



GMES
AND AFRICA



African
Union 



CSIR
Touching lives through innovation

Remote sensing for aquaculture support in the Western Indian Ocean

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Geospatial Modelling and Analysis, CSIR Pretoria



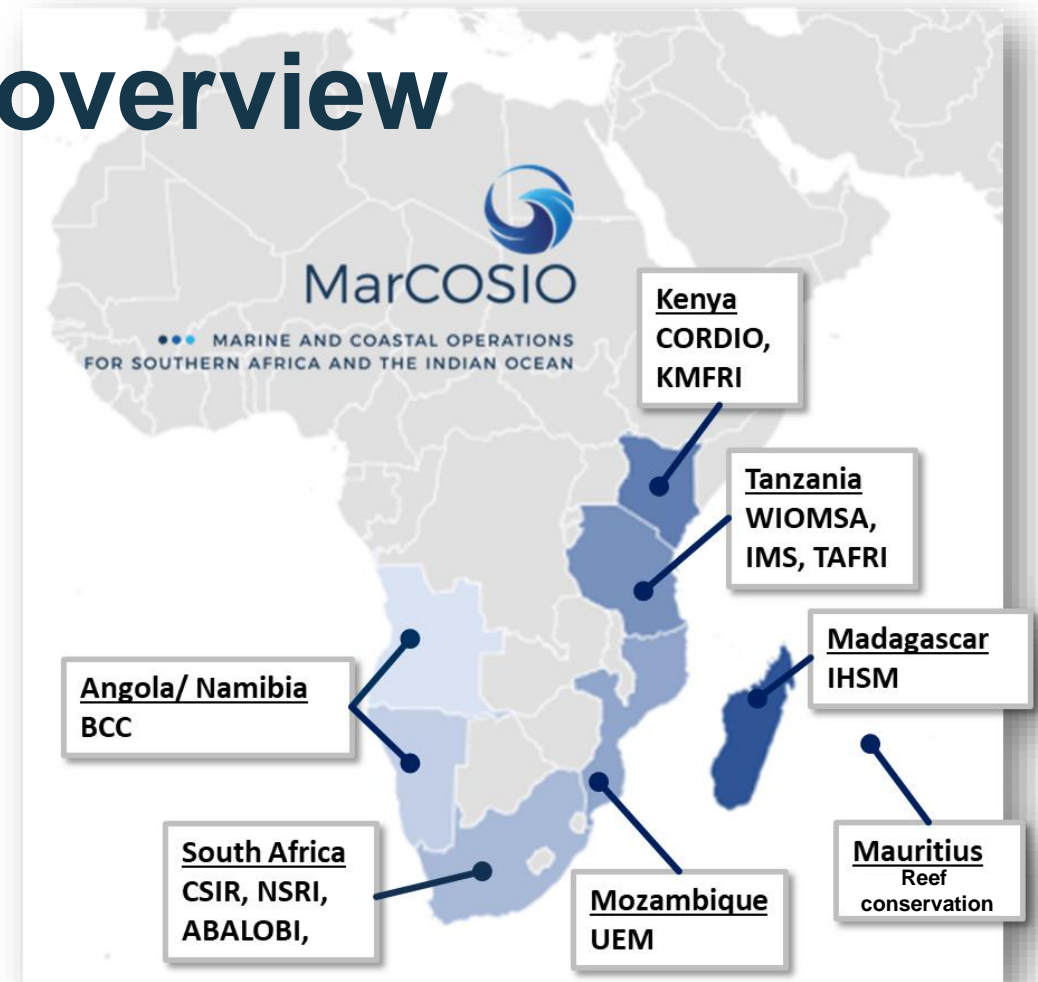
<https://marcosio.org/>

MARINE AND COASTAL OPERATIONS
FOR SOUTHERN AFRICA AND THE INDIAN OCEAN


MarCOSIO

GMES&Africa MarCOSIO overview

- One of 2 marine consortia within the GMES&Africa programme
- The MarCOSIO project is lead by the CSIR (South Africa)
- The project represents 12 partners in 8 countries in Southern Africa and the Western Indian Ocean (WIO) region





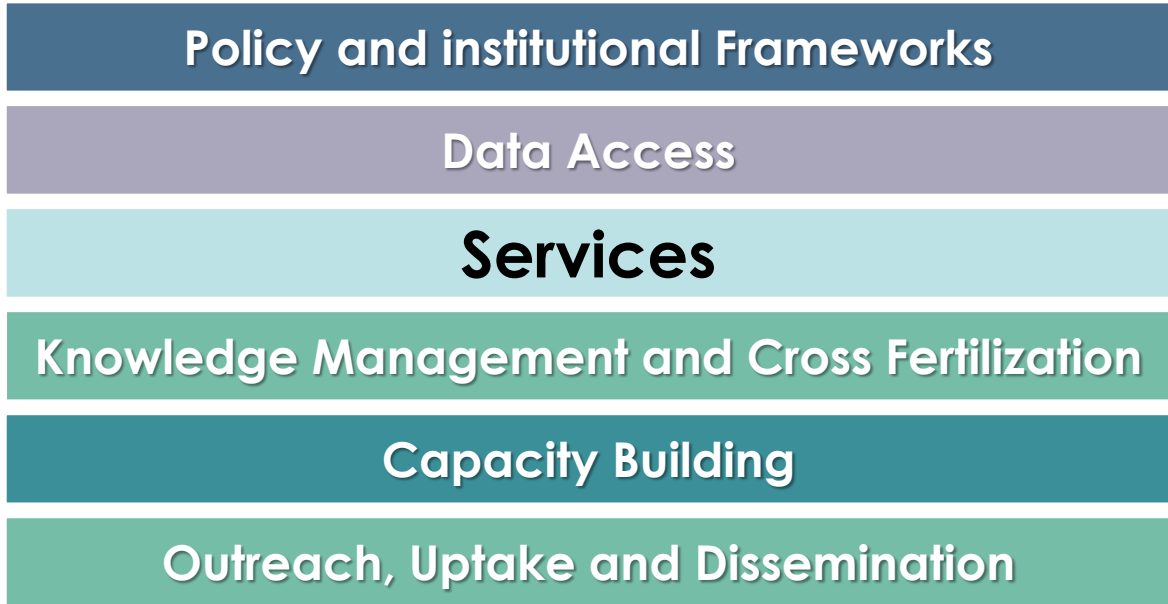
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**African
Union**



Project pillars



**Fisheries
and
Aquaculture
Service**



Fisheries



Aquaculture

**Coastal
Service**



Coral Bleaching
Monitoring



Coastal
Ecosystems

**Marine and
Maritime
Service**



Ship Traffic
Monitoring



Sea Rescue



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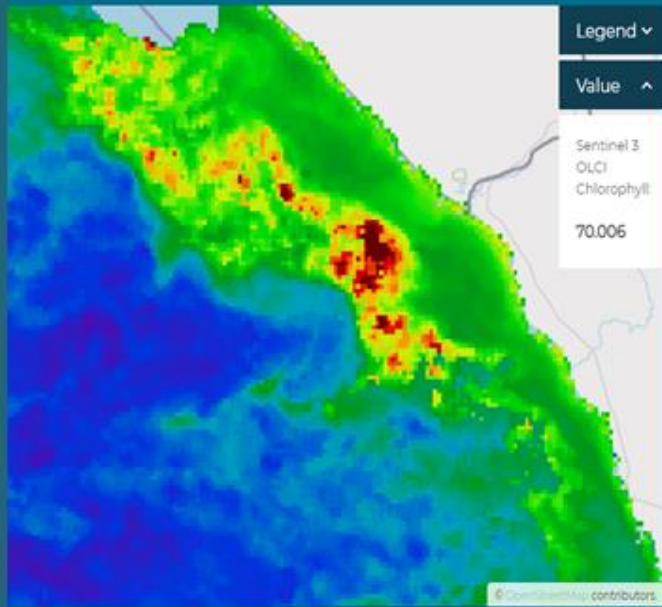
African
Union



MarCOSIO



Aquaculture
Support Service



DATE ON VIEW: 2021-08-25

SEEK TO SPECIFIC DATE:

-1 DAY

+1 DAY

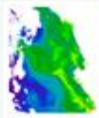
PICK DATE:

2021-08-25



Now viewing:

Sentinel 3 OLCI Chlorophyll



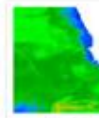
Sentinel 3
OLCI
Chlorophyll



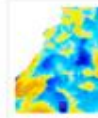
Sentinel 3
SLSTR
SST (AM)



Sentinel 3
SLSTR
SST (PM)



SST



SST
Anomaly



GlobColour
Chlorophyll

Aquaculture Support Service

<https://ocims.csir.co.za/hab/app/#>



<https://marcosio.org/>

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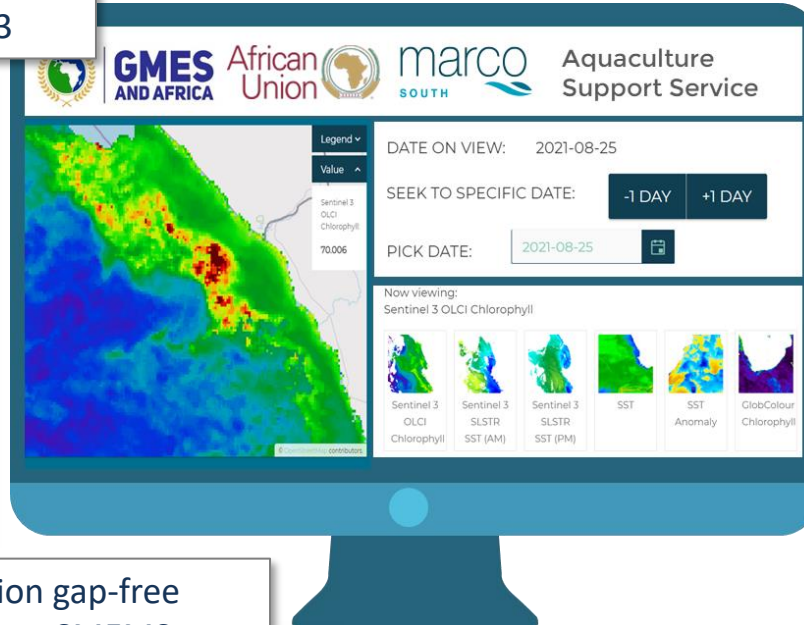
MarCOSIO



The web-based viewers

The Aquaculture support service

High resolution near real time products from Sentinel 3



Low resolution gap-free products from CMEMS

- Web-based application for Aquaculture and Fisheries support in southern Africa
 - Spatial coverage from north of Angola to Kenya
- Low latency 1km Chl-a & SST products from Sentinel 3
- 1-2 day latency gap-free SST, SST anomaly (5km) and Chl-a (4km) products from Copernicus Marine Services (CMEMS)

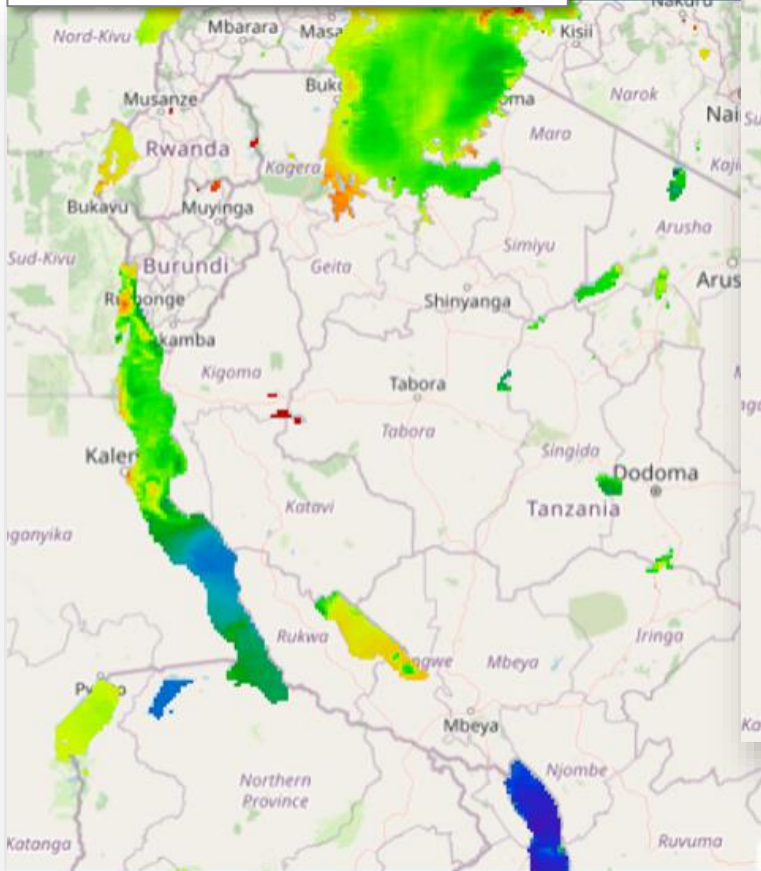
<https://ocims.csir.co.za/hab/app/#>

The web-based viewers

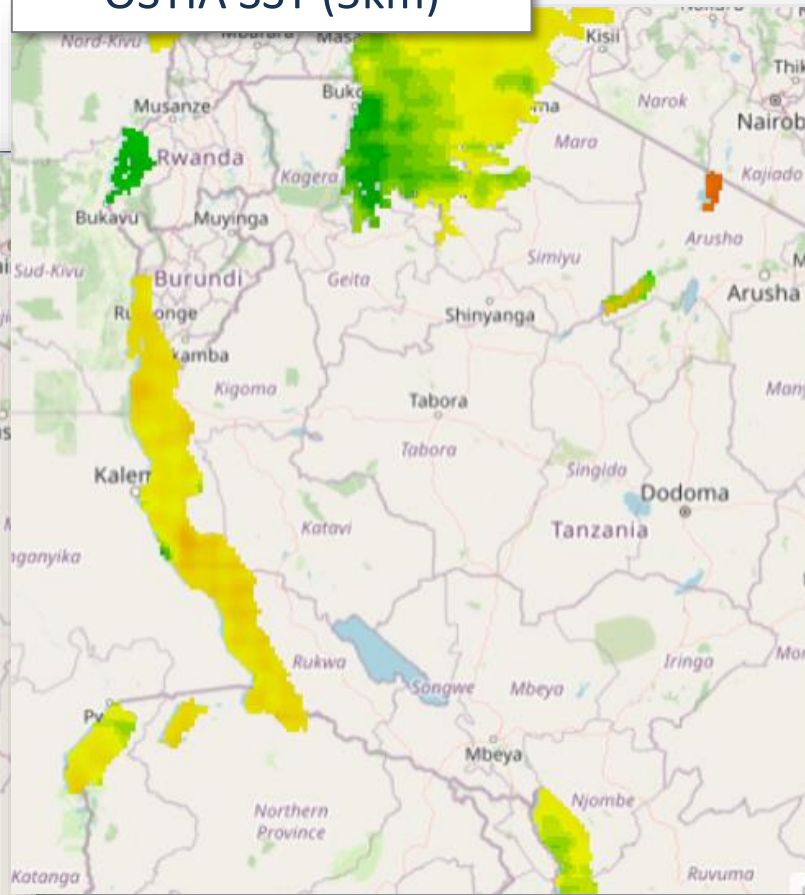
The Aquaculture support service



Globcolor Chl-a (4km)



OSTIA SST (5km)



- Both the low resolution SST and Chl-a products already provide data for the large lakes
- If there is interest we can look at add higher resolution data products over the lakes

<https://ocims.csir.co.za/hab/app/#>



Western Indian Ocean Coral Bleaching Monitoring Service

Date on View: 2023-10-22

Search by Date: 2023-10-22

Seek to specific date: -1 Day +1 Day

Virtual Stations

Virtual stations: Kenya - Kisite Mpunguti

Date Range: Past 12 months

Show/Hide Virtual stations:

Legend

Value

Click on a feature to get feature value...

Download

In situ bleaching observations

Show/Hide in situ bleaching observation data:

Date Range: All

Links to Cordio:

Cordio Bleaching Alert

Cordio GIS Tool

Virtual Stations

Virtual stations: Kenya - Kisite Mpunguti

Date Range: Past 12 months

Show/Hide Virtual stations:

Legend: sst min, sst max, sst mean, sst median, sst centroid

Coral Bleaching Monitoring Service

<https://ocims.csir.co.za/coralbleaching/>



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The web-based viewers

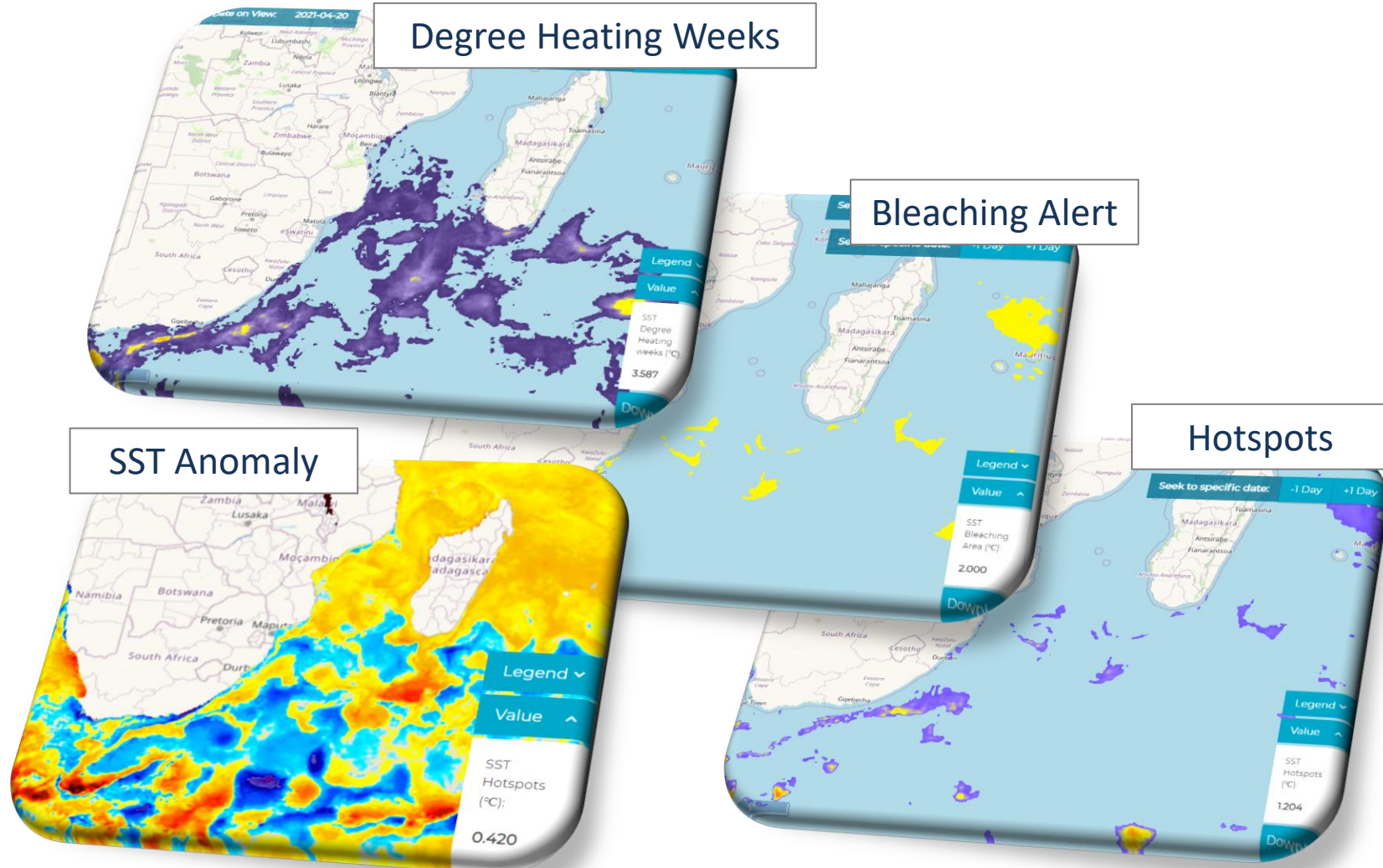
Coral Bleaching Monitoring service

CORDIO
East Africa



<https://ocims.csir.co.za/coralbleaching/>

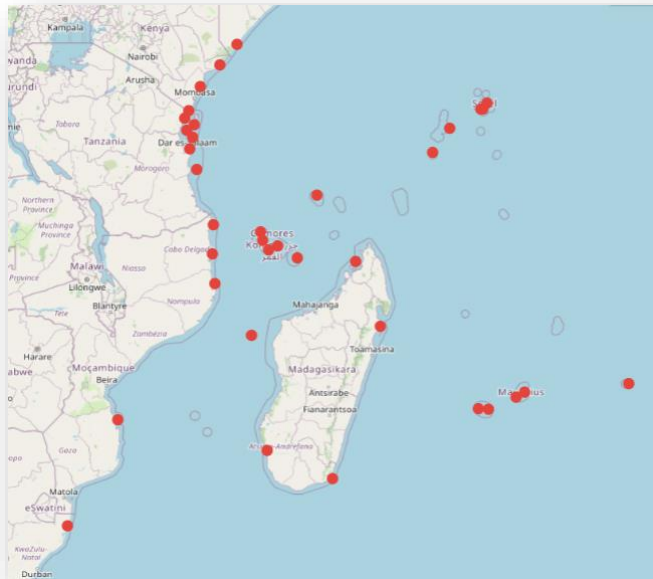
- Thermal stress products
 - Gap-free satellite products derived from SST (5km resolution), providing information on potential bleaching alerts, immediate and accumulated thermal stress



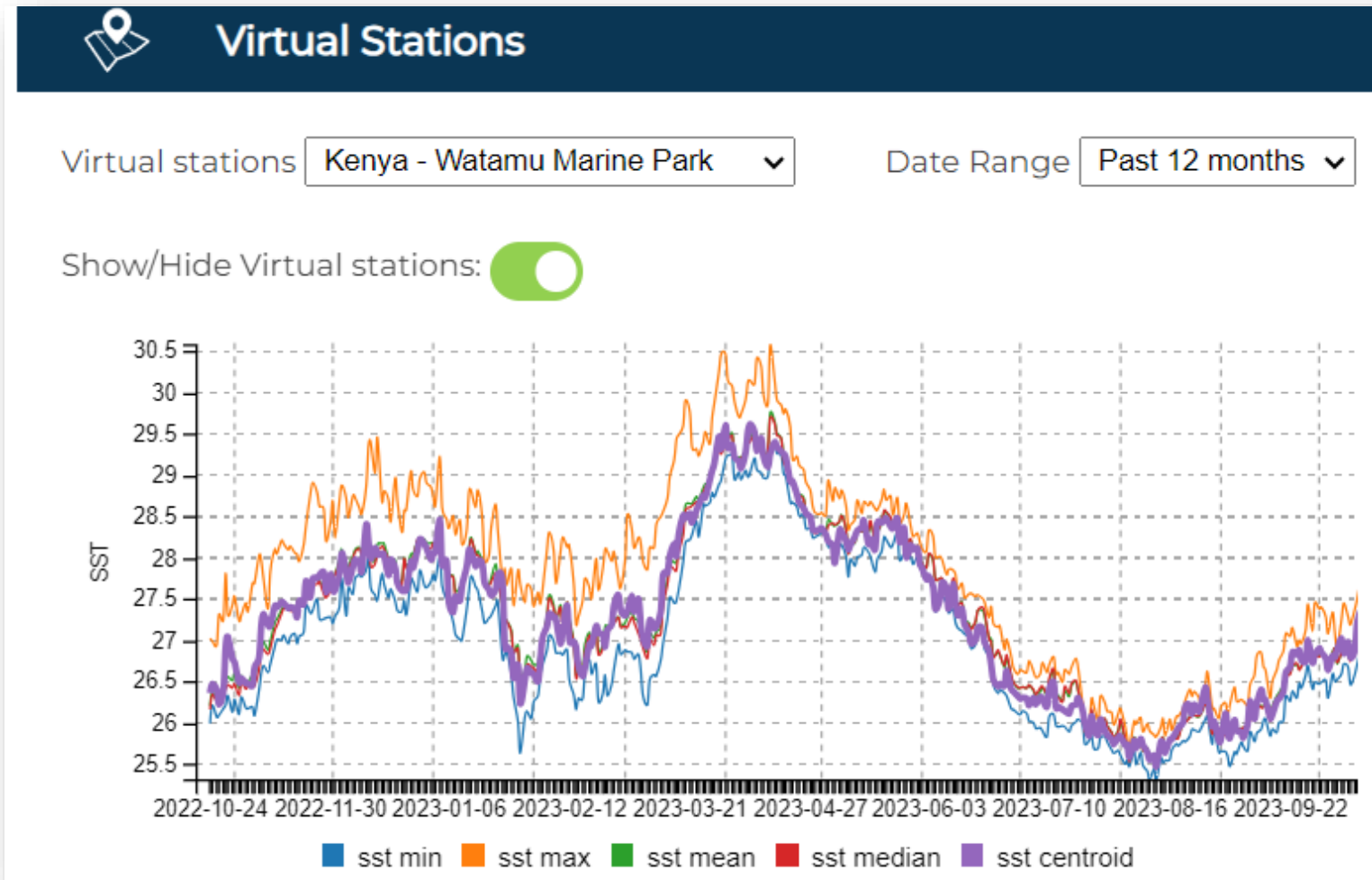
The web-based viewers

Coral Bleaching Monitoring service

- Virtual stations
 - Interactive graphical presentations of key monitoring sites showing historical information on SST within the past 12 months



<https://ocims.csir.co.za/coralbleaching/>





Coastal Ecosystems Monitoring Service

<https://online.cyanolakes.com/marcosio/>



<https://marcosio.org/>

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The web-based viewers

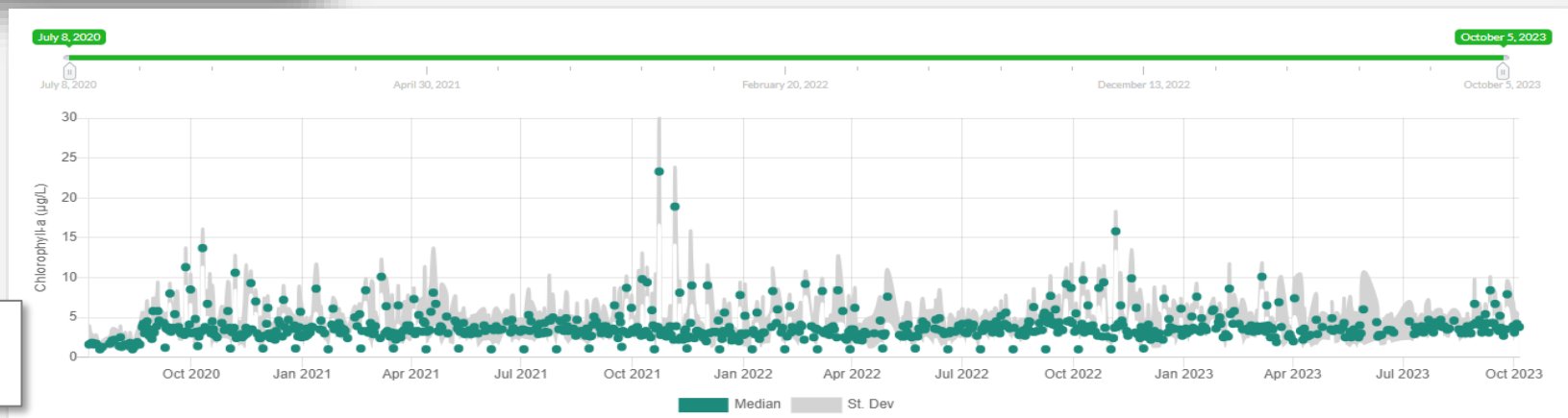
Coastal Ecosystems (Water Quality) Monitoring service



Enhanced vegetation product using Sentinel 2

- In collaboration with CyanoLakes
- 300 m resolution Chl-a, cyanobacteria, and floating vegetation products (near-daily)
- 10 m resolution vegetation indicator products and true color images (every 5 days)
- Several locations around Africa, but can scale to other regions

<https://online.cyanolakes.com/marcosio/>



Graphical summary of micro-algae biomass



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Other support



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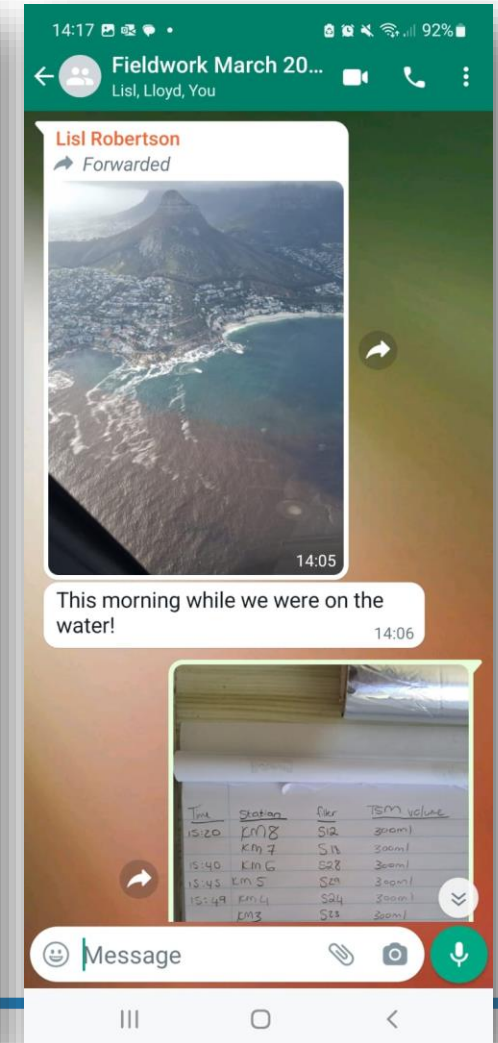
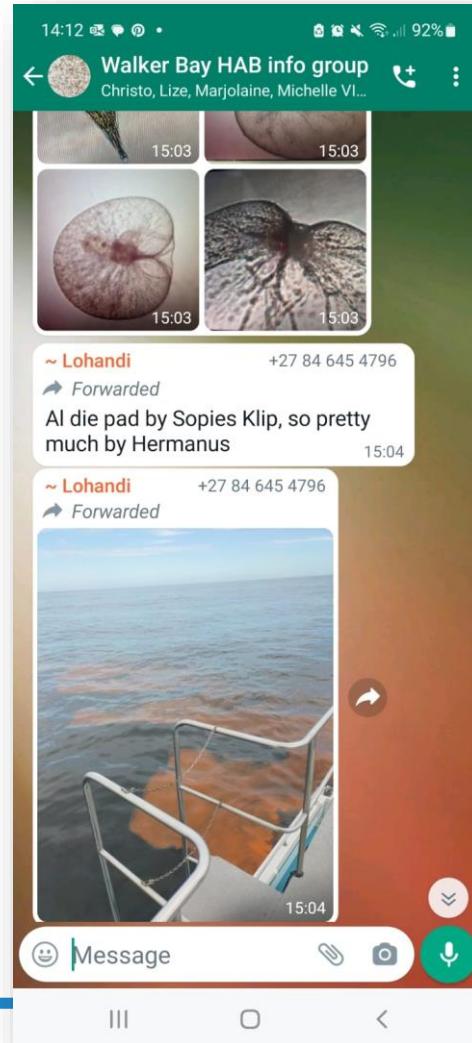
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Supporting Aquaculture

WhatsApp support groups

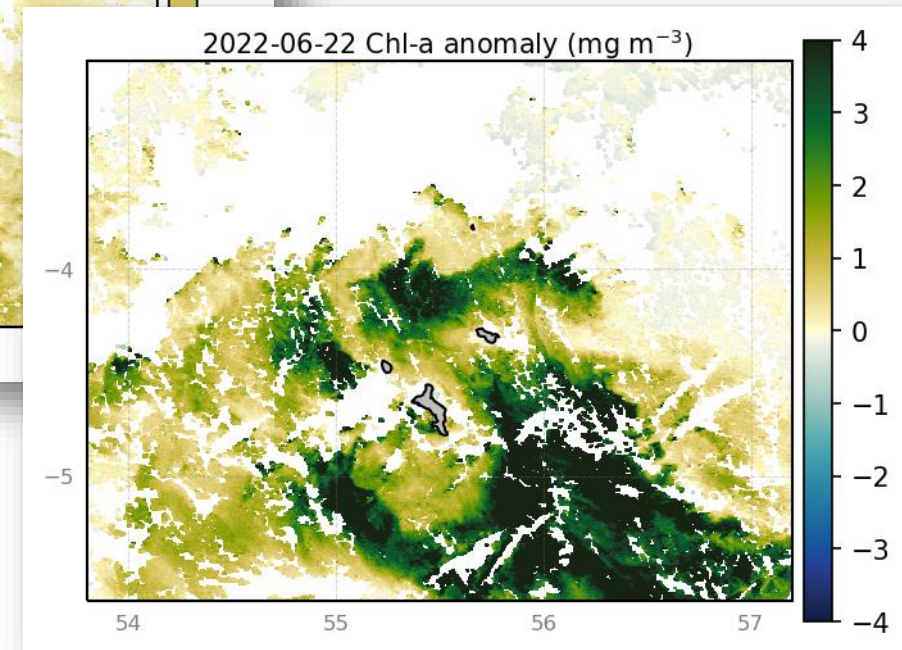
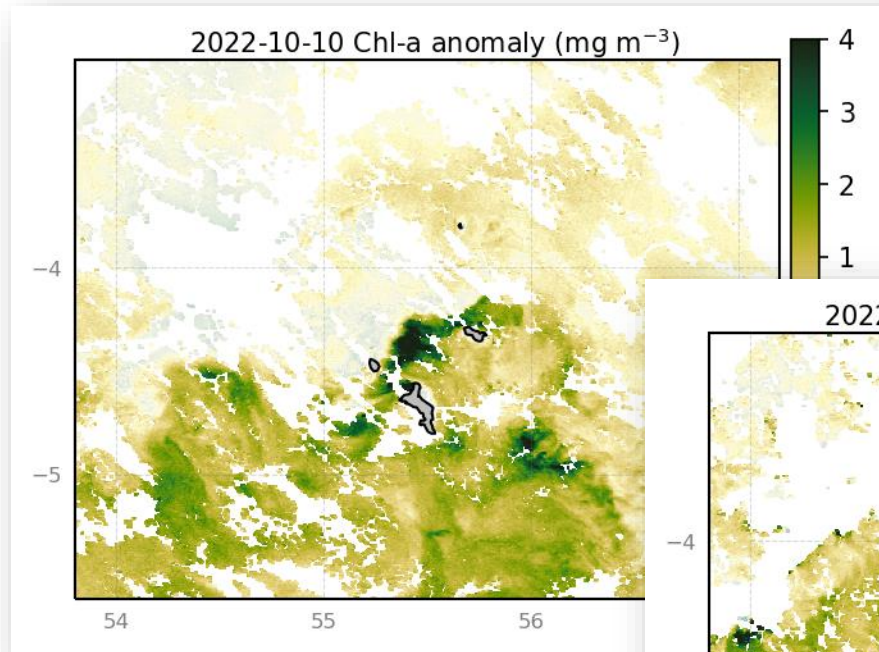
- Useful as initial showcase and explanations of data products
- Works best if conversation is started and lead by the community



Supporting Aquaculture

Event-scale investigations

- Harmful Algal Bloom events occurred in July and October 2022 in the Seychelles, causing fish kills in the area
- We are working with local stakeholders and researchers at the University to assess how satellite data products can be useful to detect, monitor and potentially predict such events



The way forward

Crowd-sourcing for Water Quality information

- Aquaculture and Water Quality go hand in hand
- People on the ground use mobile devices and WhatsApp
- There is a need for a simple mechanism to effectively report on & capture water quality issues that affect public and industry



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The way forward

Crowd-sourcing for Water Quality information

- Under OCIMS we will be rolling out a simple mobile application for crowd-sourcing of general Water Quality reporting; to be upscaled into MarCOSIO region
- Manually or automatically records date-time-location; upload photos
- Directly engage with stakeholders in hotspot areas to show if/how remote sensing data can assist



16:01 86%

Water Quality Reporting Tool

Some dead and some alive
 Unknown

AI Clinical signs *
Please select all that apply

Dead animal/fish
 Algae; discoloured water
 Chemical waste
 Plastic/nurdles
 Oil slick/spill
 Sewage

Please confirm the location *
Allow your device location to be accessed or use the map to navigate to the area.

34.105°S 18.479°E

Muizenberg

✓



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PARTNERS

PROGRAMME

RESOURCES

TRAINING

MEDIA

BLOG

CONTACT



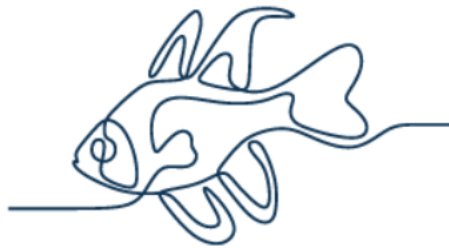
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MARCOSIO SERVICES

The Global Monitoring for Environment and Security (GMES) and Africa MarCOSIO project will provide new co-designed decision-making services to promote sustainable management of marine resources, improve marine governance and stimulate the growth of the blue economy in the South and East African Regions.



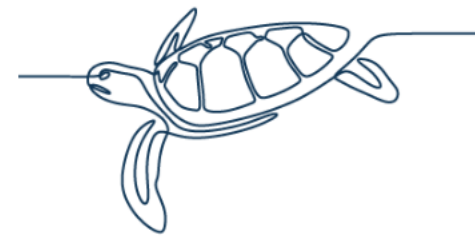
FISHERIES AND
AQUACULTURE **SERVICE**

VIEW



MARINE AND
MARITIME **SERVICE**

VIEW



COASTAL
MONITORING **SERVICE**

VIEW



<https://marcosio.org/>

MARINE AND COASTAL OPERATIONS
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FISHERIES AND AQUACULTURE **SERVICE**

FISHERIES **SUPPORT**

Provides fishers in different sectors 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 and fishing effort. There will be a particular focus on supporting small scale fishing communities through the ABALOBI partnership.

[LINK TO SERVICE](#)

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.

[LINK TO SERVICE](#)





Opportunities

- How can WE help YOU?
 - Reach out to us with your needs or specific case studies
- How can YOU help US?
 - We are looking for representatives with regional knowledge to join our technical advisory group and help guide our services development to best support different regional communities
 - Please provide any feedback on the services



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Asante Sana!

Contact MSmith2@csir.co.za



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