



**Twelfth Meeting of the  
GEO Science and Technology Committee**

**14 November 2009**

**Ronald Reagan Building  
1300 Pennsylvania Avenue NW, Washington, D.C., USA**

**MEETING RECORD**

Annex 1: Meeting Outcomes and Actions

Annex 2: Agenda

Annex 3: List of Participants

**1. Introduction** (*Chair: G. Ollier*)

Opening remarks from the STC Co-chairs:

The Co-chair representative from European Commission (EC), G. Ollier began by welcoming participants, thanking P.-Y. Whung from United States Environmental Protection Agency (EPA) for hosting the meeting and J. Connery (ERG) for her help arranging it, and noting that the meeting was occurring in the context of the GEO plenary. P.-Y. Whung thanked everyone for coming (especially on a Saturday) and welcomed the participants to the Ronald Reagan building. She thanked the STC co-chairs, as well as K. Fontaine, J. Connery, the GEO Secretariat, and EPA staff for their help in organizing the meeting. G. Ollier noted that the EPA is becoming more involved with science and technology (S&T) in GEO.

The Co-chair representative from Germany, J. Hoffmann began by thanking the meeting hosts, the GEO Secretariat, and J. Connery. Since the last meeting, P.-Y. Whung has been very active preparing the Health SBA for review. He then remarked that since he became a co-chair one year ago, the STC has come a long way and that the role they now play—structuring work concretely and actively guiding the discussion on pursuing S&T objectives—is an important step.

However, a resourcing issue—the committee members’ time—remains. He noted three objectives for the meeting: 1) concluding how STC can support health SBA issues based on panel discussion spearheaded by the U.S. EPA, 2) determining how the STC can support the Ministerial Summit and how the Ministerial can support the STC’s objectives, and 3) addressing lagging implementation of the STC roadmap and catalyzing movement and participation in the committee.

The Co-chair from Australia, S. Minchin thanked P.-Y. Whung and noted that the success of the STC depends on its participants; high attendance is a good indicator of interest. V. Munsami thanked the meeting hosts and noted that the Ministerial Summit next year is important to showcasing the STC’s success. The STC needs to work on garnering increased political support in addition to technical support.

G. Ollier observed that STC has made much progress over the last year and that this year they will address a key STC objective: promoting science and technology in the GEO community. This includes making people aware of what GEO can bring to them and defining the relationship between GEO and other prominent Earth observation bodies. Many outreach events are anticipated: the GEO session at the American Geophysical Union meetings, the IGOS-P Symposium, and the GEO side-event, “Earth Observations in Support of Climate Change Monitoring,” organized by the European

Community (EC). This event will take place at the United Nations Climate Change Conference (COP-15) this December in Copenhagen, Denmark. It offers a chance for GEO to show the climate community that GEO has value to them in monitoring and predicting climate change. GEO must be viewed as the right vision for years to come. Although GEO may appear to conflict with existing initiatives, the STC can allay these fears by emphasizing that GEO does not replace existing communities but facilitates implementation of their activities.

From the GEO Secretariat, D. Cripe delivered remarks on behalf of José Achache, Director of the GEO Secretariat. This meeting is viewed as a follow-up to the Melbourne meetings and key to implementing the SBA review process (with a review of the Health SBA as the initial effort). The STC has been building momentum and is posed to provide scientific input to the Executive Committee and GEOSS implementation.

The participants then introduced themselves.

The 11<sup>th</sup> STC meeting record was approved, acknowledging a few items remained to be fine-tuned.

Changes to agenda: Discussion of the status of 11<sup>th</sup> STC meeting outcomes and action items was moved to the end of the meeting. J. Hoffman proposed that the STC continue its Melbourne discussions of the Task Symposium during the “Any Other Business” portion of the current meeting. The agenda was then approved.

## **2. Status of Actions Decided at the 11<sup>th</sup> STC Meeting**

(This item was moved to the end of the meeting and later omitted due to lack of time.)

## **3. Report on Task ST-09-01: Catalyzing Research and Development (R&D) Resources for GEOSS**

F. Beroud reported on the progress of and subsequent timeline for the four outputs of ST-09-01, and reported on the meeting with IGFA ([link to presentation](#)).

### *The Role of GEO in GOOS*

G. Ollier observed that the task was well-structured and being implemented, but several issues remain, including obtaining resources to ensure that proper science and technology components are included in GEOSS. He hoped that discussion would be fruitful, as many members represent science organizations. S.-J. Khalsa wondered why IGFA was concerned that the IGOS oceans theme was being assimilated into GEO. L. Brown responded that, at the IGFA meeting, WCRP Executive Director Ghassam Asrar had indicated that the overall lack of open ocean observations and sparse data availability for some regions are major gaps. It was suggested that GEO/GEOSS may be perceived as not actively moving forward with respect to deep ocean observations.

S.-J. Khalsa suggested that the STC can identify this as a data gap and work through GEO to fill this gap, since filling such data gaps is a key purpose of GEO. The representative of ICSU reminded the Committee that the Global Ocean Observing System (GOOS) already exists, with its own strengths and weaknesses, and suggested that the Committee discuss the role of GEO in support of GOOS. The question is whether the World Climate Research Program (WCRP) (and the other major international global change research programs) should address this issue directly with GOOS or act through GEO. P.-Y. Whung seconded G. Glaser and affirmed that a global ocean observing system already exists and that NOAA is very actively engaged in ocean observation. Thus, the focus for GEO should be to facilitate the implementation of GOOS.

S. Minchin recalled GOOS’ presentations at the 11<sup>th</sup> STC meeting in Melbourne, which highlighted

continuity issues. Invited talks by P. Dexter (Australia BoM) and D. Halpern (USA NASA) illustrated how STC could contribute to GEOSS through reducing the impacts of several ocean observing continuity challenges, including coordination, collaboration and cooperation; continuity of in-situ and satellite measurements of the global ocean; identification of priorities and gaps; integration of biological, chemical and physical oceanographic measurements; increased efficiency in management of multi-variate measurements; and, initialization of coupled ocean-atmosphere models through assimilation of in-situ and satellite measurements. D. Halpern had described how the following GEO Tasks were relevant to GOOS: AR-09-02(c), AR-09-03(b), AR-09-03(c), ST-09-02, DI-09-03(a), CL-06-01(c), EC-09-01(c), and AG-06-02.

Building a global infrastructure depends on continued support, not just short-term funding. GEO is not in a position to install new ocean observing systems to fix the problem; however, GEO can keep pushing continuity requirements as a key issue with member governments. W. Zhang noted that related efforts include not only GOOS, but also the Joint Commission on Oceanography and Marine Meteorology (JCOMM), supported by World Meteorological Organization (WMO) and UNESCO. He also noted there is a need to identify ocean observing priorities across *all* Societal Benefit Areas (SBAs), not just weather and climate (as emphasized by UNESCO and WMO). GEO can consolidate and coordinate these priorities. D. Halpern noted that the two talks on GOOS at the STC's Melbourne meeting provided recommendations about how GEO could work to improve the situation.

K. Fontaine reminded the committee that Task US-09-01a (to be presented later in the day), addresses Earth observation requirements by SBA and will permit cross-analysis of ocean observing needs. L. Brown requested the summary of recommendations presented in Melbourne. G. Ollier remarked that, in Melbourne, it had been decided that GEO should be a *facilitator* for GOOS. GOOS already has very good planning and is at a good implementation stage, but there are still huge gaps—for example, in deep ocean observing where data are lacking for modeling, especially in some regions.

G. Glaser strongly supported this and proposed that the STC recommend that GOOS be recognized within GEOSS as a principal element in the strategic targets (similar to the Global Climate Observing System [GCOS]). G. Ollier responded that the strategic targets discussion cannot be re-opened. P.-Y. Whung seconded W. Zhang's suggestion that they look at the SBAs from a scientific perspective and identify priority areas. G. Ollier proposed that the Co-chairs write a position paper recognizing GEO as a facilitating mechanism for GOOS.

#### Status of the IGFA Document Request

J. Hoffmann observed that connecting scientific questions with Earth observations adds weight; this link needs to be articulated when specifying continuity needs. He then asked whether the document IGFA requested (regarding what scientific challenges in the GEO Work Plan remain to be addressed) was being prepared and wondered whether documents already planned within the task could serve this purpose. In response, F. Beroud suggested that the STC discuss an appropriate reply, as this would be a high-level document beyond the scope of the task team.

J. Hoffman observed that STC Roadmap Activity 1a (Scientific Work Plan Review) addresses scientific challenges and that perhaps the document IGFA requested could be lifted from there. K. Fontaine noted that Task US-09-01a and Activity 1a together provide an overall analysis of gaps and priorities across all SBAs, at many different levels and from many perspectives, and that the STC should wait for this assessment to be complete.

#### Data Sharing Principles

L. Brown noted that IGFA, at its most recent meeting, had been very supportive of the GEO data sharing principles. D. Halpern reminded that STC that these principles emphasized, not only free and open data exchange, but also data sharing with minimum cost and time delay.

### Automated Task Sheets

J. Hoffmann noted that getting feedback on S&T components was still an issue. D. Cripe noted that the task sheets should all be online by the start of GEO Plenary VI and that the automated task sheet process was functioning. S. Marsh remarked that the automated process seemed ad hoc and did not fit his task well. Also, requests that the GEO Secretariat provide some sort of feedback mechanism for input on task sheet formatting.

### Summary

G. Ollier concluded the discussion by observing that representatives from all 80 Member countries that have endorsed GEO should be at the table. The STC also welcomes participation from all major ventures rooted in science (e.g., GOOS, GCOS).

## **4. Report on Task ST-09-02: Promoting Awareness and Benefits of GEO in the Science and Technology (S&T) Community**

H.-P. Plag gave a progress report on ST-09-02, outlining the status of the five activities housed in the task ([link to presentation](#)). There are no new membership or resource issues.

G. Ollier began the discussion by noting that time equals resources; although there is some duplication between tasks, ST-09-01 clearly tackles the issue of resources needed for research and ST-09-02 tackles promoting GEO in the S&T community. Much progress has been made in implementing the task. K. Fontaine warned that the Executive Committee document regarding Participating Organizations (POs) may or may not be adopted at GEO Plenary VI, and suggested the STC take caution. She also noted that, based on their current definitions, the ST-09-01 and ST-09-02 Tasks no longer seem to overlap. R. Lefevre remarked that IEEE is very involved with ST-09-02 and coordinates several related activities per year, for example, IGARSS presentations. Videos of these activities could be made available on the GEO website for publicity. G. Ollier remarked that much work has already been done to reach different communities, with actions and achievements.

### Record of Scientific Meetings

G. Foley wanted to compliment Task ST-09-02. For the past 2-3 years, the User Interface Committee (UIC) has wanted documentation of the scientific meetings where GEO had a presence to provide a record of what was said (e.g., where the GCI might be able to address people's questions). He cautioned that Task ST-09-02 could easily be overwhelmed by information, even if it focused on just what STC members could provide, and wondered if the GEO Secretariat puts the information on the website. H.-P. Plag commented that the web page is set up by the task team, and the design could be improved by input from the task leads. S. Marsh commended the web space prepared by the task team and recommended it as a model for the GEO Secretariat when automating their task sheets.

### Value Added of GEO

T. Piekutowski raised the issue of how to respond to scientists who ask: "What does GEO do for me?" G. Ollier replied that there had been much discussion already on this and, although it is complicated and the answers are not straightforward, as an example, GEO has a niche in *facilitating* the delivery of global datasets to scientists to improve modeling. Scientists build new observing systems, but GEO can guide the observing systems of the future. F. Beroud noted that the GEO European Project Workshop tries to entice scientists into the GEO community; they address the "value added" question, in part, by highlighting GEO as a framework to promote international cooperation.

At a recent project workshop in Istanbul, projects had been positive about GEO and about registering datasets with GEOSS. P.-Y. Whung responded that GEO has helped her focus the perspective of scientific communities she works with on societal benefits in decision making. US-GEO has brought many agencies (CDC, NIH, USDA, EPA) together to address the important issue of environment and health. More broadly, GEO is a platform to bring data architecture experts, scientists, users, and

capacity-building specialists together to help build a comprehensive approach for addressing questions of applying Earth observations, from science to societal benefits.

#### Citation Standard

L. Brown commended the task team for its progress in promoting recognition of GEO, and asked if GEO offers research scientists incentives to register their datasets, in particular. For example, the WMO Global Telecommunications System (GTS) offers the knowledge that data submitted through the GTS will be used for environmental monitoring, climate predictions, weather forecasting, etc.; however, GEO does not offer such immediate benefits. He also asked whether there are any peer-reviewed journals that would publish articles from scientists involved with GEO and provide credit that way. H.-P. Plag replied that, while research activities can be published, no journal would permit short articles on datasets. L. Brown clarified that he was not referring to the dataset itself, but how the dataset contributes to scientific progress or broader objectives like SBAs.

H.-P. Plag replied that this type of content can already be published; for example, people acknowledge the Global Digital Elevation Model (GDEM) as recognition of GEO. G. Ollier concurred that research activities in support of GEOSS will mention GEOSS in their articles. S. Marsh agreed that earth observation application activities are easy to publish, but the actual data is more difficult to credit. The Journal of Maps is one (digital) forum where maps and major datasets can get into the peer-reviewed literature.

A. Gasiewski also called the Committee's attention to the Journal of Special Topics in Applied Earth Observations and Remote Sensing as another option. In addition, member countries of GEO should respect and look favorably upon proposals that have a GEO component; this would hold scientists' interest in GEO. J. Maso was not clear how research proposals can contribute to GEO. G. Ollier responded that in the EC, participants in research activities are encouraged to contribute to GEO (for examples, by registering datasets).

#### Status of Participating Organizations

S. Marsh expressed concerns over the Executive Committee's reluctance to see the number of POs increase. Closing the door too soon could exclude some organizations that may be more important than those already recognized as POs. This approach also creates an uninviting atmosphere if, when reaching out to organizations, they have to be informed that they may not be able to join GEO.

#### Miscellaneous

J. Hoffmann inquired whether the four examples of S&T in GEOSS gathered as part of ST-09-02 were being considered as contributions to the Ministerial. H.-P. Plag responded that the compelling examples were obtained only very recently, but within a few weeks the task team could have recommendations for the STC about which to include at the Ministerial. J. Hoffmann also wondered how task team members were prioritizing their limited resources (i.e., How do they decide which conferences to attend?). H.-P. Plag responded that, so far, this decision has been made on an ad hoc basis informed by what active members know; however, it would be good to have a more systematic approach with respect to the SBAs.

#### Summary

G. Ollier concluded the discussion, noting that the STC is making significant progress, especially compared with the last two years, and he is very happy to see this. Even though some processes are still ad hoc, the committee is playing an active role in promoting S&T in GEO.

### **5. Report on US-09-01a: Identifying Critical Earth Observation Priorities for Societal Benefit Areas (Chair: J. Hoffmann)**

L. Friedl, the lead for Task US-09-01a, reported on the status of the task. He concluded by asking the

STC to address the question of whether S&T is sufficiently mature for the advanced Earth observations that scientists want ([link to presentation](#)).

The presentation was followed by a question-and-answer session:

**Q.** G. Percivall: How did the task team come up with the common terminology for the categories/parameters used to describe Earth observations?

**A.** L. Friedl: In many cases, the terminology came from the language of the documents themselves. The analysts in conjunction with their Advisory Groups used best judgment; in some cases the language had to be simplified for the table.

**Q.** S. Minchin: This process reveals many of the continuity issues the STC has been concerned with. Have any gaps been identified so far?

**A.** L. Friedl: Gap analysis is at the heart of the task, but it is too early in the process to say anything definitive (many reports are still preliminary).

**Q.** S. Marsh: As an expert in the disaster area, I agree with the Earth observation priorities I see listed for the Disasters theme, which suggests to me that the process for analyst and Advisory Group member selection has been effective. However, as someone highly involved in the field, I was not aware of the process when it took place. How were the analysts and the Advisory Group members selected?

**A.** L. Friedl: Initially, there was a formal call for participants from the GEO Secretariat to the member countries, but that was ineffective. We then proceeded informally. Funds were secured for the analysts from a small number of organizations. The analysts were charged with assembling a globally representative and highly credentialed team of experts based on research and/or policy records. The task is currently soliciting for members for an oceans advisory group and would be grateful for STC participation.

**Q.** A. Gasiewski: How will the task deal with the critical, planned, but at-risk Earth observations (e.g., from radio frequency interference)?

**A.** L. Friedl: Risk analysis is beyond the scope of the initial exercise to identify the Earth observations, but it could be folded into the meta-analysis, perhaps in conjunction with the STC.

**Q.** P.-Y. Whung: Were the algorithms necessary for modeling (and other data architecture) considered?

**A.** L. Friedl: The task took a demand side (i.e., user-based) approach independent of S&T. Earth observation needs were included whether or not they are algorithm-dependent; some derived products were included.

**Comment:** G. Foley noted that the UIC has been asked by the Architecture and Data Committee to create a user requirements registry for the GEOSS Common Infrastructure (GCI). Material in these reports could be used to populate the registry as a first shot and GEO members would be allowed to add to it. *Volunteers are sought to help with this project.*

**Q.** K. Fontaine: What, specifically, is the STC being asked to do for the task, and how was the S&T user community already considered by the task?

**A.** L. Friedl: The S&T community has already been represented by many of the advisory group members (who are experts in their fields) and by the documents themselves (which are often scientific papers).

**Q.** K. Fontaine: To what extent were the individual tasks involved, and what is the timeline for the meta-analysis?

**A.** L. Friedl: Tasks were neither included nor excluded in any systematic way. Analysts were encouraged to touch base with GEO Communities of Practice, which often had ties to the tasks. The final reports for five of the SBAs are anticipated to be done by January, and the other four by

February. Follow-up to some of the SBAs will be conducted in March-April, and the meta-analysis is expected to be done by May so that documents can be prepared for the Ministerial Meeting.

**Comment:** K. Fontaine noted that many of the analysts would be at the UIC's meeting two days later (November 16) if anyone wished to talk to them.

**Q.** T. Piekutowski: How will the information be presented at the Ministerial Meeting?

**A.** L. Friedl: We will use the same matrix approach and highlight the under-realized societal benefits from gaps in Earth observations. We hope this will encourage member countries to consider their investments and, ideally, step up at the summit to save or implement those observations.

**Comment:** S. Marsh had a point of information that IGOS and WMO established and maintained a database of Earth observation requirements, and wondered if the task team had found it.

**Comment:** S. Minchin proposed an that one or more STC members liaise with the UIC and draft a position paper on how the STC should get involved with the task. S. Minchin volunteered to participate in this.

J. Hoffmann closed the session by noting that coordinating the three activities—ST-09-01, ST-09-02, and US-09-01a—is a challenge. The STC needs to be aware of work completed and planned under US-09-01a and, conversely, US-09-01a needs to be aware of STC activities. However, important differences exist; in particular, the STC will have to look more closely at the algorithm/modeling requirements, rather than just the Earth observation needs. J. Hoffmann asked US-09-01a to keep tabs on ST-09-01 and requested that findings be better communicated between task leads than in the past. L. Friedl hoped that, in turn, the STC would consider the needs of users when pursuing an investigation of modeling requirements and keep the UIC informed about those activities.

## 6. Report on the Ministerial Task Force

G. Ollier reported on his meeting with Datong Zhao (China) and David Grimes (Canada) on 22-23 October 2009 ([link to presentation](#)).

J. Hoffmann proposed a three-fold objective for discussion, including 1) choosing showcases for the Ministerial, 2) deciding on the presence of the STC at the Ministerial, and 3) determining the STC's recommendations for the contents of the Ministerial Declaration.

### Declaration Recommendations

S. Minchin reminded of the STC's three emphasis points for the declaration: 1) data sharing principles, 2) the commitment to funding S&T gaps, and 3) the continuity issue (especially needs and requirements for GEOSS operational support). Political-level commitment is crucial: scientists can put up datasets, but GEO cannot guarantee operational continuity. T. Piekutowski asked if the declaration was supposed to contain committee recommendations. G. Ollier replied that recommendations do appear in the declaration and the sub-text (based on the 2007 Cape Town declaration) is that the ministers do endorse what appears in the declaration.

N. Pirrone asked what the selection criteria are for the Ministerial showcases, and if the agenda will reflect relevant events (e.g., the 2011 UNEP council). J. Hoffmann replied that the criteria are in a paper written by the Ministerial Task Force and being presented to the Plenary. In addition, a specific request is being made to the GEO Secretariat to provide a list of conferences surrounding the Summit so they know what the ministers are concerned with. G. Glaser wanted the STC's message to emphasize the need for moving from limited-duration research-based observing systems to sustained operational systems. The STC could even go one step further and show the interlinked continuum between Earth observations, research, assessments, and policy advice; it will be important to show ministers these are not separate silos.

### Showcase Recommendations

G. Glaser recommended the GEO Biodiversity Observing Network (GEO-BON) as a Ministerial Meeting showcase, as it has a strong GEO identity and is linked to important policy processes. Of course, many other tasks such as GOOS and the Global Terrestrial Observing System (GTOS) need support, and there should be a way for all of them to receive support. J. Hoffmann noted that continuity has already been chosen as an important topic for the Ministerial Meeting, and that the concept of an integrated system (from Earth observations to policy) is best demonstrated within each of the showcases as case studies and not as part of the declaration. G. Ollier noted that the recommendation about GEOSS' sustainability is already in the paper, and the task force is seeking advice on things not already covered.

G. Ollier reminded the Committee that the number of showcases is limited by practical concerns; the STC can help by narrowing the list. He also noted that he cannot recommend to the STC which showcases to submit to the task force as it would be a conflict of interest with his other duties. The presentation format for the four showcases is still undetermined. D. Halpern seconded the recommendation of GEO-BON and observed that GEO-BON had also been brought up in Stresa and in Melbourne as a showcase possibility. He proposed that the STC officially recommend GEO-BON to the task force. P.-Y. Whung noted that given the limitations of the showcase, the four Committees could work together to highlight an activity that encompasses the continuum of the Committees (e.g., agriculture [especially food security], health).

J. Hoffmann summarized key discussion results as: 1) a request to G. Ollier to relay the STC's three recommendations in response to the task force's letter, and 2) use of the showcases to highlight the continuum approach from scientific developments to decision making. Showcase ideas can be entered through the Task ST-09-02 mechanism, and the STC can later help develop the showcases. G. Glaser responded that recommendations should be decided as a committee, and the STC should produce a short list for the task force. J. Hoffman agreed, and clarified that the ST-09-02 Task is just one mechanism to gather proposals.

D. Halpern noted STC's concrete role in the formation and early stages of GEO-BON, and emphasized that presenting GEO-BON as a showcase to the ministers would be important to encourage its growth. V. Munsami recommended that all ministers should receive a briefing pack prior to the summit so new ministers could catch up on GEO activities. This would help to keep everyone on the same page and garner political support. G. Ollier noted that anything that reflects well on GEO (regardless of topic or connection to the STC) is a positive activity.

J. Hoffman opened the afternoon session by describing procedures the STC would use to develop its recommendations about which projects to showcase. He noted that the STC is currently considering ICOS, GEO-BON, the proposals made in Stresa, and proposals already submitted to ST-09-02. The committee welcomes additional submissions to ST-09-02 through mid-December; proposals should include some type of descriptive reasoning. Criteria for the showcase were addressed in Boulder (September 2008), at the C4 discussion in March 2009, and in the task force remarks. The STC will convene by teleconference in December to decide which proposals to recommend to the task force.

## **7. Health SBA Task Activities Panel**

P.-Y. Whung moderated a panel presentation on health SBA activities. Panel members included task leads and representatives P. Dickerson (*by phone*), G. Foley, M. Onoda, N. Pirrone, and M. Radtke (*link to presentations*). The information presented was based on interviews with the task leads, which focused on three questions:

- 1) What S&T developments are being used to complete the task?
- 2) Does the task draw on other activities inside or outside GEOSS?

3) What additional resources could be leveraged (existing and new) to complete this task?

P.Y. Whung then moderated discussion on all activities presented, as well as response to questions meeting participants had submitted in writing.

#### Regional Aspects of the Tasks

K. Fontaine led the discussion by asking, with respect to existing gaps and future needs, whether the heavily regional aspect of the tasks must be addressed. P. Dickerson responded that AIRNow International is regional only because Shanghai stepped up first, but it could be set up in any region that has the necessary monitoring network. G. Foley responded that the tasks have local, regional, and global dimensions, and that global agreements should contribute to local efforts. N. Pirrone added that there are always local or regional elements, for example, when considering energy consumption over the next 50 years.

K. Fontaine asked if the end-to-end projects for health are transferable or scalable to other regions, or constrained by their emphasis on local regions. M. Onoda suggested that the MERIT project, which currently focuses on Niger and Ethiopia, will eventually spread to other regions of Africa. However, there are many types of malaria and each type behaves differently. P.-Y. Whung remarked that, while “one shoe does not fit all,” these tools are good starting points for exploring needs. A regional focus often helps projects get launched.

S. Minchin spoke about the importance of continuity. He noted that the presentation on dust forecasting listed many non-operational satellite products. He noted the importance of ensuring the long-term availability of products that forecasting systems rely on and thus the importance of solidifying the links between the forecasting system and data providers. Concrete numbers, like 350 million people at risk for malaria, can be helpful to garner ministerial support. He also noted that the sub-tropics are at risk for malaria during flood seasons; flood observations can be used to calculate risk of populations not normally at risk.

#### Connecting with New Initiatives

G. Glaser thanked the panelists and noted the good progress of the tasks. He was pleased by the interconnectedness of the tasks and the communities, and noted that the tasks could establish links to new initiatives—for example, the Earth Systems Science Partnership (ESSP), which has launched a program on human health and global environmental change. Links between GEO and these research communities should be strengthened and, when absent, established. Also, he noted that ICSU has a new initiative on human health and well-being in the changing urban environment. The research program will rely on aerosol and air quality observations. P.-Y. Whung said she would refer written questions on HE-09-02a (about how the health community is involved and what the key S&T challenges are) to the task lead, Leonard Barrie (WMO).

#### The Global Health Observatory and GEO

P.-Y. Whung then read the next written question: How is HE-09-01, which focuses on the WHO’s Global Health Observatory (GHO), connected to GEO? M. Radtke replied that GHO is a similar concept to GEO in that it is a “one stop shop for data” and that all the portals will be linked to each other. P.-Y. Whung pointed out the added value of informatics designed from the public health perspective. The next written question asked: How are HE-09-02 and HE-09-03 being integrated into HE-09-01? P.-Y. Whung suggested that World Health Organization (WHO) members interface with the other tasks, even though WHO is not officially a GEO PO.

M. Onoda remarked that the WHO is working on interoperability with the GEOSS Common Infrastructure (GCI) in the context of Health task HE-09-01. Another participant noted that GHO is a ground-based health information system that does not include satellite-based Earth observations; the objective of HE-09-01 in general is to merge GEOSS’ Earth observation capabilities with GHO’s

public health capabilities. This is not an access issue, but rather a fundamental integration of two very powerful tools. W. Zhang noted that integration of the two systems will lead to greater success *in-situ*, and that the health community should identify their key observation requirements so that the Earth observation community can work to meet them. He also noted with respect to HE-09-02a that perhaps it is not appropriate to call it a prediction system as predictions require very robust models and progress is not yet at that point.

#### How Do the Health Tasks Benefit Developing Nations?

P.-Y. Whung asked: How will HE-09-02 bring health services to the “have not” nations? N. Pirrone noted that small-scale gold mining is a major issue in many countries. People are exposed to mercury and other contaminants that lead to disease. These overarching tasks can provide some answers, facilitate information transfer, train people to take better care of their health, and bring technology. Real-time monitoring systems are a first step. P. Dickerson described how Central America is getting involved in the AIRNow network. Although the current monitoring network is too sparse for real-time data displays, AIRNow has started to help them build up their network and also improve data-sparse regions by working with NASA and NOAA to get satellite observations.

Overall, these tasks contribute technology and knowledge transfer to “have not” nations. S. Minchin commented that the current tasks address pollution and disease, but the biggest cause of mass mortality in the next 20 years is likely lack of water, food, and nutrients to grow food. It is incumbent on the health SBA to bring out the health implications of these problems in parallel with work other SBAs (e.g., water, agriculture) are doing on other aspects of these issues. GEO needs to articulate the importance of the SBAs in addressing mortality issues in the coming years—for example, with drought early warning systems—when population begins to exceed resources. P.-Y. Whung supported the idea that the S&T community could facilitate linkages between the SBAs.

#### How Do the Health Tasks Address Uncertainty?

The final written question addressed was: How are the tasks addressing uncertainties in modeling. A general response is that the task lead works with the scientists to address uncertainty. N. Pirrone remarked that evaluating uncertainty in modeling is an important ongoing issue, but a global-scale monitoring system and real data are needed to validate a model; from the health perspective, it is important to look at medium- to long-term effects rather than daily effects. P. Dickerson noted that air quality forecasting carries its own uncertainty, as well as the uncertainty of the meteorological forecast, so the network tends to over-warn rather than under-warn the public.

#### Session Structure and Feedback

J. Hoffmann sought feedback on the panel presentation format. R. Lefevre found it very helpful for laying the groundwork for future SBA presentations. K. Fontaine suggested that disseminating the information earlier would provide more time for analysis, and expressed interest in seeing the notes collected during the information-gathering process.

J. Pearlman suggested that, during the interview phase, task leads be asked what they need from science and technology. Also, before diving into the tasks, it might be good for the STC to get some overall perspective on health activities, perhaps from some of the Community of Practice workshops. S. Marsh felt the format was useful for informing the STC, but wondered whether sufficient time had been allowed for the presenters to receive constructive feedback; under the IGOS system, reports were given more systematically.

P. Dickerson said he found the interview process helpful as it forced him to articulate and clarify work under the task, but he also hoped for more feedback from the STC in the future. M. Onoda seconded Dickerson’s comment, and noted that the task presentations could be extended to all four committees. G. Foley remarked on the ubiquity of S&T in the tasks, and hoped all the information could be made accessible via the Web. W. Zhang suggested the STC designate a liaison to determine the S&T needs

of the health tasks. G. Ollier noted that a key purpose of this component of the meeting agenda was to initiate a process to evaluate the S&T in each SBA; it is therefore incumbent on the ST-09-02 task team to follow through and identify the S&T components.

J. Hoffmann noted that the STC has limited time; therefore, complementary channels, such as communicating on via the website, could be helpful. The tasks are already making progress without the STC's input, and the appropriate partners are already involved (e.g., WHO, WMO), so the STC should consider how it can give added value. STC members are not SBA experts, but can serve as a fresh set of eyes. S. Minchin suggested moving on to another SBA at the next STC meeting, but allotting two hours instead of one, and addressing each presentation individually rather than all together. He volunteered to coordinate presenting the water SBA at the March meeting. D. Halpern remarked that the STC can also be useful in looking at the tasks across the SBAs and bringing synergies together.

D. Halpern mentioned that the Water, Weather and Climate SBAs should be reviewed at the same time in order for the STC and the Tasks themselves to search for ways to improve coordination, collaboration, and cooperation among GEO Tasks associated with different SBAs. G. Glaser suggested that the STC invite to the next SBA presentation expert scientists who could comment impartially on the tasks. H.-P. Plag noted that there currently are no points of contact for the overarching tasks; the subtasks are grouped on paper but not coordinated in reality. P.-Y. Whung volunteered to serve as the point of contact between the health SBA and the committees. F. Beroud recommended that the STC continue with the health tasks, perhaps by bringing in expertise. J. Hoffmann accepted S. Minchin's offer to prepare the water SBA for the next meeting and suggested a teleconference to discuss adjustments to the process.

## **8. STC Roadmap Implementation** (*Chair: S. Minchin*)

This presentation was moved until after the Health panel. J. Hoffmann presented on the current status of the STC roadmap, focusing on activities that have not yet been implemented (*link to presentation*).

### Scientific Review of the Work Plan

J. Hoffmann reported that the revolving scientific review of GEO's 2009-2011 Work Plan requires resources to set up expert panels. P.-Y. Whung could not commit EPA resources to this activity at this point. T. Piekutowski wondered why the STC has never been briefed on the SBA tasks before. S. Minchin clarified that the STC is considering a task symposium, but the issue under discussion was a deeper scientific review of GEO's Work Plan. Progress is stalled without resources for a workshop and for funding independent reviewers. L. Brown suggested the STC consider which SBAs are sufficiently developed that review would likely yield positive results. He proposed ICSU as a truly independent review body; the STC might be considered to have a built-in bias as a review group.

S. Marsh also clarified that while the task leads have presented to the STC, the committee is still searching for the ultimate way of interfacing with the tasks. D. Halpern reiterated that the STC should focus its limited time on synergies and collaboration between the SBAs, a value-added activity that would elevate existing partnerships. G. Ollier suggested the Work Plan review would not need as high a caliber peer review as L. Brown suggested. The goal was only to identify the science necessary to implement GEOSS, not to perform a science quality review.

J. Hoffmann clarified the two levels of review: 1) the task-level review, as discussed in the prior agenda item, and 2) scientific review of GEO's Work Plan, as described in the committee's terms of reference and which has not received any attention. ICSU is a primary resource for the latter task, and he hoped EPA could support the health area. J. Hoffmann then suggested that all Committee members raise resources to get the Work Plan review done (approximately €20,000 – 30,000 per SBA). L. Brown clarified that the National Science Foundation cannot set aside nor dedicate resources to

review work; its mandate is for basic research and thus the NSF is open to proposals from U.S. scientists for work for research that could contribute to GEOSS.

#### Review Indicators in the M&E Framework

J. Hoffmann noted that neither ST-09-01 nor ST-09-02 addressed this Roadmap activity. S. Minchin suggested adjusting the task sheets to provide space for peer review information which the task leads could report. Although this is not a difficult task, the Co-chairs really need the support of the full STC members in taking the lead on these Roadmap activities. Hoffmann noted that the feedback mechanism in the GCI is not ready to implement and that this is the responsibility of the UIC.

#### Future Actions

S. Marsh suggested that someone analyze the tasks and the Roadmap and create additional task(s) which encompass the remaining activities of the S&T roadmap. J. Hoffmann and H.-P. Plag that setting up an additional task may be one way to address this. D. Cripe cautioned that the GEO Work Plan had undergone a major revision the year prior to *reduce* the number of tasks, so perhaps finding a home for the orphaned Roadmap activities under the two current ST tasks would be a better approach.

S. Zerbini commented that Committee members need to know in advance what they are being asked to commit to, that this is not always clear. S. Minchin reiterated his need for volunteers in the committee and agreed to send more detailed information on what was needed. H.-P. Plag suggested using the website to track progress and link activities with the leads. J. Hoffmann clarified that they primarily need help analyzing *how* the STC wants to resolve remaining issues, rather actually resolving the issues at this point. K. Fontaine noted the UIC's "Activity Plan" plan divides activities into two tiers: Tier 1 activities generally support existing Work Plan tasks and often can be accomplished relatively quickly; Tier 2 generally includes activities requiring more user engagement. K. Fontaine volunteered to help discern priorities in the STC's Roadmap.

### **9. Work Plan Review Process (Status of Roadmap Activity 1a)**

(This activity was omitted due to lack of time. The presentation will be moved to the next meeting.)

### **10. Proposal for a GEO EO Assessment Report**

(This activity was omitted due to lack of time. Committee members should read the Proposal for a GEO EO Assessment Report and email comments to the co-chairs. Compiled comments will be discussed at the next meeting.)

### **11. Review of STC Report to Plenary VI (Chair: V. Munsami)**

J. Hoffmann presented the STC report to GEO-VI Plenary, and highlighted a recent addition of text at the end of slideshow regarding STC's request to Plenary for issues to bring to the Ministerial Meeting ([link to presentation](#)).

#### Request to Plenary: Continuity

G. Ollier thought that the phrase "continuity of Earth observation capacities" was too vague. He questioned whether it referred to the continuity of space missions or the concept of moving from research operations to sustained operations, as discussed earlier. As written, it seemed like old news. J. Hoffman responded that this was included as a reminder because it still needed to be acted upon; GEO has so far lacked resources to support the transition from research to operations. G. Glaser agreed that this transition is a core GEO message and is not currently happening as often as necessary. For example, interest in climate forecasting is increasing and seasonal or annual climate predictions will require as robust a data flow as currently exists for meteorology.

S. Minchin thought the phrase should specify a mechanism, as continuity means different things to different people. D. Halpern expressed concern that the phrase gave the impression of satisfaction with existing systems, when in reality implementation of new systems is an additional goal. Also, it should be a combined system of research and continued operations, not “either/or.” S. Zerbini supported D. Halpern’s comment, and noted continuity is not obvious in the global context. Critical missions such as GRACE will be closed down in a few years with no prospect of being re-launched, and around the world nations are cutting funding for observation stations and satellites. Systems must at least be maintained, but development is also important. L. Brown suggested that the specific wording is important because the committee is communicating to people higher up the line and it represents the S&T expert opinion.

J. Hoffmann reminded the Committee that this presentation is simply a note to the Plenary and they are not directly communicating to the Ministerial. S. Minchin clarified that they want these ideas to go into the Ministerial Declaration, but at the moment this is only advice to the Plenary. K. Fontaine suggested rewriting it as “the results of continuity and gap analysis of key Earth observations capabilities.” G. Ollier seconded this suggestion.

G. Foley remarked that key observations, for him, are those that underpin societal benefits, and bringing in the societal benefits is a good way to attract the ministers. J. Hoffmann reminded the committee again that this is a small part of the entire presentation, and that originally this was going to be expressed verbally by the co-chairs at the C4 meeting. K. Fontaine then suggested simplifying the bullets to just: continuity, data sharing, and resources. P.-Y. Whung and S. Minchin seconded this, and Minchin added that whoever is doing the presentation can expand verbally on those points. However, Hoffman noted that the resources point is more specific than the first two, as it is actually a hook for ST-09-01. K. Fontaine replied that ST-09-01 will already have been brought up in the presentation and the presenter can verbally hook to it.

#### Request to Plenary: Data Sharing

L. Brown remarked that the principle of data sharing is a very special success story and asked if it would be possible for the Plenary to confirm GEO’s data sharing principles. S. Minchin responded that at the moment the STC Co-chairs are not looking for any action from the Plenary. Rather, they are highlighting the STC’s wish that data sharing (and the other items noted) play a central role in the discussion at the Ministerial Summit. L. Brown then suggested that to refer to “priorities” rather than “issues” would be more positive.

## **12. Any Other Business**

#### Report on GEO Interactions with International Scientific Unions

S. Minchin informed the Committee that he had a discussion with G. Glaser earlier in which Glaser indicated that ICSU was pleased that the STC has completed the Report on GEO Interactions with International Scientific Unions and that interfacing with the listed unions is occurring. S. Minchin noted that the STC should be tracking where interactions are happening as much as possible. Members who are aware of interactions with scientific unions not captured in the report or have other specific comments should contact D. Cripe. The STC can consider putting the document on the Website. S. Marsh commended the document and noted that it demonstrates well why IUGS should be welcomed as a PO, as they front the resources without receiving recognition.

V. Munsami asked about the status of IUGS’ International Year of Planet Earth. S. Marsh noted that IUGS performed geological surveys for that initiative, which are now subsumed in the global datasets task. G. Glaser expressed gratitude for the work that has been done and strongly encouraged the member unions of ICSU to participate in GEO. Some of the unions pick up on GEO well and substantively, but more unions are missing and could be participating. This returns to the question of the added value of GEO and task ST-09-02. V. Munsami closed discussion by summarizing that the

STC seems to be looking to expand the list of the unions.

#### Next Meeting

V. Munsami noted that the STC will likely next meeting in March 2010, but the venue has not been finalized. The Scientific and Technological Research Council of Turkey (TÜBİTAK) may be receptive to hosting the meeting in Turkey. The STC is in discussion with the GEO Secretariat about having a co-located meeting in South Africa in August or September. D. Cripe added that Executive Committee would like GEO Committee meetings to occur at least one month before each Executive Committee meeting, and the Executive Committee is planning to meet three times next year in preparation for the Ministerial. This does not imply, however, that all Committees need conduct 3 meetings as well; rather that sufficient time be allowed to prepare a consolidated Committee report prior to a given Executive Committee meeting. S. Minchin clarified that this one-month rule would not apply if a Committee held just two meetings. J. Hoffmann and K. Fontaine expressed concern over these constraints. L. Brown suggested that the STC might spread two days of content over three days at its next meeting, as this would provide more opportunities for off-line discussions/drafting of documents. Hoffmann suggested choosing prospective dates in late March, such as the 23-24.

#### Task Symposium

J. Hoffmann reported on the Task Symposium concept, initially discussed at the last meeting as a means to enhance coordination between the tasks and better inform the STC. It would also give the tasks a venue to present their work to and network within the GEO framework. Because of the timeline, it cannot occur before the Ministerial. However, the proposal still stands for such an event, maybe in relation to the next GEO Plenary.

S. Minchin remarked that it is important to make sure that the task leads feel like their work is valued. Holding the symposium alongside the Plenary would create additional incentives for the task leads to attend (e.g., more activities to participate in); it would also make task leads feel like more a part of GEO as a whole. S. Minchin suggested waiting to see how the IGOS-P symposium proceeds on November 19. He offered to bring a report of that event and a proposal for the task symposium to the March STC meeting.

H.-P. Plag noted that it was important that this event is organized *by* the tasks as well as for the tasks. Task leads may not want to coordinate with the Plenary, and might prefer more of a workgroup-style meeting. He wanted to be informed of the event as a task lead, not just as an STC member. K. Fontaine suggested having the task symposium at the C4 meeting and putting discussion of the symposium on the agenda for the next meeting.

#### Proposal for “STC Report 2: What GEOSS Can Do to Advance Global Integrated Earth System Science”

D. Halpern noted that the STC co-chairs had not contacted him as agreed at the Melbourne Meeting, to discuss an STC Report 2 on the role of GEOSS to advance global integrated Earth system. The first report was “The Role of Science and Technology in GEOSS,” and the second report was proposed to discuss “What GEOSS Can Do to Advance Global Integrated Earth System Science.” D. Halpern, with the support of NASA, expressed his willingness to lead preparation of such a Second Report after receiving the STC’s endorsement. From his presentation, the main points of the report would encompass:

- Science for society (GEO SBAs).
- Data continuity – distinguishing scientific oscillations from trends; needed in support of international treaty activities; end-to-end observations-data-model-information system.
- Understanding societal risks depends on Earth observations.
- Data sharing – composite data sets with minimum time delay.
- Data gaps – new variables; data-sparse regions; timeliness.

- International Decade for Earth Exploration and Society (IDEES) – advance new multi-disciplinary limited-duration projects that will improve models of the global integrated Earth system.
- Computing capability and capacity – enable utilization of all observations in contrast to aggregated observations.
- Data integration, assessments, and partnerships.

J. Hoffmann thanked D. Halpern for his presentation and noted that it more clearly defined the scope of his vision. This is primarily an element of the ST-09-02 Task, as it addresses how the S&T community benefits from the system, and would make a valuable contribution to ST-09-02. P.-Y. Whung agreed this is an important contribution, and asked Halpern to elaborate the role NASA would play and how the activity would interface with the STC. D. Halpern clarified that NASA is willing to support Halpern to lead preparation of the report and that he and NASA would be the lead authors. Additionally, a few authors would be selected internationally, but Halpern would not be asking for volunteers.

The report would be an STC report, not a NASA report. D. Halpern expressed concern that this task was too big for ST-09-02 and that ST-09-02 already had a sufficient number of activities. D. Halpern suggested this report should be an additional task of the STC. S. Minchin clarified that the activity can still be housed in ST-09-02 as it is a logical place for the activity to connect to the STC. He also remarked that, if the report is going to be labeled as an STC document, then there must be a process for the STC to review the document.

G. Glaser expressed thanks for D. Halpern's offer to prepare this important document. He indicated that he saw connections between this proposal and the International Council for Science (ICSU's) "Earth System Science Visioning Process." He also noted that even if the activity is housed in ST-09-02, the task team would not be responsible for producing the report and thus not add to their work load. The next STC meeting could address the question of the best way forward. T. Piekutowski indicated that he would be glad to participate and noted a similar report ("interplanetary report") which has been an effective vehicle.

F. Beroud commented that care should be taken to avoid having this document duplicate some of the efforts of activity 1a. D. Halpern clarified how the outputs of this activity would differ from those of activity 1a by noting that this report would rely on science to identify gaps. J. Hoffmann noted that this activity should not be revisited by the Committee at every meeting, especially in the lead up to the Ministerial Meeting. S. Minchin noted that the STC can follow the activity's progress through the ST-09-02 reports. G. Ollier expressed his opinion that the Committee should be willing for the report to be prepared if NASA is offering to provide support for D. Halpern, but that the Committee should not extend additional support. D. Halpern requested the STC's endorsement before proceeding.

H.-P. Plag noted that the report needed greater clarity of mission and focus, and a better sense of its relative timeline (i.e., where it fits between what GEOSS "could" do and what GEOSS "can" do). He also remarked that, if it was going to be an STC document, its preparation should not be conducted on an ad hoc basis, but should follow a defined process. V. Munsami proposed an extended discussion at the next Committee meeting. L. Brown stated that he hoped a final decision on this issue could be reached at the next meeting. It was generally agreed that this required interaction between the co-chairs and D. Halpern before then.

P.-Y. Whung noted that D. Halpern was presenting this proposal on behalf of NASA and not as a part of the U.S. delegation.

#### Miscellaneous

S. Browdy had a comment that the non-profit organization, the International Sea Keepers Society,



allows scientists to reserve time on ships which travel to data-sparse regions of the open ocean. Already there is a backlog of data collected from this project.

*Resignation of G. Ollier as an STC Co-Chair*

G. Ollier announced his resignation as an STC co-chair to promote rotation among countries in chairing the committee. The EC will continue to participate in the committee as a member. D. Halpern, on behalf of the committee, thanked G. Ollier for his many hours of service and hoped for his continued participation.

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Annex 1: Meeting Outcomes and Actions

12<sup>th</sup> STC Meeting  
14 November 2009  
Hemisphere A, Ronald Reagan Building  
1300 Pennsylvania Avenue NW, Washington DC

Draft Outcomes and Action Items

Agenda Item	Outcome	Action	Who	When
1	11 <sup>th</sup> STC Meeting record approved.			
2	This item postponed until the end of the meeting.			
3	<p>In her report, F. Beroud stressed that a brief document outlining the key science questions to be answered by GEOSS would be very useful. STC viewed this as a valuable output of the Task but advised that this should not be done immediately as it requires substantial results from the Tasks work to inform its content. As the Task-Sheet reporting from Tasks on the S&amp;T issues has not improved, STC encouraged the ST-09-01 Task Team to take a more active approach towards obtaining the information. Options might be meetings, webex interviews, etc).</p> <p>Message from STC is that it strongly seeks contribution/collaboration from major ventures rooted in science (such as GCOS ,GOOS). GEO welcomes their participation in ST tasks, considers their input most helpful in supporting them.</p>			
4	Compared with where STC was 2 years ago, encouraging to see progress has occurred.			



	<p>Processes have been a bit ad hoc, but evidence is that STC is starting to achieve its goal of promoting GEO in S&amp;T community through both ST-09-01 and ST-09-02.</p> <ul style="list-style-type: none"> <li>• ST-09-02 to use Plenary Document on Participating Organization participation criteria to decide on which organizations will be approached to link their programmes.</li> <li>• ST-09-02 requests more input suggestions for conferences across other SBAs.</li> </ul>			
5	<ol style="list-style-type: none"> <li>1. Members of S&amp;T invited to participate in US-09-01a, particularly wrt to advisory group for priorities for ocean observations.</li> <li>2. ST-09-01 must be fully aware of what US-09-01a has done. ST-09-01’s objectives differ from US-09-01a in the point of view (focus on science gaps), the focus on the requirements of <u>existing</u> Tasks, and the broader scope of requirements (i.e. not only on observations).</li> <li>3. STC should consider US-09-01a activities its implementation of Activity 1a to avoid duplication.</li> </ol> <p>STC strongly recommends that US-09-01a communicates findings to all task leads.</p> <ul style="list-style-type: none"> <li>• <b><i>ST-09-01 and ST-09-02 task leads requested to monitor US-09-01a and consider impacts on the ST tasks.</i></b></li> </ul>	.		
6	3 issues STC raised in Melbourne <i>remain</i> priorities:	<b><i>STC12-01</i></b>	<b>GO</b>	31 Jan 10

	<ul style="list-style-type: none"> <li>• Continuity</li> <li>• Data sharing</li> <li>• Resource mechanisms for addressing S&amp;T gaps hindering GEOSS implementation</li> </ul>	Ministerial Task Force to be reminded of these priorities, asked to take note with respect to Ministerial Declaration.		
	GEOBon and ICOS were proposed as showcases at the meeting.	STC to prepare shortlist of recommended showcases by the following Process: <b>STC12-02a</b> Co-chairs to send email to STC to invite proposals to be made through ST-09-02 (HPP website) by December 15.	<b>CoCh</b>	15 Dec 09
		<b>STC12-02b</b> HPP to circulate list of proposals to Co-chairs.	<b>HPP</b>	15 Dec 09
	Note ST-09-02 has set up webpage at <a href="http://www.geo-tasks.org/stc_showcases/">http://www.geo-tasks.org/stc_showcases/</a> to collect suggestions. <ul style="list-style-type: none"> <li>• Seek to highlight continuum approach, from new scientific methods and developments, to decision-making.</li> <li>• STC (ICSU) to support the development of any Showcases selected by the Ministerial Task Force to demonstrate the continuum from research to operations applications as the science community envisions it.</li> </ul>	<b>STC12-02c</b> Co-Chairs to convene STC-Telecon to discuss and cull list.	<b>SMi</b>	17 Dec 09
<b>8</b>	Exercise was deemed useful and will be extended to more SBAs. However, needs some adjustments and more time (for example, task leads encouraged to think specifically in terms of how STC can help with task implementation; invite scientific experts outside GEO for input).	<b>STC12-03</b> STC Co-chairs to hold telecon to discuss adjustments to be made in SBA process	<b>CoCh</b>	15 Jan 10
		<b>STC12-04</b>	<b>SMi</b>	30 Mar 10

		Review of Water SBA to be prepared for next STC meeting	<b>SEC</b>	
<b>9</b>	Message is that burden of implementing Roadmap cannot fall on Co-chairs alone, need entire STC membership to provide feedback.	<b>STC12-05</b> J. Hoffmann to circulate current status document on roadmap to STC and request review of this, particularly on the proposed reactions.	<b>JH</b>	31 Jan 10
		<b>STC12-06</b> To help derive review indicators, S. Minchin to propose wording for task sheets, requesting feedback pertaining to level of peer-review of activities.	<b>SMi</b>	31 Jan 10
		<b>STC12-07</b> K. Fontaine and S. Marsh to review Roadmap status report and prioritize activities not covered by Tasks to assist STC membership in determining what/how to provide support.	<b>KF, SMa</b>	31 Jan 10
		<b>STC12-08</b> Results to be discussed at STC-13.	<b>CoCh</b>	24 Mar 10
<b>12</b>	S. Minchin has had interaction with G. Glaser and I. Dowman. Document with list of scientific unions has been drawn up.	<b>STC12-09</b> List to become part of STC page on GEO website.	<b>SMi, SEC</b>	31 Jan 10
	<i>13<sup>th</sup> STC Meeting</i> 1. Potential dates: 23-24 March 2010 2. Tübitak may be willing to host 3. SA has expressed interest in hosting co-located Committee meetings	<b>STC12-10</b> Co-chairs and Secretariat to follow up with Tübitak regarding 13 <sup>th</sup> STC Meeting March 2010.	<b>JH, SEC</b>	31 Dec 0910 <b>closed</b>
	S. Marsh to bring GEO-IGOS Symposium report to 13 <sup>th</sup> STC meeting, exploring suitability as template for Task Symposium. Also need to explore	<b>STC12-11</b> Task Symposium needs adequate discussion at 13 <sup>th</sup> STC meeting.	<b>CoCh</b>	24 Mar 10



	feasibility of conducting Task Symposium alongside Committee Co-located meetings			
	STC Report 2: “What GEOSS Can do to Advance Global Integrated Earth System Science” D. Halpern and NASA offering to take the lead on this as an international effort, to be published as an STC report. Requesting STC endorsement.	<b>STC12-12</b> Co-chairs to clarify document procedure as contribution under ST-09-02 before final approval at 13 <sup>th</sup> STC meeting.	<b>PYW</b>	31 Dec 09
	Doug Muchoney requested to look at FAR-GEO for potential synergy and/or overlaps.	<b>STC-12-13</b> Report at 13 <sup>th</sup> STC meeting.	<b>HPP, SEC</b>	24 Mar 10
	STC Co-chairs will take the lead with respect to next C4 interaction.	<b>STC12-14</b> Announce teleconference with C4 to be held on 09 Jan 2010.	<b>SMi</b>	18 Dec 09
	STC Co-chair teleconferences will be held on a regular basis, the 2 <sup>nd</sup> Thursday of each month, starting with 14 January 2010.			

Annex 2: Agenda

**Twelfth Meeting of the GEO Science and Technology Committee  
Hemisphere A, Ronald Reagan Building  
1300 Pennsylvania Avenue NW, Washington DC**

**AGENDA**

Saturday, 14 November 2009

<b>08:30 – 09:00</b>	<b>Arrival and Registration</b>  (Chair: <i>G. Ollier</i> )
<b>09:00 – 09:30</b>	<b>1. Introduction</b> <ul style="list-style-type: none"> <li>• Welcoming remarks (Host, Co-Chairs and GEO Secretariat)</li> <li>• Round table of introductions</li> <li>• Approval of 11<sup>th</sup> STC Meeting Record</li> <li>• Adoption of the Agenda</li> </ul>
<b>09:30 - 09:45</b>	<b>2. Status of actions decided on at the 11<sup>th</sup> STC meeting</b>
<b>09:45 - 10:15</b>	<b>3. Report on Task ST- 09- 01 (<i>F. Bérout</i>)</b> <ul style="list-style-type: none"> <li>• Report on IGFA meeting</li> </ul>
<b>10:15 - 10:35</b>	<b>4. Report on Task ST- 09- 02 (<i>H-P Plag</i>)</b>
<b>10:35 - 11:00</b>	<i>Break</i>  (Chair: <i>J. Hoffmann</i> )
<b>11:00 - 11:30</b>	<b>5. Report on Task US-09-01a (<i>L. Friedl</i>)</b>
<b>11:30 - 12:00</b>	<b>6. Ministerial Task Force (<i>G. Ollier</i>)</b>
<b>12:00 - 13:00</b>	<b>7. STC Roadmap Implementation</b> <ul style="list-style-type: none"> <li>• Overview of roadmap activities status</li> </ul>
<b>13:00 - 14:30</b>	<i>Lunch</i>  (Chair: <i>P-Y Whung</i> )
<b>14:30 - 15:30</b>	<b>8. Health SBA Task Activities (panel)</b>
<b>15:30 - 15:45</b>	<b>9. Work Plan Review Process (Status of Roadmap Activity 1a) (<i>J. Hoffmann</i>)</b>
<b>15:45 - 16:00</b>	<b>10. Proposal for a GEO EO Assessment Report (<i>H-P Plag</i>)</b>
<b>16:00 - 16:15</b>	<i>Break</i>  (Chair: <i>V. Munsami</i> )
<b>16:15 - 17:00</b>	<b>11. Review of STC Report to Plenary VI</b>
<b>17:00 - 17:30</b>	<b>12. Any Other Business</b> <ul style="list-style-type: none"> <li>• Report on GEO interactions with scientific unions (<i>I. Dowman</i>)</li> <li>• Next Meeting</li> </ul>
<b>17:30 - 18:00</b>	<b>13. Summary of Meeting Outcomes</b>
<b>18:00</b>	<b>Adjourn</b>

Annex 3: Participant List

Participants in 12th meeting of the GEO Science and Technology Committee				
14 November 2009, Washington, DC				
Family Name	First Name	Representative of	Email	
Bender	Michael	U.S. Environmental Protection Agency	bender.michael@epa.gov	
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