

Developing regional ocean observing services for local priorities, as a contribution to the Global Ocean Observing System (GOOS)



Measuring current direction and speed – La Sagesse Beach, Grenada

Geographical scope/benefitting country(ies):	Global
Duration (in months):	24 months 48 months
Name and unit of project officer	Albert Fischer, SC/IOC/OOS
Partner(s) institutions:	World Meteorological Organization, UNEP, ICSU
Total estimated budget inclusive of Programme Support costs	US \$750,000 24 months US \$1,500,000 48 months

Rationale and background

What is the project aiming to achieve?

The goal of the Global Ocean Observing System (GOOS) is delivery of actionable services for marine management and sustainable ocean ecosystems and economies. Delivery of marine services of local relevance in developing countries is a difficult challenge. These require ocean observations, data management tools and finally services using the data, which must be designed and implemented according to local needs and priorities. Many developing countries do not have the capacity to complete all of these tasks.

A relatively small number of developed countries have created a global infrastructure of observations, data management systems, and large-scale ocean products and forecasts, as a part of GOOS—many of which can be applied at the local level.

This project seeks to bridge the gap between the global infrastructures of GOOS and the local delivery of relevant services, entraining more IOC Member States into contributing to and benefiting from GOOS.

The GOOS Regional Alliances (GRAs) also address this challenge by identifying shared needs on a regional basis and implementing appropriate systems of services. The GRAs play an essential role of connecting developed and developing countries in the region to every nation's benefit. This project also seeks to develop regional ocean observing services for local priorities by organizing and encouraging GRA activities.

Why is this project needed?

The Global Ocean Observing System (GOOS) is coordinating IOC Member State and partners' activities in creating a global collaborative system of sustained ocean observations. Support of the international scientists, researchers and marine managers who volunteer their time to build and coordinate GOOS is essential to maximize the impact of GOOS observations, data and services. GOOS works closely with the relevant communities to ensure the outputs of the observing system are fit-for-purpose, and to evaluate whether the system as a whole is meeting requirements.

GRAs are essential to development of GOOS services which satisfy national and regional needs. The GRAs facilitate sustained ocean observing, data management, modelling and services that meet regional and national priorities by delivering an integrated and sustained system linking, enhancing and supplementing existing infrastructure and expertise in the region. GRAs are not distinctly open ocean or coastally focused but respond to the needs of national and regional efforts they represent. The nature of the GRAs is well-suited to accelerate the integration and expansion of observations and modelling from global to local scales. GRAs are capable of identifying observing system gaps and proposing strategies to fill those gaps.

This project will realize the potential of GRAs to help design and motivate the development of ocean services by supporting GRA activities through coordination and planning activities.

The project will speed delivery of ocean observing services to developing countries by strengthening the GRA system and enabling GRA activities. GRA activities will promote development of regional capacity:

- Through sharing of experience, success stories, best practices,
- By seeking sources of national and international financing, as part of end to end systems, developing win-win partnerships for technology transfer, working with existing GOOS, JCOMM, and IODE capacity-building programmes, and
- Increasing human capacity through: scholarships, exchanges, technical skills workshops, programmes/workshops to develop leadership and grant-writing skills.

Encourage the development of regional and national ocean observing systems by:

- Promoting the visibility, value and recognition of the services provided by ocean observing systems with governmental agencies and private companies and encourage integration at national, regional and global levels,
- Advancing the scientific and technological developments upon which services depend,
- Identifying gaps at regional and national level for ocean observations; and
- Encouraging and coordinating participation in international initiatives considered of interest by the GRA.

As a specific initial step, the project will also focus on the use of available global ocean analysis and forecast products applied to local societal challenges. This builds on experience in GOOS, the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM), IOCAFRICA, and IODE in running training courses the development of services from operational ocean products. The major objective in these training courses is to develop local capacity to deliver locally-relevant services. Developing a local audience for actionable ocean information develops local advocacy for oceanography and ocean observations, and a basis to develop core capacity to take local observations to improve the global products for local application.

Why UNESCO ?

IOC is the lead agency amongst the sponsors of the Global Ocean Observing System (GOOS), including the World Meteorological Organization (WMO), the United Nations Environment Programme (UNEP) and the International Council for Science (ICSU). Through its involvement in GOOS, the IOC has strong links with the Member State organizations and experts that are implementing the global infrastructure of systematic sustained ocean observations and services. In its mandate and as a part of GOOS principles, IOC has a focus on developing capacity so that all of its Member States can participate in its programmes.

GOOS Regional Alliances were first proposed nearly twenty years ago to assure that regional goals for GOOS were articulated and would influence the development of the global GOOS programmes. Today GRAs exist in all regions of the earth providing an organizing force to catalyse GOOS achievements for capacity development and provide avenues for technology transfer. Each GRA attempts to deliver an integrated and sustained system by linking, enhancing and supplementing existing infrastructure and expertise in the region to address their own needs:

- BlackSea GOOS: Coordinating observations of the Black Sea to understand the changing ecosystem.
- EuroGOOS: Taking the lead in organizing delivery of operational marine services in Europe.
- GOOS for Africa: Development of ocean services for the growing economies of Africa have been hampered by a lack of resources or coordination.
- GRASP: GRA for South East Pacific is greatly concerned by the El Niño - La Niña phenomena of the equatorial Pacific
- IOCARIBE: IOC's Caribbean SubCommission loosely organizes developing countries where fishing and tourism economies are disrupted by tropical storms and resource exploitation.
- IOGOOS: Indian Ocean institutes are expanding open ocean buoy arrays and coastal stations to study Monsoons and develop early warning systems for Tsunamis and coastal hazards.
- MONGOOS: Providing safety and pollution services for Mediterranean countries.
- NEARGOOS: North Eastern Asia countries share their marine data services.
- OCEATLAN: Countries of South East coast of South America monitor and investigate the oceanic processes in the Upper Southwest and Tropical Atlantic.
- PIGOOS: Pacific Island nations struggle with a lack of resources needed to understand the effects of climate change on their maritime nations.
- SEAGOOS: The growing Southeast Asia economies are heavily dependent on marine activities which can be greatly impacted by Asia Monsoon and its variability.

- U.S. IOOS: An impressive national programme has greatly supported GOOS and can be used to provide experience and resources to developing GRAs.

The observing, data management, and services capacities of the GOOS Regional Alliances have been catalogued in 2013¹. Donors will help shape priority regions, but of note are some defining characteristics of the existing infrastructure in regions where this approach may be fruitful:

- PIGOOS: Capacity is limited by the availability of personnel, with many small island states of small population,. These populations are very exposed to the ocean, and in particular to issues around sea level.
- IOCAFRICA: a large region with highly heterogeneous capacity. Capacity for innovation often lies in academic rather than service-oriented institutions. A similar project is being piloted in 2014 and will result in lessons learned.
- IOCARIBE-GOOS: a mix of Member States in this region with territories of developed countries and small island developing states provides rich potential for sharing of expertise within the region.
- SEAGOOS benefits from a strong regional GOOS organization and support from the WESTPAC secretariat.

This project builds on the experience of IOC/UNESCO in developing the GOOS, the GRAs and the IOC Sub Commissions (IOCARIBE, IOC Africa, WESTPAC) to mobilize resources and expertise at regional levels for developing countries. There is great potential in this network of regional programmes to further capacity development in the regions through coordination and sharing of resources and experience.

¹ Document GRF-VI-Doc-5, http://ioc-goos.org/index.php?option=com_oe&task=viewDocumentRecord&docID=10513

Overall Goal/Objective

The objective of the project is to enhance Member States capability to make science-supported decisions about a series of societal challenges (climate variability and change, marine and coastal hazards, ocean acidification, ecosystem services), through technical workshops, the development of local ocean information services, and participation in designing a coordinated and enhanced ocean observing system and data exchange standards.

- Strengthen the GOOS Member States by building capacity to participate in GOOS observation programmes and benefit Member State scientists and the marine management communities by increasing their access to ocean observation services.
- Improved Member State capacity to address societal challenges (coastal hazards, safety of life and property at sea, management of ocean resources) with better use of ocean observations and forecasts
- Improved Member State capacity to take local ocean observations for local and global use as a contribution to GOOS.
- Improve development of national programmes for operational oceanography within Member States by demonstration of value of ocean services delivered through GRA activities.

Main expected results

Expected Result 1

Improve Member State participation in GOOS and benefit from GOOS services through the implementation of locally-actionable information streams from ocean data.

Activities and outputs/deliverables relating to the achievement of expected results

What are the key activities to be carried out in order to produce the expected results?

Support is needed to fund planning meetings and training courses, providing start-up support for activities developing local use of global ocean services and data streams, adapted to local users and priorities. Success will be achieved by technology and expertise transfer from developed countries and more advanced GRAs to the developing countries and GRAs. Uptake of technologies should demonstrate to all nations the value of marine services and the positive benefit accrued by supporting GOOS activities.

In particular coordinating meetings and activities will enhance:

- Strategic planning and defined requirements for an ocean observing system responding to regional stakeholder needs, including summaries for policymakers
- Establishment of strengthening of regional coordination mechanisms that contribute to the global system
- Mutual assistance in coastal ocean observing techniques
- Support is needed to further the development of GOOS capacity development goals through activities organized by and for the GRAs. Key activities are:
- Strengthen governance structure of GRAs. Several GRAs are essentially ineffective due to lack of resources for even the most fundamental of organizing activities. The expertise and enthusiasm exists in these regions, but collaborative projects are not developed due to a lack of organizational capacity.
- Improve engagement within the regional scientific community and stakeholder communities to ensure that national priorities are engaged in global ocean observations. Support is needed to assure that GRAs are represented well within the international science community.

- Improving participation of experts and scientists from developing countries in GOOS and JCOMM workshops and GOOS Steering Committee and Panel activities is essential to improving capacity to take advantage of advances in marine science and observation technologies for local marine management decision making.

Activity 1 – expected result 1
<p>Output/deliverable 1.1 Improved Member State Capacity to:</p> <ul style="list-style-type: none"> ▪ Utilize ocean forecast systems for local needs. ▪ Make science-supported decisions for sustainable ocean services ▪ Address societal challenges (coastal hazards, safety of life and property at sea, management of ocean resources) with better use of ocean observations and forecasts
<p>Output/deliverable 1.2 Improved GRA Capacity to:</p> <ul style="list-style-type: none"> ▪ Organize GRA development of ocean services. ▪ Take local ocean observations for local and global use as a contribution to GOOS.

Beneficiaries and stakeholders

- IOC Member States engaged in global and basin-scale observations, including traditional and emerging ocean science communities
- GOOS Regional Alliances and partnership arrangements
- Environmental and marine management agencies
- Local coastal decision makers
- Relevant science and operational institutions
- Nations acting on UN mandates for science based decisions such as UNFCCC, CBD, Law of the Sea.

Needs are regularly assessed and articulated by the GRA directors who report via the GOOS Steering Committee to the IOC Assembly of 146 Member States, which ultimately decides IOC and GOOS work programs.

Implementation strategy

The GRAs are the best judges of regional needs and requirements for the GOOS observation programmes. Ultimately the GRA process is a volunteer programme comprised of active scientists and marine decision makers in their regions. They are the decision makers and researchers who influence funding decisions for GOOS on the National level. By providing a forum to encourage and strengthen the arguments for GOOS and marine services, the planning process at the National level can build toward the GOOS vision of a greater ocean observation and services system made up of the efforts of many nations.

Convening the GRAs, exchanging expertise and building professional networks is the best strategy to develop programs of technology transfer from which improved marine services will come.

Sustainability and exit strategy

The Global Ocean Observing System will be sustained by recognized value of its services. The GRAs are adding to the GOOS' well established role in climate services, by developing regional services, which support local and municipal marine management officers in activities that have previously only been defined by National interests. By advancing the global GOOS

perspective for these types of operational oceanography services the GRAs are improving Member State capacity to manage their coasts and regional seas.