

Science understanding and gaps on temperature change

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Slow-onset event

- By decision 1/CP.16, the COP established a work programme under the Cancun Adaptation Framework to consider approaches to address loss and damage associated with climate change impacts;
- Slow-onset events to include:

Temperature increase

Sea level rise

Desertification

Glacial retreat and related impacts

Ocean acidification

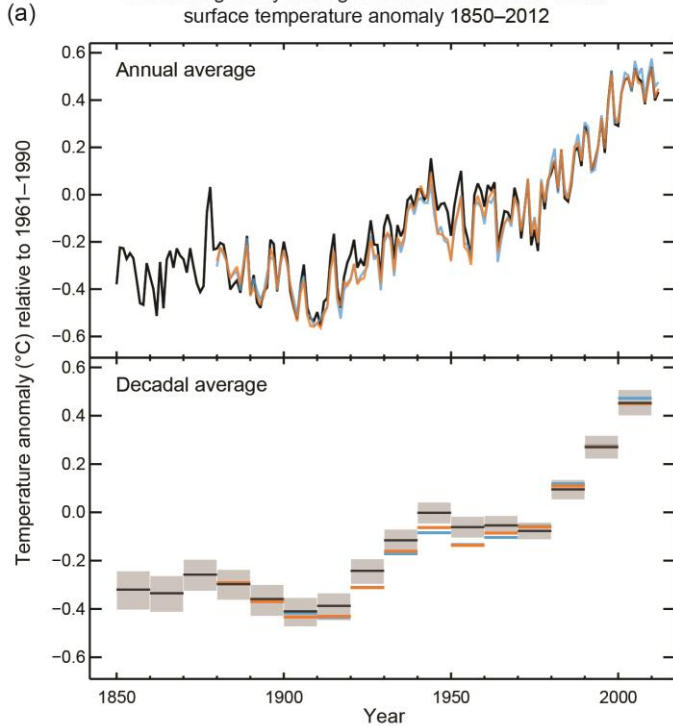
Land and forest degradation

Salinization

Loss of biodiversity

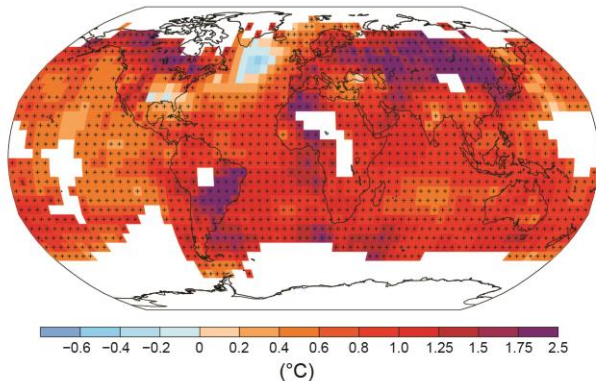
Observed temperature change from AR5

Observed globally averaged combined land and ocean surface temperature anomaly 1850–2012

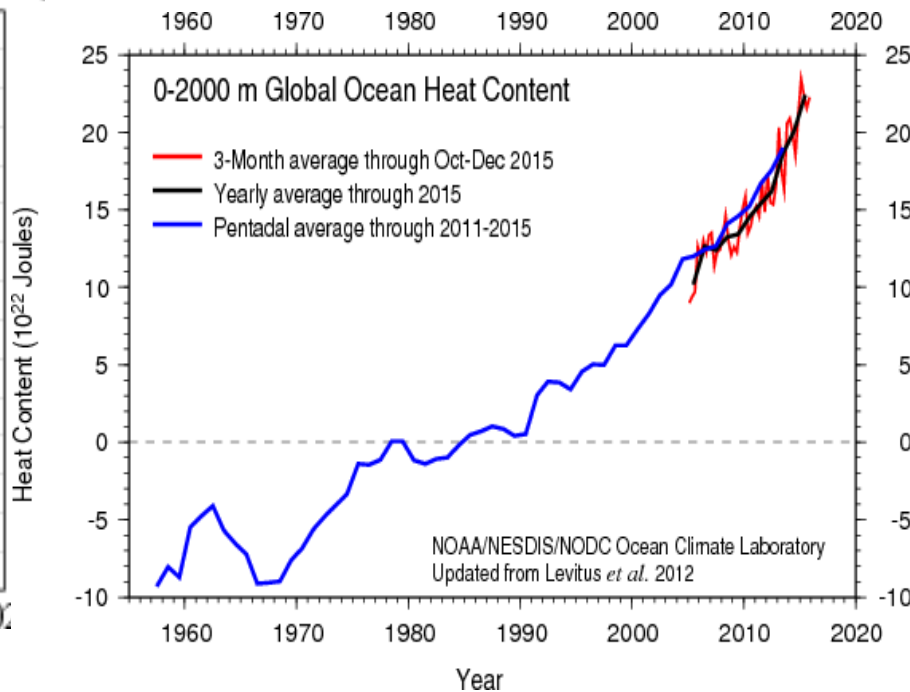
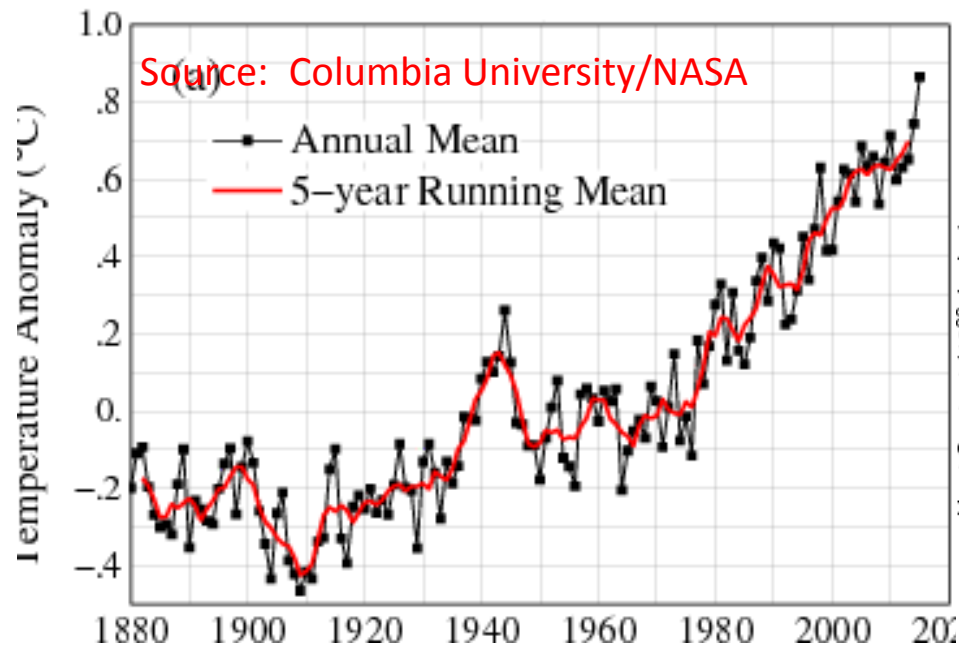


- ❖ Warming of the climate system is unequivocal
- ❖ Each of the last three decades has been successively warmer at the surface than any preceding decade since 1850.
- ❖ In situ observation gaps exist over land and ocean, especially in the earlier period.
- ❖ Reference period: ?

(b) Observed change in surface temperature 1901–2012



Updated Monitoring on changes in global mean temperature and ocean heat content

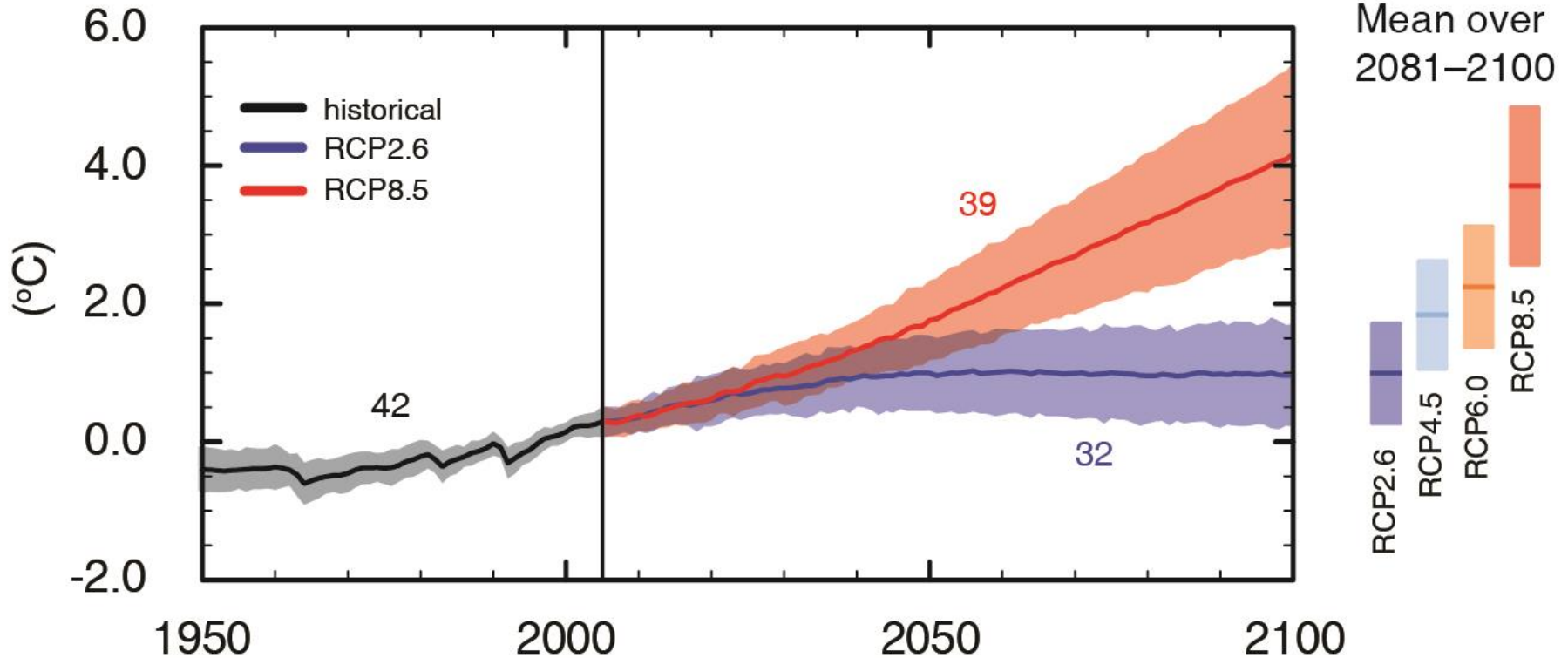


- ❖ Recent observations reaffirm that the warming trend continues despite the previous debate on warming hiatus!

Projected temperature Changes

(a)

Global average surface temperature change

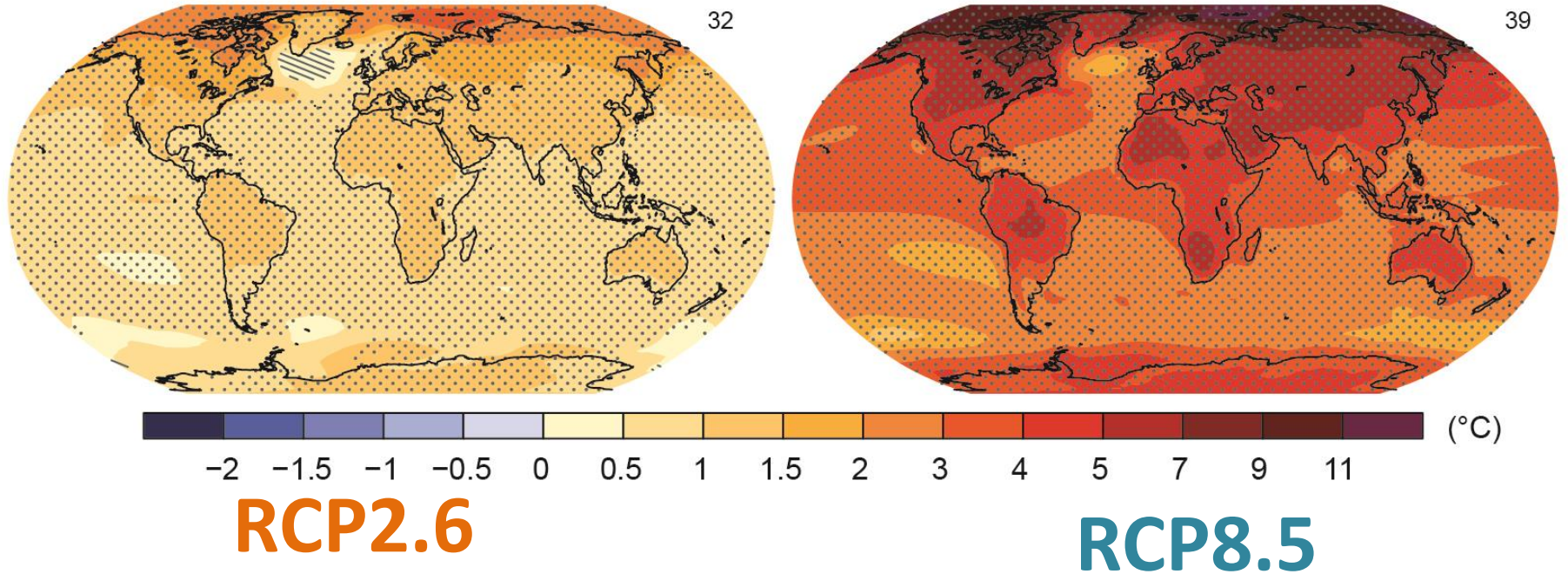


- ❖ GMST change for the end of the 21st century is likely to exceed 1.5° C relative to 1850 to 1900 for all RCP scenarios except RCP2.6.
- ❖ Projection uncertainty needs to be narrowed and reference period to preindustrial level expression should be more clear!

Projected surface temperature change

a) Change in average surface temperature (1986–2005 to 2081–2100)

Fig. SPM.8



- ❖ **Warming will continue** but exhibit interannual-to-decadal variability and will not be regionally uniform !

Emerging Science and Challenges

- ❖ Change in diurnal temperature ranges, growing season, regionality are important aspects for impact assessments, but there exist gaps in understanding their changes!
- ❖ Future projections in temperature in combination with precipitation at regional scale are crucial for impact assessments. They rely on the ongoing research on CMIP5-CMIP6, and CORDEX.
- ❖ Emerging research on GMST and regional impacts, but existing open questions about rates of changes and scenario (overshoot).
- ❖ New findings on climate sensitivity , suggesting higher sensitivity, from aerosol and cloud processes, important for multi-model spread, response to forcing, and emission scenarios compatible with targets.

Thanks so much for your attention!