

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 of coastal zones, sea-level rise, and ocean acidification). 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 Sustained Ocean Observations and Information

Leads

EC (JRC), Germany (Univ. Bremen), Spain (CSIC), CEOS (NOAA) and IOC (a.fischer@unesco.org)

Priority Actions

- Develop the IOC-WMO-UNEP-ICSU Global Ocean Observing System (GOOS) as a voluntary collaborative system based on the Framework for Ocean Observing and building on existing efforts and in partnership with other organizations such as POGO and GCOS
- Sustain and develop global ocean observations for climate, weather, and ocean forecasting based on national/international contributions adhering to GEOSS Best Practices, Standards, and Data Sharing Principles

- Promote cooperation of space agencies in measuring essential ocean variables through the CEOS Virtual Constellations for Sea Surface Temperature, Ocean Surface Topography, Ocean Surface Vector Wind, and Ocean Colour Radiometry
- Develop metrics for implementation targets and real-time tracking of the status of in-situ observing arrays (cooperative work of GOOS, JCOMM)
- Develop cooperation between governmental and non-governmental ocean data management initiatives (e.g. International Oceanographic Data and Information Exchange IODE, Ocean Biogeographic Information System OBIS, GOOS Regional Alliance data management, and Copernicus), and identify their contribution to the GEOSS Common Infrastructure
- Improve the coordination of climate and carbon activities for marine applications (with CL-01 and CL-02)

C2 Sustained Ecosystems and Food Security

Leads

Canada (POGO, tplatt@dal.ca), CEOS (NOAA) and IEEE

Priority Actions

- Assure sustainability and global coverage for both ChloroGIN (International network to assess the state of marine, coastal and inland-water ecosystems) and GACS (Global Alliance of Continuous Plankton Recorder Surveys). The longer-term aim would be to make both fully operational
- Advance the development of global monitoring services for mangroves, coral reefs, and estuaries: Assess user needs and observational requirements; support related observing networks (e.g. Global Coral Reef Monitoring Network); implement demonstrators for monitoring services; and assess status and trends based on these demonstrators
- Design and implement a suite of ecological indicators with a view to detecting changes in ocean ecosystems (e.g. due to climate change, overfishing)
- Develop applications of rapidly-evolving satellite technology to fish harvesting and fish health assessment. Accelerate the integration of Earth observation and information into fishery research and ecosystem-based fishery management on a global scale, through international coordination and outreach. Support the SAFARI project (Societal Applications in Fisheries and Aquaculture using Remotely-Sensed Imagery)

C3 Ocean Forecasting

Leads

United Kingdom (Met Office, mike.bell@metoffice.gov.uk)

Priority Actions

- Support the GODAE OceanView international programme for the consolidation and improvement of global and regional ocean forecasting systems, including (i) development and testing of the next generation of systems extending from open-ocean into shelf-seas and coastal waters, and covering biogeochemistry and ecosystems; and (ii) exploitation of this capability in applications such as weather forecasting, seasonal prediction, and climate change detection and its coastal impacts
- Build upon forecasting systems, information and services developed in the framework of the Copernicus 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 events which provide a platform for communication and collaboration among national ocean forecasting systems to foster exchange of knowledge and expertise. Promote initiatives aiming to exploit operational ocean forecasting services for greater societal benefit

C4 Services for the Coastal Zone

Leads

USA (NOAA) and IEEE (hpplag@odu.edu)

Priority Actions

- Develop a global coastal zone information system: a global cyber-infrastructure that will provide access to available information on coastal zones and facilitate the collection of new information through crowd-sourcing and citizen-science
- Implement a pilot project in an area-at-risk (e.g. Indonesian Archipelago-South China Sea domain) to demonstrate the added-value of ecosystem-based approaches for monitoring and managing the coastal zone. This will be coordinated with GOOS Regional Associations and global/regional networks (see Plan of the Panel for Integrated Coastal Observations)
- Assess climate change impact on the coasts of the Caribbean islands as a demonstrator for the application of space-based observations. Fully engage with CEOS with regard to data needs
- Assess user needs and observational requirements for coastal water quality (using the GEOSS User Requirements Registry); identify indicators and best practices for coastal water quality, and implement a monitoring service pilot for coastal water quality (with WA-01 and HE-01); disseminate information particularly to under-served communities (with IN-04)

C5 Developing Capacity and Social Awareness

Leads

Canada (POGO, tplatt@dal.ca) and USA (NOAA)

Priority Actions

- Maintain, develop and expand capacity-building in the field of ocean observations and information, building on activities of international bodies such as IOC, SCOR, and POGO
- Exchange scientific knowledge and educate expert communities on the global status of ocean acidification through the means of workshops and seminars in under-resourced regions, including making effective use of internet tools and virtual conference capabilities as a matter of good practice for reducing the footprint of carbon dioxide. Through these workshops, scientific capacity will enable local communities to monitor impacts of ocean acidification on their local marine resources
- Promote the use of applications derived from initiatives such as the Chlorophyll Globally Integrated Network (ChloroGIN) and Societal Applications in Fisheries and Aquaculture using Remotely-sensed Imagery (SAFARI)
- Develop social awareness through the production of ocean-related videos aimed at the general public, with a longer-term goal of facilitating information transfer from observing systems into decision-making functions

To Be Implemented in Connection with

DI-01 Informing Risk Management and Disaster Reduction
HE-01 Tools and Information for Health Decision-Making
HE-02 Tracking Pollutants
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

- European FP7 project “GEOSS interoperability for Weather, Ocean and Water, GEOWOW” (Ocean Component, 2011-2014); Copernicus marine services (MyOcean II)
- Canadian (CSA) Project FARO (Fisheries Applications of Remotely Sensed Ocean Colour)
- Contributions from ChloroGIN Network members in Asia, the Americas, Europe and Africa
- Support for the Global Ocean Acidification Observing Network (GOA-ON) from the USA (NOAA), UK (UK Ocean Acidification Programme), IOC, GOOS, International Ocean Carbon Coordination Project, and International Coordination Center for Ocean Acidification
- 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)
- IOC-IHO General Bathymetric Chart of the Ocean (GEBCO) programme (www.gebco.net)
- CEOS Virtual Constellations (Ocean Surface Topography, Ocean Color Radiometry, Ocean Surface Vector Wind, Sea Surface Temperature)

SB-02 Global Land Cover

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

Data Management: Preparation of and access to, among Member and Participating Organization communities, global and regional information encompassing cross-cutting data sets such as land-cover and land use information

Climate: Availability of all Essential Climate Variables needed by the WCRP, the IPCC and the UNFCCC

Ecosystems: Increased operational monitoring of major ecosystems on land on an annual basis, including properties such as land-cover type

Agriculture: Improved collaboration and coordination on the use and applications of Earth observations for land-cover mapping.

Description

Provide a suite of global land-cover and land-cover change datasets, based on improved and validated moderate resolution land-cover maps. Develop <50m global land-cover and land-cover change data sets, based on international community consensus and including a robust accuracy assessment. Improve the use of time-series products to characterize the nature and extent of land-cover change and dynamics.

Components

C1 Global Land Cover Datasets and Service

Leads

China (NSDI, chenjun@nsdi.gov.cn), Canada (Ryerson University), Spain (IGN, Spain), USA (USGS), ESA

Priority Actions

- Address operational issues related to global land cover/change, including data processing, product generation, updating, and service; with special emphasis on the use of fine resolution data
- Develop a global moderate-resolution (<50m) land-cover monitoring system. Focus on the delivery of: (i) a global geospatial database of land-cover types and associated attributes; (ii) frequent (up to annual) updating of the database by capturing land conversions and ecosystem disturbances; (iii) periodic global land-cover maps, statistics, and analyses; and (iv) land-cover products at the global scale (e.g. assessments of carbon storage or habitat conditions)
- Enhance, and continue to provide access to, historical land-cover relevant imagery and global high-resolution coverage obtained through international acquisitions coordination. Support retrospective processing of historical satellite data archives for land-cover mapping and change analyses (e.g. GLOBCOVER and MODIS land-cover)
- Build international consensus and generate products driven by requirements for land-cover as an Essential Climate Variable. Ensure coordinated operations of existing and new moderate resolution (<50m) satellites for land-cover mapping and monitoring, in particular the European Copernicus Sentinels, US Landsat, and China's resource satellites
- Design a web portal connecting all major global land cover websites to (i) form a single access point and (ii) coordinate and facilitate data sharing (images, samples, etc.) and accuracy assessment of products (in collaboration with C3)