Cold SST anomalies to the south of Japan in recent years

Masami Nonaka
and
Toru Miyama
Application Laboratory, JAMSTEC, Japan

Distinct cold sea surface temperature (SST) anomalies observed to the south of Japan in spring to early summer in 2014 (Figure). Based on Argo observations, it is found that the cold anomalies were not limited to the surface layer but extend to several hundred meter depth, and had been continued from early 2012. Subsurface temperature field shows that the cold anomalies are associated with developed Subtropical Mode Water (STMW), and upper part of the thick, low potential vorticity water makes subsurface cold water to extend upward, inducing the cold anomalies. At the same time, thermal forcing at the sea surface also affect the cold SST anomalies, especially in the northern parts of SST anomalies. In the southern parts, however, latent and sensible heat fluxes tend to damp the SST anomalies, implying possible influence on the atmosphere. Detailed formation mechanisms for the thick STMW are investigated based on JCOPE2 and OFES.

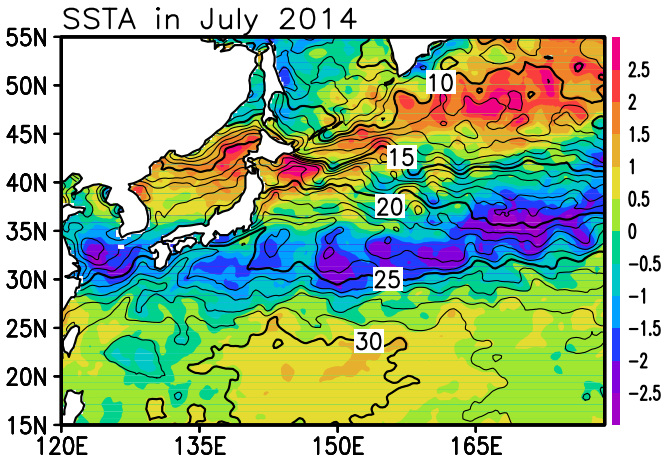

Figure. SST anomalies (from 2001-2013 mean, shades as indicated to the right of the panel) and SST (contours) in July 2014 based on NOAA OISST.