

Science Hill Watch

Science-based analysis of America's key environmental issues

Center for Science
& Public Policy
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Congressional Staff Seminar

Overview and Conclusions

On January 29, 2004, Dr. Paul Epstein's Center for Health and the Global Environment, Harvard Medical School (www.med.harvard.edu/chge) presented a set of *scientifically biased* briefings to congressional staff labeled "Oceans, Climate Change and Human Health." The sources of this unfortunate imbalance included (1) presentation of partial data and research, (2) exclusion of contradictory data and research and (3) exclusion of the most recently peer-reviewed research findings on the topics covered.

This exemplifies a major, ongoing concern over public discussion of environmental issues such as climate change and mercury: the tendency of activists to distort the facts and exaggerate consequences. Claims are rarely validated by empirical research, relying heavily on deficient models and select, incomplete data. It cannot be over-emphasized that when the facts and the theory do not coincide, highest deference should be paid to the facts. Models tend to be for people who want to believe what they want to believe.

In relation to climate change, Dr. Richard Lindzen at MIT has recently written:

A fairer view of the science will show that there is still a vast amount of uncertainty...It is crucially important that we preserve the integrity of science as a tool for effective assessment and understanding of nature. Policymakers...should devote their ingenuity to designing a system of support for science that encourages problem resolution and discourages alarmism. Equating climate change with global terrorism, as [has been] done recently, is precisely the sort of statements that all concerned, thinking citizens should condemn. (The Hill Times, Ottawa, Canada, 2-23-04)

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In addition to printed lecture summaries, numerous printed handouts were available indicating the urgent need for further policy and regulatory initiatives over a wide environmental front. Particularly noteworthy was a glossy, four-page executive summary of a report “intended to provide a comprehensive framework for evaluating the true costs of our use of oil” (www.med.harvard.edu/chge/oil.html).

It is difficult to see how anyone exposed to this material, especially congressional staff less familiar with the issues, could use it in formulating a “fair evaluation.” Aside from a thin acknowledgement that oil “has many benefits” (none of which was listed) and “energy is necessary for all our activities,” the report attributes to the extraction, transport, refining, distribution and combustion of oil nearly every imaginable health and environmental ill. Throughout, science suffers. Of particular note, relative to the theme of this set of briefings, is the scientifically untenable assertion that “Gulf Coast offshore oil rigs contaminate sediments, fish and fish consumers with mercury at levels far exceeding EPA standards.”

The Energy Foundation, a partnership of major foundations interested in “sustainable energy,” sponsored the event. The John D. and Catherine T. MacArthur Foundation, The Pew Charitable Trusts, and The Rockefeller Foundation launched it in 1991. The Mertz-Gilmore Foundation joined as a funding partner in 1996, and the McKnight Foundation in 1998 and the David and Lucile Packard Foundation in 1999.

Analysis and Commentary

Paul Epstein (Harvard Medical School).

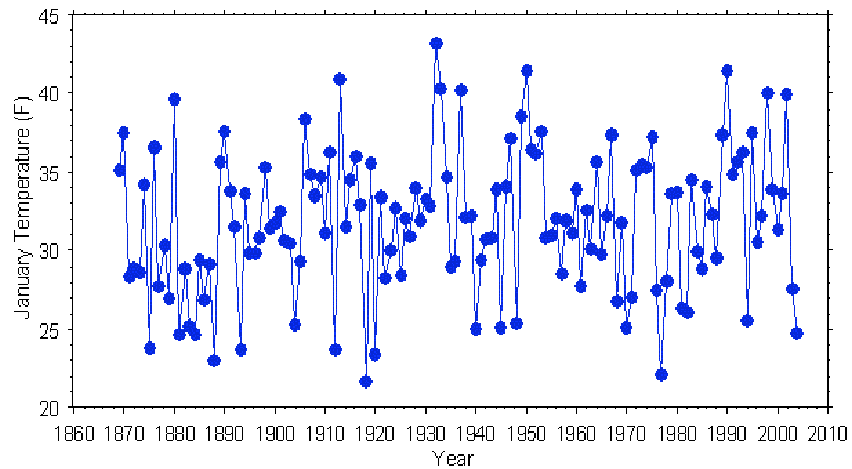
Dr. Epstein’s main message: The world is in serious trouble in terms of human induced climate change, emerging diseases and toxic chemicals. The “extraction and combustion” of fossil fuels [used to power about 85% of our energy needs] may lead to sudden North Atlantic “ice ages,” rising sea levels, ballooning extreme-weather property losses and poisoning of common sea food.

CSPP Commentary

Climate has always varied, often with large swings. A warm and benign period about 1000 years ago known as the Medieval Warm Period -- arising from natural changes either within the climate system or through external forcing such as increased irradiation from the Sun -- evidenced drastic changes in the environment, provoking ecosystem and societal responses (northward spreading of plant species, crop cultivation at higher altitudes, etc.). Conversely, the earth has experienced drastic and sudden drops in global temperatures, such as during the Younger Dryas 12,700 years ago, during which the North Atlantic region stayed very cold for nearly 1000 years; and less persistent cold periods around 8,200 years ago. These dramatic climatic ebbs and flows are naturally occurring events. A more appropriate response to potential climate change is the production and employment of resources toward meaningful adaptation strategies.

This said however, there is no evidence to suggest that we are on the edge of a sudden climate event. Yet, Dr. Epstein suggests we are in his January 28, 2004 New York Times editorial entitled “Global Chilling” (handed out at the seminar) that “New Yorkers may be able to blame the city’s current cold spell—the most severe in nearly a decade—on global warming” under his premise that global warming will lead to a sudden onset of North Atlantic “ice ages.”

Figure 1



The average January temperature observed in New York City’s Central Park since 1869. There is neither a warming, nor a cooling trend in these observations.

However, a long-term look at the January temperature history in New York City (Figure 1) shows that there has been no long-term trend, either towards warming or cooling, since record keeping began in Central Park in 1869. So, Dr. Epstein’s view that this winter’s climate is a harbinger of things to come is no more valid now that it would have been during the similarly cold January of 1875 or any other colder than normal year. Chilling claims, of the type made by Dr. Epstein, simply enjoy no observational support.

Ruth Curry (Woods Hole Oceanographic Institution).

Curry’s main message: CO₂-induced global warming (springing from human activities such as burning fossil fuels) will slow the flow of the Gulf Stream (the so-called Thermohaline Circulation, or THC), causing it to provide less heat to Europe and plunging the continent into a new Little Ice Age. (Current sensational press reports and alarmism suggest these conditions could lead to political tensions around the globe, promoting it that even the Pentagon’s strategic planners are said to be grappling with its implications.)

CSPP Commentary

The ocean and the atmosphere exhibit constant, and often dramatic, natural variability. While deep ocean modeling remains highly uncertain, requiring considerable further development, it appears that a freshening of the North

Atlantic Ocean has been observed. Therefore, Curry's data gathering efforts, as reported recently in *Nature* (vol. 426, 826-829, 2003), should be applauded and encouraged because such oceanographic measurements are sparse and difficult to obtain.

However, there appears *weak scientific evidence* for her presentation to staff that the recent salinity changes in the Atlantic Ocean indicate a weakening THC, her source materials being seriously dated.

The deep ocean is little understood due to sparse observations, and it may not actually work like a cartoon conveyer belt neatly drawing warm and less saline water from the tropics to the North Atlantic where it gives off heat, initiating a "pump" which sinks cold and dense water down to the depth of 1 to 3 kilometers. Mechanisms leading to or inhibiting sinking of surface water remain uncertain and therefore absent from most existing ocean models.

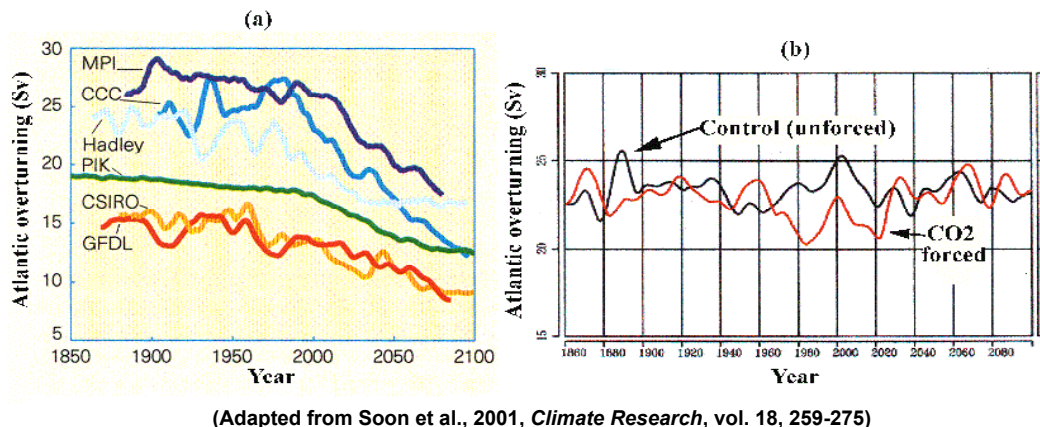
There are also questions of the physics of energy flowing through the ocean. Carl Wunsch of MIT recently concluded that it is unclear that THC did shut down during the Last Glacial Maximum, roughly 20 thousand years ago (Wunsch C., *Quaternary Science Reviews*, vol. 22, 371-385, 2003). Instead, Wunsch offered an alternate idea: the much windier conditions then could have produced a current in the Atlantic Ocean that rode at a shallower ocean depth than THC current presently does. This shallower current neither weakens nor shuts down during the cold, glacial periods.

Figure 2

Models yield conflicting results on Weakening of the North Atlantic Thermohaline Circulation (THC) due to CO2 enhancement

Models from the late 1990s predicted a weakening of THC.

A higher-resolution Model from the Max Planck Institute for Meteorology published in 2000 predicts no weakening of THC. Additional results from both NCAR and GISS also suggest no weakening.



In fairness to Curry, some early computer simulations, like those in the left panel of Figure 2, did show a weakening of the THC circulation by 20 to 50% under similar carbon dioxide loading in the air by 2100 (Figure 2, left panel). But as early as 2000, researchers from Max Planck Institute (MPI) of Meteorology in Hamburg had found *no* weakening of THC under carbon-dioxide produced global warming (Figure 2, right panel). The new MPI ocean model had an improved ability to resolve the tropical oceans -- at least four times better than in previous models.

There are additional recent scientific papers and studies, *unmentioned by Curry*, pointing out that actualization of her hypothetical scenario is close to zero, and the Gulf Stream will likely be around for a very long time.

First, a trio of scientists from the United Kingdom (Wu et al. 2004, *Does the recent freshening trend in the North Atlantic indicate a weakening thermohaline circulation?*) reported in *Geophysical Research Letters* that the Atlantic THC has *strengthened* over the past 4 decades, contrary to the projections made by several earlier general circulation models (see Figure 2). Wu et al. report that they did “not find a decreasing trend of the North Atlantic THC.” Quite the contrary, they say that “accompanying the freshening trend, the THC unexpectedly shows an upward trend, rather than a downward trend.”

What does this mean? Again, *contrary to statements* made by Dr. Curry, the scientists on the Wu team concluded that the observed freshening trend “does not seem to be consistent with an anthropogenically forced climate change scenario.” They reiterate a few sentences later that their analysis “does not seem to support an interpretation of the observed freshening trend as an early signal of climate change due to human activities.” We should further note that with no slow down of the THC, and maybe even an *increase* in its flow rate, the Gulf Stream should continue to keep Europe significantly warmer than what its latitude would suggest.

Secondly, in another paper (Bleck and Sun, *Global and Planetary Change*, vol. 40, 233-248, 2004), the authors, using a coupled ocean and atmosphere computer model with a one percent per year increase in carbon dioxide levels (itself an uncertain scenario), found that “the Atlantic overturning stream function appears to be stable,” and is “insensitive to global warming resulting from gradual CO₂ doubling.”

Once again, Dr. Curry’s scenario based on the UN’s IPCC findings is scientifically unsound. Bleck and Sun pointedly note that “recent publications...paint a picture which makes a strong decline of the Atlantic MOC [meridional overturning circulation] during CO₂ doubling appear less likely.”

Another thorough review of the science concludes: “Science is to be preferred over fiction. The current generations of climate models...fail to comprehend the difficult conditions of THC’s past or future states -- strengthening, weakening or collapsing. Touting greenhouse gas emission reduction to save the world from a

future glacial period is an unqualified prescription with no scientific vetting.”(<http://www.techcentralstation.com/022404D.html>)

Again, as to speculative suggestions of a weakening or shutdown of the North Atlantic THC circulation, prognostic confidence is necessarily lacking when past and current models predict *both* weakening and strengthening of the THC under an increasing CO2 scenario.

See (<http://millennium-debate.org/ind10feb032.htm>) for press commentary on suggestions of THC collapse. Another press report – contradicting the Curry scenario -- about a paper in Nature, August 23, 2002 blares: “ANOTHER ICE AGE MIGHT NEVER HAPPEN” (<http://www.nature.com/nsu/020819/020819-9.html>). The story began: “Mankind could lock the world into an irreversible greenhouse effect, banishing future ice ages, warn two Belgian scientists. Global warming caused by emissions of carbon dioxide and other gases could tip the Earth into a completely new climate state in which cycles of freezing and thawing are switched off, they suggest.”

For additional commentary on this issue, see (<http://www.john-daly.com>), “A Cold Greenhouse.” Observes the author, the late John Daly, “It is a case study, not of climate science, but of a hysterical mass psychology in action among society's more gullible intellectuals and climate scientists who should know better.” “In May this year, new fuel will be added to the fire with the release of the Hollywood blockbuster, *The Day After Tomorrow*, starring Dennis Quaid as an environmentalist hero in this latest of a long line of Hollywood disaster movies,” adds Daly.



Source: <http://www.thedayaftertomorrowmovie.com/>

And finally, the IPCC surface temperature record charts (based on the work of Michael Mann) Curry used in support of her presentation have been reported as critically flawed in several recent papers. McIntyre and McKittrick, for example, report that the dataset used to make the temperature construction contained “collation errors, unjustified truncation or extrapolation of source data, obsolete

data, incorrect principal component calculations, geographical mislocations and other serious defects." These errors and defects substantially affect the temperature index, rendering the results unreliable for public policy decision-making.

Virginia Burkett (USGS National Wetland Research Center).

Burkett's main message: the Gulf coast (especially Louisiana) is experiencing serious land subsidence problems from human activities that could be compounded by threats of climate-induced storm surges and relative sea level rise.

CSPP Commentary

Burkett stressed that the main cause for the estimated loss of 1 million acres of coastal wetland since 1940 in the state of Louisiana is primarily due to land subsidence, in turn related to human modification of the local and regional landscape, *not* greenhouse gas emissions. However, her statement that global sea level is expected to accelerate 2 to 4 fold over the next century appears as more alarmism, the underlying tone of the entire staff seminar. Available tide-gauge evidence for the 20th century confirms *no* acceleration in sea level rise as predicted by deficient climate models. As the oceanographer, Raymond Schmitt (Woods Hole Oceanographic Institution) sharply cautioned: "We will not come to an understanding of climate by more computational cycles of models with incorrect physics."

Burkett stated that the rate of global sea level rise during the 20th century is only 1 to 2 mm/year, while an apparently extreme rate of 10 mm/year rise occurred around 6 to 15 thousand years ago (a period of natural recovery from the deep ice age of 20 thousand years ago).

Philip Grandjean (Harvard School of Public Health).

Grandjean's main message: Warnings about the toxicological effects of methyl mercury from man-made sources such as deep ocean oil drilling and coal-powered electricity generation plant emissions.

CSPP Commentary

Without presenting any supporting data, Grandjean asserted that his toxicological evidence from the Faroe Island study suggests that the IQ of children will drop 1.5 points for every doubling of the exposure levels to methyl mercury through maternal consumption of ocean fish. This claim is strange in that he openly admits contamination of his data through *high* PCB exposure and *no* attempt at direct measurement of the IQ of those children. "In conclusion, we have obtained evidence of subtle adverse effects on neurobehavioral functions, blood pressure, and growth. At age 7 years, a doubling of the mercury exposure corresponds to a developmental delay of up to 2 months. Although IQ tests *were not done* (emphasis added), such delays would be comparable to a loss of about 1.5 IQ points." Refer to this web site for full statement: (<http://www.masgc.org/mercury/abs-clapp.html>).

Equally astounding considering his reliance on the Faroe study, Grandjean admits that, "... increased methyl mercury exposure [in the Faroe Island test children] is mainly due to consumption of pilot whale meat." Since it is most likely that no expectant mother in the US consumes pilot whale meat (containing high methyl mercury) or whale blubber (contaminated with *high* PCBs), the Faroe children study is *neither appropriate nor applicable* for US population comparisons or reference dose safety levels of consumption. For the record, in a letter to EPA Dr. Kenneth Poirier and Dr. Michael Dourson, former EPA RfD/Reference Concentration Work Group co-chairs, alerted EPA, "The Faroe Islands studies are not the proper choice for the critical study for methylmercury RfD" (<http://ff.org/centers/csspp/pdf/mercurywhitepaper.pdf>).

In light of the best studies, it appears an ongoing popular myth that clear evidence exists for adverse neurodevelopmental effects on children exposed to present levels of methyl mercury available through fish consumption either by their birth mothers or themselves.

In what could be seen as an obvious bias to anyone familiar with the literature, Grandjean barely mentioned the well-known Seychelles Island children study (Myers et al., 2003, *Lancet*, vol. 361, 1686-1692), except to dismiss it. This ongoing study has consistently *failed* to find signs of neurological problems in a group of children ages 6, 19, 29, 60 and 108 months old despite their exposure to methyl mercury levels at least ten times *higher* than that of the average US population.

The authors of the Seychelles Islands study found, ".no detectable adverse effects in a population consuming large quantities of a wide variety of ocean fish." and "These data do not support the hypothesis that there is a neurodevelopmental risk from prenatal methylmercury exposure resulting solely from ocean fish consumption."

To the contrary, the authors report only nutritional benefits from fish consumption. As a few examples of such benefits, the most recent Seychelles Island study, which attempts to duplicate the previous neuropsychological tests performed by the Faroe Island study, found that children of women with higher levels of methyl mercury exposure were *less likely* to be hyperactive; they also had measurably superior eye-sight.

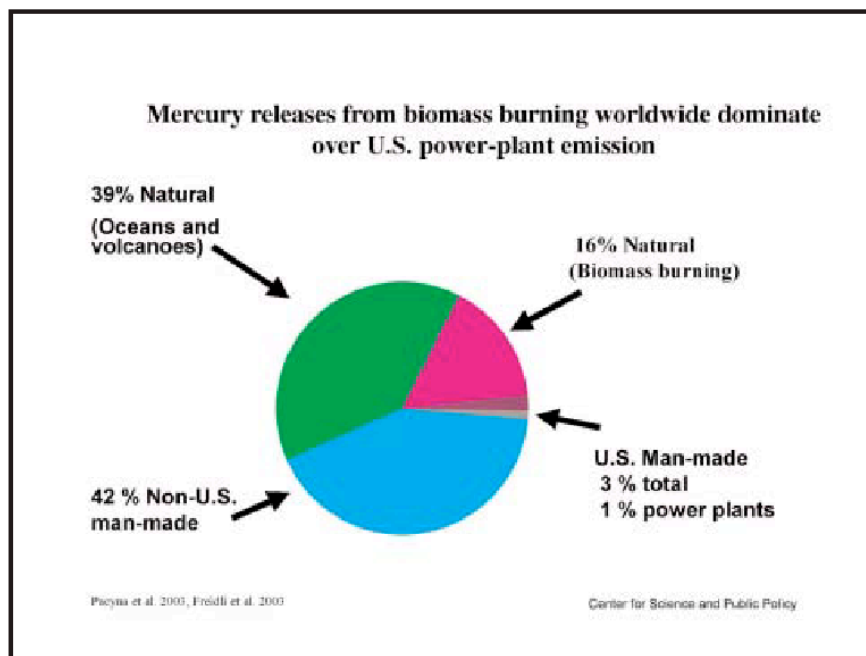
Seychelles presents the best toxicological evidence to date on exposure of children to methyl mercury through fish consumption. On the other hand, there are serious scientific concerns that the Faroe Island study, though aimed to study the effects of methyl mercury, was contaminated by maternal exposure to PCBs via binge consumption of pilot-whale blubber. In contrast, the Seychelles Island population is known to have exposure to negligible levels of PCBs. Those who insist on finding a problem to regulate, favor the use of the inferior and confounded Faroe Island study. Grandjean opening admitted that he approaches this issue with a prejudice toward "overestimation" of harmful effects, demonstrating again the unscientific character of the "precautionary principle" and its potential for harm to both to public policy and public health.

A thorough examination of current issues surrounding mercury (Hg), fish consumption and related health effects can be found in a white paper at: <http://ff.org/centers/csspp/pdf/mercurywhitepaper.pdf>

Some of the facts discussed in the paper include:

- Hg in food & environment is mainly due to background natural emissions and accumulation of man-made Hg emitted since start of industrial revolution
- Current US power plant emissions are estimated at less than 1% of total annual global emissions of Hg, while worldwide biomass burning alone accounts for 16% (see Figure 3)
- Hg present in US food is mainly due to saltwater fish and freshwater farm-raised fish (this Hg is not influenced by US power plant emissions)
- Only .05% of fish consumed in US are freshwater fish that might respond to changes in Hg emissions, according to United Nations data
- No evidence that Hg is a “growing threat”
- Hg emissions and depositions in US have declined over past several decades
- Increases in the number of fish advisories is due to increases in the number of Hg measurements in fish, not due to increases in levels of Hg in the environment
- No evidence that circulating Hg levels in US fish consumers can cause neurological or developmental problems

Figure 3



Cosette Simon (Swiss Re).

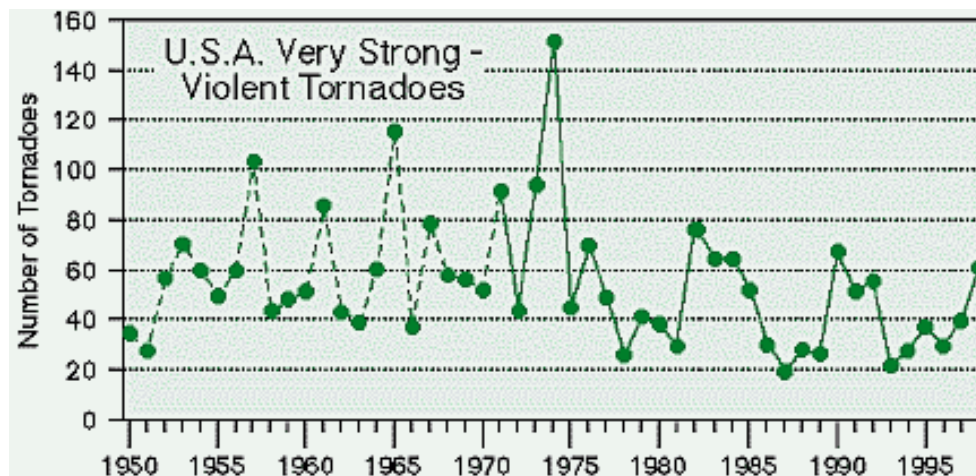
Simon’s main message: Swiss RE is interested in the bottom line of the balance sheet, not “cosmetics” issues of climate change. With Swiss Re it is all about “good business.” So important is the issue of climate change to business that Swiss Re has opened a new office in D.C.

CSPP Commentary

It is highly uncertain that “good business” could flow from the questionable science and economics used to make her points; and Simon whipped through a series of charts so quickly [due to time constraints] that only one conversant with her topic would notice. She displayed the now familiar UNEP forecast of future weather and climate events costing up to \$150 Billion/year. It is puzzling how anyone could possibly rely on such estimates, filled as they are with errors in fact and logic, when the “climate change-driven natural disasters” supposedly underlying such estimates have not even yet been forecast, let alone actually occurred. In addition, to relate natural disasters such as volcanic eruptions and massive earthquakes to the air’s increase in CO2 content stretches credulity beyond the event horizon. Simon’s major points have been examined in a number of analyses of the UNEP forecast, one of which can be found at: (<http://www.techcentralstation.com/101802M.html>).

The primary natural disaster that is the focus of warming alarmist claims, led by Swiss Re, for US property losses are Atlantic Ocean hurricanes. Often repeated is the alarmist claim, against all evidence, that global warming will increase both the frequency and intensity of hurricane storms, leading to ever more costly property losses. The same can be said of violent tornados (See Figure 4).

Figure 4



In response to such claims, Easterling et al. (2000) report that “the number of intense and landfalling Atlantic hurricanes has declined.” This is also the

conclusion of Parisi and Lund (2000), relative to the time period 1935-1998. And in a detailed study of the period 1944-1996, Landsea et al. (1999) found *decreasing* trends for (1) the total number of hurricanes, (2) the number of intense hurricanes, (3) the annual number of hurricane days, (4) the maximum attained wind speed of all hurricanes averaged over the course of a year, and (5) the highest wind speed associated with the strongest hurricane recorded in each year. In addition, they determined that the total number of Atlantic hurricanes making landfall in the United States decreased over the extended period of time from 1899 to 1996, and that normalized trends of United States hurricane damage between 1925 and 1996 reveal such damage to be *decreasing* at a rate of 728 million dollars per decade.

As shown in Fig. 4, the intensity of the intense Hurricanes over the Atlantic basin **did not increase** over time (from 1950 to 2002) when atmospheric carbon dioxide was rapidly increasing. **In fact, there is a slight decrease in the intensity** of the intense-hurricanes thus dispelling the myth that with carbon dioxide global warming the coast of Florida will be increasingly damaged by more and more intense hurricanes.

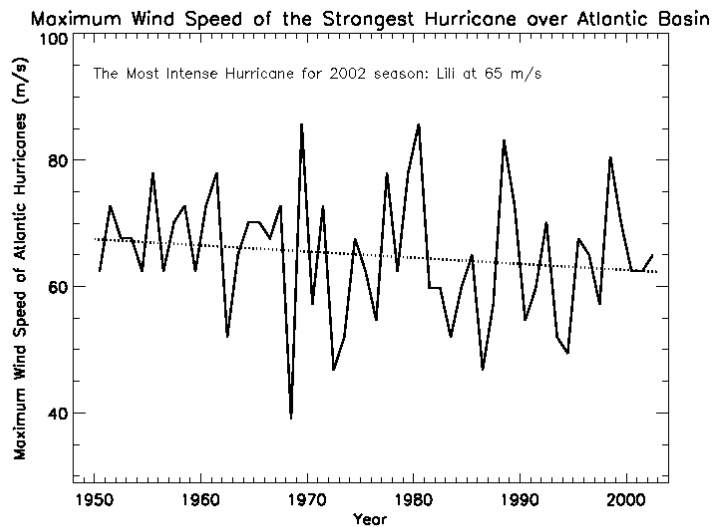


Figure 4. Intensity (maximum wind speed) of the strongest hurricanes (categories 3, 4 and 5; maximum 1-minute sustained wind speed above 50 m/s or 111 mph) over the Atlantic Basin.

Clearly, there appears to be little question but what global warming in the past has tended to reduce both the frequency and intensity of Atlantic basin hurricanes, as these many real-world studies spanning decades to millennia demonstrate.

The Center for Science and Public Policy
 March 8, 2004