
WP23_25: GEO Blue Planet

1262,290

Basic Information

Full title of the Initiative

GEO Blue Planet Initiative

Short Title or Acronym

GEO Blue Planet

Current category in the 2020-2022 GWP

GEO Initiative

Proposed category in the 2023-2025 GWP

GEO Initiative

Points of Contact

First Name	Last/Family Name	Email
Emily	Smail	emily.smail@noaa.gov
Audrey	Hasson	ahasson@geoblueplanet.org

Purpose

Objective

Bridging the gap between ocean and coastal observational data and societal needs to deliver actionable information for policy and decision making.

Please provide a short description of the Initiative

GEO Blue Planet is the ocean and coastal arm of the Group on Earth Observations (GEO) that aims to ensure the sustained development and use of ocean and coastal observations for the benefit of society.

Following GEO's mission, GEO Blue Planet promotes open, coordinated, and sustained data sharing and infrastructure for better research, policy making, decisions and action.

GEO Blue Planet's mission is to: advance and exploit synergies among the many observational programmes devoted to ocean and coastal waters; improve engagement with a variety of stakeholders for enhancing the timeliness, quality and range of services delivered; and

raise awareness of the societal benefits of ocean observations at the public and policy levels.

We do this by working with stakeholders to understand their information needs and connecting them with available data and products. We develop tools that meet their requirements, and work with them to strengthen their capacity to make informed decisions.

This requires a close collaboration between scientists who gather ocean and coastal data, those who extract information from observations and anticipate future conditions, and those who use the knowledge and forecasts in the management of our living world. GEO Blue Planet's activities are selected based on stakeholder needs and currently span 7 topics: marine litter, sargassum, coastline changes, eutrophication, fisheries, oil spills and climate adaptation. GEO Blue Planet functions as a network of ocean and coastal-observers, social scientists and end-user representatives from a variety of stakeholder groups, including international and regional organizations, NGOs, national institutes, universities and government agencies.

Why is this Initiative needed?

We live on a blue planet, and Earth's waters benefit many sectors of society. The future of our blue planet is increasingly reliant on the services delivered by marine and coastal waters. For example, approximately 60 million people rely on fisheries and aquaculture for their livelihoods and over 80% of the world's trade is carried by sea (FAO, 2018; UNCTD, 2017). The social and economic future of these and many other sectors is increasingly dependent on the services delivered by marine and coastal waters. In recent years, the global community has prioritised the need for concerted action to maintain these services through the agreement on the United Nations (UN) Sustainable Development Goal (SDG) targeted at the oceans (SDG 14: Life Below Water) and the proclamation of a Decade of Ocean Sciences for Sustainable Development (2021 – 2030) (UNESCO, 2017; UNGA, 2015). Maintenance of these services relies on the advancement of effective, evidence-based decisions by governments, civil society and the private sector about sustainable development, ecosystem management, food security, ocean-resource utilization and natural disasters. Evidence-based decisions in the marine realm need to be underpinned by the collection of physical, chemical and biological data about coastal and open-ocean areas through direct (or "in situ") measurements and remote-sensing technologies, commonly referred to collectively as ocean and coastal observations. These observations are transformed into information products, ocean forecasts and services that can be used to create knowledge for effective, evidenced-based management and policy decisions. For example, the implementation of the Sendai Framework for Disaster Risk Reduction requires ocean observations for early warning systems to allow people to prepare and mitigate against ocean related hazards such as tsunamis, storm surges and extreme waves (Arduino et al., 2017; UNISDR, 2015). The ocean has significant impact on global climate patterns, and observations provide essential information for forecasting precipitation and drought, the source of replenishment of water supplies, and of climate events that can lead to public health incidents or changes in energy demand (Malone et al., 2010; McCarthy et al., 2018; Mendez-Lazaro et al., 2014). Coastal and ocean observations are important Essential Climate Variables (ECVs) developed in support of the United Nations Framework Convention on Climate Change (UNFCCC) (GCOS, 2016). These are now fully incorporated in the Global Ocean Observing System (GOOS) Framework for Ocean Observing (Lindstrom et al., 2012) as Essential Ocean Variables (EOVs) that address biology, ecology, and biogeochemistry in addition to physical ocean characteristics. A further complement is the concept of Essential Biodiversity Variables (EBVs) being developed by Marine Biodiversity Observation Network (MBON), a theme of the GEO Biodiversity Observation Network or GEO BON (Miloslavich et al., 2018; Muller-Karger et al., 2018; Navarro et al., 2017). In addition, ocean observation of these variables helps improve predictions of longer-range forecasts of weather (Legler et al., 2015). Ocean biological and biodiversity observations are critical in monitoring the health of and changes to ocean ecosystems, and biodiversity and are required to gauge progress towards the Aichi biodiversity targets (Andrefouet et al., 2008; CBD, 2010, 2014; Miloslavich et al., 2017). Ocean observations are also important in managing fisheries and aquaculture (Hazen et al., 2018; Saitoh et al., 2011; Solanki et al., 2015). More generally, ocean information and decision support tools are needed for sustainable management of the oceans and seas and a sustainable development of the blue economy.

What evidence is there to support this need?

The global ocean community recognises the need for a step change in the way in which we coordinate and "hardwire" the links between technological innovation and sustained observations of the oceans, the data, information and services they provide, and approaches to ecologically sustainable development and ocean policy. There is therefore an urgent need for the scientific community to work together to leverage resources and agree on the variables that need to be measured (Essential Variables) and to implement these in a systematic, sustained and globally distributed manner (Lindstrom et al., 2012). The importance of stakeholder engagement, capacity development and co-development/co-design has been recognized as a requirement to reach the full societal and economic benefits from ocean and coastal observations and GEO Blue Planet works to fill this gap (Mackenzie et al., 2019; Smail et al., 2019). In addition, by organising and advancing changes in Earth Observation data access, integration and utilisation, the GEO Blue Planet initiative supports

the Ocean Decade projects that integrate data and information across the land-sea interface.

Is this Initiative open to participation by representatives of any GEO Member, Participating Organization, and GEO Associate?

Yes

Are you aware of other projects or initiatives at a global or regional scale (both in GEO and externally) that provide similar products or services?

No

Please identify the most important actual and/or intended outputs (products, services, etc.) produced by the Initiative, along with their intended and/or actual users. This list does not need to be comprehensive but should identify the outputs which are most used and are expected to have the greatest potential impact.

Output	Status	Users	Additional info
Secretariat: Development of Asian GEO Blue Planet Secretariat Office	In development	Asia-Pacific and Global Users	The Asia Office will participate as part of the Global GEO Blue Planet Secretariat Office. The office will support contributions from Asia to GEO Blue Planet activities.
Secretariat: Impact and Evaluation Plan Development	Planned	GEO Blue Planet Community	In order to evaluate our impact, we will need to develop and implement an impact and evaluation plan. We will either do this in consultation with the GEO Secretariat or with a private contractor.
Secretariat: GEO Blue Planet Symposiums	In development	Stakeholders in Africa and Asia	GEO Blue Planet Symposiums are planned for 2022 in Ghana and 2023 in South Korea.
Fisheries Working Group: SMS Fisheries Alerts for Bangladesh	Planned	The fisheries community in Bangladesh	Transfer of early warning of ocean state information disseminated using flags and SMS developed by GMES and Africa / University of Ghana, towards Bangladesh. Bangladesh is interested in generating potential fishing zone and ocean state SMS alerts for their artisanal fishing communities. The University of Ghana will be working with Shahlajal University and An Organisation for Socio-Economic Development (AOSED) in Bangladesh to do tech transfer of a similar system produced in Ghana.
Fisheries Working Group: Earth Observation and ocean data to support fisheries and climate change modeling	Planned	Various stakeholders including member states, fisheries organisations and the scientific community	Review existing best practices and standards for Earth Observation and ocean data access and dissemination to support models relevant to Fisheries and Climate Change and recommend a way forward.
Fisheries Working Group: Earth observation data	Planned	Onshore and offshore culture fisheries	This action item aims to outline a Standard

for onshore and offshore culture fisheries		communities	Operating Procedure (SOP) to use the Earth Observation data (remote-sensing, in-situ and modeling) for site selection of farms being developed, as well as in supporting the ongoing culture with a DSS (Decision Support System). Another deliverable in addition to preparation of the SOP handbook/report, would be to impart training for the countries with economy in-transition and/or emerging culture industry.
Fisheries Working Group: Identify gaps in Earth Observation data to establish the impact of marine litter on fisheries	Planned	Fisheries communities, environmental managers and the scientific community	This Action can be a joint action between the Marine Litter WG. To address this action, we will identify gaps in Earth observation data by engaging the Integrated Marine Debris Observing System, as well as with international experts from academia, industry, civil society and stakeholders. This action will also explore the opportunity to develop a way forward to address these gaps in data and knowledge to address the impact of marine litter on fish, fisheries and fisher's livelihoods.
Fisheries Working Group: Peer-reviewed White Paper from the Tuna workshop	In development	Tuna fisheries stakeholders	This Action will produce a summary White Paper from the GEO Blue Planet "Earth Observations for Tuna Fisheries Management" workshop which was held virtually in November-December 2020.
Marine Litter Working Group: Peer-reviewed white paper on the current status of marine litter monitoring and data	In development	Global Partnership on Marine Litter (GPML) and other interested stakeholders	UN Environment requested that GEO Blue Planet put together an on-going working draft of a white paper on "A Global Platform for Monitoring Marine Litter and Information Action" to

			<p>help inform the development of a Digital Platform on Marine Litter and Plastic Pollution. This document will continue to be updated as requested by UN Environment and a version of the paper will be published as a peer-reviewed document</p>
<p>Marine Litter Working Group: Support Marine Litter and Plastic Pollution Data Harmonization</p>	<p>In development</p>	<p>Environmental managers, policy makers and marine litter stakeholders</p>	<p>Marine litter data is currently not well integrated or easily comparable. GEO Blue Planet is supporting the UN Environment Program's GPML Digital Platform and their associated community of practice on marine litter and plastic pollution data harmonization and will leverage GEO resources to support this effort. This will support SDG indicator 14.1.1b (marine plastic debris).</p>
<p>Marine Litter Working Group: Support co-development of a global sustained Integrated Marine Debris Observing System with policy makers and the scientific community</p>	<p>In development</p>	<p>Environmental managers, policy makers and marine litter stakeholders</p>	<p>Establishing a globally coordinated IMDOS is supported by the UNESCO/ Intergovernmental Oceanographic Commission (IOC) Global Ocean Observing System (GOOS) programme and the GEO Blue Planet initiative and in partnership with several international organizations and expert working groups such as SCOR WG FLOTSAM, IOCCG Task Force on Remote Sensing of Marine Litter, and the MSFD Technical Group on Marine Litter. IMDOS will support the development of harmonized observations for the benefit of scientific research advancement and for the development of innovative solutions, mitigating actions and informed policymaking.</p>

<p>Sargassum Working Group: Inventory of available Sargassum products</p>	<p>In development</p>	<p>Tourism industry, fisheries industry, scientific community and other stakeholders impacted by Sargassum</p>	<p>Pelagic Sargassum are buoyant macroalgae that form rafts at the ocean surface and serve as habitat for hundreds of diverse marine species. Since 2011, massive blooms of Sargassum have occurred in the tropical Atlantic and swept through the western tropical Atlantic, Caribbean Sea, Gulf of Mexico, and the west coast of Africa. These recurring events have caused significant disruptions to coastal communities throughout the region, negatively impacting human health, tourism, fishing, navigation, coastal management operations, and nearshore ecosystems, and representing a challenge to national economies and the achievement of United Nations Sustainable Development Goals (SDGs) in the region. This inventory of available products will review the current and developing monitoring products and strengths and potential improvements of existing products as well as their status (short term funding, etc.). This information will be released on the Sargassum Information Hub (https://sargassumhub.org/).</p>
<p>Sargassum Working Group: Community Sargassum near-real-time monitoring and coastal risk inundation tool</p>	<p>In development</p>	<p>Tourism industry, fisheries industry, scientific community and other stakeholders impacted by Sargassum</p>	<p>First release of a community Sargassum near-real-time monitoring and coastal risk inundation tool with a variety of satellite-derived products at various processing levels. This first version will include NOAA/CoastWatch and NOAA/AOML datasets.</p>

			Further products from other projects might be embedded based on their availability and best-practice standard compliance.
Sargassum Working Group: Sargassum Information Hub	Regularly updated	Tourism industry, fisheries industry, scientific community and other stakeholders impacted by Sargassum	The Sargassum Information Hub aims at generating context and additional information related to Earth Observation products and services related to Sargassum to support decision making and collaboration. The Hub will be updated regularly based on stakeholder feedback. Translation into other relevant languages is planned.
Coastline Changes Working Group: WaveForce development and implementation	In development	Coastal communities on reef-lined coasts	Low-lying coral reef-lined islands and coasts are vulnerable to marine flooding as a result of storms. These events are occurring with ever increasing frequency and severity due to climate change and sea-level rise. They are a result of a combination of sea surface elevation and wave height, and can cause severe coastal flooding even on windless, sunny days. Increasing the resilience of coastal communities, while decreasing the risk to them, are key to the continued inhabitants of these islands and coastal areas in the near future. Flood forecasting is a key tool for disaster risk reduction and increasing resilience of coastal communities. The Wave-driven Flood-forecasting on Reef-lined Coasts Early warning system (WaveFoRCE) is an Action established to combine satellite observations with models to provide marine flood

			forecasts for all coral reef-lined coasts in the world. The WaveForce system is being developed and tested in a few locations. Funding for full development and global implementation and engagement with local communities will take place during this work programme period.
Coastal Changes Working Group: Satellite derived coastal bathymetry of Pacific Islands	Planned	Pacific Islands	Bathymetry in many Pacific Islands is lacking. This information is crucial for predicting coastal flooding and for marine spatial planning. Bathymetric surveys are slow and costly. Recent advances in satellite derived bathymetry show promise for mapping clear, shallow waters. This action will involve building an international team of experts to put together a proposal for funding a campaign to develop extensive satellite-derived bathymetry for the Pacific Islands and implementing the service.
Coastline Changes Working Group: Coastal Erosion/Accretion monitoring products	Planned	Coastal communities	Coastal zones are home to unique ecosystems where complex ecological processes take place. Yet, these zones are continually changing due to the dynamic interaction between terrestrial, aquatic, atmospheric, and human landscapes. Waves and winds along the coast are both eroding rock and depositing sediment continuously, and rates of erosion and accretion vary considerably from day to day in these areas. The rapid appearance of new infrastructures, urban extensions and densification, overlain by climate change effects,

			<p>rapidly accelerates the deterioration of coastal ecosystems and their ecological service functions. This makes the Low-lying coastal areas highly vulnerable to natural hazards such as sea level rise and extreme storms/tsunami. Thus, an understanding of the interactions of the oceans and the land is essential in understanding the hazards associated with coastal zones. However, there are considerable knowledge and data gaps in achieving effective and future change-proof sustainable management of coastal zones around the world due to technical and social barriers, as well as governance challenges. This activity aims to help in providing a roadmap enabling us to rely on the capabilities of Earth observations datasets and information to better support coastal zone management and mitigation of coastal hazards for sustainable development. Potential activities with Digital Earth Africa, the Korean Maritime Institute, and University of Cork College in Ireland, University of Ghana. Specifics to be determined.</p>
<p>Eutrophication Working Group: Support global reporting for SDG indicator 14.1.1a (index of coastal eutrophication)</p>	<p>Occasionally updated</p>	<p>UN Environment Programme and member countries</p>	<p>GEO Blue Planet developed two satellite-derived global indicators for indicator 14.1.1a. In collaboration with Esri, this data is being supplied yearly to UN Environment for yearly reporting on the indicator as well as analyzed for the yearly SDG report. For this action, the data will continue to be</p>

			analyzed yearly in collaboration with UN Environment.
Eutrophication Working Group: dashboards, information hub and toolkits for SDG indicator 14.1.1a	In development	UN Environment and member countries	This action involves producing visualizations of 14.1.1a indicator data and co-designing tools with users that assist with decision making. Ultimately, the aim of this activity is to combine the indicator data with other information such as land-use change, riverine discharge and agriculture data to identify sources of eutrophication and inform management decisions. This activity will be done in collaboration with other GEO groups such as EO4SDGs, GEO AquaWatch and potentially GEO GloWs, GEO GLAM and regional GEO groups and/or data cube initiatives.
Eutrophication Working Group: Support development of higher resolution, locally-tuned products	Planned	Member countries	The global SDG products have the benefit of being globally comparable but are at a fairly low spatial resolution. Some regions, such as the Northwest Pacific and Europe, have developed SDG 14.1.1a indicators that are specifically tailored to their specific region and use high resolution data and regionally-tuned algorithms. This action will involve working with regional stakeholders to support technology transfer and capacity development for the generation of specific eutrophication monitoring products in other regions.
Oil Spill Working Group: Collaboration for Oil Satellite Tracking in the Americas	In development	Countries in the Wider Caribbean and Americas region	COSTA program, which stands for Collaboration for Oil Satellite Tracking in the Americas program is a collaborative effort to coordinate, train and set up operational oil spill

			<p>monitoring and oil spill incidence satellite support for the Wider Caribbean region and Americas. The effort was supported and coordinated by GEO (Group for Earth Observation) including AMERIGEO and GEO Blue Planet Initiatives, UNESCO IOC (Intergovernmental Oceanographic Commission), RAC-REMPEITC and UN Cartagena Convention Secretariat. Several regional agencies from different countries now have near-real time operational monitoring oil spill capabilities including US NOAA and Trinidad and Tobago, while a few other partners including groups from Mexico, Peru and Central America countries are in the process of coordination and training to spin up such capabilities. The hope is that eventually the Caribbean ocean and Americas can be monitored by the easily accessible and cost-effective satellite imagery, so that oil spill, either from oil facilities or vessels can be detected from space. As a result, oil spill response and mitigation can greatly benefit from this newly added capability.</p>
Oil Spill Working Group: Earth Observation and ocean data to support oil spill monitoring and modeling.	Planned	Various stakeholders including member oil and gas stakeholders, member states and the scientific community	Review existing best practices and standards for Earth Observation and ocean data access and dissemination to support monitoring and tracking of oil spills and recommend ways forward and technology transfer opportunities.
Climate Adaptation	Planned	Parties responsible for	For this action, the GEO

Working Group: National Adaptation Plan guidance		producing National Adaptation Plans in coastal nations	Blue Planet Climate Adaptation Working Group will be working closely with the GEO Secretariat and GEO GLAM to develop a guidance document for using Earth Observations to inform National Adaptation Plans. GEO Blue Planet's contribution will be specifically geared towards using Ocean and Coastal Observations to inform NAP formulation with respect to the marine and coastal environment.
Climate Adaptation Working Group: Blue Carbon mapping	Planned	UNFCCC and member countries	Blue carbon includes carbon that is stored in coastal and marine ecosystems such as mangroves, tidal marshes and sea grasses. Blue Carbon is included in Nationally Determined Contributions as a source of carbon sequestration and is recognized as playing a crucial role in climate adaptation and coastal zone management. This action involves working to integrate and update Blue Carbon mapping using Earth observation. This activity would be a cross-GEO activity and will require significant fund raising.

If needed, please provide additional comments or explanation to accompany the outputs table

GEO Blue Planet's activities implemented by thematic working groups which include marine litter, sargassum, coastline changes, eutrophication, fisheries, oil spills and climate adaptation. All working groups support GEO Blue Planet's core action areas of Stakeholder Engagement, Cooperation and Co-Design and Capacity Development. Broadly, working group activities seek to fulfill the below objectives:

1. Identify gaps in geo-referenced data and information at the global-to-local levels (Stakeholder Engagement Core Action Area)
2. Support the development of tools and information services to inform the management to address user needs (Cooperation and Co-design Core Action Area)
3. Establish recommendations on best practices in the monitoring and modelling of based on a network of experts – (Cooperation and Co-design Core Action Area)
4. Provide support for technology transfer, training, and information exchange on monitoring (Capacity

Development Core Action Area)

Specific working group activities are continually reviewed by the Steering Committee and will be updated throughout the 2023 – 2025 work programme period.

What kinds of decisions are the outputs of this Initiative primarily intended to support?

Our outputs will support our UN agency partners fulfill their obligations to member countries and will support. For example, policy makers and end-users' decision making.

How will these decisions benefit from the outputs of this Initiative?

Many policy makers and environmental managers are having to make decisions without necessary information. There also are many countries that lack in situ data and are interested in learning how to use available ocean and coastal data.

What kinds of impacts (for example, reduced loss of life, monetary savings, conservation of biodiversity, etc.) are anticipated as a result of the use of the outputs of this Initiative?

Coastal nations, especially small island nations, are increasingly vulnerable to environmental changes. Outputs from this initiatives have the potential to reduce the loss of life, conserve biodiversity and protect coastal communities and ecosystems.

Has this Initiative been asked to provide specific information (for example, reports, data, services) on an ongoing basis to an international convention, organization, or other multilateral body?

Yes

Please identify the requesting organization.

UN Environment and IOC-UNESCO

Describe the nature of the request.

GEO Blue Planet is regularly providing data for satellite derived SDG 14.1.1a indicators to the UN Environment Programme for formal reporting purposes. GEO Blue Planet also assists with drafting the storyline for indicator 14.1.1a for the UN SDG annual report. GEO Blue Planet has been asked to support capacity development for monitoring of Sargassum and oil spills by the IOC-UNESCO Submission for the Caribbean and Adjacent regions. GEO Blue Planet has been asked by IOC-UNESCO to support the UN Decade of Ocean Science. We are currently pursuing a status as an implementing partner for the UN Decade.

Please provide supporting documentation of the request.

- letter_adg_ioc_to_geo_20_267.pdf ([link](#))

Technical Synopsis

Please provide a brief description of the methods used by the Initiative to produce its (actual or planned) outputs.

GEO Blue Planet conducts activities in three Core Action Areas: Stakeholder Engagement, Cooperation and Co-design, and Capacity Development

Stakeholder Engagement

This action area is geared towards identifying stakeholders' needs and priorities. GEO Blue Planet's portfolio of

stakeholder core actions include outreach materials, workshops, symposia and consultations and white papers on Earth Observation applications. GEO Blue Planet produces informational materials including booklets on ocean and coastal observations, examples of indicators and decision support tools that utilize ocean and coastal observations, infographics and other outreach materials. GEO Blue Planet also facilitates workshops, symposia and consultations geared towards improving our understanding of the information needed to make key decisions related to ocean and coastal resources. GEO Blue planet plans regional thematic workshops that bring together representatives of government, research institutions, industry and NGOs. GEO Blue Planet also works to ensure that stakeholders' information needs, and priorities are addressed at international GEO Blue Planet Symposia. GEO Blue planet also produces white papers on Earth Observations to help stakeholders understand the state of science, limitations and future directions of ocean and coastal observations for a specific application (e.g., management of tuna fisheries, monitoring of marine litter, etc.).

Cooperation and Co-design

This action area is geared towards meeting stakeholders' needs through cooperation and co-design between scientists, intermediaries and end-users. GEO Blue Planet's portfolio of cooperation and co-design core actions include building expert networks, developing indicators and decision support tools and co-creating information hubs. GEO Blue Planet works to bring together an expert network that can advise on the development of indicators or decision-making support tools. This may be achieved by employing internal expertise or liaising with existing groups or task teams. GEO Blue Planet also works to distill ocean and coastal information in the form of indicators and decision-making tools to support the sustainable management of the ocean and coasts. To facilitate cooperation with other communities, GEO Blue Planet also supports the development of information hubs that provide background information on earth observation-based indicators and decision-making tools.

Capacity Development

This action area is designed to develop global capacity to utilize ocean and coastal observation-derived data and information for operational capabilities, develop applications that utilize ocean and coastal observations or to maintain applications on a long-term basis. This portfolio includes the provision of training courses, information exchange and transfer of applications to operational agencies. GEO Blue Planet targets training courses at government and other stakeholder organizations that will be able to implement and maintain the skills learned on a regular and sustained basis. GEO Blue Planet also works to support information transfer related to ocean and coastal observations. Core actions involved in information transfer include ambassador programs and exchanges, best practices documentation and sharing of data, tools and protocols. To sustain the sustainability of Earth Observations and its maintenance, GEO Blue Planet works with operational agencies that support and operationalize these applications. GEO Blue Planet also works to identify operational agencies or partners to collaborate on the development of applications in GEO Blue Planet's working groups.

If you would like to provide further details on the technical methods, you may upload one or more documents here.

- geo_blue_planet_operations_and_governance_plan_181121_1.pdf ([link](#))

Are there any significant scientific or technical challenges that need to be resolved by the Initiative during the 2023-2025 period?

Yes

Please describe these challenges and the steps being taken to solve them.

Marine litter monitoring is not being done in a consistent manner. GEO Blue Planet is working to get global support for an Integrated Marine Debris Observing System. Many coastal and ocean chlorophyll products rely on Aqua/MODIS which is not function property and being phased out. GEO Blue Planet will be working with users to make sure they are aware of this issue and to integrate other sensors into their products.

Does the Initiative expect to complete any key new outputs, improvements to existing outputs, or improvements to the methods of producing outputs, in the 2023-2025 period?

Yes

Please describe these new outputs or improvements.

Work with member countries to improve and further develop the indicators, decision support tools and information hubs.

Please identify the key tasks that must be implemented to ensure delivery of these changes, with target dates for completion.

Task	Task description	Expected completion (month/year)
Compare indicators with partner country in situ data	Compare satellite derived chlorophyll products with in situ data to establish how well the indicators are work.	October/2022
Update Sargassum Information Hub	Release update of Sargassum Information Hub and update based on user feedback	January/2023
Update Sargassum monitoring products	Integrate additional data and expand range of sargassum products	August/2024
Identification of funding for WaveForce globally	WaveForce needs additional funding in order to be rolled out globally	August/2023
Identification of funding for development of satellite-derived bathymetry services for the Pacific Islands	In order to produce a significant and sustained satellite-derived bathymetry service for the Pacific Islands, significant funding will need to be secured.	March/2023
Train additional countries in the wider Caribbean and Americas to use satellite data to detect oil spills and product Marine Pollution Surveillance Reports	Since July 2021, three government agencies including the Institute of Marine Affairs (IMA), Ministry of Energy and Energy Industries (MEEI) and Environmental Management Authority (EMA) from Trinidad and Tobago have started monitoring near real time oil spill incidents and issuing reports for their Exclusive Economic Zone following a May to July US NOAA-led satellite oil spill monitoring virtual training course. The training lasted 7 weeks, with 6 hour per week actual training time and were followed by three months of operational support from NOAA. So far, many oil spill reports have been issued for their area and the satellite oil spill monitoring proved to be an invaluable tool in a larger August 2021 spill in the region. In June	August/2024

	and August 2022, scientists from the Gulf of Mexico Research Consortium (CIGOM) will receive similar training from NOAA and Trinidad and Tobago IMA to learn about the process of utilizing satellite imagery to issue oil spill products. In July and August 2022, trainees from Peru coordinated by Peru's National Commission for Aerospace Research Development (CONIDA) will be trained by NOAA and IMA. Discussions have started with Central American countries through the Central American Integration System (SICA).	
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Resources

Have all resources required to implement the Initiative's planned work in the 2023-2025 period been secured?

- Gap in financial resources
- Other gaps

What is the estimated funding gap for the 2023-2025 period?

The Secretariat is well funded. Implementation of projects such as WaveForce and the Pacific Bathymetry effort will require significant funding (~20 million per project).

Please describe the other resources required by the Initiative?

The Sargassum project is currently limited by data processing capabilities.

What actions is the Initiative taking to obtain the required resources?

We are working to put together project pitches for the large scale projects (e.g., WaveForce, Pacific Bathymetry). We will work with the GEO Secretariat resource mobilization team to find avenues to pitch these projects.

Please list all financial and non-financial contributions to the Initiative (other than in-kind, voluntary participation by individual contributors) having a value of more than USD 50,000.

Contributing Organization	GEO Status	Type of Resource	Value	Currency
EU4OceanObs	Mercator Ocean - Mercator Ocean International	Financial	2 FTE	
NOAA	United States	Financial	2 FTE	
Korean Maritime Institute	Korea, Republic of	Financial	1 FTE	
EU4OceanObs	Mercator Ocean - Mercator Ocean International	Financial	Funding GEO Blue Planet Symposium in Ghana in 2022	
Korean Maritime Institute	Korea, Republic of	Financial	Funding GEO Blue Planet Symposium in South Korea in 2023	

Lessons from the 2020-2022 Period

Were all planned activities for the 2020-2022 period implemented as expected?

No

Please describe which activities were delayed or not implemented and how has this affected plans for 2023-2025.

We had to postpone a planned symposium in South Africa due to COVID. Several planned in person workshops were moved to remote. There was some delay in project implementation due to the disruption of COVID.

Were there any key challenges faced by the Initiative in the 2020-2022 period?

Yes

Please describe.

Balancing top down v.s. bottom up priorities is always a challenge. We are continually told to pick activities based on stakeholder priorities but are then told to sunset activities that were requested by stakeholders because they do not have "a big enough impact".

Resources are always a challenge.

Were there any impacts or changes to operations due to COVID-19?

Yes

Please describe.

Creating and maintaining new relationships with stakeholders is more difficult in a virtual environment.

Please describe the key changes proposed for the 2023-2025 period, for example, new projects, new areas of focus, or adjustments to the activity governance.

Yes. We recently updated our operations and governance plan.

Does the Initiative have outputs (products, services, etc.) available to users now, even if only on a pilot or testing basis?

Yes

Please provide any available information describing this usage (for example, user statistics, results of user testing) and/or feedback from users (for example, user comments, evaluations).

We are beginning user testing for the Sargassum Information Hub and our Sustainable Development Goal eutrophication indicators. We will record feedback once gathered.

Feedback from the oil spill training in Trinidad in Tobago has been very positive. They are now operationally monitoring their own waters.

Please provide supporting documentation if available.

- no supporting documents provided -

Do you have evidence of any impacts that have occurred in part as a result of using the outputs of the Initiative (for example, policy decisions taken, behaviour changes by users, risks mitigated)?

Yes

Please provide examples, with evidence where available.

Global satellite derived eutrophication indicators: As a result of our work on the methodology for Sustainable Development Goal (SDG) indicator 14.1.1a (coastal eutrophication potential), the indicator was upgraded from tier III to tier II. GEO Blue Planet, in partnership with Esri, processed the data for the satellite derived indicators and this data was included in the 2020 SDG report and will be included in the 2021 SDG report.

Oil spill monitoring program in Trinidad and Tobago: The government of Trinidad and Tobago is now operationally monitoring their waters for oil spills and are negotiating with nearby islands on extending their monitoring to support nearby countries. As a result of their monitoring program, a significantly higher incidence of oil spills has been identified, allowing for mitigation to take place.

Please provide supporting documentation if available.

- geo_blue_planet_summit.pdf ([link](#))

Have there been any internal or external reviews or evaluations of the Initiative since 2019?

Yes

Please provide a copy of the report, if available.

- no supporting documents provided -

Please indicate any GEO Work Programme activities with which you have ongoing collaboration.

- AFRIGEO - African Group on Earth Observations
- AMERIGEO - Americas Group on Earth Observations
- AQUAWATCH - AquaWatch
- AOGEO - Asia-Oceania Group on Earth Observations
- EO4SDG - Earth Observations for the Sustainable Development Goals
- EUROGEO - European Group on Earth Observations
- GEO BON - GEO Biodiversity Observation Network

- GEO-ECO - GEO Global Ecosystems

Please indicate any additional GEO Work Programme activities with which you would like to establish new collaborations.

- GEO-DARMA - Data Access for Risk Management
- DE-AFRICA - Digital Earth Africa
- DE-PACIFIC - Digital Earth Pacific
- EO4DRM - Earth Observations for Disaster Risk Management
- EO4EA - Earth Observations for Ecosystem Accounting
- EO4HEALTH - Earth Observations for Health
- GEO Engagement Priorities Coordination - GEO Engagement Priorities Coordination
- GEO-EV - GEO Essential Variables
- GEOGLAM - GEO Global Agricultural Monitoring
- GEOGLOWS - GEO Global Water Sustainability
- HUMAN-PLANET - GEO Human Planet
- GEO-WETLANDS - GEO Wetlands
- GEO Work Programme Support - GEO Work Programme Support
- GEODESY4SENDAI - Geodesy for the Sendai Framework
- LAND-COVER - Global Land Cover
- DELTA-ESTUARY - Global Observation of Deltas and Estuaries
- GOS4POPS - Global Observation System for Persistent Organic Pollutants
- GEO-VALUE - Understanding the Impacts and Value of Earth Observations

Stakeholder Engagement and Capacity Building

Are there specific countries or organizations that your Initiative would like to engage?

Yes

Please list these countries, regions or organizations.

We are planning to increase engagement with Africa and the Asia/Pacific region.

What are your plans to engage them?

We will be hosting a symposium in Ghana in October 2022 and are opening a Secretariat office in Korea that will support engagement with Asia. We will also be working to increase engagement with the Pacific Islands on Bathymetry monitoring and through the WaveForce activity.

Does your Initiative engage users in the work of the Initiative (for example, consultation, testing, co-design)?

Yes

Please briefly describe the Initiative's approach to engaging users.

Stakeholder engagement is core to the work of the initiative. We do regular stakeholder engagement workshops and symposia to identify workshops and engage stakeholders throughout product development and testing. While we do not have a user engagement strategy written up, we are interested in generating one. We have contributed to publications that discuss the role of stakeholders such as "The Role of Stakeholders in Creating Societal Value From Coastal and Ocean Observations":
<https://www.frontiersin.org/articles/10.3389/fmars.2019.00137/full>

Does the Initiative have a user engagement strategy or similar kind of document?

Yes

Please upload it.

- no supporting documents provided -

Are there categories of users that are not represented at this time, but you would like to engage?

No

Does the Initiative have a documented capacity development strategy?

No

Please describe the approach to capacity development that is being implemented by the Initiative?

Our approach to capacity development is outlined in our operations and governance plan.

Are there any commercial sector organizations participating in this Initiative?

Yes

Please list the commercial sector organizations.

Organization name	GEO Member/PO/...	Country in which the organization is based	City in which the organization is based
Esri	United States	USA	Redlands, CA, USA
CLS	France	France	Toulouse, France
Science Crunchers	Portugal	Portugal	Lisbon, Portugal
Demois	Portugal	Portugal	

Are there opportunities for commercial sector uptake of the outputs of the Initiative?

Yes

Please describe these opportunities.

All products and outputs are openly available and can be added tailored by the commercial sector for client use.

Is there already commercial uptake occurring?

No

Are there opportunities for further commercial sector participation in the Initiative?

Yes

Please describe these opportunities.

Commercial partners are welcome to participate in working group activities

Does the Initiative have a plan for commercial sector engagement?

No

Governance

Please describe the roles of each of the key leadership positions, as well as any team structures involved in day-to-day management.

The structure of GEO Blue Planet consists of bodies responsible for governing, advising and activity operations.

Governing Bodies:

The Executive Committee is the main decision-making body of GEO Blue Planet. It is also responsible for overseeing the operations and activities of GEO Blue Planet. The main duties of the Executive Committee are: to endorse the Implementation Plan and Annual Working Group Plans, to review and endorse updates in the Governance and Operations Plan, to elect new steering committee members following the nominations review from the existing Steering Committee and strategic guidance from the Advisory Group, to provide guidance to the Secretariat on day-to-day operations and activities, to review progress on activities between Steering Committee meeting and to identify and support additional partnerships and funding opportunities.

The Patrons Group underpins operations by funding the Secretariat and works to identify opportunities to further sustain GEO Blue Planet. The main duties of the Patrons Group are to ensure the sustainability of GEO Blue Planet through financing its secretariat, to provide guidance and direction consistent with their institutional priorities, to convene and seek strategic directions from the Advisory Group and to represent the Advisory Group at Executive Committee meetings.

Operations Bodies:

The Secretariat provides scientific and logistical support for GEO Blue Planet activities. The Secretariat also provides coordination support for activities and develops partnerships. The GEO Blue Planet Secretariat reports to the Executive and Steering Committees. The Secretariat is geographically distributed with offices located in Asia, Europe, and North America which together support GEO Blue Planet's global activities. The main duties of the Secretariat are to provide overall support and coordination to the GEO Blue Planet network, to support cross-cutting and thematic Working Groups to deliver GEO Blue Planet activities as required, to support and manage global stakeholder engagement activities, to support the Steering committee in the reviewing of GEO Blue Planet activities, to promote GEO Blue Planet in the international arena, to interface with and report to the GEO Secretariat on behalf of GEO Blue Planet, to support the organization of GEO Blue Planet Symposia and other relevant events, to assist Working Groups to secure funding by circulating relevant grants, opportunities and support coordination in the formulation of proposals and to manage the GEO Blue Planet website, social media and other communications.

Working Groups are responsible for developing and implementing GEO Blue Planet's activities. Working Groups are created on a rolling basis based on identified stakeholder needs and availability of resources. The main duties of Working Groups are to develop and implement GEO Blue Planet's Core Actions, to report and update the Secretariat and Steering Committee on activities, to present on Working Group activities at international meetings and to directly support GEO Blue Planet's stakeholders and end users.

Is there a steering committee or other governance bodies that advise the Initiative but are not involved in day-to-day management?

Yes

Please describe the roles of each body. If there are multiple governance bodies, please describe the relationships among them (such as through a governance structure diagram).

Advisory Bodies:

The Steering Committee is responsible for providing scientific and technical guidance on GEO Blue Planet's activities, suggesting opportunities, identifying partners and, where possible, contributing resources. The main duties of the Steering Committee are to promote the aims and objectives of GEO Blue Planet and expand its profile and prominence, to review the Implementation Plan and Working Group Plans of GEO Blue

Planet, to monitor and evaluate institutional effectiveness of GEO Blue Planet against aims and objectives outlines in the Implementation Plan, to review proposals for new Working Groups, to review progress and provide guidance for Working Group activities, to coordinate the production of deliverables for reporting to the GEO Secretariat, to work with the GEO Blue Planet Secretariat and GEO Secretariat to identify new stakeholders that would contribute to and benefit from the GEO Blue Planet and to facilitate, support and coordinate relevant activities.

The Advisory Group is the high-level advisory group convened by the Patrons Group. The main duties of the Advisory Group are to advise on alignment of user-requested thematic activities with priorities of international bodies and organizations for policy-relevant and other information, to provide connections with organizations/ stakeholders that relay end-user needs and to support resource mobilization for supporting the Secretariat and its activities.

- no supporting documents provided -

What methods does the Initiative use to communicate with its participants?

- Email / e-newsletters
- Regular conference calls
- Website
- Regular events

Please describe the key risks that could delay or obstruct the completion of the planned activities and outputs of the Initiative, along with any actions taken to mitigate these risks.

Description of the hazard	Description of the possible impacts	Scale of impact	Likelihood of occurrence	Mitigation measures
Not securing a Knauss fellow in future years	Reduced capacity to coordinate and implement projects	Moderate	Possible	Pursuing alternative fellowship hosting arrangements

What methods are used by the Initiative to monitor its effectiveness?

- Website statistics
- Consultations or events

Would the Initiative be interested in assistance from the GEO Secretariat for developing an impact plan?

Yes

How are the results of the monitoring and evaluation activities shared with participants and the wider GEO community?

Through presentations and on the website

Are any monitoring or evaluation activities required by funders/contributors?

Yes

Please describe and provide reports if available.

- no answer given -

- no supporting documents provided -

Participants

Please list the active individual participants in the Initiative

First name	Last name	Email address	Member	Org
Pierre-Yves	le Traon	pierre-yves.letraon@mercator-ocean.fr	France	Mercator Ocean - Mercator Ocean International
Ralph	Rayner	ralph@ralphrayner.com	United States	- Sonardyne International Limited
Chuanmin	Hu	hu@marine.usf.edu	United States	USF - University of South Florida
Glenn	Nolan	glenn.nolan@marine.ie		
Hans-Peter	Plag	hpplag@odu.edu	IEEE - Institute of Electrical and Electronics Engineers	- Old Dominion University
Vladimir	Ryabinin	v.ryabinin@unesco.org	IOC - Intergovernmental Oceanographic Commission	IOC - Intergovernmental Oceanographic Commission
Sophie	Seeyave	ssve@pml.ac.uk	POGO - Partnership for Observation of the Global Ocean	POGO - Partnership for Observation of the Global Ocean
Douglas	Cripe	dcripe@geosec.org		
Samuel	Djavidnia	samuel.djavidnia@gmail.com	European Commission	POGO - Partnership for Observation of the Global Ocean
René	Garello	r.garello@ieee.org	IEEE - Institute of Electrical and Electronics Engineers	IEEE - Institute of Electrical and Electronics Engineers
Paul	Digiacommo	paul.digiacommo@noaa.gov	United States	NOAA - National Oceanic and Atmospheric Administration
Emily	Smail	emily.smail@noaa.gov	United States	University of Maryland - University of Maryland
Audrey	Hasson	ahasson@geobluep	United States	

		lanet.org		
Fifi	Adodo	fadodo@mercator-ocean.fr	France	Mercator Ocean - Mercator Ocean International
Nikelene	Mclean	nikelene.mclean@noaa.gov	United States	NOAA - National Oceanic and Atmospheric Administration
Sung-Jin	Cho	sjcho@kmi.re.kr		
Jungho	Nam	jhnam@kmi.re.kr		
Alvaro	Scardilli	sjcho@kmi.re.kr		
Ana Carolina	Ruiz Fernandez	caro@ola.icmyl.unam.mx		
Anton	Ellenbroek	anton.ellenbroek@faao.org		
Christoph	Waldmann	waldmann@marum.de		
Elham	Mahmoud Ali	elhamali201212@gmail.com		
Elva	Escobar-Briones	escobri@cmarl.unam.mx		
Eric	Chassignet	echassignet@fsu.edu		
Estradivari		estradivari.sant@gmail.com		
Hee-Jung	Choi	chj1013@kmi.re.kr		
Jeremy	Gault	j.gault@ucc.ie		
Jonathan	Hodge	jonathan.hodge@csiro.au		
Julien	Favier	julien.favier@ospar.org		
Keith	VanGraafeiland	kvangraafeiland@esri.com		
Kwame	Adu Agyekum	kaagyekum@ug.edu.gh	Ghana	- University of Ghana
Laura	David	ltdavid@msi.upd.edu.ph		
Martin	Visbek	mvisbeck@geomar.de		
Rahanna	Juman	rajuman@ima.gov.tt		
Stewart	Bernard	sbernard@sansa.or		

		g.za		
Louis	Celliers	louis.celliers@hzc.de		
James	Fitton	james.fitton@ucc.ie		
William	Skirving	william.skirving@noaa.gov		
Curt	Storlazzi	cstorlazzi@usgs.gov		
Ap	van Dongeren	ap.vandongeren@delftares.nl		
Shelly-Ann	Cox	shellsalc@gmail.com		
Isa	Elegbede	isaelegbede@gmail.com		
Katie	Geddes	katie.geddes@noaa.gov		
Lillian	Diarra	ldiarra@mercator-ocean.fr		

Other information

Please provide any other comments or information that was not included in the previous sections, but you would like to appear in the Implementation Plan.

In the next work programme period, GEO Blue Planet will aim to expand some of our working groups/activities to be multi-GEO initiative/flagship working groups/activities. A summary of ongoing and potential collaborations are outlined below:

Oil spills: The GEO Blue Planet working group on oil spills has developed a joint activity with AmeriGEO to produce a federated oil spill monitoring and information system for the Americas and Caribbean. Discussions on how best to brand the oil spill monitoring system for the Americas and Caribbean within GEO are ongoing. Options are to list this activity as a joint activity linked to AmeriGEO and the GEO Blue Planet oil spill working group or to transfer the activity over to AmeriGEO for further development and maintenance.

Eutrophication: GEO Blue Planet has approached GEO AquaWatch and GEO GloWs about expanding the eutrophication working group into a cross-GEO working group that is shared between GEO Blue Planet, GEO AquaWatch and GEO GloWS. There is the potential to also bring in GEO Glam (for agriculture distribution). Challenges for successful implementation of this idea include bandwidth of the GEO AquaWatch and GEO GloWS initiatives to add this activity to their portfolio. The benefit would be improved decision support tools that monitor both the cause and effects of nutrient pollution.

Fisheries: Several years ago, GEO Glam approached GEO Blue Planet about collaborating on aquaculture monitoring. We have not pursued this to date but there is an opportunity for collaboration in the future.

Marine litter: Mitigation of marine litter requires management and tracking of land-based waste. Combining monitoring of waste sites, human settlements, stream flow and shoreline and oceanic litter conditions are required to get a full understanding of the problem.

Blue Carbon: As part of the climate adaptation work, we have discussed potentially working with other GEO initiatives (GEO BON and GEO ECO) on Blue Carbon mapping. A Blue Carbon mapping system (including coral, sea grasses, mangroves, etc.) that is routinely updated could potentially be a goal for a new GEO flagship. Significant resources would be needed to build such a service (current maps and services are outdated, spotty or inaccurate) but the service could support both nature-based solutions to climate adaptation, biodiversity monitoring and carbon sequestration monitoring.

Disasters: The WaveForce system and oil spill monitoring activities are both directly linked to disaster risk management. We have not yet linked directly to the Sendai Framework for these efforts and could benefit from connections.

Coastal Erosion is also important for consideration for nature-based solutions nexus area activities as well as disaster resilience.

Fisheries: the

fisheries working group has implications for connections to the Blue Economy as well as food security. Connections could be made across these nexus areas and will be discussed at upcoming GEO Blue Planet Symposia.

- 2023_2025_geo_blue_planet_implementation_plan_references.docx ([link](#))

Co-Editor Management

List of co-editors for this initiative

First name	Last name	Email address
Audrey	Hasson	ahasson@geoblueplanet.org
Nikelene	McLean	nikelene.mclean@noaa.gov
Fifi	Adodo	fadodo@mercator-ocean.fr
Douglas	Cripe	dcripe@geosec.org