



Capacity development activities through ITCOcean: C2C of UNESCO



**2021
2030** United Nations Decade
of Ocean Science
for Sustainable Development



Decade Collaborative Centre
Indian Ocean Region

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United Nations
Educational, Scientific and
Cultural Organization



Intergovernmental
Oceanographic
Commission



OceanTeacher Global Academy



सत्यमेव जयते

**Ministry of Earth Sciences
Government of India**

Need for Capacity Building

Capacity-building is needed for developing and strengthening the skills, instincts, abilities, processes and resources that organizations and communities need to survive, adapt, and thrive in a fast-changing world.

(Courtesy: www.UN.org)

Recognizing this Ministry of Earth Science (MoES) has invested in ITCOO to make it a integral part of its operational services.

- A formal MOA was signed in July 2013.
- Recognized as RTC of OTGA/IODE to conduct trainings in operational oceanography



ITCOO Partners

- OTGA/IODE
- POGO
- ITEC, Ministry of External Affairs
- NERSC, Norway.
- ICTP.
- Local Universities in India
- All sister concerns of MoES
- ISRO



Objectives - Target Audience

Identify training, education & assistance needs based on regional & global priorities

Provide advanced training in operational oceanography for IOR, S. Asia, Africa, SIDS

Training on insitu & satellite platforms, data access to operational centres, modelling, forecast generation & dissemination

Promote excellence in integrated multidisciplinary oceanography

Enhance state of preparedness for nowcasting and forecasting ocean

Promote, Assist & Contribute to activities of UNESCO/IOC in marine, coastal, climate, disaster, data & information exchange, etc.

Make recommendations to governing bodies of the region on policy matters and formulate proposals for protection and sustainable development of Indian Ocean & Coasts

• **Students and research scholars**

• **Staff of maritime related institutions**

• **Govt. Officials, persons and companies involved in oceanographic services**

• **Decision makers and Navy**

• **Scientists and Faculty**

• **Institutions involved in ocean state forecasts, hazard warnings, environmental protection, NGOs, coastal planners, disaster management activities**

• **Participants originating from the Indian Ocean rim countries, South Asia, Africa, SIDS**

New Building Infrastructure

Academic & Administrative Block - 7500 Sq M

Classrooms, Labs, Auditorium, Science Centre, Faculty Rooms

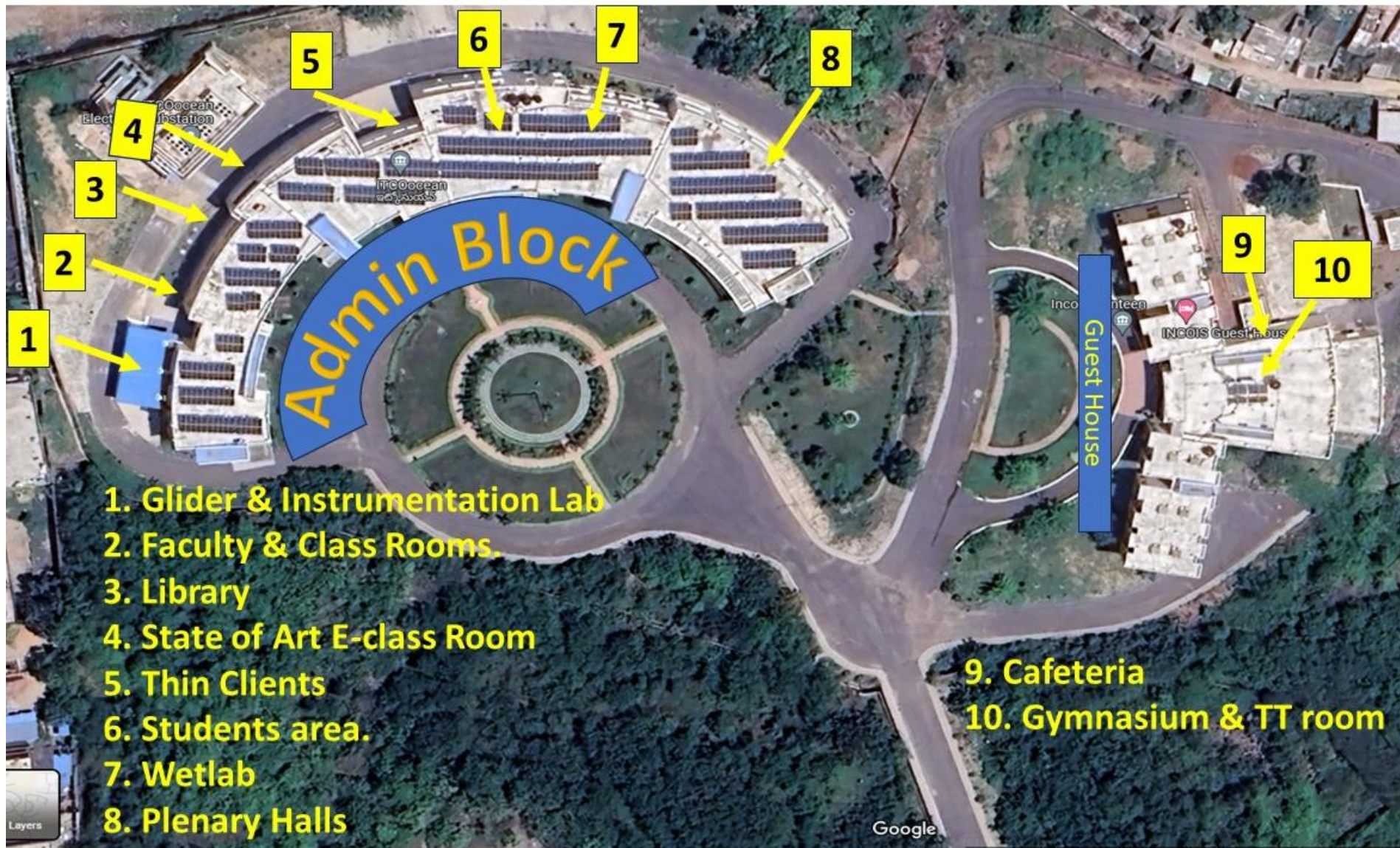


Hostel block - 3000 Sq M

Faculty Suites 11, Student Rooms 24, Dining, Recreation area



Building Infrastructure



State of the art Training Facility



Course Methods

Pre-course surveys to select preferable topics

Participant selection based on motivation/qualifications

Regular communication to offer assistance

Pre-course materials and links

Github platform for course material sharing

Group-wise mini projects/ lab sessions

Feedback, discussions and evaluations/test

Sharing presentations, video lectures, materials

After course student visits and mentoring by faculty

Courses Conducted

~6700

people trained
from 96 IOC
Member States

IOC-OTGA (International)

Coastal
Vulnerability
Mapping and
analysis using
QGIS

Ocean Color
Remote Sensing

Marine GIS for
Operational
Oceanography

Discovery and Use
of Operational
Ocean Data
Products and
Services

Data Visualization
of Marine Met
data (using
FERRET)

Marine GIS
Applications for
Coastal Zone
Management

National

Remote Sensing and GIS
applications using QGIS

Tides and its
applications in
Oceanography

Marine Meteorology
and Operational Ocean
State Forecasting

Marine Phytoplankton -
optics, pigment and
taxonomy

Seaglider Fundamentals
and Data Analysis

Ocean Data and
Information System -
Data and Applications

Indian Ocean Currents :
Data, Processing and
Applications

Ensemble Kalman
Filtering -Methods and
Algorithms

Oceanography for the
Scientists of Proof and
Experimental
Establishment

Ocean State Forecast
Services for cyclone
forecasters

Advanced Statistical
Concepts in
Atmospheric and
Oceanic Sciences

An Introduction to the
Blue Ocean

Fishery Stock
Assessment and
Ecosystem Modelling

Ocean Dynamics : From
the Large-scale
Circulation to Small-
scale Eddies and Fronts

International (other than OTGA)

Coastal
Vulnerability
Assessment and
Monitoring for
Sea-Level Rise
and Storm
Surges in the
Indian Ocean
Region

Indian Ocean
Circulation and
Sea Level
Variation

Capacity
Development in
Multi-Hazard
Early Warning
Systems

Emerging
Trends in Ocean
Observations
and Ocean Data
Analysis

Biological
Oceanographic
Processes

Remote Sensing
of Potential
Fishing Zones
and Ocean State
Forecast

Fundamentals of
Ocean Climate
Modeling at
Global and
Regional Scales

Diversified Topics

- Operational Oceanography:
 - Ocean State Forecasting
 - Tsunami Early Warning/Preparedness
 - Oil Spills/HABs/Marine Heat Waves etc
- Data Management:
 - Data processing/QC/Databases
 - Visualization and analysis.
- Remote Sensing
- Ocean Modelling.
- Fisheries Oceanography/Primary Productivity
- Ocean instrumentation/sampling/analysis
- Ocean policy/Tsunami/Multi Hazards/Disaster Management.
- AI/ML Techniques and applications to Oceanography

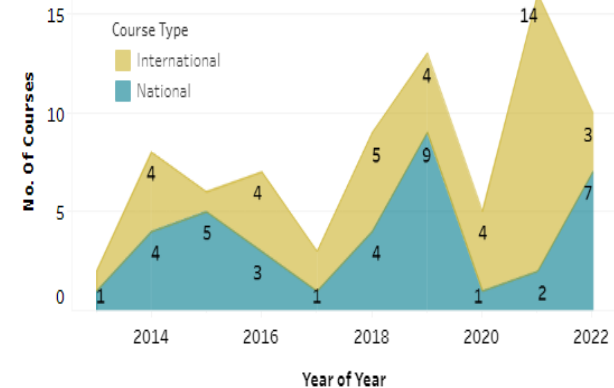
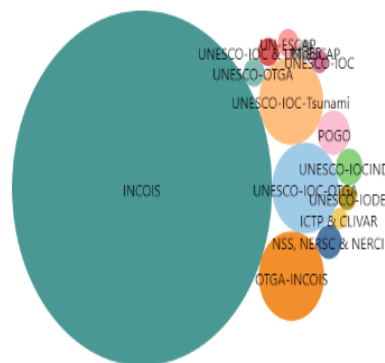
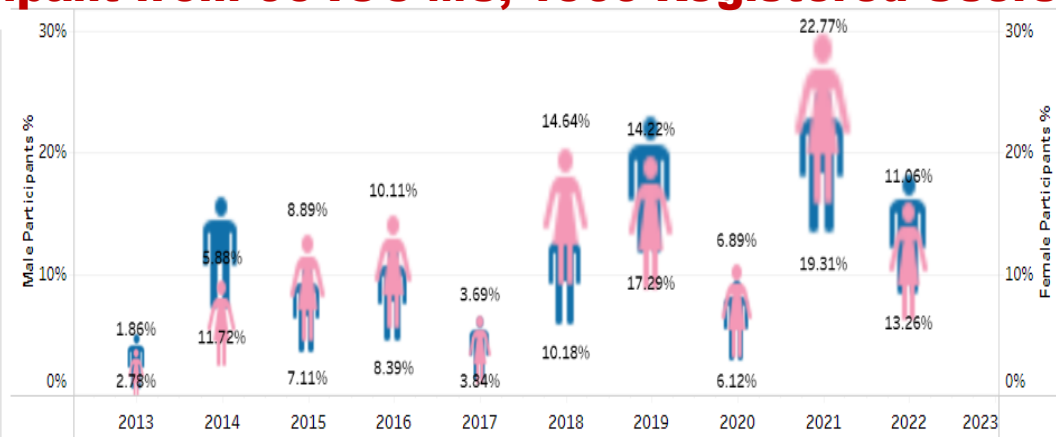
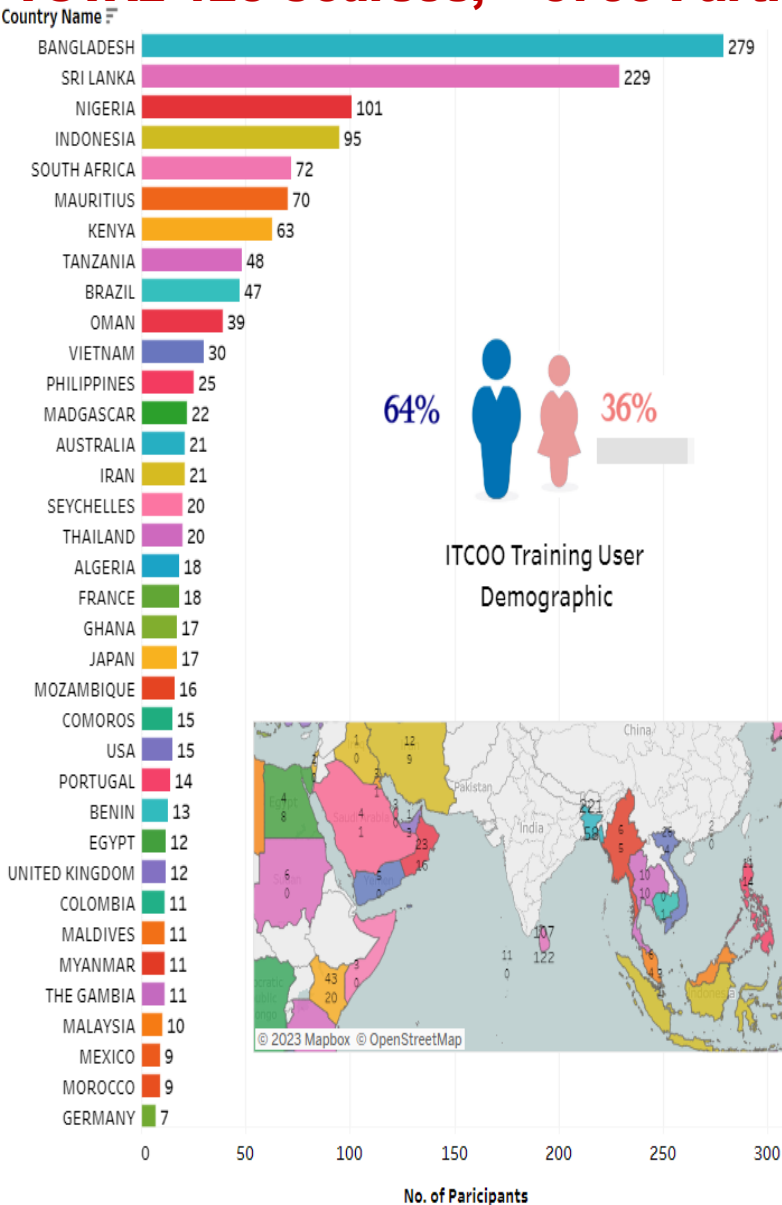
Advanced Oceanography Course

- Advanced Oceanography course to officers from Indian Navy.
- Two batches were trained.
- Duration of 4 months
 - Class room sessions
 - Practical demonstrations.
 - Onboard sample collection.
 - Computations facilities



Course Statistics

TOTAL 126 Courses; ~6700 Participant from 96 IOC MS; 1500 Registered Users



Course Tags

Blue Ocean Tidal Analysis Remote Fundamentals Induction Training Statistics Filtering Algorithms

Data Visualization Tsunami ARGO Operational Oceanography Hydrography

Coastal Training Ocean Modeling Ocean Data Analysis Ocean Services

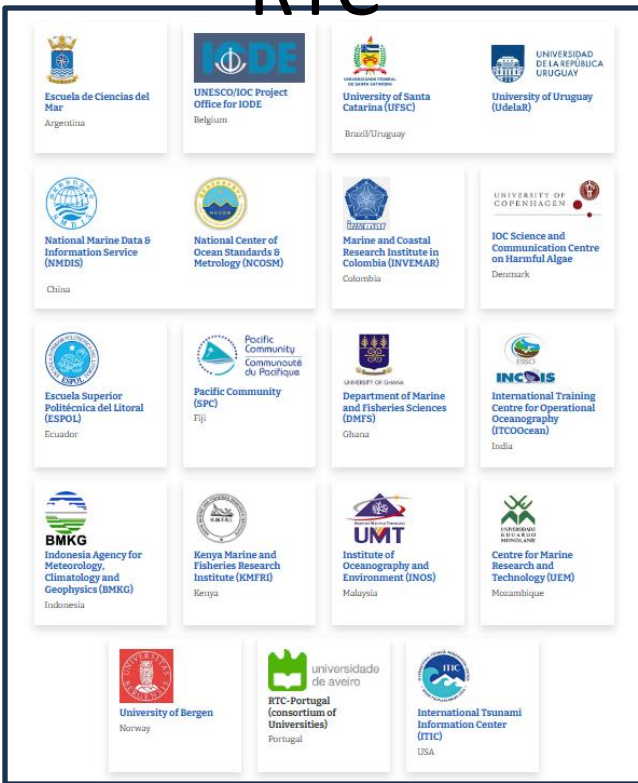
Ocean State Forecast Biological Oceanography Webinar Fisheries Cyclone Forecast Marine Phytoplankton Remote Sensing

Ocean Dynamics Ocean Observations Oil Spill Advisory Advisory Services

ITCOO Roles



RTC



Universities

C-2-C



Center of Excellence



Summary

- Capacity-building is needed for developing and strengthening the skills, instincts, abilities.
- MoES has invested in this quite early in the form of setting up ITCOO and it is now reaping rich dividends.
- ITCOO is donning multiple hats like: RTC, C2C and soon would be recognized as CoE.
- We promise to grow from strength to strength in the realm of operational oceanography and train all possible stake holders.