



The GEO Science and Technology Roadmap

Status

Draft version, March 15, 2010

Activity	Action	Short description	Needs attention?	Status
1a - Revolving scientific review of each Work Plan	1	Review Process	Yes	progressing
	2	Raise funding	Yes	progressing
	3	Future reviews	No	not started
1b - Implement review indicators in the M&E Framework	1	Implement review indicators in task sheets	Yes	delayed
	2	Track review indicators	No	delayed
	3	Implement user feedback option in portals	Yes	delay likely
1c - Assess the requirement for continuity and long-term monitoring	1	Develop continuity indicators	Yes	delayed
	2	Propose process to evaluate criticality	Yes	no progress
	3	Framework to coordinate responses	Yes	not started
1d - Ensuring state-of-the-art technology in the GEOSS Common Infrastructure (GCI) and Observation Infrastructures	1	Review GCI technology	No	progressing
	2	Review technology and relevance of Component systems	No	delayed
1e - Responding to S&T needs and priorities	1	process to communicate S&T priorities to effect responses	Yes	delayed
2a - Getting GEO/GEOSS better acknowledged	1	Propose a GEOSS citation standard	Yes	delayed
	2	Promote citation standard	No	delayed
2b – Establishing a “GEO label”	1	Propose GEO Label	Yes	delayed
	2	Discuss it in STC	No	delay likely
2c - Building awareness of GEO and GEOSS	1	Sessions at conferences	Yes	progressing
2d – Showing GEOSS at work	1	Document case examples	Yes	delayed
2e - Enhancing registration of scientific data sets	1	List key data sets	No	?
	2	Pursue their registration	No	not started
2f - Identify key commercial partners	1	List key companies	No	delayed
	2	Pursue opportunities	Yes	delay likely
2g - Catalyze research and developing funding	1	Identify programmes	Yes	delayed
	2	Convene forum/network	Yes	delayed

Activity **1a** **Revolving scientific review of each Work Plan**, starting with the current work plan for 2009-2011 on grounds of scientific and technological soundness and completeness against the outstanding questions and challenges in each of the SBAs

Specific Action **1** Initiate Review Process for GEO Work Plan 2009-11

- Identify Responsible team of experts
- Identify main challenges/open questions within the SBAs that should be addressed by the S&T component of GEOSS
- Conduct review

Implemented through Action of ST-09-01 with STC interaction

Timing Original plan: start mid-2009; Assessment report for Work Plan 2009-11 by Ministerial 2010

Reference (e.g. Task Sheet) Task Sheet of ST-09-01

Status: progressing Telecon (18/06/2009) discussed further action on this; STC-11 (09/2009) decided to pilot with one SBA (Health); STC-12 (12/2009) identified open issues hindering moving on and decided to prepare more conclusive discussion at STC-13; ST-09-01 (Q1/2010) setting up a review panel to prepare an assessment of WP2009-11, to be completed by mid-2010. STC-13 (03/2010) to approve process and act on deficits

Comment

Presently needs STC **Yes:**

- **Final approval of concept**

attention?	- Confirm that Task-Level review works.
Activity	<p>1a Revolving scientific review of each Work Plan, starting with the current work plan for 2009-2011 on grounds of scientific and technological soundness and completeness against the outstanding questions and challenges in each of the SBAs</p>
Specific Action	<p>2 Seek ways to raise dedicated funding from science foundations of member countries for review work</p>
Implemented through	ST-09-01: ESA provides funds to initial review work
Timing	
Reference (e.g. Task Sheet)	
Status: progressing	<p>Potential for limited support for review action in Health SBA, but decision not before end of 2009. ESA has agreed to provide resources for initial review. COSPAR also supports this.</p>
Comment	<p>(JH, June 2009) Should be conducted in parallel to preparation of content, i.e. previous action. STC Co-Chairs to take the lead, possibly supported by review team</p>
Presently needs STC attention?	<p>Yes: - STC-13 should decide if additional resources are required at present and where they could come from.</p>



Activity **1a** **Revolving scientific review of each Work Plan**, starting with the current work plan for 2009-2011 on grounds of scientific and technological soundness and completeness against the outstanding questions and challenges in each of the SBAs

Specific Action **3** Initiate Review Processes for future GEO Work Plan(s)

Implemented through STC

Timing Starts 2011

Reference (e.g. Task Sheet)

Status:
not started

Comment

Presently needs STC attention?

No

Activity **1b** **Implement review indicators in the M&E Framework** to ensure that activities in individual GEO Tasks and Sub-Tasks meet the applicable scientific and technological standards

Specific Action **2** Monitor review-level indicators in the context of the overall M&E Framework, approach Task leads in case of low of review activities, alert STC in case of problem

Implemented through Not yet addressed

Timing cannot start before review indicators have been set up (previous action)

Reference (e.g. Task Sheet)

Status: delayed

Comment (JH, Nov 2009) Should be done by GEOSEC and/or OAT Mentors

Presently needs STC attention? **No**

Activity **1b** **Implement review indicators in the M&E Framework** to ensure that activities in individual GEO Tasks and Sub-Tasks meet the applicable scientific and technological standards

Specific Action **3** Implement a Component User Feedback Mechanism using ratings and indicators into the GEO Portal(s)

Implemented through	Not yet decided
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Timing	By 2010 suggested
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Reference (e.g. Task Sheet)	
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Status: delay likely	Proposed to Joint Committee Meeting (Melbourne, 09/2009) and viewed generally positive; written proposal sent to UIC/ADC in Oct. 2009;
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Comment	
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Presently needs STC attention?	Yes: - STC Co-Chairs to request that ADC and UIC discuss this at their next meeting and propose a way forward
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Activity **1c Assess the requirement for continuity and long-term monitoring** by Earth observation systems of essential data from GEOSS components

Specific Action	<p>1 Develop a continuity indicator for all registered GEOSS components</p> <ul style="list-style-type: none"> - Set up data base of epochs of scheduled discontinuations of systems and data set provisions - Develop automated test of availability of Components at GCI-level - Propose appropriate reporting and options for reactions
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Implemented through	<p>Elements of this are in the objectives of Task AR-09-03 (“Advocating for Sustained Observing Systems”); ST-09-01 support this through reviewing continuity needs of Tasks”; many details not addressed, yet. (HPP: I am not sure, this activity has much overlap with AR-09-03.)</p>
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Timing	by end of 2009 suggested
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Reference (e.g. Task Sheet)

Status: delayed	<p>ST-09-02 has an activity that looks at research observation infrastructure (limited life time) that should be continued in sustained operation. This is partly overlapping with this activity.</p>
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Comment	<p>(JH, Nov 2009): If STC decides to pursue the idea of Hans-Peter Plag to prepare an “assessment report of the state of the global earth observation systems”, this would draw on this activity.</p> <p>Proposed Action (JH, Nov 2009): Discuss this issue with ADC Co-Chairs and AR-09-03 Mentor.</p>
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Presently needs STC attention?	<p>Yes:</p> <ul style="list-style-type: none"> - Decide on preferred implementation strategy - Agree on responsibilities and schedule
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Activity	1c Assess the requirement for continuity and long-term monitoring by Earth observation systems of essential data from GEOSS components
Specific Action	3 Set up framework for coordinating activities towards ensuring continued operations of essential components
Implemented through	Task ST-09-01 can contribute; Task AR-09-03 might lead (tbc);
Timing	by 2015
Reference (e.g. Task Sheet)	Task ST-09-01 Output: 3. Report on S&T gaps, priorities, and continuity needs to support GEO (2010 Summit); 4. Establishment of effective forum/network of funding agencies, (early 2010); 5. Response to S&T gaps, priorities and continuity needs by this forum, including describing Best Practices in responding to these (e.g. by a workshop report)
Status: not started	
Comment	(JH) ST-09-01 has a different focus. It addresses S&T resourcing bodies and compiles S&T gaps and needs. Continued operation of systems may be included at times, but generally will need other avenues that are not currently addressed. AR-09-03 appears more appropriate to lead Proposed Action (JH, Nov 2009): Discuss this issue with ADC or UIC(?) Co-Chairs and AR-09-03 Mentor and encourage them to lead
Presently needs STC attention?	Yes: - Decide on preferred implementation strategy - Agree on responsibilities

Activity	1d	Ensuring state-of-the-art technology in the GEOSS Common Infrastructure (GCI) and Observation Infrastructures.
Specific Action	1	Review the technology supporting the GCI
Implemented through		Activity 1b; regarding evaluation of the GCI, activities of UIC (usability testing) and ADC
Timing		2010 suggested
Reference (e.g. Task Sheet)		Task ST-09-01 Output: 3. Report on S&T gaps, priorities, and continuity needs to support GEO (2010 Summit); 4. Establishment of effective forum/network of funding agencies, (early 2010); 5. Response to S&T gaps, priorities and continuity needs by this forum, including describing Best Practices in responding to these (e.g. by a workshop report)
Status: progressing		UIC usability testing of GCI (05/2009 and 09/2009); GCI-Task Force recommendations for GCI Development (09/2009)
Comment		(JH) There is a close link to Activity 1b (in terms of identifying issues), possibly also 1c; Should be revisited regularly to monitor if this is addressed sufficiently.
Presently needs STC attention?		No

Activity	1d	Ensuring state-of-the-art technology in the GEOSS Common Infrastructure (GCI) and Observation Infrastructures.
Specific Action	2	Review the continued quality and relevance of individual component systems of GEOSS
Implemented through	Activities 1b (quality and relevance) and 1c (relevance)	
Timing	End of 2010	
Reference (e.g. Task Sheet)	Task ST-09-01 Output: 3. Report on S&T gaps, priorities, and continuity needs to support GEO (2010 Summit);	
Status: delayed		
Comment	(JH, Nov 2009) I view this as fully dependent on the implementation of activities 1b and 1c.	
Presently needs STC attention?	No	



Activity **2a** **Getting GEO/GEOSS better acknowledged** in the scientific community

Specific Action **1** Propose a GEOSS citation standard

Implemented through Task ST-09-02

Timing By the end of 2009

Reference (e.g. Task Sheet) Task Sheet of ST-09-02

Status: delayed Contacts have been made to the organizers of a broader discussion forum on data citation standards. A list of organizations/web pages discussing citation standards has been compiled. The goal is to develop a standard consistent with the general development in data citation standards.

Comment (GO, Nov 2009): strongly needed because the S&T contributors have to be acknowledged for their inputs (systems, models, data)

Presently needs STC attention? **Yes:**
- Revise schedule
- Discuss with ST-09-02 Leads if progress can be accelerated



Activity **2a** **Getting GEO/GEOSS better acknowledged** in the scientific community

Specific Action **2** Continue to promote the use of the citation standard in S&T community

Implemented through Task ST-09-02

Timing Following completion of previous action (Activity 2-1)

Reference (e.g. Task Sheet) Task Sheet of ST-09-02

Status: delayed

Comment

Presently needs STC attention?

No



Activity **2b** **Establishing a “GEO label”** to recognise the scientific relevance, quality, acceptance and societal needs for activities in support of GEOSS

Specific Action **2** Discuss potential of developing the “GEO label” as an attractive incentive for involvement of the S&T communities and initiate the relevant activities

Implemented through **STC**

Timing Following concept proposal by Task ST-09-02

Reference (e.g. Task Sheet)

Status: delay likely

Comment

Presently needs STC attention? **No**

Activity **2c** **Building awareness of GEO and GEOSS** in the different S&T communities, within the scope of the GEOSS development.

Specific Action	<p>1 Coordinate the organization of specific GEOSS sessions at relevant scientific conferences</p> <ul style="list-style-type: none"> - Compile and maintain a list of relevant conferences - Actively engage individuals to prepare GEOSS-related sessions
Implemented through	Task ST-09-02
Timing	Continued activity
Reference (e.g. Task Sheet)	Task Sheet of ST-09-02
Status: progressing	Ongoing: AGU fall meeting 2009; Session proposed for EGU 2010, COSPAR 2010, European workshop (3 have been done involving S&T Community);
Comment	(GO, Nov 2009) Need to design responsible actor to follow-up (IEEE) ???
Presently needs STC attention?	Yes: (HPP) Experience with the GEOSS Session at AGU and other sessions warrants a discussion of the general approach and possible alternatives.

Activity **2d** **Showing GEOSS at work** with a set of compelling examples showing how GEOSS serves the S&T communities in their work.

Specific Action **1** Compile set of examples from the GEO Tasks and ensure that these are documented effectively

Implemented through Task ST-09-02

Timing By end of 2009

Reference (e.g. Task Sheet) Task Sheet of ST-09-02

Status: delayed	Started during the ST-09-02 Kickoff meeting. A number of of Action items were agreed but not all were followed up. The situation improved considerably through the showcases submitted to UIC, STC, and ADC for the Ministerial, which provide a good set of examples. ST-09-02 will look into this and select appropriate showcases to be developed as examples.
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Comment (JH) STC should look into this more specifically in the context of supporting the preparation of the GEO 2010 Ministerial. (GO, Nov 2009) Building on showcases proposed by Ministerial TF – and taking advantage of the large exhibition and extensive report prepared in view of the Ministerial (a limited number of showcases will be presented so the



contributions from the tasks and organisations will have to go in the exhibition and the report).

**Presently
needs STC
attention?**

Yes:

- STC-13 to decide how this will be done vis-à-vis the Ministerial Showcase preparations and generally

Activity **2e** **Enhancing registration of scientific data sets** as an important indicator for potential contributors from the science communities in assessing the relevance of GEOSS for their work.

Specific Action **1** Compile a list of data sets and where they exist.

Implemented through Task ST-09-02

Timing Mid-2010 suggested

Reference (e.g. Task Sheet) Task Sheet of ST-09-02

Status Status should be established by STC-13 during Task Report of ST-09-02

Comment (GO, Nov 2009) Istanbul workshop has identified a EO resources generated by science community (including GMES) and proactively started to encourage registration in the GEO registry (report soon available + brochure)

Presently needs STC attention? **No**



Activity **2e** **Enhancing registration of scientific data sets** as an important indicator for potential contributors from the science communities in assessing the relevance of GEOSS for their work.

Specific Action **2** Actively approach their owners to solicit their registration with GEOSS.

Implemented through Task ST-09-02

Timing 2010 suggested

Reference (e.g. Task Sheet) Task Sheet of ST-09-02

Status:
not started

Comment

Presently needs STC attention?

No

Activity **2f** **Identify key commercial partners**, which could contribute to GEOSS and also benefit from improved observational means, products and services and might therefore support certain S&T development.

Specific Action **1** Compile a list of key companies with substantial commercial interests or datasets of broad scientific value and make it available to the GEO community

Implemented through Task ST-09-01

Timing By end 2009

Reference (e.g. Task Sheet) Task Sheet of ST-09-01

Status: delayed	Document 18 submitted to ExCom-16 initiated a broad discussion on how to engage the private sector in the GEOSS. Further discussion is planned at ExCom-18.
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Comment (GO, Nov 2009) FP7 call has encouraged submitting proposal in the visualisation domain for GEOSS including specialised companies

Presently needs STC attention?	No
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Activity **2f** **Identify key commercial partners**, which could contribute to GEOSS and also benefit from improved observational means, products and services and might therefore support certain S&T development.

Specific Action **2** Pursue opportunities of making company resources available for developing the GEOSS S&T content

Implemented through Not yet addressed

Timing 2011 suggested

Reference (e.g. Task Sheet)

Status: delay likely See comment in 2f-1. ST-09-01 is planning to open discussion on a cooperative approach with the GEO Secretariat.

Comment (JH) **Proposed Action: STC to propose this for inclusion in Task ST-09-01**

Presently needs STC attention? **Yes:**
= STC-13 to assign responsibility for this Action



Activity **2g** **Catalyze research and developing funding** to help engaging the S&T communities in the implementation of the GEOSS

Specific Action **2** Bring together an effective forum/network that can discuss regularly GEO S&T issues and programming and publish forum notes that document the outcome of the forum

Implemented through Task ST-09-01

Timing Early 2010

Reference (e.g. Task Sheet) Task Sheet of ST-09-01

Status: delayed Will be initiated after version 1 output of activities 1a, 2f and 2g.

Comment

Presently needs STC attention? **Yes:**
- STC-13 to invite ST-09-01 to update planning (incl. schedule) in implementing this action.