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Item 4.4 of the provisional agenda \*

**THE GEO BIODIVERSITY OBSERVATION NETWORK**

*Note by the Executive Secretary*

1. The Executive Secretary is pleased to make available herewith for the information of participants in the ninth meeting of the Conference of the Parties to the Convention on Biological Diversity, an information document on the GEO Biodiversity Observation Network.
2. The document was prepared by the Group on Earth Observations (GEO) Secretariat as part of the implementation task on biodiversity under the Global Earth Observation System of Systems (GEOSS), and in collaboration with a wide range of partners.
3. The document is reproduced in the form and language in which it was provided to the Secretariat.

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\* UNEP/CBD/COP/9/1.

## Building a global Biodiversity Observation Network (GEO BON)

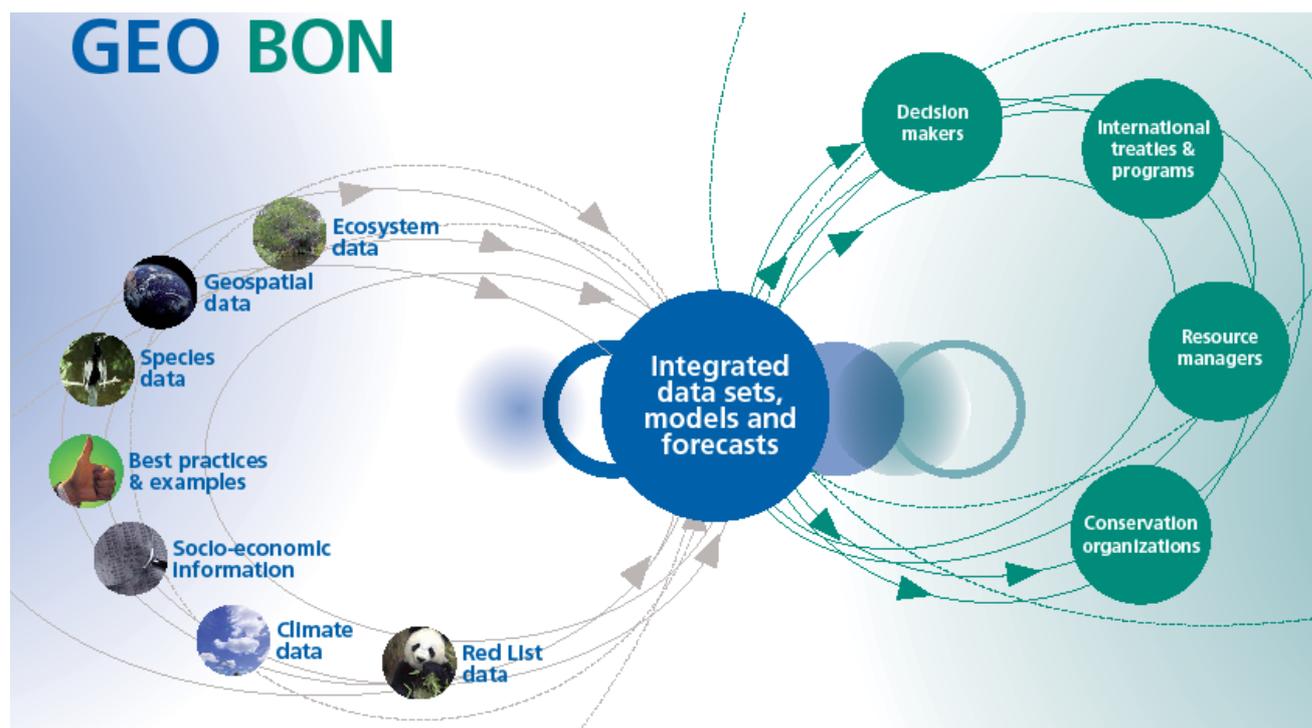
### A Briefing Note by the Group on Earth Observations (GEO)

#### 1) A new vision for biodiversity observation

National and local policymakers and resource managers need reliable biodiversity information in order to set priorities, elaborate strategies and assess the effectiveness of their actions. At the international level, implementing the Convention on Biological Diversity will also require better access to comprehensive, high-resolution and near-real-time data and analyses on all aspects of the world's biological diversity.

Because the Earth's biosphere is such a complex system, however, and because data gathering is so decentralized, a global monitoring network that can simultaneously track individual species and populations and capture trends in forests and other ecosystems has never been built. In addition, the masses of biological information now being generated are rarely integrated with data and forecasts on climate change, pollution and other threats to biodiversity.

Fortunately, new technologies are dramatically improving the collection and analysis of information on biodiversity and other key dimensions of the global environment. Increasingly sophisticated observation instruments are surveying the Earth system from space, the air, the ground and the oceans. To maximize the value of the resulting data, over 120 governments and international organizations are collaborating through the Group on Earth Observations (GEO) to interconnect their monitoring systems and create a Global Earth Observation System of Systems (GEOSS).



GEOSS will provide a cross-cutting and user-driven service. It will integrate Earth observation data and analyses on climate, weather, disasters, agriculture, water, health, energy, ecosystems and biodiversity. The biodiversity arm of this expanding “system of systems”, known as the Biodiversity Observation Network, or GEO BON, promises to revolutionize our understanding of the status of, and trends in, the world’s living resources.

GEO BON aims to greatly improve both the quality and quantity of information about biodiversity by linking together the stand-alone systems now tracking the world’s genetic resources, species and ecosystems. This will make it possible to fill gaps in taxonomic and biological information and to speed up the pace at which information is collected and disseminated. GEO BON also plans to connect biodiversity monitoring systems to other Earth observation networks that generate data of relevance to biodiversity, such as climate and pollution indicators.

Other goals include ascertaining the data requirements of user groups, reviewing and prioritizing research, facilitating interoperability among observation systems and databases, improving models of biodiversity change, generating regularly updated assessments of global biodiversity trends, designing decision-support systems that integrate monitoring with ecological modelling and forecasting, and making data and reports available to users via the internet-based GEO Portal that is currently under development. GEO BON also plans to serve as an advocate for investments in biodiversity observation systems, including filling gaps in data and models and adopting new and emerging technologies.

In this way, GEO BON can support the Convention on Biological Diversity in its need for improved biodiversity information. For example, GEO BON could contribute to establishing a credible baseline against which objectives such as the 2010 target (or a successor target) could be evaluated. It can also provide essential information for tracking trends in species and ecosystems and for evaluating the effectiveness of policies that countries adopt to implement the Convention.

***“It is imperative that the aggregate impact of the numerous actions launched worldwide to promote the conservation and sustainable use of biodiversity is carefully tracked. Establishing the Biodiversity Observation Network will help put together the data about genetic resources, species and ecosystems that we need to evaluate the effectiveness of our actions.”***

***– Ahmed Djoghlaf, Executive Secretary, Convention on Biological Diversity***

## **2) How the work is organized**

Under the three-year work plans adopted by GEO, Member governments and Participating Organizations come together voluntarily to develop and implement specific “Tasks” that contribute to the construction and use of the Global Earth Observation System of Systems. In the GEO jargon, GEO BON is Task BI-07-01, and it is being carried out under the biodiversity Societal Benefit Area.

Two organizations, the National Aeronautics and Space Administration (NASA) of the US and DIVERSITAS, the Paris-based international programme of biodiversity science, serve as Task leads; the latter also serves as the Point of Contact. Because GEO is open and participatory, other governments and organizations are welcome to contribute components at any time and to participate in the development of GEO BON.

In October 2006, contributors to the Task and other interested parties held a workshop on user needs in Geneva. The results of this workshop were presented to the GEO-IV Plenary meeting held in Cape Town in November 2007, just before the GEO Ministerial Summit. In January 2008, the group decided to form an interim GEO BON Steering Committee to prepare for a major workshop that would launch the implementation phase of GEO BON.

This workshop, hosted by the Government of Germany in April 2008 in Potsdam, was attended by over 90 organizations and government agencies active in the field of biodiversity monitoring. After three days of discussions, the participants agreed to start building GEO BON. This means that national, regional and global organizations are now starting to take practical steps to harmonize their data and information systems, identify and address gaps and overlaps in existing coverage, and ensure the continuity and sustainability of biodiversity information.

The next several years will be critical to GEO BON's development. A key priority will be to establish an enhanced ability to identify ecosystems that are unique or highly diverse; that support migratory, endemic or globally threatened species; that are of socio-economic importance; and that can support the 2010 target agreed under the Convention on Biological Diversity.

While GEO BON will continue to evolve and expand over the coming decade and beyond, the results can already be expected over the next three years due to the work that was launched at the Potsdam meeting.

### **About the Group on Earth Observations**

The Group on Earth Observations (GEO) was established in 2005 after the World Summit on Sustainable Development (WSSD), the Group of Eight leading industrialized countries (G8) and three ministerial Earth Observation Summits all called for improving existing observation systems. GEO currently consists of 72 Member governments, the European Commission and 52 Participating Organizations.

GEO is coordinating the construction of a Global Earth Observation System of Systems (GEOSS), which will link together diverse monitoring networks, instruments, data bases, models and other decision-support tools. It addresses nine Societal Benefit Areas of critical importance to the future of the human race. In this way, it aims to help countries to protect themselves against natural and human-induced disasters, understand the environmental sources of health hazards, manage energy resources, respond to climate change and its impacts, safeguard freshwater supplies, improve weather forecasts, manage ecosystems, promote sustainable agriculture, and conserve biodiversity.

The 10-Year GEOSS Implementation Plan runs from 2005 to 2015. It defines a vision statement for GEOSS, its purpose and scope, expected benefits, the nine Societal Benefit Areas, technical and capacity-building priorities, and the GEO governance structure. GEO has established four Committees responsible for advancing the 10-Year Plan. The Committees are organized around the themes of user engagement, architecture and data management, science and technology, and capacity building. These “Transverse Areas” cut across, and are relevant to, each of the issue-specific Social Benefit Areas.

### **3) The components of GEO BON**

The GEO Biodiversity Observation Network plans to generate and gather **observations** on all key aspects of biodiversity:

i) Ecosystems. Many decision makers and researchers would benefit from an information service that maps the distribution of terrestrial, freshwater and marine ecosystems; characterizes the linkages between these ecosystems; identifies changes to them; and evaluates their consequences.

ii) Species. Many potential users also need access to a coordinated and sustained global sampling scheme that addresses a large set of species selected to cover many aspects of biodiversity; information on distributional ranges for a large and representative set of species; digitized species data bases for informed research and management, made freely available, along with user-friendly tools for their analysis; improved forecasting scenarios using a variety of models to alert stakeholders to impending threats; and stronger local and regional capacity-building efforts, including for both science-based and citizen-based observations.

iii) Genetic variability. Recent advances in genetic sciences can be used to assess trends in genetic variations and their causes and consequences.

For these primary observations to inform planning and decision making, they often need to be further interpreted through **assessments** involving integrated data sets and various types of models. Models and scenarios are vital for forecasting trends and exploring the consequences of policies and actions. GEO BON aims to support modelers and analysts by providing data sets on initial conditions and on the drivers of biodiversity loss.

The dissemination and sharing of the information generated through GEO BON will benefit from GEO’s ongoing work on developing internationally agreed **Data Sharing Principles**. These Principles aim to ensure the full, open and timely exchange of data, metadata and information products within GEOSS. They will also allow for appropriate restrictions, such as protecting sensitive data on the precise location of an endangered species.

GEO BON will also draw on GEO’s work on **architecture**, defined as the fundamental design and operational structure of a system and its components. The various instruments and systems comprising GEO BON need to be made “interoperable”, which means configuring them so that they can exchange information with one another and provide the integrated data and information products that decision makers need.

#### **4) Meeting user needs**

GEO BON will only succeed if its development is driven by user needs. One key user need is easy and rapid access to the information that GEO BON will gather. This information will be made available via the internet-based GEO Portal, which, after the current testing phase, is expected to become fully operational next year. The GEO Portal is being supplemented by GEONETCast, a free satellite-based system that will allow users lacking wideband internet to access GEO BON through low-cost portable receivers.

Users of GEO BON should include:

- Parties to the biodiversity-related conventions (CBD, CITES, CMS, Ramsar, etc.)
- United Nations and other intergovernmental organizations
- National and local governments and agencies
- National and international conservation organizations
- Research and educational institutions
- Natural resource managers
- Private industry
- Individuals

Many decision makers, project managers and institutions, however, are not yet fully equipped to access, interpret and apply biodiversity data and information. Building the capacity of individuals and organizations to use biodiversity observations is essential to ensuring that policies and projects for the conservation and sustainable use of biodiversity can achieve their full potential. For this reason, GEO BON will try to facilitate training and capacity building while supporting efforts to mobilize the resources needed to ensure that the Biodiversity Observation Network does indeed meet user needs.

#### **5) The implementation plan**

With the GEO BON concept and priorities now established, the next step will be to produce a detailed implementation plan. This plan is expected to:

- Identify a detailed set of user needs.
- Identify open-access data resources with the best available global biodiversity data, as well as tools and resources for integrating and analyzing these data.
- Design, develop and implement standards and indicators that meet the needs of data providers and users.
- Develop an agreement among stakeholders on data and information policies and on a process for designing the network and validating data sources.
- Identify methodological, taxonomic, regional or ecosystem knowledge gaps and prioritize the necessary actions for filling them.
- Identify and interconnect existing terrestrial, freshwater and marine observation systems.
- Identify and interconnect systems that monitor ecosystem services with systems that monitor the drivers of biodiversity change.

Over a longer period, the plan will also elaborate ways and means to:

- Establish a global biodiversity observation facility and data clearinghouse, supervised by an independent advisory board including both data providers and users.
- Provide timely and relevant information on the status and functions of biodiversity so as to improve environmental management and human well-being.
- Provide an open-resource, user-friendly system responsive to changing requirements.
- Provide authoritative and widely respected reports and updates at appropriate intervals.
- Widen the early-warning function of the system by developing forecasting scenarios that alert stakeholders to impending threats and disasters.
- Develop links from forecasting results to decision support-systems with key “tailored” products for stakeholders and partners.

GEO is currently developing a new three-year plan for the period 2009 to 2011, which will replace, and extend, the current plan. This updated plan is to be adopted by the GEO membership at its next annual Plenary meeting (GEO-V), which is being hosted by the Government of China in Beijing in November 2008.

The GEO BON implementation plan will be crafted during the coming months in the context of this overall process for revising the GEO work plan. Meanwhile, the revised Task on GEO BON will be updated and strengthened to reflect the new GEO BON implementation plan. This will dramatically accelerate the construction and implementation of the first truly global Biodiversity Observation Network.

**For more information, see the GEO BON home page at:  
[www.earthobservations.org/cop\\_bi\\_geobon.shtml](http://www.earthobservations.org/cop_bi_geobon.shtml)**

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