Climate Change – Reducing Agriculture and Forestry Vulnerability

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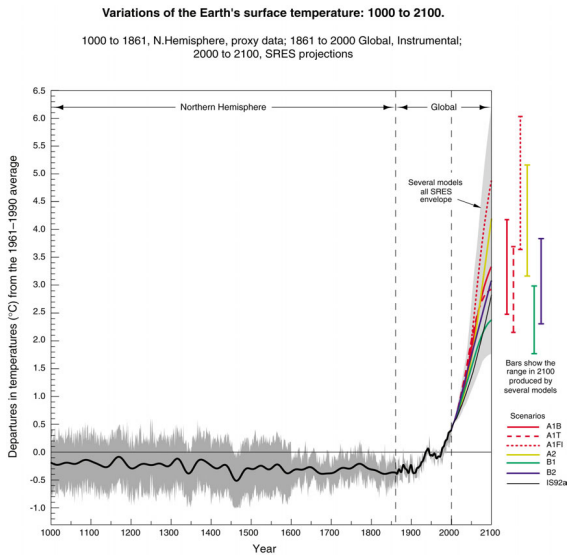
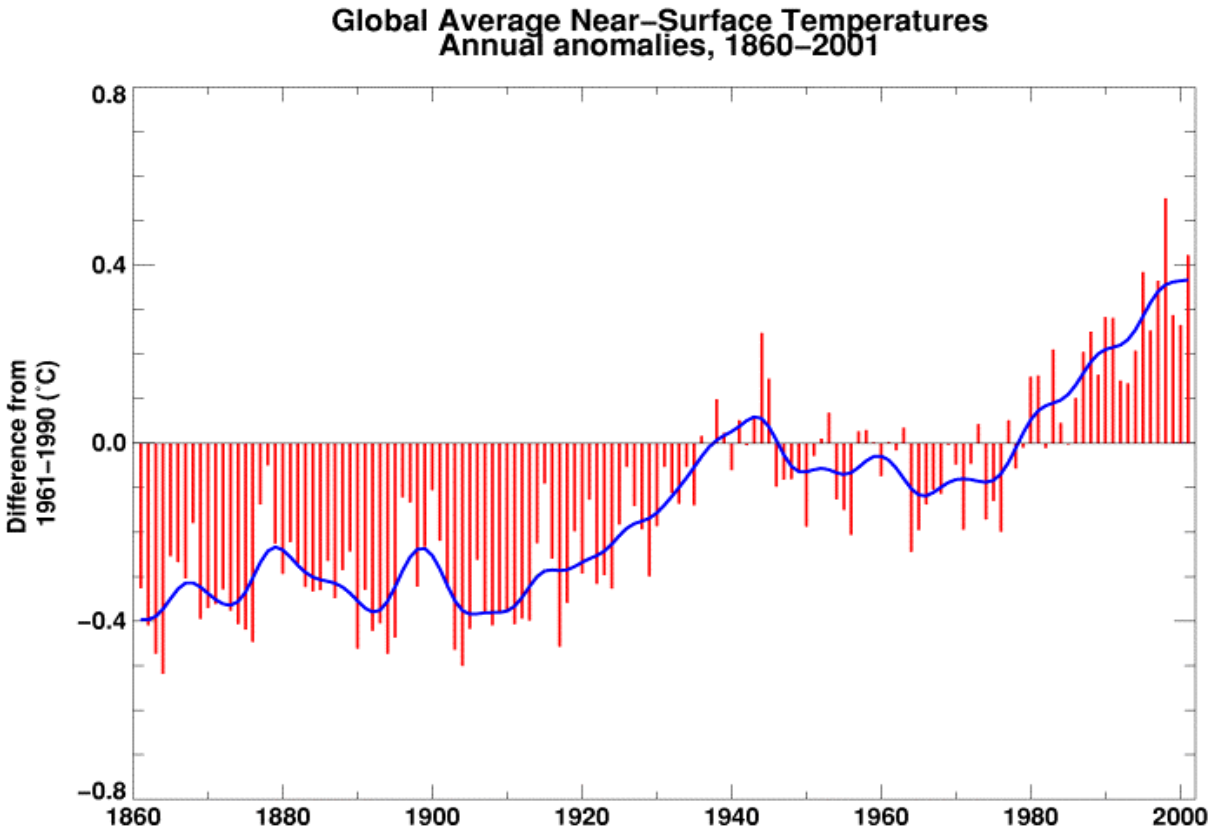
- **Climate – Past present and future**
- **Climate impacts on agriculture**
- **Climate forecasting**
- **Management practices**
- **International workshop**
- **Conclusions**



APN Asia-Pacific Network for Global Change Research

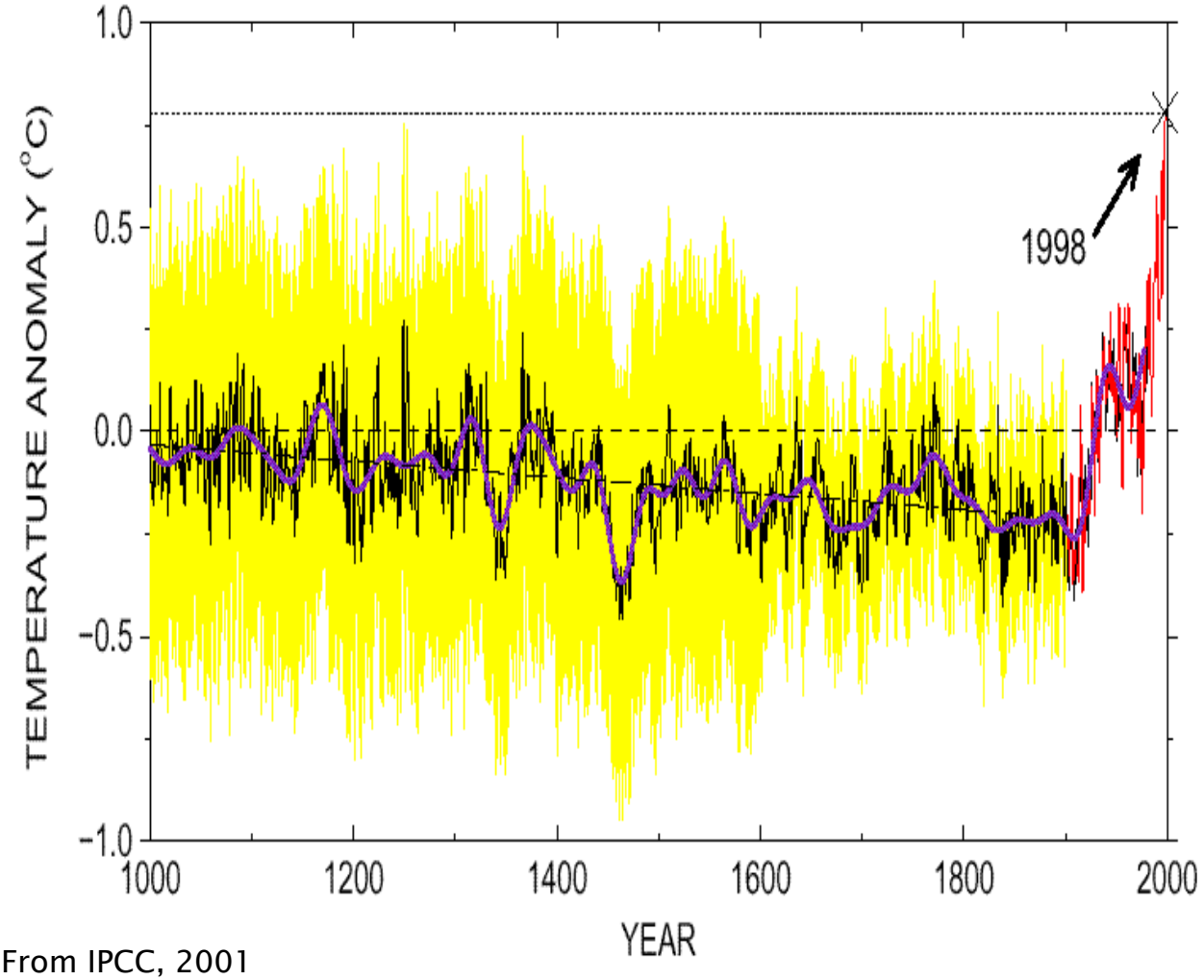
NIWA Taihoro Nukurangi

Climate – Past, present and future



- Global temperatures have increased by about 0.6° C over the 20th century
- Very likely that the 1990s was the warmest decade, 1998 the warmest year

Climate – past, present and future

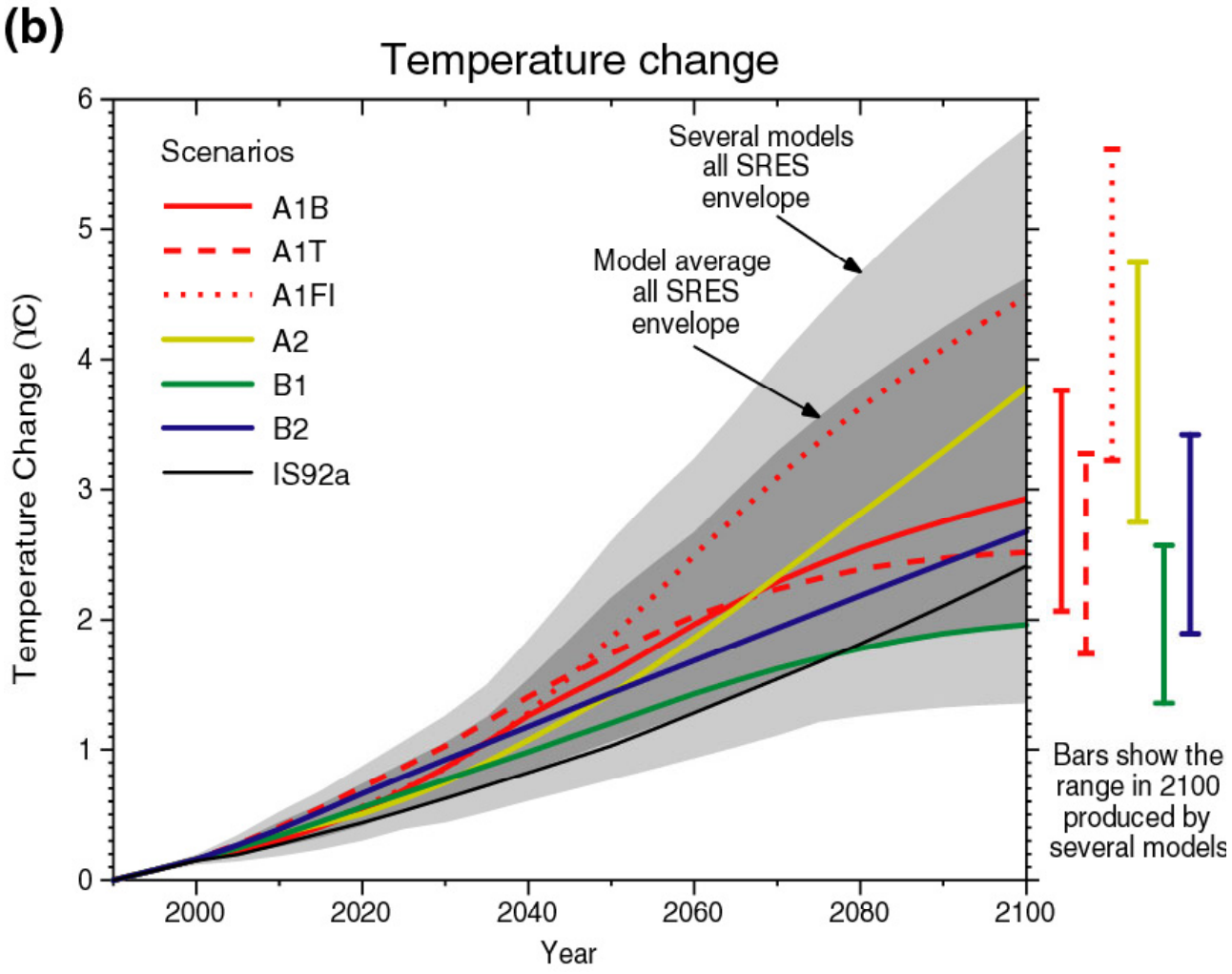


From IPCC, 2001

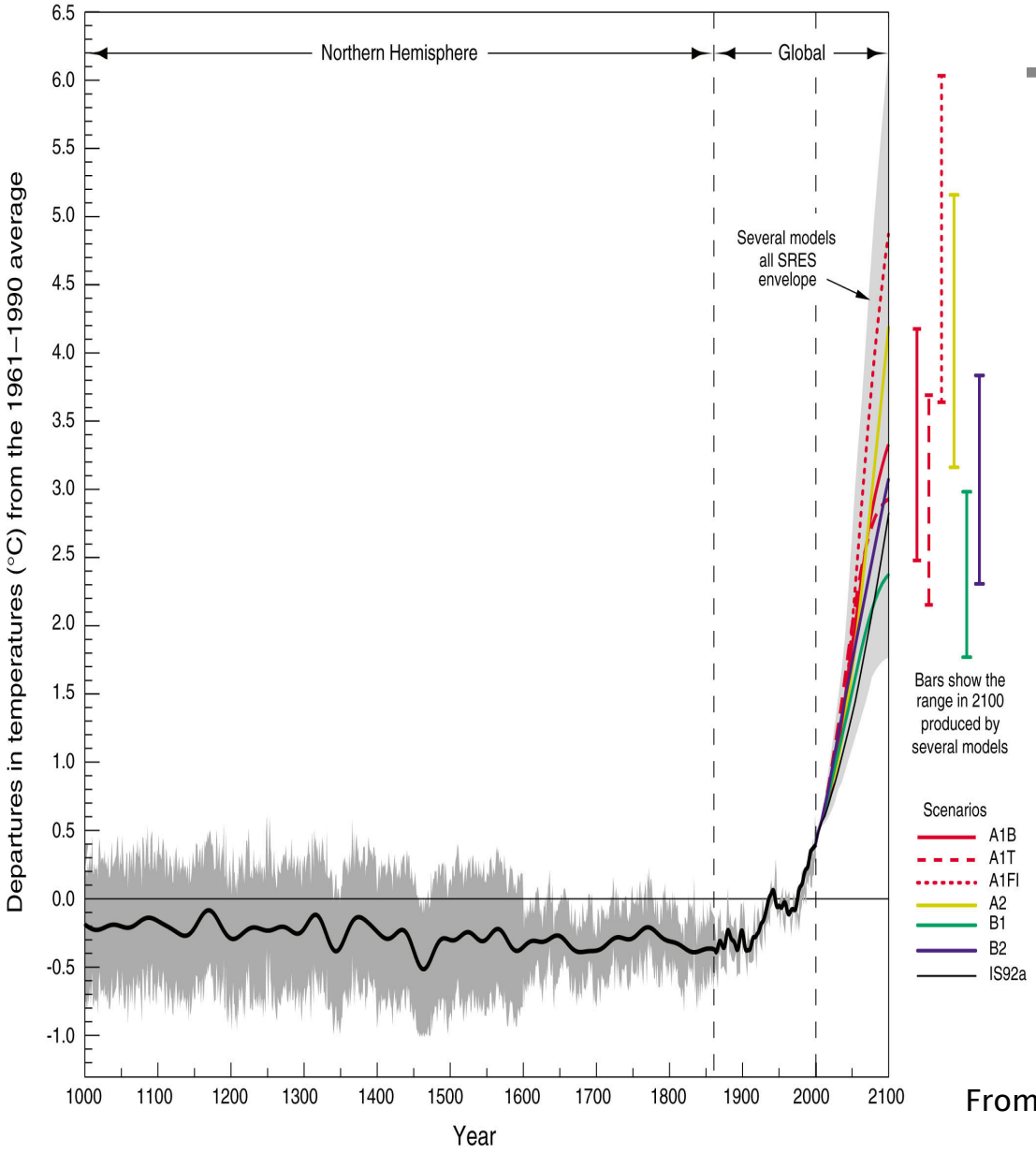
New analyses of proxy data for the Northern Hemisphere indicate that the increase in temperature in the 20th century is likely to have been the largest of any century during the past 1000 years

It is likely the Northern Hemisphere that the 1990s was the warmest decade, and 1998 the warmest year

Climate – past, present and future



Climate – past, present and future



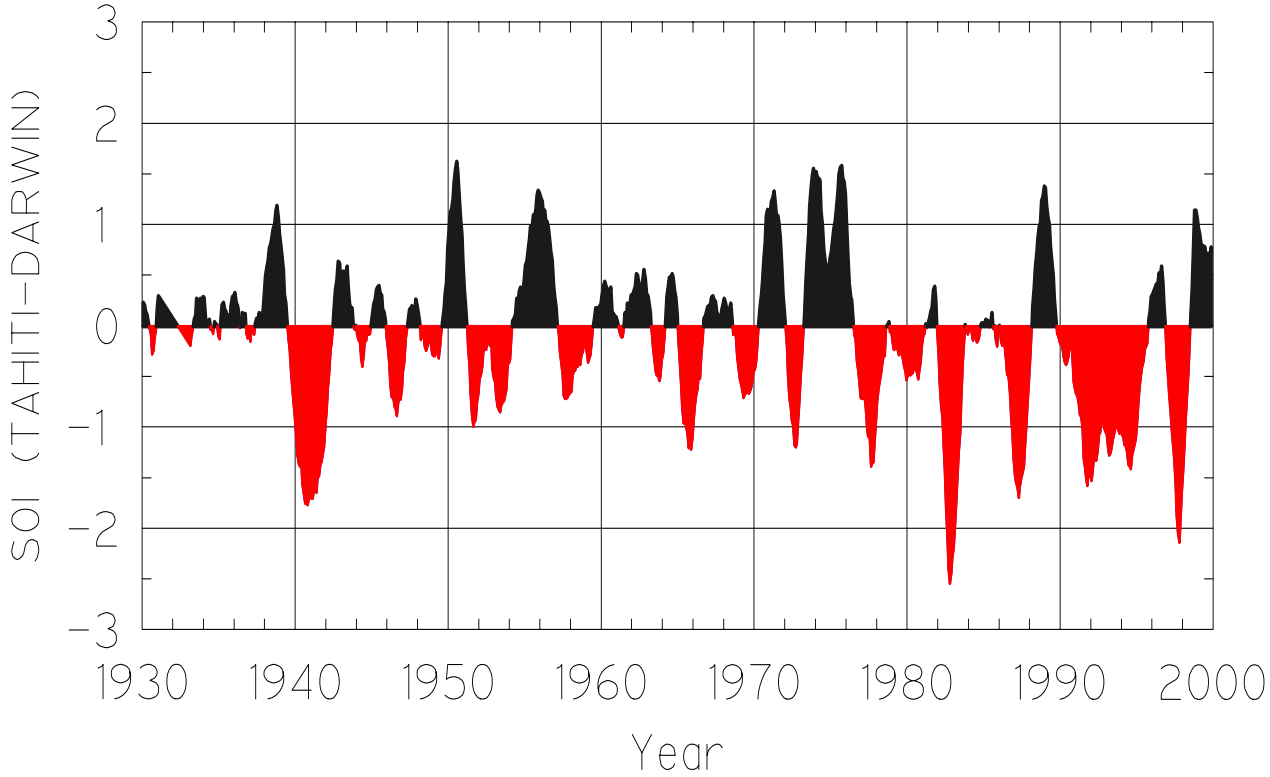
"Global average temperature and sea level are projected to rise under all IPCC SRES scenarios"

Intergovernmental Panel on Climate Change, 2001

From IPCC,2001

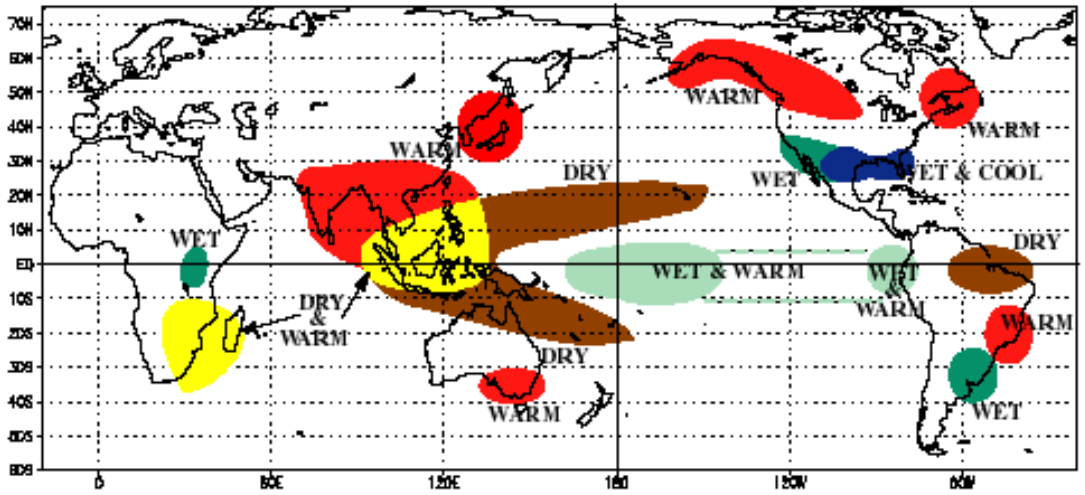
Climate Variability

The El Niño/Southern Oscillation

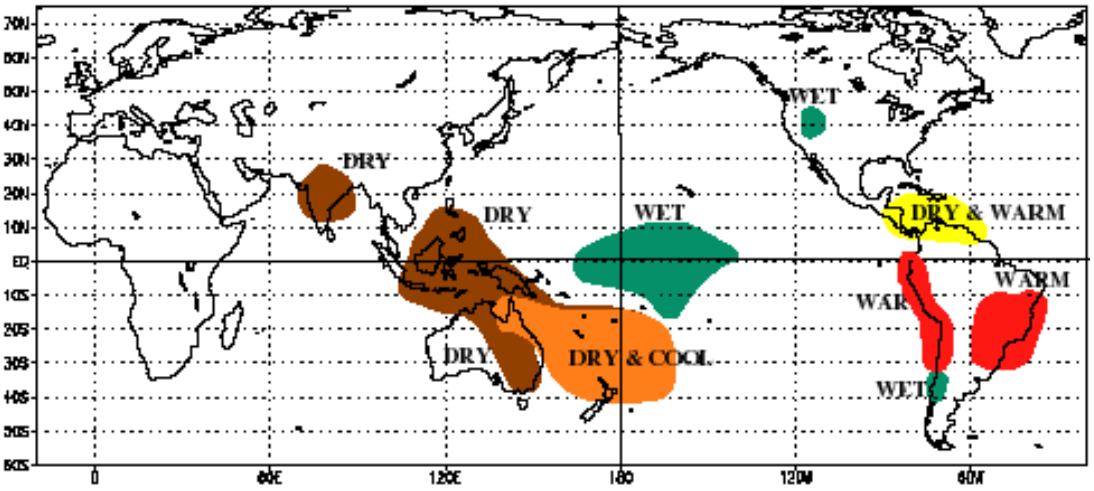


- Year-to-year variability between El Niño and La Niña
- A 3 - 5 year climate cycle of global importance driven out of the Pacific Basin

WARM EPISODE RELATIONSHIPS DECEMBER - FEBRUARY



WARM EPISODE RELATIONSHIPS JUNE - AUGUST

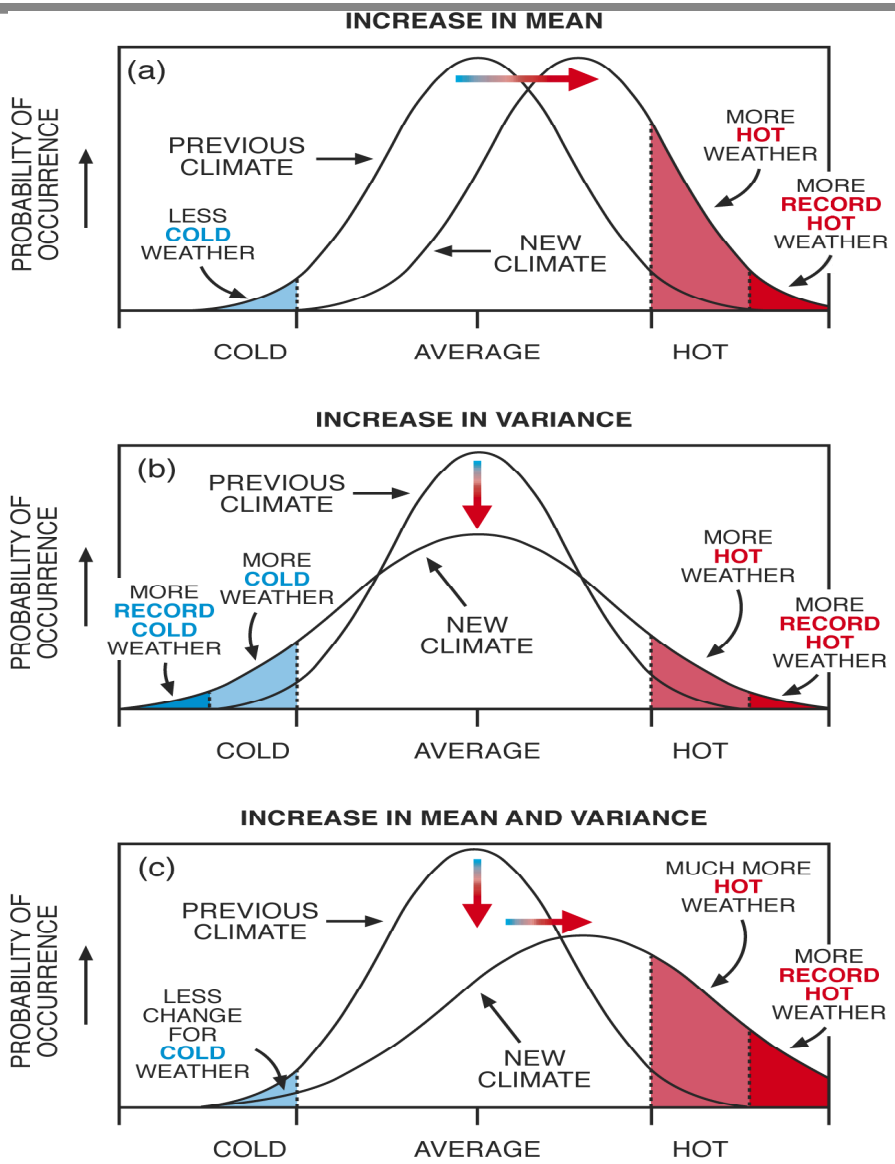


Climate Variability

ENSO Impacts

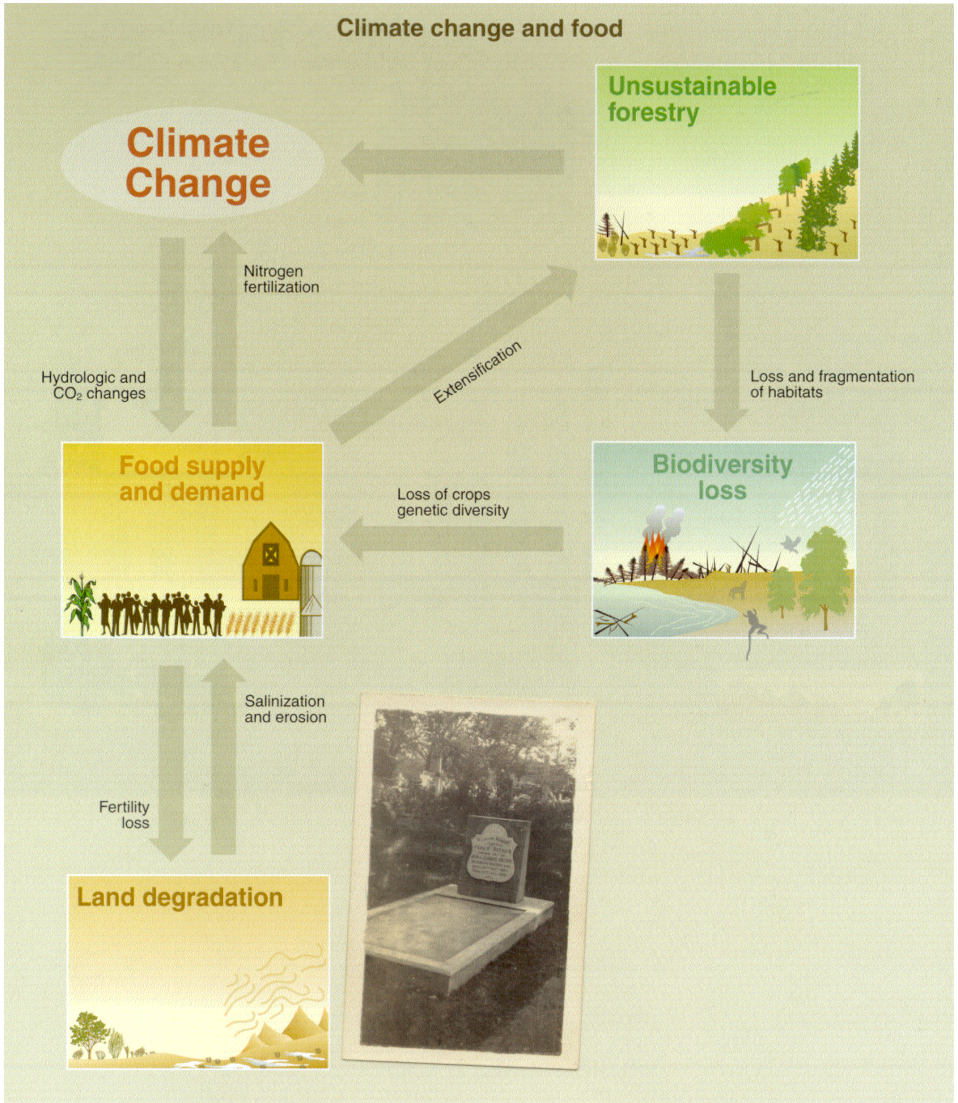
Climate Prediction Center
NCEP

Climate extremes



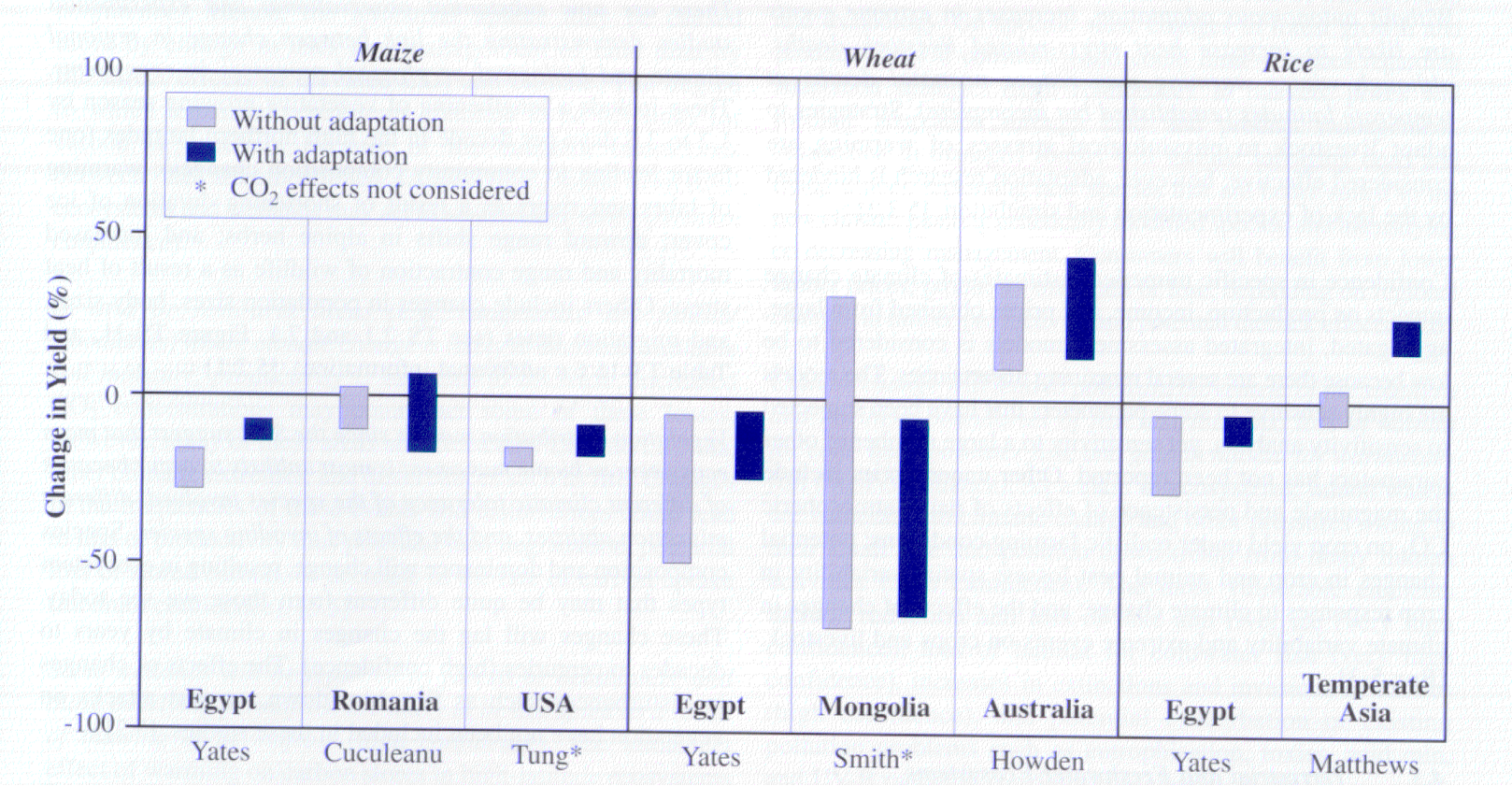
- Global average water vapour concentration and precipitation are projected to increase, with larger year to year variations very likely.
- More hot days and fewer frost days are very likely
- More heavy rainfall events are likely over many areas
- Increase in tropical cyclone peak wind intensities are likely over some areas

Climate Impacts on Agriculture



- A general reduction in potential crop yields in most tropical and subtropical regions with increases in temperature.
- Arid and semi-arid tropics has low and variable rainfall
- A reduction, in potential crop yields in most mid-latitude regions
- Increases in some mid-latitude regions for smaller temperature increases
- A potential increase in global timber supply from some managed forests

Climate Impacts on Agriculture



- Ranges of % changes in crop yields spanning various scenarios
- Each pair of results shows with and without adaptation

Climate Forecasting

- Based on slow variations, mostly oceanic
- Seasonal time scale
- Large spatial scales
- Climate somewhat chaotic
  - a limit to predictability
  - statistical/probabilistic predictions
- History often a fair guide

Climate Forecasting