

A key spot and timing to monitor chlorophyll-a in the Kuroshio western boundary current

*Takafumi Hirata¹

1. Faculty of Environmental Earth Science, Hokkaido University

The Kuroshio western boundary current originates from the subtropics in the Western Pacific and carries a thermal energy and oceanic water mass towards the north, including the south coasts and offshore islands of Japan. In spite of the oligotrophy of the origin water that the Kuroshio carries, the Kuroshio water is known for spawning and feeding grounds of commercial/non-commercial fish larvae, explaining a higher fisheries production in the region. Thus, it puzzles an oceanographic and ecological relationships among nutrient fields, standing stock and productivity of organisms. In order to understand the complex Kuroshio ecosystems, phytoplankton dynamics is investigated using remote sensing data, namely phytoplankton pigment or chlorophyll-a observed by Advanced Himawari Imager (AHI) onboard Himawari-8. The area-integrated, and the area average of, Kuroshio chlorophyll-a was found predictable from a chlorophyll-a measurement in the 134-136 °E, where the Kuroshio current direction is most stable between 130-150 °E . An analysis of short term variability (< 1 year) of the Kuroshio chlorophyll-a concentration revealed that a cumulative, and monthly average of, chlorophyll-a over a month in the Kuroshio surface water could be estimated from a chlorophyll-a measurement at a single day in the month. These results suggest that there is a key spot and timing to monitor the phytoplankton activities in the Kuroshio current.

Keywords: Kuroshio, Chlorophyll, Remote Sensing