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ENHANCEMENT IN
REGIONS OF AFRICA



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

Justin Ahanhanzo

Founder & Coordinator
GOOS Africa



Funded by
the European Union



2021
2030 United Nations Decade
of Ocean Science
for Sustainable Development



**MERCATOR
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the European Union

OPERA Kick Off Meeting

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

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*Justin Ahanhanzo, Initiator, Promoter and Founding Coordinator, GOOS-AFRICA
Ex-(retired) IOC-UNESCO Regional Liaison Officer for Latina America and the Caribbean, Asia & Pacific,
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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 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 (IPO), 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 - 1st column)

GOOS is also becoming well-linked with related initiatives such as the Global Climate Observing System (GCOS) and the Integrated Global Observing Strategy (IGOS). It has been drawn into the Convention for Climate Change, and is being made to link it organizationally with developments in the relevant UN agencies (UNEP, WMO and FAO, as well as UNESCO).

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The regional observational needs of GOOS are likely to be met more quickly because the regional systems built on sub-systems already in place. The IOC and the WMO either separately or in concert, particularly for weather, climate and sea-level observations and forecasts. However the regional systems of GOOS are less mature and will need more time to be fully operational. The interest of the regional systems for potential users for whom the merits of the GOOS framework have yet to be demonstrated.

It is now envisaged that the GOOS modules dealing with the management of coastal resources, the Ocean and Coastal Resources will soon be operational. 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 implementation of GOOS began in July 1998 with the creation of the Project Office in Paris.

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 Rome 12-13 November 1999. The workshop is taking off...

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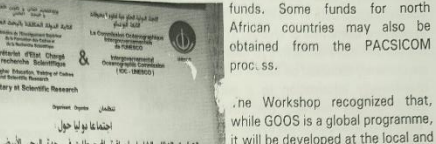
During the EuroGOOS Conference in Rome, a session on MedGOOS development was held on March 12, and a Memorandum of Understanding (MoU) was signed between the institutions forming the MedGOOS Association to implement operational oceanography in the region (see article in GOOS News No. 8).

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 a series of such workshops, 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. The workshop was closed by the Secretary of State for Education and Scientific Research of Morocco.

The meeting was organized in three parts:
- plenary lectures on GOOS and related 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. The EuroGOOS Steering Committee 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 MedGOOS, 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. It was held at the Institut National de la Mer et du Littoral (INMEL) in Rabat, Morocco. The workshop was closed by the Secretary of State for Education and Scientific Research of Morocco.

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MedGOOS Meeting, Rabat, November 1999

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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 attended 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. She was a post-doctoral fellow working in the Laboratoire d'Océanographie Dynamique et de Climatologie, Université Pierre et Marie Curie, where her research focussed on upper ocean CO2 and air-sea gas exchange processes. She has had 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 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.

NEAR-GOOS BENEFIT JOINT PIRATA-VII CLIVAR Atlas JGOFES CO2 CLIVAR SSG Coastal GOOS JCOMM Sec 3rd session LMR Panel-IV Earthwatch GDAE-IV M GLOBEC SSG HOTO-V (sub-Implementa G3OS Spon IOCARIBE G MARCUBA OOPC-V Me

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

PacificGOOS BENEFIT Joint PIRATA-VII CLIVAR Atlas JGOFES CO2 CLIVAR SSG Coastal GOOS JCOMM Sec 3rd session LMR Panel-IV Earthwatch GDAE-IV M GLOBEC SSG HOTO-V (sub-Implementa G3OS Spon IOCARIBE G MARCUBA OOPC-V Me

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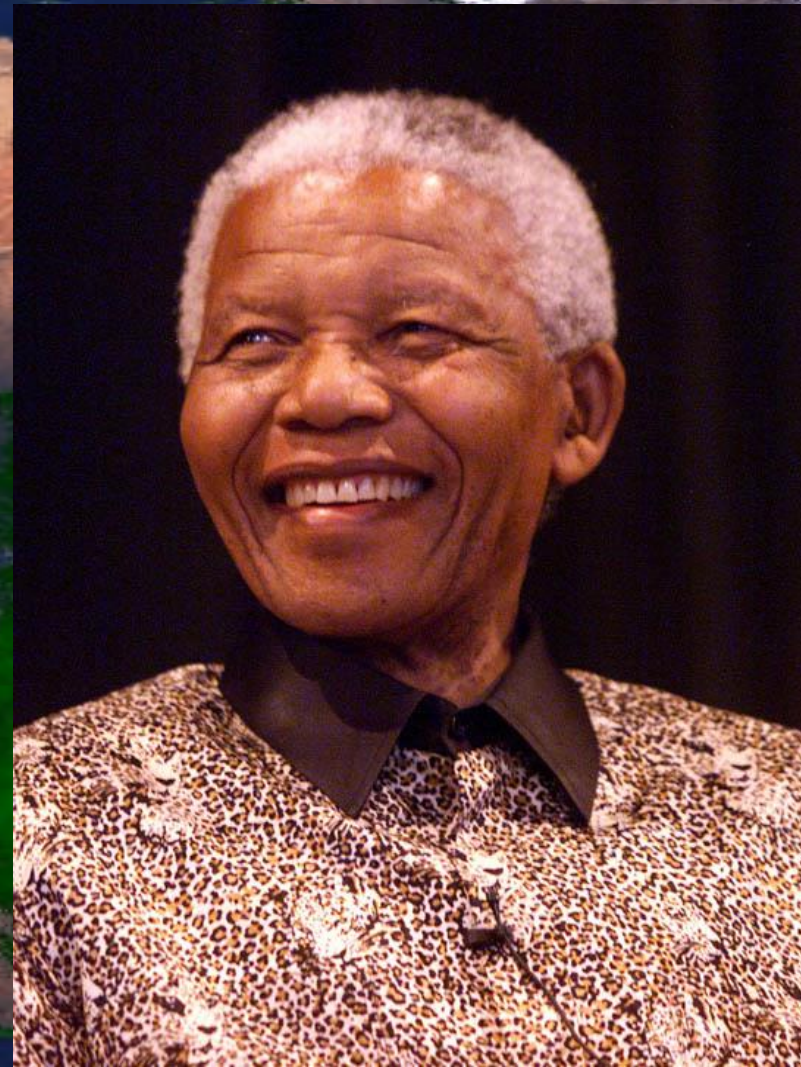
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DBCP-XVI JTA-XX WOCE SSG Ocean Obs SEA-GOOS HOTO/GIP

**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

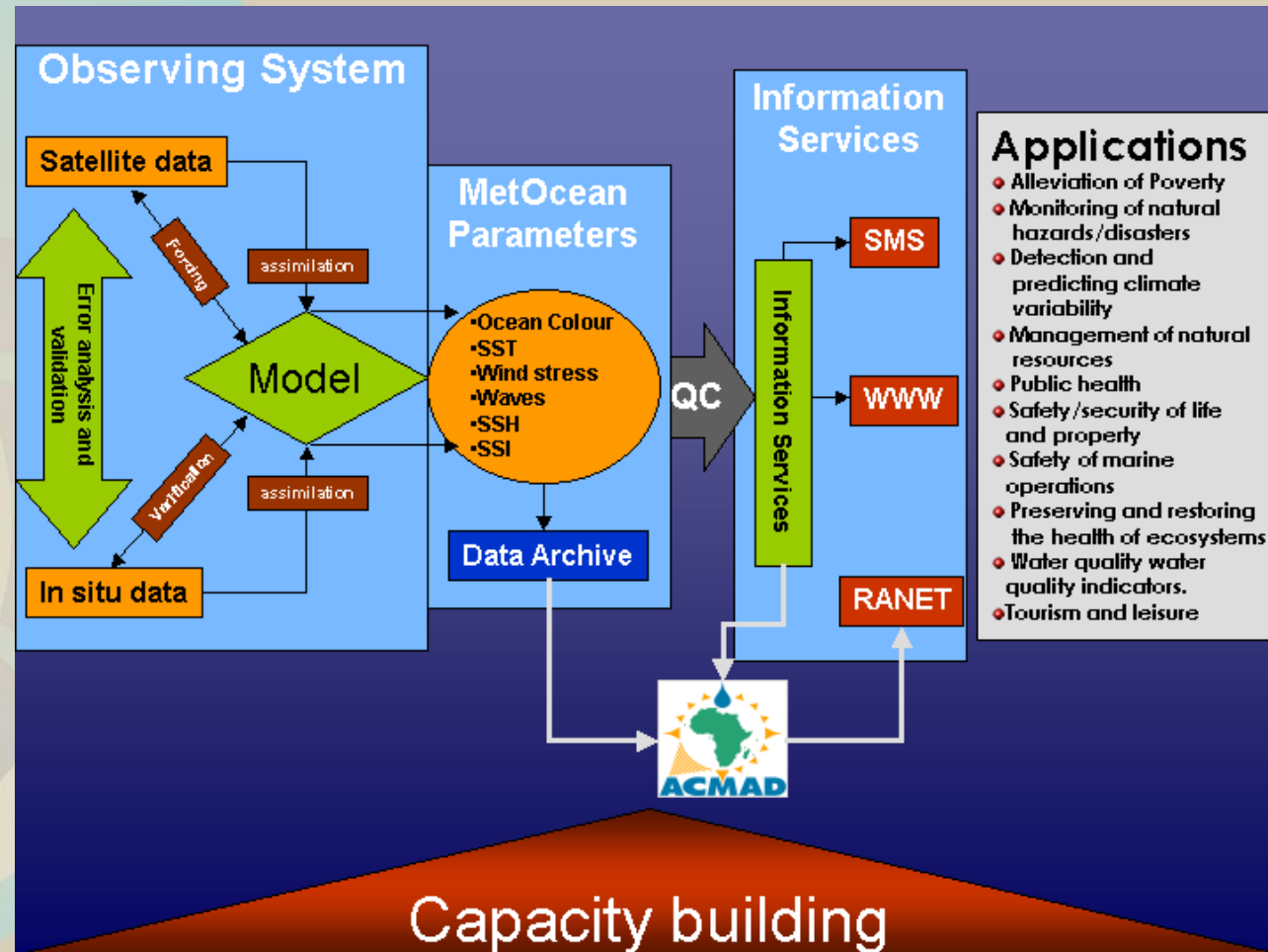


OUR RESOLUTION TOWARDS ACHIEVING

- **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

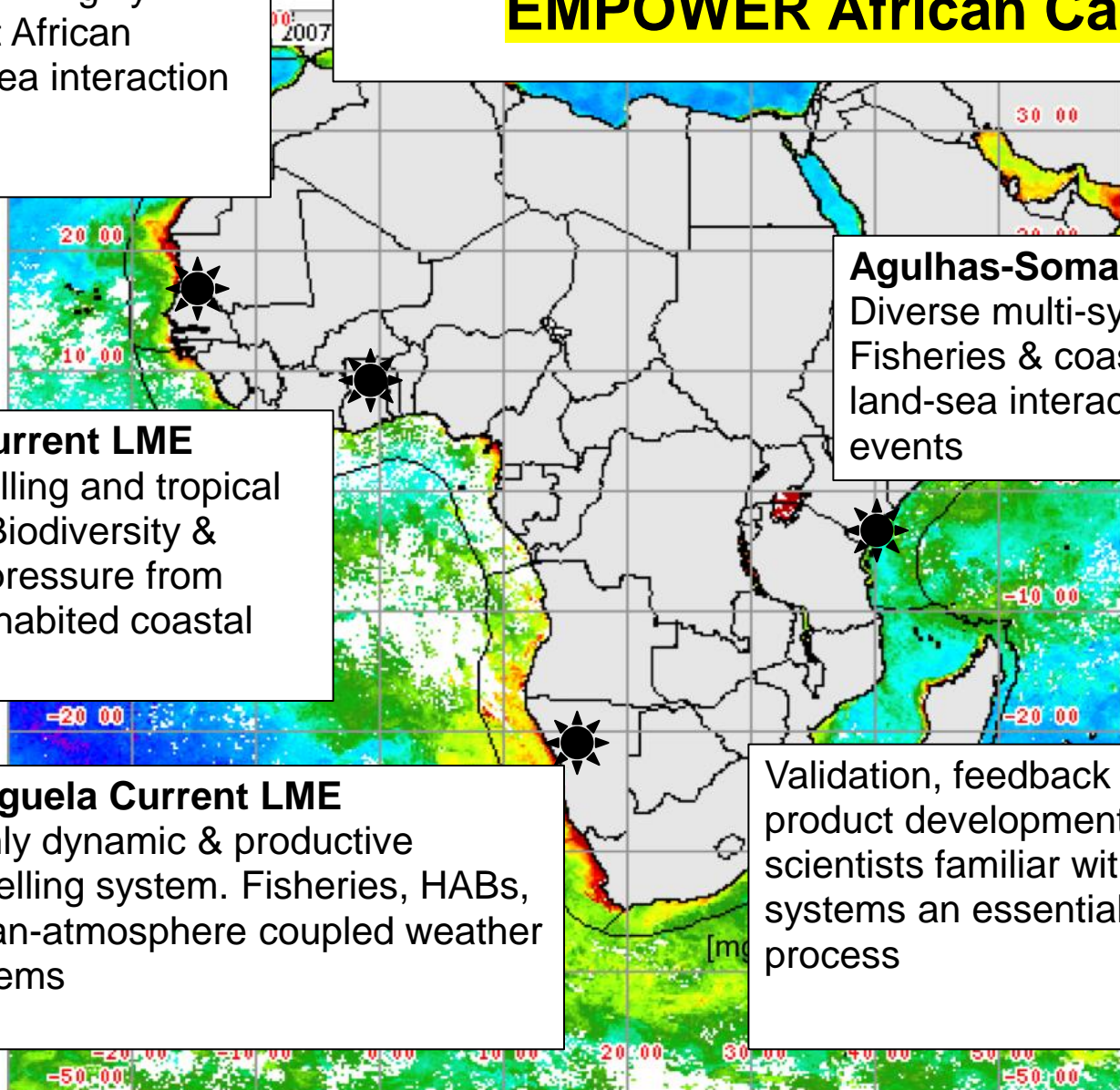




Canary Current LME

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.

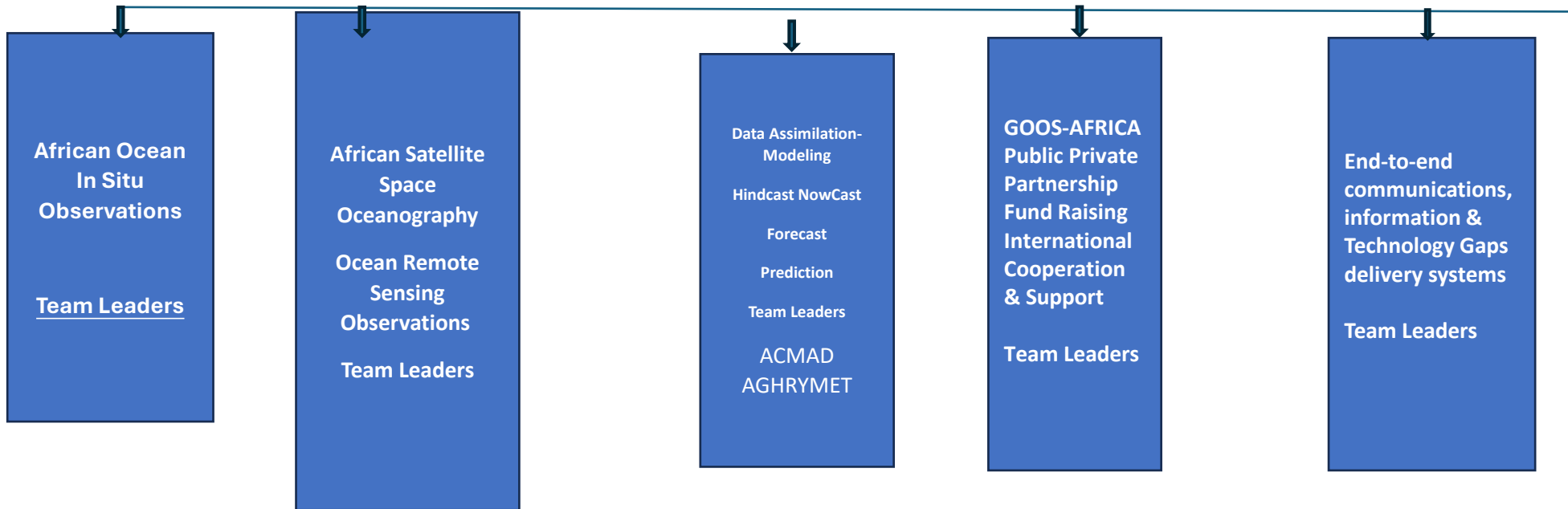
3-Go towards to the Operational Sustainability of the Sub-Commission.

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**



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







INTERNATIONAL CHAIR IN MATHEMATICAL PHYSICS AND APPLICATIONS (ICMPA)
UNESCO CHAIR IN MATHEMATICAL PHYSICS AND APPLICATIONS
 established in 2006 at the University of Abomey-Calavi (Republic of Benin)

UNITWIN/UNESCO Chairs – Twinning networks and university networks University of Abomey-Calavi

**MULTI-UNIVERSITY MASTER'S DEGREE AND DOCTORAL TRAINING PROGRAMME
 IN
 PHYSICAL OCEANOGRAPHY AND APPLICATIONS**

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:

<p>Intergovernmental Oceanographic Commission of UNESCO (IOC/UNESCO)</p> <p>Mr. Justin Abiodun Coordinator and Team Leader, Intergovernmental Oceanographic Commission of UNESCO (IOC/UNESCO) UNESCO, 1 Rue de la Libération, 75732 Paris Cedex 15, France Tel: +33 1 47 06 86 41 Fax: +33 1 47 06 86 10/12/13 E-mail: j.abiodun@unesco.org http://ioc.unesco.org</p>	<p>Paul Sabatier University (France)</p> <p>Prof. N. Hall Laboratoire d'Etudes en Géophysique et Cosmographie Spatiales LESOS/CNRS, 81 Avenue Edouard Belin, 31061 Toulouse cedex 9, France Tel: +33 5 64 53 29 19 Fax: +33 5 64 23 32 05 Email: Nick.Hall@nspn.ohsemp.fr</p>	<p>University of Abomey-Calavi (Benin)</p> <p>Prof. M. N. Houkama 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 56 89 Fax: +229 21 33 31 28 E-mail: mnhort.houkama@icmpa.net or houkama@uabon.edu.bj</p>	<p>Institut de Recherche pour le Développement (France)</p> <p>Dr. B. Bourlès Laboratoire d'Etudes en Géophysique et Cosmographie Spatiales (LEOS/CNRS) Centre de Recherche Halieutique et Cosmologique de Benin (CRH/CNRS) Représentation IRD de Cotonou, 08 801 841 Cotonou, Republic of Benin Tel: +229 21 30 03 84 +229 90 08 84 56 Fax: +229 21 30 08 60 E-mail: bernard.bourles@ird.fr</p>
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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



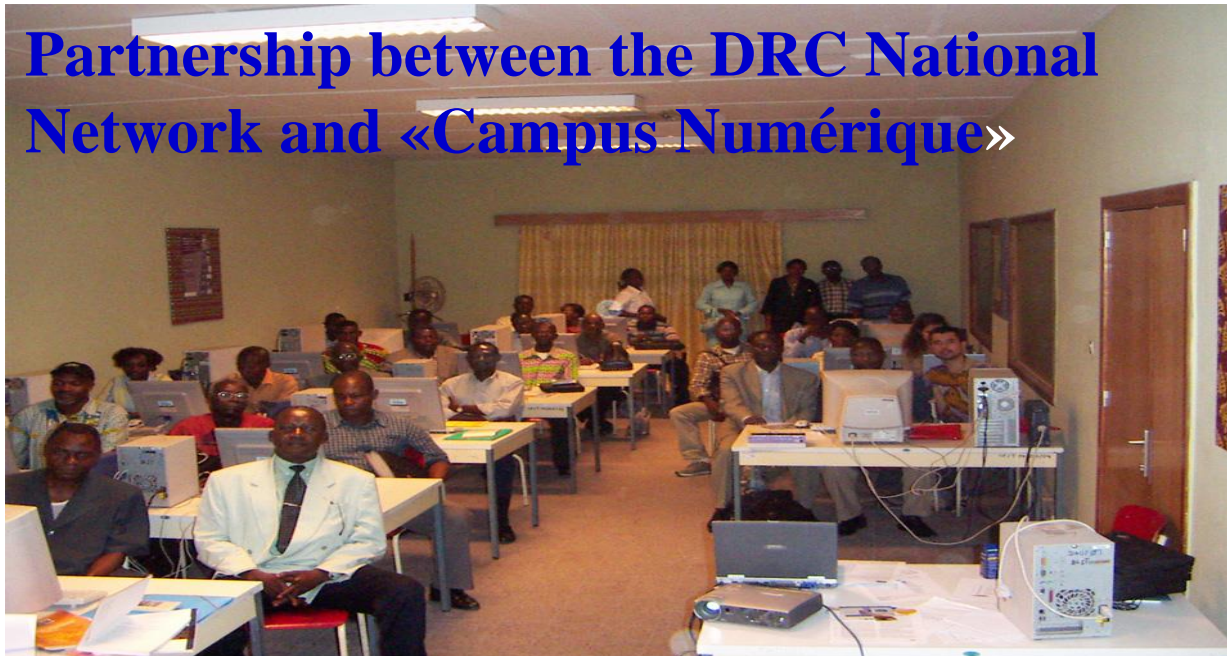


• **The African Marine Atlas Team**

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

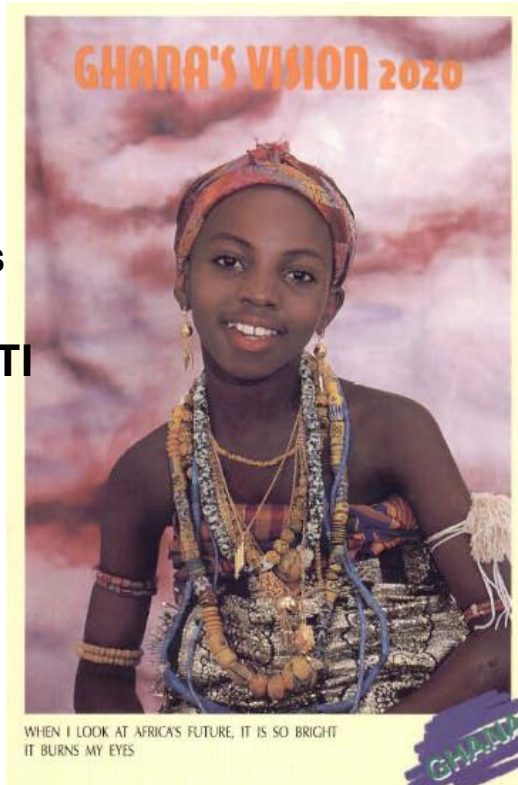
4- Sustained investment in research facilities and innovation

- 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

