IOC THEMA

GMES Workshop

Presented by J.Mosaheb MOI

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- Profile of Primary Users
- Examples of Current Products
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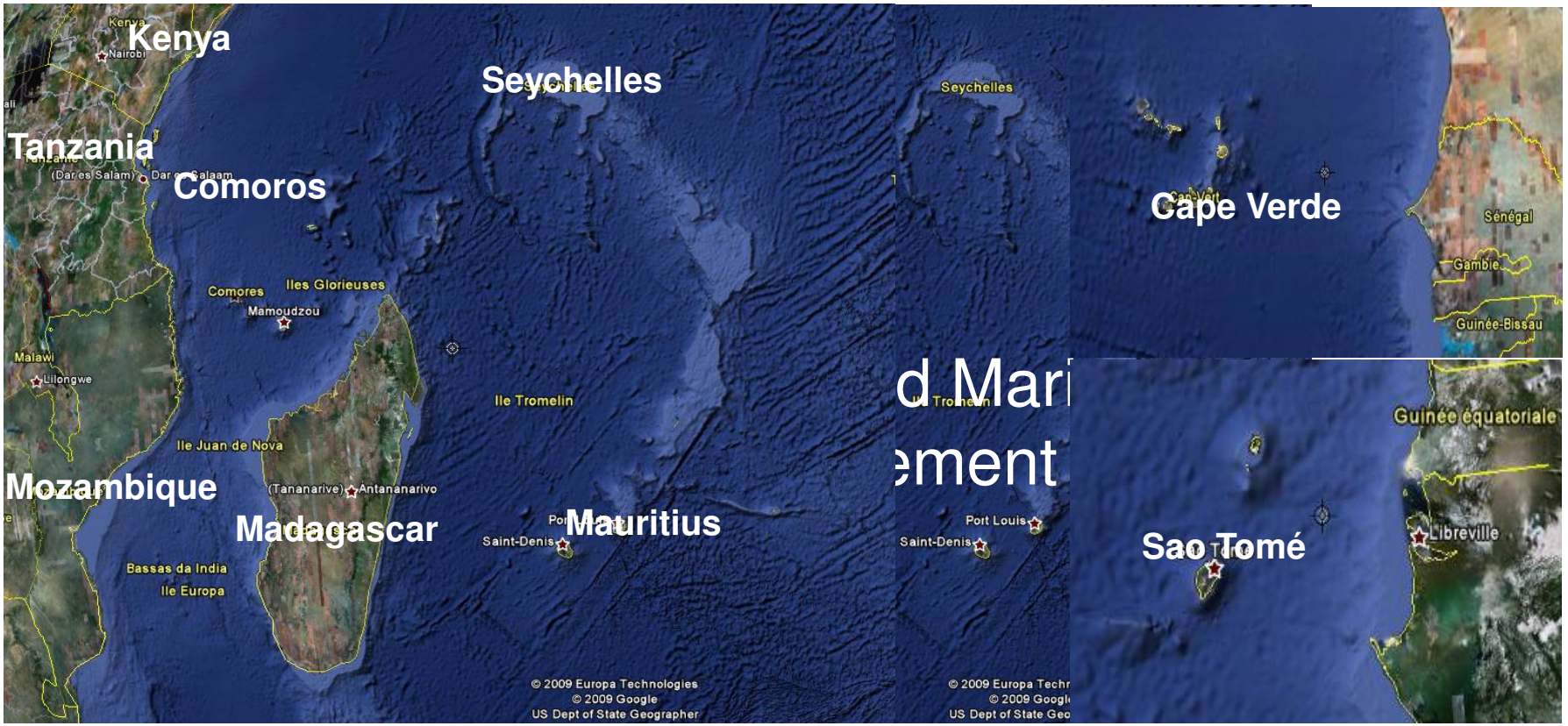
Coastal and Marine Management

Regional Economic Community :

Indian Ocean Commission

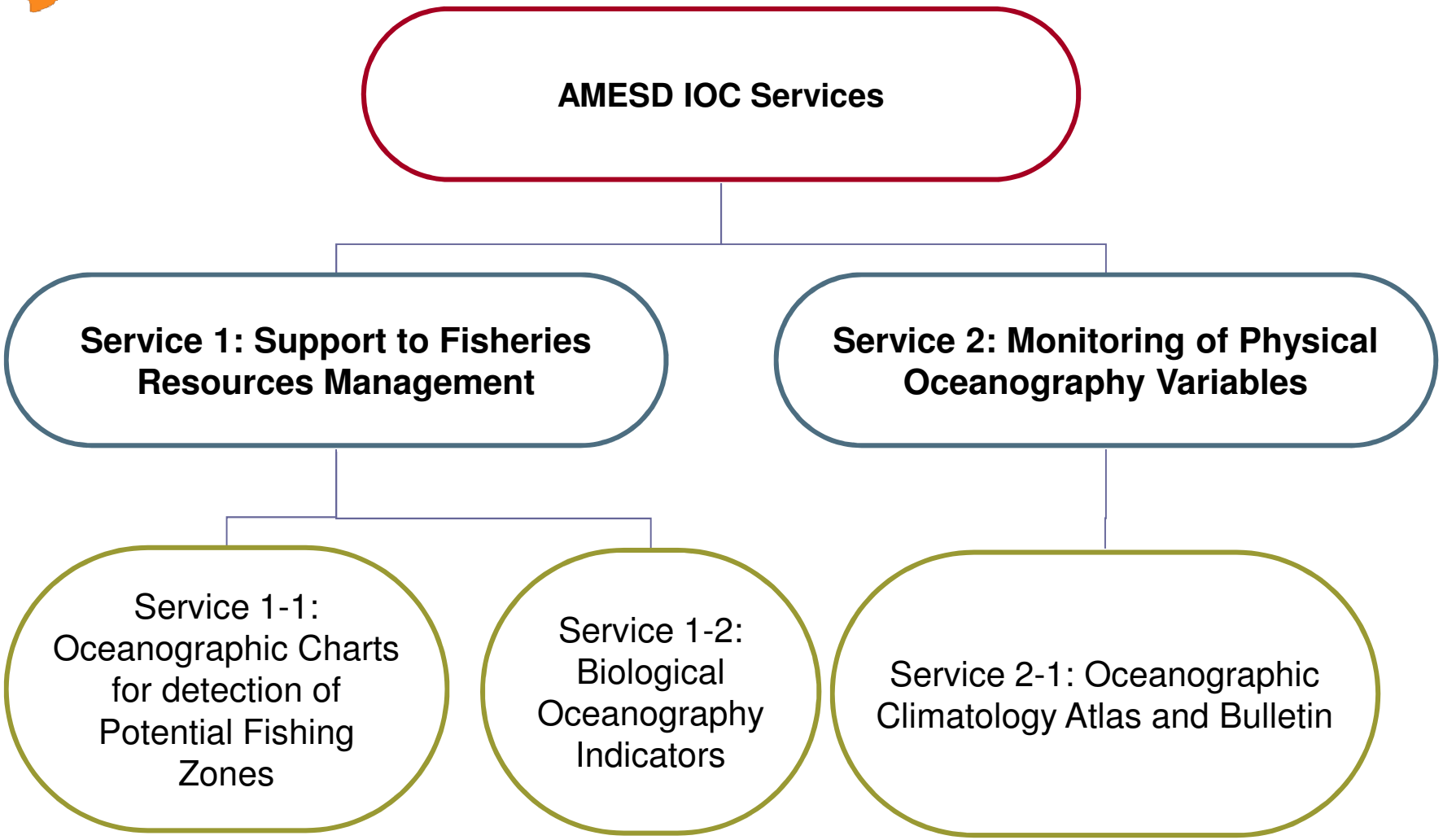
Regional Implementation Centre:

Mauritius Oceanography Institute

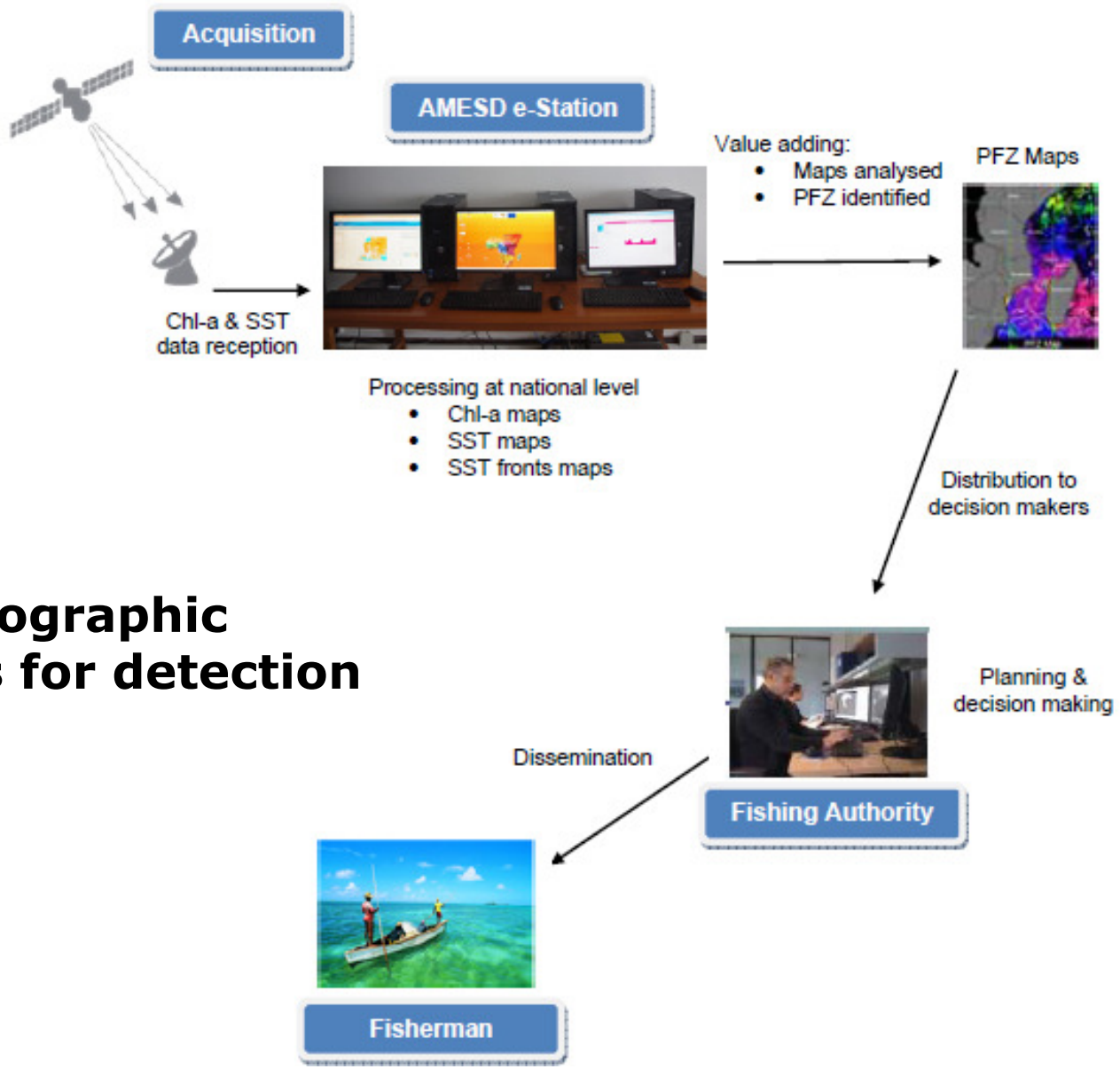


East African Coastal Countries IOC Countries West African Coastal States

Description of Service



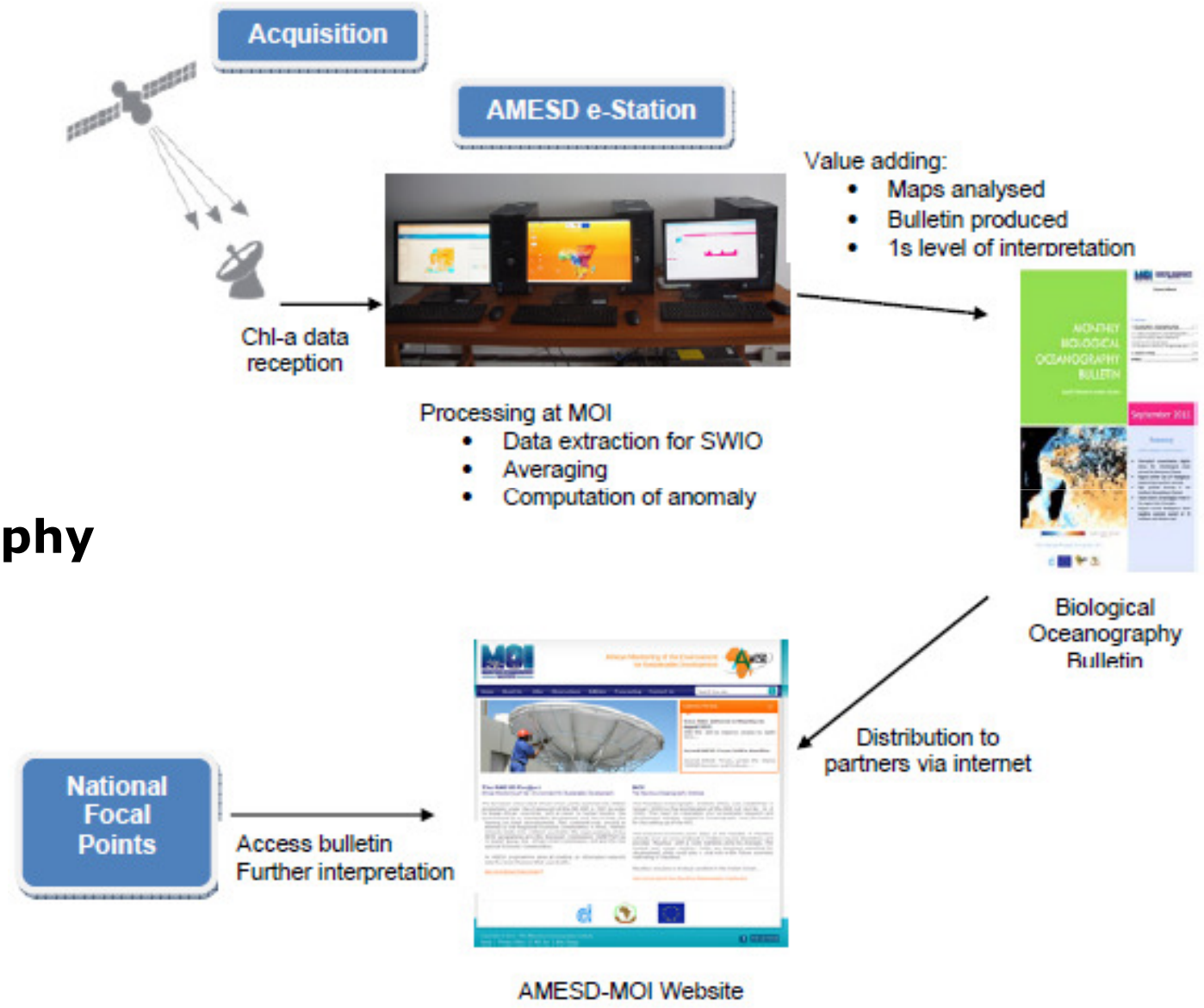
Description of Service 1-1



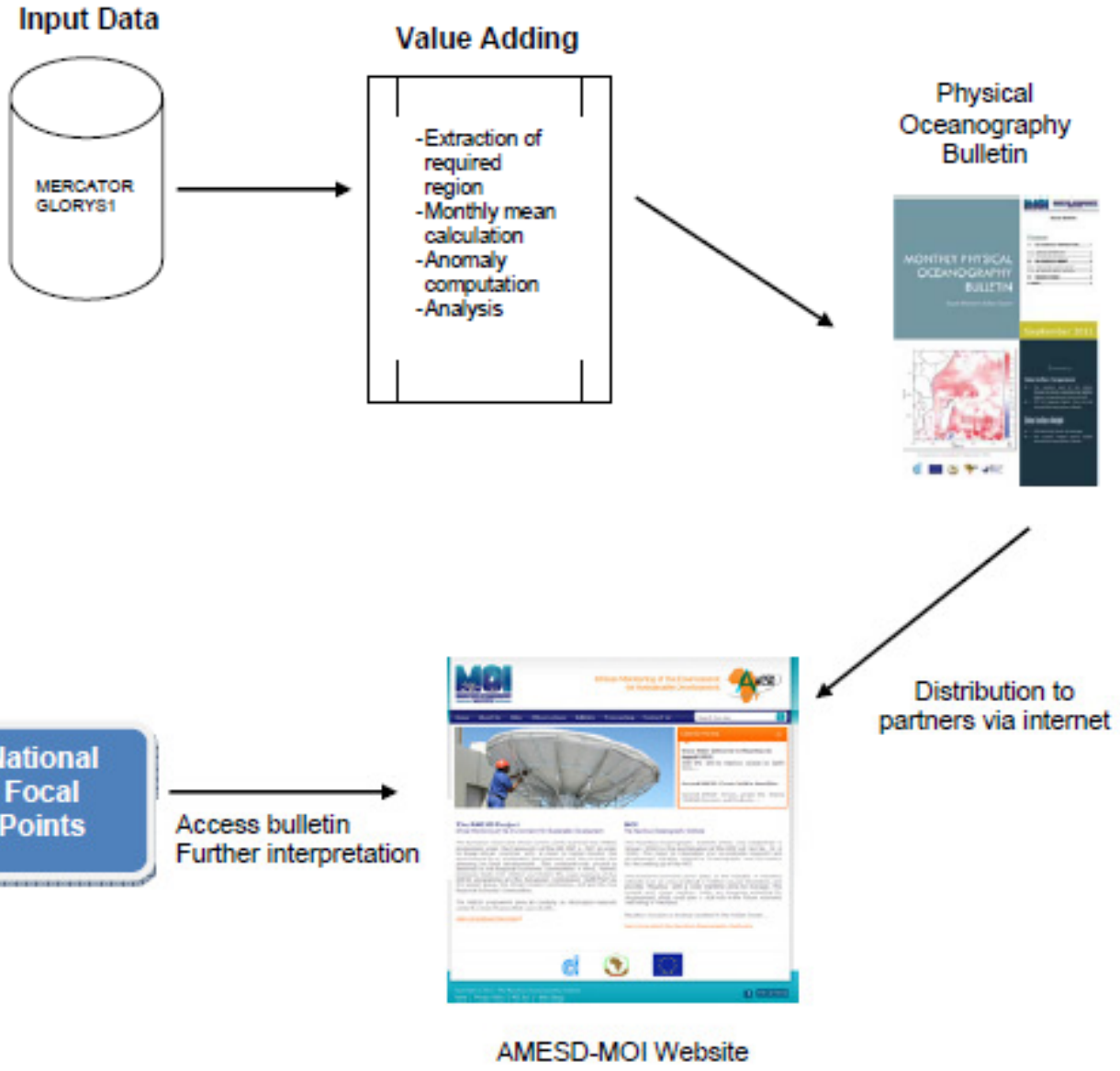
Oceanographic Charts for detection of PFZ

Description of Service 1-2

Biological Oceanography Indicators



Description of Service 2-1



Physical Oceanography Bulletin

Description of Users

- Experts involved in mechanisms in charge of the monitoring and management of marine resources
- Governmental technical services, part of the decision/policy making process

11 National Partners :

- Fisheries Research Institute (Madagascar, Mauritius, Mozambique, Kenya, Tanzania, Zanzibar)
- Ministry of Fisheries (Madagascar, Seychelles, Cabo Verde, Sao-Tomé)
- Fishing Monitoring Center (Comoros)

Profile of Primary Users

- Type of Institution: Fisheries Ministry/Research Institute
- Legal Status: Government Organisations
- Sector : Mostly Fisheries, Training and Research
- General Mandate: Develop and implement fisheries policies – coherent with the THEMA objectives

Service 1 - Products

Service 1 - Support to Fisheries Resources Management			
Product	**Expected Output**	**Frequency**	**Usefulness**
Service 1-1	**Oceanographic Charts for detection of Potential Fishing Zones**		
Product 1-1-1: Daily Chl-a concentration	Map of Chl-a concentration at 1km resolution	Daily	• Map potential fishing grounds • Help in Marine Resources Management • Assist artisanal fishermen
Product 1-1-2 :Daily Sea Surface Temperature (SST)	Map of SST at 1km resolution	Daily	
Product 1-1-3 :Daily SST front	Map of SST fronts	Daily	
Service 1-2	**Biological Oceanography Indicators**		
Product 1-2-1 : Mean monthly values (climatology) of Chl-a concentration	Chart of Chlorophyll-a climatology at 4km resolution	Monthly	• Global view biological "state" of the ocean • Inputs for product 1.2.4
Product 1-2-2 : Monthly Chl-a concentration	Chart of monthly Chl-a concentration at 4km resolution	Monthly	
Product 1-2-3 : Monthly Chl-a anomaly	Chart of Chl-a concentration anomaly at 4km resolution	Monthly	
Product 1-2-4 : Monthly global bulletin of biological oceanography indicators	PDF bulletin of biological oceanography indicator (Chl-a) for South West Indian Ocean region	Monthly	• Understand effect of ocean variations on fish stocks • Examine the bloom variability patterns

Service 2 - Products

Service 1 - Support to Fisheries Resources Management			
Product	**Expected Output**	**Frequency**	**Usefulness**
Service 1-1	**Oceanographic Charts for detection of Potential Fishing Zones**		
Product 1-1-1: Daily Chl-a concentration	Map of Chl-a concentration at 1km resolution	Daily	• Map potential fishing grounds • Help in Marine Resources Management • Assist artisanal fishermen
Product 1-1-2 :Daily Sea Surface Temperature (SST)	Map of SST at 1km resolution	Daily	
Product 1-1-3 :Daily SST front	Map of SST fronts	Daily	
Service 1-2	**Biological Oceanography Indicators**		
Product 1-2-1 : Mean monthly values (climatology) of Chl-a concentration	Chart of Chlorophyll-a climatology at 4km resolution	Monthly	• Global view biological "state" of the ocean • Inputs for product 1.2.4
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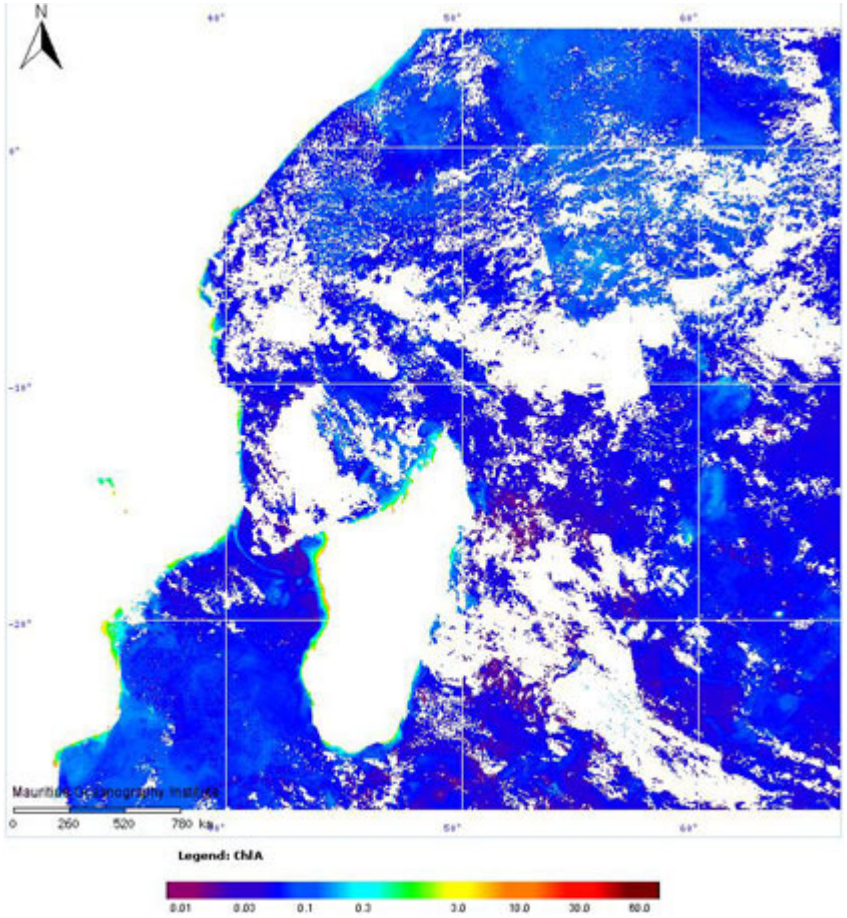
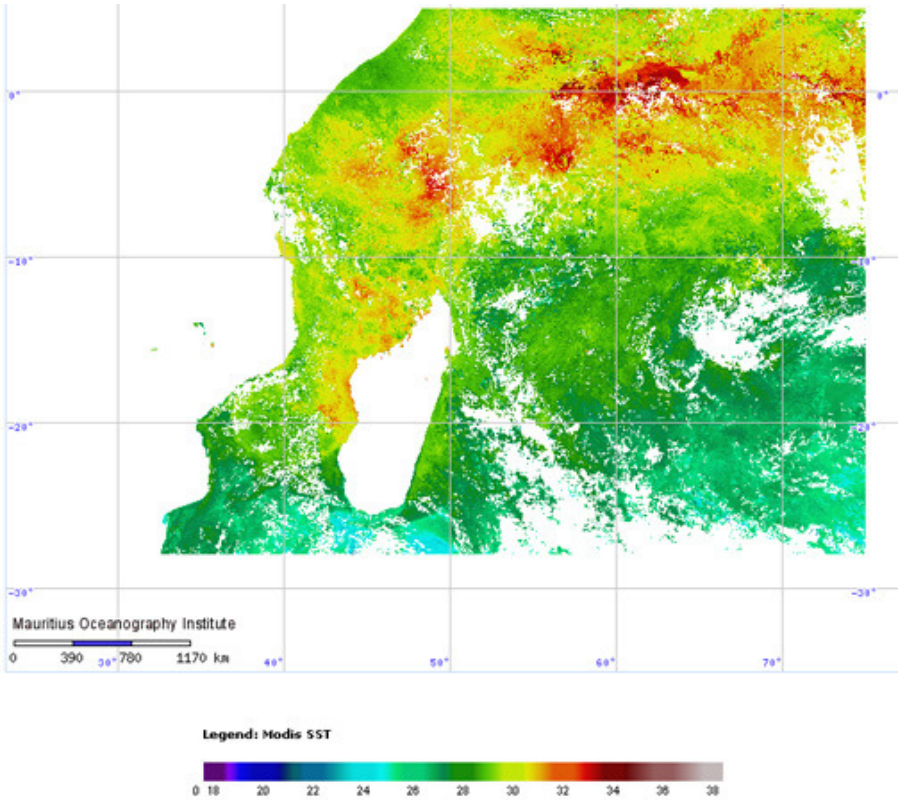
Product 1-2-4 : Monthly global bulletin of biological oceanography indicators	PDF bulletin of biological oceanography indicator (Chl-a) for South West Indian Ocean region	Monthly	• Understand effect of ocean variations on fish stocks • Examine the bloom variability patterns

Examples of Products

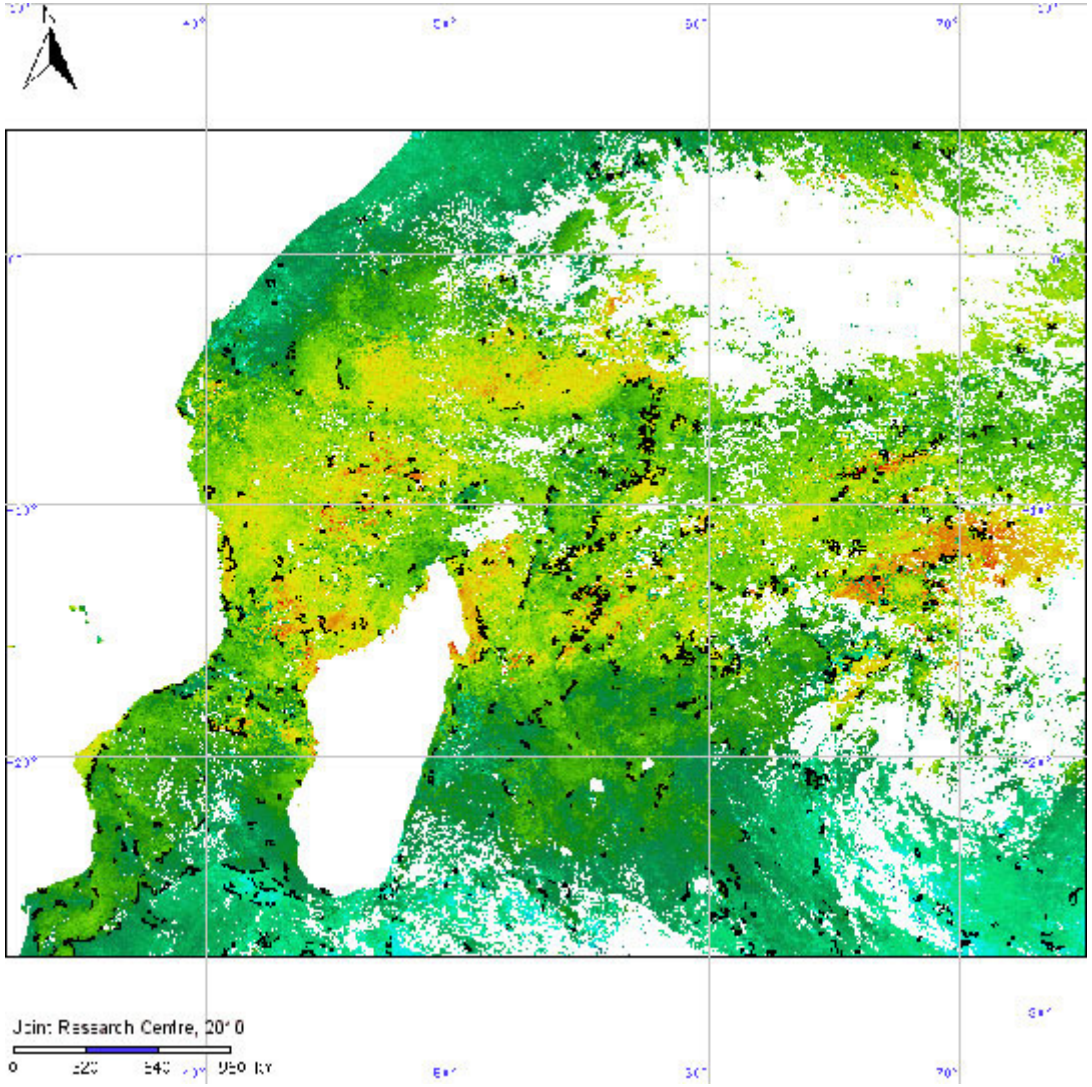


Chl-a at 1km resolution



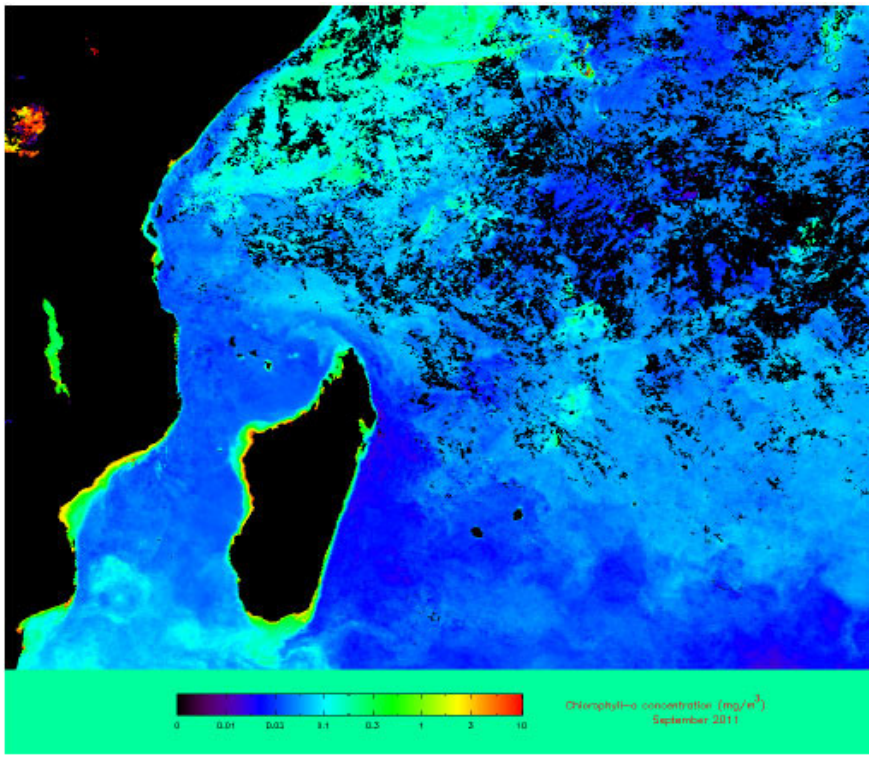
SST at 1km resolution

Examples of Products

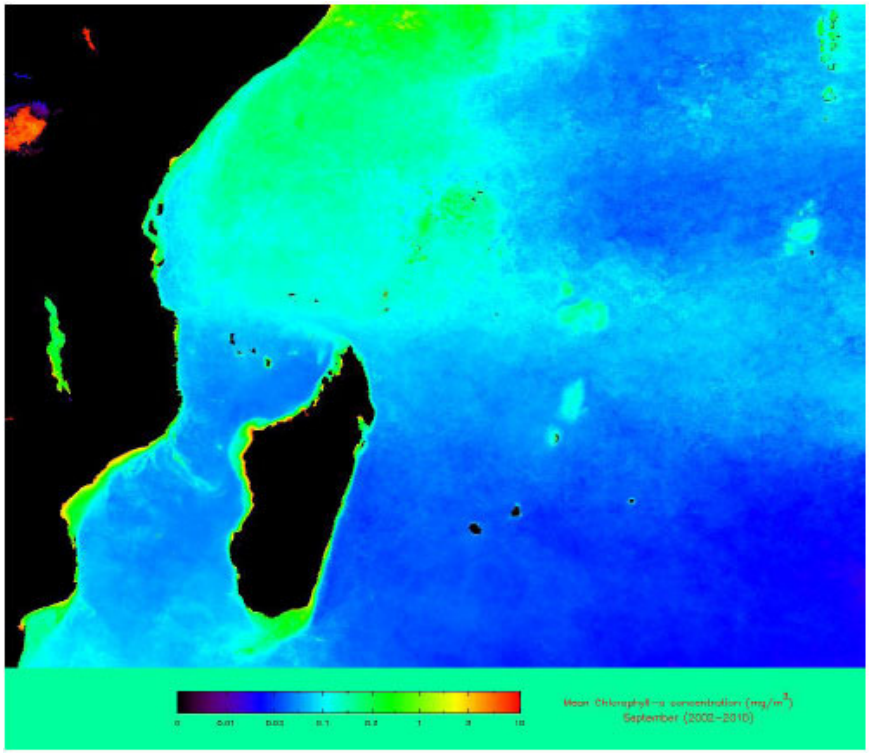


SST Fronts map

Examples of Products

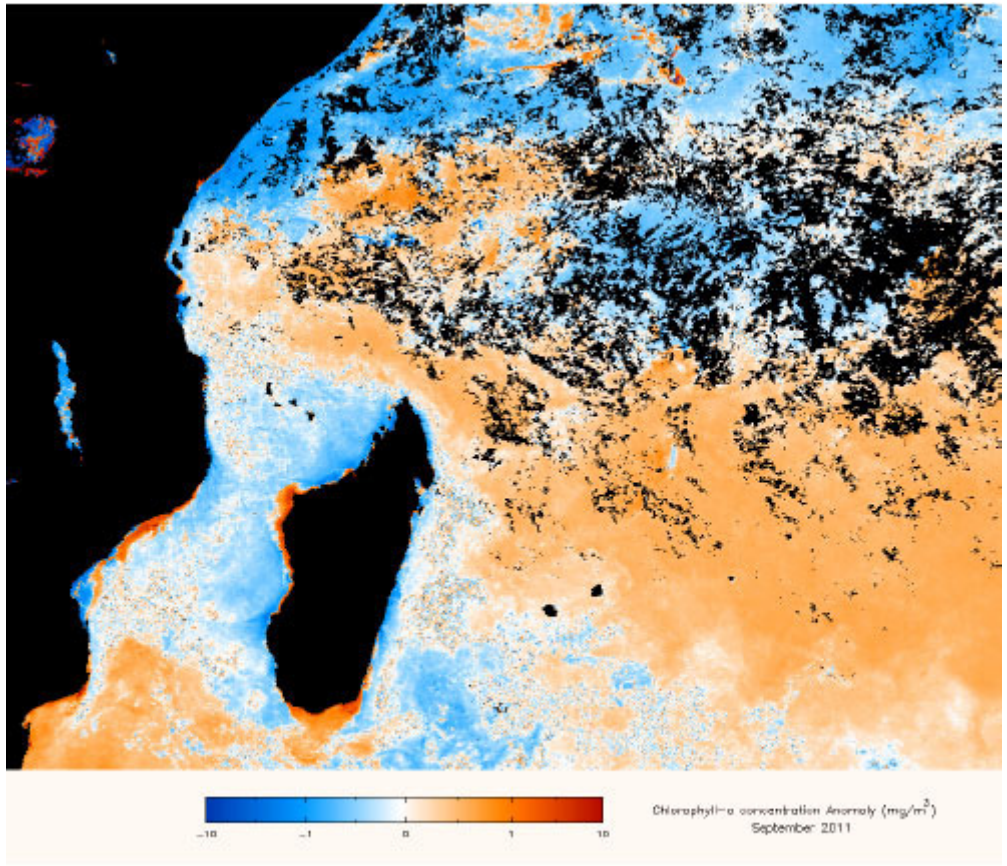


Average chlorophyll concentration for September 2011 (mg/m^3)



Climatological Mean chlorophyll concentration for September (2002-2010)

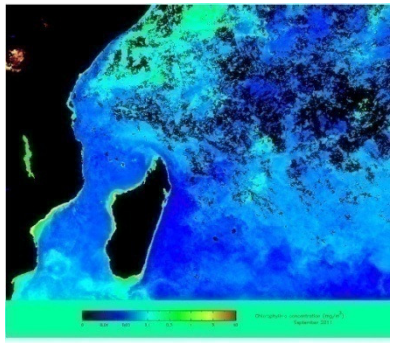
Examples of Products



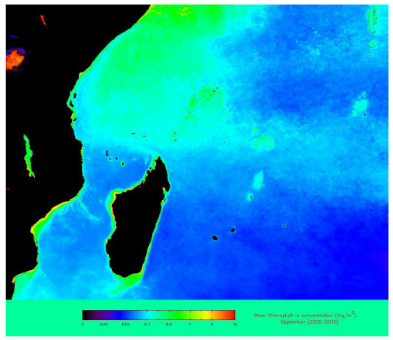
Chlorophyll concentration anomaly for September 2011

Examples of Products

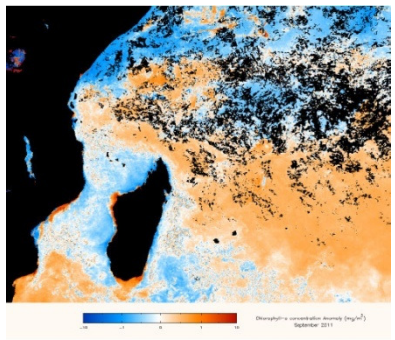
Monthly Biological Oceanography Bulletin – Version 1



Average chlorophyll concentration for September 2011 (mg/m³)



Climatological Mean chlorophyll concentration for September (2002-2010)



Chlorophyll concentration anomaly for September 2011

Monthy Chl-a

MONTHLY BIOLOGICAL OCEANOGRAPHY BULLETIN

South Western Indian Ocean

September 2011

MOI MAURITIUS OCEANOGRAPHY INSTITUTE

Ocean Bulletin

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Summary

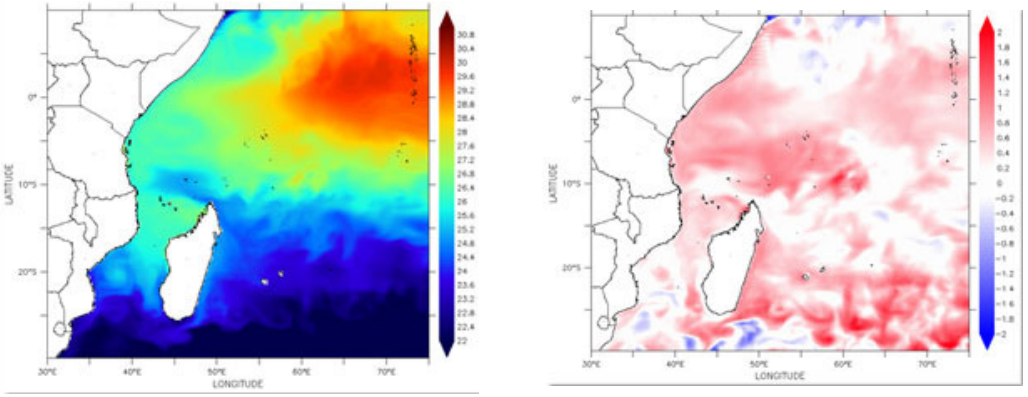
Chlorophyll Concentration

- Chlorophyll concentration slightly above the climatological mean around the Mascarene Plateau.
- Region further East of Madagascar experiencing a positive anomaly.
- High positive anomaly in the Southern Mozambique Channel.
- Values below climatological mean in the region East of Somalia.
- Regions around Madagascar show negative anomaly except at its Southern and Western tips.

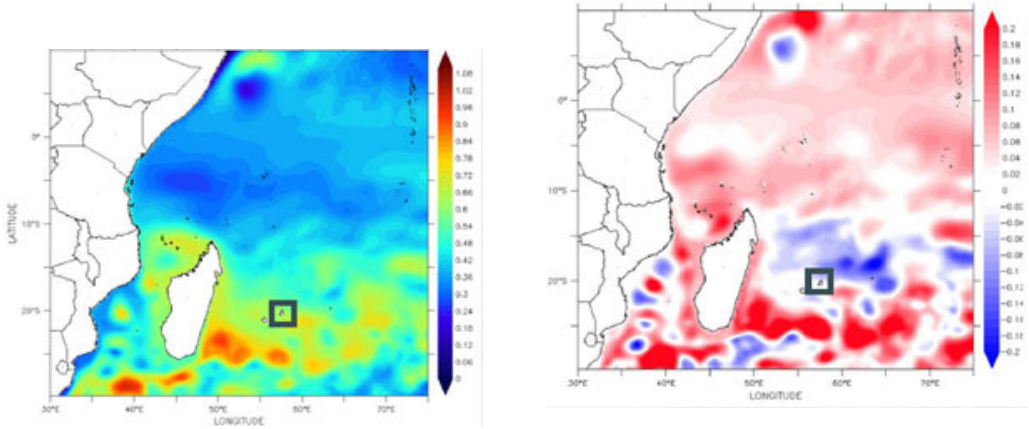
Mean Chlorophyll anomaly for September 2011

Examples of Products

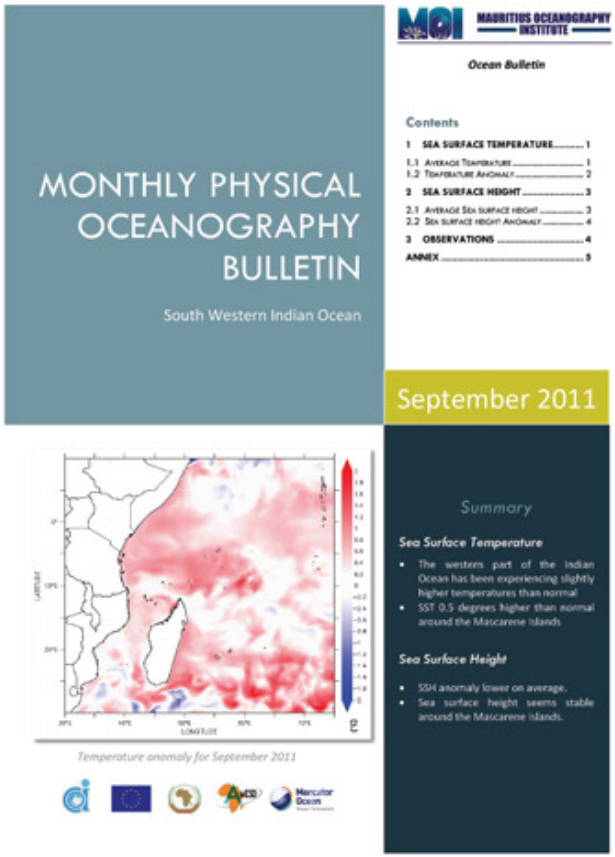
Monthly Physical Oceanography Bulletin – Version 1



Monthly SST average (L) & anomaly (R)



Monthly SSH average (L) & anomaly (R)



Use of Thematic Information in Tanzania

Context:

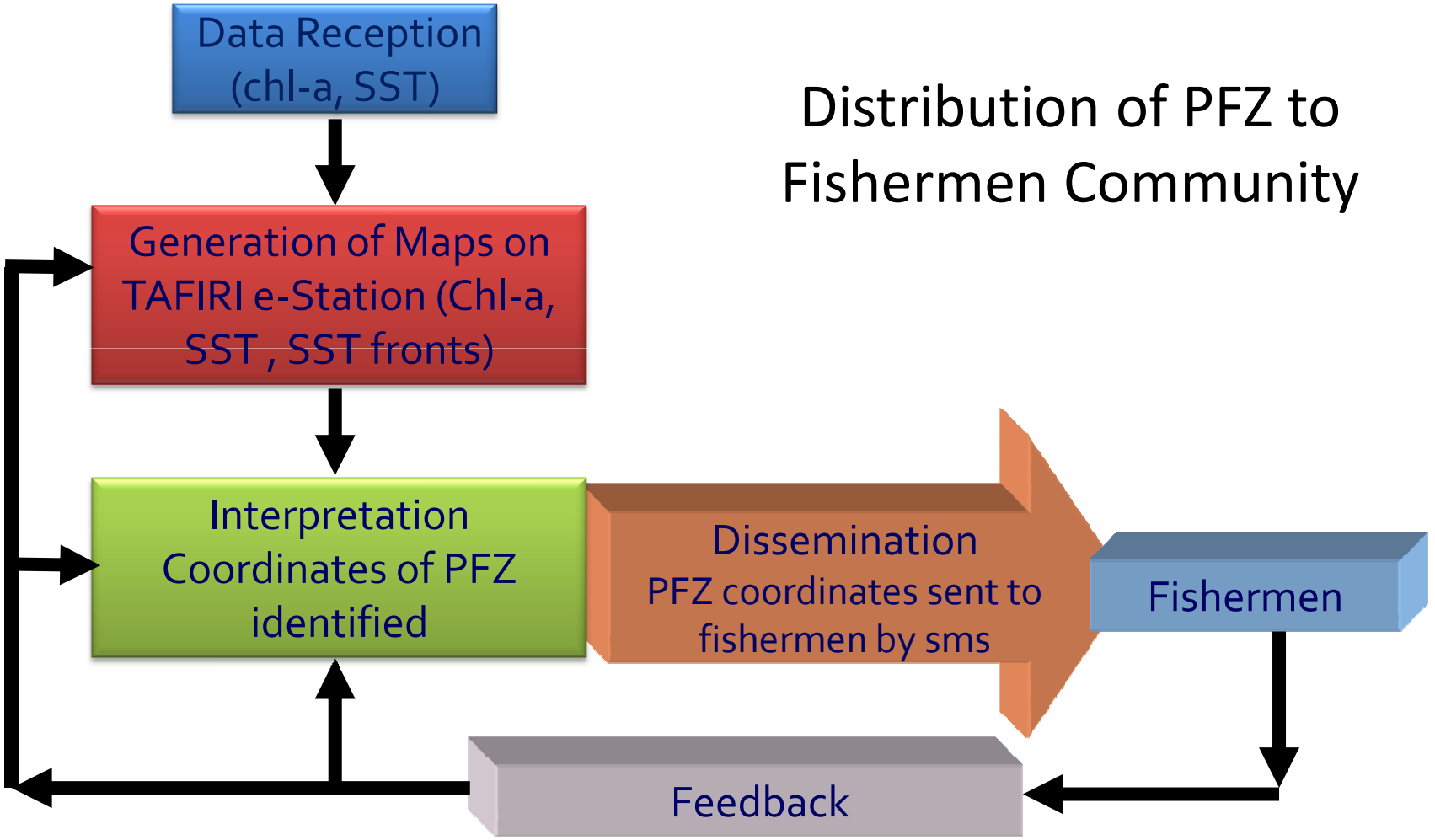
- Fisheries source of income to coastal communities in Tanzania
- Fishery predominantly artisanal, 90% total landings
- Catch : mainly composed of demersal species as well as few large and small pelagic species
- Locating and catching fish has become challenging

Example of Information Usage

Approach used by champion user TAFIRI

- Implementation of a pilot project with fishermen with RIC support
- User Awareness – meeting with fishermen/stakeholders
- User training on use of GPS
- Use of AMESD products - Chl-a, SST, SST fronts maps
- Interpret SST thermal fronts and identify coordinates of Potential Fishing Zones
- Distribute coordinates to fishermen
- Feedback from fishermen on catch

Example of Information Usage



Distribution of PFZ to Fishermen Community

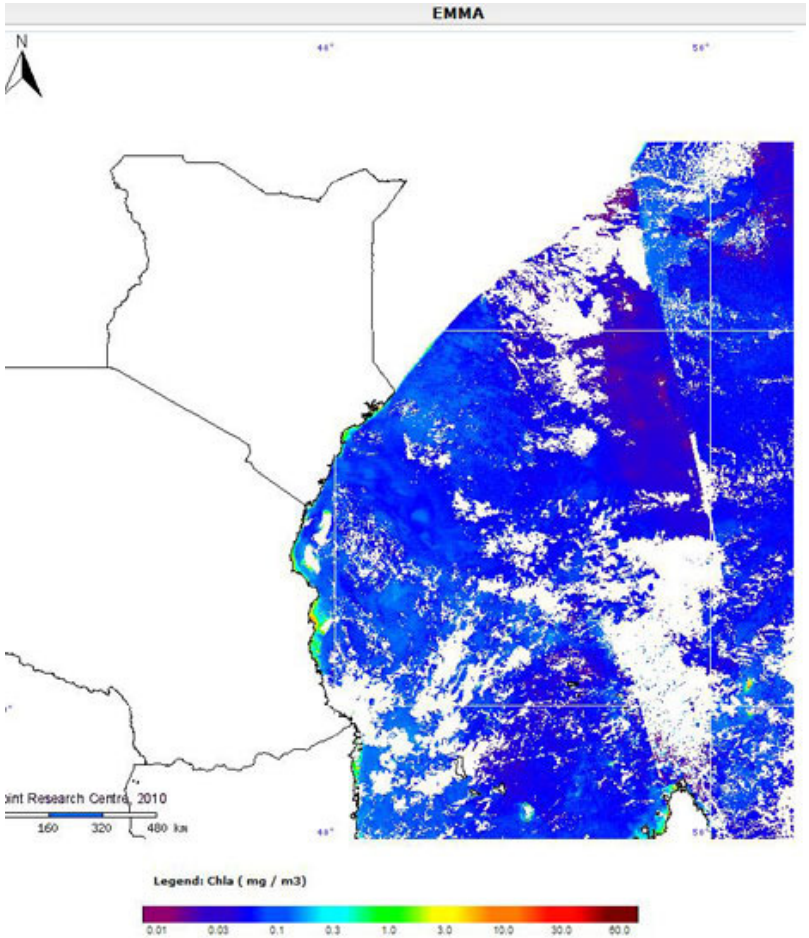
Example of Information Usage

TAFIRI Pilot Project

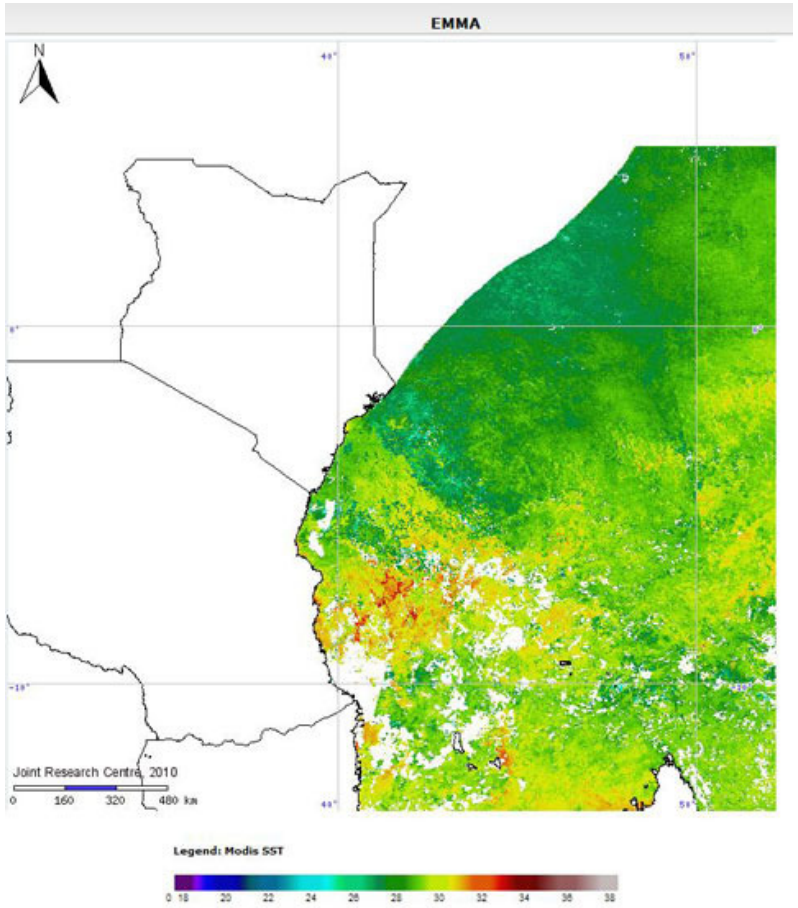
- **Project :** Application of Remote Sensing for the identification of preferred habitats for the pelagic species in the continental shelf of Tanzania
- **Objective:** Produce maps of Potential Fishing Zones (PFZ) and validate them through the measure of Catch per unit effort within the zones and the surrounding areas. Operational support to fishers
- **Desired Impact :** improved efficiency in the control and follow-up of fishing by fisheries authorities, better forecasting of the potential presence of fish, a sustainable fishery industry, reduce search time for fish and increase the catch per unit effort, reduce fuel costs

Example of Information Usage

Products generated for Tanzania region



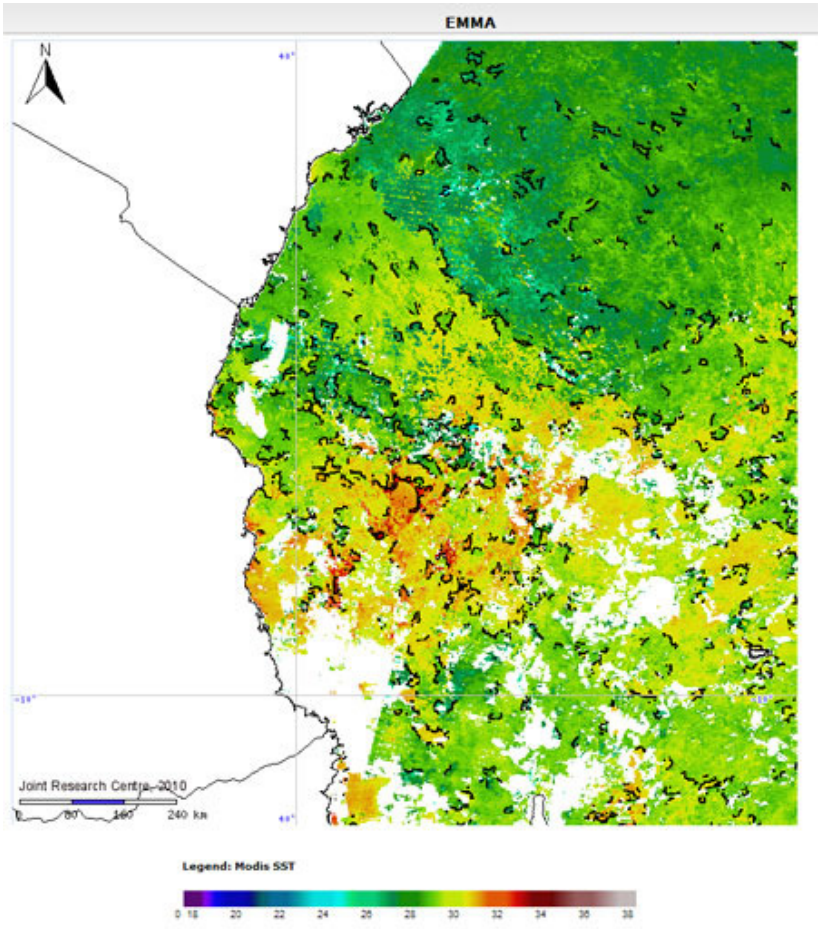
Chl-a Map



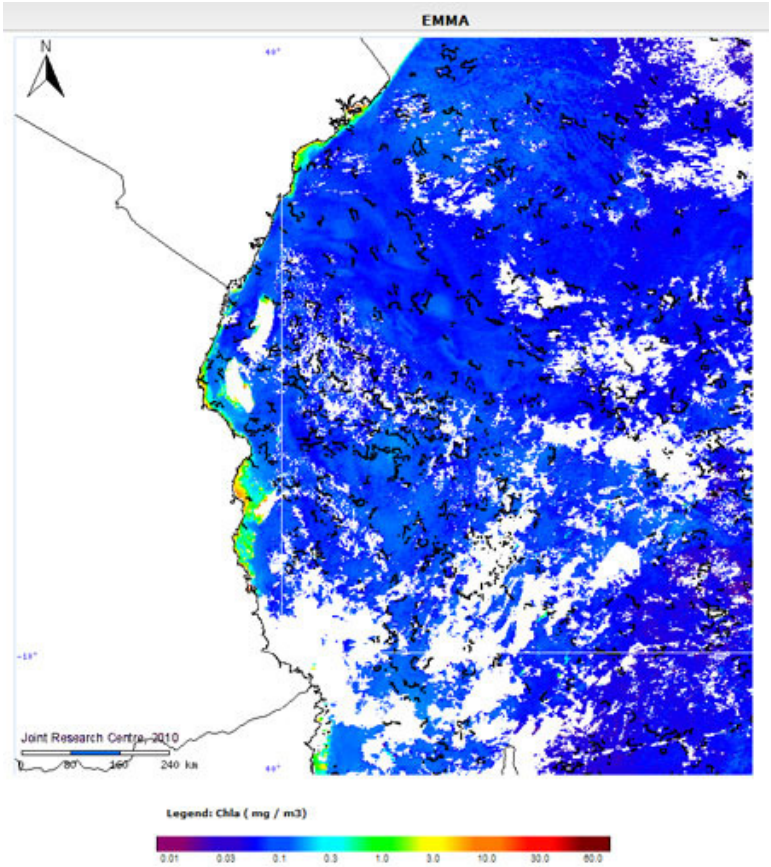
SST Map

Example of Information Usage

Products generated for Tanzania region



SST fronts



SST fronts over laid on chl-a

MESA

Potential Services being proposed:

- Service 1 Marine Resources Management

- Service 2 Monitoring of Marine Environment
  - Pollution Hazard and Ship Detection
  - Combat IUU (Illegal, Unreported and Unregulated) fishing

- Service 3 Monitoring of Coastal Environment / ICZM
  - Wave and Surge Monitoring
  - ICZM Strategy

Description of Services:

Service 1 - Marine Resources Management

- The system presently allows (in various countries mentioned above) the visualization and analysis of the ocean observation data virtually in real time for the identification and localization as accurately as possible of any PFZ.
- MESA will now complement the PFZ with additional higher resolution imagery and data on the Mixed Layer Depth, current and wind.
- The follow-up in real-time of the productivity of the coastal zone, upwelling.
- Fine-tuning the Bulletins and Atlases on Physical and Biological Oceanography thus providing additional information for the end user.

Description of Services:

Service 2 - Monitoring of Marine Environment

- The service will be based on the analysis of radar satellite imagery acquired by the Synthetic Aperture Radar (SAR) satellites (ERS 1-2 or Radarsat 1-2).

- The service aims at strengthening operational response for accidental and deliberate discharges from ships as well as detection of IUU vessel across the EEZs of the partner countries.

Description of Services:

Service 3 - Monitoring of Coastal Environment / ICZM

- This service will be developed under the supervision of the MOI in collaboration with the meteorological station of the partner countries. It would make use of the previously developed regional/coastal wave forecasts as well as input from existing buoys. The way to go about is to deploy additional wave data buoys (wave rider) in selected areas (off - lagoon) in each partner country that will complement the existing services being offered.
- For the ICZM part the beach profiles along with coastline changes and dunes mapping will be determined at different period (summer and winter) and also after extreme events such as cyclones and tidal or storm surges. A habitat cover classification of the lagoons will be carried out. The idea is to retrieve achieved satellite data targeted at certain regions in each partner countries and to compare it with actual imagery. This will determine signs of (if any) erosion and accretion.

- Thank You for your attention