

OCEAN OPTICS XXIV

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Monday, October 8

Poster Session 1

16:00–18:00

Poster 93

SEAWATER TRANSPARENCY IN THE JAPAN SEA

Seawater transparency is a measure of how clear the seawater is, which is related to the depth that light can penetrate seawater. Solar energy is a source for ocean biological activity because aquatic plants need sunlight for photosynthesis. Thus, transparency is often used as an indicator of water quality. In this study, the attenuation coefficient at 490 nm (K_d490) derived from Moderate Resolution Imaging Spectroradiometer (MODIS) onboard the Aqua satellite is used as an index of seawater transparency. The Ensemble Empirical Mode Decomposition (EEMD) and the Empirical Orthogonal Function (EOF) methods are used to investigate the seawater transparency in the Japan Sea (East Sea). The time series of monthly K_d490 shows a higher high value in April and a lower high value in November. A significant increasing trend of K_d490 is also found, which implies that the seawater is getting opaque. The EEMD analysis decomposes monthly K_d490 data into six modes. It contains biannual, annual, and interannual (2-7 years) cycles. Comparing with the distribution of chlorophyll-a concentration, the biannual period of K_d490 is caused by the spring bloom and the fall bloom of chlorophyll. The first EOF mode contains 76.95% of the total variance of the data, which displays high K_d490 values around the coastal areas of the north Japan Sea and its principal component shows an increasing trend from 2003 to 2017.

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