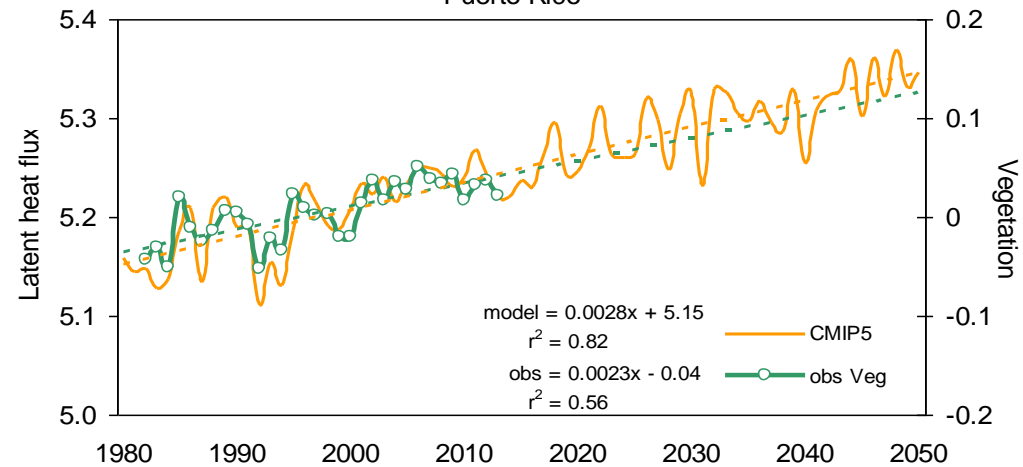
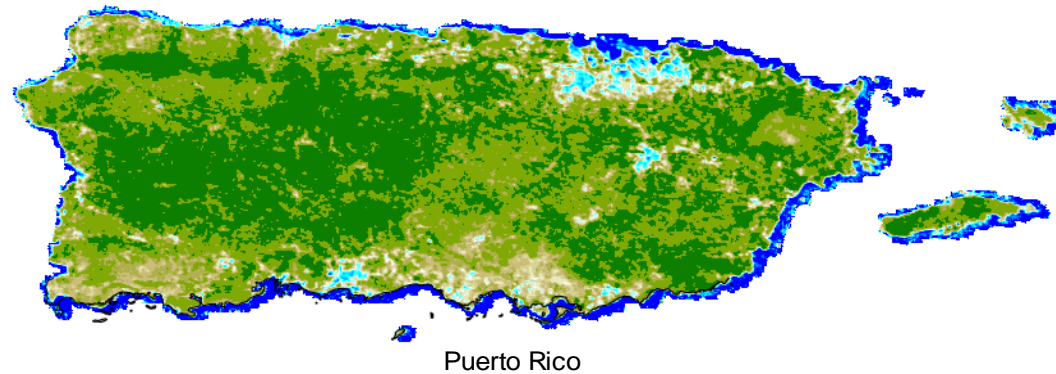
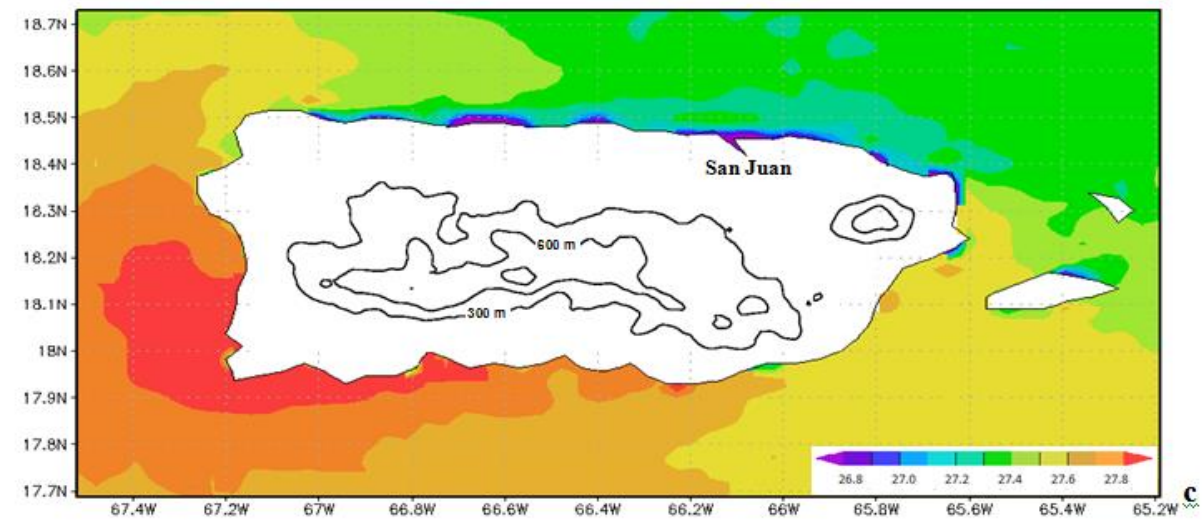
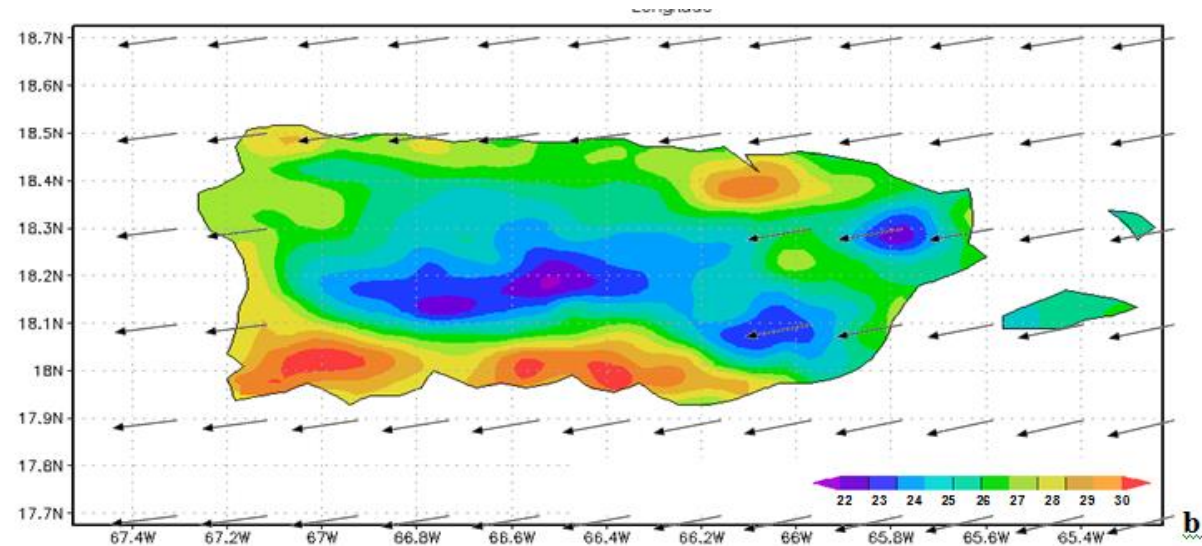


Climatic trends in Puerto Rico: observed and projected since 1980

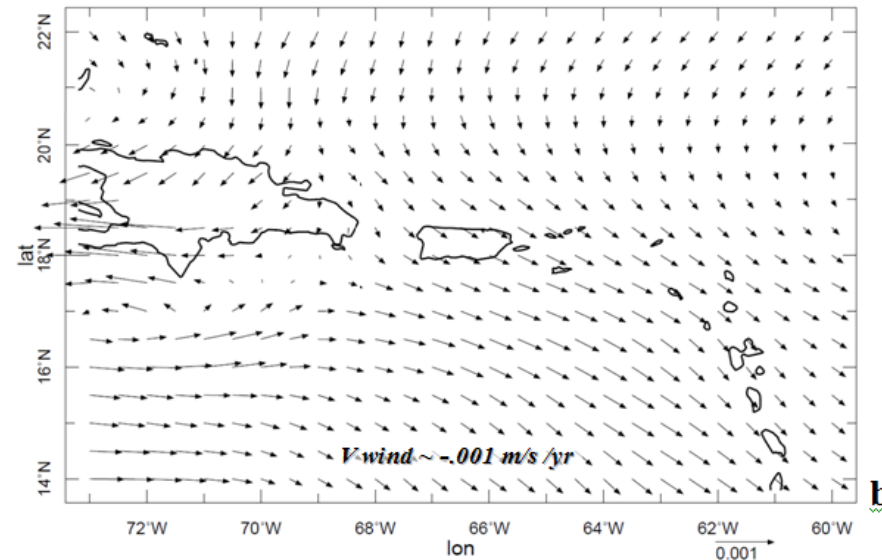
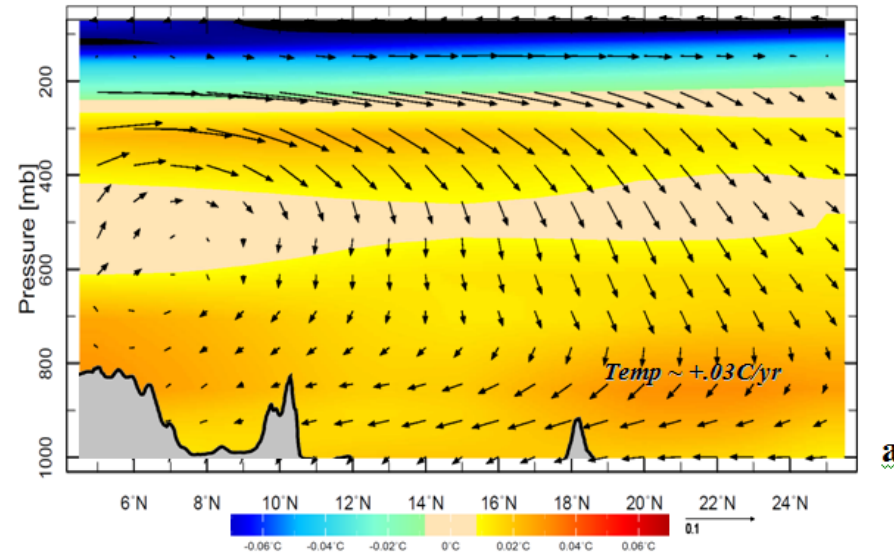
Mark Jury, Univ. Puerto Rico Mayaguez



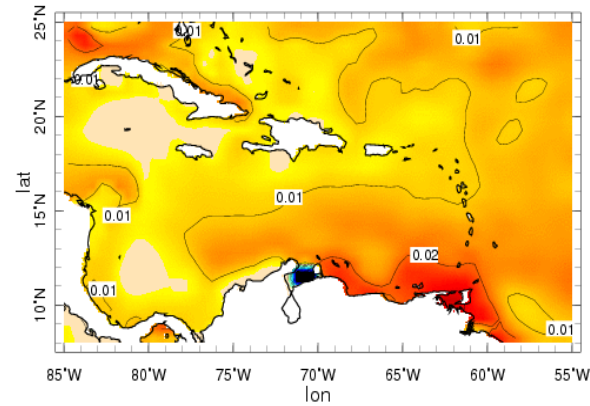
Mean land and sea temperatures



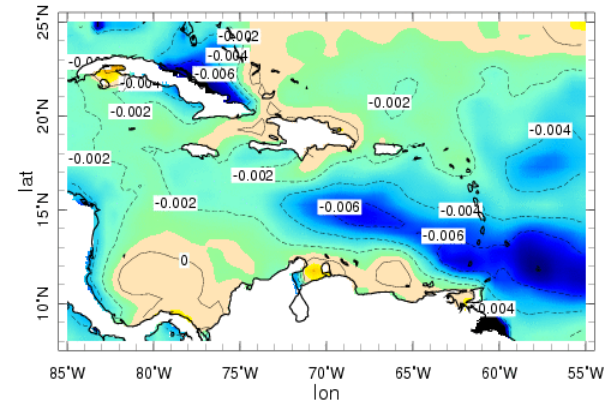
Hadley cell and surface wind trends



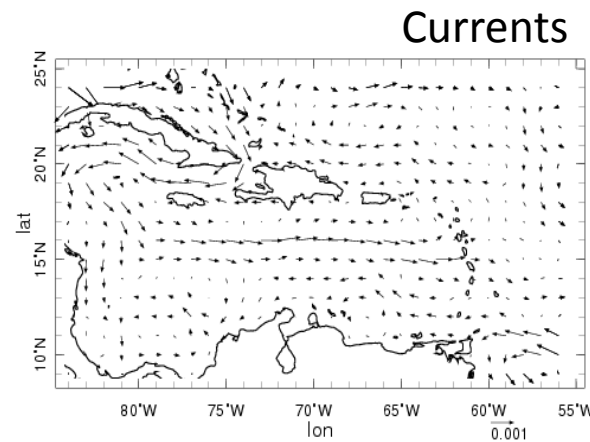
Marine trends



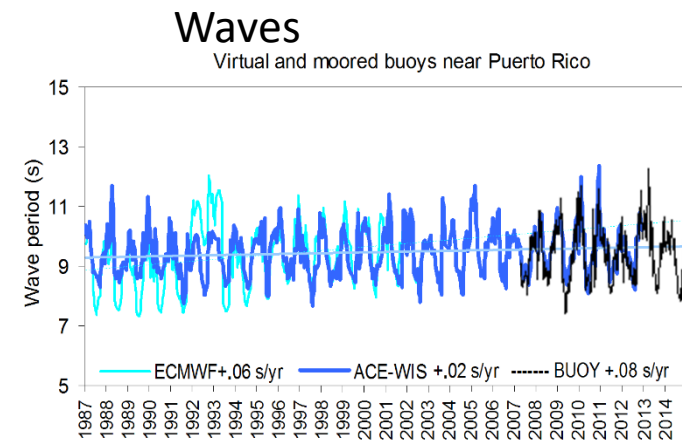
Temp 0-200m



Salinity



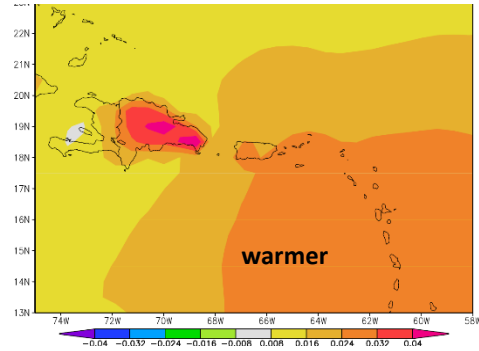
Currents



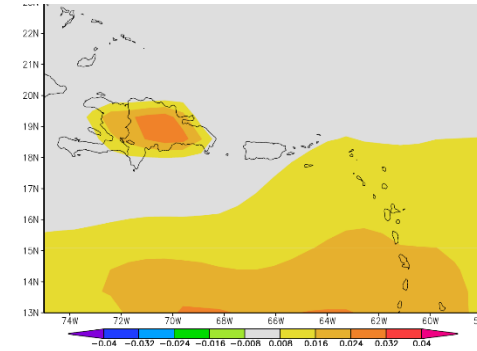
Waves

Virtual and moored buoys near Puerto Rico

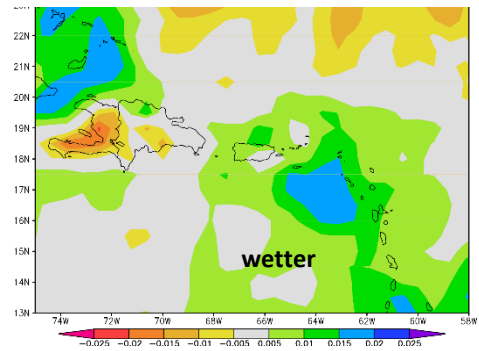
Reanalysis trends 1980+



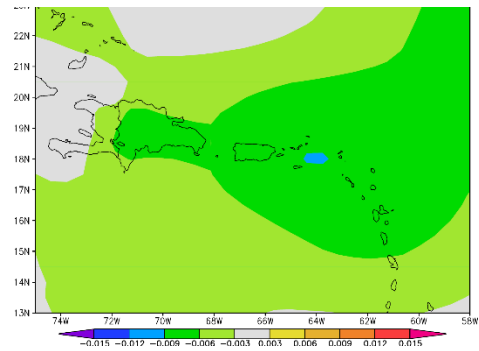
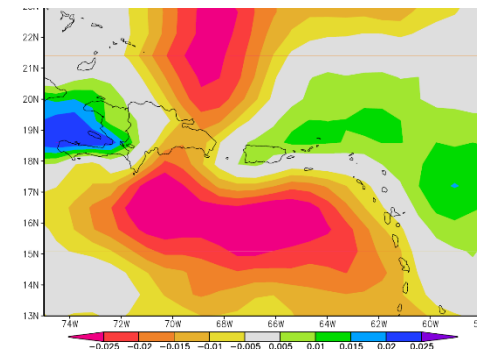
Air temp



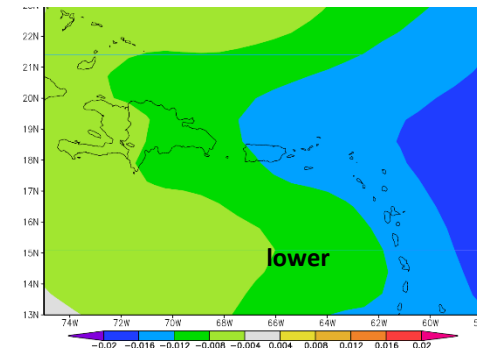
NASA (left)



Rainfall

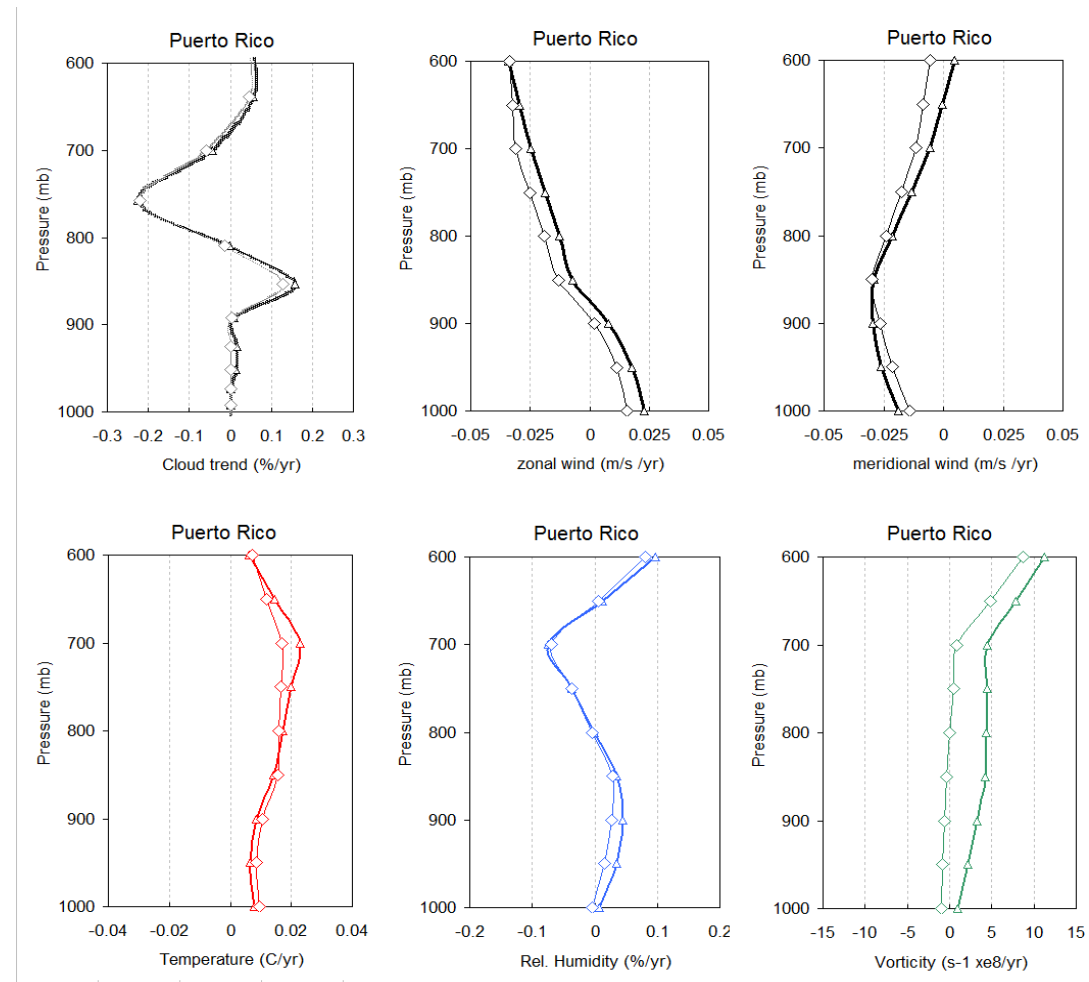


Euro (right)



Air press

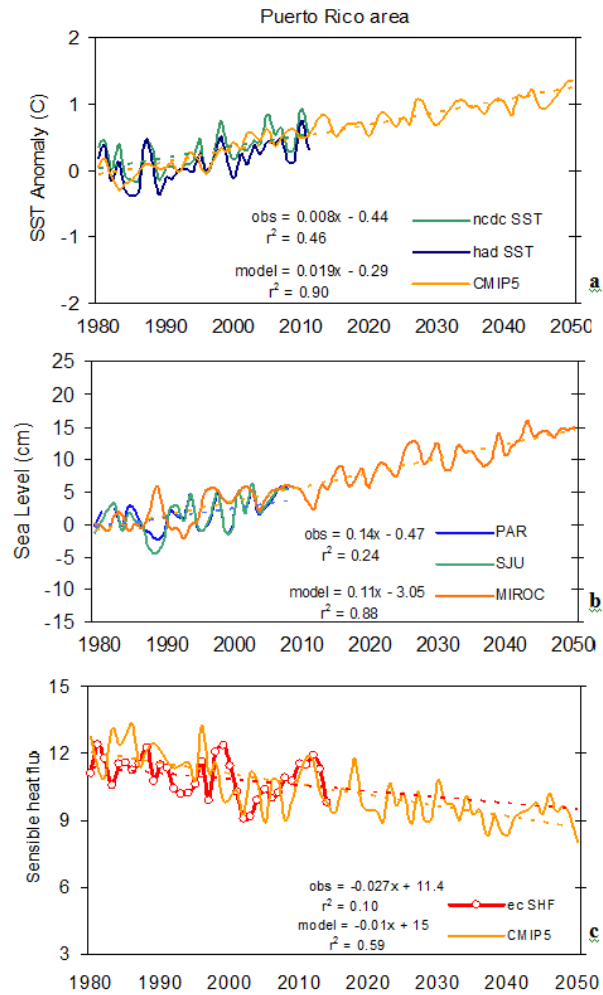
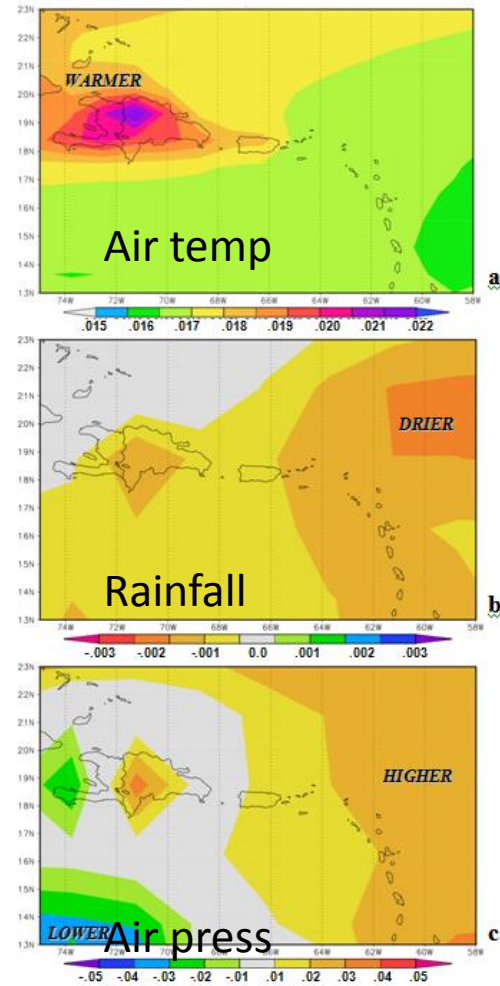
NCEP2 profile trends



thick line upstream east of PR

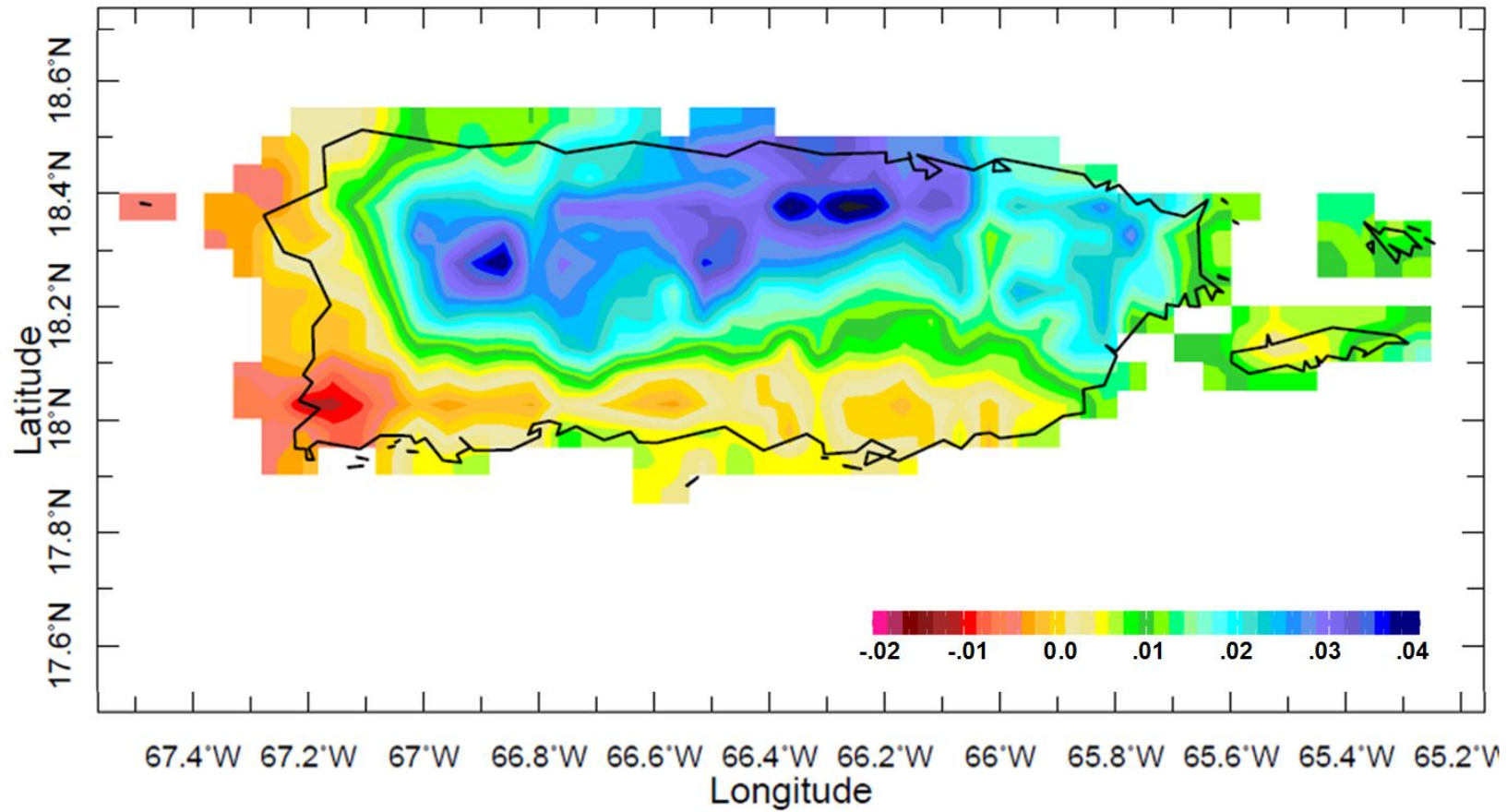
thin line downstream west of...

CMIP5 ensemble trends



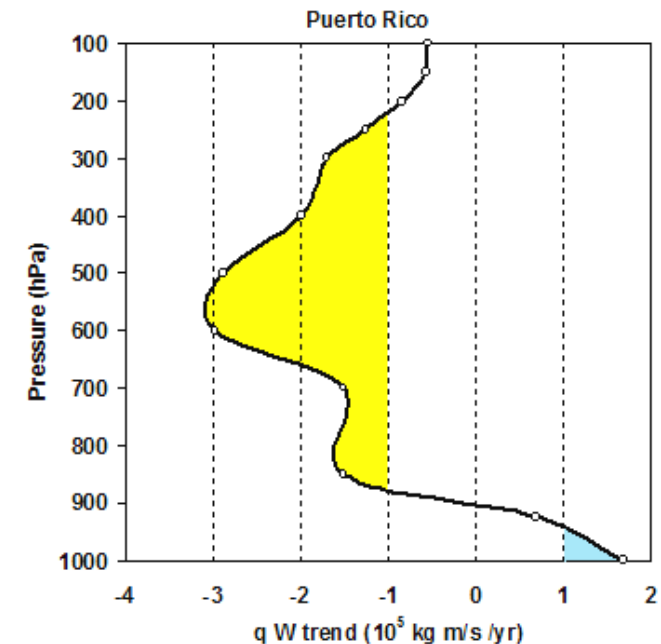
Rainfall trends

(gauges interpolated with satellite data at 5 km res)



Climate trends - summary

- This study has considered observed and CMIP5 projected climate trends in Puerto Rico, with a focus on change maps and time series since 1980.
- The Hadley circulation has accelerated and sinking motions have warmed the lower atmosphere faster ($+0.03^{\circ}\text{C}/\text{yr}$) than the underlying ocean ($+0.01^{\circ}\text{C}/\text{yr}$).
 - Increased evaporation and northerly winds drive upward trends in rainfall on the Atlantic coast, while the Caribbean side is drying.
 - Global warming enhances shallow clouds and vegetation, and inhibits deep convection around PR.
 - Trends in the satellite era are enhanced by the AMO.
 - Published in Climate Research 2015: 66, 113-123.



Two ways to deal with the key problem of receding beaches

- – reactive: CC scientists predict PR will have no beaches in 10 years, blame government inaction (on set-backs)
- + proactive: CC scientists working with tourism-oriented municipalities on low cost solutions to preserve PR beaches (via improved coastal access)

