

Course Description, ATOC 7500- Human Impacts on Weather and Climate

Roger A. Pielke Sr.

An Assessment of the Human Impact on Climate

This course is designed to investigate the range of reported impacts on climate that have resulted (and will continue to result) from human activity. This activity includes human-caused changes in atmospheric composition (CO₂; aerosols, methane, etc) and land-cover changes. Metrics of climate change will be evaluated from original data sources. These metrics include tropospheric temperature changes, surface temperature changes, stratospheric temperature changes, atmospheric circulation changes (e.g., NAO, AO, PDO, ENSO), ocean heat storage changes, continental glacier changes, sea ice and snow cover changes, etc.

The students will be required to select one of these metrics to explore in depth. They will summarize the available peer-reviewed literature on the observed trends, and the spatial and temporal variability in the selected metric. In addition, they will obtain original data to perform their own assessment to determine if it conforms to the reported changes. Student term papers will be the primary evaluation mechanism for the class.

There will also be assigned readings from selected parts of the following:

Cotton, W.R. and R.A. Pielke Sr., 2007; *Human Impacts on Weather and Climate*. Cambridge University Press. 2nd Edition.

Houghton, J.T., Y. Ding, D.J. Griggs, M. Noguer, P.J. van der Linden, D. Xiaosu (Eds.), P.J., Dai, X., Maskell, K., and Johnson, C.A., 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, Cambridge and New York, 881 pp.

National Research Council, 2003 *Understanding climate change feedbacks*. Committee on Radiative Forcing Effects on Climate Change. Climate Research Committee, Board on Atmospheric Sciences and Climate, Division on Earth and Life Studies, The National Academies Press, Washington, D.C., 152 pp.
<http://newton.nap.edu/catalog/10850.html#toc>

National Research Council, 2005: *Radiative forcing of climate change: Expanding the concept and addressing uncertainties*. Committee on Radiative Forcing Effects on Climate Change, Climate Research Committee, Board on Atmospheric Sciences and Climate, Division on Earth and Life Studies, The National Academies Press, Washington, D.C., <http://www.nap.edu/openbook/0309095069/html/>

Papers with new insight published in late 2005 through early 2007 will also be assigned as appropriate.