



Future Climate Simulations over the Gulf of Fonseca (Central America) using CMIP5 models under Statistical Downscaling

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Thanks to the CMIP5 (Coupled Model Intercomparison Project Phase 5), a set of Global Climate Models have been made available for its use in climatic studies, particularly for downscaling studies. We have used a two-step analog statistical downscaling method that has been widely used in Europe, and that has been successfully adapted to Central America. The study area is the Gulf of Fonseca, a gulf in Central America bordering Honduras, El Salvador, and Nicaragua. We have downscaled three global climate models in order to evaluate future climate projections, using available RCPs (Representative Concentration Pathways), the historical experiment as simulation of recent past, and the NCEP/NCAR Reanalysis for the observed data / simulated climate linking.

The first step of our statistical downscaling method is an analog approach, and the adaptation for Central America uses the daily wind (eastward wind and northward wind, both in its mean daily value) for selecting the analogues; in a second step, we have used multiple regression for simulating daily temperatures and an empirical probability distribution function – one for every simulated month – for simulating daily precipitation.

The results allow us to study different future climate projections for daily maximum and minimum temperature and precipitation over our study area. These results are being used to define policies for the adaptation of the different natural and human systems to climate change effects – which has social and economical effects.

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