

Impact of the Coastal Oyashio water on spring bloom on the Oyashio area

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The Coastal Oyashio water (COW) flowed out of the Okhotsk Sea to the Northwestern Pacific during winter-spring and is characterized typically by temperature and salinity less than 2 °C and 33, respectively, colder and less saline than the Oyashio water. The COW includes rich nutrients and dissolved iron, which are essential for growth of phytoplankton. Distribution of the COW is generally thought to be limited to the coastal and shelf region off the Hokkaido and Sanriku coasts. Therefore, there have been few studies that quantitatively examined contribution of the COW to spring bloom over the Oyashio area offshore of the shelf region. Synthesizing previous studies, this study proposed a hypothesis that the COW can control formation of the spring bloom on the Oyashio area. To validate this hypothesis, we analyzed in situ monitoring data in May of 1990-2016 on the A-line, encompassing the Oyashio and Mixed Water Region off the southeastern coast of Hokkaido, and revealed relationships between presence of spring bloom and temperature-salinity properties, which were tightly linked with the COW or its modified water. Moreover, using historical temperature-salinity data across the Northwestern Pacific, we will demonstrate spatial extent of the water mass that was potentially linked with the spring bloom to discuss possible contribution of the COW to the whole of the Oyashio area.

Keywords: Oyashio area, Spring bloom, Coastal Oyashio water