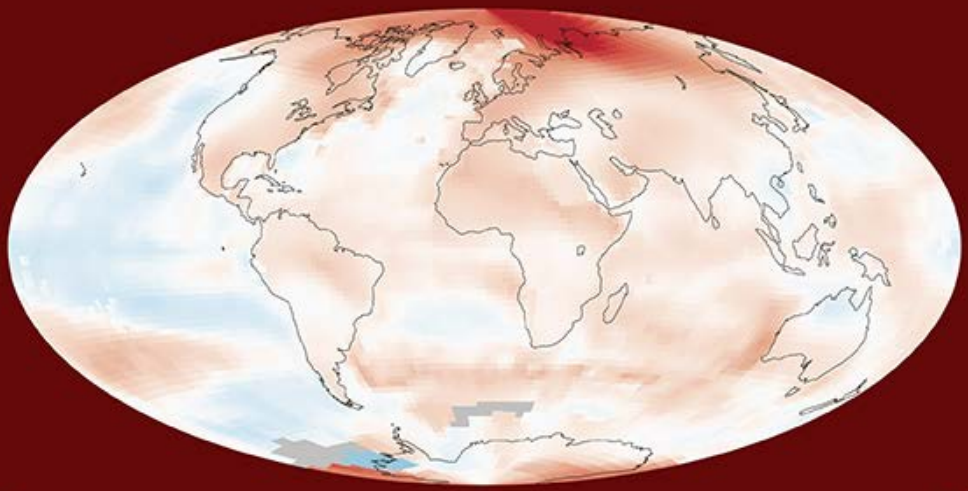
Projecting local sea level rise

Peter Guttorp

NR and UW

Advances in Statistical Climatology, Meteorology and Oceanography



An international open-access journal on applied statistics

Copernicus Publications
The Innovative Open Access Publisher

IPCC approach

Steric sea level rise directly from CMIP5 model projections

Eustatic slr from temperature projections forcing land ice melt models

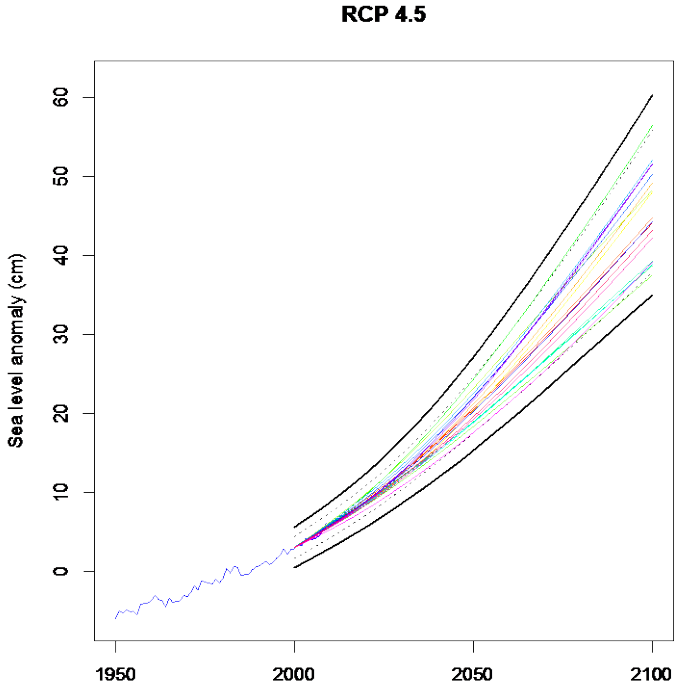
3 models in CMIP5 calculate slr

(one reports all zeros)

Semi-empirical approach

Relate historical sea level (change) to historical temperatures

Apply this relationship to projected temperatures

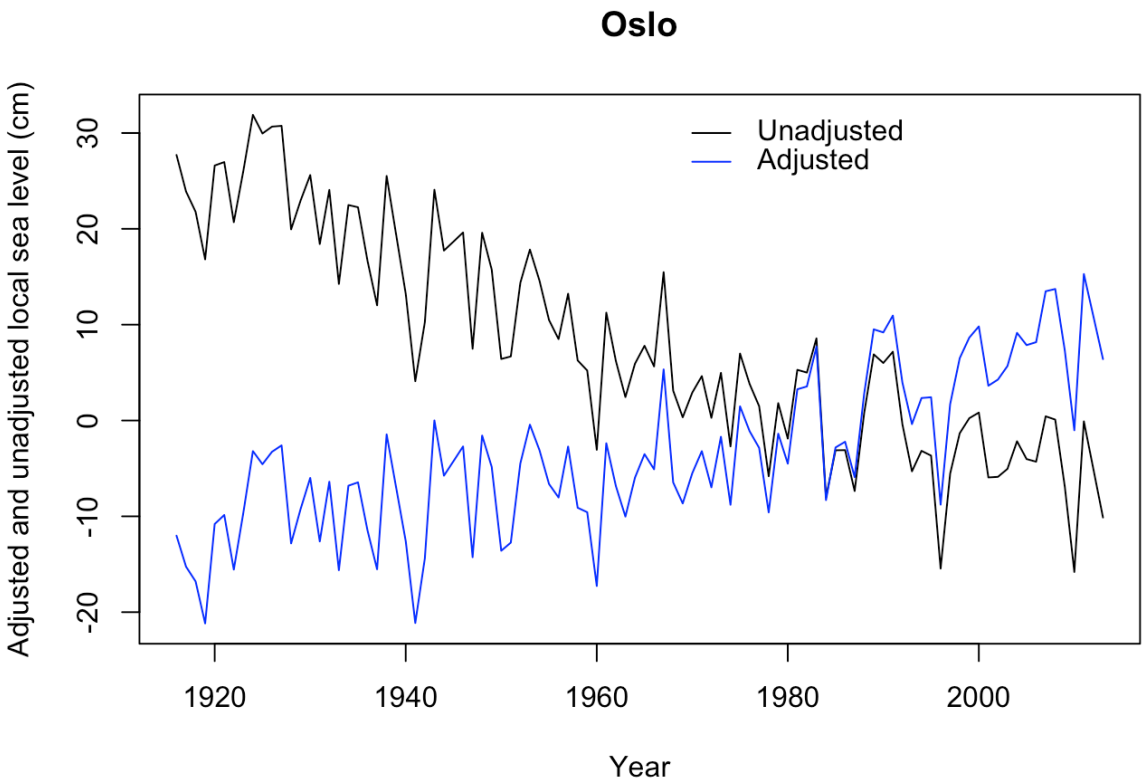


IPCC
33-68

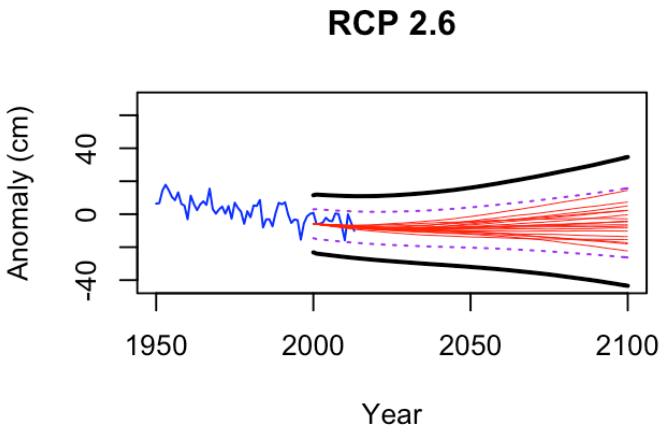
Local downscaling

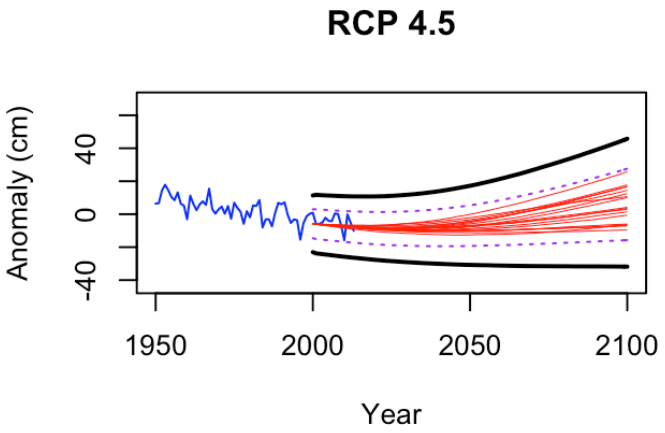
Relate local sea level to global sea level

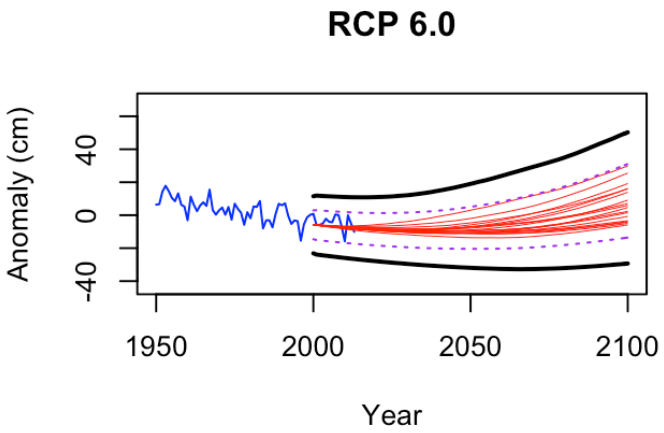
Glacial isostatic adjustment

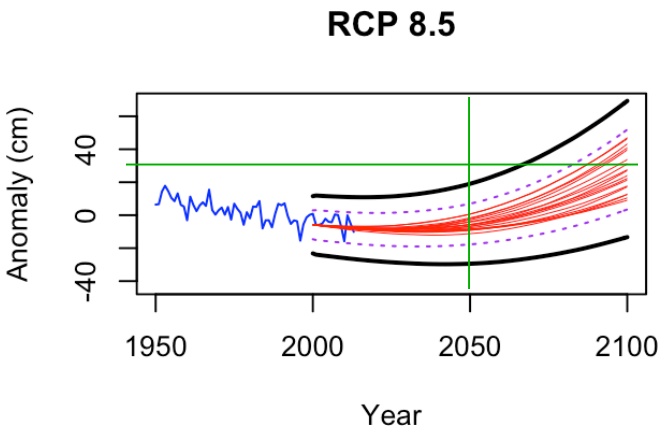


Results for Oslo







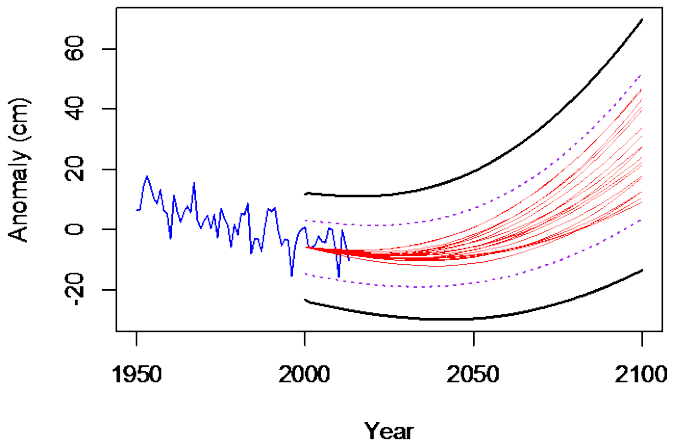


Another possibility

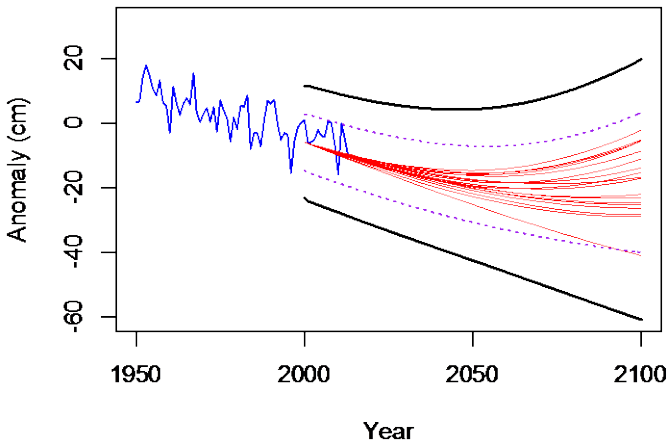
Relate global mean sea level to historical temperature model runs instead of observed temperatures

RCP 8.5

From observations



From models



What about extremes?

Worst case =

Mean sea level

+ (highest high tide – msl)

+ storm surge

Storm surge GEVD with location dependent on msl

Will hht change relative to msl?