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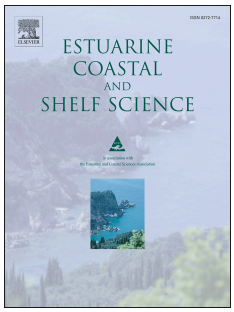

Possibilities of optical remote sensing of dispersed oil in coastal waters

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Possibilities of optical remote sensing of dispersed oil in coastal waters

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Abstract

This study is intended to be one of the first steps in assessing the feasibility of remote sensing of dispersed oil in seawater. All optically active seawater constituents, including oil droplets, shape the water-leaving light flux and contribute to a commonly measured apparent optical variable known as remote sensing reflectance (R_{rs}). Radiative transfer simulations were performed in visible bands for natural seawater in the coastal zone of the Southern Baltic Sea and for a model of seawater polluted by dispersed *Petrobaltic* crude oil characterised by different droplet size distributions. Our model was supplied by simultaneous *in situ* measurements of inherent optical properties and the R_{rs} of natural seawater. The optical description of dispersed oil was based on previous experiments and new application of the Mie solution to the *Petrobaltic* crude oil of a log-normal size distribution characterised by peak diameters ranging from 0.5 to 500 μm. The results of radiative transfer modelling showed that the typically considered concentration of 1 ppm of oil droplets can locally affect