



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

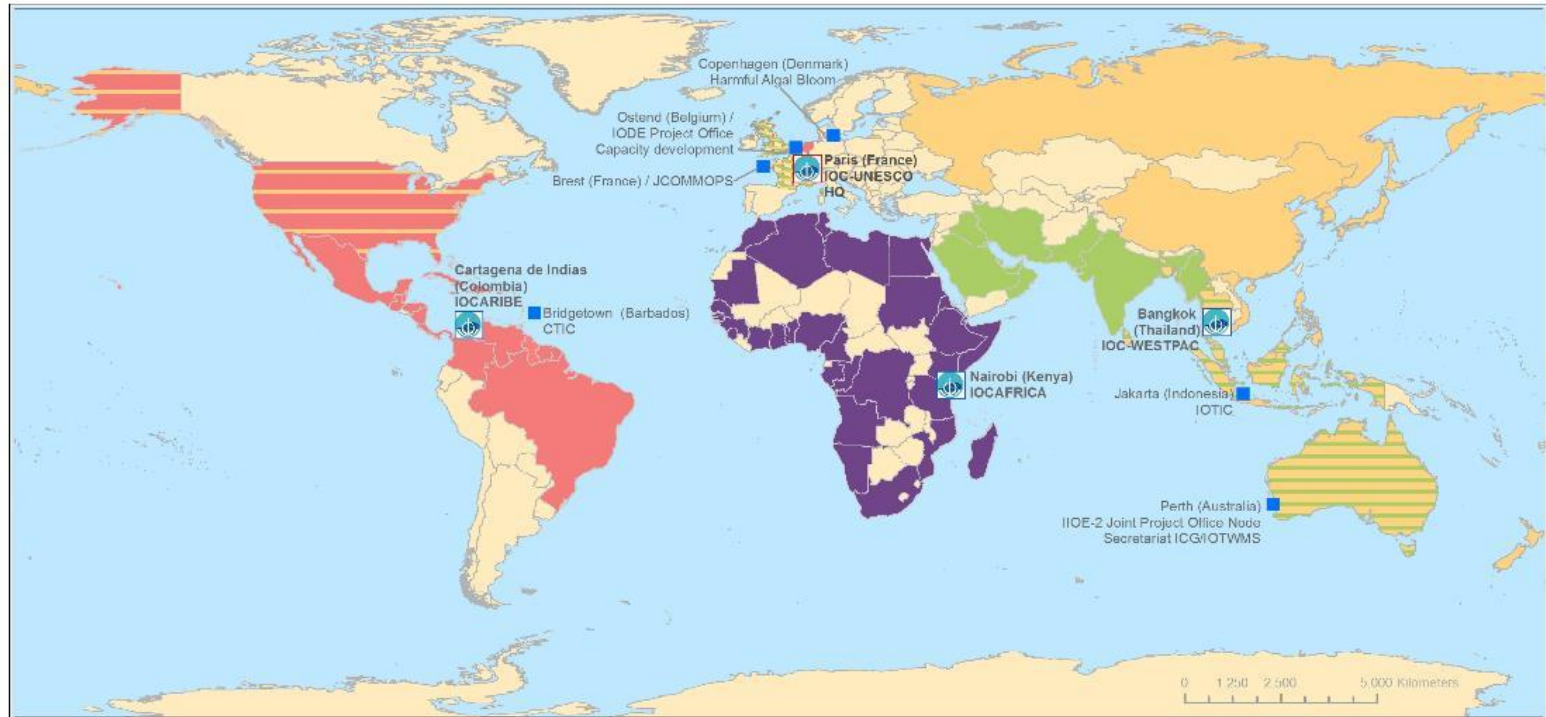
• Межправительственная
океанографическая
комиссия

Contribution of IOCAFRICA to IIOE-2

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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.

-  IOCAFRICA 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.

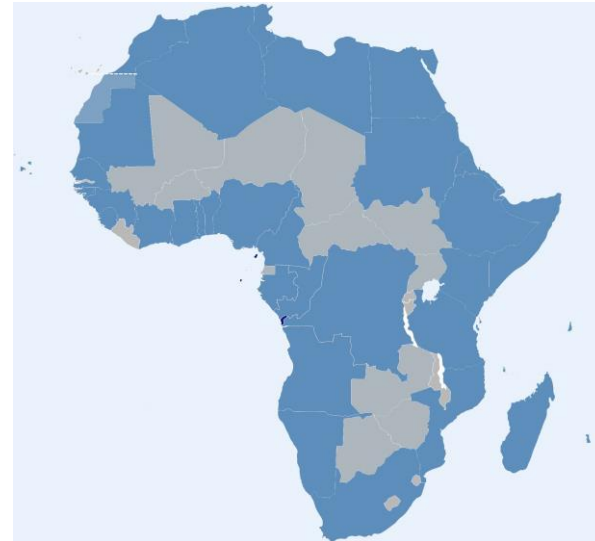
Promote regional and international cooperation for the understanding and management of the African oceans and coastal ecosystems, in order to ensure sustainable development and safety of the coastal populations, taking into account the priorities of Member States from Africa

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



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**



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



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).

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



MAPUTO RECOMMENDATIONS

- ✓ Inventory of the past cruises undertaken in the WIO region
- ✓ Inventory of the data sets available in the WIO region
- ✓ Marine Science Country profiles updated
- ✓ Detailed National plans for the IIOE-2 (contribution of national and bilateral programmes to IIOE-2, coordination mechanisms at the national level, CD requirements, sharing of resources)
- ✓ Strengthen communication between the WIO region scientists
- ✓ Addressing emerging research issues such as: microplastics, marine biotechnology, pharmaceuticals from marine organisms (e.g. sponges and algae);
- ✓ Analysis, interpretation and publication of results
- ✓ Strengthening and re-branding existing institutions (legacy institutions)

NATIONAL WORK PLANS

1. Kenya
2. Madagascar
3. Mauritius
4. Mozambique
5. South Africa
6. Tanzania

- ✓ Issues/phenomena/processes to study (national & regional)
- ✓ Sampling transects/stations (possible RV??)
- ✓ Parameters to be sampled (Essential Ocean Variables??)
- ✓ Frequency of surveys (and when?)
- ✓ Data processing, analysis, publications
- ✓ Possible participating institutions
- ✓ Capacities required/available (legacy institutions)
- ✓ preliminary work??

PROPOSED REGIONAL SURVEYS

Somali Upwelling and Penetration of Red Sea water

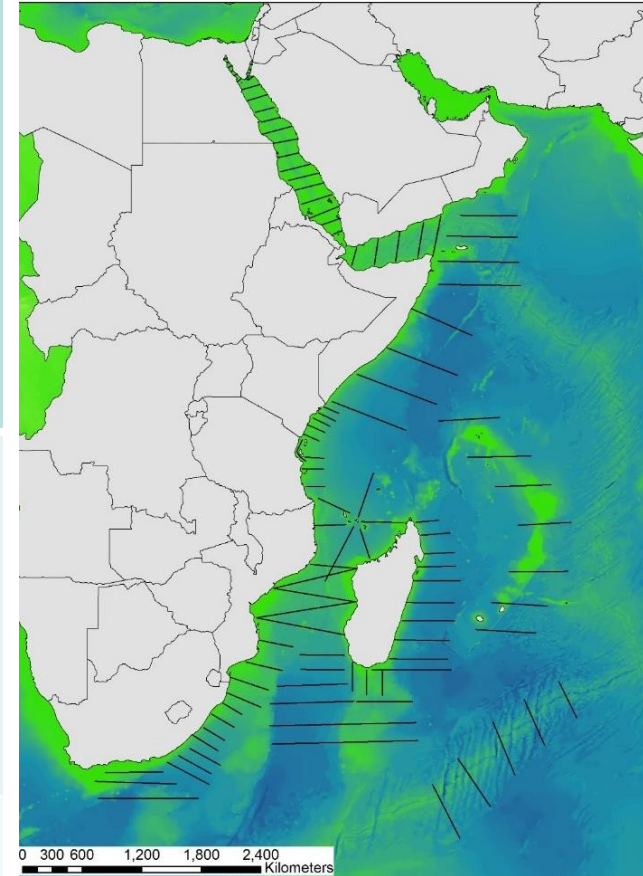
Information on environmental variability, upwelling, productivity and related fisheries. Determine how Red Sea water reaches the WIO to increase understanding of global thermohaline circulation & inter-ocean water exchange

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

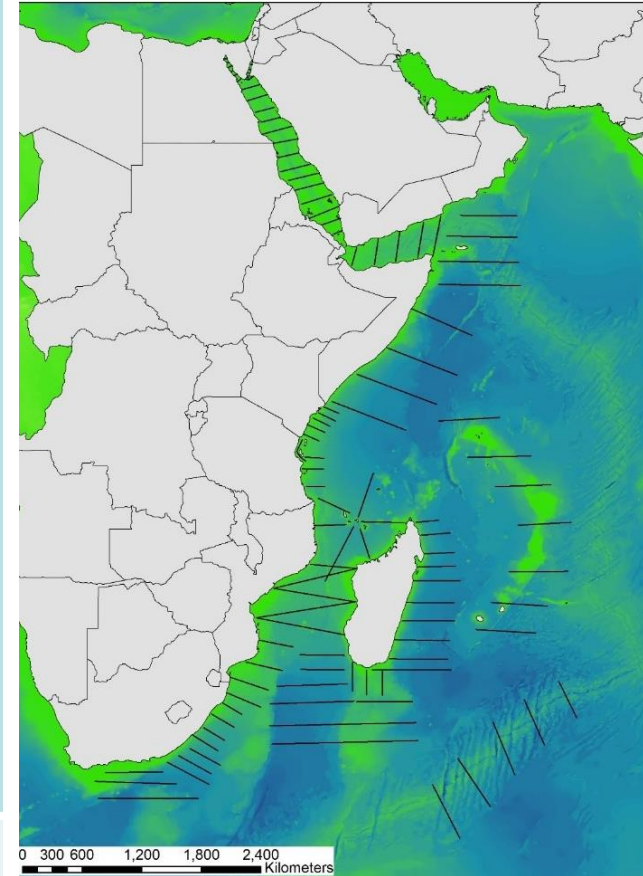
Areas of the Mozambique and SA coasts

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

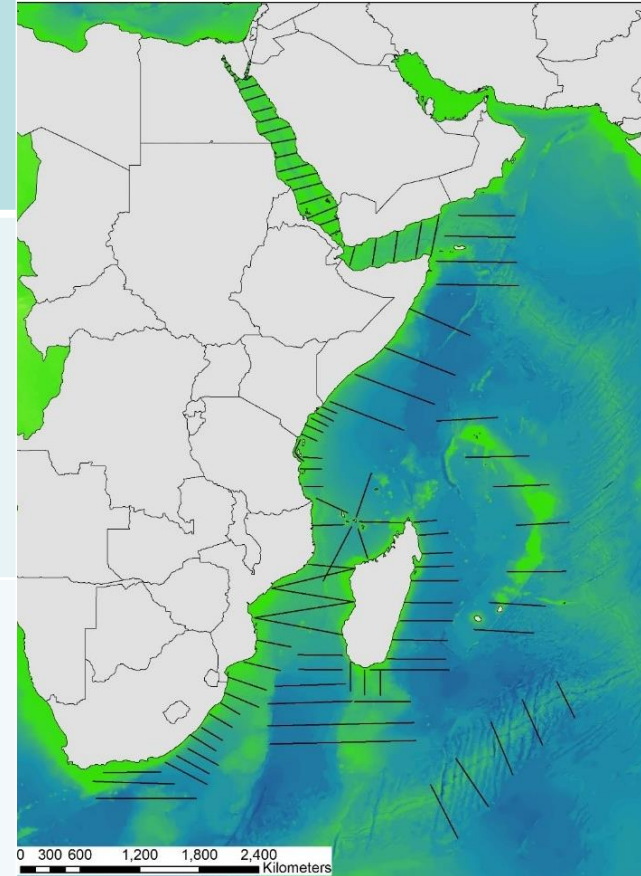
Information on the interaction of physico-chemical and biological processes in this large, shallow, mid-ocean region. Specific information needed on seagrass beds, overall climatic patterns, variability, and the potential influence of the Indian Equatorial Jet on productivity

Southern Madagascar

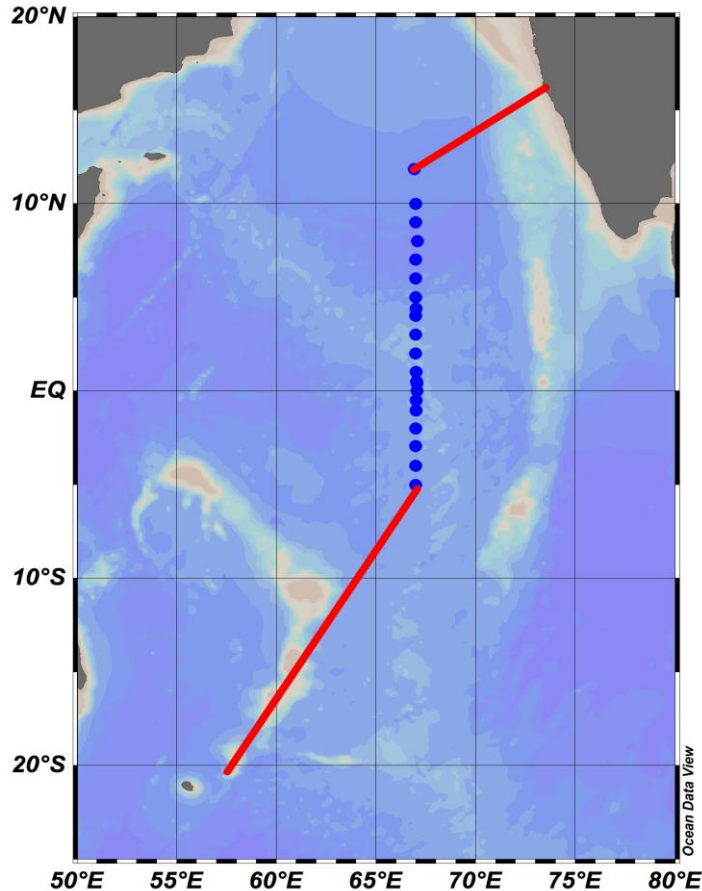
The splitting of the southern and northern branch of the East Madagascar Current: Knowledge of shelf and coastal circulations, biodiversity, chemistry and geology virtually non-existent.

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



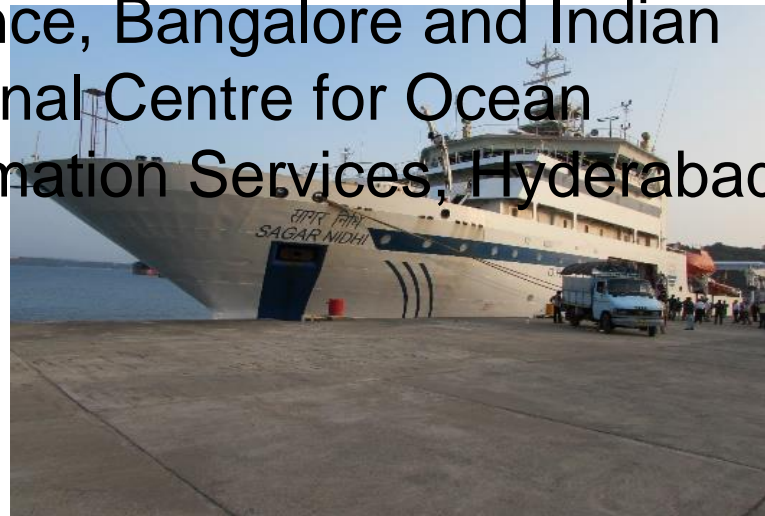
RV SAGAR NIDHI - INDIA



PERIOD: December 2015

SURVEY AREA: From Goa (India) to port Louis (Mauritius). Focus on Longitude 73 degrees E.

ORGANIZATIONS: Indian Institute of Science, Bangalore and Indian National Centre for Ocean Information Services, Hyderabad.

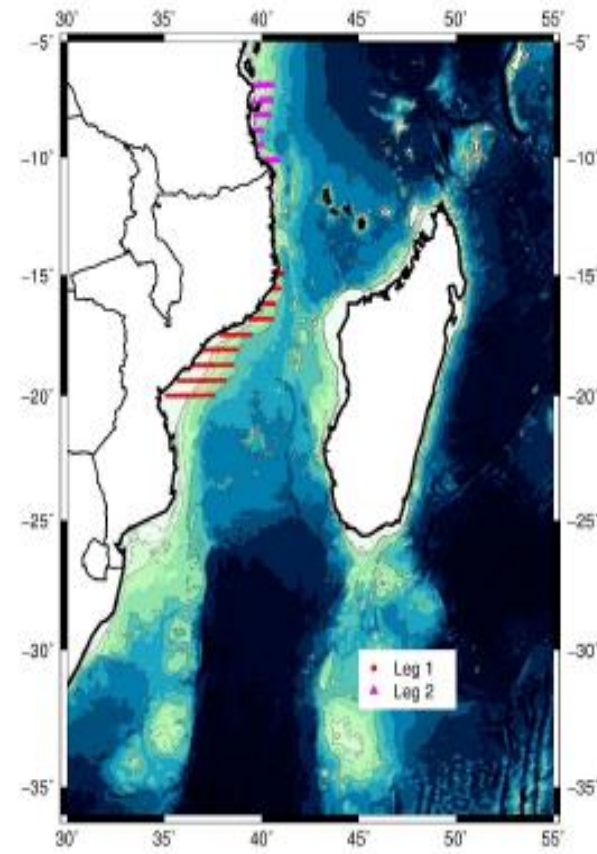


SA AGULHAS II SOUTH AFRICA

PERIOD: October – November 2017

SURVEY AREA: Off the coasts of South Africa, Mozambique and Tanzania.

ORGANIZATIONS: Department of Environmental Affairs, South Africa.

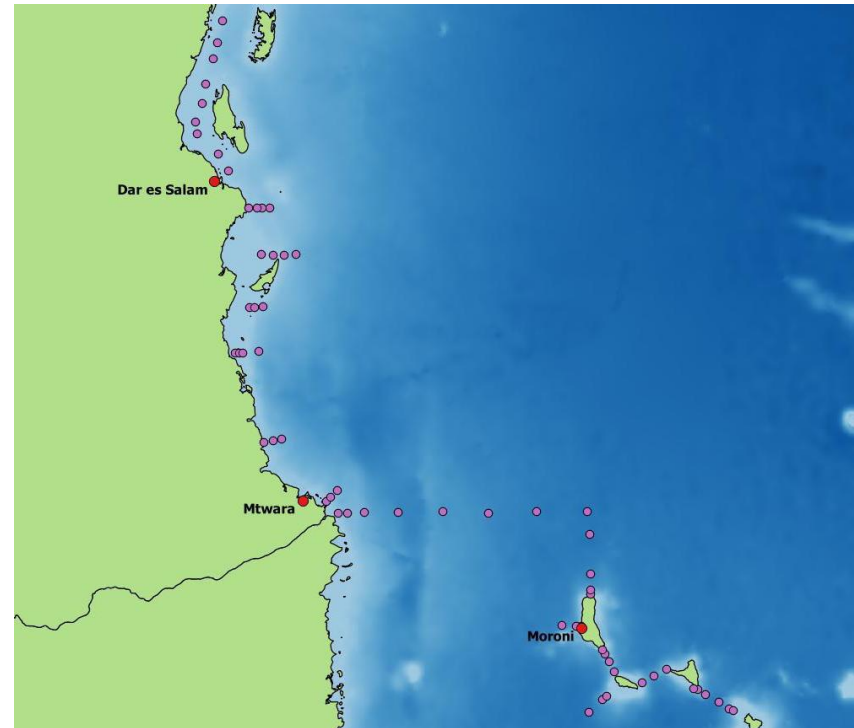


SA AGULHAS II SOUTH AFRICA

PERIOD: June – July 2018

SURVEY AREA: Off the coasts of South Africa, Tanzania and Comoros.

ORGANIZATIONS: Department of Environmental Affairs, South Africa.

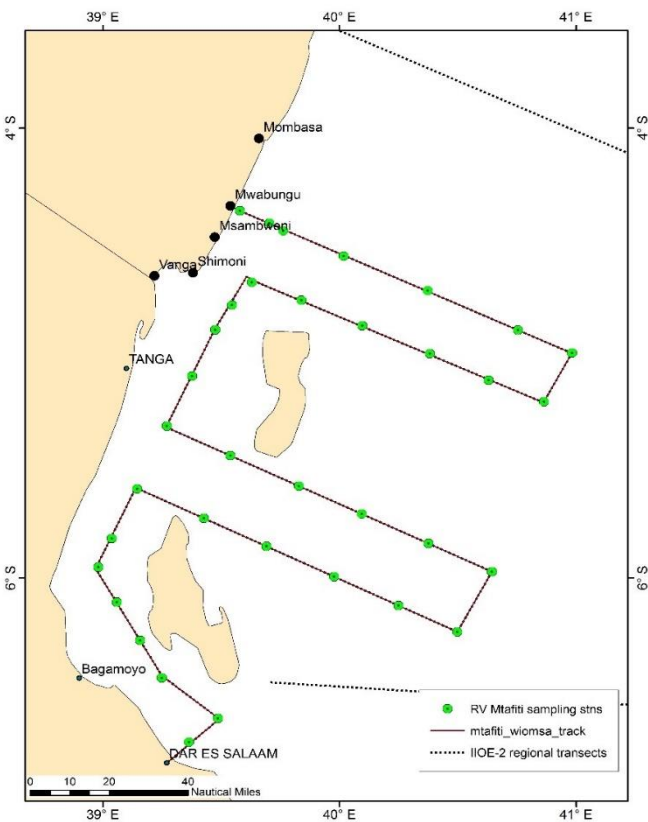


RV MTAFITI - KENYA

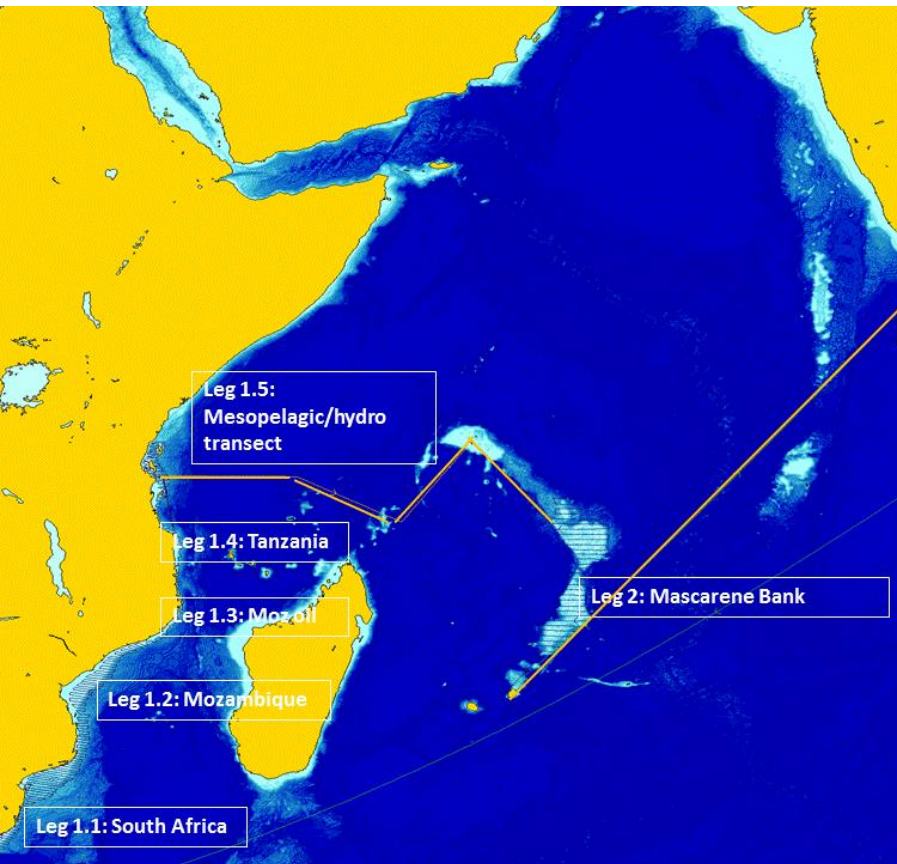
PERIOD: Discussions ongoing

SURVEY AREA: Off the coasts of Kenya and Tanzania.

ORGANIZATIONS: Kenya Marine and Fisheries Research Institute.



RV DR FRODJHOF NANSEN – FAO/NORAD



PERIOD: January – June 2018

SURVEY AREA: South Western Indian Ocean

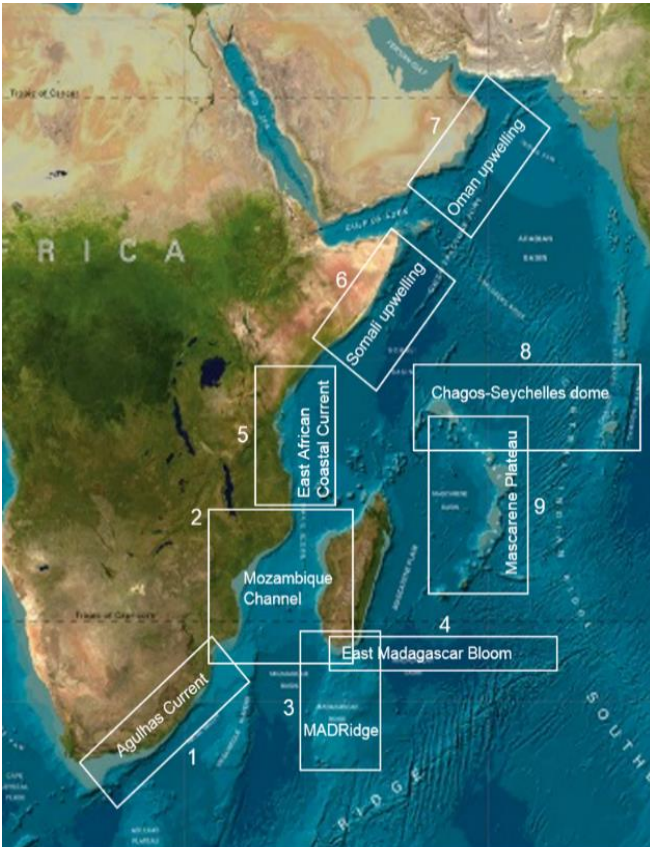
ORGANIZATIONS: United



WESTERN INDIAN OCEAN UPWELLING INITIATIVE - WIOURI

9 WIO REGIONAL UPWELLING SYSTEMS.

1. Agulhas Current driven upwelling
2. Upwelling in the Mozambique Channel
3. Madagascar Ridge and seamounts upwelling
4. Southeast Madagascar shelf and SICC chlorophyll-a bloom
5. Upwelling in the East African Coastal Current (EACC) and influence of major islands (Mafia, Zanzibar, Pemba)
6. Upwelling Somalia Current system
7. Oman/Arabian Sea upwelling system
8. Chagos -Seychelles upwelling dome and Chagos Ridge, and
9. Mascarenes Plateau induced upwelling



WIO LEGACY INSTITUTIONS FOR IOE-2

IOCAFRICA proposes the rebranding of marine science institutions in the region, including the establishment of centres of excellence on selected topics such as:

- ✓ Operational Oceanography (***Nelson Mandela Metropolitan University, South Africa***),
- ✓ Marine Biodiversity (***Institute of Marine Sciences, Tanzania***),
- ✓ Ocean Data and Information Management (***Kenya Marine and Fisheries Research Institute, Kenya***) and
- ✓ Marine Remote Sensing (***Mauritius***).

IN SITU MEASUREMENTS

- ✓ Additional tidal stations with met ocean sensors
- ✓ Wind and waves measuring systems -possibly on light houses?
- ✓ Sea surface temperature measurements
- ✓ Network of moored stations

A photograph of a beach at sunset. The sky is a warm orange and yellow. The ocean has gentle waves. In the foreground, the sand is dark. In the middle ground, several people are silhouetted against the bright water. They appear to be standing near a small boat or a low wall. The overall mood is peaceful and reflective.

One Ocean – One Planet

Thank you!

***IOC Sub Commission for Africa & the Adjacent Island
States***

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