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AND AFRICA



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# GMES & Africa: An overview of the Marine & Coastal Operations for Southern Africa and Indian Ocean States (MarCOSIO)

## Reef Conservation Webinar Introducing GMES and Africa

Sives Govender  
Research Group Leader - CSIR  
Consortia Lead AUC GMES and Africa  
5 November 2024  
Mauritius



<https://marcosio.org/>

MARINE AND COASTAL OPERATIONS  
FOR SOUTHERN AFRICA AND THE INDIAN OCEAN



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## Africa's oceans and coasts

The **African Union** “estimates that the Blue Economy currently generates nearly US\$300 billion for the continent, creating 49 million jobs in the process. These and other crucial benefits—most notably food security, livelihoods, and biodiversity—are entirely dependent on the ocean's health. Africa has 38 coastal and island states and a coastline of over 47,000 km, and hence presents an enormous opportunity for the continent to develop the sectors typically associated with the blue economy”.



# AFRICA'S BLUE ECONOMY STRATEGY

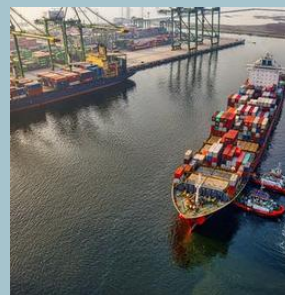
A template for protecting Africa's maritime and aquatic resources, and utilizing them in a sustainable way that benefits our people

## 5 PILLARS

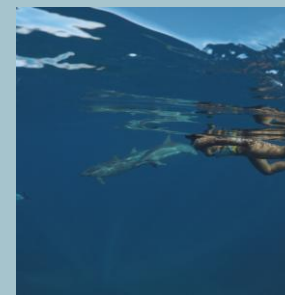
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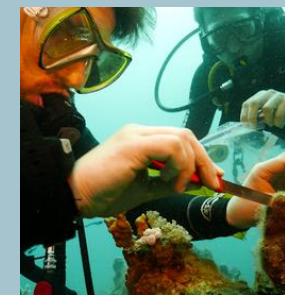
FISHERIES,  
AQUACULTURE  
CONSERVATION &  
SUSTAINABLE  
AQUATIC  
ECOSYSTEMS;



SHIPPING,  
TRANSPORT,  
TRADE, PORTS,  
MARITIME  
SECURITY, SAFETY  
AND  
ENFORCEMENT;



COASTAL AND  
MARITIME  
TOURISM,  
CLIMATE  
CHANGE,  
RESILIENCE,  
ENVIRONMENT &  
INFRA-  
STRUCTURE;

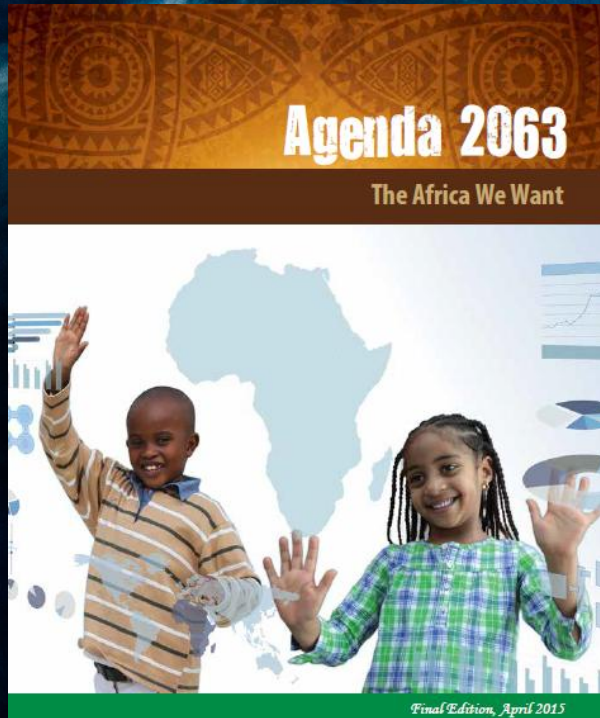


SUSTAINABLE  
ENERGY AND  
MINERAL  
RESOURCES, AND  
INNOVATIVE  
INDUSTRIES;



POLICIES,  
INSTITUTIONAL &  
GOVERNANCE  
FRAMEWORKS,  
EMPLOYMENT, JOB  
CREATION AND  
POVERTY  
ERADICATION,  
INNOVATIVE  
FINANCING





6. Blue/ocean economy for accelerated economic growth.

- Marine resources and energy
- Port operations and marine transport

14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development.





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## RELATED POLICY IMPERATIVES



AFRICAN UNION

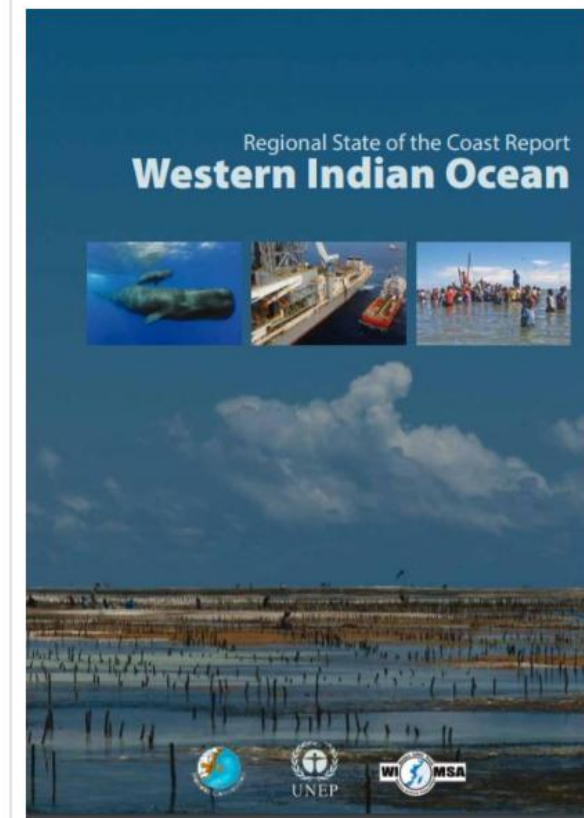
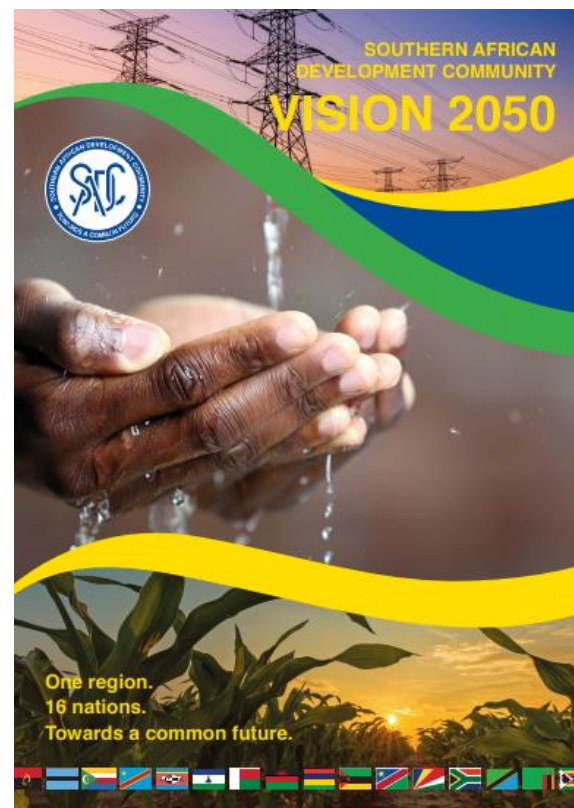
الاتحاد الأفريقي



UNION AFRICAINE

UNIÃO AFRICANA

**2050  
AFRICA'S INTEGRATED MARITIME STRATEGY  
(2050 AIM STRATEGY)**



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## Key AIMS and Blue Economy Services and sectors for Africa

Seeking to assess and realize the economic multiple co-benefits potential of Africa's millions of hectares of marine area;

Promoting the sustainable development of marine industry through strategic funding programmes and essential scientific services;

Safeguarding Africa's marine environment through research and environmental monitoring;

Type of ecosystem services	Blue Economy sectors
Harvesting of living aquatic resources (seafood, plant marine organisms, and marine-biotechnological products)	Fishing (inland, coastal, and deep seas) Aquaculture Mariculture Pharmaceuticals, chemicals, cosmetics, genetic research
Extraction of nonliving resources and generation of new energy resources	Deep-sea and seabed mining Offshore oil and gas Renewable energy Marine salt harvesting Coastal mining of sand, gravel, and other construction materials
Commerce and trade in and around the ocean and rivers	Maritime transport and services Port infrastructure Shipbuilding and repairs River transport Tourism and recreation
Protection	Coastal protection Marine ecosystem protection Water resource protection



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## Key to the goals of MarCOSIO consortia

## The Western Indian Ocean Large Marine Ecosystems Strategic Action Programme Policy Harmonisation and Institutional Reforms (WIO LME SAPPHIRE)



14.2

By 2020, sustainably manage and **protect marine and coastal ecosystems** to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans

14.4

By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics

14.7

By 2030, increase the economic benefits to Small Island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism

17.14

Enhance policy coherence for sustainable development

14.a

**Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries**

14.b

**Provide access for small-scale artisanal fishers to marine resources and markets**

14.c

Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in United Nations Convention on the Law of the Sea, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of "The future we want"



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- A FLAGSHIP PROGRAMME OF AUC

- AU-EU Collaboration on Space applications
- A unique historical continuity



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## EU Support



**esa**



**JRC**



**EUMETSAT**

- Use of the Cloud computing Platforms (**ESA, JRC**)
- Service Design (**JRC, EUMETSAT**)
- On job the Training (**JRC**)
- Installation of E Station (**EUMETSAT, JRC**)
- Maintenance and use of E Station (**EUMETSAT, JRC**)
- Training on the use of JRC-BDAP Platforms
- Accessing EO-Data : **Full, Free and Open Access to Copernicus Data**



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MarCOSIO



# GMES at a Glance

8 consortia leads (CSIR, UoG, ICPAC, RCMRD, SASCAL, OSS, CSE, CICOS)

122 institutions in 45 African countries

12 e-Stations delivered 10 regional geoportals (7 terrestrial and 3 marine)

+100 training delivered / + 10,000 trainees and trainers / for 25,000 training days

Distance Learning Platform (DLP) <https://gmestraining.Africa-union.org>

GMES Network of Universities

Women in GMES & Africa

Youth hackathons



<https://marcosio.org/>

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The GMES and Africa's Marine and Coastal Operations for Southern, Eastern Africa and the West Indian Ocean Island states, is coordinated by the CSIR.

The MarCOSIO consortia develops applications and services to support policy and economic drivers for the Oceans economy.

The consortia champions co-designed and co-developed (indigenous knowledge) decision-supporting services utilizing the EO data accessed through the EU Copernicus (Sentinel suite).

## MarCOSIO Objectives

- Understand local ocean and coastal systems (bespoke offerings).
- Understand **user needs through the networks and expertise of the consortia partners.**
- Promote the sustainable management of marine resources.
- Support marine governance and protection (Africa is policy rich).
- Stimulate the utilization of EO based services and applications to promote the growth of the blue economy.
- **Build and strengthen sustainable expertise and institutions.**







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# Consortium Partners



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MARINE AND COASTAL OPERATIONS  
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Organization	Country
CSIR (Lead)	South Africa
ABALOBI	South Africa
Benguela Current Convention	Namibia, Angola
Coastal Oceans Research Indian Ocean East Africa	Kenya
Institute of Marine Sciences, University of Dar es Salaam	Tanzania
Institut Halieutique et des Sciences Marines	Madagascar
Kenya Marine Fisheries Institute	Kenya
National Sea Rescue Institute	South Africa
Tanzania Fisheries and Research Institute	Tanzania
University of Eduardo Mondlane	Mozambique
Western Indian Ocean Marine Science Association	Tanzania

Sub-consultants	Country
Reef Conservation	Mauritius and the Indian Island Ocean States
Cyanolakes	South Africa







Partner	Countries	Technical	Policy	Academic	Domain
Abalobi (NPO)	South Africa	X			Artisanal Fishers App
BCC	Angola, Namibia, South Africa		X		
CSIR	South Africa	X		X	
CORDIO-EA	Kenya	X	X	X	Coral Reef
IH.SM	Madagascar		X	X	
IMS	Tanzania	X		X	
KMFRI	Kenya	X	X		
NSRI (NPO)	South Africa		X		Sea Rescue
TAFIRI	Tanzania	X	X		PFZs
UEM	Mozambique			X	
WIOMSA	Tanzania (WIO Region)		X	X	
Cyanolakes (sub-consultant)	South Africa	X			Water quality
Reef Conservation (sub-consultant)	Mauritius	X	X	X	Coral Reef, Fisheries User engagement



## MarCOSIO Services

### Fisheries and Aquaculture Service



Fisheries



Aquaculture

### Coastal Service



Coral Bleaching  
Monitoring



Coastal  
Ecosystems

### Marine and Maritime Service



Ship Traffic  
Monitoring



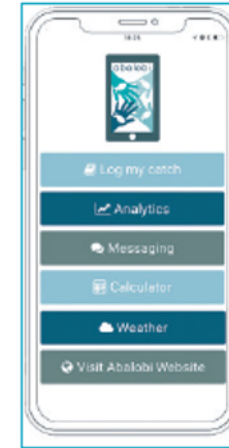
Sea Rescue



## FISHERIES AND AQUACULTURE SERVICE

### FISHERIES SUPPORT

- Provides fishers and regulators with the tools to optimise fishing effort, improve safety at sea, better understand environmental variability, and monitor Illegal, Unreported and Unregulated (**IUU**) fisheries.
- Supporting small scale fishing communities through the ABALOBI (Non-profit) partnership.
- “tech” and “touch” approach.



### AQUACULTURE SUPPORT

- Provides users with the capability to monitor historical and current harmful algal bloom events along the coastline of Angola, Namibia, South Africa, Mozambique, Tanzania, Kenya and Reunion Islands.
- Decision makers will have the ability to be notified of red-tide occurrences and the ability to predict rock lobster walkouts





## COASTAL MONITORING SERVICE

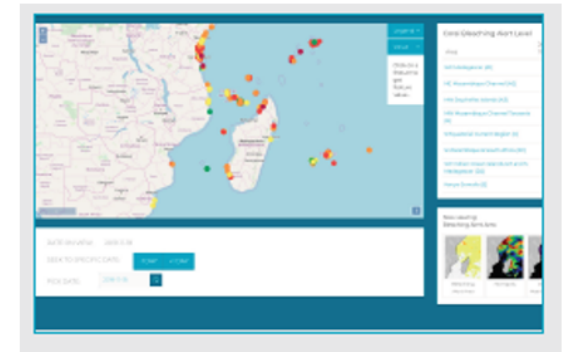
### COASTAL ECOSYSTEMS

- Provides decision makers with an accurate mapping of coastal ecosystems as well as the monitoring of their changes, be it seasonal or man-made.



### CORAL BLEACHING MONITORING

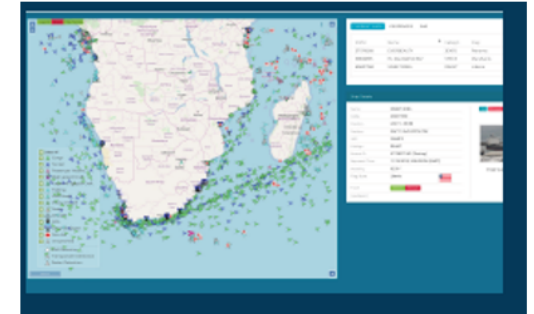
- Provides users with the capability to monitor coral reef bleaching occurrences by building new services based on Copernicus products to detect thermal stress.
- The service will provide the ability to assess historical and real time bleaching alerts.



## MARINE & MARITIME SERVICE

### SHIP TRAFFIC MONITORING APPLICATION

- Provides **authorised users** with the capability to monitor vessels near real time 24/7, 365
- Decision makers will have the ability to monitor co-operative vessels (PAN reports etc).
- Derive strategic information on non-co-operative vessels.



### SAFETY AT SEA APPLICATION

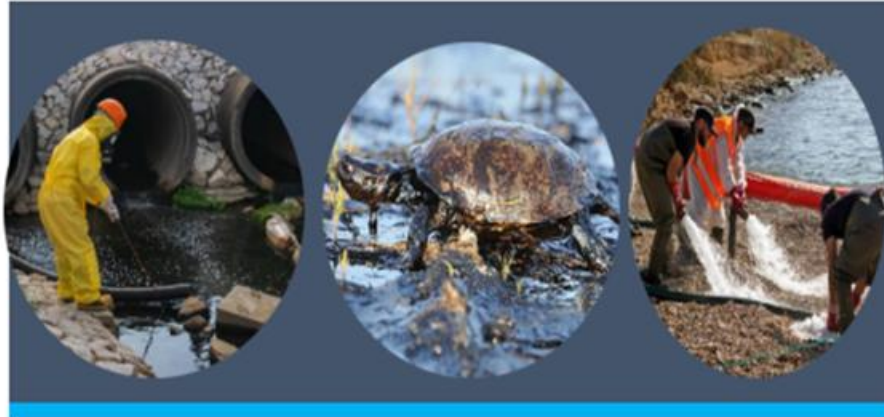
- Provides users with the capability to monitor and predict ocean and sea state variables such as wind, currents and waves.
- Sea search and rescue organisations can make use of this service to assist with the planning of sea search and rescue operations.
- Less search more rescue.







**BENGUELA CURRENT LARGE MARINE ECOSYSTEM  
OIL SPILL RISK ASSESSEMENT,  
PREPAREDNESS AND RESPONSE  
(NAMIBIA & SOUTH AFRICA)**



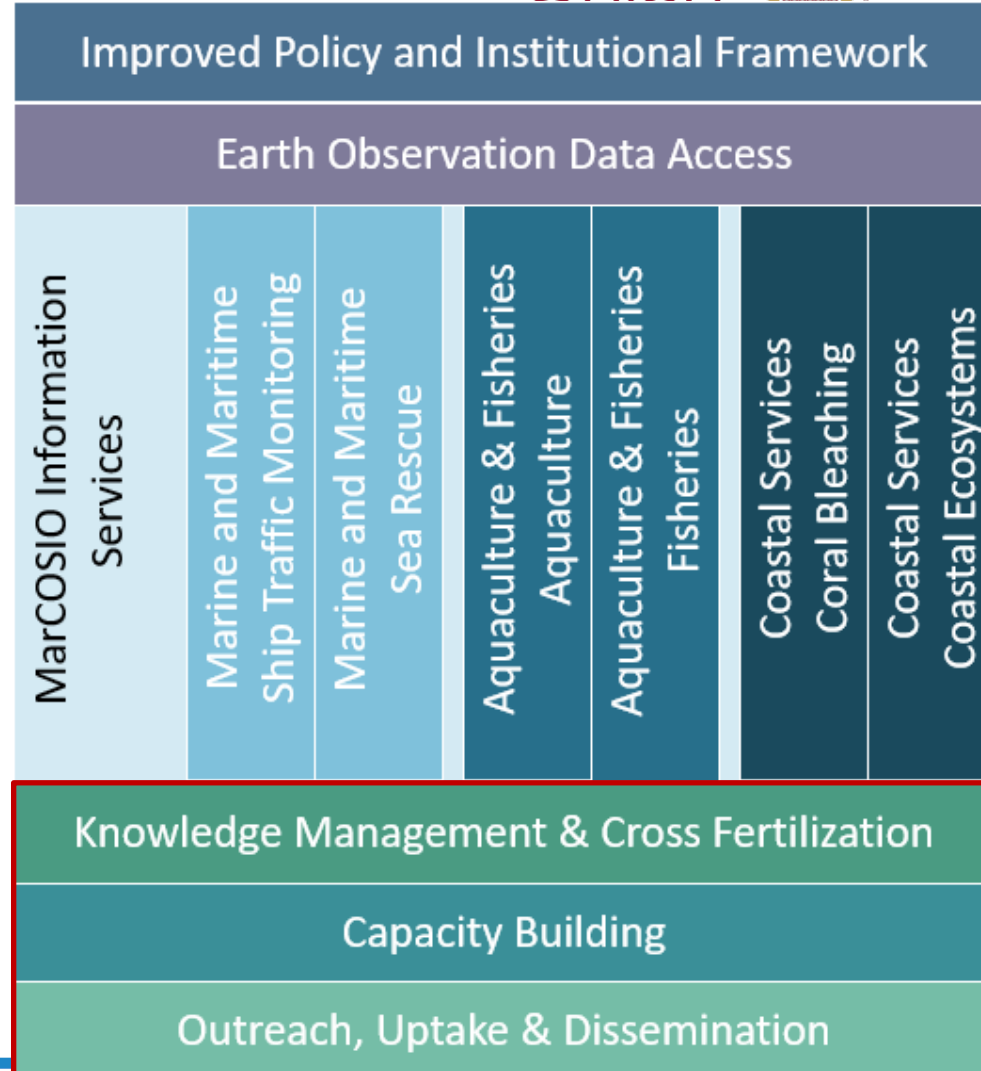
**MarCOSIO** supports BCC risk assessment model that addresses the likelihood of an incident, and the potential consequence should the incident materialise in a specific area in the region.



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MarCOSIO



- Marine and Ocean workshop (May – Cape Town)
- Madagascar Stakeholders Event (June) (Nairobi Convention)
- Southern African Regional student exchange workshop (September Kenya)
  - More than 30 students from Madagascar, South Africa, Kenya, Tanzania and Mozambique are attended the workshop.
- Southern African Regional Workshop (September Kenya)
- EO4Africa symposium in Frascati-Italy in September (JRC/ESA/EUMETSAT, AUC ) event
- Namibia Stakeholder Event (2025) (Support Abidjan Convention)
- Award studentships to African students 2024/25 ongoing





- Increase high level awareness of GMES and Africa and MarCOSIO.
- Align services to policy and institutional framework for sustainable management of GMES products and services
- Sharing knowledge and best practices among consortia as well as among all GMES & Africa programme's stakeholders and partners
- Involve policy experts and senior technical experts from relevant African stakeholders (public institutions), academia, and private sector.



# GMES AND AFRICA

# Outreach and communication



Africa Marine and Coastal Operations for Southern Africa  
430 followers  
3mo •

Are you attending #GEOWeek2023 in #CapeTown? To learn more about @geoaquawatch and #waterquality activities, be sure to check out Monday's flashtalk by Africa Marine and Coastal Operations for Southern Africa ...see more



**IMPACTING GLOBAL WATER QUALITY**

Monday Nov 6th,  
14:40-14:50  
Orchid Room



COMPILED BY JANE KIGUTA  
JANE KIGUTA @JANEKIGUTA

**Overall coral bleaching risk in WIO low, February forecast shows**

Coral bleaching alerts are still. According to research findings by COROSIO-East Africa (a consortium of GMES AND AFRICA, African Union, and CSIR), the overall coral bleaching risk in Western Indian Ocean (WIO) region in 2023 is low.

"This latest forecast may however change in the coming weeks and this will be confirmed in updated alerts," says James Mwangi who is the coral bleaching alert forecast lead in GMES project. "Year 2022 was a relatively cool and quiet year."

No major bleaching was reported in the WIO and cyclone activity was limited, adds James. However, the long protected La Niña conditions in the Pacific that provided a boost for the WIO, is transitioning quickly to a neutral El Niño Southern Oscillation (ENSO).

Coral bleaching is thought about by warming oceans, among other factors, which degrade the reefs. Bleaching is triggered by increases in sea surface temperatures, due to climate change, and is exacerbated by marine pollution and other local threats.

According to the findings documented in the **South Eastern Indian Ocean State of the World 2020**, coral reefs occur in more than 100 countries and territories. And while they cover only 0.2 per cent of the seafloor, they support a quarter of marine species and underpin the safety, coastal protection, wellbeing, food and economic security of hundreds of millions of people.

The findings further reveal that the value of goods and services provided by coral reefs is estimated at US\$2.7 trillion per year globally, including US\$36 billion in coral reef fisheries.

It is against this background that GMES & Africa project in partnership with COROSIO-East Africa, is generating critical data aimed at combating coral reef bleaching. One

## TAFIRI set to use GMES & Africa data following the launch of fishing app

BY JANE KIGUTA  
The Africa Marine and Coastal Operations for Southern Africa and Indian Ocean (MarCOSIO) consortium was among stakeholders that graced Tanzania Fisheries Research Institute's (TAFIRI) 40<sup>th</sup> anniversary celebrations held at APC Hotel and Conference Centre, in **Bunda Dar es Salaam**.



(AUC) and the European Union Commission (EUC).



Under the project, 15 mobile applications on marine and coastal areas have been developed by 28 African institutions. TAFIRI is among 12 consortia institutions from eight countries that comprise MarCOSIO.

The two Earth Observation technologies by TAFIRI are aimed at helping fishers identify and potential zones to boost fisheries output and hopefully make juaquiculture the mainstay of Tanzanian citizens. According to PS Livestock and Fisheries, Republic of Tanzania, about

## ABALOBI HOSTS PARTNER EXCHANGE TRAINING

By Jonathan Kilow and Obakeng Molele

The ABALOBI MarCOSIO GMES & Africa partner exchange training, which was hosted in Mutsaersburg, South Africa, in October, was an active engagement involving partners and stakeholders from southern and eastern Africa. Delegates from the Benguela Current Convention, WIOSEA, CORDIO East Africa, Oceanographic Institute of Mozambique, Hanganani Artisanal Fishers Association, the Wildlife Conservation Society and the Kenya Marine and Fisheries Research Institute, were in attendance.



Participants in the exchange were presented with an in-depth overview of ABALOBI's co-design approach and fisher-driven methodology and a tour to Struis Baai, a coastal town in the Western Cape region, provided an opportunity to engage with the fishers and their assistants, in most cases

The fishers were welcoming and hospitable, sharing valuable insights into their way of life. They explained how fishing is not just a job, but a tradition that has been passed down through generations. They spoke about the joys and challenges of being a fisher and how it requires skill, patience and

Africa Marine and Coastal Operations for Southern Africa  
544 followers  
6mo •

TAFIRI TAFIRI Director General Dr Ishmael at the #Anniversary #celebrations says the Institute stands tall because of what it has achieved for the past 40 years. He attributed @TAFIRI milestones to collaborations and partnerships with like-minded organizations, support and collaborative projects such as Africa Marine and Coastal Operations for Southern Africa GMES & Africa 2021 WIOSEA - Western Indian Ocean Marine Science Association among others. By using #EarthObservation #Fisheries services, tools and apps developed under #MarCOSIO TAFIRI TAFIRI will boost constant flow of relevant research data and information to continually aid policy making and inform strategic environmental assessment African Union Commission European Commission Dr. Tidiane Ouattara Hamdi KACEM Sives Govender Rietje Pretorius Dr. Emmanuel Mbaru, PhD ABALOBI Benguela Current Commission (BCC) CORDIO East Africa Kenya Marine and Fisheries Research Institute Council for Scientific and Industrial Research (CSIR) Universidade Eduardo Mondlane #TAFIRI #Anniversary



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287 followers  
2mo •

Council for Scientific and Industrial Research (CSIR) Africa Marine and Coastal Operations for Southern Africa (MarCOSIO) team showcases IEC materials that capture various #EarthObservation #Services #Tools #Apps developed ...see more



## KMFRI hosts GMES & Africa Science-Policy Technical Tour

COMPILED BY JANE KIGUTA



MarCOSIO Lead Mr Sives Govender Receives a Gift Package from KMFRI

Kenya Marine & Fisheries Research Institute (KMFRI) on September, 27, 2023, hosted African Union Commission (AUC) delegation attending a three-day regional workshop under the auspices of the Global Monitoring for Environment and Security and Africa (GMES and Africa) project. The Blue Economy Science-Policy Interface workshop was held at Pride Inn Paradise Resort in Mombasa, Kenya.

The three-day meet that ran from September 25-27, 2023, culminated in a technical tour at KMFRI - a partner organization under GMES and Africa Marine and Coastal Operations for Southern Africa and Indian Ocean (MarCOSIO) consortium comprised of Southern and Eastern African countries.

GMES and Africa project is co-funded by the African Union Commission and the European Commission.

The workshop brought together 54 participants drawn from 22 countries from across Africa comprising African Union member states, Regional Economic Communities, marine and coastal areas, as well as GMES & Africa partners and implementing institutions.



MarCOSIO Lead Mr Sives Govender Signs the Visitors Book During Courtesy Call



## CSIR puts best foot forward in Angola GMES & Africa workshop

BY JANE KIGUTA



CSIR team and partners during the workshop

(MarCOSIO) project presented products and technical services developed under the GMES & Africa programme. The workshop which was themed "Earth Observation bridging the gap between science and policy" was sponsored by the African Union Commission and the European Union. EU was represented by Mr Danilo Barbato.





- GMES MarCOSIO, uses a consortia approach in the development of its services.
- Utilizes and builds upon the African partner expertise (capacity development)
- Key philosophy is Co-design, co-create and co-fund.
- Integrates data from multiple sources to address issues around climate change, biodiversity loss and pollution.
- MarCOSIO wants to support presidential level policy mandates to the safety and livelihoods of the artisanal fisher.
- Awareness, capacity building, monitoring and education are key!
- success of MarcoSIO and your partnership with other west Indian ocean island states.
- GMES Phase 3 opportunities.





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**Thank you**  
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**[Sives.Govender@gmail.com](mailto:Sives.Govender@gmail.com)**

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