



OPERA
OCEAN PREDICTION
ENHANCEMENT IN
REGIONS OF AFRICA



OceanPrediction DCC - African Regional Team

Kouadio Affian

Chair of IOC Africa - Chair of African Regional Team

University Félix-Houphouët-Boigny



Funded by
the European Union



UN DECADE
COLLABORATIVE
CENTRE



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**MERCATOR
OCEAN**
INTERNATIONAL

Current Initiatives in Ocean Prediction in Africa

1. Human Resources Available

Africa is making progress in building capacity for ocean science, but disparities remain across regions

◆ Strengths:

Regional centres of excellence (e.g., RCMRD, CERSGIS, SANSA)

Universities offering programs in marine science, Remote sensing meteorology, and environmental monitoring (e.g., University of Cape Town, University of Ghana, UCT, NMU, CURAT Université Félix Houphouet-Boigny)

Training initiatives supported by:

- GMES & Africa
- UNESCO/IOC-UNESCO (OceanTeacher Global Academy)
- POLLEN, POGO, and SCOR Fellowships
- West Indian Ocean Marine Science Association (WIOMSA) training and support



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◆ Challenges

- Limited number of operational-level ocean forecasters and modelers.
- Lack of interdisciplinary integration (e.g., between meteorology, oceanography, and fisheries).

2. 🏢 Availability of Infrastructure

Infrastructure to support ocean prediction is unevenly distributed but growing with international support

◆ Observation Systems & Instruments

- **Tide gauges** (installed through ODINAFRICA, IOC-UNESCO).
- **ARGO floats** and **drifters** (via international collaborations like GOOS and CLIVAR).
- **HF Radars** for real-time coastal current monitoring in pilot locations.

Weather buoys deployed in select areas in the Gulf of Guinea and Indian Ocean



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◆ **Modeling & Forecasting Centers:**

South African Weather Service (SAWS):

NICI (National integrated cyber infrastructure system South Africa)

SANSA (South African National Space Agency)

AGRHYMET (West Africa):

SAEON

MESA/GMES marine services

Tanzania Meteorological Authority (TMA)

NANSEN TUTU CENTER

3. 🚧 **Ongoing Projects and Initiatives**

***GMES & Africa Marine and Coastal Services**

***GOOS AFRICA (Global Ocean Observing System – Africa)**

***WIOGEN (Western Indian Ocean Global Ocean Observing System)**

***FISHGOV 2 (African Union) and EAF-Nansen Programme**



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***EU-funded Projects**

Copernicus Marine Service

ODYSSEA Project

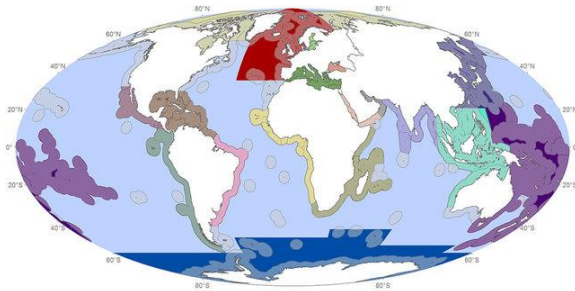
4. 🚧 Expectations

- Africans be involved in the selection process of the centers
- The centers be strengthened through OPERA
- the centers be prioritized over individuals
- The centers design tailored training programs to improve the level of prediction and modeling
- Leverage Existing African Infrastructure – Emphasis on utilizing current HPC, modeling, and digital ocean facilities across the continent
- Enhance and Expand Regional Modelling Capacity – Support for high-resolution models and integration of advanced methods like machine learning
- Ensure that data collected through OPERA should be stored and managed within African repositories to ensure regional access, sovereignty, and long-term sustainability

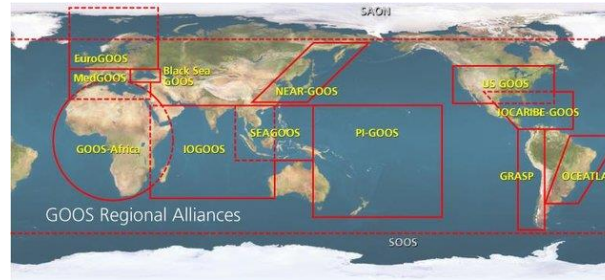
A global and transversal community

Oceanprediction DCC **Regional Teams**: Promoting the implementation and use of ocean forecasting systems worldwide

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

“Boots on the ground” work:

- Support decade actions related to ocean forecasting
- Identify gaps and ways forward
- Capacity building
- Advocate for the implementation of Best Practices, Standards, and Tools
- ...



OceanPrediction DCC structure

- Chair: Professor **Kouadio Affian** (Ivory Coast), chair of the IOC Sub Commission for Africa and the Adjacent Island States

Coastal regions representatives

- Pr. **Antonio Hogane** (Mozambique- Director General of the Institute of Oceanography) for Eastern Africa
- Dr. **Jennifer Veitch** (South Africa- SAEON) for Benguela LME & Agulhas current. Acting also as co-chair
- Pr. **Kouadio Affian** (Ivory Coast - Chair of IOC Africa) for the Gulf of Guinea LME. Acting as Chair
- Dr. **Karim Hilmi** (Morocco- Vice Chair of IOC/UNESCO) as a focal point for the Canary Current Large Marine Ecosystem. Acting also as co-chair
- Pr. **Amr Hammouda** (Egypt -President of NIOF) for the Mediterranean Sea Region
- Dr. **Sivareddy Sanikommu** (KAUST - Red Sea Modeling and Prediction Group) for the Red Sea. Acting also as co-chair

Key partners and players



PROGRAMS

GEMS Ocean, DITTO, Foresea, CoastPredict, Ocean Best Practices, ...

DCCs and DCOs

Ocean Observing, Ocean Data Sharing, Coastal Resilience, IndianOcean ...

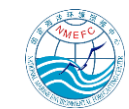
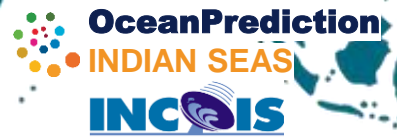
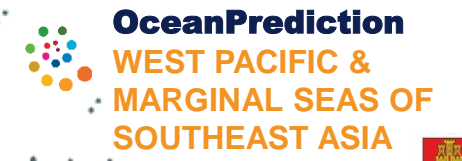
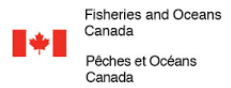


IOC Sub Commission for Africa and the Adjacent Island States



SEAWARD AFRICA

4. OceanPrediction community: 9 regional teams



Some examples of actions by the regional teams:



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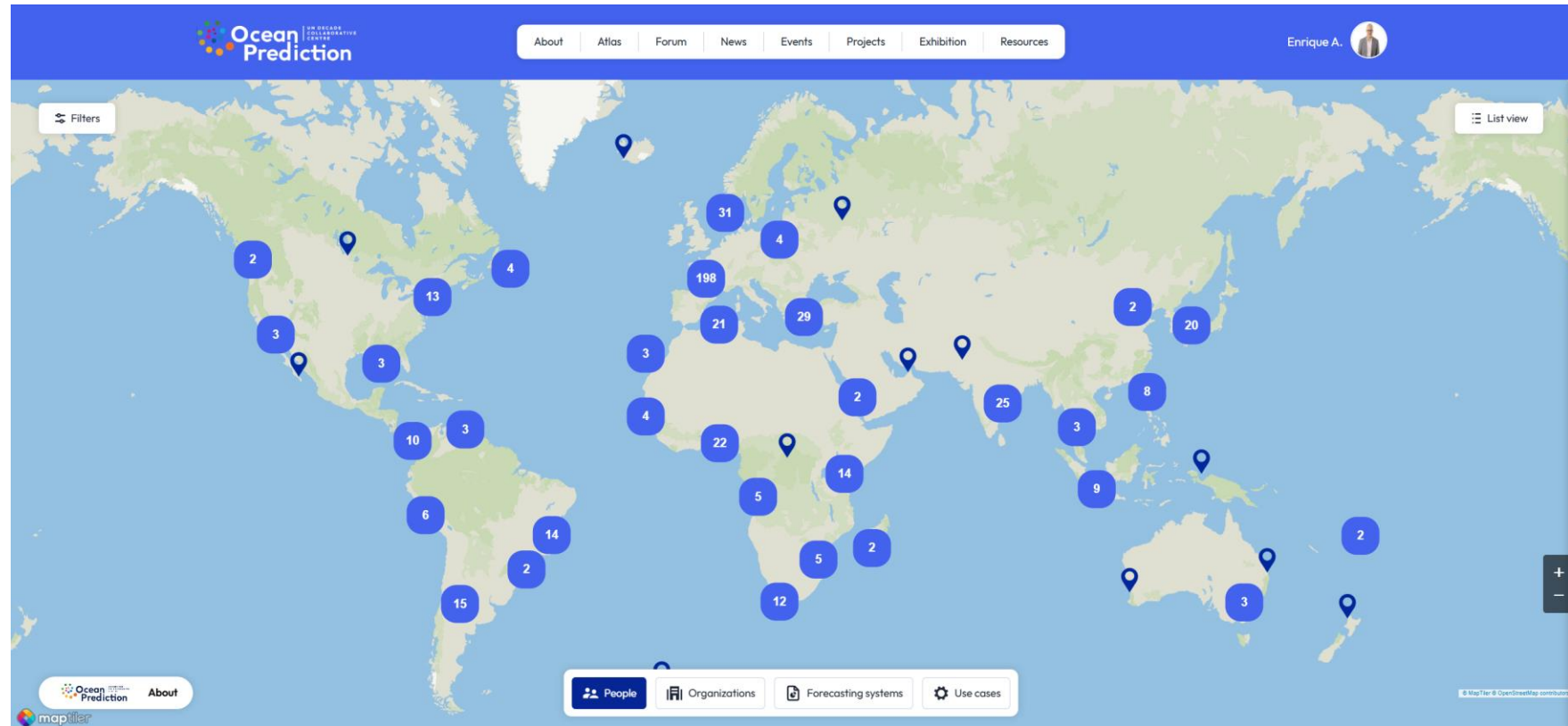


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Support community building in the regional Team

Action 1: Build our community



<https://www.unoceanprediction.org/en/atlas/people>

Make sure you register!



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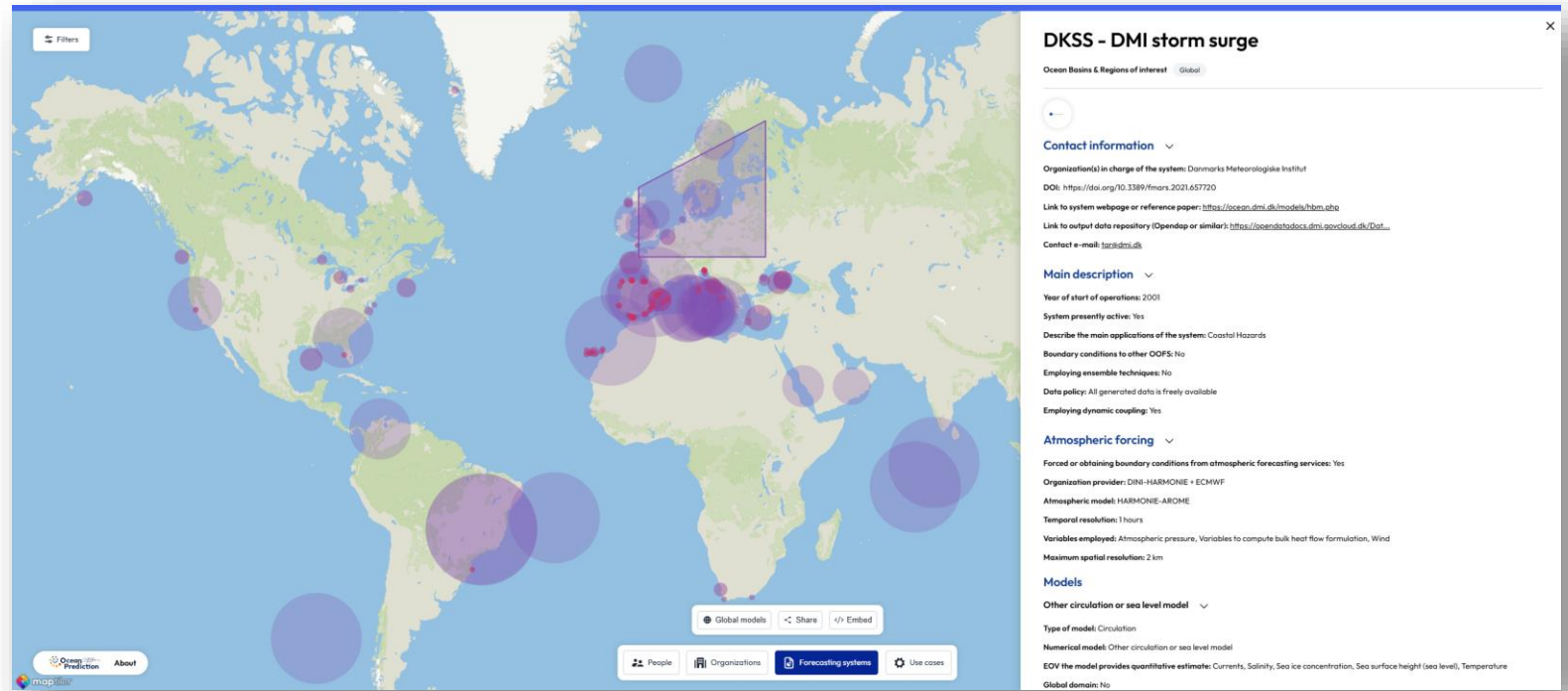


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Support community building in the regional Team

Action 1: Ensure that the mapping exercise we are going to do with the OceanPrediction DCC Atlas is completed and updated.



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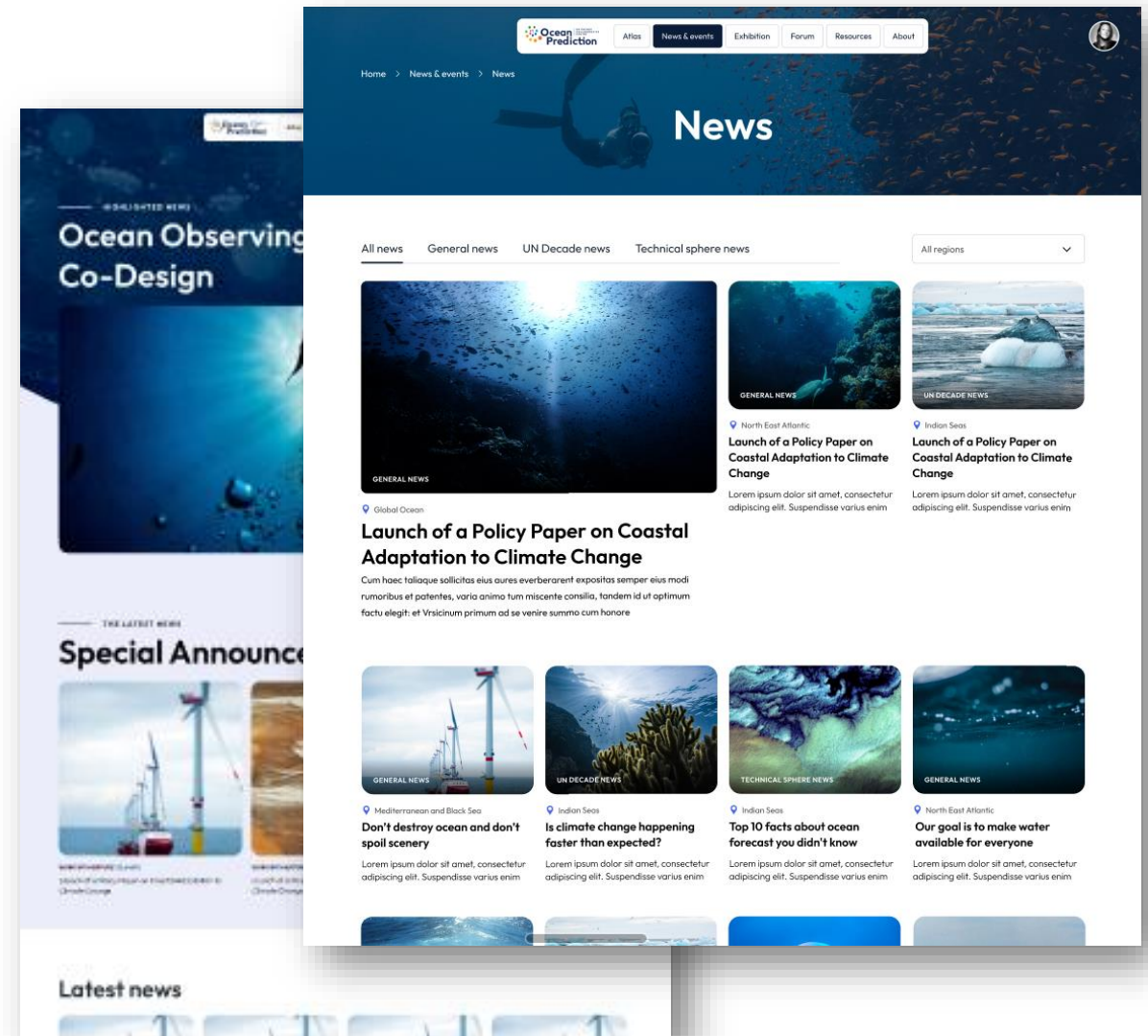
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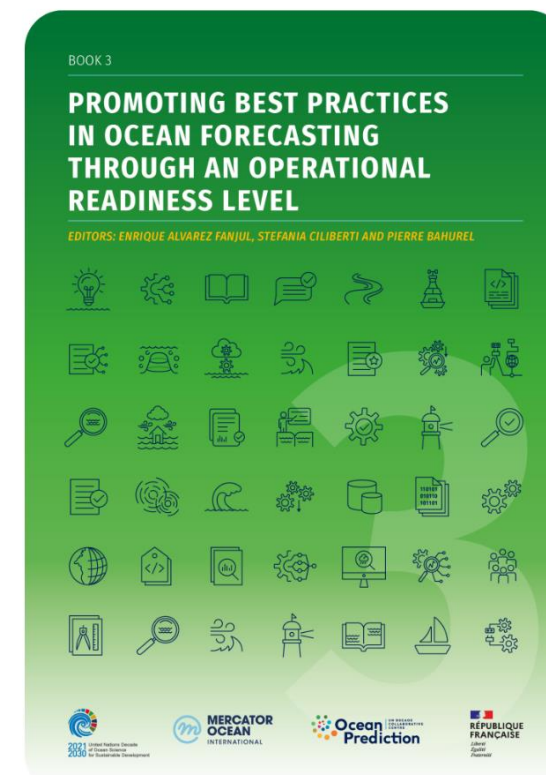
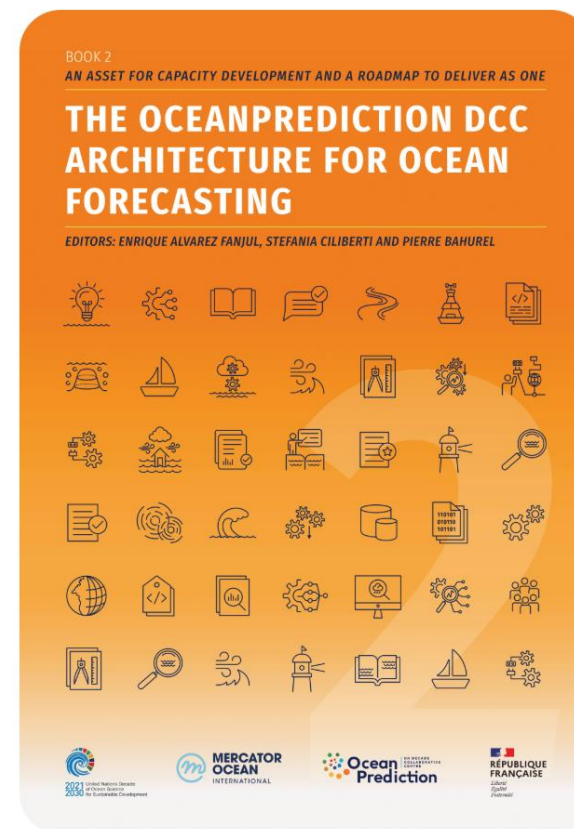
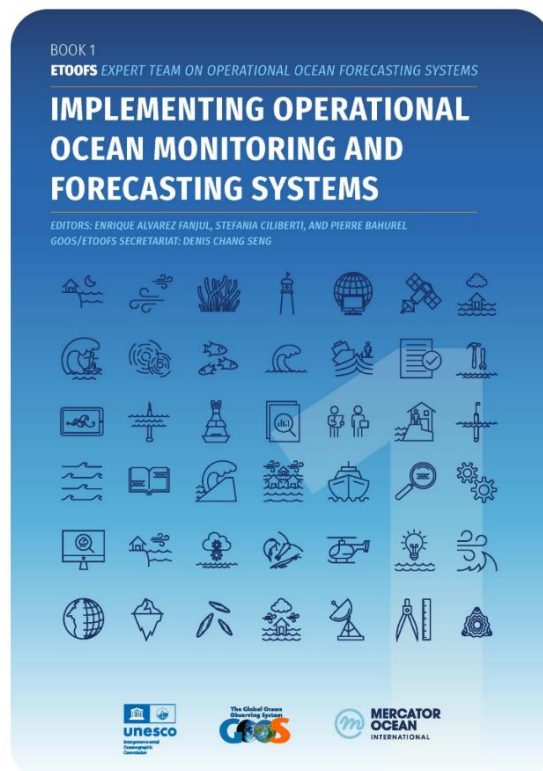
Action 3: Contribute to the preparation of News for the OceanPrediction DCC web.

- Reaching a transversal audience (from coastal to deep sea, nowcast to climate, Bio to physics, public to private, users to scientists). Now 1800+ persons registered for the kick-off event:
 - News from the regional teams
 - Latest news
 - Special announcements
 - News from Decade actions



Building the Technical Scenario (Collaboration in regional indicators)

Action 5:
Contribute to the
technical
developments



Contributing to the Decade framework

Action 6: Ensure that the connection between the OceanPrediction DCC and the decade actions is properly established.



Conclusions

- The Regional Teams are at the core of how OceanPrediction DCC is creating a global community
- The Africa Regional team is well structured and active, and it was critical to build OPERA
- There are many ongoing activities, and the Africa Regional Team is active in its contributions
- The Africa Regional Team will be at the core of the OPERA development, working together with other organizations and initiatives
- May OPERA serve as a pathway to strengthen centers in Africa and leave a positive legacy for the African oceanography community this is our wish.



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