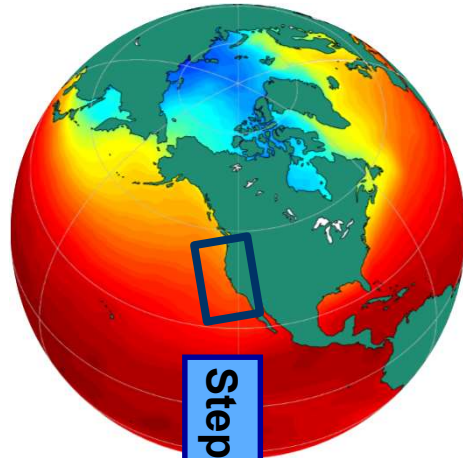


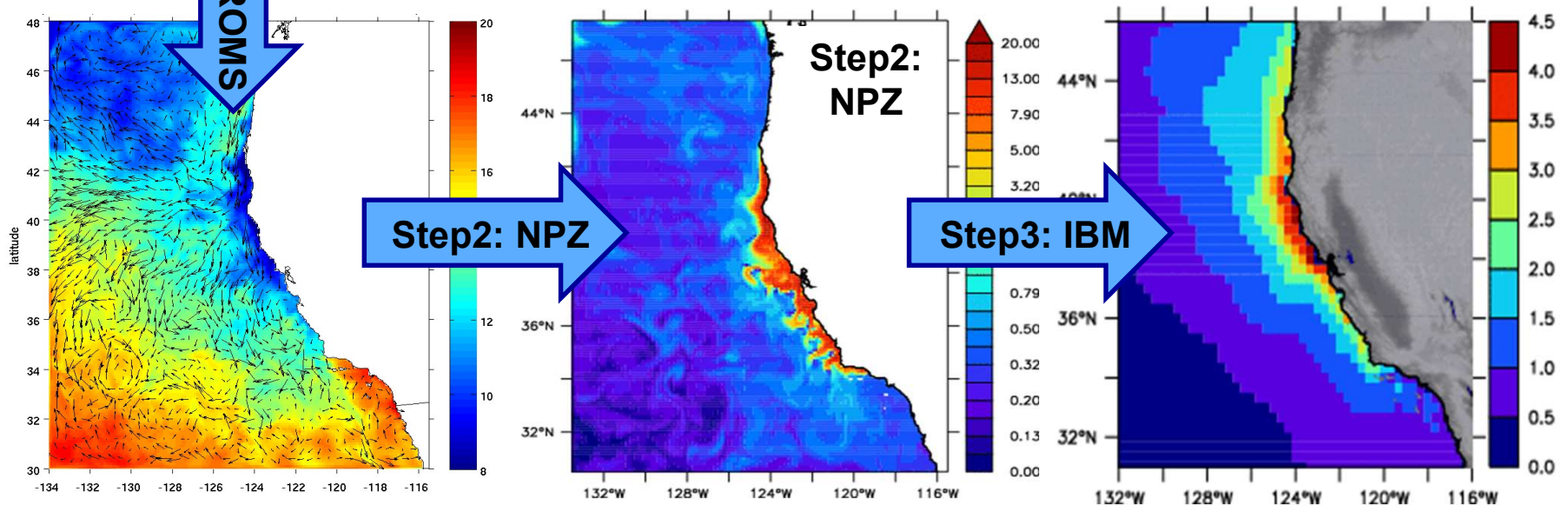
Climate to Fish: Global to Regional Downscaling



Step 1: Downscaling of global reanalysis (e.g. SODA) or earth system model (e.g. CMIP5) to regional ROMS model for CCS ($1^\circ \rightarrow 1/10^\circ$ resol).

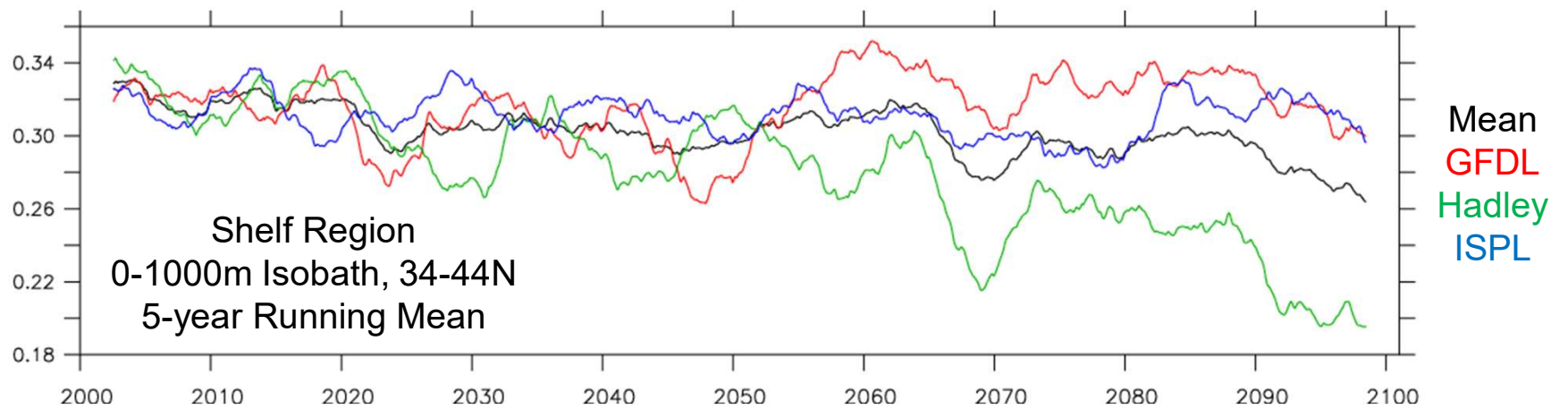
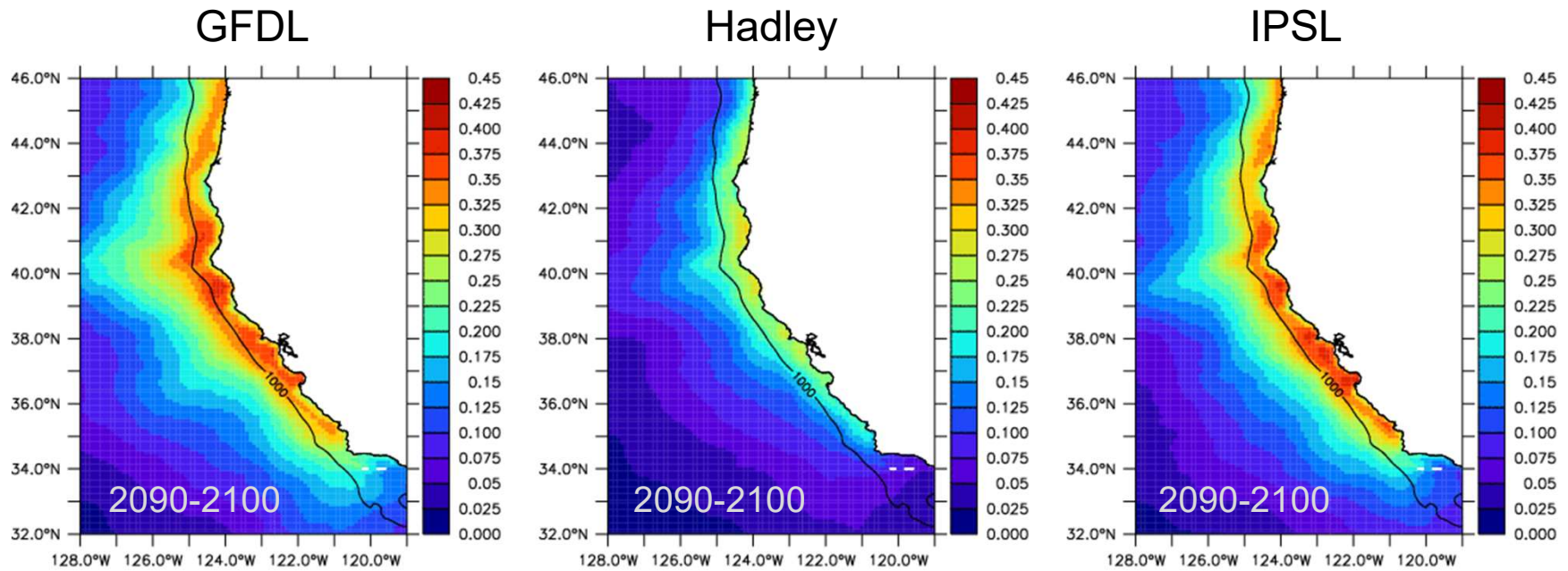
Step 2: Offline biogeochemical (NPZ) solution forced by downscaled physical solution

Step 3: Offline fish IBM forced by downscaled physical and biogeochemical solutions

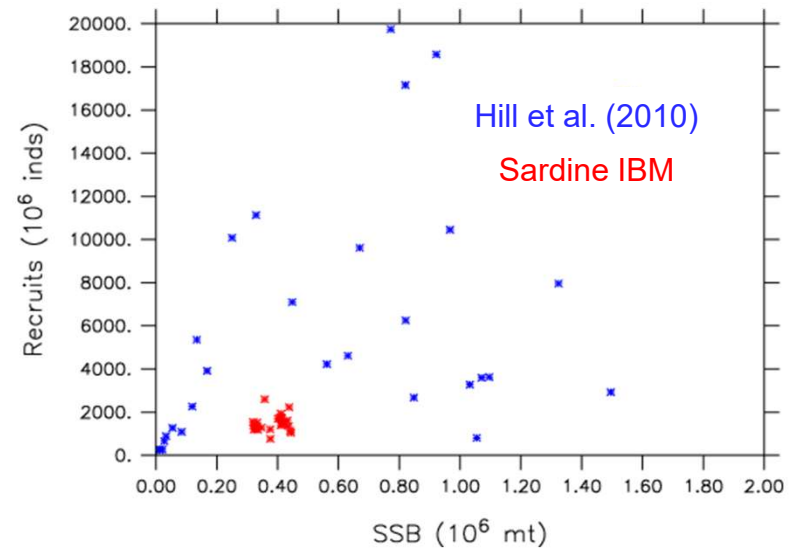
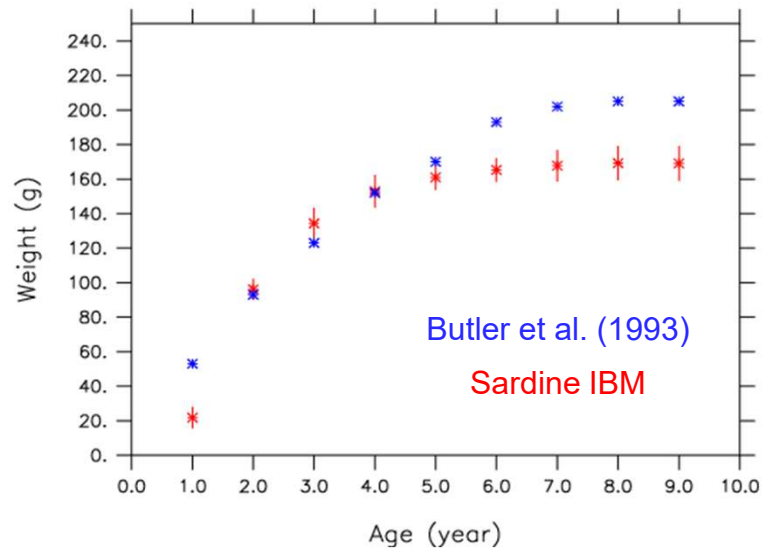
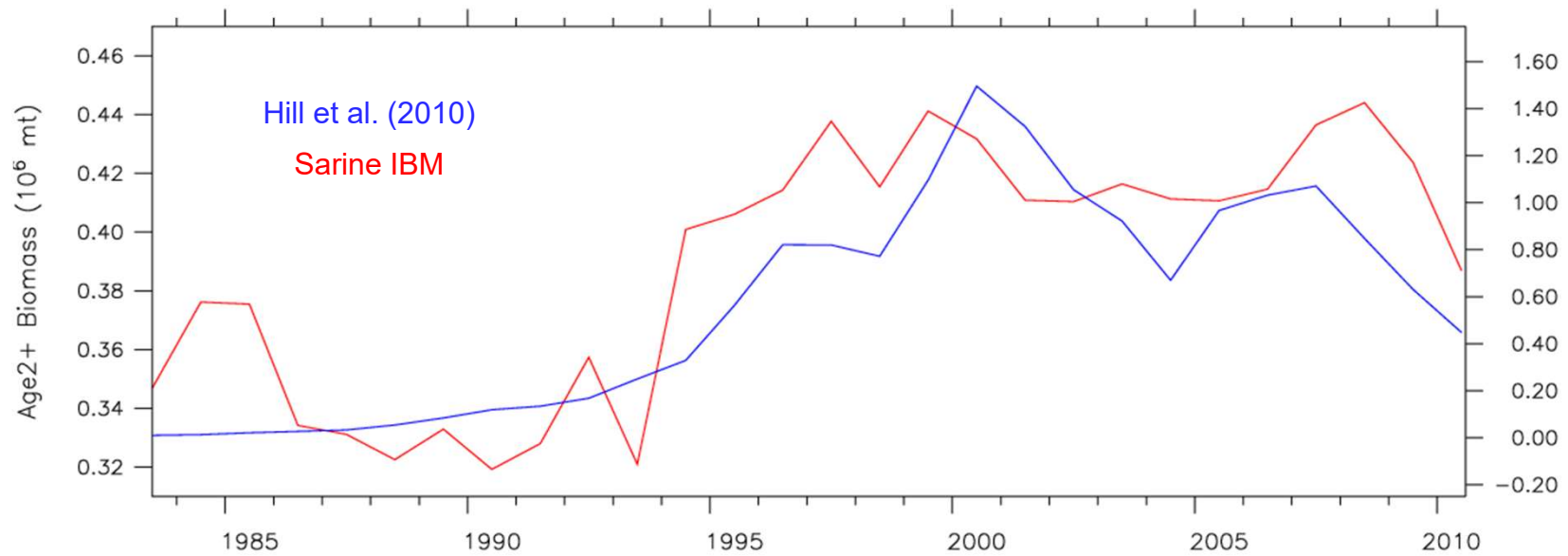


Contact: Jerome Fiechter, UC Santa Cruz, fiechter@ucsc.edu

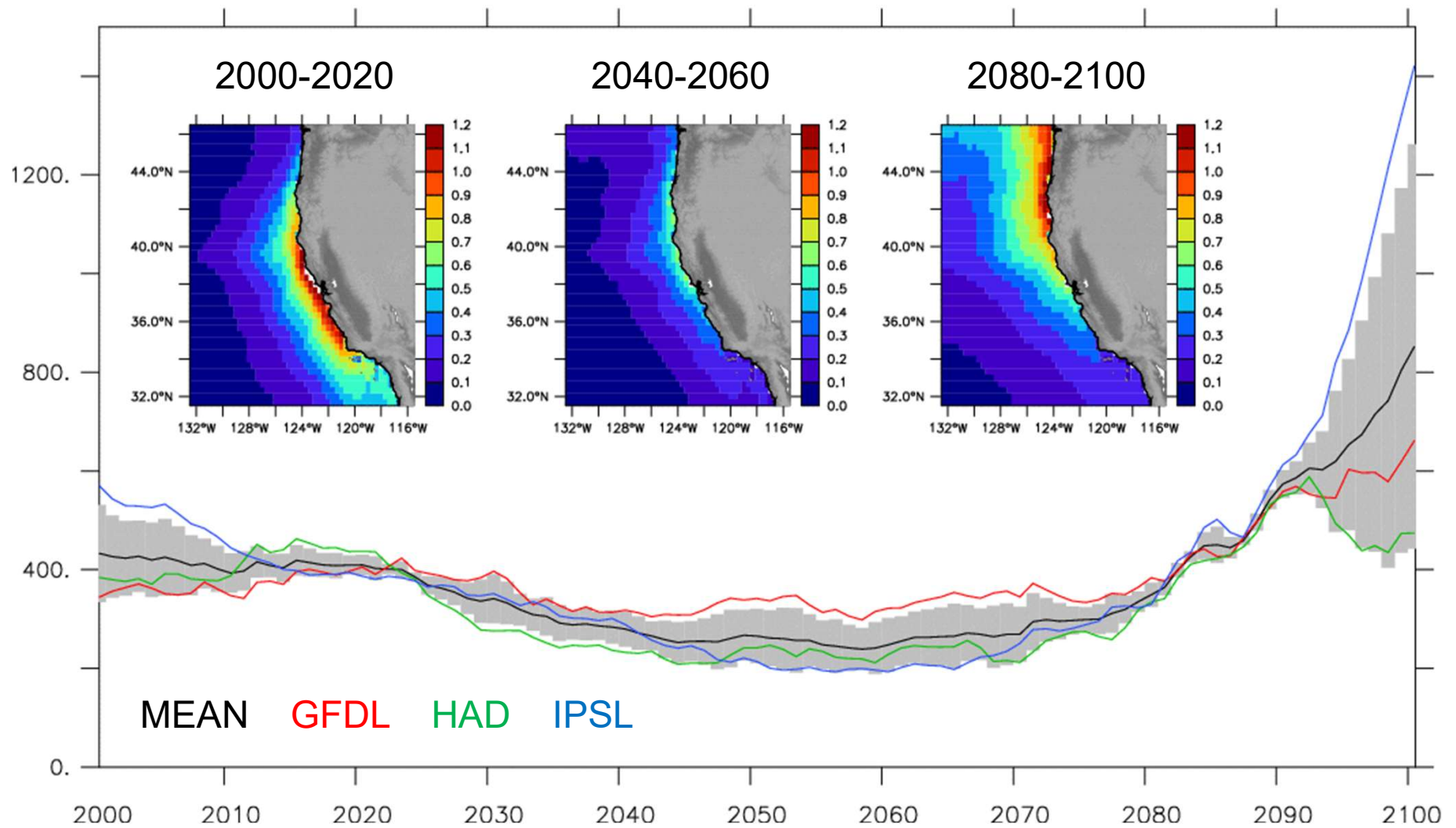
Regional Projections: Krill Abundance



Model Evaluation: Sardine Population Attributes



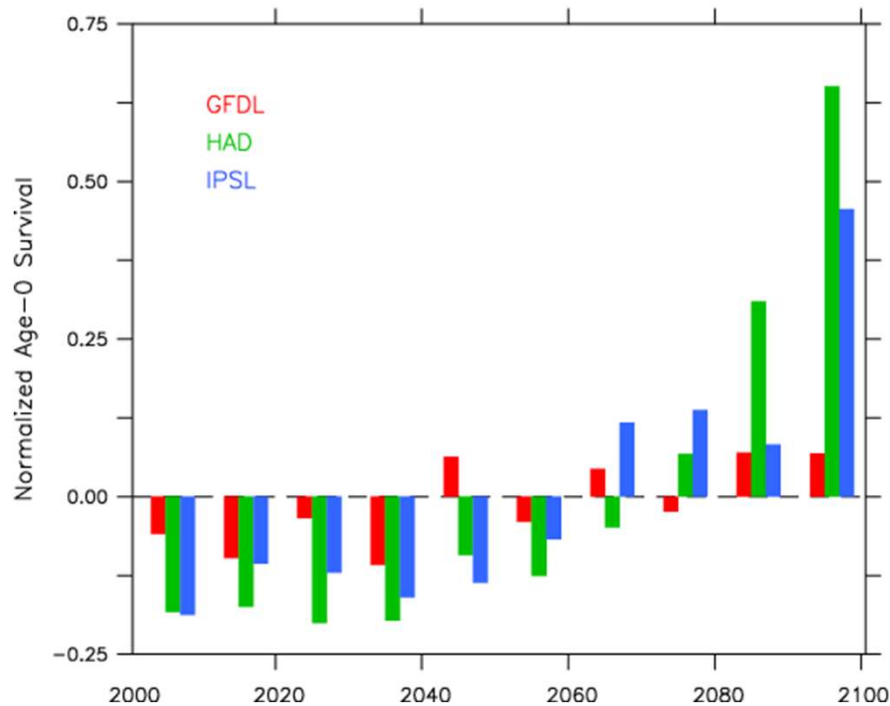
Regional Projections: Sardine Population



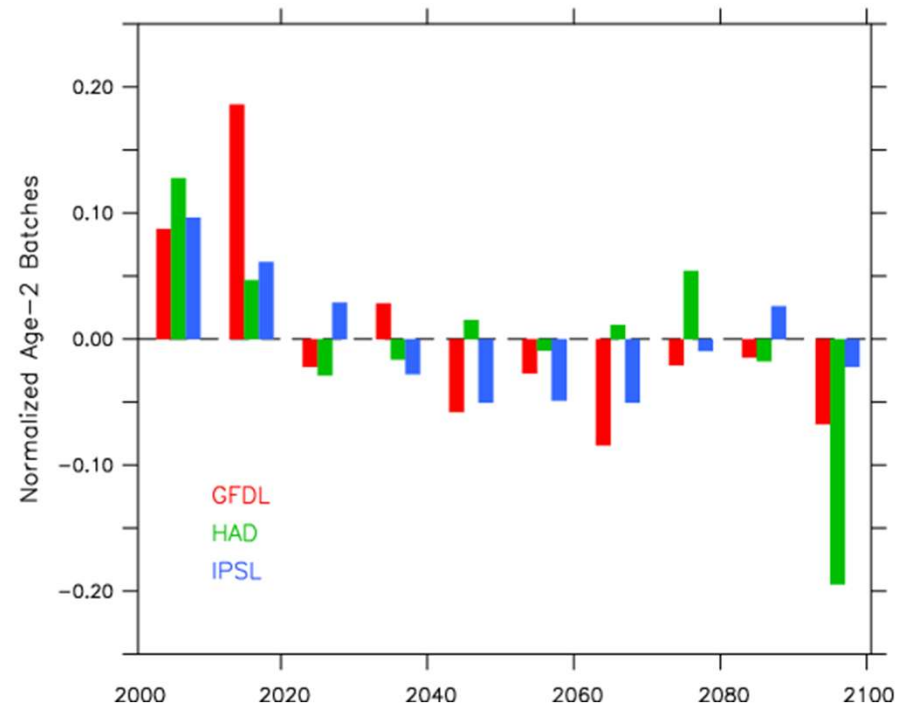
Projected change in annual sardine biomass (10^3 tons)

Regional Projections: Sardine Population

Drivers of projected change in sardine biomass

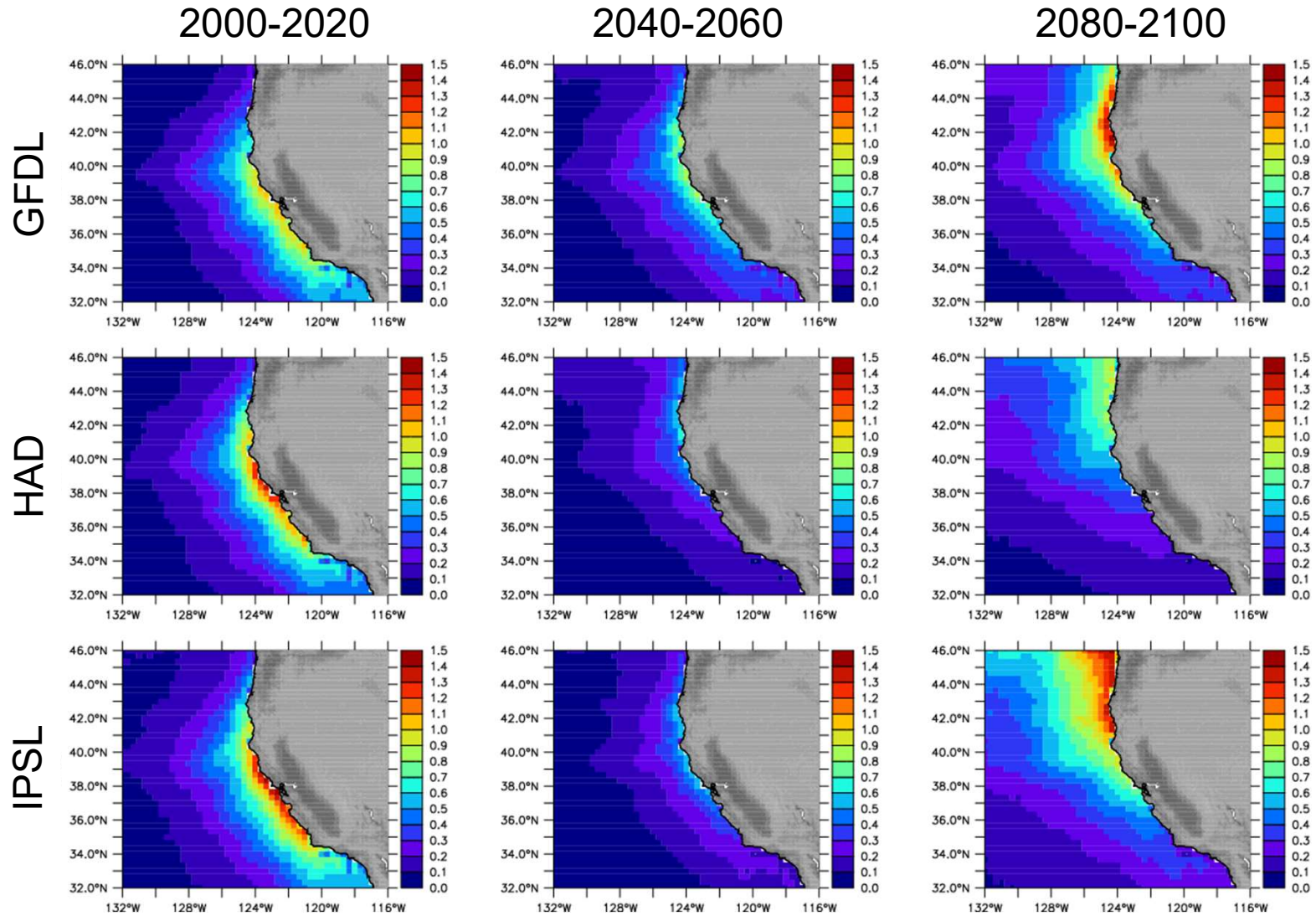


Relative change in early life survival to age-1 (temperature effect)



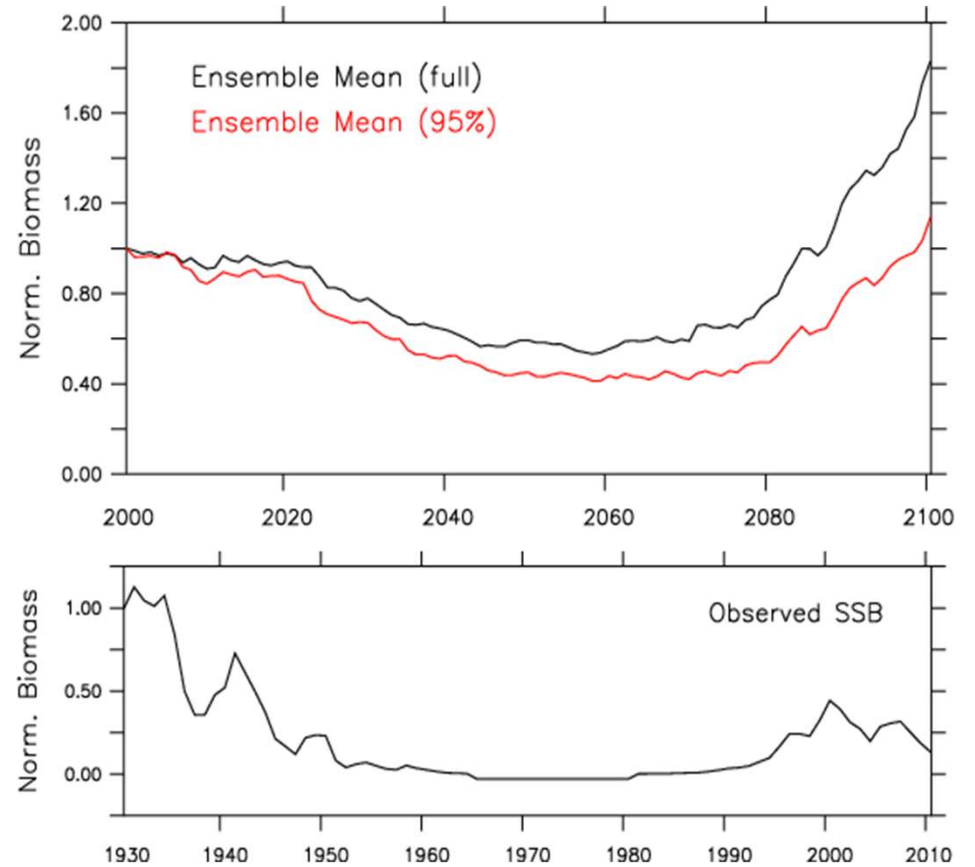
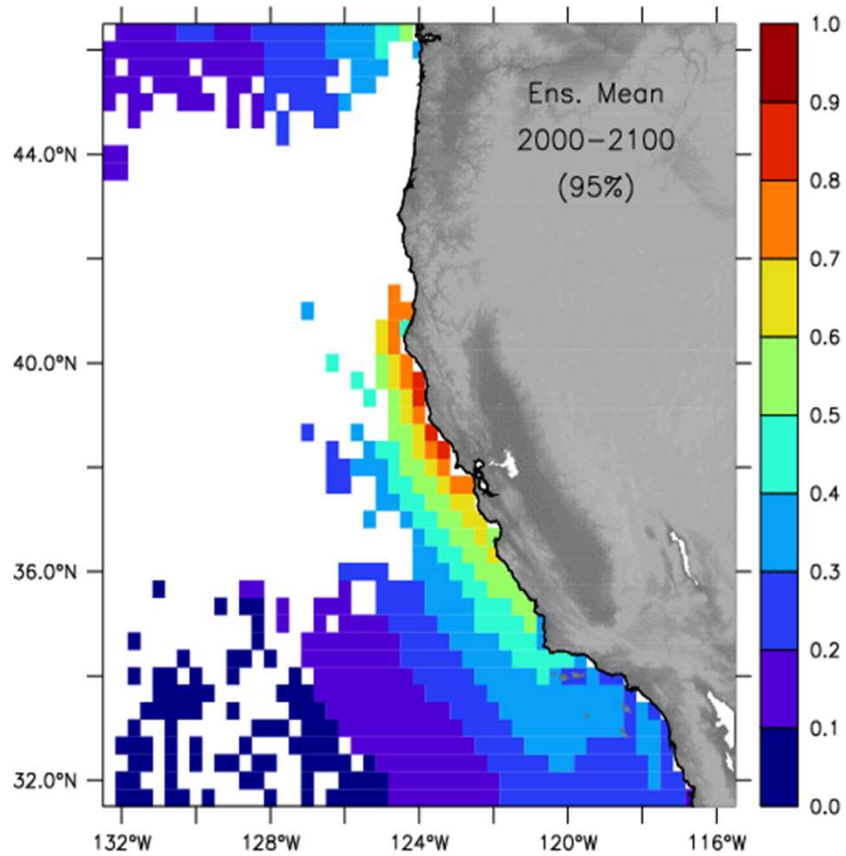
Relative change in age-2 batch production (prey/growth effect)

Regional Projections: Sardine Population



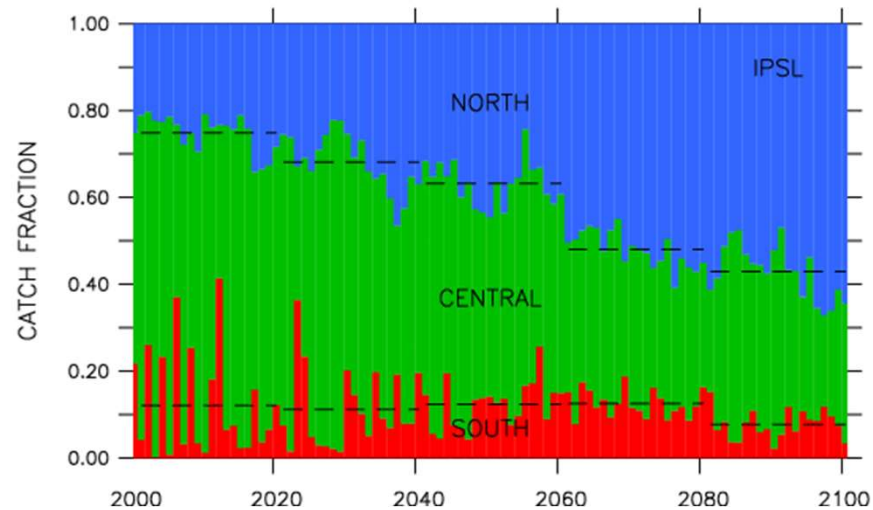
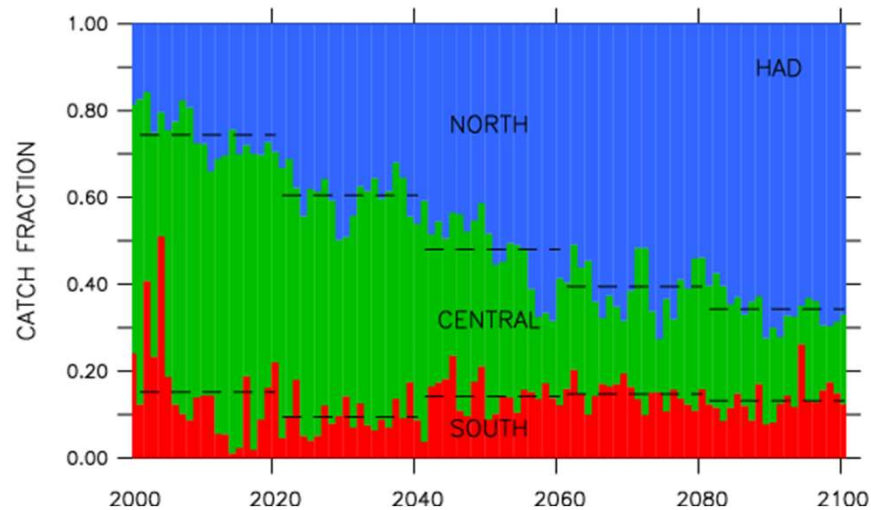
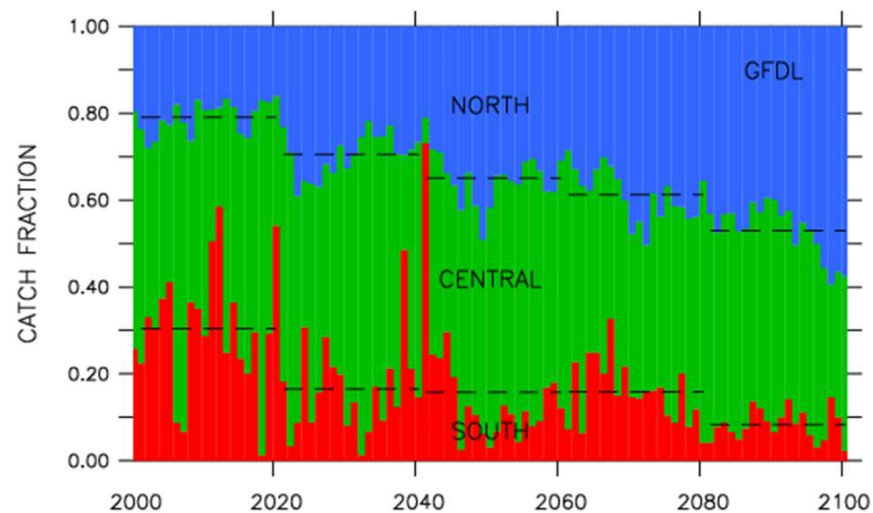
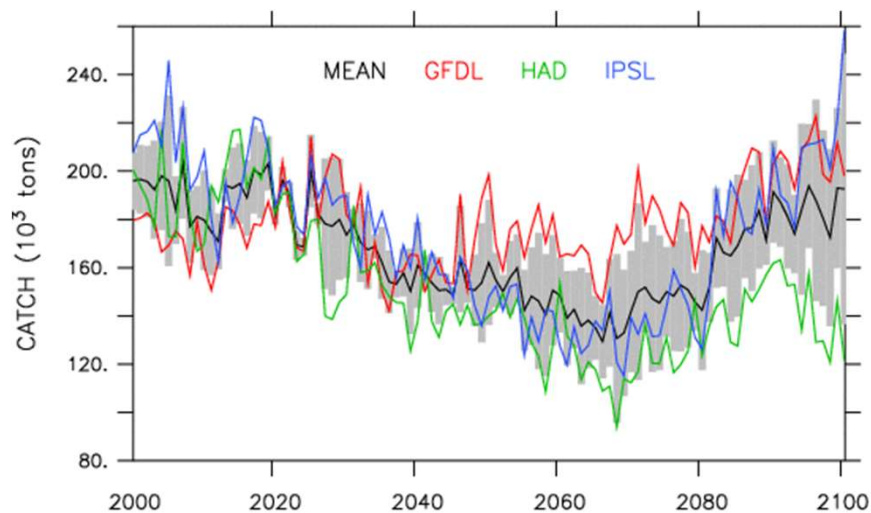
Projected change in annual sardine biomass (10^3 tons)

Regional Projections: Sardine Population



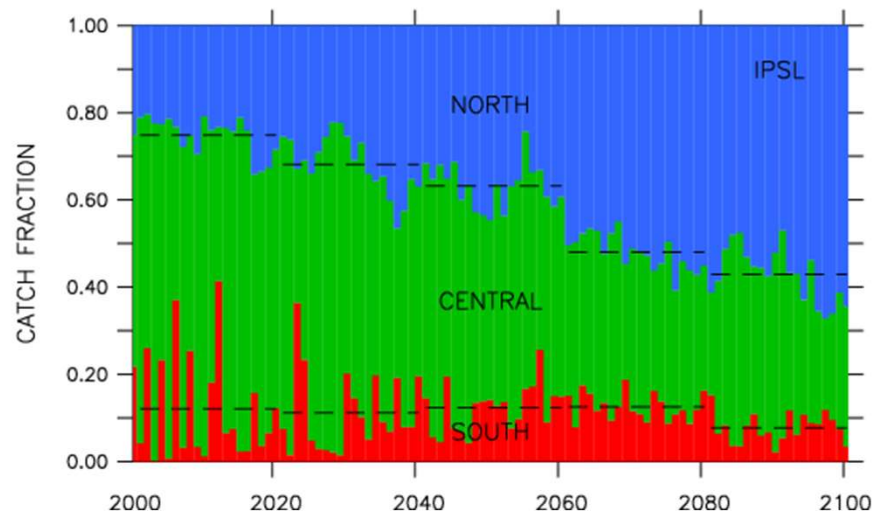
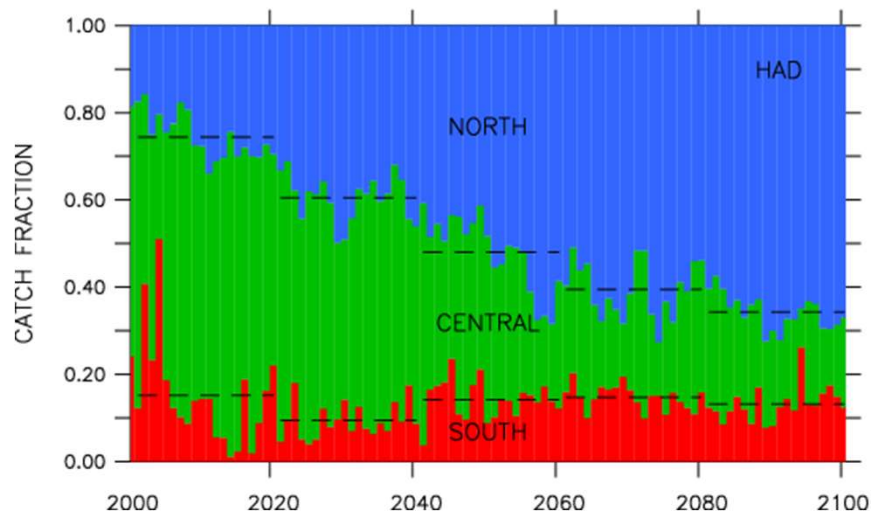
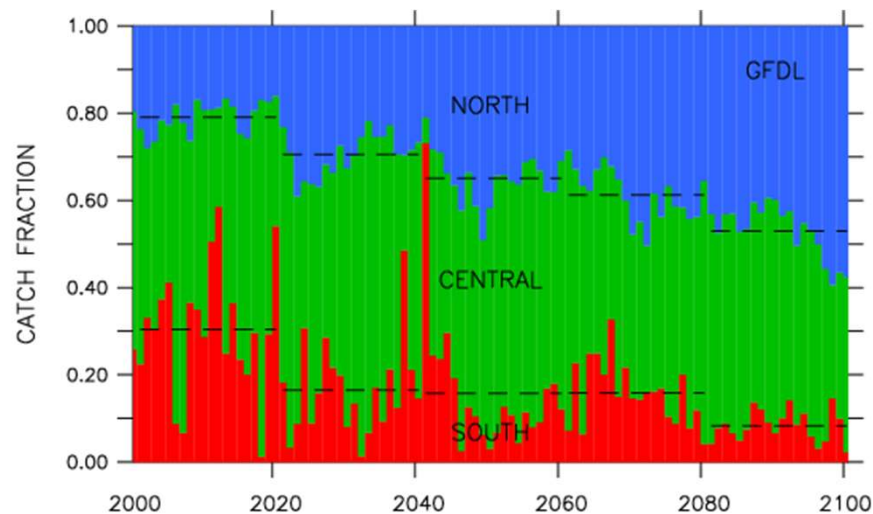
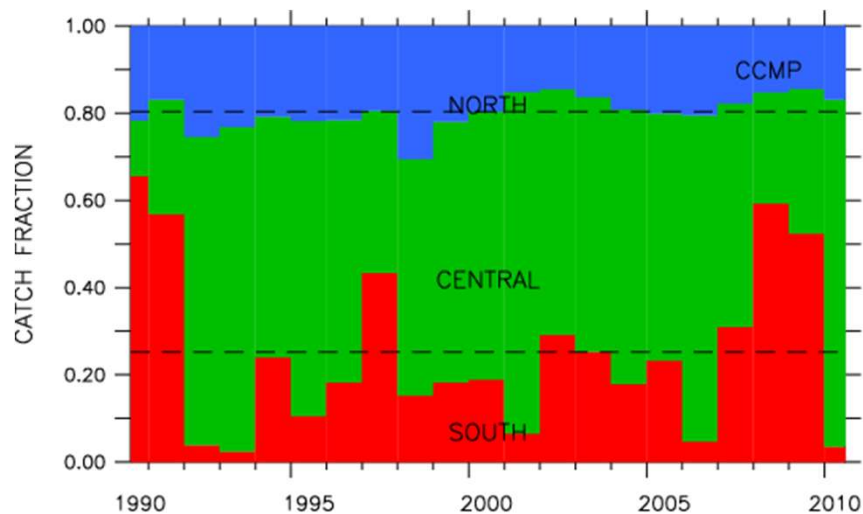
Projected change in annual sardine biomass (10³ tons)

Regional Projections: Sardine Fisheries



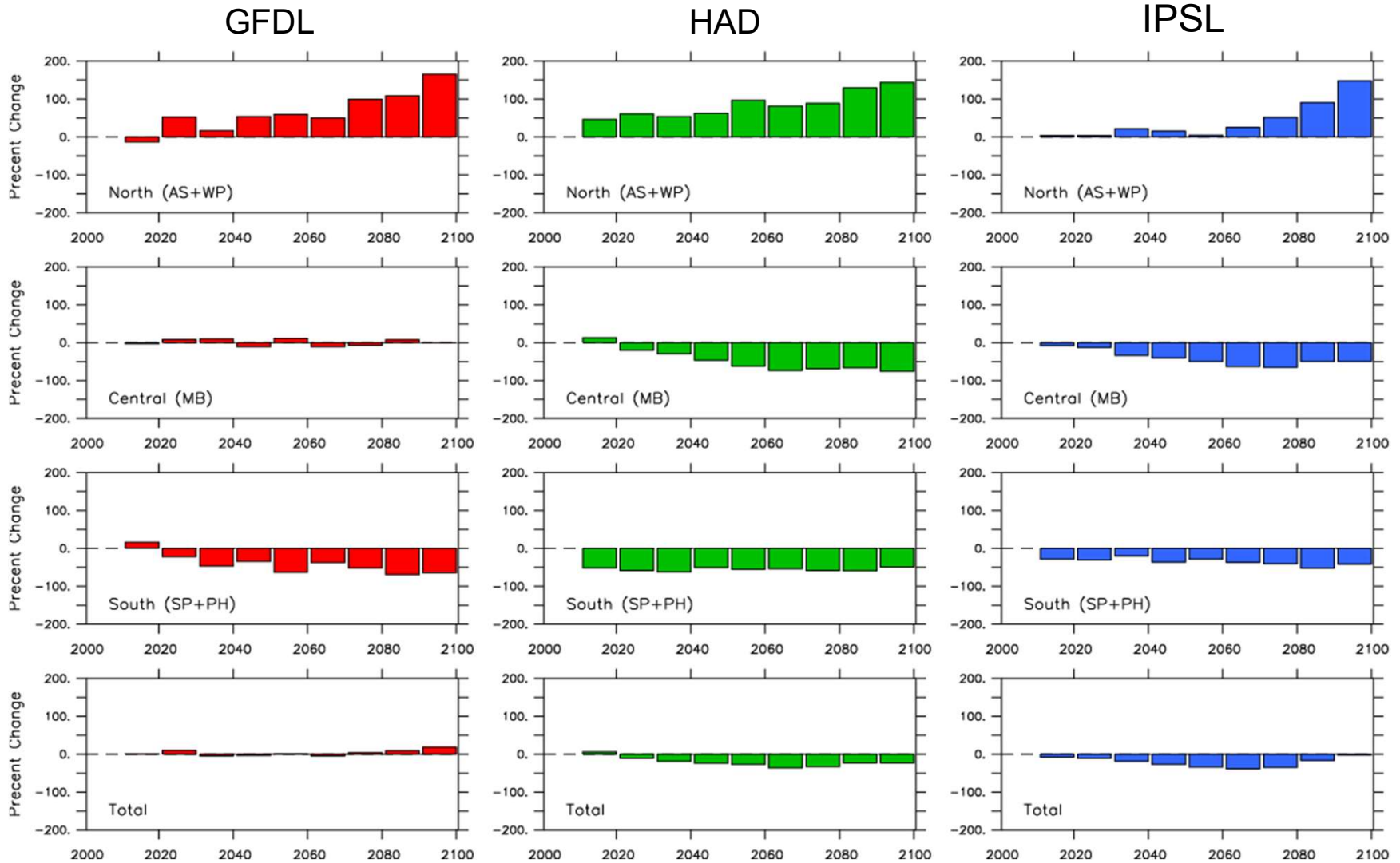
Projected change in annual sardine catch (10³ tons)

Regional Projections: Sardine Fisheries



Historical and projected change in annual sardine catch (10^3 tons)

Regional Projections: Sardine Fisheries



Projected change in annual sardine catch relative to 2000-2010