

Diurnal Jets and Fresh Jets: Challenges for the Tropical Pacific Observing System

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Because of the weak winds that characterize the western equatorial Pacific, near surface stratification can form that can trap wind-generated momentum into a thin surface-intensified jet. For example, daytime warming can lead to near-surface “warm layer” that has a skin temperature several degrees warmer than the foundation temperature just a few meters below. Wind forcing acting on this diurnal warm layer results in a “diurnal jet” that has maximum amplitude approximately in phase with the “warm layer” stratification. Likewise, rainfall can lead to a near-surface halocline and surface-intensified “fresh jet”. The impact of these jets on mixing and advection can have surprisingly large impacts on the ocean and climate systems. Understanding these impacts may require a process study. If these impacts can lead to better predictability within the climate system, then monitoring these jets may be justified. Monitoring these jets in key regions may also be important for testing ocean and coupled general circulation models. In this invited talk, I will discuss an underway Tropical Pacific Observing System (TPOS)-2020 pilot study for observing these jets from moorings.