GEO User Interface Committee
Status of Task US-09-01a

UIC Member Task Lead:
Lawrence Friedl, USA-NASA

UIC Co-Chair Task Lead:
Ellsworth LeDrew, IEEE (Canada)

Task Coordinator:
Amy Jo Swanson, USA-NASA

14th UIC Meeting • Reading, England
3-March-2010
GEO Task US-09-01a:

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.

Resources to Support Task
Website: http://sbageotask.larc.nasa.gov/

Email address: geo-task-us-0901@lists.nasa.gov
Group on Earth Observations
Task US-09-01a

**Current Status**

**Climate**
Final Report delivered

**Disasters**
Final Report delivered on Earthquakes, Landslides, Floods.

USA/NASA sponsoring Analyst for additional Disaster report (Disasters II) on Wildfires, Volcanoes, Tropical Cyclones

*Will need to combine the two Disaster reports*

**Ecosystems**
Final Report delivered on forest health, coastal, watersheds

USA/NASA sponsoring Analyst for additional Ecosystems report (Ecosystems II) on Deserts, Grasslands, Tundra, Ocean islands, and Inland waters

*Will need to combine the two Ecosystem reports*

**Energy**
Final Report delivered

**Health**
Final Reports delivered (Aeroallergens; Air Quality; Infectious Disease); some edits based on Analysts meeting may occur
<table>
<thead>
<tr>
<th>Current Status</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water</strong></td>
<td>Report in final draft review; expected March</td>
</tr>
<tr>
<td><strong>Weather</strong></td>
<td>Final Report delivered; some edits based on Analysts meeting may occur</td>
</tr>
<tr>
<td><strong>Agriculture</strong></td>
<td>UIC Member did not deliver report on Ag/Forests</td>
</tr>
<tr>
<td></td>
<td>USA/NASA sponsoring Analyst to prepare reports - one report on Agriculture, one on Forests/Forestry</td>
</tr>
<tr>
<td><strong>Biodiversity</strong></td>
<td>Report delivered does not identify Earth observations</td>
</tr>
<tr>
<td></td>
<td>Task team plans to attempt to remedy this situation. Will attempt to identify a new Analyst who can take the information already gathered and deliver an adequate report.</td>
</tr>
</tbody>
</table>
Overview of Completed SBA Reports

**Excludes Forests, Agriculture, Biodiversity, and follow-on Ecosystems & Disasters Reports**
Final SBA Documents designated a total of 187 “unique” parameters, such as surface air temperature,

- Need to exclude some non-Earth Observation (EO) parameters
  - e.g., 11 human dimension parameters such as poverty distribution
  - e.g., poultry movement outside traditional definition of EO
- Some parameters are inter-related, derived
  - e.g., Ecosystems designated “direct” and “indirect” parameters
  - e.g., land cover relies on spectral classification and multiple other parameters

May need to do some “parameter cleaning”...

...will end up with ~150 parameters to prioritize.

List of Final Priority Parameters for UIC will be >10 but <150.
Parameter Cleaning

• Combine **duplicate terms** for nearly identical parameters
  – E.g. topography and elevation
• Treatment of **modeled or derived parameters**
  – E.g., snow cover, relies on topography, SAR images, cloud cover, and land cover classification
• Treatment of **broad topics** (rather than parameters)
  – E.g., Deforestation, from HH: Infectious Diseases SBA Report
  – E.g., Hydrology, from Ecosystems SBA Report
• Treatment of reports that **considered current technology**
Initial analysis for Analysts discussion: Assumes equal SBA weighting, with very little parameter cleaning

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Rank</th>
<th>Parameter</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Cover</td>
<td>1</td>
<td>Net Primary Productivity (NPP)</td>
<td>13</td>
</tr>
<tr>
<td>Precipitation</td>
<td>2</td>
<td>Ambient Nitrogen Dioxide Concentration</td>
<td>14</td>
</tr>
<tr>
<td>Elevation</td>
<td>3</td>
<td>Ambient Particulate Matter Concentration (course)</td>
<td>15</td>
</tr>
<tr>
<td>Air Temperature</td>
<td>4</td>
<td>Ambient Sulfur Dioxide Concentration</td>
<td>16</td>
</tr>
<tr>
<td>Normalized Difference Vegetation Index (NDVI)</td>
<td>5</td>
<td>Direct Normal Irradiation (DNI)</td>
<td>17</td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>6</td>
<td>Global Horizontal Irradiation (GHI)</td>
<td>18</td>
</tr>
<tr>
<td>Soil Moisture</td>
<td>7</td>
<td>Bathymetry</td>
<td>19</td>
</tr>
<tr>
<td>Wind Speed</td>
<td>8</td>
<td>Pollen Counts</td>
<td>20</td>
</tr>
<tr>
<td>Ambient Ozone Concentration</td>
<td>9</td>
<td>Spore Counts</td>
<td>21</td>
</tr>
<tr>
<td>Ambient Particulate Matter Concentration (fine)</td>
<td>10</td>
<td>Soil Composition</td>
<td>22</td>
</tr>
<tr>
<td>Water run-off</td>
<td>11</td>
<td>Slope Angle</td>
<td>23</td>
</tr>
<tr>
<td>Land Surface Temperature</td>
<td>12</td>
<td>Cloud Cover (cloud index)</td>
<td>24</td>
</tr>
</tbody>
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Group on Earth Observations
Task US-09-01a

Current Task Schedule

- Final reports from 7 SBAs: Dec. 2009 - Feb. 2010
- Meta-analysis across SBAs and existing reports: Jan-April 2010
- 2nd Meeting of the Analysts: February 2010
- Preliminary Reports on Agriculture, Disasters II, Ecosystems II: April 2010
- Preliminary Cross-SBA US-09-01a Report *: April/May 2010
- Preliminary Report on Ag/Forests: May 2010
- Initial Final Cross-SBA US-09-01a Report *: July 2010
- Final Reports on Agriculture, Disasters II, Ecosystems II: July 2010
- Final Report on Ag/Forests: August 2010
- Amended Final Cross-SBA US-09-01a Report: September 2010
- Gap Analyses: TBD
- Plenary GEO VII: November 2010

* these Cross-SBA reports will not include Agriculture, Forests, Disasters II, and Ecosystems II
Cross-SBA Report Template/Outline

Summary
1. Introduction
   - GEO, GEO Task US-09-01a, Purpose of Report, Scope of Report

2. Methodology
   - Task Process, Analyst and Advisory Group, Methodology

3. Societal Benefit Areas
   - SBA Descriptions, Sub-areas, Documents, User Types

4. Earth Observations Priorities for each SBA
   - Brief summary of each SBA report

5. Priority Earth Observations for the SBA
   - Table(s) of the observations

6. Additional Findings

7. Comments and Recommendations
   - Process and Methodology, Challenges, Recommendations

Appendix & Bibliography/References
Future Considerations,
UIC Discussion,
and Decisions
Current & Future States of Critical Earth Observation Priorities

Results of Gap Analysis can be shown in such a diagram.

<table>
<thead>
<tr>
<th>Critical Earth Observation Priorities</th>
<th>Currently Available</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Available in Future</td>
<td></td>
</tr>
<tr>
<td>Planned</td>
<td>Good situation</td>
</tr>
<tr>
<td>No Plan</td>
<td>Possible crisis</td>
</tr>
</tbody>
</table>

Is this because the science & technology isn’t mature?
Future Considerations for UIC on Task US-09-01a

The Task Lead (with others) is preparing an over-arching report across all the SBAs. The Task Lead will deliver this report to GEO UIC, which can deliver it to GEO as partial fulfillment of task US-09-01a.

Suggested Follow-on Activities

1. Assess the Advisory Group members vis a vis GEO MC/POs and CoPs
   - Identify potential new countries and organizations GEO could recruit
   - Identify potential new members for GEO CoPs

2. Presentations to announce the results of priority Earth observations
   - GEO UIC presentations to GEO committees, C4, GEO Sec., others

3. Perform a gap analysis regarding the current/future availability of the “priority Earth observation parameters” (see next chart)
   - Note: This action is not specified in the task, yet seems the next logical activity.
   - GEO UIC could initiate this activity outright or GEO could create a new task

4. User Requirements Registry
Summary Information for UIC on Task US-09-01a

1. US-09-01a information to include in report & presentation to Plenary VII

2. UIC approach on gap analyses
   - Gap analysis on information in GEOSS
   - Gap analysis on availability (current and future) observations that serve the observation priorities

3. GEO UIC release all the individual SBA reports in conjunction with the over-arching US-09-01a report
   - Primary US-09-01a deliverable is the over-arching report with Earth obs common to many SBAs
Back-up Materials
GEO UIC US-09-01a Process: Nine Steps

-The process lists the steps serially, yet some of them can be done in parallel.

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 final report on Earth observations for the SBA

When all SBA reports are complete, the Task Lead (and others) will perform a meta-analysis on the 9 SBA reports & parameter lists. They will write an overarching report, including a parameter list on “Earth observation priorities common to many SBAs.” The report will include lessons learned and recommendations.