

3 INFORMATION FOR SOCIETAL BENEFITS

SB-01 Oceans and Society: Blue Planet

Task implementation is supported by the Coastal Zone Community of Practice and Ocean Community of Practice

Related GEOSS Strategic Targets (from *GEO-VI Document 12 Rev1*)

Climate: Improved scientific understanding, modelling and prediction of climate. Accessibility of all the observational data needed for climate monitoring and services in support of adaptation to climate variability and change. Availability of all Essential Climate Variables needed by the WCRP, the IPCC and the UNFCCC.

Ecosystems: Increased operational monitoring of major marine and coastal ecosystems on an annual basis including properties such as extent, water temperature, salinity, pH and pCO₂, phytoplankton species composition and productivity and marine resource stocks, based on remote sensing and sampled in-situ observations using internationally agreed standards.

Agriculture: Improved collaboration and coordination on the use and applications of Earth observations for fisheries and aquaculture.

Biodiversity: Increased routine collection of long term in-situ and remotely sensed biodiversity observations. Increased information sharing on biodiversity conservation and sustainable use of biodiversity resources. Increased availability of biodiversity information necessary to respond to and support related topics (ecosystems, health, climate, etc).

Description

Provide sustained ocean observations and information to underpin the development, and assess the efficacy, of global-change adaptation measures (such as those related to vulnerability and impacts of sea-level rise). Improve the global coverage and data accuracy of coastal and open-ocean observing systems (remote-sensing and in-situ). Coordinate and promote the gathering, processing, and analysis of ocean observations. Develop a global operational ocean forecasting network. Establish a global ocean information system by making observations and information, generated on a routine basis, available through the GEOSS Common Infrastructure. Provide advanced training in ocean observations, especially for developing countries. Raise awareness of biodiversity issues in the ocean.

Components

C1 Global Ocean Information Coordination and Access

Leads

EC (GMES), Germany (Bremen University), CEOS, GOOS, IOC (a.fischer@unesco.org), IEEE, POGO

Priority Actions

- Promote the implementation of the Global Ocean Observing System (GOOS), a scientifically designed international system for gathering, processing, and analyzing ocean observations, and distributing data products
- Support and provide access to GOOS products which describe the state of the ocean globally at regular intervals. In particular, develop access to GOOS Essential Ocean Variables datasets through the GEOSS Common Infrastructure building upon the GEOWOW project

- Continue to establish data management and communications systems (e.g. Regional Alliances) for interoperability among monitoring systems and data integration. Promote the development of internationally- and intergovernmentally-agreed coastal ocean observation standards, data sharing, and data management arrangements
- Establish a Global Ocean Information System (GOIS), building on existing capabilities such as GMES MyOcean and forging close links between data providers (in situ and satellite-based) which already have effective monitoring, forecasting, and other information tools available, and potential users
- Promote activities of the International Ocean Colour Coordinating Group (IOCCG) and applications of remotely-sensed ocean-colour data through coordination, training, liaison between providers and users, advocacy and provision of expert advice. Coordinate with CEOS climate activity plans to optimize its marine elements
- Develop vulnerability and integrated management of coastal zones in order to inventory, protect, and monitor coastal lands in the context of climate change and associated risk. Form links with disaster management activities (see also DI-01)
- Provide advanced training in ocean observations and services, especially for personnel from developing countries and economies in transition, through a series of fellowship schemes, pilot projects (e.g. MARINEMET, EAMNet) and a Centre of Excellence

C2 Operational Systems for Monitoring of Marine and Coastal Ecosystems

Leads

Canada (Dalhousie University, tplatt@dal.ca), Estonia (University of Tartu), UK (PML), USA (NOAA, WHOI), CEOS, GOOS, IEEE

Priority Actions

- Support the implementation of OceanSITES, a worldwide system of deepwater time-series stations, featuring capabilities such as surface moorings (observing air-sea interactions), and subsurface moorings (that can carry instrumentation down to the sea floor). OceanSITES complement satellite imagery and Argo float data by adding dimensions of time and depth
- Promote rapid development of a global high frequency radar network to measure coastal surface currents. High frequency radar is recognized as a cost-effective solution to augment in-situ measurements and provide increased spatial and temporal resolution
- Establish a global coastal network of observations and modeling that target sentinel and reference sites for rapid detection of changes in ecosystem states caused by land-based sources of pollution, fishing and climate change
- Promote the Chlorophyll Global Integrated Network (ChloroGIN) project which coordinates in-situ measurement of chlorophyll and related bio-optical properties of the ocean, in combination with satellite derived estimates of the same. ChloroGIN is a network of regional networks
- Develop and expand global plankton biodiversity monitoring, building upon 80 years of phytoplankton and zooplankton biodiversity data obtained in the North Atlantic by means of the “Continuous Plankton Recorder” survey (see also BI-01)
- Support the development of the “International Quiet Ocean Experiment” to quantify global ocean sound (natural/anthropogenic) and measure the effects of changing sound exposure on marine life. Implement essential acoustical applications within existing ocean observing systems (e.g. GOOS)
- Fully engage with the four ocean-related CEOS Virtual Constellations: Ocean Surface Vector Wind, Ocean Surface Topography, Ocean Colour Radiometry, and Sea Surface Temperature (see also IN-01)

C3 A Global Operational Ocean Forecasting Network

Leads

Denmark (DMI), EC (GMES), UK (MetOffice, mike.bell@metoffice.gov.uk), IOC/WMO (JCOMM), POGO

Priority Actions

- Support the continuation of the GODAE OceanView international programme for the consolidation and improvement of global and regional ocean forecasting systems, including development and scientific testing of the next generation of systems extending from open-ocean into shelf-seas and coastal waters, covering biogeochemistry and ecosystems, and using multi-model ensemble forecasting techniques
- Build upon forecasting systems, information and services developed in the framework of the GMES projects MyOcean and MyOceanII
- Establish a global operational oceanography network, connecting advanced operational forecasting centres in developed countries and quasi-operational centers in Asia, Africa and Latin America. Promote and extend international collaboration, and establish regional cooperation projects between advanced and less-developed operational centers
- Support assessment of observing system impact on ocean forecasting for the various components of the international ocean observation system
- Support events which provide a platform for communication and collaboration between national ocean forecasting systems to allow wide exchange of knowledge and expertise. Promote initiatives aiming to exploit operational ocean forecasting services for greater societal benefit

C4 Applications of Earth Observations and Information to Sustainable Fishery and Aquaculture Management

Leads

Canada (CSA, Dalhousie University, shubha@dal.ca), Estonia (University of Tartu), Nigeria (NASRDA), UK (PML), FAO

Priority Actions

- Facilitate the application of rapidly-evolving satellite technology to fish harvesting and fish health assessment. Accelerate the assimilation of Earth observation into fisheries research and ecosystem-based fisheries management on a global scale, through international coordination and outreach. Support the development of the Societal Applications in Fisheries and Aquaculture using Remotely-Sensed Imagery (SAFARI) project
- Design and implement a suite of ecological indicators with a view to detecting changes in ocean ecosystems (e.g. due to climate change, overfishing). Design and implement indicators responsive to seasonal and interannual changes in ocean ecosystems (see also EC-01)

To Be Implemented in Connection with

DI-01 Informing Risk Management and Disaster Reduction

CL-01 Climate Information for Adaptation

CL-02 Global Carbon Observation

EC-01 Global Ecosystem Monitoring

BI-01 Global Biodiversity Observation (GEO BON)

All “Infrastructure” and “Institutions and Development” Tasks

Resources Available for Implementation (tentative and preliminary)

- European FP7 project “GEOSS interoperability for Weather, Ocean and Water, GEOWOW” (Ocean Component, 2011-2014); GMES marine services (MyOceanII)
- IOC regular annual budget support for GOOS
- Multilateral member states implementation of GOOS
- USA (NOAA) annual funding for the climate module of GOOS
- Open Ocean Module of the Global Environmental Facility - Transboundary Water Assessment Program (GEF-TWAP) (2012-2015)