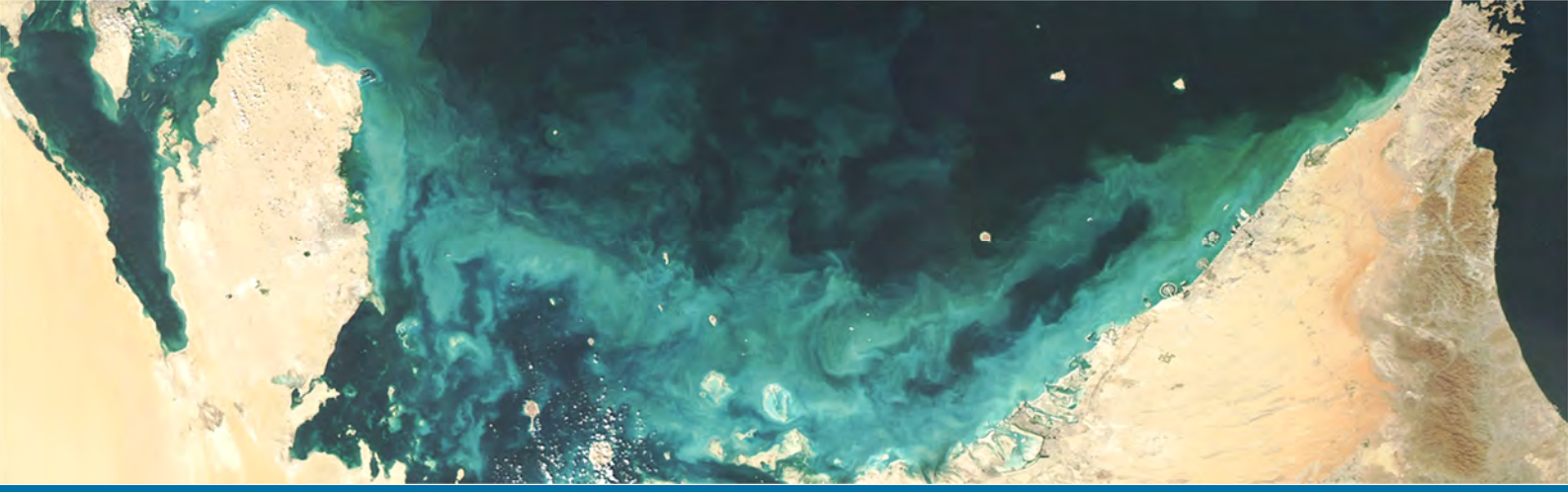


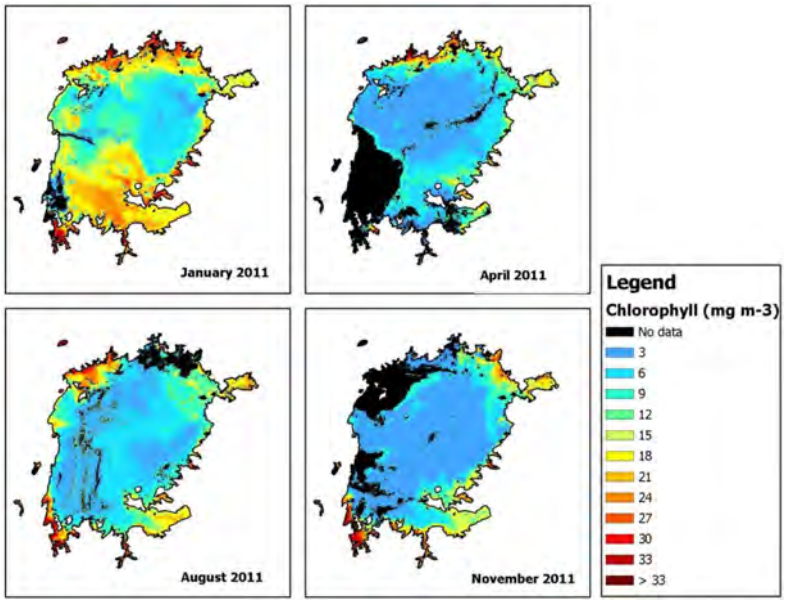
EARTH OBSERVATION FOR SUSTAINABLE DEVELOPMENT

WATER QUALITY AND LEVELS MONITORING

The provision of clean fresh water is a serious environmental challenge, and Earth Observation has become an increasingly important tool to assess the spatiotemporal variability of surface fresh water and to monitor the quality of water on a regular basis. This is especially the case in developing countries where existing water quality information is sparse, difficult to obtain, and variable in content and validity.

Satellite derived water quality information is essential to assess the ecological state of inland and coastal waters and to identify changes or trends in water quality over time. Such information is needed in order to be able to respond to emerging water quality problems, such as point source pollution, sedimentation, harmful algae blooms and aquatic weed proliferation. In addition, satellite altimetry has become increasingly important for measuring water levels of rivers, lakes and reservoirs in order to address key hydrological questions on water storage and discharge.

EO-based water quality and levels monitoring has typically been restricted to coastal regions and large lakes due to sensor limitations. But new sensors, such as the Sentinel-2 and -3 missions, with increased spatial, spectral and/or temporal resolutions will in combination with in-situ data and novel analytical techniques provide enhanced capacities for inland water monitoring as well as better options for atmospheric correction to improve water quality retrieval in turbid waters.



Example of chlorophyll-a concentration maps derived from satellite data in 300m resolution.

SUMMARY

CHALLENGE

- Unavailability of historical water quality baseline of an area
- Need to monitor the environmental impact of large infrastructure projects
- Need to assess the ecological state of coastal and inland waters
- High cost of traditional monitoring approaches at uncertain safety levels

SOLUTION

- Satellite based remote sensing is recognized as a reliable and cost-effective technique for water quality monitoring of inland and coastal waters

VALUE

- Using satellite data archives it is possible to establish long-term baseline conditions for any region of the World.
- Near real-time information with data delivery within hours after the satellite overpass
- Quick access to information from anywhere through a web browser, smart phone and other devices
- Very cost-efficient approach compared to traditional in-situ monitoring and with no associated safety issues
- Reliable source of information – the method is well-proven and has been successfully applied globally

esa

water resources management
eo4sd

Satellite Earth Observation (EO) technology has a tremendous potential to inform and facilitate international development work. Since 2008 the European Space Agency (ESA) has worked together with the International Financing Institutions (IFIs) and their client countries to harness the benefits of EO in their operations and resources management.

EO4SD – Earth Observation for Sustainable Development – is an ESA initiative which aims to achieve a step increase in the uptake of satellite-based information in the IFIs regional and global programs, aiming at more systematic data user approach in order to meet longer-term strategic geospatial information needs in the individual developing countries as well as international and regional development organizations.

The EO4SD initiative cover a wide range of thematic domains including Water Resources Management which is regarded as one of the most critical development challenges.

The activities will start in spring 2016 and will run for a period of three years. The first year will be dedicated to stakeholder engagement and requirements consolidation and with years two and three focusing on information production, delivery and capacity building.

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