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Short Communication

Methods and Approaches for Identifying Coastal Water Elements

Shen Cheng*

Department of Atmospheric and Oceanic Sciences, Fudan University, Shanghai, China

DESCRIPTION

Seas along the coast are very dynamic ecosystems. Particularly, the water in the North Sea's shallow, soft-bottom coast is constantly changing due to the powerful tidal currents. Monitoring these characteristics, including suspended particulate matter and all of its constituents as well as phytoplankton, is a very difficult task. One method for identifying some of the important variables and producing high-resolution weekly or monthly maps of their distribution is ocean colour remote sensing [1]. Contrary to the open ocean, the optically complex coastal waters provide a number of challenges for optical remote sensing since they contain a variety of different classes of compounds.

Methods and techniques

Remote sensing of ocean color needs two main procedures. To obtain the radiance reflectance exiting the water, sunlight is backscattered by the water molecules and all water elements, including phytoplankton it is necessary to first compute atmosphere typically accounts for more than 90% of the light at the top of the atmosphere, this atmospheric adjustment step is particularly important. The quantities of the compounds in water, as well as the inherent optical properties, such as the absorption and scattering coefficients, must be determined from the radiance reflectance spectrum exiting the water as the second stage. Different types of processes have been created for this purpose, some of which are empirical, but for coastal waters they are often based on radiative transfer models [2].

Seasonal variations in North Sea phytoplankton

Examining the horizontal phytoplankton dispersion patterns in the North Sea throughout the year is one use of ocean color remote sensing. Climate change may cause it to shift in the future, which could have important repercussions for the ecosystem of the North Sea, especially its fish populations. Light is the primary component that regulates the development of phytoplankton growth in spring, when the water is nutrient-rich [3].

Wintertime circumstances include too few days, a low sun elevation, and a well-mixed water column in most of the North Sea. A phytoplankton cell won't receive enough light for 24 hours to thrive because it can be found everywhere in the water column, even the deepest parts [4]. Growing phytoplankton begins in shallow water as the days grow longer because there, even with a well-mixed water column, there is enough light each day. Growth can only begin in the uppermost layers of deep seas when calm, sunny weather combined with enough heating causes the water column to stratify. These circumstances allow the phytoplankton to remain in the upper mixed layer rather than sinking into the deeper, darker levels. It receives sufficient light and begins to expand quickly [5].

CONCLUSION

The growing season often starts in the northernmost, deepest North Sea around the middle of April. When the stratification is destroyed by high winds or when the nutrients run out, the growth phase is halted or ends. Additionally, grazing by zooplankton, which follows the development of the phytoplankton, lowers the biomass of the latter. The Skagerrak and the Norwegian Trench are an exception. Here, stratification may be brought on by less salinized light water from the Baltic Sea that enters the North Sea as an upper layer and moves in a counterclockwise direction down the Norwegian coast. As a result of the greater lighting in this upper layer, the phytoplankton growing season begins significantly earlier.

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Correspondence to: Shen Cheng, Department of Atmospheric and Oceanic Sciences, Fudan University, Shanghai, China, E-mail: shen@gmail.com

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