



August 14<sup>th</sup>, 2008

Subject: Comments on the Draft “Global Climate Change Impacts in the United States: Unified Synthesis Product Report by the U.S. Climate Change Science Program, First Draft, July 2008”<sup>1</sup>

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Pursuant to NOAA’s Federal Register Notice of July 17, 2008<sup>2</sup> please consider the following comments on the Draft “Global Climate Change Impacts in the United States” (hereafter, “the document”<sup>3</sup>).

The transmittal letter to Congress says that document, pursuant to Department of Commerce and NOAA Information Quality Act (IQA) guidelines, does not “express any regulatory policies of the United States or any of its agencies, or provide recommendations for regulatory action.” Yet the document continually commingles science and advocacy for regulatory controls on carbon dioxide.

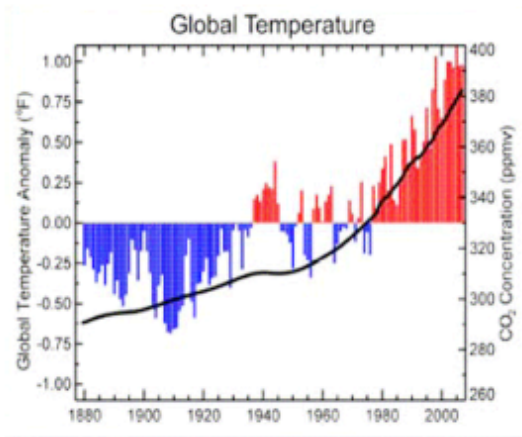
The cheerleading begins on the cover page with a figure depicting global temperatures from 1880 to the present. The figure is scaled to scare the public, making a 1.5°F warming over 130 years look gigantic. If the X Axis had been a household thermometer, spanning minus 20° to 120°F, the warming of the past 130 years would barely be discernible.

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<sup>1</sup> Submitted on August 14, 2008, by mail to the above-cited individuals and by E-mail to [USP-comments@climatescience.gov](mailto:USP-comments@climatescience.gov).

<sup>2</sup> July 17, 2008, Volume 73, Number 138; page 41042.

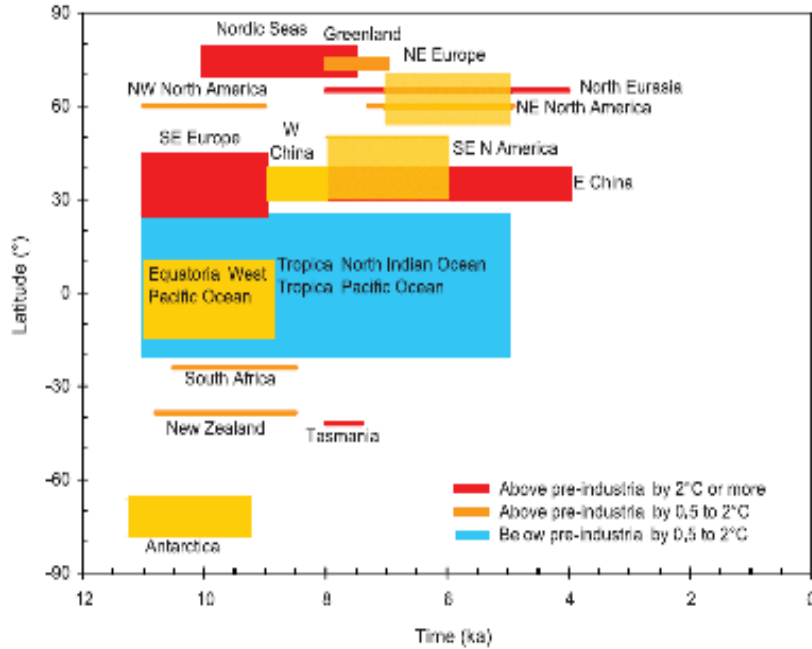
<sup>3</sup> Version viewed at <http://downloads.climatescience.gov/sap/usp/usp-prd-all.pdf>.



**Correction:** Remove the scary-looking figure from the cover page, or rescale it so that the general public easily sees what all the fuss is about—a gradual warming of the Earth at a rate of tenths of a degree per decade.

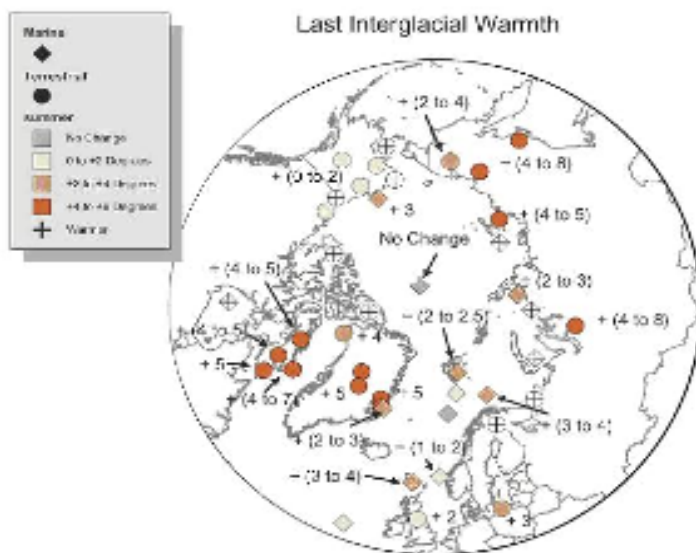
The Executive Summary is over-the-top advocacy, beginning with the caption: “The Future is in Our Hands.” This is the bottom-line conclusion of a *science* report? The Me Generation likes to view itself as the turning point of world history, making “choices” that will either save the planet or destroy it. This conceit may be appropriate in a political stump speech or a Sci-Fi disaster film, but it is out of place in a science report.

The Executive Summary invokes the scary but gauzy concept of “Tipping Points,” a topic hardly discussed, much less quantified, later in the report. Although tipping points undoubtedly exist in nature, the hype on this topic has gotten out of hand. For example, the claim that warming will melt permafrost and release billions of tons of carbon dioxide and methane, creating a gigantic feedback loop, is highly implausible. The Holocene Climate Optimum was significantly warmer than the present for thousands of years, especially in the Arctic.



Source: IPCC

During the Last Interglacial Period, the Arctic was several degrees Celsius warmer than the present for thousands of years.



Source: CAPE Members Project

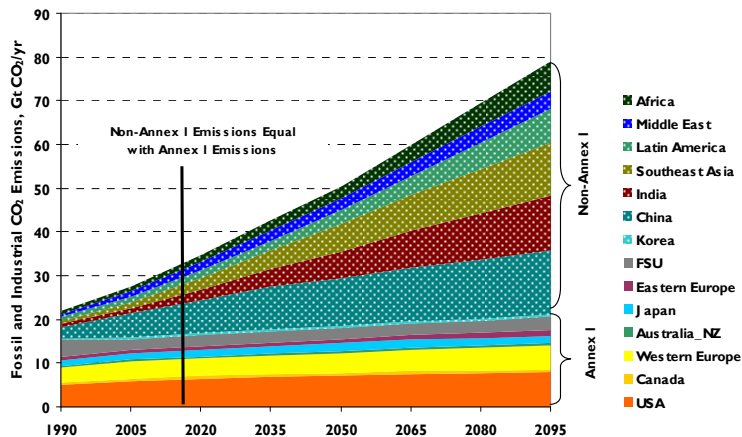
Yet, as the document says on page 17, carbon dioxide levels today are the highest they have ever been in 800,000 years. The same is probably true of methane. If the Holocene

Optimum and the Last Interglacial Period did not tip the permafrost into releasing gigatons of carbon dioxide and methane, then there is no reason to fear that our much milder warming, of much shorter duration, will have this catastrophic effect.

**Correction:** Delete the Executive Summary with its invocation of “Tipping Points” and call for “Urgent Action.”

Advocacy rears its ugly head again on page 17: “The amount of warming that we actually experience will be determined largely by the choices made now and in the near future. Lower amounts of heat-trapping emissions will yield less future warming, while higher amounts will result in more warming and more severe impacts on our society and economy as well as the natural world.” Well, no, the choices we make today and in the near future are climatically irrelevant. As is widely known, the Kyoto Protocol, even if faithfully implemented by all industrial countries, would avert only a hypothetical and undetectable 0.07°C of warming by 2050.<sup>4</sup>

Nearly all the growth in emissions over the next several decades will occur in developing countries.



Source: Department of Energy

China, for example, is building a new coal-fired power plant at the rate of one a week, and India, one a month. Automobile ownership in those countries is skyrocketing. Consequently, the choices “we” make now and in the near future will have very little effect on global emissions.

<sup>4</sup> Wigley, T.M.L., 1998, The Kyoto Protocol: CO<sub>2</sub>, CH<sub>4</sub> and climate implications, *Geophysical Research Letters*, **25**, 2285–2288.

More fundamentally, the document ducks the core scientific issue: climate sensitivity. It says: “Lower amounts of heat-trapping emissions will yield less future warming, while higher amounts will result in more warming and more severe impacts on our society and economy as well as the natural world.” Although true in the abstract, this statement tells us nothing about how severe the impacts of warming will be, because if the climate is relatively insensitive to rising greenhouse gas concentrations, then even “higher amounts” of emissions will produce relatively little warming. Failure to address the core issue of climate sensitivity recurs throughout the document.

**Correction:** Delete the sentences on page 17 inflating the climatic importance of “choices made now.”

The discussion of water vapor feedback on page 19 is incomplete and therefore misleading. Warming from carbon dioxide increases evaporation and allows the atmosphere to hold more water vapor, “which in turn leads to more warming.” Well, that’s one hypothesis. The document offers no experimental confirmation that water vapor is, in fact, operating as a “feedback loop.” The document should at least reference the satellite-based research of Roy Spencer and colleagues, who found a strong negative feedback effect in the tropical troposphere not foreseen by any IPCC climate model.<sup>5</sup> All IPCC models assume that cirrus clouds (essentially frozen water vapor) increase as the tropical atmosphere warms. Spencer’s team found that although high altitude ice clouds increase initially, they unexpectedly and rapidly decline as the temperatures continue to climb. In the [press release](#) accompanying the publication of their study, Spencer describes the potential implications for global warming forecasts:

“To give an idea of how strong this enhanced cooling mechanism is, if it was operating on global warming, it would reduce estimates of future warming by over 75 percent,” Spencer said. “The big question that no one can answer right now is whether this enhanced cooling mechanism applies to global warming.”

The only way to see how these new findings impact global warming forecasts is to include them in computerized climate models.

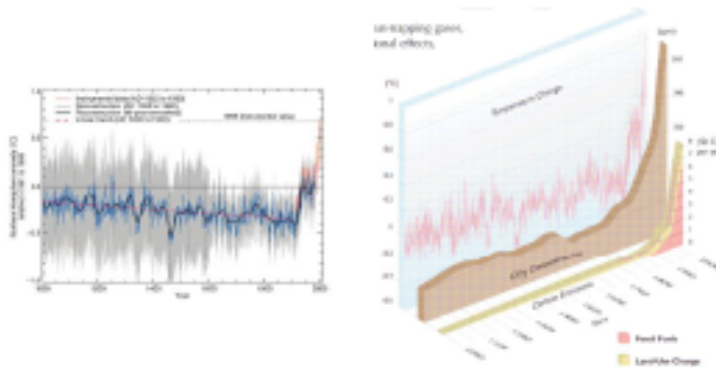
“The role of clouds in global warming is widely agreed to be pretty uncertain,” Spencer said. “Right now, all climate models predict that clouds will amplify warming. I’m betting that if the climate models’ ‘clouds’ were made to behave the way we see these clouds behave in nature, it would substantially reduce the amount of climate change the models predict for the coming decades.”

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<sup>5</sup> Spencer, R.W., Braswell, W.D., Christy, J.R., Hnilo, J., 2007. Cloud and radiation budget changes associated with tropical intraseasonal oscillations. *Geophysical Research Letters*, **34**, L15707, doi:10.1029/2007/GL029698.

**Correction:** Clarify that clouds are a form of water vapor, their role in global warming is uncertain, and recent empirical research suggests the potential for a strong negative climate feedback from cirrus clouds. More fundamentally, clarify that climate sensitivity is the core scientific issue, which remains an unknown quantity despite 20 years and billions of dollars in taxpayer funded research.

The chart on page 19 is the infamous Hockey Stick. This once highly touted study, which allegedly proved that the 1990s were the warmest decade and 1998 the warmest year of the past millennium, has been thoroughly discredited.<sup>6</sup>



Although the chart in the document emphasizes carbon dioxide concentrations, the temperature graph floating above the CO<sub>2</sub> graph is nothing but the old, unrepentant Hockey Stick. Moreover, the caption indicates that it is an illicit amalgam of proxy temperature data and instrumental data.

If proxies are used to estimate temperatures before the 20<sup>th</sup> century, they should also be used to estimate 20<sup>th</sup> century temperatures. Otherwise the graph combines apples and oranges. Instrumental data is much more susceptible to contamination from heat islands and malpractice in the management of climate sensing equipment.

A study by Ross McKittrick and Patrick Michaels indicates that as much as half the land-surface warming since 1980 may be due to the heat effects of urbanization.<sup>7</sup> Retired meteorologist Anthony Watts has surveyed 534 U.S.

<sup>6</sup> See for example, Testimony of Edward J. Wegman, House Energy and Commerce Committee, July 19, 2006, <http://energycommerce.house.gov/reparchives/108/Hearings/07192006hearing1987/Wegman.pdf>

<sup>7</sup> McKittrick, R. R., and P. J. Michaels, 2007. Quantifying the influence of anthropogenic surface processes inhomogeneities on gridded global climate data. *Journal of Geophysical Research*, **112**, D24S09, doi:10.1029/2007JD008465.

weather stations, and found that only 13 percent follow all U.S. Weather Service specifications for proper placement of temperature sensing equipment.<sup>8</sup>



This station, for example, contains several heat sources—cell tower, air conditioning unit exhaust fans, and asphalt parking lot—proximate to the temperature sensing instruments.

**Correction:** Delete the Hockey Stick and clarify that attempts to compare 20<sup>th</sup> century temperatures to pre-industrial temperatures must be based on homogeneous data sets.

Page 20 of the document begins, “Two significant natural factors also influence climate: the Sun and volcanic eruptions.” The document concludes that the Sun cannot explain recent warming because there has been “no net increase” in the Sun’s usual 11-year cycle. This very terse discussion conveys the impression that the Sun’s only mechanism for warming the planet is an increase in luminosity—solar brightening. But Henrik Svensmark of Denmark argues that a magnetically active Sun may warm the Earth by blocking cosmic rays, leaving fewer nuclei for cloud formation.<sup>9</sup> If the authors of the document think that Svensmark’s research is irrelevant, then they should explain why. They should not act as if it doesn’t exist.

<sup>8</sup> <http://www.surfacestations.org/>

<sup>9</sup> Discover Interview: Sun’s Shifts May Cause Global Warming, <http://discovermagazine.com/2007/jul/the-discover-interview-henrik-svensmark>



**Correction:** Clarify that the real debate about the Sun’s role concerns its possible effect on cosmic rays and, hence, on cloud formation.

In a new study, Roy Spencer finds that climate models simply assume that observed changes in cloud cover are the effect of changes in global temperature. This makes the climate look very sensitive. But, he argues, the models may mix up cause and effect, and a very small change in cloud cover—about a 1 percent reduction—would be enough to produce all the warming of the past 100 years.<sup>10</sup>

**Correction:** Clarify that models may mix up cause and effect, and that clouds may exert a significant natural influence on global temperatures.

Ocean cycles also influence climate—notably the recent shift from warm phase to cool phase of the Pacific Decadal Oscillation. N.S. Keenlyside and colleagues now forecast no additional global warming until 2015—a result not anticipated by any of the IPCC climate models.<sup>11</sup>

**Correction:** Clarify that ocean cycles also influence global climate.

Page 21, citing Canadell et al. (2007), reports that the rise in global carbon dioxide emissions is accelerating, with the growth rate increasing from 1.3 percent per year in the 1990s to 3.3 percent per year in 2006. More importantly, Canadell finds that atmospheric CO<sub>2</sub> concentrations increased by 1.93 parts per million per year during 2000-2006, compared to 1.58 ppm in the 1990s. Yet, global warming is not accelerating—it is slowing down!

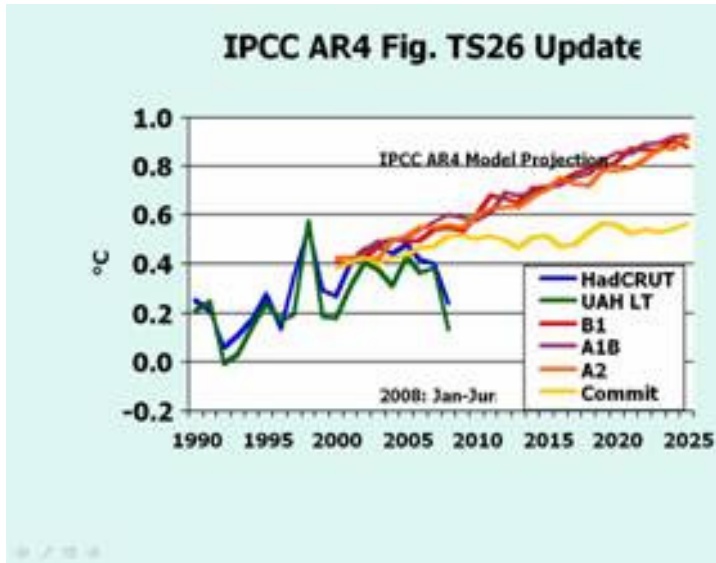
The chart below, courtesy of atmospheric scientist John Christy, shows how climate models and reality diverge. The red, purple, and orange lines are model forecasts of global temperatures under different emission scenarios. The yellow line supposedly shows how much warming is built into the climate system even if CO<sub>2</sub> levels don’t change. The blue and green lines are actual temperatures from ground-based (HadCrut) and satellite (UAH LT) monitoring systems.

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<sup>10</sup> Roy Spencer, Global Warming: Has the Climate Sensitivity Holy Grail Been Found? WeatherQuestions.Com, June 30, 2008, <http://www.weatherquestions.com/Climate-Sensitivity-Holy-Grail.htm>

<sup>11</sup> N.S. Keenlyside et al. 2008. Advancing decadal-scale climate prediction in the North Atlantic sector. Nature 453, 84-88.



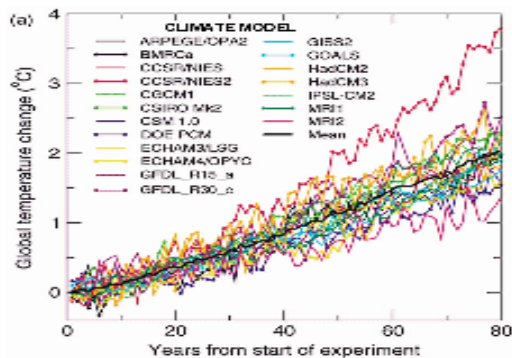


Despite accelerating emission rates and concentrations, there has been no net warming in the 21<sup>st</sup> century. Either the climate is not as sensitive as IPCC models assume, or natural drivers are more powerful than models assume.

**Correction:** Clarify that although emission rates and concentrations are accelerating, the climate is not behaving the way climate models predict.

Page 22 says “the warming trend” has been “accelerating in recent decades.” This is incorrect. Since 1975 the Earth has warmed at a fairly constant rate of about 0.17°C per decade. This rate has come down slightly, to 0.16°C per decade, because of the lack of any net warming in the 21<sup>st</sup> century.<sup>12</sup>

Most climate models predict that, once warming from rising greenhouse gas levels begins, it continues at a constant rate, not an accelerating rate.



<sup>12</sup> Calculations courtesy of Patrick Michaels.

The above chart, taken from the IPCC Third Assessment Report, shows the results of the climate model inter-comparison study. The spaghetti lines are warming forecasts from 19 climate models. Only 1 out of the 19 forecasts an accelerating warming rate.

What this implies is that warming in the 21<sup>st</sup> century is likely to be at the low-end of the IPCC range—somewhere around 1.6 to 1.7 degrees Celsius.

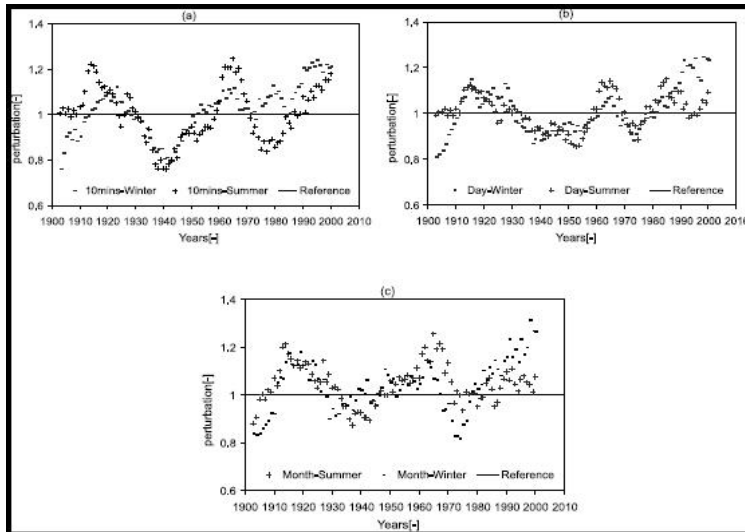
**Correction:** Explain that the rate of warming is not accelerating but has been fairly constant, “consistent with” the mathematical form of most climate model projections (to borrow a favorite CCSP phrase). Also point out that if warming continues as it has for the past 33 years, it will be in the low-end of the IPCC forecast range for the 21<sup>st</sup> century.

Page 22 also states: “Pronounced increases in precipitation over the past 100 years have been observed in eastern North America, southern South America, and northern Europe. Decreases were observed in the Mediterranean, most of Africa, and southern Asia.” The document claims these changes are due to global warming. But what the document actually describes are increases in some places and decreases in others—exactly what you’d expect in the world’s ever-changing climate.

The document does not discuss how reliable the long-term precipitation records are. It claims a “pronounced” increase in precipitation has been observed in northern Europe. That’s not what a recent study by two scientists at Belgium’s Royal Meteorological Institute found. Using the same measuring instrument (a Helmann-Fuess rain gauge) at the same location since 1898 and processed with identical quality, the Belgian scientists found an increase in intensity over the past two decades but no real trend over the past 104 years.<sup>13</sup>

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<sup>13</sup> Ntegeka, V. and P. Willems. 2008. Trends and multidecadal oscillations in rainfall extremes, based on a more than 100 years time series of 10 minutes rainfall intensities at Uccle, Belgium. *Water Resources Research*, [in press], reviewed by World Climate Report, Increasing Intense Storms? July 7, 2008, <http://www.worldclimatereport.com/index.php/2008/07/07/increasing-intense-storms>



**Comparison of average quantile perturbations for 10 minutes (a), 1 day (b) and 1 month (c) rainfall extremes and 10-year blocks for summer and winter periods.**

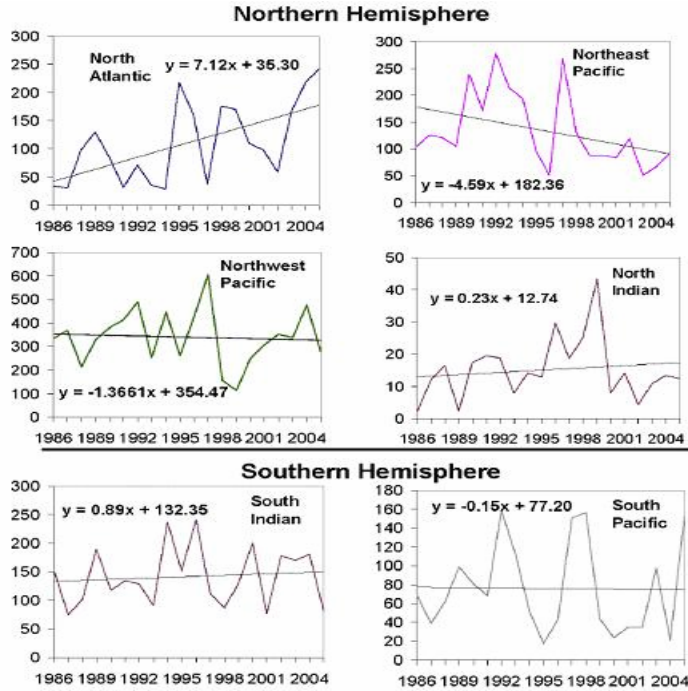
**Correction:** Clarify that there is a lot of internal climate variability in precipitation patterns, long-term records are not always reliable, and one of the best records shows cyclical variation but no long-term trend.

Page 23 says, “Evidence suggests that there have been increases in the intensity of tropical storms and hurricanes since the 1970s.”

Here the document presents one side of a robust scientific debate and ignores the other side. Some studies find an increase in tropical storm intensity since the 1970s but others don't. For example, Phil Klotzbach of Colorado State University found an increase in accumulated cyclone energy in the North Atlantic, a decrease in the Northeast Pacific, and not much change in the other four hurricane basins.<sup>14</sup>

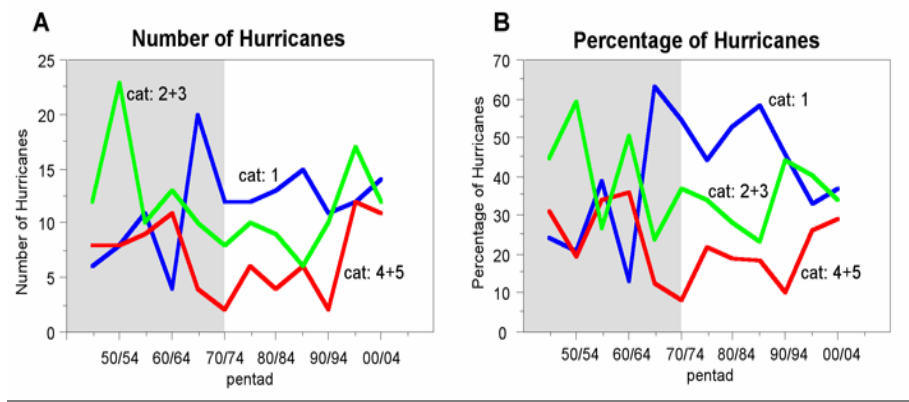
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<sup>14</sup> Klotzbach, P.J., 2006. Trends in global tropical cyclone activity over the past twenty years (1986-2005). *Geophysical Research Letters*, **33**, L010805, doi:10.1029/2006GL025881.



Source: Klotzbach (2006)

The document also fails to note that 1970 may be an inappropriate baseline for measuring long-term changes in hurricane strength. Patrick Michaels used National Hurricane Center data to extend Peter Webster’s 1970-2004 analysis of Atlantic basin storms back to 1940. He found that although the number and percentage of strong (category 4 and 5) storms has increased since 1970, there has been basically no change since 1940.<sup>15</sup>

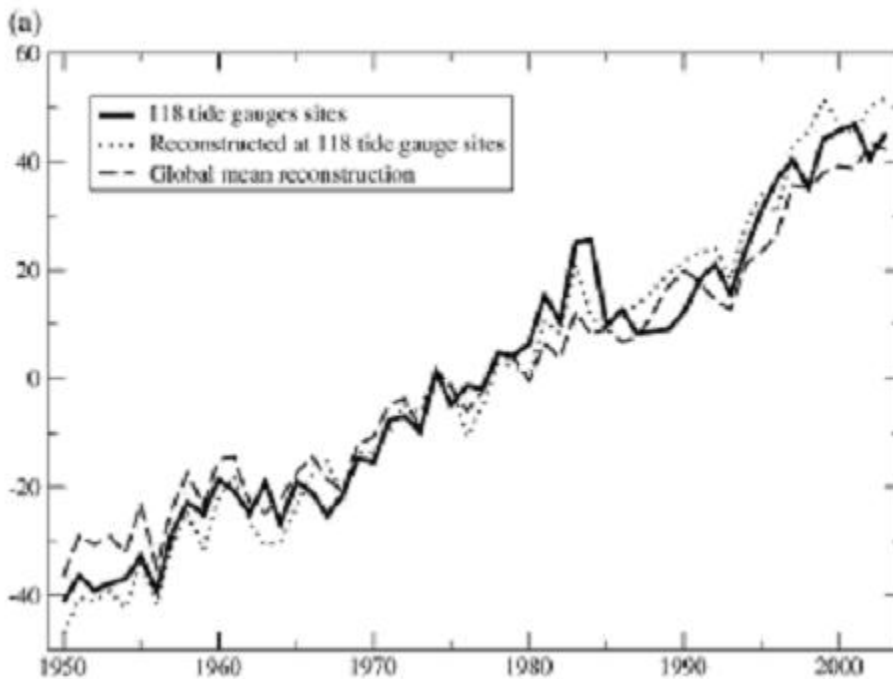


Source: Patrick Michaels

<sup>15</sup> Patrick Michaels, Global Warming and Hurricanes: Still No Connection, Capitalism Magazine, September 24, 2005, <http://www.capmag.com/article.asp?ID=4418>

Page 24 says sea level “is currently rising at an accelerating rate.” Presumably, the document refers to the IPCC estimate that sea levels increased about 3.1 mm/yr during 1993 to 2003, up from the long-term rate of 1.8 mm/yr during 1961 to 2003. But the document leaves out the IPCC caveat, “Whether the faster rate for 1993 to 2003 reflects decadal variability or an increase in the longer-term trend is unclear.”

In any event, all of this is debatable, not settled science. A study by Berge-Nguyen et al. published in *Global and Planetary Change* found no acceleration in sea level rise over the past five decades. Moreover, the long-term rate was 1.48 mm/yr—significantly below the IPCC long-term rate.



**Global sea level curves over the period 1955-2003 (from Berge-Nguyen et al., 2008)**

If the long-term trend found by Berge-Nguyen continues, sea levels will rise about six inches in the 21<sup>st</sup> century.

**Correction:** Clarify that the extent and rate of ongoing sea level rise is a field of ongoing investigation and debate. Some studies show acceleration, some not. Some show rates lower than the IPCC long-term rate.

Page 24 says that Greenland holds enough ice to raise sea levels 20 feet and Antarctica, 200 feet. The document then reports that these ice sheets are experiencing record amounts of ice melt. It further notes that cracks in the

Greenland ice sheet channel water down to the bedrock causing the ice to flow more easily to the sea. These statements are accurate yet misleading because they imply that people need to worry about 20 feet of sea level rise from Greenland or even 200 feet of sea level rise from Antarctica.

Greenland is currently shedding about 25 cubic miles of ice per year. That sounds like a lot, but Greenland has over 700,000 cubic miles of ice. This means Greenland is losing about 0.4 percent of its ice mass per century—not per year, not per decade, per century. The amount of ice Greenland is shedding translates into about two inches of sea level rise in the 21<sup>st</sup> century.<sup>16</sup> Hell will freeze over long before sea-level rise from Greenland gets anywhere near 20 feet.

The IPCC says that, “Current model studies project that the Antarctic Ice Sheet will remain too cold for widespread surface melting and is expected to gain ice mass due to increased snowfall.”<sup>17</sup> Why doesn’t the document report this finding?

While it is correct that “moulins” (cracks, vertical water tunnels) lubricate the Greenland ice sheet, the effect on glacial flow is relatively minor.<sup>18</sup> *Science* magazine reports that an entire 4-kilometer-long, 8-meter-deep melt-water lake disappeared down a moulin in about 1.4 hours, “at an average rate of about 8700 cubic meters per second, exceeding the average flow over Niagara Falls.” Sounds pretty alarming, doesn’t it! Yet, the *Science* article continues, “For all the lake’s water dumped under the ice that day and all the water drained into new moulins in the following weeks, the ice sheet moved only an extra half-meter near the drained lake.”<sup>19</sup> Bear in mind that the Greenland ice sheet is about 2,400 kilometers long and 1,100 kilometers wide.

**Correction:** Clarify that scenarios of catastrophic sea level rise have no plausibility. In particular, take issue with warnings by Al Gore and James Hansen of 20 feet of sea level rise or more in the 21<sup>st</sup> century.

Page 26 says, “Similarly, the pattern of temperature changes vertically through the layers of the atmosphere, from the surface up through the stratosphere, indicates the most likely cause of the warming is the human-induced build-up of heat-trapping gases.” The document explains: “All climate models show that heat-trapping greenhouse gases cause warming at the surface and in the layer just above the surface (the troposphere) but lead to cooling in the stratosphere.” That’s not entirely accurate. Models also project more warming in the troposphere compared to the surface. This is essential to the greenhouse explanation of global

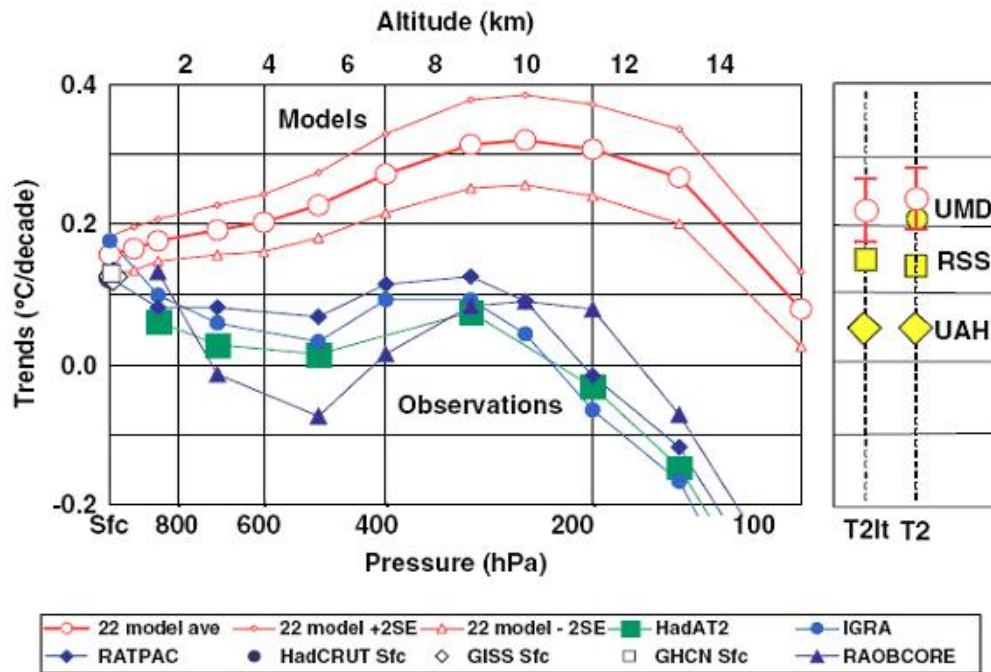
<sup>16</sup> Calculation courtesy of Patrick Michaels.

<sup>17</sup> IPCC, Fourth Assessment Report, Working Group I, Summary for Policymakers, p. 17, <http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf>

<sup>18</sup> Joughin, I., et al. 2008. Seasonal speedup along the western flank of the Greenland Ice Sheet. *Scienceexpress* 10.1126/science.1153288.

<sup>19</sup> Richard Kerr, Greenland’s Ice Slipping Away but Not All That Quickly, *Science* 18 April 2008: 301, <http://www.sciencemag.org/cgi/reprint/320/5874/301.pdf>

warming, because it is the extra heat trapped in the troposphere that supposedly warms the whole planet. Yet observations fail to find accelerated warming in the troposphere.<sup>20</sup>



HadCRUT, GHCN and GISS are various compilations of surface temperature observations. IGRA, RATPAC, HadAT2, and RAOBCORE are all balloon-based observations of the surface and lower troposphere. UAH, RSS, UMD are satellite-based data for various levels of the atmosphere. The 22-model average comes from an ensemble of 22 model simulations from the most widely used models from throughout the world. The light red lines are the +2 and -2 standard errors of the mean from the 22 models (from Douglass et al., 2007).<sup>21</sup>

**Correction:** Point out that the vertical distribution of heat in the atmosphere does not completely match the greenhouse fingerprint assumed by models. Note that this is “inconsistent” with the hypothesis that all or most recent warming is due to man-made heat-trapping gases rather than natural factors.

Page 27 says that, “an analysis of the European heat wave of 2003 found that the risk of such a heat wave is now nearly four times as great due to human influences on the climate.” The implication seems to be that global warming caused the 2003 heat wave. If that is what the authors believe, they should come out and say so.

<sup>20</sup> Douglass, D.H., J.R. Christy, B.D. Pearson, and S.F. Singer. 2007. A comparison of tropical temperature trends with model predictions. *International Journal of Climatology*, DOI: 10.1002/joc.1651.

<sup>21</sup> World Climate Report, Tropical Trends Stir Debate [review of Douglass et al], December 14, 2007, <http://www.worldclimatereport.com/index.php/2007/12/14/tropical-trends-stir-warming-debate/#more-291>



However, the United Nations Environment Program—hardly a bunch of global warming skeptics—attributed the 2003 heat wave to an atmospheric pressure anomaly:

“This extreme weather was caused by an anti-cyclone firmly anchored over the western European land mass holding back the rain-bearing depressions that usually enter the continent from the Atlantic Ocean. This situation was exceptional in the extended length of time (over 20 days) during which it conveyed very hot dry air from south of the Mediterranean.”<sup>22</sup>

Rasool et al. (2003) drew the same conclusion:

“This study demonstrates that the summer 2003 heat wave in Europe was not a direct result of a globally averaged warmer lower troposphere, but was primarily associated with large scale circulation changes.”<sup>23</sup>

**Correction:** Clarify whether or not you are claiming that global warming caused the 2003 European heat wave. If so, explain why UNEP and Rasool et al. got it wrong.

Page 29 notes that global warming could increase wind shear strength, “and this tends to work against storm formation and growth.” An obvious implication is that while some storms may get stronger due to higher sea temperatures, others may get weaker because of stronger wind shear. Yet the next sentence spells out only the downside: “It currently appears that stronger tropical storms and hurricanes are likely in some regions, though more research is required on these issues.”

**Correction:** If global warming can weaken storms as well as strengthen them, say it!

Page 31 says, “Recent studies suggest that sea levels could rise as much as 3 to 5 feet per century over the next several centuries.” Only one study is referenced: Rahmstorf, S. 2006. A semi-empirical approach to projecting future sea-level rise. *Science*, 315 (5481): 368-370. The high-end sea-level rise assumes a high-end 21<sup>st</sup> century warming of 5.8°C.

**Correction:** Either cite other studies besides Rahmstorf or say that “one study suggests” sea levels could rise as much as 3 to 5 feet per century. Also clarify that high-end sea-level rise projections

<sup>22</sup> UNEP, Early Warning of Emerging Environmental Threats, Impacts of summer 2003 heat wave in Europe, [http://www.grid.unep.ch/product/publication/download/ew\\_heat\\_wave.en.pdf](http://www.grid.unep.ch/product/publication/download/ew_heat_wave.en.pdf)

<sup>23</sup> Rasool, I., M. Baldi, K. Wolter, T.N. Chase, J. Otterman, R.A. Pielke, Sr., and F. Cesarone. August 2003 Heat Wave in Western Europe: An Analysis and Perspective, (EMS) 4th Annual Meeting - Part and Partner: 5th Conference on Applied Climatology (ECAC), Nice, France, September 26-30, 2004, <http://blue.atmos.colostate.edu/presentations/PPT-23.pdf>.

depend on high-end warming projections, and that neither find support in actual temperature and sea-level rise trends.

Page 33 says the three hottest years on record in the United States were “1998, 1934, and 2006.” This creates the impression that 1998 was the hottest year. In fact, 1934 was the hottest year in the United States.<sup>24</sup>

**Correction:** Rewrite this sentence to clarify that 1934 was the hottest U.S. year on record.

Page 38 says, “The power and frequency of Atlantic hurricanes have increased substantially in recent decades as shown in the graphs below.” The frequency graph goes back before 1920. It is very likely an artifact of the data—the fact that there were far fewer observations of non-land-falling Atlantic hurricanes before the deployment of weather satellites and even less before the deployment of hurricane hunter aircraft.

**Correction:** Delete the hurricane-frequency graph, unless you are prepared to explain why it is likely an artifact of the data rather than a reflection of actual changes in the weather. The text also refers to a substantial increase in Atlantic hurricane “power...in recent decades.” As noted above, this is likely due to picking 1970 as a baseline; there has been no change since 1940.

Page 41 raises the prospect of gigantic release in carbon dioxide and methane from melting permafrost. As noted above, warmer than present temperatures persisted for thousands of years during the Holocene Optimum and Last Interglacial Period yet did not dramatically raise carbon dioxide and methane levels.

**Correction:** Clarify that climate history does not provide evidence of a tipping point buried in Alaskan permafrost and Russian tundra.

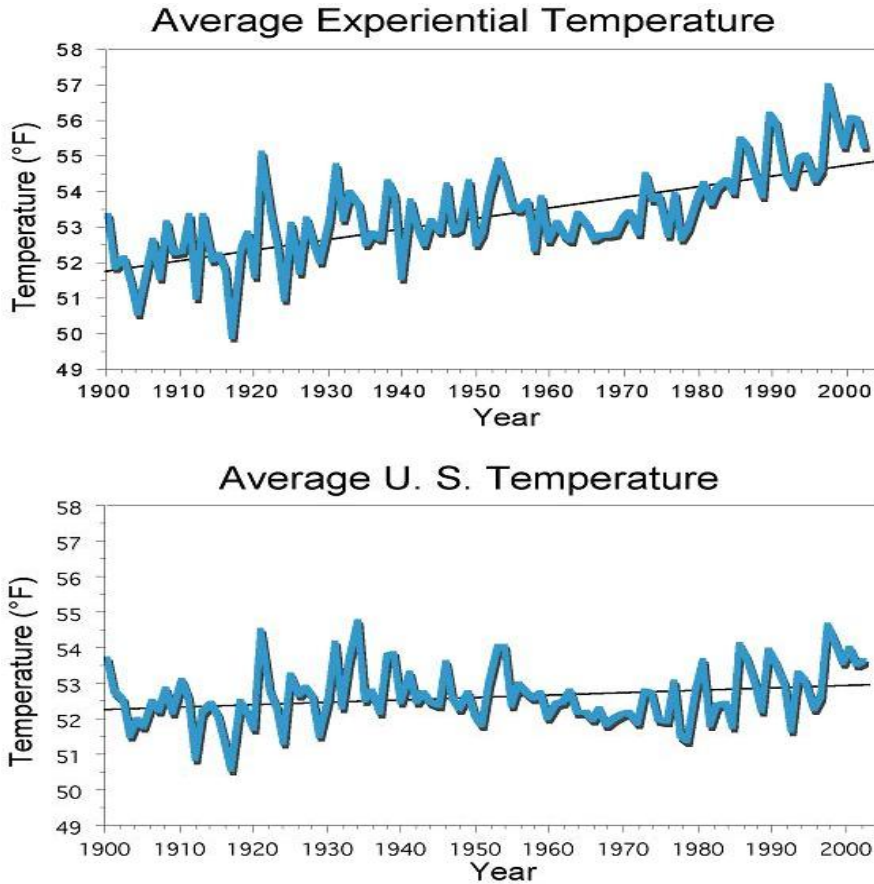
Page 44 observes that, in the 21<sup>st</sup> century, “more Americans will be living in the areas that are most vulnerable to the effects of climate change.” This has been so decades. Internal migration in the United States has predominantly been to coastal areas and the Southwest. Each year millions of Americans vote with their feet to live in warm climates and near the sea.

If global warming were as big a problem as the document claims, people would flee hot urban centers, southern states, and coastal areas. Instead, Americans deliberately move to places where they experience greater warmth than global

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<sup>24</sup> Steve McIntyre, New Leaderboard at the U.S. Open, August 8, 2007, <http://www.climateaudit.org/?p=1880>

warming itself generates. Chip Knappenberger of World Climate Report shows this via two graphs.



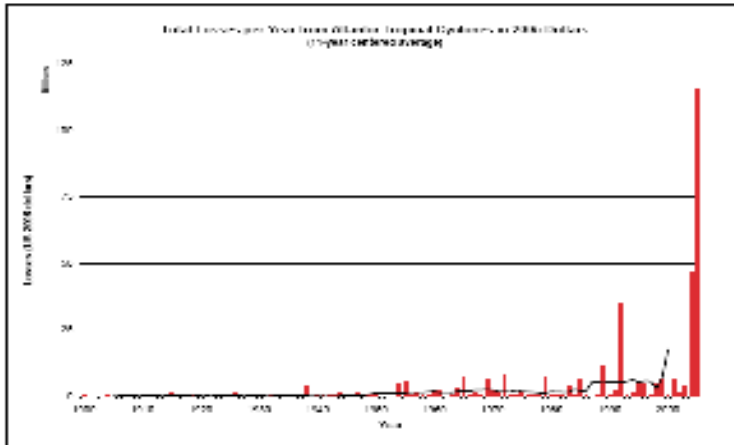
Knappenberger comments: “Annual average temperature experienced by the average American based upon the average temperature of where they lived, 1900-2003. Figure 1 (bottom) Annual average temperature history of the United States, 1900-2003. Based upon the patterns of population movement, the average ‘experiential’ temperature of the average American has increased by a much larger amount than the actual average temperature of the U.S. This occurs because, by their own free will, Americans are seeking out warmer climates.”<sup>25</sup>

**Correction:** Include Knappenberger’s graphs and accompanying explanation to enable readers to compare global warming with climate changes they willingly incur.

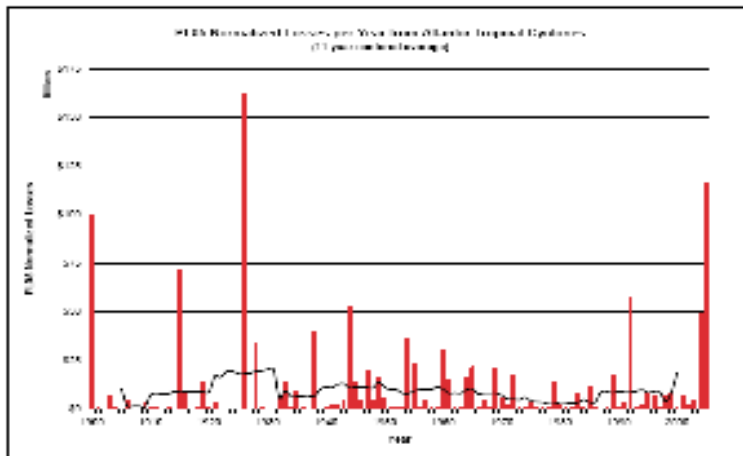
<sup>25</sup> Chip Knappenberger: CCSP Climate Impacts Report: A Perversion of Science, World Climate Report, August 5, 2008, <http://www.worldclimatereport.com/index.php/2008/08/05/ccsp-climate-impacts-report-a-perversion-of-science/#more-338>

Page 50 contains a graph of insurance industry and economic losses and implies that the losses are due to an increase in the frequency and severity of extreme weather. Roger Pielke, Jr. has done extensive research showing that there is no trend in economic losses once the data are normalized for changes in population, wealth, and the consumer price index.

For example, here are unadjusted hurricane-related damages:

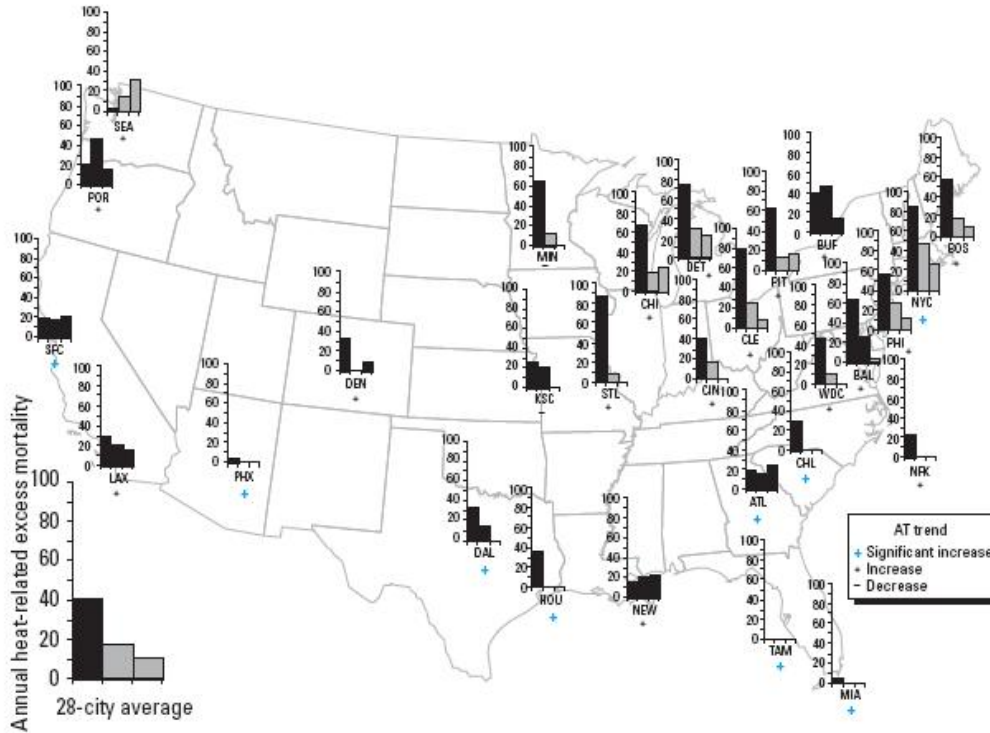


Now here's what those losses would look like if the same storms had hit the same places but with today's population, today's wealth, and at today's prices.



**Correction:** Clarify that the insurance industry and economic loss data in the chart have not been adjusted for socio-economic changes. Better yet, reproduce Pielke's two graphs to show how easily statistics can be manipulated to exaggerate the dangers of global warming.

Page 54 predicts a massive rise in mortality rates from heat waves between now and 2050. History, however, suggests otherwise. As urban air temperatures have increased, chiefly because urban heat islands grow as cities expand, heat-related mortality has gone down. Cities where hot weather is most common—places like Tampa and Phoenix, which have large elderly populations—have practically no heat-related mortality. Heat-related mortality should continue to decline unless politicians adopt carbon-suppression policies and drive up electricity costs, discouraging poor households from running their air conditioners.

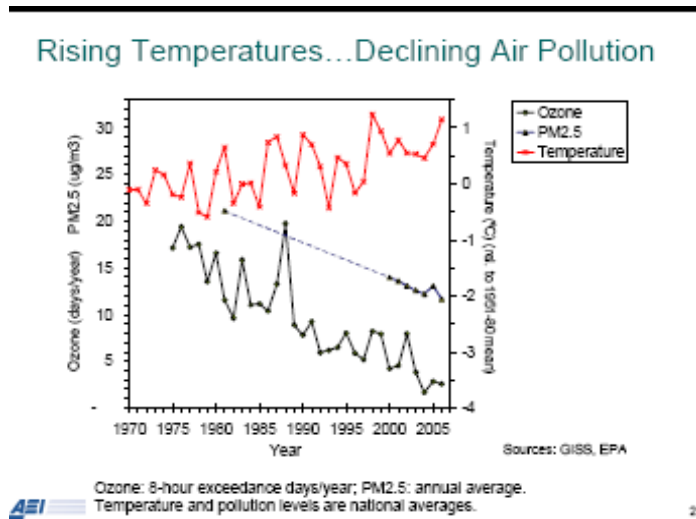


**The population-adjusted heat-related mortality for major cities across the United States. Each bar of the histogram for each city represents a different 10-yr period. The left bar represents the heat-related mortality in the 1960s/70s, the middle bar represents the 1980s, and the right-hand bar is the 1990s. No bar at all means that there was no statistically distinguishable heat-related mortality during that decade. Source: Davis et al. (2004) *Environmental Health Perspectives*, 111,1712-1718)**

**Correction:** At a minimum, summarize the results of Davis et al. for a balanced discussion of the mortality risks from heat waves in a warming world.

Page 56 warns that smog will increase dramatically in a warming world. Studies on which such warnings are based typically examine the effects of higher temperatures on today's (or yesterday's) emissions. For example, a 2006 report

commissioned by Natural Resources Defense Council used 1996 emission levels to “predict” smog conditions for 2050, even though smog-forming emissions in 2006 were already 30 percent below 1996 levels.<sup>26</sup> Like heat-related mortality, air pollution levels have fallen as cities have warmed. This trend should continue regardless of any changes in climate as auto fleets turnover to cleaner vehicles and power plants get cleaner. Most smog forming emissions will probably be gone in 20 years.<sup>27</sup>



Source: Joel Schwartz

**Correction:** Note the decline in smog-forming emissions since 1970 and discuss the policies and technologies that ensure these trends will continue. Check the studies cited in this section to identify which ones do and which ones do not unrealistically assume today’s emission levels in the future.

Page 59 attempts to link West Nile Virus to global warming, noting that it entered the country via New York City in the hot summer of 1999. “Within five years, the disease had spread across the continental United States.” Ironically, this is evidence that West Nile Virus is not related to global warming.

The North American continent contains nearly all the climate types of the world—from hot, dry deserts, to boreal forests, to Alpine tundra—a range that dwarfs any small alteration in temperatures or precipitation that may be related to greenhouse gas emissions. The virus could not have spread so far so fast, if it were climate-sensitive.

<sup>26</sup> Joel Schwartz, How NRDC Continues to Mislead Americans about Future Air Pollution Levels, Planet Gore, September 26, 2007.

<sup>27</sup> Joel Schwartz, No Way Back: Why Air Pollution Levels Will Continue to Decline, AEI Press, 2003, [http://www.aei.org/books/filter\\_bookID.428/book\\_detail.asp](http://www.aei.org/books/filter_bookID.428/book_detail.asp).

**Correction:** Spotlight West Nile Virus as a case of mistaken global warming identity.

Page 60 gives a whole new meaning to the phrase “cherry picking,” since in this presentation the CO<sub>2</sub> aerial fertilization effect only benefits poison ivy, leafy spurge, and ragweed.

**Correction:** Literally thousands of laboratory and fields observations show that CO<sub>2</sub>-enriched environments boost the productivity of trees and food crops. The document should reference this literature and quantify the crop yields associated with higher CO<sub>2</sub> levels.

Page 67 argues that increases in air temperatures could decrease the supply and increase the price of electricity. This is like castigating the mote in your neighbor’s eye and ignoring the beam in your own. The global warming movement’s proposal to ban new coal fired power plants unless they include carbon capture and storage (CCS), a technology still decades away from commercialization, would have much more severe impacts on consumers and the economy.

The Energy Information Administration forecasts that new coal power will constitute about two-thirds of all new electric generation over the next two decades, with new coal supplying 15 percent of total U.S. electric power in 2030.<sup>28</sup> Banning this electricity could create one heck of a power deficit. A chronic energy crisis would not be an unlikely consequence.

An even more mischievous policy is Al Gore’s plan to tear down all existing coal and natural gas-fired power plants and replace them with wind, solar, biomass, and geothermal power, all within 10 years. Electricity prices would go through the roof, because demand for renewable electricity, ramped up more than 30-fold by government mandates, would vastly exceed supply.

**Correction:** If the document is going to discuss the potentially adverse impacts of global warming on energy prices and energy supply, then it should also discuss the potentially much more severe impacts of global warming policy on energy prices and supply.

## Conclusion

The document abounds with alarmist bias, selective use of sources, and wholly inappropriate political advocacy. It should not be published in this form. My comments end at page 60 because I have run out of time. Reviewing a document

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<sup>28</sup> EIA, Annual Energy Outlook 2008, Electricity Projections, <http://www.eia.doe.gov/oiaf/aeo/index.html>



like this is time-consuming, because in principle one should read all the literature cited and compare those sources to the corresponding discussion in the text. I respectfully request that you extend the comment period for another 60 days.

Sincerely,

Marlo Lewis

Senior Fellow

Competitive Enterprise Institute

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