

A regional climate with global impacts: The Southeastern Tropical PacificCarlos Mechoso[†];[†] University of California Los Angeles, USALeading author: mechoso@atmos.ucla.edu

Climate variability in the southeastern tropical Pacific (SEP) is important by itself and by its impacts on the global climate via teleconnections. The SEP is crucial in events of interannual variability such as El Niño/South Oscillation. Also, the nearshore strip off the tropical and subtropical west coast of South America is the longest and perhaps the most productive area of the world's ocean in terms of pelagic fisheries. The climate of the SEP is extremely complex, resulting from interactions between clouds, aerosols, marine boundary layer (MBL) processes, upper ocean dynamics and thermodynamics, coastal currents and upwelling, large-scale subsidence, regional diurnal circulations, and the aerosol from natural and anthropogenic sources. As a consequence of such complexity, coupled general circulation models (CGCMs) have important systematic errors in the region, which must be overcome to increase the reliability of climate predictions. Recognizing the fundamental importance of the SEP, the international community has assembled under the World Climate Research Programme (WCRP) a comprehensive observational and modeling program to study the SEP climate system in unprecedented detail: VOCALS (VAMOS Ocean-Cloud-Atmosphere-Land Study). This talk presents key findings of VOCALS, with an emphasis on the project's modeling component in the context of new observations from the field component. The focus is on the improvement in the MBL parameterization and in the simulation of the regional oceanic circulation by CGCMs. It is shown how these findings have contributed to the reduction of errors in the SEP by major contemporary CGCMs. It is argued that a region with a climate determined by similar physical processes - the southeastern tropical Atlantic - presents additional difficulties that can motivate another international research effort.