

What are the benefits of the GOCI Satellite observations?

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Ocean color remote-sensing has opened a new era for biological oceanography, providing quasi-real time data on the global distribution of phytoplankton biomass. It has proved useful for a variety of applications in coastal waters as well as oceanic waters. However, most ocean color sensors deliver less than one image per day for low- and mid-latitude areas, which is not sufficient to resolve transient or high frequency processes in the ocean.

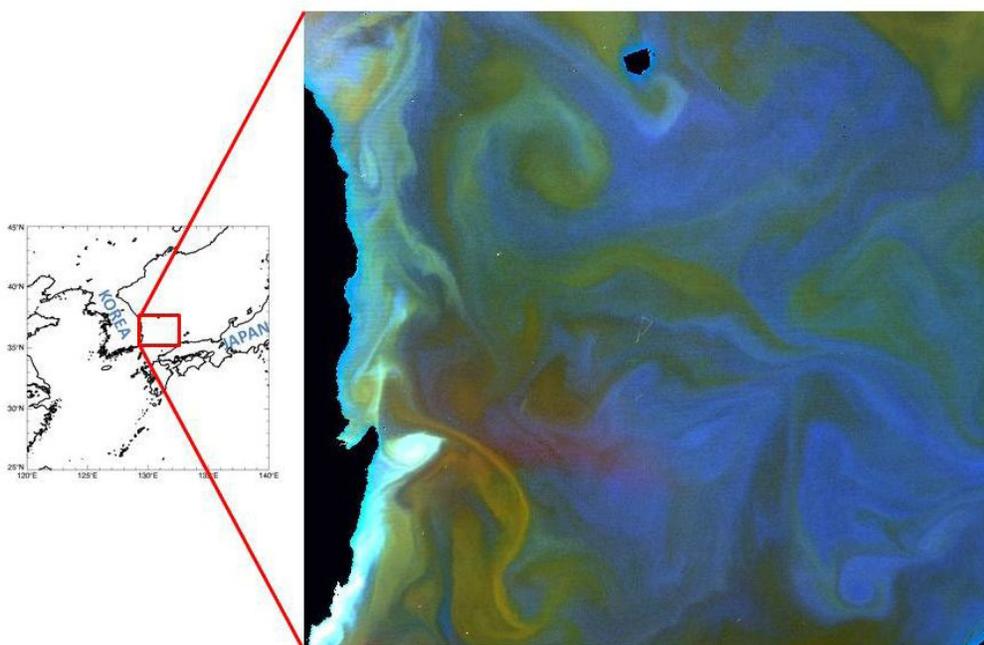


Figure: GOCI-derived sea-surface color of the southeastern part of the Japan / East Sea on April 27, 2012. Owing to its high sensitivity, GOCI could reveal dynamic features of the sea surface such as eddies and meanders, which are closely related to biological productivity in this area. The bluish color indicates low productivity while the greenish color corresponds to higher productivity, and the bright color along the southern coast of Korea is likely to be associated with suspended particles.

The Korean Geostationary Ocean Color Imager (GOCI), the world's first ocean color instrument operating on a geostationary orbit, has been collecting ocean color radiometry (OCR) data (multi-band radiances at the visible to NIR spectral wavelengths), since July 2010. GOCI has an unprecedented capability to provide eight OCR images a day with a 500m resolution for the North East Asian seas.

The temporal dimension, together with the synoptic nature of satellite observation, is expected to be a major breakthrough for ocean process studies within time-frames of a day or a few days. With a series of images consecutively acquired by GOCI, we are now able to look into (sub-)diurnal variabilities of coastal ocean color products such as phytoplankton biomass and primary production, colored dissolved organic matter and suspended particle concentrations. This time series provides another way to derive maps of ocean current velocity. GOCI data is also being used to resolve the temporal variability of algal blooms, tide-induced resuspension of sediments, river runoff, and the movement of floating algal patches.

Another benefit of the geostationary observation is its effectiveness in operational use. GOCI has provided data useful for monitoring activities such as ocean dumping and dredging. The observation capability for the local area enables us to respond in a timely manner to natural disasters and hazards. With GOCI images, we are able to quickly identify natural phenomena such as snow cover and movement of sea fog, sea ice, wild fires, volcanic eruptions and transport of yellow dust aerosols.

The high spatial and temporal resolution ocean color imagery from GOCI is expected to contribute to protecting human health and the environment as well as further improving our understanding of the dynamics of complex ocean ecosystems. GOCI data are freely available on the website kosc.kiost.ac for noncommercial scientific or educational purposes.