

Real-Time Subsurface Moorings as a Promising Component of Global Ocean Monitoring System

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Subsurface moorings have advantage in providing long term and full-depth ocean monitoring parameters. Traditional moorings normally release data once a year, which put constraints on the mooring data usage in the weather and short-term climate forecasts. Recently, the Institute of Oceanology, Chinese Academy of Sciences (IOCAS) has overcome difficulties in the long-term transmission of real-time data from subsurface moorings. Data from sensors up to 3000 m depth can be transmitted to the surface floating body through wireless acoustic communications and then to the shore through satellite. In 2016, the IOCAS had realized real-time transmission of three dimensional velocities over the upper 1000 m from one mooring for more than 280 days. In 2017, real-time transmission module was equipped on the majority of the moorings, and the depth range of data has been extended from 1000 to 3000 m; this real-time observing network has successfully been conducted for 300 days until now. The aim of this abstract is to make recommendation for Real-Time Subsurface Moorings (RTSMs) as a promising component of global ocean observing systems.

The present prediction skill of ENSO at short lead time still leaves much to be desired. Beyond surface ocean data delivered by moored buoys and satellites in real time, the RTSMs can provide the time-depth variations of temperature and velocity at the subsurface and intermediate layers (e.g., the Equatorial Undercurrent variability), which also play a crucial role in the evolution of ENSO. Assimilation of these data will further improve the ENSO prediction skill. Deep-sea data acquiring in real time are also useful to many marine applications, including shipping, fishing, ocean emergent search and rescue, and pollution monitoring. RTSMs will provide data without the need of the use of a ship. This reduces the cost of ship and the risk of data loss due to mooring damage, making the fixed observation system in a more cost-effective manner.

Keywords: Real-Time Subsurface Mooring, Global Ocean Observing Systems