



United Nations
Educational, Scientific and
Cultural Organization

Organisation
des Nations Unies
pour l'éducation
la science et la culture

Organización
de las Naciones Unidas
para la Educación
la Ciencia y la Cultura

Организация
Объединенных Наций по
вопросам образования
науки и культуры

• Intergovernmental
Oceanographic
Commission

• Commission
océanographique
intergouvernementale

• Comisión
Oceanográfica
Intergubernamental

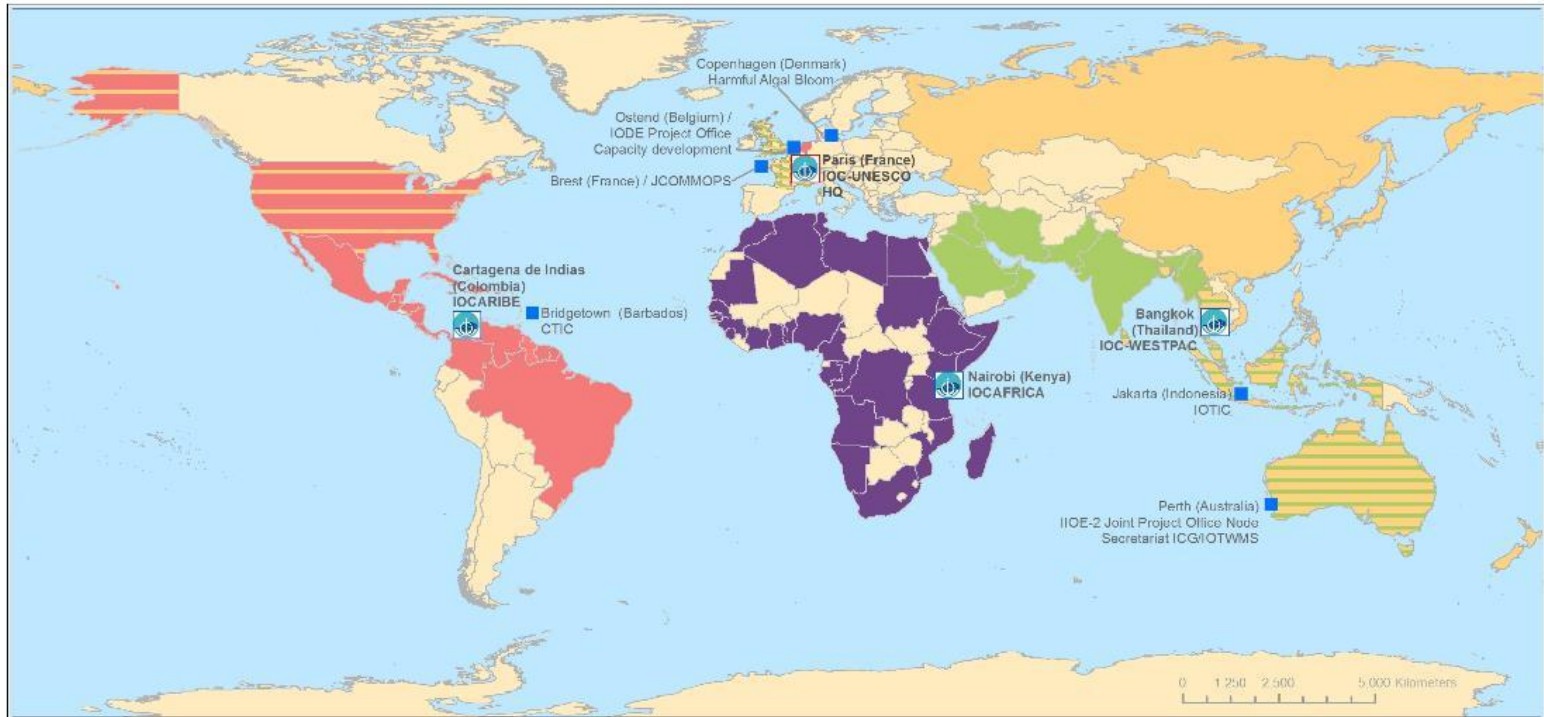
• Межправительственная
океанографическая
комиссия

Development of Ocean Observations in Africa and the Adjacent Island States

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IOC Sub Commission for Africa & the Adjacent Island States

Intergovernmental Oceanographic Commission of UNESCO IOC Sub-commissions, Programme and Project Offices



IOC-UNESCO/MPR, 2016

The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the IOC-UNESCO.

-  IOCAFRIKA Member States
-  IOCARIBE Member States
-  IOCINDIO Member States
-  IOC-WESTPAC Member States
-  IOC-UNESCO Secretariat
-  IOC Sub-Commissions
-  IOC Programme and Project Offices



IOCAFRICA Mission

- Established July 2011, and officially launched May 2012.

Promote regional and international cooperation for the understanding and management of the African oceans and coastal ecosystems, in order to ensure sustainable development and safety of the coastal populations, taking into account the priorities of Member States from Africa

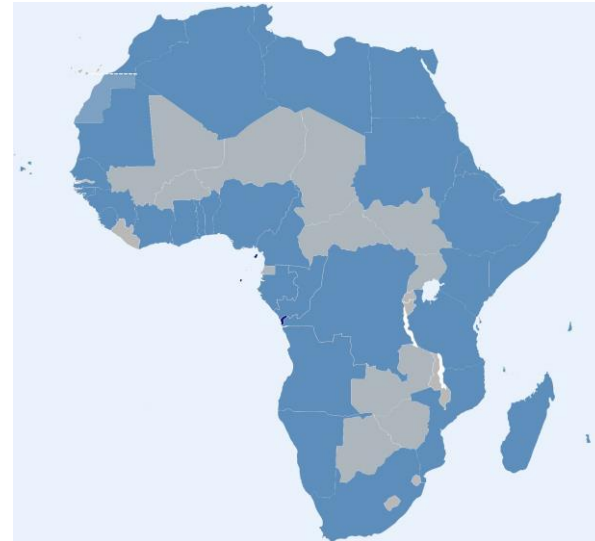
Location of IOCAFRICA Secretariat
UNESCO Regional Office for Eastern Africa
UN Offices in Nairobi, Kenya



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IOCAFRICA Vision

to be the voice of Africa on matters related to ocean science and the science base for ocean management, providing a unique Africa-wide platform, bringing together Member States, UN agencies and other stakeholders, to drive research, observations, and disaster preparedness and mitigation for the sustainable management of the African oceans and coastal areas;



36 Member States

IOCAFRICA Expected Results

- ✓ Understanding of the ocean & coastal processes around Africa
- ✓ Monitoring and early warning systems for coastal and oceanic natural hazards
- ✓ Understanding of how African oceans and coastal areas will be impacted by changing climates
- ✓ Managing and mitigating the impacts of coastal hazards and climate change
- ✓ Strengthening of marine and oceanographic training and research institutions
- ✓ Creation of critical mass of marine science professionals



IOCAFRICA THEMATIC AREAS

- 1. Ocean Observations and Monitoring**
- 2. Ocean Sciences and Assessments**
- 3. Ocean Data and Information Management**
- 4. Capacity Development in Marine Science and Technology**
- 5. Public Awareness and Science-Policy Interface**



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Ocean Observations and Monitoring

- ✓ **Surveys and monitoring of essential oceanographic and meteorological parameters,**
- ✓ **Inventory of previous ocean related hazards and extreme events (frequency, intensity, etc.) and mapping of vulnerable areas**
- ✓ **Survey and mapping of marine ecosystems to facilitate and support the development of ecosystem services**



Ocean Sciences and Assessments

- ✓ **Climate change and vulnerability, ocean acidification**
- ✓ **Ocean modelling and forecasting (including extreme weather events such as storm surges)**
- ✓ **Monitoring trends in ecosystem degradation**
- ✓ **Monitoring of Harmful Algal Blooms and biomarker indicators**
- ✓ **Marine Biodiversity and baseline surveys**

Marine Spatial Planning to zone different activities



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Ocean Data & Information Management

- ✓ Improving access to ocean data and information
- ✓ Updating the African Coastal and Marine Atlases
- ✓ Developing a marine biodiversity and biogeography programme
- ✓ Preparation of ocean data and information products for Sustainable Development of the Ocean and Coastal regions Updating of the databases created (experts, institutions, and projects)
- ✓ Developing and African Ocean Data portal



Capacity Development

- ✓ **Development of an IOCAFRICA Capacity Development portal**
- ✓ **Continuous professional development for marine scientists from the region**
- ✓ **Strengthening and development of regional training centers**
- ✓ **Strengthening ocean science programmes in African Universities Mentorship and programmes targeting youth and female scientists**
- ✓ **Organize training courses and workshops on the following topics: Operational oceanography, Ocean modeling and forecasting, Marine biodiversity, Marine spatial planning, and Identification of HABs**



Public Awareness & Science Policy Interface

- ✓ Support for activities to mark World Ocean Day and African Day of Oceans and Seas
- ✓ Developing partnerships and linkages with other organizations, programmes and projects
- ✓ Public Awareness and advocacy activities
- ✓ Preparation of technical/media briefs on priority issues
- ✓ Pan African Conference on Marine Sciences and Technology (including development of concept note, identification of potential partners, and establishment of scientific committee).



GLOBAL OCEAN SCIENCE REPORT – GOSR

OCEAN SCIENCE PUBLICATIONS AND CITATIONS

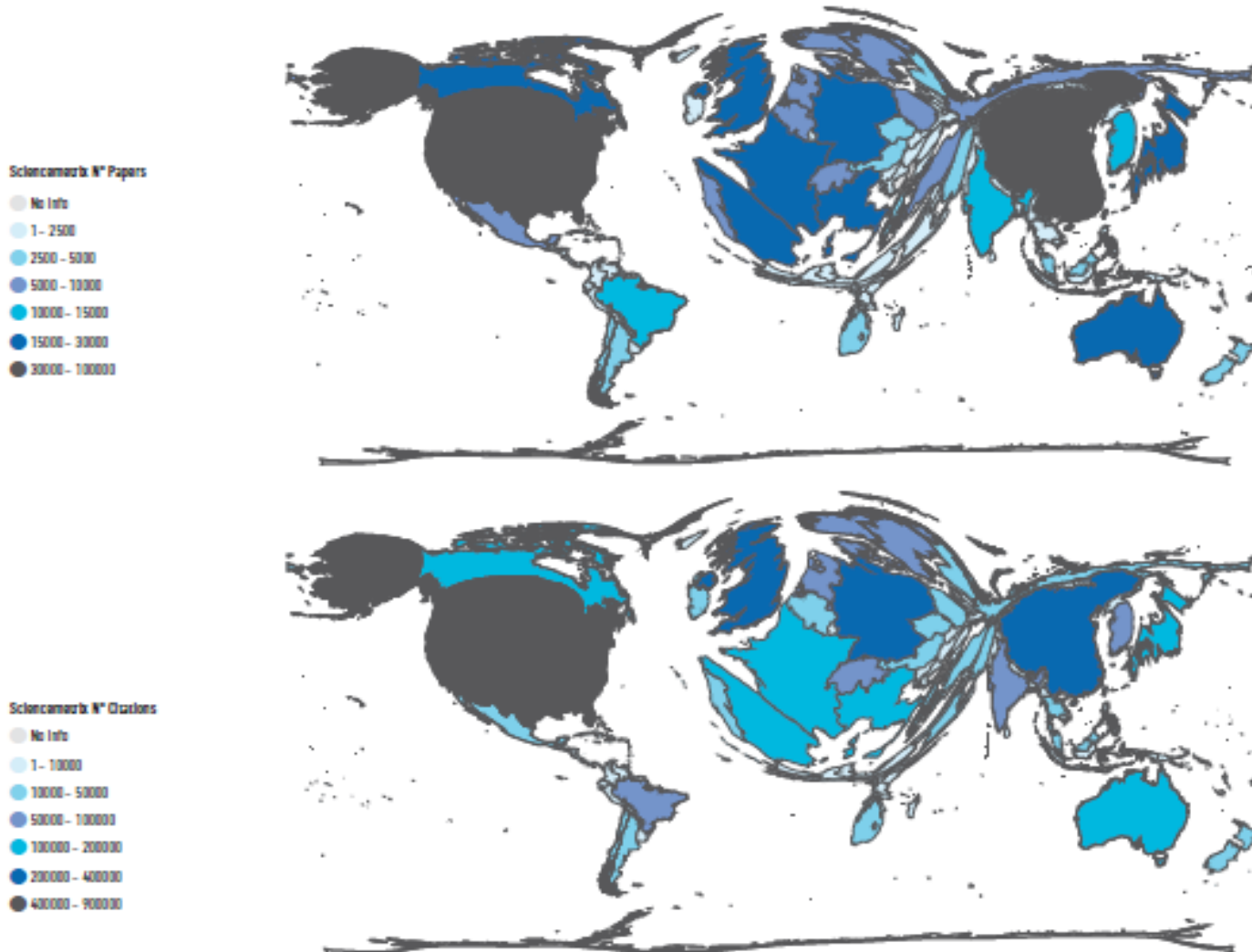


Figure ES7. Publication and citation map of the world. The area of each country is scaled and deformed according to the number of ocean science publications [top] or citations received [bottom]. Different colours indicate a different number of publications [top] or citations [bottom]. Source: ScienceMetrix, 2015.

Ocean Observations and Monitoring

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EXPECTED OUTCOME

To have a reliable and functional ocean observation system that is able to provide ocean information (products) for human security and sustainable economic development in Africa and the adjacent Island States..



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KEY ISSUES

1. Food Security and Fisheries
2. Early Warning for ocean related hazards and disaster risk reduction
3. Ecosystem services and sustainability
4. Coastal management and governance
5. Climate Variability/ Change and adaptation
6. Higher Education and training



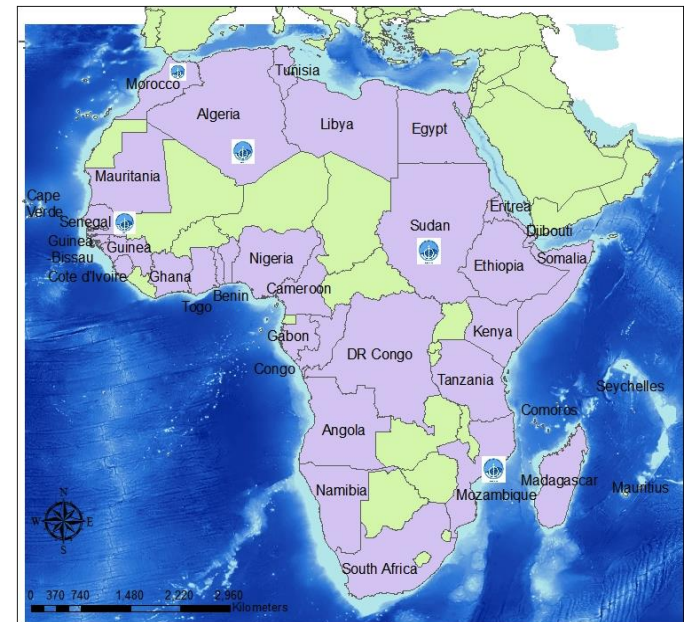
CATEGORIES OF PLATFORMS

- (a) Research vessels in the framework of national, regional and global ocean programmes;
- (b) Coastal Stations (such as tide gauges)
- (c) Drifting/moored buoys deployed along the coastline and offshore;
- (d) Satellites and other remote observation platforms.



RESEARCH VESSELS.

- (a) Research vessels owned by local institutions
- (b) Research vessels owned by other countries but based in region
- (c) Visiting research vessels
- (d) Ships of opportunity



RESEARCH VESSELS

RV Fridtjof Nansen

1. Algeria
2. Angola
3. Egypt
4. Mauritania
5. Morocco
6. Kenya
7. Namibia
8. Senegal
9. South Africa
10. Tunisia

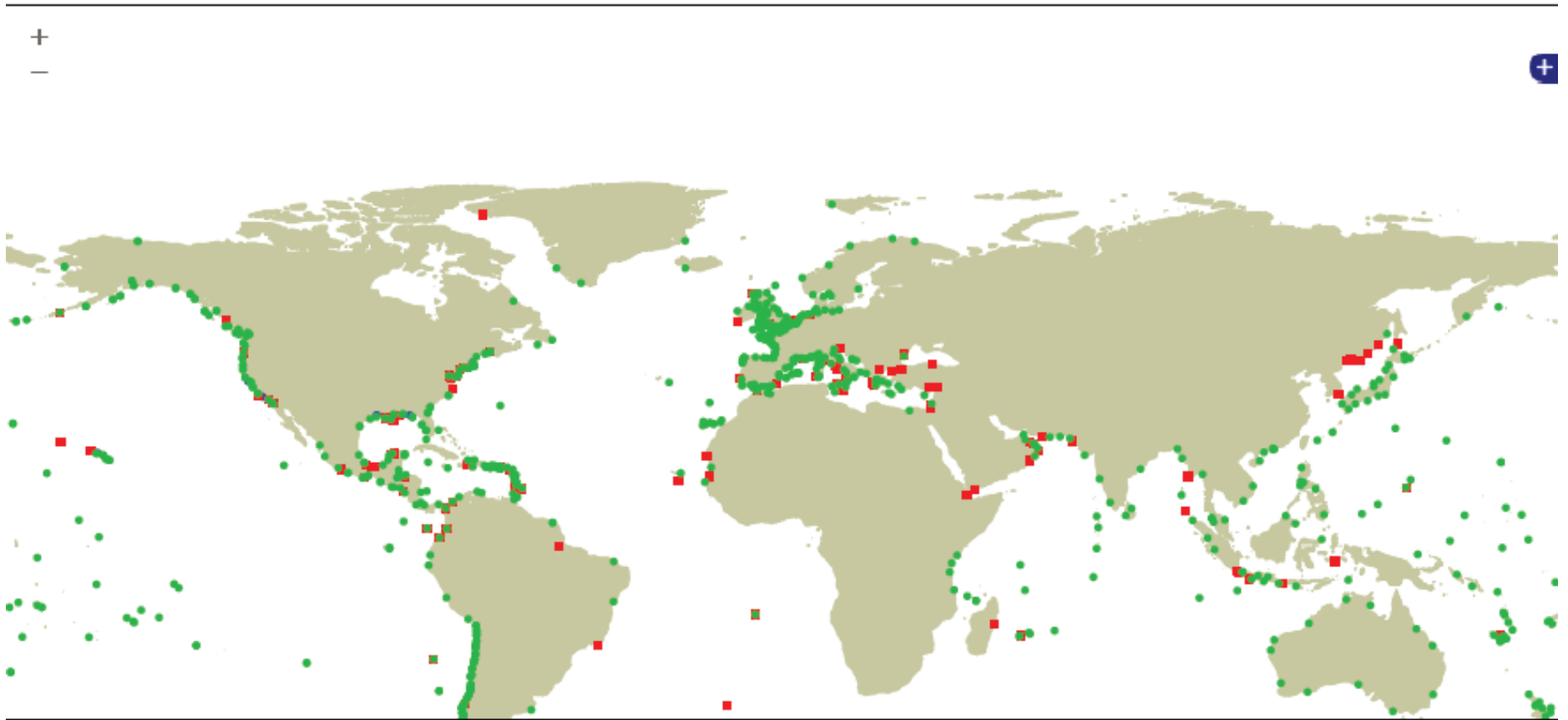


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COASTAL STATIONS.



SEA LEVEL STATION MONITORING FACILITY

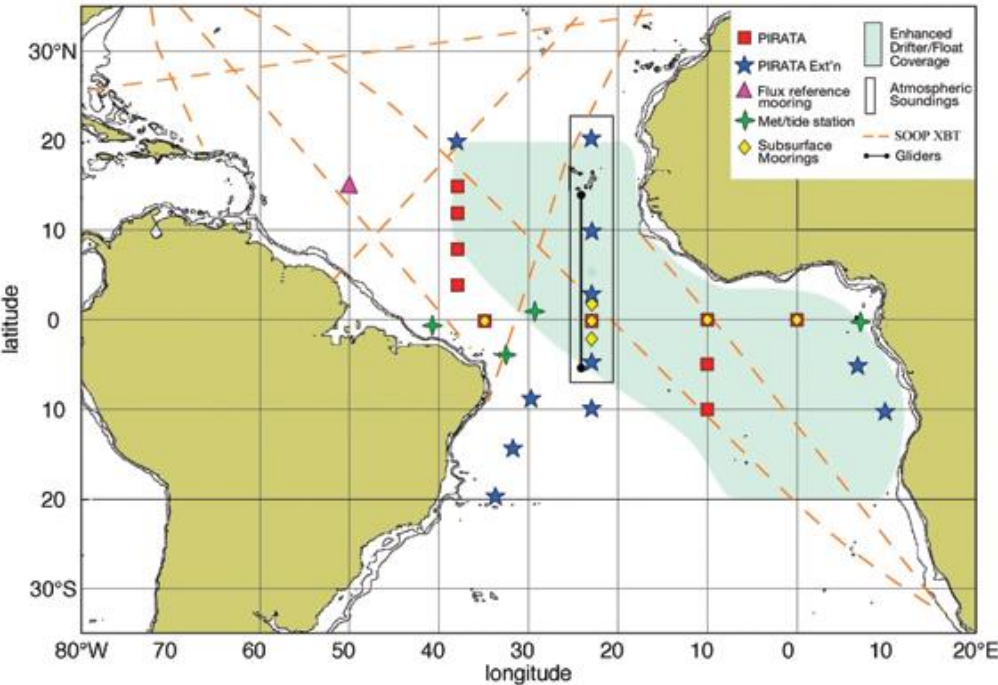


<http://www.ioc-sealevelmonitoring.org/map.php>



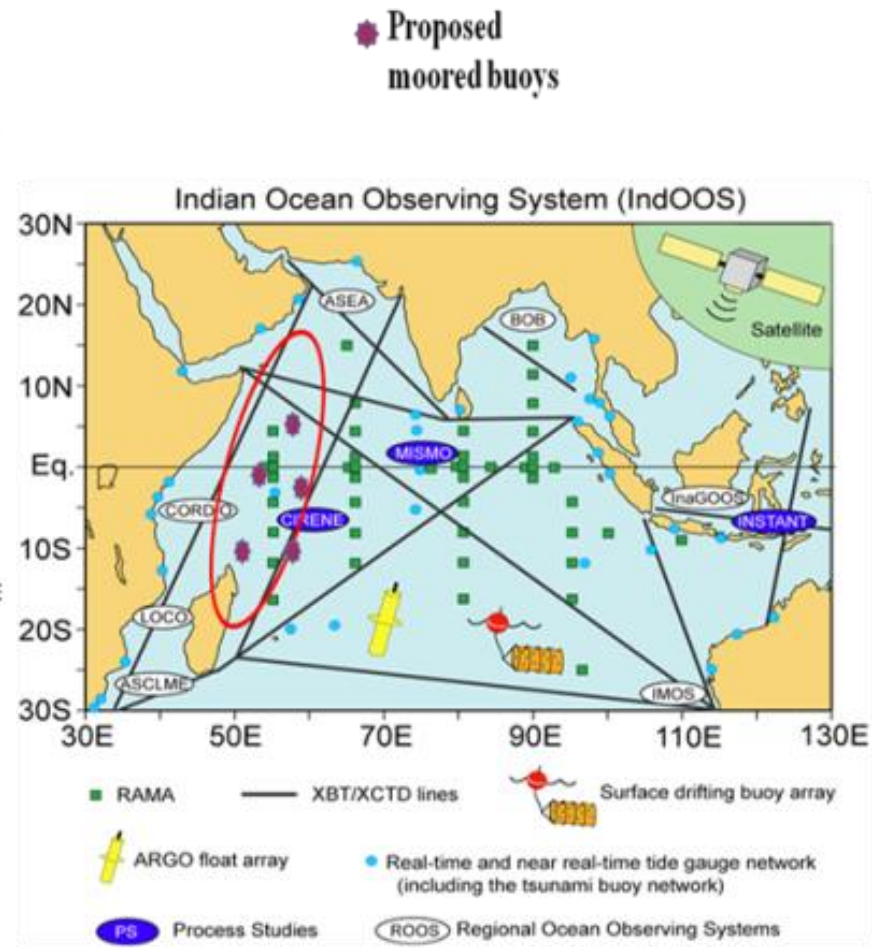
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Existing/ Planned Observation platforms



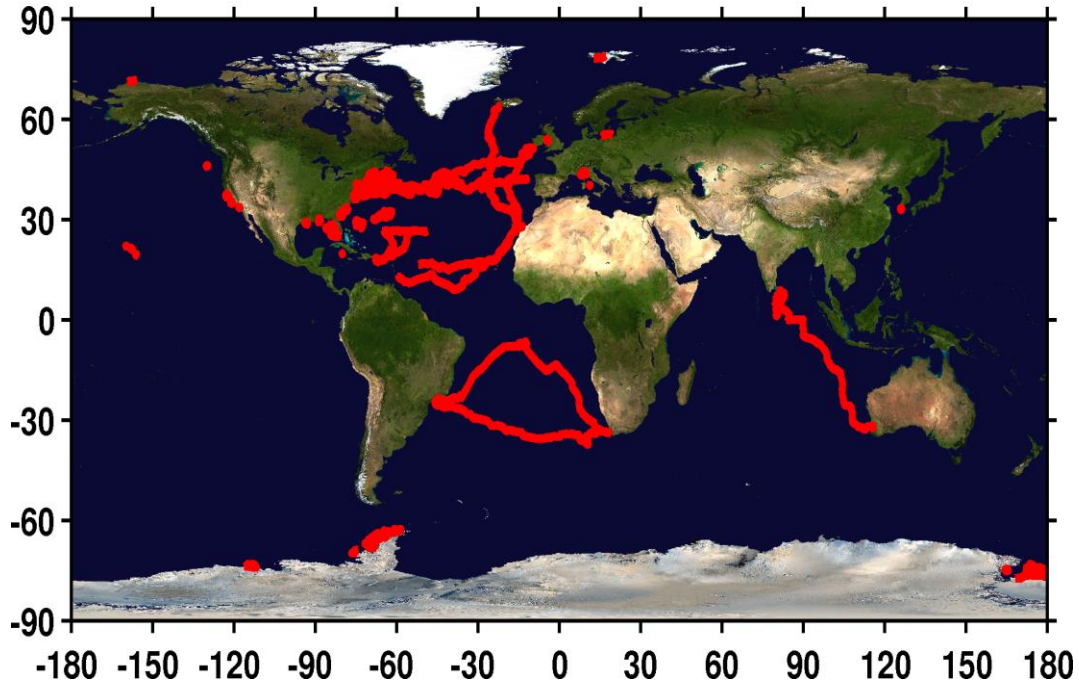
PIRATA: Prediction and Research Moored Array in the Atlantic

RAMA: Research Moored Array for African-Asian-Australian Monsoon Analysis and Prediction



WAVE GLIDERS

478 deployments - 236799.88km flown - 12405 days



<http://challenger.marine.rutgers.edu/>



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PUMA

- **Meteorological** data, satellite access,
- assessment, predictions

AMESD

- **EO technology**, mapping, RS, geo-portals, NDVI, and GIS

MESA

- increase use of **info**, better **communication**, and capacity for **environmental monitoring**
- Climate and food security

GMES
AFRICA

- promoting the development of local capacities, institutional, human and technical resources for access to and exploitation of Earth Observations-based services on an operational basis

SECOND INTERNATIONAL INDIAN OCEAN EXPEDITION IIOE-2



IOCAFRICA-III session, April 2015

- Set-up IOCAFRICA Group of Experts on IIOE-2.
- The Group identified possible WIO priority topics for IIOE-2:
 - (i) Habitat mapping and living resource inventory
 - (ii) Connectivity and genetics
 - (iii) Air-sea interactions, climate variability and extreme events such as cyclones and storm surges
 - (iv) Geology – structural features of the WIO seabed
 - (v) Coastal and shelf dynamics
 - (vi) Upwelling and food security (WIOURI)
- The Group organized a regional IIOE-2 consultation meeting in October 2015, Maputo, Mozambique



PROPOSED REGIONAL SURVEYS

Somali Upwelling and Penetration of Red Sea water

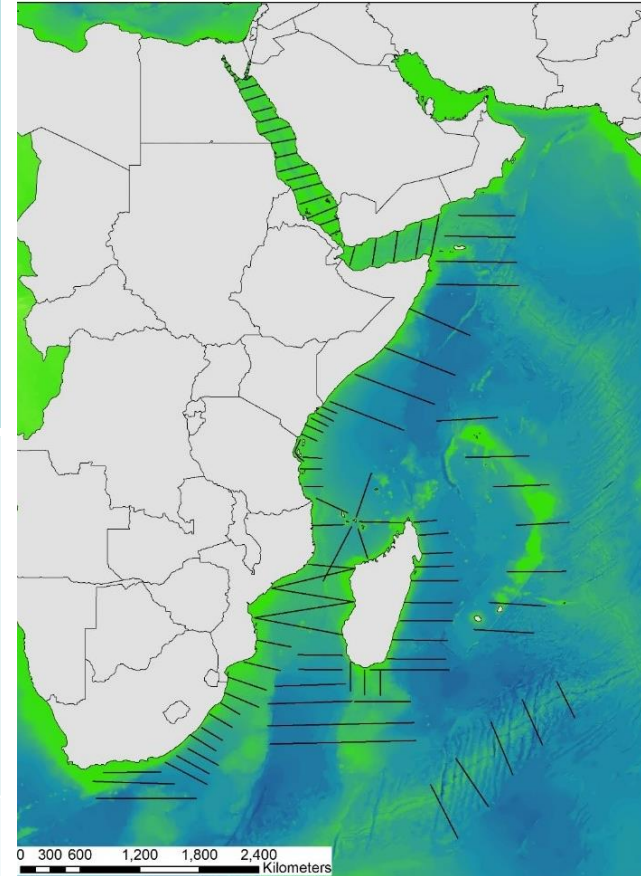
Information on environmental variability, upwelling, productivity and related fisheries. Determine how Red Sea water reaches the WIO to increase understanding of global thermohaline circulation & inter-ocean water exchange

Kenya and Tanzania Coasts

Mapping needed of inshore circulation patterns. Information needed on larval transport, recruitment, environmental conditions for fisheries, and pollutant dispersal

Mozambique Channel

Information needed on the shedding and triggering of Mozambique eddies. Information also needed on productivity



PROPOSED REGIONAL SURVEYS

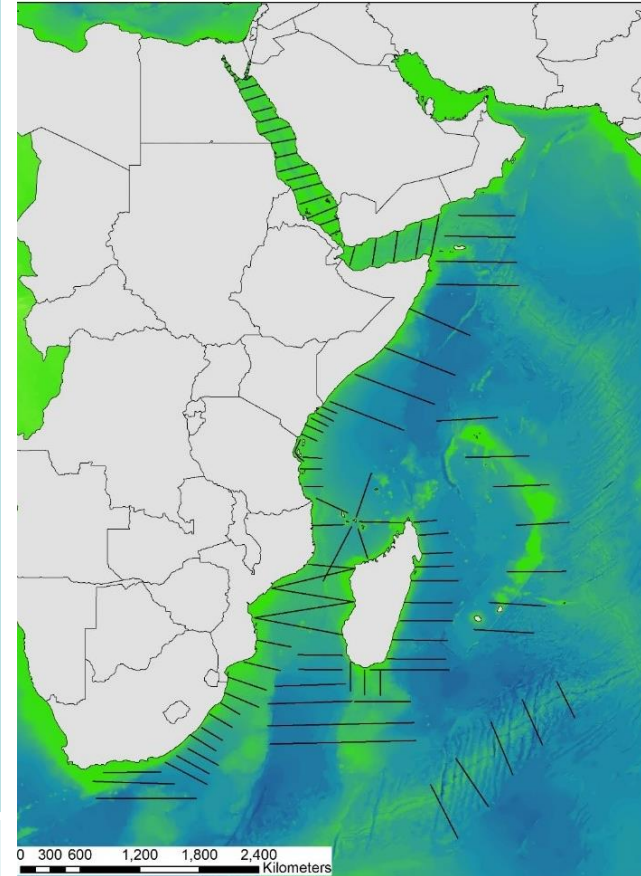
Areas of the Mozambique and SA coasts

Information needed on eddies to determine effects on overall ecology of the areas and particularly on downstream biodiversity, influence on shelf circulation, disposition of river outflows, dispersal of pollutants and thus habitat of organisms, and potential role on health of prawn fisheries

Understanding of the hydrodynamics of the Agulhas Bank to enhance existing information on the valuable anchovy and sardine fishery spawning ground which has implications for the health of these fisheries in the Benguela Current LME

Southwest Indian Ocean shelf regions

Knowledge of shelf circulation patterns and transport of fish larvae, dispersal of pollutants. Information on system productivity needed



PROPOSED REGIONAL SURVEYS

Comoros Gyre

The Gyre is an anti-cyclonic eddy that is generally located from 10° S to 15° S and between the north-east coast of Mozambique and the north-west coast of Madagascar

Mascarene Plateau

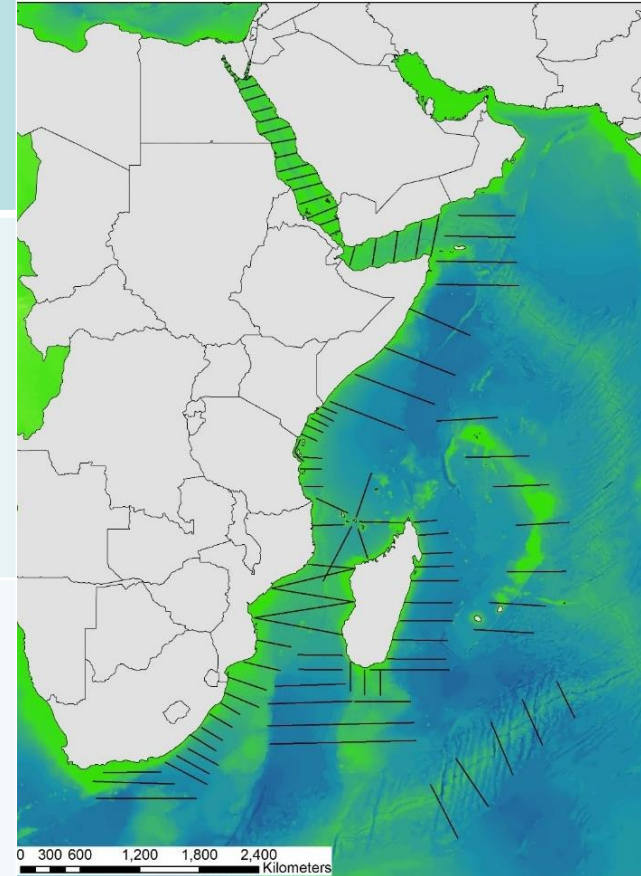
Information on the interaction of physico-chemical and biological processes in this large, shallow, mid-ocean region. Specific information needed on seagrass beds, overall climatic patterns, variability, and the potential influence of the Indian Equatorial Jet on productivity

Southern Madagascar

The splitting of the southern and northern branch of the East Madagascar Current: Knowledge of shelf and coastal circulations, biodiversity, chemistry and geology virtually non-existent.

The forcing of the South Madagascar upwelling cell: Baseline information on coastal circulations, biodiversity, chemistry and geology

Seamounts: Dynamics of the 6 seamounts at the edge of the SWIO ridge in terms of fisheries and biodiversity



ROOFS-AFRICA

Regional Ocean Observing & Forecasting System for Africa

- improved collection of *In Situ Ocean Measurements* and Observations Validation and their use in tidal prediction, erosion risk assessment, forecasts of coastal flooding and estimates of sea level rise;
- collection and spatial analysis of satellite imagery of the coastal seas for fisheries resource management and coastal planning;
- development of regional modeling and forecasting capabilities to provide additional protection against extreme events; and
- end-to-end operational system to deliver the information products to the intended users in the timely and reliable fashion



A sunset over the ocean with silhouettes of people on a beach. The sky is a warm orange and yellow, reflecting on the water. In the foreground, several people are silhouetted against the bright light of the setting sun. They appear to be standing on a sandy beach, some holding what look like fishing gear or nets. The overall mood is peaceful and serene.

One Ocean – One Planet

Thank you!

IOC Sub Commission for Africa & the Adjacent Island States

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