I. Background Information

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This comment is meant to address the claim that the past can no longer serve as a guide for the future from key finding #9:

9. Historical climate and weather patterns are no longer an adequate guide to the future.
• Planning for providing water, energy, transportation, and other services has assumed the future would be like the past; this is no longer justifiable.
• Long-lived infrastructure, from power plants to roads and buildings, must be designed and built taking climate change into account.
• Long term planning will have to continually incorporate the latest information, as climate will be ever changing, requiring adaptation strategies to constantly evolve.

This statement is inexplicable for two reasons. First, you are using the warming from 1979 to 1998 while CO2 increased as evidence of the importance of the greenhouse effect. Your future forecast is based on extrapolation from the past and on climate models used by IPCC run by other centers such as NCAR and NASA and tuned to the past.

The models have proven useless in predicting global and regional climate even on a seasonal and decadal basis. Whatsmore, government and industry is currently relying on the past states of the atmosphere to successfully forecast the future on a seasonal and even decadal basis.

THE MODELS

This is not going to be a long critique of the climate models. I will leave that to others with more modeling experience. But here is what the IPCC modelers and others have said about these models:

Kevin Trenberth IPCC Lead Author Chapter 3 of WG1 on Nature 2007 Weblog

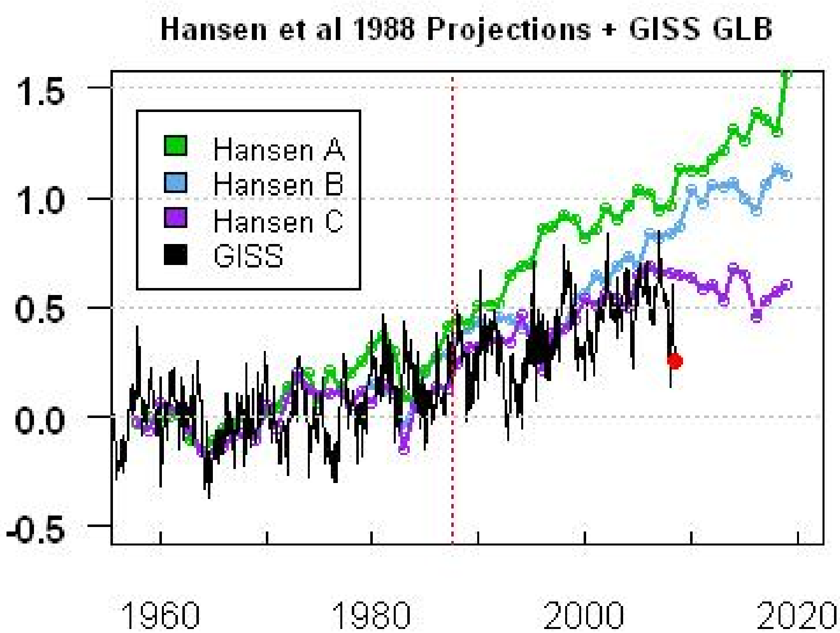
"None of the models used by IPCC are initialized to the observed state and none of the climate states in the models correspond even remotely to the current observed climate. In particular, the state of the oceans, sea ice, and soil moisture has no relationship to the observed state at any recent time in any of the IPCC models. There is neither an El Niño sequence nor any Pacific Decadal Oscillation that replicates the recent past; yet these are critical modes of variability that affect Pacific Rim countries and beyond.

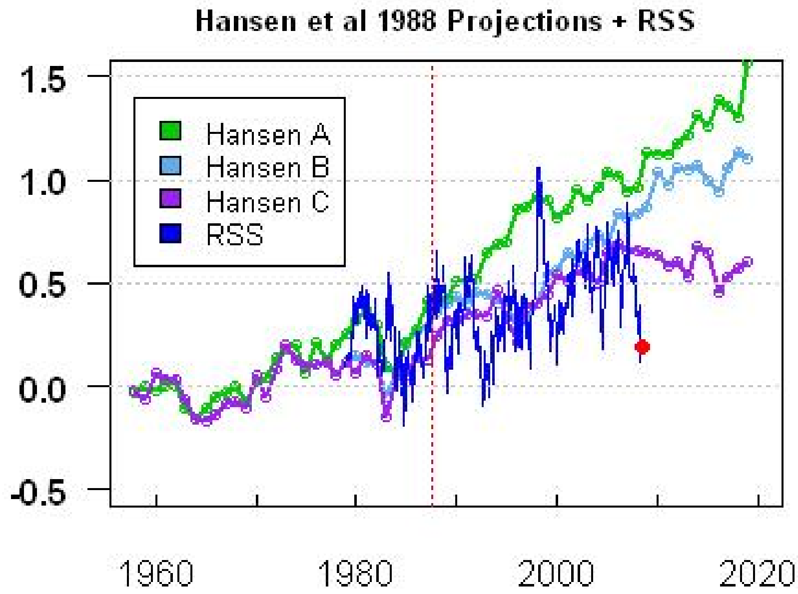
The Atlantic Multidecadal Oscillation, that may depend on the thermohaline circulation and thus ocean currents in the Atlantic, is not set up to match today's state, but it is a critical component of the Atlantic hurricanes and it undoubtedly affects forecasts for the next decade from Brazil to Europe. Moreover, the starting climate state in several of the models may depart significantly from the real climate owing to model errors. I postulate that regional climate change is impossible to deal with properly unless the models are initialized."

IPCC Lead Author Renwick of NIWA
"Climate prediction is hard, <u>half of the variability in the climate system is not predictable</u>, so we don't expect to do terrifically well."

Ken Gregory in this summary story, shows how climate models have been shown to overstate the water vapor feedback (this summary discusses Ferenc M. Miskolczi, NASA, Spencer and Lindzen findings).

Steve McIntyre has shown how actual temperatures have tracked to Hansen 1988 model projections. Hansen Scenario C supposes that CO2 are stabilized at 368 ppm in 2000 - a level already surpassed. Yet temperatures from GISS and RSS are trending lower than even Scenario C.





USING PAST CYCLES AND TELECONNECTIONS IN LONG RANGE FORECASTS

The Climate Prediction Center after the research on El Nino by their own Ropelewski and Halpert showed strong correlations with temperatures, began issuing multi-seasonal outlooks in the late 1980s. When Ants Leetma became chief on that long range branch, he advocated use of coupled climate models as the primary tool for the 15 month forecasts. Within a few short years, it was shown the skill of these climate models was not there and the statistical models, especially those related to ENSO provided better results.

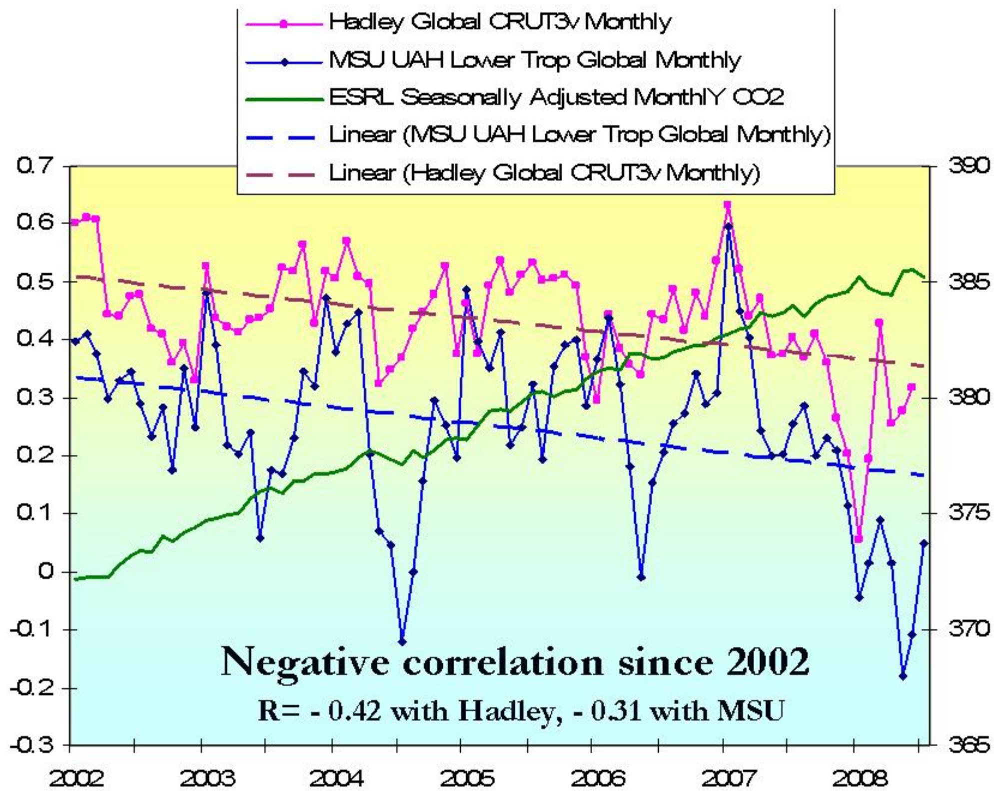
In private industry, the use of analogs where we match current state of major teleconnections like PDO, MEI, AMO, QBO, solar to past years has proven enormously successful. All the major forecast houses use some version of this “analog” approach for their predictions as far as a year or more in the future. Each one of these forecast houses and businesses have been successful in many years using this approach. While at WSI, we developed 3 teleconnection based statistical models including one analog that provided skill at 60% or higher, far above the skill of in-house climate models and CPC climate models.

I started a hedge fund using these techniques and we were ranked #2 of 167 funds after two and ½ years in performance but our growth fell victim to the hedge fund collapse of 2006/07 when major funds like Amaranth went under. Though we had increased money under management by a factor 10 ($5 to $50 million) we fell short of our goal of $100 million after 3 years, a level predetermined to make a company of 7 principals and supporting staff viable. Our techniques though were validated.

LONGER TERM (DECADAL) FORECASTS

PDO

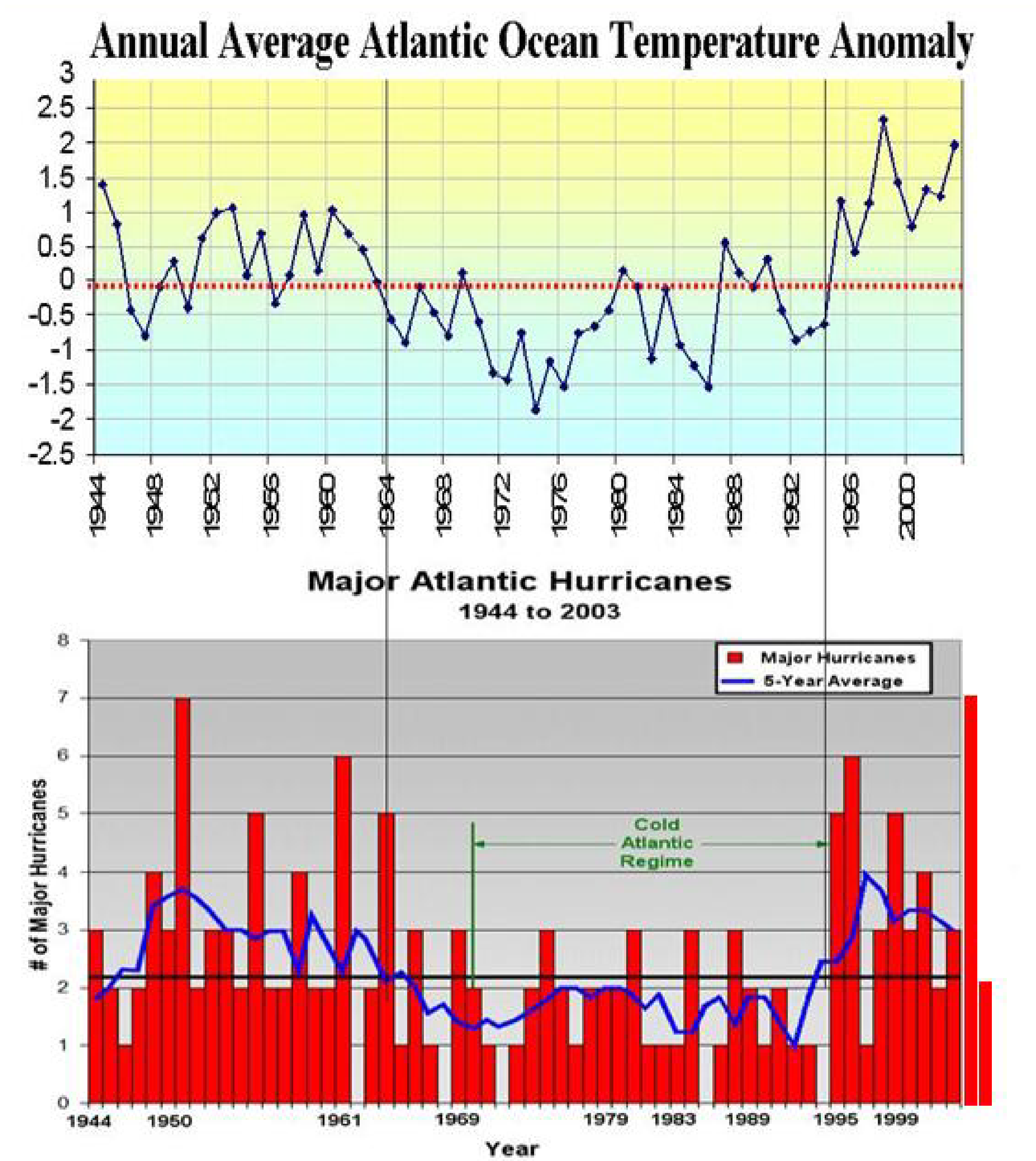
Given the very consistent multi-decadal cyclical nature of some of these major teleconnections, we can also project what might be ahead for upcoming decades far better than with use of climate models. For example we have been anticipating the flip of the PDO in the late 1990s and 2000s which would after a few years cause more La Ninas and reverse the trend of warming with the El Nino rich warm mode from 1979-1998 and indeed temperatures flattened and then post 2002 have trended downward.



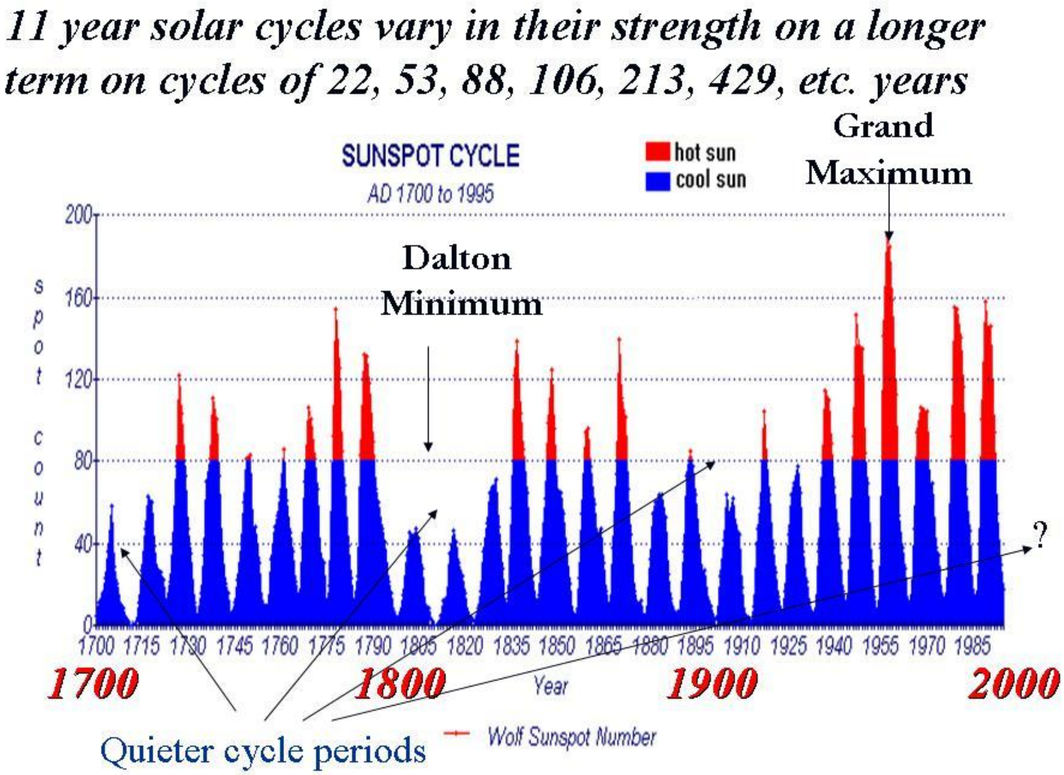
Dr. Don Easterbrook Dept. of Geology, Western Washington University, Bellingham, WA has projected the return of colder temperatures for the next three decades based on this flip.

AMO

Dr William Gray and others in the mid 1990s projected an increase in Atlantic Basin hurricanes based on the flip of the AMO from cold to warm. That has verified.

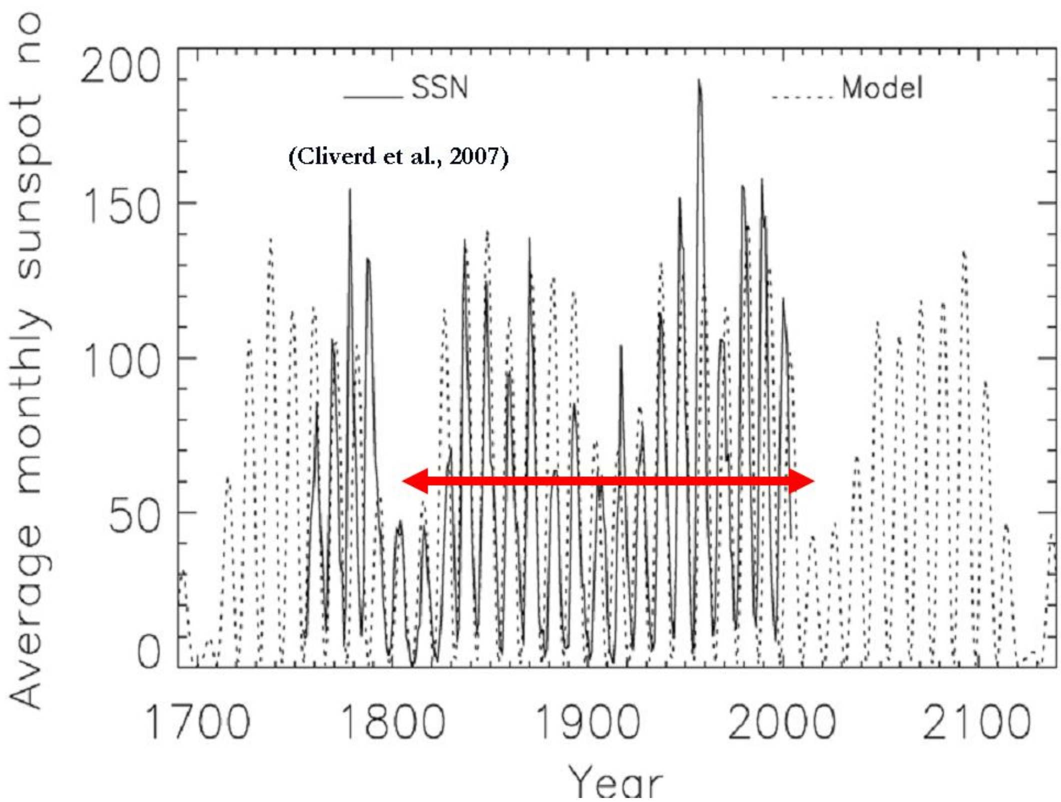


We also have, using the ultra-long term solar cycles of 106, 213 years, been anticipating the arrival or long weak cycles, perhaps similar to the Dalton Minimum in the late 1700s and early 1800s.

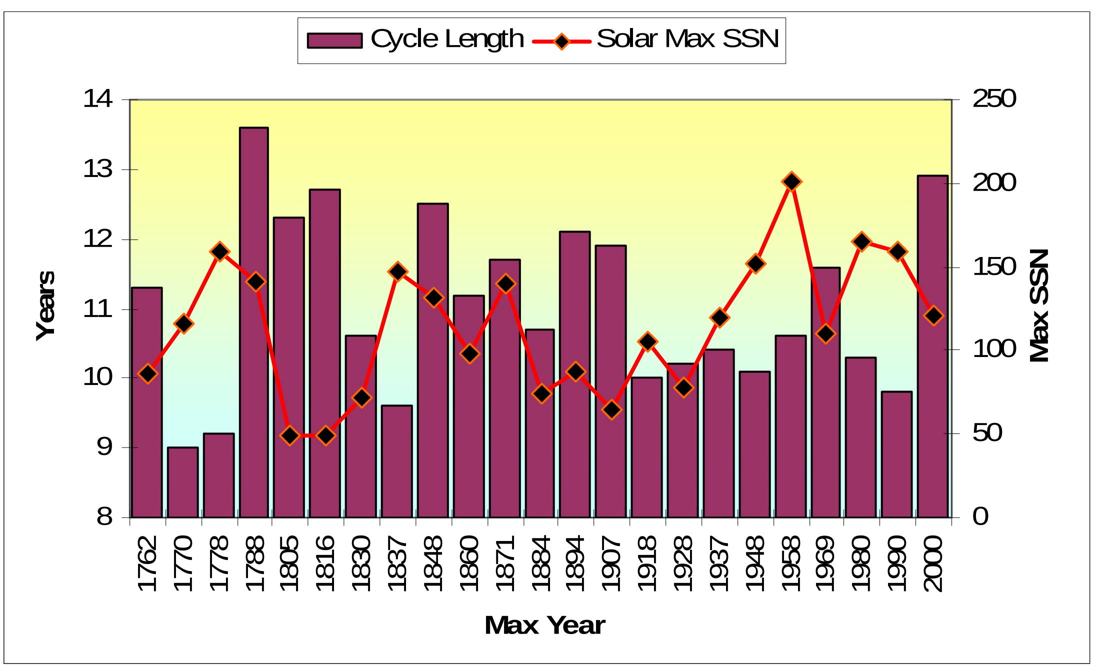


The following is a statistical model forecast by Clilverd et al (2006) utilizing past cycle behaviors.

His abstract includes the following:
"We use a model for sunspot number using low-frequency solar oscillations, with periods 22, 53, 88, 106, 213, and 420 years modulating the 11-year Schwabe cycle, to predict the peak sunspot number of cycle 24 and for future cycles, including the period around 2100 A.D. We extend the earlier work of Damon and Jirikowic (1992) by adding a further long-period component of 420 years. Typically, the standard deviation between the model and the peak sunspot number in each solar cycle from 1750 to 1970 is ±34. The peak sunspot prediction for cycles 21, 22, and 23 agree with the observed sunspot activity levels within the error estimate. Our peak sunspot prediction for cycle 24 is significantly smaller than cycle 23, with peak sunspot numbers predicted to be 42 ± 34."



So far with the solar minimum not yet in sight (12.4 years after th last minimum), projections that the current cycle 23 will at least approach 13 years in length and be similar to cycle #4 in the late 1700s which also followed two short and spiky cycles lends some credence to this forecast. The period was an unusually cold one – the Dickens Age.



SUMMARY

The past is the only operationally useful guide to the future. There is nothing extraordinary about the current time since we are able to make correct forecasts using the past. Models are even in the words of famous modellers just tools and do not rise to the important task.

CORRECTION REQUESTED

Key finding #9 needs to be deleted or altered to reflect reality.

"9. Climate models have failed forecasting global or certainly regional climate. Past cycles and oscillations have been proven useful in predicting future climate states on a seasonal and long term basis.

- **Additional research into these promising approaches must be made so that we may accurately predict future climate states and adaption measures and make wise policy decisions.**
- Long-lived infrastructure, from power plants to roads and buildings, must be designed and built taking climate change into account.
- Long term planning will have to continually incorporate the latest information, as climate will be ever changing, requiring adaptation strategies to constantly evolve.

REFERENCES

Clilverd, M. A., E. Clarke, T. Ulich, H. Rishbeth, and M. J. Jarvis (2006), Predicting Solar Cycle 24 and beyond, Space Weather, 4, S09005, doi:10.1029/2005SW000207

Delworth, T.L. ,and M.E. Mann, 2000: Observed and simulated multidecadal variability in the Northern Hemisphere. Climate Dyn., 16, 661–676.

Drinkwater, K.F. 2006. The regime shift of the 1920s and 1930s in the North Atlantic. Progress in Oceanography ***68****: 134-151.*

Ferenc M. Miskolczi, "Greenhouse Effect in Semi-Transparent Planetary Atmospheres", Quarterly Journal of the Hungarian Meteorological Journal, Vol. 111, No. 1, January - March 2007.

Gray, S.T., et al., 2004: A tree-ring based reconstruction of the Atlantic Multidecadal Oscillation since 1567 A.D. Geophys. Res. Lett., 31, L12205, doi:10.1029/2004GL019932

Hoyt, D.V. and Schatten, K.H. (1997): The role of the sun in climate change, New York Oxford, Oxford University Press, 1997

Hoyt, D.V. (1979): Variations in sunspot structure and climate, Climate Change, 2, pp 79-92

IPCC Fourth Assessment 2007

Kerr, R. A., A North Atlantic climate pacemaker for the centuries, Science, 288 (5473), 984-1986, 2000.

Labitzke, K., The global signal of the 11-year sunspot cycle in the stratosphere: Differences between solar maxima and minima, Meteorol. Zeitschift, 10, 83–90, 2001.
709-729

Latif, M. and T.P. Barnett, 1994: Causes of decadal climate variability over the North Pacific and North America. Science 266, 634-637.

Mantua, N.J. and S.R. Hare, Y. Zhang, J.M. Wallace, and R.C. Francis,1997: Pacific interdecadal climate oscillation with impacts on salmon production. Bulletin of the American Meteorological Society, 78, pp. 1069-1079.

McPhaden, M.J and D. Zhang (2002), "Slowdown of the meridional overturning circulation in the upper Pacific Ocean", Nature, 415(7), 603–608 (2002).

Miller, A.J., D.R. Cayan, T.P. Barnett, N.E. Graham and J.M. Oberhuber, 1994: The 1976-77 climate shift of the Pacific Ocean. Oceanography 7, 21-26.

Minobe, S. 1997: A 50-70 year climatic oscillation over the North Pacific and North America. Geophysical Research Letters, Vol 24, pp 683-686.

Power, S.B. and I.N. Smith (2007), "Weakening of the Walker Circulation and apparent dominance of El Niño both reach record levels, but has ENSO really changed?" Geophysical Research Letters, vol. 34, L18702, doi:10.1029/2007GL030854, 2007

Ropelewski, C. F., and M. S. Halpert, 1986: North American precipitation and temperature patterns associated with the El Nino/ Southern Oscillation (ENSO). Mon. Wea. Rev., 114, 2352-2362.

Ropelewski, C. F., and M. S. Halpert ,1987: Global and regional scale precipitation patterns associated with the El Nino/ Southern Oscillation. Mon. Wea. Rev., 115, 1606-1626.

Ropelewski, C.F. and P.D. Jones, 1987: An extension of the Tahiti-Darwin Southern Oscillation Index. Mon. Wea. Rev, 115, 2161-2165.

Ropelewski, C. F., and M. S. Halpert, 1989: Precipitation patterns associated with the high index phase of the Southern Oscillation. J. Climate, 2, 268-284.

Ropelewski, C. F., and M. S. Halpert, 1996: Quantifying Southern Oscillation-precipitation relationships. J. Climate, 9, 1043-1059.

Trenberth, K.E., and J.W. Hurrell, 1999: Decadal atmosphere-ocean variations in the Pacific. Clim. Dyn., 9, 303-319.

Wolter, K., and M.S. Timlin, 1993: Monitoring ENSO in COADS with a seasonally adjusted principal component index. Proc. of the 17th Climate Diagnostics Workshop, Norman, OK, NOAA/N MC/CAC, NSSL, Oklahoma Clim. Survey, CIMMS and the School of Meteor., Univ. of Oklahoma, 52-57.

Zhang, Y., J.M. Wallace, D.S. Battisti, 1997: ENSO-like interdecadal variability: 1900-93. Journal of Climate, 10, 1004-1020