Introduction to Geological Perspectives of Global Climate Change,

Power Point Presentation,

Lee C. Gerhard

History has seen many memorable public confrontations between belief systems and science data. Despite the scientific merit of the data, belief systems are powerful endemic and forces against which science must struggle. Some modern examples are evolution and global climate change.

In both cases, complexity is added to the debates because scientists bring their own belief systems to the controversy. Although the scientific observations and information make a scientifically correct conclusion clear with respect to both evolution and global climate change, belief systems drive media, politics, and group thinking, keeping alive a debate that has no further useful purpose, but which distracts governments and the people from mitigating the effects of natural processes and enhancing public education.

Much of problem lies in the resurgence of a new cycle of anthropocentrism that started in the 1960's with the "me" generation. It did not take very long for anthropocentric self-flagellation to begin and identify humans beings as the cause of all things "bad". The next step was inexorable and led to the worship of the "state of nature" without any human beings as the ultimate good.

The United Nations, a political organization, is the acknowledged leader in the argument that human beings are the cause of global climate change as a result of their use of fossil fuels.

The mission of the Intergovernmental Panel on Climate Change (IPCC), a United Nations organization, is not to study causes of climate change, but to document only one cause, human impacts on climate. This kind of mandate validates the recent quote from geologist, Dr. Peter Flawn, President Emeritus of the University of Texas, Austin:

"All geologists early in their careers are introduced to solving problems through multiple working hypotheses - of deriving solutions from the data rather than, as is common among some social scientists, settling upon a solution consistent with the reigning theory and supporting it with data selectively chosen."

(Flawn, Peter T., 2006, The Compass, v. 79, p.19.)

The attached Power Point presentation documents the current state of scientific information about climate change. The substantial credible scientific evidence establishes that a number of popular assumptions and hypotheses cannot be supported and in some cases are demonstrably false.

- Human emissions of carbon dioxide are a significant driver of climate. They are not.
- Climate change rates and the global warming of today are unprecedented. They are not.

However, the data does support a number of less popular hypotheses:

- Climate naturally changes constantly, from warmer to cooler and cooler to warmer, and at many levels of intensity over time at many scales.
- Variation in Solar activity closely correlates with global temperature variations, suggesting that

the amount of solar energy reaching the surface of the earth is a primary climate driver at the time scale of decades to millennia.

Notes:

Two versions of the presentation are included, one for scientists, without on-slide comment, and one for the lay public with some additional notation.

These presentations will be updated as new information becomes available.

The notes for the scientist version contain many of the base references; a reading list, partly annotated, is appended to this introduction.

Lee Gerhard's notes on power point slides, scientists version.

1. Many slides prepared by the Kansas Geological Survey, whose help is appreciated
2. We are pretty tired of fraudulent ad hominen attacks assuming we are funded by any industry. This work was not funded except for graphical assistance of the Kansas Geological Survey and the research I conducted under their auspices.
3. Humans try to be in charge and in control, the universe doesn't care about humans.
4. Humans have egos.
5. Nothing we do about our environment will make any difference in the long run if we don't address population.
6. A theory we will test in this presentation.
7. The correlations are obvious- CO2 and temperature don't co-vary. Solar energy and temperature do co-vary. Now let's look at data and theory.
Hoyt, D. V., and K.H. Schatten, 1997, The Role of the Sun in Climate Change: Oxford University Press, New York, 279 p. , withCO2 overlay from Keeling, C.D., and T.P. Whorf. 1996. Atmospheric CO2 records from sites in the SIO air sampling network. In Trends: A Compendium of Data on Global Change. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, Oak Ridge, Tenn., U.S.A.
8. Geologists are trained to think in 4 dimensions, unlike most scientists. This is especially important in assessing changes in dynamic earth processes which occur over time such as temperature and climate.
9. If earth processes were is equilibrium, this would be a dull and uninteresting place to live.
12.http://physics.ucr.edu/~wudka/Physics7/Notes_www/node6.html#SECTION02121000000000000000
Accessed 6-3-06
14. Overall, the earth's climate has been cooling for 60 million years, but that is only an average – temperature goes up and down, constantly.
15. This diagram shows that temperature rapidly rises, then slowly cools naturally, called the sawtooth effect. The dashed lines are possible computer model projections of temperature. Moore, Peter D., Bill Chaloner, and Philip Stott, 1996, Global environmental change: Blackwell Science, Oxford, England, 244 p.
16. This diagram sows the highly variable nature of earth temperature over 16,000 years, with detail for the last 2000 years. Depending on the period of the earth's history that is chosen, the climate will either be warming or cooling. Choosing whether earth is warming or cooling is simply a matter of picking end points.
Davis, John C., and Geoffrey Bohling, 2001, The Search for Patterns in Ice-Core Temperature Curves: in Gerhard, Lee C., William E. Harrison, and Bernold M. Hanson, eds.,2001, Geological Perspectives of Global Climate Change: American Association of Petroleum Geologists Studies in Geology #47, Tulsa, OK, p. 213-230.
17. Although the earth appears to be warming now, recently past events were warmer than the present one. See slide 18 for example.
Bluemle, John P., Joseph Sable, and Wibjorn Karlen, 2001, Rate and Magnitude of Past Global Climate Changes: in, Gerhard, Lee C., William E. Harrison, and Bernold M. Hanson, eds., 2001, Geological Perspectives of Global Climate Change: American Association of Petroleum Geologists Studies in Geology #47, Tulsa, OK, p. 193-212.
18. Even the last 120 years show significant variation in temperature for the United States. Data from NOAA and NASA. Note that the warm period of the 1930's exceeds current temperatures. This was also the dust bowl period.
22. Carbon dioxide is only one of many greenhouse gases, now about 380 parts per million concentration, and rising.
23. But of all the greenhouse gases, carbon dioxide represents only about ¼ of 1% of the greenhouse effect, hardly a device to drive the massive energy system of earth's climate.
Hieb, M., 2003, Global Warming: A Closer Look at the Numbers, in Hieb, M. and Hieb, H., 2003, Global Warming: A

Chilling Perspective: http://www.clearlight.com/~mhieb/WVFossils/Ice_Ages.html, accessed 2/14/06
24. Berner, 1994, as cited in: Moore, Peter D., Bill Chaloner, and Philip Stott, 1996, Global environmental change: Blackwell Science, Oxford, England, 244 p.
25. NOAA data.
26. Arthur B. Robinson, Sallie L. Baliunas, Willie Soon, and Zachary W. Robinson, 1998
27. NOAA data, yellow emphasizes downturn in temperature from 1998 to present.
29. CO2 vs temperature plot. Smooth CO2 curve does not correlate except in general with actual temperature over250 years history. Note CO2 starts rising prior to Little Ice Age. CO2 data drom Keeling, C.D., and T.P. Whorf. 1996. Atmospheric CO2 records from sites in the SIO air sampling network. In Trends: A Compendium of Data on Global Change. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, Oak Ridge, Tenn., U.S.A.
30. CO2 curve trails behind the temperature curve and is actually offset by 83 years; the actual data points do not connect. But it is a decent approximation of temperature vs. CO2.
31. The increase in atmospheric CO2 follows the temperature rise by hundreds of years. From Khilyuk, L. F., and G. V. Chilingar, 2003, Global warming: Are we confusing cause and effect?:Energy Sources 25: 357-370.
36. Gerhard, Lee C., William E. Harrison, and Bernold M. Hanson, Eds., 2001, Geological Perspectives of Global Climate Change: American Assoc. of Petroleum Geologists Studies in Geology #47, 373 p.
37. Meteorite impacts throw dust into the atmosphere, causing cooling by reflection.
38. Volcanic eruptions do the same.
41. Ewing, M., and W. Donn, 1956, A Theory of Ice Ages: Science, v. 123, p. 1061-1065
43. Gerhard, Lee C., and William E. Harrison, 2001, Distribution of Oceans and Continents: A Geological Constraint on Global Climate Variability: in., Gerhard, Lee C., William E. Harrison, and Bernold M. Hanson, eds., 2001, Geological Perspectives of Global Climate Change: American Assoc. of Petroleum Geologists Studies in Geology #47, Chapter 3, p. 51-82.
48. Bond, Gerard, Bernd Kromer, Juerg Beer, Raimund Muscheler, Michael N. Evans, William Showers, Sharon Hoffmann, Rusty Lotti-Bond, Irka Hajdas, Georges Bonani, 2001, Persistent Solar Influence on North Atlantic Climate During the Holocene: Science, Vol. 294, Issue 5549, 2130-2136.
49. Bond, Gerard, Bernd Kromer, Juerg Beer, Raimund Muscheler, Michael N. Evans, William Showers, Sharon Hoffmann, Rusty Lotti-Bond, Irka Hajdas, Georges Bonani, 2001, Persistent Solar Influence on North Atlantic Climate During the Holocene: Science, Vol. 294, Issue 5549, 2130-2136.
50. Daly, John, 2005, The 'Hockey Stick': A New Low in Climate Science: http://www.john-daly.com/hockey/hocky.htm (accessed 1/8/2006).
51. Solar intensity vs. earth temperature. A great correlation. Adapted from Hoyt, D. V., and K.H. Schatten, 1997, The Role of the Sun in Climate Change: Oxford University Press, New York, 279 p.
52. Note that it is likely WWII and atmospheric nuclear weapon testing has some effect on global temperature.
56. This primitive model more closely replicates past climate than any GCM. Data input 11 year, 80 year, and 1100 year solar cycles.
59. Kotov, Sergey R, 2001, Near-term Climate Prediction Using Ice Core Data from Greenland, Geol. Perspectives of Global Climate Change: AAPG Studies in Geology #47, p. 305-316.
64. Hoyt, D. V., and K.H. Schatten, 1997, The Role of the Sun in Climate Change: Oxford University Press, New York, 279 p. , withCO2 overlay from Keeling, C.D., and T.P. Whorf. 1996. Atmospheric CO2 records from sites in the SIO air sampling network. In Trends: A Compendium of Data on Global Change. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, Oak Ridge, Tenn., U.S.A.

Recommended readings

Part 1: Recent Important Recommended Readings: Climate Change

Alley, Richard B., and Peter U. Clark, 1999, The Deglaciation of the Northern Hemisphere: A Global Perspective: Annual Reviews, Earth and Planetary Science, v. 27, p. 149-182.

Barring, L., and H. von Storch, 2004. Scandinavian storminess since about 1800. Geophysical Research Letters, Vol. 31, L20202, doi:10.1029/2004GL020441, 2004.

Bell, Jim, 2002, Tip of the Martian Iceberg?: Science, v. 297, p. 60-61.

Bluemle, John P., Joseph Sable, and Wibjorn Karlen, 2001, Rate and Magnitude of Past Global Climate Changes: in, Gerhard, Lee C., William E. Harrison, and Bernold M. Hanson, eds., 2001, Geological Perspectives of Global Climate Change: American Association of Petroleum Geologists Studies in

Geology #47, Tulsa, OK, p. 193-212.

Bond, Gerard, Bernd Kromer, Juerg Beer, Raimund Muscheler, Michael N. Evans, William Showers, Sharon Hoffmann, Rusty Lotti-Bond, Irka Hajdas, Georges Bonani, 2001, Persistent Solar Influence on North Atlantic Climate During the Holocene: Science, Vol. 294, Issue 5549, 2130-2136.

Broecker, W., S., 2001, Was the Medieval Warm Period global?: Science, v. 291, p. 1497-1399.

Carslaw, K. S., R. G. Harrison, and J. Kirby, 2002, Cosmic Rays, Clouds, and Climate: Science, v. 298, p. 1732-1737.

Conway, H., B. L. Hall, G. H. Denton, A. M. Gades, and E. D. Waddington, 1999, Past and Future Grounding-Line Retreat of the West Antarctic Ice Sheet: Science, v. 286, p. 280-283.

Crisci, A, B. Gozzini, F. Meneguzzo, S. Pagliara, and G. Maracchi, 2002, Extreme rainfall in a changing climate: regional analysis and hydrological implications in Tuscany: Hydrological Processes, v. 16, p. 1261-1274.

Daly, John L., 2000, The 'Hockey Stick': A New Low in Climate Science: http://www.microtech.com.au/daly/hockey/hockey.htm

Davis, John C., and Geoffrey Bohling, 2001, The Search for Patterns in Ice-Core Temperature Curves: in Gerhard, Lee C., William E. Harrison, and Bernold M. Hanson, eds.,2001, Geological Perspectives of Global Climate Change: American Association of Petroleum Geologists Studies in Geology #47, Tulsa, OK, p. 213-230.

Doran, Peter T., John C. Priscu, W. Berry Lyons, John E. Walsh, Andrew G. Fountain, Diane M. McKnight, Daryl L. Moorhead, Ross A. Virginia, Diana H. Wall, Gary D. Clow, Christian H. Fritsen, Christopher P. McKay, and Andrew N. Parsons, 2002, Antarctic climate cooling and terrestrial ecosystem response:
Nature, v. 415, p. 517-520.

Energy Information Administration, 1998, Impacts of the Kyoto Protocol on U. S. Energy Markets and Economic Activity: Energy Information Administration SR/OIAF/98-03, 227 p.

Esper, Jan, Edward R. Cook, Fritz h. Schweingruber, 2002, Low-Frequency Signals in Long Tree-Ring Chronologies for Reconstructing Past Temperature Variability: Science, v. 295, p. 2250-2253. (See also: Mann and Hughes' critique and Cook and Esper's response, Science, v. 296, p. 848-849.)

Ewing, M., and W. Donn, 1956, A Theory of Ice Ages: Science, v. 123, p. 1061-1065.

Fischer, H., M. Wahlen, J. Smith, D. Mastoianni, and B. Deck, 1999, Ice Core Records of Atmospheric CO2 Around the Last Three Glacial Terminations: Science, v. 283, p.1712-1714.

Friis-Christensen, E, and K. Lassen, 1991, Length of the solar cycle: an indicator of solar activity closely associated with climate: Science, v. 254, p. 698-700.

Gerhard, Lee C., 2004, Climate Change: Conflict of observational science, theory, and politics: American Association of Petroleum Geologists Bulletin, v. 88, p. 1211-1220).

Gerhard, Lee C., William E. Harrison, and Bernold M. Hanson, Eds., 2001, Geological Perspectives of

Global Climate Change: American Assoc. of Petroleum Geologists Studies in Geology #47, 373 p.

Gerhard, Lee C., and William E. Harrison, 2001, Distribution of Oceans and Continents: A Geological Constraint on Global Climate Variability: in., Gerhard, Lee C., William E. Harrison, and Bernold M. Hanson, eds., 2001, Geological Perspectives of Global Climate Change: American Assoc. of Petroleum Geologists Studies in Geology #47, Chapter 3, p. 51-82.

Gulev, S. K., O. Zolina, and S. Grigoriev, 2001, Exratropical cyclone variability in the Northern Hemisphere winter from the NCEP/NCAR reanalysis data: Climate Dynamics, v. 17, p. 795-809.

Hong, Y. T., H. B. Jiang, T. S. Liu, L.P. Zhou, J. Beer, H. D. Li, X. T. Leng, B. Hong, and X. G. Qin, 2000, Response of climate to solar forcing recorded in 6000-year delta 18O time series of Chinese peat cellulose: The Holocene, v. 10, p. 1-7.

Hoyt, D. V., and K.H. Schatten, 1997, The Role of the Sun in Climate Change: Oxford University Press, New York, 279 p.

Hu, F.S., Ito, E., Brown, T.A., Curry, B.B. and Engstrom, D.R. 2001. Pronounced climatic variations in Alaska during the last two millennia. Proceedings of the National Academy of Sciences, USA 98: 10,552-10,556.

Hu, F. S., D. Kaufman, S. Yoneji, D. Nelson, A. Shemesh, Y. Huang, J. Tian, G. Bond, B. Clegg, and T. Brown, 2003, Cyclic Variation and Solar Forcing of Holocene Climate in the Alaskan Subarctic: Science, v. 301, p. 1890-1893.

IPCC (Intergovernmental Panel on Climate Change), 2001, Climate Change 2001: The Scientific Basis: Cambridge University Press, Cambridge.

Houghton, J. T., Y. Ding, D. J. Griggs, M. Noguer, P. J. van der Linden, X. Dai, K. Maskell, C. A. Johnson, eds., 2001, Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, NY, 881 p.

Jenkins, David A, 2001, Potential Impacts and Effects of Climate Change: in., Gerhard, Lee C., William E. Harrison, and Bernold M. Hanson, eds., 2001, Geological Perspectives of Global Climate Change: American Assoc. of Petroleum Geologists Studies in Geology #47, Chapter 3, p. 337-360.

Keeling, C.D., and T.P. Whorf. 1996. Atmospheric CO2 records from sites in the SIO air sampling network. In Trends: A Compendium of Data on Global Change. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, Oak Ridge, Tenn., U.S.A.

Khilyuk, L. F., and G. V. Chilingar, 2004, Global warming and long-term climatic changes: a progress report: Environmental Geology, v. 46, p. 970-979.

Khilyuk, L. F., and G. V. Chilingar, 2003, Global warming: Are we confusing cause and effect?:Energy Sources 25: 357-370.

Khodri, M., Y. Leclalnche, G. Ramstein, P. Braconnot, O. Marti, and E.Cortijo, 2001, Simulating the amplification of orbital forcing by ocean feedbacks in the last glaciation: Nature, v. 410, p. 570-574.

Koren, I., Y. J. Kaufman, L. A. Remer, and J. V. Martins, 2004, Measurements of the Effect of Amazon

Smoke on Inhibition of Cloud Formation: Science, v. 303, p. 1342-1345.

Kotov, Sergey, 2001, Near-Term Climate Prediction Using Ice Core Data from Greenland: in, Gerhard, Lee C., William E. Harrison, and Bernold M. Hanson, eds., 2001, Geological Perspectives of Global Climate Change: American Assoc. of Petroleum Geologists Studies in Geology #47, Chapter 3, p. 305-316.

Lamb, H. H., 1995, Climate, History, and the Modern World: 2nd Ed., Routledge, NY, 433 p.

Labitzke, K, van Loon, H, 1988, Associations between the 11-year solar cycle, the QBO, and the atmosphere: I. The troposphere and stratosphere in the northern hemisphere in winter: Journal of Atmospheric and Terrestrial Physics, v. 50, p. 197-206.

Ma, Z., H. Li, M. Xia, T. Ku., Z. Peng, Y. Chen, and Z. Zhang, 2003, Paleotemperature changes over the past 3000 years in eastern Beijing, China: A reconstruction based on Mg/Sr records in a stalagmite: Chinese Science Bulletin, v. 48, p. 395-400

Mann, M. E., R. S. Bradley, and M. K. Hughes, 1999, Northern Hemisphere Temperatures During the Past Millennium: Inferences, Uncertainties, and Limitations: Geophysical Research Letters, v. 26, n. 6, p. 759-762.

McHarg, Ian, 1969, Design With Nature: Natural History Press, 197 p.

McIntyre, Stephen and Ross McKitrick, 2003. Corrections to the Mann et. al. (1998) Proxy Data Base and Northern Hemispheric Average Temperature Series. Energy & Environment, Vol. 14, No 6, pp. 751-771, October 26, 2003

McIntyre, Stephen, and RossMcKitrick, 2005, Hockey sticks, principal components, and spurious significance: Geophysical Research Letters, 32, L03710, doi: 10.1029/2004GL021750

Moberg, Anders, Wibjörn Karlén et al., 2005. Highly variable Northern Hemisphere temperatures reconstructed from low- and high-resolution proxy data. Nature Vol. 433, No. 7026, pp. 613-617, February 10, 2005

Moore, Peter D., Bill Chaloner, and Philip Stott, 1996, Global environmental change: Blackwell Science, Oxford, England, 244 p.

Naish, T. R., K. J. Woolfe, P. J. Barrett, G. S. Wison, C. Atkins, S. M. Bohaty, C. J. Bucker, M. Claps, F. J. Davey, G. B. Dunbar, A. G. Dunn, C. R. Fielding, F. Florindo, M. J. Hannah, D. M. Harwood, S. A. Henrys, L. A. Krissek, M. Lavelle, J. van der Meer, W. C. McIntosh, F. Niessen, S. Passchier, R. D. Powell, A. P. Roberts, L. Sagnotti, R. P. Scherer, C. P. Strong, F. Talarico, K. L. Verosub, G. Villa, D. K. Watkins, P. N. Webb, and T. Wonik, 2001, Orbitally induced oscillations in the East Antarctica ice sheet at the Oligocene/Miocene boundary: Nature, v. 413, p. 719-723.

National Research Council, 2000, Reconciling Observations of Global Temperature Change: National Academy Press, Washington D.C., 85 p.

Paulson, D. E., H. C. Li, and T. L. Ku, 2003,Climate variability in central China over the last 1270 years revealed by high resolution stalagmite records: Quaternary Science Reviews, v. 22, p. 691-701.

Pekarek, Alfred, 2001, Solar Forcing of Earth's Climate: in, Gerhard, Lee C., William E. Harrison, and

Bernold M. Hanson, eds., 2001, Geological Perspectives of Global Climate Change: American Association of Petroleum Geologists Studies in Geology #47, Tulsa, OK, p. 19-34.

Petit J.R., Jouzel J., Raynaud D., Barkov N.I., Barnola J.M., Basile I., Bender M.,Chappellaz J., Davis J. Delaygue G., Delmotte M. Kotlyakov V.M., Legrand M., Lipenkov V.M., Lorius C., Pépin L., Ritz C., Saltzman E., Stievenard M., 1999, Climate and Atmospheric History of the past 420,000 years from the Vostok Ice Core, Antarctica: Nature, 3 June 1999.

Reid, G. C., 1991, Solar total irradiance variation and the global sea surface temperature record: Journal of Geophysical Research v. 96, p. 2835-2844.

Royer, D. L., R. A. Berner, I. P. Montanez, N. J. Tabor, and D.J. Beerling, 2004, CO2 as a primary driver of Phanerozoic climate: GSA Today, v. 14, p. 4-10.

Santer, B. D., T. M. L. Wigley, G. A. Meehl, M. F. Wehner, C. Mears, M. Schabel, F. J. Wentz, C. Ammann, J. Arblaster, T. Bettge, W. M. Washington, K. E. Taylor, J. S. Boyle, W. Bruggemann, and C. Doutriaux, 2003, Influence of Satellite Data Uncertainties on the Detection of Externally Forced Climate Change: Science: v. 300, p. 1280-1284.

Sharma, Mukul, 2002, Variations in solar magnetic activity during the last 200,000 years: is there a Sun-climate connection?: Earth and Planetary Science Letters, v. 199, p. 459-472.

Shaviv, Nir J., and Jan Veizer, 2003, Celestial driver of Phanerozoic climate?: GSA Today, v. 13, n. 7, p. 4-10.

Sherwood, Keith, and Craig Idso, 2004, The Canary in the Coal Mine: Singing a Song of Something...But Certainly Not CO2: Editorial Commentary, CO2 Science Magazine, V. 7, n. 10,: 10 March 2004, http://www.co2science.org/edit/v7/v7n10edit.htm

Siegenthaler, U., T. Stocker, E. Monin, D. Luthi, J. Schwander, B. Stauffer, D. Raynaud, J-M. Barnola, H. Fischer, V. Masson-Delmotte, and J. Jouel, 2005, Stable carbon cycle-climate relationship during late Pleistocene: Science, v. 310, p. 1313-1317.

Soon, W., S. Baliunas, S. B. Idso, K. Y. Kondratyev, and E. S. Posmentier, 2001a, Modeling climatic effects of anthropogenic carbon dioxide emissions: unknowns and uncertainties: Climate Research, v. 18, p. 259-275.

Soon, W., S. L. Baliunus, A. B. Robinson, and Z. W. Robinson, 2001b, Global warming – a guide to the science: Risk Controversy Series 1, The Fraser Institute, Vancouver, 62 p.

Soon, Willie, Sallie Baliunas, Craig Idso, Sherwood Idso, and David Legates, 2003, Reconstructing Climatic and Environmental Changes of the Past 1000 Years: A Reappraisal: Energy and Environment, v 14, issues 2&3, p. 233-296.

Starkel, L., 2002, Change in the Frequency of Extreme Events as the Indicator of Climatic Change in the Holocene (in Fluvial Systems). Quaternary International 91:25-32.

Tsiropoula, G., 2003. Signatures of solar activity variability in meteorological parameters. Journal of Atmospheric and Solar-Terrestrial Physics 65, 469– 482, 2003, online <http://zeus.nascom.nasa.gov/~bfleck/jastp_publ.pdf>

Zahn, Rainer, 2002, Milankovitch and Climate: The Orbital Code of Climate Change: JOIDES Journal, v. 28, n. 1, p. 17-22.

Part 2: Some annotations:

The major reference of human history and climate:

Lamb, H. H., 1995, Climate, History, and the Modern World: 2nd Ed., Routledge, NY, 433 p.

Past Climate history:

Moberg, Anders, Wibjörn Karlén et al., 2005. Highly variable Northern Hemisphere temperatures reconstructed from low- and high-resolution proxy data. Nature Vol. 433, No 7026, pp. 613-617, February 10, 2005
"A number of reconstructions of millennial-scale climate variability have been carried out in order to understand patterns of natural climate variability, on decade to century timescales, and the role of anthropogenic forcing. These reconstructions have mainly used tree-ring data and other data sets of annual to decadal resolution. Lake and ocean sediments have a lower time resolution, but provide climate information at multicentennial timescales that may not be captured by tree-ring data. Here we reconstruct Northern Hemisphere temperatures for the past 2,000 years by combining low-resolution proxies with tree-ring data, using a wavelet transform technique to achieve timescale-dependent processing of the data. Our reconstruction shows larger multicentennial variability than most previous multi-proxy reconstructions, but agrees well with temperatures reconstructed from borehole measurements and with temperatures obtained with a general circulation model. According to our reconstruction, high temperatures—similar to those observed in the twentieth century before 1990—occurred around AD 1000 to 1100, and minimum temperatures that are about 0.7 K below the average of 1961–90 occurred around AD 1600. This large natural variability in the past suggests an important role of natural multicentennial variability that is likely to continue."

Solar Influence:

Bond, Gerard, Bernd Kromer, Juerg Beer, Raimund Muscheler,
Michael N. Evans, William Showers, Sharon Hoffmann, Rusty
Lotti-Bond, Irka Hajdas, Georges Bonani, 2001, Persistent Solar Influence on North Atlantic Climate During the Holocene: Science, Vol. 294, Issue 5549, 2130-2136, December 7, 2001
(Originally published in Science Express as 10.1126/science.1065680 on November 15, 2001)

Demonstrates 18,000 years of complete solar control of climate fluctuations as measured by ice advances and retreats in northern hemisphere. Supplemental data on Internet version provides graph of solar variability for 20th Century. Data based on Carbon 14 and Beryllium 10 isotopes and ice rafting events.

Hu, F. S., D. Kaufman, S. Yoneji, D. Nelson, A. Shemesh, Y. Huang, J. Tian, G. Bond, B. Clegg, and T. Brown, 2003, Cyclic Variation and Solar Forcing of Holocene Climate in the Alaskan Subarctic: Science, v. 301, p. 1890-1893.

16,000 years of data…….

Hoyt, D. V., and K.H. Schatten, 1997, The Role of the Sun in Climate Change: Oxford University Press, New York, 279 p.

An entire small book on the topic.

Carslaw, K. S., R. G. Harrison, and J. Kirkby, 2002, Cosmic Rays, Clouds, and Climate: Science, v. 298, p. 1732-1737.

A review article. Points out that while many may argue that solar variability seems too small to affect climate, effects are multiplied by clouds generated through solar variability. An important step in gaining recognition of solar effects.

Orbital influence:

Zahn, Rainer, 2002, Milankovitch and Climate: The Orbital Code of Climate Change: JOIDES Journal, v. 28, n. 1, p. 17-22.

A good introduction to orbital and climate cyclicity

Naish, T. R., K. J. Woolfe, P. J. Barrett, G. S. Wison, C.Atkins, S. M. Bohaty, C. J. Bucker, M. Claps, F. J. Davey, G. B. Dunbar, A. G. Dunn, C. R.Fileding, F. Florindo, M. J.Hannah, D. M. Harwood, S. A. Henrys, L. A. Krissek, M. Lavelle, J. van der Meer, W. C. McIntosh, F. Niessen, S. Passchier, R. D. Powell, A. P. Roberts, L. Sagnotti, R. P. Scherer, C. P. Strong, F. Talarico, K. L. Verosub, G. Villa, D. K. Watkins, P. N. Webb, and T. Wonik, 2001, Orbitally induced oscillations in the East Antarctica ice sheet at the Oligocene/Miocene boundary: Nature, v. 413, p. 719-723.

A must read article about a natural driver.

Antarctic climate cooling:

Peter T. Doran, John C. Priscu, W. Berry Lyons, John E. Walsh, Andrew G. Fountain, Diane M. McKnight, Daryl L. Moorhead, Ross A. Virginia, Diana H. Wall, Gary D. Clow, Christian H. Fritsen, Christopher P. McKay, and Andrew N. Parsons, 2002, Antarctic climate cooling and terrestrial ecosystem response:
Nature, v. 415, p. 517-520, 31 Jan 2002.

Demonstrates that Antarctica is cooling, not warming, thus that greenhouse gases are not driving climate change. Suggests that climate is cooling, not warming, but that is not specified. Some have started to worry about global cooling from this data.

Which comes first, CO2 or Temperature changes?:

Fischer, H., M. Wahlen, J. Smith, D. Mastoianni, and B. Deck, 1999, Ice Core Records of Atmospheric CO2 Around the Last Three Glacial Terminations: Science, v. 283, p.1712-1714.

This paper demonstrates that carbon dioxide concentrations tend to lag climate change by up to 400 years through Phanerozoic history, thus arguing that carbon dioxide concentration increase is a resultant not a driver.

Siegenthaler, U., T. Stocker, E. Monin, D. Luthi, J. Schwander, B. Stauffer, D. Raynaud, J-M. Barnola, H. Fischer, V. Masson-Delmotte, and J. Jouel, 2005, Stable carbon cycle-climate relationship during late Pleistocene: Science, v. 310, p. 1313-1317.

1600 years lag in ice cores.

The infamous hockey stick:

Mann, M. E., R. S. Bradley, and M. K. Hughes, 1999, Northern Hemisphere Temperatures During the Past Millennium: Inferences, Uncertainties, and Limitations: Geophysical Research Letters, v. 26, n. 6, p. 759-762.

IPCC used this paper as the basis for their statement that human influence on climate is clearly discernible. Students of human history know that this is not a logical ,even possible, conclusion (see Lamb, 1995). But it was the only paper in the literature that the IPCC could draw upon to state a human climate contribution conclusion, so it was cited and used despite the objections of reviewers of the IPCC report.

Esper, Jan, Edward R. Cook, Fritz h. Schweingruber, 2002, Low-Frequency Signals in Long Tree-Ring Chronologies for Reconstructing Past Temperature Variability:Science, v. 295, p. 2250-2253.

Breaks the hockey stick, re-demonstrates the Medieval Climate Optimum, effectively negates the Mann et al paper.

The IPCC based its 2001 assessment that human influence of climate was clearly discernible on an inadequately reviewed paper that proclaimed that the Medieval Warm Period did not exist, and that the temperature rise seen taking place from the end of the 19th century into the 20th century was anomalous. The original controversial paper was based on selected tree ring data. The Esper paper reviews and corrects earlier work, demonstrating the current temperature change is consistent with past changes during recorded human history.

Daly, John L., 2000, The 'Hockey Stick': A New Low in Climate Science: http://www.microtech.com.au/daly/hockey/hockey.htm

A detailed discussion of the hockey stick paper.

McIntyre, Stephen and Ross McKitrick, 2003. Corrections to the Mann et. al. (1998) Proxy Data Base and Northern Hemispheric Average Temperature Series. Energy & Environment Vol. 14, No 6, pp. 751-771, October 26, 2003 .

A devastating re-analysis of the Mann et al data and methodology. One might make the interpretation from this body of work and succeeding debate that there is a problem with the scientific integrity of the Mann paper and thus, the IPCC work.

Lower troposphere temperature not changing:

Santer, B. D., T. M. L. Wigley, G. A. Meehl, M. F. Wehner, C. Mears, M. Schabel, F. J. Wentz, C. Ammann, J. Arblaster, T. Bettge, W. M. Washington, K. E. Taylor, J. S. Boyle, W. Bruggemann, and C. Doutriaux, 2003, Influence of Satellite Data Uncertainties on the Detection of Externally Forced Climate Change: Science: v. 300, p. 1280-1284.

A discussion that perhaps satellite data is consistent with GCM models (this is an ongoing debate – whatever the conclusion, the amount of cooling or of warming is so slight that it is hard to discern, and even harder to use for proof of either greenhouse warming or natural cooling.

National Research Council, 2000, Reconciling Observations of Global Temperature Change: National Academy Press, Washington D.C., 85 p.

After exhaustive study, lower troposphere balloon and satellite measurements are substantiated; greenhouse requires heating to take place first in the lower troposphere, since it is not heating, it is difficult to see greenhouse as a driver of climate.

Severe weather events are either not changing or dereasing:

Starkel, L., 2002, Change in the Frequency of Extreme Events as the Indicator of Climatic Change in the Holocene (in Fluvial Systems). Quaternary International 91:25-32.

Theory holds that greenhouse warming will lead to more severe storm events, but this paper, among several others, has totally debunked that there is any increase in severe storm events.

Barring, L., and H. von Storch, 2004. Scandinavian storminess since about 1800. Geophysical Research Letters, Vol. 31, L20202, doi:10.1029/2004GL020441, 2004.

China participation in Medieval Climate Optimum:

Hong, Y. T., H. B. Jiang, T. S. Liu, L.P. Zhou, J. Beer, H. D. Li, X. T. Leng, B. Hong, and X. G. Qin, 2000, Response of climate to solar forcing recorded in 6000-year delta 18O time series of Chinese peat cellulose: The Holocene, v. 10, p. 1-7.

Ma, Z., H. Li, M. Xia, T. Ku., Z. Peng, Y. Chen, and Z. Zhang, 2003, Paleotemperature changes over the past 3000 years in eastern Beijing, China: A reconstruction based on Mg/Sr records in a stalagmite: Chinese Science Bulletin, v. 48, p. 395-400

Paulson, D. E., H. C. Li, and T. L. Ku, 2003,Climate variability in central China over the last 1270 years revealed by high resolution stalagmite records: Quaternary Science Reviews, v. 22, p. 691-701.

Quote from Byrnes, re: Models

In multivariate phenomena many variables do not exert independent influence. Observations made of multivariate phenomena are usually correct but present information about the phenomena from different perspectives, that is, they each test different hypotheses, make different assumptions, and hold different variables or boundary values constant. As with the three blind men describing an elephant, each is telling the truth but each provides a completely different view. It is common to construct models that are internally consistent within the boundaries of a defined problem but which are not required to be externally consistent, where the model results may not explain but are not in conflict with observations

outside the model. Fully accurate models must be able to explain, or at minimum not conflict with, ALL data or there must be a valid reason for rejecting or ignoring data that are inconsistent with the model.