

**Sub-task Number:** BI-07-01a

**Sub-task Title:** Biodiversity Observation Network (GEO BON)

**Overarching Task:** Biodiversity Observation Network (GEO BON)

**Area:** BIODIVERSITY

**Related Community of Practice:** Biodiversity

**Relevant Committee:** TBD

**Related Targets:** (to be included in 2009)

**Sub-task Definition** (as given in the 2009-2011 Work Plan):

Further develop the GEO Biodiversity Observation Network that was launched in April 2008. GEO BON will provide a global, scientifically-robust framework for observations designed to detect biodiversity change by coordinating the data gathering and delivery of biodiversity change information. GEO BON should build upon existing systems (such as GBIF and WCMC), utilise existing information, and highlight areas of importance (e.g. those supporting migratory, endemic or globally threatened species, and those whose biodiversity is of socio-economic importance) for further targeted data collection and monitoring.

Specific objectives include: (i) Develop a strategy for assessing biodiversity at the genetic, species and ecosystem levels; (ii) Facilitate enhancement and establishment of monitoring systems that enable frequent, repeated assessment of trends in species and ecosystems, particularly those of special conservation merit; and (iii) Facilitate consensus on data collection protocols and coordinate development of interoperability among monitoring programs and systems. The marine biodiversity component will be made as strong as possible to animate mutually-beneficial dialogue between terrestrial and marine components.

**Leads** (GEO Member or PO, Entity carrying out the work, Contact: e-mail):

DIVERSITAS, Point of Contact: Anne Larigauderie, anne@diversitas-international.org

EC (EBONE), Rob H.G. Jongman, rob.jongman@wur.nl

USA (NASA), Woody Turner, woody.turner@nasa.gov

**Motivation/Background**

Timely and relevant information on biodiversity status and related functions is critical to effective conservation and management of the natural world and to human well-being. However, existing biodiversity information systems were developed independently, making it difficult to integrate data from multiple sources, or to do global-level assessments. GEO BON will facilitate the collection of new data, and the interoperability of these many sources, greatly aiding global, as well as regional and local, assessments. The system will be open-resource, user-friendly and responsive to changing requirements, thus enabling the generation of authoritative and widely respected reports and updates at appropriate intervals.

**Outputs** (e.g. products and services which result from the activities of the Task/sub-task; outlined in the form of deliverables with timelines)

Planned:

- Nov 2009: Submission of progress report and evolving implementation plans to GEO VI Plenary
- 2010: First early products

Produced (current status):

- GEO BON Implementation overview presented at GEO-V, and accepted by GEO-V delegates (Doct7).
- GEO BON Concept Document presented at GEO-V for information (Doct 20)

*Activities (operations or work processes through which resources are mobilized to produce specific outputs; outlined in the form of milestones including timelines)*

Planned:

2009:

Report at GEO VI Plenary

2010:

- Meeting of all Working Groups, and finalization of GEO BON Implementation Plan
- Second meeting of SC-GEO BON
- Involvement in CBD-SBSTTA 14, and CBD COP10
- Contribution to the GEO Ministerial summit in China/Korea

-2010 First early products

Four items have been identified as potential GEO BON Early Products. They are being developed collaboratively and with limited funding requirements, and are deliverable by 2010 (though funding constraints may delay delivery of some of them). These all align with the GEO BON vision of bringing together people and data from a variety of different sources to generate novel products that could not be achieved separately.

Produced (current status):

- 22-23 June, 2009 (Geneva): First meeting of Steering Committee-GEO BON:
  - Agreement on a Chair: Dr Robert (Bob) Scholes (CSIR, S-Africa)
  - Further development of implementation plan (working groups)
  - Refinement of the set of GEO BON early products
  - Submission of progress report and further plans to GEO-VI Plenary
- Jan 2009: Interim Steering Committee meeting:
  - Production of Terms of reference for Steering Committee-GEO BON
  - GEO Members invited to join GEO BON CoP
  - Establishment of Working Groups to develop activities (implementation) matching the Concept Document.

*Resources (indication of resources – e.g. financial, human – contributed by GEO Members or Participating Organisations to produce outputs)*

Contributed by DIVERSITAS (2008): \$55'000 (staffing, travels and Potsdam , and GEO V meetings).

Contributed by USA (NASA; 2008):\$100'000 (staffing, Potsdam and the DC meetings, external contractor, travels).

Contributed by EC (EBONE)2008-2012 € 2.700.000 for staffing and travel for the EBONE project to produce a GEOBON pilot and its GEO products

**Architecture and Data Component**

1) Please briefly describe any task-related Earth observation resources (data set, system, website/portal) and any related Web Service interfaces that are contributed to GEOSS. State whether these items are or will be registered with the GEOSS Component and Service Registry for access via the GEO Web Portals, and whether any associated standards or other interoperability arrangements will be registered in the Standards and Interoperability Registry.

2) Please also describe what data and information your activity/system needs that you would request to be accessible through the GEOSS Common Infrastructure.

### **Capacity Building Component**

(capacity building is defined to include the development of capacity related to: (i) Infrastructure and technology transfer (Hardware, Software and other technology required to develop, access and use EO); (ii) Individuals (education and training of individuals to be aware of, access, use and develop EO) and (iii) Institutions – building policies, programs & organizational structures to enhance the value of EO data and products).

1) In accordance with the above definition does this Task have a capacity-building component? If so, please provide a short description of this component including a description of end users.

Primary Capacity Building Objectives of GEO BON are to:

- Facilitate Earth observation capacity building activities that support the understanding of biodiversity at multiple levels
- Build global capacity to use and interpret biodiversity data from global data systems.
- Build global capacity to collect and publish biodiversity data from around the world
- Develop a coordinated capacity building strategy for biodiversity observations among GEO Members and Participating Organisations
- Recommend strategies for resource mobilisation to GEO Members and Participating Organisations (e.g., e-learning approaches).

2) Have any additional CB needs for this Task been identified? Please provide a short description.

### **User Engagement Component**

(please briefly describe to what extent end users are engaged in this Task and influence the nature of the outputs produced)

The participants identified below (only a sample of the wide array of possibilities) are, with one or two notable exceptions, both providers and users of biodiversity information. Most are already involved in defining GEO BON, and others will join the network as it develops. Because biodiversity and its utilisation (conservation, research, human well being, education, trade, human and animal conflict, etc.) have so many aspects that impact positively or negatively on humans, there is a large potential audience for GEO BON.

**Biodiversity related conventions** (CITES, CBD, Ramsar, etc.) - The conventions need to assess and monitor the status of selected species and ecosystems, in order to deliver the most relevant information on biodiversity trends and evolution; to develop biodiversity indicators to facilitate that process; and to assess their effectiveness and communicate to their parties the good results, gaps and changes needed in their future development.

**UN Organisations** - The diversity of the support provided by GEO BON to the UN Organisations is important, since GEO BON will not provide only biodiversity data and assessment, but also reports on biodiversity components, including ecosystem goods and services (state of forest, agriculture and livestock, fisheries and aquaculture, soil biodiversity, etc.).

**National and International Conservation Organisations** - The benefit to conservation organisations will come from integration allowing them to do much more analysis, modeling, predictions, and scenarios work to better develop plans and priorities.

**National Governments and Agencies** - Because local organisations and governments have the responsibility of data collection, data sharing and harmonisation in their region and/or country, local and national information and data will be part of the services provided by GEO BON.

**European Commission** – The European Commission and its institutions (European Environmental Agency and Topic Centre for Biodiversity) are committed to coordinate national and regional efforts in Europe to halt biodiversity loss and to monitor and report on the favourable condition of species and habitats of European Conservation Importance as regulated in the EU Birds Directive and the Habitats and Species Directive, through the European Biodiversity strategy and its Sustainable Development Strategy .

**Academic/Research Institutions** - Many academic institutions perform and support biodiversity assessment and monitoring, provide data services and develop models and tools. Researchers especially would benefit from improved data availability and interoperability.

**Private sector** – A number of private companies have an interest in biodiversity information and sustainable management when their business relies on its use and availability.

**Genetic researchers** - GEO BON will provide a mechanism for researchers, conservationists and others to study genetic adaptations in relation to the geospatial framework within which they evolved, and enable discovery of environmental drivers of genetic change, adaptation, population decline, and other phenomena. The molecular informatics community has many sophisticated tools that may also be adaptable to certain types of analyses of data types from the species or ecosystem levels of biological organisation.

**DIVERSITAS** - The international programme on biodiversity science of ICSU and UNESCO, is committed to providing strong scientific guidance to the development of GEO BON. Working through its international network of biodiversity scientists and in collaboration with many users and providers of data, DIVERSITAS will support the design of a system that can provide information at policy relevant timescales and spatial scales on biodiversity components from genes and species to ecosystems.

**GBIF** - GBIF is an inter-governmental initiative mandated to facilitate development of a global biodiversity informatics infrastructure to enable free and open access to primary biodiversity data. GBIF has much to offer to GEO BON, including a growing global network of data holders, relevant information infrastructures, data exchange standards, and network-building experience. GEO BON has much to gain from the political agreements and social networking established by GBIF.

**ILTER Network** - The world's ILTER sites are a rich resource of both aut- and synecological datasets already directly linked to geospatial data. Their datasets will serve as a valuable "ground-truthing" measure for remote sensing data and modeling efforts.

**Space Agencies** - Remotely sensed data are an important source of biological and environmental information, and are particularly valuable for biodiversity assessments when combined with ground observations, a process that often involves the use of computer models. Space agencies and organisations that utilise and process remotely sensed data have also expressed interest in participating in GEO BON, and some of these will help develop Early Products.

**UNEP-WCMC** - The UNEP World Conservation Monitoring Centre is a collaboration to evaluate and highlight the many values of biodiversity and put biodiversity knowledge at the centre of decision making through the synthesis, analysis and dissemination of global biodiversity knowledge, providing authoritative, strategic and timely information for conventions, countries, organisations and companies to use in the development and implementation of their policies and decisions. WCMC can both contribute to and benefit from GEO BON because of the data it holds and can share, and also because of its leadership role in the Conservation Commons.

### ***Science and Technology (S&T) Component***

*1) Please briefly describe the elements of scientific research or technological development contained in this Task.*

*2) In relation to the S&T component(s) of this task, please describe gaps, priorities, continuity needs, barriers, scientific expertise and additional resource needs (this information will be used for developing a gaps and needs assessment in Task ST-09-01)*

### ***Members and POs' Contributions to Outputs and Activities above:***

*(Input is optional. This section gives the chance to Members and POs to provide more details (3-5 lines) on their individual activities, making a clear connection with the Outputs and Activities outlined above).*

Contributions received from Portugal, USA, EEA and EC

#### **Portugal**

*University of the Azores:* is working on the project EDEN Azorean Habitats. which will survey five Azorean islands, on the basis of the relative proportion of land allocated to agriculture and pristine habitats.

**USA**

NASA, USGS, Smithsonian, and JPL personnel have participated as members of the GEO BON interim and now the permanent steering committee. In this role, they have helped formulate and draft the foundation documents for GEO BON.

**EEA**

EEA contributions to CBD and SEBI2010.

GEO Secretariat's comment: CBD became a member of the GEO BON Steering committee recently and GEO BON will work with CBD on biodiversity targets.

**European Commission**

The *EBONE* project (coordinator Alterra, Rob Jongman) will deliver a pilot as a European Contribution to GEO BON, delivering a tested system for biodiversity observation linking species, habitats and RS data. The contribution is the main content of an EC-FP7 project.

Contributions for 2009:

- Document on a European Monitoring Approach
- European Environmental Stratification (part of EC 06-01)
- Field data collection standards for habitat and species monitoring.
- Key to Annex 1 habitats (Species and Habitats Directive)
- Handbook for habitat monitoring
- Communication to the main users

Expected products for 2010:

- Testing of the approach in a sample for Europe.

*EU-project HYPOX*: contributing biodiversity studies in shelf and open seas, and land locked water bodies (e.g., Black Sea, Swiss lakes, Fjord Systems) and fostering monitoring systems that enable frequent, repeated, globally coordinated assessment of trends and distributions of species and ecosystems.

*EuroGEOSS* will contribute a GEOSS component for this task with specific focus on Africa.

It should be noted that many Members, POs, and other organizations –not listed here- are leading a wealth of activities that contribute to the implementation of GEO BON worldwide. GEO BON has also stimulated the development of several regional initiatives, which will also contribute to the implementation of GEO BON. Examples include: EBONE, Asia-Pacific BON, and J BON. The participation list below, lists participants and organisations, involved in GEO BON, and members of the SC-GEO BON.

**Participation** (Table to be filled in 2009):

Type	SC - GEO BON	Member or PO	Representing	Contact Name	EmailAddress
Lead(PoC)		DIVERSITAS	DIVERSITAS	Anne Larigauderie	anne@diversitas-international.org
Lead		EC	EBONE	Rob H.G. Jongman	rob.jongman@wur.nl
Lead		USA	NASA	Woody Turner	woody.turner@nasa.gov
Contributor		USA	USDA/Forest Service	Andy Gray	agray01@fs.fed.us
Contributor	Chair	S-Africa	CSIR	Robert Scholes	bscholes@csir.co.za
Contributor		UK	Imperial College London	Ben Collen	Ben.Collen@ioz.ac.uk
Contributor		EC	EuroGEOSS	Gregoire Dubois	gregoire.dubois@jrc.it
Contributor	Member	Australia	The Australian Museum	Dan Faith	dpfaithma@yahoo.com.au
Contributor	Member	Australia	CSIRO	Simon Ferrier	Simon.Ferrier@csiro.au
Contributor	Member	The Philippines	ASEAN Center for Biodiversity	Consuelo D. Garcia	mcdgarcia@aseanbiodiversity.org
Contributor	Member	USA	NASA	Gary Geller	gary.n.geller@nasa.gov
Contributor	Member	The Netherlands	Royal Netherlands Institute for Sea Research (NIOZ)	Carlo Heip	c.heip@nioo.knaw.nl
Contributor		USA	Smithsonian Institution	Len Hirsch	LPH@si.edu
Contributor	Member	Canada	Convention on Biological Diversity Secretariat	Robert Höft	robert.hoft@cbd.int
Contributor	Member	Germany	University of Hamburg	Norbert Jürgens	Norbert.Juergens@t-online.de

Type	SC - GEO BON	Member or PO	Representing	Contact Name	EmailAddress
Contributor	Member	UK	UNEP-WCMC	Jon Hutton	jon.hutton@unep-wcmc.org
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NB: The list will be completed as the GEO BON network formally develops.