



Liaison Report from UN FAO to ISO TC/211



A Framework for Terrestrial Climate-Related Observations  
and  
Development of Standards for the Terrestrial ECVs

## Proposed Workplan

Presented on behalf of **John Latham** UNFAO and GTOS  
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*SBSTA 33, November 2010*





# OUTLINE

## 1. Background

## 2. Proposed workplan

- a. Organizational aspects
- b. ECV standardization

## 3. Implementation

- a. Framework
- b. ECV standards
- c. Tasks and timetable
- d. Resources for implementation

## 4. Conclusions

## 5. Recommendations given to SBSTA

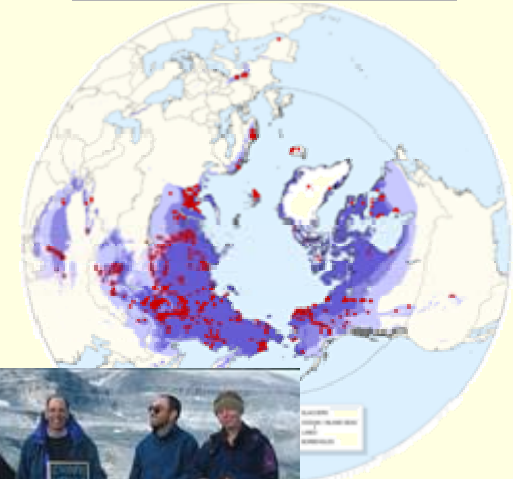
This report is based on the report given by GTOS to SBSTA 33 November 2010



Subsidiary Body for Scientific and Technological Advice (**SBSTA**)  
Conference of the Parties (**COP**) to the UNFCCC  
United Nations Framework Convention on Climate Change (**UNFCCC**)  
**GTOS**, Global Terrestrial Observing System (**GTOS**)  
Global Climate Observing System (**GCOS**)

# Background: Task

- Work followed invitation to GTOS by the COP/ SBSTA, motivated by GCOS Implementation Plan
- **Task:**
  - COP-9 “... , to *develop a framework for the preparation of guidance materials, standards and reporting guidelines for terrestrial observing systems for climate, and associated data and products..*”
  - SBSTA-26 “.. *to assess the status of the development of standards for each of the essential climate variables in the terrestrial domain*”



## Background: Response

- Following several preparatory steps [refer to reports submitted to SBSTA sessions -26 (Bonn), -27 (Bali), -29 (Poznan)]



- Helpful SBSTA feedback obtained, leading to a proposal submitted to SBSTA -30 that:
  - meets requirements and criteria identified by the SBSTA (particularly SBSTA-27)
  - builds on existing organizations/ programs and capabilities as much as possible
  - minimizes additional/ incremental activities and costs



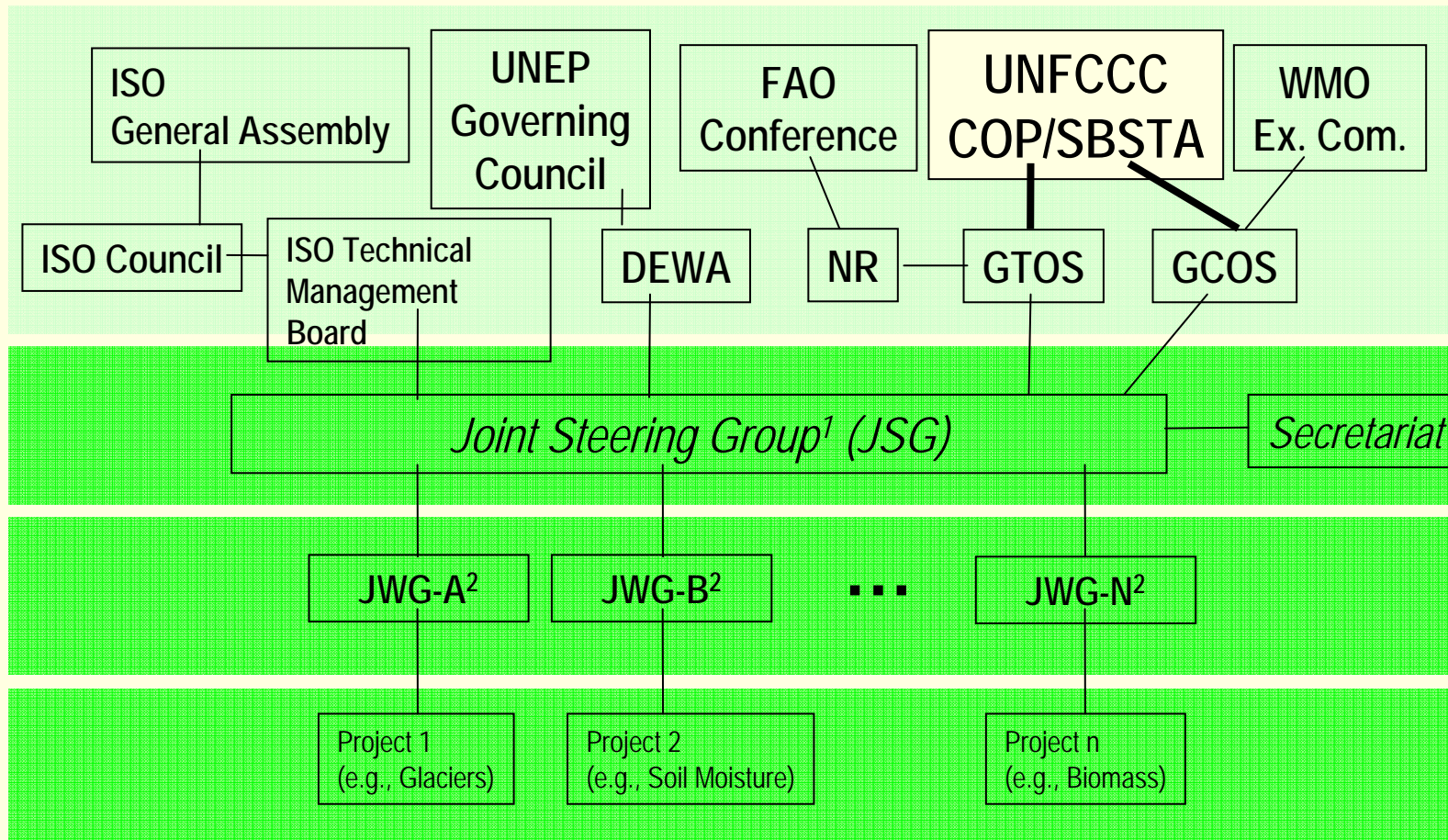
## Background: SBSTA-30 decision

### SBSTA

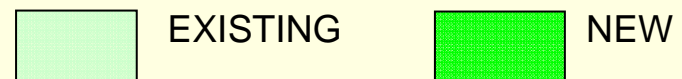
*“..encouraged the GTOS secretariat and the GTOS sponsoring agencies **to implement the framework**. The SBSTA also invited the GTOS secretariat and the GTOS sponsoring agencies to **elaborate a workplan** for developing observational standards and protocols for the 13 terrestrial ECVs assessed.”*



# Organizational aspects: Framework



- 1) Meeting ad hoc, mostly via teleconferences
- 2) JWG = Joint UN-ISO Working Group, established by JSG to develop a particular standard or standards



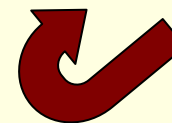


## Organizational aspects: Framework characteristics

- While the **UNFCCC/SBSTA** is the principal client for the desired standards, **other UN organizations** are also involved (as participants and beneficiaries)
- The working tasks will be approved by the **Joint Steering Group (JSG)**:
  - JSG is an inter-agency group external to the ISO's technical structure, reporting to the sponsoring UN organizations as well as to the ISO Technical Management Board
- Standards will be developed by **Joint Working Groups (JWG)**:
  - JWGs and their terms of reference will be established by the JSG
  - Principal JWG tasks will be the preparation of Draft International Standards or other document formats as decided/ approved by the JSG
  - JWG membership will include representation of ISO Technical Committees, of UN organizations and their programs, and of other specialist bodies such as international scientific programs or projects
  - JWGs will be responsible to the JSG for the conduct and reporting of their work

## Organizational aspects: Implications for

- UN organizations (UNFCCC, GTOS Sponsors,...) : decide on requirements; contribute to planning and development of standards; endorse developed standards
- ISO: contribute to planning, development and approval of standards, track and report on progress, deliver standards
- National governments: support their national committees' and experts' involvement in the development of the standards; endorse international standards' use through UN organizations; adopt standards in country monitoring programs
- Research community: contribute to the development of methods and standards, both in *situ* and satellite- based





# ECVs: Considerations

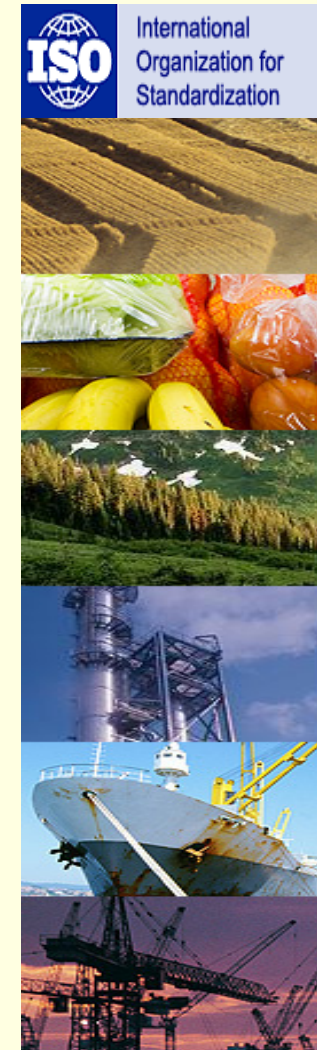
- The workplan must reflect [both the need for ECV standards and the availability](#) of knowledge, experience and expertise
- The large number of ECVs and the urgency in developing standards are [important constraints](#)
- The development process needs to be [sequential](#), and it should begin with important ECVs that are 'ripe' for standardization
- Nevertheless, the urgency of the requirement for standardization means that [several standards](#) need to be under development at any one time
- A key challenge will be to identify the [specific issues](#) a standard must address, e.g. the extent/ coverage, characteristics/ quality, consistency (including compatibility), and availability/ accessibility of the observations
- ...





# ECVs: Considerations

- ...
- Ideally, the ECV standards should encompass both in situ and satellite data. However, a good portion of the satellite- based techniques is at an experimental stage.
- The desired number of deliverables from each ECV standardization project and the scope of each are also important (comprehensive standards are more difficult to complete than several simpler standards addressing components of the problem).
- In preparing this workplan, the previously collected information (refer to SBSTA (2009 report) ) was used to identify critical issues that need to be addressed



# ECVs: Technical view

## FACTORS:

- An ECV encompasses several different types of observations (= '**observables**' ) which may differ in kind as well as spatial and/ or temporal attributes (e.g., ECV Snow Cover encompasses four *observables* (cover extent, depth, water equivalent, cover duration)
- The various *in situ observables* may be expressed as a point, a line, or a polygon (= a boundary delineating a homogenous patch)
- To various degrees, the ECVs require *in situ* and satellite- based *observables*, the latter typically derived using gridded spatial coverage



# ECVs: Technical view

## FINDINGS (preliminary):

- The 14 ECVs represent **38 different observables**
- Using *in situ* techniques, roughly 23 (60%) are taken as point measurements, 14 (37%) as polygons, and one (glacier front variation) as a line
- **Satellite** observations are a primary data source in 17 cases (45%) and play supporting role in further 14 (37%). A number of the satellite-based approaches are under active development
- Seven *observables* (18%) rely on *in situ* observations alone, and will likely continue so for the foreseeable future.





# ECVs: Prioritization

## **CRITERIA:**

- Urgency and importance
- Readiness and feasibility

## **RESULTS:**

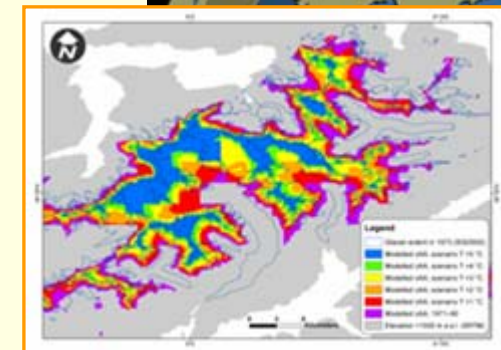
- Tier 1: High priority: ECV ready for standardization to begin now
- Tier 2: Medium priority: standardization to begin in ~3 years
- Tier 3: Low priority: standardization to begin after ~3-4 years.

Tier 1 is further divided into two groups on the basis of urgency, i.e. existence of documentation and/ or of ongoing collaboration through which convergence to standard approaches is evolving.

# ECVs: Tier content

- **Tier 1** (High (H) – Medium (M) urgency, H-M readiness):
  - **Tier 1a** = initial set 5 ECVs:
    - ECV Biomass
    - ECV Glaciers and Ice Caps
    - ECV Land Cover
    - ECV Permafrost
    - ECV Soil Moisture
  - **Tier 1b** = coincident with *Tier 1a* (provided resources are available):
    - ECV Leaf Area Index
    - ECV River Discharge
- **Tier 2** (M-Low (L) urgency, H-M readiness):
  - ECV Albedo
  - ECV Fraction of Absorbed Photosynthetically Active Radiation
  - ECV Snow Cover
- **Tier 3** (L urgency or L readiness):
  - ECV Fire Disturbance
  - ECV Lake Levels and Reservoir Storage
  - ECV Ground Water
  - ECV Water Use.

*in situ measurements+  
remote sensing+  
modelling*



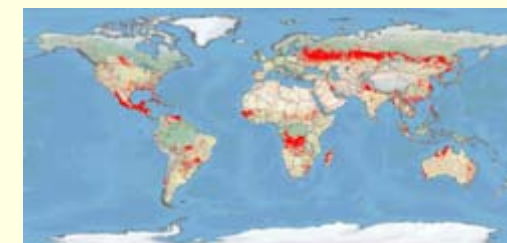
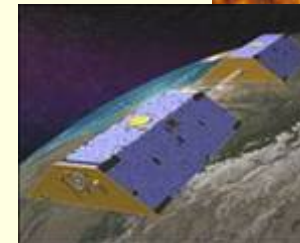


# Implementation: Organizational framework

- **Foundations:** SBSTA's endorsement of the 2009 proposal & Memorandum of Understanding (MOU) between the GTOS Sponsors and the ISO
- The **following steps** will be required to implement the framework, assuming SBSTA's endorsement of this workplan and its recommendations:
  - **MOU signing** by the UN Sponsors of GTOS (FAO, ICSU, UNEP, UNESCO, WMO) and the ISO
  - **Establishment** of the Joint Steering Group (JSG), including a specifying a consistent way to represent GTOS Sponsors
  - **Adoption** of the JSG terms of reference, nomination of its members, and establishment of the JSG Secretariat
  - **Establishment** of a resource/ support mechanism for the JSG, including the Secretariat
- **Adoption** of a workplan by the JSG (based on the report to SBSTA -33 and after modifications as required)
- Once the workplan is adopted the stage will be set for the development of ECV standards.

# Implementation: ECV standardization

- The overall approach consists of:
  - **Adopting a common format/** architecture for the ECV standards and an overall plan for sequencing the standards development work
  - **Preparation of ECV- specific proposals** defining a) Objectives; b) Scope; c) Applicable existing standards; guides and other sources; and d) Approach to implementation (pre-defined format, by *observable*, <3-4 pages overall)
  - **Considering & approving** proposals by the JSG
  - **Executing** the approved proposals, tracking progress and modifying the developmental strategy as appropriate
    - *A Joint Working Group (JWG) will be established for each ECV to be standardized, with tailored terms of reference*
    - *The actual development and approval process will follow procedures and practices of the ISO.*



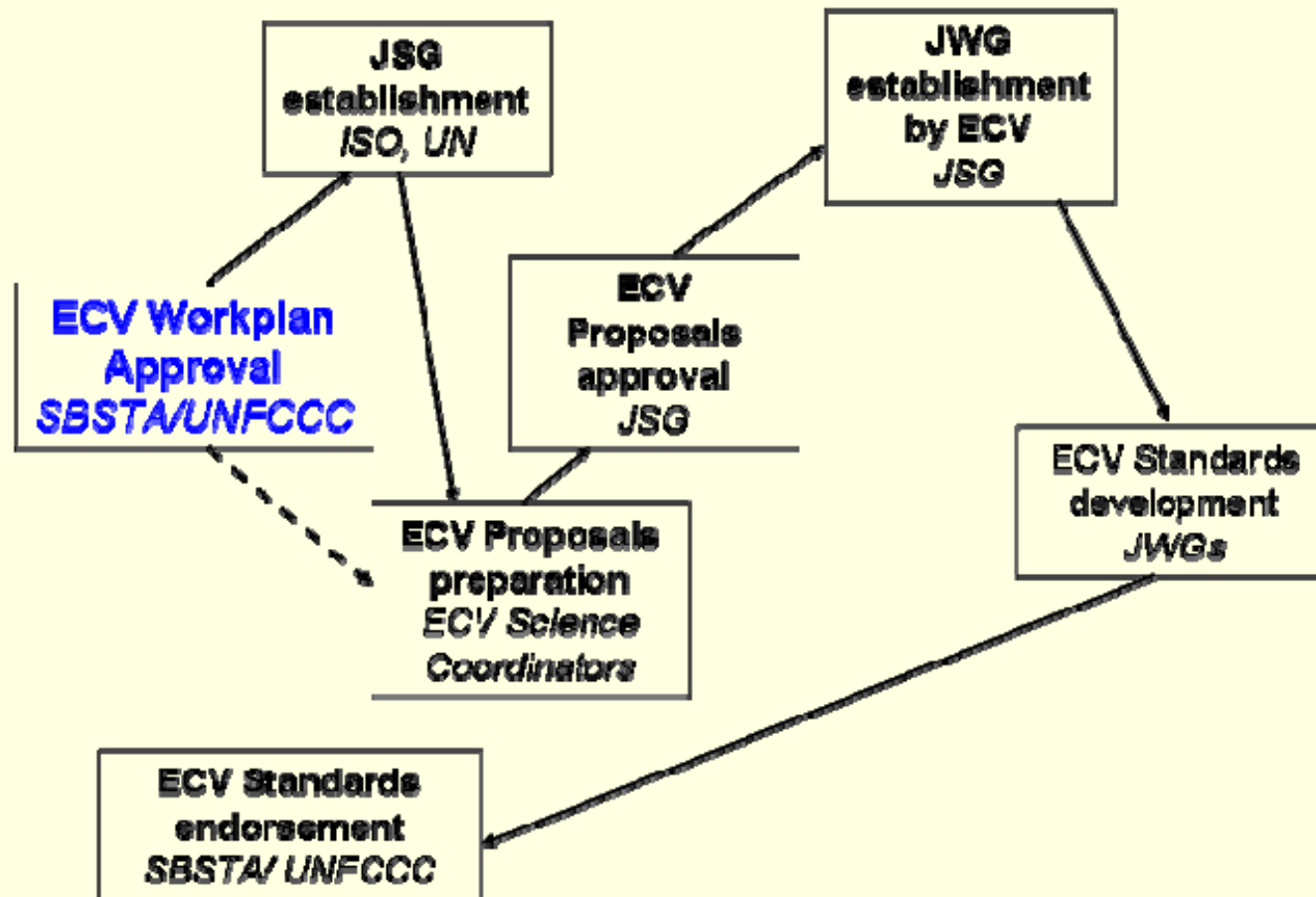
# Implementation: ECV standardization

- The approved standards will be presented by the GTOS and its UN Sponsors to the UNFCCC/ SBSTA for endorsement as '[meeting the requirements of the UNFCCC](#)'. They will be published and made available in a way consistent with the UN-ISO Memorandum of Understanding, and maintained using ISO procedures and practices.





# Implementation: Main steps and actors





# Implementation: Timetable

- **Assuming SBSTA's approval of this workplan in November 2010:**

- **2011**

- Signing UN-ISO MOU (near- final draft available)
- JSG establishment
- Preparation of ECV proposals for priority ECVs
- JSG decision on initial standards to be developed, establishment of JWG, JWG work begins

- **2012-2015**

- Development, approvals and publication of ECV standards for priority ECVs
- Preparation of proposals for other ECVs
- JSG decisions on other standards to be developed, establishment of appropriate JWG, JWG work underway.

# Implementation: Resources

- While most of the work will be carried out by technical bodies and experts, the overall effort requires substantial logistical, management and administrative **Secretariat support**
- Secretariat support includes contributions to drafting of working documents, project management, and organization and execution of meetings (ISO, 2000)
- For the terrestrial ECVs, the task is **further complicated** by the precedent- setting establishment of the Framework structure, the thematic diversity of the ECV documents, and the intensive work expected over the next few years
- The proposed JSG Secretariat will require a **higher initial level of support** than a typical ISO Technical Committee.





# Conclusions

1. Sufficient information and technical [resources are available](#) to undertake the development of standards for ECVs to be addressed during the initial period, while progress continues to be made in other cases where standardization is less urgent.
2. The standardization should [focus on \*in situ\* observation](#) methods but since the resulting data will in many cases (~45-82% of the ECV *observables*) be used for the preparation of satellite- based information products, the needs of the latter [must be built into](#) the initial standards where feasible.
3. The specific issues and questions meriting standardization differ substantially among ECVs. Consequently, although a common architecture for the standards is desirable and should be defined at the outset, the standards development [must address](#) ECV- specific issues such as identified in this report.
4. Significant human and financial [resources are required](#) if the framework is to succeed in producing effective standards within the proposed time frame.



# Recommendations to SBSTA

## Recommendation 1:

- SBSTA endorses the proposed workplan, in present form or modified as appropriate.

## Recommendation 2:

- SBSTA requests:
  - GTOS and its UN Sponsors together with the ISO to **implement the workplan**.
  - Parties to respond to the financial requirements of the standardization framework and **to resource GTOS Secretariat** to implement the workplan.
  - Space agencies and the scientific community **to continue developing capabilities for observing and delivering** integrated terrestrial ECV information products from *in situ* and satellite data.
  - GTOS **to report on the progress** at the 35th session of the SBSTA.

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