



Observation of sea surface water in the northwestern South China Sea by satellite data

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The main purpose of this study is to examine the behavior of the cold water in the northwestern South China Sea, especially in the sea around the Hainan Island (HNI). A series of Aqua satellite MODIS sea surface temperature (SST) and related chlorophyll-a concentration (Chl-a) data are considered. The sea surface wind (SSW) data from QuikSCAT satellite SeaWinds is also included to see the possible mechanism to induce the cold water phenomena around the HNI. It is found that the cold water around the HNI is seasonal, it is mainly off the north and northwest HNI in winter, and off the northeast and southwest HNI in summer. Besides the seasonal monsoon wind driving, the topographic effect and seasonal tidal mixing are also the reasons to develop the cold water around the HNI. The higher Chl-a around the HNI seems not to completely correspond to the colder SST. The tidal mixing would be the main reason to cause the higher Chl-a around the HNI. During the period from 2002 to 2006 for our satellite data, it is found the weaker SSW in 2004 El Niño summer showing reflection on SST and Chl-a around the HNI. The colder SST off the southeastern NHI weakened and the spatial gradient of Chl-a also lowered in that summer.