



United Nations
Educational, Scientific and
Cultural Organization

In partnership with



Intergovernmental
Oceanographic
Commission

International Training Course On "Ocean Colour Remote Sensing- Data, Processing and Applications"

November 10-14, 2014

**Organized
by**

**International Training Centre for
Operational Oceanography (ITCOcean)
ESSO-INGOIS, Hyderabad, India
and
Ocean Teacher Global Academy,
IODE / IOC**

Background:

Indian National Centre for Ocean Information Service (INCOIS) under Earth System Science Organization (ESSO) is a dedicated institution for operational oceanography and the only institution in the Indian region that has been providing operational ocean information and advisory services over the past 10 years. It has established leadership particularly in ocean observations, ocean modeling and ocean information and advisory services in the Indian Ocean region.

ESSO-INCOIS and UNESCO's Intergovernmental Oceanographic Commission (IOC-UNESCO) signed a Memorandum of Agreement on 4th July, 2013 during the 27th session of the IOC Assembly in Paris, for cooperation in conducting training courses at the International Training Centre for Operational Oceanography (ITCOcean) set up by ESSO-INCOIS in Hyderabad, India. The centre will operate as a contribution to IOC's training and capacity development activities in mainly the Indian Ocean rim countries. It will cooperate with IODE programme and focus on establishing a regional training centre as part of the new Ocean Teacher Global Academy, (www.iode.org). The Centre aims at promoting the development and optimization of scientific base, technology and information system for operational oceanography at national, regional and global levels. The Centre has conducted four training courses during 2013-14 in various themes in operational oceanography (For more details kindly visit www.incois.gov.in)

About the Course:

Remote sensing of ocean colour from space began in 1978 with the successful launch of NASA's Coastal Zone Color Scanner (CZCS) and generated valuable data sets until early 1986. Since then many other sources of ocean colour data became available with the launch of other sensors, and in particular the SeaWiFS, OCM-1, MODIS and MERIS. Several new ocean-colour sensors have recently been launched, including the Indian Ocean Colour Monitor (OCM-2) on-board Oceansat-2. More ocean colour sensors are planned over the next decade by various space agencies.

The ocean colour analysis has proven to be an efficient tool for determining the health of ocean by measuring oceanic biological activity through optical means. Phytoplankton pigment, chlorophyll_a, a major light absorber, absorbs blue and red light resulting in the oceans blue-green colour. This also acts as an indicator of the equilibrium of CO₂ concentration between atmosphere and ocean. The optical component of dissolved organic matter known as coloured/Chromophoric Dissolved Organic Matter (CDOM) has potential source from land. The inorganic suspended matter consists of sand and dust created by erosion of continental rocks and soils. These enter the ocean through river runoff or by deposition of wind-blown dust or by wave or current suspension of bottom sediments. The oceanic colour change due to chlorophyll_a provides the level of primary productivity whereas the colour change due to CDOM can be attributed to the level of pollution and higher particulate matter in suspension can be directly linked to waves and currents.

The ability of optical sensor to map the spatial and temporal patterns of ocean colour over regional and global scales has provided important insights into the fundamental bio-optical properties and bio-physical processes occurring in the aquatic media. There are mainly three broad scientific applications of ocean-colour data. The first concerns the role of the ocean in climate change by linking the oceanic primary productivity and the ocean carbon cycle. The second application of ocean colour is to provide a synoptic observational link between the ocean ecosystem and physics of the mixed layer by estimation of diffuse attenuation coefficient (K_d). The third application of ocean colour is in the domain of coastal zone protection and the management of marine resources.

Remote sensing products, such as chlorophyll, sea surface temperature (SST) and photo-synthetically active radiation (PAR) can be operationally scaled up to estimate primary production and from them to estimate the fish stocks. Further the combination of reflectance signal can also be used to assess the aggregation of algal blooms. A spin off from these applications is in fisheries, commonly called as Potential Fishing Zones (PFZ) as implemented at Indian National Centre for Ocean Information Services (INCOIS).

Course Contents:

The Lectures will tentatively cover the following topics:

-  Marine optics, Ocean colour- sensor characteristics, data, uncertainties
-  Ocean colour Algorithms, Chlorophyll, shallow water remote sensing, algal blooms
-  Atmospheric correction of ocean color observations
-  Marine primary production and P-I experiments
-  Phytoplankton classification using ocean colour data

Hands on Exercises and Laboratory visits (Afternoon sessions):

- ✍ Visit to Ground station: Satellite data sets and value added products
- ✍ Introduction on SeaDAS – Processing capability and available tools
- ✍ Demonstration of Complex water Atmospheric Algorithm Scheme (CAAS) and Algal Bloom Index (ABI)
- ✍ Generation of PI parameters, maps of Primary productivity
- ✍ Demonstration on Phytoplankton classification using ocean colour data

Faculty:

The faculty for the course consists of scientists/experts in different fields drawn from the host institute (INCOIS) and also from other organizations like Indian Space Research Organization (ISRO), CMLRE etc. These experts have long and varied experience in the field of Oceanography, Modeling, Instrumentation and applications.

Venue:

The training course will be held at ITCOOcean, Indian National Centre for Ocean Information Services (INCOIS), Hyderabad, India.

Who can apply?

The training program is open to scientists, post-graduate fellows, and doctoral students involved in oceanographic work with specific reference to Ocean Colour Remote Sensing and its applications. Priority will be given to students from Indian Ocean RIM countries.

The trainees are expected to have basic knowledge of Ocean Optics and Remote Sensing along with basic computer skills. Preference will be given to the candidates pursuing their research or building a carrier in the above topics.

Course Fee and Financial support:

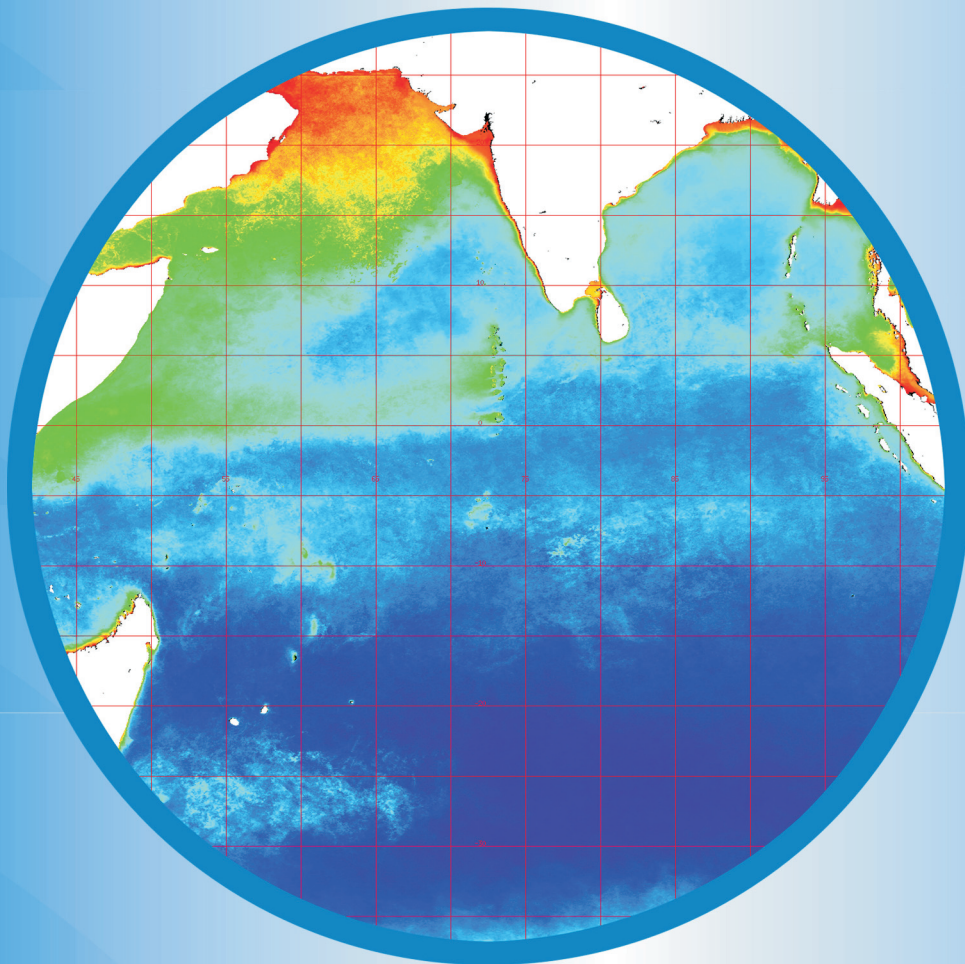
There is no course fee charged for the training course. The participants are expected to make their own arrangements for all expenses, including International to and fro travel. However, INCOIS can provide local transportation, food and lodging at their Hostel for few deserving candidates. Preference in admission will be given to candidates who are supported by their own organizations. International participants may approach UNDP, UNESCO, UN-ESCAP, IOC, SCOR and other agencies for financial assistance.

Application:

The interested candidates should fill in the attached application form and provide a recommendation letter from Research Supervisor / Head of the Institute. The completed and signed application form should be sent to:

Contact Address:

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