

**CONSIGLIO NAZIONALE DELLE RICERCHE
ISTITUTO DI SCIENZE MARINE**



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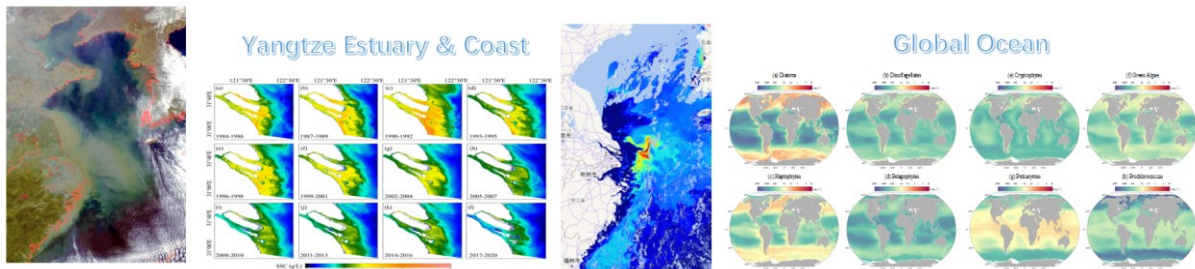
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Ocean Color Remote Sensing: from China's Estuary and Coast to the Global Ocean

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The Yangtze River Estuary, which is the largest estuary in China and the third largest in the world in terms of river discharge, has extremely high suspended sediment concentration and complex spatiotemporal distribution changes. The adjacent coastal waters frequently experience algal bloom outbreaks. Quantitative estimation of suspended sediment concentration and estimation of phytoplankton chlorophyll-*a* concentration with the presence of sediments pose significant challenges for ocean color remote sensing. This report highlights the challenging research areas in ocean color remote sensing, spanning from estuarine and coastal waters to oceanic regions:

- (1) Addressing high suspended sediment concentrations (SSC) and spectral saturation: a semi-empirical radiative transfer model based SSC inversion algorithm was proposed, and its response to natural factors and human activities in the Yangtze River estuary was explored.
- (2) Explorations were conducted on optical remote sensing observations of phytoplankton pigment concentration, particle size classes, and taxonomic groups in turbid waters. A simple and effective remote sensing detection method for algal blooms and species was developed.
- (3) By combining machine learning optimization with extensive observations from ocean satellite remote sensing and simulations, a high-precision retrieval of the spatiotemporal distribution of phytoplankton community structures was established for both global and regional scales.