GROUP ON EARTH OBSERVATIONS

GEO's proposed contribution to the Decade of Ocean Science for Sustainable Development

(Preliminary Inputs – November 2019)

1. What are the knowledge gaps/ scientific questions/ priority areas that should be addressed in order to achieve the specific Decade outcome?

A clean Ocean

- Implementation of an operational integrated marine debris observing system
- Monitor and identify sources of land-based pollution
- Implementation of a virtual marine pollution tracking system that includes quantification of the type of pollutants

A healthy and resilient Ocean

- Implement the agreed 10-yr plan to coordinate networks collecting marine biological monitoring data relevant to Essential Biological Variables (EBVs) through the biological and other Essential Ocean Variables (EOVs) and Essential Climate Variables (ECVs)
- Synthesize information and guide applications for sustainable development of ocean spaces and wise conservation of marine resources
- Strengthen regional observing networks to ensure timely delivery of information on ocean health and potential hazards
- Support "large ocean states" in building capacity and transfer of technology in Earth Observations
- Identify thresholds for major ocean challenges such as ocean acidification and marine pollution to support policy development and urge action
- Develop a global framework for ocean accounting

A predicted Ocean whereby society has the capacity to understand current and future ocean conditions, forecast their change and impact on human wellbeing and livelihoods

- Implementation of global-coverage operational forecasting systems to inform marine and coastal hazards
- Understanding and predicting impacts of global biodiversity changes in marine and coastal environments
- Implementation of an operational monitoring and forecasting systems for climatic changes and corresponding oceanic key risks
- Improve datasets that provide critical boundary conditions for models
- Monitor hazards of a biological nature, such as harmful algae blooms and harmful bacterial blooms that are related to human activities, land-ocean interactions, or are generated by changing environmental conditions

A safe Ocean whereby human communities are protected from ocean hazards and where safety of operations at sea and on the coast is ensured;

- Identify and elaborate the pathways of Earth observation products to support adaptation policy processes such as the UNFCCC National Adaptation Plans for least developed countries
- Integrate observational and climate services in support of adaptation at various scales from regional through to national, sub-national to local scales

- Understand the contribution of Earth observation data and information for the transformation of society where the limits of adaptation have been reached

A sustainably harvested and productive Ocean

- Develop innovative tracking and enforcement measures for Illegal, Unreported and Unregulated fishing and build capacity of fisheries enforcement officers using open-source programming tools
- Further the sustainability of marine industries such as aquaculture, renewable energy and recreation
- Promote the idea of a sustainable Blue Economy
- Assess and monitor the outcomes of conservation measures

A transparent and accessible Ocean

- Develop and implement best practices across the value chain for ocean observing, forecasting, and use
- Recognise and articulate Traditional Knowledge as an important and complementary knowledge economy of global benefit
- Improve communication of ocean information to policy makers and youth
- Develop innovative and affordable technologies and methods for collecting and disseminating ocean and coastal observations and information
- Integrate data and information across the land-sea interface, bridging both environmental and social sciences such as economics and law, with particular focus on water quality, flooding/inundation, and nearshore ecosystem health and productivity (e.g., mangroves, salt marshes, seagrasses)
- Introduce best practices and minimum standards on quality and quality of service for ocean observations and data across observational networks
- Improve findability and accessibility of ocean data and information by supporting a harmonized certification process of WMO and IOC/IODE data centers
- Ensure oceanographic data are compliant with GEO's data management and sharing principles[1]

2. What are the existing International initiatives/programmes/partnerships and resources of your organization that could help address these knowledge gaps/science questions?

The Group on Earth Observations (GEO) is an intergovernmental partnership working to improve the availability, access and use of Earth observations for the benefit of society. GEO's 109 Member Countries and 132 Participating Organizations work to actively improve and coordinate global EO systems and promote broad, open data sharing.

The GEO Work Programme consists of various thematic, regional and foundational tasks that have the potential to contribute to the Decade. GEO is a supporting body to UN agencies that functions as a flexible entity, using its convening power to provide a unique opportunity to support activities that integrate information across environments, regions and disciplines. The GEO Work Programme consists of GEO Flagships, Initiatives, Regional GEOs, Community Activities, and Foundational Tasks. Activities related to ocean science in GEO are led by the GEO Blue Planet Initiative. Development of the GEO Knowledge Hub (GKH) will be of particular support to the Decade of Open Science. The GKH will feature end-to-end applications of Earth Observations (data, methods, algorithms/code, computing environments, and results) in an open source/open science context, allowing

[1] http://earthobservations.org/documents/GEO_Strategic_Plan_2016_2025_Implementing_GEOSS.pdf

reproduction of the application in a first instance prior to adaptation for customized purposes. The GKH will enable scaling-up of Earth observation applications, while working in particular to lower the barriers for developing nations to make use of Earth observations (including big data) and computing technology, for informed decision-making.

The GEO Blue Planet Initiative is proposing to leverage GEO's convening power and interdisciplinary work programme to organize and advance changes in Earth Observation data access, integration and utilization in support of the Decade on Ocean Science for Sustainable Development.

GEO networks that will be leveraged to support the decade include:

Thematic GEO Networks

- GEO Blue Planet Initiative: GEO initiative that aims to ensure the sustained development and use of ocean and coastal observations for the benefit of society.
- GEO Marine Biodiversity Observation Network: Thematic node of the GEO Biodiversity Observation Network (GEOBON Flagship) that seeks to establish a process for sustained, operational measurements of biodiversity around the globe.
- GEO Data Access for Risk Management (GEO-DARMA) Initiative: GEO initiative that aims to support operational risk reduction activities through the implementation of end user priorities in line with the Sendai Framework for Risk Reduction, on a trial basis in regions of the developing world.
- GEO AquaWatch Initiative: GEO initiative that aims to develop and build the global capacity and utility of Earth Observation-derived water quality data, products and information to support water resources management and decision making**.**
- GEO Earth Observations for SDGs (EO4SDGs) Initiative: GEO initiative that works to advance global knowledge about effective ways that Earth observations and geospatial information can support the SDGs.
- GEO Human Planet Initiative: GEO initiative that seeks to generate the global-scale data and knowledge needed to advance our understanding of societal processes and their impact on Earth systems, and to generate useful indicators to inform policy.
- GEO Earth Observations for Ecosystem Accounting (EO4EA) Initiative: GEO initiative that works to further the development and use of Earth Observations for natural capital accounting (NCA) consistent with the set of standards and guidelines put forth by the UN System of Environmental-Economic Accounting (SEEA) and specifically the Ecosystem Accounts (EA).

Regional GEO Networks

- AfriGEO: Africa Group on Earth Observations
- AmeriGEO: Americas Group on Earth Observations
- AOGEO: Asia-Oceania Group on Earth Observations
- EuroGEO: European Group on Earth Observations

3. Please elaborate possible contributions of your organization with regard to the four cross-cutting themes

Capacity building and technology transfer

- Build upon existing networks within and outside of GEO by supporting linkages to stakeholders and other disciplines to address limitations and information gaps
- Work to form new global networks for the sharing of Earth observation information and development of decision support tools related to fisheries, marine pollution, coastal zone management and socio-economic analysis of ocean observing benefits
- Provide guidance to data providers and the research community about how they can be more responsive to those in charge of sustainable development planning related to the ocean
- Support development of a comprehensive platform for integration across networks to support an improved and integrated system of system for obtaining ocean and coastal information
- Partner with the IOC Ocean Best Practices System (OBPS) to develop, review, disseminate and implement best practices
- Collaborate with the IOC and other groups to advance capacity building and technology transfer

Partnerships and financing

- Work across the GEO work programme to increase awareness of the importance of ocean and coastal observations and solicit collaborations and contributions to support the Decade
- Expand linkages with the seabed mapping community and GEO, especially through the GEBCO Seabed 2030, to promote and contribute to the global effort to map the ocean floor by 2030
- Expand partnerships and linkages with the private sector

Access to information, data and knowledge

- Work with the GEO community to develop projects that integrate data and information across the land-sea interface
- Organize a series of workshops aimed at revolutionizing how biological coastal and marine data are shared and integrated with environmental and socio-economic data
- Develop Earth observation applications and information related to thematic areas including fisheries, marine pollution and coastal hazard management for contribution to the GEO Knowledge Hub
- Identify mechanisms for sustaining ocean and coastal data and apply novel approaches for extracting actionable information

Communication and awareness raising

- Support communications for the Decade through GEO Blue Planet's Ocean Communicators United group.
- Organize a series of outreach events aimed at engaging civil society, particularly youth-led and youth-focused organizations, in ocean science
- Promote citizen science within GEO to engage citizens on the importance of the ocean and data collection
- Generate and disseminate information and strategies to address biodiversity conservation and use in the context of sustainable development and scientific research

4. Suggested additions/modifications to the current R&D priority areas

R&D Priority Areas

We recommend modifying R&D priority area 6 into two separate R&D priorities:

- Earth-system model and predictions

- Integration of marine environmental science with the social sciences

Societal Outcomes

Regarding the societal outcomes, we note that there is overlap between "a predicted ocean" and "a safe ocean" as warning systems require forecasts. We recommend combining these outcomes as follows:

A predicted and safe Ocean whereby society has the capacity to understand future ocean conditions, forecast their change and impact on human wellbeing and livelihoods, and are adequately warned about ocean hazards.

5. If feasible, you may wish to provide brief information about any potential commitment(s)

The GEO Blue Planet Initiative commits to working with the GEO community to increase awareness of the importance of ocean and coastal observations at the ministerial level and working with the various GEO Work Programme activities to identify collaborations and contributions to support the Decade. GEO Blue Planet also commits to supporting communications for the Decade and leveraging Secretariat resources to support engagement workshops. The Marine Biodiversity Observation Network (MBON) of the GEO BON is committed to working with GEO Blue Planet and with other GEO efforts, and to continue to work directly with the IOC and the Executive Planning Group, to advance the objectives of the Decade for Ocean Science for Sustainable Development.

Endorsement or a formal request from UNESCO-IOC (and other relevant UN agencies) to the GEO Secretariat inviting the GEO Blue Planet Initiative to support the Decade for Ocean Science would strengthen GEO Blue Planet's ability to raise the visibility of the Decade within GEO and potentially increase the likelihood of resource mobilization from GEO Member countries and Participating Organizations.

6. From your perspectives, who else, or which institutions/programmes/networks shall be further engaged into the preparations for and implementation of the UN Decade?

World Meteorological Organization (WMO)

GEO recommends that the Decade align activities with WMO's ocean agenda. The specific objectives outlined in WMO's Operating Plan 2020-2023 are listed below:

- Strengthening the Global Ocean Observing System (GOOS) within WMO observing and data processing activities and facilitating meteorological and oceanographic observations in coastal regions and the open ocean
- Fostering Earth system modelling – coupling ocean with land, cryosphere and atmosphere – to advance science, prediction and services: leveraging the United Nations Decade of Ocean Science for Sustainable Development
- Promoting ocean science to support the value chain of the seamless Global Data Processing and Forecasting System and enhancing socioeconomic benefits of marine meteorological and oceanographic services

- Better integrating the ocean in multi-hazard early warning with WMO disaster risk reduction, climate applications and services, and research activities (e.g. tropical storm, cyclones, sea level rise and other coastal inundation components)
- Raising the capacity of developing countries, including small island developing States, in ocean observation, science and services through an enhanced regional approach

GEO Participating Organizations

GEO recommends that the Decade draw upon the resources of GEO Members and Participating Organizations, particularly those with expertise in ocean monitoring, prediction and technology innovation, in order to help achieve its objectives.

Do you wish to make your contribution publically available on the UN Decade website?

Yes: _X_

No: ___