A Dynamics-based Approach to Ocean Observing Network Assessment and Design in the Tropical Pacific

The Tropical Pacific is home to the El Nino-Southern Oscillation (ENSO), arguably the largest mode of large-scale, large-amplitude seasonal to interannual variability of the global climate system. There are suggestions that the frequency of extreme El Nino events will double over the coming century, with potentially severe and far-reaching impacts on agriculture, ecosystems, and economic activity. As a result, monitoring ENSO for improved prediction and understanding of future change is a recognized priority for safeguarding human health and security worldwide and a core element of the Tropical Pacific observing system (TPOS) mission. The TPOS 2020 Project (TPOS2020) has aimed to deliver an updated observing strategy - harnessing new sampling technologies and less susceptible to compromise - but raised concerns that array reconfiguration may hinder trend evaluation and anomaly detection. This highlights the need for a fundamentally dynamics-based approach to observing system assessment/design, offering a rob

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