

Mitigation: Major Climate Change Can Be Avoided!

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Overview

- Mitigation versus adaptation...if we do nothing about emission then it is adaptation
- If we go to an low emission mitigation scenario, what does this mean in terms of climate change and impacts

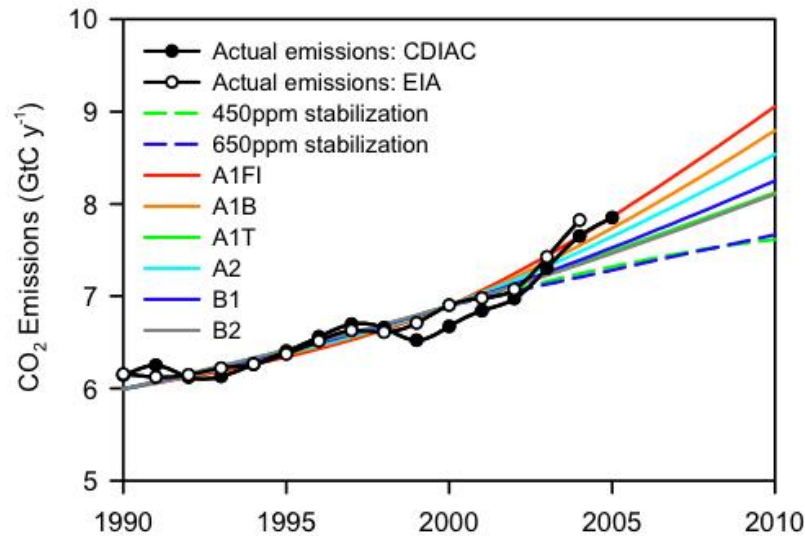
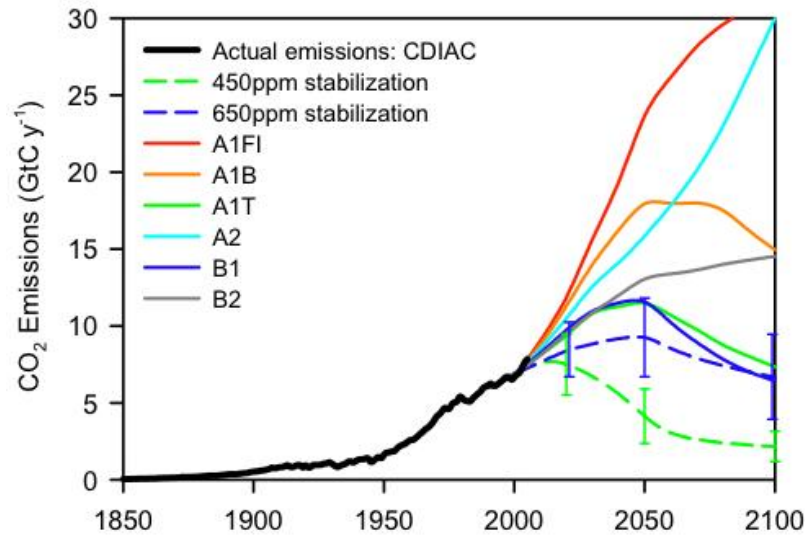


Low Emission Future Climate Change Simulations

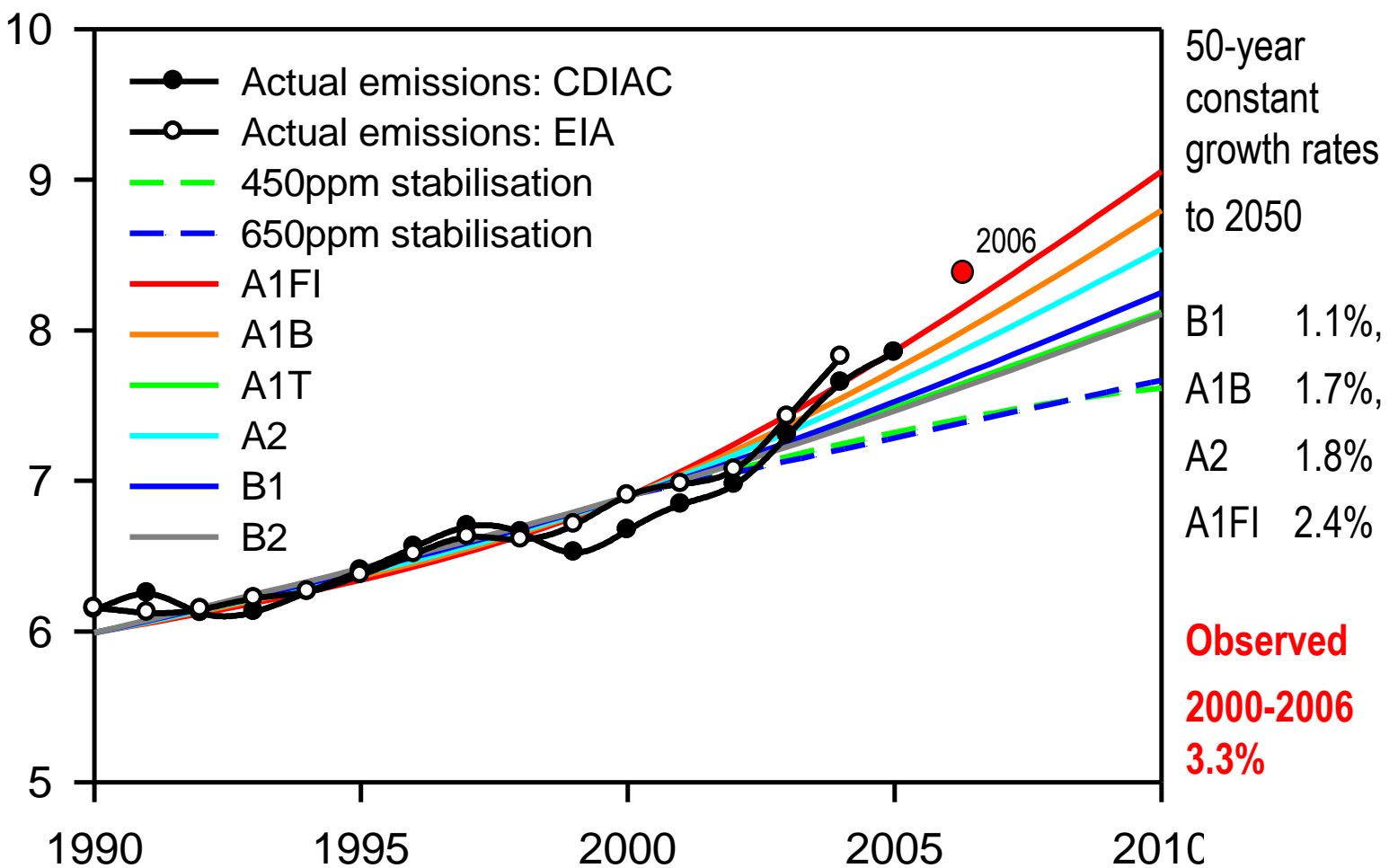
- Can we stabilize global warming using the new CCSP Report 2.1a scenarios?
- Can we limit global warming to 2°C from years 1870 to 2100?
- What are climate change impacts on surface temperature, precipitation, and sea ice?



Actual Emissions vs. Scenario Emissions



Trajectory of Global Fossil Fuel Emissions

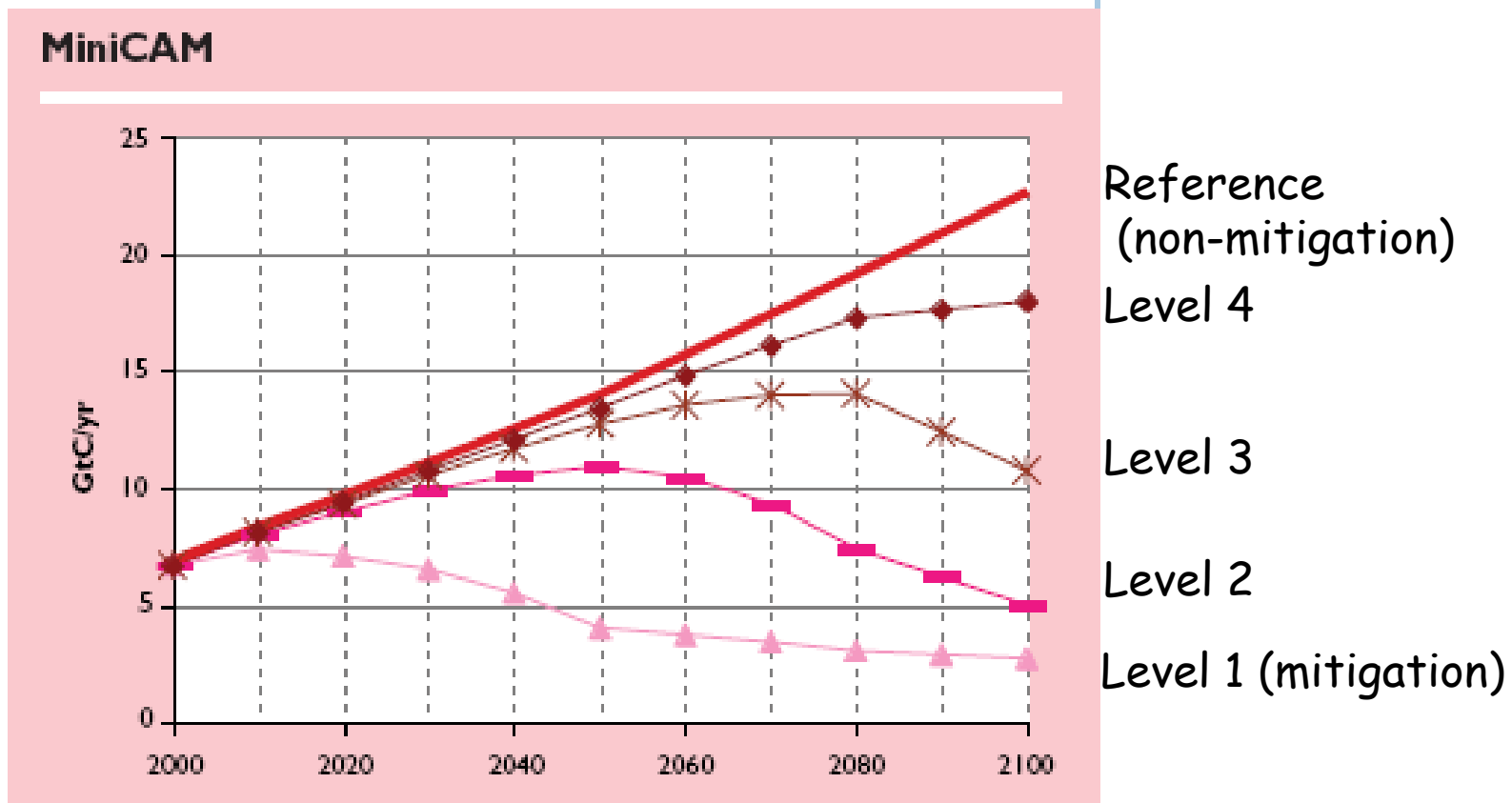


Assumptions

- If conservation, renewables, solar, wind, biomass, and nuclear became a larger component of the energy mix, it is possible that CO_2 concentration could be limited to roughly 450 ppm (Level 1 of the new CCSP scenarios) and we could limit warming from 1870 to 2100 to about 2°C .

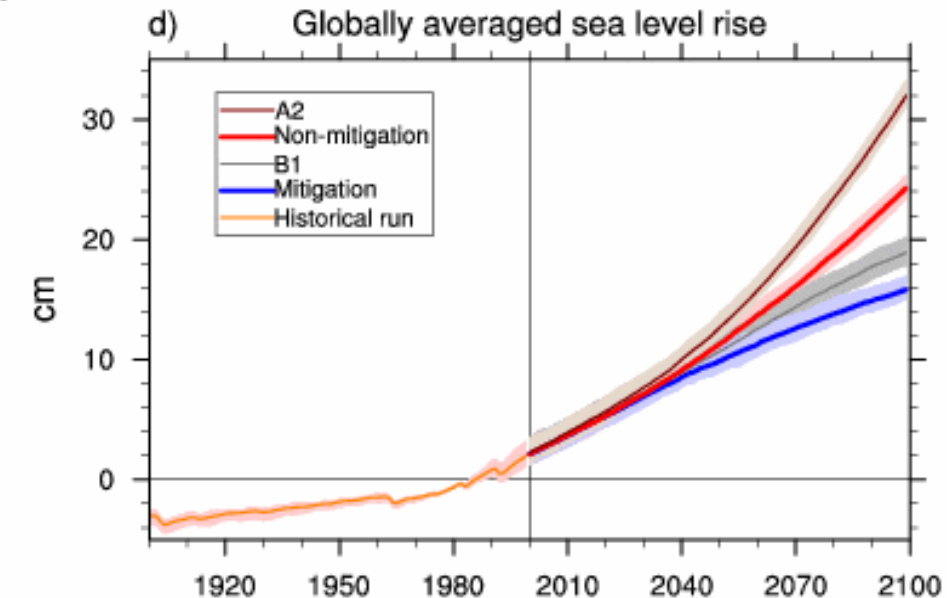
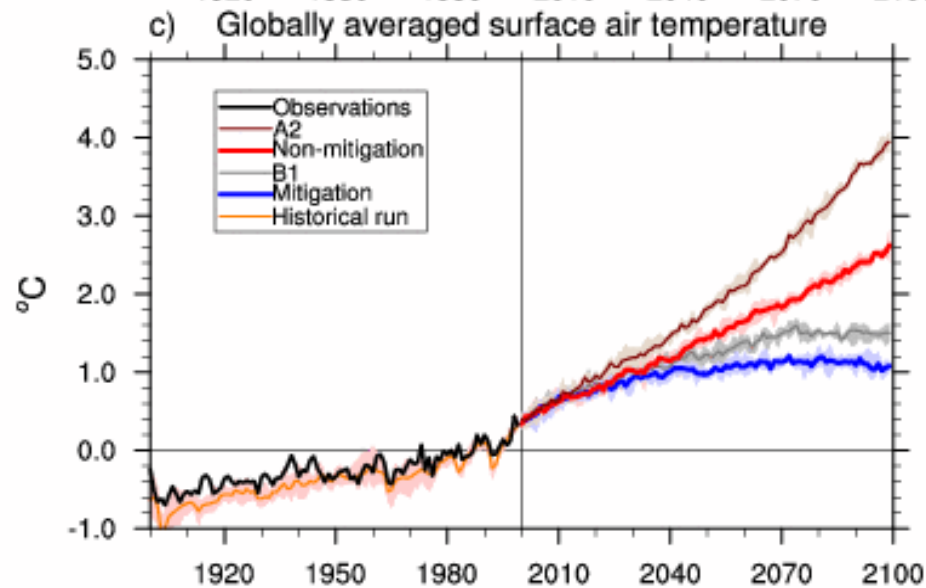
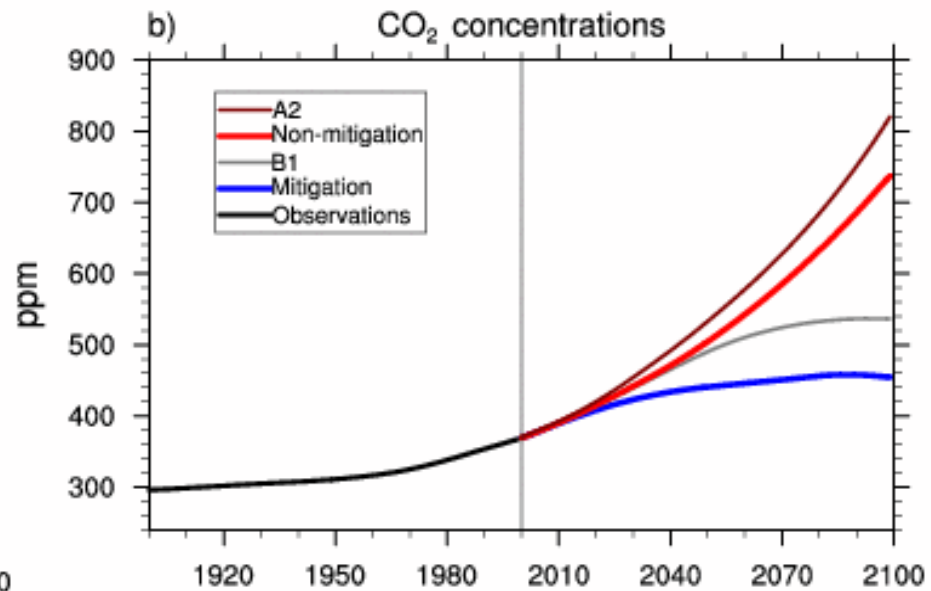
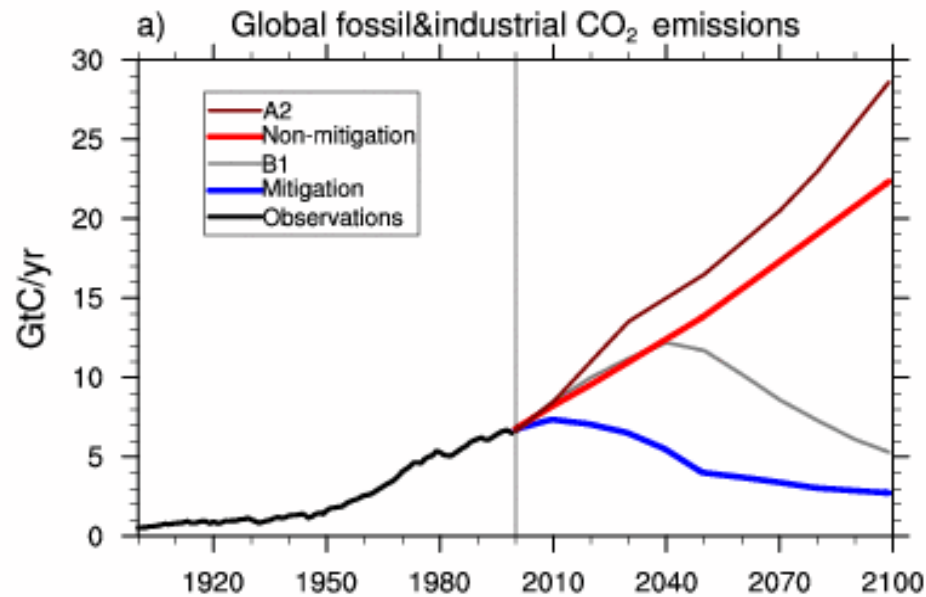


Reduction in CO₂ Emissions

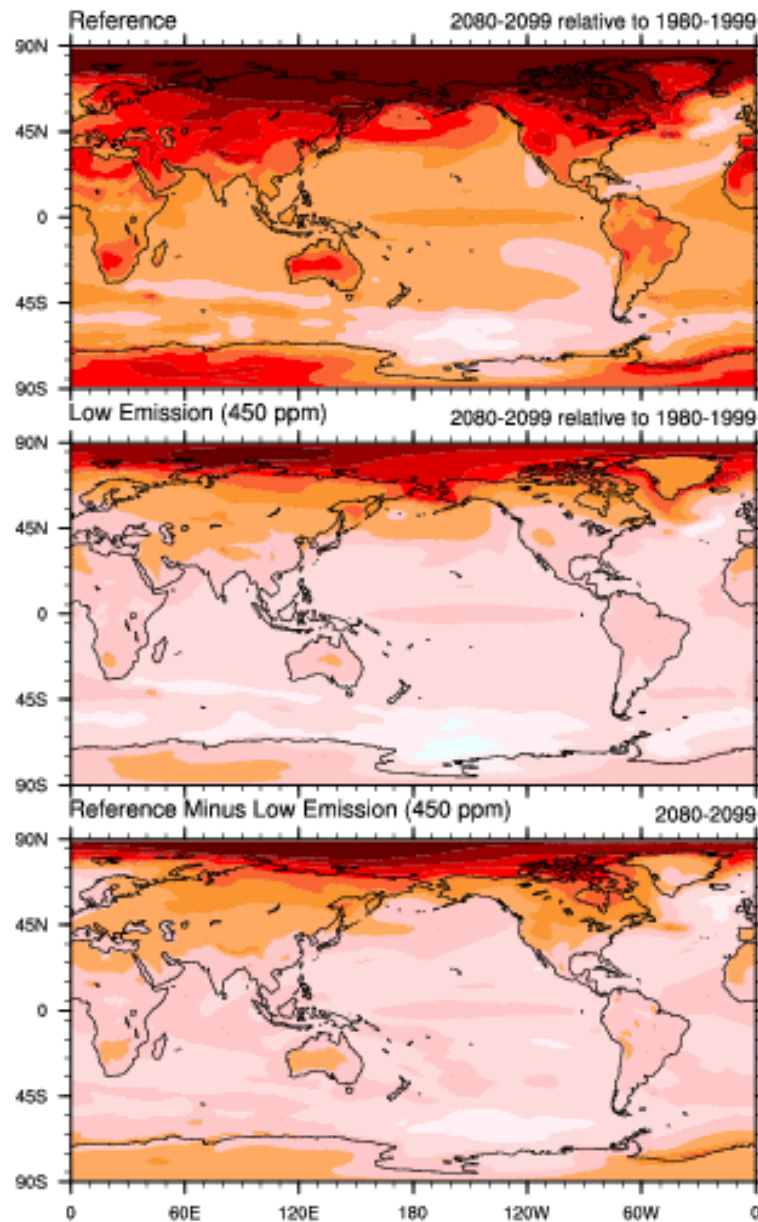


~ 70% cut in carbon emissions by the end of century

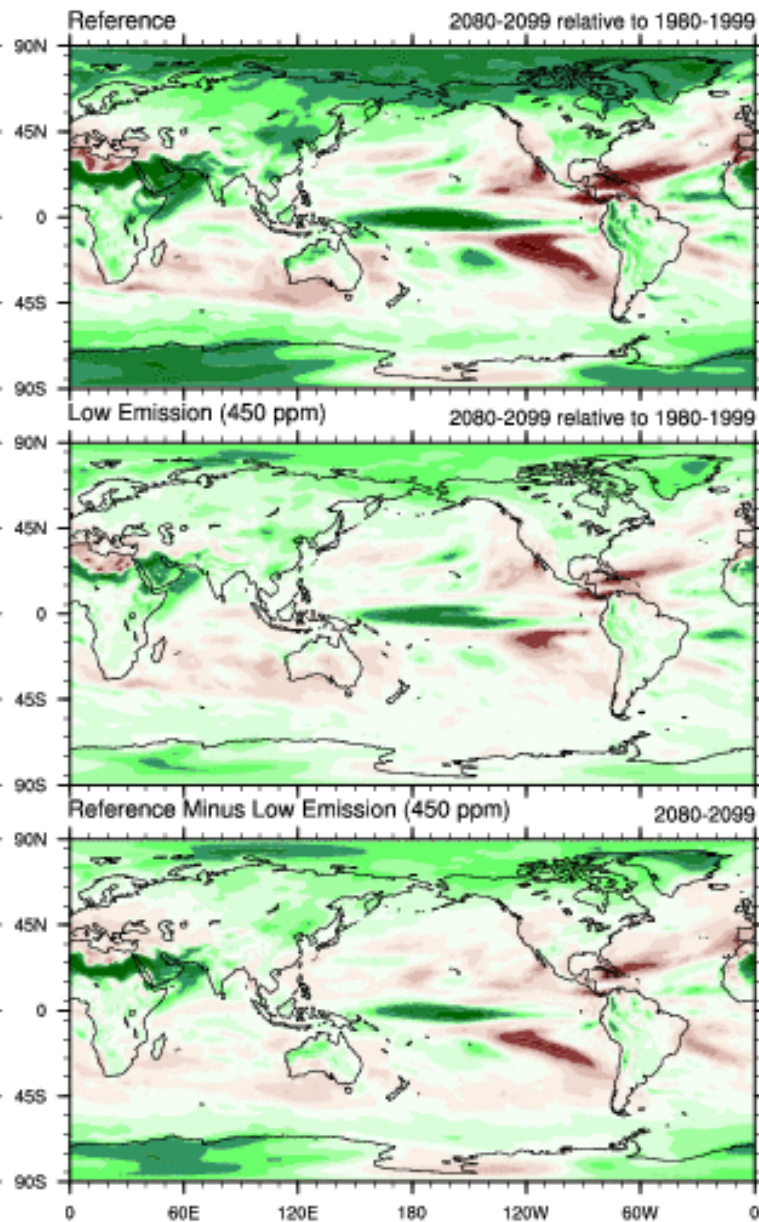




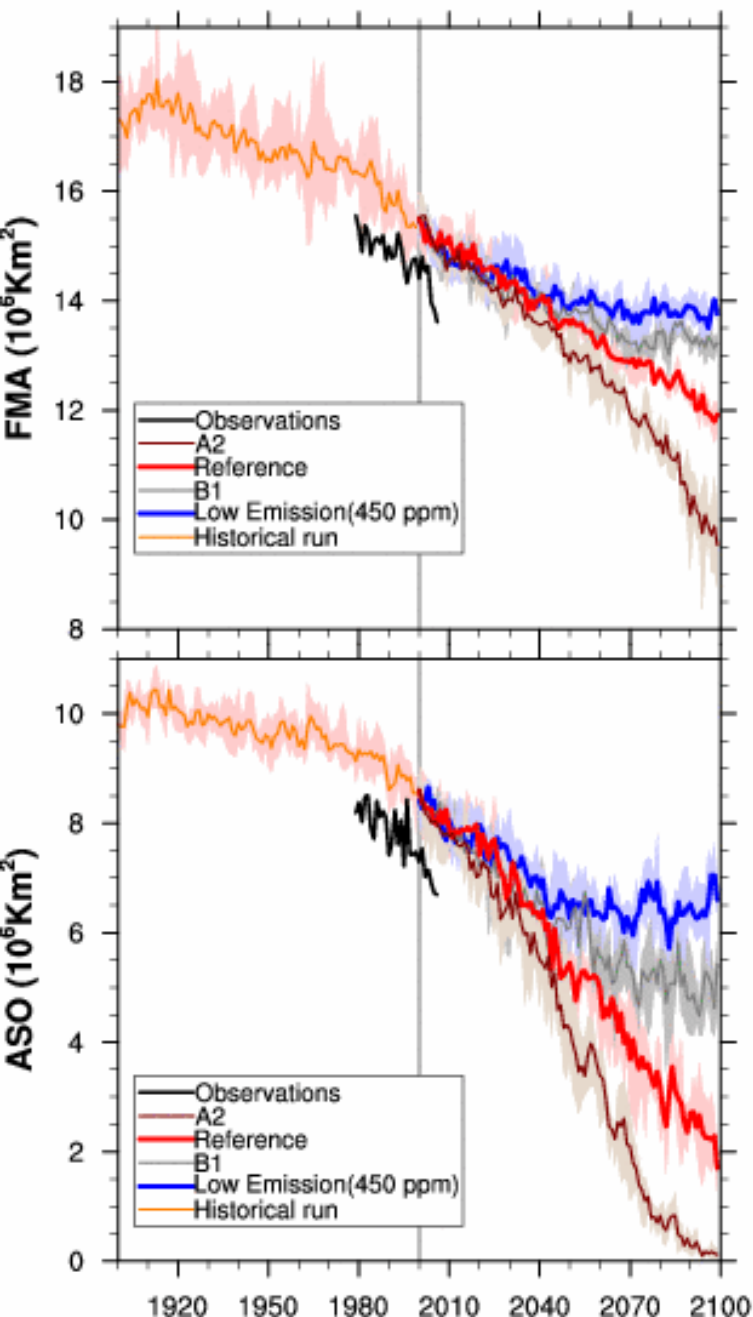
a) Surface air temperature anomalies ($^{\circ}\text{C}$)



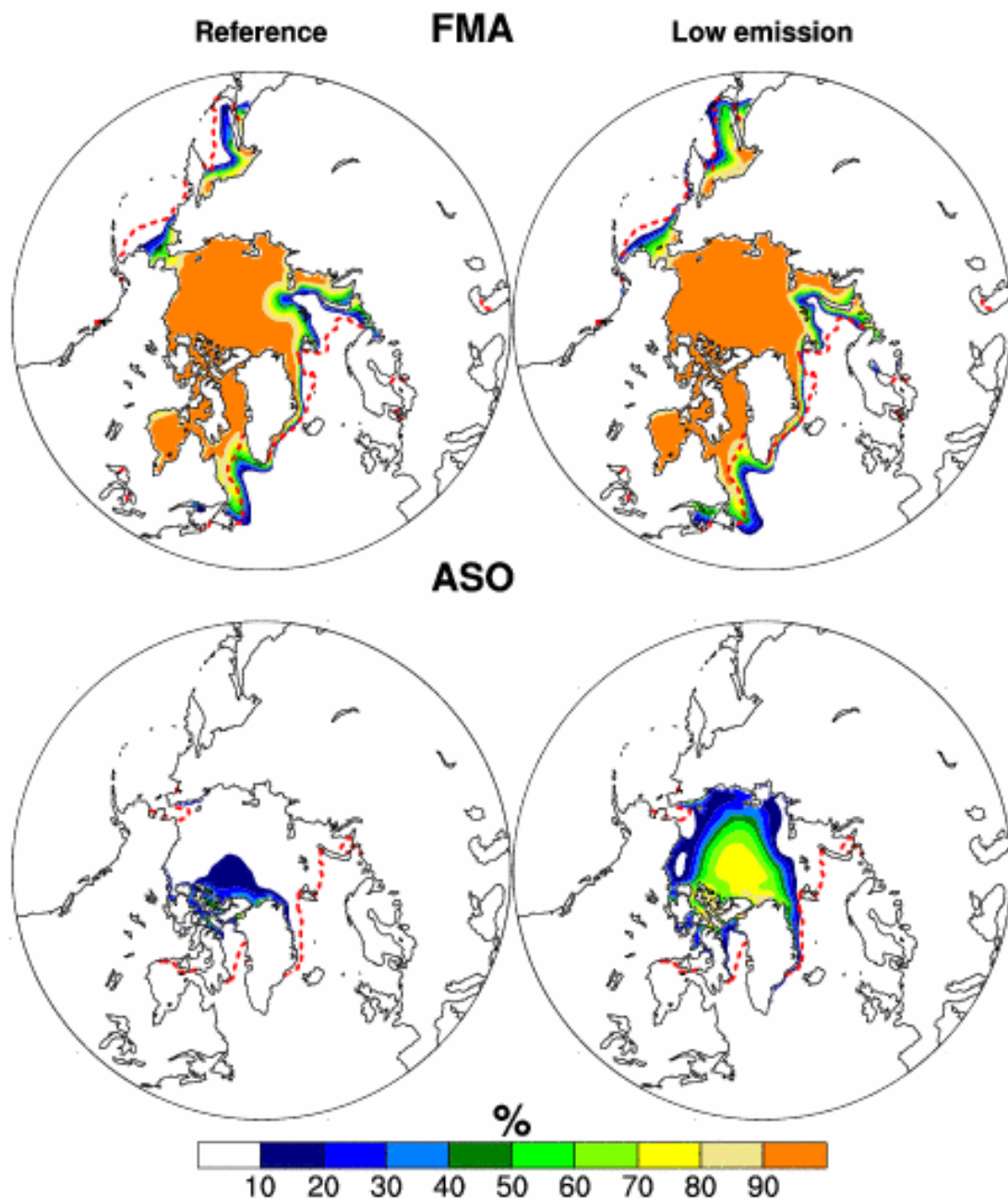
b) Precipitation anomalies (%)



a) Sea ice extent



b) Sea ice concentration (2080-2099)



Impacts

- Ecology
- Animals...Polar bears
- Ocean
- Permafrost
- Extremes: Heat waves and water (flooding and droughts)



The End



NCAR