WPI-AIMEC: Connectivity and non-linear interactions across spatiotemporal scales of variability

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Theme 1 of the newly formed WPI Advanced Institute for Marine Ecosystem Change seeks to decipher climate-ocean-ecosystem interaction and regime shifts. In this presentation, we will introduce the sub-theme on the connectively and nonlinear interactions across temporal and spatial scales of variability. Scales of interest range from basin-size and to the ocean mesoscale and submesoscale, and from decadal to days, and include water mass distribution and their variability, modes of climate variability such as El Niño and as encompassed by the Pacific Decadal Oscillation, to eddy scales and associated air-sea interaction. Analyses will include classical linear covariance structures and spectral characteristics and coherences, and then expand to consider nonlinear processes. Dynamical framework range from stochastic models to nonlinear regimes that enable rapid transition. We will discuss examples and outline the proposed research.

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