Other than continuing confirmation, things still haven't changed much since this 1998 debate with Mitchel Jones on SPF, so it seems worth still keeping this around for later review.

5/18/98 5:40 AM, posting to sci.physics.fusion

It takes me several days to post here, so I lag way behind the discussion. I'd still like to make a few points:

(1) Based on your above criteria, you seem to imply the need to throw out every land based piece of temperature data. This would represent a major *distortion* to the data. Global warming is just that - global warming. Throwing out a major piece of the globe is to skew the data. What is important is that the data points be representational of the sample space, i.e. not overly skewed towards urban areas.

(2) Most weather stations in the US were located on farms in order to get a good spread of data for graphing purposes, for plotting isobars, etc. If this is true, then the data may in fact be skewed to the cool side most of the year due to the cooling effect of the green crops.

(3) Based on 20 years personal experience living in South Central Alaska, I can attest to the fact that the weather has changed dramatically, and that glacier activity indicates the sudden weather change is significant over an approximately 10,000 year period. I can assure you that Alaska is not subject to any significant amount of urban development, BTW.

(4) What is most alarming is the rate of change of the weather, despite years of volcanic activity, high forest fire activity, and the smoke release of desert storm, which cools the earth on a temporary basis. This, to me, is indicative of a powerful underlying trend towards warming. If true, then then changes in the earth's albedo due to snow melting, increased solar activity, and settling of atmospheric dust, could all work together to cause a significant temperature spike in the near future.

(5) Studies based upon mountain snow melt, ocean sedimentation, polar ice cores, and tree rings, taken in a representative way, can be (and have been) used to calculate mean global temperatures.

(6) The real danger to the earth from warming appears to be methane release. This is already occurring at an alarming rate in the arctic. Large quantities of methane is being released from the thawing tundra. Much more important is the fact this rate is accelerating. It is not in equilibrium. Methane produces over 20 times the

greenhouse effect as CO2.

(7) The methane hydrate in frozen pools at the bottom of the ocean possibly represent a bigger threat. The ice enclosing the methane melts at about 0 C, so a major release can occur suddenly and without warning in large areas where the sea bottom warms slightly. The earth's atmosphere at one time contained a large amount of methane, so there is a lot of the stuff around.

(8) Low altitude water in the atmosphere increases albedo and cools the earth. High altitude water vapor, that occurs increasingly with higher temperatures, however, acts in a greenhouse fashion. This is one of the reasons why venus is so hot, even though its albedo is very high. It is possible the earth could be like venus in a very short time if enough factors all pull together. The possibility exists for an unstable temperature runaway regime to develop. We may in fact already be in that regime.

(9) If urbanization has such a dramatic effect on land temperature, then it has significant effect on global temperature. If urbanization has such a dramatic effect on global warming, then urbanization must stop! It is not just CO2 emission that should be curtailed.

(10) Any debate about the existence of global warming should exclude discussion of how disagreeable the political consequences are.

Update 21 Aug. 2002:

"New surveys from satellites and aircraft document an alarming acceleration in the melting of glaciers around the world."

http://news.nationalgeographic.com/news/2002/08/0821_020821_wireglaciers.html

Update 23 Oct. 2003:

"According to Comiso's study, when compared to longer term ground-based surface temperature data, the rate of warming in the Arctic over the last 20 years is eight times the rate of warming over the last 100 years."

"The result has direct connections to NASA-funded studies conducted last year that found perennial, or year-round, sea ice in the Arctic is declining at a rate of nine percent per decade and that in 2002 summer sea ice was at record low levels". See:

http://www.nasa.gov/centers/goddard/news/topstory/2003/1023esuice.html

Update 7 April 2004:

"Jonathan Gregory and colleagues from the University of Reading, UK, say their studies forecast an 8C increase in Greenland's temperature by 2350." ... "They believe that if the ice cap melts, global average sea level will rise by about 7m (23ft)" ... "Even if global warming was halted the rise could be irreversible, they say."

See: http://news.bbc.co.uk/2/hi/science/nature/3607335.stm

Update 9 Nov. 2004:

"Scientists have determined that the ice in Greenland and the Arctic is melting so rapidly that much of it could be gone by the end of the century." ... "The rising temperatures are likely to cause the melting of at least half the Arctic sea ice by the end of the century. A significant portion of the Greenland ice sheet—which contains enough water to raise the worldwide sea level by about 23 feet (about 7 meters)—would also melt." ... "The consequences of such a massive meltdown of northern ice would be dramatic, according to the study." ... "Low-lying coastal areas in Florida and Louisiana could be flooded by the sea. A 1.5 feet (50-centimeter) rise in sea level could cause the coastline to move 150 feet (45 meters) inland, resulting in substantial economic, social, and environmental impact in low-lying areas." See:

http://news.nationalgeographic.com/news/2004/11/1109_041109_polar_ice.html

Update 24 Nov. 2005:

"Current levels of the greenhouse gases carbon dioxide and methane in the atmosphere are higher now than at any time in the past 650,000 years."

"We find that CO2 is about 30% higher than at any time, and methane 130% higher than at any time; and the rates of increase are absolutely exceptional: for CO2, 200 times faster than at any time in the last 650,000 years." For great photos and animations see:

http://news.bbc.co.uk/2/hi/science/nature/4467420.stm

Update 12 March 2006:

"In August of 2005 a team of scientists from Oxford and Tomsk University in Russia announced that a massive Siberian peat bog the size of Germany and France combined was melting, releasing billions of tons of methane as it did." ... **"**The Amazon rainforest, the boreal forests (one of the largest terrestrial carbon sinks in the planet), and soils in temperate areas are all releasing more carbon than they are absorbing, due to global warming-induced droughts, diseases, pest activity, and metabolic changes." ... **"**The polar ice cap is also melting far faster than models predict, setting off another feedback loop." **...** "Populations of krill have plummeted by 80% in the last few years due to loss of sea ice. Krill are the single most important species in the marine foodchain, and they also extract massive amounts of carbon out of the atmosphere."

http://www.commondreams.org/views06/0222-27.htm

Update 15 March 2006:

Polar carbon dioxide increasing at surprising rate. See:

http://www.guardian.co.uk/science/story/0,,1729255,00.html

"In 1990 this key cause of global warming was rising at a rate of 1 part per million (ppm). Recently, that rate reached 2 ppm per year. Now, scientists at the Mount Zeppelin monitoring station have discovered it is rising at between 2.5 and 3 ppm."

Update 30 March 2006:

"Winter air temperatures over Antarctica have risen by more than 2C in the last 30 years, a new study shows."

http://news.bbc.co.uk/2/hi/science/nature/4857832.stm

"To try to resolve the conundrum, the BAS team compared the data with 20 simulations of the climate over the last century. ... The team found that in all cases, the models failed to simulate the rise."

"... it is likely that current climate models are unable to sufficiently recreate conditions on the continent."

"... the region holds enough water in its ice to raise sea levels by 60 metres."

Update 1 April 2006:

World's coral reef loss 'an underwater holocaust'

http://www.cnn.com/2006/TECH/science/03/31/coral.death.ap/index.html

"It's an unprecedented die-off, ... in the Virgin Islands."

"If you want to see a coral reef, go now, because they just won't survive in their current state."

"The Caribbean is actually better off than areas of the Indian and Pacific ocean where mortality rates -- mostly from warming waters -- have been in the 90 percent range in past years..."

Update 2 April 2006:

Pacific Ocean getting warmer, more acidic:

http://www.sciencedaily.com/upi/index.php?feed=Science&article=UPI-1-20060331-16214000-bc-us-oceans.xml

"The pH of the saltwater has dropped 0.025 units since the early 1990s, the pH scale is exponential, so a one-unit drop is a 10-fold decrease, therefore the new measurement puts the ocean on track for a dramatic decline by the end of the century..."

Update 8 April 2006:

Air heats up high above Antarctica:

http://www.newscientist.com/channel/earth/mg19025463.700-air-heats-up-high-above-antarctica.html

"Although rapid warming at the surface of Antarctica has been well-documented, this is the first report of climate change much higher above the continent. What's more, it is the largest warming of its kind found anywhere on Earth (Science, vol 311,

p 1914)." "... temperatures over Antarctica have increased at a rate of 0.5 to 0.7 °C per decade over the past 30 years.

Update 12 April 2006:

Higher Carbon Dioxide, Lack of Nitrogen Limit Plant Growth:

http://www.nsf.gov/news/news_summ.jsp?cntn_id=106861

"Earth's plant life will not be able to "store" excess carbon from rising atmospheric carbon dioxide levels as well as scientists once thought because plants likely cannot get enough nutrients, such as nitrogen..."

"As a result, soils will be unable to sustain plant growth over time [as atmospheric carbon dioxide continues to increase]..."

Update 15-18 April 2006: Global Dimming

Why the Sun seems to be 'dimming':

http://news.bbc.co.uk/2/hi/science/nature/4171591.stm

"...the amount of solar energy reaching the Earth's surface has been gradually falling ... the decline in sunlight may mean that global warming is a far greater threat to society than previously thought."

More on global dimming:

http://www.pbs.org/wgbh/nova/sun/about.html
http://www.grist.org/news/maindish/2004/09/22/keen-dimming/
http://en.wikipedia.org/wiki/Global_dimming
http://www.guardian.co.uk/life/feature/story/0,13026,1108853,00.html
http://www.bbc.co.uk/sn/tvradio/programmes/horizon/dimming_prog_summary.shtml
http://www.globalissues.org/EnvIssues/GlobalWarming/globaldimming.asp
http://www.commondreams.org/headlines04/0513-01.htm
http://www.abc.net.au/4corners/content/2005/s1325819.htm

Update 15 May 2006:

Meltdown fear as Arctic ice cover falls to record winter low:

http://www.guardian.co.uk/science/story/0,,1774815,00.html

“Satellite measurements show the area covered by Arctic winter sea ice reached an all-time low in March ... Scientists say the decline highlights an alarming new trend, with recovery of the ice in winter no longer sufficient to compensate for increased melting in the summer. If the cycle continues, the Arctic ocean could lose all of its ice much earlier than expected, possibly by 2030.”

“...decline of ice around the north pole seems to have sharply accelerated since 2003, raising fears that the region may have passed one of the "tipping points" in global warming. In this scenario, warmer weather melts ice and drives temperatures higher because the dark water beneath absorbs more of the sun's radiation. This could make global warming quickly run out of control.”

Update 16 May 2006:

Global Warming May Have Damaged Coral Reefs Forever:

http://www.sciencedaily.com/releases/2006/05/060515232529.htm

This article is in regards to the “1998 event where global warming caused Indian Ocean surface temperatures to increase to unprecedented and sustained levels, killing off (or 'bleaching') more than 90 per cent of the inner Seychelles coral”.

"Reefs can sometimes recover after disturbances, but we have shown that after severe bleaching events, collapse in the physical structure of the reef results in profound impacts on other organisms in the ecosystem and greatly impedes the likelihood of recovery.”

Update 26 May 2006:

Faster Atmospheric Warming In Subtropics Pushes Jet Streams Toward Poles:

http://www.sciencedaily.com/releases/2006/05/060525194257.htm

"It is direct observational evidence of atmospheric circulation changes seen from satellites..." "The jet streams mark the edge of the tropics, so if they are moving poleward that means the tropics are getting wider...”

Update 23 June 2006:

Backing for 'hockey stick' graph

http://news.bbc.co.uk/2/hi/science/nature/5109188.stm

“The Earth was hotter in the late 20th Century than it had been in the last 400 or possibly 1,000 years ... The new report, carried out by a panel of the US-based National Research Council (NRC), largely vindicates the researchers' work, first published in 1998 ... there is a lot more science behind the projected warming expected in the 21st Century than just the palaeo-record of the last few millennia.”

Update 4 July 2006:

Growing Acidity of Oceans May Kill Corals

http://www.washingtonpost.com/wpdyn/content/article/2006/07/04/AR2006070400772.html?nav=rss_print/asection

“The escalating level of carbon dioxide in the atmosphere is making the world's oceans more acidic ... by the end of the century, the trend could decimate coral reefs and creatures that underpin the sea's food web ... oceans are more acidic than they have been for "many millions of years."”

Update 8 July 2006:

A people dependent on coral

http://news.bbc.co.uk/2/hi/programmes/from_our_own_correspondent/5158504.stm

The United Nations is being asked to step in to protect a barrier reef which lies just off Belize ... reef scientists tell us it [the cause of the coral bleeching damage] is global warming ... Americans on the [UN] committee do not like the petition and they are trying to get it thrown out.” “Belize's coral reef is the biggest in the Western Hemisphere”.

Update 14 September 2006:

Changes In Solar Brightness Too Weak To Explain Global Warming

“Changes in the Sun's brightness over the past millennium have had only a small effect on Earth's climate ... over the past century, climate change due to human influences must far outweigh the effects of changes in the Sun's brightness ... Reconstructions of climate over the past millennium show a warming since the 17th century, which has accelerated dramatically over the past 100 years. “

“The review, led by Peter Foukal (Heliophysics, Inc.), appears in the September 14 issue of Nature. Among the coauthors is Tom Wigley of the National Center for Atmospheric Research. NCAR's primary sponsor is the National Science Foundation.”

Update 5 Sept 2006:

Continued Warming Of The Arctic Ocean

http://www.sciencedaily.com/releases/2006/10/061004173104.htm

"Compared to last summer, the water that flows from the Norwegian Sea to the Arctic has been an average 0.8 degrees Celsius warmer this summer..."

Update 4 Nov 2006:

Greenhouse gases hit record high

http://news.bbc.co.uk/2/hi/science/nature/6114250.stm

“The WMO said concentrations of carbon dioxide (CO2) were measured at 379.1 parts per million (ppm), up 0.53% from 377.1 ppm in 2004.”

Update 12 Dec 2006:

Arctic sea ice 'faces rapid melt'

http://news.bbc.co.uk/2/hi/science/nature/6171053.stm

“... the Arctic may be free of all summer ice by as early as 2040. ... This is a positive feedback loop with dramatic implications for the entire Arctic region.”

Update May 2007:

Intergovernmental Panel on Climate Change
Fourth Assessment Report
Climate Change 2007: Mitigation of Climate Change

Summary for Policymakers:

http://www.ipcc.ch/SPM040507.pdf

"Finally, widespread scientific agreement on many technical aspects of climate change, despite powerful efforts to ignore or suppress those facts because of their consequences to policy making. "

Update June 23, 2008:

Global Warming Twenty Years Later
(by James Hansen on June 23, 2008)

http://www.worldwatch.org/node/5798

"...more warming is already "in-the-pipeline," delayed only by the great inertia of the world ocean. And climate is nearing dangerous tipping points. Elements of a "perfect storm," a global cataclysm, are assembled ... Climate can reach points such that amplifying feedbacks spur large rapid changes."

Update June 24, 2008:

NASA scientist issues dire warning on global warming

http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/20080624/global_warming_080624/20080624?hub=SciTech

"We're Toast"

"James Hansen says the situation is so bad the world's only hope is drastic action."

"Earth's atmosphere can only stay this loaded with man-made carbon dioxide for a

couple more decades without changes such as mass extinction, ecosystem collapse and dramatic sea level rises”

Update September 7, 2008:

"Thawing Permafrost Holds Vast Carbon Pool", Science Daily, Sept 7, 2008:

http://www.sciencedaily.com/releases/2008/11/081124141053.htm

“The estimated 1,672 billion metric tons of carbon locked up in the permafrost is more than double the 780 billion tons in the atmosphere today.”

"It's bigger than we thought," Schuur said.”

Update November 26, 2008:

"Ocean Growing More Acidic Faster Than Once Thought; Increasing Acidity Threatens Sea Life", Science Daily, Nov. 26, 2008:

http://www.sciencedaily.com/releases/2008/09/080903134309.htm

“The new study is based on 24,519 measurements of ocean pH spanning eight years, which represents the first detailed dataset on variations of coastal pH at a temperate latitude—where the world's most productive fisheries live.”

"The acidity increased more than 10 times faster than had been predicted by climate change models and other studies ... This increase will have a severe impact on marine food webs and suggests that ocean acidification may be a more urgent issue than previously thought, at least in some areas of the ocean."

Update Februrary 6, 2009:

"Collapse Of Antarctic Ice Sheet Would Likely Put Washington, D.C. Largely Underwater**”**

http://www.sciencedaily.com/releases/2009/02/090205142132.htm

“The catastrophic increase in sea level, already projected to average between 16 and 17 feet around the world, would be almost 21 feet in such places as Washington,

D.C. ... There is widespread concern that the West Antarctic Ice Sheet may be prone to collapse, resulting in a rise in global sea levels ...".

Maps of sea level changes:

http://www.cresis.ku.edu/research/data/sea_level_rise

Note that many areas of oil production will be under water, as well as New Orleans and much of Southern Florida.

Update July 6, 2009:

'The Vanishing Face of Gaia' by James Lovelock

"It is not simply too much carbon dioxide in the air . . . ," he writes in "The Vanishing Face of Gaia," "the root cause is too many people, their pets, and their livestock -- more than the Earth can carry. No voluntary human act can reduce our numbers fast enough even to slow climate change."

“The human species (but not the whole population) will survive in habitable pockets near the poles, and those who can had best start moving there.” "Are we sufficiently talented to take on what might become the onerous permanent task of keeping the Earth in homeostasis?" Lovelock asks. "The alternative is the acceptance of a massive natural cull of humanity and a return to an Earth that freely regulates itself."