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Forecasting ENSO Impacts on Marine Ecosystems of the US West Coast

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The US West Coast eastern boundary upwelling system supports one of the most productive marine ecosystems in the world and is a primary source of ecosystem services for the US. Long-term historical bio-physical observations in this region since the 1950s have lead to an excellent foundation for understanding the ecosystem impacts of dominant climate fluctuations such as the El Niño-Southern Oscillation (ENSO). In the Northeast Pacific, ENSO impacts a wide range of physical and biotic processes including temperature, stratification, winds, upwelling, and primary and secondary production. The El Niños can result in extensive geographic range displacements and altered catches of fishes and invertebrates. However, despite empirical observations and understanding of the coupling between climate and marine ecosystems along the US West Coast, there has been no systematic attempt to use this knowledge to forecast marine ecosystem responses to individual ENSO events. ENSO forecasting has become routine in the climate community, however, little has been done to forecast the impacts of ENSO on ecosystems and their services. This becomes especially important in light of the strong 2015-16 El Niño and the climate model predictions that ENSO extremes may become more frequent. This talk synthesizes the discussions from a recent workshop focused on developing a framework for using ENSO forecasts to predict changes in the marine ecosystem off of the US West Coast, and outlines the ongoing efforts in developing a joint CLIVAR/PICES working group on "Climate and Ecosystem Predictability”

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