



Characteristics and Origin of North Pacific Tropical Intermediate Water in the Western Pacific

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The tropical western Pacific is the "crossroad of water masses" that the Antarctic Intermediate Water (AAIW) formed at the high latitudes of the South Pacific travels across the equator and intrudes under the North Pacific Intermediate Water (NPIW) formed at the high latitudes of the North Pacific. We conducted the CTD observations in November 2017 and in November 2018 using the R/V Isabu in the Philippine Sea. The NPIW and AAIW are characterized by a salinity minimum layer in the North Pacific and the South Pacific, respectively. In the south-western Philippine Sea, the upper salinity minimum layer is the NPIW and the lower salinity minimum layer is the AAIW. The maximum salinity layer, which distinguishes the two salinity minimum layers, was not clear because of small difference in salinity. Dissolved oxygen minimum layers appears below each salinity minimum layers, with a dissolved oxygen maximum layer between these two dissolved oxygen minimum layers. The presence of a dissolved oxygen maximum layer means that fresher water mass is present between the two intermediate waters. The water mass corresponding to this dissolved oxygen maximum layer appeared below the salinity maximum layer between the two intermediate water layers. This high salinity and high dissolved oxygen water between the NPIW and AAIW is the North Pacific Tropical Intermediate Water (NPTIW). The NPTIW is known as it is characterized by the dissolved oxygen minimum layer between two intermediate waters. However, we found that the dissolved oxygen maximum layer is a distinguishing feature of the NPTIW. From Argo data analysis, it is revealed that the NPTIW comes from off the east of New Guinea coast. It seems that the NPTIW is a lower part of South Pacific Tropical Water and transported into the Philippines Sea by the New Guinea Coastal Under Current. This research was a part of the project titled 'Study on Air-Sea Interaction and Process of Rapidly Intensifying Typhoon in the Northwestern Pacific' funded by the Ministry of Oceans and Fisheries, Korea and by a National Science Foundation of Korea grant (NRF-2009-C1AAA001-0093065).