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1NC Hurricanes Frontline (1/3)

1. Deterring hurricanes is physically impossible and unnecessary. Turns case and leaves your hurricane scenario dead in the water.

**Landsea 11**(Dr. Chris Landsea is a science and operations officer at the National Hurricane Center in Miami and for the NOAA “Hurricanes and Global Warming,” http://sciencepolicy.colorado.edu/prometheus/archives/climate\_change/000322landsea\_on\_hurricane.html)

There have been numerous techniques that we have considered over the years to modify hurricanes: seeding clouds with dry ice or Silver Iodide, cooling the ocean with cryogenic material or icebergs, changing the radiational balance in the hurricane environment by absorption of sunlight with carbon black, exploding the hurricane apart with hydrogen bombs, and blowing the storm away from land with giant fans, etc. (Some of these have been addressed in detail in this section of our TCFAQ.) As carefully reasoned as some of these suggestions are, they all share the same shortcoming: They fail to appreciate the size and power of tropical cyclones. For example, when Hurricane Andrew struck South Florida in 1992, the eye and eyewall devastated a swath 20 miles wide. The heat energy released around the eye was 5,000 times the combined heat and electrical power generation of the Turkey Point nuclear power plant over which the eye passed. The kinetic energy of the wind at any instant was equivalent to that released by a nuclear warhead. Perhaps if the time comes when men and women can travel at nearly the speed of light to the stars, we will then have enough energy for brute-force intervention in hurricane dynamics. Human beings are used to dealing with chemically complex biological systems or artificial mechanical systems that embody a small amount (by geophysical standards) of high-grade energy. Because hurricanes are chemically simple --air and water vapor -- introduction of catalysts is unpromising. The energy involved in atmospheric dynamics is primarily low-grade heat energy, but the amount of it is immense in terms of human experience. Attacking weak tropical waves or depressions before they have a chance to grow into hurricanes isn't promising either. About 80 of these disturbances form every year in the Atlantic basin, but only about 5 become hurricanes in a typical year. There is no way to tell in advance which ones will develop. If the energy released in a tropical disturbance were only 10% of that released in a hurricane, it's still a lot of power, so that the hurricane police would need to dim the whole world's lights many times a year. Perhaps some day, somebody will come up with a way to weaken hurricanes artificially. It is a beguiling notion. Wouldn't it be wonderful if we could do it? Perhaps the best solution is not to try to alter or destroy the tropical cyclones, but just learn to co-exist better with them. Since we know that coastal regions are vulnerable to the storms, building codes that can have [houses stand up](http://www.aoml.noaa.gov/hrd/weather_sub/shutters.html) to the force of the tropical cyclones need to be enforced. The people that choose to live in these locations should be willing to shoulder a fair portion of the costs in terms of property insurance - not exorbitant rates, but ones which truly reflect the risk of living in a vulnerable region. In addition, [efforts to educate the public](http://www.nws.noaa.gov/om/hurricane) on effective preparedness needs to continue. Helping poorer nations in their mitigation efforts can also result in saving countless lives. Finally, we need to continue in our efforts to better understand and observe hurricanes in order to more accurately predict their development, intensification and track.

2. Recent studies show a negative trend in hurricane occurrences.

**Knutson 08** (Dr. Thomas R. Knutson is a research meteorologist and expert climate modeler. He primarily works in the NOAA’s Geophysical Fluids Dynamics Lab “Global Warming and Hurricanes ” http://www.gfdl.noaa.gov/global-warming-and-hurricanes)

Existing records of past Atlantic tropical storm numbers (1878 to present) in fact do show a pronounced upward trend, which is also correlated with rising SSTs (see Figs. 1 and 9 of [Vecchi and Knutson 2008](http://www.gfdl.noaa.gov/bibliography/related_files/gav0802.pdf)). However, the density of reporting ship traffic over the Atlantic was relatively sparse during the early decades of this record, such that if storms from the modern era (post 1965) had hypothetically occurred during those earlier decades, a substantial number would likely not have been directly observed by the ship-based "observing network of opportunity." We find that, after adjusting for such an estimated number of missing storms, there is a small nominally positive upward trend in tropical storm occurrence from 1878-2006. But statistical tests reveal that this trend is so small, relative to the variability in the series, that it is not significantly distinguishable from zero (Figure 3). In addition, a new study by [Landsea et al. (2010)](http://ams.allenpress.com/archive/1520-0442/preprint/2009/pdf/10.1175_2009JCLI3034.1.pdf) notes that the rising trend in Atlantic tropical storm counts is almost entirely due to increases in short-duration (<2 day) storms alone. Such short-lived storms were particularly likely to have been overlooked in the earlier parts of the record, as they would have had less opportunity for chance encounters with ship traffic. In short, the historical tropical storm count record does not provide compelling evidence for a substantial greenhouse warming induced long-term increase. If we instead consider Atlantic basin hurricanes, rather than all Atlantic tropical storms, the result is similar: the reported numbers of hurricanes were sufficiently high during the 1860s-1880s that again there is no significant positive trend in numbers beginning from that era (Figure 4, black curve, from CCSP 3.3 (2008) ). This is without any adjustment for "missing hurricanes". The evidence for an upward trend is even weaker if we look at U.S. landfalling hurricanes, which even show a slight negative trend beginning from 1900 or from the late 1800s (Figure 4, blue curve). Hurricane landfalling frequency is much less common

1NC Hurricanes Frontline (2/3)

[card cont.] than basin-wide occurrence, meaning that the U.S. landfalling hurricane record, while more reliable than the basin-wide record, suffers from degraded signal-to-noise characteristics for assessing trends. While major hurricanes (Figure 4, red curve) show more evidence of a rising trend from the late 1800s, the major hurricane data are considered even less reliable than the other two records in the early parts of the record. Category 4-5 hurricanes show a pronounced increase since the mid-1940s (Bender et al., 2010) but again, we consider that these data need to be carefully assessed for data inhomogeneity problems before such trends can be accepted as reliable. Direct model simulations of hurricane activity under climate change scenarios offer another perspective on the problem. We have developed a regional dynamical downscaling model for Atlantic hurricanes and tested it by comparing with observed hurricane activity since 1980. This model, when forced with observed sea surface temperatures and atmospheric conditions, can reproduce the observed rise in hurricane counts between 1980 and 2006, along with much of the interannal variability (Figure 5).  Turning to future climate projections, current climate models suggest that tropical Atlantic SSTs will warm dramatically during the 21st century, and that upper tropospheric temperatures will warm even more than SSTs. Furthermore, most of the models project increasing levels of vertical wind shear over parts of the western tropical Atlantic (see [Vecchi and Soden 2007](http://www.agu.org/pubs/crossref/2007/2006GL028905.shtml)). Both the increased warming of the upper troposphere relative to the surface and the increased vertical wind shear are detrimental factors for hurricane development and intensification, while warmer SSTs favor development and intensitification. To explore which effect of these effects might "win out", we can run experiments with our regional downscaling model. Our regional model projects that Atlantic hurricane and tropical storms are substantially reduced in number, for the average 21st century climate change projected by current models, but have higher rainfall rates, particularly near the storm center. The average intensity of the storms that do occur increases by a few percent (Figure 6), in general agreement with previous studies using other relatively high resolution models, as well as with hurricane [potential intensity theory (Emanuel 1987)](http://wind.mit.edu/~emanuel/holem/holem.html).

3. There is no correlation between warming and hurricane intensity.

**Landsea 05** (Dr. Chris Landsea is a science and operations officer at the National Hurricane Center in Miami and for the NOAA “Hurricanes and Global Warming,” http://sciencepolicy.colorado.edu/prometheus/archives/climate\_change/000322landsea\_on\_hurricane.html)

There are no known scientific studies that show a conclusive physical link between global warming and observed hurricane frequency and intensity. Whatever suggested changes in hurricane activity that might result from global warming in the future are quite small in comparison to the large natural variability of hurricanes, typhoons and tropical cyclones**.** For example, the latest GFDL global warming study suggested about a 5% increase in the winds of hurricanes 80 years in the future. This contrasts with the more than doubling that occur now in numbers of major hurricanes between active and quiet decades in the Atlantic basin. If global warming is influencing hurricane activity, then we should be seeing a global change in the number and strength of these storms. Yet there is no evidence of a global increase in the strength and frequency of hurricanes, typhoons, and tropical cyclones over the past several years.

4. Lives can be saved through preparation instead of solar power.

**Lomborg 07** (Bjorn Lomborg, Ph.D. in political science and adjunct professor at Copenhagen Business School. Cool it: the skeptical environmentalist's guide to global warming)

One climatologist pointed out, “It is probable that this hurricane would have occurred irrespective of any recent increase in greenhouse gases." On the other hand, it was clear that the catastrophe happened because of bad planning, poorly maintained levees, and environmental degradation of the city’s protective wetlands. So had you been in charge in the l990s of helping potential victims of future hurricanes, you should not have worked to cut greenhouse gases ﬁrst but instead invested heavily in better planning, better levees, and healthier wetlands. And that lesson remains as we try to prevent the losses from future Katrinas. It is perhaps sobering to realize that while the industrialized world (and the big insurance companies) worry about increasing ﬁnancial costs, hurricanes cost less in the third world but cause many more deaths. Yet here also the message stays the same: we know effective action is possible to reduce disaster losses even in the face of poverty and dense population. During the 2004 hurricane season, Haiti and the Dominican Republic, which share the island of Hispaniola, provided us a powerful lesson. Julia Taft of the United Nations Development Program explained: “In the Dominican Republic, which has invested in hurricane shelters and emergency evacuation networks, the death toll was fewer than ten, as compared to an estimated two thousand in Haiti.... Haitians were a hundred times more likely to die in an equivalent storm than Dominicans.” We have to ask how we can do the most good, or in the words of two of the top specialists in hurricane losses: Those who justify the need for greenhouse gas reductions by exploiting the mounting human and economic toll of natural disasters worldwide are either ill-informed or dishonest. Prescribing emissions reductions to forestall the future effects of disasters is like telling someone who is sedentary, obese, and alcoholic that the best way to improve his health is to wear a seat belt.

**1NC Hurricanes Frontline (3/3)**

**Legal issues make hurricane alteration impossible to begin with-someone has to suffer the consequences of a hurricane.**

**Wood 07** (Graeme Wood has written for *The Atlantic* since 2006. “Riders on the Storm” http://web.mit.edu/alamaro/www/atlantic\_hurricane\_oct\_2007.pdf)

Still, few scientists believe these new ideas will be tried outside the computer lab anytime soon. The problem isn’t the science. It’s the lawyers. Modifying hurricanes entails big risks: Changing a hurricane’s environment is likely to also change its path. Indeed, some hurricane researchers, including Hoffman and Alamaro, hope that their interventions will allow them to steer storms away from population centers in addition to diminishing them. But Hoffman says he fears that if his team tampers with a storm and pushes it even a dozen miles off its natural course, the storm could destroy towns that otherwise might not have been hit—and his team could end up drowned in civil suits, even if it’s made the storm weaker, or pushed it away from a major city. “There will never be large-scale weather modification in America,” says Charles Hosler, a weather-modification pioneer. “All weather is good or bad for somebody, and when it’s bad, that somebody’s going to sue.” (Hosler would know: He and his colleagues once successfully fought a suit by a tourist who had broken his leg after leaping out of a ski lift that had been struck by lightning. Hosler’s group had been studying thunderstorms nearby, and the tourist claimed the scientists were responsible for the strike.) American courts have been ruling on weather modification since at least the late 1800s, when a judge decided that a preacher who had prayed for rain wasn’t liable for the thunderbolt that razed his neighbor’s barn in the ensuing storm. (The preacher had prayed only for rain, said the court, not for lightning.) In the mid-1960s, farmers in Pennsylvania sued after fruit growers in the region had called in a cloud seeder to suppress hail over their orchards. (The fruit growers were accused of playing God and causing a drought.) The difficulty of proving causation saved the defendants in court, as it usually does in suits involving weather modification. But the courts have suggested that farmers might have a right to what legal analysts have called the “rivers flowing through [their] skies,” just as they have a right to the water under their fields. Stealing clouds could be legally analogous to diverting a stream. Past attempts to mitigate hurricanes have resulted in both legal and diplomatic headaches. In one early experiment, Hosler says, lawyers for General Electric (which was part of Project Cirrus at the time) counseled the company to keep silent about its cloud-seeding activities, after a storm with which it had been tinkering swerved and battered South Carolina. Fidel Castro later accused American scientists working on Project Stormfury of using hurricanes as a counterrevolutionary instrument of war. In both cases, the experiments almost certainly did nothing to alter any hurricane’s course—their methods, science now shows, were likely hopeless. But that’s scant comfort to hurricane researchers today, some of whom may seek legal protection before field-testing their ideas. In a 2006 paper, for example, Alamaro and two collaborators proposed treaties that would eliminate civil liabilities for hurricane modifiers and guarantee compensation for hurricane victims.

2NC Hurricanes-XT 2-Frequency

The frequency of hurricanes have become less- statistics prove global warming does not affect areas around the Equator.

**Taylor 05** (George Taylor is a Certified Consulting Meteorologist and State Climatologist, Oregon. “Hurricanes and Global Warming: Is There a Link?” TechCentralStation.com)

I could see this one coming. The other day a lady in my department saw me and said, "Well, George, with all these hurricanes it's pretty clear that global warming is happening, right?" I think Jane was just being playful, because she's heard me talk about global warming and knows of my "politically incorrect" viewpoint on this issue, Yet she raises a question that a lot of people have been asking: does the busy hurricane year in the Atlantic have anything to do with global warming? The short answer: no. The long answer: Long-term statistics on hurricanes are quite good, so we can have some confidence in the trends we see in hurricane counts. There are two reasons for this: (1) hurricanes are big, powerful storms and very hard to miss; (2) they are well-defined. The Saffir-Simpson scale uses wind speed (one-minute average) to define a hurricane's strength, starting at 74 mph (Category 1) and ending at speeds above 155 mph (Category 5). Other rating systems use central pressure as a criterion. Figure 1, obtained from data provided by the National Hurricane Center, shows hurricane strikes (landfalls) by decade in the U.S. since 1900. The 1940s were rather busy, the 70s the quietest, and the 1990s pretty close to the long-term average. A simple linear fit suggests a decrease over time. This is a result echoed by Easterling, et al (2000), who said, "the number of intense and landfalling Atlantic hurricanes has declined." In the Gulf of Mexico there is "no sign of an increase in hurricane frequency or intensity," according to Bove, et al (1998). For the North Atlantic as a whole, according to the United Nations Environment Programme of the World Meteorological Organization, "Reliable data ... since the 1940s indicate that the peak strength of the strongest hurricanes has not changed, and the mean maximum intensity of all hurricanes has decreased." Granted, there has been an upswing in the Atlantic since 1995, and this year's bumper crop of storms has struck Florida in numbers and intensities seldom occurring before. A sign of things to come, especially in a warmer world? Not according to Bill Gray's Tropical Forecast group at Colorado State University. Gray, who has developed successful methods for predicting hurricane activity, said, "Various groups and individuals have suggested that the recent large upswing in Atlantic hurricane activity (since 1995) may be in some way related to the effects of increased man-made greenhouse gases such as carbon dioxide (CO2). There is no reasonable scientific way that such an interpretation of this recent upward shift in Atlantic hurricane activity can be made." And there is no reason to expect increases in hurricanes due to greenhouse warming. Climate models, for all their problems, are unanimous in at least one respect: they predict that most of the future warming will be in high latitudes, in the polar regions. This will reduce the north-south temperature gradient and make poleward transfer of heat less vigorous -- a task in which tropical storms play a major role. All other things being equal, a warmer world should have fewer, not more, hurricanes. The same effect should reduce the overall intensity of mid-latitude storms as well. Does it? Let's examine the evidence. Schwartz and Schmidlin (2002) analyzed frequencies of blizzards in the US since 1959. Defining a blizzard as a storm with falling or blowing snow, visibilities less than 400 meters and winds over 16 m/sec, they concluded that there have been increasing numbers of blizzards reported, while the area affected by all blizzards has not changed significantly. This would indicate that blizzards are becoming smaller. It is also possible that "NWS is recording smaller, weaker blizzards in recent years that went unrecorded earlier in the period, as occurred also in the official record of tornadoes in the United States," which would suggest that blizzard frequency increases may be overstated. Changnon and Changnon (2000) studied hail frequencies in the US over the last century. They found that "the national average based on all hail values formed a bell-shaped 100year distribution with hail occurrences peaking in mid-century." Thunderstorm distributions were similar to the hail results. Further, the authors found that hail insurance loss values have declined since the 1950s, in agreement with the hail results. Zhang, et al (2000) examined storm activity along the US East Coast over the twentieth century. After stating, "it has been speculated that future global warming will change the frequency and severity of tropical and extratropical storms," the authors used historical data in an attempt to help predict future trends. Using a variety of indices, including storm surge water levels, the authors found "no significant trend in storm activity during this century along the East Coast." The real problem along the coastline, they say, is not changing climate but changing land use, as more and more development occurs along the shorelines, creating greater susceptibility to storm damage. Gulev, et al (2000) employed NCEP/NCAR reanalysis data since 1958 to study the occurrence of winter storms over the northern hemisphere. They found a statistically significant (at the 95% level) decline of 1.2 cyclones per year for the period, during which temperatures reportedly rose in much of the hemisphere. "Global warming causes increased storminess" makes for interesting headlines. It also violates fundamental scientific truth and the lessons of history.

2NC Hurricanes-XT 3-No correlation

Data from global warming does not show any connection to hurricane activity or is impelling enough to discount other theories.

**Maue 09** (Dr. Ryan Maue is a scientist, a climatologist, a good guy at Florida State University. He monitors cyclone activity for the official record, works for COAPS “Global hurricane activity has decreased to the lowest level in 30 years” Climate Audit)

As previously reported [here](http://www.climateaudit.org/?p=2471) and [here](http://www.climateaudit.org/?p=2296) at [Climate Audit](http://www.climateaudit.org/), and chronicled at my [Florida State Global Hurricane Update page](http://www.coaps.fsu.edu/~maue/tropical), both Northern Hemisphere and overall Global hurricane activity has continued to sink to levels not seen since the 1970s. Even more astounding, when the Southern Hemisphere hurricane data is analyzed to create a global value, we see that Global Hurricane Energy has sunk to 30-year lows, at the least. Since hurricane intensity and detection data is problematic as one goes back in time, when reporting and observing practices were different than today, it is possible that we underestimated global hurricane energy during the 1970s. See notes at bottom to avoid terminology discombobulation. Using a well-accepted metric called the Accumulated Cyclone Energy index or ACE for short ([Bell and Chelliah 2006](http://ams.allenpress.com/perlserv/?request=get-abstract&doi=10.1175%2FJCLI3659.1)), which has been used by [Klotzbach (2006)](http://tropical.atmos.colostate.edu/Includes/Documents/Publications/klotzbach2006.pdf) and [Emanuel (2005)](http://www.nature.com/nature/journal/v436/n7051/abs/nature03906.html) (PDI is analogous to ACE), and most recently by myself in [Maue (2009)](http://www.agu.org/pubs/crossref/2009/2008GL035946.shtml), simple analysis shows that 24-month running sums of global ACE or hurricane energy have plummeted to levels not seen in 30 years. Why use 24-month running sums instead of simply yearly values? Since a primary driver of the Earth’s climate from year to year is the El Nino Southern Oscillation (ENSO) acts on time scales on the order of 2-7 years, and the fact that the bulk of the Southern Hemisphere hurricane season occurs from October – March, a reasonable interpretation of global hurricane activity requires a better metric than simply calendar year totals. The 24-month running sums is analogous to the idea of “what have you done for me lately”… Under global warming scenarios, hurricane intensity is expected to increase (on the order of a few percent), but MANY questions remain as to how much, where, and when. This science is [very far from settled](http://www.npr.org/templates/story/story.php?storyId=9047642). Indeed, Al Gore has dropped the related slide in his PowerPoint (btw, is he addicted to the [Teleprompter](http://www.washingtontimes.com/news/2009/mar/10/obamas-reliance-on-teleprompters/) as well?) Many papers have suggested that these changes are already occurring especially in the strongest of hurricanes, e.g. [this](http://www.nature.com/nature/journal/v455/n7209/abs/nature07234.html) and [that](http://www.sciencemag.org/cgi/content/full/309/5742/1844) and [here](http://www.nature.com/nature/journal/v436/n7051/abs/nature03906.html), due to warming sea-surface temperatures (the methodology and data issues with each of these papers has been discussed here at CA, and will be even more in the coming months). The notion that the overall global hurricane energy or ACE has collapsed does not contradict the above papers but provides an additional, perhaps less publicized piece of the puzzle. Indeed, the very strong interannual variability of global hurricane ACE (energy) highly correlated to ENSO, suggests that the role of tropical cyclones in climate is modulated very strongly by the big movers and shakers in large-scale, global climate. The perceptible (and perhaps measurable) impact of global warming on hurricanes in today’s climate is arguably a pittance compared to the reorganization and modulation of hurricane formation locations and preferred tracks/intensification corridors dominated by ENSO (and other natural climate factors). Moreover, our understanding of the complicated role of hurricanes with and role in climate is nebulous to be charitable. We must increase our understanding of the current climate’s hurricane activity.

2NC Hurricanes-XT 4-Preparedness

**Hurricane agencies like FEMA prove better preparedness and ability to save lives after Katrina.**

**Collins 07** (Susan Collins is a Republican Senator for Maine who is a ranking member on the Senate Homeland Security and Governmental Affairs Committee CONGRESSIONAL TRANSCRIPTS Congressional Hearings May 22, 2007)

Let me begin my comments today by associating myself with your remarks. I am baffled that there are those who are proposing that FEMA -- the new, improved, strengthened FEMA -- be moved out of the Department of Homeland Security. I have no idea what has prompted a renewal of this debate that we went through last year, and concluded that it was the wrong solution to the problems that we face. I also want to point out, Mr. Chairman, as you're well aware -- as most of the members of this committee are well aware -- that this committee conducted the most in-depth investigation into the flawed response to Hurricane Katrina of any entity. It was the only bipartisan investigation. We held 24 hearings. We interviewed 400 individuals. We had 85 public witnesses. And we reviewed 838,000 pages of documents. And, yes, we actually issued subpoenas, as well, to get the information that we needed. And the results were a detailed, lengthy report and comprehensive legislation: The Post-Katrina Emergency Management Reform Act, which became law in October. That act brought about sweeping changes to the Federal Emergency Management Agency. It raised FEMA's visibility, protected its status and budget within DHS, gave its administrator a direct channel to the president, restored the linkage between preparedness and response, strengthened its regional presence and established multi-agency strike teams to promote rapid and effective action. And this was all brought about because of the universal dissatisfaction with the response of government at all levels to the horrors of Hurricane Katrina. The 2007 hurricane season does start very soon, on June 1st. The wisely regarded Colorado State University forecast also calls for a very active season, as does the NOAA forecast that was released this morning. So this is the ideal time for us to ask the question of whether or not FEMA is better prepared for potentially significant storms. I think the answer to that is, obviously, "yes." But it leads to another question, which is, "Is FEMA sufficiently prepared to respond to a catastrophe?" While memories of Hurricane Katrina and the approaching hurricane season provide the impetus for this very timely hearing, the purpose of our reform efforts was broader than just the response to hurricanes or even to natural disasters in general. Our legislation explicitly defined FEMA's mission as "all hazards, whether natural or manmade," and it invoked the full range of emergency-management functions: Preparedness, protection, response, recovery and mitigation. In fact, one of the reasons that I'm so opposed to moving FEMA out of DHS is that it would inevitably require DHS to create a duplicate of FEMA to respond to terrorist attacks. Our nation is regularly challenged by natural disasters such as fires, floods, tornadoes, earthquakes, as well as, at times, by terrorist attacks. So when we ask whether FEMA is sufficiently prepared for the 2007 hurricane season, we'll really posing questions that are proxies for a broader and deeper set of concerns. The FEMA administrator, Mr. Paulison, who is here with us today, recently testified on the House side, that his agency is leaning forward and is an engaged partner with state and local agencies. And I've seen this firsthand lately in FEMA's response to the Patriot’s Day storm in Maine that was devastated to the southern coat of Maine. And I'm very grateful that the FEMA administrator came to see firsthand the damage and has been so responsive to our concerns. I've also see the response to the recent tornadoes in the Midwest. And, again, FEMA has received commendable praise for its quick response. There have been a lot of improvements. FEMA has a new operating agreement with the Defense Logistics Agency. It has new capabilities for procuring, delivering and monitoring supplies. None of us will soon forget the shocking, wasteful and sometimes tragic stories of supplies delayed, spoiled or misdirected because of an inadequate logistics system that hampered the response to Katrina's victims. I'm sure the chairman remembers that ice destined for the Gulf Coast spent weeks in Portland, Maine, in cold storage at a terrible waste and tremendous cost. FEMA is also adopting new controls that will increase assistance the victims, as well as help curtail fraud and abuse. There are other indications of progress. Earlier this month, I participated in a New England exercise in Rhode Island and Massachusetts. The response was to a hypothetical hurricane event that struck New England. And the difference was remarkable. I saw first- responders and emergency-managers from all levels of government working with the National Guard, going through training -- the kind of joint training that is essential. One of the lessons of Hurricane Katrina is, "Never again should we have people who are in charge of the response exchanging business cards in the midst of the crisis." And I was very pleased what I saw during this New England exercise. There still is, obviously, much to do, but I want to also tout a reform that is already paying dividends. And that is the reform that we mandated of having defense- coordinating officers assigned to regional FEMA offices. That has made a big difference. And coordination with other federal partners still needs to be improved. But I think we're seeing considerable progress. We're not yet there. We're not yet where we need to be, but I, too, Mr. Chairman, am pleased with the results of our legislation. So I thank you for scheduling this hearing, as our witnesses come before us to help us explore our readiness to respond to the inevitable next catastrophe, regardless of its cause.

Alt cause- people on coastlines

**Damages and costs of hurricanes are created by concentration of people along the cost, not hurricane intensity.**

**NOAA 08** (“Increased Hurricane Losses Due to More People, Wealth Along Coastlines, Not Stronger Storms, New Study Says” http://www.noaanews.noaa.gov/stories2008/20080222\_hurricane.html)

A team of scientists have found that the economic damages from hurricanes have increased in the U.S. over time due to greater population, infrastructure, and wealth on the U.S.  coastlines, and not to any spike in the number or intensity of hurricanes. “We found that although some decades were quieter and less damaging in the U.S. and others had more land-falling hurricanes and more damage, the economic costs of land-falling hurricanes have steadily increased over time,” said Chris Landsea, one of the researchers as well as the science and operations officer at [NOAA’s National Hurricane Center](http://www.hurricanes.gov/) in Miami. “There is nothing in the U.S. hurricane damage record that indicates global warming has caused a significant increase in destruction along our coasts.” In a newly published paper in Natural Hazards Review, the researchers also found that economic hurricane damage in the U.S. has been doubling every 10 to 15 years. If more people continue to move to the hurricane-prone coastline, future economic hurricane losses may be far greater than previously thought. “Unless action is taken to address the growing concentration of people and property in coastal hurricane areas, the damage will increase by a great deal as more people and infrastructure inhabit these coastal locations,” said Landsea. The Natural Hazards Review paper, “[Normalized Hurricane Damage in the United States: 1900-2005](http://www.noaanews.noaa.gov/exit.html?http%3A%2F%2Fsciencepolicy.colorado.edu%2Fadmin%2Fpublication_files%2Fresource-2476-2008.02.pdf),” was written by Roger A. Pielke Jr. (University of Colorado), Joel Gratz (ICAT Managers, Inc.), Chris Landsea, Douglas Collins (Tillinghast-Towers Perrin), Mark A. Saunders (University College London), and Rade Musulin (Aon Re Australia). The team used two different approaches, which gave similar results, to estimate the economic damages of historical hurricanes if they were to strike today, building upon the work published originally by Landsea and Pielke in 1998, and by Collins and Lowe in 2001. Both methods used changes in inflation and wealth at the national level. The first method utilized population increases at the county coastal level, while the second used changes in housing units at the county coastal level. The results illustrate the effects of the tremendous pace of growth in vulnerable hurricane areas. If the 1926 Great Miami Hurricane were to hit today, the study estimated it would cause the largest losses at $140 billion to $157 billion, with Hurricane Katrina second on the list at $81 billion. The team concludes that potential damage from storms – currently about $10 billion yearly – is growing at a rate that may place severe burdens on exposed communities, and that avoiding huge losses will require a change in the rate of population growth in coastal areas, major improvements in construction standards, or other mitigation actions. The National Oceanic and Atmospheric Administration, an agency of the U.S. Commerce Department, is dedicated to enhancing economic security and national safety through the prediction and research of weather and climate-related events and information service delivery for transportation, and by providing environmental stewardship of our nation's coastal and marine resources. Through the emerging Global Earth Observation System of Systems ([GEOSS](http://www.noaa.gov/eos.html)), NOAA is working with its federal partners, more than 70 countries and the European Commission to develop a global monitoring network that is as integrated as the planet it observes, predicts and protects.

Attributing increased hurricane frequency to global warming is impossible- damages are caused by human concentration on the coast.

**Lomborg 07** (Bjorn Lomborg, Ph.D. in political science and adjunct professor at Copenhagen Business School. Cool it: the skeptical environmentalist's guide to global warming)

So has global warming caused stronger and more frequent hurricanes? And can we expect more in the future? Let us here use the latest consensus statement from the UN World Meteorological Organization (parent organization of the IPCC), which is more recent and more speciﬁc but generally in agreement with the 2007 IPCC report. It makes three strong points. “1. Though there is evidence both for and against the existence of a detectable anthropogenic [human-caused] signal in the tropical cyclone climate record to date, no ﬁrm conclusion can be made on this point.” That is, the strong statements of humans causing more and stronger hurricanes (or tropical cyclones, as researchers call them) are simply not well supported. We just don't know yet. Al Gore is incorrect when he tells us that there is a “scientiﬁc consensus that global warming is making hurricanes more powerful and more destructive." “2. No individual tropical cyclone can be directly attributed to climate change.” The strong public statements on Hurricane Katrina are simply not supportable. However, the third WMO consensus point is perhaps the most important one. We rarely care about hurricanes as such—what we care about is their damage. Do they kill people and cause widespread disruption? And with global warming, will they kill and disrupt even more? The answer is—perhaps surprisingly—that the whole hurricane debate is somewhat tangential to this important question. “3. The recent increase in societal impact from tropical cyclones has largely been caused by rising concentrations of population and infrastructure in coastal regions.” While the theoretical debate over whether hurricanes are increasing or not increasing is unlikely to reach a clear-cut conclusion anytime soon, most observers end up pointing out how damages [CARD CONTINUES] from hurricanes are rising dramatically and quickly. Gore ends his discussion on hurricanes by presenting the historically increasing hurricane and ﬂooding costs, telling us it is the “unmistakable economic impact of global warming.” He tells us that by 2040, weather-related disasters could cost as much as $1 trillion, “driven by climate change.” The numbers are correct. But attributing them to global warming is wrong.

Hurricanes- No Impact

Hurricanes are a minor threat to humanity and the state.

**Norman 09** (Rogers Norman Rogers is a Senior Policy Advisor at the Heartland Institute , a Chicago-based think tank. He is a member of the American Geophysical Union and the American Meteorological Society. “Global Warming = More Hurricanes?” http://www.climateviews.com/Climate\_Views/Download\_Articles\_files/HurricanesLinkdedToGLobalWarming.pdf)

Hurricanes are a manageable threat. Only 73 strong hurricanes have landed in the U.S. in the last 100 years (wind speed greater than 111 MPH). Only 2 of the 73 were very dangerous category 5 storms with winds over 156 MPH. There is evidence that strong hurricanes were much more frequent between 1000 and 3500 years ago4. The radius of intense winds in hurricanes is limited and hurricanes quickly collapse when moving on to land. Generally serious hurricanes strike at a particular place only infrequently, on the order of every 100 years depending on how serious is serious. Damages can be limited by better building standards and damage can be compensated by insurance. In Florida, probably the state most at risk for hurricanes about $10 billion5 was paid in 2007 for hurricane insurance premiums. During the same year the gross domestic product of the state was $734 billion. This is 1.36% of gross state product, expensive, but manageable. Residents pay far more in state and local taxes. The cost of insurance may be reduced in the future by better building codes. Certainly there is plenty to worry about with hurricanes but the alleged global warming connection is far down the list.

Hurricanes and other natural disasters are publicized in the media and do not actually cause many casualties.

**Borden and Cutter 08** (Kevin A. Borden and Susan L. Cutter, Hazards and Vulnerability Research Institute, Department of Geography, University of South Carolina, Columbia. “Spatial Patterns of Natural Hazards Mortality in the United States” http://www.medscape.com/viewarticle/586637\_3)

Figure 1 shows the distribution of deaths for 11 hazard categories as a percent of total hazard deaths from 1970 - 2004. Heat/drought ranks highest among these hazard categories causing 19.6% of total deaths, closely followed by severe summer weather (18.8%) and winter weather (18.1%). Geophysical events (such as earthquakes), wildfires, and hurricanes are responsible for less than 5% of total hazard deaths combined. What is noteworthy here is that over time, highly destructive, highly publicized, often catastrophic singular events such as hurricanes and earthquakes are responsible for relatively few deaths when compared to the more frequent, less catastrophic events such as heat waves, and severe weather.

Hurricanes do not adversely affect the economy due to increased spending elsewhere.

**Carey 11** ([John Carey](http://e360.yale.edu/author/John__Carey/102/) is a freelance writer covering the environment, energy, science, technology and medicine. “Calculating the True Cost Of Global Climate Change**” Yale Environment 360**. http://e360.yale.edu/feature/calculating\_the\_true\_cost\_of\_global\_climate\_change/2357/ )

True, the models don’t include all possible costs or catastrophes, Nordhaus and Mendelsohn respond. For one thing, the models calculate the damages. The costs of a catastrophic event would be so enormous that it would overwhelm the analysis from climate change only in terms of economic activity. They don’t assess damages from non-market effects like loss of species. Take [ocean acidification](http://e360.yale.edu/feature/an_ominous_warning_on_the__effects_of_ocean_acidification/2241/), which makes climate change more worrisome than it appeared to be in the 1990s, Nordhaus says. The direct economic damages from acidification are negligible. “We know the actual economic impacts are almost sure to be small because they involve fisheries, which are already pretty small, and they involve only ocean fisheries that are sensitive to carbon,” Nordhaus says. Similarly, the calculated damages from extreme events are small, Nordhaus and Mendelsohn say. While the estimated cost of Hurricane Katrina topped $150 billion, hurricanes don’t actually hurt the economy, as measured by GDP. “If your million-dollar house blows away tomorrow, it would not affect GDP,” explains Nordhaus. The reason: spending to rebuild stimulates the economy. “This is one of the ways in which GDP is a flawed measure,” Nordhaus adds. Mendelsohn has spent years trying to figure out what the additional damages from extreme events might be — and he argues that they don’t amount to much. “As long as we didn’t measure this number, the perception was that it was huge,” he says. “But when we actually measure it, it turns out not to be big.”

Offense-Global Warming Good

Global warming is good- preferable to global cooling and is part of a natural cycle.

**Wigmore 07** (Barry Wigmore was a freelance feature writer working mostly for the London Times “Global warming? It's natural, say experts” http://www.dailymail.co.uk/news/article-481613/Global-warming-Its-natural-say-experts.html)

Global warming is a natural event and the effects are not all bad, two respected researchers claimed yesterday. Authors Dennis Avery and Fred Singer looked at the work of more than 500 scientists and argue that these experts are doubtful the phenomenon is caused by man-made greenhouse gases. Climate change is much more likely to be part of a cycle of warming and cooling that has happened regularly every 1,500 years for the last million years, they say. And the doom and gloom merchants, who point to the threat to the polar bear from the melting North Pole, are wrong, the authors say. Even if our climate is changing, it is not all bad, they suggest, because past cold periods have killed twice as many people as warm periods. Mr Avery said: "Not all of these researchers who doubt man-made climate change would describe themselves as global warming sceptics but the evidence in their studies is there for all to see. "Two thousand years of published human histories say that the warm periods were good for people. "It was the harsh, unstable Dark Ages and the Little Ice Age that brought bigger storms, untimely frost, widespread famine, plagues and disease." Mr Singer said: "We have a greenhouse theory with no evidence to support it, except a moderate warming turned into a scare by computer models whose results have never been verified with real-world events. "The models only reflect the warming, not its cause." The most recent global warming was between 1850 and 1940, the authors say, and was therefore probably not caused by man-made greenhouse gases. Historical evidence of the natural cycle includes a record of floods on the Nile going back 5,000 years; Roman wine production in Britain in the first century AD; and thousands of museum paintings that portray sunnier skies during what is called the Medieval Warming, and more clouds during the Little Ice Age. The authors looked at a raft of studies which, they claim, undermine the "scare-mongering" by those blaming man for destroying the planet. In the current warming cycle, they say there is evidence that storms and droughts have been fewer and milder; corals, trees, birds, mammals and butterflies have adapted well; and sea levels are not rising significantly. Mr Avery is a fellow of the Hudson Institute, an independent U.S. thinktank that tends to side with big business. He was a senior agricultural analyst at the State Department when Ronald Reagan was president. Mr Singer is a climate physicist. The pair spent months analysing scientific reports for their book, Unstoppable Global Warming: Every 1,500 Years, to counter claims made by former U.S. Vice President Al Gore in his film An Inconvenient Truth. They argue that variations in the Sun's radiation have far more influence on our climate than humans. Mr Singer said: "This can all be explained by the Sun's activity." He added: "The number of the Sun's cosmic rays hitting the Earth affect the number of low, cooling clouds that reflect solar heat back into space, amplifying small variations in the intensity of the Sun."

Hurricane Impacts Inevitable

**Realistically, there is no way to solve through moving hurricanes- someone always draws the short stick.**

ROSS N**. HOFFMAN**, JOHN M. **HENDERSON**, GEORGE D. **MODICA**, S. MARK **LEIDNER**, CHRISTOPHER **GRASSOTTI** AND THOMAS **NEHRKORN 06** (Hoffman, Henderson, Modica, Leidner, and Grossotti are all partners at the Atmospheric and Environmental Research, Inc, “A DUAL USE FOR SPACE SOLAR POWER”)

In addition, a number of problems must be solved in the political, economic, and legal realms. For inhabitants of New Orleans, eliminating a hurricane threat to that city may take precedence over all else, yet farmers in the middle of the US might suffer without the resulting rain. This example shows that many competing factors must be considered in defining the cost function to be optimized. These “social engineering” issues may prove more difficult to overcome than the science and hardware engineering issues. The U.N. Convention on the Prohibition of Military or any Other Hostile Use of Environmental Modification Techniques was negotiated and signed in the late 1970s. (Visit www.unog.ch/frames/disarm/distreat/environ.pdf.) Weather modification for beneficial purposes (e.g., for managing hydrological resources) is not banned, however. Most changes to the weather will have some positive and some negative effects. It is not too soon to think about the political and social issues involved. Since the atmosphere is a coupled system, one nation practicing large-scale weather modification may change the weather of its neighbors. The same holds on a smaller scale for provinces and metropolitan regions.