

A Proposed Draft Prospectus CCSP Synthesis and Assessment Product 3.2

(Climate Projections for Research and Assessment Based on CCSP Product 2.1 Emissions Scenarios)

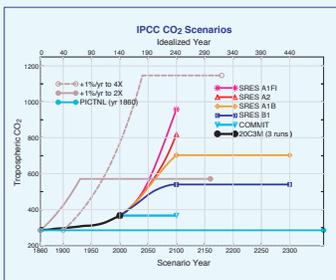
The Proposed Prospectus for CCSP Synthesis and Assessment Product 3.2 will address the following questions:

Abstract

The Earth's climate system derives its energy from the Sun and any variations in the energy being received at the surface can change the climate. Variations can be caused by natural factors, such as changes in solar output and volcanic eruptions, or by anthropogenic changes in atmospheric concentrations of long-lived greenhouse gases, aerosols, and other radiatively active short-lived species.

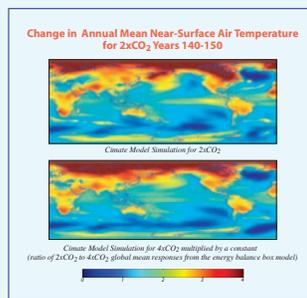
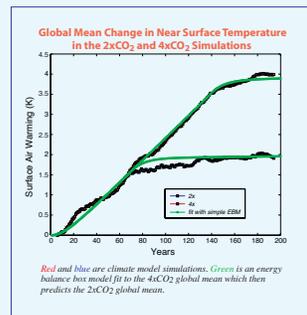
Computer models of the earth's climate are essential tools for understanding the past and making projections of a future driven by both natural and anthropogenic changes in radiative forcing. This requires estimates, e.g. scenarios, of future emissions of greenhouse gases, aerosols, and other short-lived species. A number of these scenarios have been developed for the IPCC Assessment process, and their future climate impacts explored. As part of the CCTP and CCSP process, updated CO₂ emission scenarios are being developed by Synthesis and Assessment Product 2.1.

Do Product 2.1 CO₂ emission scenarios differ significantly from IPCC scenarios?



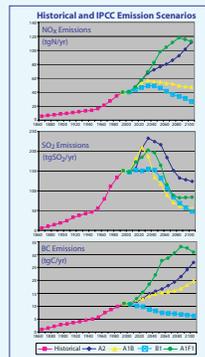
The CCSP 2.1 CO₂ emission scenarios are expected to fall within the envelope of emission scenarios considered by IPCC.

If the CCSP 2.1 CO₂ emission scenarios do fall within the envelope of emission scenarios previously considered by the IPCC, can the existing IPCC climate simulations be used to estimate 50-100 year climate responses for the CCSP 2.1 CO₂ emission scenarios?

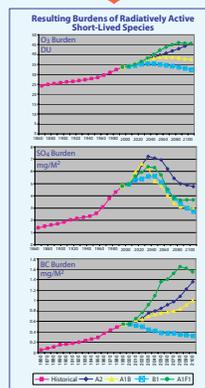


We expect that the climates resulting from CCSP 2.1 CO₂ emission scenarios can be reasonably estimated from the existing IPCC climate simulations which were performed for the envelope of IPCC CO₂ emission scenarios.

How do we generate the time and spatially varying distributions of short-lived radiatively active species that are needed for climate simulations from specified emission scenarios? The Historical Emissions shown below are from the EDGAR-HYDE inventory, and the Future Emissions are SRES scenarios from the IPCC.

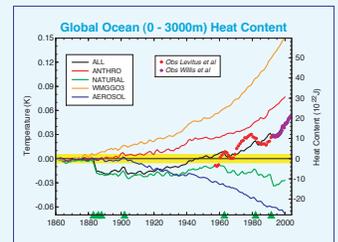


MOZART Chemical Transport Model
2.8 deg x 2.8 deg, 34 levels
80 chemical species, 175 reactions



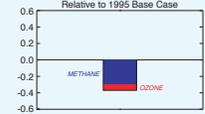
While global average burdens are displayed, MOZART produced time and space varying distributions for each decade.

If we focus on the first 50-100 years, what are the climate impacts of reducing certain radiatively active [e.g. methane and short-lived] species to address air quality issues?

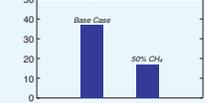


Lower Global Methane Emissions Cool Climate and Improve U.S. Air Quality
(50% reduction in anthropogenic methane)

Change in Radiative Forcing (W/m²) Relative to 1995 Base Case



Grid-Square days > 80 pptv over USA



There appear to be significant climate impacts to reducing methane and aerosols.

Therefore, we propose to examine the climate impacts of emission scenarios that combine the CCSP 2.1 CO₂ emission scenarios and emission scenarios for short-lived species, and that also address air quality issues.

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