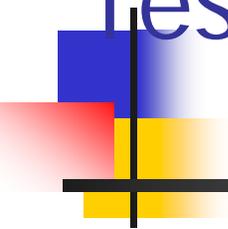
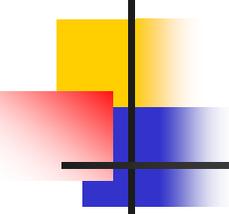


2007.06.15 7th SCA at
Okinawa

Climate Change due to Global Warmingsimulated by the high- resolution AO-coupled model



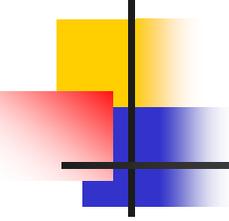
Akimasa Sumi
TIGS/IR3S
CCSR
The University of Tokyo



Does extreme events increase due to the Global Warming?

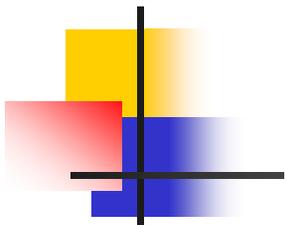
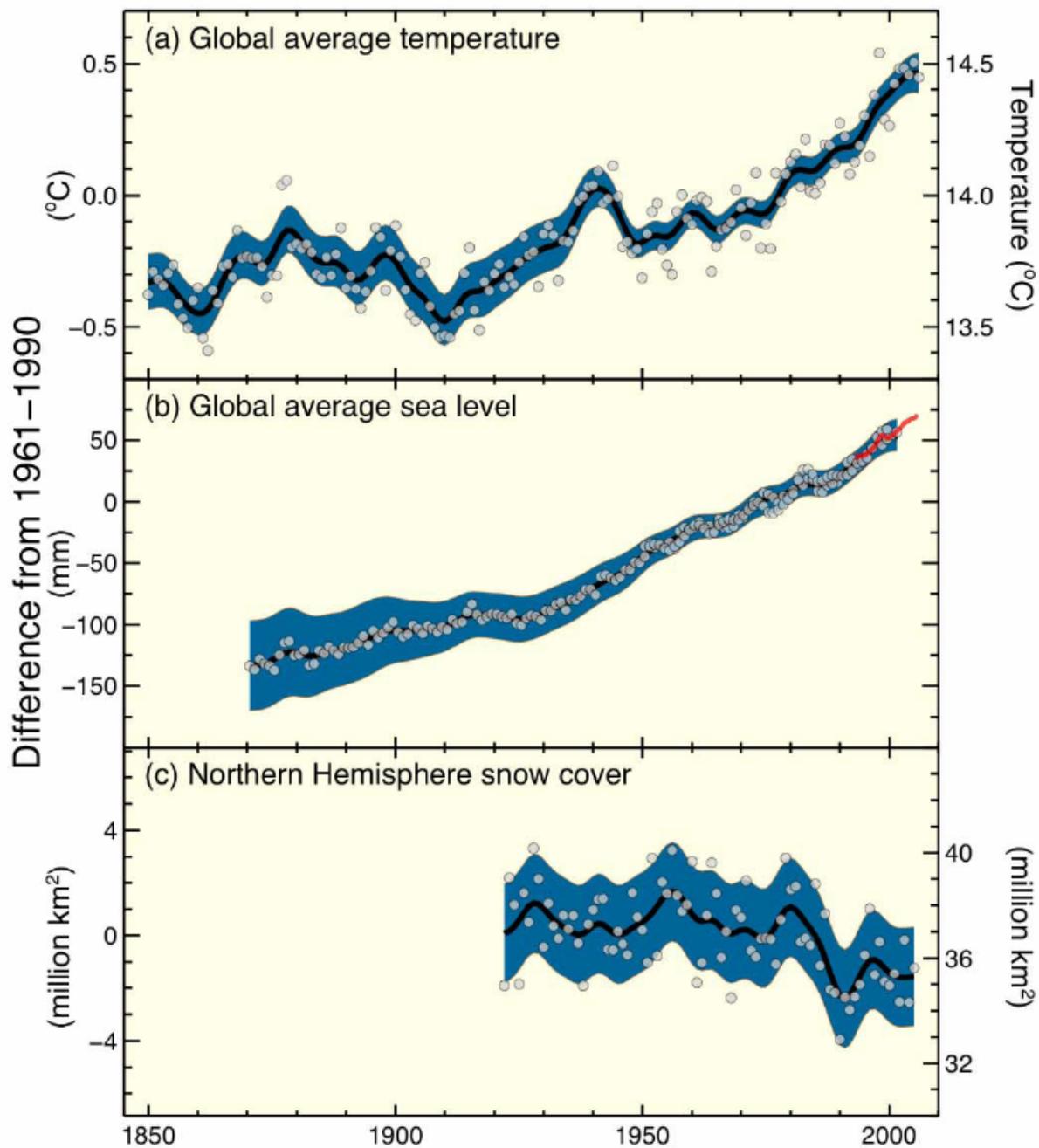
- Recent increase of days of extreme events, such as 2003 hot summer in Europe, 2004 hot summer in Japan, Hurricane Catholine in 2005, introduces concern about the future climate among people.
- Hot summer day, draught ?
- Typhoon and heavy rainfall ?

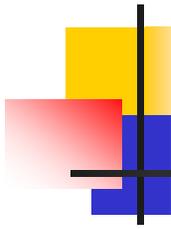
IPCC AR4 was published!



- WG1 2007.Feb.
- WG2 2007 , Apr.
- WG3 2007, May
- November, Synthesis Report

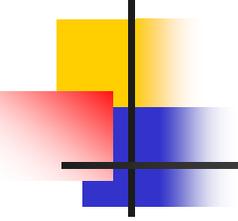
Changes in Temperature, Sea Level and Northern Hemisphere Snow Cover





MAIN Conclusion of IPCC WG1 - AR4

Most of the observed increase in globally averaged temperatures since the mid-20th century is *very likely* due to the observed increase in anthropogenic greenhouse gas concentrations¹². This is an advance since the TAR's conclusion that "most of the observed warming over the last 50 years is *likely* to have been due to the increase in greenhouse gas concentrations". Discernible human influences now extend to other aspects of climate, including ocean warming, continental-average temperatures, temperature extremes and wind patterns (see Figure SPM-4 and Table SPM-1). {9.4, 9.5}



Reason

- Increase of understanding our climate system
- Improvement of a climate model

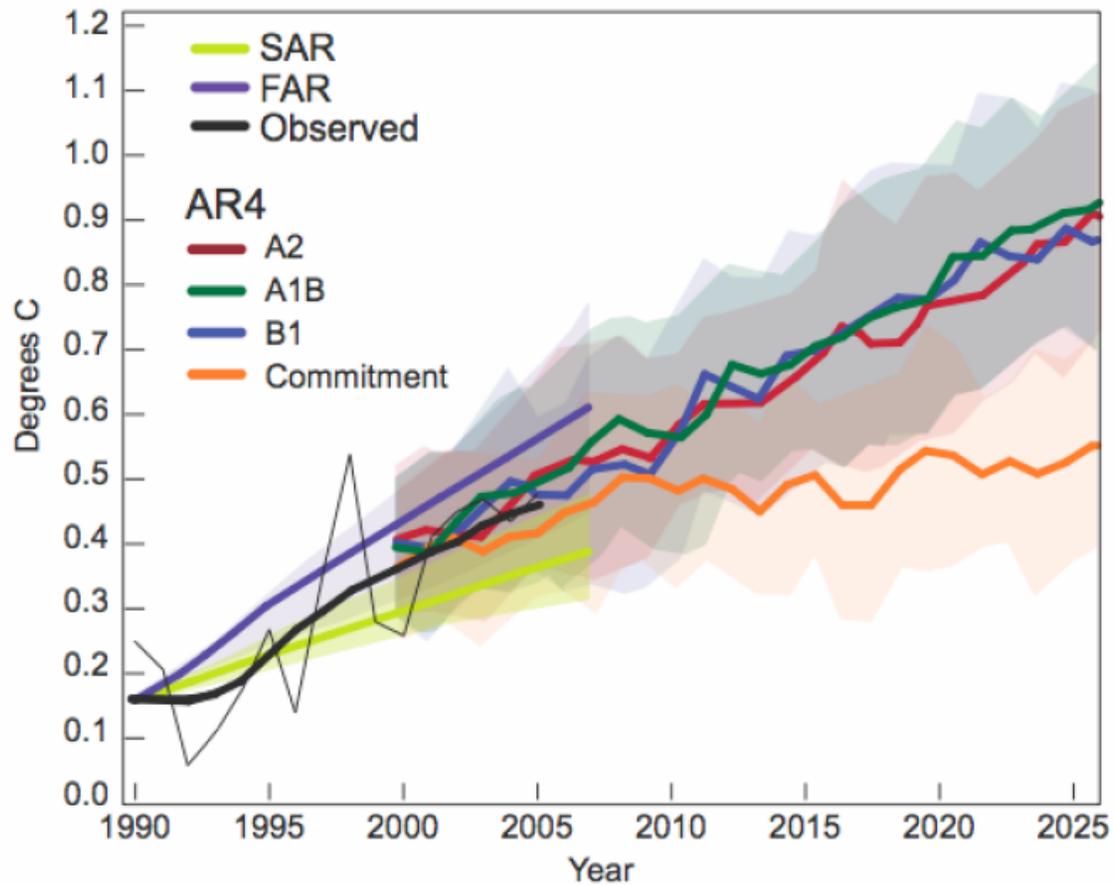
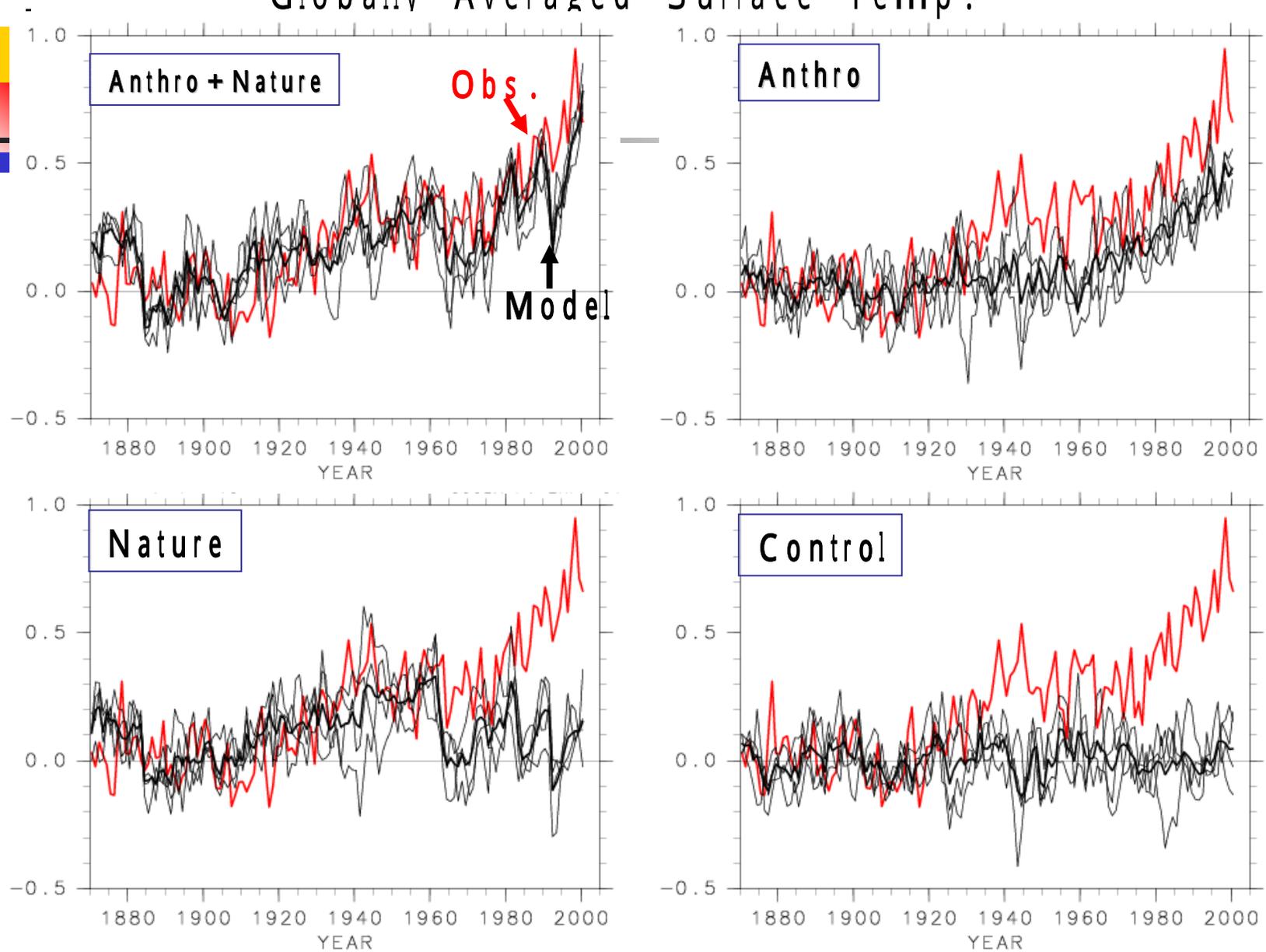


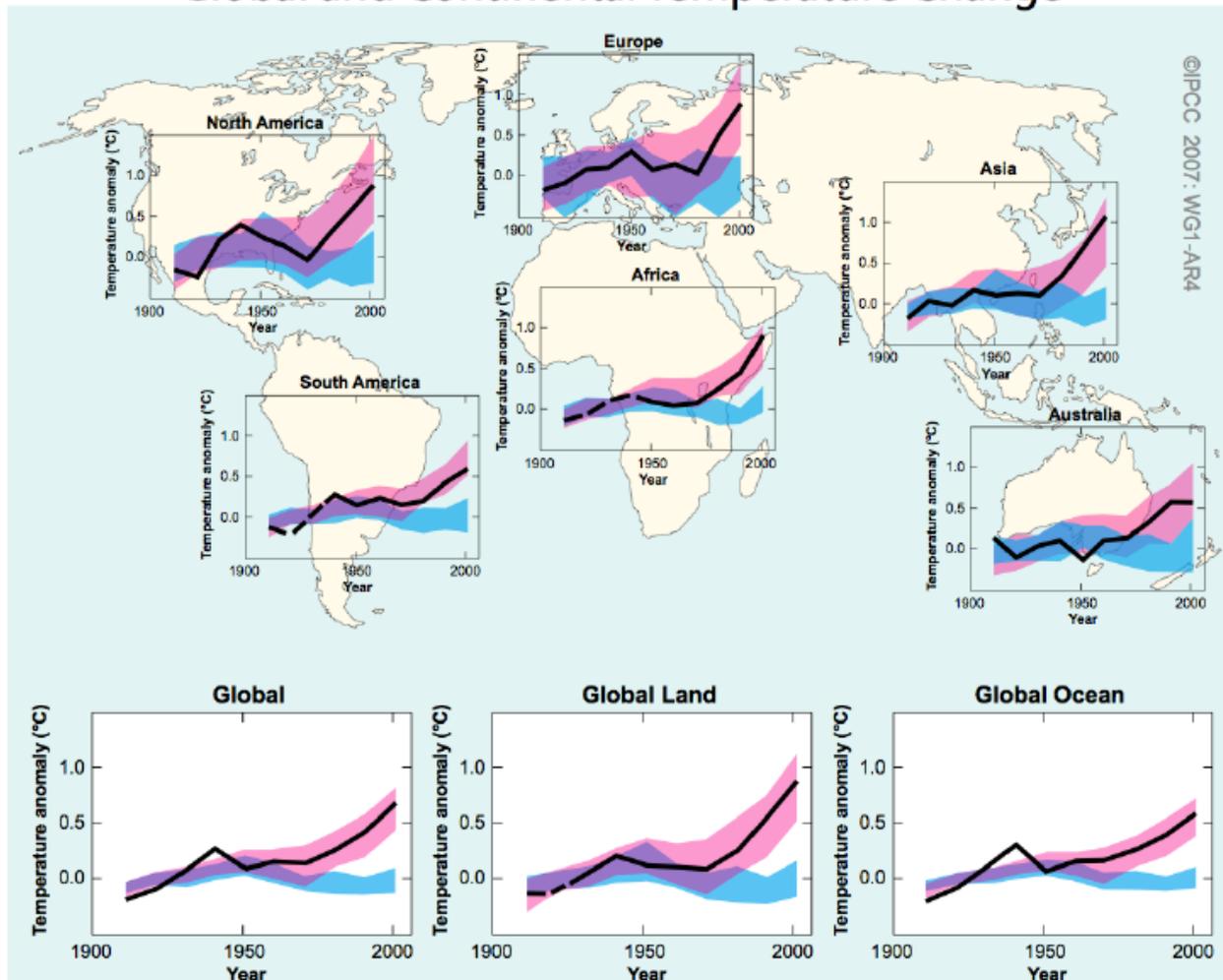
Figure TS-29. Model projections of global mean warming compared to observed warming. Projections given in the IPCC First and Second Assessment Reports (solid lines labelled FAR and SAR) and their corresponding uncertainty ranges (shaded areas) are compared with observed annual temperature anomalies (thin black line from 1990) and smoothed temperatures (thick black line). Projections from this report for the B1, A1B and A2 SRES scenarios are shown starting in 2000 as blue, green and red curves with shaded areas representing uncertainty ranges. The orange curve from year 2000 and associated shaded area shows model projections of warming if greenhouse gas and aerosol concentrations were held constant from year 2000 – i.e., the constant forcing commitment for the period 2000–2025.

20C3 Experiments

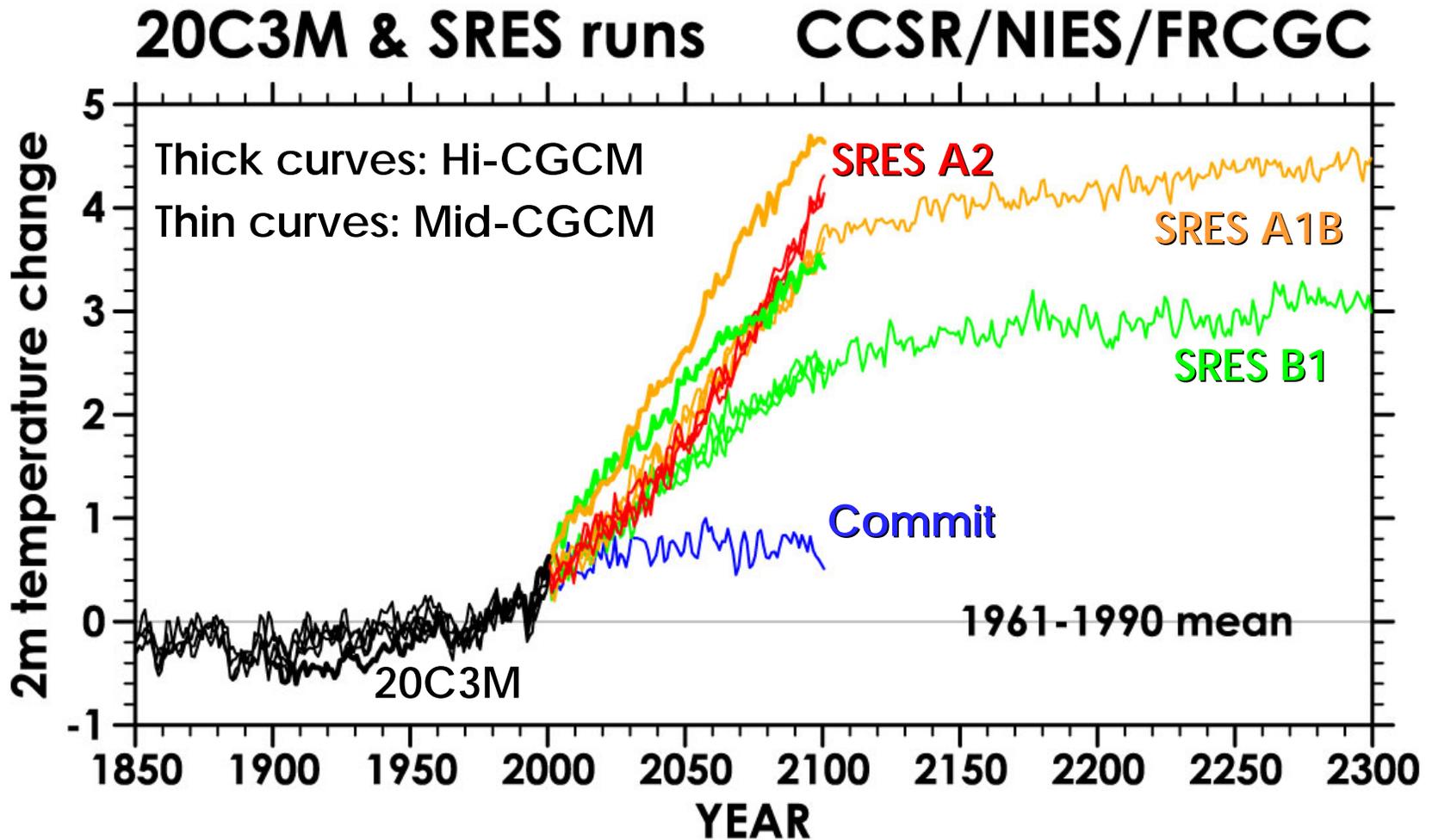
Globally Averaged Surface Temp.



Global and Continental Temperature Change

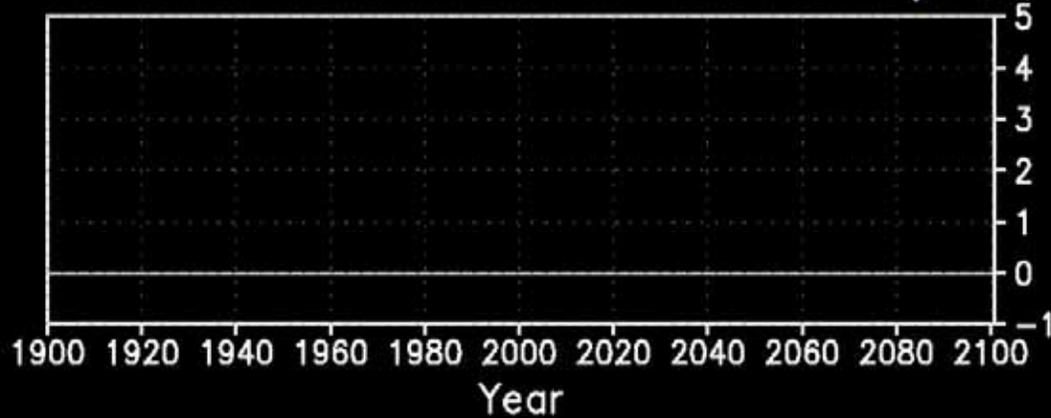
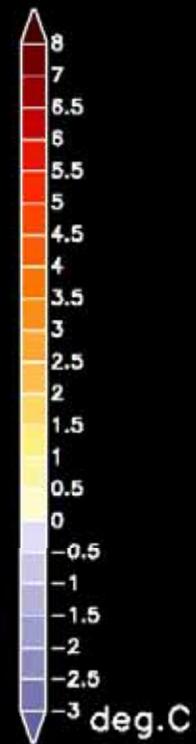
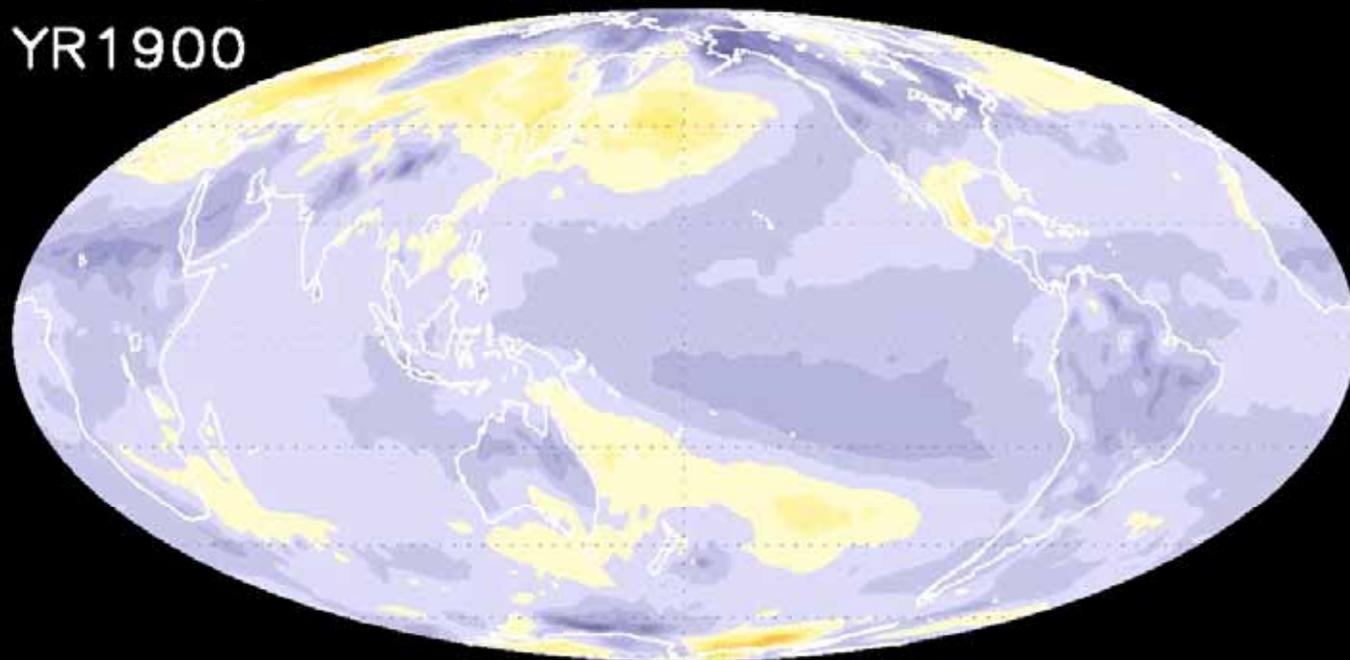


Global Mean Surface Temperature

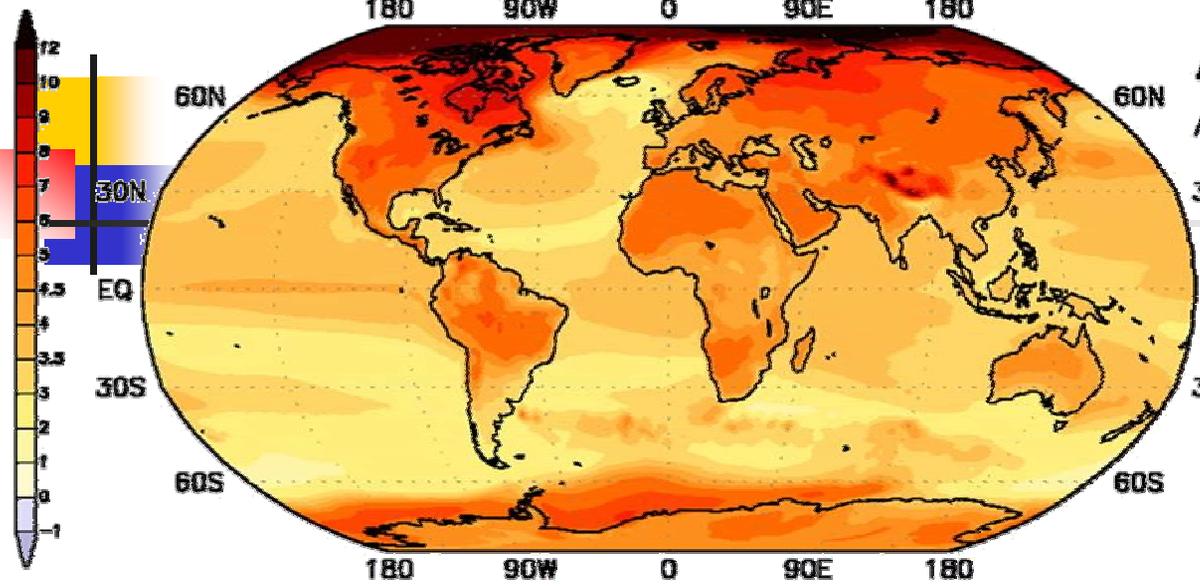


Global Warming Simulation
by the CCSR/NIES/FRCGC Climate Model

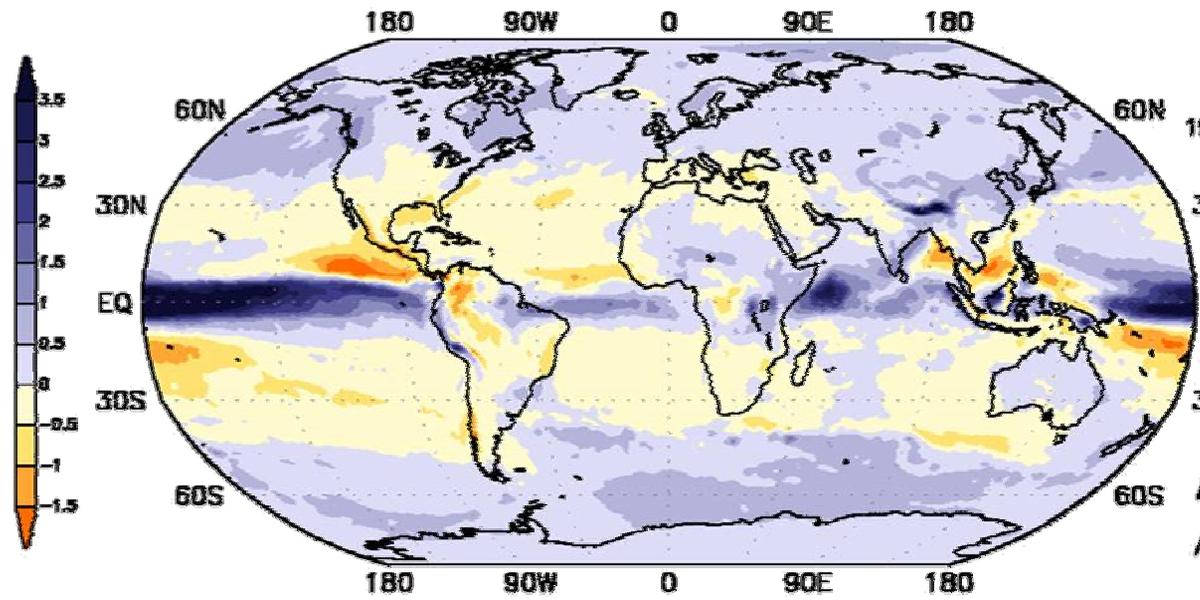
YR1900



Global Warming Simulation by the CCSR/NIES/FRCGC Climate Model



ΔSAT
A1b(2071-2100)
-20C3M(1971-2000)



ΔRain
A1b(2071-2100)
-20C3M(1971-2000)

