Questioning the Global Warming Science:
An Annotated bibliography of recent peer-reviewed papers
(Short Version)

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For
FRIENDS OF SCIENCE
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Scope & Purpose of the Document

This Document presents an annotated bibliography of selected peer-reviewed papers which question the current state of the Global Warming science. Seven major areas of the Global Warming science are identified and followed by a list of key papers questioning the present assessment.

1. ***Temperature reconstruction using proxy data: The Hockey-Stick Graph***

The following studies demonstrate conclusively that the highly publicized Hockey-stick graph was based on several erroneous calculations and assumptions.

a. "Corrections to Mann et al (1998) proxy data base and northern hemisphere average temperature series" S McIntyre & R McKitrick *Energy & Environment Vol. 14 (2003) p. 751-777*

b. "Reconstructing past climate from noisy data" H von Storch et al *Science Vol. 306 (2004) p. 679-682*

c. "Hockey sticks, principal components and spurious significance" S McIntyre & R McKitrick *Geophysical Research Letters, Vol. 32 (2005) L03710*

d. "Highly variable northern hemisphere temperatures reconstructed from low- and high-resolution proxy data" A Moberg et al *Nature Vol. 433 (2005) p. 613-617*

e. Wegman Edward, Scott D W and Said Yasmin H 2006: Ad Hoc Committee Report to Chairman of the House Committee on Energy & Commerce and to the Chairman of the House sub-committee on Oversight & Investigations on the Hockey-stick global climate reconstructions. US House of Representatives, Washington USA. Available for download from *ITTP://energycommerce.house.gov/108/home/07142006 Wegman Report.pdf*

f. "Reconstruction of temperature in the central Alps during the past 2000 yr from a delta^{18}O stalagmite record" A Mangini, C Spotl & P Verdes *Earth & Planetary Science Letters, 235 (2005)p. 741-751*

2. ***Impact of solar variability on* the *earth's climate***

a. "Solar variability and the earth's climate: introduction and overview" George Reid *Space Science Reviews 94 (2000) p.1-11*

Provides a general overview of the sun's impact on the earth's climate through the Little Ice Age as well as through geological times and the complexity in establishing the solar/climate link.

b. "Low cloud properties influenced by cosmic rays" N D Marsh & H Svensmark *Physical Review Letters 85 (2000) p. 5004-5007*

Documents how galactic cosmic rays can influence the earth's low cloud cover and how this in turn would impact the mean temperature.

c. "Global temperature forced by solar irradiation and greenhouse gases?" Wibjorn Karlen *Ambio, Vol. 30 (2001)p. 349-350*

Argues that the present interglacial has been cooler by about 2°C than the previous ones during the last 400,000 thousand years when the atmospheric concentration of CO_2 was 100 ppmv less than at present.

d. "The sun's role in climate variations" D Rind *Science Vol. 296 (2002) p. 673-677*

Provides a general overview of the sun's impact on the earth's climate through the Little Ice Age, as well as through geological times, and the complexity in establishing the solar/climate link.

e. "Solar influence on the spatial structure of the NAO during the winter 1900-1999" Kunihiko Kodera *Geophysical Research Letters, Vol. 30 (2003) 1175 doi:10.1029/2002GL016584*

North Atlantic oscillation is shown to be strongly modulated by high & low solar activity as identified through sunspot cycles.

f. "Can slow variations in solar luminosity provide missing link between the sun and the climate?" Peter Fokul *EOS, Vol. 84, No. 22 (2003)p.205&208*

Presents additional evidence of recent changes in solar irradiance and make a case for solar impact on the earth's climate.

g. "Celestial driver of phanerozoic climate?" N Shaviv & J Veizer *Geological Society of America 13 (2003) p.4-10*

Documents, using a "sea-shell thermometer", how the earth's temperature over last 500 million years is decoupled with atmospheric CO_2 levels, while showing strong correlation with variations in the cosmic ray flux.

h. "Variable solar irradiance as a plausible agent for multidecadal variations in the Arctic-wide surface air temperature record for the past 130 years" Willie W-H Soon *Geophysical Research Letters Vol. 32 (2005) L16712*

Demonstrates a strong link between total solar irradiance and Arctic-wide surface temperature over a long period from 1875-2000.

i. "Solar forcing of the polar atmosphere" P A Mayewski et al *Annals of Glaciology Vol. 41 (2005) p. 147-154*

Analyzes high-resolution calibrated proxies for atmospheric circulation from several Antarctic ice cores, which reveal decadal-scale association with solar variability over the last 600 years.

j. "The influence of the 11-yr solar cycle on the interannual-centennial climate variability" Hengyi Weng *J of Atmosphere and solar-terrestrial physics Vol. 67 (2005) p. 793-805*

Re-confirms the solar variability impact on earth's climate by analyzing monthly sunspot numbers in conjunction with global and regional sea surface temperatures.

k. "Living with a variable sun" Judith Lean *Physics Today (2005) Vol 58, No. 6 p. 32-37 American Inst. Of Physics USA*

Presents additional evidence of recent changes in solar irradiance and makes a case for solar impact on the earth's climate.

l. "Phenomenological solar contribution to the 1900-2000 global surface warming" N Scafetta & B J West *Geophysical Research Letters Vol. 33 (2006) L05708*

Constructs a phenomenological model to include solar forcing and demonstrates its linkage to the earth's temperature change over last 400 years.

m. "Phenomenological solar signature in 400 years of reconstructed northern hemisphere temperature record" N Scafetta & B J West *Geophysical Research Letters Vol. 33 (2006) L17718*

Constructs a phenomenological model to include solar forcing and demonstrates its linkage to the earth's temperature change over last 400 years.

n. "Empirical evidence for a nonlinear effect of galactic cosmic rays on clouds" R G Harrison & D B Stephenson *Proceedings of the Royal Society A (UK): 10.1098/rspa.2005.1628 (2006)*

Documents how galactic cosmic rays can influence the earth's low cloud cover and how this in turn would impact the mean temperature.

3. Sea-level rise, ocean surface warming/cooling etc.

Sea-level Rise

a. "New perspectives for the future of the Maldives" N-A Morner M Tooley & G Possnert *Global and Planetary Change 40 (2004) p. 177-182*

In the region of Maldives a general fall in sea-level rise occurred some 30 years ago.

b. "Estimates of the regional distribution of sea-level rise over the 1950-2000 period" J A Church et al *J of Climate 17 (2004) p. 2609-2625*

Analyzes patterns of regional sea level rise over the period 1950-2000 and concludes that it is not possible to detect a significant sea level rise over this period anywhere.

c. "Low sea-level rise projections from mountain glaciers and icecaps under global warming" Sarah Raper & Roger Braithwaite *Nature V. 439 (2006) p. 311-313*

Projects sea level rise from mountain glacier and icecaps (outside of Greenland & Antarctic Ice Sheets) as only about 5.1 cm by 2100, half of previous projections.

d. "Nonlinear trends and multiyear cycles in sea-level records" S Jevrejeva et al *J of Geophysical Research V.111(2006) C09012*

Obtains global sea level rise trend of 2.4 mm per year for the period 1993-2000

e. "On the decadal rates of sea level changes during the twentieth century" S J Holgate *Geophysical Research Letters 34 (2007) doi:10.1029/2006GL028492*

Analyses nine long and continuous records of sea level changes from 1904 through 2003. Sea level change of ~2.03 +/-.35 mm/yr from 1904-1953. 1954-2003, sea-level change is found to be lower ~1.45 +/-.34 mm/yr.

Ocean Surface Warming/Cooling

a. "The sustained North American warming of 1997 and 1998" A Kumar et al *J of Climate 14 (2001)p.345-353*

Shows how the sustained North American land warming was primarily due to the intense El Nino event of 1997/98, which produced and maintained high sea surface temperature values over the Pacific basin, as well as other ocean basins through the middle of 1998.

b. "Recent cooling of the upper ocean" J Lyman J Willis & G Johnson *Geophysical Research Letters 33 (2006) L18604*

Documented cooling of the upper oceans and in particular of the southern north Atlantic.

c. "Anomaly of heat content in the northern Atlantic in the last 7 years: Is the ocean warming or cooling?" V Ivchenko N Wells & D Aleynik *Geophysical Research Letters 33 (2006) L22606*

Data from the Argo profiling buoys are analyzed for the North Atlantic, and found that the southern north Atlantic has cooled in the last seven years.

d. "How much is the ocean really warming?" V Gouretski & K P Koltermann *Geophysical Research Letters 34 (2007) L01610*

Studies global hydrographic data, as provided by bathythermographs, and found a warming bias when the bathythermographs data are compared against bottle and current temperature density data.

4. Arctic & Antarctic temperatures: from Holocene to present

a. "First survey of Antarctic sub-ice shelf sediment reveals mid-Holocene ice shelf retreat" C J Pudsey & J Evans *Geology 29 (2001) p.787-790*

Documents that the Larsen A & B ice shelves in the northeastern Antarctic Peninsula were probably altogether absent about two thousand years ago.

b. "Antarctic climate cooling and terrestrial ecosystem response" P Doran et al *Nature online 13 January 2002 (DOI:10.1038/nature 710)*

Documents a cooling trend in the Antarctica using recent temperature data.

c. "Variability and trends of air temperature and pressure in the maritime Arctic, 1875-2000" I V Polyakov et al *J ournal of Climate 16 (2003) p. 2067-2077*

Presents a long series of temperature and pressure data (1875-2000) over the Arctic basin, and documents strong multi-decadal variability on a time scale of 50-80 years.

d. "Holocene climate variability" P A Mayewski et al *Quaternary Research 62 (2004) p. 243-255*

Identifies *Rapid Climate Change* throughout the Holocene, involving cool polar regions and wet (or dry) tropical regions.

e. Global warming & the Greenland ice sheets" P Chylek, J E Box & G Lesins *Climatic Change (2004) 63 p. 201-221*

Shows that a rapid warming over all of coastal Greenland occurred in the 1920s. Average annual temperature rose between 2° and 4°C in less than ten years.

f. "A multi-proxy lacustrine record of Holocene climate change on northeast Baffin Island, Arctic Canada" *Quaternary Research (2006) 65 p. 431-442*

Shows a pronounced Holocene temperature maximum, about 5°C warmer than present.

g. "Greenland warming of 1920-1930 and 1990-2005" P. Chylek, M K Dubey & G Lesins *Geophysical Research Letters 33 (2006) L11707*

Shows that a rapid warming over all of coastal Greenland occurred in the 1920s. Average annual temperature rose between 2° and 4°C in less than ten years.

h. "Extending Greenland temperature records into the late eighteenth century" B M Winter et al *J of Geophysical Research 111 (2006) D11105*

Extends Greenland temperature records back to the year 1784. The 1930s and the 1940s were the warmest decades, with 1941 as the warmest year.

i. "Ice shelf history from petrographic and foraminiferal evidence, Northeast Antarctic Peninsula" C J Pudsey et al *Quaternary Science Reviews 25 (2006) p. 2357-2379*

Documents that the Larsen A & B ice shelves in the northeastern Antarctic Peninsula were probably altogether absent about two thousand years ago. Further concludes that the CO_2 concentration was about 100 ppm lower than at present.

5. Impact of large-scale circulation patterns

a. "A study of NAO variability and its possible non-linear influences on European surface temperatures" D Pozo-Vazquez et al *Climate Dynamics, Vol. 17 (2001) p. 701-715*

Shows that a positive value of the north Atlantic oscillation index can produce winter season warming in Europe.

b. "Impacts of low frequency variability modes on Canadian winter temperature" B Bonsal, A Shabbar & K Higuchi *Int'l journal of Climatology, Vol. 21 (2001) p. 95-108*

Shows how an El Nino event, together with positive values of the Pacific decadal oscillation index, can provide strong positive winter temperature anomalies over most of Canada.

c. "Are stronger North-Atlantic southwesterlies the forcing to the late-winter warming in Europe?" J Ottermann et al *Int'l J of Climatology, Vol. 22 (2002) p. 743-750*

Suggests that stronger south-westerlies in the North Atlantic may be producing early spring-like conditions in parts of Europe.

d. "Variability of extreme temperature events in south-central Europe during the twentieth century and its relationship with large-scale circulation" P Domonkos et al *Int'l J of Climatology, Vol. 23 (2003) p. 987-1010*

Shows that a positive value of the north Atlantic oscillation index can produce winter season warming in Europe.

e. "January Northern Hemisphere circumpolar vortex variability and its relationship with hemispheric temperature and regional teleconnection" R Rohli, K Wrona & M McHugh *Int'l J of Climatology, Vol. 25 (2005) p. 1421-1436*

Discusses the circumpolar vortex and its linkage to both the Atlantic oscillation variability, and the Pacific North American pattern.

6. Extraneous influence on mean temperature trends: urbanization, land-use change etc.

a. "The influence of land-use change and landscape dynamics on the climate system: relevance to climate-change policy beyond the radiative effect of greenhouse gases" R A Pielke sr et al *Phil. Trans. R soc. London UK (2002)360 p.1705-1719*

Considered a landmark paper in the present global warming debate. This paper brings out an important aspect of land-use change and its dominating impact.

b. "Impact of urbanization and land-use change on climate" E. Kalnay & M Cai, *Nature, Vol. 423, 29 May 2003, p. 528-531*

Using the National Centre for Atmospheric Research, USA, re-analyses upper-air data and an extrapolation to the surface, obtaining the urbanization impact on mean temperature trend to be about 0.28^{0}C over 100 years and about 0.18^{0}C over the recent 30 years.

c. "The urban heat island in winter at Barrow, Alaska" K Hinkel et al *International J of Climatology, Vol. 23, 2003, p. 1889-1905*

Obtains the urban-rural temperature difference of over 2^0C during the winter months at Barrow, Alaska.

d. "Impacts of anthropogenic heat on regional climate patterns" A Block, K Keuler & E Schaller *Geophysical Research Letters, Vol 31, L12211, 2004*

Shows how anthropogenic heat released from highly industrialized and populated areas can produce a permanent warming from 0.15° to 0.5°C.

e. "A test of correction for extraneous signals in gridded surface temperature data" R McKitrick & P Michaels, *Climate Research, Vol. 26, 2004, p. 159-173*

Documents a definite warm bias in the temperature trend, as a result of non-climatic impact of local (and regional) economic activity.

f. "Evidence for a significant urbanization effect on climate in China" L Zhou et al *Proc. National Academy of Science(USA) V. 101 (2004) p.9540-9544*

Obtains urbanization impact over China to be more than the estimated 0.27°C in the USA during the 20th century.

g. "Evidence for influence of anthropogenic surface processes on lower tropospheric and surface temperature trends" A T J De Laat & A N Maurellis, *International J of Climatology, 26, 2006, p. 897-913*

Studies the influence of anthropogenic surface processes on mean temperature trends, estimated using green house gas emission world-wide database as proxy for industrial activity. The mean temperature trends at highly industrial regions and locations were found to be higher than elsewhere.

h. "Urban heat island effect analysis for San Juan, Puerto Rico" A Velazquez-Lozada, J E Gonzalez & A Winter, *Atmospheric Environment, 40, 2006, p. 1731-1741*

Documents a strong urban heat island effect at San Juan, Puerto Rico. It is estimated that the urban-rural temperature difference could increase to about 8°C by the year 2050.

7. Uncertainties in climate model simulations of regional & global features

a. "Potential role of solar variability as an agent for climate change" C Bertrand & J Van Ypersele *Climatic Change V 43 (1999) p.387-411*

It is shown that, although total solar irradiance reconstruction is insufficient to reproduce observed warming of the 20th century, the model response suggests that the Gleissberg cycle (~88 yr) solar forcing should not be neglected in explaining the century-scale time variations.

b. "Simulated impacts of historical land-cover changes on global climate in northern winter" T N Chase et al *Climate Dynamics V 16 (2000) p. 93-10*

The simulations suggest that anthropogenic land cover changes can produce tele-connection patterns affecting global temperature and precipitation distributions.

c. "Monsoon prediction-why yet another failure?" S Gadgil M Rajeevan & R Nanjundiah *Current Science(India) V 88 (2005) P.1389-1400*

Examines prediction of the Indian monsoon for 2004 and conclude that the skill in forecasting the Indian summer monsoon variability has not improved in the last fifty years

d. "Detection and attribution of twentieth-century northern & southern African rainfall change" M Hoerling et al *J of Climate V 19 (2006) p. 3989-4008*

Finds that the Sahel region drought of 1950-2000, was not influenced by the green house gas forcing, indicating that the Sahel drought conditions were likely of natural origin.

e. "ENSO evolution and teleconnections in IPCC's twentieth-century climate simulations: realistic representation?" R Joseph & S Nigam *J of Climate V 19 (2006) p.4360-4377*

Concludes that climate models are still unable to simulate many features of El Nino southern oscillation variability, its circulation and hydro-climatic tele-connections. Further the climate system models are not quite ready for making projections of regional-to-continental scale hydro-climatic variability and change.

f. "Precipitation characteristics in eighteen coupled climate models" Aiguo Dai *J of Climate V 19 (2006) p.4605*

Concludes that considerable improvements in precipitation simulations are still desirable for the latest generation of the world's coupled climate models.

g. "Is the thermohaline circulation changing?" M Latif et al *J of Climate V 19 (2006) p.4631-4637*

Examines the thermohaline circulation in the North Atlantic, which is responsible for large amounts of heat and freshwater transport by the Gulf Stream. Suggests the changes in the thermohaline circulation during the 20th century are likely to be the result of natural multi-decadal climate variability.

8. Miscellaneous Studies

a. "Reconciling observations of global temperature change" Richard Lindzen & Constantine Giannitsis *Geophysical Research Letters V 29 (2002) No 12 10.1029/2001GL014074*

Analyzes the discrepancy between global mean temperature trends, obtained by satellite microwave data, and surface temperature measurements.

b. "Compilation and discussion of trends in severe storms in the United States: Popular perception vs climate reality" Robert Balling Jr & Randall Cerveny *Natural Hazards V 29 (2003) p. 103-112*

Documents the mismatch between popular perceptions, as created by media reports, and climate reality, which does not show extreme weather as increasing in the USA.

c. "On destructive Canadian Prairie windstorms and severe winters: A climatological assessment in the context of global warming" Keith Hage *Natural Hazards V 29 (2003) p. 207-228*

Documents a temporal frequency peak in severe windstorms and associated tornadoes during the 1920s and 1930s, then a steady decline since 1940 through 1980s. A steep rise in tornado frequency since 1970 is attributed to increasing awareness and reporting of tornado activity in recent years, and NOT due to change in tornado climatology.

d. "Shifting economic impacts from weather extremes in the Unites States: a result of societal changes, not global warming" Stanley Changnon *Natural Hazards V 29 (2003) p. 273-290*

Documents that increasing economic impacts of extreme weather events in the USA is a result of societal change and NOT global warming.

e. "The global warming debate: A review of the present state of science" M L Khandekar T S Murty & P Chittibabu *Pure & Applied Geophysics V 162 (2005) p. 1557-1586*

Concludes that the recent warming of the earth's surface is primarily due to urbanization, land-use change, etc. and not due to increasing green house gas in the atmosphere.

f. "Extreme weather trends vs dangerous climate change: A need for a critical reassessment" M L Khandekar *Energy & Environment V 16 (2005) p.327-331*

Shows that extreme weather events like heat waves, winter blizzards, rainstorms, droughts etc are not increasing anywhere in Canada, USA or elsewhere, where sufficient data are available for adequate analysis.

g. "The interaction of climate change and the carbon dioxide cycle" A Rorsch R S Courtney & D Thoenes *Energy & Environment V 16 (2005) p. 217-238*

Argues the relatively large rise of CO_2 in the 20th century, was caused by the increase in the mean temperature which preceded it.

h. "Can we detect trends in extreme tropical cyclones?" Christopher Landsea et al *Science V 313 (2006)p.452-454*

Suggests the Dvorak technique, developed to estimate hurricane strength, was not available in the late 1960s and early 1970s or before, when some of the hurricanes and tropical cyclones may have been stronger than estimated.

i. "Trends in western North Pacific tropical cyclone intensity" M- C Wu K-H Yeung & W-L Chang *EOS Transactions AGU V 87 (2006) No 48 28 November 2006*

Suggests that the western North Pacific tropical cyclone climatology does not reveal increasing strength for typhoon records from 1965 to 2004.

j. "On global forces of nature driving the earth's climate: Are humans involved?" L F Khilyuk & G V Chilinger *Environmental Geology V 50 (2006) p. 899-910*

Presents a comprehensive review of the global forces driving the earth's climate over geological times. The present warming of the last 150 years is a short warming episode in the earth's geologic history. Human activity (anthropogenic green house gas emission) may be responsible for only 0.01°C of the approximately 0.56°C warming of the 20th century.

Summary & Conclusions

1. **The recent warming of the earth's surface (~0.4°C) is significantly influenced by human activity on ground like urbanization, land-use change etc. The warming due solely to human-added CO_2 appears to be a smaller part of the total recent warming.**

2. **Solar variability and changes in large-scale atmospheric flow patterns in recent years have also contributed to some of the recent warming of the earth's surface.**

3. **The Arctic basin temperature changes of the last 125 years, appear to be intimately linked to the Total Soar Irradiance (TSI) while showing a weak correlation with atmospheric CO_2 concentrations.**

4. **The earth's climate experienced *Rapid Climate Change* during the entire Holocene period. and in particular during the last 5000 years or so. Ice core and other proxy data document mid-Holocene warming of the Arctic as well as the Antarctic. This Holocene warming appears to be strongly linked to solar variability and not to the greenhouse gas forcing.**

5. **There does not appear any discernible link between Global Warming and recent increase in extreme weather events world-wide. The apparent increase in extreme weather events is more a perception than reality, this perception being created due to increased media attention and publicity of extreme weather events.**

6. **North Atlantic hurricanes appear to have strengthened in recent years; however typhoons and tropical cyclones in other ocean basins do not show consistent increase in strength in recent years.**

7. **The Sea Level Rise of the 20th century is influenced significantly by inter-decadal variability. The most recent study (published January 2007) shows that the sea-level change in the last fifty years were smaller than those in the early part of the 20th century. There is no evidence of accelerated sea-level change in recent years.**

8. **Present state-of-the-art coupled climate models still cannot simulate many important features of major climate events like El Nino South oscillation and tropical and/or Asian Monsoon at this time. The climate models do not simulate many features of convective or large-scale precipitation characteristics.**

9. **The Thermohaline Circulation in the North Atlantic has exhibited considerable variability in the 20th century; however this variability appears to be part of natural multi-decadal climate variability and does not appear to be linked to Global Warming.**

10. **Future projections of earth's climate using present climate models do not have sufficient reliability for climate policy decisions.**