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

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For
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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.


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


   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.


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


   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 CO₂ was 100 ppmv less than at present.


   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.


   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.

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.


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


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.


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


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


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


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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**


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


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.


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

   Analyses nine long and continuous records of sea level changes from 1904 through 2003. Sea level change of ~2.03 +/- 0.35 mm/yr from 1904-1953. 1954-2003, sea-level change is found to be lower ~1.45 +/- 0.34 mm/yr.

Ocean Surface Warming/Cooling

   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.

   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.

   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

   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.

   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.

   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.

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

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

   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 CO₂ concentration was about 100 ppm lower than at present.

5. Impact of large-scale circulation patterns

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

   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.

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

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

   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.

   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.

   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°C over 100 years and about 0.18°C over the recent 30 years.
   Obtains the urban-rural temperature difference of over 2°C during the winter months at Barrow, Alaska.

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

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

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

   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.

   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

   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 teleconnection patterns affecting global temperature and precipitation distributions.

   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

   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.

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

Analyzes the discrepancy between global mean temperature trends, obtained by satellite microwave data, and surface temperature measurements.
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.
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.
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.
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.
Argues the relatively large rise of CO2 in the 20th century, was caused by the increase in the mean temperature which preceded it.
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.
Suggests that the western North Pacific tropical cyclone climatology does not reveal increasing strength for typhoon records from 1965 to 2004.

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 greenhouse 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 Solar 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.