

Model projections of time-dependent response to increasing carbon dioxide. Final report

M. Hoffert, B. Flannery · Published 1 May 1985 · Environmental Science

The state-of-the-art of mathematical models of transient climate change from historical and projected increases in atmospheric carbon dioxide and related factors is reviewed, including studies done at NYU and elsewhere. Major conclusions are: (1) the transient climate changes over 10 to 100 year timescales are probably driven by several "external" factors acting simultaneously, as well as "internal" factors such as variations in ocean dynamics; (2) the response of global temperature to this forcing is not instantaneous, but is delayed by times of the order 10 to 100 years by thermal damping by the upper ocean; (3) the development of reliable models is hampered by lack of a clear validation strategy for testing models against observations; (4) when run with standard scenarios, current models predict a global warming of the order of 1/sup 0/C by the year 2000 relative to 1850, with an additional 2 to 5/sup 0/C over the next century; However, the sensitivity of these predictions to uncertainties has not been sufficiently explored. Specific research programs are recommended to improve our ability to predict transient climatic changes from continued fossil fuel burning. [Collapse](#)

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