

Air Pollution, Climate, and Health

Chairs: Kenneth L. Demerjian and Ross Anderson

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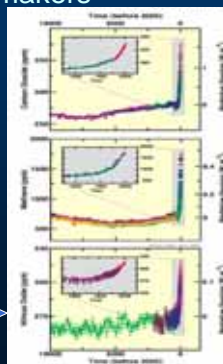
Public Awareness and Concern Regarding Climate Change Has Increased Dramatically in the Past Several Years

- Driven by Increasing Interest in the Popular Press and Documentaries; e.g. A. Gore's "Inconvenient Truth"; E. Kolbert's "Field Notes from a Catastrophe"
- Increasing Inquiry and Scientific Evidence, Ultimately Culminating in Consensus Documents such as the Recent Intergovernmental Panel on Climate Change (IPCC) – 4th Assessment Report
- Public Perception that "Weather is Changing" as Manifested in Recent Extreme Weather Events

Findings of the 4th IPCC – Summary Report for Policymakers

- Global atmospheric concentrations of carbon dioxide, methane and nitrous oxide have increased markedly as a result of human activities since 1750 and now far exceed pre-Industrial values determined from ice cores spanning many thousands of years.
- The global increases in carbon dioxide concentration are due primarily to fossil fuel use and land-use change, while those of methane and nitrous oxide are primarily due to agriculture.

Changes in Greenhouse Gases from Ice-Core and Modern Data



Source: IPCC WG1 AR4

The Climate is Warming!

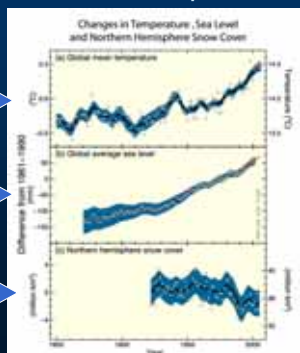
It's the First Law of Thermodynamics – STUPID!

Direct Observations of Recent Warming of the Climate System are Unequivocal

Global mean temperature

Global average sea level

Northern hemisphere snow cover



Source: IPCC WG1 AR4

IPCC – WG1 AR4 Provides a Variety Metrics Indicative of a Warming Climate

- Eleven of the last twelve years (1995 -2006) rank among the 12 warmest years in the instrumental record of global surface temperature (since 1850).
- The updated 100-year linear trend (1906–2005) of 0.74 [0.56 to 0.92]^oC is therefore larger than the corresponding trend for 1901-2000 given in the TAR of 0.6 [0.4 to 0.8]^oC.
- The linear warming trend over the last 50 years (0.13 [0.10 to 0.16]^oC per decade) is nearly twice that for the last 100 years. The total temperature increase from 1850 – 1899 to 2001 – 2005 is 0.76 [0.57 to 0.95]^oC.

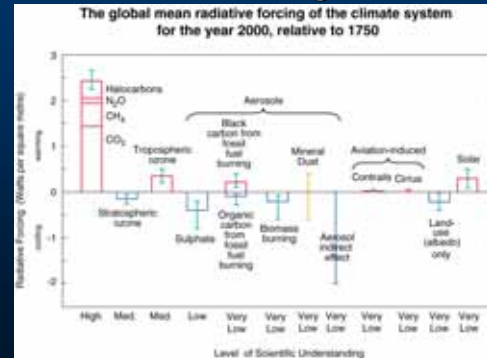
Source: IPCC WG1 AR4

Findings of the 4th IPCC – Summary report for Policymakers

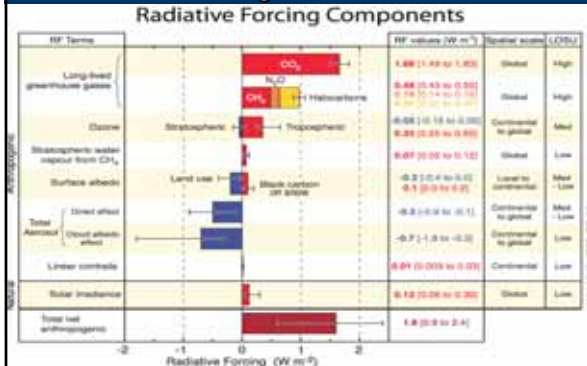
- The understanding of anthropogenic warming and cooling influences on climate has improved since the Third Assessment Report (TAR), leading to *very high confidence* that the globally averaged net effect of human activities since 1750 has been one of warming, with a radiative forcing of +1.6 [+0.6 to +2.4] W m⁻²

Source: IPCC WG1 AR4

Global-average radiative forcing estimates and ranges TAR



Global-average radiative forcing estimates and ranges WG1 AR4



Air Pollution, Climate, and Health

- Overview of Atmospheric Processes** (Daniel Jacob, Harvard University)
- Modeling and Prediction of Future Pollution Levels Under Climate Change Scenarios** (Dick Derwent, rdscientific, UK)
- Air Pollution and Temperature-Related Health Effects** (Jonathan Patz, University of Wisconsin at Madison)

Thanks for Your Attention