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EC14A-0956: Biogeochemical responses to meso- and submesoscale oceanic variability in the Kuroshio region

ABSTRACT

Monday, February 22, 2016
04:00 PM - 06:00 PM
Ernest N. Morial Convention Center - Poster Hall

Influences of the Kuroshio and associated meso- and submesoscale variability due to frontally- and topographically-induced eddies on biogeochemical processes in the Kuroshio region off Japan are examined with a synoptic downscaling ocean modeling using the UCLA version of ROMS (Shchepetkin and McWilliams, 2005; 2008) coupled with an NPZD (nutrient, phyto/zooplanktons and detritus) nitrogen-based biogeochemical model (*e.g.*, Fasham *et al.,* 1990). The hydrodynamic model is initialized and forced by the JCOPE2 assimilative oceanic reanalysis (Miyazawa *et al.*, 2009) with a horizontal grid resolution of 1/12^{o} (*dx* ≈ 10 km) to convey the basin-scale information including the transient Kuroshio path though the parent ROMS-L1 model (*dx* = 3 km) and the child ROMS-L2 model (*dx* = 1 km) successively with the one-way offline nesting technique (Mason *et al*., 2011). The JMA GPV-MSM assimilative atmospheric reanalysis (*dx* = 6 km) is used to force both the ROMS models, while the NPZD model is configured according to Gruber *et al*. (2006). The model result is extensively compared with satellite (*e.g.*, AVISO, MODIS/Aqua Chl.a) and in-situ data (*e.g.*, the JMA's ship measurement) to confirm good agreement. The submesoscale eddy-resolving L2 output exhibits that intermediate water containing abundant nutrients occasionally surfaces by localized upwelling associated with cyclonic eddies, and that high Chl.a concentration appears around the Kuroshio Front. Furthermore, it is found that meso- and submesoscale eddies developed between the Kuroshio and the coastline also influence on the nearshore biogeochemical productivity.

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