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GEOSPATIAL WORLD FORUM

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Blue Economy Development National, Regional, Global strategies/frameworks – India perspective

**Indian National Centre for Ocean information Services (INCOIS)
Ministry of Earth Sciences, Govt of India
Hyderabad -500090**

Structure

- Introduction
- Blue Economy & Its significance
- India's policy on Blue Economy
- INCOIS services – Contribution in Blue Economy
- Ocean Observation Network of India And Collaborations
- Regional/Global frameworks
- Emerging trends, and challenges in Blue Economy Sectors

Indian National Centre For Ocean Information Services (INCOIS)

ESSO-INCOIS was established as an autonomous body in 1999 under the Ministry of Earth Sciences (MoES) and is a unit of the Earth System Science Organisation (ESSO). ESSO-INCOIS is mandated to provide the best possible ocean information and advisory services to society, industry, government agencies and the scientific community through sustained ocean observations and constant improvements through systematic and focused research.

Our Vision

To emerge as a Knowledge and Information Technology Enterprise for the Oceanic realm.

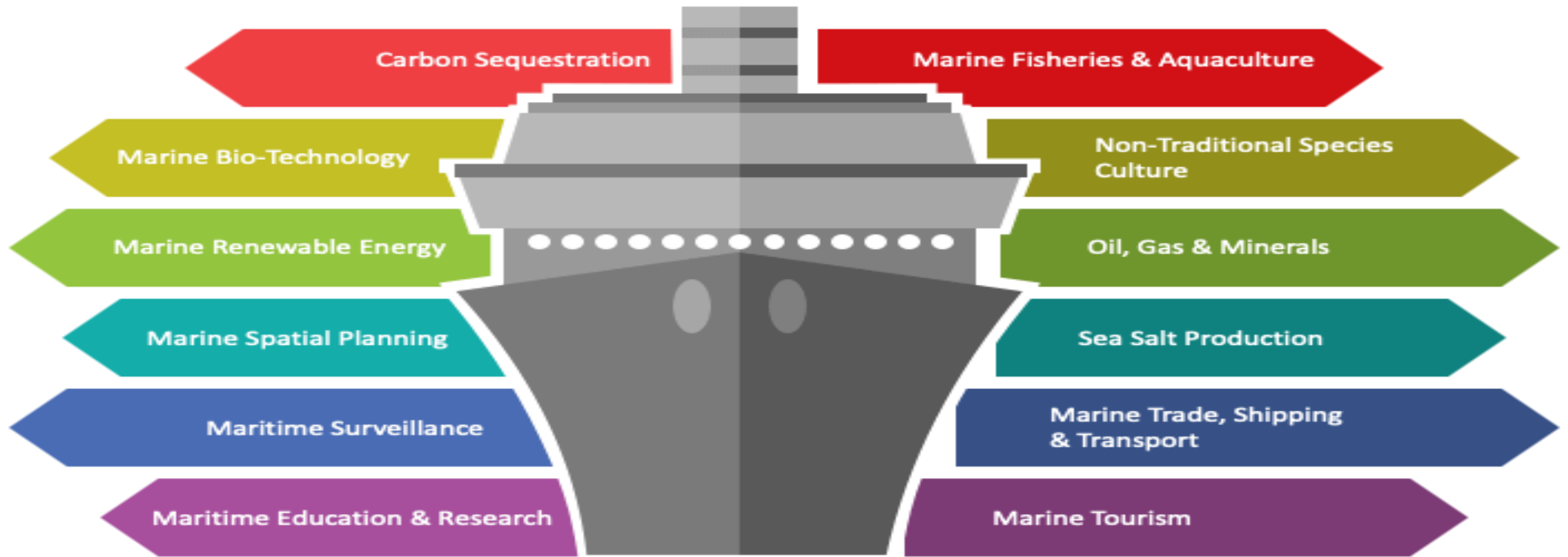
Our Mission

To provide ocean data, information and advisory services to society, industry, the government and the scientific community through sustained ocean observations and constant improvements through systematic and focused research in information management and ocean modelling.

Blue Economy

BLUE ECONOMY

Blue Economy Sectors



Blue Economy Significance

UN-Sustainable Development Goals



CLEAN WATER

6



CLEAN ENERGY

7



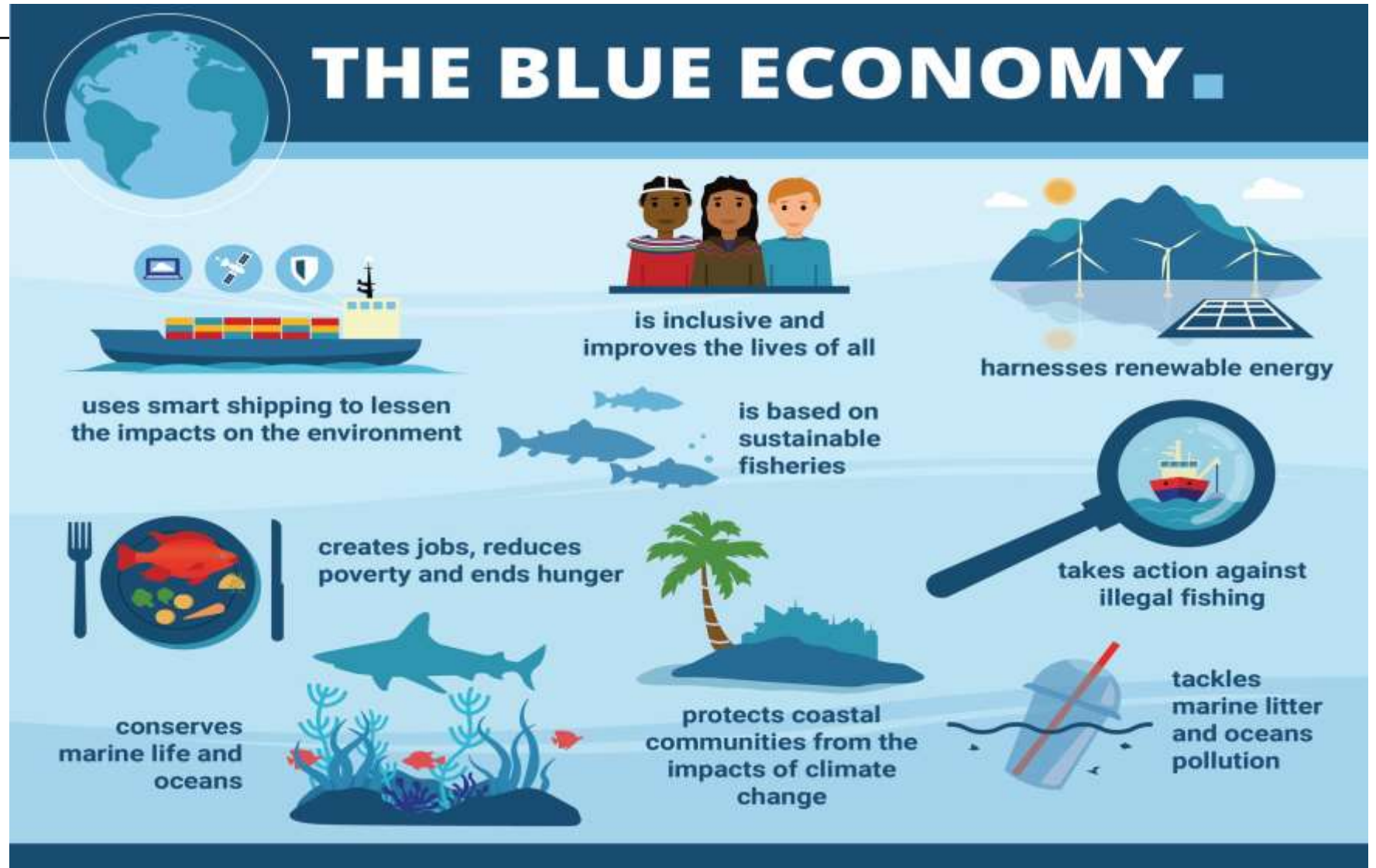
CLIMATE ACTION

13

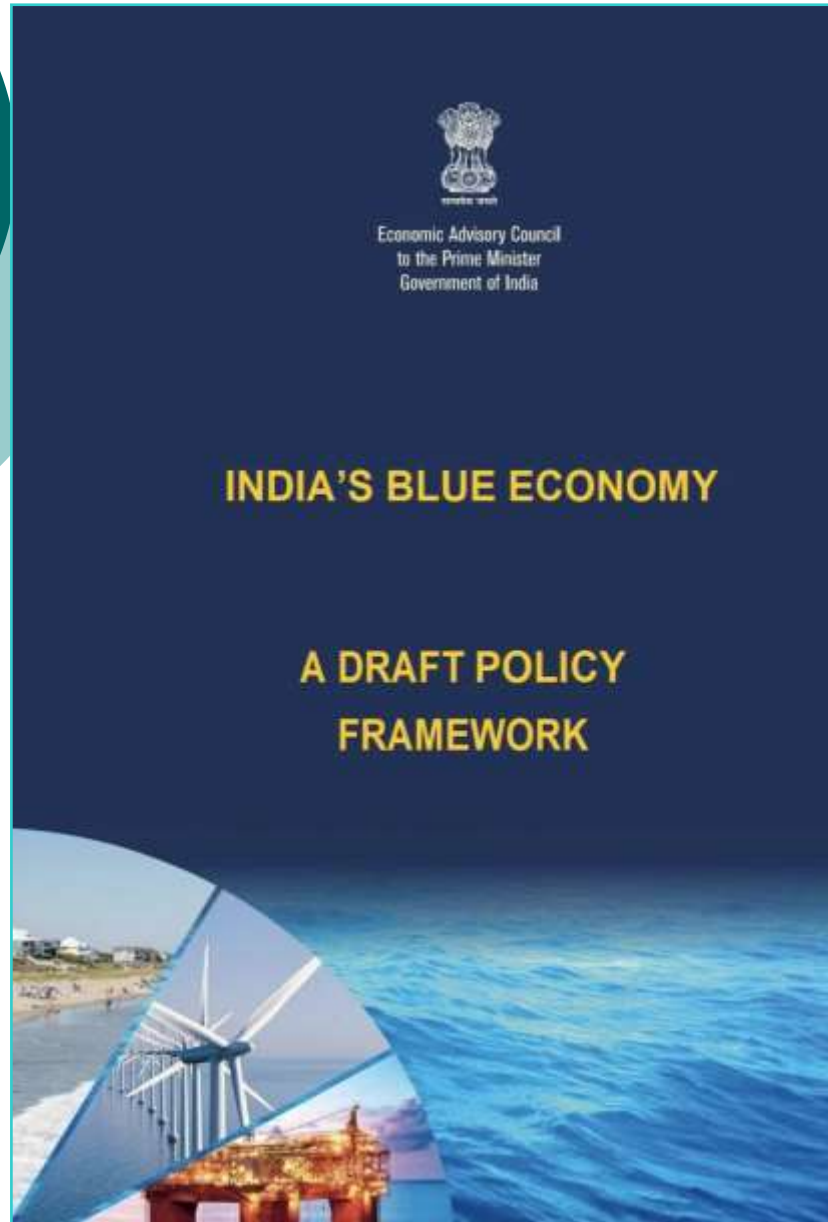


LIFE BELOW WATER

14



Draft Blue Economy Policy - India



Oceans are key to understanding our Climate & Weather

Ocean Observations, information and advisory services play a critical role in securing the lives & livelihoods of communities; in achieving the goals envisaged in our Blue Economy Framework

The seven priority areas identified were:

Priority Area 1: National Accounting Framework for Blue Economy and Ocean Governance

Priority Area 2: Coastal Marine Spatial Planning and Tourism

Priority Area 3: Marine Fisheries, Aquaculture and Fish Processing.

Priority Area 4: Manufacturing, Emerging Industries, Trade, Technology, Services and Skill Development

Priority Area 5: Logistics, Infrastructure and Shipping (including transshipments)

Priority Area 6: Coastal and Deep-Sea Mining and Offshore Energy

Priority Area 7: Security, Strategic Dimensions and International Engagement

Priority areas in the national blue economy policy

National Accounting Framework for Blue Economy and Ocean Governance

A new robust mechanism needs to be devised to collect data for estimating the Blue Economy in India.

Establish active scientific collaborations with leading countries/institutions to develop suitable scientific tools and methodologies relevant to Blue Economy measurement and management.

Coastal Marine Spatial Planning and Tourism

Coastal Marine Spatial Planning (CMSP) approach of the Intergovernmental Oceanographic Commission (IOC) - UNESCO (2009) guidelines.

New Mapping policy for emerging requirements of data security and transparency.

Controlled tourism development linking to CMSP for better environmental management.

Plastic elimination and National Marine Litter Policy.

Marine Fisheries

Monitor and regulate fisheries through legal and regulatory reforms.

Prevent Adverse impact on vulnerable marine ecosystems

Enhance mariculture production (for pharma, jewellery etc.)

Ocean health monitoring and management.

Marine biotechnology.

Priority areas in the national blue economy policy

Manufacturing, Trade, Technology

Promote industries related to marine sectors through public-private partnerships etc.

Separate chapter on Blue Economy in the Industrial policies of Governments (Central/State)

R&D Hubs promoting AI/ML in deep-sea mining, logistics etc.

Upskilling human resources to cater to the marine sectors.

Logistics, Infrastructure, Shipping

Shipbuilding adhering to Energy Efficient Design Index

Sagarmala initiative to develop ports and infrastructure promoting coastal economic zones etc.

Sustainable port development

Controlled tourism development linking to CMSP for better environmental management.

Enhance last mile connectivity for efficiency in logistics etc.

Transshipment hubs

Coastal Deep-sea mining and Energy, and Security aspects

Deep Ocean Mission (DOM) is an initiative under Ministry of Earth Sciences (MoES) to develop technologies for Deep Sea Mining and Manned Submersibles.

SAMUDRAYAAN for deep ocean exploration.

Offshore renewable energy (wind/tide/thermal) potential

Maritime security and collaborative frameworks.

Key takeaways from India's Blue Economy policy

Promoting Economic Growth

Aims to foster sustainable economic development from the Oceans

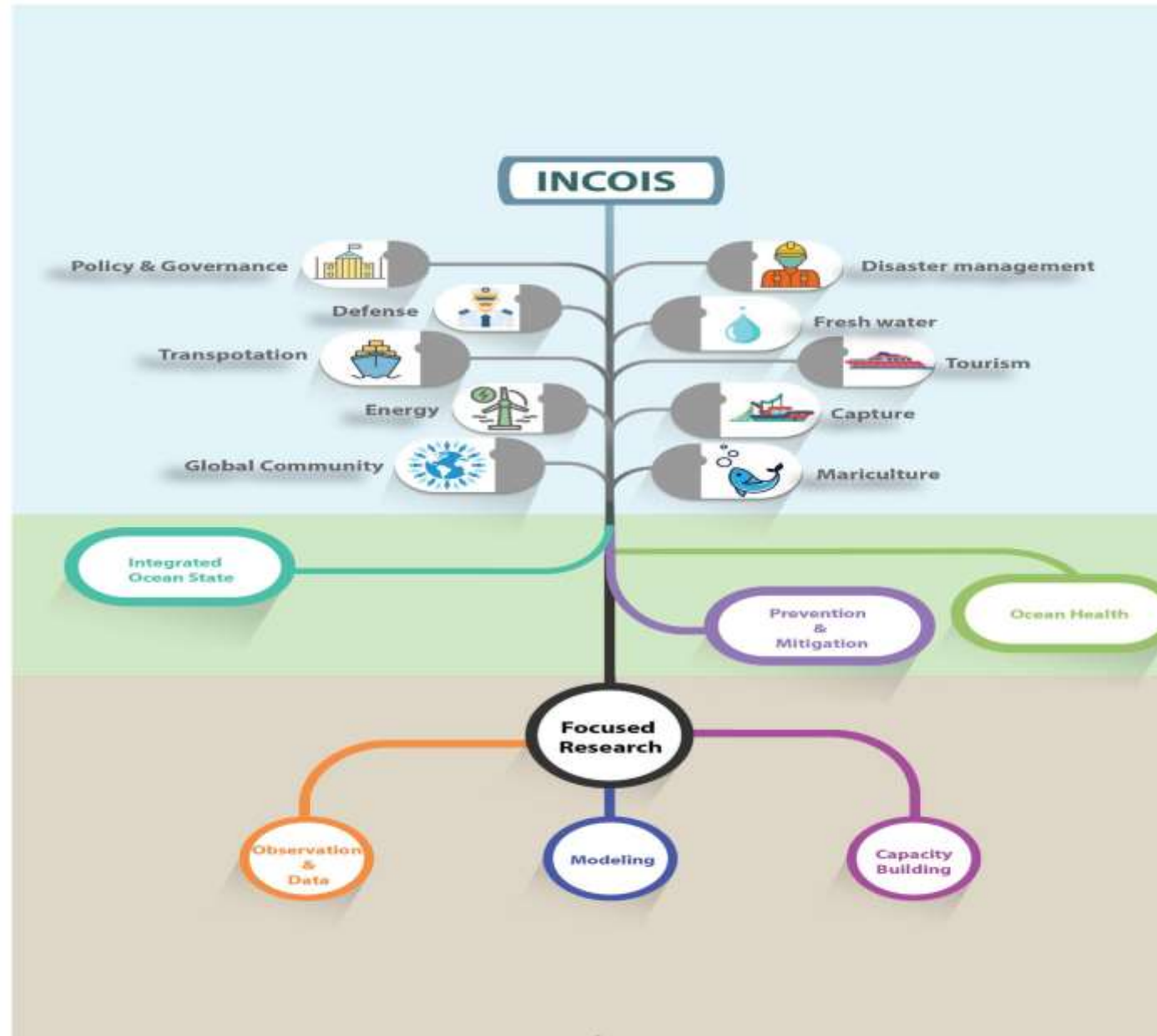
Job Creation Focus

Strives to generate employment opportunities from the maritime sector

Environmental Sustainability

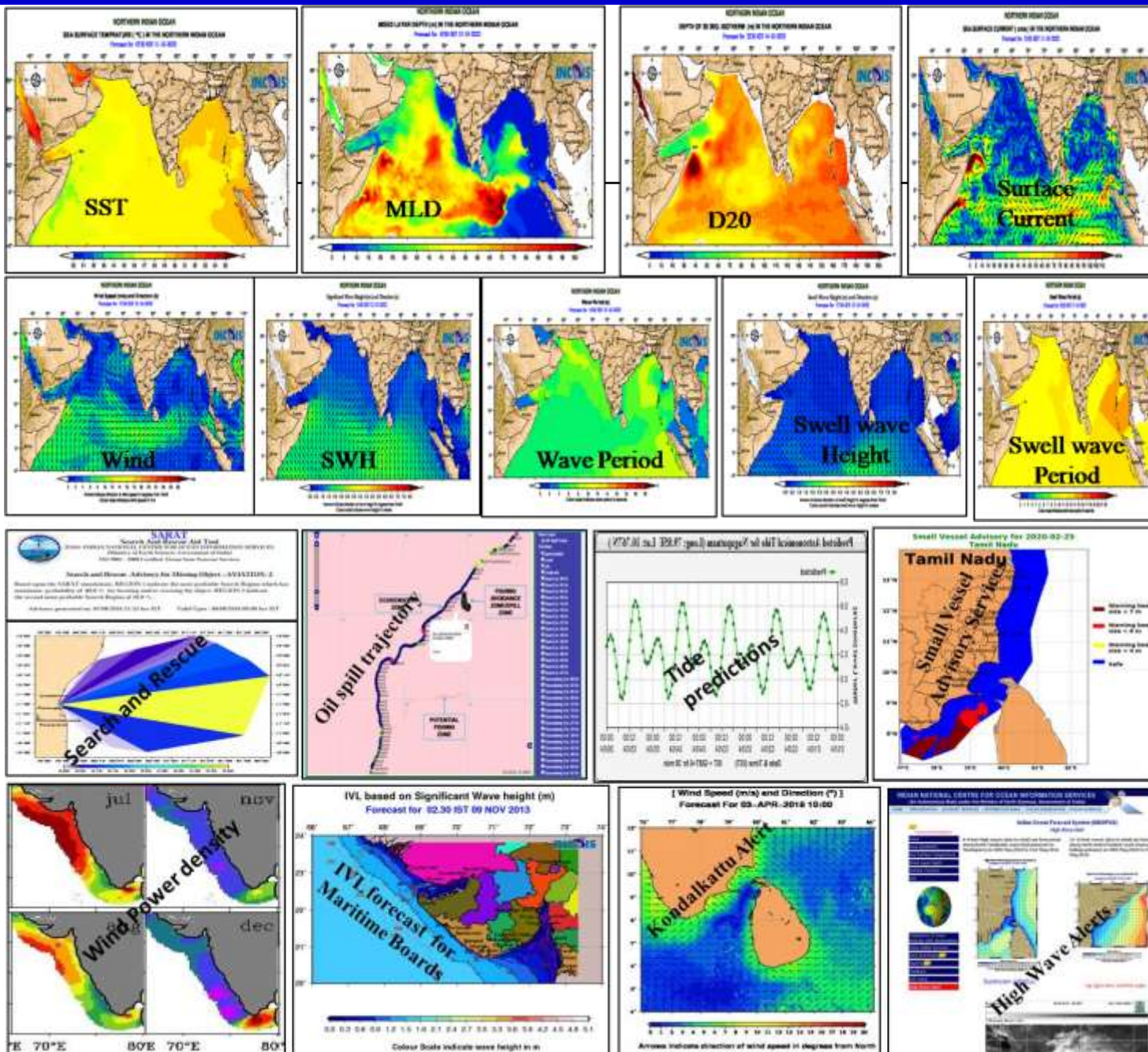
Ensures responsible use of ocean resources for environmental preservation

INCOIS Services – Contribution to Blue Economy



Ocean State Forecast Services

Ocean State Forecasts
45 User specified daily forecast products for India
and 06 Neighbouring Countries

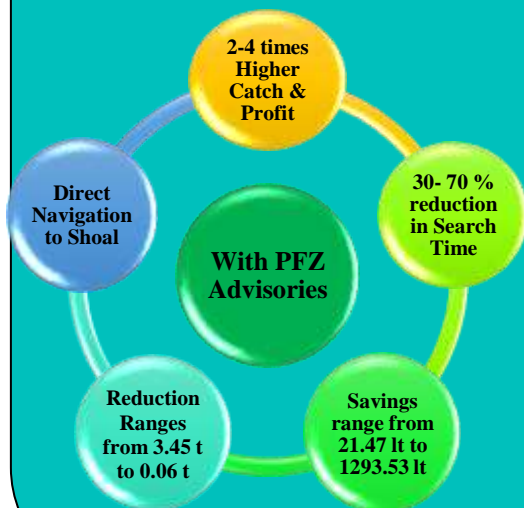


- 3-5 Day Forecasts of Ocean State
- High Wave/swell/bulletins
- Bulletins on Ocean State Forecast along Standard shipping routes

- OSF for Ports & Harbours
- OSF for Shipping
- OSF For Navy
- OSF for Oil & Gas E&P
- Online Oil spill advisories (OOSA)
- Search and Rescue Aid Tool (SARAT)
- Small Vessel Advisory System

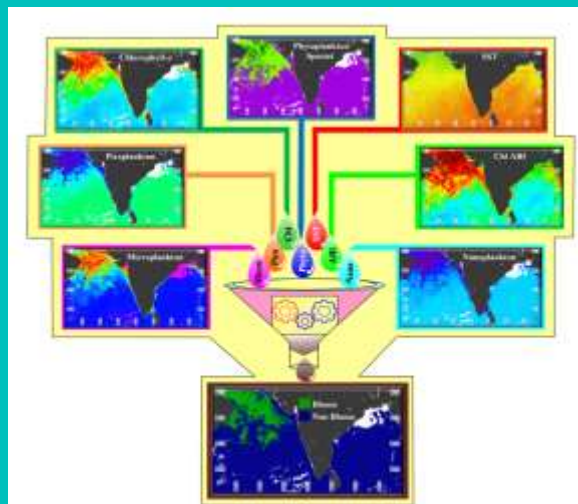
Potential Fishing Zones

Recognized by the International Community as a matured operational application of satellite remote sensing for providing timely and reliable advisories to fishermen/



Algal Bloom Information

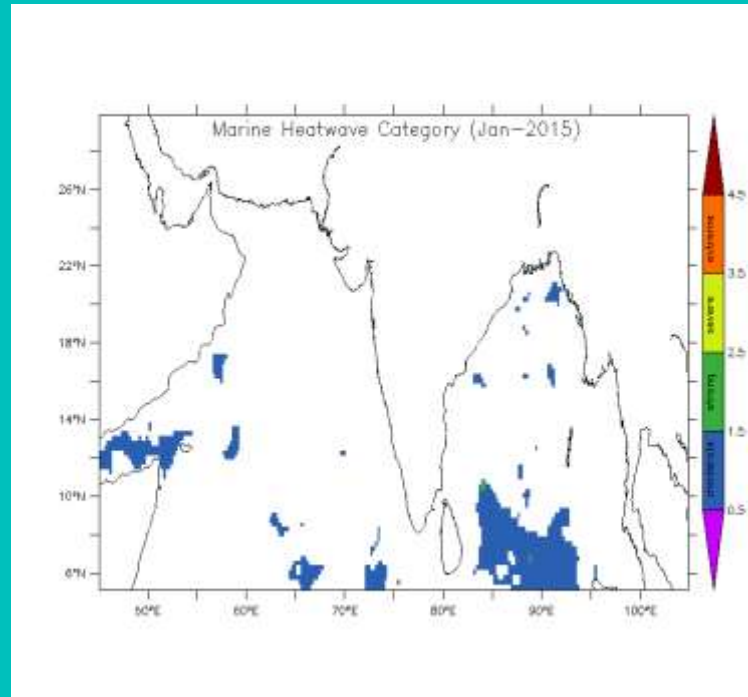
- NAS, Kochi, Gulf of Mannar, Gopalpur
- Satellite products: Chl-a, SST, BI, Chl anomaly, SST anomaly, Spread of Green, red noctiluca and diatom, phytoplankton size class



Coral bleaching



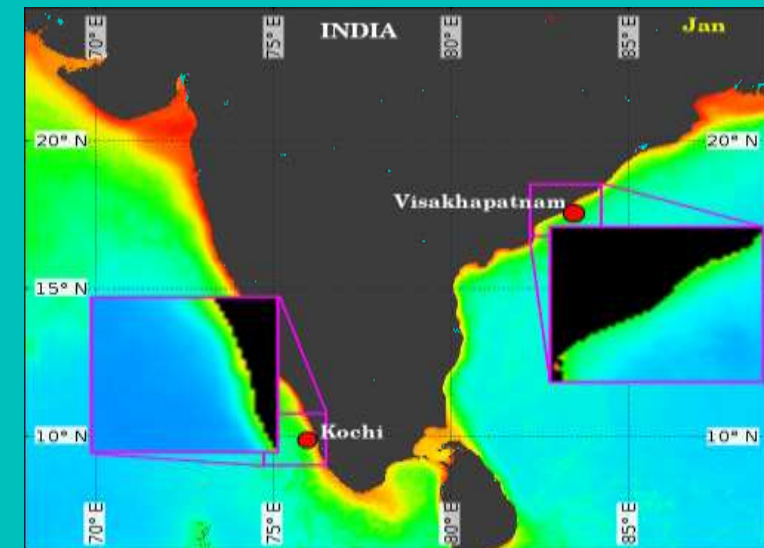
Marine Heatwaves



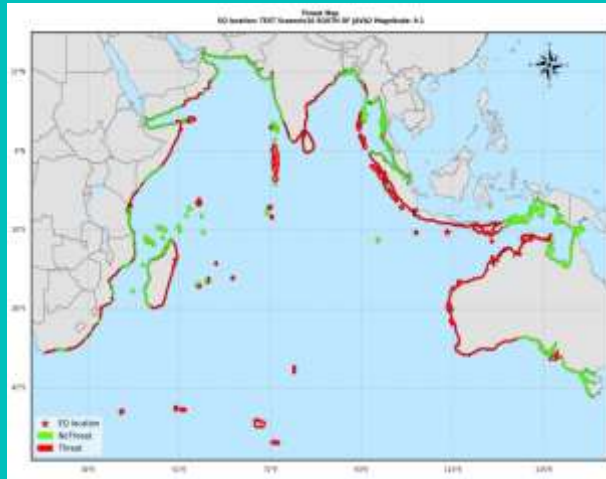
Water quality

Monitoring harmful algae, mitigate coastal pollution, promote coastal tourism etc.

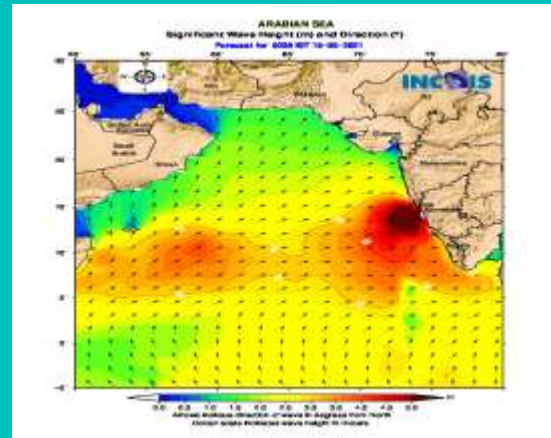
Temperature, Salinity, CDOM, Nitrate, Nitrite, Phosphate, silicate, Oxygen, Oxygen saturation, Scattering



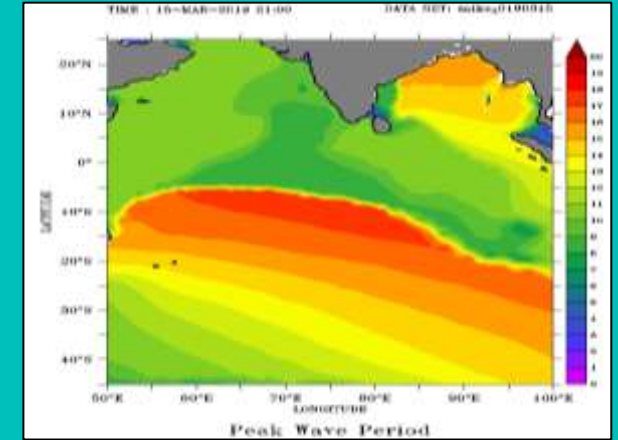
Tsunami early warnings



Cyclones/Storm surges



Swell Surges

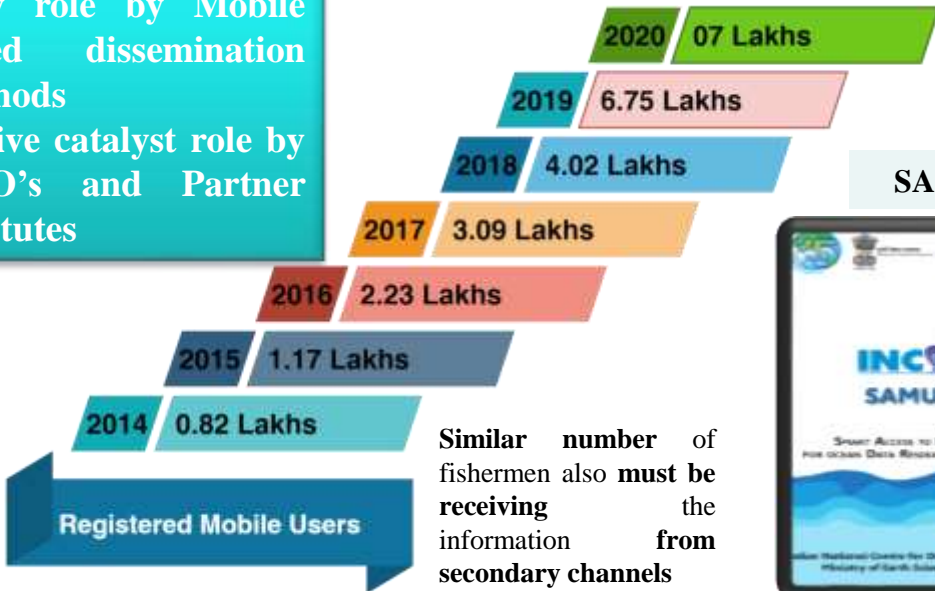




GAGAN based GEMINI Satellite based Solution

Simple & Easy Integration
Economic
Plug & Play

- Key role by Mobile based dissemination methods
- Active catalyst role by NGO's and Partner institutes



Android QR Codes for SAMUDRA



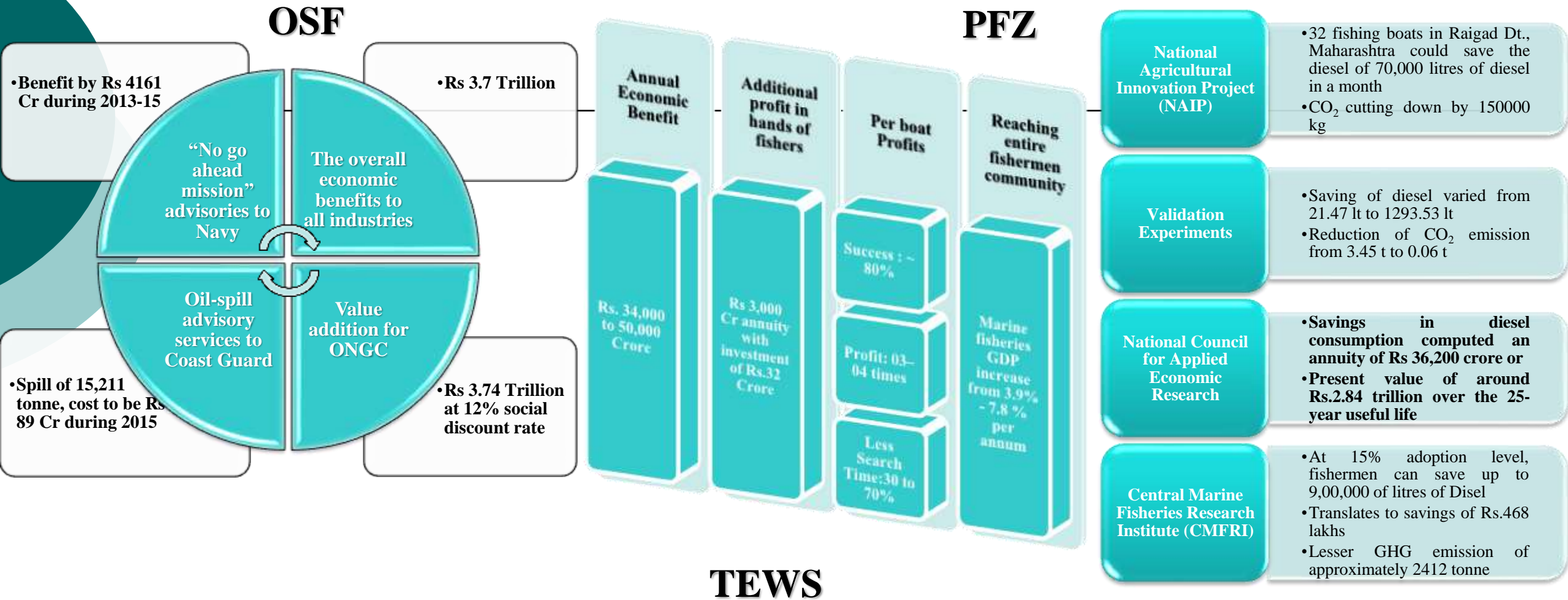
iOS

എറണാകുളം തീരത്തു നിന്നും 13-10-2015 തീൻ ലഭ്യമാണ് മേഖല: 9°55.16"N, 75°58.21"E ദിശ- SW(253°), അകലം- 28 km, സമുദ്രം തൊഴം- 30 m

മാছൻ സഹായ പ്രാപ്തി सम्पर्कित উপগ্রহ তথ্য 27-10-2015 মীথা উপকূল থেকে পূর্বত ; 20°43.36"N, 87°052.22"E দিক: SE(170°), পূর্বত- 105 km, পতীরতা- 86 m

Message:PFZ- মাংগোল ডিনারেথী 14/04/2015 মাছীমারীনু সংলবিত ধীর: 20°27.66'N, 69°31.23'E, দিशा - SW (220°), অঁতর- 94 km, দরীযানী উঁসিধ - 87 m

Multilingual SMS Services



The economic benefits of the Tsunami Early Warning Centre can be simply accessed by the list of under-sea earthquakes in the Indian Ocean Region for which a ‘No Tsunami Threat’ advisory avoids relocation and rehabilitation expenditure. Considering the expenditure incurred by Odisha government for evacuation and relocation of coastal population during Phailin, an expenditure of Rs 3,400 Cr would be required in the absence of “No Tsunami Threat” advisory.”

Collaboration for Sustainable Blue Economy

Adoption of Blue Economy Strategy

Crucial for the region's stability, prosperity, and environmental conservation

Need for Joint Efforts

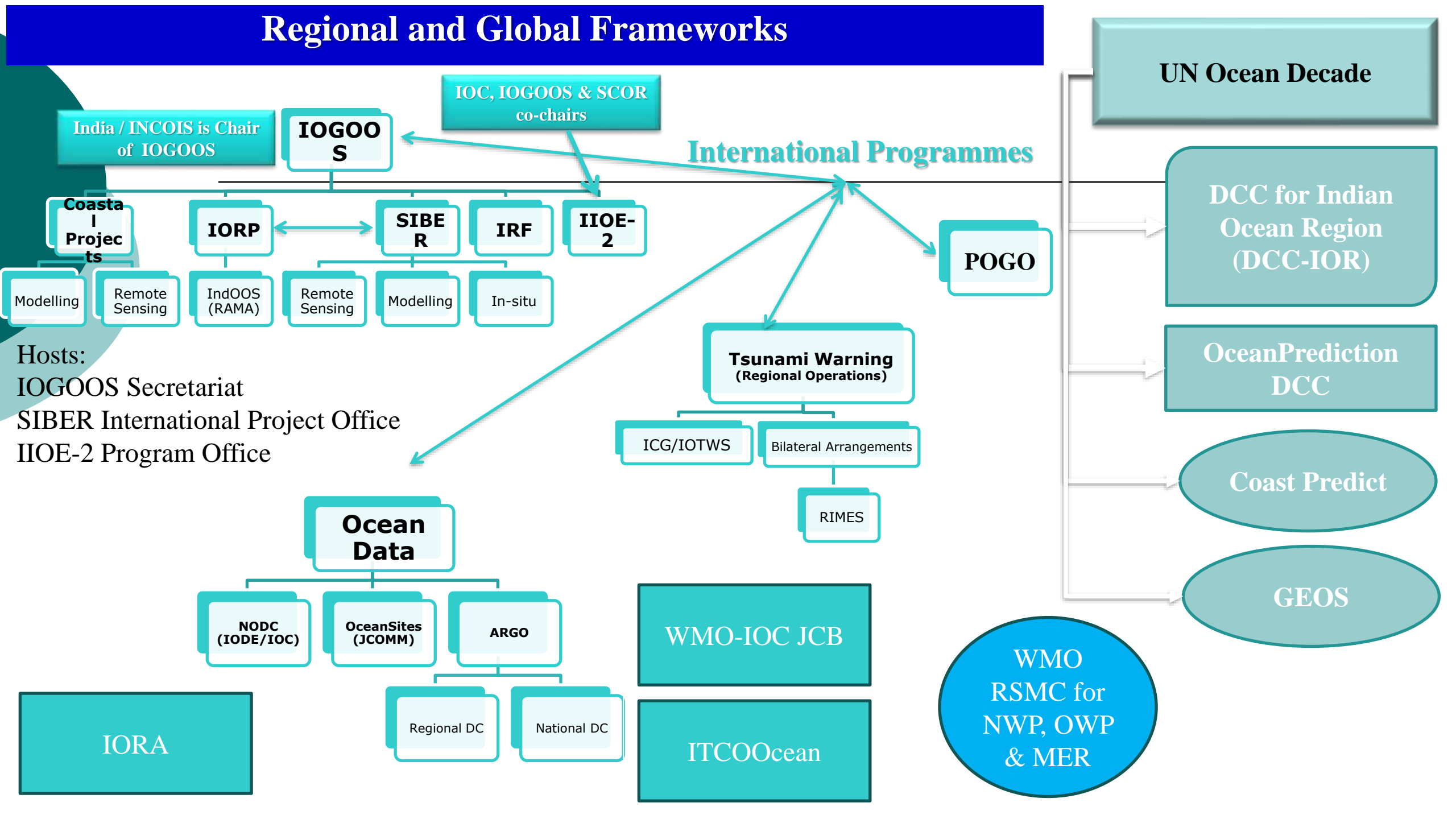
To counter climate change impacts and restore habitats

Collaborations

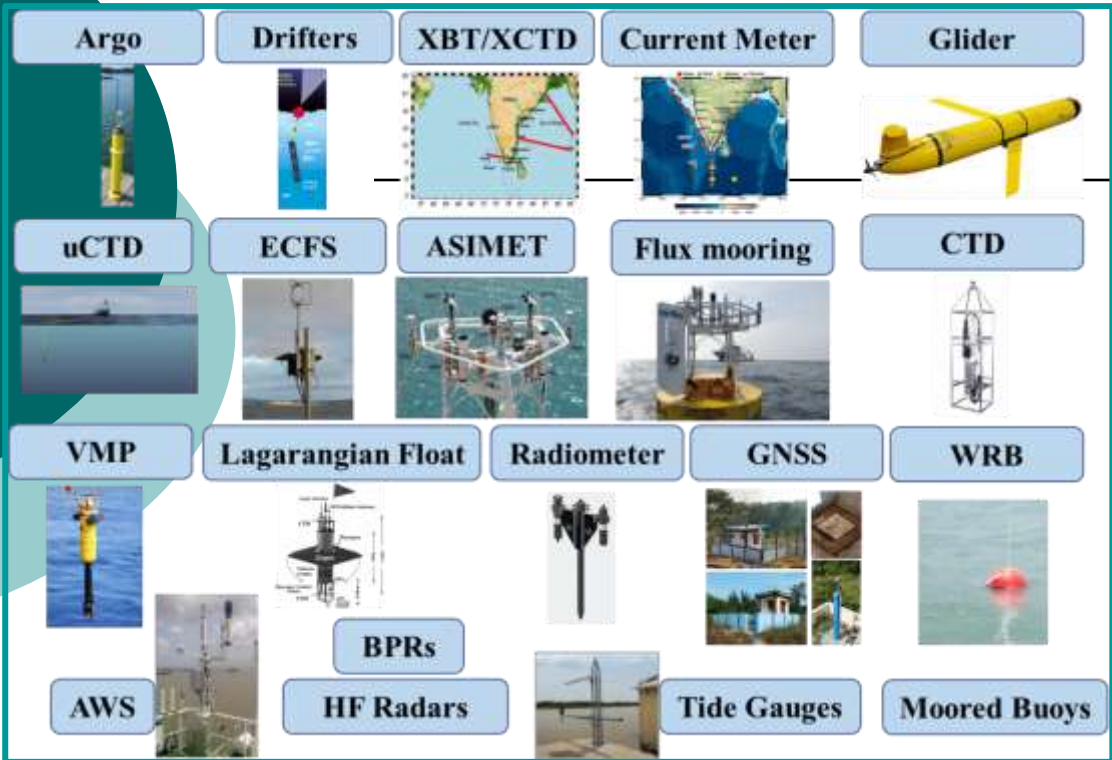
India-Norway task force

G20 HLPs – Chennai High Level Principles

Regional and Global Frameworks



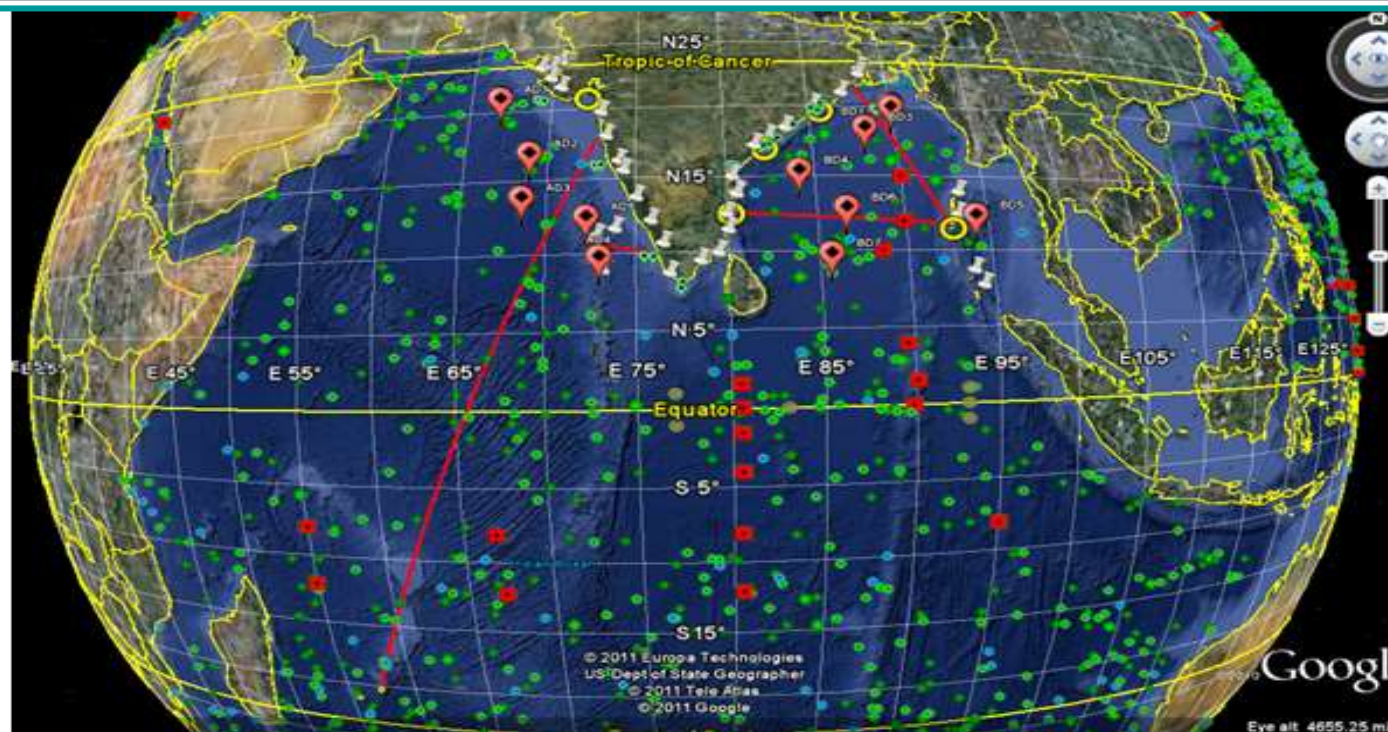
Ocean Observation Network of India And Collaborations



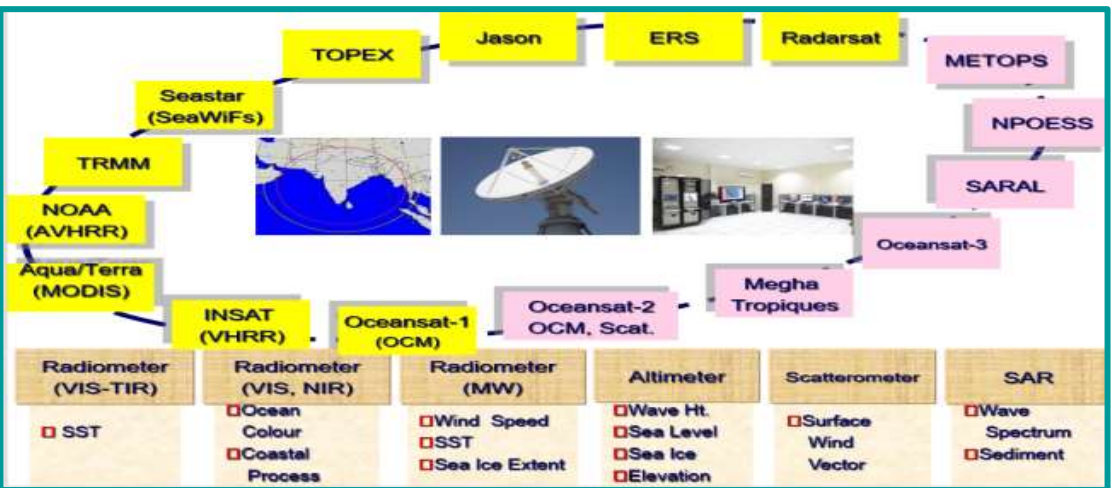
Global Design (GOOS) -> Regional Implementation (IndOOS) -> National Contributions (INCOIS & NIOT OOS, IMD Weather Watch)

Themes: Climate, Operational Ocean Services, and Ocean Health

Essential Ocean Variables: Physics, BGC, Biology & Ecosystems, Atmosphere



Green – Argo, Red line – XBT, Blue – Drifters, Red square – RAMA, Yellow- CODAR, green oval- ADCP, Red oval – Moorings, white mark - TG



IndCOS-2
A roadmap to sustained observations of the Indian Ocean for 2020-2030

WMO
United Nations Educational, Scientific and Cultural Organization
Intergovernmental Oceanographic Commission
GLOBAL OCEAN OBSERVING SYSTEM FOR INDIAN OCEAN

Emerging trends, and challenges in Blue Economy Sectors

UN-Sustainable Development Goals



Climate Change



- Increase in Ocean temperature
- Global sea level rise
- Upper Ocean acidification
- Increase in extreme events

Demographic trends








- Coastal migration
- Food and water insecurity
- Population increase
- Transportation demands
- Urbanization

Technological trends



- AI/ML
- Shift in computation
- Augmented/virtual reality
- Internet Of Things
- Data storage
- Autonomous Instruments

- Depletion
Health risk for marine biota
Shift in fish stocks
Over exploitation
Demand for mariculture 
- Towards renewable energy
Depletion of fossile fuels
Maritime energy demand 
- Increase in seaborne trade
Surplus marine transport 
- Coral bleaching
Coastal erosion
Infrastructure vurnarability
Increase in marine tourism 
- Fresh water scarcity
Increase desalination 
- Heatwaves
Compound Flooding
Droughts
Tropical Cyclones
Heavy precipitaion 

Emerging trends and challenges in operational oceanography



Thank You!