Geophysical Research Abstracts
Vol. 19, EGU2017-8624, 2017
EGU General Assembly 2017

Quantifying the impact of mesoscale eddies on SSS changes in the tropical Pacific Ocean

Thierry Delcroix (1), Dodji Soviadan (2), Alexis Chaigneau (1), and Jacqueline Boutin (3)

(1) IRD, LEGOS, Toulouse, France (thierry.delcroix@legos.obs-mip.fr), (2) CIPMA, Université d'Abomey Calavi, Cotonou, Bénin, (3) CNRS, LOCEAN, Paris, France

High-resolution ocean model results as well as sporadic observations collected in different regions indicate that mesoscale eddies imprint distinguishable changes in collocated Sea Surface Salinity (SSS) and/or precipitation (P) distribution. This presentation shows this is indeed the case for the tropical Pacific, by collocating 6 years (2010–2016) of SMOS-derived SSS, TRMM-derived P and AVISO-derived sea level anomalies.
The main characteristics of mesoscale eddies are first identified in sea-level altimetry maps, and their signature is then determined using concomitant satellite-derived SSS and P data. A composite analysis for the whole tropical Pacific first reveals a physically-realistic relationship between mesoscale eddies and SSS and P changes. The overall tropical Pacific relationship is then stratified as a function of cyclonic and anticyclonic eddies, their amplitude, size, location, kinetic energy (EKE), as well as their SSS and P signatures. For example, in the central basin and near the intertropical convergence zone (where eddy activity dominates and precipitation largely exceeds evaporation), we found that mesoscale eddies can strongly modulate P ($\pm$ 5 mm/day), probably in line with SST changes, that in turn impacts SSS ($\pm$ 0.3) with the largest changes found near the eddy center decaying radially to reach minimum values outside. The role of mesoscale eddies in the mixed layer salinity budget is finally discussed.