

Eastern Tropical Oceans Synthesis Working Group (ETOS WG)

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A US CLIVAR Working Group (WG) was announced in February 2011, on “Eastern Tropical Ocean Synthesis”. An unresolved problem spanning several decades is that of warm SST biases in the eastern tropical Pacific and Atlantic Oceans of coupled climate models. Field programs such as the VAMOS-sponsored VOCALS (2008) are making great strides in providing process-level observations of the ocean and atmosphere that will improve representation of cloudy boundary layers in climate models. Insufficient clouds is a known contributor to warm SST errors. Residuals in the heat budget imply cooling by ocean circulation maintains the observed SST distribution, in particular eddy-mixing, though the precise mechanisms are less clear. Monsoons of the American and African continents influence the trade winds that in turn help establish the equatorial cold tongue. The interests of the ETOS working group couple closely to VAMOS interests in predicting the pan-American monsoon, modeling and predicting SST variability in the pan-American seas, and improving the prediction of droughts and floods.

This new working group has begun to tackle a small portion of this challenging problem, beginning with the essential task of building on existing observations and modeling activities to quantify the effect of ocean eddies in the Pacific. While scientific understanding has led to improvement in coupled climate simulations of the Pacific, model errors persist largely unabated in the Atlantic. In the Atlantic, a first step will be to develop an observational-model surface heat budget comparison for a number of CMIP5-generation models. This comparison will coordinate the scientific community to hypothesize processes that explain the eastern Atlantic Ocean heat budget. The working group will also prioritize which measurements are most-needed to constrain the heat budget.