

Lecture 3a: Dangerous Climate Change

Climate Change Ecology
Geography 404
Jeff Hicke

Dangerous climate change

From the 1992 UN Framework Convention on Climate Change (signed by 166 countries including US):

The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

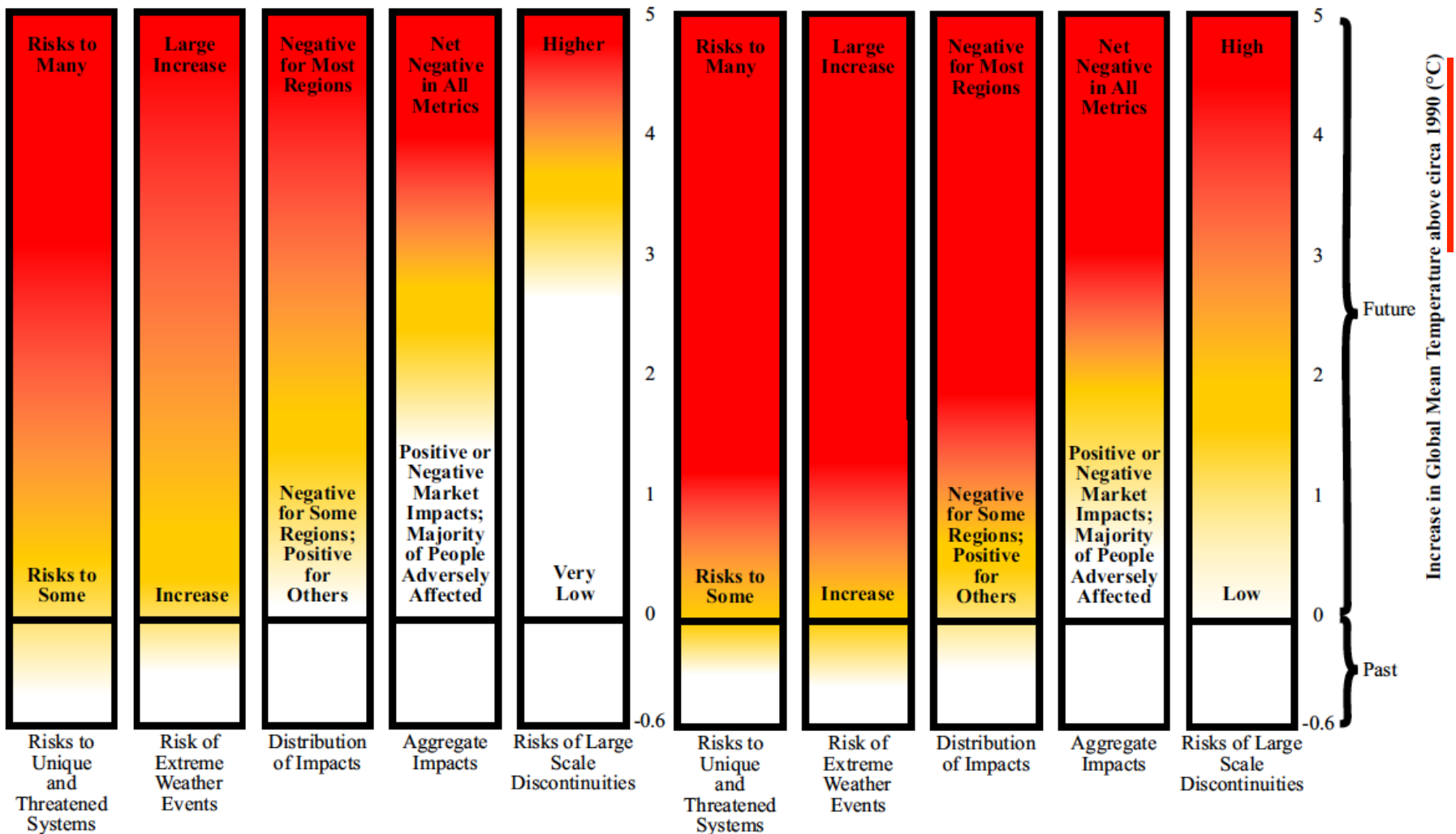
Dangerous climate change

Previous estimates

“Current” estimates

TAR (2001) Reasons For Concern

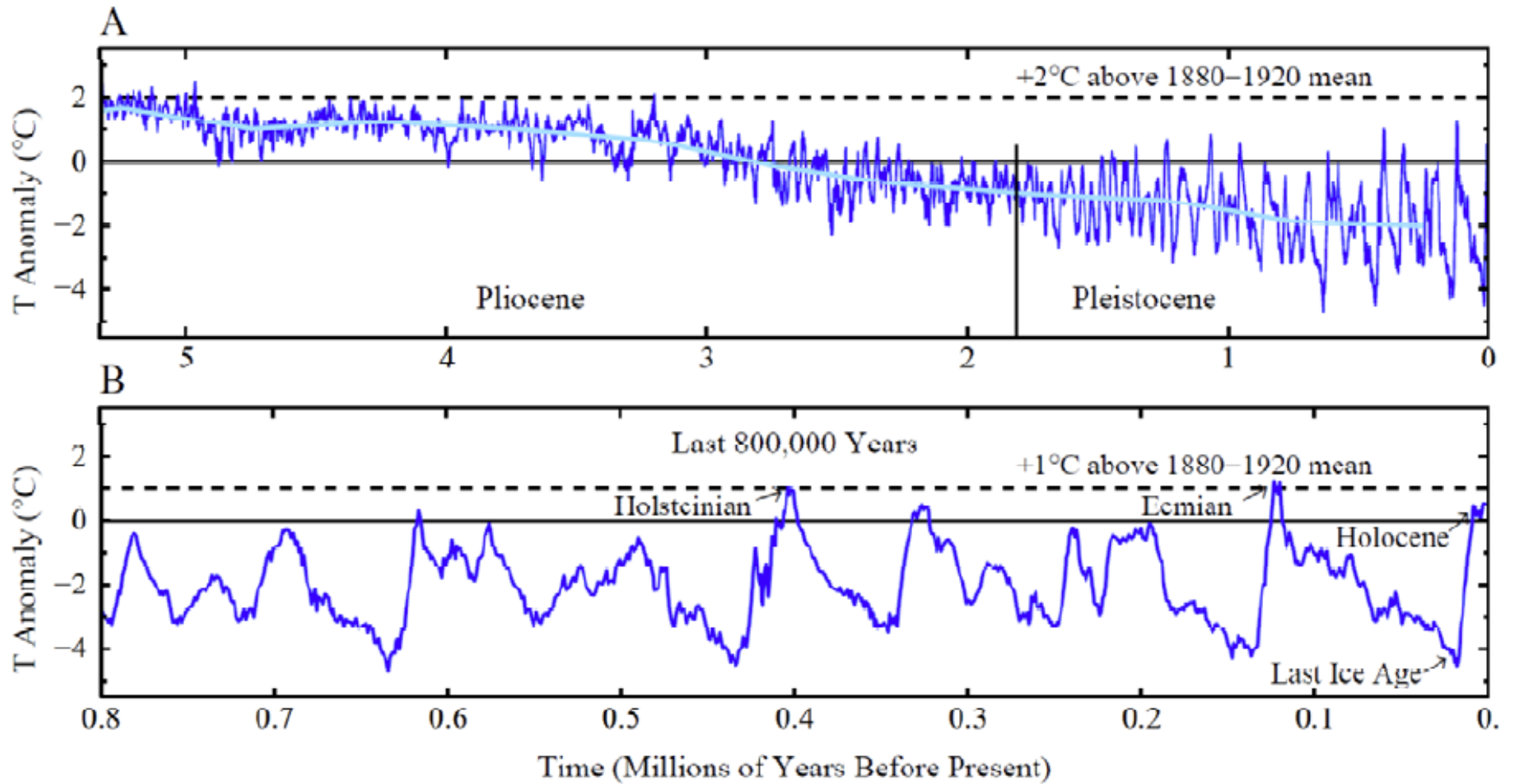
Updated Reasons For Concern



Smith et al., PNAS, 2009

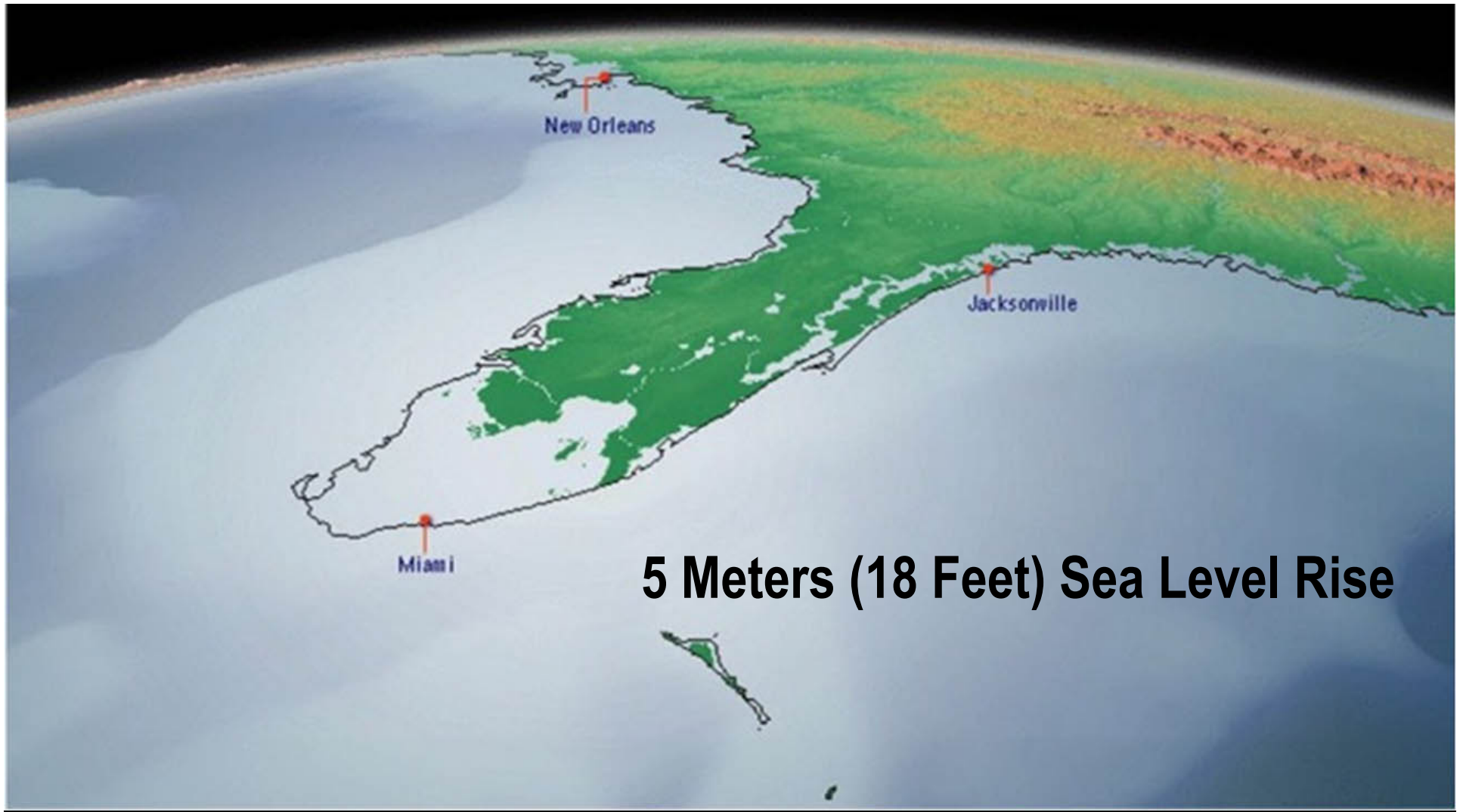
Dangerous climate change

Temperature in last millions of years



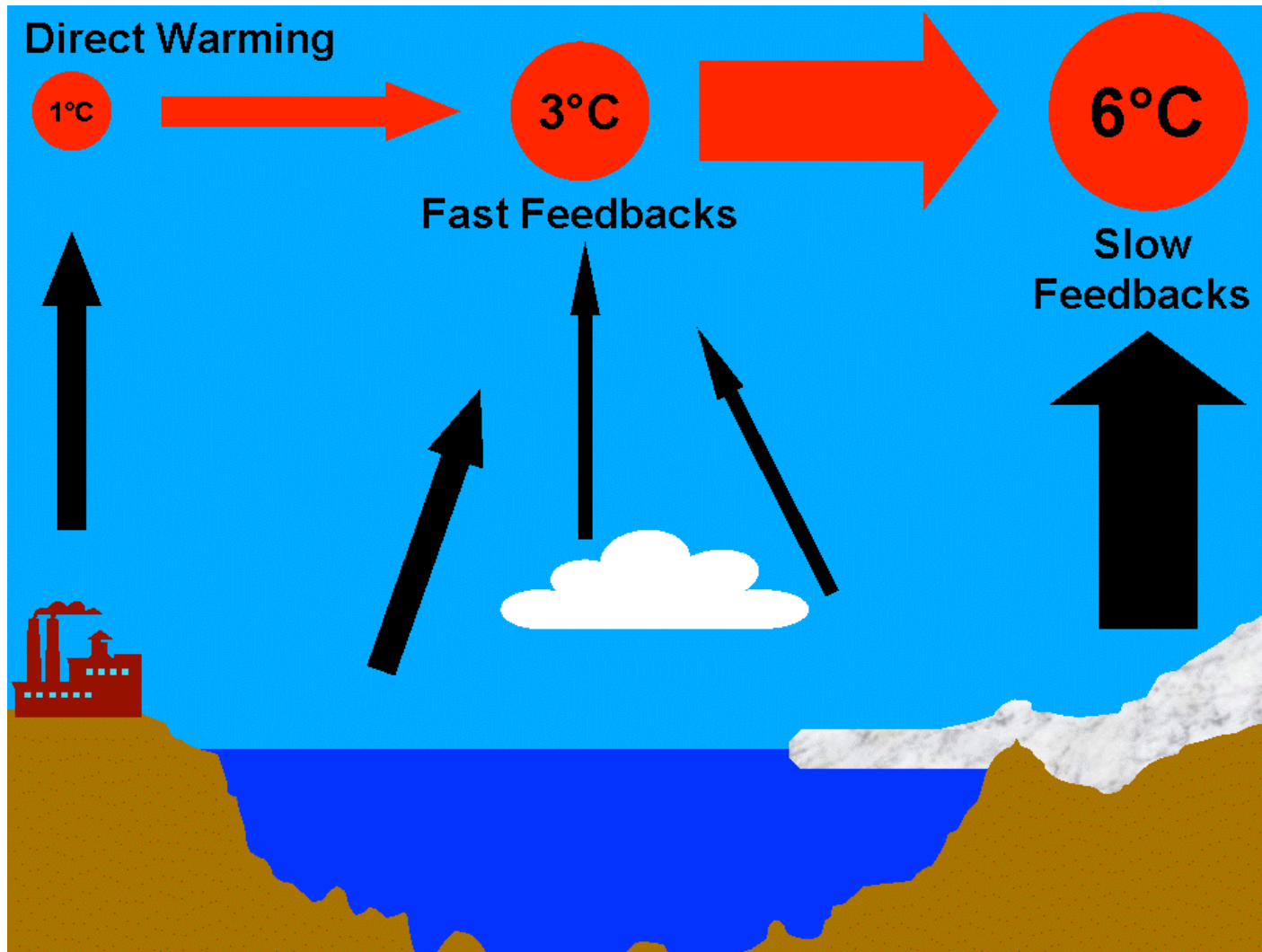
Hansen et al. submitted to PNAS

Dangerous climate change



Slide courtesy James Hansen

Dangerous climate change

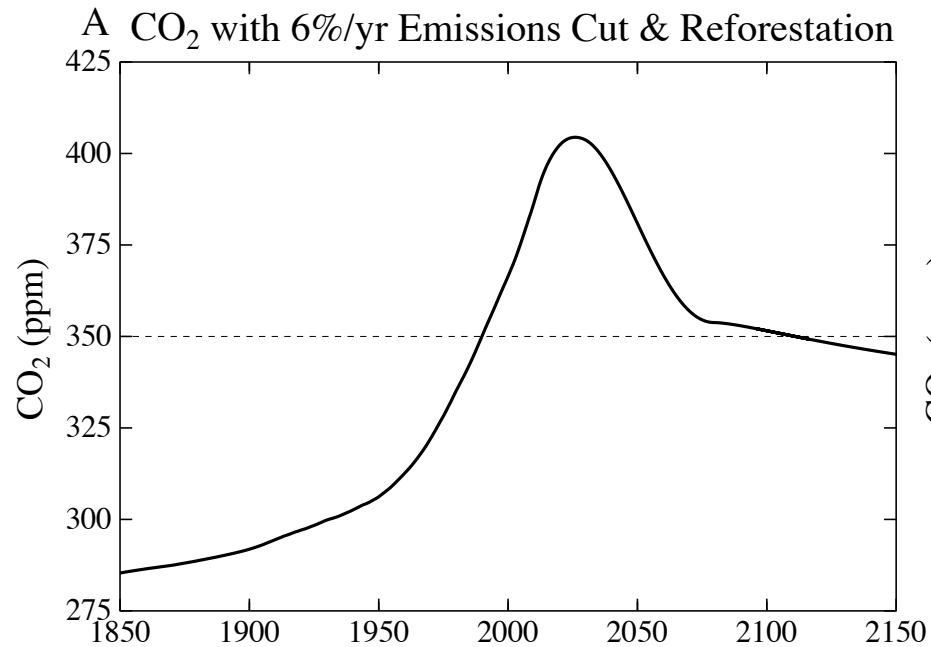


www.skepticalscience.com/print.php?r=350

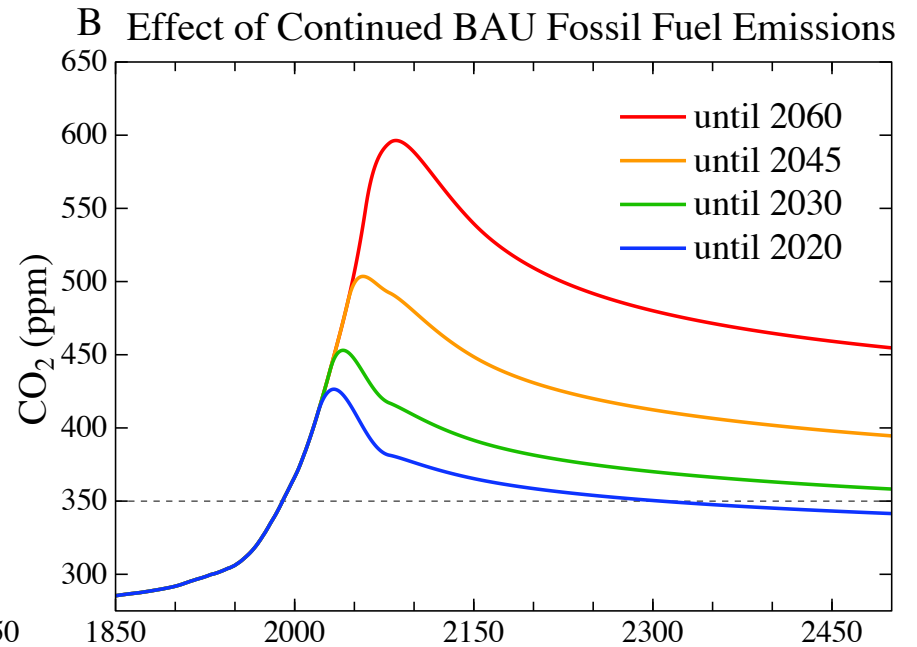
Dangerous climate change

Responses of CO₂ under different emissions scenarios

Beginning now



Beginning later



note different x and y axes

Hansen et al. submitted to PNAS

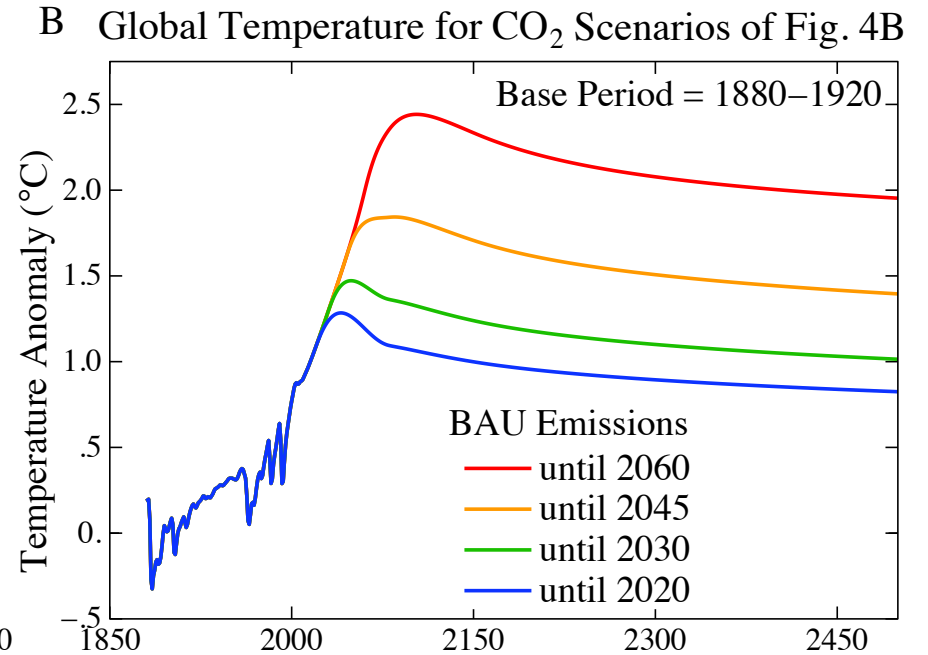
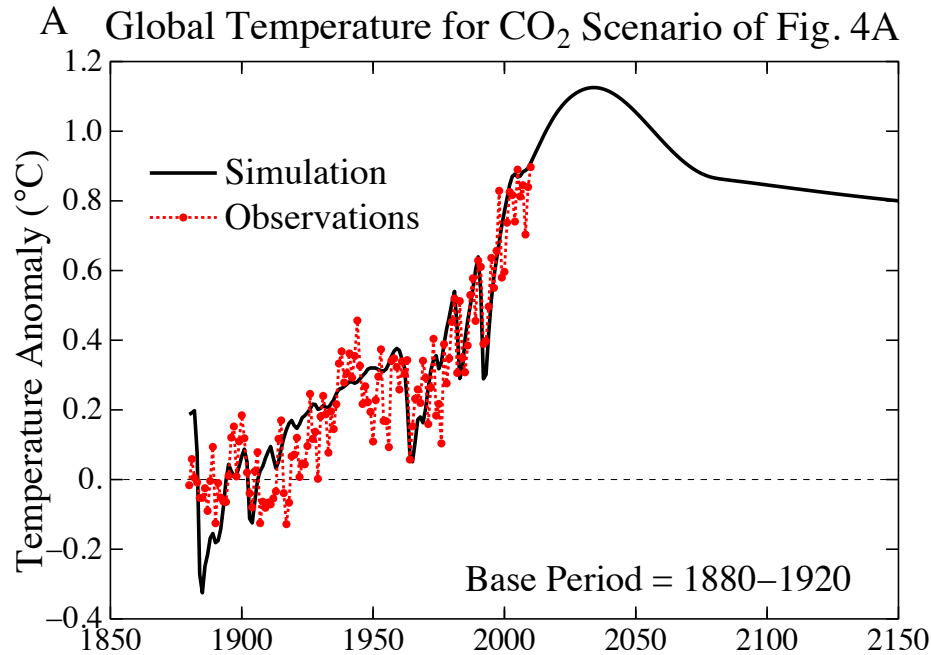
Dangerous climate change

Responses of temperature under different emissions scenarios

6% reduction/year, reforest.

Beginning now

Beginning later

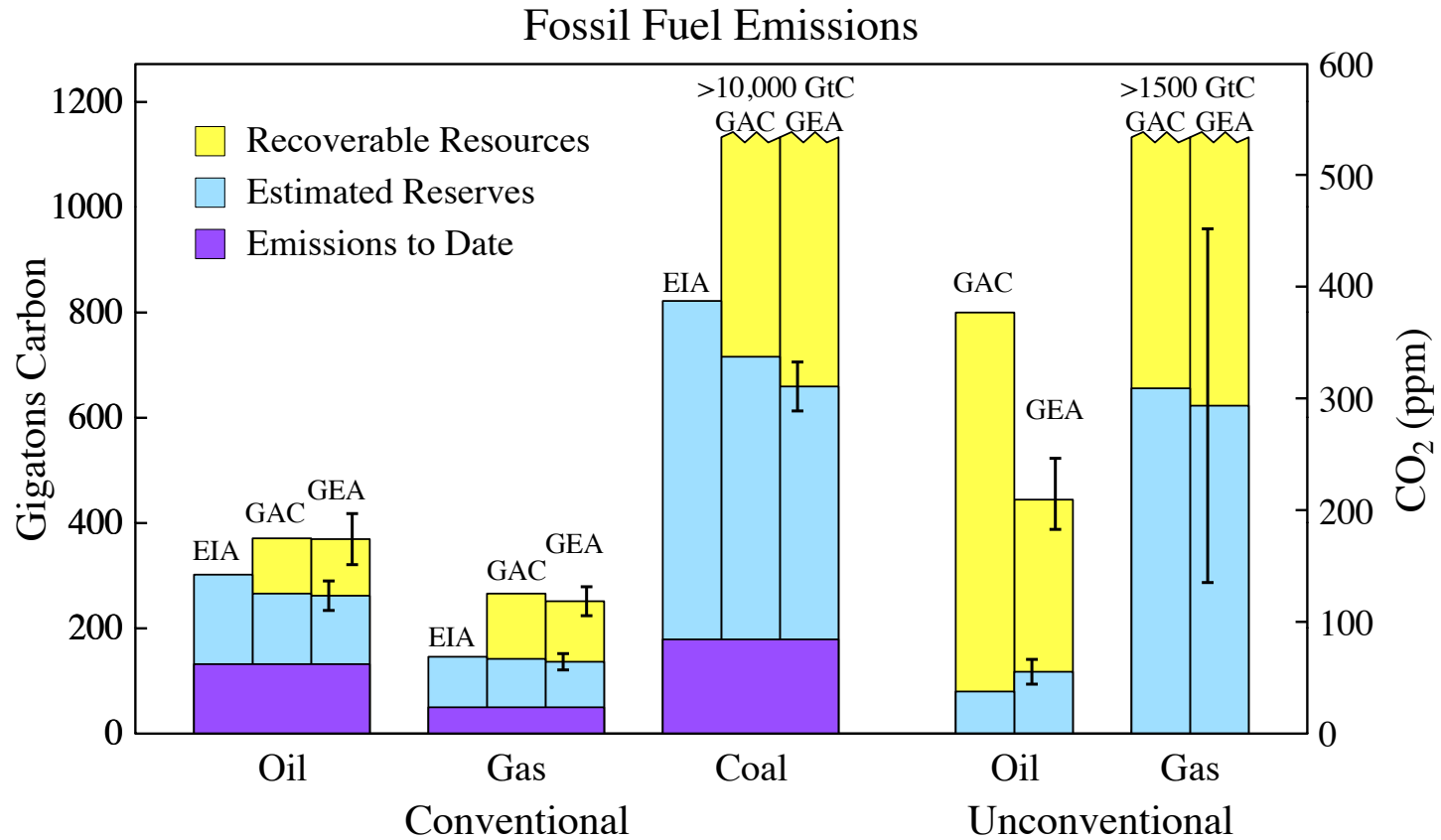


note different x and y axes

Hansen et al. submitted to PNAS

Dangerous climate change

Amount of past and potential fossil fuel emissions by fuel type



Hansen et al. submitted to PNAS

Dangerous climate change

A call to arms...

“Considering the stakes involved, it is disquieting that young people have not become more involved in the issue of the planet's future and more insistent on intergenerational justice. The tentative efforts to pursue legal redress, for which our present paper provides scientific rationale and quantification, are an effort of adults on behalf of young people. In the case of the very young, their inactivity is understandable. College-educated youth are equipped to understand the predicament and articulate their case, but their numbers so far have been too modest for their voice to compete against special financial interests (102, 103).”

Hansen et al. submitted to PNAS