Satellite-based red tide monitoring in the Korean coastal waters

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Occurrence and spread of red tide known to develop in the environment of eutrophic coastal region, cause living sea creatures great damages such as fishkills, shellfish poisoning, mortality in benthic habitats. In the Korean coastal waters, harmful Cochlodinium polykrikoides blooms frequently appeared mainly in the environment of semi-enclosed bay, and it has also occurred and distributed to the East Sea of the Korean Peninsula since 1995. Ocean color observation satellite images, have successfully distinguished HABs in the coastal region. Geostationary ocean color imager (GOCI), a new ocean color satellite imager placed in a geostationary orbit, has advantage over other ocean color sensors in that it collects images every hour during daytime enabling monitoring of temporal variability in ocean environment. GOCI has successfully identified the short-term variations in coastal water turbidity, investigated ocean surface current and detected eddies in the Korea coasts and East China Sea with a spatial resolution of 500 m. Thus, GOCI can be effectively applied to the monitoring of the dynamic movement and spread of the red tide.

In this study, distribution and spread range of red tide, which had been found in the east coast of Korean peninsula in August 2013, was monitored using GOCI. The red tide had originally been occurred in the Southeatern coastal area of Korean peninsula in the middle of July 2013 and spread to the east coast of the peninsula. Several days of cruise was carried out for the identification of the red tide species and their optical characteristics. GOCI was employed to detect the patches of the red tide and its movement for about a month based upon the results of the field works.