

An LETKF-based ocean reanalysis for the Asia-Oceania region using Himawari-8 SSTs

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Himawari-8 is a geostationary satellite which has allowed sea surface temperature (SST) to be measured at a horizontal resolution of 2 km with a time interval of 10 minutes since mid-July 2015 (Bessho et al. 2016; Kurihara et al. 2016). We have calibrated Himawari-8 infrared-sensor SSTs to GCOM-W microwave-sensor SSTs (both provided by JAXA) using a $10^\circ \times 10^\circ$ sliding window, and then assimilated the improved daily SST dataset (hereafter H8-SSTs) to a three-dimensional ocean reanalysis system based on sbPOM (Mellor 2004; Jordi and Wang 2012) and LETKF (Hunt et al. 2007; Miyoshi et al. 2010) with 20 members. The H8-SST assimilation system has been configured for both the southeast Asian coastal regions at a horizontal/vertical resolution of $1/36^\circ \times 1/36^\circ \times 47$ layers with application to fishery and marine environmental monitoring, and the large-scale Asia-Oceania region at a horizontal/vertical resolution of $1/12^\circ \times 1/12^\circ \times 47$ layers with application to tropical cyclone studies.

Oceanic data assimilation for the southeast Asian coastal region (off Thailand and Vietnam) is a new challenge of several reasons. One reason is that the availability of the Argo float observations is limited. We have established capability to use both AQC Argo data version 1.2 (provided by JAMSTEC) and GTSP (Sun et al. 2010) in the western South China Sea. Another region is that high-resolution atmospheric forcing associated with the southwesterly summer and northeasterly winter monsoon is necessary to reproduce the coastal upwelling and cold tongue along the Vietnam coast, respectively. Consequently, we have investigated by performing two assimilation runs to compare a reanalysis wind forcing (JRA55; Kobayashi et al. 2015) and a satellite wind forcing (J-OFURO3; Tomita et al. in prep.). The last reason is the assessment of salinity distribution in the reanalysis data that may be attributed to the treatment of fresh-water discharges from rivers. Building a link between the additional in-site/remote-sensing measurements of shelf waters and H8-SST assimilation system in our next step.

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