli of Stanford University’s Hopkins Marine Station in Pacific Grove, California, in partnership with the Mexican organization Comunidad y Biodiversidad’s Scientific Director Andrea Sáenz-Arroyo and other colleagues.

“Our study preceded the 2009 mortality event, allowing us an unprecedented view of its demographic effects, both within the reserve and in fished areas,” said Micheli. The study discovered that after the 2009 hypoxic event, abalone biomass declined by 75 percent at fished sites but only 50 percent in reserves. Perhaps more important, it found that the recruitment rate (the rate at which abalone are ready to be harvested) of juveniles in the reserves remained stable but were nine times lower in fished areas. “Both the large size of the protected abalones and the population density were key to resilience,” noted Micheli. “Marine reserves are vital to jumpstart the recovery of species following a mass mortality.”

The Isla Natividad marine reserves were established by the local fishing cooperatives after seeing sharp declines in abalone catches due to fishing and past El Niño events. Climate change is happening on a global scale, leaving many communities with few options to protect their local ecosystems and the livelihoods that are dependent on them. The establishment of marine protected areas, including marine reserves, is one option available to local communities even while global climate change mitigation continues to be debated.

“Historically governments and communities had to make a leap of faith that a marine reserve could provide long-term benefits that offset the short-term loss of fishing grounds,” Micheli said. “There were no studies or scientific evidence that a marine reserve could help a region of the ocean bounce back from a local environmental disaster. Now we have that evidence.”

The study focused on abalone because of their high commercial value and because their populations have been depleted in recent years. Since the mid-1800s, the herbivorous mollusk has been harvested around the North Pacific, leading to a decline in the total catch of all five species from a high of 24,000 metric tons to 115 metric tons in 1995. Since 1997, both commercial and sport fishing of abalone has been closed south of San Francisco, California. Although commercial fishers pull $20 million of pink abalones annually from the waters off Baja California, recent years netted 10 times smaller catches than the peak year.

The hypoxic events that are impacting abalone populations are relatively new developments along the western coast of North America. Recent research indicates that midwater Oxygen Minimum Zones are expanding, setting the stage for future hypoxic events. This, combined with other environmental impacts such as an increase in mean ocean temperatures, lends scientific support to recommendations for the establishment of networks of marine protected areas to help offset environmental impacts.

1AR – Reserves Solve (1/2)

**Predator reserves relieve pressure on ecosystems and stabilize the food chain**

**Brittin, 13** – Officer of Communications at Pew Marine Fellows Institute (Rachel, “No-Take Marine Reserves Make Coral Reefs More Resilient”, Pew Trusts, 7/30/13, http://www.pewtrusts.org/en/research-and-analysis/fact-sheets/2013/07/30/notake-marine-reserves-make-coral-reefs-more-resilient)

A new study finds no-take marine reserves, where fishing for parrotfish is prohibited, may make coral reefs six times more resilient to coral bleaching and other disturbances. Parrotfish eat algae, so a reef system with abundant parrotfish is more likely to recover from disturbance rather than "tip" into an undesirable state in which algae dominate. Reducing greenhouse gas emissions also improves coral resilience, but only in the long term.

The research is the result of Dr. Peter Mumby's three-year Pew Marine Fellowship project to better understand the health of coral reefs.

"This added resilience is important because it shows that protecting parrotfish, through such measures as marine reserves and fisheries policies, increases the ability of corals to adapt to warming oceans," said Dr. Mumby, lead author of the study and a professor at University of Queensland in Australia. "In addition, it should reduce the loss of ecosystem services that reefs provide, such as support for fisheries and coastal protection from storms."

The Study

Dr. Mumby and four other scientists used a simulation model to study the effects of marine reserves and climate change on a large coral reef in Belize. They focused on ecological resilience—which they defined as the odds that coral will regrow after a hurricane or coral bleaching event.

The researchers used the model to test two factors that could affect coral's ability to recover. The first was the existence of a no-take marine reserve, which would prohibit fishing, including for parrotfish. The second factor was reducing greenhouse gas emissions to slow the warming of the oceans, which could lead to thermal stress in corals.

Effects of reserves and reduced emissions

The study found that, in the near term, corals are six times more likely to regrow after a disturbance if parrotfish are protected by a reserve: the probability of corals regrowing by year 2030 was 12 percent without a reserve but 79 percent with one. If corals do not regrow, the reef is likely to “tip” into an algae-dominated state.

Reductions in greenhouse gas emissions had little effect in the near term, but in the long term (by 2080), the model showed that aggressive reductions improved coral reef resilience. Combining these reductions with a no-take reserve produced the largest benefit. With both measures in place, it took the average reef 25 years to degrade to the point where the area covered by live coral was less than 10 percent. In a scenario with no reserve and no steps to limit emissions, that took only eight years.

"Dr. Mumby's work highlights the importance of grazers like parrotfish for Belize reefs and others around the world," said Polita Glynn, director of the Pew Marine Fellows Program, which supported his research. "These results suggest that removing fishing pressure on parrotfish or other algae grazers could enrich coral reef ecosystems."

1AR – Reserves Solve (2/2)

**Recent studies prove – marine ecosystems adapt**

**University of Southampton, 13** (“Marine reserves enhance resilience to climate change”, Science Daily, 12/1/13, http://www.sciencedaily.com/releases/2013/12/131201174331.htm)

A new study, led by a University of Southampton scientist, highlights the potential for fish communities in marine reserves to resist climate change impacts better than communities on fished coasts.

The study, which is published in the journal Nature Climate Change, involved an Australian research team from the Institute for Marine and Antarctic Studies at the University of Tasmania and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) Marine and Atmospheric Research.

The researchers looked at different types of fish community responses to both short- and long-term environmental variability. They found that marine reserves have the potential to build community resilience through mechanisms that promote species and functional stability, and resist colonisation by warm water vagrants.

In addition, some ecological signals were consistently noted in both the reserve and fished sites, such as in increase in the number of herbivorous fish. Their results therefore suggest that persistent long-term warming in southeast Australia will lead to major changes in the structure and function of shallow reef fish communities.

"What I found most striking about this work," comments lead author Dr Amanda Bates from the University of Southampton, "is that marine reserves have an important role to play in understanding ecological change in the absence of fishing -- the knowledge that we have gained was only possible because the long-term data on fish species were available from a marine reserve."

The authors took advantage of a two decade long data series of fish abundance from the Maria Island Marine Reserve, collected by Dr Neville Barrett and Professor Graham Edgar since 1992 with support from the Tasmanian Parks and Wildlife Service. The study focused on how the biodiversity and biological characteristics of fish communities changed in the marine reserve following a sustained period of sea warming in comparison to nearby sites open to fishing.

2AC – AT: Invasive Species

**Invasive species aren’t automatically bad --- some non-indigenous species can help ecosystem resilience**

Jeffrey A. **Crooks**, May **2002.** Smithsonian Environm. Res. Center and Romberg Tiburon Center, San Francisco State Univ. “Characterizing ecosystem-level consequences of biological invasions: the role of ecosystem engineers,” Oikos 97.2.

Invasions by exotic species represent both threats to ecosystems as well as opportunities to learn more about them. Among the invaders that will have the largest impacts are those that directly modify ecosystems and thus have cascading effects for resident biota. Exotics can affect ecosystems by altering system-level flows, availability, or quality of nutrients, food, and physical resources (e.g. living space, water, heat or light). The invader-mediated control of physical resources, typically achieved through the modification of habitats, has received limited attention in invasion biology. This reflects a general trend in ecology, and only recently has the concept of ecosystem engineering been developed to account for the role of species that shape habitats. Plants and animals in terrestrial and aquatic systems can both create and destroy structure. When introduced into ecosystems, these exotic engineers cause physical state changes with effects that ramify throughout the system. Although the consequences of these modifications are varied and complex, insight gained from general ecological principles offers an opportunity to predict what invaders will do upon their integration into systems. Examples from the literature suggest that introduced ecosystem engineers that increase habitat complexity or heterogeneity tend to cause abundances and/or species richness to rise, while those that decrease complexity tend to have the reverse effect. In assessing such patterns, however, it is critical to also consider spatial scales and the life habits of resident organisms. In addition to providing predictive power, recognition of engineering as a major means by which invasive species affect ecosystems provides a unifying theme for invasion biology and offers a chance to consider more fully the general role of species in ecosystems.

1AR – AT: Invasive Species

**Even if species invade the artificial reefs, they won’t necessarily spread to the rest of the native environment.**

Jeffrey A. **Crooks**, May **2002**. Smithsonian Environm. Res. Center and Romberg Tiburon Center, San Francisco State Univ. “Characterizing ecosystem-level consequences of biological invasions: the role of ecosystem engineers,” Oikos 97.2.

In this preliminary survey, we found 3 exotic species on oil platforms in California. Of these platforms, 2 (Holly, Houchin) are located re latively close to inshore natural rocky reefs and harbors (within 3 km). Either these exotic species have not been reported (Watersipora ?subtorquata, Diadllmene sp.), or they are present in extremely low abundance (Caprella mutiea) on natural rocky reefs. Their potential to invade natural habitats and to become important space holders in these habitats is unknown. Of the 3 species, C. mutiea may have the greatest potential to disperse in significant numbers to natural reefs. Although caprellid amphipods brood their young, juveniles and adults can become dislodged from the substratum and drift in the plankton (Smith 1977), often in association with drift macroalgae (Sano e t al. 2003). In contrast, dispersal of W. ?subtorquata may be very limited, since this species has a planktonic larval duration of hours and no mobility of juvenile and adult stages (Wisely 1958). This species recruited to settlement plates attached to Platform Gilda, but not to plates at the other 6 platforms, including the nearest platform, Grace (-6.4 km distant) (e. S. Culver unpubl. data). Similarly, small individuals of the anemone Diadumene sp. · were not observed on deployed settlement plates at platforms other than Platform Gail. These 2 species may depend more on mechanical transport via crewboats or barges for dispersal. In evaluating the potential of these exotic species to disperse to natural reefs, it is interesting to note that Wa tersipora ?subtorquata, Caprella mu tiea, and species of Diadumene have been reported from some embayments and harbors (Cohen et al. 2002). Their occurrence on offshore platforms, which are located in an oceanic climate, suggests that the abiotic conditions of embayments are not required for the successful invasion of these species, and that abiotic factors pe r se will not limit their spread to natural reefs. In addition to propagule supply (discussed above), biotic processes, including competition and predation, may play a role in limiting invasions into natural reefs. Coastal embayment and platform communities differ in species composition and abundance from those of nearshore rocky reefs and these differences may include the availability of potential competitors and predators that could influence the establishment of exotic species.

2AC – AT: Drilling Links

**Offshore drilling safe and decreases pollution**

**Thornley 2009** (Drew Thornley, independent public-policy analyst, adjunct and part-time university lecturer at UT-Austin and Concordia, and licensed attorney, April 2009, “Myth 8: Offshore oil drilling has often caused significant environmental damage, Manhattan Institute, http://www.manhattan-institute.org/energymyths/myth8.htm)

In January 1969, a natural gas blowout on an oil rig miles off the coast of Santa Barbara, California, spilled 80,000 gallons of oil into the Pacific Ocean and onto surrounding beaches. Twenty years later, in March 1989, the Exxon Valdez oil tanker struck a reef and spilled 10.4 million gallons of oil into Prince William Sound, Alaska, affecting 1,300 miles of shoreline.¶ These two great oil spills are perhaps the principal sources of public antipathy toward offshore drilling for natural resources. Images of spilled oil bubbling to the ocean’s surface and covering birds and other wildlife have firmly cemented in much of the public mind that offshore drilling is dangerous, that it inflicts tremendous environmental harm, and that its costs are not worth its benefits. Thus the means by which the U.S. obtains about 25 percent of the nation’s natural gas production and about 24 percent of its oil production[102] have become, understandably, linked to environmental degradation.¶ A majority (64.4 percent) of respondents favored expanded offshore oil drilling, while 31.8 percent opposed it. Over 42 percent of those who opposed it believed that the U.S. already uses too much oil. Interestingly, even smaller percentages of those who opposed expanded drilling cited concerns that offshore drilling is the major cause of oil spills into the ocean (17.5 percent) or that oil rigs damage the environment (26.6 percent). Perhaps many are aware of offshore drilling’s successful track record.¶ Since 1975, offshore drilling in the Exclusive Economic Zone (within 200 miles of U.S. coasts) has a safety record of 99.999 percent, meaning that only 0.0001 percent of the oil produced has been spilled.[103] With regard to the Outer Continental Shelf (U.S. waters under federal, rather than state, jurisdiction),[104] between 1993 and 2007 there were 651 oil spills, releasing 47,800 barrels of oil. Given 7.5 billion barrels of oil produced during that period, one barrel of oil has been spilled in the OCS per 156,900 barrels produced. [105]¶ Research published in 2000 by the U.S. Minerals Management Service (MMS)[106] documents the decreasing occurrence of crude-oil spills in the OCS. Revising previous estimates first published in 1994, the authors analyzed data through 1999 and concluded that oil-spill rates for OCS platforms, tankers, and barges continued to decline.[107] Additionally, the number of oil spills from platforms, tankers, and pipelines is small, relative to the amount of oil extracted and transported. Even so, oil spills remain an unpleasant reality of offshore oil drilling. Certainly, any amount of oil spilled into the ocean is undesirable, but offshore oil operations contribute relatively little of the oil that enters ocean waters each year.¶ For example, ocean floors naturally seep more oil into the ocean than do oil-drilling accidents and oil-tanker spills combined. (However, such seepage generally does not rise to the surface or reach the coastlines and, thus, is not as apparent as oil-drilling spills.) According to the National Academies’ National Research Council, natural processes are responsible for over 60 percent of the petroleum that enters North American ocean waters and over 45 percent of the petroleum that enters ocean waters worldwide.[108] Thus, in percentage terms, North America’s oil-drilling activities spill less oil into the ocean than the global average, suggesting that our drilling is comparatively safe for the environment.¶ Ironically, research shows that drilling can actually reduce natural seepage, as it relieves the pressure that drives oil and gas up from ocean floors and into ocean waters. In 1999, two peer-reviewed studies found that natural seepage in the northern Santa Barbara Channel was significantly reduced by oil production. The researchers documented that natural seepage declined 50 percent around Platform Holly over a twenty-two-year period, concluding that, as oil was pumped from the reservoir, the pressure that drives natural seepage dropped.[109]¶ Offshore oil drilling is carefully monitored for environmental safety. Using state-of-the-art technology and employing a range of procedural safeguards, U.S. offshore drilling has a track record of minimal environmental impact. Modern oil drilling is even designed to withstand hurricanes and tropical storms. According to the MMS, 3,050 of the Gulf of Mexico’s 4,000 platforms and 22,000 of the 33,000 miles of the Gulf’s pipelines were in the direct path of either Hurricane Katrina or Hurricane Rita. The hurricanes destroyed 115 drilling platforms, damaged 52 others, and damaged 535 pipeline segments, yet “there was no loss of life and no major oil spills attributed to either storm.”[110]¶ All forms of energy production come with risks, both to humans and to the environment. Offshore oil drilling is no exception. Spills from offshore drilling and tankers undoubtedly will continue to occur, but they are rare and are decreasing in frequency; and the amount of oil spilled from rigs and tankers is small, compared with the amount of oil extracted and with the amount of oil that enters ocean waters naturally from ocean floors. As technology continues to advance, and as companies find themselves accountable to a public increasingly concerned about environmental stewardship, drilling for oil in our coastal waters will continue to be conducted in a safe and environmentally conscious manner.

1AR – AT: Drilling Links (1/2)

**Regulations check the impact**

**BOEM 2011** (Bureau of Ocean Energy Management, “Proposed Outer Continental Shelf Oil & Gas Leasing Program 2012-2017”, November, <http://www.boem.gov/uploadedFiles/Proposed_OCS_Oil_Gas_Lease_Program_2012-2017.pdf>)

Offshore Drilling Safety, Spill Preparedness and the Lessons of Deepwater Horizon The Deepwater Horizon blowout and oil spill exposed the overconfidence in the safety of offshore drilling that had developed over time. Because there had not been a major blowout or drilling accident in U.S. waters in decades, both government and industry underestimated the well control issues posed by offshore drilling, particularly in deep and ultra-deepwater. This Proposed Program is informed by both our better understanding of the risks posed by offshore drilling and the substantial measures that have been implemented since the Deepwater Horizon event to address and reduce those risks. Immediately after Deepwater Horizon, the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) – with its functions now divided between BOEM and the Bureau of Safety and Environmental Enforcement (BSEE) – imposed heightened standards for offshore drilling operations, which included new requirements for well design and integrity and the testing and maintenance of blowout preventers (BOPs). The BOEMRE also introduced, for the first time in U.S. waters, new performance-based standards that require operators to develop Safety and Environmental Management Systems programs that, among other things, systematically and thoroughly evaluate the hazards involved with offshore facilities and operations and implement measures to address those hazards. These new and heightened standards are designed to help prevent a loss of well control or a spill from happening. While these measures have made offshore drilling safer, the risk of an accident cannot be eliminated and government and industry must be prepared in the event of a loss of well control or a spill. After Deepwater Horizon, BOEMRE issued new guidance to operators that revised the methodology for calculating the worst case discharge potential of individual wells to provide more accurate estimates of true worst case scenarios. Operators must submit Oil Spill Response Plans that demonstrate sufficient response capacity to address these revised worst case discharge estimates, as well as other enhancements based on experience with the response to Deepwater Horizon. Most significantly, unlike prior to Deepwater Horizon, operators using subsea BOPs or drilling from a floating facility must demonstrate in advance that they have access to and can deploy an effective subsea containment system in the event of a loss of well control. This includes systems, such as a capping stack, to shut in the well and, if necessary, to capture and contain flow from a well. Industry has developed these systems, and they are available for every covered well in the Gulf of Mexico that has been permitted since Deepwater Horizon. xi The government’s oversight of offshore oil and gas operations has also undergone broad and substantial reforms. Prior to Deepwater Horizon, the Minerals Management Service (MMS) had jurisdiction over offshore activities, was severely under-resourced, and saddled with multiple, sometimes conflicting missions that included responsibility for leasing and environmental reviews, safety oversight, and the collection of revenue from offshore operations. Soon after the Deepwater Horizon explosion, the Secretary of the Interior abolished MMS. In its place, the Secretary established BOEMRE and announced that the DOI’s management of OCS resources and oversight of offshore energy activity would be reorganized into three new agencies – BOEM, BSEE, and the Office of Natural Resources Revenue (ONRR). That reorganization is now complete, and three strong, independent agencies with clear and distinct missions have been established to manage and oversee safe and environmentally responsible offshore activity that helps to meet the Nation’s energy needs and provides a fair return to the public. The BOEM is charged with managing the nation’s offshore resources in a balanced way that promotes prompt and environmentally responsible development. The BSEE is a safety authority responsible for enforcing safety and environmental protection standards. Finally, ONRR is responsible for collecting the public’s share of revenue from resource development on public lands and waters. These new agencies will provide more effective and appropriately balanced management and oversight of the nation’s offshore oil and gas resources.

1AR – AT: Drilling Links (2/2)

**Drilling inevitable- US key to best practices**

**Krauthammer 2008** (Charles Krauthammer, August 1, 2008, “Pelosi: Save the Planet, Let Someone Else Drill,” Washington Post, http://www.washingtonpost.com/wp-dyn/content/article/2008/07/31/AR2008073102824.html)¶ Places such as Nigeria, where chronic corruption, environmental neglect and the resulting unrest and instability lead to pipeline explosions, oil spills and illegal siphoning by the poverty-stricken population -- which leads to more spills and explosions. Just this week, two Royal Dutch Shell pipelines had to be shut down because bombings by local militants were causing leaks into the ground.¶ Compare the Niger Delta to the Gulf of Mexico, where deep-sea U.S. oil rigs withstood Hurricanes Katrina and Rita without a single undersea well suffering a significant spill.¶ The United States has the highest technology to ensure the safest drilling. Today, directional drilling -- essentially drilling down, then sideways -- allows access to oil that in 1970 would have required a surface footprint more than three times as large. Additionally, the United States has one of the most extensive and least corrupt regulatory systems on the planet.¶ Does Pelosi imagine that with so much of America declared off-limits, the planet is less injured as drilling shifts to Kazakhstan and Venezuela and Equatorial Guinea? That Russia will be more environmentally scrupulous than we in drilling in its Arctic?¶ The net environmental effect of Pelosi's no-drilling willfulness is negative. Outsourcing U.S. oil production does nothing to lessen worldwide environmental despoliation. It simply exports it to more corrupt, less efficient, more unstable parts of the world -- thereby increasing net planetary damage.