GTOS Panel Chairs Meeting
ICSU HQ, Paris, France, 28–29 June 2006

2ND GTOS PANEL CHAIRS MEETING

ICSU headquarters

Paris, France, 28–29 June 2006

MEETING REPORT

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OPENING OF THE MEETING

Jeff Tschirley (Food and Agriculture Organization of the United Nations – FAO), on behalf of Berrien Moore (Chair of the Global Terrestrial Observing System – GTOS), opened the Second Meeting of the Chairs of the GTOS Technical Panels. Thomas Rosswall (International Council for Science – ICSU) welcomed the participants to ICSU headquarters, stressing the importance of the occasion for the Chairs to interact directly, independently of the sponsoring organizations. Thereafter, the agenda (Annex 1) was introduced, and approved with slight changes to the schedule.

Agenda Item No. 1 Review of the progress made on the action items from the GTOS Steering Committee Meeting

The GTOS Programme Director, John Latham, provided an update on the implementation of the actions agreed at the 3rd GTOS Steering Committee Meeting by referring to the relevant document prepared by the GTOS Secretariat (Annex 2). In the update and ensuing discussion, particular focus was placed on the development of the new GTOS Strategic Plan and the outcomes of the stocktaking exercise: the importance of finalizing the report of the stocktaking exercise and the urgency of developing a new GTOS vision were emphasized. The discussion also highlighted the 2008 International Year for Planet Earth and the International Year of Potatoes as events to be taken into consideration in future GTOS activities.

This was also an occasion for the participants to be informed of the interest expressed by the Committee on Earth Observations Satellites (CEOS) in the IGOL Report in view of the upcoming CEOS meeting (September 2006) and to further discuss the socio-economic content in the Report by referring to the potential utilization of Terrestrial Ecosystem Monitoring Sites (TEMS) and FAO health- and poverty-related databases.

The need for establishing regular teleconferences among the Panel Chairs and regular inter-panel interactions (e.g. through self-funded participation of Panel Chairs in plenary Panel meetings) was reiterated in the discussion.

Follow-up Action 1/PC: GTOS Secretariat, in collaboration with the GTOS Chair, to schedule and organize regular inter-panel teleconferences and to encourage inter-panel interactions.

Agenda Item No. 2 Panel Chairs discussion on Panel activities that require coordination or support from other Panels (including requirements, needs, concerns, etc.)

The agenda item was introduced by the Chair, emphasizing the importance of inter-panel dialogue and recalling the urgency concerning the identification of a new Chair for the Terrestrial Observations Panel for Climate (TOPC). Thereafter, each Panel Chair provided an update on their Panel's activities, noting where there was a need for coordination with or support from other Panels.

GTOS Coastal Panel (C-GTOS)

Robert Christian, GTOS Coastal (C-GTOS) Panel Chair, presented the Panel's activities, starting with the development of a GTOS-GOOS joint panel (Joint Panel for Integrated Coastal Observations – J-PICO) and requested inputs from other Panel Chairs with respect to the identification of five members, taking into account gender and geographical balance, with expertise in both "Land" and "Ocean" sides (i.e. remote sensing; modelling; land cover and use; urbanization; socio-economics; hazards and coastal inundation; biodiversity and invasive

species; shoreline position and coastal erosion; public health and waterborne pathogens; and data communications and management).

An update on cooperation with the Ramsar Convention on Wetlands was also provided, reporting on the signature of the GTOS–Ramsar Memorandum of Cooperation (MoC), the Call for Partnership on wetlands mapping and inventory initiated by C-GTOS at the 13th Meeting of the Scientific and Technical Review Panel (STRP) of the Ramsar Convention, and the paper to be presented at the upcoming Meeting of the Society of Wetlands Scientists (SWS). The other Panels were invited to take advantage of this cooperation, taking into consideration the Ramsar Convention's calendar (e.g. Midterm STRP Workshop in March 2007).

An update on the C-GTOS proposed initial products was also presented by introducing the work with the Global Land Cover Network (GLCN) on deltas, with the UNESCO Man and the Biosphere (MAB) Programme and the World Heritage Convention (WHC) on conservation of cultural coastal sites, and with the University of Parma (Italy) and MedWet on the establishment of a network of sites in the coastal Mediterranean region for nutrients delivery in coastal lagoons. The participants welcomed such an update on C-GTOS progress and identified activities that should be considered for potential collaboration within the C-GTOS pilot projects (e.g. a three-year coastal project in Italy; work on wetlands as reference systems for climate change within Europe; and the World Wildlife Fund (WWF) work on a mapping project on humid areas in Europe).

Global Observation of Forest and Land Cover Dynamics (GOFC-GOLD)

John Townshend, Global Observation of Forest and Land Cover Dynamics (GOFC-GOLD) Panel Chair, reported on the revisited 1999 GOFC-GOLD Strategy (see document GOFC-GOLD 21/GTOS-39) by pointing out the importance of identifying the key tasks for an international coordination body for observation, and by presenting the following tasks:

1. Specifying requirements for products.
2. Assessing algorithms and data assimilation procedures.
3. Ensuring the availability of observations.
4. Developing protocols and standards, including harmonization.
5. Ensuring that operational products meet accuracy requirements.
6. Building capacity and the role of regional networks.
7. Creating GOFC-GOLD products and services.
8. Providing information to support international assessments and agreements.
9. Taking an advocacy role, especially in relation to the continuity of observations and validation.

This list was pointed out by the Chair as an example to follow for the overall GTOS Programme in the development of its Strategic Plan. Throughout the update, coordination among the Panels was highlighted as crucial to avoid disagreements and discrepancies, especially within international mechanisms (e.g. Conventions, GEO/GEOSS). The role of the Panel, and consequently of GTOS, within international Conventions and Mechanisms was also illustrated by underlining the function of Panels in providing a scientific demonstration of feasibility, and the role of GTOS with respect to advocacy. This discussion allowed for clarifications between GOFC-GOLD and TCO on advocating the inclusion of avoided-deforestation in the post-Kyoto context, and for stressing the importance of combining GOFC-GOLD and TCO efforts towards the establishment of regional carbon budgets, highlighting the important role for GTOS in coordinating regional and national observing systems. India and China were reported as having interest and funds in this matter. However, Africa was considered as a possible macro-region test case, within the framework of the GCOS Implementation Strategy Meeting (UNECA, Addis Ababa, Ethiopia, 18–21 April 2006) as follow-up to the G8 commitments (Gleneagles 2005) towards supporting the

development of the GCOS observing system in Africa for national and regional applications only. In this respect, the issues of financing the networks were discussed by considering the involvement of the development agencies, emphasizing the potential application of observation in development-related issues. Inclusion of such considerations in the new GTOS Strategic Plan was also discussed.

TOPC

Alan Belward, outgoing TOPC Panel Chair, presented the activities of the TOPC Panel, identifying the important role of TOPC for setting standards, and the implications for the other Panels. Particular focus was placed on the activities within the United Nations Framework Convention on Climate Change (UNFCCC) and the process that will lead towards a third Adequacy Report of the Global Observing Systems for Climate. Reference was made to the advocacy role of TOPC with respect to GTN-Permafrost, GTN-Glaciers, GTN-Lakes and GTN-Rivers, and also within the framework of the International Polar Year. The linkages with other Panels, namely GOFC-GOLD and TCO, were reported by pointing out the participation by GOFC-GOLD and TCO representatives in the TOPC Meeting (March 2006). John Latham (GTOS Programme Chair) suggested that a model similar to the Global Ocean Data Assimilation Experiment (GODAE) could be considered, to develop a data assimilation role for TOPC, and that there are some Japanese or Chinese institutes that could support such new activities and potentially provide a panel chair. Berrien Moore (GTOS Chair) agreed, identifying Japanese institutions that have supported carbon modelling work. John Townshend (GOFC-GOLD Panel Chair) also stated that some Chinese institutes have been involved in the land cover data assimilation and could contribute to a TOPC modelling activity. The priority for the next phase of TOPC was identified by Belward as ensuring that satellite operators maintained commitment to the GCOS Implementation Plan (GIP) response post-COP 12**.**

The current TOPC membership, comprising 13 experts (with a core of eight experts actively involved) and a network of experts outside the Panel, was also presented in terms of strengths and weaknesses. Thereafter, taking into account that the final decision rests with GCOS and GTOS Sponsors, the participants discussed extensively the identification of the new Panel Chair and identified the following characteristics for candidates: (i) scientific expertise in the terrestrial domain, and (ii) experience in the WMO system to enable support to Member States' activities. Participants identified Peter Cox as a potential candidate for the position, and agreed for the GTOS Secretariat to enquire into this possibility by organizing a conference call in the first week of July to discuss such an option with John Zillman and Paul Mason. Moreover, it was also suggested that the input of Ann Henderson Sellers be sought to aid in the selection process for the next TOPC Panel Chair, considering the potential role of the Chair in developing TOPC data assimilation products. The possibility of utilizing the TCO and the GOFC-GOLD networks to identify other nominations was also expressed.

This discussion was also an opportunity to underline the need for improving the representation of Panel Chairs in terms of gender balance and geographical distribution, and to suggest the appointment of Panel co-Chairs.

Terrestrial Carbon Observations (TCO)

Riccardo Valentini, TCO Panel Chair, provided an update on Panel activities, with particular reference to the TCO kick-off Meeting (FAO headquarters, Rome, Italy, 26–27 June 2006), the current membership of the Panel, and the Implementation Plan. The following activities were highlighted: (i) launch of a global carbon database; (ii) synthesis of regional approaches and scaling up; (iii) avoided deforestation; (iv) vulnerabilities of carbon pools; (v) innovative methods and techniques for carbon observation; and (vi) capacity-building activities ("carbon schools"). Updates on these main activities were provided by referring to deadlines and

planned events, such as the UNFCCC workshop on avoided deforestation (August 2006), and the first Meeting of the EC-funded "CarboAfrica" project (October 2006). The involvement of TCO, through GTOS, in the GEO tasks was also presented.

The issue of coordination and cross-membership amongst the Panels was raised in the discussion, with particular reference to the possibility of C-GTOS–TCO collaboration identified in existing and proposed TCO measurements in protected coastal areas. Notice was also drawn to the alignment of TCO activities and objectives with the initiatives and priorities of the GTOS Sponsoring Agencies (mostly UNESCO and FAO) and development agencies.

Follow-up Action 2/PC: GTOS Panel Chairs, GTOS Chair and GTOS Secretariat to provide nominations to C-GTOS Panel Chair for five other J-PICO members.

Follow-up Action 3/PC: GTOS Secretariat to continue to organize a conference call with John Zillman and Paul Mason in the first week of July to discuss candidates for TOPC Panel Chair.

Follow-up Action 4/PC: C-GTOS and TCO Panel Chairs to further explore issues for joint initiatives and cooperation.

Agenda Item No. 3 GTOS and the Conventions – overall strategy and *modus operandi*

The agenda item was introduced by recalling the many changes that had occurred in the Conventions and international mechanisms since the establishment of GTOS, and by stressing the key role of observations in the implementation of the Conventions. Emphasis was also placed on the fact that GTOS should consider the Conventions as a major "client-group", and on the identification of relevant Conventions and GTOS products.

A review on the SBST(T)A/COP and other formalized interactions between GTOS and the Conventions was provided by the GTOS Programme Director, highlighting the SBSTA-level interaction with UNFCCC, the signature of the MoC with the Ramsar Convention, and the ongoing processes with the Convention on Biological Diversity (CBD) and Convention on the Conservation of Migratory Species of Wild Animals (CMS) for identifying potential areas and mechanisms for cooperation.

The Rio Conventions (UNFCCC, United Nations Convention to Combat Desertification – UNCCD and CBD) and some Biodiversity-related Conventions (Ramsar, CMS and WHC) were confirmed as the main focus of the interactions between GTOS and the Conventions. It was commented that the Rio Conventions were a window on the funds of the Global Environment Facility (GEF), and it was also noted that through GEF, the World Bank had shown interest in observations as instruments to evaluate their investments in Protected Area activities during a presentation on GOFC-GOLD. An enhanced focus on biodiversity and desertification was discussed, and called for by the participants.

In this respect, the need to strengthen linkages with CBD was agreed, considering GOFC-GOLD biodiversity-related activities, the outcome of the IGOL Special Meeting on Biodiversity, the current establishment of B-GTOS, the interactions and discussion between the GTOS and the CBD Secretariats, and the appointment of a new CBD Executive Secretary. The potential role of GTOS in implementation of the CBD was identified as providing information on status in and around Protected Areas within the framework of the Ecosystem Approach and Target 2010.

Moreover, the formalization of cooperation with UNCCD was also agreed by noting the need for science within the UNCCD processes (in particular on the issues of indicators for land degradation), as also recently called for in the International Scientific Conference "The Future of Drylands" (Tunis, Tunisia, 19–21 June 2006) and its Declaration on research priorities to promote sustainable development in drylands (the "Tunis Declaration"[1]).

[1] www.unesco.org/mab/ecosyst/drylands/docs/E_Tunisdeclaration.pdf

The following actions were proposed so as to establish linkages with the UNCCD, through the assistance of TCO network: a meeting with the UNCCD Executive Secretary; an audit at the Task Force for Reform of the Convention; a GTOS presentation scheduled in the Agenda of the Committee on Science and Technology (CST); and the elaboration of an adequacy report for terrestrial observations at UNCCD/COP in 2007. An ad hoc experts group for brainstorming on GTOS support to UNCCD and the development of a concept note or memorandum was also suggested.

The overall approach to the Conventions and the related GTOS *modus operandi* were also discussed by emphasizing that GTOS should not necessarily exhibit a uniform approach to all the Conventions, given the cross-cutting issues across GTOS Panels and across Conventions, and that GTOS support to the Conventions should be formal, through SBSTTA requests or similar mechanisms. The MoC with the Ramsar Convention, GCOS' approach to UNFCCC (e.g. through objective evaluation of adequate observations) and the ongoing GTOS work within the UNFCCC on the Essential Climate Variables (ECVs) were presented as examples to follow for structuring interactions with other Conventions. In this respect, it was suggested that a survey be conducted among the Panel Chairs so as to improve knowledge of observation requirements and to develop new ideas to assist in the Conventions' implementation. The importance of the establishment of an executive-committee-like body (comprising the Panel Chairs, Chair and the Programme Director) with regular interactions (e.g. scheduled teleconferences) was highlighted as enabling such, and other, processes. The realization of a Web page in the GTOS Web site on "GTOS and the Conventions", comprising documents, initiatives, news notes, flagship issues and products, and useful links, was also considered as a useful action to be coordinated by the GTOS Secretariat.

Follow-up Action 5/PC: GTOS Secretariat to promote further formalization of linkages with CBD.

Follow-up Action 6/PC: GTOS Secretariat, in collaboration with the TCO Panel Chair, to promote further formalization of linkages with UNCCD.

Follow-up Action 7/PC: GTOS Secretariat, in consultation with Panel Chairs, to realize a Web page on "GTOS and the Conventions".

Follow-up Action 8/PC: GTOS Secretariat to coordinate a survey among the Panel Chairs so as to improve knowledge of observation requirements and to develop new ideas to assist in Convention implementation.

Agenda Item No.4 Developing a Strategic Plan for GTOS – discussion on content and progress

In introducing this topic, emphasis was placed on the importance of developing a new vision and strategy for GTOS that takes into account the new international framework (e.g. Millennium Development Goals (MDGs), GEO/GEOSS, Multilateral Environmental Agreements (MEAs) and Conventions) and involving all relevant stakeholders. This was the opportunity for the GTOS Programme Director to underline that the report (available at the meeting only in draft form) elaborated by K.C. Lai (GTOS consultant) after the stock-taking exercise was not to be considered as a draft for developing the strategic plan, but rather as a background document in order to evaluate the adequacy of the current GTOS structure and core components. Points for discussion were distributed by the Secretariat. The discussion

highlighted that the document should have a 2006–2015 time frame, and should take into account the structures of GOOS and GCOS and the IGOL Report. This was also the occasion to reiterate that the documentation elaborated by the Panels should also be considered in the process. Thereafter the Panel Chairs were asked to present their views on this issue (see also Annex 6, for slides).

GOFC-GOLD

John Townshend, GOFC-GOLD Panel Chair, described three different "types" of GTOS to be taken into account in developing the strategy:

- A large structure on the GOOS model, which would take into account all operational observing system activities, such as buoy deployment at a national level.
- A medium-sized structure that included the panel activities linked with operational international activities, such as those in the programmes of the United Nations organizations.
- A smaller structure based on project activities of GTOS Panels, similar to the current structure.

The ensuing discussion highlighted the differences between GTOS and GOOS in terms of structure, especially within the framework of hosting and sponsoring UN organizations. In particular, it was noted that GOOS was much more linked and structured within UNESCO than GTOS was within FAO. The linkages with UNESCO and UNEP were also analysed, taking into account UNEP "Environment Watch" and UNESCO's focus on Protected Areas (e.g. Biosphere Reserves).

TOPC

Alan Belward, outgoing TOPC Panel Chair, described the role of GCOS and the overall framework of relevant international mechanisms (e.g. Global Monitoring for Environment and Security (GMES), GEO/GEOSS, UNFCCC and the Intergovernmental Panel on Climate Change (IPCC)) in order to evaluate similarities and differences between GTOS and GCOS, with specific focus on the support to the Conventions. The presentation and ensuing discussion highlighted the broad focus of GTOS compared with GCOS, in part by also referring to its lack of structures, such as meteorological services.

C-GTOS

Robert Christian, C-GTOS Panel Chair, highlighted that the GTOS strategy should consider the need for cross-linkages among the Panels (e.g. joint members and funding opportunities). In this respect, a diagram was presented to show the linkages between C-GTOS, TOPC, TCO and GOFC-GOLD, taking the carbon cycle as an example. This was also the occasion to highlight the importance of reconsidering the future role of the TEMS database and other data management initiatives (within the framework of GTOS, the new strategy, and current financial and human resources).

Follow-up Action 9/PC: Consultant K.C. Lai to finalize the report of the stocktaking exercise.

Follow-up Action 10/PC: GTOS Secretariat to coordinate the elaboration of the 2006–2015 GTOS strategic plan.

Agenda Item No. 5 Discussion on funding opportunities and strategies, including the importance of widening the donor base and increasing the stability of funding sources. Identify key funding opportunities and strategies

Panel Chairs were reminded of the importance of incorporating a fund-raising strategy in each Panel's work plan, and to widen their donor base. The GTOS Programme Director also informed the meeting of the request made to the Government of Italy (Italian Development Cooperation) to support GTOS for a second year, and of the upcoming meetings at UNESCO with the Assistant Directors-General (ADGs) for the Natural Sciences Sector and for the Intergovernmental Oceanographic Commission (IOC) to discuss GTOS/UNESCO synergies and annual financial contributions.

Follow-up Action 11/PC: Panel Chairs to develop fund-raising strategy in Panel work plans.

Agenda Item No. 6 GTOS and GEO – current status and coordination of GTOS activities in support of the GEO 2006 work plan

The current GTOS activities within the framework of GEO were reported by the GTOS Secretariat. Discussion followed on issues related to supporting GTOS/GEO interactions and activities, taking into account the temporal, human and financial resources required. In this respect, the importance of coordinating GTOS participation in GEO/GEOSS meetings was discussed, with consensus that GTOS representation at plenary and committee meetings would be coordinated and prioritized through the GTOS Secretariat. In this respect, the importance of participating in the Science and Technology Committee Meeting, before the GEO-III Plenary (Geneva, Switzerland, 28–29 November 2006), was indicated.

This was also the opportunity for the GTOS Programme Director to present the importance of coordinating the delivery of GEO Task CL-06-03 on terrestrial climate observations, and to agree on the alignment of its time frame within existing GTOS requirements for reporting to UNFCCC.

Reviewing a proposal elaborated by the GTOS Secretariat on a protocol for interactions between the GTOS Secretariat and the Technical Panels on GEO/GEOSS, the participants agreed on a protocol (Annex 7).

Follow-up Action 12/PC: GTOS Secretariat to coordinate GTOS participation in GEO meetings.

Agenda Item No. 7 Panel Chair nominations of potential new Steering Committee members

Emphasis was placed in expediting the process of nominations, taking into account gender and geographical balance of the full membership (including Chairs of Panels and Initiatives), so as to have the nominations in place before the next GTOS Steering Committee Meeting (tentatively foreseen for March 2007). The participants were reminded that another five experts were to be nominated, and that one of the previously-appointed experts, Dr Arroyo (Chile), had withdrawn from the Steering Committee.

The current nominations, and their CVs provided by the GTOS Secretariat, were reviewed. The discussion covered the importance of including representation from Russia,

China and Eastern Africa, and expertise in desertification, biodiversity (especially from *in situ* and NGO perspectives) and the social sciences. It was agreed to have a final review by the Panel Chairs so as to arrive at a list of seven recommended nominations to be submitted to the Sponsors for the final appointment of another five new members.

Follow-up Action 13/PC: Panel Chairs, with support of the GTOS Chair and GTOS Secretariat, to elaborate a list of seven recommended nominations to be submitted to the Sponsors for the final appointment of another five new GTOS Steering Committee members.

Agenda Item No. 8 Identification of suitable Steering Committee meeting dates for February–March 2007

The participants were informed that the GTOS Secretariat had consulted GTOS Steering Committee (SC) members so as to identify suitable dates in February–March 2007 for the next GTOS SC Meeting. The financial implications of organizing the Meeting at UNEP headquarters in Nairobi were also discussed. The final date and venue for the GTOS SC Meeting would be communicated by the GTOS Secretariat at the earliest possible convenience, taking into account the appointment of new members.

Follow-up Action 14/PC: GTOS Secretariat, in consultation with Chair and GTOS Steering Committee members, to finalize the identification of dates and venue for the next GTOS SC meeting.

Any other business and closure of the Meeting

Participants were informed of two events and their relevance to GTOS:

- The Earth System Science Partnership (ESS) Open Science Conference (Beijing, China, 9–12 November 2006): opportunity to raise awareness of GTOS activities at the Conference, given the participation of the GTOS Chair.
- Eco Summit 2007 (Beijing, China, 22–27 May 2007): opportunity for GTOS to become one of the sponsors serving in the Scientific Committee.

The meeting was closed.

ANNEX 1 — DRAFT AGENDA

Wednesday, 28 June 2006 ICSU Conference Room
Day 1
Session will start at 09:00
Lunch at 13:00 to 14:00
Session will end at 17:00

Topics to be discussed (Discussion on the action items will be lead by Berrien Moore):
1. Review of the progress made on the action items from the GTOS Steering Committee meeting.
2. Panel Chairs discussion on Panel activities that require coordination or support from other Panels (including requirements, needs, concerns, etc.).
3. GTOS and the Conventions: overall strategy and *modus operandi*.
4. Developing a Strategic Plan for GTOS – discussion on content and progress.
5. Discussion on funding opportunities and strategies, including the importance of widening the donor base and increasing the stability of funding sources. Identify key funding opportunities and strategies. Panel Chairs should bring with them material on funding opportunities.
6. GTOS and GEO – current status and coordination of GTOS activities in support of the GEO 2006 work plan.
7. Panel Chair nominations of potential new SC members (these could then be submitted to the Sponsors for consideration).
8. Identification of suitable SC meeting dates for February–March 2007.

NOTE: the above points should be discussed rather than presented, so please keep presentation material to a minimum.

Thursday, 29 June Library Room
Day 2
Session will start at 09:00
Buffet lunch available with the compliments of ICSU
Meeting will close at 13:00

Topics to be discussed – continuation of agenda from Day 1.

ANNEX 2 — PROGRESS ON ACTIONS ITEMS AGREED AT THE 3RD GTOS STEERING COMMITTEE MEETING

(Data updated in June 2006)

Action 1	GTOS Secretariat: to finalize meeting report and consult SC members on the elements of a new strategic plan. This should take into consideration feedback and information gathered by Lai during the stocktaking exercise.	Due by: March 2006	GTOS Secretariat (GTOS Sec) has finalized the meeting report and circulated for comments to the members of the GTOS Steering Committee (GTOS SC) by e-mail in March 2006. The comments and corrections provided have been incorporated. Mr Lai has compiled and analysed the information collected through interviews and questionnaires and has discussed the preliminary results with GTOS Sec at meeting held at FAO headquarters on 19–20 June 2006. An updated summary report will be sent by Mr Lai to the GTOS Programme Director by the end of July 2006. GTOS Sec has been trying to identify a consultant to lead the development of the GTOS Strategic Plan. Consultations have taken place with Sponsors (bilaterally). GTOS Sec has prepared a draft outline of the scope of the GTOS Strategic Plan, which will be reviewed at the Panel Chairs meeting (28–29 June 2006) and the process for its participatory development will be discussed and agreed at the Panel Chairs Meeting. Target date for completion of this action is February 2007 or one month prior to the GTOS SC Meeting.
Action 2	GOFC-GOLD Executive Director: to circulate CEOS documents reporting progress made on the ECVs.	Due by: February 2006	The documents were provided by GOFC-GOLD to GTOS Sec, which has then circulated them to the GTOS SC members by e-mail.
Action 3	GOFC-GOLD Executive Director: to circulate details of the GOFC-GOLD Jena meeting in March 2006.	Due by: February 2006	The documents were provided by GOFC-GOLD to GTOS Sec, which has then circulated them to the GTOS SC members by e-mail.
Action 4	IGOL Co-Chairs: to ensure that there is adequate socio-economic components in the Theme Report. If possible, the report should include economic estimates and potential "value" of the observations included in the next IGOS Theme Report.	Due by: February 2006	The socio-economic components are currently being taken into account in the development of the IGOL Theme Report.

Action 5	GTOS Sec: to circulate to the members of the GTOS SC the first draft of IGOL Theme Report for review and comments.	Due by: March–April 2006	The IGOL Theme Report is still under development and thus has not yet being circulated to the members of the GTOS SC for review and comments. GTOS Sec will be circulating the document to the members as soon as the draft has been finalized for review.
Action 6	ICSU: to circulate the report on socio-economic data prepared by UNEP and ICSU.	Due by: February 2006	ICSU has provided the GTOS Secretariat with the URL of the "Workshop Report on Socioeconomic Data in Relation to the Integrated Global Observing Strategy Partnership strengthening international science for the benefit of society (IGOS-P)" by e-mail (February 2006), and GTOS Sec has then provided the information to the GTOS SC members by e-mail (February 2006). The URL is here provided for easier reference: http://www.icsu.org/Gestion/img/ICSU_DOC_DOWNLOAD/550_DD_FILE_Socio_Eco_Data_Report.pdf
Action 7	Recommendation: Ensure that cross-referencing and links are established (maybe with cross-membership or cross-participation in respective activities) with other Panels (GOFC-GOLD and TOPC) to improve synergy and to avoid duplication.	Due by: March 2006	Participation of representatives of different Panels in other Panels' meetings has been observed as an instrument to develop the cross-referencing and links among Panels. For information: GOFC-GOLD and TCO representatives participated in the TOPC Meeting held in March 2006; TCO invited the other Panels to participate in the teleconference during the TCO Meeting to be held on 25–26 June 2006.
Action 8	TOPC Chair: to re-visit the Terms of Reference of TOPC to address new issues that now must be addressed as TOPC matures, including the issues of regional studies requiring further guidance and information.	Due by: March 2006	GTOS Sec has discussed the issue with TOPC Chair who has highlighted that the ToRs currently cover all the areas of TOPC and that their focus should remain climate oriented.
Action 9	SC Members: requested to provide guidance on TOPC membership, including identification of new Panel Chair.	Due by: March 2006	The GTOS Sec and the GTOS Chair, together with GCOS Sec, has started consultations on the identification of a new TOPC Chair. At the moment no final decisions has been made on this matter. Inputs and views from the Panel Chairs will be sought during the Panel Chairs meeting to be held on 28–29 June 2006. The final decision will rest with GTOS and GCOS Sponsors.
Action 10	[Deleted]		

Action 11	GCOS Director: to make available the CEOS report on products and specification, which is currently under review.	Due by: March 2006	The Report "Systematic Observation Requirements for Satellite-based Products for Climate – A Supplement Report to the Implementation Plan for the Global Observing System for Climate in Support of the UNFCCC (GCOS-92)" has been made available on the web (GCOS home page) for open review (April 2006) at http://www.wmo.ch/web/gcos/gcoshome.html
Action 12	GCOS, TOPC, GOOS: recommendation that GOOS, GCOS and TOPC interact to ensure there is no unnecessary overlap in GCOS African networks and GOOS planned station installations.	Due by: 2006	GCOS, GTOS (Bob Scholes), TOPC (Alan Belward) and GOOS (Charles Magori) were represented at a meeting in April in Addis Ababa entitled "Climate For Development In Africa", which involved the linkages between observing systems, climate and development in Africa. A summary of the meeting is available through GTOS Sec.
Action 13	GTOS Sec: to improve functions and visibility of TEMS (especially to sites).	Due by: June 2006	Improvement of functions and visibility of TEMS has been demonstrated in the experiment of integration with EcoPort. Analysis of the outcome and consideration of next steps are under way. Progress will be reported to the SC by 1 October 2006.
Action 14	GTOS Sec: to introduce into the site efficient and easy mechanisms that ensure feedback from TEMS users and allow analysis of TEMS success. Establish criteria for success and determine targets that should be reached.	Due by: April 2006	Upon installation of new Web-stat software at FAO HQ, GTOS Sec has contacted the Web-stat staff for processing of statistics on TEMS so as to improve analysis of success. A new improved feedback system will be studied, depending on the evolution of the integration with EcoPort.
Action 15	GTOS Sec: metadata should allow users to determine if data is suitable for their requirements. GTOS should avoid getting into quality control issues (complicated and not enough resources).	Due by: June 2006	GTOS Sec has initiated contacts with the GeoNetwork staff for conversion of the present TEMS metadata structure to the ISO 19115 standard.
Action 16	GTOS Secretariat: should provide on the Web a reference citation to be used in publications that use TEMS resources.	Due by: February 2006	GTOS Sec contacted the FAO Legal Office and the FAO Web-stat staff concerning the Web reference and “Privacy statement”. Clearance has been granted and the new sections published on the TEMS Web site.
Action 17	GTOS Sec: to contact relevant World Data Centers (WDCs) to initiate discussions on possible collaboration. GTOS Panel Chairs to investigate which existing WDCs hold data relevant to their focus areas.	Due by: April 2006	GTOS Sec has contacted the Global Observing Systems Information Centre (GOSIC) in order to determine which World Data Centers match the TEMS admission criteria. This process will allow discussion on possible collaborations with WDCs, and it should lead to their registration into the database.
Action 18	ICSU WDC Panel Chair: circulate documentation regarding the criteria used to determining eligibility of institutions to become a WDC.	Due by: February 2006	Mr Ferris Webster provided GTOS Sec with appropriate documentation, which was then provided to the GTOS SC members by GTOS Sec by e-mail (February 2006)

Action 19	Meeting participants: Send Ferris Webster details of possible institutions that could qualify and might be interested in becoming a WDC (implies a long-term commitment). Institutions are especially needed in Africa because of a need to improve data access in this region.	Due by: March 2006	GTOS Sec to discuss this action at the GTOS Panel Meeting to be held on 28–29 June 2006.
Action 20	C-GTOS Panel Chair: to develop funding strategy, identifying existing and potential available resources and funding gaps.	Due by: May 2006	Development of the strategic funding report underway, with date of completion expected for August 2006. The report will take into account the solicited inputs of UNESCO-IOC on planning and funding of a joint Coastal Panel, resulting from follow-on activities for developing joint ToRs (Action 21).
Action 21	GTOS and GOOS: to develop ToRs for a joint panel on coasts, with explicit milestones, a sunset clause and a Panel size limitation.	Due by: March 2006	Joint ToRs for the GTOS/GOOS joint Coastal Panel have been drafted by the GTOS/GOOS Secretariats, in collaboration with C-GTOS Panel Chair. The ToRs have been sent to the UNESCO IOC for approval at the Executive Council (21–28 June 2006). Pending approval, a Memorandum of Understanding will need to be elaborated for establishing the joint Panel. GTOS Chair Programme Director and Chair C-GTOS will meet ADG/IOC on 29 June 2006 to further discuss the implementation of such a Panel.
Action 22	GTOS Sec: should develop specific criteria on what initiatives qualify as a Panel. Panel reporting guidelines should also be developed.	Due by: May 2006	GTOS Sec has been elaborating a proposal on the issue for insertion in Annex B of the revised version of the GTOS Memorandum. GTOS Chair will seek inputs from Panel Chairs on this issue at the GTOS Panel Meeting to be held on 28–29 June 2006. The revised MoU to be submitted for consideration and adoption by the GTOS Sponsors.
Action 23	Establishment of a B-GTOS design team, to be chaired by Robert Scholes, based on the specifications in Annex VI, approved by the GTOS SC. Development of a B-GTOS draft strategy and implementation plan by the design team, following the mandate provided by the SC in Annex VI.	Due by: September 2006	B-GTOS Chair, with the support of GTOS Sec, has been working towards the identification of experts for a B-GTOS Task Team that will work towards the development of a strategy and implementation plan, which will enable the GTOS SC to make an informed decision regarding the long-term commitment of GTOS to terrestrial observation relating to biodiversity in its broad sense. Further discussion and update on this issue (including the convening of a B-GTOS Meeting) will take place at the GTOS Panel meeting on 28–29 June 2006.
Action 24	GTOS Sec: Chairs of GOFC-GOLD, TCO and TOPC to hold a teleconference to discuss strategies on developing products for the Conventions.	Due by: March 2006	The teleconference will be convened by GTOS Sec as a follow-up to the GTOS Panels Meeting on 28–29 June. An agenda item for the GTOS Panels Meeting (28–29 June 2006) concerns this action and the linkages between GTOS and the Conventions.

Action 25	Based on Conventions document (document 27), a paper should be developed on synergy between the Conventions in terms of observational data needs.	Due by: September 2006?	GTOS Sec, in consultation with GTOS Chair, proposes the establishment of an Inter-Panel Working Group on the Conventions to address this action. This idea will be presented by the GTOS Chair at the Panel meeting on 28–29 June 2006.
Action 26	GTOS Sec, in coordination with the GTOS Panel Chairs, to develop a position paper on the International Year on Deserts and Desertification 2006.	Due by: September 2006?	GTOS Chair proposes not to implement this action, given the time frame. GTOS Sec proposes to discuss actions for the upcoming International Year of Planet Earth in 2008.
Action 27	GTOS Sponsors: to review and select 4 new members of SC (considering expertise, regional location, gender, etc.).	Due by: April 2006	GTOS Sec has requested further nominations and has compiled the information, while identifying other experts for evaluation by GTOS Sponsors. An agenda item for the GTOS Panels Meeting (28–29 June 2006) concerns this action.
Action 28	GTOS Chairman: to organize a two-day GTOS Panel Chairs meeting in Paris at ICSU headquarters (GTOS Sponsors can attend, but not required).	Due by: April 2006	GTOS Panel meeting has been convened by the GTOS Sec at ICSU headquarters (Paris, France) on 28–29 June 2006
Action 29	GTOS Secr: to place details (including picture) of new GTOS SC members on the GTOS Web site.	Due by: April 2006	GTOS Sec has not yet published the details and pictures of the GTOS members on the GTOS Web site, as awaiting publication of the new GTOS Biennial Report. GTOS Sec currently working on the update and additions to the overall Web site.
Action 30	GTOS Secretariat: to identify next meeting date, in February or March of 2007.	Due by: April 2006	GTOS Sec has requested GTOS SC members to provide their availability for GTOS SC meeting in February–March 2007 (since February 2006): dates have not yet identified. An agenda item for the GTOS Panels Meeting (28–29 June 2006) concerns this action.
Action 31	GTOS Sec: teleconference to be held between GTOS Sponsors to discuss new SC member and the contribution of UNESCO to the GTOS initiative.	Due by: April 2006	GTOS Sec has moved the deadline for this action to September 2006, as meeting with UNESCO has been postponed from February 2006 to 29 June 2006.

ANNEX 3 — GTOS STRATEGY FOR SECOND DECADE OF ITS OPERATION — 2006–2015

Contents

1. Introduction

The year 2006 marks the start of the second decade of the Global Terrestrial Observing System (GTOS), which was established by FAO, ICSU, UNEP, UNESCO and WMO in 1996. Preparatory activities for its establishment started in 1992, following the United Nations Conference on Environment and Development (UNCED). The most important results of UNCED have been its action plan for sustainable development – Agenda 21 – and three environmental Conventions:

- The United Nations Framework Convention on Climate Change (UNFCCC). This was amended in 1997 by adoption of the Kyoto Protocol to the FCCC, which commits industrialized countries to reduction targets for greenhouse gasses emissions.
- The Convention on Biological Diversity (CBD).
- The United Nations Convention to Combat Desertification (UNCCD).

The Agenda 21 priority tasks include, i.a., two requirements: bridging the data gap between developing and industrialized countries; and improving the quality and availability of environmental information. Thus, the design of GTOS was directed at specific information needs identified in Agenda 21 and by environmental conventions, rather data collection for its own sake. It was based on three guiding principles:

- Be global in scope, meaning both that its coverage is comprehensive, but regionally balanced and resolved, and that it should address phenomena that are global in their nature and impact.
- Provide continuity of information collection over the long-term periods – from years to decades – that are consistent with the rate at which global processes occur, in order to detect trends sensitively and in a timely fashion.
- Be an integrated system, in which the separate pieces of information add to each other's value. In particular, GTOS data must not only detect and describe environmental changes, but also facilitate their understanding and forecasting.

While the primary purpose of GTOS has been to support global environmental initiatives, its national benefits include greater access to data and new technologies for environmental assessment and planning of sustainable development and management of natural resources.

2. GTOS' first Implementation Plan (GTOS-IP)

GTOS' first Implementation Plan responded to information requirements of Agenda 21 and environmental Conventions by addressing the need to fill the information gaps related to terrestrial ecosystems, including coastal zones and impacts of climate variability on land and water resources. High priority was given in GTOS-IP to the information needs of developing

countries to strengthen their capacities for sustainable development and management of natural resources. Links were established with the other two global observing systems, the Global Climate Observing System (GCOS) and the Global Ocean Observing System (GOOS), to facilitate synergy among their respective activities and promote compatibility of their databases. All three global observing systems (GOS) are managed by United Nations organizations in cooperation with the scientific community and national governments. GTOS has its Secretariat at FAO, GCOS at WMO, and GOOS at the Intergovernmental Oceanographic Commission (IOC), which is part of UNESCO.

The central mission of GTOS, on which the design of GTOS-IP was based, is to provide policy-makers, resource managers and researchers with the data needed to detect, quantify, locate and give early warning of changes in the capacity of terrestrial ecosystems to support human life, and to help advance our understanding of such changes. It should be accomplished through the development of an equitable partnership between data generators and users that meets both the short-term needs of national governments and the longer-term needs of the global change research community.

GTOS data collection is based on four objectives:

- identifying and quantifying the natural and anthropogenic factors that affect terrestrial ecosystem function and structure;
- Determining the relative importance of these factors at the national, regional or global level, and their interactions;
- distinguishing short-term natural variations from long-term changes of anthropogenic origin; and
- assisting modelling and multidisciplinary analysis of possible future changes in terrestrial ecosystems.

Successful realization of the above objectives had to be preceded by:

- establishing a global configuration of *in situ* observation sites representative for each major ecosystem (terrestrial ecosystem monitoring sites – TEMS), based on existing monitoring networks and sites;
- identifying a global set of variables of which observation is required to meet the above objectives;
- developing a hierarchical system of ground- and satellite-based observations of selected variables;
- facilitating harmonization of the GTOS data management framework with internationally accepted protocols and procedures for data collection, processing, database design, management and access; and
- encouraging the upgrading of monitoring site instrumentation and observation procedures where appropriate, and establishment of new sites when required.

Based on the requirements of Agenda 21 and the environmental Conventions, the GTOS-IP identified as its priorities five thematic tasks of global concern:

- Changes in land quality.
- Availability of fresh water resources.
- Loss of biodiversity.
- Climate change.
- Impacts of pollution and toxicity.

The *modus operandi* of GTOS-IP has been based on “partnership of partnerships”, formed by linking together existing but disparate geospatial databases, networks and monitoring sites, as well as satellite- and ground-based observing systems, into a common framework. Considering the global outreach of GTOS, heterogeneity of observing systems, sites and variables, the harmonization of data products and terminology has been one of its most important requirements.

3. New information requirements and developments related to GTOS

While the UNCED Agenda 21 recommendations and the information requirements of environmental Conventions provided the initial *raison d'être* for development of GTOS and its strategy for the first decade of its operation, new, important events related to GTOS objectives that have taken place since the dawn of the new millennium make it necessary to revise the first GTOS-IP. These events include, in particular, the United Nations Millennium Summit in 2000, the World Summit on Sustainable Development (WSSD) in 2002, and the formulation of the Global Earth Observation System of Systems (GEOSS) in 2004–5.

3.1 United Nations Millennium Summit

At the United Nations Millennium Summit in September 2000, the largest gathering of world leaders in history unanimously approved the UN Millennium Declaration that prioritized the international development objectives. In September 2001, the United Nations General Assembly adopted the "Road Map towards the Implementation of the United Nations Millennium Declaration", in which the prioritized objectives were elaborated into a set of eight Millennium Development Goals (MDGs).

These eight goals (with 18 targets and 48 indicators) have become the benchmarks against which advances in international development are judged. Their primary focus is on socio-economic issues, in particular on the reduction of poverty and hunger, improvement of health, gender equality and education. Two MDGs are directly related to the GTOS-IP objectives: MDG #7 – Ensure environmental sustainability – and MDG #8 – Develop a global partnership for development. The new strategy of GTOS should include collection of data that enable monitoring of links among sustainable development, the state of environment and socio-economic conditions.

3.2 World Summit on Sustainable Development

The World Summit on Sustainable Development (WSSD), which took place in Johannesburg, South Africa, in 2002, also emphasized the importance of socio-economic issues for sustainable development. It identified three sustainable development pillars: economic; social; and environmental. WSSD adopted two main documents:

- the Johannesburg Declaration on Sustainable Development; and
- the WSSD Plan of Implementation.

The Johannesburg Declaration on Sustainable Development traces the road from the Stockholm United Nations Conference on the Human Environment, which took place in 1972, to UNCED in 1992, and WSSD in 2002. It addresses new challenges, such as deepening fault lines between rich and poor; biodiversity depletion; degradation of land and water resources; and demographic shifts caused by continuing population increase in developing countries and urbanization. It reaffirms a commitment to sustainable development and to building a humane and equitable global society, but calls for reformulation of sustainable development strategies to include poverty reduction goals.

The WSSD Plan of Implementation provides a framework for action. It contains over 30 targets, many stemming from the MDGs. In comparison with Agenda 21, it places more emphasis on social aspects of the development agenda, in particular on eradication of poverty and on good governance.

3.3 The Global Earth Observation System of Systems (GEOSS)

In July 2003, responding to MDG targets and WSSD recommendations, the ministers of 33 countries and the representative of the European Commission at the First Earth Observation Summit in Washington D.C., USA, decided to commence development of a comprehensive, coordinated and sustained Earth Observation System. To further this goal, they established the ad hoc intergovernmental Group on Earth Observation (GEO). Membership in GEO is open

to all Member States of the United Nations and the European Commission. Intergovernmental, international and regional organizations with a mandate in Earth observation or related activities can become participating organizations. At present (2006), GEO includes 64 member countries, the European Commission, and 43 participating organizations.

The Second Earth Observation Summit, held in Tokyo, Japan, in April 2004, adopted the Framework Document for a 10-year Implementation Plan (IP) for the Global Earth Observation System of Systems (GEOSS). The Third Earth Observation Summit, held in Brussels, Belgium, in February 2005, endorsed the GEOSS IP and designated the intergovernmental Group on Earth Observation to manage GEOSS implementation.

The holistic concept of Earth observation adopted by GEOSS represents a departure from earlier approaches that looked at individual components of the Earth's system. The existing Earth observation systems will provide essential building blocks for GEOSS, which will be supporting their interoperability, reaching a common understanding of user requirements, addressing critical gaps and improving delivery of information to users. Its implementation will seek to ensure effective consultation and cooperation with the UN System and other international and national agencies sponsoring or co-sponsoring Earth observation systems.

Based on the MDGs and the WSSD recommendations, the implementation of GEOSS will focus on nine societal benefit areas:

- Reducing loss of life and property from natural and human-induced disasters.
- Understanding environmental factors affecting human health and well-being.
- Improving management of energy resources.
- Understanding climate variability and change, and assessing, predicting, mitigating and adapting to their impacts.
- Improving water resources management through better understanding of the water cycle.
- Improving weather information, forecasting and warning.
- Improving the management and protection of terrestrial, coastal and marine ecosystems.
- Supporting sustainable agriculture and combating desertification.
- Understanding, monitoring and conserving biodiversity.

Examples of GEOSS tasks, related to GTOS objectives, which will be initiated in 2006, include:

- Natural disasters mitigation and early warning.
- Demonstrating the utility of Earth observations for human health needs.
- Assessing the benefits of Earth observation-derived information for sustainable energy management.
- Expanding observations of climate variables.
- Improving and expanding space-based and *in situ* observations of hydrological variables.
- Encouraging the development of advanced weather forecasting systems and data dissemination methods.
- Initiating planning for a global carbon observing system.
- Improving tools for space-based and *in situ* ecosystems observations, pursuing harmonization of ecosystems observing methods, and developing a global operational scheme for ecosystems classification.
- Advocating for the development of new applications for Earth observation data in the agriculture, forestry and fishery sectors, especially in developing countries.
- Developing coherent biodiversity observation strategies within the context of an agreed-upon ecosystem classification system.

4. GTOS' vision statement for its second decade of operation

There is no challenge facing humanity that is more important than managing the Earth's environment to ensure that it can sustain life in all its forms. All other problems – and they are

both innumerable and serious – fade in comparison with this primary, life preservation task. Sustainable management of the environment requires availability of reliable data that provide objective information on its current status and past changes, and enable prediction of future trends. Yet, in spite of over 30 years of Earth observation from satellites, and completion of numerous mapping and monitoring projects, such data, at appropriate scales and temporal intervals and in user-friendly formats, remain in short supply. The situation is particularly serious in developing countries because of continuing high rates of population increase, widespread poverty and hunger, and degradation of land and water resources. Lack of coordination and compatibility among existing data, projects and their information products has contributed to this situation.

GTOS, during the first decade of its operation, established a global framework for multilevel, systematic and consistent terrestrial observations from satellite and ground platforms. At present, GTOS is configured as four Panels (GOFC-GOLD, TOPC, TCO, C-GTOS), initiatives and networks (hydrology, river runoff, permafrost, glaciers, mountains, etc.). TEMS contains 40 observation networks, hundreds of participating institutes, and over 2000 terrestrial ecosystem monitoring sites. TEMS includes sites representative for the main terrestrial ecosystems, from coastal to mountain ecosystems, rain tropical forest to boreal forest, deserts to wetlands. The database contains site metadata and data and technical descriptions of a set of 120 essential terrestrial variables.

GTOS, during its second decade of operation, will continue further development of its configuration and capacity to account for new developments in Earth observations and information requirements, as outlined in the preceding section. In particular, it will promote and support generation of geospatial information products required for timely attainment of MDGs, and integrate its operation with GEOSS.

By the end of its second decade, GTOS will have contributed to sustainable management of terrestrial ecosystems through increased availability of a wide range of Earth observation data and information products designed to meet user requirements. Societal benefits from its products and services would be enhanced through the GTOS and GEOSS partnership. An important component of GTOS operation would be strengthening international cooperation in sharing Earth observation data and developing information products, and increasing institutional capacities in developing countries to ensure effective application of these products.

5. Proposed outline of GTOS' Strategy for its second decade (2006–2015)

GTOS' strategy for its second decade could follow a four-pronged approach:

- Coordinate development of new Earth observation initiatives and their applications to sustainable management and monitoring of terrestrial ecosystems, with priority focus on societal benefit areas identified by MDGs, WSSD and GEOSS.
- Support international environmental Conventions (UNFCCC, CBD, CDC, Ramsar) in meeting their objectives.
- Further strengthen GTOS networks and capacities for sustained global observation of terrestrial ecosystems.
- Assist developing countries with strengthening their institutional capacities for effective use of Earth observation data and information products.

Issues and background factors that need to be considered in developing a new strategy are considered below.

5.1 The Millennium Development Goals and WSSD recommendations

The MDGs and WSSD recommendations underscored the importance of ensuring environmental sustainability and developing a global partnership for development. Attainment

of these goals ought to be based on reliable global assessments and observations, including land cover and land use, their changes and future trends. GTOS should identify where it can contribute and facilitate, supporting stakeholders in reaching and monitoring the eight MDG goals (including the 18 targets and 48 indicators), especially those related to environmental sustainability (MDG #7) and a global partnership for development (MDG #8). The new GTOS strategy could include collection of data that enable monitoring of links among sustainable development, the state of the environment, and socio-economic conditions. GTOS should promote and support generation of geospatial information products required for timely attainment of MDGs.

Certain societal benefit areas could be selected as GTOS priorities for its second decade, based on information requirements for MDGs and WSSD, and the GEOSS 10-Year Implementation Plan (2006–2015) and Work Plan for 2006, including:

- **Climate**: assessment of impacts of climate variability on terrestrial ecosystems, including its human and economic aspects (e.g. due to agricultural drought, or land degradation).
- **Water**: improving and expanding space-based observations for hydrological variables, providing inputs to hydrological models, and for management of watersheds and coastal zones.
- **Ecosystems**: improving the management and protection of terrestrial and coastal ecosystems by monitoring changes in land cover and land use, land degradation and water pollution.
- **Agriculture (Agronomy, Livestock and Forestry)**: monitoring land cover changes at global level, based on existing data sets and new observations; providing inputs to food security early warning systems in Africa; monitoring changes in net primary productivity; global inventory of irrigated areas; and assessment of aquaculture potential.
- **Terrestrial carbon**: global inventory of carbon natural sinks and monitoring their change, using on space- and ground-based observation data.
- **Biodiversity**: developing coherent biodiversity observation methodology, global biodiversity monitoring, and assessment of trends.

5.2 New priorities for Earth observation of terrestrial ecosystems

New priorities for Earth observation of terrestrial ecosystems, as formulated by MDGs, WSSD and GEOSS, will require further strengthening of GTOS networks and capacities, with a focus on societal benefit applications. For example, new or strengthened capacities will be needed for monitoring of large-scale demographic shifts in developing countries caused by increasing population, climate variability, land degradation, and rapid urbanization. Improved forecasting, monitoring and mitigation of natural disasters, including establishment of early warning systems (e.g. for floods or agricultural drought), will also require expansion of present GTOS networks and capacities.

5.3 Assistance to the international environmental Conventions and MEAs

GTOS needs to clearly determine the support it will provide to the international environmental Conventions and Multilateral Environmental Agreements (MEAs), and in particular UNFCCC, UNCDD, CBD, Ramsar and CMS, in monitoring and assessments exercises at the local, national, regional and global scales within the framework of Target 2010 and the MDGs. In particular, GTOS should facilitate the harmonized collection, analysis and exchange of relevant information related to loss of biodiversity, land degradation and climate change. Actions and activities would include:

- The need for an informal working group on Environmental Conventions in order to provide a steering group for GTOS activities (e.g. projects or initiatives development; participation or statement at statutory meetings; cooperation agreements) in support of the Conventions.

- Close collaboration with the Secretariats and the scientific or advisory bodies of the CBD, CMS and the Ramsar Convention to identify GTOS products and services relevant to development and implementation of indicators for measuring progress towards Target 2010, and to implement mechanisms to support the countries (in particular developing countries) Parties to the Conventions in assessing progress towards Target 2010. GTOS Technical Panels and Initiatives should be enabled to contribute actively to the implementation of the Conventions and to global and regional exercises like Target 2010 (e.g. SEBI2010, 2010BIP, Countdown2010).
- Close collaboration with the UNCCD Secretariat, the Committee on Science and Technology (CST), and in particular with the Committee for the Review of the Implementation of the Convention (CRIC), to identify relevant GTOS tools, products and services. GTOS Technical Panels and Initiatives would assist in development through training workshop modules specific to the collection, analysis and exchange of land degradation data, in collaboration with the Global Land Cover Network (GLCN) and other specialized entities.

5.4 United Nations Framework Convention on Climate Change (UNFCCC)

One of the stakeholders that has already requested the assistance of GTOS and its sister observing system (GCOS) is the SBSTA of the UNFCCC. GTOS, mainly through TOPC, has contributed to the development of the Implementation Plan for GCOS, the Adequacy reports, and the development of the essential climatic variables (ECVs). In particular, GTOS has been requested to assess the status of the development of standards for each of the ECVs in the terrestrial domain, and to initiate the development of a framework for the preparation of guidance materials, standards and reporting guidelines for terrestrial observing systems for climate and associated data and products. In addition, there is collaboration with the space agencies to ensure optimum use of earth observing satellite data for monitoring the terrestrial component of the climate system.

Another important dimension is the continuing work being undertaken with the networks (GTN) to identified gaps and ensure adequate coverage for each ECV.

5.5 Global Earth Observation System of Systems (GEOSS)

GTOS should assist in the GEOSS process and contribute to the terrestrial applications of Earth observations from space-based, airborne and ground systems. GTOS should derive benefits through expanded linkages with organizations participating in GEOSS, and the harmonization of their respective activities and products. Opportunities for sharing funding in targeted areas should be explored. It is hoped that the GEOSS process will undertake the important task of identifying gaps and overlaps in earth observations, and develop these issues to resolution. Due to the broad scope of GEOSS, GTOS should determine and engage in strategic areas of interest that fulfil its other mandates and goals.

5.6 Integrated Global Observing Strategy (IGOS)

GTOS has contributed to the development of a number of the theme reports of the Integrated Global Observing Strategy (IGOS), especially for Carbon, Coastal, Cryosphere, Land and Water. GTOS needs to ascertain its role in the implementation of the components of these themes. In particular, GTOS should take a leading role in the implementation of the Land theme (possibly even hosting the implementation office) and relevant components of the other themes (especially Coastal and Carbon). Priority should be given to observations and products required to achieve the goals of the main GTOS stakeholders.

5.7 Standards, validation and data access

Through its partnership with other initiatives (especially GEOSS), GTOS should assist in the development of common standards for data quality, database access, interoperability and data

transfer protocols (to allow data harmonization and development of regional and global products). It should also ensure quality of products using multiple data sources (e.g. use of multiple sensor and *in situ* data) and validation should be carried out using standard protocols. The Land Cover Classification System (LCCS) being adopted as an international ISO standard is a route that should be considered for the other terrestrial variables. GTOS should also assist in data management, database creation and maintenance, and dissemination. Data access should be considered in all its aspects (physical access, format, metadata, support, etc.). In addition, data consistency and continuity are important areas to be considered.

5.8 Outreach

The objective of GTOS outreach activities is to raise awareness and understanding of GTOS objectives and its societal benefits, and to promote participation in its activities. GTOS could undertake the following outreach activities during its second decade:

- appraisal workshops for policy-makers;
- management of the GTOS internet Web site;
- production of GTOS bulletins and news notes; and
- presentation of GTOS activities at scientific conferences.

An important component of GTOS operation will be strengthening international cooperation in sharing Earth observation data and developing information products.

Another important aspect of outreach is to ensure that the products developed and released by GTOS are validated and are, if possible, directly relevant to the end-user community (especially the key stakeholders). Earth observation products need to be promoted and their use in reaching policy and management goals need to be demonstrated.

5.9 Capacity building

The objective of GTOS capacity building activities is to assist developing countries through strengthening their institutional capacities for effective use of Earth observation data and information products in sustainable management of terrestrial ecosystems. Potential GTOS capacity building activities during its second decade include:

- Training courses for resource managers and land use planners.
- Implementing demonstration projects.
- Producing technical reports and guidelines.
- Facilitating study tours and scientific exchanges.
- Increasing institutional capacities in developing countries to ensure effective application of products (in both the scientific and policy and management spheres.

5.10 Cross-cutting issues

Cross-cutting issues need to be considered in a holistic context to be receptive to the totality of potentially germane activities. These will of necessity have to cover a conceptually broad gamut: socio-economic aspects; data access and distribution; responsibilities, both shared and specific; roles advocacy, advisory, facilitation and coordination; capacity building; implementation mechanisms; donor and support; science development vs operational issues; interlocutory role in engaging with key stakeholders; etc. Also to be borne in mind is GTOS's role in national activities and implementation. There is the potential for development of an interaction mechanism to provide an integrative bridge between the vertically oriented international scientific pillars and the horizontal social dimensions paramount at national level. In this context, the terrestrial framework being developed by UNFCCC might be an example for emulation.

5.11 Other user groups to be considered

Although GTOS will define its principle stakeholders, it might also want to carry out a detailed stakeholder analysis to determine who are the major and minor stakeholders, and

what are their roles, needs, priorities, linkages and interactions. GTOS would then need to determine how and with whom to interact. Stakeholders include:

- **International Conventions** To assist in implementation and develop of products tailored to the requirments of the UN Conventions (CBD, UNCCD, UNFCCC, Ramsar, etc.).
- **Regional and international agencies and institutions** For undertaking regional and global analyses of environmental change; advising governments on the state of the global environment; for regional and global early warnings; supporting regional action plans; and determining development priorities.
- **National governments and NGOs** For interpreting the national state of the environment (including natural resources and biodiversity) in relation to global processes; assessing the efficacy of existing conservation systems in natural and managed ecosystems; planning and executing appropriate land and water management for sustainable development; and supporting national action plans. As State Parties to the Conventions, national governments are an important end user category.
- **Global Change Research community** For detecting global change and to develop and validate global change assessment models (university research departments; international, national and regional research institutions and laboratories, including ESA, NASA, etc.).
- **Sponsors and Donor Group** GTOS will need to attract sponsors and donor support in identifying linkages of interest with GTOS goals. There is a risk of orienting GTOS activities to opportunistic activities to meet donor requirements, whilst losing sight of the overall objectives of the GTOS initiative.

5.12 Adequacy of GTOS current structure

Once the new goals, purpose and outputs of GTOS have been determined, it will be important to assess if the current organizational structure of GTOS (Panels, activities, networks, etc.) is suitable to implement the required activities.

In addition to points highlighted in the preceding sections, in the subsequent sections attention is drawn to a number of continuing activities of direct relevance to the broad scope of GTOS.

5.13 GOFC-GOLD

GOFC-GOLD initially focused on defining the requirements for observational products and their specifications, mainly for the needs of global change science and the natural resources communities. More recently, GOFC-GOLD has also directed its efforts towards addressing needs for terrestrial observations for the following initiatives:

- International environmental Conventions, such as UNFCC, UNCCD, CBD and Ramsar.
- Implementation Plan for the Global Climate Observing System (GCOS).
- Land theme of the Integrated Global Observing Strategy (IGOS).
- Societal benefit areas of the Global Earth Observation System of Systems (GEOSS).
- Proposed international Land Earth Observation Satellite network composed of multiple satellites with 30-m (or better) capabilities.

The goals of GOFC-GOLD, revisited and reported in the strategy document, are to be progressed further, largely through Regional Networks, i.e. voluntary groups of scientists within a specific geographical region, whose work is directly relevant to GOFC-GOLD's mission. In addition, GOFC-GOLD has two so-called Implementation Teams, dedicated to global implementation of relevant activities on Land Cover and on Fire, respectively.

Summary of Top Priorities for GOFC-GOLD Land Cover

The recent land cover requirements identified by GEOSS, coupled with the GCOS implementation plan, encourage the Land Cover team to work on the following priorities:

- Encourage consistency, continuity, adequacy and accessibility of coarse and fine resolution satellite and *in situ* land cover observations.

- Establish international standards and specifications for the production of land cover characterization maps, and their accuracy assessment. Implementation is ensured through the joint international harmonization and validation framework.
- Cooperate with ongoing international mapping initiatives (e.g. GLOBCOVER).
- Further engage in capacity building (link to GLCN) and regional partnerships and networks.
- Implement land cover harmonization and interoperability case studies to make best use of existing resources.

Summary of Top Priorities for GOFC-GOLD Fire

Future priorities for GOFC-GOLD Fire are to:

- Advocate international space agency coordination of global high resolution data acquisition and availability.
- Obtain meteorological agency support for the global geostationary fire network.
- Ensure operational fire monitoring capabilities on the National Polar-orbiting Operational Environmental Satellite System (NPOESS) and the (EUMETSAT) Metop system, providing data continuity (MODIS and Landsat (NPOESS), AVHRR (METOP)).
- Develop an international collaborative programme on global burned area product validation.
- Obtain support to run the regional network fire programmes and develop capacity building programmes on the use of satellite fire data.
- Identify research priorities and gaps, e.g. fire-affected area, rather than just burned area.
- Establish GOFC-GOLD Fire as a coordination mechanism for securing the necessary fire observations for GEOSS and products in support of the international Conventions.

5.14 TOPC

The main activities conducted by TOPC are within the framework of the support to the UNFCCC highlighted in Section 5.4, above.

5.15 TCO

TCO considers three broad categories of information: *in situ* data, remote sensing data, and terrestrial ecosystems data. The TCO overarching goals are to: (i) better identify the potential users and the required data and scale; (ii) collect, organize, harmonize and coordinate that data, from local to regional and global scale; and (iii) act as a link between the science community and potential users. To these ends, TCO should coordinate international response to scientific and policy needs for reliable data and information about carbon at different levels (spatial distribution and temporal dynamics of terrestrial C sources and sinks; quantity and rate of change in terrestrial and atmosphere ecosystems).

The new TCO mission is to act as links between science and operation and focus on specific products and services, aiming to improve our understanding of the carbon cycle and to create a “common forum” for scientists and stakeholders interested in carbon accounting.

Main TCO issues and activities include:

- identification of the potential users, and funds raising;
- identification of the required data set and launch of a global database;
- harmonization and the validation process;
- the spatial scale and the importance of the regional aspect;
- anthropogenic sources of green-house gases (GHGs) – the role of cities;
- links with the environmental Conventions;
- avoided deforestation;
- fires;
- links with other programmes;
- dissemination and capacity building; and

- products (TCO will be a products-oriented programme).

A feasible timetable is being developed for the next two year period.

5.16 C-GTOS

The GTOS and GOOS Secretariats are in the process of establishing the mechanisms, terms of reference and agreements for development of a Joint Panel for Integrated Coastal Observations (J-PICO), to develop jointly GTOS and GOOS coastal activities and to better support other international mechanisms addressing coastal observations (e.g. GEO Coastal Community of Practice, IGOS Coastal theme, and coastal initiatives in support of MEAs). C-GTOS is in the process of implementing three of the five priority products (management of conservation and cultural sites in the coastal zone; distribution of sites appropriate for analysis of delivery systems; and enhancement of TEMS database for coastal users). In addition, it is establishing the partnership on wetland mapping and inventory, with outputs towards the 2006–2008 work plan of the Scientific and Technical Review Panel (STRP) of the Ramsar Convention.

5.17 TEMS

The TEMS vision is to unite the fragmented terrestrial *in situ* observations community into a cohesive and strong entity that will address in a more efficient way the challenges posed by global environmental change.

Issues to be considered include:

- enhancing services;
- integrating with other databases;
- improving metadata and data inputs;
- filling geographical and observational *in situ* gaps (for multiple users); and
- promoting the use of standards and methods to generate and make available the required data products.

TEMS could have a strategic role in gathering the required ECVs, using the agreed standards and methods. The Web access could then act as the interface to the data and information gathered at site level. What is generated should also support other national and international activities, including GEO, IGOS and the MEAs.

5.18 B-GTOS

The new biodiversity initiative of GTOS is intended to assist in access to geospacial and ecological data required by the international community in reaching Target 2010 within the framework of the Conventions and related MEAs. B-GTOS will develop products and services to support the work of the CBD and other Biodiversity-Related Conventions. A task team of biodiversity experts has been established to steer such a process.

6. Conclusion

A proposed GTOS strategy for its second decade is to transform the capacity for global, comprehensive and sustained observation of terrestrial ecosystems from space and ground platforms that was developed and tested during its first ten years (1996-2005), into tangible societal benefits identified by MDGs and the WSSD. Attainment of this objective will be helped by planned partnership with the newly established international GEOSS.

It is often argued that the ecological footprint of humanity has reached its limits and that the Earth cannot support further population increase. Yet, the world's population of 6.5 billion is still rapidly growing, particularly in the least developed countries. The latest population projection by the United Nations estimates another 40% population growth in the next 50 years. That is an increase of about 2.5 billion people, which equals the total population of the world in 1950. Such an increase in population demands mobilization of all our resources to be

able to assure adequate food supplies while preserving the Earth's environment for future generations.

Assuring the availability of reliable, timely and affordable information on the state of ecosystems, their past changes and future trends is an essential part of the solution. GTOS offers such capacity and its planned partnership with GEOSS will further strengthen it. Realization of the GTOS 10-Year Strategic Plan will greatly contribute to fulfilment of this task.

ANNEX 4 — RESOLUTION OF THE THIRD EARTH OBSERVATION SUMMIT

(As adopted 16 February 2005)

We, the participants in the Third Earth Observation Summit held in Brussels, Belgium, on February 16, 2005:

Recalling the Declaration of the first Earth Observation Summit, held in Washington, D.C., on July 31, 2003, and the Framework Document adopted at the Second Earth Observation Summit, held in Tokyo, on April 25, 2004;

Building on the commitment made at those Summits to move toward a comprehensive, coordinated, and sustained Earth observation system of systems, taking into account the particular needs of developing countries;

Remaining cognizant of the fact that observing and understanding the Earth system more completely and comprehensively will expand worldwide capacity and means to achieve sustainable development as envisioned in our commitments in the Johannesburg Plan of Implementation adopted at the 2002 World Summit on Sustainable Development, and will yield advances in many specific societal benefit areas, including disaster reduction, health, energy, weather, climate, water, ecosystems, biodiversity, agriculture and combating desertification;

Acknowledging the achievements of the established national, regional, and international observing systems, including those sponsored and cosponsored by a number of UN Specialised Agencies and Programmes; and

Determined to build upon, strengthen and expand, where appropriate, the established observing systems by working with and through existing planning and coordination mechanisms;

Affirm our support to the process, recognizing the increased attention to our initiative with more countries and organizations participating since the first Summit;

Acknowledge with appreciation the work of the *ad hoc* Group on Earth Observations (GEO) to develop a 10-Year Implementation Plan, based on user requirements and building on existing systems, and seeking to undertake concerted capacity-building efforts, especially within developing countries;

Endorse the 10-Year Implementation Plan as the basis for its further development and for establishing a Global Earth Observation System of Systems (GEOSS) to fulfil user requirements among various socio-economic benefit areas;

Note with appreciation the extensive supporting information compiled in the GEOSS 10-Year Implementation Plan Reference Document prepared by the *ad hoc* GEO;

Establish the intergovernmental Group on Earth Observations (GEO), to take those steps necessary to implement GEOSS in accordance with its implementation plan;

Encourage the governments of all UN member states to participate in GEO and invite the governing bodies of the UN Specialised Agencies and Programmes and other relevant international and regional organizations, which sponsor and cosponsor established global, regional, and national observing systems, to endorse the implementation of GEOSS and to encourage and assist GEO in its work;

Request GEO to consult the intergovernmental and other sponsors of the component systems of GEOSS on progress and on issues involved in implementation of the Plan;

Affirm our intention to provide the support necessary to execute the GEOSS 10-Year Implementation Plan;

Resolve to meet again, before the end of 2007, to take stock of progress and provide further guidance towards the successful implementation of GEOSS; and

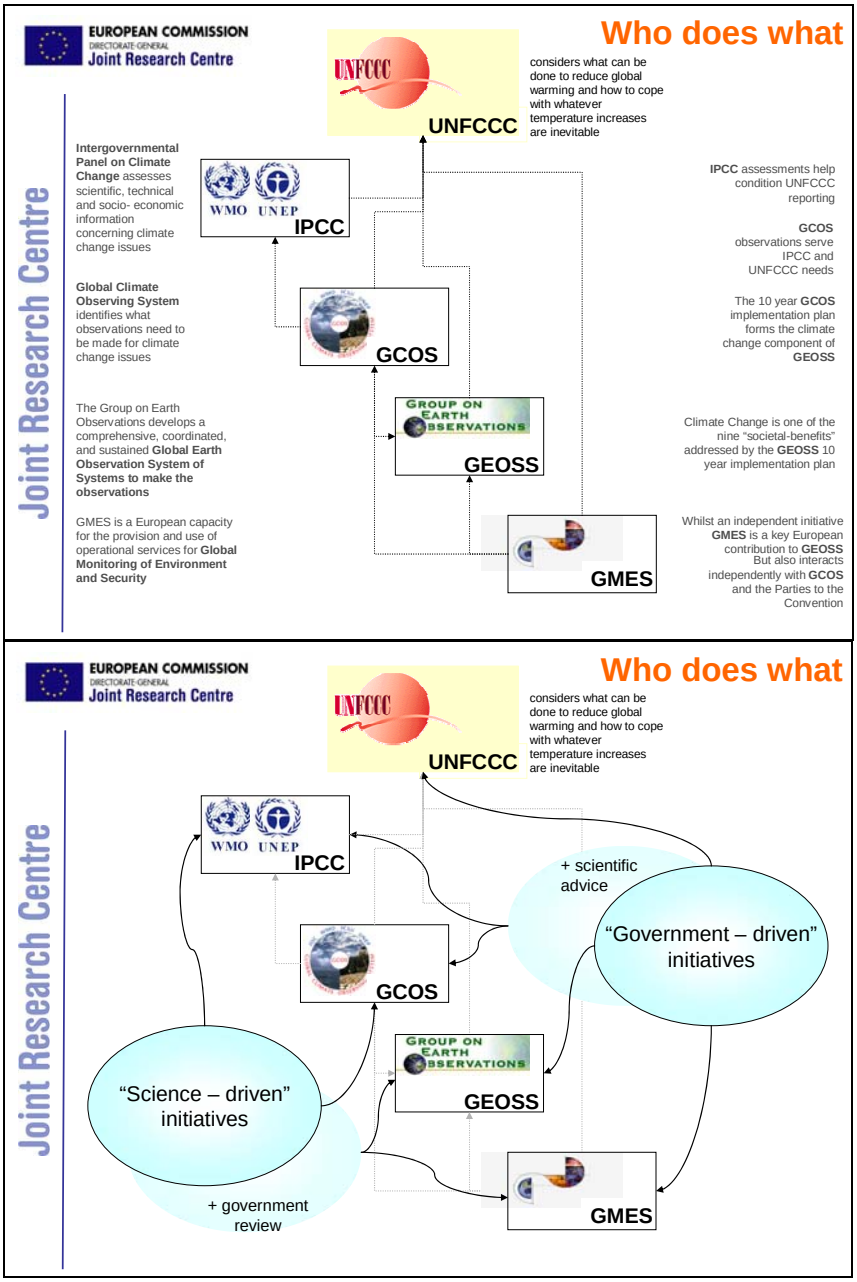
Resolve to conduct a mid-term assessment of GEO by 2010.

ANNEX 5 — UN MILLENNIUM DEVELOPMENT GOALS (MDGs)

1. Eradicate extreme poverty and hunger	• Reduce by half the proportion of people living on less than a dollar a day • Reduce by half the proportion of people who suffer from hunger
2. Achieve universal primary education	• Ensure that all boys and girls complete a full course of primary schooling
3. Promote gender and equality and empower women	• Eliminate gender disparity in primary and secondary education preferaably by 2005, and at all levels by 2015
4. Reduce child mortality	• Reduce by two thirds the mortality rate among children under five
5. Improve maternal health	• Reduce by three quarters the maternal mortality ratio
6. Combat HIV/AIDS, malaria and other diseases	• Halt and begin to reverse the spread of HIV/AIDS • Halt and begin to reverse the incidence of malaria and other major diseases
7. Ensure environmental sustainability	• Integrate the principles of sustainable development into country policies and programmes; reverse loss of environmental resources • Reduce by half the proportion of people without sustainable access to safe drinking water • Achieve significant improvement in lives of at least 100 million slum dwellers, by 2020
8. Developm a global partnership for development	• Develop further an open trading and financial system that is rule-based, predictable and non-discriminatory, includes a commitment to good governance, development and poverty reduction— nationally and internationally • Address the least developed countries' special needs. This includes tariff- and quota-free access for their exports; enhanced debt relief for heavily indebted poor countries; cancellation of official bilateral debt; and more generous official development assistance for countries committed to poverty reduction • Address the special needs of landlocked and small island developing States • Deal comprehensively with developing countries' debt problems through national and international measures to make debt sustainable in the long term • In cooperation with the developing countries, develop decentand productive work for youth • In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries • In cooperation with the private sector, make available the benefits of new technologies— especially information and communications technologies

ANNEX 6 — PANEL CHAIRS' SLIDES ON THE DEVELOPMENT OF A NEW STRATEGIC PLAN FOR GTOS

Alan Belward's Slides (TOPC Outgoing Panel Chair)



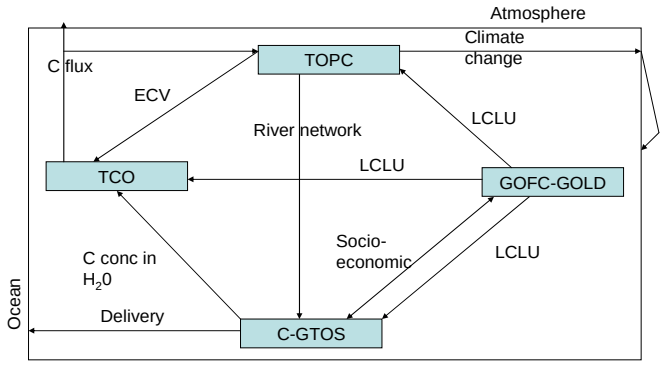
Robert Christian's Slides (C-GTOS Panel Chair)

GTOS Strategies and issues

- Need to cross-link panels
  - Joint members, but how to attract with twice the work load.
  - Identify variables of common interest, commonalities and differences, and lead partner - what can be done to strengthen cross-use.
  - Joint funding opportunities.

Straw person Carbon – GLADIS

e.g., $Issue_1$: Terrestrial impacts on Atmospheric C transcend vertical fluxes alone.
e.g., $Issue_2$:Urbanization promotes atmospheric C production with positive feedbacks.



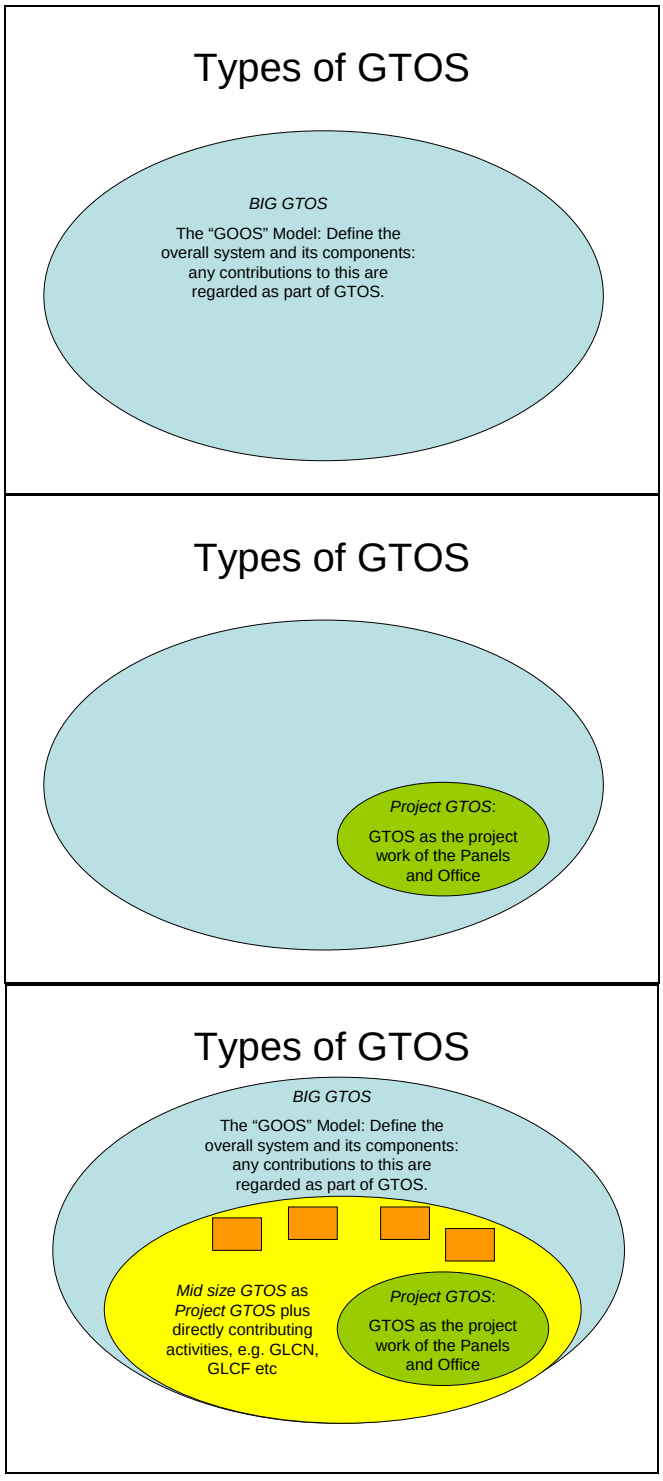
TEMS

- What to do with a 20th database in the 21st century?
  - Must provide positive feedback to sites
  - Must be more interactive to user.
  - Must be up-to-date with activities of GTOS

OR

- Is there another approach?

John Townshend's Slides (GOFC-GOLD Panel Chair)



ANNEX 7 — PROTOCOL AGREED AT THE PANEL CHAIRS MEETING FOR GTOS INTERACTIONS WITH GEO

Working procedures for GTOS interaction with GEO:

- GTOS secretariat will provide periodic synthesis on meeting information, invitations and documents from the GEO Secretariat. This will be provided via e-mail to GEO contacts within each panel, and/or directly to GTOS contacts for individual tasks.
- GTOS secretariat will coordinate attendance of GTOS representation at major GEO meetings (GEO Plenary and Committee meetings). In the case where GTOS secretariat members are not attending, it is requested that other GTOS members attending facilitate the submission of any written contributions and presentations of GTOS contributors. Ongoing correspondence will be required on this matter.
- GTOS panels that are a lead contributor on tasks should have representatives attending related GEO Committee meetings. This will not be required for those meetings where members of the GTOS secretariat can attend on behalf of GTOS.
- To facilitate coordination of GEO-related activities, all official correspondence should included electronic copies sent to the GTOS secretariat (e-mail to: GTOS@fao.org).

ANNEX 8 — LIST OF PARTICIPANTS

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ANNEX 9 — ACRONYMS USED IN THE REPORT

2010BIP	See BIP
ADG	Assistant Director-General
B-GTOS	Biodiversity initiative of GTOS
BIP	Biodiversity Indicators Partnership (2010)
CBD	Convention on Biological Diversity
CEOS	Committee on Earth Observations Satellites
C-GTOS	GTOS Coastal Panel
CMS	Convention on the Conservation of Migratory Species of Wild Animals
COP	Conference of the Parties
CRIC	Committee for the Review of the Implementation of the Convention
CST	Committee on Science and Technology
CV	curriculum vitae
EC	European Commission
ECVs	Essential Climate Variables
ESA	European Space Agency
ESS	Earth System Science Partnership
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GCOS	Global Climate Observing System
GEF	Global Environment Facility
GEO	Group of Earth Observations
GEOSS	Global Earth Observation System of Systems
GIP	GCOS Implementation Plan
GLCN	Global Land Cover Network
GMES	Global Monitoring for Environment and Security
GOFC-GOLD	Global Observation of Forest and Land Cover Dynamics (GTOS)
GOSIC	Global Observing Systems Information Center
GOOS	Global Ocean Observing System
GTN	Global Terrestrial Observing Network
GTOS	Global Terrestrial Observing System
GTOS-IP	Global Terrestrial Observing System Implementation Plan
GTOS SEC	Global Terrestrial Observing System Secretariat
HQ	headquarters
ICSU	International Council for Science
IGOL	Integrated Global Observing Strategy – Land Theme
IGOS	Integrated Global Observing Strategy
IGOS-P	Integrated Global Observing Strategy Partnership
ILTER	International Long-Term Ecological Research
IOC	Intergovernmental Oceanographic Commission
IP	Implementation Plan
IPCC	Intergovernmental Panel on Climate Change

IPY	International Polar Year
ISO	International Organization for Standardization
J-PICO	Joint Panel for Integrated Coastal Observations
LADA	Land Degradation Assessment in Drylands
LCCS	Land Cover Classification System
MA	Millennium Ecosystem Assessment
MAB	Man and the Biosphere Programme
MDG	Millennium Development Goal
MEA	Multilateral Environmental Agreement
MedWet	Mediterranean Wetlands Initiative [Ramsar]
MoC	Memorandum of Cooperation
MoU	Memorandum of Understanding
NASA	National Aeronautics and Space Administration
NGO	non-governmental organizations
NPOESS	National Polar-orbiting Operational Environmental Satellite System
PA	protected area
Ramsar	Ramsar Convention on Wetlands
SBSTA	Subsidiary Body for Scientific and Technological Advice [UNFCCC]
SBSTTA	Subsidiary Body for Scientific, Technical and Technological Advice [CBD]
SC	Steering Committee
SEBI2010	Streamlining European Biodiversity Indicators for 2010
STRP	Scientific and Technical Review Panel [Ramsar]
SWS	Society of Wetlands Scientists
TCO	Terrestrial Carbon Observations
TEMS	Terrestrial Ecosystem Monitoring Sites
TOPC	Terrestrial Observation Panel for Climate
ToRs	Terms of Reference
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNECA	United Nations Economic Commission for Africa
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational Scientific and Cultural Organisation
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
WDC	World Data Centers
WCP	World Climate Programme
WHC	Convention Concerning the Protection of the World Cultural and Natural Heritage ("World Heritage Convention")
WMO	World Meteorological Organization
WSSD	World Summit on Sustainable Development