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## Humans cause climate change debate

### Climate change is anthropogenic—general

#### Carbon Dioxide Increase occurring now

**Prothero, Professor of Geology at Occidental College in Los Angeles, and Lecturer in Geobiology at the California Institute of Technology, 2012.**

(Donald “How We Know Global Warming is Real and Human Caused” Skeptic VOl 17 iss 2 ebsco nww)

<<Carbon dioxide in our atmosphere has increased at an unprecedented rate in the past 200 years. Not one data set collected over a long enough span of time shows otherwise. Mann et al. (1999) compiled the past 900 years' worth of temperature data from tree rings, ice cores, corals, and direct measurements in the past few centuries, and the sudden increase of temperature of the past century stands out like a sore thumb. This famous graph is now known as the "hockey stick" because it is long and straight through most of its length, then bends sharply upward at the end like the blade of a hockey stick. Other graphs show that climate was very stable within a narrow range of variation through the past 1000, 2000, or even 10,000 years since the end of the last Ice Age. There were minor warming events during the Climatic Optimum about 7000 years ago, the Medieval Warm Period, and the slight cooling of the Little Ice Age in die 1700s and 1800s. But the magnitude and rapidity of the warming represented by the last 200 years is simply unmatched in all of human history. More revealing, die timing of this warming coincides with the Industrial Revolution, when humans first began massive deforestation and released carbon dioxide into the atmosphere by burning an unprecedented amount of coal, gas, and oil.>>

#### Consensus climate anthropogenic

Weiss & Madrid, Weiss is a Senior Fellow and Director of Climate Strategy at the Center For American and Jorge Madrid is a Research Associate at CAP, 2012

[By Daniel J. Weiss and Jorge Madrid, Daniel J. Weiss is a Senior Fellow and Director of Climate Strategy at the Center For American and Jorge Madrid is a Research Associate at CAP. “More Action on Climate Change: CAP’s Comments To the EPA on Its Proposed Carbon Pollution Standard.” *ThinkProgress Climate Progress*

< http://thinkprogress.org/climate/2012/06/26/506541/more-action-on-climate-change-caps-comments-to-the-epa-on-its-proposed-carbon-pollution-standard/?mobile=nc > June 26, 2012 accessed 06272012.] NWW

Climate change is one of the gravest threats posed to humans. It is essential that the United States and other nations significantly reduce their industrial carbon and other pollutants responsible for it. We are already experiencing many of the harmful consequences of climate change that scientists have warned us about, including warming temperatures, severe drought, massive rainfall and floods, and other extreme weather events. In 2010 the National Academy of Sciences determined that global warming is real and human induced: There is a strong, credible body of evidence, based on multiple lines of research, documenting that climate is changing and that these changes are in large part caused by human activities.

#### Climate change anthropocentric

**EPA 12**

(Environmental Protection Agency “Greenhouse Gas Emissions”, <http://www.epa.gov/climatechange/ghgemissions/gases/co2.html>) CKP

Carbon dioxide (CO2) is the primary greenhouse gas emitted through human activities. In 2010, CO2 accounted for about 84% of all U.S. greenhouse gas emissions from human activities. Carbon dioxide is naturally present in the atmosphere as part of the Earth's carbon cycle (the natural circulation of carbon among the atmosphere, oceans, soil, plants, and animals). Human activities are altering the carbon cycle--both by adding more CO2 to the atmosphere and by influencing the ability of natural sinks, like forests, to remove CO2 from the atmosphere. While CO2 emissions come from a variety of natural sources, human-related emissions are responsible for the increase that has occurred in the atmosphere since the industrial revolution.

#### Climate change anthropogenic – hockey stick graph

Mann, Climatologist at the Earth System Climate Center at Pennsylvania State University, 2012

(Michael, ThinkProgress “Michael Mann: The Danger Of Climate Change Denial” April 23, 2012, <http://thinkprogress.org/climate/2012/04/23/469307/michael-mann-the-danger-of-climate-change-denial/>) CKP

My work first appeared on the world stage in the late 1990s with the publication of the third assessment report of the Intergovernmental Panel on Climate Change, which featured what is now popularly known as the hockey-stick graph. Using what we call proxy data – information gathered from records in nature, like tree rings, corals, and ice cores – my co-authors and I pieced together the puzzle of climate variability over the past 1,000 years. What we found was that the recent warming, which coincides with the burning of fossil fuels during the Industrial Revolution, sticks out like the blade of an upturned hockey stick. By itself, this finding didn’t indicate that humans were solely responsible for the warming, but it was a compelling demonstration that something unusual was happening and, by inference, that it was probably related to human activity. Over the last few decades, the evidence, based on work from thousands of studies, has become much more robust and conclusive.

#### Even if they win some part of cyclical warming, natural occurring phenomena—climate change worsens impacts of natural climate

Weiss & Madrid, Weiss is a Senior Fellow and Director of Climate Strategy at the Center For American and Jorge Madrid is a Research Associate at CAP, 2012

[By Daniel J. Weiss and Jorge Madrid, Daniel J. Weiss is a Senior Fellow and Director of Climate Strategy at the Center For American and Jorge Madrid is a Research Associate at CAP. “More Action on Climate Change: CAP’s Comments To the EPA on Its Proposed Carbon Pollution Standard.” *ThinkProgress Climate Progress* < http://thinkprogress.org/climate/2012/06/26/506541/more-action-on-climate-change-caps-comments-to-the-epa-on-its-proposed-carbon-pollution-standard/?mobile=nc > June 26, 2012 accessed 06272012.] NWW

While much remains to be learned, the core phenomenon, scientific questions, and hypotheses have been examined thoroughly and have stood firm in the face of serious scientific debate and careful evaluation of alternative explanations.[3] [emphasis added] The U.S. Global Change Research Program, primarily written under President George W. Bush, also determined that “global warming is unequivocal and primarily human-induced.”[4] It further states that climate-related impacts are visible now and will continue to grow. Unfortunately, extremely hot and dry temperatures are already the “new normal” according to experts from the National Ocean and Atmospheric Administration, or NOAA.[5] Last year was the second-hottest and second-driest summer on record. This year set temperature records for the warmest spring in the lower 48 states since NOAA began keeping records in 1895.[6] Climate change is making these conditions more frequent and severe.

### Climate science—anthropogenic

#### warming results in multiple scenarios for death and destruction

**Prothero, Professor of Geology at Occidental College in Los Angeles, and Lecturer in Geobiology at the California Institute of Technology, 2012.**

(Donald “How We Know Global Warming is Real and Human Caused” Skeptic VOl 17 iss 2)

<<How do we know that global warming is real and primarily human caused? There are numerous lines of evidence that converge toward this conclusion. 1. Carbon Dioxide Increase. Carbon dioxide in our atmosphere has increased at an unprecedented rate in the past 200 years. Not one data set collected over a long enough span of time shows otherwise. Mann et al. (1999) compiled the past 900 years' worth of temperature data from tree rings, ice cores, corals, and direct measurements in the past few centuries, and the sudden increase of temperature of the past century stands out like a sore thumb. This famous graph is now known as the "hockey stick" because it is long and straight through most of its length, then bends sharply upward at the end like the blade of a hockey stick. Other graphs show that climate was very stable within a narrow range of variation through the past 1000, 2000, or even 10,000 years since the end of the last Ice Age. There were minor warming events during the Climatic Optimum about 7000 years ago, the Medieval Warm Period, and the slight cooling of the Little Ice Age in die 1700s and 1800s. But the magnitude and rapidity of the warming represented by the last 200 years is simply unmatched in all of human history. More revealing, die timing of this warming coincides with the Industrial Revolution, when humans first began massive deforestation and released carbon dioxide into the atmosphere by burning an unprecedented amount of coal, gas, and oil. 2. Melting Polar Ice Caps. The polar icecaps are thinning and breaking up at an alarming rate. In 2000, my former graduate advisor Malcolm McKenna was one of the first humans to fly over the North Pole in summer time and see no ice, just open water. The Arctic ice cap has been frozen solid for at least the past 3 million years (and maybe longer),4 but now the entire ice sheet is breaking up so fast that by 2030 (and possibly sooner) less than half of the Arctic will be ice covered in the summer.5 As one can see from watching the news, this is an ecological disaster for everything that lives up there, from the polar bears to the seals and walruses to the animals they feed upon, to the 4 million people whose world is melting beneath their feet. The Antarctic is thawing even faster. In February-March 2002, the Larsen B ice shelf - over 3000 square km (the size of Rhode Island) and 220 m (700 feet) thick- broke up in just a few months, a story typical of nearly all the ice shelves in Antarctica. The Larsen B shelf had survived all the previous ice ages and interglacial warming episodes over the past 3 million years, and even the warmest periods of the last 10,000 years- yet it and nearly all the other thick ice sheets on the Arctic, Greenland, and Antarctic are vanishing at a rate never before seen in geologic history. 3. Melting Glaciers. Glaciers are all retreating at the highest rates ever documented. Many of those glaciers, along with snow melt, especially in the Himalayas, Andes, Alps, and Sierras, provide most of the freshwater that the populations below the mountains depend upon - yet this fresh water supply is vanishing. Just think about the percentage of world's population in southern Asia (especially India) that depend on Himalayan snowmelt for their fresh water. The implications are staggering. The permafrost that once remained solidly frozen even in the summer has now Üiawed, damaging the Inuit villages on the Arctic coast and threatening all our pipelines to die North Slope of Alaska. This is catastrophic not only for life on the permafrost, but as it thaws, the permafrost releases huge amounts of greenhouse gases which are one of the major contributors to global warming. Not only is the ice vanishing, but we have seen record heat waves over and over again, killing thousands of people, as each year joins the list of the hottest years on record. (2010 just topped that list as the hottest year, surpassing the previous record in 2009, and we shall know about 2011 soon enough). Natural animal and plant populations are being devastated all over the globe as their environments change.6 Many animals respond by moving their ranges to formerly cold climates, so now places that once did not have to worry about disease-bearing mosquitoes are infested as the climate warms and allows them to breed further north. 4. Sea Level Rise. All that melted ice eventually ends up in the ocean, causing sea levels to rise, as it has many times in the geologic past. At present, the sea level is rising about 3-4 mm per year, more than ten times the rate of 0.10.2 mm/year that has occurred over the past 3000 years. Geological data show Üiat ttie sea level was virtually unchanged over the past 10,000 years since the present interglacial began. A few mm here or there doesn't impress people, until you consider that the rate is accelerating and that most scientists predict sea levels will rise 80-130 cm in just the next century. A sea level rise of 1.3 m (almost 4 feet) would drown many of the world's low-elevation cities, such as Venice and New Orleans, and low-lying countries such as the Netherlands or Bangladesh. A number of tiny island nations such as Vanuatu and the Maldives, which barely poke out above the ocean now, are already vanishing beneath the waves. Eventually their entire population will have to move someplace else.7 Even a small sea level rise might not drown all these areas, but they are much more vulnerable to the large waves of a storm surge (as happened with Hurricane Katrina), which could do much more damage than sea level rise alone. If sea level rose by 6 m (20 feet), most of die world's coastal plains and low-lying areas (such as the Louisiana bayous, Florida, and most of the world's river deltas) would be drowned. Most of the world's population lives in lowelevation coastal cities such as New York, Boston, Philadelphia, Baltimore, Washington, D.C., Miami, and Shanghai. All of those cities would be partially or completely under water with such a sea level rise. If all the glacial ice caps melted completely (as they have several times before during past greenhouse episodes in the geologic past), sea level would rise by 65 m (215 feet)! The entire Mississippi Valley would flood, so you could dock an ocean liner in Cairo, Illinois. Such a sea level rise would drown nearly every coastal region under hundreds of feet of water, and inundate New York City, London and Paris. All that would remain would be the tall landmarks such as the Empire State Building, Big Ben, and the Eiffel Tower. You could tie your boats to these pinnacles, but the rest of these drowned cities would lie deep underwater.>>

### Climate change is anthropogenic—transportation

#### Climate change is anthro-transportation Transportation generates co2

**EPA 12**

 (Environmental Protection Agency “Greenhouse Gas Emissions”, <http://www.epa.gov/climatechange/ghgemissions/gases/co2.html>) CKP

The combustion of fossil fuels, such as gasoline and diesel to transport people and goods is the second largest source of CO2 emissions, accounting for about 31% of total U.S. CO2 emissions and 26% of total U.S. greenhouse gas emissions in 2010. This category includes transportation sources such as highway vehicles, air travel, marine transportation, and rail.

### Climate change is anthro-not natural

#### Climate science debate—AT they say ‘natural’

**Prothero, Professor of Geology at Occidental College in Los Angeles, and Lecturer in Geobiology at the California Institute of Technology, 2012.**

(Donald “How We Know Global Warming is Real and Human Caused” Skeptic VOl 17 iss 2)

<<Despite the overwhelming evidence there are many people who remain skeptical. One reason is that they have been fed distortions and misstatements by the global warming denialists who cloud or confuse the issue. Let's examine some of these claims in detail: \* "It's just natural climatic variability." No, it is not. As I detailed in my 2009 book, Greenhouse of the Dinosaurs, geologists and paleoclimatologists know a lot about past greenhouse worlds, and the icehouse planet that has existed for the past 33 million years. We have a good understanding of how and why the Antarctic ice sheet first appeared at that time, and how the Arctic froze over about 3.5 million years ago, beginning the 24 glacial and interglacial episodes of the "Ice Ages" that have occurred since then. We know how variations in the earth's orbit (the Milankovitch cycles) controls the amount of solar radiation the earth receives, triggering the shifts between glacial and interglacial periods. Our current warm interglacial has already lasted 10,000 years, the duration of most previous interglacials, so if it were not for global warming, we would be headed into the next glacial in the next 1000 years or so. Instead, our pumping greenhouse gases into our atmosphere after they were long trapped in the earth's crust has pushed the planet into a "super-interglacial," already warmer than any previous warming period. We can see the "big picture" of climate variability most clearly in ice cores from the EPICA (European Project for Ice Coring in Antarctica), which show the details of the last 650,000 years of glacial-inters glacial cycles (Fig. 2). At no time during any previous interglaciai did the carbon dioxide levels exceed 300 ppm, even at their very warmest. Our atmospheric carbon dioxide levels are already close to 400 ppm today. The atmosphere is headed to 600 ppm within a few decades, even if we stopped releasing greenhouse gases immediately. This is decidedly not within the normal range of "climatic variability," but clearly unprecedented in human history. Anyone who says this is "normal variability" has never seen the huge amount of paleoclimatic data that show otherwise. \* "It's just another warming episode, like the Medieval Warm Period, or the Holocene Climatic Optimum or the end of the Little Ice Age." Untrue. There were numerous small fluctuations of warming and cooling over the last 10,000 years of the Holocene. But in the case of the Medieval Warm Period (about 950-1250 A.D.), the temperatures increased only 10C, much less than we have seen in the current episode of global warming (Fig. 1). This episode was also only a local warming in the North Atlantic and northern Europe. Global temperatures over this interval did not warm at all, and actually cooled by more than i°C. Likewise, the warmest period of the last 10,000 years was the Holocene Climatic Optimum (5,000-9,000 BCE.) when warmer and wetter conditions in Eurasia contributed to the rise of the first great civilizations in Egypt, Mesopotamia, the Indus Valley, and China. This was largely a Northern HemisphereEurasian phenomenon, with 2-30C warming in the Arctic and northern Europe. But there was almost no warming in the tropics, and cooling or no change in the Southern Hemisphere.8 From a Eurocentric viewpoint, these warming events seemed important, but on a global scale the effect was negligible. In addition, neither of these warming episodes is related to increasing greenhouse gases. The Holocene Climatic Optimum, in fact, is predicted by the Milankovitch cycles, since at that time the axial tilt of the earth was 24o, its steepest value, meaning the Northern Hemisphere got more solar radiation than normal - but the Southern Hemisphere less, so the two balanced. By contrast, not only is the warming observed in the last 200 years much greater than during these previous episodes, but it is also global and bipolar, so it is not a purely local effect. The warming that ended the Little Ice Age (from the mid-i700S to the late 1800s) was due to increased solar radiation prior to 1940. Since 1940, however, the amount of solar radiation has been dropping, so the only candidate remaining for the post-1940 warming is carbon dioxide.9>>

### C02 leads to climate change—Answer to alt causes

#### At they say alt cause methane and cosmic rays—carbon key

**Prothero, Professor of Geology at Occidental College in Los Angeles, and Lecturer in Geobiology at the California Institute of Technology, 2012.**

(Donald “How We Know Global Warming is Real and Human Caused” Skeptic VOl 17 iss 2)

<<"It's just the sun, or cosmic rays, or volcanic activity or methane." Nope, sorry. The amount of heat that the sun provides has been decreasing since 1940,10 just the opposite of the critics' claims (Fig. 3). There is no evidence of an increase in cosmic ray particles during the past century." Nor is there any clear evidence that large-scale volcanic events (such as the 1815 eruption of Tambora in Indonesia, which changed global climate for about a year) have any long-term effects that would explain 200 years of warming and carbon dioxide increase. Volcanoes erupt only 0.3 billion tonnes of carbon dioxide each year, but humans emit over 29 billion tonnes a year,12 roughly 100 times as much. Clearly, we have a bigger effect. Methane is a more powerful greenhouse gas, but there is 200 times more carbon dioxide than methane, so carbon dioxide is still the most important agent.13 Every other alternative has been looked at and can be ruled out. The only clearcut relationship is between human-caused carbon dioxide increase and global warming.>>

#### Must reject fence sitting—and affirm that human cause climate change and therefore need to change their consumption patterns

**Prothero, Professor of Geology at Occidental College in Los Angeles, and Lecturer in Geobiology at the California Institute of Technology, 2012.**

(Donald “How We Know Global Warming is Real and Human Caused” Skeptic VOl 17 iss 2)

<<<\* "I agree that climate is changing, but I'm skeptical that humans are the main cause, so we shouldn't do anything." This is just fence sitting. A lot of reasonable skeptics deplore the right wing's rejection of the reality of climate change, but still want to be skeptical about the cause. If they want proof, they can examine the huge array of data that points directly to human caused global warming.22 We can directly measure the amount of carbon dioxide humans are producing, and it tracks exactly with the amount of increase in atmospheric carbon dioxide. Through carbon isotope analysis, we can show that this carbon dioxide in the atmosphere is coming directly from our burning of fossil fuels, not from natural sources. We can also measure the drop in oxygen as it combines with the increased carbon levels to produce carbon dioxide. We have satellites in space that are measuring the heat released from the planet and can actually see the atmosphere getting warmer. The most crucial evidence emerged only within the past few years: climate models of the greenhouse effect predict that there should be cooling in the stratosphere (the upper layer of the atmosphere above 10 km or 6 miles in elevation), but warming in the troposphere (the bottom layer below 10 km or 6 miles), and that's exactly what our space probes have measured. Finally, we can rule out any other suspects (see above): solar heat is decreasing since 1940, not increasing, and there are no measurable increases in cosmic rays, methane, volcanic gases, or any other potential cause. Face it- it's our problem.>>

### Climate change is not anthropogenic—natural cycles

#### Climate change is natural—2,000 year cycle of warming and cooling

C3 Headlines, 2012

(C3 Headlines “Extreme Climate Change: Asian Researchers Document Natural Global Warming and Global Cooling Cycle” June 18, 2012, <http://www.c3headlines.com/2012/06/extreme-climate-change-asian-researchers-document-natural-global-warming-global-cooling-cycle.html>) CKP

"[In the early 1990s](http://notrickszone.com/2012/06/17/hockey-stick-was-refuted-before-its-fabrication-study-ignored-ipcc-and-mann-took-world-on-a-10-year-joyride/), Japanese scientists Kitagawa and Matsumoto extracted eleven tree ring cores from cedars on the...Japan island of Yakushima. The cores contained tree-rings going back some 2000 years. The researchers determined the carbon 13 isotope values and found the delta-13-C values fluctuated in a characteristic manner...The results showed that temperatures over the previous 2000 years in South Japan fluctuated over a range of 5°C...A clear millennium cycle is depicted. The cold period of the Migration Period, the Medieval Warm Period, the Little Ice Age and the Modern Warm Period are clearly recognisable. Moreover, this climate development is well documented in Japanese historical records...They carried out a detailed frequency analysis of their data and found characteristic cycles with periods in the range of several decades and centuries. Among others, they discovered a period of 187 years, which coincides with the known Suess/de Vries solar activity cycle. In a similar manner the 70 and 89-year Gleissberg-cycle was identified." [Hiroyuki Kitagawa and Eiji Matsumoto 1995: [Geophysical Research Letters](http://www.agu.org/pubs/crossref/1995/95GL02066.shtml)] Conclusion: Extreme climate change as represented by significant global cooling and global warming periods over the past 2,000 years, is a natural phenomenon. Thus, modern global warming that took place over the late 20th century is not "unprecedented."

#### IPCC wrong—Climate change naturally occurring and cyclic

Bell, Professor at the University of Houston, 2012

(Larry, Forbes “Global Warming? No, Natural, Predictable Climate Change” January 10, 2012, <http://www.forbes.com/sites/larrybell/2012/01/10/global-warming-no-natural-predictable-climate-change/>) CKP

An extensively peer-reviewed study published last December in the Journal of Atmospheric and Solar-Terrestrial Physics indicates that observed climate changes since 1850 are linked to cyclical, predictable, naturally occurring events in Earth’s solar system with little or no help from us. The research was conducted by Nicola Scafetta, a scientist at Duke University and at the Active Cavity Radiometer Solar Irradiance Monitor Lab (ACRIM), which is associated with the NASA Jet Propulsion Laboratory in California. It takes issue with methodologies applied by the U.N.’s Intergovernmental Panel for Climate Change (IPCC) using “general circulation climate models” (GCMs) that, by ignoring these important influences, are found to fail to reproduce the observed decadal and multi-decadal climatic cycles. As noted in the paper, the IPCC models also fail to incorporate climate modulating effects of solar changes such as cloud-forming influences of cosmic rays throughout periods of reduced sunspot activity. More clouds tend to make conditions cooler, while fewer often cause warming. At least 50-70% of observed 20th century warming might be associated with increased solar activity witnessed since the “Maunder Minimum” of the last 17th century. Dr. Scafetta’s study applies an astronomically-based model that reconstructs and correlates known warming and cooling phases with decadal and multi-decadal cycles associated with influences of planetary motions, most particularly those of Jupiter and Saturn. This “astronomical harmonics model” was used to address various cycles lasting 9.1, 10-10.5, 20-21, and 60-62 year-long periods. The 9.1-year cycle was shown to be likely related to decadal solar/lunar tidal oscillations, while those of ten years and longer duration relate to planetary movements about the Sun that may have solar influences that modulate electromagnetic properties of Earth’s upper atmosphere which can regulate the cloud system.

#### Climate change is natural—greenhouse gas effect is mostly due to water vapor

Chiodo, Contributor to the Holland Sentinel, 2012

(Jim, Holland Sentinel “MY TAKE—Climate change theory is more ‘religion’ than science” April 2, 2012, <http://www.hollandsentinel.com/mobile_opinion/x586042421/MY-TAKE-Climate-change-theory-is-more-religion-than-science>) CKP

Murray states national academies of science of 18 countries acknowledge human contribution in climate change. If he had bothered to attend Tuesday he would have heard Mr. Goreham agree. He would have learned Earth’s naturally occurring events also impact climate change (both warming and cooling). Yet nature’s impact is 100 times greater than man. Missing from Murray’s claims of consensus are scandals evidenced in leaked e-mails demonstrating false data to arrive at projections by elite scientists. The so-called “science” of global warming is a religion, based on emotion despite evidence that doesn’t require a scientist to see. Should we offer sacrifices like ancients did? Sadly, we already are. We’re not throwing maidens into the hot lava. Instead billions are wasted on climate change with the same effect achieved by human sacrifice to “the gods” in ancient times. According to Murray, the general population is too dumb to understand. When you learn the polar bear population is increasing in contrast to propaganda suggesting bears are becoming extinct, does it take a scientist to realize why pictures of polar bears are doctored? When actual reported temperatures and ice cap thickness doesn’t agree with computer model projections by “experts,” does it require a degree to understand? CO2 is a life-giving compound without which all plants on Earth would die. CO2 represents a small portion of the greenhouse gas effect; most is due to water vapor. Should water be labeled toxic? Does CO2 have an impact on the Earth’s temperature? The answer is yes but the impact is barely measurable. Many factors, including natural cycles contribute to both warming and cooling of the Earth. All one has to do is look at centuries of temperature variation to see this. But that might require only common sense.

### Climate change is not anthro-alt causes

#### Livestock responsible for 30% of emissions – bigger share than transport

**Lava 2012**

(Vin, BusinessWorld “”Why go organic?” March 11, 2012, LexisNexis Date accessed: June 30, 2012) CKP

On climate change, the FAO (Food and Agriculture Organization) is on the record as saying, "Using a methodology that considers the entire commodity chain, it estimates that livestock are responsible for 18% of greenhouse gas emissions, a bigger share than that of transport." The UK-based Institute of Science in Society has said that, "The total mitigating potential of organic sustainable food systems is 29.5% of global greenhouse gas emissions and 16.5% of energy use, the largest components coming from carbon sequestration and reduced transport from re-localizing food systems." But can organic agriculture feed us? In a report submitted by the UN Special Rapporteur on the right to food, Olivier De Schutter said, "Jules Pretty et. al. compared to the impact of 286 recent sustainable agriculture projects in 57 poor countries covering 37 million hectares (3% of the cultivated area in developing countries). They found that such interventions increased productivity on 12.6 million farms, with an average crop increase of 79%, while improving the supply of critical environmental services."

## Climate science debate

### Consensus-yes

#### Science debate---studies demonstrate consensus—neg ev only media coverage of scandals. Prefer our evidence for its methodology in measuring consensus

Lieberman, Science and environmental writer, 2012

(Bruce, Yale Climate Media Forum May 2, “Scientific Consensus Stronger than Scientists Thought?” <http://www.yaleclimatemediaforum.org/2012/05/scientific-concensus-stronger-than-scientists-though/>; CKP)

*<<*An innovative sampling of a small group of climate scientists’ perspectives suggests their views may be more commonly shared among their science colleagues than they had thought. More than two decades after the Intergovernmental Panel on Climate Change (IPCC) began publishing [the latest scientific consensus](http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml#.T4osE-0zJcM) on the globe’s changing climate, widespread doubts persist in the U.S. over whether there really is widespread agreement among scientists. It’s the primary argument of those who deny basic scientific foundations of warming. But new and innovative survey results suggest the consensus among scientists might actually be stronger than the scientists themselves had thought. The battles to define and debunk scientific consensus over climate change science have been fought for years. In 2004, University of California San Diego science historian [Naomi Oreskes](http://history.ucsd.edu/people/faculty/oreskes-naomi.html) wrote about [a broad consensus](http://historyweb.ucsd.edu/oreskes/Papers/ScientificConsensusonclimate.pdf) she found after studying 928 scientific papers published between 1993 and 2003. Meanwhile, the blow-up over climate researchers’ hacked e-mails in 2009 fueled speculation among skeptics that “consensus” actually is the closely guarded creation of a small cabal of scientists determined to [silence opposing views](http://online.wsj.com/article/SB10001424052748704398304574598230426037244.html), accusations now widely dismissed as unsubstantiated. That perspective has been largely debunked, but the beat goes on. On the heels of a January 26 skeptics letter (“[No Need to Panic About Global Warming](http://online.wsj.com/article/SB10001424052970204301404577171531838421366.html)“) in *The Wall Street Journal*, there have been several follow-up commentaries. They include [a vigorous rebuttal](http://www.nybooks.com/articles/archives/2012/mar/22/why-global-warming-skeptics-are-wrong/) on March 22 in the *New York Review of Books* by Yale University economist William D. Nordhaus; [a follow-up response](http://www.nybooks.com/articles/archives/2012/apr/26/climate-casino-exchange/) in the April 26 edition of same journal by climate change skeptics Roger W. Cohen, William Happer and Richard Lindzen; and a second response by Nordhaus. Now, from Carnegie Mellon University and the University of Minnesota Institute on the Environment, comes a fresh study on [the question of scientific consensus](http://environmentalresearchweb.org/cws/article/yournews/49258). Its findings offer something new: scientists appear actually to underestimate the extent to which they, as a group, agree on key questions related to climate change science. In sum, the newly released [poll results](http://visionprize.com/results) identified surprisingly common points of agreement among climate scientists; and yet for each point, those scientists underestimated the amount of agreement among their colleagues. The results: Human activity has been the primary cause of increases in global average air and ocean temperatures in the last 250 years. (About 90 percent of respondents agreed with this characterization, but those respondents estimated that less than 80 percent of their scientist colleagues held that view.) If governmental policies do not change, the CO2 concentration in the atmosphere will exceed 550 parts per million between 2050 and 2059. (More than 30 percent agreed, but those respondents estimated that just over 20 percent of their peers held that view.) If and when atmospheric CO2 concentrations reach 550 ppm, the increase in global average surface temperature relative to the year 2000 will be 2-3 degrees Celsius, or 3.2-4.8 F. (More than 40 percent agreed, but those respondents estimated that less than 30 percent held that view.) If governmental policies do not change, in the year 2050, the increase in global average surface temperature relative to the year 2000 will be 1.5-2 degrees Celsius, or 2.4-3.2 F). (More than 35 percent agreed, but those respondents estimated that just over 30 percent held that view.) The likelihood that global average sea level will rise more during this century than the highest level given in the 2007 assessment of the IPCC (0.59 meters, 23.2 inches) is more than 90 percent. (More than 30 percent agreed, but those respondents estimated that less than 20 percent held that view.) Since 1851, the U.S. has experienced an average of six major hurricane landfalls (> 111 mph) per decade. The total number of major hurricane landfalls in the U.S. from 2011-2020 will be seven to eight. (Nearly 60 percent agreed, but those respondents estimated that just over 30 percent held that view.) The total number of major hurricane landfalls in the U.S. from 2041 to 2050 will be seven to eight. (About 35 percent agreed, but those respondents estimated that less than 30 percent held that view.) Given increasing levels of human activity, the concentration of CO2 in the atmosphere can be kept below 550 ppm with current technology — but only with changes in government policy. (Nearly 70 percent agreed, but those respondents estimated that just over 50 percent held that view.)>>>

#### Science consensus debate—any skepticism reflects scientific method overestimation not lack of climate data

Lieberman, Science and environmental writer, 2012

(Bruce, Yale Climate Media Forum May 2, “Scientific Consensus Stronger than Scientists Thought?” <http://www.yaleclimatemediaforum.org/2012/05/scientific-concensus-stronger-than-scientists-though/>; CKP)

While the poll revealed consensus among scientists on key questions related to climate science, the question remains: Why do they believe — incorrectly — that consensus on those questions is lacking? “It’s not just that they’re inaccurate,” Kriss said of the respondents’ assumption that there is not broader agreement on climate science. “They’re systematically underestimating the extent to which they agree. That’s the part that I found most surprising.” Research going back decades shows that people generally overestimate the extent to which people agree with them. So, what’s going on with climate scientists? The poll didn’t address that question, Kriss said. But he speculated that scientists may simply expect their views to be challenged. After all, science advances through vigorous questioning and debate. Perhaps that ingrained view shapes scientists’ assumptions about how much their colleagues agree — or more to the point, don’t agree — with them. Kriss said he wanted to examine the views of scientists on climate change not only to test the polling method developed by Prelec, but also to inform a major policy topic. “Our biggest concern is that people may underestimate the amount of agreement among climate experts … and we think that may hinder effective decisionmaking — that if people perceive disagreement, that would be a reason to not act,” Kriss said. “If that perception is inaccurate, it would be nice to correct it.” As an academic studying behavioral science, Kriss added that the climate issue is an interesting case study of how groups form collective opinions and act or don’t act based on those views. Research shows that it’s a challenge for people to work together toward better outcomes, and Kriss said he hopes to help organizations improve decisionmaking. “In some sense, it’s the mother of all collective action problems,” Kriss said of the climate challenge. “There’s uncertainty, there’s a long time scale, and there are all sorts of factors that make resolving it difficult. This seems like the biggest real world problem where I thought I could make some contribution.”

#### 97% of scientists agree with anthropogenic climate change – investment in a low carbon economy solves and leads to economic growth

Trenberth, Distinguished Senior Scientist, 2012

(Kevin, The Wall Street Journal “Check With Climate Scientists for Views on Climate” February 1, 2012, <http://online.wsj.com/article/SB10001424052970204740904577193270727472662.html>) CKP

The National Academy of Sciences of the U.S. (set up by President Abraham Lincoln to advise on scientific issues), as well as major national academies of science around the world and every other authoritative body of scientists active in climate research have stated that the science is clear: The world is heating up and humans are primarily responsible. Impacts are already apparent and will increase. Reducing future impacts will require significant reductions in emissions of heat-trapping gases. Research shows that more than 97% of scientists actively publishing in the field agree that climate change is real and human caused. It would be an act of recklessness for any political leader to disregard the weight of evidence and ignore the enormous risks that climate change clearly poses. In addition, there is very clear evidence that investing in the transition to a low-carbon economy will not only allow the world to avoid the worst risks of climate change, but could also drive decades of economic growth. Just what the doctor ordered.

#### Global warming anthropogenic – 98% of scientists agree

**Clynes, editor, June 21, 2012**

(Tom, Popsci “The Battle Over Climate Science”, <http://www.popsci.com/science/article/2012-06/battle-over-climate-change?single-page-view=true>) CKP The evidence to support the theory of anthropogenic, or human-caused, climate change has been mounting since the mid-1950s, when atmospheric models predicted that growing levels of CO2 in the atmosphere would add to the natural “greenhouse effect” and lead to warming. The data was crude at first, and opinions vacillated (skeptics like to recall a 1974 Time cover story that predicted an impending ice age). But by the mid-1990s, thousands of lines of independent inquiry supported the conclusion summarized in the 1995 IPCC report: “The balance of evidence suggests a discernible human influence on global climate.” Since then, the case for anthropogenic climate change has only strengthened; 98 percent of actively publishing climate scientists now say that it is undeniable. But several finer points remain unsettled. For instance, researchers still don’t completely understand the role of aerosols in the atmosphere, the variable effects of clouds at different heights, and the influence of feedback mechanisms such as the changing reflectivity of the Earth’s surface and the release of gases from permafrost or deep seabeds. Climate-change skeptics have been keen to capitalize on those gaps in knowledge. “They play up smaller debates,” says Francesca Grifo at the Union of Concerned Scientists, “and divert the dialogue by attacking particular aspects. They represent climate science as a house of cards, where you pull out one and it all falls apart.”

#### Berkley studies proves global warming happening- consensus

Roosevelt, 2011

(Margot, , She worked for 13 years at The Washington Post, for 20 years at TIME, and was at the Los Angeles Times from 2007 to 2011. http://articles.latimes.com/2011/apr/04/local/la-me-climate-berkeley-20110404 , accessed 28 June 2012, NWW)

A team of UC Berkeley physicists and statisticians that set out to challenge the [scientific consensus](http://www.climate.gov/) on global warming is finding that its data-crunching effort is producing results nearly identical to those underlying the prevailing view. The [Berkeley Earth Surface Temperature project](http://berkeleyearth.org/) was launched by physics professor Richard Muller, a longtime critic of government-led climate studies, to address what he called "the legitimate concerns" of skeptics who believe that global warming is exaggerated. But Muller unexpectedly told a congressional hearing last week that the work of the three principal groups that have analyzed the temperature trends underlying climate science is "excellent.... We see a global warming trend that is very similar to that previously reported by the other groups." The hearing was called by GOP leaders of the House [Science & Technology committee,](http://science.house.gov/hearing/full-committee-hearing-climate-change) who have expressed doubts about the integrity of climate science. It was one of several inquiries in recent weeks as the [Environmental Protection Agency's efforts to curb planet-heating emissions](http://www.epa.gov/climatechange/endangerment.html) from industrial plants and motor vehicles have come under strenuous attack in Congress.

### Answers To “Climate Skeptics prove no climate change”—Quals debate

#### Climate skeptics aren’t credible – conservative think tanks, no climate expertise, no peer-reviewed journals, confuses public

Jaques, Social scientist, 2012

(Peter, Global Environmental Politics Vol. 12, No. 2, May 2012 pg.9-17) CKP

Climate skepticism comes as an anti-reflexive counter-movement to beat back the ontological threats to Western modernity, organized through conservative think tanks, mostly in the US, with some in the UK.14 The true ideological and material objectives of the counter-movement are camouflaged by several tactics that confuse fair-minded citizens but empower those ready to deny climate change.15 While most climate deniers do not have substantial climate expertise,16 well-credentialed contrarians serve as spokesmen (mostly men) to media forums outside peer-reviewed journals. Thus, it appears to policy elites, journalists, and of course the general public that there are two equally legitimate “sides” and that each should receive equal attention.17 Climate denial advocates sow confusion in a public that is often unaware that core elements of climate science have far more vetting, good-faith witnesses, corroboration, and merit.

#### Climate skeptics are wrong – there are skeptics in every field of science

Trenberth, Distinguished Senior Scientist, 2012

(Kevin, The Wall Street Journal “Check With Climate Scientists for Views on Climate” February 1, 2012, <http://online.wsj.com/article/SB10001424052970204740904577193270727472662.html>) CKP

You published "No Need to Panic About Global Warming" (op-ed, Jan. 27) on climate change by the climate-science equivalent of dentists practicing cardiology. While accomplished in their own fields, most of these authors have no expertise in climate science. The few authors who have such expertise are known to have extreme views that are out of step with nearly every other climate expert. This happens in nearly every field of science. For example, there is a retrovirus expert who does not accept that HIV causes AIDS. And it is instructive to recall that a few scientists continued to state that smoking did not cause cancer, long after that was settled science. Climate experts know that the long-term warming trend has not abated in the past decade. In fact, it was the warmest decade on record. Observations show unequivocally that our planet is getting hotter. And computer models have recently shown that during periods when there is a smaller increase of surface temperatures, warming is occurring elsewhere in the climate system, typically in the deep ocean. Such periods are a relatively common climate phenomenon, are consistent with our physical understanding of how the climate system works, and certainly do not invalidate our understanding of human-induced warming or the models used to simulate that warming.

#### Global warming real – your scientists are paid by the API to discredit climate change

**Clynes, editor, June 21, 2012**

(Tom, Popsci “The Battle Over Climate Science”, http://www.popsci.com/science/article/2012-06/battle-over-climate-change?single-page-view=true) CKP

In 1998, following the negotiation of the Kyoto Protocol on global warming, the American Petroleum Institute convened a task force to spend more than $5.9 million to discredit climate science and quash growing public support of curbing emissions. The group borrowed many of the methods and people, including Milloy, that had been used to mislead Congress and the public about the connection between smoking and cancer and heart disease. In a leaked memo titled the “Global Climate Science Communications Plan,” the task force laid out a strategy to “build a case against precipitous action on climate change based on the scientific uncertainty.” The memo details a plan to recruit, train and pay willing scientists to sow doubt about climate science among the media and the public. “Victory will be achieved,” the memo states, when “recognition of uncertainties becomes part of the ‘conventional wisdom’ ” and when “those promoting the Kyoto treaty on the basis of the extant science appear to be out of touch with reality.”

#### Even those that once signed on to skepticism are convinced

Black, Environment correspondent, 2012

(Richard, BBC News “Climate consensus cracking open – or not February 6 http://www.bbc.co.uk/news/science-environment-16906738; CKP)

In interpreting the various letters that have claimed to see signs of the crack, it's also important to be very clear about what the people signing them are and aren't saying. In 2007, for example, I wrote [a series of articles](http://news.bbc.co.uk/1/hi/sci/tech/7081026.stm) loosely based on the letter to the Financial Post, and found that among its signatories there were widely divergent views about which aspects of the "consensus" they disagreed with. One, Gordon Swaters from the University of Alberta, went as far as to[**retract his signature**](http://www.desmogblog.com/signatory-bails-on-anti-climate-science-petition) saying he had thought he was signing something asking for more research on climate change, rather than denying its existence. "Clearly the agony of having stupidly signed that damn first letter will not abate," he told me at the time. "I am not a climate skeptic... anthropogenic climate change is clearly occurring (and) it is likely the case that most of the observed warming over that 50 years or so is the result of human activities.">>>>

#### AT climate skeptics—studies allegedly disproving climate paid for by the oil and coal industries

Prothero, Professor of Geology at Occidental College in Los Angeles, and Lecturer in Geobiology at the California Institute of Technology, 2012.

(Donald “How We Know Global Warming is Real and Human Caused” Skeptic VOl 17 iss 2)

If the climate science community speaks with one voice (as in the 2007 IPCC report, and every report since then), why is there still any debate at all? The answer has been revealed by a number of investigations by diligent reporters who got past the PR machinery denying global warming, and uncovered the money trail. Originally, there were no real "dissenters" to the idea of global warming by scientists who are actually involved with climate research. Instead, the forces with vested interests in denying global climate change (the energy companies, and the "free-market" advocates) followed the strategy of tobacco companies: create a smokescreen of confusion and prevent the American public from recognizing scientific consensus. As die famous memo27 from the tobacco lobbyists said "Doubt is our product." The denialists generated an anti-science movement entirely out of thin air and PR. The evidence for this PR conspiracy has been well documented in numerous sources. For example, Oreskes and Conway revealed from memos leaked to the press that in April 1998 the right-wing Marshall Institute, SEPP (Fred Seitz's lobby that aids tobacco companies and polluters), and ExxonMobil, met in secret at the American Petroleum Institute's headquarters in Washington, DC There they planned a $20 million campaign to get "respected scientists" to cast doubt on climate change, get major PR efforts going, and lobby Congress mat global warming isn't real and is not a threat. The right-wing institutes and the energy lobby beat the bushes to find scientists - any scientists - who might disagree with the scientific consensus. As investigative journalists and scientists have documented over and over again,28 the denialist conspiracy essentially paid for the testimony of anyone who could be useful to them. The day that the 2007 IPCC report was released (Feb. 2, 2007), die British newspaper The Guardian reported diät die conservative American Enterprise Institute (funded largely by oil companies and conservative think tanks) had offered $10,000 plus travel expenses to scientists who would write negatively about the IPCC report.29 In February 2012, leaks of documents from the denialist Heartland Institute revealed that they were trying to influence science education, suppress the work of scientists, and had paid off many prominent climate deniers, such as Anthony Watts, all in an effort to circumvent the scientific consensus by doing an "end run" of PR and political pressure. Other leaks have shown 9 out of 10 major climate deniers are paid by ExxonMobil.30 We are accustomed to hired-gun "experts" paid by lawyers to muddy up the evidence in the case they are fighting, but this is extraordinary- buying scientists outright to act as shills for organizations trying to deny scientific reality. With this kind of money, however, you can always find a fringe scientist or crank or someone with no relevant credentials who will do what they're paid to do.>>>

### Answers to “we win consensus debate”

#### Your skepticism arguments are what justifies inaction on climate change - it is key to reject those arguments to solve for climate change

Feder, Writer at the American Institute of Physics, 2012

(Toni, PhysicsToday Vol. 65, Issue 2, pg. 22 “Climate scientists are not cowed by relentless climate change deniers”, <http://www.physicstoday.org/resource/1/phtoad/v65/i2/p22_s1>) CKP

Climate scientists overwhelmingly agree that climate change is happening, although details of how it will play out are uncertain. Every few years, the Intergovernmental Panel on Climate Change (IPCC) issues a report prepared by hundreds of scientists and govern­ment officials from around the world; the next is due out in 2014. The latest, published in 2007, says that warming of the climate system is unequivocal, that most of the observed increase in glo - bally averaged temperatures since the mid 20th century is due to human activ­ities, and that past and future anthro­pogenic carbon dioxide emissions will contribute to warming and sea- level rise for more than a millennium. Yet deniers have hampered efforts to tackle climate change, and their actions, espe­cially in North America, the UK, and Australia, have led to climate re - searchers being investigated by their governments, suffering nervous break­downs, and spending time and money defending their rights and reputations. Harassment of climate scientists by climate-change deniers goes back at least to 1995, after the IPCC published its Second Assessment Report. Santer Was the lead author of chapter 8, which looked at the causes of climate change. “The single sentence ‘The balance of evidence suggests a discernible human influence on global climate’ changed my life,” he says. “I was the guy who was associated with this sentence. Those who did not like that finding did everything not only to undermine the finding but also to undermine my sci­entific reputation.” The harassment has ramped up in recent years, says Michael Mann of the Pennsylvania State University, whose book The Hockey Stick and the Climate Wars: Dispatches from the Front Lines, due to be published by Columbia Univer - sity Press in early March, includes a retelling of his own ongoing experi­ences with harassment. “Political intim­idation, character attacks, what appear to be orchestrated phone and email campaigns, nasty and thinly veiled threats, not just to us but to our families, are what it means in modern American life to be a climate scientist,” says Mann. Even this magazine, after publishing last October articles on the science of climate change—about its being under fire and about communicating that sci­ence to the public—received an abun­dance of letters with the tenor, “How could PHYSICS TODAY print such a one-sided portrayal of climate science when many reputable scientists disagree?” Fossil-fuel interests, says Gavin Schmidt, a climate researcher at NASA, “have adopted a shoot-the- messenger approach. It’s been a very successful strategy. They have created a chilling effect, so other [scientists] won’t say what they think and the conversation in public stays bereft of anyone who knows what they are talking about.” Schmidt cofounded [RealClimate.org](http://RealClimate.org), a forum for climate scientists to “provide a quick response to developing stories and provide the context sometimes missing in mainstream commentary.” Meanwhile, the Competitive Enterprise Institute, a vocal opponent to limiting greenhouse gas emissions, is suing NASA for the release of Schmidt’s per­sonal emails. Kevin Trenberth of the National Center for Atmospheric Research says he has seen young scientists get a surge of nasty emails when they publish on climate change. “They are flabber - gasted. A lot of the community is unaware this is happening.” And, he notes, the people who send the emails have “gotten off scot-free.” Although direct correlation is diffi­cult to prove, climate scientists point to governmental inaction to exemplify deniers’ successes. The US never signed on to the Kyoto Protocol, the inter - national agreement to reduce emissions of greenhouse gases, and in December Canada became the first country to withdraw from the agreement. Public concern about climate change is volatile, and the US and many other governments have dragged their feet on requiring emissions reductions. “Burn­ing fossil fuels has consequences for air quality, acid rain, climate change,” says Trenberth. “The biggest problem is that [the US] has not put a price on carbon. There ought to be a cost attached [to emissions] to compensate future gener­ations for all the environmental and health damages, especially those dam­ages yet to come.”

#### Even if they win some number of people deviate from consensus, no impact to lack or presence of consensus

Black, Environment correspondent, 2012

(Richard, BBC News “Climate consensus cracking open – or not” February 6 http://www.bbc.co.uk/news/science-environment-16906738; CKP)

What's brought me here now is [the letter published in the Wall Street Journal (WSJ)](http://online.wsj.com/article/SB10001424052970204301404577171531838421366.html)about 10 days ago, in which a group of 16 scientists declared there was "no need to panic on global warming". "A large and growing number of distinguished scientists and engineers do not agree that drastic actions on global warming are needed," it says. In other words - in a meme that's become very familiar over the last few years - "the consensus is cracking". It's a troublesome meme in several ways. First, and most obvious, is the absence of any evidence that it's actually true. Certainly, since the "ClimateGate" affair there's been criticism from within the scientific community about the practices of some climate scientists - but that's very different from disputing their broad conclusions. [A letter to the Financial Post](http://www.canada.com/nationalpost/financialpost/story.html?id=3711460e-bd5a-475d-a6be-4db87559d605) newspaper in 2006 protesting against the "consensus" was signed by 67 scientists, [another to the UN](http://www.globalwarminghoax.com/news.php?extend.123) in 2009 was signed by 141, while the latest garnered just 16 - and was met by [a riposte](http://online.wsj.com/article/SB10001424052970204740904577193270727472662.html?mod=WSJ_Opinion_MIDDLEThirdBucket) bearing 37 names. The numbers tell you precisely nothing of value. A second problem is the absence of clarity over which consensus we are talking about; consensus that the Earth is warming, consensus that greenhouse gas emissions are the main reason, or consensus that it's a problem requiring urgent solution, to name but three? Thirdly, is the fact that it may not matter very much. A couple of years back, at one of the UNFCCC meetings in Bonn, I had a long chat with Viscount Monckton. As a scholar of Classics, he was able to detail with Classical derivation the reasons why consensus matters far less than simply being right. And he is surely correct; after all, in more recent times, Galileo, Darwin, Einstein and Hawking are among those whose work broke with the consensus, yet turned out to be correct. But if the presence of a consensus is irrelevant, so, logically, is its absence; which makes the continued use by sceptics' groups of the "consensus is cracking" meme a bit mystifying. After all, how many times can you say it's cracking before people start asking "so why hasn't it cracked, then?" In both cases - consensus and breaking consensus - it's surely the evidence that should count, not the number of people you can get to sign your letter.>>>>

#### AT skeptics—consensus nearly unanimous

Prothero, Professor of Geology at Occidental College in Los Angeles, and Lecturer in Geobiology at the California Institute of Technology, 2012.

(Donald “How We Know Global Warming is Real and Human Caused” Skeptic VOl 17 iss 2)

<<Thanks to all the noise and confusion over climate change, the general public has only a vague idea of what the debate is really about, and only about half of Americans think global warming is real or that we are to blame.23 As in the evolution/creationism debate, the scientific community is virtually unanimous on what the data demonstrate about anthropogenic global warming. This has been true for over a decade. When science historian Naomi Oreskes24 surveyed all peer-reviewed papers on climate change published between 1993 and 2003 in the world's leading scientific journal, Science, she found that there were 980 supporting die idea of human-induced global warming and none opposing it. In 2009, Doran and Kendall Zimmerman25 surveyed all tlie climate scientists who were familiar with the data. They found that 95-99% agreed that global warming is real and human caused. In 2010, the prestigious Proceedings of the National Academy of Sciences published a study that showed tñat 98% of the scientists who actually do research in climate change are in agreement over anthropogenic global warming.26 Every major scientific organization in the world has endorsed the conclusion of anthropogenic climate change as well. This is a rare degree of agreement within such an independent and cantankerous group as the world's top scientists. This is the same degree of scientific consensus ttiat scientists have achieved over most major ideas, including gravity, evolution, and relativity. These and only a few other topics in science can claim this degree of agreement among nearly all the world's leading scientists, especially among everyone who is close to the scientific data and knows the problem intimately. If it were not such a controversial topic politically, there would be almost no interest in debating it since the evidence is so clear-cut.>>>

#### Even if they some legit skeptics, no evidence of hoax or conspiracy

Prothero, Professor of Geology at Occidental College in Los Angeles, and Lecturer in Geobiology at the California Institute of Technology, 2012.

(Donald “How We Know Global Warming is Real and Human Caused” Skeptic VOl 17 iss 2)

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<<<Even if there had been some conspiracy on the part of these few scientists, there is no reason to believe that the entire climate science community is secretly working together to generate false information and mislead the public. If there's one thing that is clear about science, it's about competition and criticism, not conspiracy and collusion. Most labs are competing with each other, not conspiring together. If one lab publishes a result that is not clearly defensible, other labs will quickly correct it. As James Lawrence Powell wrote: Scientists. . ..show no evidence of being more interested in politics or ideology than the average American. Does it make sense to believe that tens of thousands of scientists would be so deeply and secretly committed to bringing down capitalism and the American way of life that they would spend years beyond their undergraduate degrees working to receive master's and Ph.D. degrees, then go to work in a government laboratory or university, plying the deep oceans, forbidding deserts, icy poles, and torrid jungles, all for far less money than they could have made in industry, all the while biding their time like a Russian sleeper agent in an old spy novel? Scientists tend to be independent and resist authority. That is why you are apt to find them in the laboratory or in the field, as far as possible from the prying eyes of a supervisor. Anyone who believes he could organize thousands of scientists into a conspiracy has never attended a single faculty meeting.34>>

### Answers to “we have evidence no consensus”

#### AT climate skeptics—consensus undercovered by media

**Prothero, Professor of Geology at Occidental College in Los Angeles, and Lecturer in Geobiology at the California Institute of Technology, 2012.**

(Donald “How We Know Global Warming is Real and Human Caused” Skeptic VOl 17 iss 2)

<<On January 27, 2012, the Wall Street Journal ran an Opinion Editorial written by 16 people who challenge the evidence of human-induced climate change. Most of the authors of the editorial were not climate scientists.1 Predictably, the Rupert Murdoch-owned Journal refused to run a statement by 255 members of the National Academy of Sciences, although a "Letter to the Editor" by 38 of the world's leading climate scientists2 was published. This letter pointed out the numerous errors, mistakes, and fallacies in the editorial. It included a scathing rebuke by climate scientist Kevin Trenberth, whose remarks were quoted out of context to make them seem the opposite of what he actually said. As the Trenberth et al. letter argued, the 16 authors of the editorial were so far out of their depth in discussing the topic that they were the "climate-science equivalent of dentists practicing cardiology." And as if to answer the op ed, the Earth sent a resounding message in reply. On Feb. 2, 2012, news came of an 18-mile crack that appeared in Pine Island Glacier in Antarctica, a prelude to the calving off of an iceberg 350 square miles in area, one of the largest icebergs ever seen (See cover photo).3>>

#### AT climate skeptics—their evidence just quote mining disregard their evidence

Prothero, Professor of Geology at Occidental College in Los Angeles, and Lecturer in Geobiology at the California Institute of Technology, 2012.

(Donald “How We Know Global Warming is Real and Human Caused” Skeptic VOl 17 iss 2)

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<<<The climate deniers have a lot of other things in common with creationists and other anti-science movements. They too like to quote someone out of context ("quote mining"), finding a short phrase in the work of legitimate scientists that seems to support their position. But when you read the full quote in context, it is obvious that they have used the quote inappropriately. The original author meant something that does not support their goals. The "CIimategate scandal" is a classic case of this. It started with a few stolen emails from the Climate Research Unit of the University of East Anglia. If you read the complete text of the actual emails32 and comprehend the scientific shorthand of climate scientists who are talking casually to each other, it is clear that there was no great "conspiracy" or that they were faking data. All six subsequent investigations have cleared Philip Jones and the other scientists of the University of East Anglia of any wrongdoing or conspiracy.33>>>

#### International scientific consensus proves not a hoax

Prothero, Professor of Geology at Occidental College in Los Angeles, and Lecturer in Geobiology at the California Institute of Technology, 2012.

(Donald “How We Know Global Warming is Real and Human Caused” Skeptic VOl 17 iss 2)

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<<<There are many more traits that the climate deniers share with the creationists and Holocaust deniers and others who distort the truth. They pick on small disagreements between different labs as if scientists can't get their story straight, when in reality is always a fair amount of give and take becompeting labs as they try to get the answer before the other lab can do so. The key point is that when all these competing labs around world have reached a consensus and get the same there is no longer any reason to doubt their conclusion. The anti-scientists of climate will also point to small errors by individuin an effort to argue that the entire enterprise be trusted. It is true that scientists are and do make mistakes, but the great power the scientific method is that peer review weeds out, so that when scientists speak with consenthere is no doubt that their data are checked carefully>>>

#### Data proves consensus right—climate change is real even the GOP backed skeptics agree

Prothero, Professor of Geology at Occidental College in Los Angeles, and Lecturer in Geobiology at the California Institute of Technology, 2012.

(Donald “How We Know Global Warming is Real and Human Caused” Skeptic VOl 17 iss 2)

<<<If the data about global climate change are indeed valid and robust, any qualified scientist should be able to look at them and see if the prevailing scientific interpretation holds up. Indeed, such a test took place. Starting in 2010, a group led by U.C. Berkeley physicist Richard Müller re-examined all the temperature data from the NOAA, East Anglia Hadley Climate Research Unit, and the Goddard Institute of Space Science sources. Even diough Müller started out as a skeptic of the temperature data, and was funded by the Koch brothers and other oil company sources, he carefully checked and re-checked the research himself. When the GOP leaders called him to testify before the House Science and Technology Committee in spring 2011, they were expecting him to discredit the temperature data. Instead, Müller shocked his GOP sponsors by demonstrating his scientific integrity and telling the truth: the temperature increase is real, and the scientists who have demonstrated that the climate is changing are right (Fig. 5). In the fall of 2011, his study was published, and the conclusions were clear: global warming is real, even to a right-wing skeptical scientist. Unlike the hired-gun scientists who play political games, Müller did what a true scientist should do: if the data go against your biases and preconceptions, then do the right thing and admit it - even if you've been paid by sponsors who want to discredit global warming. Müller is a shining example of a scientist whose integrity and honesty came first, and did not sell out to the highest bidder.36>>>

### IPCC credible—studies

#### Global warming is real – Berkeley Earth Surface Temperature project proves

Roosevelt, Journalist at the Los Angeles Times, 2011

(Margot, Los Angeles Times “Critics’ review unexpectedly supports scientific consensus on global warming” April 4, 2011, <http://articles.latimes.com/2011/apr/04/local/la-me-climate-berkeley-20110404>) CKP

The Berkeley Earth Surface Temperature project was launched by physics professor Richard Muller, a longtime critic of government-led climate studies, to address what he called "the legitimate concerns" of skeptics who believe that global warming is exaggerated. But Muller unexpectedly told a congressional hearing last week that the work of the three principal groups that have analyzed the temperature trends underlying climate science is "excellent.... We see a global warming trend that is very similar to that previously reported by the other groups." The hearing was called by GOP leaders of the House Science & Technology committee, who have expressed doubts about the integrity of climate science. It was one of several inquiries in recent weeks as the Environmental Protection Agency's efforts to curb planet-heating emissions from industrial plants and motor vehicles have come under strenuous attack in Congress. Muller said his group was surprised by its findings, but he cautioned that the initial assessment is based on only 2% of the 1.6 billion measurements that will eventually be examined. The Berkeley project's biggest private backer, at $150,000, is the Charles G. Koch Charitable Foundation.Oil billionaires Charles and David Koch are the nation's most prominent funders of efforts to prevent curbs on the burning of fossil fuels, the largest contributor to planet-warming greenhouse gases. The $620,000 project is also partly funded by the federal Lawrence Berkeley National Laboratory, where Muller is a senior scientist. Muller said the Koch foundation and other contributors will have no influence over the results, which he plans to submit to peer-reviewed scientific journals. Ken Caldeira, an atmospheric scientist at the Carnegie Institution for Science, which contributed some funding to the Berkeley effort, said Muller's statement to Congress was "honorable" in recognizing that "previous temperature reconstructions basically got it right…. Willingness to revise views in the face of empirical data is the hallmark of the good scientific process." But conservative critics who had expected Muller's group to demonstrate a bias among climate scientists reacted with disappointment. Anthony Watts, a former TV weatherman who runs the skeptic blog WattsUpWithThat.com, wrote that the Berkeley group is releasing results that are not "fully working and debugged yet.... But, post normal science political theater is like that." Over the years, Muller has praised Watts' efforts to show that weather station data in official studies are untrustworthy because of the urban heat island effect, which boosts temperature readings in areas that have been encroached on by cities and suburbs. But leading climatologists said the previous studies accounted for the effect, and the Berkeley analysis is confirming that, Muller acknowledged. "Did such poor station quality exaggerate the estimates of global warming?" he asked in his written testimony. "We've studied this issue, and our preliminary answer is no." Temperature data are gathered from tens of thousands of weather stations around the globe, many of which have incomplete records. Over the last two decades, three independent groups have used different combinations of stations and varying statistical methods and yet arrived at nearly identical conclusions: The planet's surface, on average, has warmed about 0.75 degrees centigrade (1.4 degrees Fahrenheit) since the beginning of the 20th century. Temperature data were the focus of the so-called 2009 Climategate controversy, in which opponents of greenhouse gas regulation alleged that leaked emails from a British climate laboratory showed manipulation of weather station records. Five U.S. and British government and university investigations have refuted the charges.

### Answer to Mueller study flawed

#### No its not Berkley Group credible

Roosevelt, 2011

(Margot, , She worked for 13 years at The Washington Post, for 20 years at TIME, and was at the Los Angeles Times from 2007 to 2011. http://articles.latimes.com/2011/apr/04/local/la-me-climate-berkeley-20110404 , accessed 28 June 2012, NWW)

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## Happening now/Rate debate

### Climate change now-fast

#### Global warming real, caused by emissions, and its rate is increasing – CSIRO and Bureau of Meteorology study proves

**Ansley, Australia correspondent, March 15 2012**

(Greg, The NZ Herald, <http://www.nzherald.co.nz/world/news/article.cfm?c_id=2&objectid=10792060>; CKP)

The deluges and floods that have inundated vast tracts of eastern Australia in the past two years have not affected accelerating trends that have pushed carbon dioxide levels to their highest in 800,000 years.

While the extreme rains have been dumped as a result of two successive la Nina events, the earth has continued heating at a rate that has seen each decade warmer than the preceding 10-year period since 1950. And a new report from the federal science agency CSIRO and the Bureau of Meteorology says that average temperatures across Australia are expected to rise by up to 5C by 2070. It says rising CO2 levels from the burning of fossil fuels continue to warm the continent"s land and oceans. This will bring more droughts and bushfires - but also an increase in intense rainfall in many areas. Launching the two agencies" latest State of the Climate report yesterday, CSIRO chief executive Megan Clark said Australia"s climate varied greatly from one year to the next, but long-term trends remained clear. "Much of Australia may have lurched from drought to floods ... but this has occurred against a backdrop of steadily increasing air and ocean temperatures and rising sea levels," she said. "What"s more, the rate of change is increasing. The fundamental physical and chemical processes leading to climate change are well understood, and CSIRO and the Bureau of Meteorology observations demonstrate that change is occurring now." The CO2 concentration of the atmosphere had risen to about 390 parts per million by 2011, with an increase of more than 3 per cent over the past decade projected to cause significant further global warming. "The main cause of the observed increase in CO2 concentration in the atmosphere is the combustion of fossil fuels since the industrial revolution," the report says. It says that over the past 60 years the number of warm nights has been increasing, with more monthly maximum temperatures being broken.

#### Climate real and anthropocentric---your evidence lacks scientific credibility

Prothero, Professor of Geology at Occidental College in Los Angeles, and Lecturer in Geobiology at the California Institute of Technology, 2012.

(Donald “How We Know Global Warming is Real and Human Caused” Skeptic VOl 17 iss 2)

ous

<<<Fishing around to find anyone with some science background who will agree with you and dispute a scientific consensus is a tactic employed by the creationists to sound "scientific". The NCSE created a satirical "Project Steve,"31 which demonstrated that there were more scientists who accept evolution named "Steve" than the total number of "scientists who dispute evolution". It may generate lots of PR and a smokescreen to confuse the public, but it doesn't change the fact that scientists who actually do research in climate change are unanimous in their insistence that anthropogenic global warming is a real threat. Most scientists I know and respect work very hard for little pay, yet they still cannot be paid to endorse some scientific idea they know to be false.>>>

#### Global Warming anthropogenic – warming not only natural variability—Australia proves

Ansley, Australia correspondent, March 15 2012

(Greg, The NZ Herald, <http://www.nzherald.co.nz/world/news/article.cfm?c_id=2&objectid=10792060>; CKP)

Sea levels have risen around the continent at **rates** equal to or greater than the global average, and sea surface temperatures in the region have increased faster than the global average, rising by about 0.8C since 1910 to their highest level on record in 2010.

The planet’s average mean sea level last year was 210mm above 1880 levels, with sea levels rising faster between 1993 and 2011 than during the entire 20th century. The report says that while both natural and human influences have affected climate over the past century, it was "very likely" that most of the surface global warming observed since the 1950s was because of human activity. It says human activities have also influenced ocean warming, sea-level rise, and temperature extremes. "The warming around Australia is consistent with the global pattern and cannot be explained by natural variability alone."

#### Global Warming anthropogenic – human influence is too large for it to not have an effect

McQuaid, Science and environment journalist, June 7, 2012

(John, Forbes “The Mother of All Tipping Points”, [**http://www.forbes.com/sites/johnmcquaid/2012/06/07/the-mother-of-all-tipping-points/**](http://www.forbes.com/sites/johnmcquaid/2012/06/07/the-mother-of-all-tipping-points/); CKP)

Human activity now dominates 43 percent of Earth’s land surface and [affects twice that area](http://sedac.ciesin.columbia.edu/wildareas/documents/human_footprint_Sanderson_etal2002.pdf). One-third of all available fresh water is diverted to human use. A full [20 percent of Earth’s net terrestrial primary production](http://www.wired.com/wiredscience/2012/06/earth-tipping-point/www.eoearth.org/article/Global_human_appropriation_of_net_primary_production_%28HANPP%29#gen), the sheer volume of life produced on land every year, is harvested for human purposes. Extinction rates compare to those [recorded during the demise of dinosaurs](http://www.newyorker.com/reporting/2009/05/25/090525fa_fact_kolbert) and average temperatures will likely be higher in 2070 than at any point in human evolution. The basic argument against climate change seems to be, at its heart, that humans couldn’t possibly be having a massive global impact on the atmosphere, oceans, and ecosystems. The evidence says otherwise, and predictions of doom are, unfortunately, growing less speculative.

### Climate change now-ice proves

#### Melting ice caps anthropogenic – rate of melting proves

Romm, Editor of Climate Progress, 2011

(Joe, ThinkProgress “Hottest Decade on Record Would Have Been Hotter But for Deep Oceans – Accelerated Warming May Be On Its Way” September 23, 2011, http://thinkprogress.org/climate/2011/09/23/327298/hottest-decade-deep-oceans-warming-may-be-on-its-way/) CKP

Antarctica is disintegrating much faster than almost anybody imagined — see [“Nothing in the natural world is lost at an accelerating exponential rate like this glacier.”](http://climateprogress.org/2009/08/13/west-antarctic-ice-sheet-pine-island-glacier-thinning-faster-sea-level-rise/) In 2001, the IPCC “consensus” said neither Greenland nor Antarctica would lose significant mass by 2100. They both already are.  As Penn State climatologist Richard Alley said in March 2006, the ice sheets appear to be shrinking “[100 years ahead of schedule](http://www.csmonitor.com/2006/0324/p01s03-sten.html).” A presentation at the fall 2010 meeting of the American Geophysical Union sheds some light on the underlying cause of this rapid melt — the ice is being attacked from the bottom.  Discovery News had [the story](http://news.discovery.com/earth/antarctica-melting-warming-penguins-101214.html): Global warming is sneaky. For more than a century it has been hiding large amounts of excess heat in the world’s deep seas. Now that heat is coming to the surface again in one of the worst possible places: Antarctica. New analyses of the heat content of the waters off Western Antarctic Peninsula are now showing a clear and exponential increase in warming waters undermining the sea ice, raising air temperatures, melting glaciers and wiping out entire penguin colonies. “In the area I work there is the highest increase in temperatures of anywhere on Earth,” said physical oceanographer Doug Martinson of the Lamont-Doherty Earth Observatory. Martinson has been collecting ocean water heat content data for more than 18 years at Palmer Island, on the western side of the Antarctic Peninsula. And that was updated in a June post, [Ocean Currents Speed Melting of Antarctic Ice, as “Seawater Appear[s] to Boil on the Surface Like a Kettle on the Stove.”](http://thinkprogress.org/romm/2011/06/27/254996/melting-antarctic-ice/) The [news release](http://www.earth.columbia.edu/articles/view/2815) by Columbia University’s Earth Institute explained: Stronger ocean currents beneath West Antarctica’s Pine Island Glacier Ice Shelf are eroding the ice from below, speeding the melting of the glacier as a whole, according to a new study in Nature Geoscience. A growing cavity beneath the ice shelf has allowed more warm water to melt the ice, the researchers say—a process that feeds back into the ongoing rise in global sea levels. The glacier is currently sliding into the sea at a clip of four kilometers (2.5 miles) a year, while its ice shelf is melting at about 80 cubic kilometers a year – 50 percent faster than it was in the early 1990s – the paper estimates. This [new study](http://www.nature.com/ngeo/journal/vaop/ncurrent/full/ngeo1188.html), “Stronger ocean circulation and increased melting under Pine Island Glacier ice shelf” (subs. req’d), gives us a better understanding of just how PIG is being undermined from underneath: “We conclude that the basal melting has exceeded the increase in ice inflow, leading to the formation and enlargement of an inner cavity under the ice shelf within which sea water nearly 4◦C above freezing can now more readily access the grounding zone. Here is a particularly remarkable observation the scientific team made one day:

### Climate change now—ocean temps

#### Ocean temps prove warming occurring—only explanation for energy loss

Romm, Editor of Climate Progress, 2011

(Joe, ThinkProgress “Hottest Decade on Record Would Have Been Hotter But for Deep Oceans – Accelerated Warming May Be On Its Way” September 23, 2011, <http://thinkprogress.org/climate/2011/09/23/327298/hottest-decade-deep-oceans-warming-may-be-on-its-way/>) CKP

Even so, NASA’s Goddard Institute for Space Studies (GISS), which probably has the best of the long temperature datasets, reported the [12-month running mean global temperature reached a new record in 2010](http://climateprogress.org/2010/06/03/nasa-giss-james-hansen-study-global-warming-record-hottest-year/).  As a NASA analysis found: “We conclude that global temperature continued to rise rapidly in the past decade” and “there has been no reduction in the global warming trend of 0.15-0.20°C/decade that began in the late 1970s.” But other datasets appeared to show a slight slowing in the rate of warming, though even that may have been due to flawed data, as in the case of the UK’s [Hadley Center](http://thinkprogress.org/romm/2010/12/01/207110/met-office-hadley-centre-underestimate-global-warming/). Scientists have long known that the overwhelming majority of human-caused warming was [expected to go into the oceans](http://thinkprogress.org//romm/2009/10/10/204783/skeptical-science-global-warming-not-cooling-is-still-happening-ocean-heat-content/) (see figure below).  And many have suspected that deep ocean warming has also been masking surface warming. Now a [new stud](http://www2.ucar.edu/news/5364/deep-oceans-can-mask-global-warming-decade-long-periods)y led by led by the National Center for Atmospheric Research (NCAR) finds that may indeed be the case: The planet’s deep oceans at times may absorb enough heat to flatten the rate of global warming for periods of as long as a decade even in the midst of longer-term warming…. The study, based on computer simulations of global climate, points to ocean layers deeper than 1,000 feet (300 meters) as the main location of the “missing heat” during periods such as the past decade when global air temperatures showed little trend. The findings also suggest that several more intervals like this can be expected over the next century, even as the trend toward overall warming continues…. “This study suggests the missing energy has indeed been buried in the ocean,” [coauthor Kevin] Trenberth says. “The heat has not disappeared, and so it cannot be ignored. It must have consequences.”

### Climate change now—temps

#### Temps prove climate change occurring now

Zabarenko , Environmental Correspondent, 2012

[By Deborah Zabarenko, Environmental Correspondent. “Warmest U.S. spring on record: NOAA.” <http://www.reuters.com/article/2012/06/07/us-climate-warmth-usa-idUSBRE8561BK20120607?feedType=RSS&feedName=everything&virtualBrandChannel=11563> WASHINGTON | Thu Jun 7, 2012 5:00pm EDT accessed 06272012.] NWW

(Reuters) - So far, 2012 has been the warmest year the United States has ever seen, with the warmest spring and the second-warmest May since record-keeping began in 1895, the U.S. National Oceanic and Atmospheric Administration reported on Thursday. Temperatures for the past 12 months and the year-to-date have been the warmest on record for the contiguous United States, NOAA said. The average temperature for the contiguous 48 states for meteorological spring, which runs from March through May, was 57.1 degrees F (13.9 C), 5.2 degrees (2.9 C) above the 20th century long-term average and 2 degrees F (1.1 C) warmer than the previous warmest spring in 1910. Record warmth and near-record warmth blanketed the eastern two-thirds of the country from this spring, with 31 states reporting record warmth for the season and 11 more with spring temperatures among their 10 warmest. "The Midwest and the upper Midwest were the epicenters for this vast warmth," Deke Arndt of NOAA's Climatic Data Center said in an online video. That meant farming started earlier in the year, and so did pests and weeds, bringing higher costs earlier in the growing season, Arndt said. "This warmth is an example of what we would expect to see more often in a warming world," Arndt said. More long-lasting heat waves, record-high daytime temperatures and record-high overnight low temperatures are to be expected in a warming world, said Jake Crouch of NOAA's National Climatic Data Center. CARBON DIOXIDE MILESTONE "And that's what we're seeing," Crouch said by telephone. "We've seen it quite a bit over the last 12 months." Alaska's spring months were 2.7 degrees F (1.5 C) cooler than average and 10.5 percent wetter and snowier, while drought spread over Hawaii, though exceptional drought was eliminated across the island state. Warmth was evident in parts of the Arctic in May, where sea ice declined rapidly at first and then more slowly through the month, ending at below average levels for 1979-2000, according to the National Snow and Ice Data Center. However, there was more ice cover in the Arctic in May 2012 than in May 2011, the center said on Wednesday on its website nsidc.org/arcticseaicenews/ . There was heavy ice in the Bering Sea, but unusually low ice extent in the Barents and Kara Seas. Another Arctic measurement related to climate reached a milestone this spring, NOAA reported: the concentration of atmospheric carbon dioxide at Barrow, Alaska, reached 400 parts per million, the first time a monthly average for this greenhouse gas passed that level at a remote location. The level of 450 ppm is regarded by many scientists and environmental activists as the upper limit the planet can afford if global temperature rise is to be kept to within 3.6 degrees F (2 C) this century. Some advocates suggest 350 ppm is a more appropriate target. The 400 ppm mark for carbon dioxide in less remote locations, such as Cape May, New Jersey, has been reached for several years in the springtime, NOAA said in a statement. But measurements of carbon dioxide over 400 ppm at remote sites like Barrow - and at six other remote Arctic sites - reflect long-term human emissions of the climate-warming gas, rather than direct emissions from a nearby population center. The global monthly mean level of atmospheric carbon dioxide was about 394 ppm in April, compared to 336 ppm in 1979, pre-industrial levels of about 278 ppm and ice age levels of about 185 ppm.

### Climate change not happening now

#### Models flawed hard to predict with precision effects of emissions on temps

**Palmer, Health and science writer 2012**

**(**Brian, Washington post, January 23 2012<http://www.washingtonpost.com/national/health-science/global-warming-would-harm-the-earth-but-some-areas-might-find-it-beneficial/2012/01/17/gIQAbXwhLQ_story.html>) JMV

When you talk to climate scientists about winners and losers, a few words come up over and over again: could, might, maybe. According to University of Arizona environmental economist Derek Lemoine, local climate-change patterns are difficult to predict because uncertainties in the global model "are compounded when considering smaller scales."

For this reason, it's very hard to pin down climate scientists on local effects. Klaus Keller, an associate professor of geosciences at the Pennsylvania State University, is working to develop strategies to manage the effects of climate change. I posed a simple question to him: If the leaders of Russia or Norway asked whether their countries would be better off in 50 years if the temperature increased by a few degrees, what would you say?

"We don't know," he replied

### Climate change now-inevitable

#### Industrial Revolution source of carbon—can’s solve

EPA 12

(Environmental Protection Agency “Greenhouse Gas Emissions”, <http://www.epa.gov/climatechange/ghgemissions/gases/co2.html>) CKP

Carbon dioxide is constantly being exchanged among the atmosphere, ocean, and land surface as it is both produced and absorbed by many microorganisms, plants, and animals. However, emissions and removal of CO2 by these natural processes tend to balance. Since the Industrial Revolution began around 1750, human activities have contributed substantially to climate change by adding CO2 and other heat-trapping gases to the atmosphere.

In the United States, since 1990, the management of forests and non-agricultural land has acted as a net sink of CO2, which means that more CO2 is removed from the atmosphere, and stored in plants and trees, than is emitted. This sink offset about 15% of total emissions in 2010 and is discussed in more detail in the [Land Use and Forestry](http://www.epa.gov/climatechange/ghgemissions/sources/lulucf.html)

### Climate change inevitable—past the tipping point

#### Climate change inevitable—melting ice sheets, mass tree deaths, lost carbon sink activity

Chestney, Senior Environmental Markets Correspondent, 2012

(Nina, Reuters “Global warming close to becoming irreversible-scientists” March 26, 2012, <http://www.reuters.com/article/2012/03/26/us-climate-thresholds-idUSBRE82P0UJ20120326>) CKP

For ice sheets - huge refrigerators that slow down the warming of the planet - the tipping point has probably already been passed, Steffen said. The West Antarctic ice sheet has shrunk over the last decade and the Greenland ice sheet has lost around 200 cubic km (48 cubic miles) a year since the 1990s. Most climate estimates agree the Amazon rainforest will get drier as the planet warms. Mass tree deaths caused by drought have raised fears it is on the verge of a tip ping point, when it will stop absorbing emissions and add to them instead. Around 1.6 billion tonnes of carbon were lost in 2005 from the rainforest and 2.2 billion tonnes in 2010, which has undone about 10 years of carbon sink activity, Steffen said. One of the most worrying and unknown thresholds is the Siberian permafrost, which stores frozen carbon in the soil away from the atmosphere

### Carbon creates positive feedback loop

#### Positive feedback from permafrost thawing will release carbon emissions until 2300

Deimling et al., Researcher at the Potsdam Institute for Climate Impact Research, 2011

(Schneider von, Biogeosciences Discussions “Estimating the permafrost-carbon feedback on global warming” May 12, <http://www.biology.ufl.edu/ecosystemdynamics/Reprints%20Final%20All/Schneider_2011.pdf>) CKP

The inclusion of a highly simpliﬁed, dynamic permafrost module into the reduced complexity carbon-cycle climate model MAGICC has shown how permafrost carbon emissions could aﬀect long-term projections of future temperature change. Our results underline the importance of analyzing long-term consequences of land carbon emissions beyond 2100. Studies focusing on short time horizons (e.g. Anisimov, 2007) infer a rather small permafrost feedback, in line with our results, while climatic consequences of thawing permafrost soils become clearly apparent after 2100 for the medium and higher RCP scenarios. Even more pronounced than many other components of the Earth System, the permafrost feedback highlights the inert and slow response to human perturbations. Once unlocked under strong warming, thawing and decomposition of permafrost can release amounts of carbon until 2300 comparable to the historical anthropogenic emissions up to 2000 (approximately 440 GtC, cf. Allen et al., 2009). Under the RCP8.5 scenarios – with cumulative permafrost CO2 emissions of 362 PgC to 705 PgC, this permafrost-carbon feedback could add nearly half a degree warming (0.17–0.94 ◦ 5 C) warming from 2200 onwards, albeit in a world that will already be dissimilar to the current one due to global-mean temperature levels near to and possibly in excess of 10 ◦ C. Our method is however not able to bound a worst-case scenario. For example, if there is extensive thermokarst formation (Walter et al., 2007b, 2006) or subsea permafrost degradation (Shakhova et al., 2010b; Shakhova et al., 2010a), 10 substantial CH4 emissions could result from thawing these high Arctic ecosystems.

#### Decomposition of permafrost releases carbon – positive feedback loop

Natali, Polar Programs Fellow at the University of Florida, 2011

(Susan, American Geophysical Union “Increased carbon loss from upland tundra with experimental warming and permafrost degradation” Fall, <http://adsabs.harvard.edu/abs/2011AGUFMGC41F..06N>) CKP

Northern permafrost systems play a critical role in global carbon (C) cycling because of the vast pool of thermally-protected C stored in these ecosystems and the strong potential for changes in C storage in a warmer climate. Increased decomposition of previously frozen organic C may result in a significant positive feedback to global climate change; however, some respiratory C losses may be offset, in part, by warming-mediated increases in plant productivity. To determine the magnitude of warming effects on ecosystem C balance, we established a new warming experiment-the Carbon in Permafrost Experimental Heating Research (CiPEHR) project-where we increased air and soil temperatures and degraded surface permafrost. We used snow fences coupled with spring snow removal to increase deep-soil temperatures and thaw depth (winter warming) and open top chambers to increase summer air temperatures (summer warming). Here we present ecosystem C balance results from three years of experimental warming and permafrost degradation of upland tundra in Interior Alaska. Winter warming increased soil temperature (integrated 5-40 cm depth) by 1.5o C, which resulted in a 10% increase in growing season thaw depth. Surprisingly, the additional 2 kg of thawed soil C m-2 in the winter warming plots did not result in an increase in net growing season CO2 loss from this ecosystem. In contrast, winter warming treatment increased growing season CO2 uptake, which was a result of both higher net primary production and an inhibition of microbial decomposition by soil saturation at the base of the active layer. However, on an annual basis, winter warming caused a significant increase in net ecosystem CO2 loss, which was driven by a two-fold increase in ecosystem respiration during the snow-covered period. While most changes to the abiotic environment at CiPEHR were caused by the winter warming treatment, summer warming effects on plant and soil processes resulted in 20% increases in both gross primary productivity and growing season ecosystem respiration and significantly altered the age and sources of CO2 respired from this ecosystem. These results demonstrate the vulnerability of organic C stored in near surface permafrost to increasing temperature and the strong potential for warming tundra to serve as a positive feedback to global climate change.

### Climate change negative feedback loop—solves

#### Forests are a negative feedback loop—absorbs carbon from the atmosphere

Whitehead, Scientist at the Landcare Research Institution, 2011

(David, Tree Physiology Vol, 31, Issue 9, Pg. 893-902 “Forests as carbon sinks—benefits and consequences” May 30, 2011, <http://treephys.oxfordjournals.org/content/31/9/893.full>) CKP

The history of the Canopy Processes Working Group has its origins in planted forests. One of its aims is linking management and ecophysiological processes to maximize forest productivity (Ryan 2002). In the last decade, atmospheric concentrations of greenhouse gases have increased markedly (Canadell et al. 2007) and global terrestrial and oceanic carbon sinks may be approaching saturation (Raupach et al. 2007). Nevertheless, international agreements towards combating climate change remain elusive (Nordhaus 2010). In the debate on how to address climate change, managed forests have become more important as potential carbon sinks for at least mitigating rising [CO2]. However, the positive and negative consequences of forest plantations being established in large areas of non-forested land for carbon sequestration need careful scrutiny. The effects of afforestation on some variables, for example landscape water balance (see Zhang et al. 2001 or Jackson et al. 2005), are better understood than others, for example surface albedo and radiative forcing in the atmosphere, or soil carbon stores. In the opening paper of this issue, Whitehead (2011) argues that new forests will generally have a lower albedo than the grasslands they replace. As less short-wave radiation is reflected by forests, increased radiative forcing and warming in the atmosphere is anticipated. This potential trade-off against the increased storage of carbon offered by forests has rarely been explored in detail, despite recent observations that canopy-scale CO2 uptake capacity and canopy [N] are strongly and positively correlated to surface albedo (Ollinger et al. 2008). Additionally, while numerous reviews have addressed the effects of planting forests on soil carbon (see, e.g., Guo and Gifford 2002, Paul et al. 2003), uncertainty remains over the direction and magnitude of the response. However, it is generally accepted that there will be larger changes in the above- than below-ground carbon pools (Whitehead 2011). The capacity to manipulate the carbon and water cycles in managed forests using silvicultural interventions represents one of their greatest advantages. Thinning and weeding of Pinus pinaster stands in southern France reduced carbon uptake by up to 73%. Importantly, these silvicultural interventions only resulted in minimal (15%) reductions in evapo-transpiration. Nevertheless, thinned and weeded stands were less vulnerable to drought than the unweeded control plots, which became a carbon source during summer drought (Moreaux et al. 2011). This complex and multi-scale study was considered outstanding and nominated as Tree Physiology's best student paper at the workshop; it is featured in this issue as an open access article.

### Climate change is natural phenomena

### Climate change--alternative cause

#### Can’t solve, Panetta airplane rides contribute

Investor’s Business Daily, 2012

[(Investor’s Buisiness Daily, https://libproxy.library.unt.edu/login?url=http://proquest.umi.com/pqdweb?did=2651452091&sid=6&Fmt=3&clientId=87&RQT=309&VName=PQD, Proquest, 7 May 2012 (Panetta Panders) Pg.A16] NWW

<<Nonsense: Defense Secretary Leon Panetta says climate change is a national security issue. Isn't he the fellow who jets across the country to go home on weekends? If he's right, then he's undermining his own mission. Speaking Wednesday to the Environmental Defense Fund, Panetta claimed: "The area of climate change has a dramatic impact on national security." We've heard this before. Rising sea levels, droughts, storms that are more frequent and intense -- they're all going to cause people to migrate in mass numbers, become violent and start wars. Five years ago the United Nations warned that global warming would create conflict. Two years back the Pentagon categorized it as a destabilizing force.>>

#### Black carbon and methane speed up climate change

ScienceDaily 12

(ScienceDaily “What Can Be Done to Slow Climate Change?” Jan. 12, 2012, http://www.sciencedaily.com/releases/2012/01/120112193442.htm) CKP

<<Black carbon, a product of burning fossil fuels or biomass such as wood or dung, can worsen a number of respiratory and cardiovascular diseases. The small particles also absorb radiation from the sun causing the atmosphere to warm and rainfall patterns to shift. In addition, they darken ice and snow, reducing their reflectivity and hastening global warming. Methane, a colorless and flammable substance that is a major constituent of natural gas, is both a potent greenhouse gas and an important precursor to ground-level ozone. Ozone, a key component of smog and also a greenhouse gas, damages crops and human health.>> While carbon dioxide is the primary driver of global warming over the long term, limiting black carbon and methane are complementary actions that would have a more immediate impact because these two pollutants circulate out of the atmosphere more quickly.>>

### Tipping Point Now – must act

#### Must stop now—warming triggers more warming

Zabarenko , Environmental Correspondent, 2012

[By Deborah Zabarenko, Environmental Correspondent. “Climate change will boost number of West's wildfires” *Reuters.* WASHINGTON | Tue Jun 12, 2012 12:03pm EDT. <http://www.reuters.com/article/2012/06/12/us-climate-wildfires-idUSBRE85B09420120612> accessed 06272012.] NWW

"In the long run, we found what most fear - increasing fire activity across large areas of the planet," said lead author Max Moritz of the University of California-Berkeley. "But the speed and extent to which some of these changes may happen is surprising. These abrupt changes in fire patterns not only affects people's livelihoods, but also they add stress to native plants and animals that are already struggling to adapt to habitat loss," Moritz said in a statement. Co-author Katharine Hayhoe of Texas Tech University said this study gives a unique global perspective on recent fire patterns and their relationship to climate. Climate scientists, including those affiliated with the United Nations Intergovernmental Panel on Climate Change, have projected that more frequent wildfires would be likely in a warming world. Other effects of global warming include more severe storms, floods and droughts, these scientists have said. CONTROLLED FIRES In a separate study, researchers approved of the intentional setting of controlled fires, a wildfire-fighting technique that has sometimes raised questions about its impact on wildlife. Writing in the June issue of the journal BioScience, researchers at the University of California-Berkeley reviewed two decades of research on the ecological impact of cutting forest wildfire risk, especially in the southern Sierra Mountains, where precipitation was at half of normal levels. The idea behind so-called controlled burns is to reduce the amount of fuel that would feed a wildfire. The new study found that these fuel-reducing fires do not cause substantial harm. "The few effects we did see were usually transient," Berkeley's Scott Stephens said in a statement. "Based upon what we've found, forest managers can increase the scale and pace of necessary fuels treatments without worrying about unintended ecological consequences." A warming climate makes the carbon dioxide stored in forest soils decompose faster, sending more climate-warming carbon into the atmosphere, researchers at the University of California-Irvine and elsewhere reported Monday in the journal Proceedings of the National Academy

## Impact debate

### [Climate Change Bad Impacts—war](#_Toc303711427)

#### Climate change bad—studies prove climate cycles drive war, empirically proven

Schiermeier, editor and writer for Nature specializing in policy and climate studies, degree in geography, statistics and economics from University of Munich, 2011

Quirin, Nature Magazine, “Climate cycles drive civil war,” August 24, http://www.nature.com/news/2011/110824/full/news.2011.501.html, last accessed 7.3.12

Natural climate cycles seem to have a striking influence on war and peace around the equator. Tropical countries face double the risk of armed conflict and civil war breaking out during warm, dry El Niño years than during the cooler La Niña phase of the El Niño/Southern Oscillation (ENSO), according to an analysis published today inNature[1](http://www.nature.com/news/2011/110824/full/news.2011.501.html#B1).

The study throws light on the hotly contested issue of whether climate change has any notable effect on violence and societal stability, particularly in poor countries. The authors of several popular books have previously proposed a link, but there are disagreements within the scientific literature over whether a robust climate signal can be detected in conflict statistics.

Previous studies have focused on the question of how anthropogenic climate change might increase conflict risk. A 2009 study[2](http://www.nature.com/news/2011/110824/full/news.2011.501.html#B2) by economist Marshall Burke at the University of California, Berkeley, and his co-workers found that the probability of armed conflict in sub-Saharan Africa was about 50% higher than normal in some unusually warm years since 1981. But critics point to statistical problems — for instance when linking possibly random local temperature and rainfall variations with outbreaks of civil war — that may have resulted in a false appearance of causality.

To overcome this problem, Solomon Hsiang, an economist currently at Princeton University in New Jersey, and his colleagues opted to look at how historical changes in the global, rather than local, climate affect conflict risk[1](http://www.nature.com/news/2011/110824/full/news.2011.501.html#B1).

Clear signal

The team designed a 'quasi-experiment' for which they divided the world into regions strongly affected by the ENSO — the tropical parts of South America, Africa and the Asia–Pacific region, including parts of Australia — and regions only weakly affected by it. They then searched for a link between climate and armed conflicts that arose in the first group between 1950 and 2004.

A very clear signal appeared in the data. The team found that the risk of annual civil conflict doubles, from 3% to 6%, in countries of the ENSO-affected, or 'teleconnected', group during El Niño years relative to La Niña years. In many cases, conflicts that might have broken out anyway may have occurred earlier owing to the effects of El Niño, Hsiang suggests.

Civil conflicts have been by far the most common form of organized political violence in recent decades, Hsiang says. Globally, one-fifth of the 240 or so civil conflicts since 1950 could be linked to the 4–7-year climate cycle originating in the southern Pacific, the study concludes. The results were unaffected by any modification to the statistical set-up of the analysis — such as excluding particularly crisis-prone African countries — which the team performed to confirm the robustness of their findings.

"A doubling of risk is a very strong effect," says Halvard Buhaug, a conflict researcher with the Peace Research Institute Oslo, who was not involved in the study.

Buhaug, who has previously criticized[3](http://www.nature.com/news/2011/110824/full/news.2011.501.html#B3) claims such as Burke's, says he feels "surprised and a bit puzzled" by the results. He grants that the study is "very competently executed" but adds that the issue is nonetheless far from being settled. "I don't dismiss that a correlation exists, but it is a correlation we so far don't understand," he says. "I remain sceptical about any potential causal connection."

A more detailed analysis of the 'narratives' of historical conflicts that have occurred during El Niño years is needed to establish whether any factors that may have caused these conflicts — such as harvest failures that led to food shortages — can be traced to El Niño events, he says.

Greenhouse effects

The authors of the study are aware of its limitation and of the difficulties involved in establishing a causal link between climate and conflict. But, says Hsiang, case studies are ongoing at Columbia University in New York and elsewhere on how El Niño events might link to local outbreaks of violence.

"Different hypotheses have been proposed as to how one phenomenon causes the other, and we aren't sure yet what the correct narrative is," he says. "It could be that agricultural income in El Niño years drops to levels that can trigger violence. Furthermore, psychologists think that aggressive behaviour gets generally more widespread during exceptionally warm conditions."

#### Climate change bad—melting arctic triggers geopolitical conflicts—fast timeframe for melting means peaceful solutions are less likely—lack of multilateral frameworks in the arctic makes conflict even more likely

Kroh, Associate Director of Ocean Communications for the Center for American Progress, 2012

Kiley, Climate Progress, “How Climate Change Could Reshape Geopolitics Around the Arctic,” June 12, http://thinkprogress.org/climate/2012/06/12/498091/how-climate-change-could-reshape-geopolitics-around-the-arctic/, last accessed 7.3.12

The Arctic is warming at an alarming rate – twice as fast as the rest of the planet – and according to a new [report,](http://www.c2es.org/press-center/press-releases/climate-change-international-arctic-security) those changes will be a key driver of geopolitics in the coming years.

As the rapidly melting ice unlocks commercial opportunities in shipping, tourism and oil and gas extraction, the world’s largest economies are jockeying for control of the region. According to the Center for Climate and Energy Solutions, the melting of the Arctic is a “bellwether for how climate change may reshape geopolitics in the post-Cold War era.”

The widely held notion that climate change will occur gradually over the 21st century, allowing ample time for society to adapt, is belied by the unprecedented pace of both climate change and policy developments in the Arctic today. Such rapid changes will challenge governments’ abilities to anticipate and diplomatically resolve international disputes within the region.

Accelerating changes in the region are causing sea ice to melt at a rate exceeding [scientists’ predictions](http://thinkprogress.org/climate/2011/08/11/294403/arctic-ice-thinning-4-times-faster-than-predicted-by-models-semi-stunning-m-i-t-study-finds/).  The absence of ice will open up strategic waterways, such as the Northwest Passage, for longer periods of time and allow more opportunity for activities like offshore oil exploration that require open water. Analysts believe the economic impact could be significant – new and expanded shipping routes can significantly reduce the transit time between Asia, North America and Europe, and oil companies like Royal Dutch Shell are eager to unlock the [“great opportunity”](http://www.shell.us/home/content/usa/aboutshell/projects_locations/alaska/)for fossil fuels they believe lies beneath the pristine Arctic waters.

But increased opportunity will also lead to increased conflict. In analyzing recent policy statements and actions of the Arctic states, the report notes that while the countries seem “focused on building a cooperative security environment in the region,” there is an “apparently contradictory trend toward modernizing their military forces in the Arctic … Consequently, if political cooperation in the region should sour, most of the Arctic nations will have forces that are prepared to compete in a hostile environment.”

Further complicating Arctic claims is the absence of the U.S. in the [Law of the Sea](http://www.nytimes.com/2012/05/24/world/americas/law-of-the-sea-treaty-is-found-on-capitol-hill-again.html) treaty, or UNCLOS, which details the rights and responsibilities of nations when it comes to use and protection of the world’s oceans. The treaty also provides an important framework for resolving territorial disputes in the Arctic.  UNCLOS is ratified by every other developed country and is supported by a broad coalition that includes [five former Republican secretaries of state](http://online.wsj.com/article/SB10001424052702303674004577434770851478912.html), the Chamber of Commerce, and major environmental groups.  America’s failure to ratify this key treaty puts us at an immediate disadvantage in frontier regions like the Arctic.

#### Climate change turns your arg---root of security threats

Weiss & Madrid, Weiss is a Senior Fellow and Director of Climate Strategy at the Center For American and Jorge Madrid is a Research Associate at CAP, 2012

[By Daniel J. Weiss and Jorge Madrid, Daniel J. Weiss is a Senior Fellow and Director of Climate Strategy at the Center For American and Jorge Madrid is a Research Associate at CAP. “More Action on Climate Change: CAP’s Comments To the EPA on Its Proposed Carbon Pollution Standard.” *ThinkProgress Climate Progress* < http://thinkprogress.org/climate/2012/06/26/506541/more-action-on-climate-change-caps-comments-to-the-epa-on-its-proposed-carbon-pollution-standard/?mobile=nc > June 26, 2012 accessed 06272012.] NWW

The climate change risks are real. That is why 33 retired U.S. generals and admirals in 2010 called for a comprehensive climate and energy legislation since climate change is a threat to U.S. security, warning that “climate change and energy are two key issues that will play a significant role in shaping the future security environment.”[11]

### Climate change bad impacts—loss US hegemony

#### Climate induced sea level rise risks military bases and energy grid

Bingaman, chair Senate Energy and Natural Resources, 2012

(Larry, president and CEO of the South Central Connecticut Regional Water Authority “Impacts of Sea Level Rise” Senate Energy and Natural Resources Committee News Release Congressional Documents and Publications, 19 April 2012 proquest, accessed 6/29)

<"The Department of Defense, in its 2010 'Quadrennial Defense Review Report,' highlighted the more than 30 U.S. military installations that are already facing elevated levels of risk from rising sea levels. The integrated energy company Entergy carried out a 'Gulf Coast Adaptation Study' to assess and manage risks to its energy assets from climate change. Today we have a witness with us from Mayor Bloomberg's office in New York City to discuss the efforts that New York is undertaking to prepare for elevated sea levels. These examples are evidence that those that will be most directly affected by climate change do not have the luxury of delaying their planning process until the politics are more favorable.>> "The discussion that we're having today is an important one. Witnesses will be testifying about real-world impacts. I hope that this hearing contributes to the restarting of a national conversation on this important topic.">>

### [Climate Change Bad Impacts—Russia](#_Toc303711428) war

#### Climate change bad—causes a new cold war in the arctic between the U.S. and Russia

**The Guardian, 2010**

Terry Macalister, “Climate change could lead to arctic conflict, warns senior NATO commander,” October 11, http://www.guardian.co.uk/environment/2010/oct/11/nato-conflict-arctic-resources, last accessed 7.3.12

One of [Nato](http://www.guardian.co.uk/world/nato)'s most senior commanders has warned that global warming and a race for resources could lead to conflict in the [Arctic](http://www.guardian.co.uk/world/arctic). The comments, by Admiral James G Stavridis, supreme allied commander for Europe, come as Nato countries convene on Wednesday for [groundbreaking talks on environmental security in the Arctic Ocean](http://www.nrf.is/images/stories/news_pdf/nato-arw_draft_agenda_environmental_security_in_the_arctic_ocean_15sep10.pdf). The discussions, in the format of a "workshop", with joint Russian leadership, are an attempt to create dialogue with Moscow aimed at averting a second cold war. "For now, the disputes in the north have been dealt with peacefully, but [climate change](http://www.guardian.co.uk/environment/climate-change) could alter the equilibrium over the coming years in the race of temptation for exploitation of more readily accessible natural resources," said Stavridis. The US naval admiral believes military forces have an important role to play in the area – but mainly for specialist assistance around commercial and other interests. "The cascading interests and broad implications stemming from the effects of climate change should cause today's global leaders to take stock, and unify their efforts to ensure the Arctic remains a zone of co-operation – rather than proceed down the icy slope towards a zone of competition, or worse a zone of conflict," he added. Stavridis made his views known in a foreword to a Whitehall paper, entitled [Environmental security in the Arctic Ocean: promoting co-operation and preventing conflict](http://www.rusi.org/publications/whitehall/ref%3AI4CA4506CA6EBA/), written by Prof [Paul Berkman](http://www.spri.cam.ac.uk/people/berkman/), head of the Arctic Ocean geopolitics programme at the University of Cambridge. The discussions, which take place at the Scott Polar Institute where Berkman is based, have been given impetus by the speed of change around the north pole where the ice cap is melting and [oil](http://www.guardian.co.uk/environment/oil) and other minerals are becoming available for extraction. In recent weeks, [Cairn Energy has announced the first oil and gas discoveries off Greenland](http://www.guardian.co.uk/business/2010/sep/21/cairn-energy-oil-find-greenland) and a wave of new mining licences are about to be awarded there. There are similar moves to produce [gas](http://www.guardian.co.uk/environment/gas) in the far north of Russia and Norway, all in the shadow of [BP's Gulf of Mexico's oil spill](http://www.guardian.co.uk/environment/bp-oil-spill). Vladimir Putin, the Russian prime minister, spoke about our "common responsibility" [at the international forum on the Arctic in Moscow two weeks ago](http://www.guardian.co.uk/world/2010/sep/23/putin-arctic-claims-international-law). He is aware the melting ice offers access to reserves of oil and minerals, as well as new shipping lanes, but that the Arctic is [an "area for co-operation and dialogue](http://www.guardian.co.uk/world/2010/sep/23/putin-arctic-claims-international-law)". Berkman, a key figure in organising the workshop, with funding from the Nato science for peace and security programme, said the challenge is to balance national and common interests in the Arctic Ocean in the interests of all humankind. "Strategic long-range ballistic missiles or other such military assets for national security purposes in the Arctic Ocean are no less dangerous today than they were during the cold war. In effect, the cold war never ended in the Arctic Ocean." One of the first speakers at the workshop will be Prof Alexander Vylegzhanin, who is codirecting the workshop from the Russian Academy of Sciences. He will be followed by former US ambassador Kenneth Yalowitz; European Parliament vice-president, Diana Wallis; and Canadian high commissioner, James Wright. There will also be contributions from senior British, Danish, Finnish, Icelandic and Norwegian delegates with participants from 16 nations. Building on the interdisciplinary discussions with academics, government administrators, politicians, and industry representatives, Berkman said the workshop should be a major first step towards building a dialogue that both considers strategies to promote co-operation as well as prevent conflict in the Arctic Ocean. As Stavridis noted: "Melting of the polar ice cap is a global concern because it has the potential to alter the geopolitical balance in the Arctic heretofore frozen in time."

#### Climate change melts the Arctic—leads to conflict over resources

**Talmadge, Writer at Associated Press, 2012**

(Eric, The Huffington Post “Arctic Climate Change Opening Region To New Military Activity” April 16, 2012, [http://www.huffingtonpost.com/2012/04/16/arctic-climate-change-military-activity\_n\_1427565.html#](http://www.huffingtonpost.com/2012/04/16/arctic-climate-change-military-activity_n_1427565.html)) CKP

YOKOSUKA, Japan (AP) — To the world's military leaders, the debate over climate change is long over. They are preparing for a new kind of Cold War in the Arctic, anticipating that rising temperatures there will open up a treasure trove of resources, long-dreamed-of sea lanes and a slew of potential conflicts. By Arctic standards, the region is already buzzing with military activity, and experts believe that will increase significantly in the years ahead. Last month, Norway wrapped up one of the largest Arctic maneuvers ever — Exercise Cold Response — with 16,300 troops from 14 countries training on the ice for everything from high intensity warfare to terror threats. Attesting to the harsh conditions, five Norwegian troops were killed when their C-130 Hercules aircraft crashed near the summit of Kebnekaise, Sweden's highest mountain. The U.S., Canada and Denmark held major exercises two months ago, and in an unprecedented move, the military chiefs of the eight main Arctic powers — Canada, the U.S., Russia, Iceland, Denmark, Sweden, Norway and Finland — gathered at a Canadian military base last week to specifically discuss regional security issues.

### [Climate Change bad Impacts---Agriculture](#_Toc303711429)

#### Climate change bad—temperature spikes massively harm crop yields—discussions of how a rise in “average temperate” affects crop yields ignore effects of peak temperature

**The Economist, 2011**

“One Degree Over,” March 17, http://www.economist.com/node/18386161/, last accessed 7.2.12

FOR a scientist, there are few happier accidents than finding a trove of data that were gathered for other purposes, but which apply to your pet problem. That happened to David Lobell, a researcher at Stanford University, when he started talking to Marianne Bänziger of the International Maize and Wheat Improvement Centre, in Mexico, about how climate change would affect crops in Africa.

Dr Bänziger and her colleagues had been running an ambitious set of field trials designed to look at what sorts of maize (corn, to Americans) grow best in various parts of southern and eastern Africa, paying special attention to drought resistance. They were struggling, though, to find the money to pull the results from 123 separate research stations together into one big, tractable database. Dr Lobell realised that if he helped them he could also use the result to correlate yields with meteorological conditions other than drought, and thus reveal any harm done by hotter-than-usual weather. His conclusions, published this week in Nature Climate Change, confirm for the tropics the findings for temperate climes of a recent American study. This is that peak, rather than average, temperatures are what matter most to maize.

Days above 30°C are particularly damaging. In otherwise normal conditions, every day the temperature is over this threshold diminishes yields by at least 1%. Moreover, days where the temperature exceeds 32°C do twice the harm of those at 31°C. And during a drought, things are worse still. Then, yields take a hit of 1.7% per day over 30°C.

This matters because **increasing the average temperature only a bit can multiply the number of the hottest days a lot.** The research predicts that a 1°C rise in average temperature will reduce yields across two-thirds of the maize-growing region of Africa, even in the absence of drought. Add drought and that effect spreads over the entire area.

### Climate change increase food prices

Koch, 2012

(By Wendy Koch, USA TODAY “Climate change to worsen hunger as U.N.'s Rio+20 begins” Jun 20, 2012 <http://content.usatoday.com/communities/greenhouse/post/2012/06/climate-change-exected-to-worsen-hunger-as-rio20-begins/1#.T_RsbfXh-So> accessed 7.4) NWW

"Undernutrition is a determinant of poor health and it is women and children who suffer the most," Julio Frenk, dean of Harvard University's School of Public Health, said in announcing the findings. "Maternal undernutrition can continue in children, extending the cycle for at least three generations." The report says climate change will also affect food prices. Citing World Bank data, it says those prices jumped 8% in the first quarter of 2012, partly due to extreme cold in Europe that affected wheat crops and excessive heat in South America that lower production of sugar, maize and soybeans. Another report, published today in the journal Energy and Environmental Science, suggests several solutions to climate change and food shortages: farm efficiency, food waste recycling and lower meat consumption. These changes could reduce the amount of land needed for farming, despite population growth, and leave sufficient land to produce bio-energy, according to the study from the University of Exeter in the United Kingdom.

### Climate change Bad impacts—weather events

#### Climate change bad—weather events harm economy

**Borenstein, Science writer at the Associated Press, 2012**

(Seth, Chicago Sun Times “Scientists warn of climate-change onslaught” April 30, <http://www.suntimes.com/news/world/11585476-418/scientists-warn-of-climate-change-onslaught.html>) CKP

<<Some weather extremes aren’t deadly, however. Sometimes, they are just strange.

Report co-author David Easterling of the National Climatic Data Center says this month’s U.S. heat wave, while not deadly, fits the pattern of worsening extremes. The U.S. has set nearly 6,800 high temperature records in March. Last year, the United States set a record for billion-dollar weather disasters, though many were tornadoes.

“When you start putting all these events together, the insurance claims, it’s just amazing,” Easterling said. “It’s pretty hard to deny the fact that there’s got to be some climate signal.”

Northeastern University engineering and environment professor Auroop Ganguly, who didn’t take part in writing the IPCC report, praised it and said the extreme weather it highlights “is one of the major and important types of what we would call ‘global weirding.’” It’s a phrase that some experts have been starting to use more to describe climate extremes.

Field doesn’t consider the term inaccurate, but he doesn’t use it.

“It feels to me like it might give the impression we are talking about amusing little stuff when we are, in fact, talking about events and trends with the potential to have serious impacts on large numbers of people.”

AP

0, the scientists wrote in the journal Ecosphere, a publication of the Ecological Society of America. Using satellite-based fire records and 16 different climate change models, the international team of researchers found that while wildfires will increase in many temperate zones due to rising temperatures, fire risk may actually decrease around the Equator, especially in tropical rainforests, because of increased rainfall. "In the long run, we found what most fear - increasing fire activity across large areas of the planet," lead author Max Moritz of the University of California-Berkeley.>> "But the speed and extent to which some of these changes may happen is surprising. These abrupt changes in fire patterns not only affects people's livelihoods, but also they add stress to native plants and animals that are already struggling to adapt to habitat loss," Moritz said in a statement. Co-author Katharine Hayhoe of Texas Tech University said this study gives a unique global perspective on recent fire patterns and their relationship to climate. Climate scientists, including those affiliated with the United Nations Intergovernmental Panel on Climate Change, have projected that more frequent wildfires would be likely in a warming world. Other effects of global warming include more severe storms, floods and droughts, these scientists have said.

#### Global warming causes storms, droughts, heat waves - $80 billion of damage every year and increasing

Borenstein, Science writer at the Associated Press, 2012

(Seth, Chicago Sun Times “Scientists warn of climate-change onslaught” April 30, <http://www.suntimes.com/news/world/11585476-418/scientists-warn-of-climate-change-onslaught.html>) CKP

WASHINGTON — Global warming is leading to such severe storms, droughts and heat waves that nations should prepare for an unprecedented onslaught of deadly and costly weather disasters, an international panel of climate scientists said in a new report issued Wednesday. The greatest threat from extreme weather is to highly populated, poor regions of the world, the report warns, but no corner of the globe — from Mumbai to Miami — is immune. The document by a Nobel Prize-winning panel of climate scientists forecasts stronger tropical cyclones and more frequent heat waves, deluges and droughts. The 594-page report blames the scale of recent and future disasters on a combination of man-made climate change, population shifts and poverty. In the past, the Intergovernmental Panel on Climate Change, founded in 1988 by the United Nations, has focused on the slow inexorable rise of temperatures and oceans as part of global warming. This report by the panel is the first to look at the less common but far more noticeable extreme weather changes, which lately have been costing on average about $80 billion a year in damage. “We mostly experience weather and climate through the extreme,” said one of the report’s top editors, Chris Field, an ecologist with the Carnegie Institution of Washington. “That’s where we have the losses. That’s where we have the insurance payments. That’s where things have the potential to fall apart. “There are lots of places that are already marginal for one reason or another,” Field said. But it’s not just poor areas: “There is disaster risk almost everywhere.” The report specifically points to New Orleans during 2005’s Hurricane Katrina, noting that “developed countries also suffer severe disasters because of social vulnerability and inadequate disaster protection.” In coastal areas of the United States, property damage from hurricanes and rising seas could increase by 20 percent by 2030, the report said. And in parts of Texas, the area vulnerable to storm surge could more than double by 2080. Already U.S. insured losses from weather disasters have soared from an average of about $3 billion a year in the 1980s to about $20 billion a year in the last decade, even after adjusting for inflation, said Mark Way, director of sustainability at insurance giant Swiss Re. Last year that total rose to $35 billion, but much of that was from tornadoes, which scientists are unable to connect with global warming. U.S. insured losses are just a fraction of the overall damage from weather disasters each year. Globally, the scientists say that some places, particularly parts of Mumbai in India, could become uninhabitable from floods, storms and rising seas. In 2005, over 24 hours nearly 3 feet of rain fell on the city, killing more than 1,000 people and causing massive damage. Roughly 2.7 million people live in areas at risk of flooding. Other cities at lesser risk include Miami, Shanghai, Bangkok, China’s Guangzhou, Vietnam’s Ho Chi Minh City, Myanmar’s Yangon (formerly known as Rangoon) and India’s Kolkata (formerly known as Calcutta). The people of small island nations, such as the Maldives, may also need to abandon their homes because of rising seas and fierce storms. “The decision about whether or not to move is achingly difficult and I think it’s one that the world community will have to face with increasing frequency in the future,” Field said in a telephone news conference Wednesday.

#### Climate change causes flooding, droughts, cylones, seal level rise, migration—IPCC studies

Mank, Political Scientist, and Jackson, Social scientist, 2012

(Bradford, James, Human Rights Quarterly Vol. 34, No. 1, February “Climate Change and Displacement: Multidisciplinary Perspectives”, <http://muse.jhu.edu/journals/hrq/summary/v034/34.1.mank.html>) CKP

In 2007, the United Nations Intergovernmental Panel on Climate Change (IPCC), which includes leading scientists from many disciplines relating to climate issues and numerous nations, issued its Fourth Assessment Report, which concluded that there is “unequivocal” evidence the Earth is significantly warming compared to temperatures since 1850. The industrial revolution initiated the massive burning of fossil fuels emitting carbon dioxide and other greenhouse gases (GHGs). The rate of warming has accelerated since 1995. The IPCC states that “[m]ost of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations.”1 Furthermore, the IPCC report concluded, “There is high agreement and much evidence that with current climate change mitigation policies and related sustainable development practices, global GHG emissions will continue to grow over the next few decades.”2 The IPCC predicts that global temperatures will significantly rise between the time of the report and 2100, although different models predict temperature increases ranging from 1.1 to 6.4 degrees centigrade between 2007 and 2100.3 Considering the best estimates of these projected temperature increases, the IPCC predicts that both flooding and droughts will increase in certain areas, cyclones will increase in intensity, and sea levels will rise.4 As a result of these adverse changes in the environment, the IPCC predicts the potential for significant population migration as people flee areas with these problems.

#### Climate change bad—increase risk cyclones

Borenstein, Science writer at the Associated Press, 2012

(Seth, Chicago Sun Times “Scientists warn of climate-change onslaught” April 30, <http://www.suntimes.com/news/world/11585476-418/scientists-warn-of-climate-change-onslaught.html>) CKP

<<This report — the summary of which was issued in November — is unique because it emphasizes managing risks and how taking precautions can work, Field said. In fact, the panel’s report uses the word “risk” 4,387 times.

Field pointed to storm-and-flood-prone Bangladesh, an impoverished country that has learned from its past disasters. In 1970, a Category 3 tropical cyclone named Bhola killed more than 300,000 people. In 2007, the stronger cyclone Sidr killed only 4,200 people. Despite the loss of life, Bangladesh is considered a success story because it was better prepared and invested in warning and disaster prevention, Field said.

A country that was not as prepared, Myanmar, was hit with a similar sized storm in 2008, which killed 138,000 people.

The study forecasts that some tropical cyclones — which include hurricanes in the United States — will be stronger because of global warming. But the number of storms is not predicted to increase and may drop slightly.

Some other specific changes in severe weather that the scientists said they had the most confidence in predicting include more heat waves and record hot temperatures worldwide and increased downpours in Alaska, Canada, northern and central Europe, East Africa and north Asia,

IPCC Chairman Rajendra Pachauri told The Associated Press that while all countries are hurt by increased climate extremes, the overwhelming majority of deaths occur in poorer, less developed places. Yet, it is wealthy nations that produce more greenhouse gases from burning fossil fuels, raising the issue of fairness.>>

#### Climate change heats oceans – leads to La Nina effect, causing heavy floods and rains

Steffen, Executive director of the ANU Climate Change Institute, 2012

(Will, TheAustralian “We’re likely to be in a land of increasingly severe droughts and floods” March 19, 2012, <http://www.theaustralian.com.au/national-affairs/opinion/were-likely-to-be-a-land-of-increasingly-severe-droughts-and-floods/story-e6frgd0x-1226303249377>) CKP

As the oceans warm there will be more La Nina events bringing heavy summer rains. AUSTRALIA has long been a land of droughts and flooding rains, and the past two years have been a good example of that well-known climatic pattern. When the dams are full, the paddocks are green and the dry soil has turned soggy, we tend to forget about drought and its risks for our health and wellbeing. However, it has always been wise to a take a long-term perspective and to acknowledge that a few wet years don't mean we'll never see a severe drought again. Furthermore, with climate change now in the mix, it is even more important to take a broader, long-term perspective. Climate change is influencing more than just droughts, as the recent CSIRO-Bureau of Meteorology State of the Climate 2012 report clearly outlines. Temperatures over land and in the oceans continue to increase rapidly, sea levels are rising and extremely hot days have become more common. But it is the recent period of very wet, cool weather bringing floods to many parts of Australia that has grabbed the most attention in the past few months. The Climate Commission's report on the science behind southeast Australia's wet, cool summer provides the broader, long-term perspective needed to understand the significance of the big wet. The 2010-2011 period was the wettest two-year period on record in Australia. The exceptionally high rainfall was driven by back-to-back La Nina events, the phase of natural climate variability that periodically brings heavy rainfall to eastern Australia. La Nina events are associated with higher-than-average sea surface temperatures across Australia, which lead to higher rates of evaporation from the surface ocean and more water in the air for rainstorms. In fact, the sea surface temperatures to the north of Australia during the spring and early summer of 2010-2011 were the highest on record, very likely contributing to the amount and intensity of the rainfall. The very high sea surface temperatures were also, in part, a result of the underlying global warming trend. We are not only seeing increasing temperatures over land, but the surface waters of the ocean are also heating up. For this reason, many scientists are concerned global warming may have contributed to the strength of the La Nina event and thus to the heavy rainfall and flooding.

#### Increase flooding and erratic weather

Hennessy, 2012

[Joan Hennessy, freelance writer in Laurel, Md., who specializes in education policy, May/June 2012 https://libproxy.library.unt.edu/login?url=http://proquest.umi.com/pqdweb?did=2685930191&sid=6&Fmt=3&clientId=87&RQT=309&VName=PQD (Rising Waters and Political Wrangling) Pg.20] NWW

<<Although John Boon, a marine scientist and professor emeritus at VIMS, has written a book about sea-level rise, he avoids 1 00-year predictions. Boon prefers evidence from the past. Taking both sea level and land subsidence into account, a gauge measuring the tide at Gloucester Point, Virginia, has registered a rise of 1.4 feet during the past 100 years. "The inference is that we should be very concerned about what is going to be unfolding over the next 100 years," he says. "How could anyone turn around and say there is no problem?" Warm water drives storms. If more storms strike in a place where sea level is higher, me storm damage will be greater, explains Roger Mann, director of research and advisory services for MMS.>>

#### Climate change increase erratic weather including extreme rain

Zabarenko , Environmental Correspondent, 2012

[By Deborah Zabarenko, Environmental Correspondent. “Extreme rain doubled in US Midwest - climate study.” <http://www.reuters.com/article/2012/05/16/climate-rain-midwest-idUSL1E8GGLZD20120516?feedType=RSS&feedName=everything&virtualBrandChannel=11563> WASHINGTON | Wed May 16, 2012 4:38pm EDT accessed 06272012.] NWW

The number of extreme rainstorms - deluges that dump 3 inches or more in a day - doubled in the U.S. Midwest over the last half-century, causing billions of dollars in flood damage in a trend climate advocates link to a rise in greenhouse gas emissions. Across the Midwest the biggest storms increased by 103 percent from 1961 through 2011, a study released by the Rocky Mountain Climate Organization and the Natural Resources Defense Council reported on Wednesday. States in the upper Midwest fared worse than those in the south part of the region, the study found, with the number of severe rainstorms rising by 203 percent in Wisconsin, 180 percent in Michigan, 160 percent in Indiana and 104 percent in Minnesota. Illinois saw an 83 percent increase in extreme storms, Missouri had 81 percent, Ohio 40 percent and Iowa 32 percent, according to the study. "The increase in extreme storms, because of the linkage to flooding, probably represents the Midwest's greatest vulnerability to climate change," said study author Stephen Saunders, president of the Rocky Mountain Climate Organization. Overall annual precipitation for the region rose 23 percent between 1961 and 2011, the study found, using data from weather stations. The worst flood year during the period was 2008, followed by 1993. Those two years saw the worst Midwest flooding since the 1930s, Saunders said by telephone. In 2008, he noted, "You had these enormous storms, and they happened in quick succession. We ended up with federal disaster areas all over the Midwest, with $16 billion in damage." Extreme rains became floods that washed out the city of Cedar Rapids, Iowa, in 2008; forced the U.S. Army Corps of Engineers to blow up Mississippi River levees to save Cairo, Illinois, in 2011; and, also in that year, sent the Missouri River over its banks for hundreds of miles. A series of strong rainstorms in the first half of June 2008 was particularly damaging because the saturated ground failed to recover from one storm in time to absorb the water from the next, Saunders said. He pointed to global studies projecting more extreme precipitation and floods as a result of climate change, which is a product of increased emissions of heat-trapping greenhouse gases like carbon dioxide. Carbon dioxide is emitted by natural and human sources, notably the burning of fossil fuels. "A threshold may already have been crossed, so that major floods in the Midwest perhaps now should no longer be considered purely natural disasters but instead mixed natural/unnatural disasters," Saunders said. "And if emissions keep going up, the forecast is for more extreme storms in the region."

### [Climate Change Bad Impacts—water](#_Toc303711431) wars

#### Climate change causes resource conflict – droughts, water scarcity

Holtermann et al, Doctoral researcher at PRIO, Winter 2011

(Helge, International Security Vol. 36, No. 3 pg 79-106 “Climate Wars? Assessing the Claim That Drought Breeds Conflct”) CKP

Climate change is hot. Twice in recent years, the Nobel Peace Prize has been awarded to environmental activists: in 2004 to Wangari Maathai and in 2007 to the United Nations’ Intergovernmental Panel on Climate Change (IPCC) and former U.S. Vice President Al Gore. In April 2007, the UN Security Council held its first ever debate on climate security. The chair of this debate, then British Foreign Secretary Margaret Becket, left no doubt as to the connection between climate and confict: “What makes wars start? Fights over water. Changing patterns of rainfall. Fights over food production, land use.”1 In the same year, a report by eleven retired U.S. generals and admirals stated that environmental security is no longer soft politics, concluding that climate change is a “threat multiplier” for instability and confict that will have repercussions for all.2 And in a speech to the UN on September 22, 2009, U.S. President and Nobel laureate Barack Obama asserted that “the threat from climate changes is serious, it is urgent, and it is growing,” as more frequent droughts and crop failures “breed hunger and confict.”3 Surely, such statements must be based on solid scientific evidence—much in the same manner as the natural sciences inform the debate on likely physical changes? Not so. As a matter of fact, the policy debate on the security implications of climate change has run far ahead of the scientific evidence base. This study represents one scholarly attempt to catch up with the rhetoric. At the heart of the climate security discourse lies the issue of water scarcity. A key characteristic of the world’s poorest and most vulnerable societies is their dependence on rain-fed agriculture for income and food supply. Global warming is likely to affect precipitation patterns and increase the unpredictability of extreme weather events, thereby probably having a negative impact on health and food security in many parts of the world.4 Some argue that these developments might also have implications for peace and security in a stricter sense. The environmental security literature offers several case-based accounts of armed conflict within the context of competition over scarce resources.5 Yet, it remains unclear whether these cases are exceptions or whether they epitomize a more systematic pattern of resource scarcity and conflict, in general, and drought and violent conflict, in particular.6

### [Climate Change Bad Impacts—](#_Toc303711436)Oceans warming

#### Ocean warming melting ice caps – El Nino can release energy in oceans rapidly

**Romm, Editor of Climate Progress, 2011**

(Joe, ThinkProgress “Hottest Decade on Record Would Have Been Hotter But for Deep Oceans – Accelerated Warming May Be On Its Way” September 23, 2011, http://thinkprogress.org/climate/2011/09/23/327298/hottest-decade-deep-oceans-warming-may-be-on-its-way/) CKP

These potential consequences include accelerated warming in the coming decade and melting of the West Antarctic Ice Sheet. Let’s take these two in order. [The heat may have been](http://www.dailycamera.com/science-environment/ci_18932226) carried deep into the ocean by overturning circulations, which can plunge surface water from the subtropical regions into the ocean’s depths. The burying of warmer water also corresponds with La Nina weather patterns, which are born from cooler-than-average surface water temperatures in the tropical Pacific. And over the last decade, La Nina conditions have dominated, Trenberth said. That the heat is buried in the ocean, and not lost into space, is troublesome, Trenberth said, since the heat energy isn’t likely to stay in the ocean forever,perhaps releasing back into the atmosphere during a strong El Nino, when sea surface temperatures in the tropical Pacific are warmer than average. “It can come back quite fast,” he said. “The energy is not lost, and it can come back to haunt us, so to speak, in the future.” I asked Trenberth whether we might see a decade where warming is a tad faster than expected, and he emailed me, “Yes.”  Once the decade of slower warming “is over, the subsequent warming can play catchup.”

#### Climate change harms fisheries

Axelrod Environmental politician 2011 (Mark project muse Global Environmental politics August 2011 6/26/12) JMV

Recent projections suggest that climate change will significantly reduce marine biodiversity, with particularly strong impacts on high-latitude species and those living in semi-enclosed seas where migration options are limited.1 Although re­search is limited by system complexity and indirect estimation, studies have al­ready documented important marine ecosystem changes resulting from long­term temperature shifts. These atmospheric changes lead to modified phyto­plankton photosynthesis3 and shifting habitats for fish and other oceanic spe­cies.4 The resulting new ecological patterns also affect social systems dependent on fishing-related livelihoods.5 As a result, we might expect governments to turn their attention towards climate change adaptation in the fisheries sector. Regional fisheries management organizations (RFMOs), meeting annually to set fishing limits and other management rules, present an ideal venue in which to address climate change impacts on marine fisheries. Indeed, some RFMOs—such as the International Whaling Commission (IWC)—have ad­dressed climate change repeatedly. Nonetheless, in 2007, the same year that the Intergovernmental Panel on Climate Change (IPCC) reiterated climate threats and uncertainties for marine biodiversity6 and capture fisheries,7 only one out of 17 UN-recognized RFMOs took explicit action on climate change. In that year, despite growing awareness of vulnerability throughout the world’s oceans, the Commission for Conservation of Antarctic Marine Living Resources (CCAMLR) was the only RFMO to place climate change prominently on its an­nual agenda. CCAMLR parties required the organization’s Scientific Committee to take action, and ensured that climate change would appear on all future CCAMLR annual agendas.8 Although CCAMLR was the only RFMO to directly address climate change in 2007, eight of the 17 RFMOs have addressed climate change in at least one annual meeting since 1992. This article seeks to explain when and why RFMOs move beyond their classic management approaches—as­signment of property rights, catch limits, and gear restrictions—to include cli­mate change in their research and management plans. Variation in RFMO ap­proaches to climate change provides an opportunity to understand member state and secretariat behavior surrounding linkage politics.

### Climate change bad impacts—climate change causes sea level rise

#### Greenhouse gas emissions lead to rise in sea level, puts crucial infrastructure at risk

Spotts, Science reporter, 2012

(Pete, The Christian Science Monitor “West Coast sea levels: New report estimates greater rise by 2010” June 22, 2012, <http://www.csmonitor.com/Environment/2012/0622/West-Coast-sea-levels-New-report-estimates-greater-rise-by-2100>) CKP

If greenhouse-gas emissions continue unabated, the expected additional warming could raise sea levels by up to four or five feet all along the US West Coast by 2100, according to an analysis released Friday by the National Research Council (NRC). Beyond any real estate permanently inundated, such an increase would bring some $100 billion worth of facilities that currently are high and dry into a new 100-year flood plain, according to previous studies that assumed a comparable increase in sea levels. Those facilities include power plants, airports and seaports, and other big-ticket pieces of infrastructure.

#### GW causes sea levels to rise—melting ice caps and water expansion

Spotts, Science reporter, 2012

(Pete, The Christian Science Monitor “West Coast sea levels: New report estimates greater rise by 2010” June 22, 2012, http://www.csmonitor.com/Environment/2012/0622/West-Coast-sea-levels-New-report-estimates-greater-rise-by-2100) CKP

Rising sea levels triggered by global warming are superimposed on these natural factors. Warming by itself affects the oceans in several ways. The ocean expands from heating alone. Melting land-based ice contributes. And human-induced changes to river flows also have an effect: Dams tend to reduce rivers' input of water to the oceans, while heavy use of aquifers can increase the flows to the sea. Between the 2007 IPCC report and the NRC study, new studies have shown thermal expansion to have played a smaller role in sea-level rise than the IPCC estimated. But melting ice's role has grown. The latest estimates attribute 65 percent of the rise in global average sea levels between 1993 and 2008 to melting ice. Ground water and water stored in reservoirs in effect cancel each other out.

#### Science consensus--NRC and the IPCC project up to 100 in rise in sea level by 2100

Spotts, Science reporter, 2012

(Pete, The Christian Science Monitor “West Coast sea levels: New report estimates greater rise by 2010” June 22, 2012, http://www.csmonitor.com/Environment/2012/0622/West-Coast-sea-levels-New-report-estimates-greater-rise-by-2100) CKP

The NRC estimates that by 2030, global average sea levels could rise between three and nine inches over 2000 levels, range from six inches to two feet by 2050, and from 19 to 55 inches by 2100. The IPCC's upper estimate from 2007 projects as much as a 23-inch rise by 2100.

#### Sea level rise happening now—climate change

Barboza, LATimes reporter, 2012

(Tony, The LATimes, June 24 <http://articles.latimes.com/2012/jun/24/local/la-me-adv-sea-level-20120625> June 27, 2012; CKP)

Sea levels along the California coast are expected to rise up to 1 foot in 20 years, 2 feet by 2050 and as much as 5 1/2 feet by the end of the century, climbing slightly more than the global average and increasing the risk of flooding and storm damage, a new study says. That's because much of California is sinking, extending the reach of a sea that is warming and expanding because of climate change, according to a report by a committee of scientists released Friday by the National Research Council. In Washington and Oregon, where geological processes are flexing the land upward, researchers predict a less dramatic sea level rise that will register below the global average. The report, commissioned by California, Oregon, Washington and several federal agencies, is the closest look yet at how global warming -- which causes ocean water to expand and ice to melt -- will raise sea levels along the West Coast. Tide gauges show that the world's oceans have risen about 7 inches in the last century, and that rate is accelerating, the report notes. "Sea level rise isn't a political question, it's a scientific reality," said Gary Griggs, director of the Institute of Marine Sciences at UC Santa Cruz and a member of the committee that produced the report.

#### Rising sea levels put coastal cities at risk – waves, storm surges, high tides

Barboza, LATimes reporter, 2012

(Tony, The LATimes, June 24 <http://articles.latimes.com/2012/jun/24/local/la-me-adv-sea-level-20120625> June 27, 2012; CKP)

The report is the latest to warn that the rising sea will place coastal communities at increasing risk, with most of the damage caused by a combination of big waves, storm surges and high tides. The warm ocean conditions of a strong El Nino can magnify those effects, the report says, expanding sea water and raising sea levels by about a foot for several months. Coastal California could see serious damage from storms within a few decades, especially in low-lying areas of Southern California and the Bay Area. San Francisco International Airport, for instance, could flood if the sea level rises a little more than a foot, a mark expected to be reached in the next few decades. Erosion could cause coastal cliffs to retreat more than 100 feet by 2100, according to the report. For an idea of what's in store, the report says, look at what happened in the winter of 1983. That's when a series of potent El Nino-driven storms hit California's coast, causing more than $200 million in damage from flooding, high waves and erosion. More than 3,000 homes and businesses were damaged and 33 oceanfront homes destroyed.

### Climate change bad impacts—sea level rise bad

#### Sea level rise from global warming puts 3.7 million Americans at risk

Wehner, Senior fellow at the Ethics and Public Policy Center, 2012

(Peter, Commentary Magazine “Obama and the Rise of the Ocean Tides” March 16, 2012, <http://www.commentarymagazine.com/2012/03/16/obama-and-rise-of-ocean-tides/>) CKP

The New York Times published a [story](http://www.nytimes.com/2012/03/14/science/earth/study-rising-sea-levels-a-risk-to-coastal-states.html?hp=&pagewanted=all) earlier this week with the headline, “Sea Level Rise Seen as Threat to 3.7 Million.” According to reporter Justin Gillis, “About 3.7 million Americans live within a few feet of high tide and risk being hit by more frequent coastal flooding in coming decades because of the sea level rise caused by global warming, according to new research. If the pace of the rise accelerates as much as expected, researchers found, coastal flooding at levels that were once exceedingly rare could become an every-few-years occurrence by the middle of this century.” The Times goes on to inform us that the ocean has been rising slowly and relentlessly since the late 19th century, but “the rise appears to have accelerated lately and many scientists expect a further acceleration … One estimate that communities are starting to use for planning purposes suggests the ocean could rise a foot over the next 40 years, though that calculation is not universally accepted among climate scientists.”

#### Accelerated sea level rise risks coastal communities—now key time to act

**Gillis, writer New York Times, 2012**

(Justin, New York Times March 13 <http://www.nytimes.com/2012/03/14/science/earth/study-rising-sea-levels-a-risk-to-coastal-states.html?_r=1> accessed 7/2 tm)

About 3.7 million Americans live within a few feet of high tide and risk being hit by more frequent coastal flooding in coming decades because of the sea level rise caused by global warming, according to new research.If the pace of the rise accelerates as much as expected, researchers found, coastal flooding at levels that were once exceedingly rare could become an every-few-years occurrence by the middle of this century. By far the most vulnerable state is Florida, the new analysis found, with roughly half of the nation's at-risk population living near the coast on the porous, low-lying limestone shelf that constitutes much of that state. But Louisiana, California, New York and New Jersey are also particularly vulnerable, researchers found, and virtually the entire American coastline is at some degree of risk. ''Sea level rise is like an invisible tsunami, building force while we do almost nothing,'' said Benjamin H. Strauss, an author, with other scientists, of two new papers outlining the research. ''We have a closing window of time to prevent the worst by preparing for higher seas.''

#### climate costs the government in flood insurance payments

Gillis, writer New York Times, 2012

(Justin, New York Times March 13 <http://www.nytimes.com/2012/03/14/science/earth/study-rising-sea-levels-a-risk-to-coastal-states.html?_r=1> accessed 7/2 tm)

Insurance companies got out of the business of writing flood insurance decades ago, so much of the risk from sea level rise is expected to fall on the financially troubled National Flood Insurance Program, set up by Congress, or on state insurance pools. Federal taxpayers also heavily subsidize coastal development when the government pays to rebuild infrastructure destroyed in storm surges and picks up much of the bill for private losses not covered by insurance. For decades, coastal scientists have argued that these policies are foolhardy, and that the nation must begin planning an orderly retreat from large portions of its coasts, but few politicians have been willing to embrace that message or to warn the public of the rising risks. Organizations like Mr. Ebell's, even as they express skepticism about climate science, have sided with the coastal researchers on one issue. They argue that Congress should stop subsidizing coastal development, regarding it as a waste of taxpayers' money regardless of what the ocean might do in the future. ''If people want to build an expensive beach house on the Florida or Carolina coast, they should take their own risk and pay for their own insurance,'' Mr. Ebell said. The new research calculates the size of the population living within one meter, or 3.3 feet, of the mean high tide level, as estimated in a new tidal data set from the National Oceanic and Atmospheric Administration. In the lower 48 states, that zone contains 3.7 million people today, the papers estimate, a figure exceeding 1 percent of the nation's population. Under current coastal policies, the population and the value of property at risk in that zone are expected to continue rising. The land below the 3.3-foot line is expected to be permanently inundated someday, possibly as early as 2100, except in places where extensive fortifications are built to hold back the sea. One of the new papers calculates that long before inundation occurs, life will become more difficult in the low-lying zone because the rising sea will make big storm surges more likely. Only in a handful of places have modest steps been taken to prepare. New York City is one: Pumps at some sewage stations have been raised to higher elevations, and the city government has undertaken extensive planning. But the city -- including substantial sections of Brooklyn, Queens and Staten Island -- remains vulnerable, as do large parts of Long Island, Connecticut and New Jersey.

#### Climate change causes sea level rise—risk to coastal communities

**Gillis, writer New York Times, 2012**

(Justin, New York Times March 13 <http://www.nytimes.com/2012/03/14/science/earth/study-rising-sea-levels-a-risk-to-coastal-states.html?_r=1> accessed 7/2 tm)

The project on sea level rise led by Dr. Strauss for the nonprofit organization Climate Central appears to be the most elaborate effort in decades to estimate the proportion of the national population at risk from the rising sea. The papers are scheduled for publication on Wednesday by the journal Environmental Research Letters. The work is based on the 2010 census and on improved estimates, compiled by federal agencies, of the land elevation near coastlines and of tidal levels throughout the country. Climate Central, of Princeton, N.J., was started in 2008 with foundation money to conduct original climate research and also to inform the public about the work of other scientists. For the sea level project, financed entirely by foundations, the group is using the Internet to publish an extensive package of material that goes beyond the scientific papers, specifying risks by community. People can search by ZIP code to get some idea of their own exposure. While some coastal governments have previously assessed their risk, most have not, and national-level analyses have also been rare. The new package of material may therefore give some communities and some citizens their first solid sense of the threat. Dr. Strauss said he hoped this would spur fresh efforts to prepare for the ocean's rise, and help make the public more aware of the risks society is running by pumping greenhouse gases into the air. Scientists say those gases are causing the planet to warm and its land ice to melt into the sea. The sea itself is absorbing most of the extra heat, which causes the water to expand and thus contributes to the rise.

#### Climate change induced sea level rise costs billions

**Gillis, writer New York Times, 2012**

 (Justin, New York Times March 13 <http://www.nytimes.com/2012/03/14/science/earth/study-rising-sea-levels-a-risk-to-coastal-states.html?_r=1> accessed 7/2 tm)

The ocean has been rising slowly and relentlessly since the late 19th century, one of the hallmark indicators that the climate of the earth is changing. The average global rise has been about eight inches since 1880, but the local rise has been higher in some places where the land is also sinking, as in Louisiana and the Chesapeake Bay region. The rise appears to have accelerated lately, to a rate of about a foot per century, and many scientists expect a further acceleration as the warming of the planet continues. One estimate that communities are starting to use for planning purposes suggests the ocean could rise a foot over the next 40 years, though that calculation is not universally accepted among climate scientists. The handful of climate researchers who question the scientific consensus about global warming do not deny that the ocean is rising. But they often assert that the rise is a result of natural climate variability, they dispute that the pace is likely to accelerate, and they say that society will be able to adjust to a continuing slow rise. Myron Ebell, a climate change skeptic at the Competitive Enterprise Institute, a Washington research group, said that ''as a society, we could waste a fair amount of money on preparing for sea level rise if we put our faith in models that have no forecasting ability.'' Experts say a few inches of sea level rise can translate to a large incursion by the ocean onto shallow coastlines. Sea level rise has already cost governments and private landowners billions of dollars as they have pumped sand onto eroding beaches and repaired the damage from storm surges.

#### Sea level rise destroys energy infrastructure

Bingaman, chair Senate Energy and Natural Resources, 2012

(Larry, president and CEO of the South Central Connecticut Regional Water Authority “Impacts of Sea Level Rise” Senate Energy and Natural Resources Committee News Release Congressional Documents and Publications, 19 April 2012 proquest, accessed 6/29/12)NWW

<<"Over the past century, a tremendous amount of high-value infrastructure has been built along the coastlines of the United States. This infrastructure serves the needs of coastal communities and is the foundation for developing much of our abundant coastal energy resource. "Much of that infrastructure has been built in low-lying areas that were already prone to flooding from extreme weather. That's become even more at-risk as sea levels have riSen. About 5 million Americans now live in coastal areas that are less than 4 feet above sea level. There are nearly 300 high-value energy facilities standing on land below that level. These energy facilities include power plants, oil and gas refineries, and natural gas infrastructure. Recent history has shown that not only is this infrastructure already vulnerable to extreme weather, but also that when coastal energy assets are compromised, the energy disruption affects the entire economy. "Sea level rise takes the current level of vulnerability and multiplies it. When sea levels rise, the storm surge associated with extreme storms gets even worse, and even an average storm can have above-average consequences. Water systems that were designed based on a lower sea level may not function properly. Saltwater intrudes on freshwater resources that communities have depended on for years. "These impacts from sea level rise are not theoretical and they are not disputed and they are not in the distant future. They are being confronted today in places like Louisiana and Florida. The affected communities there are already paying substantial costs to try to address them>>.

### Climate change bad impacts—health

#### Climate change will cost over $62 billion in health care costs—asthma proves

Weiss & Madrid, Weiss is a Senior Fellow and Director of Climate Strategy at the Center For American and Jorge Madrid is a Research Associate at CAP, 2012

[By Daniel J. Weiss and Jorge Madrid, Daniel J. Weiss is a Senior Fellow and Director of Climate Strategy at the Center For American and Jorge Madrid is a Research Associate at CAP. “More Action on Climate Change: CAP’s Comments To the EPA on Its Proposed Carbon Pollution Standard.” *ThinkProgress Climate Progress* < http://thinkprogress.org/climate/2012/06/26/506541/more-action-on-climate-change-caps-comments-to-the-epa-on-its-proposed-carbon-pollution-standard/?mobile=nc > June 26, 2012 accessed 06272012.] NWW

Carbon pollution standard will protect public health By contributing to climate change, carbon pollution increases temperatures and amplify the ill-health effects of ground-level ozone (smog) and other pollutants. Smog and other air pollutants worsen asthma symptoms and other respiratory illnesses.[12] A 2011 study in the New York Academy of Sciences by the late Dr. Paul Epstein of Harvard Medical School and others projects that the “best estimates from literature” of the “climate damages from [coal] combustion emissions” is $62 billion annually.[13] The EPA’s own Endangerment Finding for carbon and other greenhouse gas pollutants noted that air pollution “endanger[ed] both the public health and the public welfare of current and future generations.”[14]

### Climate change bad impacts—marginalized groups

#### Climate change disproportionately impacts marginalized groups

Weiss & Madrid, Weiss is a Senior Fellow and Director of Climate Strategy at the Center For American and Jorge Madrid is a Research Associate at CAP, 2012

[By Daniel J. Weiss and Jorge Madrid, Daniel J. Weiss is a Senior Fellow and Director of Climate Strategy at the Center For American and Jorge Madrid is a Research Associate at CAP. “More Action on Climate Change: CAP’s Comments To the EPA on Its Proposed Carbon Pollution Standard.” *ThinkProgress Climate Progress* < http://thinkprogress.org/climate/2012/06/26/506541/more-action-on-climate-change-caps-comments-to-the-epa-on-its-proposed-carbon-pollution-standard/?mobile=nc > June 26, 2012 accessed 06272012.] NWW

The United States will also experience an increase in regional ozone pollution due to higher temperatures and poor air circulation. These health concerned are shared by more than 120 health organizations including the American Academy of Pediatrics, American Lung Association, American Medical Association, American Nurses Association, American Public Health Association, American Thoracic Society, and others who favor reductions in carbon pollution to protect public health. These organizations identified a number of serious health harms from climate change: Climate change is a serious public health issue. As temperatures rise, more Americans will be exposed to conditions that can result in illness and death due to respiratory illness, heat- and weather-related stress and disease carried by insects. These health issues are likely to have the greatest impact on our most vulnerable communities, including children, older adults, those with serious health conditions and the most economically disadvantaged.[15]

### Climate change bad impacts—death straight up

#### Climate change bad---increased mortality rates

Fyall, Environment correspondent, 2012

(Jenny, The Scotsman “Hot summers kill tens of thousands”, http://www.highbeam.com/doc/1P2-31116537.html) CKP

INCREASED fluctuations in summer temperatures caused by climate change could lead to tens of thousands of extra deaths among elderly people each year, a study has warned. Scientists examined the impact on mortality of day-to-day variations in temperature during the summer, which are expected to increase as a consequence of climate change. They found that even small temperature swings, of as little as 1C more than usual, may shorten the life expectancy of elderly people with chronic medical conditions. Previous studies have focused on the short-term effects of heat waves but this is the first study to examine the longer-term effects of climate change on life expectancy. In recent years, scientists have predicted that climate change will not only increase overall world temperatures but will also increase summer temperature variability. The authors looked at the impact of temperature variations on elderly people with diabetes, heart failure, chronic lung disease and those who have survived a previous heart attack.

#### Increasing temperatures result in more than 10,000 deaths per year

Fyall, Environment correspondent, 2012

(Jenny, The Scotsman “Hot summers kill tens of thousands”, <http://www.highbeam.com/doc/1P2-31116537.html>) CKP

Antonella Zanobetti, senior research scientist in the Department of Environmental Health at Harvard School of Public Health, who led the study, said: "The effect of temperature patterns on long-term mortality has not been clear to this point. "We found that, independent of heat waves, high day-to-day variability in summer temperatures shortens life expectancy. "This variability can be harmful for susceptible people." The researchers used data from 1985 to 2006 to follow the long-term health of 3.7 million chronically ill people over the age of 65 and living in 135 US cities. They found that years when the summer temperature swings were larger had higher death rates than years with smaller swings. Each 1C increase in summer temperature variability raised the death rate for elderly people with chronic conditions between 2.8 per cent and 4 per cent, depending on the condition. Mortality risk increased 4 per cent for those with diabetes, 3.8 per cent for those who had had a previous heart attack, 3.7 per cent for those with chronic lung disease and 2.8 per cent for those with heart failure. Based on these increases in mortality risk, the researchers estimate that greater summer temperature variability in the US alone could result in more than 10,000 additional deaths per year. The study is published in the Proceedings of the National Academy of Sciences.

#### Emission reduction slows GW and prevent millions of deaths in Asia and Middle East

ScienceDaily 12

(ScienceDaily “What Can Be Done to Slow Climate Change?” Jan. 12, 2012, <http://www.sciencedaily.com/releases/2012/01/120112193442.htm>) CKP

<< A new study led by a NASA scientist highlights 14 key air pollution control measures that, if implemented, could slow the pace of global warming, improve health and boost agricultural production.The research, led by Drew Shindell of NASA's Goddard Institute for Space Studies (GISS) in New York City, finds that focusing on these measures could slow mean global warming 0.9 ºF (0.5ºC) by 2050, increase global crop yields by up to 135 million metric tons per season and prevent hundreds of thousands of premature deaths each year. While all regions of the world would benefit, countries in Asia and the Middle East would see the biggest health and agricultural gains from emissions reductions.>>

#### Increase temps alone kill hundreds of thousands---we don’t have to win the rate debate

Zabarenko , Environmental Correspondent, 2012

[By Deborah Zabarenko, Environmental Correspondent. “150,000 more US heat deaths projected by 2100.” <http://www.reuters.com/article/2012/05/23/us-climate-heat-deaths-idUSBRE84M1GQ20120523?feedType=RSS&feedName=everything&virtualBrandChannel=11563> WASHINGTON | Wed May 23, 2012 5:11pm EDT accessed 06272012.] NWW

(Reuters) - Killer heat fueled by climate change could cause an additional 150,000 deaths this century in the biggest U.S. cities if no steps are taken to curb carbon emissions and improve emergency services, according to a new report. The three cities with the highest projected heat death tolls are Louisville, with an estimated 19,000 heat-related fatalities by 2099; Detroit, with 17,900, and Cleveland, with 16,600, the Natural Resources Defense Council found in its analysis of peer-reviewed data, released on Wednesday. Concentrated populations of poor people without access to air conditioning are expected to contribute to the rising death tolls. Thousands of additional heat deaths were also projected by century's end for Baltimore, Boston, Chicago, Columbus, Denver, Los Angeles, Minneapolis, Pittsburgh, Providence, St. Louis and Washington, D.C., the report said. June, July and August are expected to see above-normal temperatures over most of the contiguous United States, from inland California to New Jersey, and from as far north as Idaho and Wyoming to Texas, Florida and the desert Southwest, the National Oceanic and Atmospheric Administration said in a May 17 forecast. The last 12 months, from May 2011 to April 2012, were the warmest in the contiguous United States since modern record-keeping began; last month was the hottest April on record for the Northern Hemisphere. These figures show climate change is already being powerfully felt, and more dangerously hot summer days are in prospect under a business-as-usual scenario, said Dan Lashof, director of NRDC's climate and clean air program. NRDC, which with other environmental groups has pushed for curbs on U.S. emissions of heat-trapping carbon dioxide, is backing a plan by the U.S. Environmental Protection Agency to limit carbon emissions from new U.S. power plants. The EPA is holding public hearings on Thursday on the dangers of carbon pollution from power plants. The EPA's plan is unlikely to go into effect until after this year's election campaign. DEADLIEST DAYS The deadliest days are those designated Excessive Heat Events (EHEs), often in urban areas where air conditioning is scarce or unreliable, with sizable poor populations and municipal services unprepared for large numbers of people sickened by the heat, Larry Kalkstein, a University of Miami professor who wrote two studies on the subject. One was published in the American Meteorological Society's journal Weather, Climate and Society; the other in the journal Natural Hazards. Both were peer-reviewed. There could be five times the number of Excessive Heat Event days by mid-century and eight times that number by the end of the century, Kalkstein said in a telephone briefing. The current average number of EHEs per year is 233; by mid-century it could be 1,342, and by 2100, it could be 1,913.The full report is available online here . The most disastrous heat waves, like the one that killed more than 700 people in the Chicago area in 1995, come when high heat lasts beyond two days in urban areas without plans to reach the most vulnerable populations: the elderly, the obese and those on medication. Kalkstein praised Chicago for improving its heat warning system, emergency services and cooling centers since then. He also said Philadelphia and Seattle had put measures in place to lessen the risk from excessive heat days. The studies considered cities because that is where two-thirds of the U.S. population lives, Lashof said. There is some evidence that heat deaths in rural areas will also rise, but that is harder to document, he said. U.S. cities aren't the only ones bracing for the impacts of extreme weather. Ten Asian cities are assessing how ready they are to deal with floods, droughts, heat waves and other expected results of climate change.The Asian Cities Climate Change Resilience Network is working in 10 cities in India, Indonesia, Thailand and Vietnam to figure out technical indicators -- such as the capacity of water systems, sewage and waste-water services and the size of deforested areas upstream from urban areas -- to help plan to protect city residents. More information on the plan is available at www.acccrn.org/ .

### Climate Change Bad Impacts—migration and conflicts

#### Climate changes make resources scarce—leads to armed conflict

Holtermann et al, Doctoral researcher at PRIO, Winter 2011

(Helge, International Security Vol. 36, No. 3 pg 79-106 “Climate Wars? Assessing the Claim That Drought Breeds Conflct”) CKP

The general expectation that failing precipitation could cause armed conflict draws on an influential body of work commonly referred to as the environmental security literature. Thomas Homer-Dixon’s well-known typology of supply- and demand-induced and structural scarcities of renewable resources has informed much research in this area.17 According to this school of thought, less developed countries are most predisposed to endemic resource shortages because they lack the necessary knowledge and capabilities to overcome persistent resource pressure. Likely consequences include reduced economic productivity, migration, sharpening of group demarcations, and disruption of political institutions. These problems would indicate a higher risk of armed conflict, and the environmental security literature is not short on reports of conflicts in resource-poor regions. The models, explanations, and particularly the assumptions of environmental security scholarship have been heavily criticized from a political ecology point of view.18 Quantitative cross-national empirical research has still not converged on a systematic and robust connection between resource scarcity and civil war,19 although disaggregated studies of single countries appear somewhat more supportive.20 Yet, even if endemic scarcities do not generally cause civil war, a sudden drop in resource supply might. For example, subsistence-based populations may be forced to relocate when environmental shocks eradicate their crops or livestock. Migration may instigate violent conflict in several ways: through resource competition between newcomers and natives; through increasing polarization and hardening of socioeconomic cleavages among identity groups; and through antagonism between host authorities and the migrants’ home government caused by suspicion over the real cause or motive for displacement.21 Indeed, migration is viewed with much concern in the emerging discourse on climate security.22 Although there is some statistical evidence for a link between transnational refugee flows and the outbreak of armed conflict,23 it is far from obvious that environment-induced migration (to the extent migration can be considered monocausal) will have the same security implications. Because of a lack of conceptual clarity and a complex web of migration drivers, no empirical study has been able to explore the general consequences of “environmental migration” across multiple cases. Besides, the temporal aspect of the migration-conflict link is underdeveloped and vague, as epitomized by claims that the Sahelian drought in the 1980s caused the war in Darfur more than a decade later.24 The recent economic literature on civil war provides an alternative explanation for a scarcity-conflict connection. In rain-fed agrarian societies, significant deviations from normal precipitation levels will have a negative impact on agricultural output, thereby reducing state income from taxation and exports.25 Such economic shocks are argued to heighten the risk of conflict in two ways. First, they can reduce the government’s counterinsurgent capacity and its ability to deliver public goods, thereby increasing the opportunities and incentives for dissident organizations to take up arms. Second, they can reduce individuals’ economic opportunity cost of becoming a rebel soldier. The latter argument is part of a more general theory of rebellion as individual criminal behavior, where the decision to rebel is based on calculations of expected private economic gains.26

#### Migration from climate change-caused disasters are only short term—displaced people return to rebuild their community

Mank, Political Scientist, and Jackson, Social scientist, 2012

(Bradford, James, Human Rights Quarterly Vol. 34, No. 1, February “Climate Change and Displacement: Multidisciplinary Perspectives”, <http://muse.jhu.edu/journals/hrq/summary/v034/34.1.mank.html>) CKP

Graeme Hugo,18 a geography and environmental studies professor, assesses the potential for climate-induced migration in the Asia-Pacific region, which is considered a possible migration “hot spot” because climate change may have a greater impact in this region compared to other parts of the world. He contends that climate change and resulting environmental degradation are only one cause of migration in the Asia-Pacific region. Because multiple factors besides environmental change contribute to human migration, Hugo argues that measuring the interrelation among varying causes of migration and then accurately forecasting the impact of environmentally-induced migration is quite difficult.19 He emphasizes that a complex interrelationship exists among the mobility of a particular population, the population’s resources (financial, natural, or otherwise), environmental changes, economic development, and social change.20 Scholars must avoid assuming that environmental deterioration is the sole cause of human displacement because environmental changes may in‑ fluence migration, but are not necessarily determinative in causing migration. Hugo identifies five principal causes of environmentally induced migration: (1) natural disasters; (2) slow-onset cumulative changes; (3) involuntarily caused and industrial accidents; (4) development projects; and (5) conflicts and biological workforce changes. Of these, only natural disasters and slow-onset cumulative changes typically involve climate change and migration.21 Some natural disasters such as earthquakes or volcanic eruptions are unrelated to climate change, but the IPCC has identified flooding and intensified cyclones as being linked to climate change.22 Hugo argues that the number of natural disasters is increasing significantly, as is the number of people impacted by them.23 Policy-makers and researchers dedicate most attention to natural disasters and often neglect slow-onset cumulative changes.24 According to Hugo, natural disasters can, and often do, result in forced migration depending on the severity of the disaster, whereas slow-onset cumulative changes tend to induce voluntary migration that is only partly due to environmental factors. It is important to view environmentally induced migration in the context of a continuum, moving from voluntary migration to forced migration. Forced migrants, as distinguished from voluntary migrants, typically do not make preparations, usually maintain a greater commitment to their origin, are more likely to be in a state of stress, are less likely to bring assets, and are less likely to have connections to their host country.25 Hugo explains that people respond to different types of environmental changes through two main migration strategies. Human movements can be used for adapting to the impacts of climate change, or viewed as displacement when “environmental deterioration becomes so extreme that people are forced to leave an area.”26 Adaptation, as a mobility strategy, is most commonly utilized to cope with slow-onset cumulative environmental changes. Because the changes are gradual, people affected by slow-onset cumulative environmental changes have the time to adapt to the environmental impacts through planned migration. As a result, adaptation migration most commonly results in long-term or permanent migration to an elected destination.27 Furthermore, Hugo argues that displacement, as caused by climate change, frequently results in temporary or short-term migration. This strategy is most often in response to sudden and destructive natural disasters. Often, people displaced by disaster return to rebuild their community. The mobility strategies of adaptation versus displacement hinge on a timing factor. The time available to adjust and react to the environmental changes dictates the type of migration strategy employed.28

### Climate Change Bad impact---biodiversity

#### Biodiversity loss past tipping point coming—must act now adaptation doesn’t work

Jowit, political correspondent, March 7 2010

(Juliette, theguardian, <http://www.guardian.co.uk/environment/2010/mar/07/extinction-species-evolve>; CKP)

For the first time since the dinosaurs disappeared, humans are driving animals and plants to extinction faster than new species can evolve, one of the world's experts on biodiversity has warned. Conservation experts have already signalled that the world is in the grip of the "sixth great extinction" of species, driven by the destruction of natural habitats, hunting, the spread of alien predators and disease, and climate change. However, until recently it had been hoped that the rate at which new species were evolving could keep pace with the loss of diversity. Speaking before two reports this week on the state of wildlife in Britain and Europe, Simon Stuart, chair of the Species Survival Commission for the International Union for the Conservation of Nature - the body that officially declares species threatened or extinct - said that that point had now almost certainly been crossed. "Measuring the rate at which new species evolve is difficult, but there's no question that the current extinction rates are faster than that; I think it's inevitable," said Stuart. The IUCN created shockwaves with a major assessment of the world's biodiversity in 2004 which calculated the rate of extinction had reached 100 to 1,000 times that suggested by fossil records before humans. No formal calculations have been published since, but conservationists agree the rate of loss has increased, and Stuart said it was possible the dramatic predictions of experts such as the Harvard biologist EO Wilson, that the rate of loss could reach 10,000 times the background rate in two decades, could be correct. "All the evidence is he's right," said Stuart. "Some people claim it already is that . . . things can only have deteriorated because of the drivers of the losses, such as habitat loss and climate change, all getting worse. But we haven't measured extinction rates again since 2004, and because our current estimates contain a tenfold range there has to be a very big deterioration or improvement to pick up a change."

#### Biodiversity loss accelerating

Jowit, political correspondent, March 7 2010

(Juliette, theguardian, <http://www.guardian.co.uk/environment/2010/mar/07/extinction-species-evolve>; CKP)

Extinction is part of the evolution of life, and only 2-4% of the species that have ever lived on Earth are thought to be alive today. However, fossil records suggest that for most of the planet's 3.5bn-year history the rate of loss may have been about one in every million species each year. Only 869 extinctions have been formally recorded since 1500, because scientists have described fewer than 2m of an estimated 5m-30m species around the world, and assessed the conservation status of only 3% of those. The global extinction rate is extrapolated from the rate among known species. In this way the IUCN calculated in 2004 that the loss had risen to 100-1,000 per million species each year, a situation comparable to the five previous mass extinctions - the last of which was when the dinosaurs were wiped out about 65m years ago. Critics, including the author of The Skeptical Environmentalist, Bjorn Lomborg, have argued that because such figures rely on so many estimates, the margins of error make them unreliable. However, Stuart said that the IUCN figure was likely to be an underestimate of the problem, because scientists are reluctant to declare species extinct even when they have sometimes not been seen for decades, and because few of the world's plants, fungi and invertebrates have yet been formally recorded and assessed. Swedish scientists had already warned that anything over 10 times the background rate of extinction - 10 species in every million per year - was above the limit if the world was to be safe for humans, said Stuart. "No one's claiming it's as small as 10 times," he said. "The only thing we're certain about is the extent is way beyond what's natural and it's getting worse." Many more species are discovered every year around the world than are recorded extinct, but these "new" plants and animals are existing species found by humans for the first time.

#### Now is key - Loss of biodiversity can lead to rapid and irreversible changes in global ecosystems, causing extinction

McQuaid, Science and environment journalist, June 7, 2012

(John, Forbes “The Mother of All Tipping Points”, <http://www.forbes.com/sites/johnmcquaid/2012/06/07/the-mother-of-all-tipping-points/>; CKP)

Is the world doomed? Well, not exactly. But the world we know may be heading toward a series of irreversible ecological tipping points that will render it unrecognizable, according to a [new study out in Nature](http://www.nature.com/nature/journal/v486/n7401/full/nature11018.html) with the understated title “Approaching a state shift in Earth’s biosphere” (behind a paywall, unfortunately). An interdisciplinary group of scientists analyzed dozens of studies documenting rapid ecosystem changes from the past and already underway. The basic takeaway: ecosystems can change quickly, and irreversibly, on small scales and large. Over the past 10,000 years the rise of civilization has put unprecedented stresses on global ecosystems. As Brandon Keim writes in Wired.com, a certain point, what began as local transformations can [scale up and become global](http://www.wired.com/wiredscience/2012/06/earth-tipping-point/): [We seem to face] a type of transformation not described in traditional ideas of nature as existing in a static balance, with change occurring gradually. Instead, the systems seem to be dynamic, ebbing and flowing within a range of biological parameters. Stress those parameters — with fast-rising temperatures, say, or a burst of nutrients — and systems are capable of sudden, feedback loop-fueled reconfiguration. According to some researchers, that’s what happened when [life’s diversity exploded in an eyeblink 540 million years ago](http://edoc.gfz-potsdam.de/pik/get/2028/0/896c9a896f4705498180bc4acdefaf63/bloh.pdf), or much more recently when a glacier-chilled Earth became in a couple thousand years the temperate garden that cradled human civilization. But while the Cambrian explosion and Holocene warming were sparked by natural, planet-wide changes to ocean chemistry and solar intensity, say Barnosky and colleagues, there’s a new force to consider: [7 billion people](http://www.wired.com/wiredscience/2011/10/7-billion-people/) who exert a combined influence usually associated with planetary processes.

#### Pressure on biodiversity from human activities

Ansley, Australia correspondent, March 15 2012

(Greg, The New Zealand Herald, <http://www.nzherald.co.nz/world/news/article.cfm?c_id=2&objectid=10792060>; CKP)

Twenty years ago this month, Canada and an-other 192 countries signed a legally binding international agreement - the Convention on Biological Diversity - to protect biodiversity. This week, delegates from around the globe are meeting at the Rio+20 conference in Rio de Janeiro to evaluate progress made in conserving bio-diversity in the interim. But at a time when we are facing economic stagnation and the need to feed 7 billion people on the planet, why should we worry about bio-diversity and reduce our use of the environment? Because life on Earth, to the best of our knowledge, is unique in the universe. It is an awe-inspiring multitude of living creatures that inhabit, but also sustain, a biosphere upon which all humans depend. Biological diversity - or its contraction, "biodiversity" - refers to the great variety of life in all its manifestations, from genes to ecosystems and bacteria to belugas. Expansion of the human enter-prise is eroding biodiversity at a rate unprecedented in human history. Already, 627 species are at risk of extinction in Canada. The rate of extinction will peak in the next 50 years because of on-going economic expansion, climate change, pollution and habitat destruction. By then we may well be experiencing the Earth's sixth mass extinction. Our ecosystems are of enormous benefit to Canadian society, providing goods such as food, timber and water, and services such as flood control and fertile soils. Past research has estimated the value of such "ecosystem ser-vices" from Canadian boreal ecosystems at $93 billion per year, roughly nine per cent of Canada's GDP. If we view ecosystems as giant engines that transform simple inputs (such as sun-light and carbon dioxide) into useful outputs (such as oxygen, biomass and clean water), then species are the moving parts in this engine. How many of these parts can an ecosystem lose before it ceases to operate efficiently?

#### Loss of biodiversity leads to extinction, empirics prove

Wagler, Assistant Professor of Science Education, 2011

(Ron, The American Biology Teacher Vol. 73 February 2011) CKP

There have been five past great mass extinctions during the history of Earth. There is an ever-growing consensus within the scientific community that we have entered a sixth mass extinction. Human activities are associated directly or indirectly with nearly every aspect of this extinction. This article presents an overview of the five past great mass extinctions; an overview of the current Anthropocene mass extinction; past and present human activities associated with the current Anthropocene mass extinction; current and future rates of species extinction; and broad science-curriculum topics associated with the current Anthropocene mass extinction that can be used by science educators. These broad topics are organized around the major global,anthropogenic direct drivers of habitat modification, fragmentation, and destruction; overexploitation of species; the spread of invasive species and genes; pollution; and climate change. (vol.73) There have been five past great mass extinctions during the history of Earth (Jablonski, 1995; Erwin, 2001. All five were characterized by “a profound loss of biodiversity during a relatively short period” (Wake & Vredenburg, 2008: p. 11466). The first mass extinction, the Ordovician—Silurian, occurred approximately () 439 million years ago (mya). The fifth, the Cretaceous—Tertiary, occurred 65 mya (Jablonski, 1995; Erwin, 2001). It was this extinction that saw the demise of the nonavian dinosaurs (Wake & Vredenburg, 2008). The most devastating mass extinction was the Permian—Triassic extinction (251 mya), in which 95% of all global species went extinct (Jablonski, 1995; Erwin, 2001).

#### Biodiversity impact—Bio-d key to economy

Ansley, Australia correspondent, March 15 2012

(Greg, The NZ Herald, <http://www.nzherald.co.nz/world/news/article.cfm?c_id=2&objectid=10792060>; CKP)

The last 20 years has seen an enormous scientific effort to answer this question. More than 600 experiments have examined how biodiversity loss impacts our ecosystems and showed overwhelming evidence that reducing local biodiversity results in un-healthy ecosystems. If we do not slow the rate of biodiversity loss, our economy will begin to pay a massive ecological price for business as usual. The widespread consequences for humankind stand in sharp contrast to the lack of current political leadership on the subject. This is particularly evident in Canada, where existing environmental legislation is already weaker than comparable laws in the U.S. and Western Europe.

#### Climate change bad—even if it saves some species, more will go extinction—our evidence is comparative

Associated Press, 2012

Seth Borenstein, St. Louis Today, “Global Warming Benefits Once-Rare Butterfly,” May 25, http://www.stltoday.com/news/national/global-warming-benefits-once-rare-butterfly/article\_8181ac9b-cd71-5894-a782-1ce6e05cad9d.html, last accessed 7.2.12

The climate is threatening the existence of many species, such as the giant polar bear. But in the case of the small drab British butterfly, it took a species in trouble and made it thrive.

It's all about food. Over about 25 years, the butterfly went from in trouble to pushing north in Britain where it found a veritable banquet. Now the butterfly lives in twice as large an area as it once did and is not near threatened, according to a study in Friday's issue of the journal Science.

Decades ago, the brown Argus "was sort of a special butterfly that you would have to go to a special place to see, and now it's a butterfly you can see in regular farmland or all over the place," said study co-author Richard Fox, an ecologist at Butterfly Conservation, a science and advocacy group in the United Kingdom.

Global warming helping the brown Argus is unusual compared with other species, and that's why scientists are studying it more, said study co-author Jane Hill, a professor of ecology at the University of York.

Biologists expect climate change to create winners and losers in species. Stanford University biologist Terry Root, who wasn't part of this study, estimated that for every winner like the brown Argus there are three loser species, like the cuckoo bird in Europe. Hill agreed that it's probably a 3-1 ratio of climate change losers to winners.

As the world warms, the key interactions between species break down because the predator and prey may not change habitats at the same time, meaning some species will move north to cooler climes and won't find enough to eat, Root said.

"There are just so many species that are going to go extinct," Root said.

### Climate change Bad Impacts—wildfires

#### Climate change bad--GW causes wildfires—economic and biodiversity harms from wildfires

Zabarenko, Environment correspondent, 2012

(Deborah, Reuters “Climate Change will boost number of West’s wildfires” June 12, <http://uk.reuters.com/article/2012/06/12/us-climate-wildfires-idUKBRE85B09420120612>) CKP

Climate change will make U.S. western wildfires, like those now raging in parts of Colorado and New Mexico, more frequent over the next 30 years, researchers reported on Tuesday. More broadly, almost all of North America and most of Europe will see wildfires more often by the year 210

#### Climate change rapidly increases temperatures – wildfires

Borenstein, Science writer at Associated Press, 2012

(Seth, The Huffington Post “Climate Change: U.S. Heat Waves, Wildfires And Flooding Are ‘What Global Warming Looks Like” July 3, 2012, [http://www.huffingtonpost.com/2012/07/03/climate-change-us-heat-wave-wildfire-flooding\_n\_1645616.html#](http://www.huffingtonpost.com/2012/07/03/climate-change-us-heat-wave-wildfire-flooding_n_1645616.html)) CKP

Such patterns haven't happened only in the past week or two. The spring and winter in the U.S. were the warmest on record and among the least snowy, setting the stage for the weather extremes to come, scientists say. Since Jan. 1, the United States has set more than 40,000 hot temperature records, but fewer than 6,000 cold temperature records, according to the National Oceanic and Atmospheric Administration. Through most of last century, the U.S. used to set cold and hot records evenly, but in the first decade of this century America set two hot records for every cold one, said Jerry Meehl, a climate extreme expert at the National Center for Atmospheric Research. This year the ratio is about 7 hot to 1 cold. Some computer models say that ratio will hit 20-to-1 by midcentury, Meehl said. "In the future you would expect larger, longer more intense heat waves and we've seen that in the last few summers," NOAA Climate Monitoring chief Derek Arndt said. The 100-degree heat, drought, early snowpack melt and beetles waking from hibernation early to strip trees all combined to set the stage for the current unusual spread of wildfires in the West, said University of Montana ecosystems professor Steven Running, an expert on wildfires.

#### Climate Change increases temperatures—wildfires

Borenstein, Science writer at Associated Press, 2012

(Seth, The Huffington Post “Climate Change: U.S. Heat Waves, Wildfires And Flooding Are ‘What Global Warming Looks Like” July 3, 2012, [http://www.huffingtonpost.com/2012/07/03/climate-change-us-heat-wave-wildfire-flooding\_n\_1645616.html#](http://www.huffingtonpost.com/2012/07/03/climate-change-us-heat-wave-wildfire-flooding_n_1645616.html)) CKP

So far this year, more than 2.1 million acres have burned in wildfires, more than 113 million people in the U.S. were in areas under extreme heat advisories last Friday, two-thirds of the country is experiencing drought, and earlier in June, deluges flooded Minnesota and Florida. "This is what global warming looks like at the regional or personal level," said Jonathan Overpeck, professor of geosciences and atmospheric sciences at the University of Arizona. "The extra heat increases the odds of worse heat waves, droughts, storms and wildfire. This is certainly what I and many other climate scientists have been warning about." Kevin Trenberth, head of climate analysis at the National Center for Atmospheric Research in fire-charred Colorado, said these are the very record-breaking conditions he has said would happen, but many people wouldn't listen. So it's I told-you-so time, he said. As recently as March, a special report an extreme events and disasters by the Nobel Prize-winning Intergovernmental Panel on Climate Change warned of "unprecedented extreme weather and climate events." Its lead author, Chris Field of the Carnegie Institution and Stanford University, said Monday, "It's really dramatic how many of the patterns that we've talked about as the expression of the extremes are hitting the U.S. right now." "What we're seeing really is a window into what global warming really looks like," said Princeton University geosciences and international affairs professor Michael Oppenheimer. "It looks like heat. It looks like fires. It looks like this kind of environmental disasters." Oppenheimer said that on Thursday. That was before the East Coast was hit with triple-digit temperatures and before a derecho – a large, powerful and long-lasting straight-line wind storm – blew from Chicago to Washington. The storm and its aftermath killed more than 20 people and left millions without electricity. Experts say it had energy readings five times that of normal thunderstorms. Fueled by the record high heat, this was among the strongest of this type of storm in the region in recent history, said research meteorologist Harold Brooks of the National Severe Storm Laboratory in Norman, Okla. Scientists expect "non-tornadic wind events" like this one and other thunderstorms to increase with climate change because of the heat and instability, he said.

### Carbon emissions bad—ocean acidification

#### Emissions acidifying oceans at a rapid rate—threatens species, collapses ocean ecosystem

Chestney, Senior Environmental Markets Correspondent, 2012

(Nina, Reuters “Global warming close to becoming irreversible-scientists” March 26, 2012, <http://www.reuters.com/article/2012/03/26/us-climate-thresholds-idUSBRE82P0UJ20120326>) CKP

Increased CO2 in the atmosphere has also turned oceans more acidic as they absorb it. In the past 200 years, ocean acidification has happened at a speed not seen for around 60 million years, said Carol Turley at Plymouth Marine Laboratory. This threatens coral reef development and could lead to the extinction of some species within decades, as well as to an increase in the number of predators.

#### Carbon emissions causes ocean acidification destroy marine life

Collins, Science Correspondent, 2012

(Nick, The Telegraph, <http://www.telegraph.co.uk/earth/environment/climatechange/9115699/Oceans-acidifying-at-unparalleled-rate.html> June 27, 2012; CKP)

A new study published in the *Science* journal suggests the increasing amount of carbon dioxide being absorbed by the seas is causing them to turn acidic with "unparalleled" speed. If the trend continues it could have a variety of serious effects on marine life by slowing rates of growth, causing animals to produce fewer offspring and causing shells to dissolve, experts said. Oceans currently absorb about a quarter of all CO2 emissions, and as levels of the gas in the atmosphere increase so does the rate at which it dissolves in seawater, making the water more acidic. Researchers studying 300 million years' worth of data on global warming and acidifying oceans found the current rate of acidification is even greater than four other major periods of climate change in the Earth's history. These included the impact of the asteroid which wiped out the dinosaurs, and the Permian mass-extinction 252 million years ago, when 95 per cent of life on Earth was destroyed. Professor Andy Ridgwell, of Bristol University, said: "The geological record suggests that the current acidification is potentially unparalleled in at least the last 300 million years of Earth history, and raises the possibility that we are entering an unknown territory of marine ecosystem change. "Although similarities exist, nothing in the last 300 million years parallels rates of future projections in terms of the disrupting of ocean carbonate chemistry – a consequence of the unprecedented rapidity of CO2 release currently taking place."

## Answer to Answer blocks to defend climate change is bad

### [They say “any climate change good argument”](#_Toc303711445)

#### Climate doesn’t create winners--really

**Palmer, Health and science writer 2012**

**(**Brian, Washington post, January 23 2012<http://www.washingtonpost.com/national/health-science/global-warming-would-harm-the-earth-but-some-areas-might-find-it-beneficial/2012/01/17/gIQAbXwhLQ_story.html>) JMV

Keller chafes at the notion of climate-change winners. "It's one thing that, on average, the yield of a few cultivars can increase," he says. "But heat waves increase mortality, increased drought makes life less enjoyable, and extreme weather events can be quite damaging."

### They say “adaptation possible”

#### Mitigation can slow sea level rise long enough for adaptation

Chestney, Senior Environmental Markets Correspondent, 2012

(Nina, Reuters “Rise in sea level can’t be stopped: scientists” July 1, 2012, http://www.reuters.com/article/2012/07/01/us-climate-sealevel-idUSBRE8600EG20120701?feedType=RSS&feedName=everything&virtualBrandChannel=11563)CKP

If global average temperatures continue to rise, the melting of ice sheets and glaciers would only add to the problem. The scientists calculated that if the deepest emissions cuts were made and global temperatures cooled to 0.83 degrees in 2100 - forecast based on the 1986-2005 average - and 0.55 degrees by 2300, the sea level rise due to thermal expansion would continue to increase - from 14.2cm in 2100 to 24.2cm in 2300. If the weakest emissions cuts were made, temperatures could rise to 3.91 degrees Celsius in 2100 and the sea level rise could increase to 32.3cm, increasing to 139.4cm by 2300. "Though sea-level rise cannot be stopped for at least the next several hundred years, with aggressive mitigation it can be slowed down, and this would buy time for adaptation measures to be adopted," the scientists added.

### [They say “climate change good—increase agriculture”](#_Toc303711450)

#### AT AG turn---CO2 not so good for plants

**Prothero, Professor of Geology at Occidental College in Los Angeles, and Lecturer in Geobiology at the California Institute of Technology, 2012.**

(Donald “How We Know Global Warming is Real and Human Caused” Skeptic VOl 17 iss 2)

\* "Carbon dioxide is good for plants, so the world will be better off." Who do they think they're kidding? The Competitive Enterprise Institute (funded by oil and coal companies and conservative foundations17) has run a series of shockingly stupid ads concluding with the tag line "Carbon dioxide: they call it pollution, we call it life." Anyone who knows the basic science of earth's atmosphere can spot the gross inaccuracies in this ad.18 True, plants take in carbon dioxide that animals exhale, as they have for millions of years. But the whole point of the global warming evidence (as shown from ice cores) is that the delicate natural balance of carbon dioxide has been thrown off balance by our production of too much of it, way in excess of what plants or the oceans can handle. As a consequence, the oceans are warming19,20 and absorbing excess carbon dioxide making them more acidic. Already we are seeing a shocking decline in coral reefs ("bleaching") and extinctions in many marine ecosystems that can't handle too much of a good thing. Meanwhile, humans are busy cutting down huge areas of temperate and tropical forests, which not only means there are fewer plants to absorb the gas, but the slash and burn practices are releasing more carbon dioxide than plants can keep up with. There is much debate as to whether increased carbon dioxide might help agriculture in some parts of the world, but that has to be measured against the fact that other traditional "breadbasket" regions (such as the American Great Plains) are expected to get too hot to be as productive as they are today. The latest research21 actually shows that increased carbon dioxide inhibits the absorption of nitrogen into plants, so plants (at least those that we depend upon today) are not going to flourish in a greenhouse world. It is difficult to know if those who tell the public otherwise are ignorant of basic atmospheric science and global geochemistry, or if they are being cynically disingenuous.>>>

### [They say “Climate good ice age”](#_Toc303711451)

**No cooling now—flawed data**

**Prothero, Professor of Geology at Occidental College in Los Angeles, and Lecturer in Geobiology at the California Institute of Technology, 2012.**

(Donald “How We Know Global Warming is Real and Human Caused” Skeptic VOl 17 iss 2)

<\* "The climate records since 1995 (or 1998) show cooling." That's simply untrue. The only way to support this argument is to cherry-pick the data.14 Over the short term, there was a slight cooling trend from 19982000, but only because 1998 was a record-breaking El Niño year, so the next few years look cooler by comparison (Fig. 4). But since 2002, the overall long-term trend of warming is unequivocal. All of the 16 hottest years ever recorded on a global scale have occurred in the last 20 years. They are (in order of hottest first): 2010, 2009, 1998, 2005, 2003, 2002, 2004, 2006, 2007, 2001, 1997, 2008, 1995, 1999, 1990, and 2000.1S In other words, every year since 2000 has been on the Top Ten hottest years list. The rest of the top 16 include 1995, 1997, 1998, 1999, and 2000. Only 1996 failed to make the list (because of the short-term cooling mentioned already).>>

### [They say “US/Russia need climate change to access Artic”](#_Toc303711457)

#### Increase tension from development of region

Kroh, Climate Guest Writer at ClimateProgress, 2012

(Kiley, ThinkProgress “How Climate Change Could Reshape Geopolotics Around the Arctic”, http://thinkprogress.org/climate/2012/06/12/498091/how-climate-change-could-reshape-geopolitics-around-the-arctic/) CKP

Increased opportunity will also lead to increased conflict. In analyzing recent policy statements and actions of the Arctic states, the report notes that while the countries seem “focused on building a cooperative security environment in the region,” there is an “apparently contradictory trend toward modernizing their military forces in the Arctic … Consequently, if political cooperation in the region should sour, most of the Arctic nations will have forces that are prepared to compete in a hostile environment.” Further complicating Arctic claims is the absence of the U.S. in the [Law of the Sea](http://www.nytimes.com/2012/05/24/world/americas/law-of-the-sea-treaty-is-found-on-capitol-hill-again.html) treaty, or UNCLOS, which details the rights and responsibilities of nations when it comes to use and protection of the world’s oceans. The treaty also provides an important framework for resolving territorial disputes in the Arctic. UNCLOS is ratified by every other developed country and is supported by a broad coalition that includes [five former Republican secretaries of state](http://online.wsj.com/article/SB10001424052702303674004577434770851478912.html), the Chamber of Commerce, and major environmental groups. America’s failure to ratify this key treaty puts us at an immediate disadvantage in frontier regions like the Arctic. And what of the environmental implications? With more vessels trying to navigate the narrow straits and channels of the Northwest Passage, commercial fishing vessels, cruise ships, and drilling rigs operating in the previously inaccessible Arctic Ocean, the risk of a collision or oil spill increase exponentially. As detailed in the Center for American Progress report,[Putting a Freeze on Arctic Ocean Drilling: America’s Inability to Respond to an Oil Spill in the Arctic](http://www.americanprogress.org/issues/2012/02/pdf/arcticreport.pdf), the U.S. lags far behind other Arctic nations in infrastructure and preparedness to respond to a major event. There are no U.S. Coast Guard stations north of the Arctic Circle, and we currently operate just one functional icebreaking vessel. Alaska’s tiny ports and airports are incapable of supporting an extensive and sustained airlift effort. The region even lacks such basics as paved roads and railroads.

## Climate change not so bad

### Climate change impact defense—no water wars

#### Climate change does not lead to conflict

Holtermann et al, Doctoral researcher at PRIO, Winter 2011

(Helge, International Security Vol. 36, No. 3 pg 79-106 “Climate Wars? Assessing the Claim That Drought Breeds Conflct”) CKP

This study offers a rigorous assessment of the claim that drought and water shortages increase the risk of civil war.7 In contrast to earlier attempts to study the scarcity-conflict nexus in a comparative manner, we explicitly incorporate the role of ethnopolitical structures. Not all groups in a society are equally vulnerable to environmental shocks. Almost all accounts of land and water conflicts in Africa concern peripheral and neglected groups in weak or oppressive regimes—even though the nature of the political system in these narratives often remains implicit. Environmental hardships, such as prolonged drought, tend to accentuate societal divides, as marginalized groups lack alternative means of livelihood and income and are less likely to be at the receiving end of government-sponsored redistribution programs and relief aid. This leads to a second significant improvement of this study: its geographically disaggregated design. Grievances and human suffering will emerge first, and be most acute, in locations where drought coincides with political and economic marginalization. Local, short-term implications could include lowered opportunity cost of rebel recruitment and a higher motivation for using violence to redress grievances. Therefore, if leading politicians, think tanks, and environmental security scholars are correct—if a regular pattern of increasing water scarcity and increasing risk of violent conflict truly exists—this should be observed where drought strikes marginalized populations in poor, agrarian, nondemocratic societies. To evaluate the empirical validity of this general proposition, we employ a high-resolution gridded dataset of Africa from 1960 to 2004 that combines georeferenced and annualized precipitation data with new data on the point location of civil war onset and the location and political status of ethnic groups.8 We test a large selection of alternative location-specific drought measures and allow for both direct and conditional relationships, where the effect of drought is contingent on various sociopolitical characteristics at the local as well as the national level. In contrast to popular conception, the analysis reveals little evidence of a drought-conflict connection. Although we find strong support for the exclusion perspective—African civil wars break out disproportionately in politically marginalized areas—this statistical regularity is unaffected by abrupt local water shortages. This finding calls for moderation when discussing security implications of climate change, particularly within the context of policy advice and practice.

#### No correlation between drought and conflict—studies prove

Holtermann et al, Doctoral researcher at PRIO, Winter 2011

(Helge, International Security Vol. 36, No. 3 pg 79-106 “Climate Wars? Assessing the Claim That Drought Breeds Conflct”) CKP

In his acceptance lecture on the occasion of the Nobel Peace Prize award, President Barack Obama stated, “There is little scientific dispute that if we do nothing, we will face more drought, more famine, more mass displacement all of which will fuel more conflict for decades.”79 So far, there is little scientific evidence to support this claim. The results presented in this article demonstrate that there is no direct, short-term relationship between drought and civil war onset, even within contexts presumed most conducive to violence. At the same time, the analysis solidifies claims of recent scholarship on the importance of ethnically inclusive institutions for maintaining peace. Ethnopolitical exclusion is strongly and robustly related to the local risk of civil war. These findings contrast with efforts to blame violent conflict and atrocities on exogenous non-anthropogenic events, such as drought or desertification. The primary causes of intrastate armed conflict and civil war are political, not environmental. Consequently, the future security of Africa depends not on climate mitigation but on political and socioeconomic development.

#### Empirically climate shocks do not lead to war

Bergholt and Lujala 2012

[ Bergholt, D. and Lujala, P. 2012. Climate-related natural disasters, economic growth, and armed civil conflict. Journal of Peace Research 49 vol. 49 no. 1 : 147-162. <http://www.co2science.org/articles/V15/N26/C1.php> accessed 06272012] NWW

In the first stage of their analysis, the two Norwegian researchers did indeed find that "climate-related disasters have a negative impact on growth," but they say that their analysis of disaster data and conflict onset shows that "climate-related natural disasters do not have any direct effect on conflict onset." And they additionally report that they "did not find any evidence that economic shocks caused by climate-related disasters have an effect on conflict onset," noting that their findings "are similar to those in the recent cross-country study by Ciccone (2011)."

### Climate change impact defense—sea level rise

#### Sea level rise inevitable—thermal expansion

Chestney, Senior Environmental Markets Correspondent, 2012

(Nina, Reuters “Rise in sea level can’t be stopped: scientists” July 1, 2012, <http://www.reuters.com/article/2012/07/01/us-climate-sealevel-idUSBRE8600EG20120701?feedType=RSS&feedName=everything&virtualBrandChannel=11563>) CKP

But even if the most ambitious emissions cuts are made, it might not be enough to stop sea levels rising due to the thermal expansion of sea water, said scientists at the United States' National Centre for Atmospheric Research, U.S. research organization Climate Central and Centre for Australian Weather and Climate Research in Melbourne. "Even with aggressive mitigation measures that limit global warming to less than 2 degrees above pre-industrial values by 2100, and with decreases of global temperature in the 22nd and 23rd centuries ... sea level continues to rise after 2100," they said in the journal Nature Climate Change. This is because as warmer temperatures penetrate deep into the sea, the water warms and expands as the heat mixes through different ocean regions. Even if global average temperatures fall and the surface layer of the sea cools, heat would still be mixed down into the deeper layers of the ocean, causing continued rises in sea levels.

### Climate change impact defense—Atlantic Conveyor belt

#### CC Good- Research proves that the North Atlantic conveyor belt is not being harmed

**Bruno,** Senior Research Fellow at the Fondation pour la Recherche Stratégique, Paris **11**

**(**Tertrais, ‘The Climate Wars Myth” THE WASHINGTON QUARTERLY, summer 2011, Accssed 7/4/12) SACPg.21,

[The interruption of the North Atlantic Conveyor Belt (‘‘Gulf Stream’’) due to global warming is a favorite of thrillers and science-fiction writers. The study of its consequences by a consulting firm at the request of the U.S. Department of Defense’s Office of Net Assessment a few years ago was widely noted. 19 The problem is that the credibility of this scenario is close to nil. Recent scientific research has shown that the Gulf Stream is animated much less by thermohaline circulation (differences in the temperature and salinity of water) than by the winds. Moreover, its role in shaping and regulating the climate of Northern Atlantic regions has been seriously put in doubt.] Pg 21

### Climate change impact defense—adaptation possible

#### Climate change impact defense---effects beneficial in some geographic areas

**Palmer, Health and science writer 2012**

**(**Brian, Washington post, January 23<http://www.washingtonpost.com/national/health-science/global-warming-would-harm-the-earth-but-some-areas-might-find-it-beneficial/2012/01/17/gIQAbXwhLQ_story.html>) JMV

Global warming" and "climate change" succinctly describe a complicated phenomenon, and in just a few decades they have become common descriptors. But while global warming would be bad for the Earth as a whole, the accumulation of greenhouse gases in the atmosphere would affect different areas in different ways, and local climate change is what matters to many people. So let's look at the relative winners and losers. Two factors will likely determine whether a particular region will prosper or suffer as climate change progresses: starting temperature and adaptability.

You don't hear much talk about it, but countries that are cold right now could see very real benefits from a few extra degrees. Consider the Northern Sea shipping route, which runs through the Arctic waters north of Europe and Asia. It's a faster and cheaper way to ship oil from Russia and Norway to markets around the world, but it's currently too icy to navigate for much of the year. Climate change could open the route earlier and keep it clear later. It may also allow companies to extract new oil and mineral wealth from beneath the sea. Immigration patterns may shift as different areas become more comfortable. In his book ["The World in 2050](http://www.amazon.com/World-2050-Shaping-Civilizations-Northern/dp/0525951814)," UCLA professor Laurence C. Smith notes that cold-weather Canada has the look of a future superpower. Over the next four decades, the country's population growth rate will be among the highest in the developed world. There's also a potential farming benefit. According to the International Panel on Climate Change, global warming[could improve agricultural productivity](http://www.ipcc.ch/publications_and_data/ar4/wg2/en/ch12s12-4-7.html)in northern Europe. The region might see as much as a 30 percent increase in wheat production, for example, by 2080. Some countries will become hospitable to foods they can't grow in 2012. There may be a 50 percent increase in the areas of Sweden and Finland that are suitable for growing corn. "There's a perception that Norway will be a climate-change winner, and some have even talked about growing wine grapes," says Karen O'Brien, a professor of sociology and human geography at the University of Oslo who has written about the winners and losers in the future world of climate change. She cautions Norwegian policymakers against irrational climate-change exuberance, though. "Once you go above [an increase of] three or four degrees Celsius [about five to seven degrees Fahrenheit], it's hard to imagine anyone benefitting. Changes in precipitation patterns and volume could undermine the temperature benefits, and the warmer winters could open the area to new pests and invasive species."

### Climate change good impacts—ag

#### Climate change good—higher CO2 levels would boost agriculture—CO2 increases would be incremental, most studies overstate positive feedbacks

**Happer, Professor of Physics at Princeton University, 2011**

William, Public Service Europe, “Will increased carbon dioxide levels actually benefit the plantet?,” August 22, http://www.publicserviceeurope.com/article/751/will-increased-carbon-dioxide-levels-actually-benefit-planet, last accessed 7.3.12
Did the world have just the right concentration of carbon dioxide at the pre-industrial level of 270 parts per million? Reading breathless media reports about CO2 "pollution" and about minimising our "carbon footprints", one might think that the earth cannot have too little CO2. Humans and most other animals would do fine in a world with no atmospheric CO2 - but most plants stop growing if CO2 levels drop much below 150 ppm, so we would starve to death without at least this minimal amount. We are probably better off with our current 390 ppm than with the preindustrial 270 ppm, and we would be better off with still more CO2. For example, there is evidence that California orange groves are about 30 percent more productive today than they were 150 years ago because of the increase of atmospheric CO2.
What atmospheric levels of CO2 would be a direct threat to health? Both the United States Navy and NASA have performed extensive studies of human tolerance to CO2. As a result of these studies, the navy recommends an upper limit of about 8,000 ppm for cruises of 90 days and NASA recommends an upper limit of 5,000 ppm for missions of 1,000 days. We conclude that atmospheric CO2 levels should be above about 150 ppm to avoid harming green plants and below about 5,000 ppm to avoid harming people.
That is a big range, and our atmosphere is much closer to the lower end than the upper end. We were not that far from CO2 anorexia when massive burning of fossil fuels began. At the current rate of burning fossil fuels, we are adding about 2 ppm of CO2 per year to the atmosphere, so getting from our current level of about 390 ppm to 1,000 ppm would take about 300 years—and 1,000 ppm is still less than most plants would prefer, and much less than either the NASA or the navy limit.
Yet there are strident calls to immediately stop further increases in CO2 levels and reduce levels back to the 270 ppm pre-industrial value that was supposedly "the best of all possible worlds". The first reason for limiting CO2 was to fight global warming. Since the predicted warming has failed to be nearly as large as computer models forecasts, the reason was amended to stopping climate change. Sancta simplicitas. Climate change itself has been embarrassingly uneventful, so another rationale for reducing CO2 is now promoted: to stop the supposed increase of extreme climate events like droughts, hurricanes or tornados.
But dispassionate data show that the frequency of extreme events has hardly changed and in some cases has decreased in the 150 years that CO2 levels have increased from 270 ppm to 390 ppm. Other things being equal, doubling the current CO2 level in the atmosphere will increase the surface temperature by about 1 C. This modest warming, together with documented benefits to plant life, would be an overall benefit. The supposed ill effects of more CO2 are from computer models in which water vapour and clouds multiply the modest direct warming by factors of three, four even 10. Observations show no evidence for these large ``positive feedbacks."
In the preface to the first edition of his Extraordinary Popular Delusions and the Madness of Crowds, Charles Mackay wrote: "The object of the author in the following pages has been to collect the most remarkable instances of those moral epidemics which have been excited, sometimes by one cause and sometimes by another, and to show how easily the masses have been led astray, and how imitative and gregarious men are, even in their infatuations and crimes." The contemporary crusade to demonize CO2 has much in common with the medieval crusades Mackay describes - with true believers, opportunists, cynics, money-hungry governments, manipulators of various types and even children's' crusades. The world has more important, real problems to tend to.

#### Climate change good—increased CO2 boosts crop yields—negative effects are exaggerated

**Happer, Professor of Physics at Princeton University, 2011**

William, The Wall Street Journal, “Global Warming Models Are Wrong Again,” March 27, http://online.wsj.com/article/SB10001424052702304636404577291352882984274.html, last accessed 7.3.12

CO2 is not a pollutant. Life on earth flourished for hundreds of millions of years at much higher CO2 levels than we see today. Increasing CO2 levels will be a net benefit because cultivated plants grow better and are more resistant to drought at higher CO2 levels, and because warming and other supposedly harmful effects of CO2 have been greatly exaggerated. Nations with affordable energy from fossil fuels are more prosperous and healthy than those without.

The direct warming due to doubling CO2 levels in the atmosphere can be calculated to cause a warming of about one degree Celsius. The IPCC computer models predict a much larger warming, three degrees Celsius or even more, because they assume changes in water vapor or clouds that supposedly amplify the direct warming from CO2. Many lines of observational evidence suggest that this "positive feedback" also has been greatly exaggerated.

There has indeed been some warming, perhaps about 0.8 degrees Celsius, since the end of the so-called Little Ice Age in the early 1800s. Some of that warming has probably come from increased amounts of CO2, but the timing of the warming—much of it before CO2 levels had increased appreciably—suggests that a substantial fraction of the warming is from natural causes that have nothing to do with mankind.

Frustrated by the lack of computer-predicted warming over the past decade, some IPCC supporters have been claiming that "extreme weather" has become more common because of more CO2. But there is no hard evidence this is true. After an unusually cold winter in 2011 (December 2010-February 2011) the winter of 2012 was unusually warm in the continental United States. But the winter of 2012 was bitter in Europe, Asia and Alaska.

Weather conditions similar to 2012 occurred in the winter of 1942, when the U.S. Midwest was unusually warm, and when the Wehrmacht encountered the formidable forces of "General Frost" in a Russian winter not unlike the one Russians just had.

Large fluctuations from warm to cold winters have been the rule for the U.S., as one can see from records kept by the National Ocean and Atmospheric Administration, NOAA. For example, the winters of 1932 and 1934 were as warm as or warmer than the 2011-2012 one and the winter of 1936 was much colder.

Nightly television pictures of the tragic destruction from tornadoes over the past months might make one wonder if the frequency of tornadoes is increasing, perhaps due to the increasing levels of CO2 in the atmosphere. But as one can read at Andrew Revkin's New York Times blog, dotearth, "There is no evidence of any trend in the number of potent tornadoes (category F2 and up) over the past 50 years in the United States, even as global temperatures have risen markedly."

Like winter temperatures, the numbers, severity and geographical locations of tornadoes fluctuate from year-to-year in ways that are correlated with the complicated fluid flow patterns of the oceans and atmosphere, the location of the jet stream, El Niño or La Niña conditions of the tropical Pacific Oceans, etc.

As long as the laws of nature exist, we will have tornadoes. But we can save many more lives by addressing the threat of tornadoes directly—for example, with improved and more widely dispersed weather radars, and with better means for warning the people of endangered areas—than by credulous support of schemes to reduce "carbon footprints," or by funding even more computer centers to predict global warming.

It is easy to be confused about climate, because we are constantly being warned about the horrible things that will happen or are already happening as a result of mankind's use of fossil fuels. But these ominous predictions are based on computer models. It is important to distinguish between what the climate is actually doing and what computer models predict. The observed response of the climate to more CO2 is not in good agreement with model predictions.

### Climate change good impacts—ice age

####  Climate change good—new studies prove global warming is preventing a future ice age

**Reuters, 2012**

Nina Chestney, “Next Ica Age Delayed By Global Warming Gases, Study Finds,” January 9, http://www.huffingtonpost.com/2012/01/09/next-ice-age-global-warming\_n\_1193900.html, last accessed 7.3.12

LONDON (Reuters) - High levels of carbon dioxide emissions in the atmosphere mean the next ice age is unlikely to begin for at least 1,500 years, an article in the journal Nature Geoscience said on Monday.
Concentrations of the main gases blamed for global warming reached record levels in 2010 and will linger in the atmosphere for decades even if the world stopped pumping out emissions today, according to the U.N.'s weather agency.
An ice age is a period when there is a long-term reduction in the earth's surface and atmospheric temperature, which leads to the growth of ice sheets and glaciers.
There have been at least five ice ages on earth. During ice ages there are cycles of glaciation with ice sheets both advancing and retreating.
Officially, the earth has been in an interglacial, or warmer period, for the last 10,000 to 15,000 years, and estimates vary on how long such periods last.
"(Analysis) suggests that the end of the current interglacial (period) would occur within the next 1,500 years, if atmospheric CO2 concentrations do not exceed (around) 240 parts per million by volume (ppmv)," the study said.
However, the current carbon dioxide concentration is of 390 ppmv, and at that level an increase in the volume of ice sheets would not be possible, it added.
The study based on variations in the earth's orbit and rock samples was conducted by academics at Cambridge University, University College London, the University of Florida and Norway's University of Bergen.
The causes of ice ages are not fully understood but concentrations of methane and carbon dioxide in the atmosphere, changes in the earth's orbit around the sun, and the movement of tectonic plates are all thought to contribute.

### Climate change good impacts—war

#### Climate change good—studies prove that increased climate change has precipitated peace—countries built on fossil fuel economies are more stable and prosperous, thus reducing the likelihood of conflict

—for them to win their spillover claims, they have to win that a bunch of developing, growing countries weaken their economies in an effort to curb warming—that causes conflict

**Gartzke, Professor of Political Science, UC-San Diego, 2012**

Erik, Journal of Peace Research, “Could Climate Change Precipitate Peace?,” January 31, http://dss.ucsd.edu/~egartzke/publications/gartzke\_jpr\_2012.pdf, last accessed 7.3.12

Where the basic science of climate change preceded policy, this second consensus among politicians and pundits about climate and conflict formed in the absence of substantial scientific evidence. While anecdote and some focused statistical research suggests that civil conflict may have worsened in response to recent climate change in developing regions (c.f. Homer-Dixon, 1991, 1994; Burke et al., 2009), these claims have been severely criticized by other studies (Nordås & Gleditsch, 2007; Buhaug, Gleditsch & Theisen, 2010; Buhaug, 2010).

In contrast, the few long-term macro statistical studies actually find that conflict increases in periods of climatic chill (Zhang et al., 2006, 2007; Tol & Wagner, 2010). Research on the modern era reveals that interstate conflict has declined in the second half of the 20th century, the very period during which global warming has begun to make itself felt (Goldstein, 2011; Hensel, 2002; Levy, Walker & Edwards, 2001; Luard, 1986, 1988; Mueller, 2009; Pinker, 2011; Sarkees, Wayman & Singer, 2003).

While talk of a ‘climatic peace’ is premature, assertions that global warming is injurious to world peace must be evaluated in light of countervailing evidence and contrasting causal claims.

To understand why global warming can coincide with a reduction in interstate conflict, it will be useful to recall that the contemporary situation differs from earlier eras of climate change to the degree that warming is a product of human activity. Human beings burn fossil fuels that produce greenhouse gases that lead to global warming. These same fossil fuels propel economic and political systems that appear less inclined to certain forms of violent conflict (Gartzke & Rohner, 2010, 2011). Industrialization leads to economic development and democracy, each of which has been associated with peace. Prosperity also encourages international institutions and stabilizing global and regional hierarchies. Thus, global warming may coincide with peace, while not actually inhibiting warfare. This study explores the relationship between climate change, liberal processes fueled by industrialization (development, democracy, international institutions), and interstate conflict. Previous studies of liberal peace have not paid much attention to climate change. Climatic peace may be yet another benefit purchased by all but accruing mostly to the developed world. At the same time, there might be trade-offs to consider in terms of the pace of development and the environment. The curvilinear relationship between development and interstate peace reported here and elsewhere (Boehmer & Sobek, 2005) suggests important advantages to increasing the pace of development, rapidly moving states through the ‘danger zone’ of partial industrialization. If efforts to combat climate change cause nations to stagnate economically, then the world may unintentionally realize the worst fears of pundits and politicians for climate-induced conflict.

### Climate change good impacts—Arctic exploration

#### A. Arctic melting opens up undiscovered oil and natural gas

Talmadge, Writer at Associated Press, 2012

(Eric, The Huffington Post “Arctic Climate Change Opening Region To New Military Activity” April 16, 2012, [http://www.huffingtonpost.com/2012/04/16/arctic-climate-change-military-activity\_n\_1427565.html#](http://www.huffingtonpost.com/2012/04/16/arctic-climate-change-military-activity_n_1427565.html)) CKP

The U.S. Geological Survey estimates that 13 percent of the world's undiscovered oil and 30 percent of its untapped natural gas is in the Arctic. Shipping lanes could be regularly open across the Arctic by 2030 as rising temperatures continue to melt the sea ice, according to a National Research Council analysis commissioned by the U.S. Navy last year. What countries should do about climate change remains a heated political debate. But that has not stopped north-looking militaries from moving ahead with strategies that assume current trends will continue.

#### B. Arctic resources are key to Russia economy

Huebert et al., Associate Professor at the Depart of Political Science at the Universtiy of Calgary, 2012

(Rob, Center for Climate and Energy Solutions “Climate Change & International Security: The Arctic as a Bellwether” May 2012, <http://www.c2es.org/docUploads/arctic-security-report.pdf>) CKP

Russia is the world’s largest Arctic state and, with roughly two million Arctic inhabitants, possesses by far the largest Northern population. The Arctic region has been an important contributor to the Russian economy since the discovery of Siberian oil in the 1960s. In large measure, the recovery of the Russian economy over the past decade, as well as its continued health, has been and remains directly related to the export of oil and gas. By law, Russian oil and gas is considered a strategic resource and development is heavily controlled by the central government. All told, the industry accounts for roughly 20% of the country’s GDP, with fully 22% of the nation’s export earnings being produced in the Arctic. The tax revenue from the state-owned gas company Gazprom makes up roughly 25% of Russia’s federal tax revenue. Despite this control, Russian energy resources have been opening up to foreign investment. The need for foreign capital and expertise in Arctic operations led to a major 2011 partnership between Rosneft and ExxonMobil to develop blocks in the Kara Sea. Exxon will however only be a minority shareholder, with a 33% stake in the venture. This deal is part of the principal thrust of Russian Arctic policy, which has been the expansion of its Northern resource base. Russian President Dmitry Medvedev, a former head of Gazprom, has publicly described the use of Arctic resources as central to the country’s energy security, stating: “Our first and main task is to turn the Arctic into Russia’s resource base of the 21st century” (Seattle Times news services 2008). Both the state’s September 2008 Arctic policy and May 2009 state security policy emphasize the growing energy potential of the North and the importance of its development

#### c. Russian economic deterioration leads terrorism and nuclear conflict resulting in extinction.

**Filger, 9**

[Sheldon, “Russian Economy Faces Disastrous Free Fall Contraction” May 10, 2009, <http://www.huffingtonpost.com/sheldon-filger/russian-economy-faces-dis_b_201147.html>]

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 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.

### Climate change good impacts—Arctic exploration extensions

#### Melting ice caps key to economy – new shipping routes, fossil fuel discovery

Kroh, Climate Guest Writer at ClimateProgress, 2012

(Kiley, ThinkProgress “How Climate Change Could Reshape Geopolotics Around the Arctic”, <http://thinkprogress.org/climate/2012/06/12/498091/how-climate-change-could-reshape-geopolitics-around-the-arctic/>) CKP

The Arctic is warming at an alarming rate – twice as fast as the rest of the planet – and according to a new [report,](http://www.c2es.org/press-center/press-releases/climate-change-international-arctic-security) those changes will be a key driver of geopolitics in the coming years. As the rapidly melting ice unlocks commercial opportunities in shipping, tourism and oil and gas extraction, the world’s largest economies are jockeying for control of the region. According to the Center for Climate and Energy Solutions, the melting of the Arctic is a “bellwether for how climate change may reshape geopolitics in the post-Cold War era.” The widely held notion that climate change will occur gradually over the 21st century, allowing ample time for society to adapt, is belied by the unprecedented pace of both climate change and policy developments in the Arctic today. Such rapid changes will challenge governments’ abilities to anticipate and diplomatically resolve international disputes within the region. Accelerating changes in the region are causing sea ice to melt at a rate exceeding [scientists’ predictions](http://thinkprogress.org/climate/2011/08/11/294403/arctic-ice-thinning-4-times-faster-than-predicted-by-models-semi-stunning-m-i-t-study-finds/).  The absence of ice will open up strategic waterways, such as the Northwest Passage, for longer periods of time and allow more opportunity for activities like offshore oil exploration that require open water. Analysts believe the economic impact could be significant – new and expanded shipping routes can significantly reduce the transit time between Asia, North America and Europe, and oil companies like Royal Dutch Shell are eager to unlock the [“great opportunity”](http://www.shell.us/home/content/usa/aboutshell/projects_locations/alaska/) for fossil fuels they believe lies beneath the pristine Arctic waters.

### Climate change good impacts—Arctic exploration extensions

#### Russia planning to defend resources in Arctic region—sees the US as the main rival

Huebert et al., Associate Professor at the Depart of Political Science at the Universtiy of Calgary, 2012

(Rob, Center for Climate and Energy Solutions “Climate Change & International Security: The Arctic as a Bellwether” May 2012, <http://www.c2es.org/docUploads/arctic-security-report.pdf>) CKP

The Russian ability to project power into the Arctic has strengthened over the past five years and will likely increase in the near future. Russian defense budgets have been increasing rapidly in the 21st century and a large portion of this new money has been earmarked for the Navy. The Navy is currently building its next-generation Borey and Yasen class nuclear submarines; ten of each are expected to be built as part of the state armaments program through 2015 (RIA Novosti 2008). In addition to what was announced in that plan, the Russian government has begun work on the first of four French Mistral class amphibious assault ships. Capable of carrying 16 attack helicopters and two hovercrafts to deliver troops to shore, the Mistral has caused concern among Russia’s Baltic and Scandinavian neighbors. On the ground the Russian military has begun to assemble two Army brigades and Special Forces units that will specialize in Arctic warfare and guard oil and gas infrastructure and Russian interests in the region. In part to support its hard-line position in the region, Moscow has become increasingly antagonistic in its relations with the West. The state’s national security policy has labeled the United States a “main rival,” while Russian state-owned newspapers have increasingly criticized the United States and NATO, accusing the West of coveting Russian resources and attempting to militarize the North (APA 2008). Securing and developing the Arctic’s resources, particularly the oil and gas reserves, are the principal aims of Russian Arctic policy. While Russian action in the Arctic has remained within the boundaries of international law, the state is prepared to act unilaterally if it perceives its Arctic interests to be threatened.

#### Russia has interests in the Arctic region—preparing for conflict to defend resources

Huebert et al., Associate Professor at the Depart of Political Science at the Universtiy of Calgary, 2012

(Rob, Center for Climate and Energy Solutions “Climate Change & International Security: The Arctic as a Bellwether” May 2012, <http://www.c2es.org/docUploads/arctic-security-report.pdf>) CKP

The majority of the Arctic’s undeveloped hydrocarbons, which Russian and international companies are investing billions of dollars to develop, are located in the offshore areas on the continental shelf (Gautier, et al. 2009). The Russian shelf is estimated to possess vast amounts of oil and gas and Moscow is sparing no effort to map the region and claim as much undersea territory as possible. During one mapping expedition in 2007, Russia created an international sensation by planting its flag on the seafloor at the North Pole. Russia is attempting to stake its claim to an extended continental shelf under the guidelines of UNCLOS and the government will make a revised claim sometime in 2012, after initial submissions were rejected for a lack of information. Russia’s Transport Minister Igor Levitin has also stated Moscow’s desire to substantially increase maritime traffic along the Northern Sea Route, also known as the Northeast Passage (Pettersen 2009). The potential for increased shipping generated by the Arctic’s thinning ice is reflected in ship orders. A large number of liquid natural gas and oil tankers with ice-breaking capability have been ordered by oil and gas companies, and the Russian government has announced plans to order four to six nuclear powered icebreakers by the year 2020. Russia has been working within the boundaries of international law in its attempts to expand its continental shelf. Russia’s submissions and supplementary information for an extended continental shelf in the Arctic have been provided to the Commission on the Limits of the Continental Shelf. Furthermore, through its support of the Ilulissat declaration and various public pronouncements, Russia has repeatedly exhibited a preference for resolving Arctic disputes through diplomatic channels. In 2011 Russia and Norway reached such an agreement to settle their disputed maritime border in the Barents Sea and clarify oil and gas rights in that area. However, policy documents and pronouncements by both political and military leaders make it plain that Russia considers military force an acceptable means of defending what it considers its Arctic interests.

#### Arctic resources key to Russian economy

Pilyavsky, Vice Chancellor for Research and Development at the State Polar Academy, 2011

(Valery, Freidrich-Ebert-Stifttung “The Arctic: Russian Geopolitical and Economic Interests” March 2011, <http://library.fes.de/pdf-files/id/07925.pdf>) CKP

Russia’s national interests in the Arctic are economic, geopolitical, scientific and environmental. The Russian Arctic is also a place where the geopolitical interests of both Arctic and non-Arctic states intersect owing to their geographical position. The economic interests focus on the major mineral reserves (hydrocarbons, non-ferrous and precious metals and so on). Practically 100 percent of known non-ferrous and precious metal reserves in Russia are in the northern region. The importance of the scientific development of the Arctic stems from the fact that the natural processes taking place there are closely linked to global natural processes. Research and scientific support are necessary for the implementation of practical economic and defence tasks. Preserving and increasing the potential of Russian science in the Arctic is a priority today. It is important to note that the bulk of Russia’s energy resources are concentrated in the Arctic region. For example, the main reserves of hydrocarbons are concentrated in the north of Western Siberia. The mineral and raw materials potential of many fields has not yet been fully studied and is not being fully tapped, which may have implications for future economic development

#### Arctic melting key to economy—resources, jobs, investment

Tuomioja, Foreign Minister in Finnish Arctic Partnership, 2012

(Erkki, Ministry for Foreign Affairs of Finland “Speech by Minister Tuomioja in the Finnish-Russian Arctic Partnership Seminar” June 5, 2012, <http://formin.finland.fi/Public/default.aspx?contentid=251007>) CKP

1. The Arctic region’s changed status and the new opportunities, challenges and threats arising from it are based, above all, on the thawing of the ice cover as a result of climate change. Whenever this development has been estimated, the changes have proved to have taken place more rapidly than had been forecast. A one-degree change in the average global temperature corresponds to a two-to-three-degree change in the Arctic. Therefore new regions’ natural resources become available for exploitation, and new routes and opportunities for transportation are found whose economic potential attracts people’s attention towards the north. Even though for many, the change means nothing but new profitable investment opportunities and jobs, it is even more important to understand that the vulnerable Arctic ecology and the global repercussions affecting it require exceptional caution. It is essential to take care that the economic potential of the Arctic region is exploited without causing indispensable damage and loss. The growing significance of Arctic natural resources has a direct impact on events in the global economy and politics. Because of climate change, globalisation and technological development, the Arctic region is no more seen as a peripheral area but it is gaining a place at the centre of international attention. The academic interest directed at it to date is rapidly transforming into concrete political and economic interest and action. Arctic change is inevitable, still mainly unpredictable, but of huge dimensions. More information is needed but it is not enough. What is necessary, too, is immediate steps. The question goes as follows: do the decision-makers meet the prerequisites needed to be able to make the right decisions? To be able to understand the Arctic region and the fundamental transformation there, we need to view it from as broad perspective as possible, taking into account not only the natural resources and transport routes but also the environment and the people. Our actions – at both national and international levels – are based on formulating a comprehensive outlook of the situation and its causes and effects.

### Climate Change good impacts—Russian Economy

#### Climate change good—melting of permafrost revitalizes the Russian economy, multiple reasons

**Korepin, research intern at the Russia and Eurasia Program at CSIS, 2011**

Serge, CSIS, “Might Russia Welcome Global Warming,” August 11, http://csis.org/blog/might-russia-welcome-global-warming, last accessed 7.3.12

If you were participating in a competition for power and influence where you had the option of having your opponents become much weaker, while you became only slightly weaker, would you take that option? This may be the question Kremlin leaders are asking themselves in regard to cooperation on curbing global warming. It is, of course, a moral issue because many people will suffer from the effects of global warming. Scientific analyses have stated that there will be a rise of sea levels, the disruption of ecosystems, erratic weather, and the spread of diseases are the direct result of human activity. While moral considerations will play a role in the Kremlin’s evaluation of the net effects of global warming, there are additional and significant realist implications for the Kremlin to consider. The U.S. National Intelligence Council noted in 2008 that Russia “has the potential to gain the most from increasingly temperate weather.” If this is so, it is possible that Russia—the third-largest emitter of greenhouse gases after China and the United States—will not cooperate on curbing global warming. Andrew Light, the Director of the Center for Global Ethics at George Mason University [says](http://www.nytimes.com/2009/07/27/business/energy-environment/27iht-green27.html?partner=rss&emc=rss&pagewanted=all): “no climate deal will likely succeed without real participation from Russia.” Might Russia see a relative benefit to global warming?

 To help answer this question, let’s consider how cold it is in Russia. Hill and Gaddy write, “by nearly any conventional measure of temperature, Russia claims the distinction of being the coldest country in the world.”1 Most of Siberia’s climate—the majority of Russia’s territorial holdings—is “continental subarctic,” with an annual average of [-5 °C](http://en.wikipedia.org/wiki/Siberia#cite_note-27). Of course, Siberia can get much colder—the lowest recorded temperature in a settlement was −71.2 °C (−96.2 °F) in the Siberian town of Oymyakon. Another aspect of Russia’s coldness is illustrated by the early settlers of Yakutsk (with a current population of 270,000), who [wrote](http://www.lrb.co.uk/v32/n17/tony-wood/frozenology) that they could not dig a well nor could they expect to grow wheat. This is because the cold in Siberia is accompanied by permafrost—soil that remains frozen all year (with the exception of a thin top-layer that thaws seasonally). Permafrost covers over [two-thirds](http://www.lrb.co.uk/v32/n17/tony-wood/frozenology) of all of Russia’s territory—roughly 6.22 million square miles ([see map](http://nsidc.org/fgdc/maps/images/perm_tmp_300.jpg)).
Russia pays a price for this cold. Hill and Gaddy demonstrate that there is an accelerating drop in the efficiency of human and machine work as the temperature drops from freezing to -40 °C;2 in fact, sometimes it is too cold to work at all. In addition, as the temperature drops, wind has an increasingly negative effect: at -15 °C, a 20 mph wind quadruples the amount of time to perform a task.3 Writing on this topic in 1983, Victor Mote concluded “In an average year, total losses to the cold comprise 33% of all possible working time in the Soviet north.”4  Furthermore, cold causes damage to industries, human health, buildings, equipment, and infrastructure; at -15 °C high carbon steel breaks, at -25-30 °C unalloyed steel breaks, frost-resistant rubber is required. When temperatures hit -35-40 °C tin-alloy steel components shatter, all compressors stop work, standard steels and structures rupture en mass.5 These climate effects result in high maintenance and replacement costs.
          In addition to these efficiency costs, it is also expensive to live in the cold climates; for example, there are high heating and snow and ice removal costs. These costs affect Russia more so than other areas because communist planners have populated cities and built industries that are too big to be economically viable in the relative coldness of their locations.6 Thus, there is economic pressure because of the cold for many Russian cities to shrink (which has been difficult given the existing infrastructure of these cities). Russia’s increasing temperatures (which are probably the result of global warming) could relieve some the economic pressures that result from the cold climate. Warming will directly reduce the effects of cold on work efficiency in Russia and reduce adaptation costs. In fact, this is already happening. Rosgidromet (Russia’s Hydro-meteorology agency) [stated](http://www.lrb.co.uk/v32/n17/tony-wood/frozenology) in 2008 that average annual temperature in Russia has risen by 1.3 °C over the past 30 years and that winter temperatures in Siberia have increased 2-3 °C over the past 120-150 years.7 This is reflected in the agency’s estimate that there will be five fewer days that require heat in 2015 than in 2000. The agency also [estimates](http://www.lrb.co.uk/v32/n17/tony-wood/frozenology) that Russians could reduce heating costs by as much as 10 % by 2050.
Russia will further gain from the warming of the ground and water in and around its territory. The UN sponsored Intergovernmental Panel on Climate Change predicted in 2001 that if average air temperature increased by 2-3.5 degrees, a quarter of the earth’s permafrost would melt.8 This is already happening; Greenpeace’s 2009 report on Russia states that over the past 35 years the southern boundary of permafrost has moved north by 18-25 miles in European Russia and 50 miles near the Urals. Rosgidromet [predicts](http://www.lrb.co.uk/v32/n17/tony-wood/frozenology) that by 2050 the permafrost boundary would shift north by another 95-125 miles. The retreat of permafrost will make extraction of raw materials easier; Victor Mote wrote; “In Siberia standard mining and excavation machinery may be used for only three to four months a year in northern Siberian tin and gold operations.9 In addition, [most of Russia’s](http://www.lrb.co.uk/v32/n17/tony-wood/frozenology) gas and oil comes from Arctic regions, as well as “considerable quantities of the world’s nickel, cobalt, copper and diamonds.” Observers are tracking additional warming trends like the [spread](http://www.gvsu.edu/cms3/assets/6F3A5573-CB18-AB70-6C7C30870C53998C/documents/Hollister_PP.pdf) of trees and shrubs northward, which implies an increase of habitable land. Warming will also allow agriculture to spread north, extend the growing seasons, and perhaps increase overall agricultural yields—Russia has recently [marked](http://themoscownews.com/business/20110803/188896119.html) [yield](http://english.ruvr.ru/2010/11/24/35557914.html) [records](http://www.itar-tass.com/en/c154/197907.html).
In addition, Russia’s chief forecaster, Alexander Frolov, [said](http://www.bloomberg.com/news/2011-08-03/arctic-ice-melt-at-near-record-clears-shipping-route-to-asia-russia-says.html) that the North Pole may be completely ice-free in the summer within a few decades. The retreat of Arctic ice will reduce the cost of extracting natural resources from Arctic waters, which contain large reserves of oil, gas, gold, diamonds, nickel and tungsten. One concern for such extraction has been icebergs. A reduction in Arctic ice is also opening up a trade route which would be an alternative to the Suez Canal; the distance between Rotterdam and Yokohama is about [one-third shorter](http://www.bloomberg.com/news/2011-08-03/arctic-ice-melt-at-near-record-clears-shipping-route-to-asia-russia-says.html) via the [Northern Sea Route](http://en.wikipedia.org/wiki/Northern_Sea_Route)—along Russia’s north coast and then south through the Bering Strait. Rosgidromet has [stated](http://www.bloomberg.com/news/2011-08-03/arctic-ice-melt-at-near-record-clears-shipping-route-to-asia-russia-says.html) that Russia is close to opening “almost the entire Northern Sea Route to icebreaker-free shipping [from August to September].” In fact, representatives of the eight Arctic powers are already [discussing](http://english.ruvr.ru/2011/08/08/54349564.html) the development of the route. The Northern Sea Route’s freight consisted of about [110,000](http://www.itar-tass.com/en/c154/191391.html) tons this year. By 2020, some predict freight will increase to [64 million](http://english.ruvr.ru/2011/08/08/54349564.html) tons. Additionally, Siberia contains eleven of the world’s fifty longest rivers—all of them flowing into the Arctic Ocean, except the Amur that flows to the Sea of Okhotsk (to a port that is unusable for five months out of the year because of the ice). As the Arctic sea-ice retreats, the settlements along these rivers will no longer be on waterways that essentially come to a dead end. It will become possible to transport cargo from these rivers to ports around the globe, which could lead to a decrease in transport costs and an increase in trade volume from the interior of Siberia. David Lempert and Hue Nhu Nguyen [write](http://www.theecologist.org/investigations/climate_change/269603/why_most_of_the_major_powers_really_want_global_warming.html) in The Ecologist that “the biggest winner from global warming is going to be Russia.”

### NO change in policy justified

#### risks associated with efforts to limit carbon result in economic downturn with little measureable benefit

**Black, Environment correspondent, 2012**

(Richard, BBC News “Climate consensus cracking open – or not February 6 http://www.bbc.co.uk/news/science-environment-16906738; CKP)

<<<Finding the name of a Cambridge University engineering professor, Michael Kelly, on the WSJ letter, I decided to get in touch and find out his reasons for signing.

His basic position is that the kind of energy transformation through which the UK, for example, is planning to go is really tough to achieve in engineering terms, and would be financially ruinous.

To meet the goals of the [**Climate Change Act**](http://www.legislation.gov.uk/ukpga/2008/27/contents) (notably an emissions cut of 80% from 1990 levels by 2050) he argues that "we'd really need a command economy of the kind we had in World War 2 if we were really serious about meeting the targets in full.

"What we need to do will bankrupt us if we really go for it and ignore the rest of the world."

He would, he says, still endorse the rapid transformation if he thought the scientific evidence for needing it was compelling. "Are you convinced that the world's going to hell in a handbasket on the basis of the predictions and what's been happening for the last 10 or 12 years? "The answer is simply 'no'. "I look back 300 years and I find that the temperature went up by more than it's gone up recently - in [Central England](http://www.metoffice.gov.uk/hadobs/hadcet/) from about 1699 to 1729 it went up by nearly 2C - and nobody said that was carbon dioxide." (UPDATE: The full CET time series is graphed [here](http://www.meteogroup.co.uk/fileadmin/filemounts/global/climate_change/graph2.jpg), while one of the original science papers on analysis of its early years is [here](http://www.rmets.org/pdf/qj74manley.pdf)) Other components of his argument are that money is better spent on aid to Africa than on a dash to renewables, that higher CO2 levels will boost plant growth, that current climate models are not trustworthy - in particular, because they project an acceleration of warming whereas over the last 17 years we have seen a deceleration - and that wind turbines may be left derelict in future when the cost of replacing the nascelles proves uneconomic. He also cites [a recent study on ocean acidification](http://hofmannlab.msi.ucsb.edu/publications/Hofmann%20et%20al%202011_PLoS%20ONE_pH.pdf/view) showing that natural short-term variability in ocean pH is greater than the change in the average projected to occur over the next century or so. And he has a bet with other Fellows of the Royal Society that temperatures during the current decade will be lower, on average, than during the preceding one, the stake being a case of wine. All of the points above are challengeable, and - playing Devil's advocate - I did challenge him on some. What we agreed on is that formulating climate change polity is first and foremost a question of risk judgement. In Prof Kelly's view, the risks of rushing into a low-carbon future, as opposed to taking the transition more slowly, outweigh the risks of not doing so; hence the WSJ article's title, "No need to panic". I'm sure his arguments will find favour with many regular readers, and equally infuriate many others who contend that political leaders aren't panicking enough. But it is surely the arguments themselves that ought to be the focus for discussion - not what they purport to say about a cracking consensus.

## CPs and answers

### Adaptation

#### Adaptation Cp solves key but requires money

**Palmer, Health and science writer 2012**

**(**Brian, Washington post, January 23 2012<http://www.washingtonpost.com/national/health-science/global-warming-would-harm-the-earth-but-some-areas-might-find-it-beneficial/2012/01/17/gIQAbXwhLQ_story.html>) JMV

<Keller argues that adaptability is the more important factor in determining how countries will fare. The most obvious and tragic cases of adaptability have to do with elevation. Mohamed Nasheed, president of the Maldives, has been among the most vocal proponents of climate-change mitigation, arguing that rising sea levels could leave his island nation underwater. But in most cases, adaptability largely comes down to money

### Cap and trade CP Solvency

#### Trading the gas caps leads to investment and innovation

Environmental Defense Fund, no date given

(Environmental Defense Fund, “How cap and trade works,” <http://www.edf.org/climate/how-cap-and-trade-works>, Accessed: July 4, 2012) KKC

<<Some companies will find it easy to reduce their pollution to match their number of permits; others may find it more difficult. Trading lets companies buy and sell allowances, leading to more cost-effective pollution cuts, and incentive to invest in cleaner technology.

Unlike with some pollutants, all CO2 goes into the upper atmosphere and has a global — not local — effect. So it doesn't matter whether the factory making the emission cuts is in Boston, Baton Rouge, or Berlin, it reduces global emissions.

Companies can turn pollution cuts into revenue. If a company is able to cut its pollution easily and cheaply, it can end up with extra allowances. It can then sell its extra allowances to other companies. This provides a powerful incentive for creativity, energy conservation and investment -- companies can turn pollution cuts into dollars.

The option to buy allowances gives companies flexibility. On the other hand, some companies might have trouble reducing their emissions, or want to make longer-term investments instead of quick changes. Trading allowances gives these companies another option for how to meet each year's cap.

The same amount of pollution cuts are achieved. While companies may exchange allowances with each other, the total number of allowances remains the same and the hard limit on pollution is still met every year.>>

#### Cap and trade reduces emissions and benefits the economy.

Shammin, Environmental Studies, Oberlin College, Bullard, Mechanical Engineering, University of Illinois, 2008

(Rumi, Clark, Ecological Economics, “Impact of cap-and-trade policies for reducing greenhouse gas emissions on U.S. households,” <http://www.sciencedirect.com/science/>article/pii/S09218009

09001311#fn1, 16 March, Accessed: July 4, 2012) KKC

Legislation pending before the U.S. Congress would establish a cap-and-trade system that would cut greenhouse gas emissions approximately 2% annually through 2050.[1](http://www.sciencedirect.com/science/article/pii/S0921800909001311#fn1) Even greater reductions may eventually be required by international treaties if the United States is to contribute its fair share of the 60–80% reductions needed globally to stabilize atmospheric concentrations of greenhouse gases ([IPCC, 2007](http://www.sciencedirect.com/science/article/pii/S0921800909001311#bib14)).

All cap-and-trade proposals have three elements: 1) the cap, or phase-out schedule; 2) tradable emission allowances to enable early implementation of the most cost-effective reductions; and 3) the formula for distributing the emission allowances. It is the latter feature that raises the most serious questions of equity and justice.

When greenhouse gas emissions are capped, the pollution allowances become scarce and therefore valuable. Tradable allowances assume a market value reflecting the marginal cost of compliance with the cap, whether they are distributed free or auctioned by the government. Distributing valuable allowances is equivalent to distributing the auction revenues. Thus a cap-and-trade system allows efficiency and equity issues to be handled separately, unlike other policy instruments (e.g. tax credits, grants, loan guarantees, regulations) in which they are inextricably linked. The underlying economic theory is described in general terms by [Montgomery (1972)](http://www.sciencedirect.com/science/article/pii/S0921800909001311#bib18)and[Tietenburg (2003)](http://www.sciencedirect.com/science/article/pii/S0921800909001311#bib28). [Chameides and Oppenheimer (2007)](http://www.sciencedirect.com/science/article/pii/S0921800909001311%22%20%5Cl%20%22bib5) point out that a properly implemented economy-wide cap on emissions and trading of emission allowances could have all the benefits of an equivalent carbon tax in addition to the distinct advantage of assuring that environmental goals would be achieved by a certain date.

#### Cap and Trade system great at reducing emissions

Navarro, environmental writer for the New York Times, 2012

(Mireya, The New York Times, “Emissions fell Under Cap and Trade Program, Report Says,” <http://green.blogs.nytimes.com/2012/06/04/emissions-fell-under-cap-and-trade-program-report-says/>, June 4, Accessed: July 4, 2012) KKC

<<The cap and trade system known as the [Regional Greenhouse Gas Initiative](http://www.rggi.org/) [announced](http://www.rggi.org/docs/PR060412_Compliance.pdf) on Monday that carbon dioxide emissions from power plants in the nine participating states on the East Coast fell by an average of 23 percent during the first three years of the program.

The pioneering program, known as [RGGI](http://green.blogs.nytimes.com/2012/06/04/emissions-fell-under-cap-and-trade-program-report-says/) (pronounced reggie), sets a ceiling on carbon dioxide emissions from electric power providers and requires the companies to pay for their emissions by buying allowances in auctions held four times a year. As an incentive to cut emissions, companies that pollute less can sell their unused allowances to other companies at the auctions.

RGGI officials said that 206 of the 211 power plants subject to the program’s requirements met their compliance obligations during the first three-year period. From Jan. 1, 2009, to Dec. 31, 2011, average annual carbon dioxide emissions amounted to 126 million tons, a 23 percent decline from the previous three-year period running from 2006 through 2008.
Pollution from the plants was 33 percent below the program’s annual pollution cap of 188 million tons, a trend that is partly [attributed](http://www.rggi.org/docs/Retrospective_Analysis_Draft_White_Paper.pdf) to a greater reliance on natural gas (which pollutes less than coal-fired electricity) as gas prices declined. Other factors included state investments in energy efficiency and setbacks in the economy, RGGI officials said.>>

#### A cap is the only certain way to limit pollution

Environmental Defense Fund, no date given

(Environmental Defense Fund, “How cap and trade works,” <http://www.edf.org/climate/how-cap-and-trade-works>, Accessed: July 4, 2012) KKC

<<A cap sets a maximum allowable level of pollution and penalizes companies that exceed their emission allowance. No other system can guarantee to lower emissions.

The cap is a limit on the amount of pollution that can be released, measured in billions of tons of carbon dioxide (or equivalent) per year. It is set based on science.

It covers all major sources of pollution. The cap should limit emissions economy-wide, covering electric power generation, natural gas, transportation, and large manufacturers.

Emitters can release only limited pollution. Permits or "allowances" are distributed or auctioned to polluting entities: one allowance per ton of carbon dioxide, or CO2 equivalent heat-trapping gases. The total amount of allowances will be equal to the cap. A company or utility may only emit as much carbon as it has allowances for.

Industry can plan ahead. Each year, the cap is ratcheted down on a gradual and predictable schedule. Companies can plan well in advance to be allowed fewer and fewer permits – less global warming pollution – each year.>>

### Carbon Tax CP

#### Carbon tax is better than cap and trade

Limpaitoon, et al., Electrical Engineer, 2011

(Tanachai, Journal of Regulatory Economics, SpringerLink, Volume 40, Accessed: July 4, 2012) KKC

In a perfectly competitive market, for instance, a carbon tax levied upstream on

power plants would shift production toward low-carbon technologies such that total

emissions should be reduced. Such intuition, however, may not hold when the behavior of strategic ﬁrms (owners of power plants) and demand response are taken into consideration. Under an emissions tax, these ﬁrms will face higher energy generation costs, and they will therefore alter their production schedules accordingly while taking into account emissions costs. In a locational marginal price (LMP)-based electricity markets, changes in energy outputs from plants at different locations might alleviate or intensify transmission congestion, thereby altering congestion patterns that possibly lead to some unintended consequences. For example, Downward (2010) illustrates through a stylized two-node system that overall carbon emission can increase after a carbon tax is imposed. When a carbon tax is levied on power plants, “cleaner” ﬁrms may become more competitive. Changes in the relative costs could eliminate congestion, thereby lowering energy prices. As a result, lower prices may induce higher electricity consumption, in effect lifting the overall carbon emissions. Even though this example represents a theoretical market anomaly, which may not be prevalent in practice, it highlights the need to consider the interactions and the potential unexpected consequences of environmental regulation in the electricity sector. Under the C&T approach, changes in a ﬁrm’s output affect not only its marginal abatement cost, but also other ﬁrms’ marginal costs through changes in the permit price (Kolstad and Wolak 2003). Since the market-based permit price can be unpredictable and volatile, the interaction of strategic behavior and C&T in the presence of transmission constraints can complicate the outcomes further.

### Renewable Energy Standards CP

#### CP solvency—renewable energy standards

Weiss & Madrid, Weiss is a Senior Fellow and Director of Climate Strategy at the Center For American and Jorge Madrid is a Research Associate at CAP, 2012

[By Daniel J. Weiss and Jorge Madrid, Daniel J. Weiss is a Senior Fellow and Director of Climate Strategy at the Center For American and Jorge Madrid is a Research Associate at CAP. “More Action on Climate Change: CAP’s Comments To the EPA on Its Proposed Carbon Pollution Standard.” *ThinkProgress Climate Progress* < http://thinkprogress.org/climate/2012/06/26/506541/more-action-on-climate-change-caps-comments-to-the-epa-on-its-proposed-carbon-pollution-standard/?mobile=nc > June 26, 2012 accessed 06272012.] NWW

In practice, the proposed carbon pollution standard could make the construction of most new coal-fired power plants uneconomical. The typical new coal-fired power plant would have to reduce its carbon pollution by 40 percent to 60 percent. Generating electricity from coal with this pollution reduction level may only be possible with expensive carbon-capture-and-storage technology that can add as much as 30 percent to operation costs.[17] And this new technology is not yet close to commercial viability. The carbon pollution standard would help level the energy playing field by creating an incentive for investors, utilities, and decision makers to invest in new renewable energy projects such as wind and solar, whose fuels are completely free, clean, and unlimited. Along the way, the United States can build new industries, jobs, and technical capacity to protect the recovering economy from further—and likely inevitable—fossil-fuel price hikes.

#### CP solves—renewable energy solves jobs and economy

Weiss & Madrid, Weiss is a Senior Fellow and Director of Climate Strategy at the Center For American and Jorge Madrid is a Research Associate at CAP, 2012

[By Daniel J. Weiss and Jorge Madrid, Daniel J. Weiss is a Senior Fellow and Director of Climate Strategy at the Center For American and Jorge Madrid is a Research Associate at CAP. “More Action on Climate Change: CAP’s Comments To the EPA on Its Proposed Carbon Pollution Standard.” *ThinkProgress Climate Progress* < http://thinkprogress.org/climate/2012/06/26/506541/more-action-on-climate-change-caps-comments-to-the-epa-on-its-proposed-carbon-pollution-standard/?mobile=nc > June 26, 2012 accessed 06272012.] NWW

Renewable energy, paired with investments in energy efficiency, can help meet future demand for electricity. And the potential impact on jobs is promising: According to a University of Massachusetts analysis, every $1 million spent on clean energy technology creates 16.7 jobs, compared to those same dollars creating only 5.3 jobs in the fossil-fuel sector.[18] We should not shy away from this grand challenge of reimagining and re-engineering a future in which new competitive and groundbreaking technology replaces old, inefficient, and dirty modes of electricity generation. This is where Americans have historically shown their true spirit of innovation and problem solving. Next steps CAP applauds the EPA’s first-ever proposal to limit carbon pollution from new coal-fired power plants—but the hard work is only beginning. The first steps for the EPA are to finalize the carbon pollution standard, along with the proposed carbon pollution limits for motor vehicles that were proposed in November 2011.[19] We urge the EPA to listen public health professionals, scientists, and millions of Americans who have voiced their support for these reductions, and not the special interests in the fossil fuel industry who seek to continue to pollute. We urge the EPA to ensure that the final carbon pollution standard for power plants does not enable new power plants to operate for a long time without achieving some reduction in carbon pollution. In addition, the EPA must hold polluters accountable by strictly enforcing these pollution limits. Power plants dump more than 2 billion tons of carbon and other toxic pollutants into the air each year—nearly 13,000 pounds for every man, woman, and child in the United States.[20] This pollution must be reduced to stave off the worst effects of climate change. While regulating new plants is an important first step, CAP urges the EPA to propose rules for existing power plants and other sources of air pollution. Such reductions are essential to reduce the extreme temperatures and other conditions from climate change that will increase respiratory illnesses and cause other public health harms. Conclusion CAP joins an overwhelming chorus of voices who support cleaner air and healthier communities. Limiting carbon pollution from new power plants will be the first step in mitigating climate change, which poses grave risk to all Americans. This essential standard will also encourage investment in clean energy and energy efficiency, which will create jobs, foster competition, and boost domestic manufacturing. In addition to reducing emissions, the United States should continue to invest in the development and production of clean and renewable alternatives to fulfill our energy needs. With the carbon pollution standard and the adoption of additional pollution reductions, we can look forward to a healthier, more prosperous, and more sustainable future.

### Answers to Geoengineering CP

#### Many problems with geoengineering – controversy, international relations

Lorinc, Globe and Mail, 2011

 (John, The Globe and Mail “The radical science of geo-engineering: Maybe it’s not so crazy” June 24, 2011, <http://www.theglobeandmail.com/technology/science/the-radical-science-of-geo-engineering-maybe-its-not-so-crazy/article584575/?page=all>) CKP

The scholarly work on geo-engineering to date has been largely theoretical, with scientists modelling different solutions using climate and atmospheric data. But in recent years, a handful of privately financed ocean fertilization research projects generated international controversy as critics questioned why for-profit entities should be allowed to gamble with sensitive marine ecosystems. For that reason, the participants at the Lima meeting included environmentalists and international-relations experts who want to ensure that the emerging research activity surrounding geo-engineering is accountable to some kind of international governance body. "We see geo-engineering as not just a climate issue, but an emerging international relations issue," says Arunabha Ghosh, chief executive officer of India's Council on Energy, Environment and Water. His goal: push the IPCC to think about ethical and legal questions, such as what would happen if one country chose to unilaterally deploy a geo-engineering system without consulting its neighbours.

### Answers to Iron fertilization

#### Iron fertilization bad – unpredictable impacts on ocean, slow, costly, not effective

Lorinc, Globe and Mail, 2011

(John, The Globe and Mail “The radical science of geo-engineering: Maybe it’s not so crazy” June 24, 2011, http://www.theglobeandmail.com/technology/science/the-radical-science-of-geo-engineering-maybe-its-not-so-crazy/article584575/?page=all) CKP

The oceans absorb atmospheric carbon, and the resulting acidification has threatened marine ecosystems. Fertilization proposes the use of agents such as iron filings, nitrogen or phosphorous to promote the growth of algae, which absorb carbon. The algae sink, with the carbon sequestered in the depths. Verdict: The impact on the ocean environment is highly unpredictable. Also it is seen to be slow and costly. It can at best play a "moderate role in carbon sequestration."

### AT Plant trees

#### Using forestation as carbon sinks for a negative feedback loop ultimately warms the earth further

**Kirschbaum et al., Landcare Researcher at the European Geosciences Union, 2011**

(Biogeosciences Vol. 8 Issue 12 pg. 3687-3696 “Implications of albedo changes following afforestation on the benefits of forests as carbon sinks” 2011, <http://www.biogeosciences.net/8/3687/2011/bg-8-3687-2011.pdf>) CKP

Increased carbon storage with afforestation leads to a decrease in atmospheric carbon dioxide concentration and thus decreases radiative forcing and cools the Earth. However, afforestation also changes the reflective properties of the surface vegetation from more reflective pasture to relatively less reflective forest cover. This increase in radiation absorption by the forest constitutes an increase in radiative forcing, with a warming effect. The net effect of decreased albedo and carbon storage on radiative forcing depends on the relative magnitude of these two opposing processes. We used data from an intensively studied site in New Zealand's Central North Island that has long-term, ground-based measurements of albedo over the full short-wave spectrum from a developing Pinus radiata forest. Data from this site were supplemented with satellite-derived albedo estimates from New Zealand pastures. The albedo of a well-established forest was measured as 13 % and pasture albedo as 20 %. We used these data to calculate the direct radiative forcing effect of changing albedo as the forest grew. We calculated the radiative forcing resulting from the removal of carbon from the atmosphere as a decrease in radiative forcing of −104 GJ tC−1 yr−1. We also showed that the observed change in albedo constituted a direct radiative forcing of 2759 GJ ha−1 yr−1. Thus, following afforestation, 26.5 tC ha−1 needs to be stored in a growing forest to balance the increase in radiative forcing resulting from the observed albedo change. Measurements of tree biomass and albedo were used to estimate the net change in radiative forcing as the newly planted forest grew. Albedo and carbon-storage effects were of similar magnitude for the first four to five years after tree planting, but as the stand grew older, the carbon storage effect increasingly dominated. Averaged over the whole length of the rotation, the changes in albedo negated the benefits from increased carbon storage by 17–24 %.

### \*\*\*International Cooperation Debate\*\*\*

#### Multilateral integration not key—unilateral approach to climate change solves

Green, Environmental scientist and policy analyst, 2012

(Kenneth, AEI Ideas “Non-Kyoyo-ratifying U.S. leads globe in lowering greenhouse gas emissions” June 6, 2012, <http://www.aei-ideas.org/2012/06/non-kyoto-ratifying-u-s-leads-globe-in-lowering-greenhouse-gas-emissions/>) CKP

Last month, the International Energy Agency released its latest estimates of global trends in greenhouse gas emissions, to remarkably little fanfare from the mainstream media. Perhaps that’s because it runs counter to the narrative that the US is an evil, uncontrolled emitter of greenhouse gases that refuses to sign on to international agreements. The IEA reports that: Global carbon-dioxide (CO2) emissions from fossil-fuel combustion reached a record high of 31.6 gigatonnes (Gt) in 2011, according to preliminary estimates from the International Energy Agency (IEA). This represents an increase of 1.0 Gt on 2010, or 3.2%. Coal accounted for 45% of total energy-related CO2 emissions in 2011, followed by oil (35%) and natural gas (20%) But lo, what’s this (emph. mine)? CO2 emissions in the United States in 2011 fell by 92 Mt, or 1.7%, primarily due to ongoing switching from coal to natural gas in power generation and an exceptionally mild winter, which reduced the demand for space heating. US emissions have now fallen by 430 Mt (7.7%) since 2006, the largest reduction of all countries or regions. This development has arisen from lower oil use in the transport sector (linked to efficiency improvements, higher oil prices and the economic downturn which has cut vehicle miles travelled) and a substantial shift from coal to gas in the power sector. Yes, you read that right, the U.S. has seen faster declines in greenhouse gas emissions over the last 6 years than all of the countries that signed onto the Kyoto Protocol, and implemented national greenhouse-gas control strategies.

#### Global climate conferences key to solving for GW

Brazier, Consultant at Africa’s Intelligence’s Environmental Africa Unit, 2012

(Wayne, NGO Pulse “Are Climate Change Meetings Helping the Climate or Contributing to the Acceleration of Environmental Change?” June 18, 2012, <http://www.ngopulse.org/article/are-climate-change-meetings-helping-climate-or-contributing-acceleration-environmental-chang>) CKP

There are numerous benefits to having regional and global climate meetings. The main aim of the COP meetings is to establish a binding agreement among parties for a long-term, sustainable solution to climate change (17). Leaders in climate change issues, government representatives and decision-makers are brought together, as well as civil society and NGOs, among others, to share ideas and to discuss a way forward in resolving climate change issues (18). Furthermore, meetings like these allow countries to develop cooperative projects with other countries, such as the cooperative project between China and South Africa, to convert a coal-fired brick factory to natural gas in Johannesburg (19). Another benefit of these conferences is that they facilitate the cooperation of countries to focus on global climate change and share ideas on what the best practice to reduce emissions is. For example, the aim of the Green Climate Fund is to provide funding to developing countries that do not have the adequate resources or infrastructure to invest in clean technologies (20). Most of the natural vegetation that exists is found in developing countries and this needs to be conserved because natural environments are known to store carbon and prevent it from entering the atmosphere (21). The carbon footprint of these large meetings has not gone unnoticed. The United Nations (UN) has begun to offset these emissions by providing certain areas with clean energy or by restoring previously damaged environments. For example, the carbon offsets for COP16 included the installation of a wind turbine and solar panels to create clean energy, the transport used for the conference was powered by biofuels, regular recycling points at the conference and by planting and protecting trees (22). With regard to COP17, the Community Ecosystem Based Adaptation (CEBA) initiative was formed to offset the carbon footprint of the conference by restoring natural lands that have been damaged (23). The first project on the list is to restore and reforest the uMbilo River catchment in Durban. CEBA credits were voluntarily bought at the conference and will contribute to this project (24). These offsets to the unavoidable carbon emissions are essential to balance the costs and benefits of hosting climate talks, and if every emission - conference-related and otherwise - was avoided or offset in full, then there would be no surplus in emissions and the carbon levels would remain constant.

### International cooperation fails

#### Meetings fail—no cooperation, create carbon footprint due to the conference itself

Brazier, Consultant at Africa’s Intelligence’s Environmental Africa Unit, 2012

(Wayne, NGO Pulse “Are Climate Change Meetings Helping the Climate or Contributing to the Acceleration of Environmental Change?” June 18, 2012, <http://www.ngopulse.org/article/are-climate-change-meetings-helping-climate-or-contributing-acceleration-environmental-chang>) CKP

Regional and global meetings are often held for authorities to discuss the future of climate change and how best to manage it. Well-known examples of global meetings are the Conference of the Parties (COP) negotiations. These meetings are annual conferences held for the signatory countries to the United Nations Framework Convention on Climate Change (UNFCCC) to discuss methods to reduce and stabilise GHG concentrations in the atmosphere, to protect the planet’s future (7). COP17, the latest in the series of negotiations, was held in Durban from 28 November to 11 December 2011 and was attended by representatives from 194 countries (8). Despite the large distances travelled by many of the leaders in combating climate change, some say that very little was accomplished at this meeting (9). This is due to the fact that the meeting did not produce a legally-binding contract to force countries to reduce their carbon emissions. UNFCCC COP meetings have generally expended large amounts of energy over the years, and have contributed to creating considerable carbon footprints brought about by air transport emissions, large conference venue infrastructures, as well as the sheer amounts of food produced for these meetings which typically go on for approximately two weeks. Seeing as these conferences are convened with the sole intention of putting together action items for countries to curb their emissions, can the large expenditure of energy and the large carbon footprint of an event like this be justified? COP meetings are known to have large carbon footprints. For example, approximately 20 000 representatives from around the world attended the COP17 conference with nearly 30 000 people involved in putting the conference together in the form of hosts and catering (10). This equates to a carbon footprint of 15 000 - 76 900 metric tons of CO2 depending on the source of information (11). Most of these emissions are produced by the high release of planes used to transport these delegates from around the world (12). The release of carbon dioxide from transport and freight vehicles, especially planes, is increasing faster than the population size in many developed countries, and is therefore a large contributor to GHG emissions The previous meeting, COP16 in Cancun, Mexico, was estimated to have a carbon footprint of 25 000 tons of CO2 (14); while the preceding one, COP15, held in Copenhagen, Denmark, was estimated to have a footprint of 46 200 tons of CO2 (15) with the largest contributor to these also being the flights to and from the venue (16). Taking into account that there have been 17 COP meetings in the past, the combined carbon footprint for all the conferences must be enormous.

### Oil abundance decreases climate change

#### Oil abundance and low prices increases emissions, leading to further global morning

**Levi, Senior Fellow for Energy and the Environment at CFR, 2012**

(Michael, Council on Foreign Relations “Does Oil Abundance Mean Climate Doom?” June 6, <http://blogs.cfr.org/levi/2012/06/06/does-oil-abundance-mean-climate-doom/>) CKP

All of these emissions paths are likely to be disastrous for climate change. The case with low oil prices represents a limit of how dangerous oil abundance could be for climate change. (Abundant oil encourages consumption and thus emissions by driving down prices.) The results are undoubtedly ugly. But the reference and high price cases, which are both variations on the oil scarcity theme, are almost as bad. The difference between oil scarcity and abundance isn’t as automatically consequential for climate change as one might suppose.

What I’ve left out, though, is the political dimension. Abundant oil can influence emissions by changing the political environment in which battles over what to do about our energy systems play out. This might ultimately be more consequential for emissions than the economic and physical influences are. The influence of oil abundance on climate policy could run either way.

### Public likes climate policy

#### Majority of public supports GW – survey proves

Romm, Editor of Climate Progress, 12

(Joe, ThinkProgress “Public Understanding Of Climate Science Rebounds, 72% of Independents Say There Is ‘Solid Evidence’ Of Global Warming” June 13, 2012, <http://thinkprogress.org/climate/2012/06/13/498892/public-understanding-of-climate-science-rebounds-72-of-independents-say-there-is-solid-evidence-of-global-warming/>) CKP

Brookings has released a [new survey](http://www.brookings.edu/research/papers/2012/06/~/media/Research/Files/Papers/2012/6/11%20climate%20rabe%20borick/NSAPOCC_Belief_Spring%20Formatted.pdf) that confirms other recent polls: Public understanding of climate science is rebounding, and the recent record-smashing extreme weather events are playing a key role. As you can see, the biggest jump is from independents, demonstrating once again that global warming has become a major wedge issue. Many other recent polls have made that clear (see “[Gallup poll: Public understanding of global warming gains](http://thinkprogress.org/romm/2011/03/15/207698/gallup-poll-global-warming-gains/)” and “[Independents, Other Republicans Split With Tea-Party Extremists on Global Warming](http://thinkprogress.org/romm/2011/12/02/380400/koch-denial-backfires-independents-other-republicans-split-with-tea-party-on-global-warming/)”). Now if progressive politicians would only seize on this winning issue. Perhaps even more remarkable than this rebound in understanding is the record rise in the public’s confidence in their accurate understanding of climate science that the National Survey of American Public Opinion on Climate Change [NSAPOCC] found: Just under two thirds of those who believe global warming is occurring stated that they were very confident of this position. This 63 percent confidence level is 14 percentage points higher than in the fall of 2011 and marks the highest level since the NSAPOCC began in 2008. Why would confidence be growing, especially when the media and key opinion-makers have [all but stopped](http://thinkprogress.org/climate/2012/04/18/466484/climate-coverage-plummets-80-on-broadcast-networks-from-2009-to-2011/) talking about climate change? Brookings had previously found that [Americans’ Understanding of Climate Change Is Increasing With More Extreme Weather, Warmer Temperatures](http://thinkprogress.org/climate/2012/02/29/434563/poll-americans-understanding-climate-change-increasing-with-more-extreme-weather-warmer-temperatures/). Certainly the American public is seeing for themselves the off-the-chart heat waves and other extreme weather that climate scientists have long said would become more common as we pour more heat-trapping greenhouse gases into the atmosphere (see [NOAA Chief: U.S. Record of a Dozen Billion-Dollar Weather Disasters in One Year Is “a Harbinger of Things to Come”](http://thinkprogress.org/romm/2011/12/07/384524/noaa-us-sets-record-with-a-dozen-billion-dollar-weather-disasters-in-one-year/)). That was especially true in March (see “[March Came In Like A Lamb, Went Out Like A Globally Warmed Lion On Steroids Who Smashed 15,000 Heat Records](http://thinkprogress.org/climate/2012/04/10/461167/march-came-in-like-a-lamb-went-out-like-a-globally-warmed-lion-on-steroids-who-smashed-15000-heat-records/)“). The new survey added further evidence that “the growth in the percentage of Americans who see evidence of global warming appears to be related to individual perceptions of weather conditions and events.”: During the cold and snowy winters of 2010 and 2011 the percentage of respondents who indicated that their experiences with milder winters had a very large effect on their views about global warming was relatively low with 19 percent and 17 percent of respondents selecting this response. Conversely, about twice as many respondents in the latest NSAPOCC reported that the mild winter had a large effect on their view that planetary temperatures are rising. The effect of the milder winter conditions were also evident in many of the openended comments that respondents provided to the question regarding the primary factor behind their belief that global warming was occurring. For example, a middle-aged male from Connecticut stated that “there was no winter this year,” and a young woman in Maryland noted that “the seasons are abnormal with no snow and cold.” When asked to provide the key factor behind her view that global warming was occurring a middle-aged woman in Wisconsin said that her “garden was already growing in March.” Even though extreme weather events are increasing in frequency and intensity, the close relationship between weather and beliefs about global warming can potentially make public opinion fickle over the short term — particularly since the continental United States comprises only a tiny fraction of the world and thus its weather is even more erratic than the Earth’s climate as a whole. But that may be less of a concern if meteorologist Dr. Jeff Masters is [correct that](http://thinkprogress.org/climate/2012/02/07/420141/meteorologist-masters-climate-new-state-rare-unprecedented-weather-events/) “The climate has shifted to a new state capable of delivering rare & unprecedented weather events.” People are [starting to connect the dots](http://thinkprogress.org/climate/2012/04/18/466621/poll-large-majority-of-americans-understand-global-warming-made-several-major-extreme-weather-events-worse/). Now if only policymakers can start doing the same.

#### More and more public belief in GW – weather variation

Borick, Professor and Director of the Muhlenburg College Institute of Public Opinion, and Rabe, Senior fellow in Governance Studies, 2012

(Governance Studies at Brookings “Continued Rebound in American Belief in Climate Change: Spring 2012 NSAPOCC Findings” June 11, 2012, <http://www.brookings.edu/~/media/research/files/papers/2012/6/11%20climate%20rabe%20borick/nsapocc_belief_spring%20formatted.pdf>) CKP

During the past five years the views of the American public on the issue of global warming have demonstrated considerable volatility. Between 2008 and 2010 many national surveys found that a declining percentage of Americans believed that there was solid evidence of global warming. This decline has been followed by a period of modest rebound in more recent years. The most recent version of the National Survey of American Public Opinion on Climate Change (NSAPOCC), fielded in late March and early April of 2012, finds that the rebound in public belief in evidence of global warming continues to occur with current belief levels approaching those recorded in 2008. Notably, the relatively high number of Americans that indicated there is solid evidence of global warming came during a Spring fielding of the NSAPOCC, countering declines in belief levels that occurred in Spring interviews following winter seasons in 2010 and 2011. This contrast with past spring results corresponds with substantially varied winter weather in most parts of the United States in recent years; the 2010 and 2011 winters produced record snowfall in many areas whereas the 2012 winter season ended up as one of the most mild in the last century. This correlation of weather variation and changing levels of belief is accompanied by additional evidence that Americans are linking weather events and experiences to their views on the existence of climate change.