



OceansPrediction DCC

The African Regional Hub



Supporting the full value-chain from
forecast systems to downstream applications



Jennifer Veitch

SAEON (The South African Environmental Observation Network)

SOMISANA (A Sustainable Ocean Modelling Initiative a South AfricaN Approach)

Co-chair of OceanPrediction-DCC African Seas





OceanPrediction DCC

The voyage



“to galvanize and coordinate efforts towards the co-development and integration of worldwide ocean prediction activities, serving Decade objectives and in close collaboration with the Decade endorsed actions and other stakeholders”

2020: THE OCEAN FORECAST WE HAVE



OceanPrediction DCC VESSEL

Captain: UN Ocean Decade

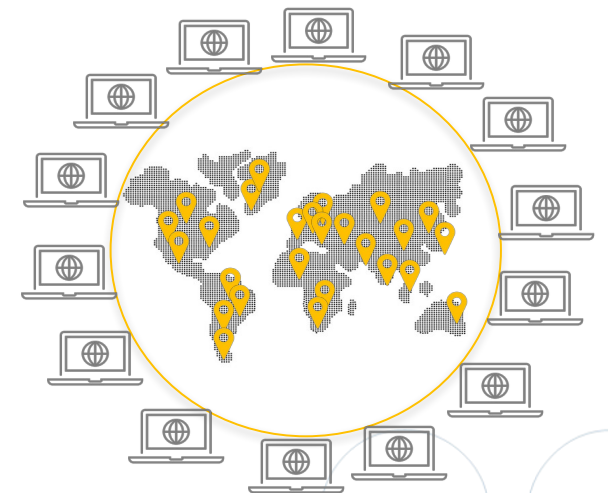
Chief engineer: Decade actions and DTO

Crew: OceanPrediction DCC community

Navigator: OceanPrediction DCC



2030: THE OCEAN FORECAST WE WANT



- ➔ Connected community and services
- ➔ Many robust systems worldwide

- Useful but partially disconnected services
- Poor presence in under-resourced countries



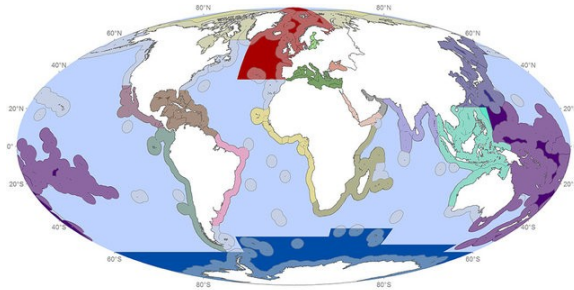
OceanPrediction DCC

1. Regional Hubs : a global and transversal community

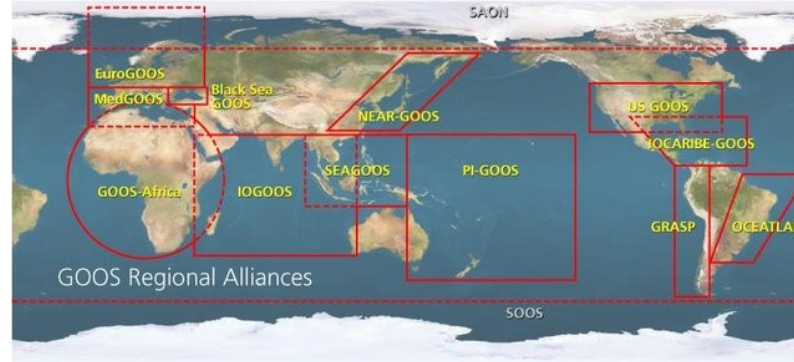


“Focused on **community** and **capacity development**”

UNEP regional seas



GOOS regional alliances



Region 1: West Pacific and MSEA

Region 2: Indian seas

Region 3: African seas

Region 4: Mediterranean and Black Sea

Region 5: North-East Atlantic

Region 6: South and central America

Region 7: North America

Region 8: Arctic

Region 9: Antarctic



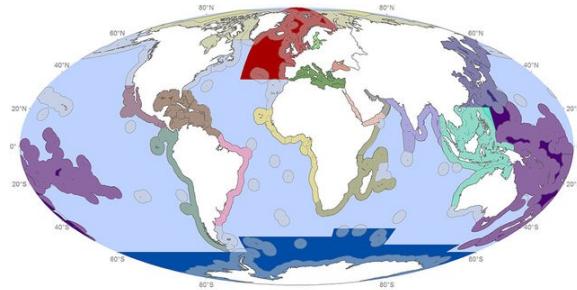
OceanPrediction DCC

1. Regional Hubs : a global and transversal community

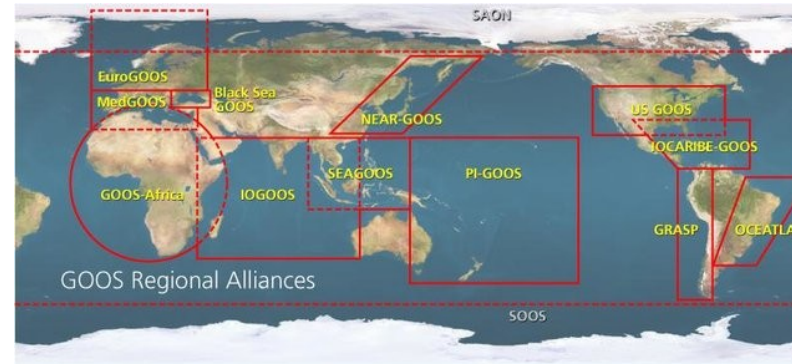


“Focused on **community** and **capacity development**”

UNEP regional seas



GOOS regional alliances



- Region 1: West Pacific and MSEA
- Region 2: Indian seas
- Region 3: African seas
- Region 4: Mediterranean and Black Sea
- Region 5: North-East Atlantic
- Region 6: South and central America
- Region 7: North America
- Region 8: Arctic
- Region 9: Antarctic

Regional nodes support the objectives of OceanPrediction DCC:

- Promote the use of forecasting services for decision making
- Support decade actions related to ocean forecasting
- Map the landscape, identifying gaps and ways forward
- Capacity building
- Advocate for implementation of Best Practices, Standards and Tools
- Community building: both within and across hubs





OceanPrediction DCC

2. The OceanForecasting Co-Design Team



Focused on alignment for Co-Design. Formed by experts on different topics of the ocean forecasting value chain.



THE OCEAN FORECASTING
CO-DESIGN TEAM

PROBLEM

**GAPS: SYSTEMS
TECHNICALLY
DISCONNECTED**

During development: new systems require a development from scratch. "Core" services disconnected

During exploitation: No possibility to use common tools for Oofs validation, dissemination and exploitation

OPPORTUNITY

The decade as game changer: a new scenario for ocean forecasting will be possible by harnessing UN Decade and Digital Twin opportunities

TOWARDS A SOLUTION

An "Ocean Forecasting Co-design Team": will design a new architecture (standards, tools, best practices, etc.) in cooperation with related Decade programmes

Results to inspire: Decade programmes development targets

OceanPrediction DCC Website

Forum

The forum interface includes a sidebar with filters for Ocean basin/region, Community announcements, Matchmaking Services, UN Decade Forecasting, Technical and numerical models, and Wave models. The main content area shows a discussion post by Jawhara ZENTI titled "Operational Chains, Cloud Computing, and GPU Computing".

The Atlas interface displays a "Model information" form for the FVCOM (Finite Volume Community Ocean Model). It includes fields for numerical model, essential ocean variables (EOV), domain globality, and geographical boundaries.

Atlas

The Atlas interface features a world map with geographical boundaries and data points, allowing users to explore model information across different regions.

News

The News interface displays a grid of news articles, including "Launch of a Policy Paper on Coastal Adaptation to Climate Change" and "Launch of a Policy Paper on Coastal Adaptation to Climate Change".

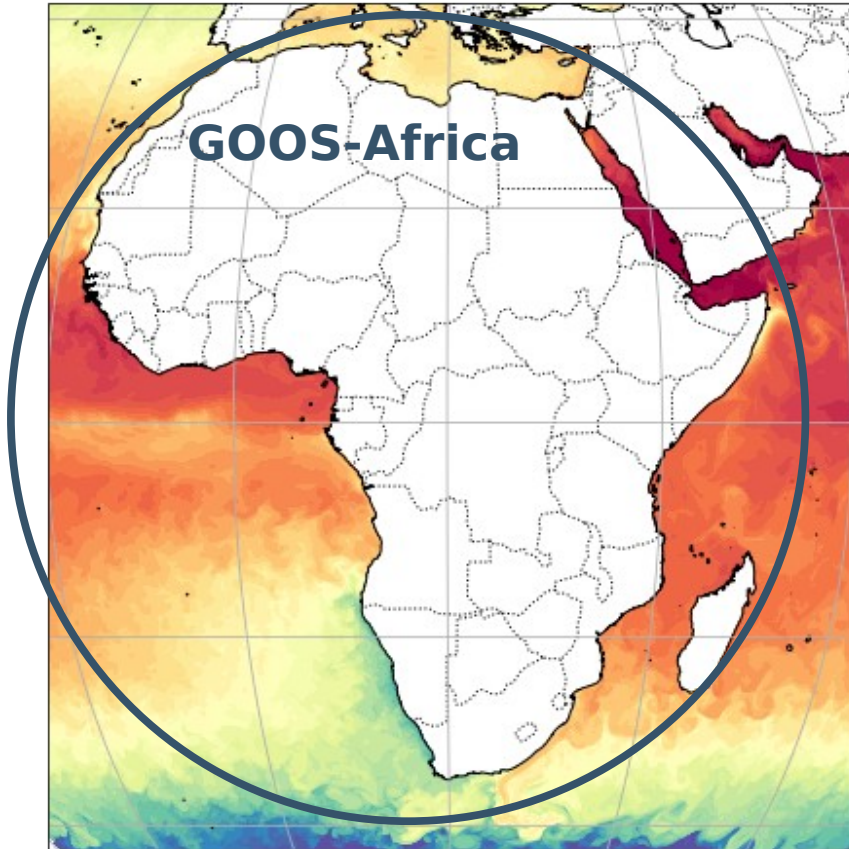
ETOOFS guide

converted to wiki site

The ETOOFS guide interface shows an interactive guide with chapters on "Introduction", "Wave modelling", and "Definition of ocean forecasting systems: temporal and spatial scales solved by marine".



Defining the African Regional Hub GOOS Regional Alliance & UNEP Regional Seas



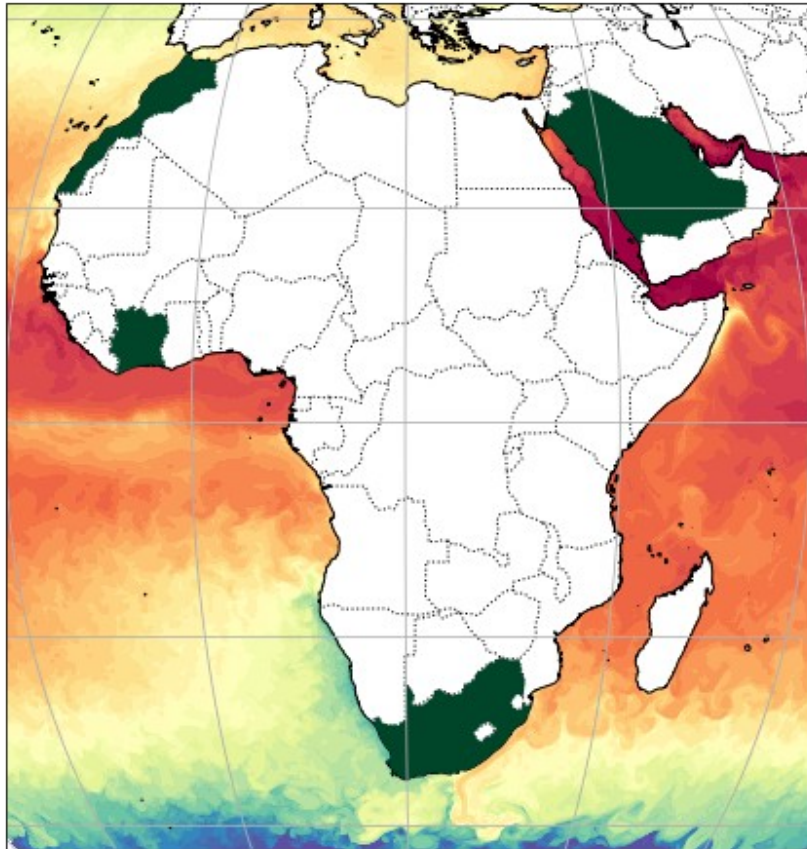
Mercator global ocean analysis & forecast, 12 June 2023





Defining the African Regional Hub

GOOS Regional Alliance & UNEP Regional Seas



Mercator global ocean analysis & forecast, 12 June 2023

11-12 January 2023 OceanPrediction DCC Kick-Off

Confirmation of African Regional Chairs



Kouadio Affian
Cote d'Ivoire



Karim Hilmi
Morocco



Sivareddy Sanikommu
Saudi Arabia



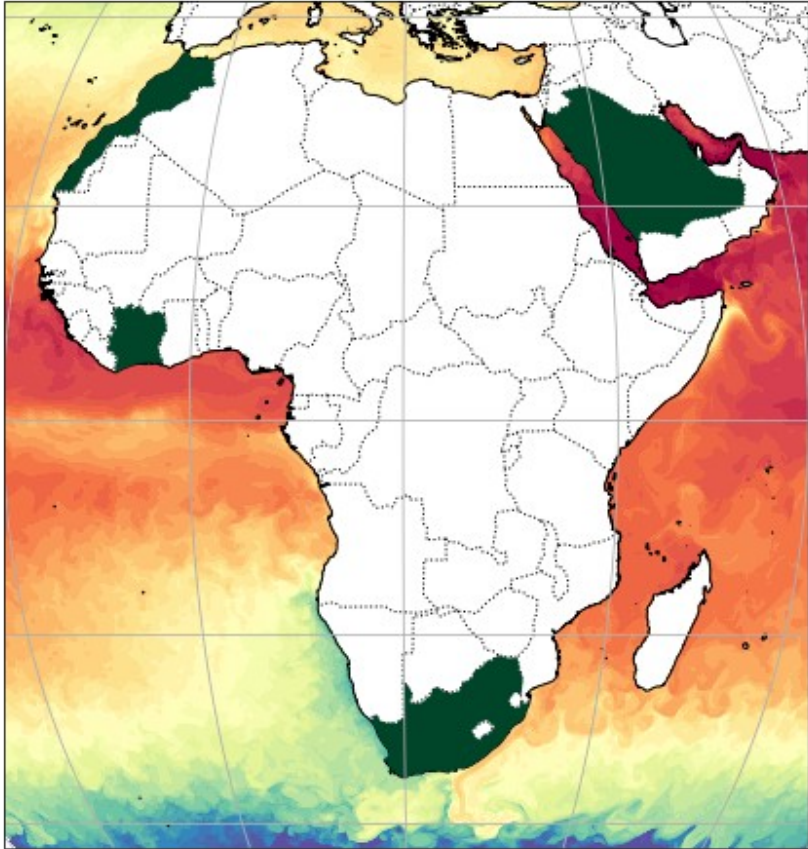
Jennifer Veitch
South Africa

Regional contributions to the OceanForecasting Co-Design Team



Defining the African Regional Hub

GOOS Regional Alliance & UNEP Regional Seas



Mercator global ocean analysis & forecast, 12 June 2023

11-12 January 2023 OceanPrediction DCC Kick-Off
Confirmation of African Regional Chairs



Kouadio Affian
Cote d'Ivoire



Karim Hilmi
Morocco



Sivareddy Sanikommu
Saudi Arabia



Jennifer Veitch
South Africa

14 June 2023: 1st African Regional Hub Meeting

Nomination of Steering Committee - ongoing

Regional contributions to the
OceanForecasting Co-Design Team

Identification of experts to support the OP-DCC forum

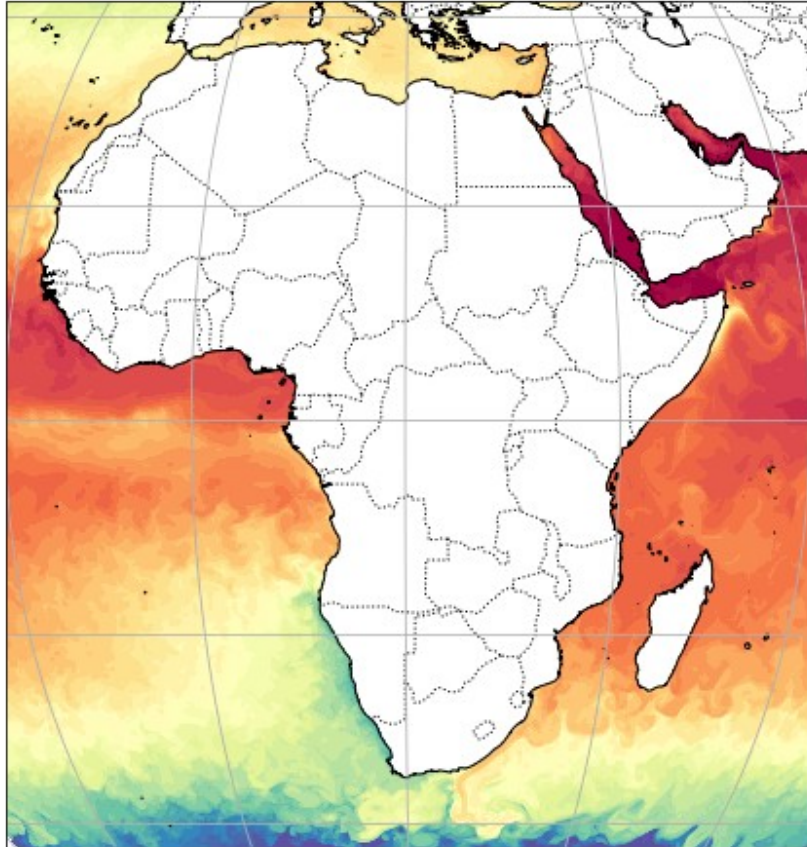


The African Regional Hub

Steering Committee



..to organize activities and promote actions related to the OP-DCC and to ensure connection between the different regional hubs as well as with the Co-Design Team.



Mercator global ocean analysis & forecast, 12 June 2023

Thematic Area
Ocean Observing
Ocean Forecasting: Physics
Ocean Forecasting: Biogeochemistry
Ocean Forecasting: Climate
Ocean Health
Digital Ocean
Connection with Users
Capacity Building
Ocean Literacy
Policy and Legal aspects of the Region

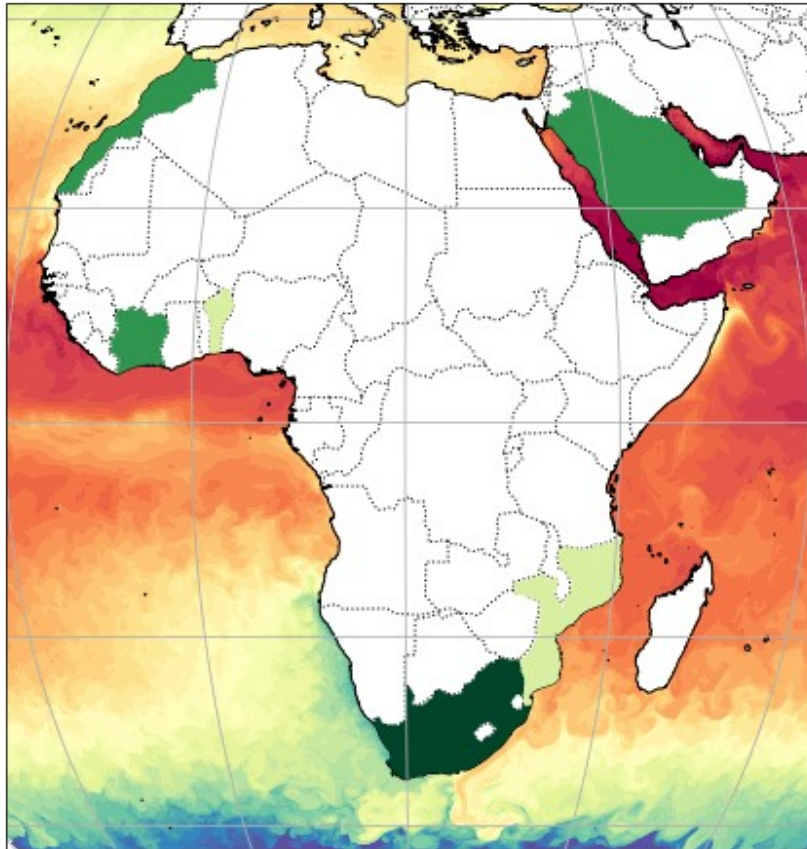


The African Regional Hub

Steering Committee



..to organize activities and promote actions related to the OP-DCC and to ensure connection between the different regional hubs as well as with the Co-Design Team.



Mercator global ocean analysis & forecast, 12 June 2023

Thematic Area	Confirmed Member
Ocean Observing	**
Ocean Forecasting: Physics	*
Ocean Forecasting: Biogeochemistry	
Ocean Forecasting: Climate	***
Ocean Health	
Digital Ocean	*
Connection with Users	
Capacity Building	*
Ocean Literacy	
Policy and Legal aspects of the Region	*

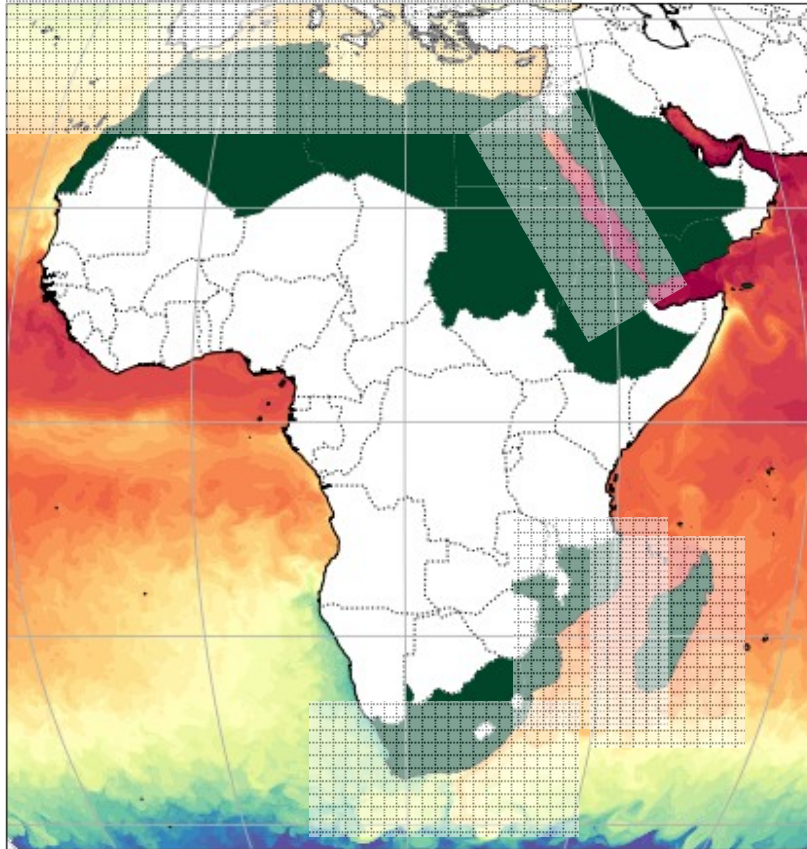


Regionally Optimized Forecasts for African Seas

Mapping the Landscape

- Useful but partially disconnected services
- Poor presence in under-resourced countries

LIMITED REGIONAL COLLABORATION





Regionally Optimized Forecasts for African Seas

Mapping the Landscape

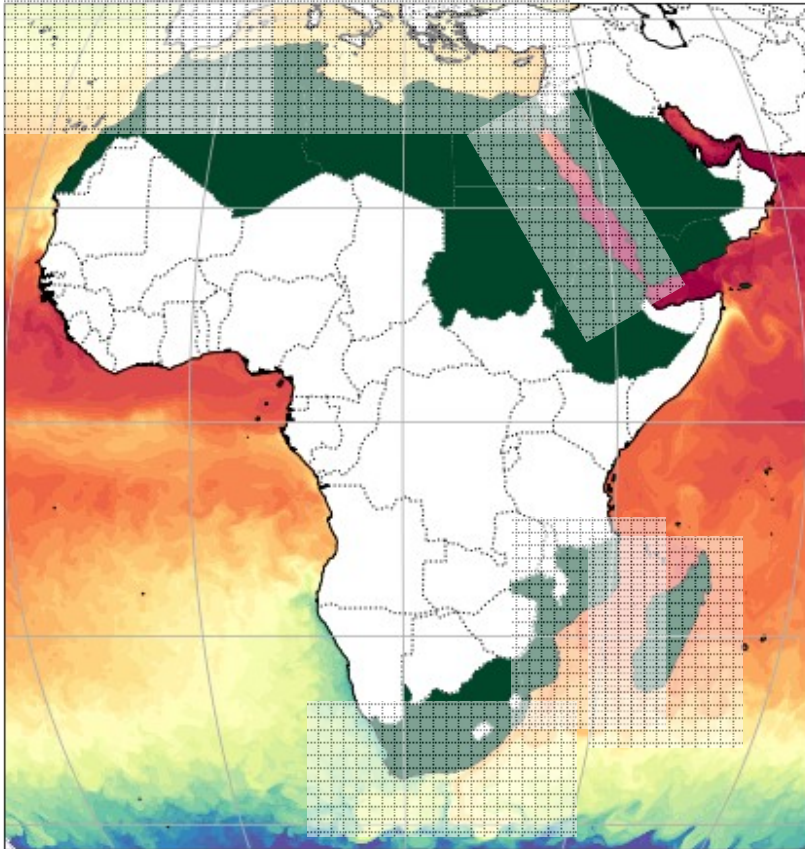
- Useful but partially disconnected services
- Poor presence in under-resourced countries

LIMITED REGIONAL COLLABORATION

An opportunity!

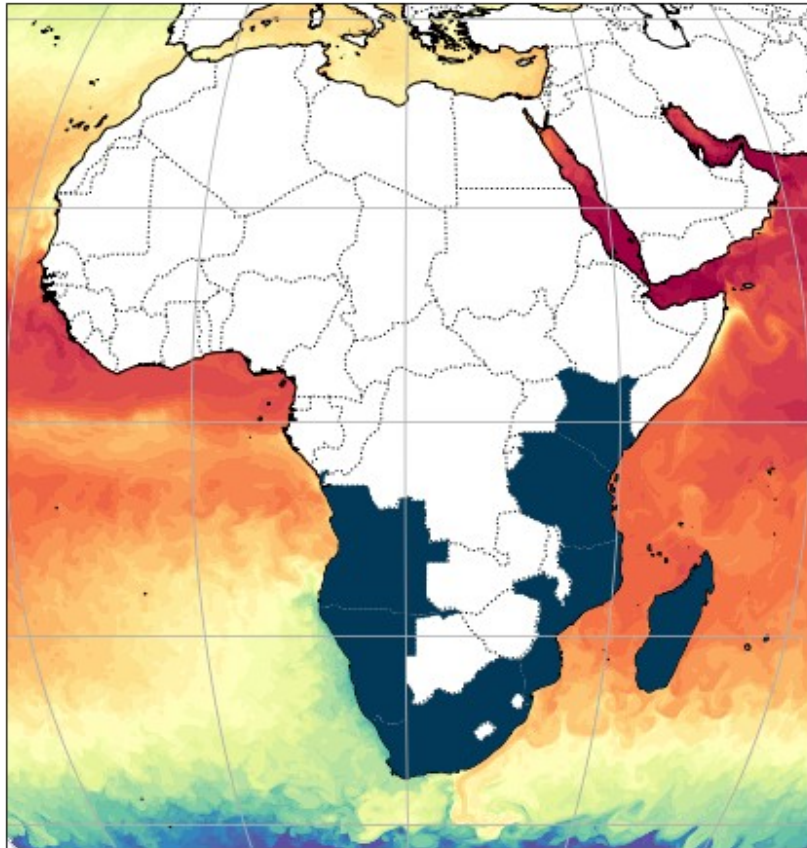
- Develop interoperable systems according to standards and best practices informed by developed systems (but modified according to local needs)

THINK REGIONALLY!





Alignment with existing operational services



●●● MARINE AND COASTAL OPERATIONS FOR SOUTHERN AFRICA AND THE INDIAN OCEAN

‘the development of regionally-optimised satellite observations and model-based forecast services focused on sustainable socio-economic development for the South and East African marine and coastal domains.’



THANK YOU



and needs

I'd love to hear about the operational forecast services in your region!



Please contact me: ja.veitch@saeon.nrf.ac.za



science & innovation
Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA

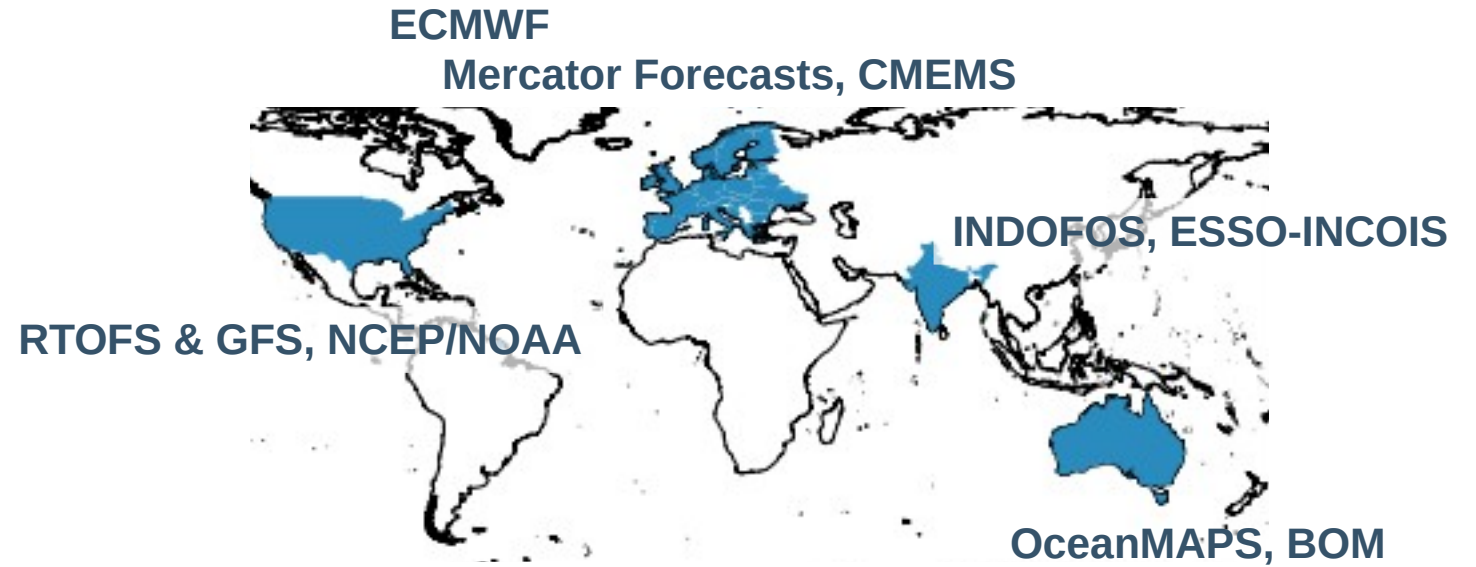
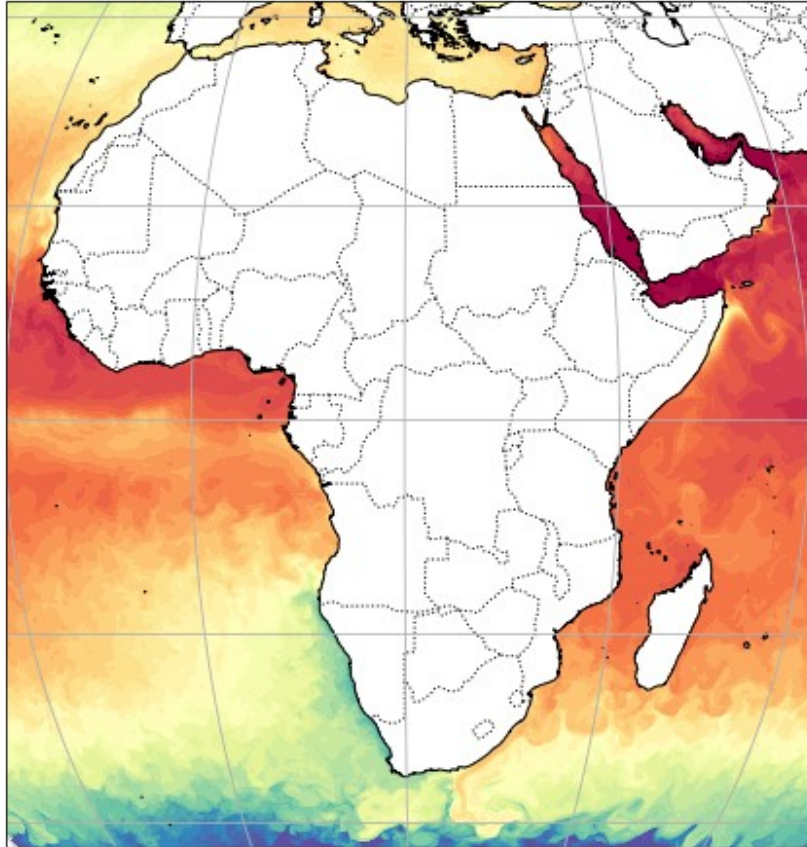


SAEON
South African Environmental
Observation Network



Landscape of African forecast systems and services

Global forecast systems utilized for African Seas

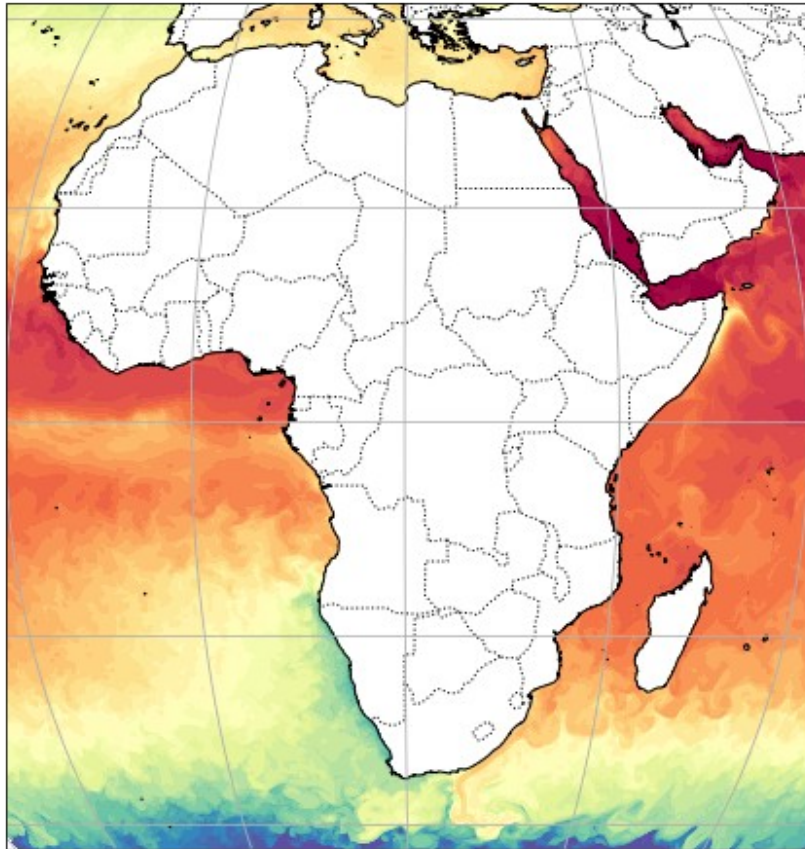




Landscape of African forecast systems and services

Global forecast systems utilized for African Seas :

how are they utilized ?



MINISTRY OF ENVIRONMENT AND FORESTRY
KENYA METEOROLOGICAL DEPARTMENT
REPUBLIC OF KENYA

HOME ABOUT US SERVICES RESOURCES TENDERS MEDIA CENTER CON

7-Day Marine Forecast for the KENYAN Coast

MARINE FORECAST VALID 6th to 12th JUNE 2023.

GENERAL OUTLOOK
11 Wind Speed & Direction

[Download 7 Days Marine Forecast](#)

1. Bulletins
2. SMS alerts
3. Visualization of global forecast results

Mauritius Oceanography Institute

Documents Career Tender Media Corner

ABOUT RESEARCH PUBLICATIONS EVENTS GALLERY DATABASE GMES & Africa LOCATION

EUROPEAN UNION GMES AND AFRICA OCEAN INDIA MAURITIUS OCEANOGRAPHY INSTITUTE

MONTHLY OCEANOGRAPHY BULLETIN

The Oceanography Bulletin is produced on a monthly basis and covers the South West Indian Ocean region. The bulletin is presented in the form of a PDF document with a general summary and several charts with short comments. It is targeted at users from the marine and fisheries realm for monitoring purposes and is a source of information for researchers and

GMES & AFRICA

[About GMES & Africa](#)

[Marine & Coastal Service](#)

South African Weather Service Marine Portal Home Forecasts

Surface Currents
Current Velocity [m.s⁻¹]

Maputo Richards Bay Durban East London Cape Town

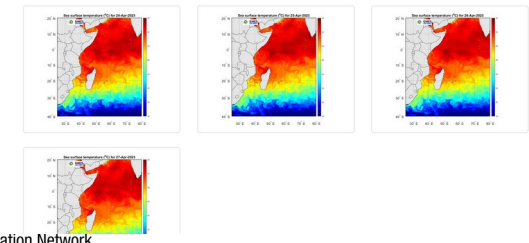
Init. 12-Jun-2023 12:00:00 UTC

First << Rewind < Step S

3 DAYS FORECAST

In the framework of the GMES & Africa project, the 3 days Marine Weather Forecast application has been consolidated by the Mauritius Oceanography Institute with the support of the Seychelles Meteorological Authority. 3 days forecast covering the East Africa region are derived using the GLOBAL_ANALYSIS_FORECAST_PHY_001_024 and GLOBAL_ANALYSIS_FORECAST_WAV_001_027 products from the Copernicus Marine Environment Monitoring Service. The spatial resolution of the forecast data is 1/12 degrees. The oceanic parameters include: Sea Surface Temperature, Sea Surface Height, Sea Surface Current, Sea Surface Salinity, Significant Wave Height and Significant Wind Wave Height.

Sea Surface Temperature (Nowcast / 1Day Forecast / 2Day Forecast / 3Day Forecast)

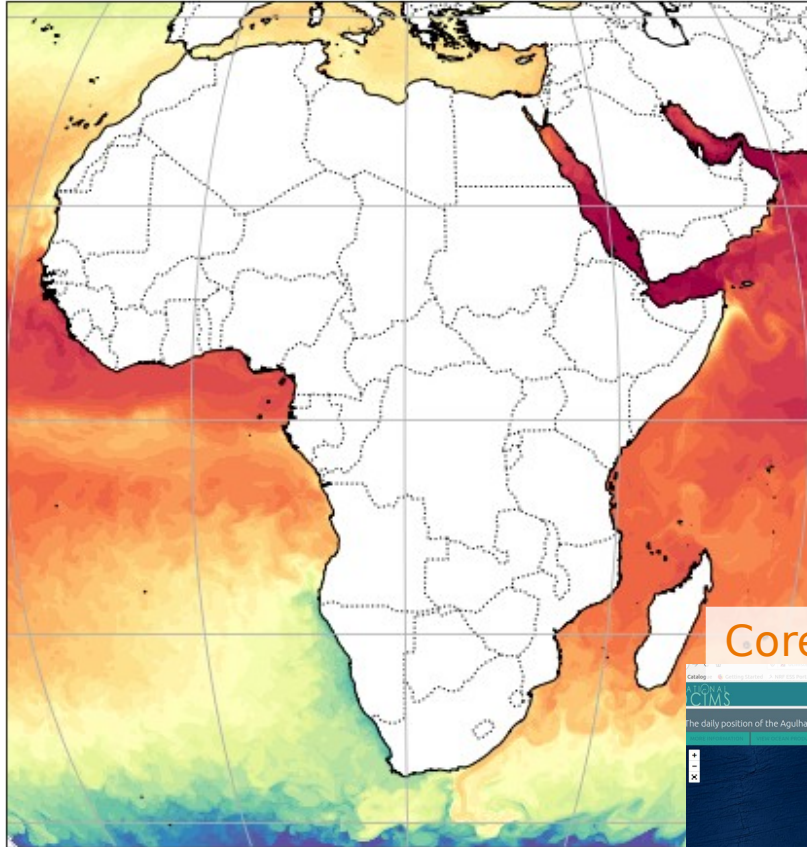




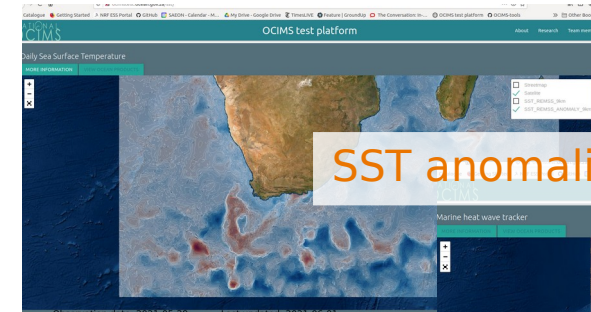
Landscape of African forecast systems and services

Global forecast systems utilized for African Seas :

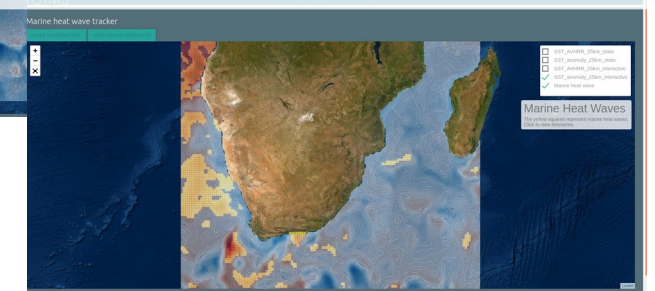
how are they utilized ?



1. Bulletins
2. SMS alerts
3. Visualization of global forecast results
4. Adding value to global forecast results

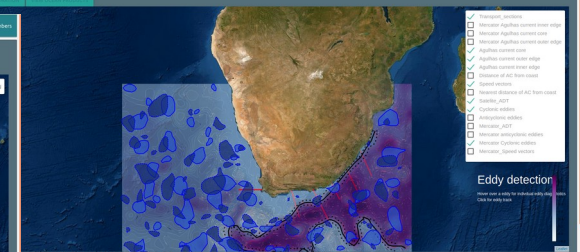
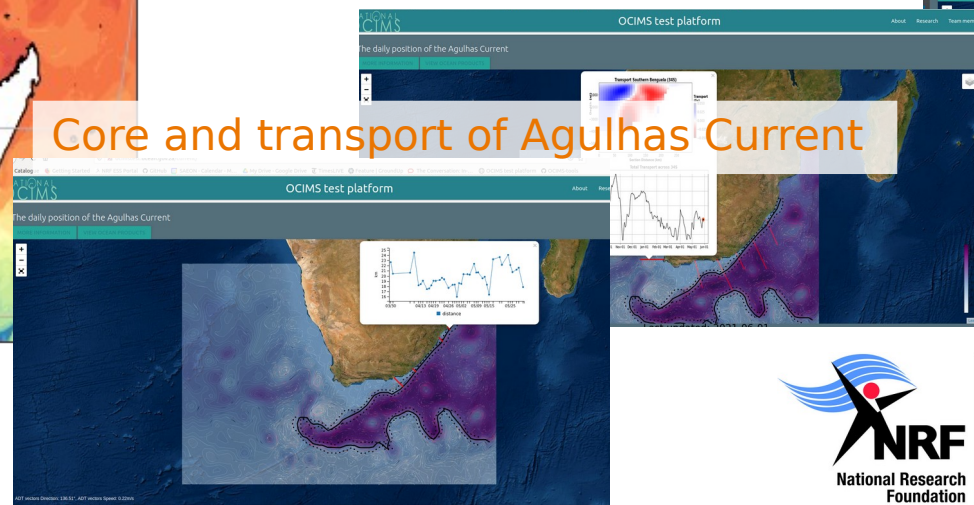


SST anomalies and marine heatwaves



Eddy-tracking platform

Core and transport of Agulhas Current



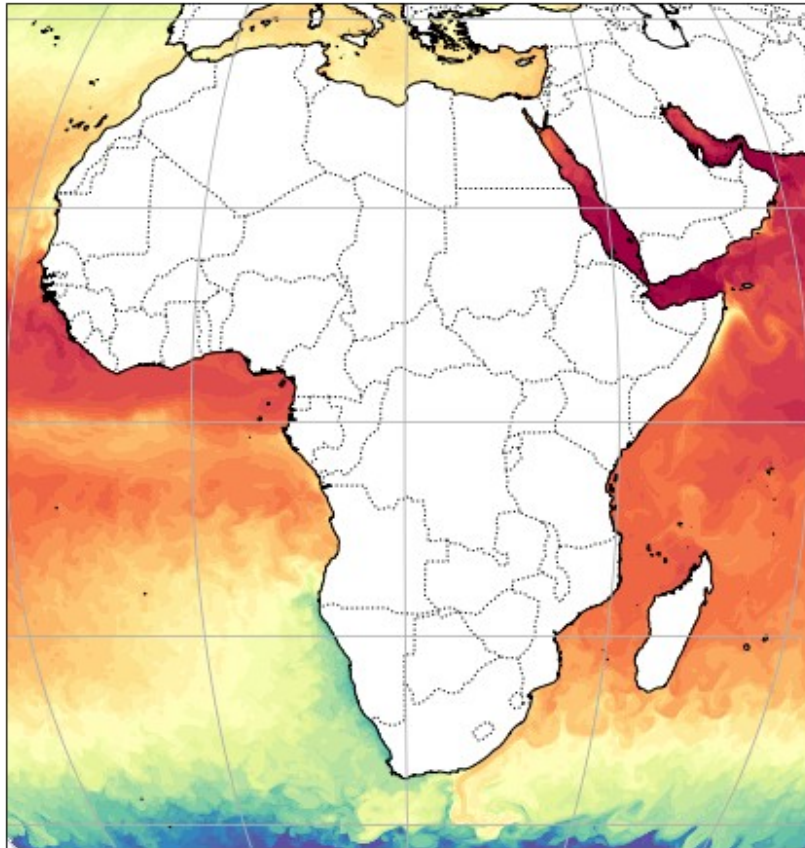
Global Service: CMEMS



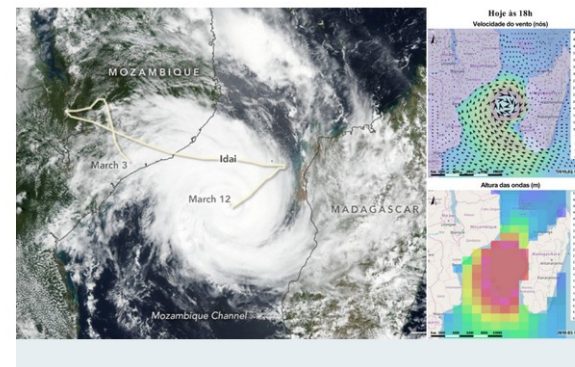
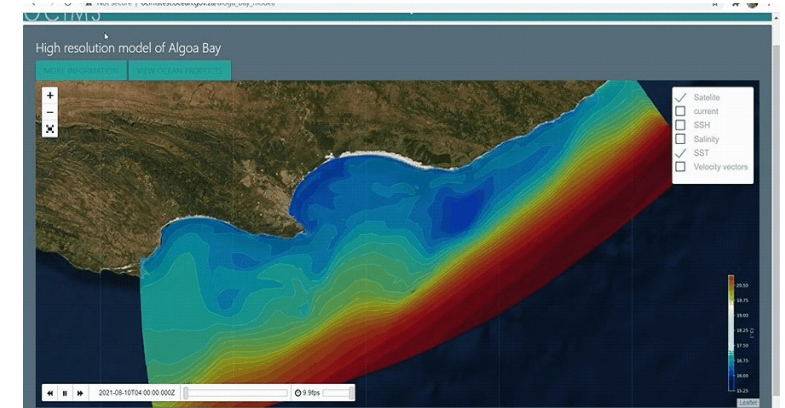
Landscape of African forecast systems and services

Global forecast systems utilized for African Seas :

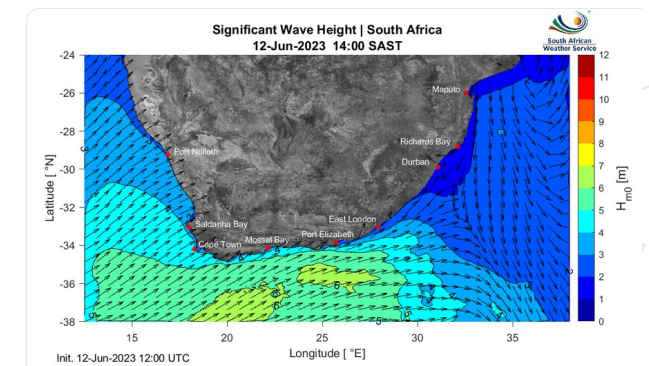
how are they utilized ?



1. Bulletins
2. SMS alerts
3. Visualization of global forecast results
4. Adding value to global forecast results
5. As boundary conditions for a local forecast system



South African Weather Service

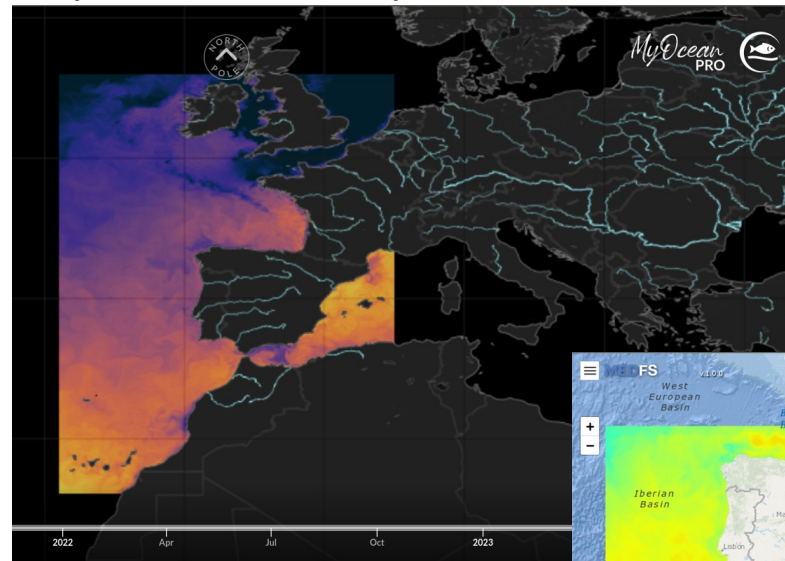
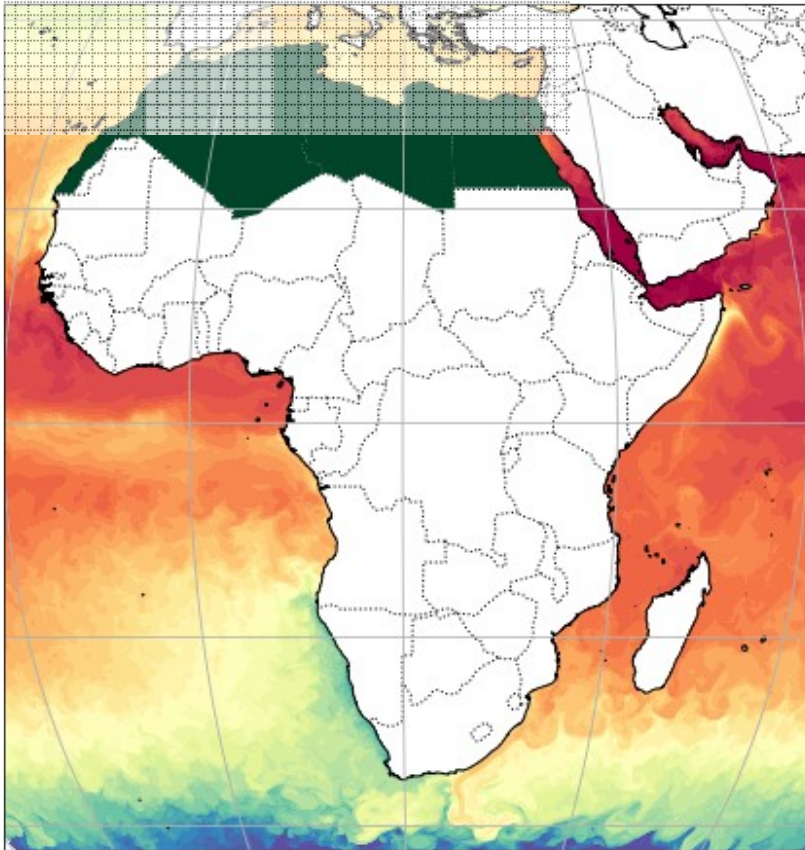




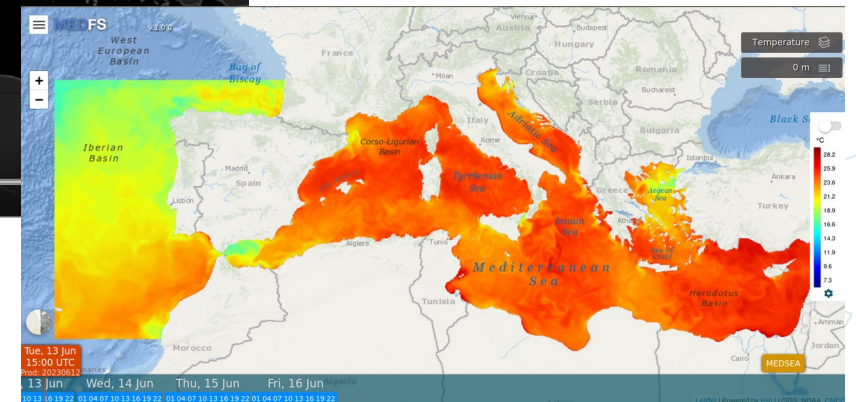
Regional Forecasts

1. IBI-MFC Ocean & BGC. CMEMS
2. Mediterranean forecast system, CMCC

<https://data.marine.copernicus.eu/viewer/>



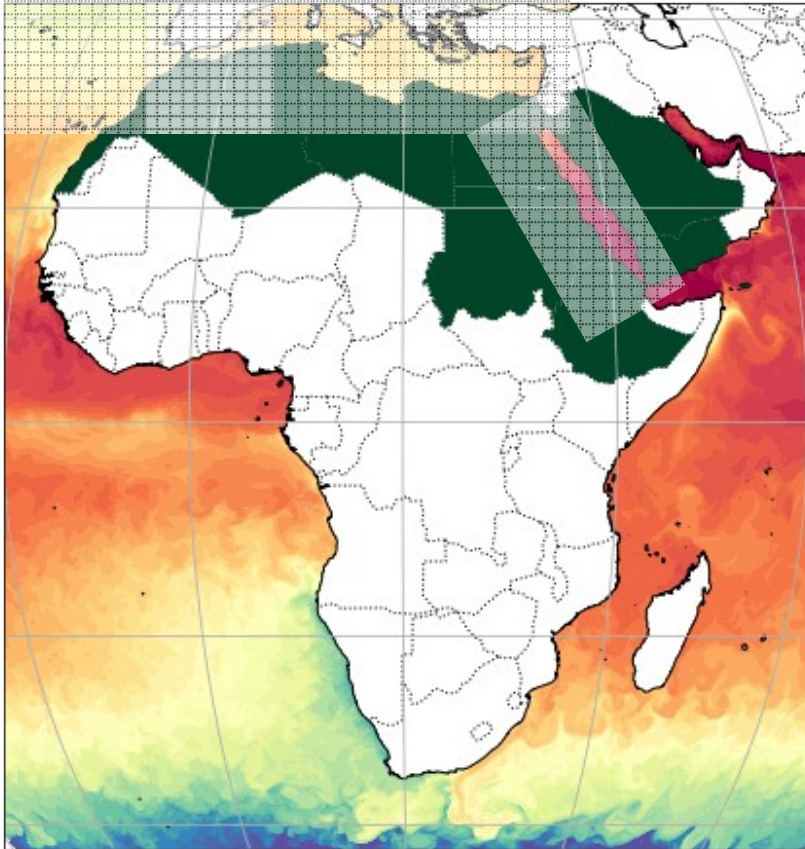
<https://medfs.cmcc.it/>



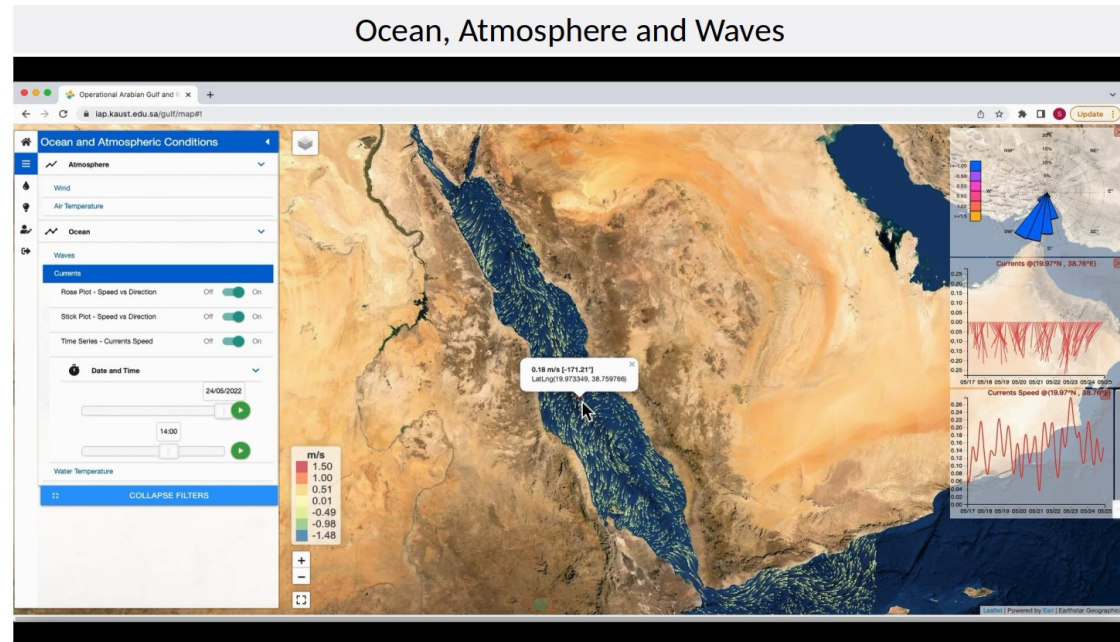


Regional Forecasts

1. IBI-MFC Ocean & BGC. CMEMS
2. Mediterranean forecast system, CMCC
3. Red Sea Forecast, KAUST, Saudi Arabia

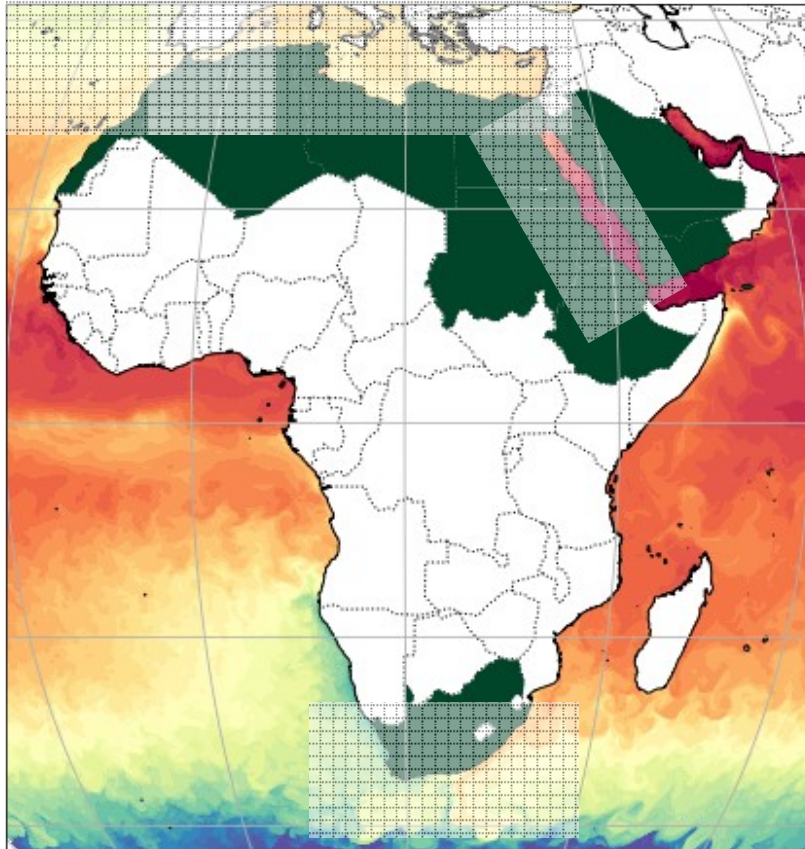


Ocean, Atmosphere and Waves



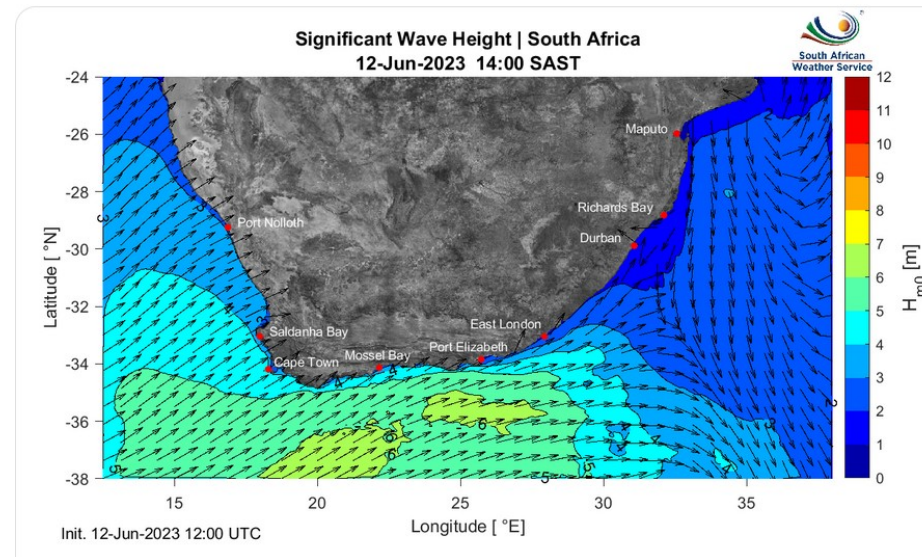


Regional Forecasts



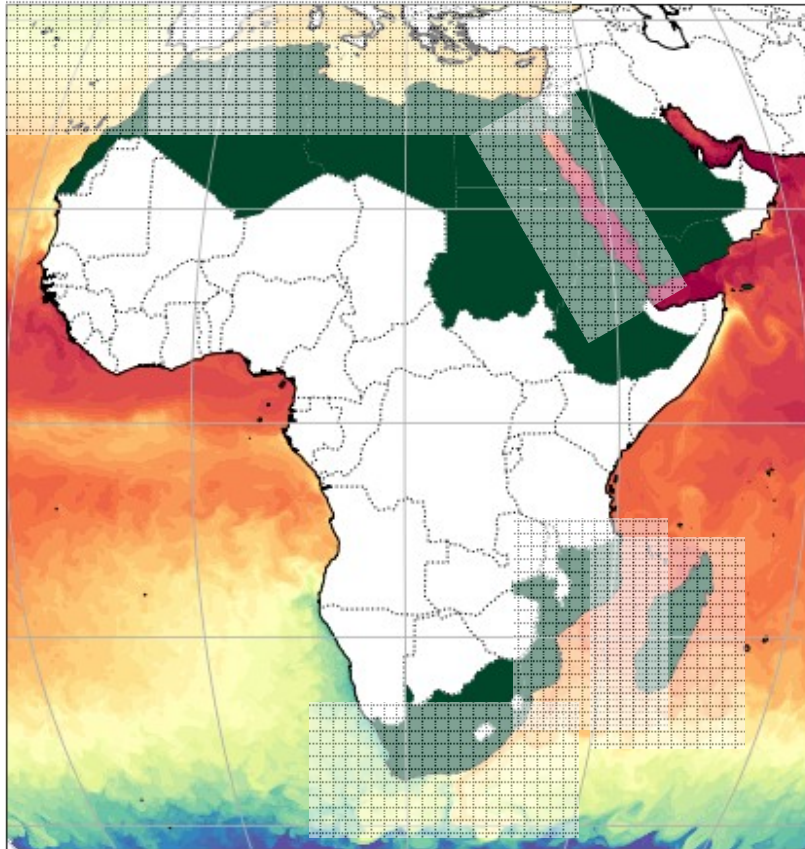
1. IBI-MFC Ocean & BGC. CMEMS
2. Mediterranean forecast system, CMCC
3. Red Sea Forecast, KAUST, Saudi Arabia
4. Wave and storm surge, South African Weather Service

https://marine.weathersa.co.za/Forecasts_Home.html

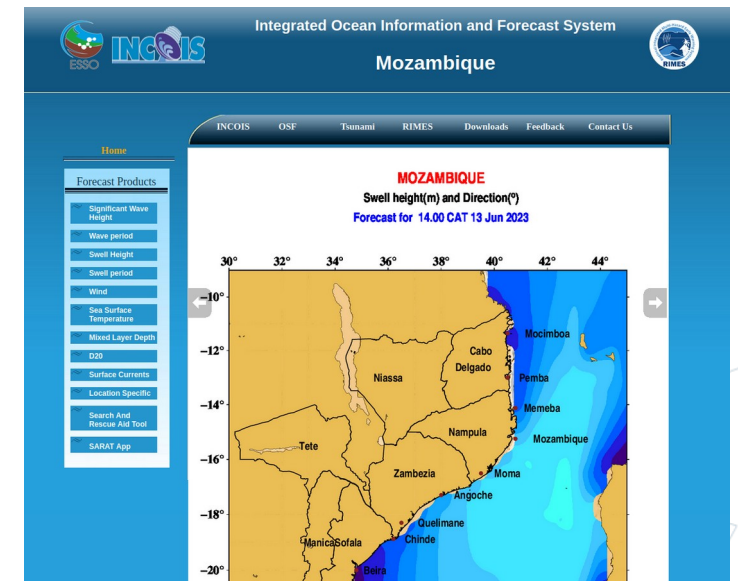




Regional Forecasts



1. IBI-MFC Ocean & BGC. CMEMS
2. Mediterranean forecast system, CMCC
3. Red Sea Forecast, KAUST, Saudi Arabia
4. Wave and storm surge, South African Weather Service
5. Multi-hazard early-warning system (RIMES), INCOIS



https://incois.gov.in/portal/osf/mozambique_rimes/index.jsp

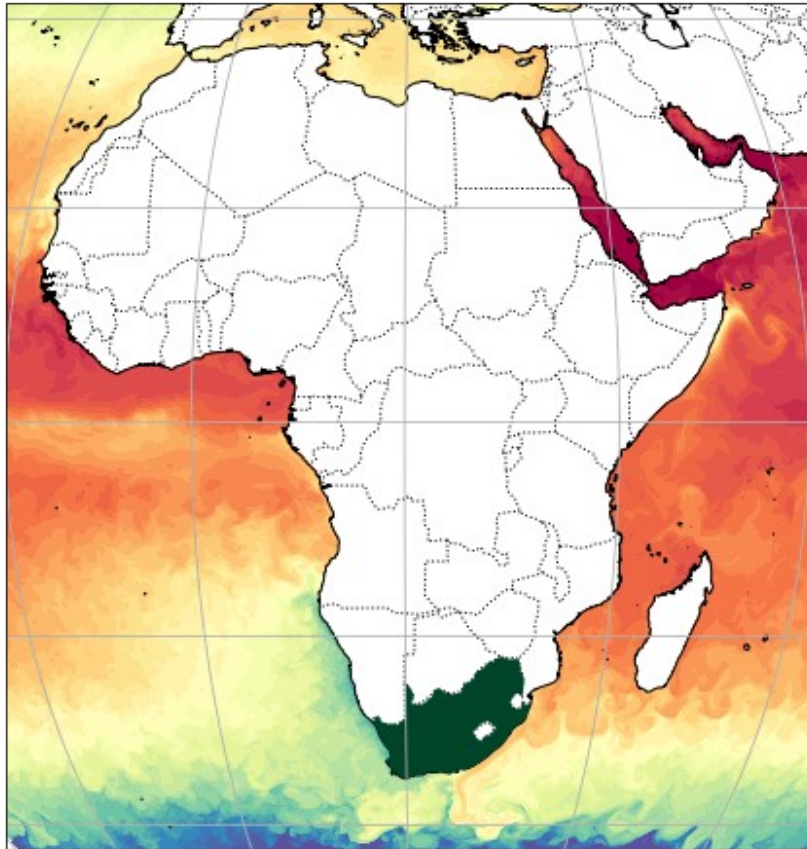


Coastal Forecast Services

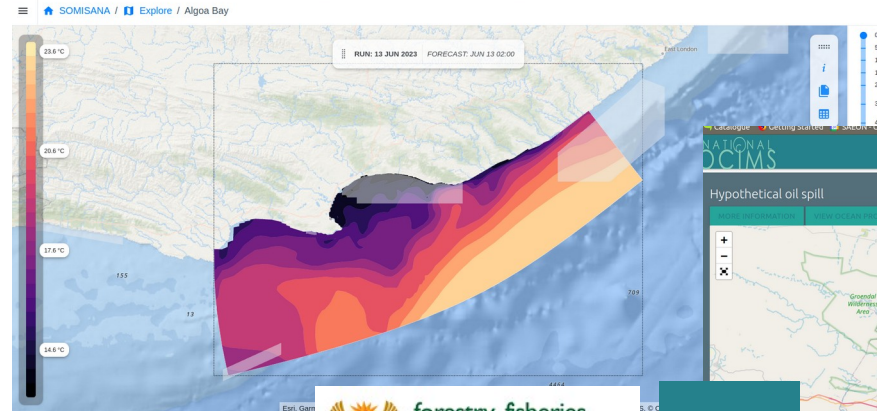
A South African example (<https://somisana.ac.za/>)



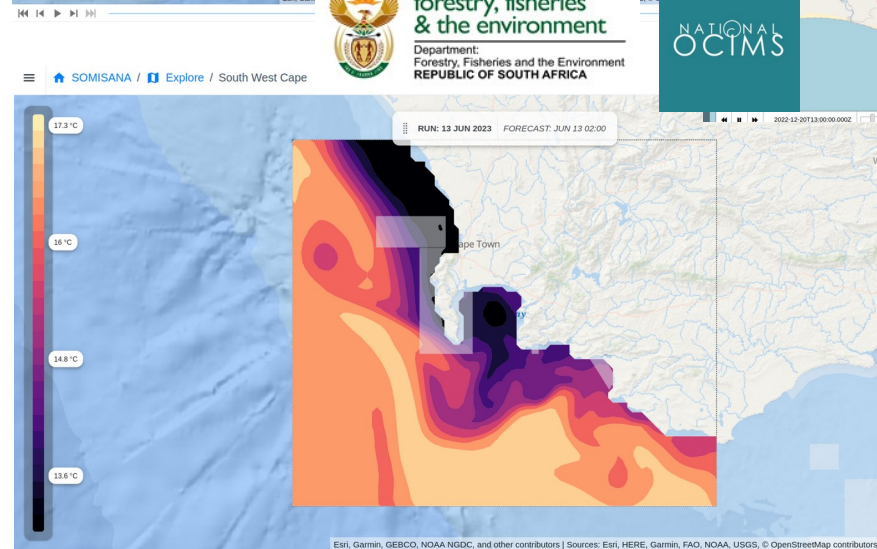
SOMISANA: 5 day forecasts of ocean physics



Browser tabs: mail.google, SAEON - Calendar - W..., T7-Sheen, Peña, Kane..., My Drive - Google Drive, NRF ESS Portal, Communications Jour..., (D) WhatsApp, GitHub, Other Bookmarks



Oil spill-tracking



Oil Bunkering



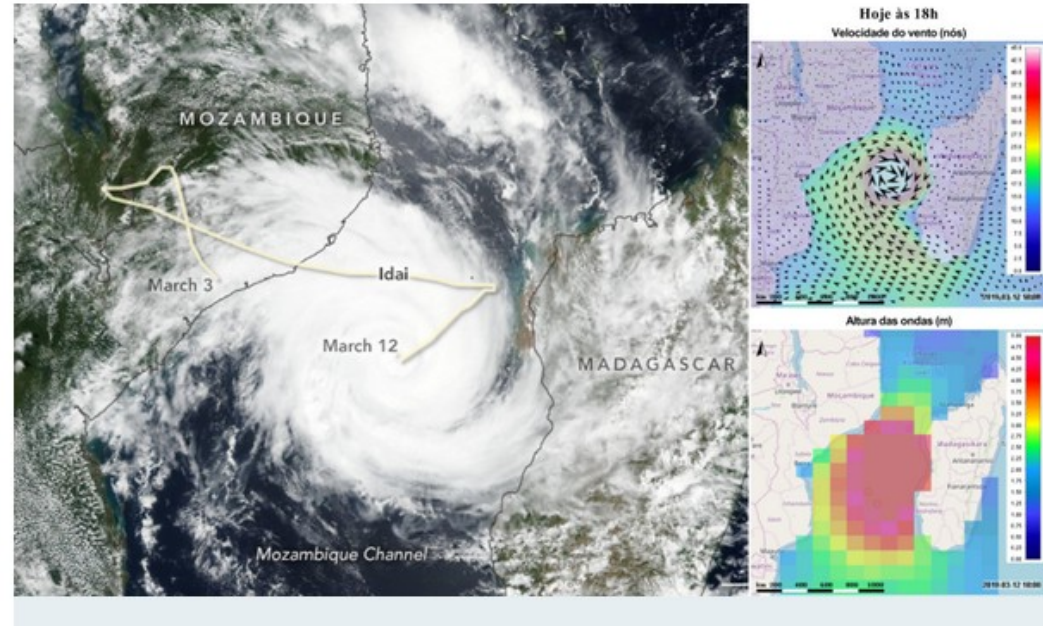
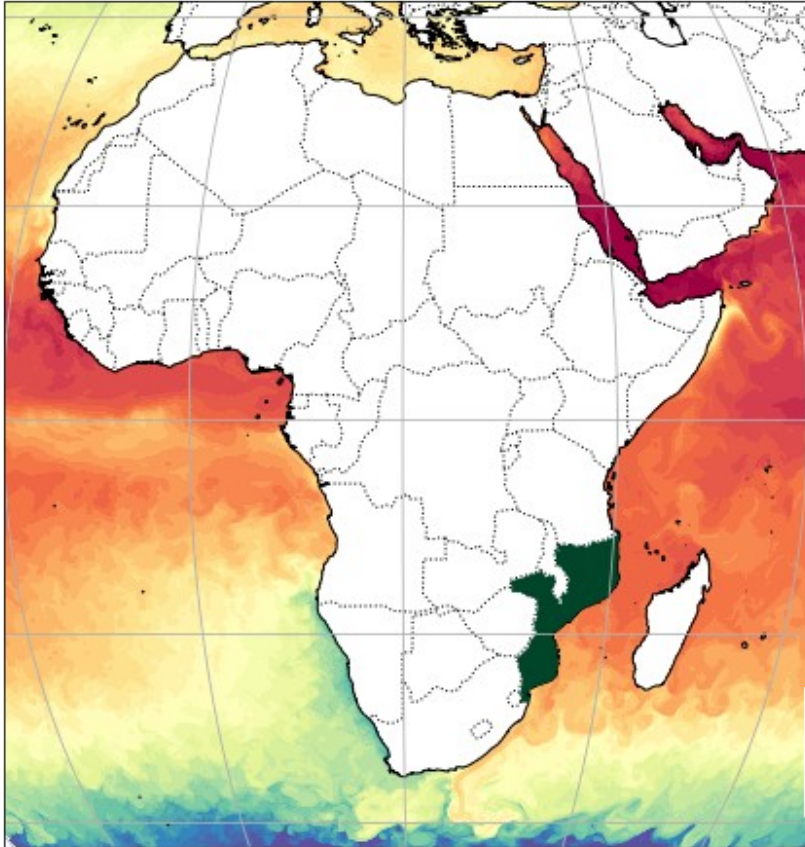
Global Service: CMEMS (ocean forcing) & GFS (atmospheric forcing)



Coastal Forecast Services

A Mozambiquan example

National Coastal Forecasting System for Mozambique
(FEWS-INAM)

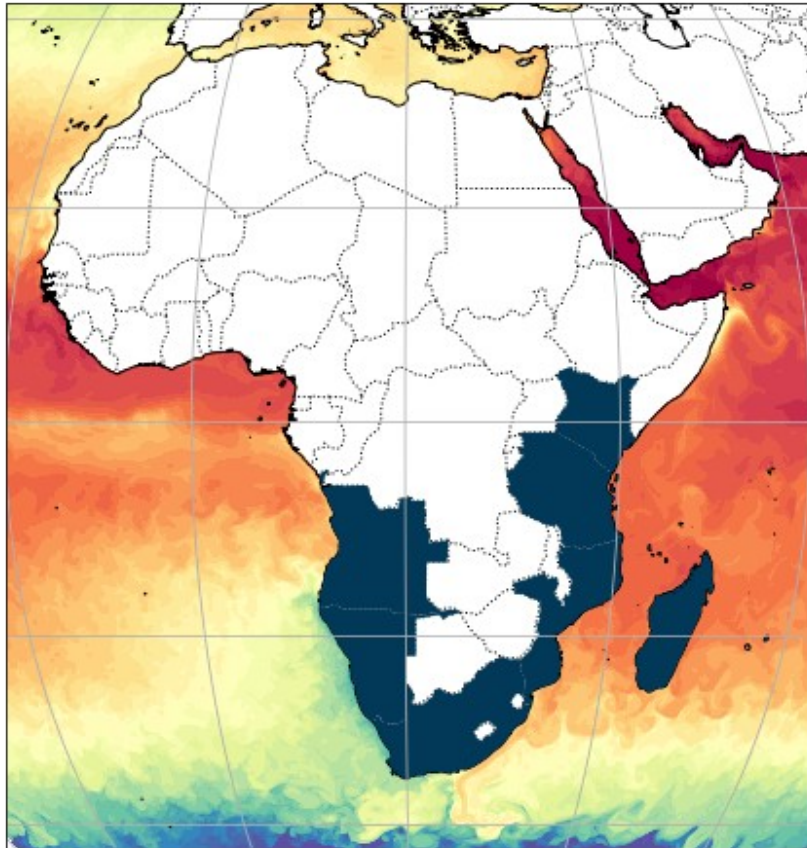


Subscribed users are provided daily bulletins by text message.

Global Service: GLOSSIS (storm surge) & GFS (atmospheric & wave forcing)



Alignment with existing operational services



●●● MARINE AND COASTAL OPERATIONS
FOR SOUTHERN AFRICA AND THE INDIAN OCEAN

‘the development of regionally-optimised satellite observations and model-based forecast services focused on sustainable socio-economic development for the South and East African marine and coastal domains.’

