

Group on Earth Observations



User Interface Committee

*UIC Activity under GEO Task US-06-01 (now US-09-01a):
General Process to Identify Critical Earth Observation Priorities
for each Societal Benefit Area*

Task US-06-01 (now US-09-01a) in the GEO 2007-2009 Workplan states:

Establish a GEO process for identifying critical Earth observation priorities common to many GEOSS societal benefit areas, involving scientific and technical experts, taking account of socio-economic factors, and building on the results of existing systems' requirements development processes.

At the GEO-III Plenary, the UIC members formed groups to develop possible processes to identify critical Earth observation priorities for each Societal Benefit Area (SBA). In early 2007, the UIC evaluated the proposed processes across the nine SBAs, discussed the alternatives, and decided on a general approach to follow for each SBA, allowing for specific tailoring of the process for unique aspects of a SBA. After UIC identifies the priority observations within each SBA, the UIC will compare the observation priorities across the SBAs and identify ones that are common to many SBAs.

This document describes the general process to identify critical Earth observation priorities for each SBA. Since some GEO Members and Participating Organizations have already conducted activities to identify Earth observation needs, this process seeks to incorporate and build on those activities. Thus, this process could easily be viewed as a “meta-analysis” exercise. In harvesting observation needs expressed in existing documents, this process tries to avoid the duplication of efforts that GEO Members and Participating Organizations have or will perform as part of their responsibilities.

The GEO 10-year Implementation Plan provides a description and summary of topics within each SBA. Teams of international representatives (aka IPTT) developed that Plan, and the Plan identified some initial observation priorities for each SBA. This process incorporates those priorities and seeks to involve the representatives.

The general structure of the process is to have an “advisory group” and an “analyst” working together to develop the priorities within each SBA. The advisory group will be approximately 10 people from developed and developing countries that represent experts in an SBA; in some cases, the members of the GEO Communities of Practice and people who were involved in the IPTT may be part of an advisory group. (Note: The advisory groups are *ad hoc* and will disband after UIC completes the process. The UIC will likely invite advisory group members to join a Community of Practice if they are not already involved with one.)

The advisory group will help to identify documents, comment on analytic methods and priority-setting criteria, and review the analysts' findings, priorities, and reports. The analyst will be the primary person to read and analyze the documents, develop an analytic method and priority-setting criteria, and conduct the meta-analysis to identify common priorities within a SBA. The

analyst will be the primary coordinator and organizer of the activity to meet the schedules and deadlines.

Since each SBA may span a range of issues, the analyst and advisory group may need to conduct this process on a sub-set of issues to address. In addition, observation priorities change over time as needs are met, technologies develop, and new needs arise. Thus, this process assumes that the GEO UIC will periodically conduct this process to account for the range of issues in a SBA and for changes in priorities.

This proposed process involves nine steps. The process lists the steps serially, yet some of them can be done in parallel. The analyst and advisory group conducting this process should develop a detailed schedule, including the duration for each step, determination of which steps can be done concurrently, and overall milestones.

The following list summarizes the nine steps. This document describes each step in detail below.

- Step 1: UIC Members identify Advisory Groups and Analysts for each SBA
- Step 2: Determine scope of topics for the current priority-setting activity
- Step 3: Identify existing documents regarding observation priorities for the SBA
- Step 4: Develop analytic methods and priority-setting criteria
- Step 5: Review and analyze documents for priority Earth observations needs
- Step 6: Combine the information and develop a preliminary report on the priorities
- Step 7: Gather feedback on the preliminary report
- Step 8: Perform any additional analysis
- Step 9: Complete the report on Earth observations for the SBA

General Process to Identify Critical Earth Observation Priorities for each SBA

Step 1: UIC Members identify Advisory Groups and Analysts for each SBA

GEO UIC directs each Community of Practice (CP) to organize an advisory group for its SBA or sub-portion of an SBA. The CPs should incorporate IPTT members, CP members, UIC members, and others to constitute their advisory groups, and the groups should include representatives from developed and developing countries (the GEO Secretariat can assist CPs with contacts for developing country representatives). GEO UIC also requests each CP to identify an analyst to work with the advisory group and coordinate the activity. For the SBAs without a CP, the UIC members need to organize an advisory group and identify an analyst. The GEO Secretariat may be able to provide a contractor to serve as an analyst for some of the SBAs.

Step 2: Determine scope of topics for the current priority-setting activity

The GEO 10-year Implementation Plan provides a description and summary of topics within each SBA and an initial set of observation priorities. The analyst and advisory group will review the range of topics and select the set of topics for this priority-setting activity.

Step 3: Identify existing documents regarding observation priorities for the SBA

For the range of topics selected in Step 2, the advisory group will specify documents and reports from international, regional, and national efforts (including recent workshops, surveys, and

projects) that have identified Earth observation needs. The group will provide the documents (or appropriate reference information) to the analyst. The analyst will concurrently do a bibliographic search for major documents and reports for critical Earth observation priorities for the SBA. The analyst and advisory group can contact international/regional organizations associated with the SBA to solicit their comments, reports, and recommendations for critical Earth observation priorities on the range of topics selected in Step 2.

Examples of possible documents for the Water SBA may include:

- IGOS-P Integrated Global Water Cycle Observations Theme Report (2003)
- Report from UN/Austria/ESA series of Symposia on “Space Solutions for Water Management” (2003-2005)
- Report from GEO Inland and Nearshore Coastal Water Quality Workshop (3/2007)
- GMES Building an Information Capacity for Environmental Protection and Security
- USA National Academy of Sciences report on *Earth Science and Applications from Space: National Imperatives for the Next Decade and Beyond* (2007)
- Japan Earth Observation Satellite Development Plan and Data Utilization Strategy (2005).
- IGOS-P Coastal Theme Report (2006)
- Reports from World Water Fora and World Water Congresses

Note: Can do concurrently with Step 4.

Step 4: Develop analytic methods and priority-setting criteria

The analyst develops quantitative and qualitative methods to review and analyze the documents, incorporate socio-economic factors, and conduct the meta-analysis. (Examples of analytic methods might include statistical analysis, assessment of common observation characteristics, frequency analysis.) The analyst also develops a proposed set of priority-setting criteria. The analyst discusses the methods and priority-setting criteria with the advisory group for the advisory group’s approval.

Note: Can do concurrently with Step 3.

Step 5: Review and analyze documents for priority Earth observations needs

The analyst will read and analyze the reports, documents, recommendations, and other information compiled. The analyst will record the observation needs in the materials. If possible, the analyst should also record the assessment processes that the documents employed and the user groups represented and their respective needs, scientific objectives, and/or decision-making responsibilities. In reviewing the documents, the analyst will develop an annotated bibliography of all documents and materials used.

Note: Can do some aspects in parallel with Steps 3 & 4.

Step 6: Combine the information and develop a preliminary report on the priorities

The analyst will compile the information and analysis gathered in Step 5 and conduct a meta-analysis. The analyst will use the set of criteria (Step 4) to create a preliminary, candidate list of priority Earth observation needs for the SBA.

The analyst will write a brief, preliminary report that documents the candidate priorities. The report will include a description of the group’s analytic methods, a list of the criteria, and an annotated bibliography of the source documents. As possible, the group will use the GEOSS

diagram¹ to articulate connections between Earth observations and user needs for decision support. The analyst will submit this report to the advisory group for their review.

Step 7: Gather feedback on the preliminary report

The advisory group will read and review the preliminary report. The group will provide comments on the report and set of priorities. The group will review the bibliography and determine if additional source materials need to be represented (e.g., developing country reports).

Step 8: Perform any additional analysis

Based on the advisory group's comments and recommendations, the analyst will perform any additional analysis on supplementary documents. The analyst will incorporate the new materials in the analysis and update the priorities. The analyst will present the updated list to the advisory group, and the analyst and group will discuss and establish an updated set of critical Earth observation priorities.

The analyst and advisory group would also identify the necessary activities to prepare a questionnaire/survey that GEO UIC might use to gather input and feedback on the priorities. The schedule does not allow for the analyst and advisory group to conduct the survey prior to the deadline. However, GEO UIC is interested in the recommendations from the analyst and advisory group on the appropriate questions and audiences for such a survey, so GEO UIC might conduct the survey in future years.

Step 9: Complete the report on Earth observations for the SBA

The analyst will update the preliminary report (Step 7) and complete a final report that will articulate the set of critical Earth observation priorities for the SBA (for the subset of topics selected in Step 2). The analyst and advisory group will provide any recommendations to the GEO UIC on methods to improve the priority-setting process.

The analyst and advisory group will submit this final report to GEO, and they will discuss their findings, recommendations, and priorities with GEO Committees as needed.

¹ Figure 2.1 in *GEOSS 10-Year Implementation Plan Reference Document* (February 2005).