

RECENT CLIMATE OBSERVATIONS: DISAGREEMENT WITH
PROJECTIONS

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RECENT CLIMATE OBSERVATIONS: DISAGREEMENT WITH PROJECTIONS

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ABSTRACT:

The non-linear trend in *Rahmstorf et al. [2007]* is updated with recent global temperature data. The evidence does not support the basis for their claim that the sensitivity of the climate system has been underestimated.

Using mean global temperature and sea level measurements up to 2006, *Rahmstorf et al. [2007]* plotted a non-linear trend line and noted its termination in the upper part of the range of projections [*IPCC 2001*]. They proposed three hypotheses to explain this apparent change in trend – intrinsic climate variability, additional forcings, or heightened CO₂ sensitivity. Even though they acknowledged considerable uncertainty, without calculating a quantitative estimate of confidence, they clearly preferred the third hypothesis suggesting, “underestimation of the climate sensitivity to CO₂ (i.e., model error)”. Figure 1 replicates their methodology, using new global mean temperature data points for 2007 and 2008. The trend line now turns down and terminates well within the limits of the IPCC projections. A recent reevaluation of the data indicates a reduction in the rate of sea level rise since 2003 [*Cazenave et al. 2008*]. These recent observations seem to disagree with their preferred hypothesis.

Their assessment of recent global temperature trends was based on the non-linear series fitting methodology called singular spectrum analysis (SSA) [*Moore et al. 1995*]. Statistical uncertainty expands considerably at the terminus of a non-linear trend line due to the reduction in effective data points and arbitrary choices for boundary constraints [*Mann 2004*]. Based on the updated trend, *Rahmstorf et al. [2007]* appears to make a statistical Type I error – mistaking a random deviation for a significant change. Despite the lapse in statistical rigor, *Rahmstorf et al. [2007]* has been widely cited in support of more urgent action on emission controls [*e.g. Garnaut 2008*]. On the contrary, it provides an additional case study in support of greater due diligence when using peer-reviewed scientific publications for public policy formation [*McKittrick and McCullough. 2009*].

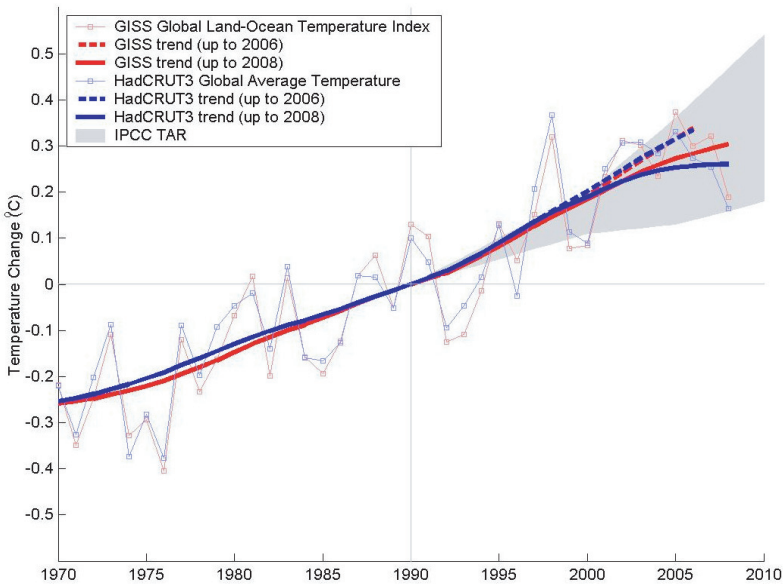


Fig. 1: Annual global mean of land and ocean combined surface temperature from GISS (red) and the Hadley Centre, Climatic Research Unit, (blue) with their trends to 2006 (dashed) and trends to 2008 (solid) as produced by the nonlinear curve fitting technique, singular spectrum analysis (SSA), used in *Rahmstorf et al. [2007]*.

REFERENCES

- Rahmstorf, S., Cazenave A., Church J.A., Hansen J.E., Keeling R.F., Parker D.E., and R.C.J. Somerville. 2007. Recent climate observations compared to projections. *Science*, Vol. 316, No. 709, doi:10.1126/science.1136843.
- International Panel on Climate Change. 2001. *Climate Change 2001: The Scientific Basis*. Retrieved from http://www.grida.no/climate/ipcc_tar/
- Cazenave A., Dominh K., Guinehut S., Berthier E., Llovel W., Ramillien G., M. Ablain M., and G. Larnicol. 2008. Sea level budget over 2003–2008: A reevaluation from GRACE space gravimetry, satellite altimetry and Argo. *Global and Planetary Change* doi:10.1016/j.gloplacha.2008.10.004
- Moore, J.C., Grinsted A., and S. Jevrejeva. 2005. New tools for analyzing time series relationships and trends. *Eos*, Vol. 86 No. 24.
- Mann, M.E. 2004. On smoothing potentially non-stationary climate time series. *Geophysical Research Letters*, Vol. 31:L07214, doi:10.1029/2004GL019569.
- Garnaut, R. 2008. *The Garnaut climate change review : final report*. Cambridge University Press, Port Melbourne, Vic. Retrieved from <http://www.garnautreview.org.au>
- McKittrick, R. and B. McCullough. 2009. *Check the Numbers: The Case for Due Diligence in Policy Formation*. Fraser Institute. ISBN:1918-8323, Retrieved from <http://www.fraserinstitute.org/researchandpublications/publications/6511.aspx>