

GCOS STEERING COMMITTEE
SEVENTEENTH SESSION
PARIS, FRANCE
27-30 OCTOBER 2009

Item X.X

Terrestrial Observation Panel for Climate 2009 report

(Submitted by Han Dolman)

Summary and Purpose of Document

ACTION PROPOSED

GCOS SSC to advise on a strategy to develop a coordinated set of reference station with CEOP Cal/Val group.

GCOS SSC to take note of development of standards, carbon observation, and issues relating to GTN.

GCOS SSC to discuss and recommend strategy to more integrated approach to carbon observation re. role towards GEO and AOPC and OOPC.

Activities of the Chairman

Attendance GCOS SSC XIV, Geneva (24-28 October)
Participation on review of Progress report Geneva, 2-5 February
Participation in meeting IP update Geneva 18-20 March
GEWEX-iLeaps Symposium, Convenor New monitoring strategies
Input into white paper on observations for WCC-3
Co-lead GEO Carbon task CL09003a Integrated Carbon Observing System
Regular inputs on request from GTOS and GCOS Secretariats.

A considerable amount of time of this reporting period was spent on delivering terrestrial input into the progress report for UNFCCC. Below is the summary from this report for terrestrial observations:

Progress on Terrestrial Domain Actions

Increasing significance is being placed on terrestrial data for estimating climate forcing and better understanding of climate change and variability, as well as for impact and mitigation assessment. The recognition of this has led to substantial progress in a number of areas in the terrestrial domain: 56 percent of terrestrial domain Actions show progress in the range from moderate to good, although advances are still limited or absent in others.

- **There has been significant progress in defining internationally accepted standards for the terrestrial ECVs.** The GTOS Secretariat has been reporting regularly to SBSTA on collaboration with the International Organization for Standardization (ISO) in that regard.
- **Progress in establishing institutional support for *in situ* networks has been slow,** leading to networks that are still poorly coordinated and harmonized, despite considerable effort of the research community to keep them running.
- **The objective of creating a comprehensive and well coordinated reference network for *in situ* observations of the fullest possible range of terrestrial ECVs is a continuing, yet still a largely unmet challenge.** Such a network would provide the observational data and associated details relevant to their application in model validation, process studies, and the validation of observations derived from Earth observation satellites.
- **The establishment of several Global Terrestrial Networks (GTNs) in a number of areas (e.g. Hydrology, Glaciers, Permafrost), where data collection takes place largely through *in situ* measurements has significantly improved the coordination and global coverage of these observations,** though gaps still remain.
- **Observations taken for purposes other than climate, but with climate relevance, are often not made available,** sometimes due to their economic or national strategic value. This has for instance, led to a declining number of reports of river discharge. However some networks, such as for glaciers (GTN-G), have shown remarkable resilience and now operate very effectively. Similar progress has been made in the production of fire-related global datasets.
- **Good progress has been made in guaranteeing short-term continuity in the availability of high-resolution optical observations from satellites,** a gap highlighted in previous GCOS reports. Long-term commitment to continuity of this class of missions, though crucial to successful maintenance of the observation records, has yet to be secured.
- **The increasing commitment of space agencies to produce fundamental climate data records from existing systems has led to improved availability of global datasets, such as burned area and land cover.** The community now increasingly uses these datasets. Substantial gaps remain in quality control, which need to be addressed through intercomparison and validation.
- **The analysis of historical records, both *in situ* and satellite based, has been**

progressing slowly and needs the urgent consideration of space agencies together with the potential users.

Progress against each of the 37 terrestrial Actions in the IP-04 has been evaluated, and the details on each assessed Action are given in the main Report. Table 4 summarises the evaluation of terrestrial Actions.

Table 4: Assessment of Progress on the 37 Terrestrial Domain Actions in the IP-04

Assessment Categories	No or Low Progress	Moderate to Low Progress	Moderate Progress	Good to Moderate Progress	Good Progress
Number of Actions	8	8	4	5	12
Percent of Actions ¹⁷	22%	22%	11%	13%	32%

One of the key conclusions of the progress report is that although there has been marked improvement, the setting up of reference sites for validation of satellite observations and algorithms is however poorly developing.

The development of standards for ECV's

With FAO, GTOS secretariat, the status of the development of standards for each of the essential climate variables in the terrestrial domain was assessed. The report can be accessed at <http://www.fao.org/gtos/Pubs.html>. TOPC members have been involved in the writing and reviewing of these document.

Carbon observation network

There has been considerable activity around the Geo carbon tasks, in particular CL0903a, the Integrated Carbon Observing System. TOPC's chairs is one of the co-leads of this task and involved in writing a new GEO-report on carbon observations. In practice the development of an integrated network is progressing slowly. The failure of the launch of OCO was a considerable setback, although GOSAT is now producing data. On the Geo plenary in Washington a presentation on this task will be given. The updated GEO Carbon report will be available at Copenhagen. TOPC is working with GTOS TCO panel to improve carbon observations by defining new possible carbon ECV's.

TOPC panel meeting November 2008, Rome.

Meeting report is available at: <http://www.wmo.int/pages/prog/gcos/Publications/gcos-133.pdf>.

Some issues were noted during the TOPC meeting related to the Global Terrestrial Networks.

GTN-H/GTN-R

The GTN-H had a meeting in New York in July this year. Regards to the GTN-R river network no progress has been made. Up until now only Australia has been contacted and

they are in a process of reviewing the proposed GTN-R stations. The GTN-R requirements have been stated to the developers and real-time data should be coming from Australia some time next year. The only countries regularly reporting near real-time data are Romania, Norway and Iceland.

The IT system to collect and harmonize all the GTN-H data has been built but not yet implemented. It is planned to have the system implemented during 2010 and then all countries prepared to provide near real-time data will be included into the system.

GTN-L

SHI /HYDROLARE and CNES/LEGOS have agreed on a collaborative agreement that would facilitate the contribution of the Hydroweb database (a database for lake level and surface variations from satellite remote sensing: radar altimetry and multi-spectral imagery) to HYDROLARE, noting the complementary nature of both efforts. Both institutions will work in cooperation on the implementation of an interface between Hydroweb data base and Hydrolare data centre. Exchange of bilateral visits between CNES/LEGOS and HYDROLARE in 2009 should be encouraged for this purpose, including the HYDROLARE Steering Committee meeting in July 2009.

GTN-G

A recently established GTN-G Steering Committee coordinates, supports and advises the operational bodies responsible for the international glacier monitoring, which are the World Glacier Monitoring Service (WGMS), the US National Snow and Ice Data Center (NSIDC) and the Global Land Ice Measurements from Space (GLIMS) initiative, the latter with additional support from ESA's GlobGlacier project.

By the end of 2009, a new GTN-G website (www.gtn-g.org) will go online including a map-based web-interface to spatially link the available data sets. With this new online service, GTN-G provides fast access to information on glacier inventory data from 100,000 glaciers mainly based on aerial photographs and from 80,000 glaciers mainly based on satellite images, length change series from 1,800 glaciers, mass balance series from 230 glaciers, special events (e.g., hazards, surges, calving instabilities) from 130 glaciers, as well as 10,000 photographs from some 470 glaciers.

GTN-P

Measurements of borehole temperature are carried out in a growing net but coordination needs improvement. The International Permafrost Association responsible for GTN-P is getting more active in guiding this activity. The website urgently needs upgrading, the "mountain community" must be systematically involved (the experience with the ECV publication could serve as a lesson that the collaboration must be improved), the results from the monitoring rather than just meta-information on it must become visible and periodical assessments of ongoing developments must be made. A clear definition of responsibilities for data collection, management and dissemination is needed.

Snow

A most important ECV with considerable challenges for organising and coordinating a GTN-S. Efforts are urgently needed.

Ice sheets

An important new ECV in the light of rather surprising fast developments (collapse of shelves, flow acceleration of outlet glaciers, draw down of large firn areas, increased ablation in Greenland). A GTN-IS should be established as soon as possible. Koni Steffen (TOPC) is a perfect person for this but must take the corresponding steps (which are far from being easy).

Fire

The idea of a centralized facility for all fire data seems to be a long way off at this time - given the various interoperability efforts which are underway in the various agencies. A different approach might be to work/push for one location (portal) where all fire products are listed with active links to data, including validation data with the published accuracy assessment and an informed description/guide for the user community as to which data are appropriate for which broad kind of analysis.

Next meeting

The next TOPC meeting is scheduled for 4 and 5 November 2009 in Rome (FAO)