Development of A High-Resolution Simulation of the Gulf of Mexico Suitable for Climate Change Studies

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Abstract

The Gulf of Mexico is a hotspot for climate change and hosts a unique array of air-sea coupled dynamics, such as the Loop Current and coastal upwelling zones, requiring a carefully tailored modeling approach to understand and project its future climate state. In this presentation we discuss a regional climate modeling framework using HYCOM and boundary forcing provided by a climate model large ensemble to simulate both present-day and future climate in the Gulf. This ensemble approach allows for a detailed characterization of anticipated surface warming and trends in other ocean fields such as ocean currents and salinity. It also enables a broader characterization of the Gulf's energy budget and its connections to climate change, aspects that are covered in this presentation.