



Expectation for the Adaptation to Climate Change through Ecosystem Services

Expert Conference on Development of Island's Sustainable Societies, OIST, June 30th, 2014

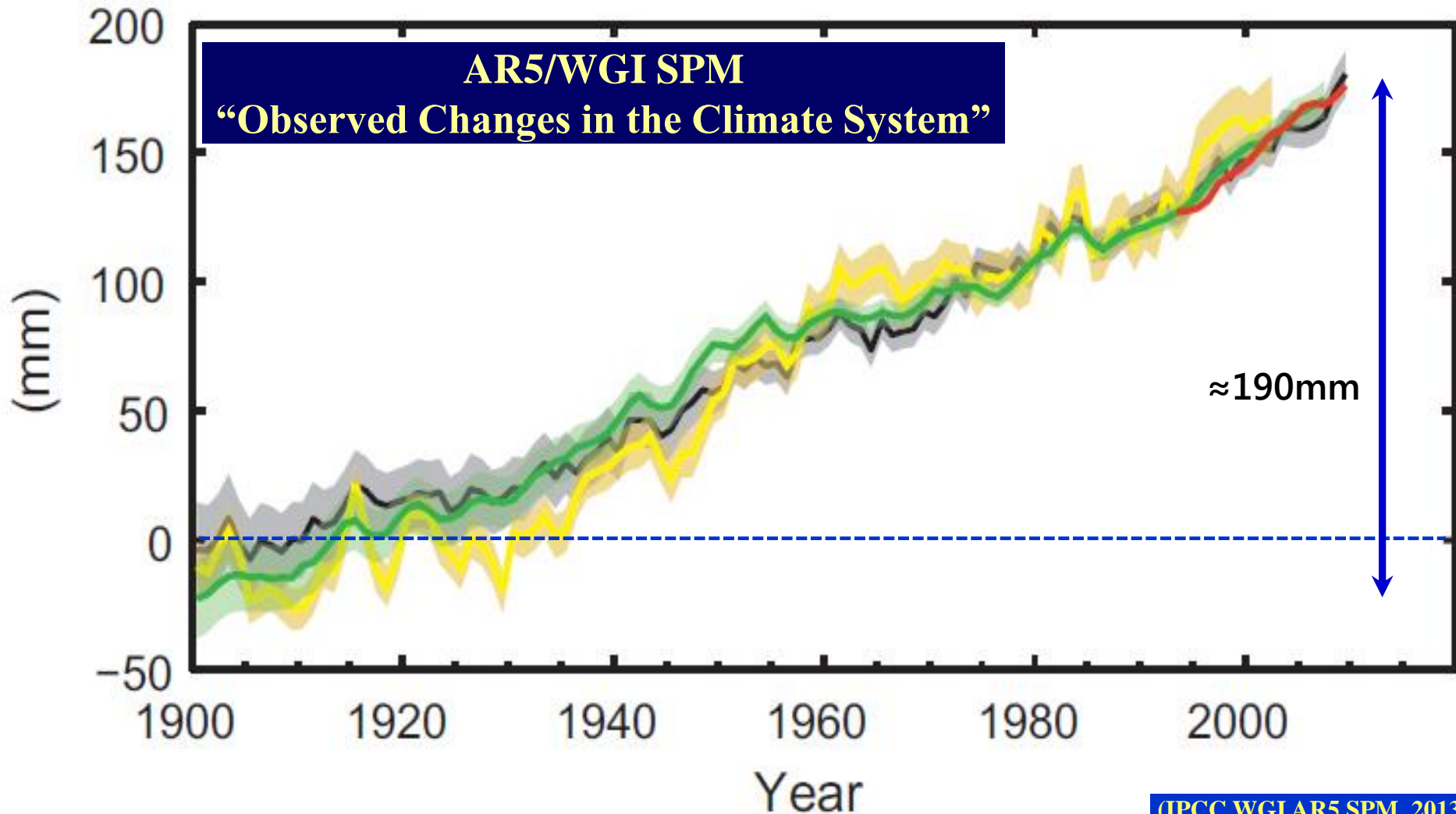
Taikan Oki

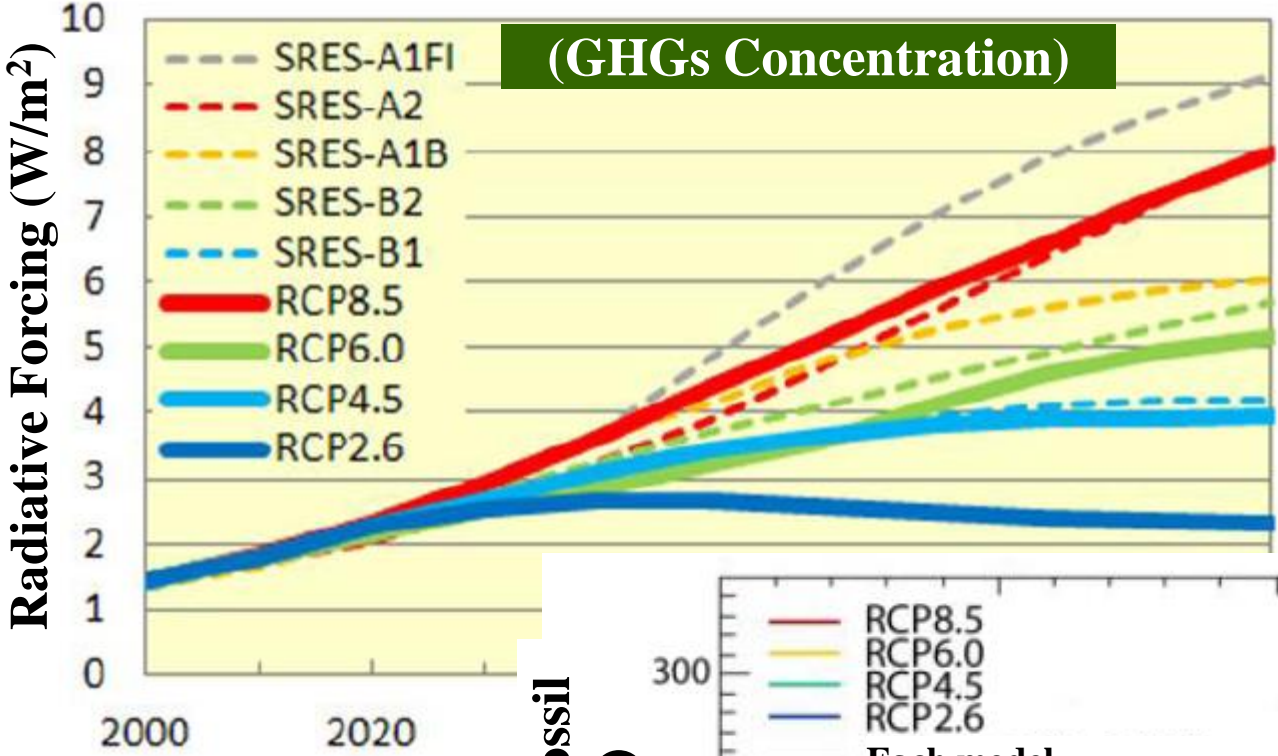
Institute of Industrial Science, The Univ. of Tokyo

The rate of sea level rise since the mid-19th century has been larger than the mean rate during the previous two millennia (*high confidence*). Over the period 1901 to 2010, global mean sea level rose by 0.19 [0.17 to 0.21] m

(d)

Global average sea level change





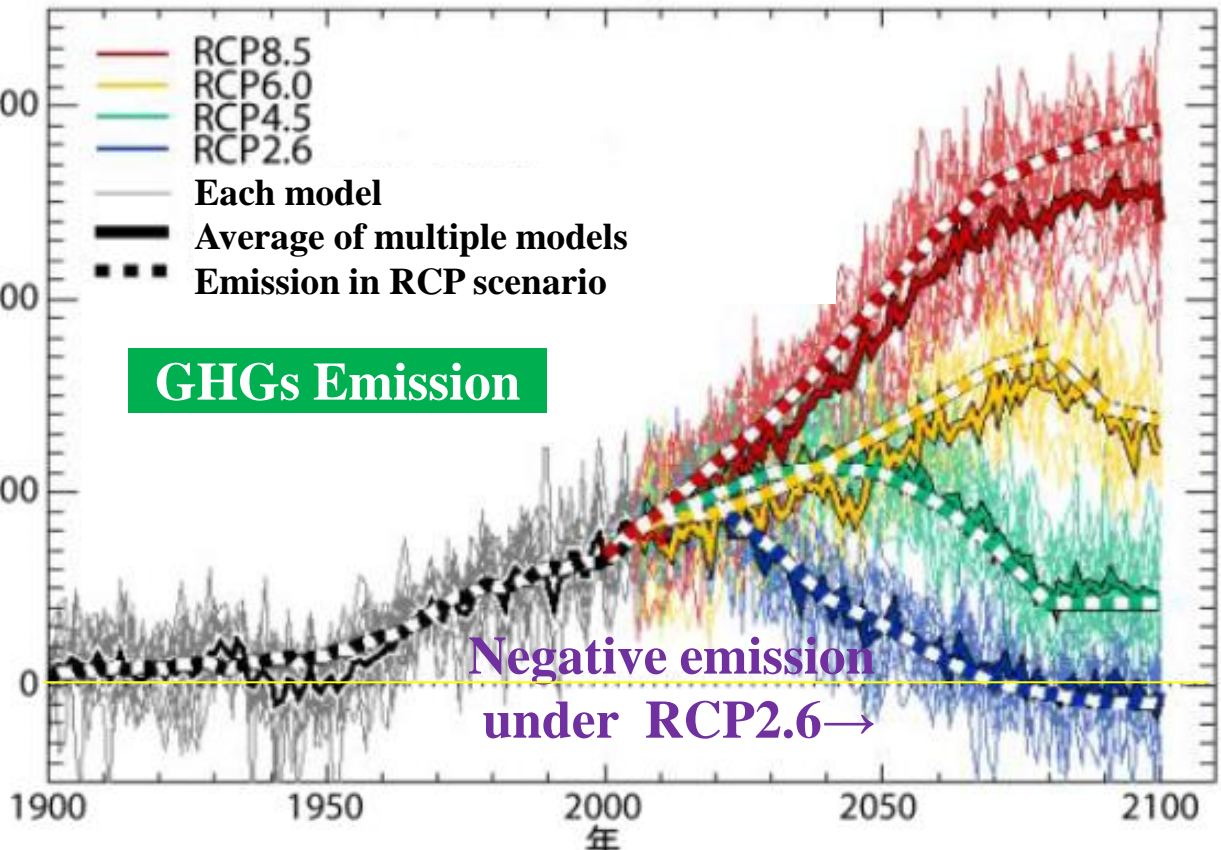
RCP8.5 ≙ A2

RCP6.0 ≙ B2

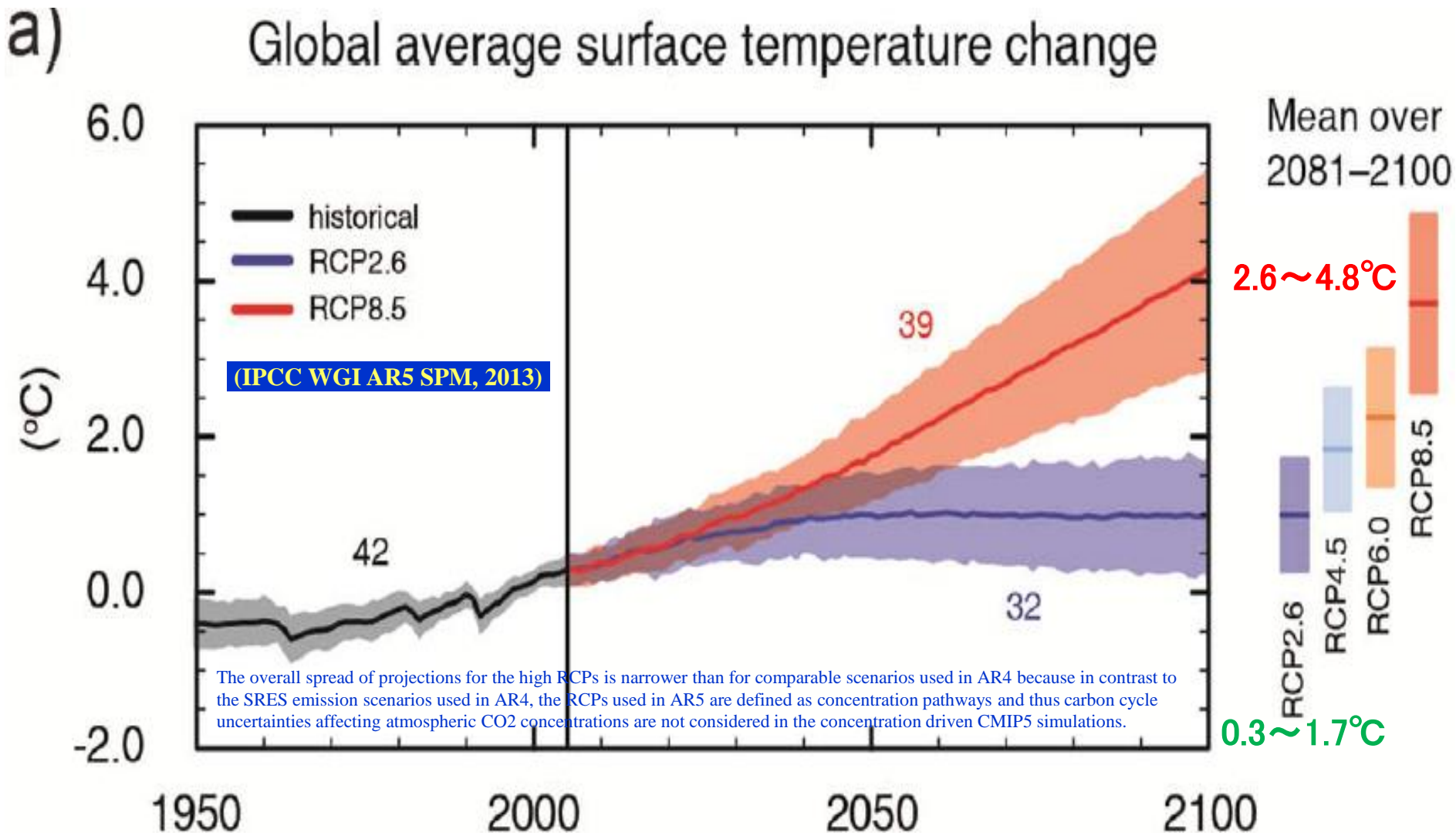
RCP4.5 ≙ B1

RCP 2.6

CO2 emission from fossil fuels (C 10⁸ t/year)

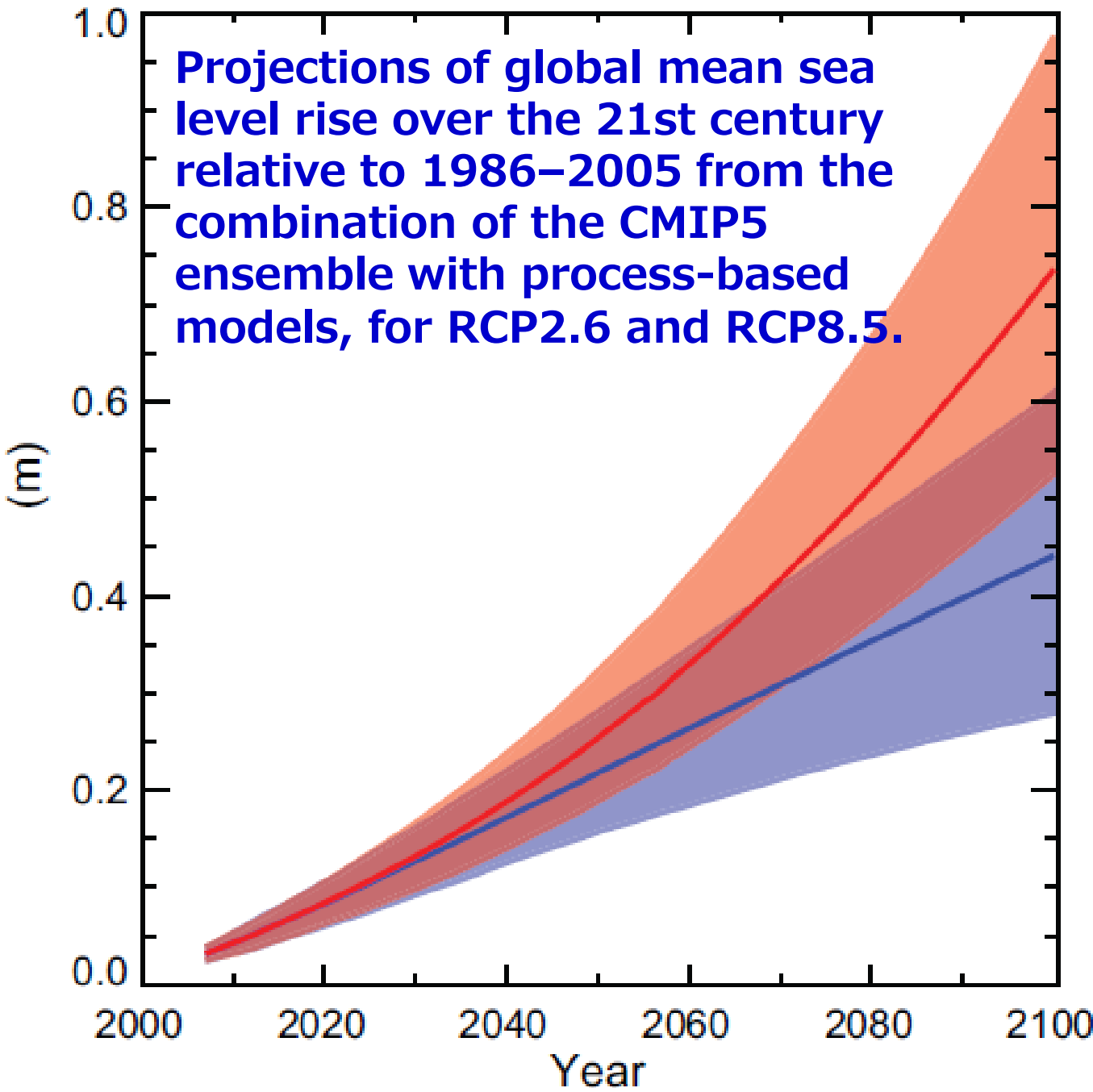


CMIP5 multi-model simulated time series 1950 to 2100 for change in global annual mean surface temperature relative to 1986-2005

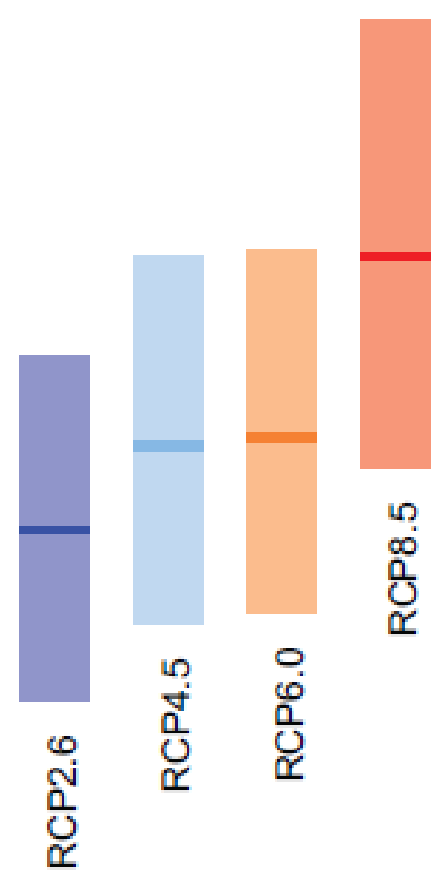


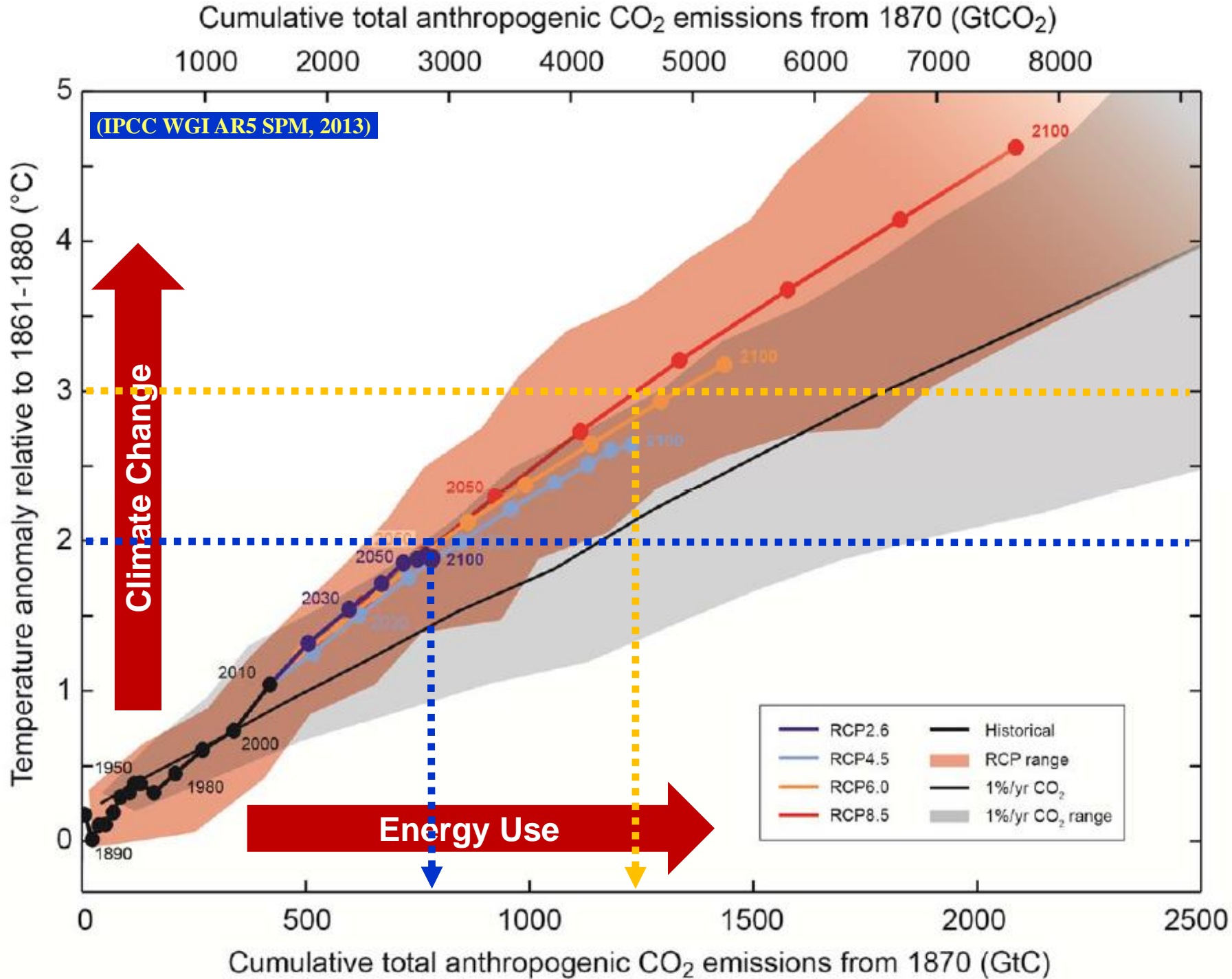
Global mean sea level rise

Projections of global mean sea level rise over the 21st century relative to 1986–2005 from the combination of the CMIP5 ensemble with process-based models, for RCP2.6 and RCP8.5.



Mean over 2081–2100





Counter Measures against CC

💧 Mitigation (slow down the speed of CC)

- ❄️ Reduce the emission of green house gases

- ❄️ Also good for energy saving, air pollution, energy security (\Leftrightarrow nuclear power), new industry (solar panel, eco-car, ...)

💧 Adaptation (reduce disasters due to CC)

- ❄️ Enhance the resilience of the society

- ❄️ Also solves the existing social issues: poverty, vulnerabilities for natural disasters, sustainable energy, health, food and agriculture, ecosystem, transportation, ...



Small Islands

- 💧 **Adaptation to climate change generates larger benefit to small islands when delivered in conjunction with other development activities, such as disaster risk reduction and community based approaches to development (*medium confidence*).**
- 💧 **Adaptation and mitigation on small islands are not always trade-offs, but can be regarded as complementary components in the response to climate change (*medium confidence*).**

Coastal Ecosystems

- 💧 Coral reefs, sea grasses and mangroves play an important role in protecting coastal communities from wave erosion, tropical cyclones, storm surges, and even moderate tsunami waves (Cochard et al., 2008).**
- 💧 Whilst coastal forests including both endemic and exotic species especially mangroves are seen as effective adaptation options ('bioshields' Feagin et al., 2010) in the coastal zones, they also play an important role in mitigation as carbon sinks (van der Werf et al., 2009).**
- 💧 Thus, the management and conservation of mangrove forests has the potential to generate synergies between climate change adaptation and mitigation.**

Remarks

- 💧 **Climate change poses **risks** for human & natural systems.**
 - ❄️ **Changes in both climate system and socioeconomic processes, including mitigation and adaptation, are drivers of hazards, exposure, and vulnerability.**
- 💧 **Adaptation and mitigation choices in the near-term will affect the **risks** of climate change in the 21st century.**
 - ❄️ **Should be/can be integrated into coastal and water resources management, environmental protection and land planning, disaster risk management, and sustainable development.**
 - ❄️ **Ecosystem-based approaches: coastal reforestation of mangroves, conservation agreements, community management of natural areas, protection of ecosystems for carbon storage and other ecosystem services, ...**

<http://www.climatechange2013.org/>

http://ipcc-wg2.gov/AR5/images/uploads/IPCC_WG2AR5_SPM_Approved.pdf

Thank You!