

A Three-year Plan Toward Convergence

The preparation of the 2007-2009 Work Plan has been an opportunity to build on the mobilization of 2006 and drive the process toward convergence, reducing the number of Tasks and initiating more encompassing cross-disciplinary actions. The 2007-2009 Work Plan presented to Plenary contains 72 Tasks. The purpose of this document is to provide an overall review of this process, highlight the main changes made in the final preparation of this Plan, and clarify how the more important issues raised by Member and Participating Organizations in their comments on the previous version of the Work Plan (V2), were addressed by the Secretariat.

1 Toward V2

In the preparation of V2, the Secretariat endeavored to emphasize the added-value of GEO by combining related efforts into a single Task, merging activities where appropriate, and ensuring linkage between related Tasks. In addition, the Secretariat proposed to recognize a number of Tasks of the 2006 Work Plan as supporting activities. In summary, of the 96 Tasks contained in the 2006 Work Plan:

- 8 Tasks have been or will be completed in 2006;
- 33 Tasks have been terminated or merged into a new more encompassing Task;
- 11 Tasks have been recognized as supporting activities;
- 44 Tasks have been recognized to be continued.

In addition to the 44 Tasks to be continued, 29 new ones were proposed to:

- merge previously disconnected Tasks and increase coherence;
- ensure completion of 2-year Targets and initiate activities relating to 6-year and 10-year Targets requiring early start;
- propose new ideas and invite new communities to engage in GEO.

This led to a proposal for the 2007-2009 Work Plan (V2), with only 73 Tasks, showing significant consolidation from the 2006 Work Plan, which was submitted for official comments to the Members and Participating Organisations.

2 The 2007-2009 Work Plan

The official review of the 2007-2009 Work Plan by Members and Participating Organizations provided guidance to the Secretariat to refine the plan by further grouping some Tasks, adding related activities, and providing more homogeneity in the Task descriptions. The comments also requested clarifications on the origin, level of commitment, and prioritization of the new Tasks.

The comments recommended the addition of 22 new Tasks. A careful analysis of the content and strategic value of these Tasks led the Secretariat to propose that 10 of them could be addressed by adding specific activities in existing Tasks, four should be accepted as new Tasks in the Plan (“Data Assimilation”, WE-07-01, “Beijing Olympics”, WE-07-02, “Invasive Species”, BI-07-02, and “Sensor Web”, DA-07-04), and eight should not be included in the Plan in order to abide to the request to reduce the overall number of Tasks.

In response to the comments, the Secretariat recognized that the process for contributing new components to GEOSS, whether they are observing systems or information systems is an essential and discrete element in the implementation of the GEOSS. This activity, which appeared earlier within “Interoperability Arrangements”, AR-07-P1, is now reflected as a separate Task called “GEOSS Components Process”, AR-07-04.

In addition, the Secretariat made the following changes:

- DI-07-P2 (“Slowly Developing Disasters”) was modified and became to US-07-03 (“Environmental Risk Management);
- AR-06-09 (“Multispectral Imagery”) and AR-06-10 (“Global Precipitation Mission”) were merged into DA-07-03 (“Virtual Constellations”);
- DA-06-06 (“Spatial Data Infrastructure”) was merged into AR-07-01 (“Interoperability Arrangements”);
- All three new Capacity Building Tasks were merged into one, recognizing sub-tasks, which may grow into Tasks in the future;

Finally, the Secretariat restored one Task of the 2006 Work Plan on “Ensemble-Technique Forecasting Demonstrations”, DA-06-03, and terminated two others, DI-06-05, because of its major overlaps with other tasks, and AG-06-06, because of no activity.

This led to a total of 72 Tasks remaining in the 2007-2009 Work Plan.

The Secretariat also strived to bring the description of the Tasks to a more even level by transferring many details into the Task Sheets. For the same reason, many of the comments received from Members and Participating Organizations will be reflected in these Task Sheets rather than in the Task description.

To clarify the origin and level of support of the new Tasks, Members and Participating Organizations that have already expressed an interest in participating in a new Task have been listed with the Task description. For the ongoing 2006 Tasks, the existing leads have also been recalled in the document.

Finally, it should be noted that the reference numbers of the new Tasks, being no longer proposals, have now been changed to match the general nomenclature (e.g., BI-07-P1 becomes BI-07-01).

The table in Annex 1 can be used to track the transition from the 2006 Work Plan to the 2007-2009 Work Plan.

Annex 2 provides the grouping of all the Tasks of the 2007-2009 Work Plan under the five streams of activities for building GEOSS introduced earlier:

- Establish the basic arrangements and policies to build the system of systems (7 Tasks);
- Contribute new components and improve existing components of GEOSS (19 Tasks);
- Produce coordinated observation methodologies (12 Tasks);
- Make new data sets available (9 Tasks);
- Engage with communities (support, modelling, workshops, user requirements, etc.) to improve/enhance/increase use of Earth observations (25 Tasks).

Considering that streams 1 and 2 pertain to GEOSS component systems, that 3 and 4 pertain to data, the current work plan provides a balanced distribution of Tasks among system (26), data (21), and users (25).

It should further be noticed that out of the 19 Tasks to contribute and improve GEOSS components (stream 2), four concern space components and two relate to in-situ, while 12 relate to both. This confirms that a proper balance between space and in situ is maintained in GEOSS Implementation.

Annex 3 provides a list of the 2-year and 6-year Targets of the Implementation Plan indicating how they are being addressed. It should be noted that four 2-year Targets remain unaddressed at this stage. Of these, Targets 45 and 67 are advocacy tasks that can be carried out by the Secretariat. Target 23 on Health “paradigm environments” and Target 38 on paleoclimate research cannot be addressed without the commitment of a qualified group of experts. The Secretariat will work to identify such groups. Only eight 6-year Targets are not yet addressed, but will be in subsequent years.

3 Defining priorities and scheduling Task implementation

As mentioned above, several Members have requested that a process be established for prioritizing the Tasks. Clearly, the Architecture and Data Tasks, which will establish the basic arrangements for the GEOSS (e.g., interoperability arrangements, web portal, clearing house, components commitment), should have a high priority. In addition, the necessity for GEO to deliver early successes (“picking the low-hanging fruits”) should be another driver for prioritization and, hence, a list of these early successes will be discussed at the Plenary.

Finally, a third criteria which can be used for prioritization is the level of support from Members and Participating Organizations to a given Task. The current document provides a preliminary indication of the Members and Participating Organizations which have already expressed support for a Task. In order to collect a more complete information on this level of support for the benefit of the Plenary, a provisional Matrix of Tasks will be established by the Secretariat before end October and circulated to all Members and Participating Organizations. They will be invited to express their intention to contribute or lead Tasks of the Plan. Of course, this process will remain open after the Plenary.



The request for prioritization also responds to the need for monitoring the progress of the Work Plan implementation at the end of each year for the next three years. To this end, it is important to identify those Tasks that will require new resources in order to be initiated, and therefore may not be initiated immediately after the acceptance of the Plan.

Indeed, the new Tasks of the Plan can be grouped in two separate categories. In the first category, the participants have already identified the resources and, in some instances, activities have even already been initiated. Such Tasks have been included in the GEO Work Plan in an effort to identify synergies with similar a related activities of other Members or Participating Organizations. A portion of these tasks merely reflect ongoing activities conducted by Members and Participating Organizations. This does not mean that GEO will be duplicating these activities. Rather, they are recognized as contribution of these Members and Participating Organizations to the implementation of the GEOSS. To paraphrase Abraham Lincoln, GEO is of the members, by the members and for the members.

The second category comprises Tasks that are not yet initiated, but will use their visibility in the GEO Work Plan to leverage resources with their funding agencies and governments. Clearly these Tasks will not be initiated until such resources are made available.

We propose to take benefit of the provisional Matrix signing-in process, conducted before the Plenary, to identify to which category the Task belong, or, at least, what fraction of resources is readily available for the Task. This document will allow the Plenary to recognize these Tasks which will show progress during 2007 and those which will be initiated at a later date during the 3-year Plan.

Annex I

Five Streams of GEOSS Implementation

This table provides a breakdown of the 72 tasks of the 2007-2009 Work Plan into five streams necessary for GEOSS implementation.

1. Establish the basic arrangements and policies to build the system of systems.

Task No.	Title
AR-07-01	Interoperability arrangements for GEOSS
AR-07-02	Interface Implementation for GEOSS
AR-07-03	Global geodetic reference frames
AR-06-11	Radio Frequency Protection
DA-06-01	GEOSS Data Sharing Principles
DA-06-02	GEOSS Quality Assurance Strategy
DA-07-04	Sensor Web Enablement for in-situ observation network facilitation

**2. Contribute new components and improve existing components of GEOSS.**

Task No.	Title
DI-06-02	Seismographic networks improvement and coordination
HE-07-01	Strengthen observation and information systems for health
HE-07-03	Integrated atmospheric pollution monitoring, modelling and forecasting
CL-06-06	Global ocean observation system
EC-07-01	Global Ecosystem Observation and Monitoring System
BI-07-01	Biodiversity Observation and Monitoring System
BI-07-02	Invasive Species Monitoring System
WA-06-05	In-situ water cycle monitoring
WA-07-01	Global Water Quality Monitoring
WE-06-01	Surface-based Global Observing System
WE-06-02	Space-based Global Observing System
EC-06-01	Integrated Global Carbon Observation (IGCO)
EC-06-07	Regional networks for Ecosystems
US-07-01	Nowcasting and Forecasting User Applications
AR-07-04	GEOSS Components Commitment
DA-07-03	Virtual Constellations
DA-07-05	Higher Level Data Product Tools
DA-07-06	Data Integration and Analysis System



Task No.	Title
CB-06-04	GEO-NETCast

3. Produce coordinated observation methodologies.

Task No.	Title
DI-06-03	Integration of InSAR technology
CL-06-01	Sustained reprocessing and reanalysis efforts
CL-06-05	GEOSS IPY Contribution
CL-07-01	Seamless Weather and Climate Prediction System
WA-07-02	Satellite water quantity measurements and integration with in-situ data
AG-06-04	Forest Mapping and Change Monitoring
AG-07-01	Improving measurements of biomass
AG-07-02	Agricultural Risk Management
DA-06-03	Ensemble-Technique Forecasting Demonstrations
DA-06-04	Data, Metadata and products Harmonisation
DA-06-05	Guidance Document for Basic Geographic Data
DA-07-01	DEM interoperability

**4. Make new data sets available.**

Task No.	Title
DI-06-07	All-hazard zonation and maps
DI-06-09	Use of satellites for Risk Management
CL-06-02	Key climate data from satellite systems
CL-06-03	Key terrestrial observations for climate
WA-06-02	Forecast modeling for drought and water resource management
AG-06-02	Data Utilisation in Aquaculture
AG-07-03	Operational Agricultural Monitoring System
BI-06-03	Capturing Historical Biodiversity Data
DA-07-02	Global Land Cover

5. Engage with communities (support modelling workshops, user requirements, etc.) to improve / enhance / increase use of Earth observations.

Task No.	Title
DI-06-04	Implementation of a Tsunami Early Warning System at global level
DI-06-08	Multi-hazard approach definition and progressive implementation
DI-06-13	Implementation of a Fire warning System at global level
DI-07-01	Risk Management for Floods



Task No.	Title
HE-06-03	Forecast Health Hazards
HE-07-02	Environment and health monitoring and modelling
EN-06-04	Using New Observation Systems for Energy
EN-07-01	Management of Energy Sources
EN-07-02	Energy Environmental Impact Monitoring
EN-07-03	Energy Policy Planning
WA-06-07	Capacity building program for water resource management
WE-06-03	THORPEX Interactive Global Grand Ensemble (TIGGE)
WE-06-05	Numerical Weather-Prediction Capacity Building
WE-07-01	Data Assimilation for Operational Use
WE-07-02	Weather Demonstration Project for the Beijing 2008 Olympic Games
EC-06-02	Ecosystem Classification
AG-06-01	GEOSS Agriculture Strategic Plan
AG-06-07	Training Modules for Agriculture
BI-06-02	Biodiversity Requirements in Earth Observation
US-06-01	Identify priorities and synergies between SBAs
US-06-02	Pilot Communities of Practice
US-07-02	Millennium Development Goals



Task No.	Title
US-07-03	Environmental Risk Management
DA-06-09	GEOSS Best Practices Registry
CB-07-01	Capacity Building Strategy Implementation

Annex II

2006 Task Evolution Table

Task No.	Title	Status & Remarks
DI-06-01	Encourage in-situ and space agencies to (i) systematically record data over coastal regions subject to tsunami risk, and (ii) archive data in a form easily accessible to all countries.	Closed To be merged into DI-06-04 and DI-06-05
DI-06-02	<p>Seismographic Networks Improvement and Coordination</p> <p>Facilitate improvement of capabilities for global seismographic networks such as GSN, FDSN, DAPHNE, and sharing of data and event products among GEO members.</p> <p><u>New Title:</u> "Facilitate improvement of capabilities for global seismographic networks such as GSN, FDSN, DAPHNE, GNSS networks and new ocean bottom networks such as VENUS and NEPTUNE and sharing of data and event products among GEO members."</p>	To be continued The title has been slightly modified to give proper visibility to new ocean bottom networks and GNSS networks, the latter being in any case already included into the task.
DI-06-03	<p>Integration of InSAR Technology</p> <p>Support the improved integration of InSAR (Interferometric Synthetic Aperture Radar) technology for disaster warning and prediction.</p>	To be continued The task will also address the integration of GNSS and InSAR.



Task No.	Title	Status & Remarks
DI-06-04	<p>Implementation of a Tsunami Early Warning System at Global Level Promote and facilitate free and unrestricted exchange of all Earth observation data relevant to Tsunami Early Warning Systems. <u>New Title:</u> "Support the IOC Implementation Plan, through (i) promotion and facilitation of free and unrestricted exchange of all Earth observation data relevant to Tsunami Early Warning Systems (ii) contribution in terms of GEO developed operational capabilities (iii) definition and implementation of standards"</p>	<p>To be continued This task now includes all the activities related to the implementation of a Tsunami Early Warning System at global level, including activities from tasks DI-06-01 and DI-06-06. The IOC Implementation Plan will be the programmatic reference for task implementation. JCOMM will be included in the contributing Organisations.</p>
DI-06-05	<p>Building on existing techniques, as well as available maps and data, create a plan for the production in coastal zones of high resolution (i) near-shore bathymetric maps (ii) land use/land cover maps and (iii) Digital Elevation Models. <u>New Title:</u> "Building on existing techniques, create a plan for the production of high resolution (i) near-shore bathymetric maps (ii) land use/land/ floodplain cover maps and (iii) Digital Elevation Models."</p>	<p>Closed No Task Point of Contact, no activities reported. Land use/land/ floodplain cover maps are further considered under DA-07-02. Digital Elevation Models are further considered under DA-07-01.</p>
DI-06-06	<p>Harmonize existing efforts towards the preparation of a "global tsunami hazard map" to support coastal zone monitoring and infrastructure planning & investment.</p>	<p>Closed To be merged into DI-06-04 and DI-06-07</p>
DI-06-07	<p>Multi-hazard Zonation and Maps Conduct an inventory of existing geologic and all-hazard zonation maps and identify gaps and needs for digitization. <u>New Title:</u> "Conduct an inventory of existing geologic and all-hazard zonation maps, identify gaps and needs for digitization and progressively develop related products"</p>	<p>To be continued The scope of the task was redirected to include progressive production of maps and integration of data (coming also from task DI-06-03) into the GEO clearinghouse.</p>



Task No.	Title	Status & Remarks
DI-06-08	<p>Multi-hazard Approach Definition and Progressive Implementation</p> <p>Promote the cooperation of national and international agencies towards a multi-hazard approach to address more effectively and systematically coastal risks (e.g. from tropical cyclones, storm surges, tsunamis, land slides, volcanic eruption).</p> <p><u>New Title:</u> "Promote the cooperation of national and international agencies towards the definition and implementation of a multi-hazard approach to systematically address all risks."</p>	<p>To be continued</p> <p>The scope of the task was better focused to fully support ISDR in the Implementation of the Hyogo Framework for action. It will include, as an important complement to the on going programs on the implementation of a Tsunami Early Warning System, a pilot project on the implementation of a risk management system for geohazards in the SE Asian Region. This project will be constructed in coordination and in support of existing organisations and projects (such as ASEAN, APEC, Sentinel Asia), with the participation of the Community of practice rather active in the area.</p>
DI-06-09	<p>Use of Satellites for Risk Management</p> <p>Expand the use of meteorological geostationary satellites for the management of non-weather related hazards.</p> <p><u>New Title:</u> " With reference to a multi-hazard approach, define and facilitate implementation of a virtual constellation for risk management"</p>	<p>To be continued</p> <p>The scope of the task was reviewed in order to take into account related 6-years targets. In coordination with AR-07-03 (virtual constellations) the main objective would be to identify a virtual constellation for risk management.</p> <p>The Secretariat will continue its action towards Board of the International Charter as well as relevant CEOS members, in order to identify possible strengthening of Charter mechanisms and options for widening its scope.</p>
DI-06-10	<p>Initiate and maintain a dialogue between GEO, the Board of the International Charter on Space and major Disasters and relevant UN agencies to identify mechanisms for strengthening the scope and mandate of the Charter.</p>	<p>To be continued as an ongoing supporting activity</p>
DI-06-11	<p>Explore possibilities for the development of an international charter on telecommunication systems and disasters, building upon the experience of the International Charter on Space and Major Disasters.</p>	<p>To be continued as an ongoing supporting activity</p>
DI-06-12	<p>Initiate a knowledge-transfer programme to developing countries, to ensure basic capacity to utilize Earth observations for disaster management.</p>	<p>Closed</p> <p>The contents of general nature of this task will be integrated into the Capacity building tasks.</p> <p>Each disaster task that will generate, as output, systems, products/services will include the activities to transfer knowledge and to develop training modules.</p>



Task No.	Title	Status & Remarks
DI-06-13	<p>Implementation of a Fire Warning System at Global Level</p> <p>Initiate a globally coordinated warning system for fire and monitoring for forest conversion, including the development of improved information products and risk assessment models.</p> <p><u>New Title:</u> "Initiate a globally coordinated warning system for fire, including the development of improved information products and risk assessment models."</p>	<p>To be continued</p> <p>The task will focus only on fire warning and no longer on forest monitoring. Interface coordination will be put in place with activities of other SBA's taking benefit from data and products generated within this task.</p>
DI-06-14	<p>Support the design of multi-media training modules to communicate the levels of risk from hydro-meteorological hazards to the public to enable them to make informed decisions.</p>	<p>Closed</p> <p>The contents of general nature of this task will be integrated into the Capacity building tasks.</p> <p>Each disaster task that will generate, as output, systems, products/services will include the activities to transfer knowledge and to develop training modules.</p>
HE-06-01	<p>Consult with scientists and experts from the health, environment, and Earth observation communities to define the requirements and priorities of the Health communities regarding environmental observations.</p>	<p>Closed</p> <p>To be merged into new task HE-07-01</p>
HE-06-02	<p>Organize a workshop in Geneva in 2006 with the external support of WHO on human health issues, and their relations with Earth observations, environment and disease outbreak modelling, building upon 2005 events (EC workshop on Human health and Global Change, NIEHS/EPA workshop on Human health and Air quality, EPIDEMIO workshop, Wengen meeting on seasonal forecasts for health, etc).</p>	<p>To be continued as an ongoing supporting activity (Workshop to be held in 2007)</p> <p>Increase collaboration among stakeholders across diverse sub-communities within the field of human health and the environment by establishing exchange programmes between relevant experts, as well as promoting international, interdisciplinary workshops and collaborative research projects.</p>



Task No.	Title	Status & Remarks
HE-06-03	<p>Forecast Health Hazards</p> <p>Facilitate the formation of international consortia and coordinate, besides advocating funding for, the implementation of major demonstration pilot-projects integrating Earth observations, health and epidemiological as well as socio-economic data. As a priority, a project initiated by THORPEX will focus on the use of advanced weather and climate ensemble forecasting methods to develop and improve the predictability of major health hazards and impacts in developing countries (e.g., West Africa).</p>	<p>To be continued</p> <p>The “Health and Climate Partnership for Africa”, established by THORPEX will be developed. International demonstration projects under the “Biodiversity, Ecosystem services and Health” research theme will be established. The task will also initiate projects to improve the processing of real-time and historical data and the development of models relating remotely-sensed, in-situ and epidemiological data for detecting disease trends and the provision of early warning systems.</p>
HE-06-04	<p>Organize bi-lateral meetings with major health organizations and associations at national and regional levels and representatives of GEO, to raise awareness of potential uses of GEOSS for health.</p>	<p>To be continued as an ongoing supporting activity</p>
HE-06-05	<p>Building on the existing work of WHO, perform an assessment, with emphasis on developing countries, of existing capacities for the integration of Earth observation and health data (in terms of data collection, processing and integration). Identify gaps, and explore funding as well as existing projects to close gaps and build capacity.</p>	<p>Closed</p> <p>Merged into CB-07-01</p>
EN-06-01	<p>Consult with scientists and experts representative of the energy sector (including the private sector) to develop a set of priorities for GEO activities.</p>	<p>Closed</p> <p>Merged into EN-06-04</p>
EN-06-02	<p>Conduct a survey and assessment of energy management needs in terms of Earth observations (in-situ, airborne, and space-based) and products in cooperation with national energy agencies and associations, focusing on gaps and requirements for new observations.</p>	<p>Closed</p> <p>Merged into EN-06-04</p> <p>Will be partly implemented in the framework of EN-06-04 Workshop</p>
EN-06-03	<p>Initiate and maintain a dialogue between decision-support tool providers and energy production & distribution managers to identify requirements for the development of improved and/or new tools.</p>	<p>Closed</p> <p>Merged into EN-06-04</p> <p>Will be partly implemented in the framework of EN-06-04 Workshop</p>



Task No.	Title	Status & Remarks
EN-06-04	<p>Using New Observation Systems for Energy</p> <p>Organize a major workshop in 2006 to identify and define the main elements and orientations of a strategic 5-10 Year Plan for the optimum exploitation of the enhanced capabilities offered by the forthcoming new generation of observing systems and forecasting modelling techniques (e.g. ensemble-based techniques developed by ECMWF and others).</p> <p><u>New Title:</u> Organize a series of activities including workshops to identify and define the main elements/components of a strategic 5-10 Year Plan for the optimum exploitation of the enhanced capabilities offered by the forthcoming new generation of observing systems and forecasting modelling techniques.</p>	<p>To be continued</p> <p>The activities of tasks EN-06-01, EN-06-02, EN-06-03, EN-06-05 and EN-06-06 were merged into this task.</p>
EN-06-05	<p>Facilitate the formation of an international consortium to initiate the implementation of a demonstration project utilizing advanced ensemble forecasting techniques to improve energy management – particularly those linked to hydro-power.</p>	<p>Closed</p> <p>Merged into EN-06-04</p>
EN-06-06	<p>Participate in major energy fora and roundtables organized by international organizations, energy associations, and business councils.</p>	<p>Closed</p> <p>Merged into EN-06-04</p>
CL-06-01	<p>Sustained Reprocessing and Reanalysis Efforts</p> <p>Ensure the initiation of international mechanisms to coordinate and maintain sustained climate data reprocessing and reanalysis efforts.</p> <p><u>New Title:</u> Ensure the development of international mechanisms to coordinate and maintain sustained climate data reprocessing and reanalysis efforts. With regard to the reprocessing of historical datasets (to obtain consistent long-time series of satellite records), make relevant synergies with Task CL-06-02.</p>	<p>To be continued</p>



Task No.	Title	Status & Remarks
CL-06-02	Key Climate Data from Satellite Systems Establish actions securing the provision of key data for climate studies and forecasting from satellite systems.	To be continued Related activities will include: Promote vis-à-vis satellite agencies and policy-makers the implementation of actions proposed to respond to GCOS requirements for key climate data (a list of these actions will be presented at UNFCCC COP-12 in November 2006).
CL-06-03	Key Terrestrial Observations for Climate Consolidate the role of existing intergovernmental mechanisms for terrestrial observations needed for climate studies and forecasting. Develop a framework for the preparation of guidance materials, standards, and reporting guidelines for terrestrial observing systems for climate and associated data, metadata, and products to expand the comprehensiveness of current networks, facilitate exchange of data, and provide strategic direction to the terrestrial climate sector. <u>New Title:</u> Develop intergovernmental mechanisms for coordinating terrestrial observations needed for climate studies and forecasting. Develop a framework for the preparation of guidance materials, standards, and reporting guidelines for terrestrial observing systems for climate and associated data, metadata, and products to expand the comprehensiveness of current networks, facilitate exchange of data, and provide strategic direction to the terrestrial climate sector.	To be continued Will build on the outcome of Task CL-06-02.
CL-06-04	Identify lead international entities and national focal points for ocean observation efforts that can articulate national goals for their ocean observing sector and coordinate national activities with other designated national entities in order to evolve toward a truly global system of ocean observations.	To be completed in 2006



Task No.	Title	Status & Remarks
CL-06-05	<p>GEOSS IPY Contribution</p> <p>Coordinate with the International Polar Year (IPY) to enhance the utilization of Earth observations in all appropriate realms (including, but not limited to, sea and land ice, permafrost, coastal erosion, marine and terrestrial ecosystem change, biodiversity monitoring and impacts of increased resource exploitation and marine transport).</p> <p><u>New Title:</u></p> <p>Coordinate with the International Polar Year (IPY) to enhance the utilization of Earth observations in all appropriate realms (including, but not limited to, sea and land ice, permafrost, coastal erosion, physical and chemical polar ocean changes, marine and terrestrial ecosystem change, biodiversity monitoring and impacts of increased resource exploitation and marine transport).</p>	To be continued
CL-06-06	<p>Global Ocean Observation System</p> <p>Enhance and improve coordination of coastal and marine climate observations.</p> <p><u>New Title:</u> Enhance and improve coordination of coastal and marine climate observations in support of a global ocean observation system.</p>	To be continued Was postponed to 2007
WA-06-01	<p>Organize workshops on water observations, encompassing space-based, airborne, and in-situ observing systems, and focusing on (i) water quality, including fresh, estuarine, and marine water quality, (ii) ground water, (iii) precipitation, soil moisture, surface water, and (iv) hydrological ensemble-based prediction and new observing techniques and products.</p>	Closed Merged into WA-07-01 and WA-07-02



Task No.	Title	Status & Remarks
WA-06-02	<p>Forecast Models for Drought and Water Resource Management</p> <p>Facilitate the development of one (or more) demonstration-project that points to the added value of hydrological ensemble forecasts in water resource-management.</p>	<p>To be continued</p> <p>Enhanced prediction of the global water cycle variation is a key contribution to mitigation of water-related disasters, drought and sustainable human development. Forecasting methods are to be improved for use by hydrological services throughout the world.</p> <p>The hydrological data and information system infrastructure should be determined, the data from hydrological and meteorological services should be pulled together first on national level and then on river basin level. The systems should also be made interoperable to facilitate global exchange of data and information.</p>
WA-06-03	<p>Organize a side-event at World Water Forum IV (March 2006, Mexico), highlighting the benefits of global and coordinated Earth observations for water resource-management.</p>	<p>Completed in 2006.</p>
WA-06-04	<p>Facilitate the development of a global dataset that maps catchments to the first and second order stream level for use in applying land cover data to management of catchments and monitoring the hydrological cycle.</p>	<p>Closed</p>
WA-06-05	<p>In-situ Water Cycle Monitoring</p> <p>Initiate the creation of a coordination mechanism within GEO for global in-situ water observations, including ocean observations, and advocate synergy and sharing of infrastructure among observing systems.</p>	<p>To be continued</p> <p>The current water cycle observation capability is inadequate for monitoring long-term changes in the global water system and their feedback into the climate system, and the lack of and inaccessibility of crucial data is also a major constraint for sustainable development of water resources and improvement of water management practices.</p> <p>In addition to filling gaps in measurement capability, interoperability of observing systems, and standardization of metadata for data sharing, progress in product development of the global near real-time river runoff network, advocacy of sharing of telecommunication infrastructure and joint know-how are important goals that need to be reached within the next few years.</p>



Task No.	Title	Status & Remarks
WA-06-06	Promote best practices in Earth observation application for integrated water resource management in developing countries by supporting a series of workshops in South America, Asia, Africa, and a Small Island nation.	To be completed in 2006
WA-06-07	Capacity Building Program for Water Resource Management Initiate a capacity building program in Latin America to develop tools for using remote sensing data in support of water management, and to show the value of Earth observations generally in water resource management.	To be continued Initiate capacity building programs to develop tools for using remote sensing data in support of water management, and to show the value of Earth observations generally in water resource management. The program will be initiated in Latin America and will then be extended to Asia and Africa. Linkages with existing efforts of GEO Members and Participating Organisations will be made. Related capacity building activities would include the completion of workshops under task WA-06-06 in 2007.
WE-06-01	Surface-based Global Observing System for Weather Advocate a complete and stable surface-based (in-situ and airborne, land and possibly ocean,) Global Observing System (GOS). High priority should be given to a stable, and as much as possible automated, fully functional World Weather Watch Upper Air Network and the further development of the Aircraft Meteorological Data Relay (AMDAR) programme.	To be continued
WE-06-02	Space-based Global Observing System for Weather Advocate a stable and improved space-based Global Observing System (GOS) including operational geostationary and polar components. Support WMO efforts related to (i) increased spatial and temporal resolution for geostationary imagers and sounders and (ii) a broader availability of polar Doppler wind profiles for initial operational testing.	To be continued



Task No.	Title	Status & Remarks
WE-06-03	THORPEX Interactive Global Grand Ensemble (TIGGE) Facilitate the development and maintenance of a prototype global operational multi-model ensemble prediction system (e.g. through THORPEX) incorporating easily accessible databases. Development of TIGGE and the availability of databases will be an important contribution to the successful implementation of a number of GEO tasks that relate to risk management, early warning systems, major hazards and associated impacts.	To be continued
WE-06-04	Support the development of Advanced Dissemination Methods (ADMs) within an operational Integrated Global Data Dissemination Service (IGDDS), as a component of WMO Information System (WIS) and a contribution of the WMO Space Programme to GEONETCast.	Closed To be implemented through AR-07-01
WE-06-05	Numerical Weather-Prediction Capacity Building Co-organize a series of regional capacity building workshops with major numerical weather-prediction training centres to assist developing countries in their utilization of currently available forecasts; building in particular upon WMO programmes for developing countries and giving special emphasis on the use of ensemble forecasts for extreme event forecasting..	To be continued
EC-06-01	Integrated Global Carbon Observation (IGCO) Support the Integrated Global Carbon Observation (IGCO) development of a global carbon-observing system, in particular improved global networks of in-situ CO ₂ observations.	To be continued
EC-06-02	Ecosystem Classification Establish an ad hoc Ecosystems Classification Task Force, covering terrestrial, freshwater, and ocean ecosystems, with a mandate to create a globally agreed, robust, and viable classification scheme for ecosystems.	To be continued



Task No.	Title	Status & Remarks
EC-06-03	Initiate the harmonization of observing-methods and create synergies between ecosystem observing activities and those of other existing groups and mechanisms for terrestrial, freshwater and marine systems.	Closed Merged into EC-07-01
EC-06-04	Explore techniques for up-scaling in-situ ecosystem observations.	Closed Merged into EC-07-01
EC-06-05	Complete a survey of the research community involved in in-situ observations and modelling for new platform and sensor needs, or for suggestions for better use of existing systems.	Closed Merged into EC-07-01
EC-06-06	Conduct an inventory of archived data for ecosystems, identify data gaps, identify data at risk, and evaluate costs of data rescue. In complement, conduct a workshop to define a data archiving strategy taking into account data types, processing levels and supporting media.	Closed Merged into EC-07-01
EC-06-07	Regional Networks for Ecosystems Build upon existing initiatives (e.g. ANTARES in South America for oceans and GOFC-GOLD regional networks for terrestrial domains) to develop a global network of organization-networks for ecosystems, and coordinate workshops to strengthen observing capacity in developing countries.	To be continued Deliverables will span 2006-2007. Linkages with terrestrial ecosystems will be developed in 2007
AG-06-01	GEOSS Agriculture Strategic Plan Initiate the creation of a 5- to 10-year strategic plan: define specific objectives for 2007 and create a plan of action for GEO in agriculture. <u>New Title:</u> Initiate the creation of a 5- to 10-year strategic plan: define specific objectives for 2007 and create a plan of action for GEO in agriculture, taking account of the GEOSS 10 Year Implementation Plan Reference document targets.	To be continued



Task No.	Title	Status & Remarks
AG-06-02	Data Utilization in Aquaculture Consult with scientists and experts from the fisheries, aquaculture, coastal zone management and Earth observation communities at international and regional levels to identify opportunities for enhanced utilization of Earth observations in fisheries and aquaculture.	To be continued
AG-06-03	Utilizing global and regional high-resolution land-cover datasets (e.g. GLOBCOVER) and earlier 1-km resolution land cover data sets (e.g. Global Land Cover 2000), implement production of a high-resolution global land-cover change dataset and report. Propose mechanisms for regular analysis and reporting on land cover change building on current efforts and promulgate the use of these products, especially in developing countries.	Closed Merged into DA-07-02
AG-06-04	Forest Mapping and Change Monitoring Initiate an international assessment effort on forests and forest changes utilizing ongoing land cover mapping projects (e.g. GLOBCOVER). Ensure application of standardized classifications and harmonization of existing datasets.	To be continued
AG-06-05	Facilitate the implementation of a demonstration project, initiated by THORPEX and AMMA, on the use of advanced weather and climate ensemble forecasting methods integrating Earth observations, agricultural data and socio-economic data, to develop and improve the predictability of food-supply hazards in Africa.	Closed Merged into AG-07-02
AG-06-06	Advocate funding for demonstration projects to produce global irrigated area/crop production datasets and promulgate sustained monitoring efforts utilizing the validated methodologies	Closed No activities reported.



Task No.	Title	Status & Remarks
AG-06-07	Training Modules for Agriculture Initiate the design of training modules to demonstrate the usage of Earth observation data and products for the agricultural sectors in Africa, Asia, Latin America, Central and Eastern Europe, and in Small Island States.	To be continued
BI-06-01	Ensure participation of the biodiversity community into the Ecosystem Task Force (see Task EC-06-02) in order to ensure that the ecosystem classification system developed as part of this task is compatible with biodiversity observational requirements.	Completed in 2006.
BI-06-02	Biodiversity Requirements in Earth Observation Building on the framework adopted for monitoring biodiversity trends in the UN Convention on Biological Diversity, conduct a series of workshops and meetings to (i) define the needs and requirements of the biodiversity information users sector, (ii) delineate available methodologies and (iii) identify the adequacy of current and past observational strategies.	To be continued DIVERSITAS will conduct a workshop represented by some 70 institutions in 2006.
BI-06-03	Capturing Historical Biodiversity Data Initiate the development of a strategic plan for capturing historical biodiversity data from natural history collections and the research community.	To be continued The Global Biodiversity Information Facility will conduct a workshop in collaboration with DIVERSITAS in 2006.
BI-06-04	Initiate the development of a strategic plan for periodic global assessment of status and trends for species of merit, taking into account the Millennium Ecosystem Assessment and CBD 2010 targets. Include the remote sensing community in this discussion to determine the applicability of remote sensing to this topic.	Closed Merged into BI-07-01
BI-06-05	Facilitate the interoperability of the multi-institutional biodiversity observation network and ensure that it links to data sets of ecological and other related observation systems.	Closed Merged into BI-07-01



Task No.	Title	Status & Remarks
US-06-01	Identify Priorities and Synergies between SBAs Establish a GEO process for identifying critical Earth observation priorities common to many GEOSS societal benefit areas, involving scientific and technical experts, taking account of socio-economic factors, and building on the results of existing systems' requirements development processes.	To be continued



Task No.	Title	Status & Remarks
US-06-02	<p>Pilot Communities of Practice</p> <p>Initiate pilot communities of practice to identify and further refine users' needs, in particular on cross-cutting areas, building upon the initial experience of community of practice and on information provided by national, regional and project-level surveys.</p>	<p>To be continued</p> <p>The following task proposals, received in response to version 1 of this work plan, are to be referred to the Air and Health Community of Practice:</p> <ol style="list-style-type: none"><li data-bbox="1167 523 2110 707">(1) Facilitate international consortia, and coordinate, besides advocating funding for, the implementation of major pilot projects integrating Earth observations of long range transport of air pollutants, health, and socio-economic data to improve decision making. As a priority, evaluate and recommend strategies for an integrated sampling frame for air pollution. This activity has linkages to several other items, including US-06-01, DI-06-09 and EC-06-05.<li data-bbox="1167 715 2110 930">(2) Advocate a stable and improved surface (in-situ and airborne) and space-based observing system of global air quality including polar and geostationary satellites in line with the Integrated Global Atmospheric Composition Observations (IGACO) recommendations. Support WMO efforts related to increased spatial and temporal resolution. Construct a high spatial (kilometers) and temporal resolution (30 minutes) monitoring and forecasting system including observations, modeling and chemical data assimilation for global and local air quality.<li data-bbox="1167 938 2110 1121">(3) Support the development of a "Global Sand and Dust Storm Warning System" bringing together forecasts, observations and users, including weather forecasters, commercial aviation, surface transport, health effects, solar energy and agriculture communities. Specifically, organise a WMO International Symposium on a "Global Sand and Dust Storm Warning System" in Spain in Autumn, 2007 (Task leads:WMO/AREP).<li data-bbox="1167 1129 2110 1257">(4) Organize a "Joint Workshop on Integrated Observations for Assessing Hemispheric Transport of Air Pollution" (and hence Air Quality) in Geneva 24-26 January 2007. (Task leads: UN-ECE Convention on LRTAP Task Force on Hemispheric Transport of Air Pollution (TF-HTAP) and WMO/AREP).



Task No.	Title	Status & Remarks
US-06-03	Promote interactions, in the form of fora, between data providers, scientists, industry, international governmental and non-governmental organizations, decision- and policy- makers to identify requirements for new or improved data, products and services.	To be continued as an ongoing supporting activity
AR-06-01	Establish and maintain a process for reaching interoperability arrangements, informed by ongoing dialogue with major international programmes and consortia. That process is to be sensitive to technology and accessibility disparities among GEO Members and Participating Organizations, and must include mechanisms for upgrading arrangements.	Closed Grouped into AR-07-01
AR-06-02	Produce practical strategic and tactical guidance document on how to converge disparate systems to a higher degree of collaboration and interoperability under GEOSS including its roadmap and using existing efforts wherever possible.	Closed Grouped into AR-07-01
AR-06-03	Reach consensus on how the GEOSS architecture will link the components of GEOSS and allow for growth potential.	Closed Grouped into AR-07-01
AR-06-04	Establish a process for GEO Members and Participating Organizations to commit component systems to GEOSS, and advocate specific initial commitments of contributed systems and other components, including agreement to accept GEOSS interoperability specifications as defined to date, and allowing for growth.	Closed Grouped into AR-07-01
AR-06-05	Initiate development of a publicly accessible, network-distributed clearinghouse, subject to GEOSS interoperability specifications to date, and including an inventory of existing data, metadata, and pre defined common products.	Closed Grouped into AR-07-02
AR-06-06	Facilitate interoperability among Digital Elevation Model (DEM) data sets with the goal of producing a global, coordinated and integrated DEM.	Closed Reclassified as DA-07-01



Task No.	Title	Status & Remarks
AR-06-07	Produce an inventory of existing in-situ observation networks (including airborne), beginning with the networks of GEO Members and Participating Organizations, and associate them with societal benefit areas as appropriate.	Closed No activity reported
AR-06-08	Advocate additional resources for the maintenance and expansion of in-situ observing systems in cooperation with major national and international organizations and programmes.	To be continued as an ongoing supporting activity
AR-06-09	Advocate establishing continuity for near real-time, 30-m (or better) resolution, multi-spectral remote-sensing coverage everywhere on the Earth's surface, including support for the launch of a Landsat-equivalent follow-on mission.	Closed Grouped into DA-07-03
AR-06-10	Advocate and facilitate the timely implementation of the Global Precipitation Measurement (GPM) mission and encourage more nations to contribute to the GPM constellation	Closed Grouped into DA-07-03



Task No.	Title	Status & Remarks
AR-06-11	<p>Radio Frequency Protection</p> <p>Prepare a series of appropriate advocacy activities, including representations to the International Telecommunication Union. For example, evaluation of challenges presented by the industrial development of automobile anti-collision radar and the implications for the use of radio frequencies essential for tropospheric sounding.</p> <p><u>New Title:</u> “Assess the potential impact of interference on Earth Observations applications and in particular Satellite measurements necessary for the GEOSS and prepare a series of appropriate coordinated advocacy activities in association with Member countries, including representations to the International Telecommunication Union (ITU) and other bodies in charge of frequency management. This also include a support to GEO Members in influencing their national and regional frequency management bodies. In particular, the case of passive bands, essential for Earth observations, will be monitored with the highest care (For example, evaluation of challenges presented by the automotive short-range radars (SRR 24 GHz) applications and their implications). To this respect, it is also important to link with Scientific Committee on Frequency Allocations for Radio Astronomy and Space Science (IUCAF).”</p>	To be continued
DA-06-01	<p>GEOSS Data Sharing Principles</p> <p>Invite experts to identify steps required to further the practical application of the agreed GEOSS data sharing principles.</p>	To be continued
DA-06-02	<p>GEOSS Quality Assurance Strategy</p> <p>Develop a GEO data quality assurance strategy, beginning with space-based observations and evaluating expansion to in-situ observations, taking account of existing work in this arena.</p>	To be continued



Task No.	Title	Status & Remarks
DA-06-03	<p>Ensemble-Technique Forecasting Demonstrations Facilitate the development of demonstration projects promoting the wider use, in other disciplines, of ensemble-based techniques originally developed for weather forecasting.</p>	To be continued
DA-06-04	<p>Data, Metadata and Products Harmonisation Facilitate the development, availability and harmonization of data, metadata, and products commonly required across diverse societal benefit areas, including base maps, land-cover data sets, and common socio-economic data.</p>	To be continued
DA-06-05	<p>Guidance Document for Basic Geographic Data Develop a guidance document for basic geographic data (including format, precision, accuracy, etc.), taking into account relevant national, regional and global initiatives.</p>	To be continued
DA-06-06	<p>Advocate use of existing Spatial Data Infrastructure components as institutional and technical precedents, where appropriate, including standard protocols and interoperable system interfaces, among other components.</p>	<p>Closed Grouped into AR-07-01</p>
DA-06-07	<p>Define a model web portal system for access to all Earth observation data, based on existing portals and systems, designed to increase use, quality, and accessibility of existing information, tools, and networks. Particular attention will be given to the coordination of networks in specific societal benefit areas to enable reuse thereby to achieve synergy and leverage.</p>	<p>Closed Grouped into AR-07-02</p>
DA-06-08	<p>Develop learning tools (based on existing tools) to improve technical capability to (i) create common geo-referenced maps, (ii) merge socio economic data using geographic information systems (GIS), and (iii) combine geo-referenced maps with application tools to yield basic information systems.</p>	<p>Closed Transferred to CB-07-01</p>



Task No.	Title	Status & Remarks
DA-06-09	<p>GEOSS Best Practices Registry</p> <p>Establish GEOSS Best Practices Registry by a request for proposals from GEO organizations willing to maintain/update GEOSS Best Practices Registry. The registry should also include existing cost-benefit sharing mechanisms and examples (data sharing, cooperative data acquisition, joint development, joint flight, collaborative sciences, etc).</p>	<p>To be continued</p>
CB-06-01	<p>Perform a review of capacity-building initiatives in GEO Members and Participating Organizations, taking into account results of existing surveys, to identify existing and planned capacity-building activities and gaps.</p>	<p>Closed</p> <p>To be merged with CB-07-01</p>
CB-06-02	<p>Perform an analysis of existing documentation of Earth observation infrastructure requirements essential to the implementation of GEOSS in developing countries, and document commonly identified gaps.</p>	<p>Closed</p> <p>To be merged with CB-07-01</p>
CB-06-03	<p>Perform a review of existing education and training initiatives for Earth observation utilization in developing countries, and promulgate the use of best practices in cooperation with specialized UN agencies and other organisations.</p>	<p>To be completed in 2006</p>
CB-06-04	<p>GEONETCast</p> <p>GEONETCast, an operational service delivering data and products based on the use of communication satellites</p> <p><u>New Title:</u> "GEONETCast, a near real-time data dissemination system - in support of the GEO societal benefit areas - by which environmental /in situ/, airborne, and space-based observations, products, and services are transmitted to users through satellites."</p>	<p>To be continued</p> <p>Where infrastructure contributions are not yet in place, the strategy is to establish GEONETCast on a demonstration basis, then evolve to a fully operational global system with diverse data and product contributions to serve all GEO societal benefit areas. Capacity building needs, particularly in developing countries will be addressed.</p>
OR-06-01	<p>Develop a comprehensive list of major international conferences and workshops relevant to GEOSS (UNFCCC COP, sustainable development fora, etc.) in each societal benefit area and ensure GEOSS participation and visibility in selected events.</p>	<p>Completed in 2006</p>



Task No.	Title	Status & Remarks
OR-06-02	Engage in a series of presentations and briefings to technical audiences in each societal benefit area, with an emphasis on emerging fields of health, energy, water resources management, and ecosystems.	To be continued as an ongoing supporting activity
OR-06-03	Promote awareness of successful communities of practice activities, advancing awareness of potential applications for Earth observations.	To be continued as an ongoing supporting activity
OR-06-04	Implement a sustained outreach campaign plan of targeted communication activities.	To be continued as an ongoing supporting activity
OR-06-05	Complete preparation of outreach campaign communication tools begun in 2005, including a GEOSS logo/visual identity; an engaging website; an umbrella message and sector-specific messages; multi-media and press tools; and standard PowerPoint briefings.	To be completed in 2006
OR-06-06	In coordination with the outreach campaign, engage in a series of regular media roundtables and briefings and occasional well-timed press conferences and special events.	To be continued as an ongoing supporting activity
OR-06-07	Establish a network of press & media representatives for all GEO members and participating organizations to advance outreach objectives.	To be completed in 2006

Annex III

Mapping of tasks to the 2 and 6 year targets

2 YEAR TARGETS

Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
001	4.1.4-2.1	DISASTERS	Advocate strengthening of the International Charter on Space and Major Disasters and similar support activities to enable better response to and documentation of effects of disasters, such as floods, earthquakes and oil spills. Its scope may be expanded to allow for pre-event tasking where forecasting is adequate to justify the effort (wildland fires, some floods and coastal disasters, volcanic eruptions). An expanded scope may also encompass Earth Observation training and capacity building of local users in affected areas, particularly in developing countries.	Ongoing support activity (DI-06-10; DI-06-11) DI-06-04 DI-06-08 DI-06-09 DI-06-13 DI-07-01
002	4.1.4-2.2	DISASTERS	Facilitate global access to the 100-metre (C-band) and 30-metre (X-band) horizontal resolution digital terrain information produced during the Shuttle Radar Topography Mission (SRTM).	DI-06-05
003	4.1.4-2.3	DISASTERS	Advocate expansion of seismic monitoring networks, plus expansion of the present network of ocean-bottom pressure sensors, and upgrade existing global networks (e.g. the GSN) so that all critical instruments relay data in real time, in support of better tsunami warning worldwide.	DI-06-02 DI-06-04



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
004	4.1.4-2.4	DISASTERS	Facilitate focused pilot studies in under-served hazardous areas, for example Japan's Deployment of Asia-Pacific Hazard-mitigation Network for Earthquakes and volcanoes (DAPHNE).	DI-06-04 DI-06-08 DI-06-13 DI-07-01
005	4.1.4-2.5	DISASTERS	Facilitate ongoing capacity building, with a focus on transferring technologies and best practices. Also essential are best practices for the dissemination of real-time information and early warnings to end users and the public. Specifically, improvements in real-time flood forecasting for developing countries should be a priority, in concert with efforts by UNESCO and WMO to expand and improve flood-related information systems.	CB-07-01 DI-07-01
006	4.1.4-2.6	DISASTERS	Facilitate effective monitoring from existing geostationary satellites, launched primarily for weather monitoring, for non-weather applications such as volcanic eruptions and volcanic ash clouds, forest fires, aerosols, and other hazards that require a high observation frequency.	DI-06-09
007	4.1.4-2.7	DISASTERS	Advocate integration of InSAR technology into disaster warning and prediction systems, in particular related to floods, earthquakes, landslides and volcanic eruptions. The ERS (European Remote Sensing) and Envisat missions of the European Space Agency have pioneered these applications and should be continued for global, long-term applications. Also, the Canadian Space Agency's Radarsat-1 mission with its InSAR capability contributed significantly to the development of applications related to geohazard monitoring and research. In this respect, Radarsat-2 should be a data source for geohazard InSAR applications. As part of this effort, efficient exploitation of data from Japan's upcoming Advanced Land Observation Satellite (ALOS) should also be facilitated. Its L-band SAR sensor is the first such sensor since 1998.	DI-06-03
008	4.1.4-2.8	DISASTERS	Produce an inventory of existing geologic and hazards zonation maps and identify areas and types of hazards where they are most critically lacking, or where maps need to be digitized.	DI-06-07
009	4.1.4-2.9	DISASTERS	Advocate further development of the Global Spatial Data Infrastructure (GSDI) and draw on GSDI components as institutional and technical precedents.	DI-06-05 DI-06-07 DI-06-08



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
010	4.1.4-2.10	DISASTERS	Produce a comprehensive gaps analysis to assess the status and regional distribution of existing disaster management capacity-building programmes and initiatives.	CB-07-01c
011	4.2.4-2.1	HEALTH	Advocate new, high-resolution Earth observations relevant to health needs.	HE-07-01 HE-07-03
012	4.2.4-2.2	HEALTH	Facilitate the establishment of exchanges between health care experts in developed countries, developing countries, and indigenous communities to ensure a global perspective of the challenges and some coordinated development of a network to address problems and to leverage Earth Observation systems where appropriate.	HE-06-03 CB-07-01 US-06-P2
013	4.2.4-2.3	HEALTH	Facilitate mechanisms that help to translate the needs of health data users into requirements that Earth Observation data providers can address.	HE-06-01 HE-06-03 HE-06-04 CB-07-01 Ongoing supporting activity (HE-06-02)
014	4.2.4-2.4	HEALTH	Promote the development of an integrated public health information network database that includes information relevant to human health officials and agencies, and includes multi-scaled, multi-temporal spatial data collected from remote sensing data sources, to provide better predictive models of the effects of environmental factors affecting human health and well-being.	HE-07-01 HE-07-02



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
015	4.2.4-2.5	HEALTH	Facilitate development of data products and systems that integrate Earth science databases with health and epidemiological information. This includes social and infrastructure data needed in decision support systems for health care planning and delivery. For example, in places having no water quality data but large populations with a reduced life span, the best way to improve health may be to monitor water quality/drinking water, implement water purification, and inform the public about the need to use purified water.	HE-06-03 HE-07-02 US-07-02 CB-07-01
016	4.2.4-2.6	HEALTH	Advocate enhancements to international networks and systems needed to support Earth Observation data sharing in areas of human health.	HE-06-03 HE-07-01 AR-07-01 CB-07-01
017	4.2.4-2.7	HEALTH	Produce a comprehensive gaps analysis of existing capacity building programmes and aggressively promote initiatives for improved coordination.	HE-07-01 CB-07-01
018	4.2.4-2.8	HEALTH	Advocate, within its field of competence, an increase in collaborative research programmes between developed and developing country scientists and indigenous communities, to their mutual benefit.	HE-06-03 US-06-P2
019	4.2.4-2.9	HEALTH	Facilitate the ability to overlay on epidemiology maps the variety of relevant inventoried and processed data, including meteorological, aerosol, ocean and land features, demographic, and infrastructure. This kind of overlay map will be created through interoperable databases and services provided by existing national and international Spatial Data Infrastructures (SDIs).	HE-07-01 HE-07-03
020	4.2.4-2.10	HEALTH	Facilitate reductions in the lag time in the temporal collection and assimilation of human health data (in some cases, this can mean years) and the “real-time” synoptic data that is collected by remote sensing systems.	HE-07-01



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
021	4.2.4-2.11	HEALTH	Facilitate provision of historical remote sensing data that can be used for tracking or monitoring environmental changes as precursors for what exists today and for modelling future human health scenarios.	HE-07-01 HE-07-02
022	4.2.4-2.12	HEALTH	Facilitate identification of technical needs in terms of instrumentation and data products that will yield useful epidemiological data at the community level.	HE-07-01 CB-07-01 Ongoing supporting activity (HE-06-02)
023	4.2.4-2.13	HEALTH	Facilitate identification of “paradigm environments”, such as vaccine field sites that have strong epidemiological and demographic data, and demonstrate the utility of overlaying high resolution remotely sensed data as a way to correlate environmental factors and specific infectious diseases (e.g. cholera and malaria).	This activity will require the input of WHO. The Secretariat is working actively to ensure WHO’s participation in GEO.
024	4.2.4-2.14	HEALTH	Facilitate development of models relating remotely sensed and <i>in situ</i> data to the epidemiology of environmentally related infectious and chronic diseases	HE-06-03 HE-07-03
025	4.3.4-2.1	ENERGY	Facilitate the exchange and use of existing data/products and forecast information through specific initiatives and actions in coordination with the energy community: (i) to raise awareness about the importance and potential of environmental information; (ii) to facilitate access to the existing information and products; and (iii) to develop training and encourage the development of decision-support tools for optimal energy use.	EN-06-04 EN-07-01 EN-07-02 EN-07-03 US-06-02 US-07-01 Ongoing supporting activity (US-06-03)



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
026	4.3.4-2.2	ENERGY	<p>Produce, in coordination with the energy community, a strategic 5-10 year plan for exploitation of the benefits of the new generation of operational observing systems - both space-based and in situ - which comes on-stream in this decade. The plan should include efforts on:</p> <ul style="list-style-type: none"> (i) operationalizing existing research capabilities to meet the needs of the energy industry; (ii) research and development in advanced end-to end modelling and forecasting techniques (such as ensemble-based methods) covering both environmental and energy processes, and with an emphasis on issues of risk assessment; (iii) the improvement of information networks by linking existing systems and making them inter-operable; (iv) continue efforts to raise awareness of, facilitate access to, and operationalize improved methodologies for exploitation of GEOSS data and information products for the industry. 	<p>EN-06-04 EN-07-01 EN-07-02 EN-07-03 US-06-02 US-07-01 Ongoing supporting activity (US-06-03)</p>



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
027	4.4.4-2.1	CLIMATE	Support GSN and GUAN networks, Global Atmosphere Watch (GAW) observatories, initial Global Ocean Observing System (GOOS), river discharge, lake levels, soil moisture, permafrost, snow cover and glacier observing networks, which are recommended in the GCOS Implementation Plan.	CL-06-03 CL-06-04 (completed) CL-06-05 CL-06-06 WE-06-01 WE-06-02 WA-06-01 (completed) WA-06-05 WA-07-02 AG-06-04 AG-07-01 AR-06-09 DA-07-01 DA-07-02



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
028	4.4.4-2.2	CLIMATE	Support implementation of actions called for in GCOS Implementation Plan and the relevant IGOS-P Theme Reports.	CL-06-01 CL-06-02 CL-06-03 CL-06-04 (completed) CL-06-06 WE-06-01 WE-06-02 WA-06-01 (completed) WA-06-05 WA-07-02 AG-06-04 AG-07-01 AR-06-09 DA-07-01 DA-07-02
029	4.4.4-2.3	CLIMATE	Improve the reporting of observations to international data and analysis centres in terms of data volumes, quality and timeliness.	CL-06-03
030	4.4.4-2.4	CLIMATE	Improve the capability of international data centres for data archiving and distribution of data and products.	CL-06-03 WE-06-03 (completed)



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
031	4.4.4-2.5	CLIMATE	Establish a strong collaboration mechanism between observational organizations and research communities, and users of climate information, to further refine the observations, analyses and products required.	CL-06-02 US-06-01 Ongoing supporting activity (US-06-03)
032	4.4.4-2.6	CLIMATE	Identify the needs and solutions necessary to implement the global observing systems for climate in all regions and countries based on the recommendation of GCOS Implementation Plan and specific regional action plans.	CL-06-02 CL-06-04 (completed) CL-06-05 WA-06-01 (completed)
033	4.4.4-2.7	CLIMATE	Initiate an intergovernmental mechanism in the terrestrial domain to prepare and issue regulatory and guidance information on observational procedures and data management as, for example, also asked for in decision 9/CP.9 (UNFCCC, 2003).	CL-06-03
034	4.4.4-2.8	CLIMATE	Support JCOMM to coordinate the implementation of and prepare regulatory and guidance information for an operational <i>in situ</i> ocean observing system.	CL-06-04 CL-06-06 US-06-02
035	4.4.4-2.9	CLIMATE	Emphasize to satellite agencies the importance of satellites for long-term climate monitoring, and advocate that all Earth observing satellite systems adhere to the GCOS Climate Monitoring Principles (WMO, 2003) and commit to the suite of instrumentation called for in the GCOS Implementation Plan and in the relevant IGOS-P Theme Reports.	CL-06-02 AR-06-10 WA-07-02



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
036	4.4.4-2.10	CLIMATE	Focus on research programmes to support the development of observational capabilities for ECVs such as tropospheric ozone, cloud and aerosol properties and their vertical profiles, CO2 and other greenhouse gases, soil moisture and groundwater, above-ground biomass, permafrost, snow cover and glaciers, and ocean salinity, carbon and nutrients and their vertical profiles.	CL-06-02 CL-06-03 CL-06-05 CL-06-06 WE-06-01 WE-06-02 WA-07-02
037	4.4.4-2.11	CLIMATE	Coordinate climate sectors and broad user groups to clarify and specify requirements for socio-economic benefit areas (disaster prevention, health, energy, water resources, ecosystem, agriculture, and biodiversity) for climate products and information.	US-06-01 CL-07-01 DI-07-02 Ongoing supporting activity (US-06-03)
038	4.4.4-2.12	CLIMATE	Enforce paleoclimate research to improve knowledge about historical and current climate change, by combining natural science data and socio-economic information.	The expertise of the paleoclimate community is required for this task, and will be actively recruited by the Secretariat.
039	4.4.4-2.13	CLIMATE	Promote the improvement of emission databases for aerosols, greenhouse gases and their precursors.	CL-06-01 CL-06-02 CL-06-03
040	4.5.4-2.1	WATER	Facilitate, with countries, WMO and UNESCO, improvements in existing <i>in situ</i> observation systems through coordination and optimization of existing <i>in situ</i> networks at global, regional and national level.	WA-06-05 Ongoing supporting activity (AR-06-08)



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
041	4.5.4-2.2	WATER	Produce a plan for a network of sophisticated, integrated <i>in situ</i> observation sites, to support process studies and algorithm and model development.	WA-06-02 WA-06-05
042	4.5.4-2.3	WATER	Facilitate international data sharing and exchange agreements for water data with countries, WMO, and UNESCO, and monitor and routinely report compliance with the policy.	WA-06-05 WA-06-06 (completed)
043	4.5.4-2.4	WATER	Produce an implementation plan for a broad global water cycle data integration system that combines <i>in situ</i> and satellite and numerical model outputs and disseminates usable information for decision-making.	WA-07-02
044	4.5.4-2.5	WATER	Facilitate, with space agencies and research communities, more accurate, frequent (3-hourly), global, high spatial resolution, and microphysically detailed measurements of precipitation through a global constellation of satellites carrying passive microwave radiometers in complementary orbits.	AR-06-10 DA-07-03 WA-07-02
045	4.5.4-2.6	WATER	Advocate that IGOS-P should take the lead in development of integrated precipitation and soil moisture products and new products including indicators.	The Secretariat will take advantage of the launch of SMOS and HYDROS to facilitate this advocacy.
046	4.5.4-2.7	WATER	Facilitate, with space agencies and research communities, studies to evaluate the contribution of space-based observations to the determination of surface water quality and mapping of critical aquatic habitats.	WA-07-01
047	4.5.4-2.8	WATER	Produce an evaluation of the resolution and accuracy requirements for applying satellite altimetry to the measurement of streamflow and surface water storage.	WA-07-02



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
048	4.5.4-2.9	WATER	Facilitate establishment of an international coordination function for <i>in situ</i> water cycle observation and data integration and dissemination.	WA-06-05 Ongoing supporting activity (AR-06-08)
049	4.5.4-2.10	WATER	Produce a framework for developing ensemble-based hydrological predictions and improve the ability of users to exploit the information.	WA-06-02 US-06-02
050	4.5.4-2.11	WATER	Advocate and globalize ongoing activities that promote the use of Earth observation for both monitoring the state of, and improving implementation of, water resources management in developing countries, particularly in concert with the activities pursued by the CEOS WSSD Follow-up Programme.	WA-06-06 (completed) WA-06-07
051	4.5.4-2.12	WATER	Organise workshops and special studies for documenting the cultural barriers to technology transfer and procedures in order to identify and avoid these obstacles.	CB-07-01
052	4.5.4-2.13	WATER	Advocate eliminating barriers to the free and open exchange of data and software to enable full access by water managers in developing countries.	WA-06-06 (completed) WA-06-07
053	4.6.4-2.1	WEATHER	Facilitate investment in the critical data gaps (atmospheric wind and humidity profiles, ocean evaporation and precipitation, soil moisture, precipitation) and improve predictive models to augment the quality of forecasts of severe events and general weather conditions.	WE-06-01 WE-06-02
054	4.6.4-2.2	WEATHER	Advocate support for plans to assist developing countries to utilize the forecasts in order to reduce impacts on life and property.	WE-06-05
055	4.6.4-2.3	WEATHER	Facilitate, with WMO, education and training of developing country personnel in the effective use of currently available weather information.	WE-06-05



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
056	4.6.4-2.4	WEATHER	Advocate support for existing weather capacity building programmes and initiatives, understanding their status and regional distribution.	WE-06-01 WE-06-02 WE-06-03 WE-06-05
057	4.6.4-2.5	WEATHER	Advocate support for the WMO plans to establish the feasibility of expanding EUCOS to other regions.	WE-06-01
058	4.7.4-2.1	ECOSYSTEMS	Facilitate the harmonization of methods for observing the GEOSS set of ecosystem variables.	EC-07-01 BI-06-02 AR-07-02
059	4.7.4-2.2	ECOSYSTEMS	Facilitate the full implementation of a global carbon observing system, in accordance with the specifications detailed in the IGOS-P IGCO Theme Report, which incorporates the Terrestrial Carbon Observation plan of GTOS, and carbonrelated components of GOOS and GCOS.	EC-06-01
060	4.7.4-2.3	ECOSYSTEMS	Facilitate a globally agreed, robust and implementable (operational) classification scheme for ecosystems.	EC-06-02 EC-07-01 BI-06-01 (completed)
061	4.7.4-2.4	ECOSYSTEMS	Advocate the operational continuity of moderate to high-resolution Earth-observing satellites for land cover and ocean colour.	DA-07-02



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
062	4.7.4-2.5	ECOSYSTEMS	Facilitate efforts to eliminate regional disparity in observing capacity. For example, two thirds of the World's oceans are in the Southern Hemisphere, whereas most of the advanced oceanographic centres are in the Northern Hemisphere. Stations for observing ecological variables on land are much more closely spaced in temperate countries than in the tropical belt.	EC-07-01
063	4.7.4-2.6	ECOSYSTEMS	Facilitate the networking of institutions making observations relating to ecosystems.	EC-06-02 EC-07-01 BI-06-02 BI-06-03 AR-07-02
064	4.7.4-2.7	ECOSYSTEMS	Advocate the development of tools to scale up from a limited number of <i>in situ</i> ecosystem observations made at local scales, to arrive at a large-scale, comprehensive picture of ecosystems.	EC-07-01
065	4.7.4-2.8	ECOSYSTEMS	Advocate the continued rescue, acquisition, digitisation and making accessible of historical information relating to ecosystems.	EC-07-01
066	4.7.4-2.9	ECOSYSTEMS	Facilitate the validation of existing tools such as synthetic aperture radar and hyperspectral imagers for the measurement of ecosystem properties.	AR-07-02



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
067	4.7.4-2.10	ECOSYSTEMS	Advocate the development of new sensors and platforms, and facilitate their use for routine observations in the field on an operational basis. For example, airborne sensor technologies such as LIDAR are ready to move out of the research domain. Molecular tools are now being developed to study the microbial ecology of marine systems. <i>In situ</i> , self-contained, flow cytometers for classification of phytoplankton and bacteria (the “cytobuoys”) and underwater laser imaging and scanning techniques that can be used for recording marine life underwater and for detecting terrestrial ecosystem structures, are in advanced stages of development. New sensors are also on the horizon for measurement of the chemical properties of the ocean and terrestrial ecosystems.	The Secretariat will work with POGO and the Census of Marine Life (CoML) to address the marine aspects of this target. The terrestrial aspects are addressed by EC-07-01.
068	4.8.4-2.1	AGRICULTURE	Facilitate - with relevant users at regional, national and local level - definition of user needs for agriculture, rangelands, forestry and fisheries in terms of Earth Observation data and information, as well as mechanisms to keep users informed.	AG-06-01 AG-06-04 EC-07-01 DA-07-02
069	4.8.4-2.2	AGRICULTURE	Advocate and facilitate existing initiatives that regularly provide updates of land cover data at 1:1,000,000 scale; use agreed ISO standard to initiate land cover mapping activities at 1:500,000.	DA-07-02
070	4.8.4-2.3	AGRICULTURE	Facilitate regional training in land cover classification and the assimilation of existing data sets in Africa, Asia and Latin America.	AG-06-07 DA-06-04 DA-07-02 EC-07-01
071	4.8.4-2.4	AGRICULTURE	Facilitate the use of agriculture, forestry, and fishery production statistics to be exploited at pixel level.	AG-06-04



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
072	4.8.4-2.5	AGRICULTURE	Advocate the adoption and use of geostationary satellite data (e.g. Meteosat Second Generation) in food-insecure regions.	AG-06-01
073	4.8.4-2.6	AGRICULTURE	Facilitate establishment of a basis for the continuity of high resolution optical and radar satellite observing networks (5-30 m).	AR-06-09 DA-07-02
074	4.8.4-2.7	AGRICULTURE	Facilitate production of a map of the World's irrigated agriculture areas, and the establishment of a monitoring programme among users.	DA-07-02
075	4.8.4-2.8	AGRICULTURE	Advocate the development of on-time monitoring and information systems for significant and extreme events such as fire, forest conversion, and forest concession management.	EC-07-01
076	4.8.4-2.9	AGRICULTURE	Facilitate the development of courses to demonstrate the usage of Earth observation data and products in developing countries.	AG-06-07
077	4.9.4-2.1	BIODIVERSITY	Facilitate the interoperability of the multi-institutional biodiversity observation network through GBIF and ensure that it links to data sets of ecological and other related observation systems.	BI-07-01
078	4.9.4-2.2	BIODIVERSITY	Develop a biodiversity observation strategy that is spatially and topically prioritized, based on analysis of existing information, identifying unique or highly diverse ecosystems and those supporting migratory, endemic or globally threatened species, those whose bio diversity is of socio-economic importance, and which can support the 2010 CBD target.	BI-06-02 BI-07-01
079	4.9.4-2.3	BIODIVERSITY	Facilitate the capture of ten million new biodiversity observations per year, the agreement to data collection protocols by networks of permanent sites, and the launch of initiatives on three key issues.	BI-06-03 EC-07-01 AR-07-02



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
080	4.9.4-2.4	BIODIVERSITY	Advocate additional support to permit data system integration sharing by data providers, particularly the research and collections institutions.	AR-07-02
081	4.9.4-2.5	BIODIVERSITY	Produce an analysis of the gaps and needs in capacity building initiatives within the biodiversity observation system, including for microbial biodiversity.	BI-06-03 BI-07-01
082	4.9.4-2.6	BIODIVERSITY	Produce a strategy for capturing the outputs of citizen-based biodiversity monitoring systems.	AR-07-02
083	4.10.4-2.1	COMMONALITIES	Facilitate sharing of best practices for the development of products customized for particular socio-economic benefits.	DA-06-09 US-06-02 US-06-P1
084	4.10.4-2.2	COMMONALITIES	Produce practical strategic and tactical guidance on how to converge disparate systems to a higher degree of collaboration and interoperability using GEOSS principles.	AR-07-01
085	4.10.4-2.3	COMMONALITIES	Facilitate interoperability among data sets acquired by different countries and agencies, as these are not likely to be in compatible formats or easily usable form.	HE-07-03 DA-06-04 US-06-02 DA-07-03 AR-07-02
086	4.10.4-2.4	COMMONALITIES	Facilitate the development of basic geographic framework data.	DA-06-05 AR-07-02



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
087	5.8-2.1	ARCHITECTURE	Advocate formal commitments of contributions by GEO Members and Participating Organizations, including agreement to adhere to GEOSS interoperability specifications.	AR-07-01
088	5.8-2.2	ARCHITECTURE	Produce a publicly accessible, network-distributed catalogue maintained collectively under the auspices of GEOSS. The catalogue will include information on GEO Members and Participating Organizations and the components they support. The catalogue system will itself be subject to GEOSS interoperability specifications, including the standard search service and geospatial services.	AR-07-02
089	5.8-2.3	ARCHITECTURE	Establish and maintain a process for reaching interoperability arrangements, informed by ongoing dialogue with major international programmes and consortia. That process is to be sensitive to technology and accessibility disparities among GEO Members and Participating Organizations, and must include mechanisms for upgrading arrangements.	AR-07-01
090	5.8-2.4	ARCHITECTURE	Advocate use of existing Spatial Data Infrastructure (SDI) components as institutional and technical precedents in areas such as geodetic reference frames, common geographic data, standard protocols, and interoperable system interfaces, among other components.	DA-06-06 AR-07-01
091	5.8-2.5	ARCHITECTURE	Establish and maintain baseline sites for global <i>in situ</i> networks.	WA-06-05 EC-07-01 DA-07-04 Ongoing supporting activity (AR-06-08)
092	5.8-2.6	ARCHITECTURE	Develop a cost-and-benefit-sharing mechanism(s) for observations by which an optimum observation system can be realized.	DA-06-09



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
093	5.8-2.7	ARCHITECTURE	Provide a framework for securing the future continuity of necessary observations and initiating new observations.	AR-06-09 AR-06-10 AR-07-02 DA-07-03 DA-07-04
094	5.8-2.8	ARCHITECTURE	Facilitate the analysis of the current and planned systems for data transfer and dissemination by GEOSS members.	AR-07-01 AR-07-02
095	5.8-2.9	ARCHITECTURE	Facilitate a common understanding of future capabilities at a global level for data dissemination.	AR-07-02 CB-06-04
096	6.6-2.1	DATA & USERS	Establish a mechanism for coordinating user needs within the various societal benefit areas.	EC-07-01 BI-07-01 DA-06-01 AR-07-02 US-06-01 US-06-02 Ongoing supporting activity (US-06-03)



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
097	6.6-2.2	DATA & USERS	Facilitate, with relevant countries and international organizations, the development and availability of data, metadata, and products commonly required across diverse societal benefit areas, including base maps and common socio-economic data.	US-06-01 AR-07-02 DA-06-04 DA-07-02 Ongoing supporting activity (US-06-03)
098	6.6-2.3	DATA & USERS	Advocate, through appropriate representations to the International Telecommunication Union, the protection of radio frequencies critical to Earth observation.	AR-06-11
099	7.5-2.1	CAPACITY BUILDING	Produce a comprehensive review and gaps analysis based on existing regional and international capacity building efforts as a first step in the implementation of GEOSS. GEO will facilitate coordination of those efforts with the objective of achieving the maximum return for the effort expended.	CB-06-03 (completed) CB-07-01
100	7.5-2.2	CAPACITY BUILDING	Produce methodologies to monitor and evaluate capacity building initiatives relating to Earth Observation systems.	CB-07-01
101	7.5-2.3	CAPACITY BUILDING	Facilitate, with existing international, regional and national efforts, the maintenance and strengthening of education, training, research, and communication so that each country reaches and sustains a level of capability that enables them to participate in GEOSS, receiving maximum benefits from it according to their needs.	CB-06-03(completed) CB-07-01



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
102	7.5-2.4	CAPACITY BUILDING	Facilitate, with developing countries and across all societal benefit areas, the establishment and maintenance of baseline sites for global <i>in situ</i> and remote sensing networks that cannot always be justified on national grounds alone, in cooperation with relevant global research programs and activities to ensure that synergies in observations and understanding are achieved. Examples include the inadequacy of GCOS, GTOS, GOOS, and Global Geodetic Observing System (GGOS) sites in developing countries and the need to establish a minimum set of oceanic, terrestrial and atmospheric reference stations for long-term observations of key variables.	AR-07-02 CB-07-01
103	7.5-2.5	CAPACITY BUILDING	Develop a network of experts involved in existing local, national and global capacity building initiatives related to Earth Observation to facilitate the task of furthering capacity building, and inform the GEO Members and Participating Organizations of existing efforts in capacity building. GEO will encourage users to access this knowledge base.	CB-07-01
104	7.5-2.6	CAPACITY BUILDING	Encourage, in each societal benefit area, the development of capacity building components as a requirement to any network, project, activity, or user forum that will be a component of GEOSS.	CB-07-01
105	7.5-2.7	CAPACITY BUILDING	Facilitate access to data and models, particularly for developing countries.	CB-07-01 AR-07-02 US-06-P2
106	7.5-2.8	CAPACITY BUILDING	Develop recommended priorities for new or augmented efforts in capacity building, to meet the objectives of the overall GEOSS 10-Year Implementation Plan.	CB-07-01



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Related Tasks
107	8.4.1-2.1	OUTREACH	GEO will produce and begin to implement an outreach plan directed toward key target audiences, including decision-makers and policy makers; educators and trainers; the general public; industry and service communities; scientific and technical communities; non-governmental organizations; public interest advocacy groups; and international financial institutions and official development assistance agencies.	OR-06-05 (completed) OR-06-07 (completed) Ongoing supporting activity (OR-06-01; OR-06-02; OR-06-03; OR-06-04; OR-06-06)

6 YEAR TARGETS

Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Tasks
108	4.1.4-6.1	DISASTERS	Facilitate widespread use of LiDAR and InSAR technologies for topography in areas of low relief. For floods and coastal hazards, the most crucial need is for high vertical resolution (less than 1 metre) topographic data, plus good shallow-water bathymetry.	DI-06-03
109	4.1.4-6.2	DISASTERS	Advocate continuity and interoperability of all satellite systems providing global positioning, such as the United States Global Positioning System (GPS), European GALILEO, Russian Global Orbiting Navigation Satellite System (GLONASS) and Japanese Quasi-Zenith Satellite System (QZSS). This includes support of the global geodetic network services such as Very Long Baseline Interferometry (VLBI) and Satellite Laser Ranging (SLR), that define the orbits of the GPS satellites and thereby enable the use of GPS for precise geo-location. Applications of GPS essential to disaster response include precision topography, mapping support, and deformation monitoring, as well as geo-location for search and rescue operations.	DI-06-03



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Tasks
110	4.1.4-6.3	DISASTERS	Advocate that the international satellite community, coordinated through the Committee on Earth Observation Satellites (CEOS), plan for assured continuity of critical sensing capabilities. For example, certain research systems should become operational systems and the projected lifetimes of some systems should not result in service gaps of key satellite sensor data. Longer-term actions for monitoring of geohazards include realization of an integrated observation system of SAR interferometry and GPS.	DI-06-09
111	4.1.4-6.4	DISASTERS	Advocate enhancements of the automatic processing and evaluation of satellite imagery, to facilitate production of digital topography, and to support rapid detection of fires, oil spills, or other hazards.	DI-06-04 DI-06-05 DI-06-08 DI-06-13 DI-07-01
112	4.1.4-6.5	DISASTERS	Advocate more rapid SAR processing for interferometry to enable strain mapping over large seismically active zones and to monitor landslides and subsidence in populated areas and along transportation corridors.	DI-06-03
113	4.1.4-6.6	DISASTERS	Advocate systematic expansion of the inventory of geologic and hazards zonation maps and expansion of Geographic Information Systems (GIS) as a critical tool for managing spatial information for disaster management. In this context, digital maps based on distributed systems and data sources and conforming to recognized international GIS standards (e.g. International Organization for Standardization standards and Open Geospatial Consortium specifications).	DI-06-07 DI-06-08 DI-07-02
114	4.1.4-6.7	DISASTERS	Facilitate the development and sharing of critical airborne sensors and capabilities, such as hyper-spectral sensors, high-resolution infrared sensors and LiDAR.	DI-06-09



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Tasks
115	4.1.4-6.8	DISASTERS	Advocate the development of models to better support disaster response. One area of particular interest is the dispersion of pollution plumes in the atmosphere or in water (including the spread of oil spills in the marine environment).	DI-06-04 DI-06-08 DI-06-13 DI-07-01
116	4.1.4-6.9	DISASTERS	Establish a process for monitoring of capacity-building efforts in disaster management to enable building upon strong existing programmes in the continuing efforts to integrate and share resources.	CB-07-01
117	4.1.4-6.10	DISASTERS	Advocate access to data from seismic and infrasound networks operated by the Preparatory Commission for the Comprehensive Nuclear Test-Ban Treaty Organization (CTBTO) that are useful and relevant for monitoring earthquakes and volcanic activity.'	
118	4.1.4-6.11	DISASTERS	Facilitate access to real-time data analyzing technology and real-time access to critical data for all hazards.	DI-06-04 DI-06-08 DI-06-13 DI-07-01
119	4.1.4-6.12	DISASTERS	Advocate real-time monitoring of submarine seismic and volcanic activities and tsunami propagation.	DI-06-02 DI-06-04



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Tasks
120	4.2.4-6.1	HEALTH	Produce an inventory of available Earth remote sensing and ground-based databases that can be associated with known health problems such as asthma, pollutant exposure, birth defects, seafood contamination and certain infectious and vector-borne diseases. This includes remote sensing and ground-based databases, historic data sets encompassing well characterized epidemics, and gaps in human health related environmental data (e.g. places where water, soil, or air quality are not measured.) To accomplish this, GEOSS will develop the tools, architecture and infrastructure for a public health information network data base that can be accessed and used by the public health community at large to obtain historical and current health data for better predictability of environmental effects on human health.	
121	4.2.4-6.2	HEALTH	Facilitate further development of remotely sensed maps describing the global system for sources, transport and sinks/deposition of gasses and aerosols, and systems characterizing atmospheric, soil, river and coastal pollution.	HE-07-01
122	4.2.4-6.3	HEALTH	Facilitate human health community input to the technical specification of new major environmental observation capabilities, including <i>in situ</i> and remotely sensed observations.	HE-06-01 HE-07-02 HE-07-03 Ongoing supporting activity (HE-06-02)
123	4.2.4-6.4	HEALTH	Facilitate the development of sets of environment and infrastructural determinants of health, e.g. sanitation, transport, energy, communications, traffic management systems, and housing.	HE-06-04
124	4.2.4-6.5	HEALTH	Facilitate the development of the tools and processes needed to address health concerns and develop a useful regional network of experts and information databases, working primarily through the GEOSS coordination group for health described above.	HE-06-01 HE-07-01 HE-07-03 CB-07-01



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Tasks
125	4.2.4-6.6	HEALTH	Facilitate the establishment of a coordinating group focused on health organizations as users of Earth Observation data and information. This outreach and information sharing group must engage developed and developing country health communities to ensure a global perspective of the challenges and to catalyze a global network to address problems.	HE-06-01
126	4.2.4-6.7	HEALTH	Advocate the development of indicators of human health based on environmental measurements.	
127	4.2.4-6.8	HEALTH	Facilitate the development of monitoring methods and systems to detect early evidence of health-related changes and to further inform epidemiological modeling studies.	HE-06-03 HE-07-01 HE-07-02
128	4.2.4-6.9	HEALTH	Facilitate coordinated approaches to the integration of environmental monitoring parameters with vectors, animal reservoirs of disease, and clinical admissions.	HE-06-03 HE-07-01
129	4.2.4-6.10	HEALTH	Facilitate the development of mechanisms for alerting public health professionals to hazardous conditions identified by environmental monitoring.	HE-06-03 HE-07-02
130	4.2.4-6.11	HEALTH	Facilitate the availability of wide-area health parameters derived from satellite data, e.g. sanitation, transport, energy, communications, traffic management systems, and housing.	HE-07-03
131	4.2.4-6.12	HEALTH	Facilitate the development of geochemical baseline data and maps, such as trace element toxicity and deficiencies.	HE-07-02
132	4.3.4-6.1	ENERGY	Produce an evaluation of the Plan's progress with regard to energy and revise strategy as needed. The revised Plan will also include an assessment of the needs of the energy sector for new and/or enhanced GEOSS observations and products.	



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Tasks
133	4.3.4-6.2	ENERGY	Facilitate the exchange of data and products for efficient energy management.	EN-06-04 EN-07-01 EN-07-02 EN-07-03 US-07-01
134	4.3.4-6.3	ENERGY	Facilitate the use of improved weather and climate products for the development of new energy tailored products and services.	EN-06-04 EN-07-01 US-07-01 Ongoing supporting activity (US-06-03)
135	4.4.4-6.1	CLIMATE	Enhance the collaboration mechanism between observation organizations and research communities with users of climate information to make maximum use of the observations, analyses and products.	CL-06-02 US-06-01 Ongoing supporting activity (US-06-03)



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Tasks
136	4.4.4-6.2	CLIMATE	Support implementation of actions called for in the GCOS Implementation Plan and the relevant IGOS-P Theme Reports.	CL-06-01 CL-06-02 CL-06-03 CL-06-04 (completed) CL-06-06 WE-06-01 WA-06-01 (completed) WA-06-05
137	4.4.4-6.3	CLIMATE	Promote the establishment of data archive centres for all ECVs.	WE-06-03 WA-07-02
138	4.4.4-6.4	CLIMATE	Promote institutional commitments to provide integrated global analyses of all ECVs.	CL-06-01
139	4.4.4-6.5	CLIMATE	Develop data integration facilities for exchanging data, products and information between climate sectors and socio-economic benefit areas.	US-06-01 CL-07-01 DI-07-02 Ongoing supporting activity (US-06-03)



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Tasks
140	4.4.4-6.6	CLIMATE	Emphasize detection of current and historical climate changes and their impacts linked with other societal benefit areas such as disaster, health, water, ecosystem and agriculture by combining the natural scientific data and socio-economic information and enforcing paleoclimate research approaches.	CL-06-01 CL-06-02 CL-06-03 CL-06-05 CL-06-06 CL-07-01 WE-06-03 EC-07-01
141	4.4.4-6.7	CLIMATE	Develop and operate new <i>in situ</i> and/or space-based observation instruments for the observation of ECV such as cloud and aerosol properties and their vertical profiles, ocean salinity, ocean carbon and nutrients, soil moisture and ground water, CO2 and other greenhouse gasses.	CL-06-02 CL-06-03 CL-06-05 CL-06-06 WE-06-01 WE-06-02 WA-07-02
142	4.4.4-6.8	WATER	Produce a number of new products for precipitation, soil moisture, evaporation, evapotranspiration and other water cycle variables, by <i>in situ</i> observations and the planned space missions.	WA-06-05 WA-07-02
143	4.4.4-6.9	WATER	Provide validation of the accuracy of new water cycle data products, involving “virtual water” with respect to food production and its transportation.	



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Tasks
144	4.4.4-6.10	WATER	Advocate continuous sensor development with improvement of accuracy and higher spatial-temporal resolutions, and with special attention to snow water equivalent and streamflow.	WA-07-02
145	4.4.4-6.11	WATER	Facilitate international and fully networked operational data exchange capabilities.	WA-06-05 Ongoing supporting activity (AR-06-08)
146	4.4.4-6.12	WATER	Facilitate testing of a fully integrated prototype data system, with data assimilation, analysis and visualization capabilities for the water cycle.	WA-06-02
147	4.4.4-6.13	WATER	Advocate a study of the water resource variables required to support an expert system in water management and provide prototyping on an operational system for assimilating routine water cycle observations for improved monitoring and management of water resources.	WA-06-05 WA-07-02
148	4.4.4-6.14	WATER	Advocate a system for the routine collection of water level data for use in validating satellite data and for monitoring surface water storage.	WA-06-05 WA-07-02
149	4.4.4-6.15	WATER	Advocate precision gravity field missions for global water storage monitoring.	WA-07-02 AR-07-03
150	4.4.4-6.16	WATER	Produce a plan for institutionalizing surface water and energy flux measurements.	EN-06-04
151	4.4.4-6.17	WATER	Facilitate the establishment of coordinated <i>in situ</i> observation networks with high (and low) elevation sites along mountain transects.	WA-06-05 Ongoing supporting activity (AR-06-08)



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Tasks
152	4.5.4-6.1	WATER	Produce an experiment using the global network of sophisticatedly and temporally integrated <i>in situ</i> observation sites for water cycle observations.	WA-06-05
153	4.5.4-6.2	WATER	Produce integrated water cycle data sets (including predictions) on a continental scale, such as the Asian monsoon region or any large river watershed.	WA-06-05
154	4.5.4-6.3	WATER	Produce an evaluation of the data and product requirements for use in applications to water-related health issues with a view to developing a specialized observing system in support of health.	WA-07-01 US-06-02
155	4.5.4-6.4	WATER	Produce a plan for monitoring drinking water quality, along with efforts to extend water and sanitation services, especially in developing countries.	WA-07-01
156	4.5.4-6.5	WATER	Facilitate, with space agencies and research communities, the development of effective sensors and missions for precipitation (GPM), surface and subsurface water stores – including snow water equivalence, water stored in natural and manmade reservoirs, and groundwater.	WA-07-02 AR-06-10 DA-07-03
157	4.5.4-6.6	WATER	Facilitate, with numerical weather prediction agencies, space agencies and international research programmes, the reanalysis of products for use in determining trends in water cycle variables.	WA-06-02
158	4.5.4-6.7	WATER	Produce a plan for capacity building to support water management, including hardware and software for receiving and processing satellite and appropriate <i>in situ</i> data, and training modules for the developing countries.	WA-06-07 CB-07-01



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Tasks
159	4.6.4-6.1	WEATHER	Advocate support for WMO coordinated activities to improve data observations and models to produce reliable forecasts of severe weather. These are forecasts that include reliability/probability estimates, as well as a range of possible outcomes, and interact with local authorities to improve usage and provide tailored services through newly established regional and local warning centres.	WE-06-01 WE-06-02 WE-06-03 WE-06-05
160	4.6.4-6.2	WEATHER	Advocate support for WMO plans in developing countries to support the establishment of new regional centres, to allow reliable warnings of impending severe events.	WE-06-05
161	4.6.4-6.3	WEATHER	Advocate support for WMO plans to establish better coordinated regional <i>in situ</i> observation networks on the basis of the EUCOS model.	WE-06-01
162	4.7.4-6.1	ECOSYSTEMS	Facilitate the execution of a global (terrestrial, inland water, coastal, and oceanic) ecosystem mapping initiative at a resolution of 500 m, using a standardized classification and the tools validated above, and integrated with the Global Spatial Data Initiative.	EC-07-01
163	4.7.4-6.2	ECOSYSTEMS	Facilitate the implementation of a global nitrogen observing system.	
164	4.7.4-6.3	ECOSYSTEMS	Facilitate the coordination and expansion of a network of land, ocean and coastal reference stations for monitoring ecosystem properties such as carbon, nitrogen, phosphorus, and iron fluxes, including change detection.	
165	4.7.4-6.4	ECOSYSTEMS	Facilitate the establishment of a global, sufficient and representative <i>in situ</i> and airborne network for validating and enhancing space-based observations of ecosystem properties in both terrestrial and aquatic ecosystems, based on existing national and regional integrated environmental monitoring networks, and coordinated with and linked to the network described above.	EC-07-01 AR-07-02



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Tasks
166	4.7.4-6.5	ECOSYSTEMS	Produce or facilitate the production of baseline maps for the globe, with adequate resolution and known uncertainty, of selected ecosystem properties such as: leaf area phenology, phytoplankton bloom dynamics; primary production, and net carbon exchange; energy and water exchange; productivity at higher trophic levels (e.g. grazing, fisheries production), and ancillary data such as topography, land use, geology and soils.	AR-07-02 EC-07-01
167	4.8.4-6.1	AGRICULTURE	Advocate the development and improvement of the analytical tools and methods for agriculture risk assessment, and establish common standards and formats.	AG-07-02
168	4.8.4-6.2	AGRICULTURE	Advocate support for the completion of the World soil and terrain database (SoTer) at a resolution of 1:1 million.	AG-07-03
169	4.8.4-6.3	AGRICULTURE	Advocate support for the completion of land degradation and desertification assessment in drylands (LADA).	EC-07-01
170	4.8.4-6.4	AGRICULTURE	Facilitate provision of regularly validated global land cover product at 1:500,000.	DA-07-02 EC-07-01
171	4.8.4-6.5	AGRICULTURE	Facilitate the role of satellite data in monitoring and maintaining a global farming systems database.	AG-07-01 AG-07-03
172	4.8.4-6.6	AGRICULTURE	Facilitate the establishment of operational linkage of Earth Observation data to geospatially referenced production and use statistics. This should cover crop agriculture, livestock, forestry and freshwater fisheries.	AG-07-01 AG-07-03
173	4.8.4-6.7	AGRICULTURE	Facilitate the continuity of high-resolution imagery for monitoring logging concessions in areas with high biodiversity concentrations.	EC-07-01 Ongoing supporting activity (AR-06-09)



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Tasks
174	4.8.4-6.8	AGRICULTURE	Advocate operational on-time monitoring and information systems introduced for significant and extreme events such as crop yield and crop water stress.	AG-07-02
175	4.9.4-6.1	BIODIVERSITY	Produce timely data and information for local, national, regional and international policy makers, scientists and natural resource managers through the distributed observation network.	EC-07-01 AR-07-02
176	4.9.4-6.2	BIODIVERSITY	Facilitate the establishment of monitoring systems for policy-interest and endangered species, allowing frequently-repeated globally-coordinated assessment of trends and distributions of species of special conservation merit, including domesticated animals, cultivated plants, and fish species and their wild relatives and species of medicinal or economic value.	EC-07-01 BI-07-01 AR-07-02
177	4.9.4-6.3	BIODIVERSITY	Facilitate the operational deployment of a system to provide near-real-time data on detection, establishment and spread of problematic invasive organisms.	
178	4.9.4-6.4	BIODIVERSITY	Facilitate the systematic monitoring of biodiversity in all ecosystems using statistically valid methods.	AR-07-02 BI-07-01 EC-07-01
179	4.9.4-6.5	BIODIVERSITY	Facilitate the full operability and integration of citizen-based biodiversity observation systems.	BI-07-01 AR-07-02
180	4.9.4-6.6	BIODIVERSITY	Facilitate the addition of twelve million new spatially and temporally explicit observation records yearly.	BI-07-01
181	4.9.4-6.7	BIODIVERSITY	Facilitate the delivery of capacity building programmes on data use and interpretation.	CB-07-01



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Tasks
182	4.10.4-6.1	COMMONALITIES	Facilitate the joint evaluation of prototypes that connect multiple systems, and support making operational any research demonstrations of such collaboration and interoperability.	AR-07-01 DI-06-04 DI-06-08 DI-06-13 DI-07-01 US-06-P1
183	4.10.4-6.1	COMMONALITIES	Facilitate periodic demonstrations of the overall progress toward the highest level of collaboration and interoperability achieved, as a measure of realizing the full vision of a global system of systems for Earth observations.	AR-07-01
184	6.6-6.1	DATA & USERS	Facilitate data management approaches that encompass a broad perspective of the observation data life cycle, from input through data acquisition, processing, archiving, and dissemination, including analysis and visualization of large volumes and diverse types of data.	DA-07-06
185	6.6-6.2	DATA & USERS	Advocate and facilitate international information sharing capabilities through appropriate technologies, including, but not limited to, Internet-based services.	AR-07-02 CB-06-04
186	7.5-6.1	CAPACITY BUILDING	Advocate funding of multinational projects to leverage the end-to-end value of observations including the establishment of necessary infrastructure.	CB-07-01
187	7.5-6.2	CAPACITY BUILDING	Produce monitoring and evaluation mechanisms aimed at determining the efficacy of GEO capacity building efforts.	CB-07-01



Target #	Reference Doc. Sec.#	Area	Full Text of Target (as it appears in the GEOSS 10 Year Implementation Plan Ref.Doc)	Tasks
188	7.5-6.3	CAPACITY BUILDING	Facilitate education and training to provide a global base of technical expertise for GEOSS.	CB-07-01 CB-06-03 (completed)
189	7.5-6.4	CAPACITY BUILDING	Develop recommended priorities for new or augmented efforts in capacity building, to meet the objectives of the GEOSS 10-Year Implementation Plan.	CB-07-01
190	8.4.1-6.1	OUTREACH	All target audiences should be reached, although with different priority levels and resources. Decision-makers, educators and trainers, and the general public will remain of highest priority. In the longer term, priority will be given to private sector needs for triple bottom line reporting.	OR-06-05 (completed) OR-06-07 (completed) Ongoing supporting activity (OR-06-01; OR-06-02; OR-06-03; OR-06-04; OR-06-06)