



**OPERA**  
OCEAN PREDICTION  
ENHANCEMENT IN  
REGIONS OF AFRICA

## Presentation of OceanPrediction DCC survey results on status of ocean forecasting and future needs for Africa



Jennifer Veitch

SAEON, SOMISANA lead

OceanPrediction DCC African regional team co-chair



Funded by  
the European Union



UN DECADE  
COLLABORATIVE  
CENTRE

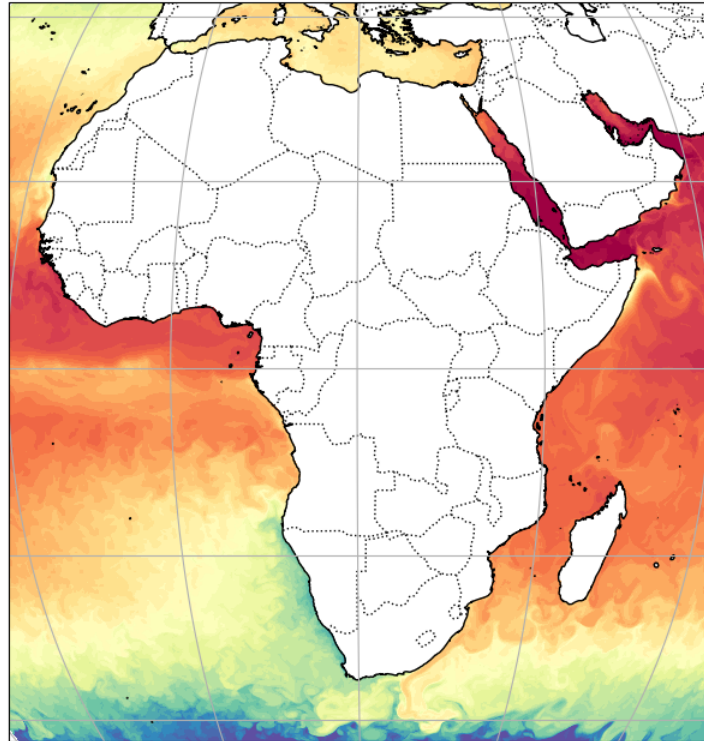


2021  
2030  
United Nations Decade  
of Ocean Science  
for Sustainable Development



MERCATOR  
OCEAN  
INTERNATIONAL

“The **OceanPrediction DCC**, in collaboration with the **African Ocean Decade Taskforce** launched the survey to gather insights from experts on the current state and future prospects of ocean forecast services in Africa”



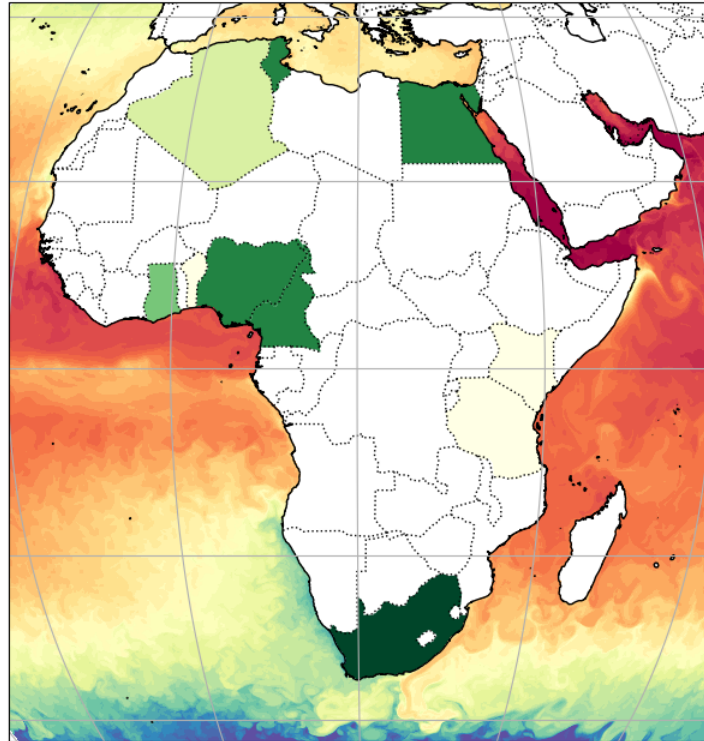
The survey was promoted through various channels including a targeted mailing list via the Africa Taskforce and the African Regional Hub of the OP-DCC

Survey statistics:

- 134 responses (81 from experts within Africa)
- South Africa (7), Egypt (6), Tunisia (6), Cameroon (6),
- India (6), Nigeria (6), Ghana (5), Algeria (4), Benin (3), Kenya (3), Tanzania (3)
- About half of the participants are affiliated with institutions that utilize ocean forecasting data services
- (but for African respondents this is about 42%)

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# 1. Available Applications Based on Ocean Forecasting

“According to the survey participants, the most used types of applications are related to the **green ocean**, that is biogeochemical processes, covering coastal ecosystem management, support for fisheries, and aquaculture”

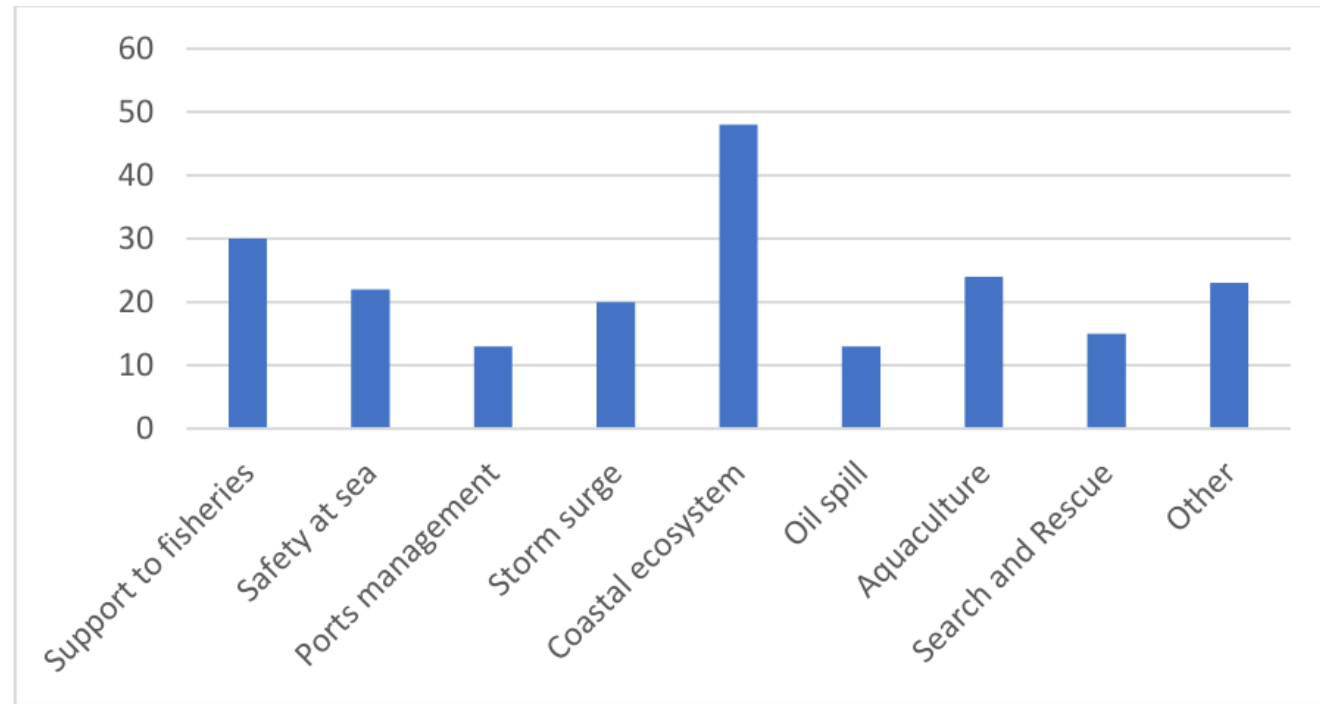


Figure 1: Type of existing Ocean forecasting applications operating in Africa (all replies considered)

# 1. Available Applications Based on Ocean Forecasting

“Accounting for only regions in African, coastal ecosystem and fisheries support continue to be the most used applications”

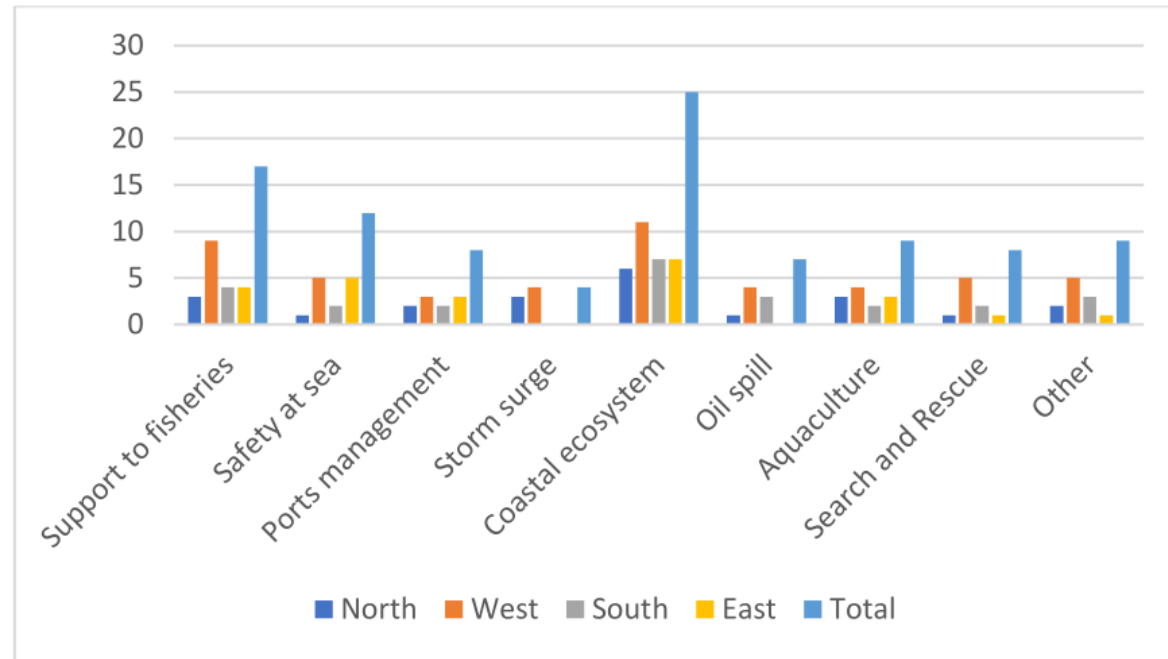


Figure 2: Type of existing Ocean forecasting applications operating in the African Region (Only replies coming from African institutions are considered). The analysis is divided by regions (North, West, South, and East), and includes the Total for Africa.

## 2. The Need for New or Upgraded Services

“It is worth noting that there is a large variability depending on the African zone: while Southern and Eastern Africa identify a clear need for improvement (84% in both cases), the percentage descends for Western (68%) and Northern regions (57%).”

“The results indicate a strong interest in developing services for improved knowledge and forecasting of Essential Ocean Variables (EOV) and for Disaster Risk Reduction (DRR)”

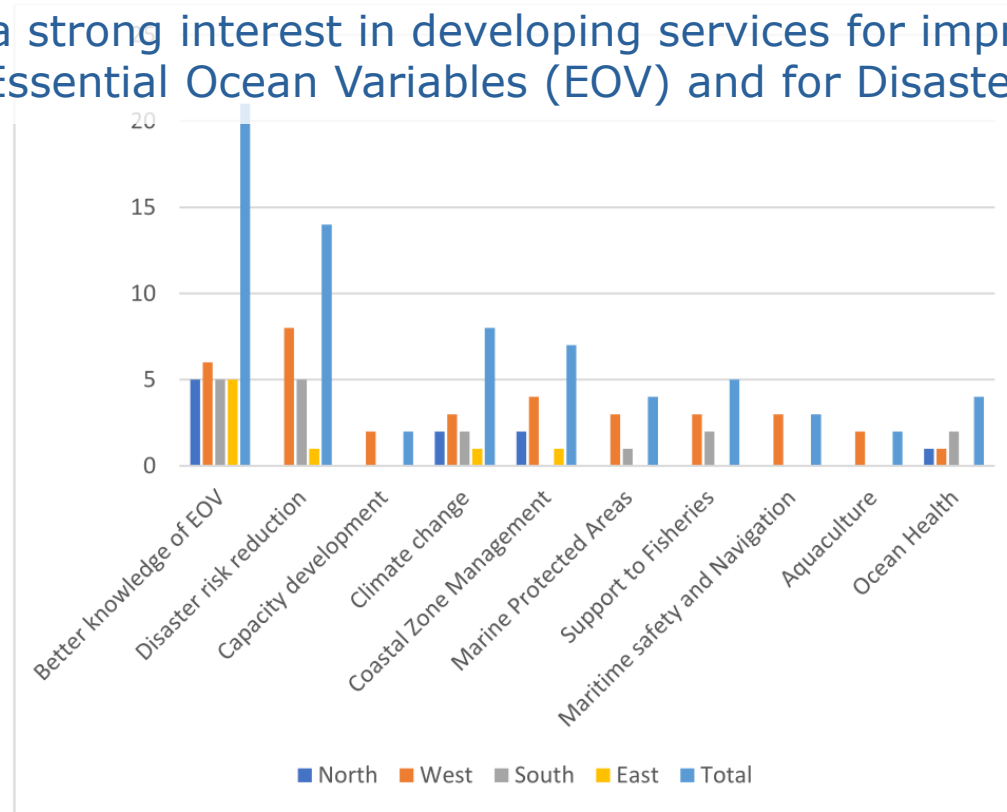


Figure 6: Needs for new or upgraded services based on Ocean Forecasting Africa (Only replies coming from African institutions are considered). The analysis is divided by regions (North, West, South, and East) and includes the total for Africa.

### 3. Additional Needs

“Regarding additional crosscutting needs, the primary one identified is capacity development, followed by dedicated funding and higher-resolution services”

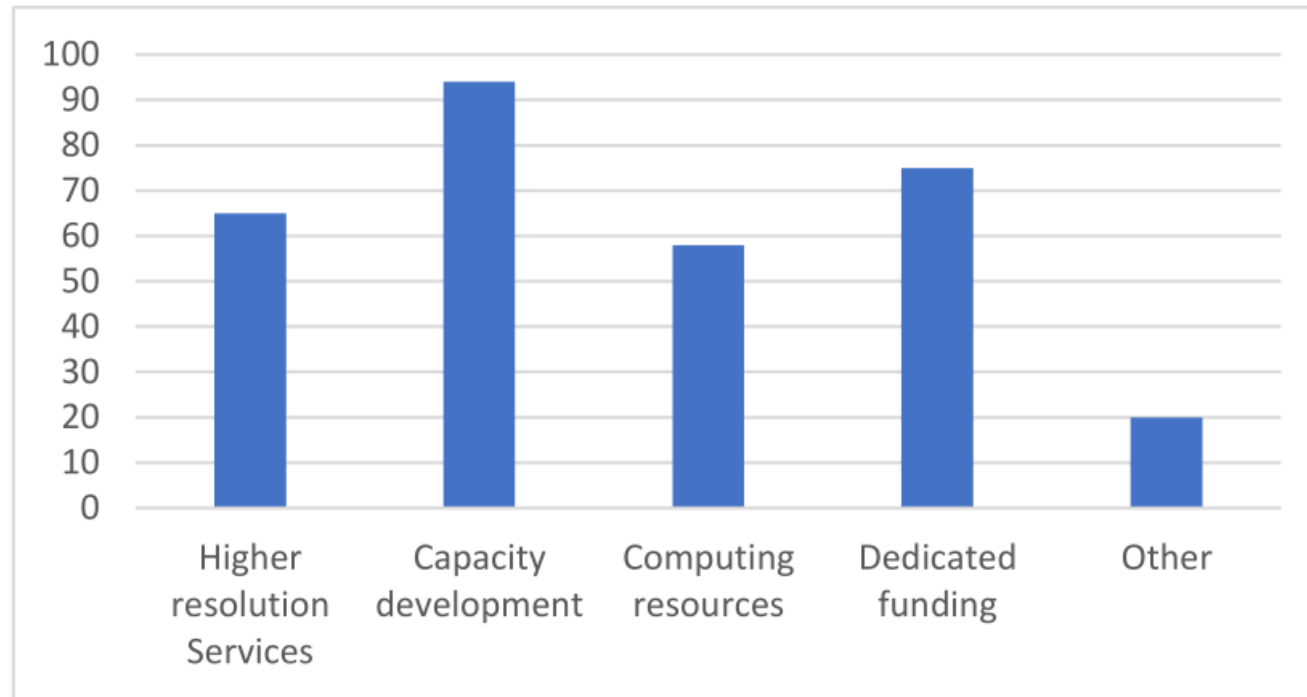
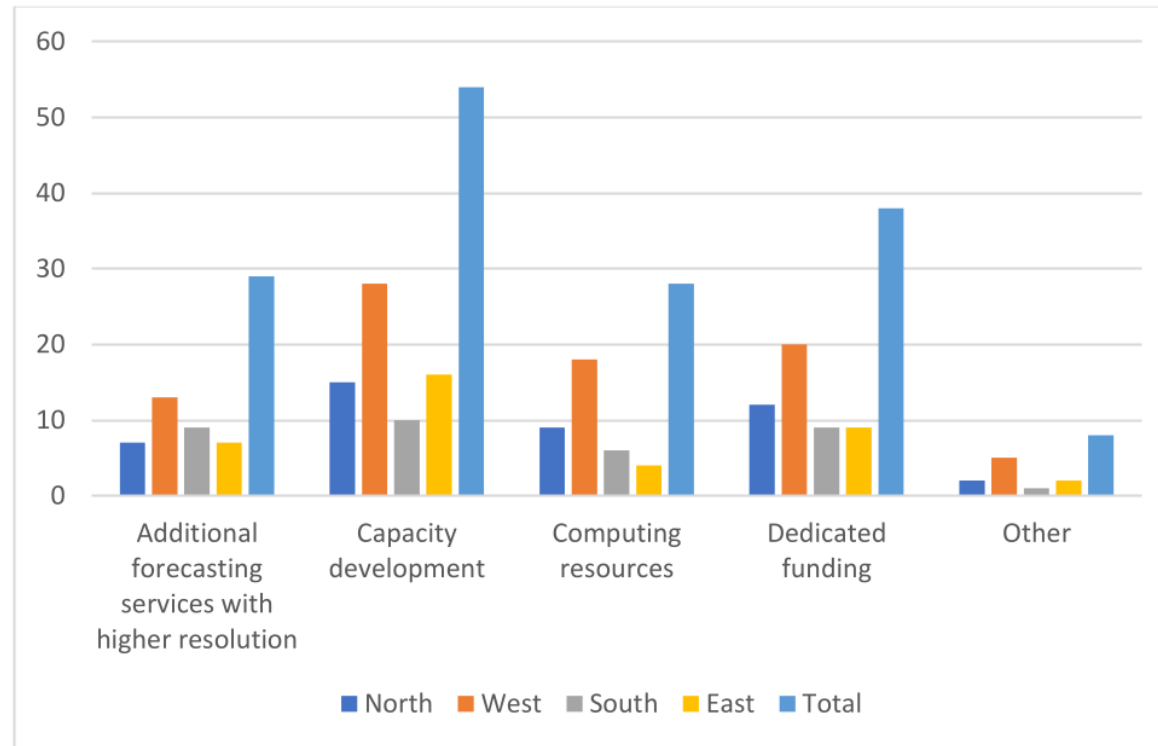


Figure 7: Additional needs related to ocean forecasting (All experts)



### 3. Additional Needs

“When the analysis is limited to the African experts' replies, capacity development remains the most requested need, followed by dedicated funding”



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## 4. Role of Institutions and Consortia

“When asked about involvement in bilateral and/or regional partnerships and in programs aimed at strengthening ocean forecasting capacity on a national or regional level, only 34% of experts responded affirmatively”

“Several collaboration frameworks related to African activities were mentioned, including **GMES & Africa**, the **OceanPrediction DCC**, the **Decade Collaborative Centre for Coastal Resilience**, and UNESCO/IOC’s Ocean Literacy and Collaboration program, among others. The **Ocean Decade** was the most mentioned initiative.”

“As expected, the experts from the institutions have **different ideas on the role of their centers** when dealing with the development of new forecasting services and their applications. Some institutions are offering a role in capacity development activities, others are expecting to participate in monitoring and modeling activities, and others declare that are ready to lead the way forward.”

# Selected Comments on Capacity Development

“We need to **join any capacity development initiative**”

“**We are likely to be the pace setters** in our part of the world if we get capacity building”

“**training in ocean forecast** would be an addition to my institution as **we are regulating fishing activities** across nine coastal counties”

“**Is urgent to support countries with lack of capacity building** and fund to deal with the ocean issues in order to speed up the pace and achieve the sustainable development goals”

# Selected Comments on the importance of Ocean Forecasting

"We are in **need to develop technologies related to early warning** systems as we are facing climate change and sea level rise"

"This intersection of **ocean forecasting and data science** is essential for understanding and addressing the complexities of **marine ecosystems** and **supporting sustainable ocean management practices**"

"...ocean forecasting is **very important for every state** as it looks into ocean dynamics, storm surges and the possible effects to the ecosystem..."

"I will just say that these services are really important. The health of the ocean is something that I really appreciate, and I want to somehow contribute to it, **with these services here in Africa many things may change, can help us taking care of our most valuable resource...**"

# Selected Comments on the need for Further Cooperation Mechanisms

“It **would be lovely to collaborate** with existing ocean prediction professionals **in the African region**”

“**Knowledge sharing** by various is **very important** for us to improve on our daily activities about ocean”

“In **order for the ocean to be sustainable it needs cooperation** for various countries to work together”

“**join workshops** and international events, **working groups**”



# Selected Comments on the need for Observations

“The **backbone of a good forecasting system is reliable data**. To collect reliable real-time data requires a **significant investment in infrastructure and human capacity**. Procuring expensive state- of-the-art sensors for long-term applications in Africa has not worked well in the past, because of the cost of maintenance, calibration of sensors and full time employment of technicians to service them. **This needs to be considered in the establishment of a forecasting system**”

“We need ocean data observation”



# Selected Comments on the need for Observations

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“We need ocean data observation”



# Conclusions

- African experts identify the importance of ocean forecasting and applications, but since only 45% of these experts are from institutes that utilize ocean forecasts suggest further development is required.
- A strong desire for African built solutions to African problems
- Capacity development is the highest priority
- There is a need for greater integration of the African community
- Most used ocean forecasting based solutions, according to the survey results, are related to the Green Ocean.
- Priorities for the development of new applications were enhanced knowledge of EOVs (through higher resolution forecast services) and on disaster risk reduction.



# Way Forward

- **Community building:** Promoting further sharing of data and knowledge among African experts..
- **Capacity development:** Preparing a new generation of scientists and technicians to provide African solutions for African problems.
- **New forecasting services:** Developing services in Africa providing higher resolution data on Essential Ocean Variables, which are highly demanded by the consulted experts.
- **New or improved applications:** Focusing especially on Disaster Risk Reduction (DRR).
- **User uptake and societal engagement:** Leaving none behind, considering indigenous knowledge, and involving all sectors, with a special focus on women and young people.

→



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# The Global Ocean Observing Systems in Africa (GOOS-AFRICA) as the Pioneering Framework for Ocean Forecasting and Predictions in Africa



Justin Ahanhanzo  
GOOS Africa



Funded by  
the European Union



2021  
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INTERNATIONAL



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# OPERA Kick Off Meeting

## Cape Town, South Africa, 08-10 April, 2025

### The Global Ocean Observing Systems in Africa (GOOS-AFRICA) as the Pioneering Framework for Ocean Forecasting and Predictions in Africa.

*Justin Ahanhanzo, Initiator, Promoter and Founding Coordinator, GOOS-AFRICA  
Ex-(retired) IOC-UNESCO Regional Liaison Officer for Latina America and the Caribbean, Asia & Pacific,  
and Africa : [j.ahanhanzo@unesco.org](mailto:j.ahanhanzo@unesco.org)*

The elephant inhales  $O_2$ , exhales  $CO_2$ .  
Plants do the reverse, provided they have sunlight and water.  
The water on land comes in clouds, fall as rain or snow, and flows back to the ocean. Earth is habitable because of this recycling of water, carbon, dioxide and numerous other chemicals

**EARTH is Habitable because ALL LIVING THINGS INTERDEPENDENT**

# Brief History of GOOS AFRICA

## GOOS-AFRICA INSTITUTIONAL BUILDING: 3 KEY GUIDING PRINCIPLES: African Grassroots Approach, Ownership and Leadership

### 1998: Formal establishment at African Ministerial conf.

### 1999: Adopted at IOC Assembly

### 2000: Resolution of UNESCO General Conference

### 2001: Integration of the Nairobi Convention, UNEP

### 2002: Integration of the Abidjan Convention, UNEP

### 2002: Adoption by the Summit of African Heads of States

### 2003: Inclusion of GOOS AFRICA/ROOFS-AFRICA in the NEPAD Environmental Action Plan, Algiers and at the UN-General Assembly and at the G8 Summits

### 22 March, 2006: African Union Resolution: A/RES/60/222

The News and Views from the IOC GOOS Project Office

GOOS MOVES AHEAD

A number of developments in the last year have given GOOS an identity and a forward vision. With a fully-functioning Project Office (PO), GOOS, together with its regional and associated pilot programmes, is now clearly identified as the prime framework for internationally co-ordinated ocean observation. At the IOC Assembly in July 1999, the GOOS Strategy was adopted...

(continued on page 2 - 1<sup>st</sup> column)

CONFERENCE ON OCEAN OBSERVATIONS FOR CLIMATE

During 1999 the OOPC focussed on preparing for the First International Conference on the Ocean Observing System for Climate (IOCCOBS99), which was convened jointly with the CLIVAR Upper Ocean Panel (UOP) in St. Raphael, France, from October 11-21, 1999. Goals of the conference were to:

The Conference was a success; it enjoyed 21 sponsors and was well attended by key officials and senior scientists. It was intended to promote the development of a global climate ocean observing system. Some 340 individuals representing 20 countries participated. The Conference outcome generated the encouragement looked for by those who have worked long hours over many years to create the concept of a global climate ocean observing system. The workshop has been closed by the Secretariat of the Scientific Research of Morocco.

It is now envisaged that the GOOS modules dealing with the management of the Ocean and Coastal Areas will soon be developed with a greater focus for planning upon the pressing management problems of coastal states.

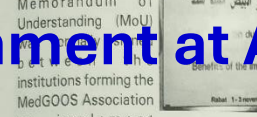
Arthur Alexiou  
GOOS Project Office  
e-mail: a.alexio@unesco.org

The practical implementation of GOOS began in 1998 with the creation of the IOC GOOS Project Office

MEDGOOS IS TAKING OFF

Two years after the first IOC workshop on GOOS capacity building for the Mediterranean, held in Malta 26-27 November 1997, a second workshop was held in the Mediterranean region. The MedGOOS project is taking off.

During the EuroGOOS Conference in Rome, a session on MedGOOS development was held on March 12, and a Memorandum of Understanding (MoU) was signed between the institutions forming the MedGOOS Association to implement operational oceanography in the region (see article in GOOS News No. 8).



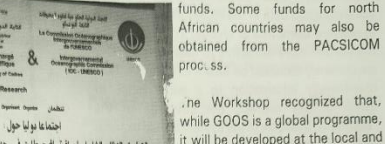
A MedGOOS Workshop on the 'Benefits of the Implementation of the Global Ocean Observing System in the Mediterranean Region' was held on 12-13 November 1999 in Rabat, Morocco. This workshop was the first of its kind in the region, and participants, including representatives of institutions from 18 Mediterranean countries, Europe and Africa, as well as from United Nations agencies and international governmental and non-governmental organizations, were present. The workshop was closed by the Secretariat of the Scientific Research of Morocco.

The meeting was organized in three parts:

- plenary lectures on global issues with focus on: GOOS 1999 activities; EC programmes in connection with GOOS; EuroGOOS; MedGOOS Strategy; GOOS AFRICA and capacity building for GOOS
- regional and national issues focussed on Mediterranean programmes related to GOOS, like MedGLOSS, MEDAR, MEDATLAS, MedGOOS, MESPA
- three working groups activities with specific tasks, as follows:

- WG-1: Networking and sharing of resources,
- WG-2: Capacity building,
- WG-3: Regional Co-ordinating System

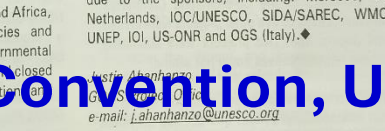
The results of the working groups will constitute the framework for project proposals to be submitted to potential donors and funding agencies. One potential source of funding is the European Commission, which is another potential source of funds. Some funds for north African countries may also be obtained from the PACSICOM proc. ss.



The Workshop recognized that, while GOOS is a global programme, it will be developed at the local and regional level through programmes like EuroGOOS, EuroGOOS, and GOOS AFRICA. The workshop participants signed the MedGOOS Memorandum of Understanding (MoU). The MedGOOS Strategy was submitted to the workshop participants by the MedGOOS Chairperson and was approved by the attendees.

Tribute is paid to the Local Organizing Committee under the chairmanship of Prof. Maria Snoussi, who handled organizational matters whilst the Chairperson of MedGOOS, Prof. Silvana Valle, conducted the workshop. Much of the success of the workshop is due to the sponsors, including: Morocco, the Netherlands, IOC/UNESCO, SIDA/SAREC, WMO, UNEP, IOI, US-ONR and OGS (Italy).

Justin Ahanhanzo  
e-mail: j.ahanhanzo@unesco.org



MedGOOS Meeting, Rabat, November 1999

GOOS NEWS No. 8 | 10

NEWS FLASH

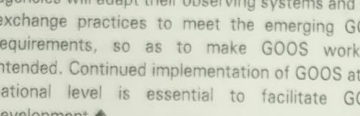
GOOS COMMITMENTS

At the national level, many coastal countries are planning or collecting their own coastal seas observations following GOOS Principles. We encourage all IOC Member States to form National GOOS Co-ordinating Committees involving all stakeholders (advice on such a committee is given on the GOOS web site, and in this issue). In July, 22 countries signed the Initial GOOS Commitments Meeting in Paris, and committed substantial parts of their present observing systems to GOOS.

As the latest details of the GOOS designs emerge over the next 18 months, we anticipate that national agencies will adapt their observing systems and data exchange practices to meet the emerging GOOS requirements, so as to make GOOS work as intended. Continued implementation of GOOS at the national level is essential to facilitate GOOS development.

Changes at the GOOS Project Office

In August of this year, IOC welcomed consultant Maria Hood, a 'double-agent' working for both IODE and GOOS on a range of data and information management issues. Maria received her PhD in Marine Chemistry and Geochemistry at the Massachusetts Institute of Technology / Woods Hole Oceanographic Institution Joint Program in the Sea in Paris in 1993, and worked as a post-doctoral fellow at the Laboratoire d'Océanographie Dynamique et de Climatologie, Université Pierre et Marie Curie, where her research focussed on upper ocean CO<sub>2</sub> and air-sea gas exchange processes. After a most enjoyable experience as an Assistant Professor at the University of Rhode Island, she was lured back to Paris to join IOC by fellow southerner and WHOI colleague, George Goulet.



Justin Ahanhanzo, our new GOOS News Editor, is an oceanographer from Benin. He started consultancy in IOC in 1994 on marine pollution issues in Eastern Africa. As assistant to the UNESCO Co-ordinator for PACSICOM, he helped to ensure the overall administration and scientific co-ordination of the UNESCO contribution to the International Year of the Ocean (IYO) in July 1998 and to the Cape Town Conference in November 1998.

Justin has assisted the Executive Secretary IOC in the implementation of IOC programmes in Africa. As co-ordinator of the GOOS-AFRICA, MedGOOS Programmes and UNESCO Chairs/UNITWIN in Marine Sciences, he co-organized and co-convened the first Pan-African LME Symposium in Cape Town while

NEW GOOS COMMITTEE MEMBERS

The GOOS Steering Committee has developed a strategy for capacity building. Part of the strategy requires creation of a GOOS Capacity Building Panel. This formal panel replaces the former ad hoc GOOS Capacity Building Panel. The Chairman is Geoff Holland, former Chairman of IOC.

The GOOS sponsors (IOC, WMO, UNEP and ICSU) have required the GOOS Steering Committee (GSC) to take on more members with operational experience. As part of a policy of time limits to committee service, Dr Ehrlich Desa, Dr Su Jilan, Dr Ichio Asanuma and Dr Neville Smith have rotated off the core committee of the GSC, having served 5 years in J-GOOS and its successor, the GSC. They have been replaced by Dr Yu Zhouwen, Dr Naoyuki Hasegawa, Dr Narayana Swamy, and Dr Ralph Rayner. Neville Smith has been invited to rejoin the GSC in his capacity as Chairman of OOPC. Julie Hall has been made Vice-Chairperson of the GSC.

Pacific GOOS BENEFIT Joint PIRATA-VII CLIVAR Atlas JGOFS CO<sub>2</sub> CLIVAR SSG Coastal GOOS JCOMM Sec 3rd session LMR Panel-IV Earthwatch GDAE-IV M GLOBEC SS HOTO-V (sub-Implementa G3OS Spon IOCARIBE G MARCUBA OOPC-V Me

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DBCP-XVI JTA-XX WOCE SSG Ocean Obs SEA-GOOS HOTO/GIP

NEAR-GOOS WCRP-IHBP C 9th HAB Cont ICES-GOOS S Cartagena Co MedGLOSS M Argo Science Oceanology I WCRP JSC M SOOP-IP-III PIRATA North LMR-GOOS-H

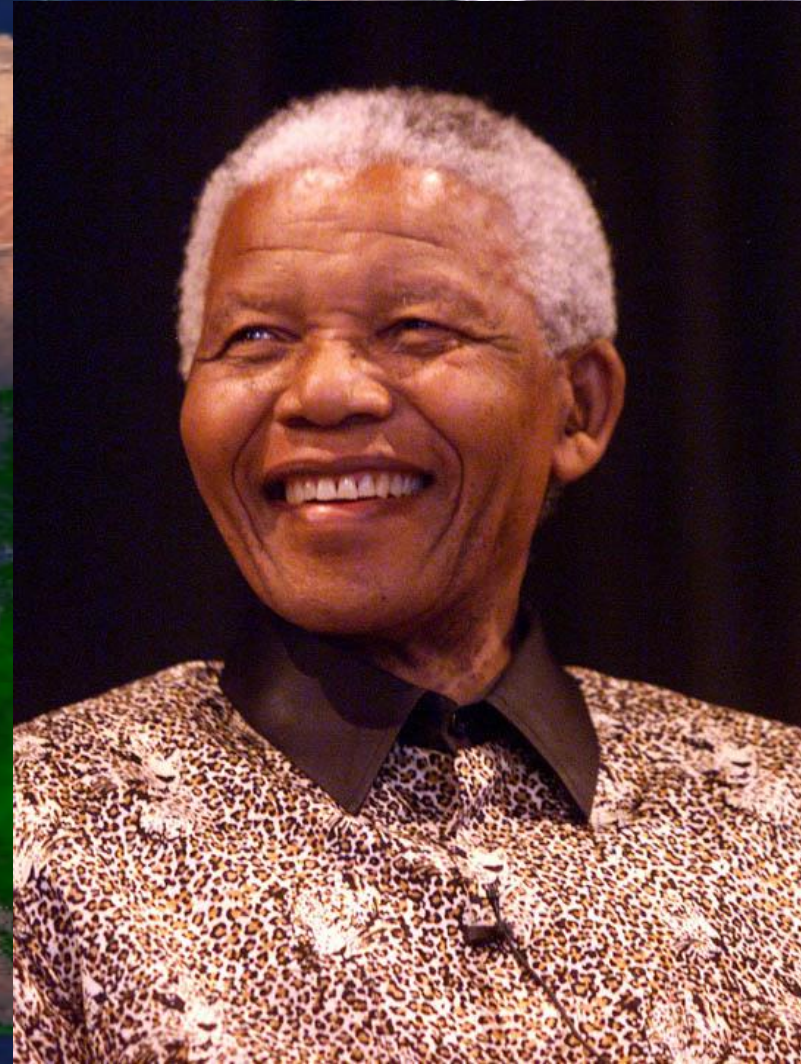
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**Cape Town Conference in 1998:  
Political and Legal Framework**

“Africa ’s long and beautiful coasts and the abundance of marine resources can contribute to improve economic, food and environmental security for the continent. These coastal and marine resources, like the rest of Africa ’s environmental resources, continue to be exploited in a manner that does not benefit AFRICA and her PEOPLE. This is a paradox of a people dying from hunger, starvation and poverty when they are potentially so rich and well endowed”.



## Priority Ocean Decade Actions for Africa



- 1. Sustainable ocean management in Africa
- 2. Ocean and human health in Africa
- 3. Unlocking the blue carbon potential of Africa
- 4. Fisheries and IUU in Africa
- 5. Strengthening multi-hazard early warning systems and community resilience
- 6. Ocean observations and forecasting systems for Africa
- 7. Digital twin for Africa - Establishing an African ocean knowledge hub
- 8. Strengthening capacities and skills of African Early Career Ocean Professionals (ECOPs)
- 9. Regional ocean literacy programme for Africa



# Take Home Message

## Triple Principal Foundation Pillars: GOOS-AFRICA TRIAD

### African grassroots-Ownership-Leadership

**These founding principles** are essential to build trust amongst African partners within and outside the continent, as the primary support, contributors and beneficiaries of GOOS-AFRICA efforts.

- **Activities conducted in Africa with grassroots approach under the ownership and leadership of African relevant institutions and competent experts, help to mobilize required resources within Africa, from the African Diaspora and beyond with Overseas partners.**

**Essential for the IOC Sub-Commission for Africa and Adjacent Island States to build on existing mechanisms and programmatic structures already in place in Africa.**

**OPERA: Governance mechanism to include African stakeholders for convening power  
IOCAFRICA, GOOS-AFRICA, WIOMSA.**



# UNDERSTANDING GOOS-AFRICA

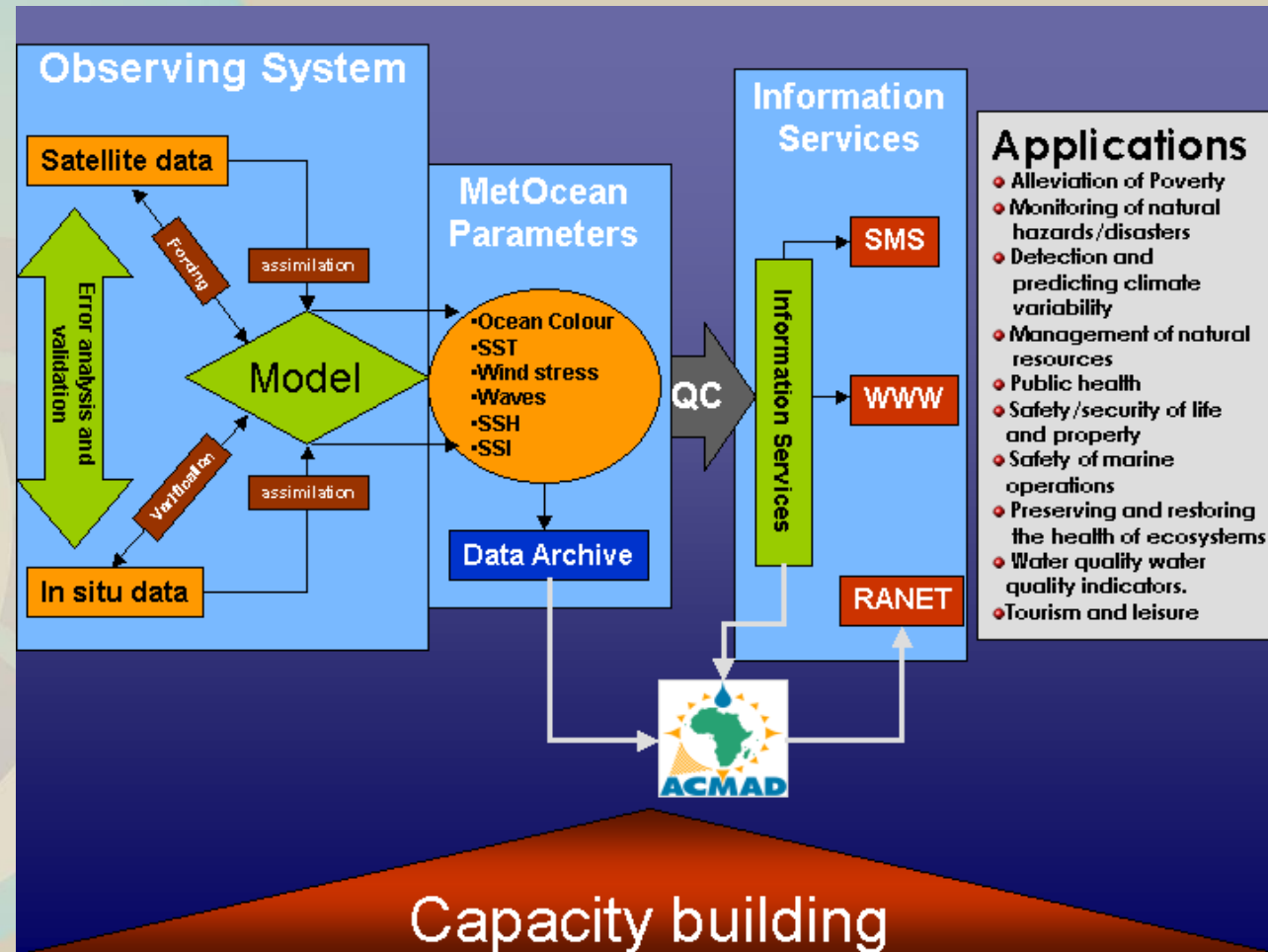


# **OUR RESOLUTION TOWARDS ACHIEVING**

- **NEPAD Action Plans**
- **African Union VISION & Strategic Frameworks**
- **WSSD Implementation Plan**
- **The Millennium Development Goals**
- **The UN SDGs**
- **The Decade of African Oceans and Seas**
- **The UN Ocean Decade**
- **The UN FCCC**
- **UN CBD**



# GOOS-AFRICA Vision & Strategy for Capacity Development in support to OPERA towards AFRICA's Development

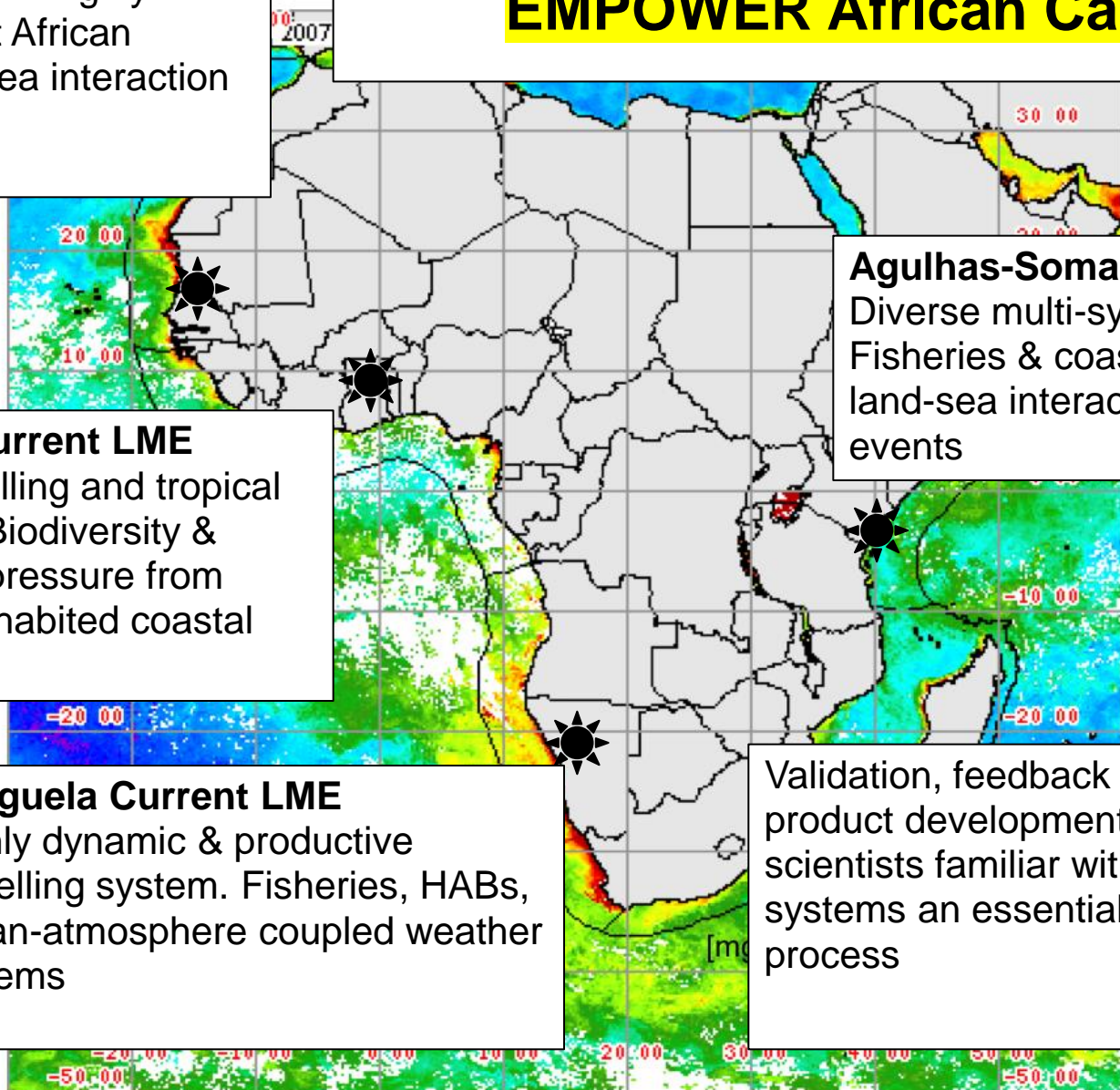




### Canary Current LME

Major boundary-current upwelling system. Highly productive West African fisheries, land-sea interaction

# GOOS-AFRICA/African Large Marine Ecosystems Connection EMPOWER African Capacity



### Guinea Current LME

Both upwelling and tropical systems. Biodiversity & fisheries, pressure from densely inhabited coastal zone

### Agulhas-Somali Current LME

Diverse multi-system LME. Fisheries & coastal ecosystems, land-sea interactions, extreme events

### Benguela Current LME

Highly dynamic & productive upwelling system. Fisheries, HABs, ocean-atmosphere coupled weather systems

Validation, feedback and ongoing product development from scientists familiar with regional systems an essential part of the process



# **GOOS AFRICA Mandate CLAIMS TO**

**1- Be an African Union Programme for the integration of African Oceans and Coasts.**

**2- Contribute to the institutional building of the IOCAFRICA Sub-Commission.**

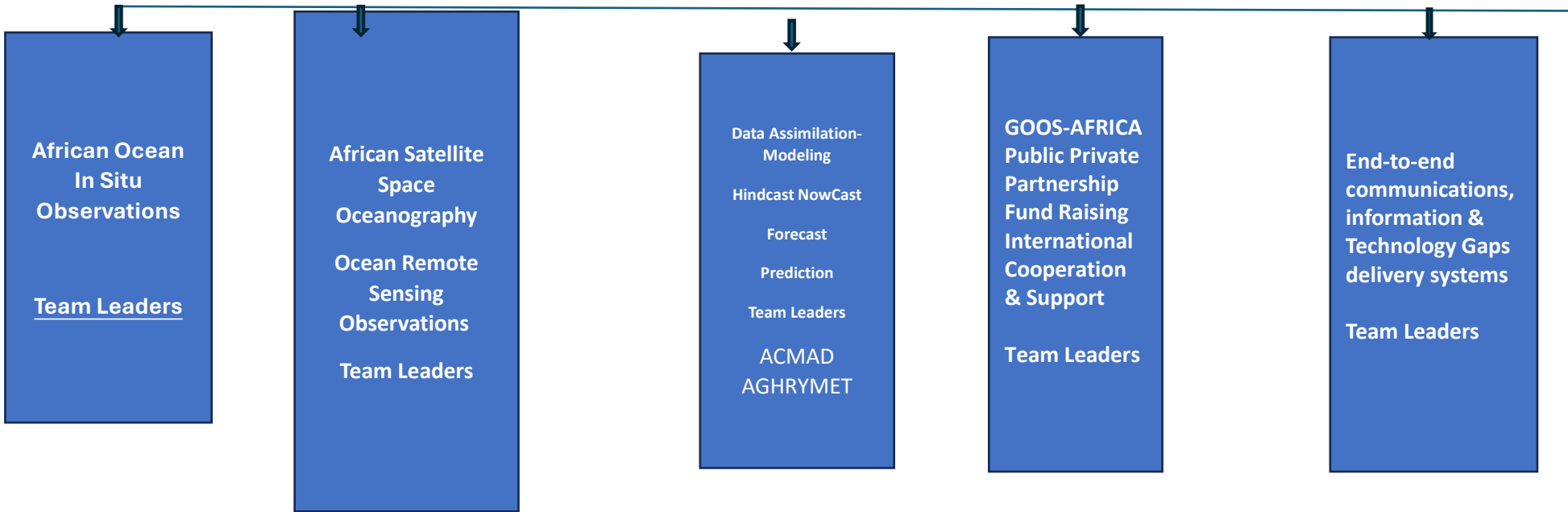
**3-Go towards to the Operational Sustainability of the Sub-Commission.**

# **WHY Ocean Observation Systems & Predictions Needed in AFRICA?**

- **Offshore and Coastal OIL & GAS**
- **Shipping and trade**
- **Offshore and Coastal Mining**
- **Coastal and offshore Fisheries**
- **Integrated Coastal Zone Management**
- **Seaside tourism**
- **Public Safety/Health & protection of properties**
- **Early Warning Systems**

**GOOS-AFRICA Advisory Board**  
Past/Former Chairs  
Past LME Leaders

**GOOS-AFRICA Coordinating  
Committee and Thematic  
Working Groups based on  
Multi-Modulars Approach**



**African Ocean  
In Situ  
Observations**  
Team Leaders

**African Satellite  
Space  
Oceanography**  
**Ocean Remote  
Sensing  
Observations**  
**Team Leaders**

**Data Assimilation-  
Modeling**  
**Hindcast NowCast**  
**Forecast**  
**Prediction**  
**Team Leaders**  
**ACMAD**  
**AGHRIMET**

**GOOS-AFRICA  
Public Private  
Partnership  
Fund Raising  
International  
Cooperation  
& Support**  
**Team Leaders**

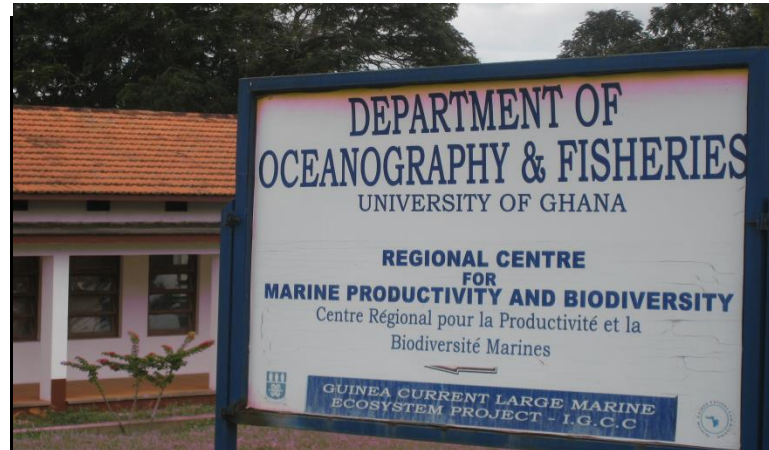
**End-to-end  
communications,  
information &  
Technology Gaps  
delivery systems**  
**Team Leaders**

**GOOS National Focal Institutions**

# BEST PRACTICES

## RAISING THE SCIENTIFIC LEVEL AND NETWORKING IN AFRICA (January 2011, Physics Today)

### LET'S DO IT AT HOME TO BRING TOP SCIENTISTS TO AFRICA MENTORING



 United Nations Educational, Scientific and Cultural Organization	 INTERNATIONAL CHAIR IN MATHEMATICAL PHYSICS AND APPLICATIONS (ICMPA) <b>UNESCO CHAIR IN MATHEMATICAL PHYSICS AND APPLICATIONS</b> established in 2006 at the University of Abomey-Calavi (Republic of Benin)		
UNITWIN/UNESCO Chairs – Twinning networks and university networks			
<b>MULTI-UNIVERSITY MASTER'S DEGREE AND DOCTORAL TRAINING PROGRAMME IN PHYSICAL OCEANOGRAPHY AND APPLICATIONS</b>			
Considering the needs of capacity building in environmental sciences, climate and coastal environment, a regional master in "Physical Oceanography and Applications" is being organized by the International Chair of Mathematical Physics and Applications (ICMPA-UNESCO Chair) of the University of Abomey-Calavi at the Faculty of Sciences and Technology, involving the following universities, research institute and organization:			
<b>Intergovernmental Oceanographic Commission of UNESCO (IOC/UNESCO)</b> Mr Justin Aboukhan Coordinator and Team Leader Intergovernmental Oceanographic Commission of UNESCO (IOC/UNESCO) UNESCO, 1 Rue de la Paix Paris Cedex 15, France Tel: +33 1 47 00 60 41 Fax: +33 1 47 00 50 12 13 E-mail: j.aboukhan@unesco.org http://ioc.unesco.org	<b>Paul Sabatier University (France)</b> Prof. N. Hall Laboratoire d'Etudes en Géophysique et Océanographie Spatiales LEGOS/CNRS, 81 Avenue Edouard Belin, 31400 Toulouse cedex 9, France Tel: +33 5 61 33 29 19 Fax: +33 5 61 23 32 05 E-mail: Nick.Hall@legos-obs-utp.fr	<b>University of Abomey-Calavi (Benin)</b> Prof. M. N. Houndakpan International Chair of Mathematical Physics and Applications (ICMPA-UNESCO Chair), 072 B.P. 90 Cotonou, Republic of Benin, Tel: +229 21 38 61 21 / +229 95 06 26 89 Fax: +229 21 33 31 28 E-mail: mnhourbet_houndakpan@icmpa.net or houndakpan@uac.edu	<b>Institut de Recherche pour le Développement (France)</b> Dr B. Bourles Laboratoire d'Etudes en Géophysique et Océanographie Spatiales (LEGOS) Centre de Recherches Halieutiques et Océanographiques du Bénin (CROB) Représentation IIR de Cotonou 08 B.P. 841 Cotonou, République de Bénin Tel: +229 21 30 03 84 / +229 90 08 84 54 Fax: +229 21 30 06 60 E-mail: bernard.bourles@ird.fr
			





# AFRICA–Wide Initiative Entirely Country-Driven Process

National Experts have been nominated by their  
countries.



**GOOS-AFRICA Project Identification Meeting, Nairobi, 2001**

## GOOS-AFRICA Preoperational workshops with international partners





R. W. JAMES BUILDING

Cape Town June 2011: Accra March 2012 and  
Zanzibar, next



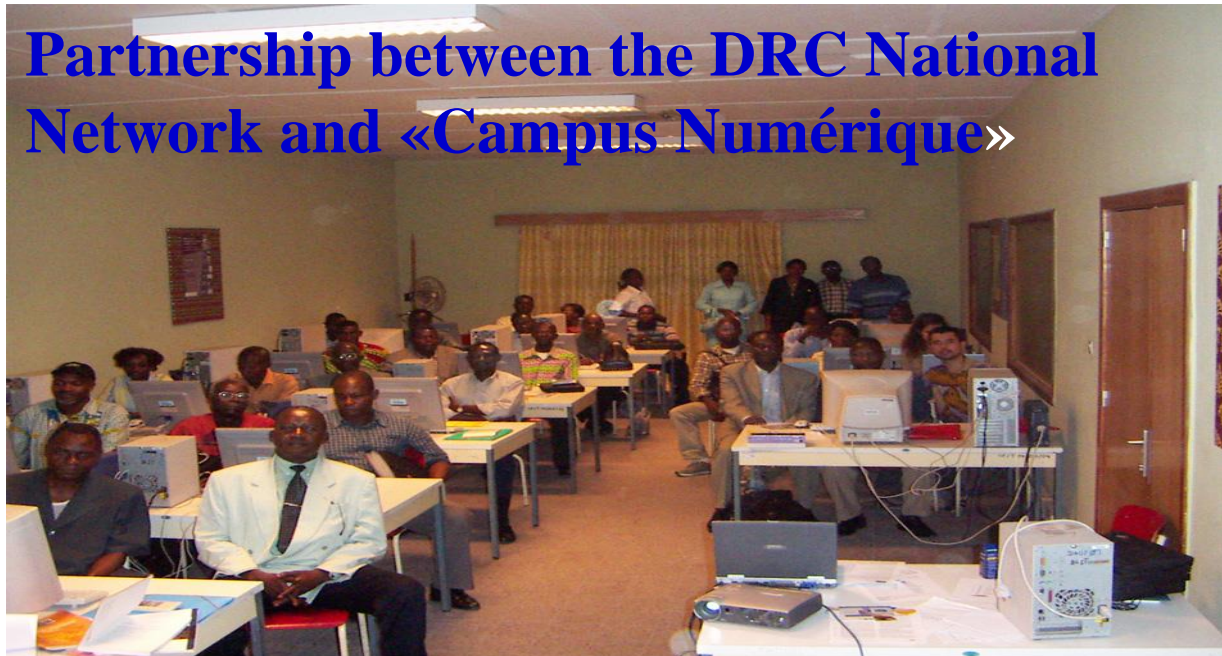


• **The African Marine Atlas Team**

# APPLICATIONS OF THE REMOTE SENSING FOR INTEGRATED MANAGEMENT OF ECOSYSTEMS AND WATER RESOURCES IN AFRICA

**Activity: Developing Learning and Users Networks**

**Partnership between the DRC National Network and «Campus Numérique»**





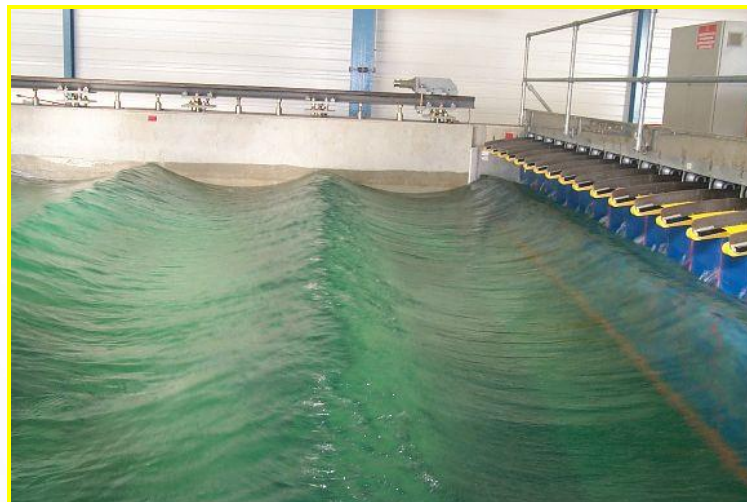
**environmental affairs**

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA

# Operational Oceanography Research Program



**INTECHMER**







## OPERATIONAL OCEANOGRAPHY

- PIRATA extension –Kizomba Buoy
- HAB's monitoring buoy
- Satellite remote sensing
  - chlorophyll a, SST, upwelling indices
- Weather stations; tide gauges
- Moored sensors: temperature, current, salinity, oxygen
- CPR's and TUOR (Aquashuttle)
- Routine monitoring lines- zooplankton



# GOOS-AFRICA contribution to OPERA to overcome multidimensional Challenges

## 1- Governance challenge: Connecting global goals to local priorities: IOCAFRICA & GOOS-AFRICA continental players

- Socio-economic importance and benefits (studies) of bilateral/global programmes to local priorities
- Networking between scientists and policy makers

## 2- Coordination challenge

- Fragmentation of initiatives in Africa: regional coordination efforts to be sustained
- Networking Research facilities and expertise across the continent and beyond

## 3- Academic and Research challenge: **POWER in Education**

- Education systems with adequate research facilities
- Recognition of the role and place of African Universities and specialised centers
- Regional Training Programmes (M.Sc/Ph. D) and on-job training

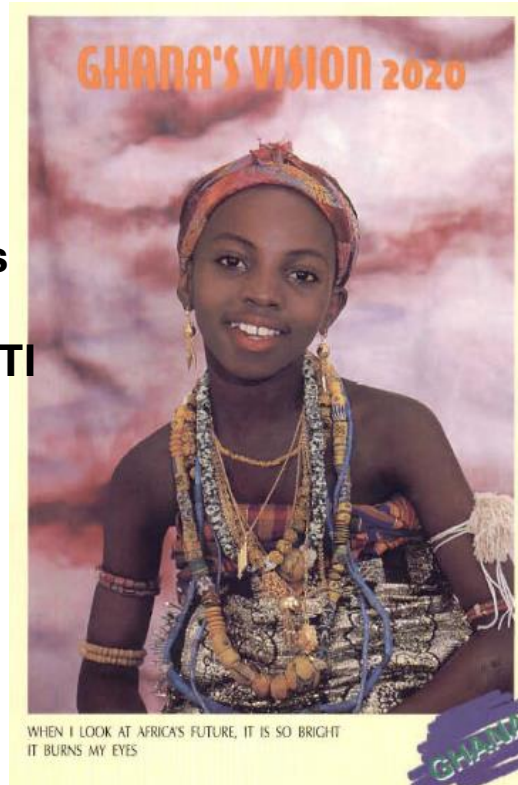
## 4- Sustained investment in research facilities and innovation

- Human and financial resources
- Operational support
- Utilisation & Retention of available human resources
- Strategic policy to **attract the youth and female** scientists in Earth and Climate Systems Sciences

# WHAT IMPACTS AND LEGACIES DO YOU WANT TO MAKE IN AFRICA with OPERA?

## THE BRIGHTEST FUTURE IN Ocean Predictions in AFRICA

When I look at Africa's future, it is so bright that I am excited and truly **COMMITTED** to the efforts towards the **Brightest future in Ocean STI in Africa including OPERATIONAL OCEANOGRAPHY**



## WHAT WOULD BE YOUR STRATEGY FOR AFRICA?

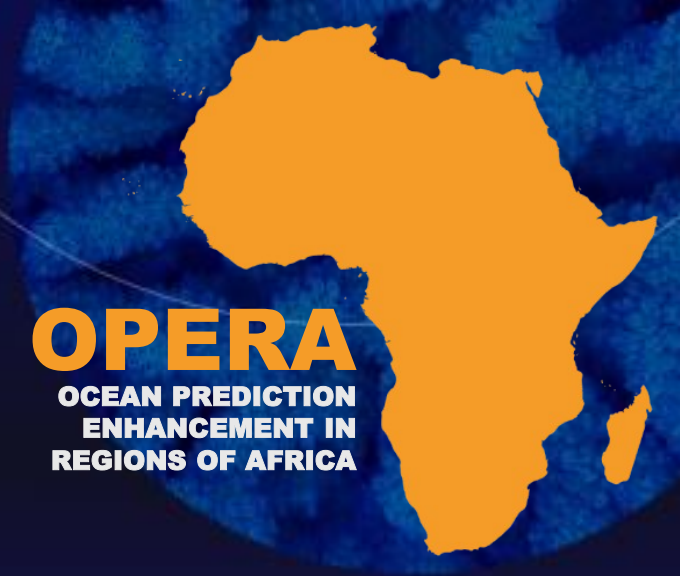
Ciència i caritat? P. Picasso, Barcelona, 1897





**It is Possible said Prof Geoff Brundit, founding Chair and GOOS-AFRICA Pioneer: Work together, building on and reinforcing existing African capacities and capabilities**





# OPERA

OCEAN PREDICTION  
ENHANCEMENT IN  
REGIONS OF AFRICA



BACK AT 2:00 pm



Funded by  
the European Union



2021  
2030  
United Nations Decade  
of Ocean Science  
for Sustainable Development



MERCATOR  
OCEAN  
INTERNATIONAL

## Presentation of OceanPrediction DCC survey results on status of ocean forecasting and future needs for Africa

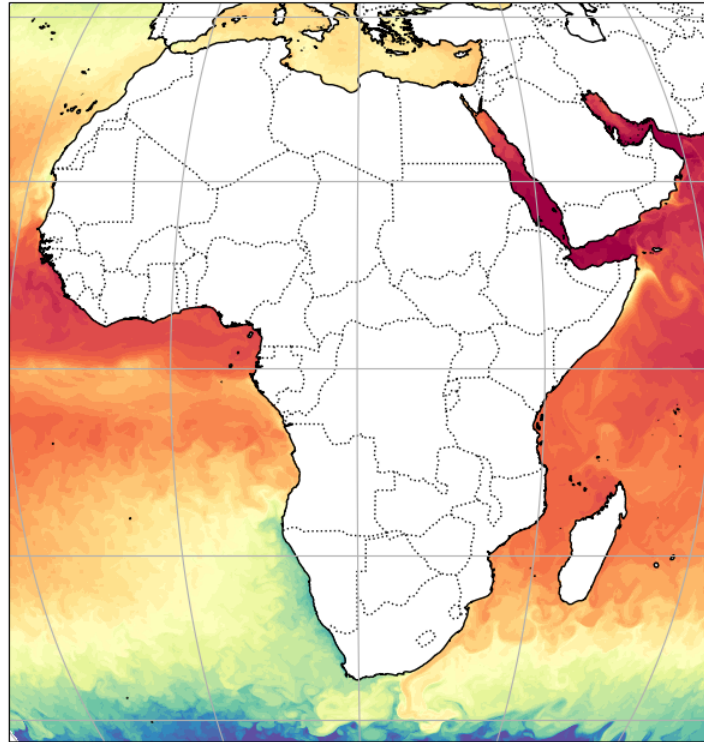


Jennifer Veitch

SAEON, SOMISANA lead

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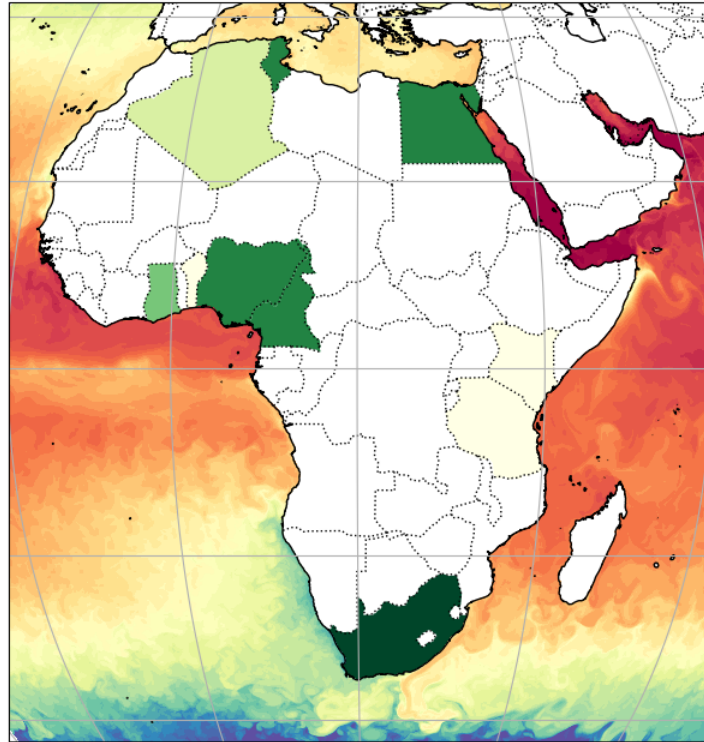


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Survey statistics:

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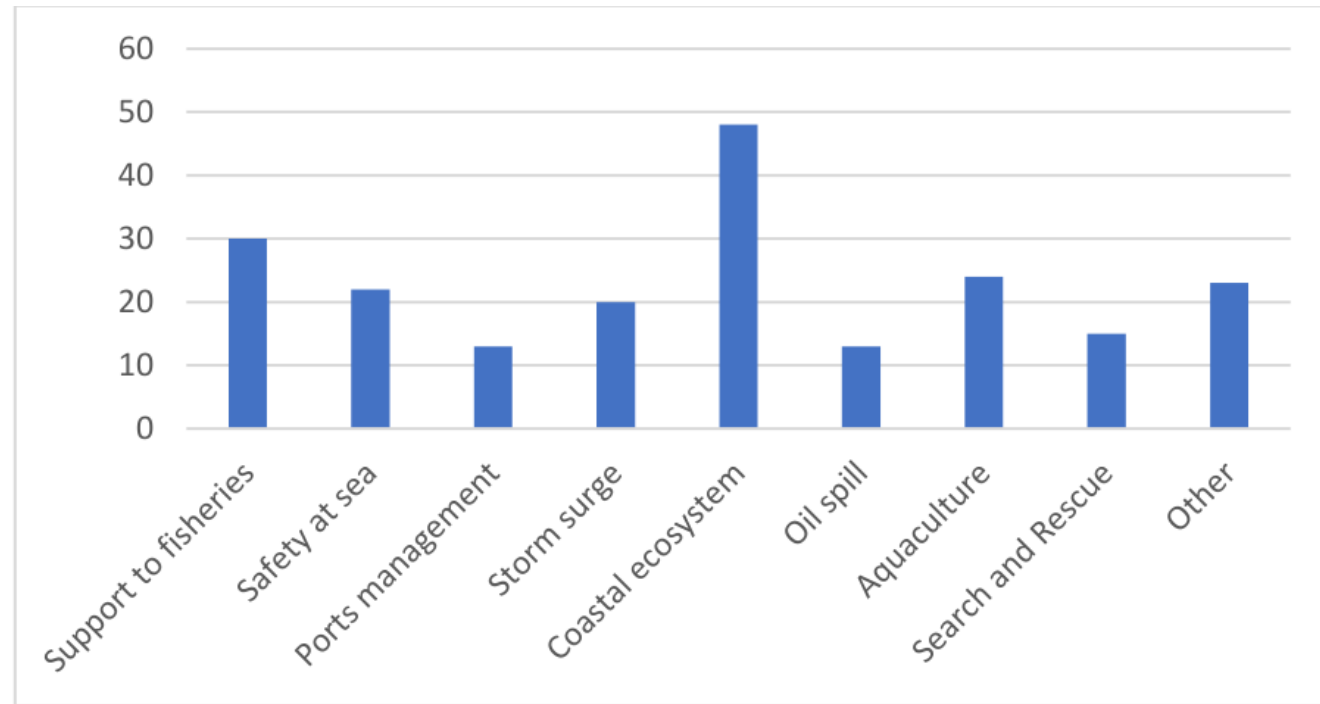


Figure 1: Type of existing Ocean forecasting applications operating in Africa (all replies considered)

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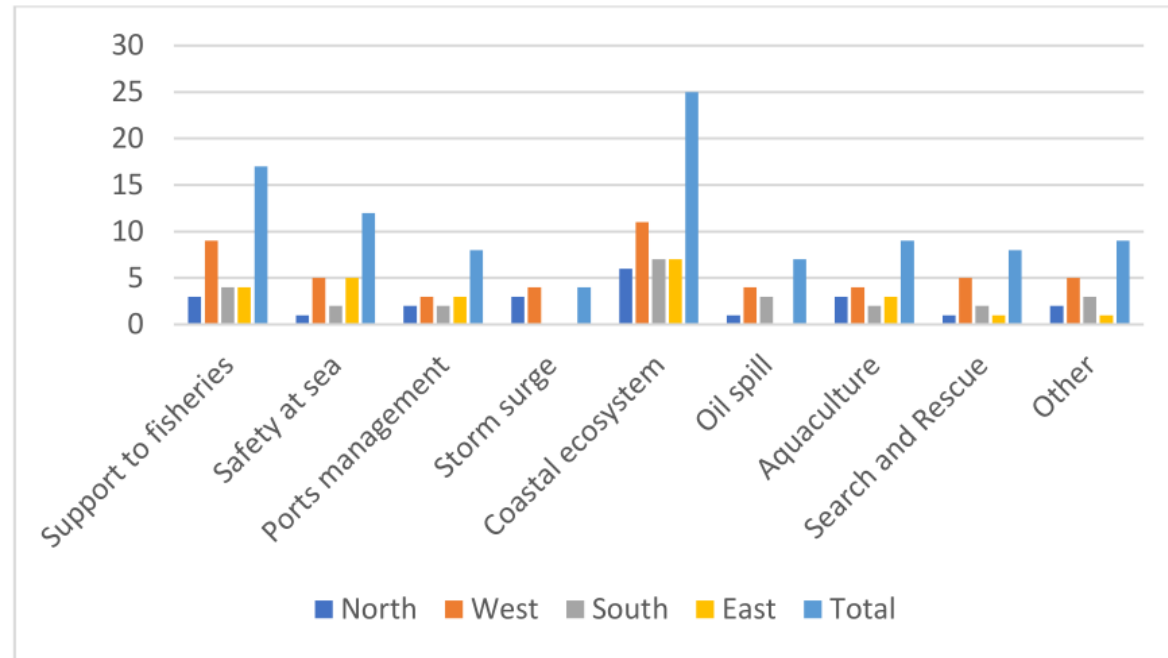


Figure 2: Type of existing Ocean forecasting applications operating in the African Region (Only replies coming from African institutions are considered). The analysis is divided by regions (North, West, South, and East), and includes the Total for Africa.

## 2. The Need for New or Upgraded Services

“It is worth noting that there is a large variability depending on the African zone: while Southern and Eastern Africa identify a clear need for improvement (84% in both cases), the percentage descends for Western (68%) and Northern regions (57%).”

“The results indicate a strong interest in developing services for improved knowledge and forecasting of Essential Ocean Variables (EOV) and for Disaster Risk Reduction (DRR)”

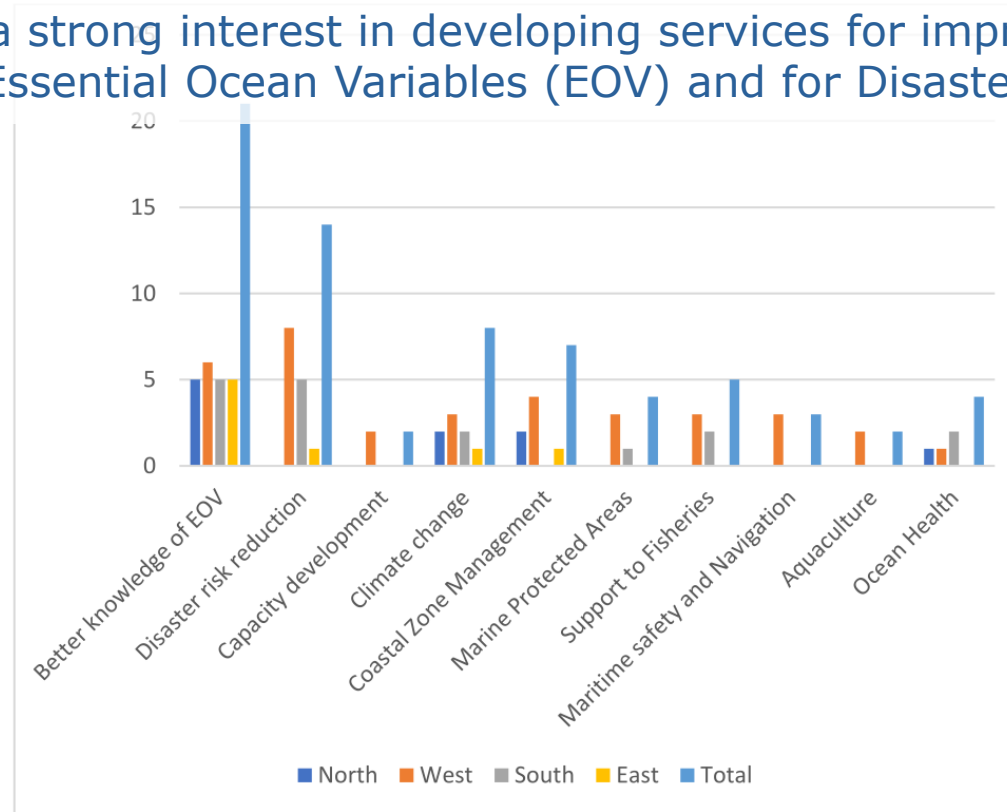


Figure 6: Needs for new or upgraded services based on Ocean Forecasting Africa (Only replies coming from African institutions are considered). The analysis is divided by regions (North, West, South, and East) and includes the total for Africa.

### 3. Additional Needs

“Regarding additional crosscutting needs, the primary one identified is capacity development, followed by dedicated funding and higher-resolution services”

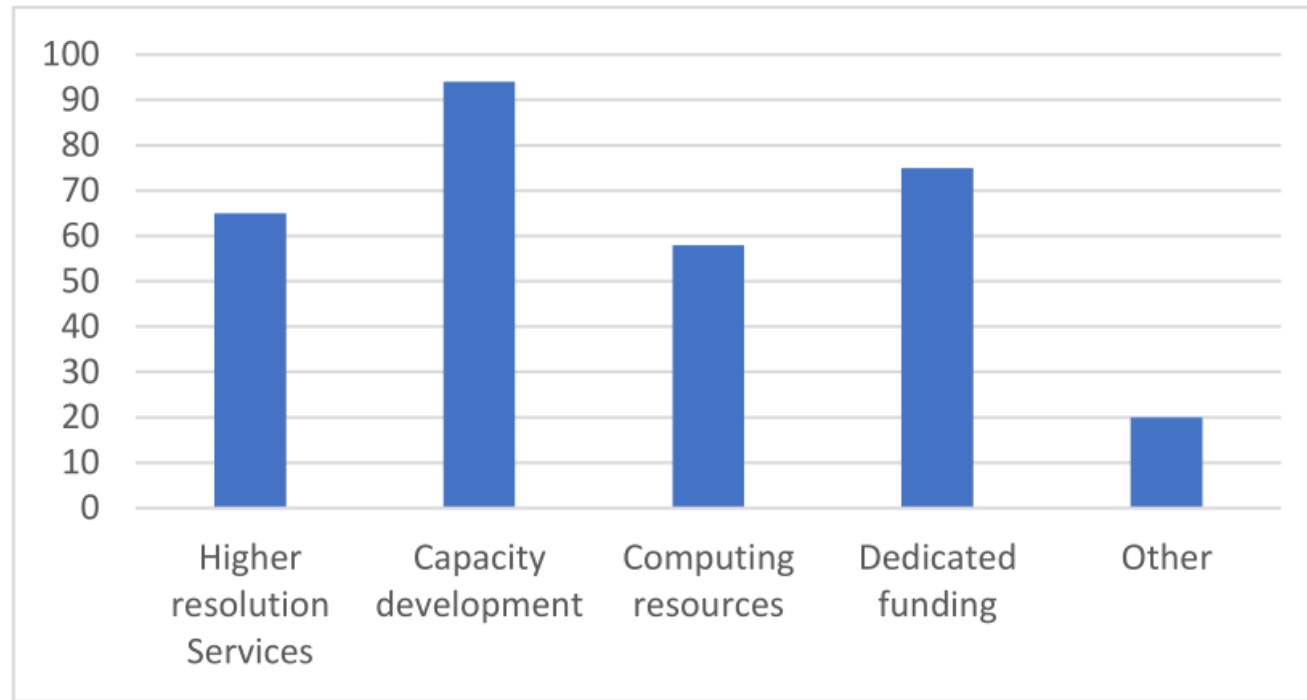
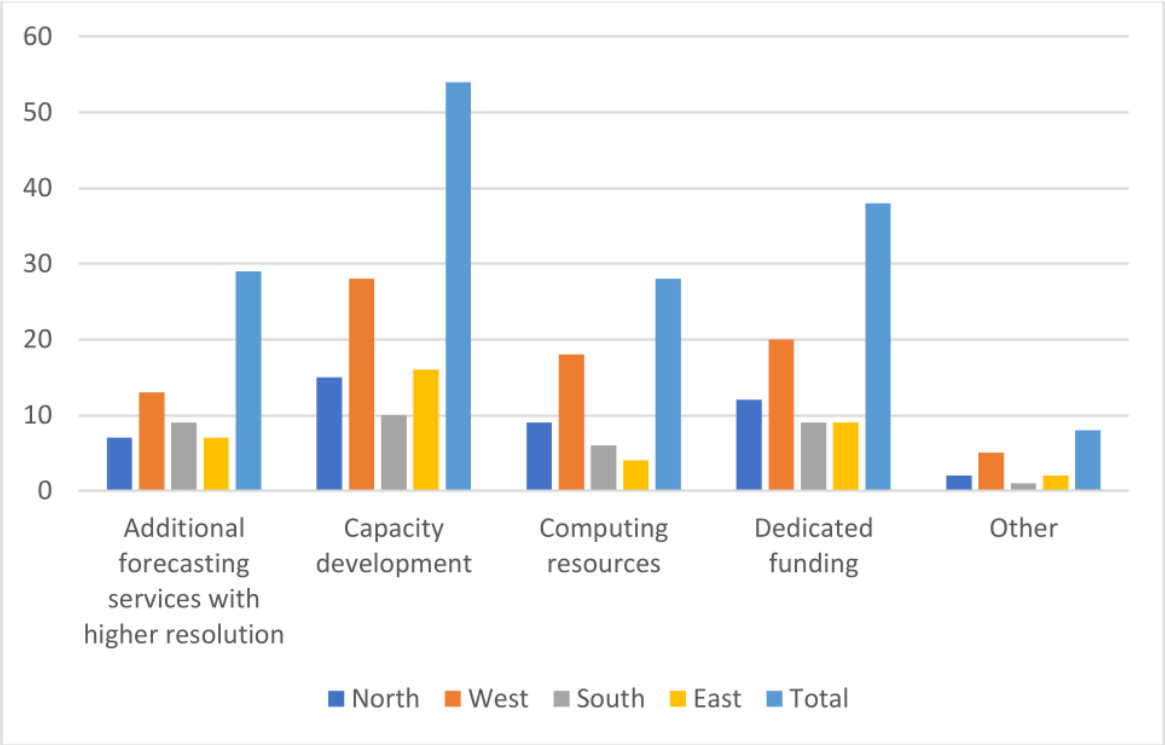


Figure 7: Additional needs related to ocean forecasting (All experts)

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“When the analysis is limited to the African experts' replies, capacity development remains the most requested need, followed by dedicated funding”



## 4. Role of Institutions and Consortia

“When asked about involvement in bilateral and/or regional partnerships and in programs aimed at strengthening ocean forecasting capacity on a national or regional level, only 34% of experts responded affirmatively”

“Several collaboration frameworks related to African activities were mentioned, including **GMES & Africa**, the **OceanPrediction DCC**, the **Decade Collaborative Centre for Coastal Resilience**, and UNESCO/IOC’s Ocean Literacy and Collaboration program, among others. The **Ocean Decade** was the most mentioned initiative.”

“As expected, the experts from the institutions have **different ideas on the role of their centers** when dealing with the development of new forecasting services and their applications. Some institutions are offering a role in capacity development activities, others are expecting to participate in monitoring and modeling activities, and others declare that are ready to lead the way forward.”

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“We need to **join any capacity development initiative**”

“**We are likely to be the pace setters** in our part of the world if we get capacity building”

“**training in ocean forecast** would be an addition to my institution as **we are regulating fishing activities** across nine coastal counties”

“**Is urgent to support countries with lack of capacity building** and fund to deal with the ocean issues in order to speed up the pace and achieve the sustainable development goals”

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“We are in **need to develop technologies related to early warning systems** as we are facing climate change and sea level rise”

“This intersection of **ocean forecasting and data science** is essential for understanding and addressing the complexities of **marine ecosystems** and **supporting sustainable ocean management practices**”

“...ocean forecasting is **very important for every state** as it looks into ocean dynamics, storm surges and the possible effects to the ecosystem...”

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“The **backbone of a good forecasting system is reliable data**. To collect reliable real-time data requires a **significant investment in infrastructure and human capacity**. Procuring expensive state- of-the-art sensors for long-term applications in Africa has not worked well in the past, because of the cost of maintenance, calibration of sensors and full time employment of technicians to service them. **This needs to be considered in the establishment of a forecasting system**”

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# Conclusions

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# Way Forward

- **Community building:** Promoting further sharing of data and knowledge among African experts..
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**OPERA**  
OCEAN PREDICTION  
ENHANCEMENT IN  
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UN DECADE  
COLLABORATIVE  
CENTRE

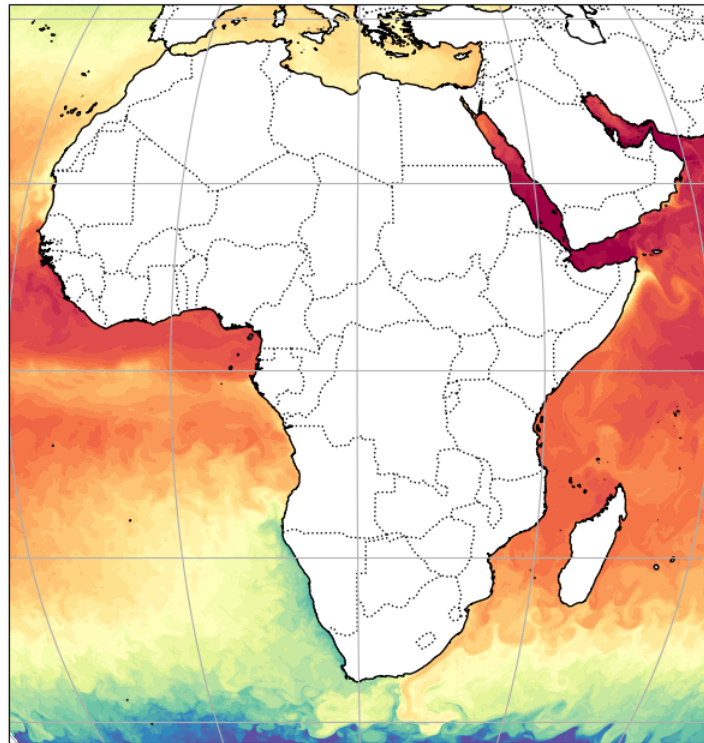


2021  
2030 United Nations Decade  
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OCEAN  
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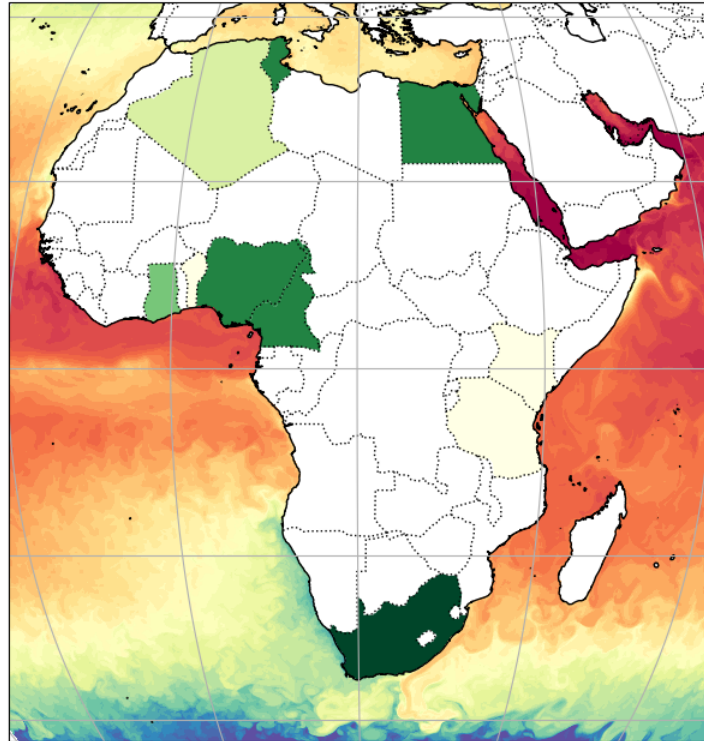
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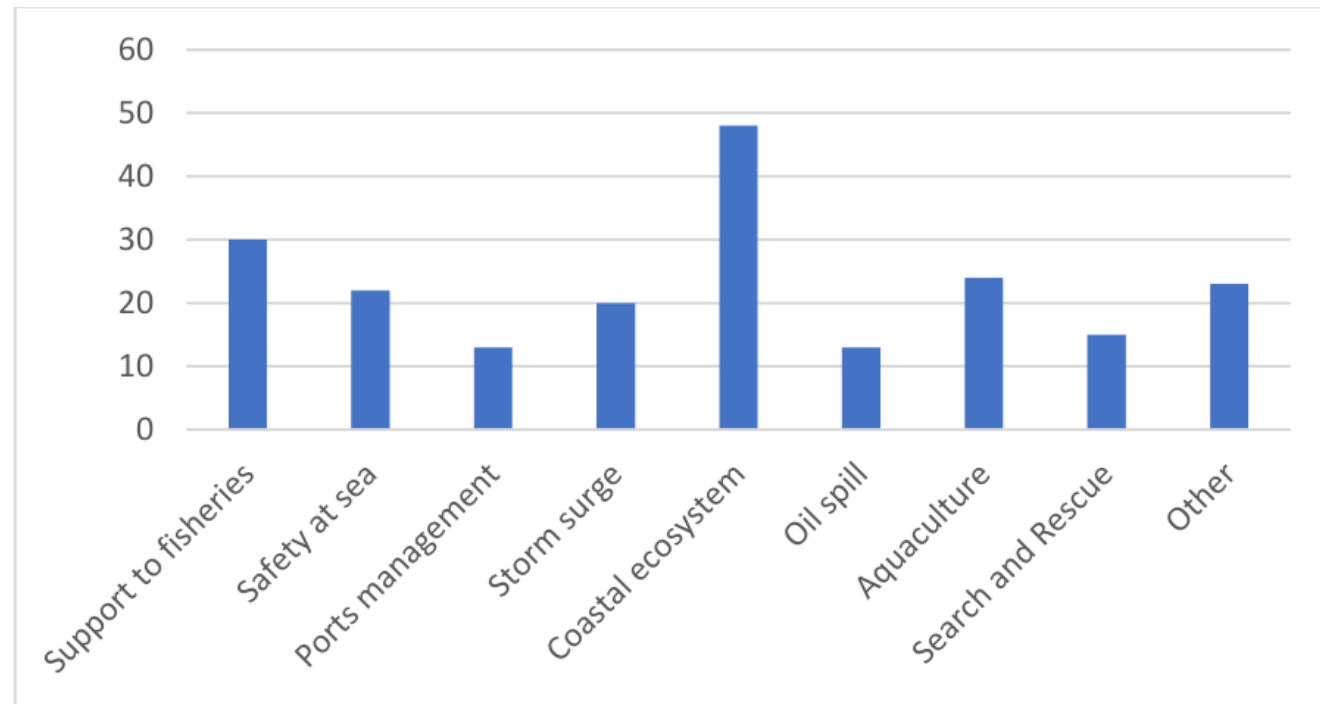


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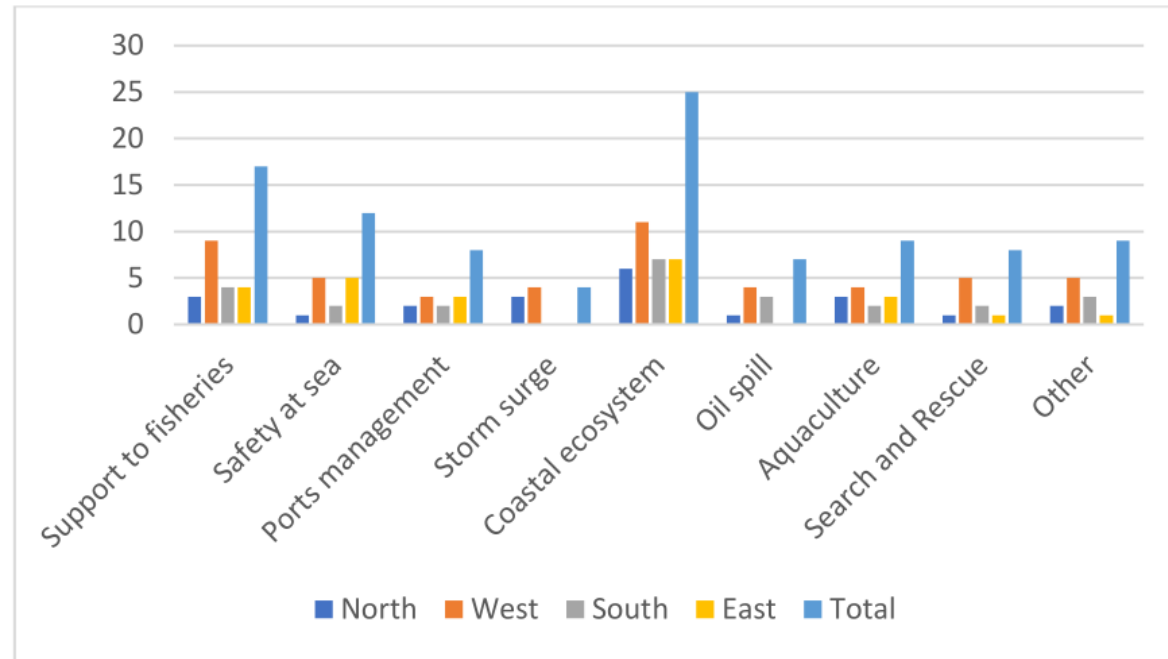


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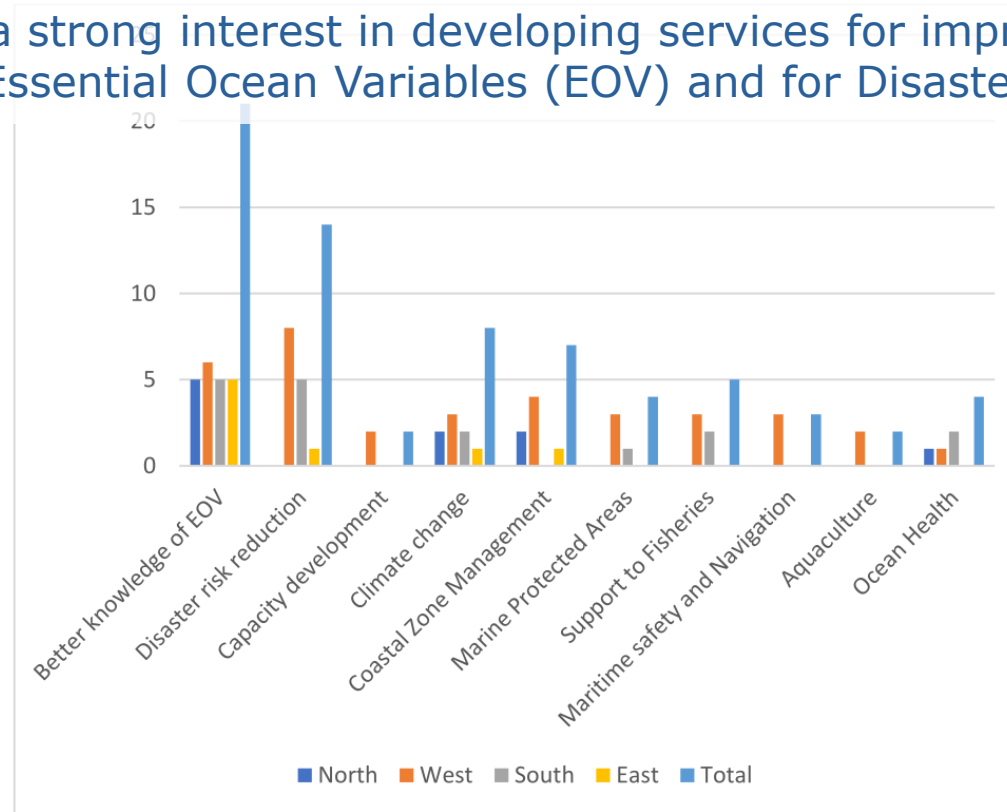


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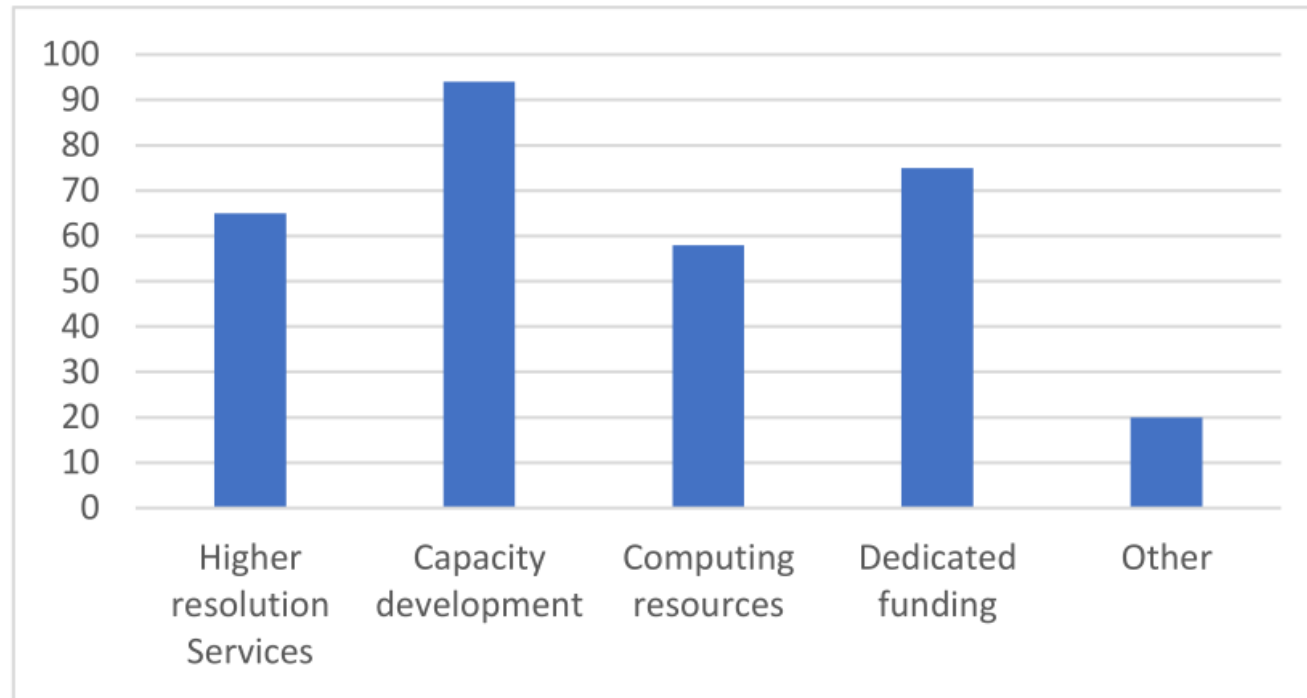
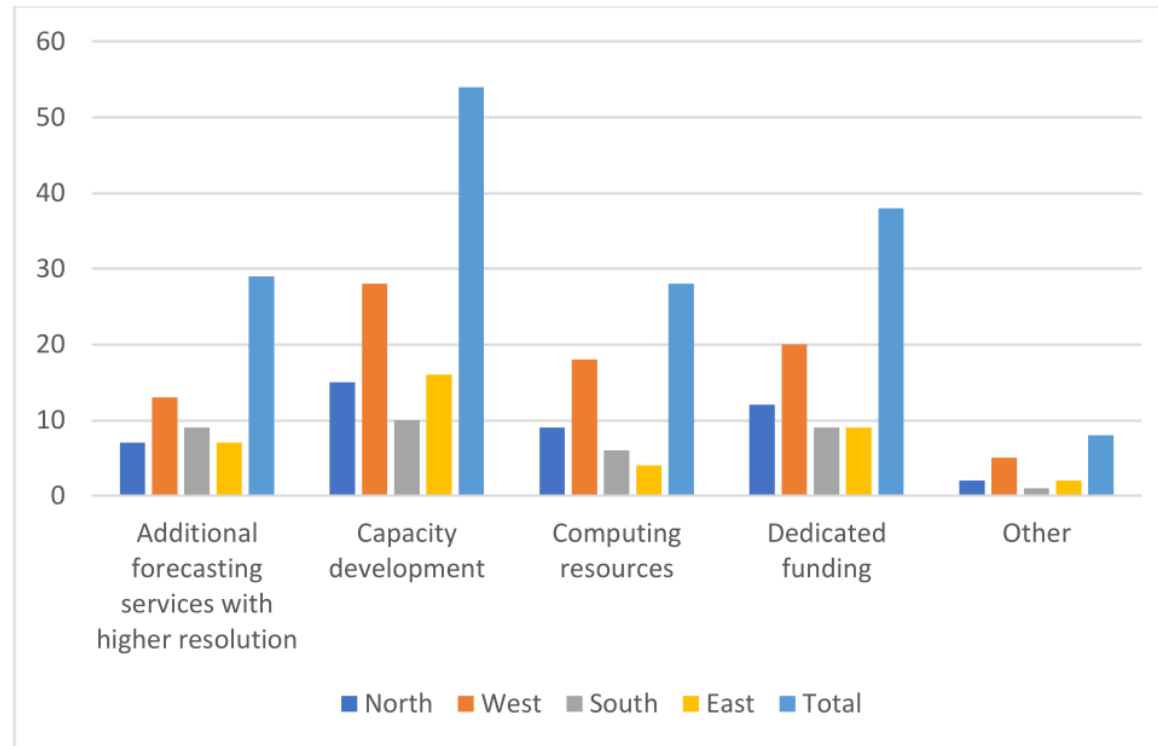


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