

**Flagships
Opportunities to help**

This Document is submitted to the GEO-XIII Plenary for information.

GEO Biodiversity Observation Network (GEO BON): Monitoring biodiversity change in support of policy

1 OVERVIEW

GEO BON is focused on helping countries understand and monitor the status and trends in their ecosystems, the biodiversity that they sustain and the services they provide. To that purpose, GEO BON facilitates the development of national and regional biodiversity observation systems. These systems are meant to collect, store and manage key biodiversity observations - the Essential Biodiversity Variables (EBVs) - utilizing tools for data analysis, visualization, and reporting. GEO BON emphasizes the development of national observation systems in order to efficiently support policies, decision making at the country level, and reporting at the national and international scale. GEO BON also works closely with and is well recognised by the Convention on Biological Diversity (CBD), the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and the Ramsar Convention. Furthermore, GEO BON facilitates regional networks, as well as thematic networks such as the Marine Biodiversity Observation Network (MBON) and the Freshwater Biodiversity Observation Network. Across all scales of observations, another GEO BON focus is the development of the EBVs to provide monitoring guidelines and standards. Network and EBV development, along with capacity building, is achieved via the development of the online toolbox, “BON in a Box”.

2 CHALLENGES

The key challenge for GEO BON is a shortage of data, particularly in biodiversity rich areas where more monitoring is needed. These data are needed so that countries can understand what is changing and take needed steps to meet their internal and international obligations, such as those under the CBD. Collecting the needed data requires a certain level of knowledge and skill; as well as infrastructure, that is not always available; and capacity needs to be built. A third challenge for GEO BON is access to funding at the national and regional scale to develop the component Biodiversity Observation Networks and build capacity.

3 HOW TO HELP

Key points where the support of the GEO members and POs is needed to overcome the challenges include:

Identification of specific contact points for national initiatives supporting biodiversity monitoring (this will help GEO BON connect with the right people);

4 INCREASE THE VISIBILITY OF GEO BON WITHIN PERTINENT AGENCIES (THIS WILL INCREASE GEO BON’S NETWORK OF SPECIALISTS ON BIODIVERSITY MONITORING);

- Participate actively in GEO BON capacity building activities and help develop new ones;
- Create funding opportunities for research and development of EBVs and the development of Biodiversity Observation Networks at the national or regional scale.

5 CONTACT INFORMATION

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GEO Global Agriculture Monitoring (GEOGLAM)

Leveraging Earth Observations for a Food Secure World

1 OVERVIEW

In the context of an expanding world population combined with climate change, feeding the planet using sustainable agricultural production is more challenging than ever. This challenge has been recognized by the G20's Action Plan on Food Price Volatility in 2011 and by the UN in 2015 through Sustainable Development Goal #2 Zero Hunger. GEOGLAM, the GEO Global Agriculture Monitoring initiative (geoglam.org), contributes to meeting this challenge by promoting the use of Earth Observations (EO) for monitoring agriculture, and is implemented globally and regionally with a focus on enhancing national capacity. This includes ensuring access to appropriate EO (in close link with the Committee on Earth Observation Satellites, CEOS), and developing monitoring methodologies in diverse landscapes, through the Joint Experiment on Crop Assessment and Monitoring (JECAM), an international network of research sites and teams (jecam.org), and through the Asia-RiCE program (asia-rice.org).

GEOGLAM has had considerable success through its Crop Monitor activities, which rely on EO to generate monthly consensus reports on global crop conditions. At the global scale, GEOGLAM operationally produces two monthly reports: the Crop Monitor for the G20 Agricultural Market Information System (AMIS), focusing on the main producing countries of four main grains (wheat, rice, maize and soybeans), and the Crop Monitor for Early Warning, focusing on countries-at-risk of food insecurity (geoglam-crop-monitor.org). At the national level, Crop Monitors have been prototyped for Tanzania and Uganda, with growing interest from other countries. GEOGLAM users are from global to local, UN and other international organisations dealing with food security, national Ministries of Agriculture, and individual farmers through extension services, NGOs and farmer unions.

2 CHALLENGES

- Understaffed Secretariat, leading to gaps in coordination around activities including regional coordination, capacity development, and partnerships with other initiatives;
- Lack of earmarked funding for the deployment of workshops and outreach activities; and
- Lack of funding to continue and develop the different GEOGLAM activities (see specific needs below).

3 HOW TO HELP

- Full-time and part-time secondments to the GEOGLAM Secretariat for general coordination activities and specifically for communication and outreach, fundraising and staffing, partnership initiation, and coordination of comprehensive implementation planning;
- Earmark funds for GEOGLAM to facilitate participation from lower income countries;
- Continue support for, and expand participation in the two GEOGLAM Crop Monitors;
- Fund high-level coordination of capacity development activities and for development and maintenance of an inventory of existing tools/methods and training materials; funding for capacity development projects targeting National Ministries of Agriculture, individual farmers through extension services, farmer unions and mobile services, with priority in developing countries;
- Establish sustained funding for JECAM to continue operational R&D on crop monitoring methods;
- Ensure continuous funding to the Asia-RiCE Programme (asia-rice.org) and develop/expand participation in the Rangeland and Pasture Productivity (RAPP, geo-rapp.org) monitoring initiative; and
- Promote access to short-term weather forecasts, to go beyond the present crop conditions.

4 CONTACT INFORMATION

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The Global Forest Observations Initiative (GFOI): Measuring and Monitoring Forest and Terrestrial Carbon

1 OVERVIEW

Through the work of its partners, GFOI supports REDD+ countries to develop their national forest monitoring systems and associated emissions measurement, reporting and verification (MRV) procedures. This is achieved through the four core components of GFOI: 1) Capacity Building, 2) R&D, 3) Methodological Guidance and, 4) Space Data Coordination. The initiative is also supported by the GFOI Programme Office.

The development of robust forest monitoring systems for REDD+ is an inherently complex task requiring consideration of specialized inputs and robust outputs. No international partner alone has the resources to meet the global demand for support from REDD+ countries, nor the breadth of expertise required to overcome all of the complexities. In recognizing this, GFOI partners are coordinating their efforts to provide a more holistic and specialized package of support than they would otherwise be able to deliver on their own. GFOI coordination allows specialists to work with REDD+ countries to deliver their expertise, whilst partnering with other experts to deliver theirs. This not only ensures that REDD+ countries are supported by specialists in a particular component of forest monitoring but it also helps to avoid overlap and duplication. This can allow for a more efficient and effective package of support and as such can ultimately help to reduce the transaction costs of REDD+.

The GFOI is not a stand-alone institution, it is instead a product of the actions of its partners. The Initiative is currently led by the Governments of Australia, Norway and the USA as well as the Food and Agriculture Organization of the United Nations (FAO) and the Committee on Earth Observation Satellites (CEOS). It is supported by an extensive community of international experts and stakeholders, including from the UNFCCC Secretariat, Intergovernmental Panel on Climate Change (IPCC), World Bank Forest Carbon Partnership Facility (FCPF), REDD+ countries, GOFC-GOLD, universities and other specialist international organizations and experts.

2 CHALLENGES

The key challenge for GFOI is in translating international knowledge and expertise in to sovereign national capacity in developing countries that can be used to meet REDD+ reporting requirements. Accessing long term and financial resources is also a challenge for GFOI. The development of meaningful and sustainable capacity is a long term undertaking, meaning that GFOI ideally needs up to 10 years of financial certainty to allow it to deliver up on its ambitious objectives.

3 HOW TO HELP

- Fund raising: GFOI needs longer term funding arrangements to allow it to complete its mission;
- GFOI Programme Office: GFOI needs financial and personnel support for the Programme Office including secondment of forest monitoring and IPCC/REDD specialists;
- Communications: GFOI needs assistance in strategically communicating the benefits of its activities to REDD+ countries and the international community;
- GFOI Capacity Building: GFOI solicits support of national and regional workshops on technical and policy issues relating to MRV, GHG and REDD+;
- Support for the participation of national representatives in the functioning and administration of GEO, and participation in GFOI technical meetings and workshops;
- Support for joint R&D activities on key technical issues.

4 CONTACT INFORMATION

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GOS4M: Global Observation System for Mercury

- in support of policy and science -

1 OVERVIEW

The GOS4M Flagship aims to: i) increase the availability and quality of Earth Observation data and information to contribute to the understanding of the cycling of mercury released to the global environment and, where appropriate, anticipate possible changes; ii) harmonize metadata production, archiving and data sharing from the mercury observation network; and iii) develop advanced services in support of policy mandate(s) through the Minamata Convention.

Engagement with relevant user communities and other stakeholders is of crucial importance for this Flagship, making sure its objectives are in tune with the real-world problems and that its results provide practical solutions. The Flagship will seek to build up a stakeholder dialogue with representative sector-specific user communities to incorporate feedback loops for the products of this Flagship, as well as to develop improvements of existing mercury data workflows.

The approach used to build this Flagship will include the establishment of a governance structure; analysis of current infrastructure and archived information on mercury; harmonization of information and production of metadata following international standards; implementation of a dedicated Portal with the EUROGEOS Broker as its core engine; design, creation and implementation of core services and tools.

2 CHALLENGES

Resources for the implementation of this Flagship derive from several funding agencies and programmes in EU and abroad, including i.e., "The European network for observing our changing planet (ERA-PLANET)" project (www.era-planet.eu) funded by the European Commission, regional and national programmes, UNEP-GEF projects. The global expected resources for the implementation of the Flagship are above €12 M.

3 HOW TO HELP

- Initiate mercury monitoring sites in your country if not yet present and take an active part in the Flagship activity by involving your national stakeholders and NGOs;
- Make available, if possible, surveys of fish/rice consumption habits, and their origin, in your country areas to gain an initial idea of the population's possible exposure to mercury;
- Make available, if possible, any historical data. Would it be possible to construct metadata for this data in line with the principles of GEOSS?

4 CONTACT INFORMATION

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Initiatives

Opportunities to help

AfriGEOSS Initiative: Strengthening use of Earth Observations and bringing GEOSS to Africa

1 OVERVIEW

The development and uptake of Earth observation (EO) data, information and knowledge is critical to improving the socio-economic status of citizens on the African continent. GEO's AfriGEOSS initiative recognizes the need to improve and coordinate observation systems across the Societal Benefit Areas (SBAs) in Africa, in particular, in water resource management, food security and agriculture, sustainable urban planning and development and sustainable forest management. Strong advocacy of open data-sharing policies and practices; improved infrastructure; and increased use of EO data and information in policy and decision-making; is the foundation of moving forward in all SBAs. Similarly, focusing significant effort on building human, institutional and technological capabilities will ensure the African continent benefits from better access to EO data, products and services, and improved understanding and use of them. AfriGEOSS provides a robust framework to coordinate and connect relevant stakeholders, institutions and agencies - across Africa and with its international partners - to initiate mutual activities within the scope of GEO and in support of key environmental and related African agendas.

2 CHALLENGES

To advance the progress made in meeting the AfriGEOSS objectives, ownership by the African community is needed. Continental, regional and national ownership can be illustrated by commitment of both in-kind and financial resources. Secondly, success is largely dependent on access to the information of Who is doing What, Where. This information needs to come from within Africa in order to strengthen African and international partnerships and to enable participation and linkages of African activities with all relevant GEO activities. AfriGEOSS could thus be enabled to fulfill its objective of being the gateway to Africa for EO activities, thereby reducing duplication of efforts, and leveraging all investments being made in or for Africa.

3 HOW TO HELP

- Strengthen active participation and contribution of African Members and Participating Organizations, e.g. by establishing national GEOs and identifying national focal points for coordination;
- Inform, engage and connect the AfriGEOSS Coordination Office to current or planned activities in Africa;
- Provide financial contributions to AfriGEOSS Coordination Office activities through the GEO Trust Fund;
- Provide financial and in-kind contributions for implementing AfriGEOSS activities as identified by the Coordination Teams in order to implement the agreed-upon Action Areas;
- Support through sponsorship and participation the annual AfriGEOSS Symposia; and
- Consider AfriGEOSS as 'The' framework in which to develop new bi-lateral/multilateral cooperation, leveraging national activities and exploiting GEO's flexibility.

4 CONTACT INFORMATION

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AmeriGEOSS Initiative: Implementing GEOSS in the Americas

1 OVERVIEW

The AmeriGEOSS initiative is a framework that seeks to promote collaboration and coordination among the Group on Earth Observations (GEO) members of the Americas that regionalizes GEO's global vision "to realize a future wherein decisions and actions, for the benefit of the region, are informed by coordinated, comprehensive and sustained Earth observations and information". The Americas Caucus members (Argentina, Bahamas, Belize, Brazil, Canada, Chile, Colombia, Costa Rica, Ecuador, Honduras, Mexico, Panama, Paraguay, Peru, the United States, and Uruguay) have recognized the value of working together as one region to meet GEO objectives. The initiative is focused on four GEO Societal Benefit Areas (SBAs) prioritized by the Americas Caucus members: food security and sustainable agriculture, disaster resilience, water resources management, and biodiversity and ecosystem sustainability. Foundational activities, e.g. data infrastructure and capacity building, are also a focus. The Initiative leverages GEO global initiatives and other available resources, and applies space-based and in-situ Earth observations to meet the regional needs in the Priority areas. The initiative seeks to make the applications of Earth observations affordable for all in the region.

2 CHALLENGES

AmeriGEOSS is a regional effort that draws on the efforts of GEO Global Initiatives to bring those initiatives to the region to meet national and regional needs. Coordination across regional and thematic needs is a challenge we are addressing. Funded projects specific to AmeriGEOSS will strengthen AmeriGEOSS. These projects could be achieved by research funding calls for projects to support AmeriGEOSS, international development agency support for AmeriGEOSS projects, and GEO Members coming forward with projects that can be added to the 2017-2019 AmeriGEOSS work plan.

3 HOW TO HELP

Priority SBA Working Groups are currently being formed; GEO Principals are in the process of nominating their National Working Group leaders who will be responsible for the development of national and local activities in their respective country. Experts in any of the priority SBAs and organizations who want to participate in AmeriGEOSS activities can contact their GEO-Principal or any of the Initiative's regional coordinators.

Members and participating organizations can inform experts in their countries on the goals and activities of AmeriGEOSS. Country experts can also provide inventories of the data sets, data products, and applications in their countries.

Research funding and development agencies in all appropriate Member countries can seek to incorporate AmeriGEOSS activities into their calls for proposals.

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Data Access for Risk Management (GEO-DARMA): Using Earth Observations for Better Decision-Making in Support of Disaster Risk Management and Resilience.

1 OVERVIEW

GEO-DARMA addresses some of the most critical issues related to Disaster Risk Reduction (DRR) affecting countries in a given region (e.g. South-East Asia, Africa, or Latin America). Through end-to-end pilot projects that rely on the use of multiple Earth observations (space, airborne, in situ) and other data (socio-economic, models outputs, etc.), GEO-DARMA will deliver specific risk information products and services in response to end-user needs.

The GEO-DARMA Team consists of leading regional institutions with a clear mandate for risk reduction. These organizations work with the lead implementing organizations of the Sendai Framework at a local, national and regional level, and are ideally positioned to establish a set of projects that effectively demonstrate the added-value EO data can provide to improve decision-making relating to disasters. These projects will be designed to be scalable to other countries in the region and ideally across regions. Ultimately, GEO-DARMA is positioned to become a clearing house of lessons learned and best practices related to the use of EO for improved risk reduction.

2 CHALLENGES

The first challenge is to establish a list of active GEO-DARMA partners, drawing from regional institutions in Latin America, Africa, and Southeast Asia. These partners will together determine regional and national projects most likely to benefit from increased use of EO for DRR. A second level challenge is identifying the appropriate resources to implement the projects in-country, either through leveraging existing DRR budgets, through new in-kind contributions, or through the identification of new resources.

3 HOW TO HELP

Regional Institutions and stakeholders active in risk management matters are invited to join GEO-DARMA, and express their interest at Plenary.

GEO Member countries regularly affected by hazards and active in disaster risk management should also contact us, and offer advice and suggestions on potential regional partners.

4 CONTACT INFORMATION

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The GEO Carbon and GHG Initiative (GEO-C): toward policy-relevant global carbon cycle observation and analysis

1 OVERVIEW

The main aim of the GEO Carbon and GHG Initiative is to facilitate cooperation to develop a coordinated system of observations and evaluation of changes in the carbon cycle, in other cycles and in greenhouse gas emissions, as they relate to human activities and climate change. The Initiative aims to provide decision makers with timely and reliable policy-relevant information.

The final users, in addition to the scientific community, are GEO members and decision makers that can benefit from the improved information flow and use it to address climate change policy.

The approach builds on existing initiatives and networks, supporting their continuity and coherence, facilitating their cooperation and interoperability, and filling in the missing pieces to obtain a comprehensive, globally coordinated carbon and GHGs observation and analysis system.

2 CHALLENGES

Awareness about the need for climate-related information has significantly increased in recent years. Existing efforts are scattered worldwide and there is widespread recognition of a need to coordinate, improve and expand on current efforts. However, country level commitments are lacking and resources are insufficient to establish and sustain a long term operational global observing system for carbon cycle and greenhouse gases.

3 HOW TO HELP

GEO Members and Participating Organizations are invited to consider ways to support GEO-C, including the promotion of linkages with other relevant initiatives, inside and outside GEO. GEO Members and POs are also invited to highlight expectations of a global Initiative of this kind, including any further needs they may have, in order to explore how GEO-C can address them.

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GEO COLD REGIONS INITIATIVE (GEO CRI)

Observing Locally, Informing Jointly, Benefiting Globally

1 OVERVIEW

Earth's Cold Regions – Antarctica, the Arctic and Antarctic high-latitude oceans, the Himalaya-Third Pole and High-Mountain Areas are the most ecologically and environmentally sensitive areas to climate change. Impacts of climate change have far-reaching implications affecting the inhabitants of more than one hundred countries where people either live in the Cold Regions or are affected by them. The need for coherent, science-based, yet easily understandable information on how to recognize, advocate, solve and adapt to these changes are relevant to all GEO Societal Benefit Areas.

GEO Cold Regions Initiative (GEOCRI) vision complements that of GEO as a whole, a world in which coordinated Earth Observations and information services are available to a range of stakeholders to support well-informed decisions and sustainable development of Earth's Cold Regions. Our mission is to develop a user-driven approach to complement the current mainly science-driven efforts, and strengthen the synergies between the ecological, environmental, climate, and cryosphere research efforts for improved Earth observations and information throughout the Cold Regions, and ultimately on a global scale.

The GEOCRI Implementation Plan will guide the initial phase of the Initiative, with activities grouped into six Tasks, each with its own dedicated Task Team: Integrating, Brokering and Promoting Earth Observations over the Cold Regions; Advocating and Practicing Data Sharing; Building a Cold-Regions Community Portal and Services; Strengthening Capacity Building and Partnerships. Each Task consists of activities with sets of milestones and deliverables throughout the current GEO Work Programme (2017-2019). GEOCRI promotes the establishment of pilot services and a coordinated network of those services. Following the execution of the GEOCRI Implementation Plan, a transition to an operational phase will be made, aligned with the next GEO Work Programme from 2020 onwards.

2 CHALLENGES

Achieving GEOCRI goals and objectives requires constructive and transformative collaboration across the Cold Regions internationally. Effective networking, community development and engagement will be critical to the success of GEOCRI.

Resources and support needed at this stage from the GEO Member States and Participating Organizations. These mainly focus on identification of and engagement with connections and partnerships most relevant for national and institutional contacts.

3 HOW TO HELP

The most critical needs of GEOCRI for support are listed below.

- Support with building up visibility of GEOCRI;
- Identification of potential contacts and partnerships with national Cold Regions Earth Observations-related agencies and institutions;
- Support with implementation of pilot services (testing, promotion to user groups);
- Support the implementation mechanism through policy mandates nationally or internationally.

4 CONTACT INFORMATION

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GEO ECO, The Global Ecosystem Initiative: Monitoring and Modeling the Changing Global Ecosystem to Improve Ecosystem Benefits

1 OVERVIEW

Knowledge-based conservation, management and restoration policies are urgently needed in order to benefit ecosystems in the face of increasing anthropogenic pressures. Fundamental to informing these policies is effective monitoring, understanding and modelling of the state and trends in ecosystem functions and services, adopting a complex system view where geosphere and biosphere interact in a tightly coupled way across multiple space and time scales. New monitoring methodologies are now available that combine remotely-sensed data and *in situ* observations. The GEO ECO Initiative builds upon available Earth observation data, results and information and use them on a global scale, identifying Protected Areas of international relevance, extending the analysis to unprotected areas and adopting the view of ecosystems as ‘one physical system’ with their environment. Knowledge about ecosystems acquired through the activities of GEO ECO will be built together with the people in charge of the management of Protected Areas, and an Ecosystem Community of Practice will be created with the goal of devising specific conservation and management policies.

2 CHALLENGES

At the moment, GEO ECO is supported by two EU H2020 projects (ECOPOTENTIAL and SWOS, focusing on mountains, arid regions, coastal areas and wetlands), by the global monitoring activities of USGS and Esri, and by the activities of the Chinese Academy of Forestry. Specific challenges are (1) extend the activities to Protected Areas in other regions of the world, (2) extend to other ecosystem types, and (3) establish close links with policy makers.

3 HOW TO HELP

- Express interest and provide support to extend GEO ECO activities to other countries/continents and establish contact with PAs, to support the creation of the Ecosystem Community of Practice;
- Provide access to databases on ecosystem state and trends, helping to establish a global archive on the changes of ecosystems in Protected Areas;
- Help extend the approach to relevant natural ecosystems outside Protected Areas and start a global action on urban ecology;
- Facilitate contact with national and regional policy makers for the management and conservation of natural ecosystems;
- Build the view of ecosystems as complex systems whose conservation cannot be split from the management of the geological, physical and chemical environment where they are located.

4 CONTACT INFORMATION

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Global Network for Observations and Information on Mountain Environments (GEO-GNOME): Improving Understanding of Mountain Regions

1 OVERVIEW

GEO-GNOME will compile data and make data available on the current and future state of the mountains to improve our understanding of the drivers, conditions and trends in the high-altitude regions and to support policy decisions. The activities will begin with delineation of mountain regions using best available data (Task 1). Thematic datasets that quantify ecosystem services, socio-economic measures and drivers arising from or impinging upon mountains will follow (Task 2). Focused campaigns related to known issues will generate new data and new insights needed to convert data into knowledge (Task 3). The final GEO-GNOME Tasks 4 and 5, will anticipate and inform new policy frameworks beyond the historical GEO SBAs to ensure that GEO-GNOME data can be useful in relevant policy contexts (e.g. SDGs). The principal benefit for stakeholders will be access to data in support of evidence-based decisions. GEO-GNOME will close loops, making data collected by third parties on local environments available to local officials for the first time. GEO-GNOME will also encourage local academic/research institutions to organize their data in forms that directly enter local governance processes.

2 CHALLENGES

The principal challenges for GEO-GNOME are financial. They arise from GEO-GNOME's nature as a network activity: while certain aspects (e.g. data access) can be implemented by a handful of participants, much of GEO-GNOME's work requires the engagement of a great number of individuals and institutions spread across numerous GEO Member countries.

3 HOW TO HELP

- Support national actors engaged in the Unified High Elevation Observing Platform (UHOP) for the completion of UHOP transects, in particular: Pakistan, Kazakhstan, Nepal, China, Russia, Japan, United States, Canada, Colombia, Ecuador, Peru, Bolivia, Chile, Argentina, Uganda, Kenya, Ethiopia, South Africa, and Austria;
- Encourage participation of states not engaged in UHOP to participate;
- Support national actors in the Global Network of Long-Term Observatories of Mountain Social-Ecological Systems (GNOMO) for further engagement of the national GNOMO sites in the GNOMO program. Countries include: China, Japan, Canada, USA, Colombia, Ecuador, Morocco, France, Switzerland, Uganda, Tanzania, South Africa Kyrgyzstan, Nepal;
- Support the incorporation of new national sites into the GNOMO network.

4 CONTACT INFORMATION

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GEO Global Water Sustainability (GEOGLOWS): Applications of Earth Observations for Sustainably Managing the World's Water Resources

1 OVERVIEW

GEOGLOWS facilitates the use of Earth observation assets to contribute to mitigating water shortages, excesses and degraded water quality arising from population growth, climate change and industrial development on a world-wide basis. It develops knowledge based on the analysis of Essential Water Variables (EWVs) and uses this knowledge to guide applications related to minimizing basin and/or regional risk; to inform policies related to enhancing global water sustainability, and to support capacity building through regional programs and alliances such as AmeriGEOSS. It supports water resource managers, other resource managers who rely on water and policy makers who formulate policy related to water at local, state, national and global levels. To achieve its objectives, GEOGLOWS strives to enhance observational programs, implements systems for data and product dissemination, innovates to make more effective use of data through applications and research, promotes and implements free and open data exchange of data, and also employs GEO principles for good data management.

2 CHALLENGES:

Water is both a global issue and a local issue. Addressing all of the water problems across scales is difficult because of the diversity and complexity of these issues. As GEOGLOWS has transitioned from a national to an international programme, it has benefitted greatly from basin-scale projects in Latin America through AmeriGEOSS. The programme, however, has yet to take hold in Asia or Africa or even Europe. This gap does not likely represent a lack of activity or expertise in these areas, but rather a lack of contact with experts who can make a difference in the GEOGLOWS programme.

GEOGLOWS is a voluntary effort and, as such, draws upon a diverse range of contributions. Funded projects are needed to provide a solid base for GEOGLOWS. This could be achieved by research funding calls for projects to support GEOGLOWS, development-agency support for GEOGLOWS projects and GEO Members coming forward with funded projects that can be integrated into the 2017-2019 GEO Work Programme. Finding ways to engage these potential GEOGLOWS partners has been a challenge. Funding is also needed to support a coordination function at a level that will meet the expectations of partners.

3 HOW TO HELP

At this juncture GEOGLOWS is looking for experts to provide advice (and in some cases to help deliver) on separate parts of the program. Members and Participating Organizations could:

- identify experts in water science and water resources management who could provide advice and connect their own initiatives with GEOGLOWS;
- inform experts in their countries and/or organizations on the goals and activities of GEOGLOWS. (GEOGLOWS would be happy to provide the information needed to make these links.);
- provide inventories of the data sets, data products, and applications available in their countries;
- encourage research funding and development agencies in all relevant GEO Member countries to incorporate advice from GEOGLOWS into their Calls for proposals.

4 CONTACTS INCLUDE

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Geohazard Supersites and Natural Laboratories - GSNL: better science for more effective Disaster Risk Reduction

1 OVERVIEW

Science-based decision making should be routine in Disaster Risk Reduction (DRR). Unfortunately in many cases the uptake of new research findings is slow and ineffective.

The Geohazard Supersites are seismic or volcanic areas where an international partnership is focused on providing new scientific results, directly supporting local DRR actions by institutional end-users. The partnership includes space agencies, providing satellite imagery at no cost; local monitoring agencies, providing ground-based data; and the international scientific community, exploiting these data to generate state of the art scientific results.

In this framework, local scientific institutions are the go-to organizations for DRR end-users at the national scale. Scientific institutions can exploit this role, transfer the community's scientific results and ensure their rapid uptake in disaster prevention and management.

2 CHALLENGES

- Assure stable resources to support adequate monitoring levels, data sharing infrastructures, and sharing of Supersite scientific resources, and to build capacity in lower income communities;
- Eliminate the obstacles which prevent rapid and effective uptake of new science in Risk Prevention and Emergency Management activities at the local scale;
- Enlarge the network of partners and Supersites, both in quantity and in quality, e.g. engaging local and international stakeholders and possibly commercial EO data providers.

3 HOW TO HELP

GEO Members and Participating Organizations can support the GSNL initiative in several ways, the most important being:

- Highlight the importance of Supersites as test beds where an Open Science approach is dedicated to directly support DRR needs, especially at local government level;
- Commit specific funding for data monitoring and sharing infrastructures, scientific research, and end-user support assigned to Supersites;
- Stimulate national stakeholders to establish new Supersites.

4 CONTACT INFORMATION

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GEO Human Planet Initiative (GEO HPI): Spatial modeling of human settlements, impact, exposure and access to resources to support the post-2015 international framework policies.

1 OVERVIEW

The GEO HPI is committed to develop a new generation of measurements and information products that provide new scientific evidence and a comprehensive understanding of the human presence on the planet to support global policy processes with agreed, actionable, goal-driven and universally applicable metrics and indicators. The GEO HPI aims to support the monitoring of the implementation of the UN Third Conference on Housing and Sustainable Urban Development (Habitat III, 2016), the post-2015 framework on Sustainable Development Goals (SDGs), the UN Framework Convention on Climate Change, and the Sendai Framework for Disaster Risk Reduction 2015-2030 (DRR). GEO HPI supports the implementation of a platform to contribute to the UN Technology Facilitation Mechanism and to enable the testing and collective discussion of alternative options in operationalization of the indicators. The extended partnership involves more than 150 individual scientists and policy makers belonging to 85 different organizations including academies, international stakeholders, governmental bodies and private firms.

GEO HPI users and partners are scientists working on global thematic issues and requiring open, harmonized, detailed evidence about human presence on the planet, and decision makers working in the frame of the post-2015 frameworks (UN, WB, national and multi-national authorities, and networks of local administrations such as citiesalliance.org). The GEO HPI addresses the problem of producing, integrating and sharing the best state-of-the art spatial baseline data, using complex heterogeneous, large volume input data such as those collected through Earth observations, national census and crowd sources as voluntary geographic information (VGI). The baseline information supported by GEO HDI facilitates the test and comparison of alternative models and indicators, before exposing the results in the decisional and negotiation processes of the post-2015 frameworks. The GEO HPI applies new spatial data analytics methods on open data and an open, reproducible method framework.

2 CHALLENGES

Proprietary data and not open data/information dissemination policies.

Earth-observation-centric data analytic paradigms.

Weak or yet-not-established formal links with other GEO initiatives. The GEO HDI will make strong linkages with the following activities included in the draft GEO Transitional Work Programme 2016: CA-01 Global Land Cover; CA-12 Soil mapping at regional and global level; GI-09 Integrated Information Systems for Health (Cholera, Heat waves); GI-12 Use of Earth observations to support the implementation of the Sendai framework 2016-2030; GI-13 Global Urban Observation and Information; GI-15 GEO and SDGs. EOs role in providing support to countries in achieving SDGs; GD-01 Data Sharing and Data Management; GD 7 GEO Knowledge Base development; CD 02 Promote the role of EOs and GEO in the post-2015 development agenda; CD-03 Reinforcing engagement at national and regional level (includes EO uptake for decision making).

3 HOW TO HELP

- Facilitate the dissemination of open data and integrated information and make data production more relevant and visible in the GEO platform;
- Facilitate methodological discussions on hybrids of satellite-data-derived information with other sources. Overcome the Earth-observation-centric approach;
- Improve GEO's links with human-related disciplines such as economy, demography, sociology and planning which are not extensively represented in the current GEO community;
- Facilitate the exchange with other GEO activities producing global open information;
- Enhance visibility of the GEO HPI in GEO's coordinating activities such as GI-18 "GEO and SDGs" and CD 02 "Promote the role of EOs and GEO in the post-2015 development agenda".

4 CONTACT INFORMATION

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GEO VENER: Vision for renewable ENERGies

1 OVERVIEW

GEO-VENER plans to lay the groundwork to link renewable energy services, data and metadata to GEOSS, to serve a large variety of users (from citizens to decision makers, including the private sector), to use EO data to enhance our knowledge and information about renewable energies in order to increase substantially the share of renewable energy in the global energy mix by 2030 as proposed within the SDG7 Target.

2 CHALLENGES

A key challenges for the GEO VENER initiative is to develop the governance of the initiative and to ensure long term resources. The main driver for the coming years will be to involve the commercial sector in initiative activities and meet their needs where possible. The bottom-up approach is key in the development and use of information and data.

3 HOW TO HELP.

- Identify participants from GEO Members and Participating Organizations to the GEO VENER Initiative;
- Work on the political mandate that can be given to GEO VENER;
- Promote awareness and disseminate the findings of the initiative.

Contact Information

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GEO-Wetlands : Coordinated Earth Observations for Sustainable Use and Conservation of Wetlands

1 OVERVIEW

The GEO-Wetlands Initiative is a collaborative framework for the development of a Global Wetland Observation System (GWOS). It brings together a broad global community from different disciplines and sectors to tackle common challenges related to wetland mapping, monitoring and assessment. This global community ranges from global conventions like the Ramsar Convention on Wetlands to regional and national agencies and local managers of wetlands, with diverse information needs. Through different activities and projects this community is already contributing to the development of GWOS. What makes GEO-Wetlands unique is its user orientation, answering to the real information needs of its user community.

2 CHALLENGES

GEO-Wetlands is based on several on-going projects that provide a solid basis for the first phase of development. The key challenge for GEO-Wetlands is to develop a set of processes on governance, user engagement, funding, information and knowledge management and communication, with the goal of securing long-term sustainability and further development of user-networks, products and services. GEO-Wetlands aims to develop an online portal to engage with different groups of users, providing easy and open access to data, information and documentation and allowing for direct interaction within the GEO-Wetlands community.

3 HOW TO HELP:

To overcome the challenges described above, additional resources (in-kind and direct) are required for:

- Development and maintenance of a functional GEO-Wetlands Website;
- Long-term maintenance, evolution and hosting of the GWOS Infrastructure that is currently being developed by the EU Horizon 2020 project SWOS;
- Co-financing/hosting of a GEO-Wetlands office to allow continuous and efficient management of the initiative; and
- Support specific thematic working groups of GEO-Wetlands centered around user needs, e.g. implementation of the Ramsar Convention or monitoring of progress towards Sustainable Development Goal 6.

In addition to these direct contributions, GEO Wetlands greatly benefits from GEO Members advertising the initiative at national level and linking national funding programmes, projects and research activities for its further development and success. Participating Organizations are welcome to join and contribute to GEO-Wetlands in terms of providing expertise and advice, and supporting dissemination, outreach, resource mobilization and user-engagement.

4 CONTACT INFORMATION

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Global Drought Information System (GDIS) - developing capabilities to monitor global drought and water scarcity for sustainability

1 OVERVIEW

Climate monitoring requires monitoring the variability of the water cycle, specifically its dry phase (droughts and water scarcity). Among other activities, the Global Drought Information System (GDIS) aims to identify the optimal blend of space-based and in situ observations that would permit drought and water scarcity monitoring at the global and continental levels, including: global precipitation monitoring; global space-based vegetation and crop monitoring for water stress due to drought; and surface water and soil water monitoring and modeling. An ancillary activity is facilitation of regional drought networks, combined with improved drought prediction for more reliable early warning, along with new techniques to monitor water usage.

2 CHALLENGES

2.1 Despite the contribution of in-kind resources of several Member governments, the main challenge facing the initiative is the lack of financial resources.

Resources could be used setting up an automated drought prediction system at ECMWF; not only setting up a Standardized Precipitation Index drought forecasting system, but also testing abilities of the ECMWF and North American Multi-Model Ensemble (NMME) members to reliably simulate and predict oceanic teleconnections; and pilot testing within Regional Climate Outlook Forums (RCOFs). For example, tropical South Atlantic sea surface anomalies, as well as those of the Indian Ocean Dipole can be tested within forecast models against drought predictive skill in Sub-Saharan West Africa.

2.2 Portal

A Member or Participating Organization donation of in-kind resources is being sought which could provide access to a “mirror” portal for test new content for the “one stop shop” combined GDIS-WMO Drought portal.

2.3 Building the Global Drought Monitor

Belize, Costa Rica, Honduras, and Panama are invited to join efforts in adding regional drought monitoring mapping for Central America to the South and North American drought networks.

Participation with Algeria, Egypt, Morocco, and Tunisia, as well as localities in West Asia, including Turkey, would be welcome in forming a regional drought monitoring capability for the Middle East and North Africa (MENA) region.

Participation with Bangladesh, India, and Pakistan would be welcome in continuing to build, as having been envisioned by World Meteorological Organization (WMO), a regional drought network for the South Asia region (joined by IWMI).

2.4 Building the Global Drought Predictor

Additional in-kind resources are sought from European Centre for Medium Range Weather Forecasting (ECMWF) in combining ECMWF SEAS with the North American Multi-Model Ensemble forecasts for pilot testing of improved drought prediction.

ACMAD is extended a cordial invitation to consider being listed as host for pilot testing of drought prediction in Sub-Saharan West Africa.

3 CONTACT INFORMATION

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GEO Global Urban Observation and Information (GI-17): Monitoring Urban Assets in Support of Sustainable Cities

1 OVERVIEW

GI-17 intends to improve urban monitoring and assessment through international cooperation and collaboration, to provide datasets, information, technologies to pertinent users (planning and environmental management agencies, especially in developing countries as well as the World Bank and UN), and to support UN SDG Goal 11: Make cities inclusive, safe, resilient and sustainable.

The pertinent government agencies that would most likely use our datasets include departments of urban and regional planning, environmental management, natural resources, metropolitan transit authorities, statistics offices and regional sustainability bodies. These agencies need datasets to obtain information about urban land use/land cover, urban form and growth patterns, infrastructure and transport needs, ecosystems and biodiversity, human health, thermal comfort, food security, and socioeconomic development. Further, the World Bank Platform for Urban Mapping and Analysis could benefit from the datasets, products, and services that this project offers. In addition, GI-17 can provide essential urban variables and indicators of sustainable cities to serve SDG 11. For the scientific community, GI-17 will provide new knowledge on global urbanization processes and innovations on urban remote sensing.

While some activities are extensions of the GEO SB-04 activities, others are fresh proposals. The activities of different organizations and countries are coalesced as one GEO initiative through collaborative and affiliated projects, annual symposia, an international summer school, publications, and coordinated user engagement efforts. GI-17 will generate various data products of global urban areas using Earth observation (EO) data, provide EO-based urban data services through various systems and tools, develop new models and algorithms to assess and monitor urban environments, create a better knowledge of cities and develop essential urban variables and indicators on sustainable cities for SDG 11. Highlights of activities for 2017-2019 include: (1) Megacities Observation and Monitoring (MOM) program; (2) Continued generation of Global Human Settlement Layers; (3) Virtual Global Urban Remote Sensing Laboratory; (4) Impervious Surface Mapping in Tropical and Subtropical Cities project (Asia, Africa, and S. America); (5) Establish a Global Institute of Sustainable Cities (GISC); and (6) Organize an annual GEO Global Urban Observation Symposium and International Summer School.

2 CHALLENGES

GEO Members and Participating Organizations can provide funding for: 1) a Project Coordinator; and/or 2) up to 10 students/young researchers from developing (low or lower-middle income) countries to attend annual GEO Global Urban Observation Symposium/the International Summer School.

3 HOW TO HELP

Under general supervision of GI-17 Lead, the Project Coordinator will ensure that the goals and objectives of GI-17 set for 2017-2019 are accomplished in accordance with priorities and funding limitations. Specific duties include:

- performing administrative support to function as the International Project Office;
- managing communications with scholars, partners and users and creating/updating a GI-17 website;
- liaising with international scholars and practitioners in facilitating project objectives including local activities that are implemented according to the scientific agenda of the project;
- editorial writing, preparing CFPs, newsletters and other publications and documents;
- leading and planning GI-17 symposia and workshops; handling logistics for travels and meetings; and
- assisting with the preparation of budgets, reports, and grant proposals.

4 CONTACT INFORMATION

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Global Wildfire Information System (GWIS): Assessing wildfire regimes and impacts globally

1 OVERVIEW

The Global Wildfire Information System (GWIS) is a Global Initiative of GEO that aims to have a comprehensive view and evaluation of fire regimes and fire effects at global level through bringing together existing information sources at regional and national level. It builds on the activities of the GOFIC GOLF Fire activities and the EC Copernicus program, to integrate information systems at the national and regional levels, promoting the networking of major national and regional fire information providers. GWIS aims ultimately at providing trans-border harmonized fire information supporting fire managers and policy makers at national, regional and international level.

2 CHALLENGES

The main challenges for a successful implementation of GWIS regard:

- The integration of information from national and regional providers into GWIS, which requires the agreement on information/data transfer protocols and formats;
- The link of GWIS to national/local fire management organizations, i.e. the transmission of GWIS information to operational networks at national and subnational level;
- The link of GWIS to international organizations/initiatives, e.g. the recognition of GWIS as the system that can help international organizations such as FAO, UNISDR, etc., supporting the Sendai Framework for Disaster Risk Reduction.

3 HOW TO HELP

- Getting involved in the development of GWIS, either as a data provider at national/regional level, or as a user of GWIS at those scales;
- Providing feedback on the usage of the system and providing recommendations for the improvement of the system; strengthening the links between data providers and data users in GWIS;
- Proposing local activities, either presentation of the GWIS services, or training activities around GWIS at local/regional level.

4 CONTACT INFORMATION

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Oceans and Society – Blue Planet: Utilizing Ocean and Coastal Observations to Benefit Society

1 OVERVIEW

We live on a Blue Planet, and Earth's waters benefit many sectors of society. The overall goal of the GEO Blue Planet Initiative is to ensure the sustained development and use of ocean and coastal observations for the benefit of society. Blue Planet will work to support the users of ocean and coastal data by working on the integration of, and access to, in situ and remote sensing data. Beneficiaries of this work will include scientists, ocean synthesis and forecast systems, and seasonal and long-term climate forecasts and projections. Blue Planet will also work to improve the connections between the data collectors and the users of ocean and coastal observation information. Blue Planet will leverage these connections to ensure users, such as civil protection authorities, regulators, industry, policy makers and recreational users, are supplied with services that provide actionable information that is beneficial to society. In addition, Blue Planet will work to champion the benefits of ocean and coastal observations and develop capacity for the collection and use of related data, products and information.

Blue Planet activities will be organized into four components: 1) data integration and informatics, 2) information services, 3) user engagement and 4) capacity building and advocacy. These components will be composed of Working Groups tasked with identifying priorities, producing prototype/pilot projects and coordinating with related GEO activities. Prototype/pilot projects will be focused on the thematic areas of coastal communities, healthy ecosystems and food security, the blue economy and maritime awareness.

2 CHALLENGES

The task that lies ahead of Blue Planet is not trivial. Collaboration and coordination is in itself a challenge, to which are added the dimensions of international, cross-cultural and cross-disciplinary work. Bringing together organizations that may feel they are in competition with each other for funding and for recognition is also a significant challenge. Blue Planet also faces challenges associated with its volunteer, best-effort nature. This means that resources (financial and human) are a limiting factor that may hinder its progress.

3 HOW TO HELP

Blue Planet is a growing Initiative that requires additional involvement from potential users. Blue Planet is seeking to expand financial and human resources and add Secretariat nodes. In addition, Blue Planet is seeking funding for pilot and prototype projects that address GEO's societal benefit areas including monitoring of coastal water quality (with GEO AquaWatch); monitoring of oil spills; improved forecasts of local sea-level rise; monitoring of offshore and coastal aquaculture industries; monitoring of coral reef and mangrove ecosystem health; monitoring of marine debris; and monitoring of illegal, unreported and unregulated fisheries operations. If you are interested in being involved in Blue Planet or supporting Blue Planet activities through in kind or financial contributions, please see contacts below.

4 CONTACT INFORMATION

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Earth Observations in Service of the 2030 Agenda for Sustainable Development:

Organize and realize the potential of Earth observations and geospatial data to advance the 2030 Agenda and enable societal benefits through achievement of the Sustainable Development Goals

1 OVERVIEW

The 2030 Agenda for Sustainable Development provides a universal development agenda for all countries and stakeholders to use as a blueprint of action for people, the planet and prosperity. The agenda is anchored by 17 Sustainable Development Goals (SDGs), associated Targets, and a global Indicator framework, and demands new data acquisition and integration approaches to improve the quality, coverage and availability of data to support the implementation of the development agenda at all levels. The Earth Observations in Service of the 2030 Agenda for Sustainable Development Initiative enables the integration of Earth observations and geospatial information into national development and monitoring frameworks, advancing societal benefits through achievement of the SDGs. Additionally, the Initiative strives to apply Earth observations to the SDGs in novel and practical ways, advance access to Earth observations data, information and knowledge, increase capabilities in uses of Earth observations and broaden awareness on Earth observations' support to the SDGs.

The prime users of the Initiative include, at the national level, National Statistical Offices (NSOs) and line ministries in charge of SDG implementation; and at the international level, regional and global statistical agencies, and UN and International Financing Institution bodies. The Initiative promotes the emergence and scaling-up of joint collaborations between these users and the Earth observations and geospatial data communities to demonstrate the effective use of satellite imagery and geospatial data in supporting traditional data systems towards achieving the SDGs. There are four elements as lines of business that collectively address technical, organizational, and programmatic aspects of the Initiative: Projects, Capacity Building, Data and Information Products, and Outreach and Engagement. Finally, the Initiative directly supports and pursues projects for the development of methods, distribution and adoption of best practices, and provision of technical guidance to other GEO activities in a federated approach to GEO's overall service to the SDGs.

2 CHALLENGES

Some of the key challenges for the Initiative include the ability to adequately and systematically engage with countries, especially with national statistical offices and "line ministries", to foster national ownership of the SDGs and support national and regional efforts towards achievement of Agenda 2030. Supplemental challenges include field testing of innovative methods that focus on Earth observations and geospatial data contributions towards achieving the SDGs, including assessments across users and regions and data availability, as well as achieving IAEG – SDGs acceptance of proposed methodologies to ensure that these are endorsed and meet the statistical community's standards. Finally, obtaining clarity on the UN process for approval of new methods that support the Agenda 2030 in novel and practical ways, while articulating how Earth observations and geospatial data can support specific SDG Targets and Indicators, remains a challenge.

3 HOW TO HELP

- Help identify country POCs responsible for reporting national-level progress towards achieving the Agenda 2030;
- Obtain list of in-country entities that have the responsibility for reporting on each Indicator(s);
- Help identify countries where a developed method, which makes use of Earth observations and geospatial data to address an Indicator, can be tested;
- Continue GEO Secretariat contributions and support for partnership initiation, and /or further engagement with existing partners;
- Bring to the GI-18 coordination framework national/cooperative projects related to the EO use in support of SDGs.

4 CONTACT INFORMATION

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