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

12th UIC Meeting • Melbourne, Australia
14-September-2009
Group on Earth Observations
Task US-09-01a

Sections of Presentation

- Brief Review of Task
- Status & Schedule
- Preliminary Results (Disasters, Energy)
- Issues for UIC Decisions
- Discussion
- Recommendations/Decisions
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.
Key Tenets Followed:
- Harvest information expressed in existing, publicly-available documents; avoid duplication of efforts already performed by GEO MC & PO.
- Representative of GEO MC & POs (broad geographic representation, developed/developing countries)
- Documents need to span a range of User-Types within each SBA (e.g., managers, researchers, policy makers, forecasters, others)
- Focus is on the “demand” side of Earth observations, independent of the specific sensor technology, collection method, or current availability.

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

Email address: geo-task-us-0901@lists.nasa.gov
**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.
<table>
<thead>
<tr>
<th>Societal Benefit Area</th>
<th>Analyst</th>
<th># in Advisory Group</th>
<th># of Documents</th>
<th>Feb-09</th>
<th>Mar-09</th>
<th>Apr-09</th>
<th>May-09</th>
<th>Jun-09</th>
<th>Jul-09</th>
<th>Aug-09</th>
<th>Sep-09</th>
<th>Oct-09</th>
<th>Nov-09</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate</td>
<td>Molly Macauley</td>
<td>7</td>
<td>35</td>
<td>4/5</td>
<td>4/5</td>
<td>4/5/6</td>
<td>4/5/6</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disasters</td>
<td>Stephanie Weber</td>
<td>13</td>
<td>40</td>
<td>4/5</td>
<td>4/5/6</td>
<td>4/5/6</td>
<td>4/5/6</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ecosystems</td>
<td>Thomas Gulbransen</td>
<td>11</td>
<td>71</td>
<td>4/5</td>
<td>4/5</td>
<td>4/5/6</td>
<td>4/5/6</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy</td>
<td>Erica Zell</td>
<td>14</td>
<td>53</td>
<td>4/5/6</td>
<td>4/5/6</td>
<td>4/5/6</td>
<td>4/5/6</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human Health: Aeroallergens</td>
<td>Hillel Koren</td>
<td>16</td>
<td>117</td>
<td>1/1</td>
<td>2</td>
<td>3</td>
<td>1 &amp; 3</td>
<td>1/3/4/5</td>
<td>1/3/4/5</td>
<td>3/4/5</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human Health: Air Quality</td>
<td>Rudy Husar &amp; Stefan Falke</td>
<td>11</td>
<td>50</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1 - 3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3/4/5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Human Health: Infectious Disease</td>
<td>Pietro Ceccato</td>
<td>18</td>
<td>278</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1/3/4</td>
<td>3 &amp; 4</td>
<td>4/5</td>
<td>5/6</td>
<td>5/6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>Sushel Unninayar</td>
<td>9</td>
<td>56</td>
<td>2</td>
<td>3/4/5</td>
<td>5/6/7</td>
<td>6/7</td>
<td>6/7</td>
<td>6/7</td>
<td>6/7</td>
<td>6/7</td>
<td>6/7</td>
<td></td>
</tr>
<tr>
<td>Weather</td>
<td>Michael Nyenhuis</td>
<td>5</td>
<td>34</td>
<td>1 - 4</td>
<td>1 - 5</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Earth Observation Priorities (Task US-09-01a)

*Documents Reviewed & ad hoc Advisory Groups Members, by SBA*

(figures as of 4-August-2009)

<table>
<thead>
<tr>
<th>GEO Societal Benefit Area</th>
<th>Advisory Group Members</th>
<th>Documents in Meta-Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>Biodiversity</td>
<td>8</td>
<td>55</td>
</tr>
<tr>
<td>Climate</td>
<td>7</td>
<td>35</td>
</tr>
<tr>
<td>Disasters</td>
<td>13</td>
<td>40</td>
</tr>
<tr>
<td>Energy</td>
<td>14</td>
<td>53</td>
</tr>
<tr>
<td>Ecosystems</td>
<td>11</td>
<td>71</td>
</tr>
<tr>
<td>Human Health: Aeroallergens</td>
<td>16</td>
<td>117</td>
</tr>
<tr>
<td>Human Health: Air Quality</td>
<td>10</td>
<td>35</td>
</tr>
<tr>
<td>Human Health: Infectious Disease</td>
<td>17</td>
<td>165</td>
</tr>
<tr>
<td>Water</td>
<td>9</td>
<td>56</td>
</tr>
<tr>
<td>Weather</td>
<td>5</td>
<td>34</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>121</strong></td>
<td><strong>676</strong></td>
</tr>
</tbody>
</table>

Analysts and Advisory Groups include people from Australia, Austria, Canada, China, Costa Rica, Denmark, Germany, Finland, France, Ghana, India, Iran, Italy, Kenya, Japan, Mexico, Norway, Paraguay, Russia, USA, Senegal, South Africa, Thailand, Tunisia, CEOS, DIVERSITAS, ECMWF, ESA, FAO, GCOS, IEEE, UNESCO, WMO, and others. Full Analysis at Nov. 2009 UIC Meeting.
Major Progress Since 11th UIC Meeting (Stresa)

1. Health (Air Quality) Analyst Identified
2. Formation of Advisory Groups for each SBA completed
3. Delivery of 5 Preliminary Reports
   - Climate, Ecosystems, Energy, Disasters, Weather
4. Creation/agreement on common template for SBA reports
5. Monthly telecons with Analysts
6. Submitted proposal for special issue of IEEE JSTARS
7. The Energy Analyst had a baby

Note: Four SBAs (Climate, Energy, Disasters, Ecosystems) created a “Revised Preliminary Report” to transform their initial Preliminary Report into the new, common report template.
   - Climate, Energy, and Disasters delivered their Revised Prelim. in August
   - Ecosystems expects to deliver its Revised Prelim. in late September
Group on Earth Observations

Task US-09-01a

Current Task Schedule

- Preliminary reports from 5 SBAs (delivered) May/June 2009
- Preliminary reports from remaining 4 SBAs Sept/Oct. 2009
- Final reports from initial 5 SBAs Sept/Oct 2009
- GEO Plenary VI & 13th UIC Meeting November 2009
  - Analysts can report findings at UIC Meeting, if desired
- Final reports from remaining 4 SBAs Dec.-Jan. 2010
- Meta-analysis across all 9 SBAs & draft report Feb.-April 2010
- Final US-09-01a Task report May 2010
  - Presentations to UIC, C4, GEO Sec., others (as needed)
- Presentation to Plenary GEO VII November 2010
Common 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 Area
   - SBA Description, Sub-areas, Documents, User Types

4. Earth Observations for the SBA Sub-areas
   - Earth Obs. by each SBA Sub-area

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

6. Additional Findings

7. Analyst’s Comments and Recommendations
   - Process and Methodology, Challenges, Recommendations

Appendix & Bibliography/References
Example of expected output for each SBA

<table>
<thead>
<tr>
<th>Observation Category</th>
<th>Parameter</th>
<th>Aggregated Characteristics of Priority Observation Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Coverage/Extent</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
US-09-01a:
Revised Preliminary Report

*Disaster Societal Benefit Area*
Method:
Used an aggregated-weighted index, based on:
- Frequency the observation category was mentioned in the documents
- Document-specific weighting factors (i.e., type of document and geographic extent, cross-cutting applicability of observation mentioned in documents)

Those parameters in the shaded area represent 75% of the total index value.
## Table 8. Priority Earth Observations for Disasters SBA.

<table>
<thead>
<tr>
<th>Observation Category</th>
<th>Parameter</th>
<th>Coverage/Extent</th>
<th>Spatial Resolution</th>
<th>Temporal Resolution</th>
<th>Accuracy</th>
<th>Latency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Deformation</td>
<td>Slip</td>
<td>• Seismically active areas</td>
<td>Moderate to High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Along active fault lines/near fault zones</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Slope Movement</td>
<td>• Seismically active areas</td>
<td>1 mm - 1 cm</td>
<td>High Frequency</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Along active fault lines/near fault zones</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strain</td>
<td>• Seismically active areas</td>
<td>50 - 75 m</td>
<td>Weekly</td>
<td>Sub-cm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Along active fault lines/near fault zones</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deformation</td>
<td>• Seismically active areas</td>
<td>1 m - 75 m</td>
<td>1 sec - 1 week</td>
<td>Sub-mm - 1 cm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Along active fault lines/near fault zones</td>
<td></td>
<td>1 month - 1 year</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elevation</td>
<td>• Global</td>
<td>0.15-5 m</td>
<td>Rapid updates after events</td>
<td>Sub-dm - 0.5 m</td>
<td>Months</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Seismically Active Areas</td>
<td>1 m for targeted areas</td>
<td>Monthly - 3 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bathymetry</td>
<td>• Areas of high landslide susceptibility</td>
<td>2-5 m global</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Near-Shore</td>
<td>90 m - &lt; 1 km</td>
<td>Monthly - 3 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Topography/Elevation</td>
<td>Slope Angle, Length, Position</td>
<td>• Areas of high landslide susceptibility</td>
<td>“High”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “High”</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Curvature</td>
<td>• Areas of high landslide susceptibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• “High”</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Seismicity</td>
<td>• National – Global Scales</td>
<td>&lt; 1 km - 2 km</td>
<td>Real-Time</td>
<td>Magnitudes of 1.5 - 2.0 (urban/regional)</td>
<td>Real-Time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Seismically Active Areas</td>
<td>(urban areas)</td>
<td></td>
<td>Magnitudes of 3.0-3.5 (global)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Areas of high landslide susceptibility</td>
<td>70 km (national scale)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Urban areas and critical facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Precipitation</td>
<td>Precipitation Intensity, Duration,</td>
<td>• Near potential and actual landslides</td>
<td>Continuous -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amount</td>
<td>• Catchment areas</td>
<td>1-50 km</td>
<td>Hourly</td>
<td>1 - 2 mm</td>
<td>Hourly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Flood areas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Blank fields indicate that no specific requirement was reported in the documents.*
### Table 8. (Continued).

<table>
<thead>
<tr>
<th>Observation Category</th>
<th>Parameter</th>
<th>Coverage/Extent</th>
<th>Spatial Resolution</th>
<th>Temporal Resolution</th>
<th>Accuracy</th>
<th>Latency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Soil Parameters</strong></td>
<td>Soil Moisture</td>
<td></td>
<td>• 100 m - 10 km</td>
<td>• 4 times/day - weekly</td>
<td></td>
<td>• Within 1 day</td>
</tr>
<tr>
<td></td>
<td>Soil Composition and Thickness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pore Pressure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rock Strength, Permeability, Spacing, Orientation</td>
<td>• 5 m</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gravity Fields</strong></td>
<td>Gravity Fields</td>
<td>• Global</td>
<td>• 100 km</td>
<td>• Approximately Monthly</td>
<td>• 0.3 μGal - 1 mGal</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Along active fault lines and near fault zones</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Magnetic Fields</strong></td>
<td>Magnetic Fields</td>
<td>• Global</td>
<td>• Along active fault lines and near fault zones</td>
<td>• Few nT</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[^a\] Blank fields indicate that no specific requirement was reported in the documents.
US-09-01a:
Revised Preliminary Report

Energy Societal Benefit Area

Note: Energy Analyst/AG used three methods for prioritization
Method A
Based on a prioritization method using simple frequency analysis:

Eight Earth observation parameters were shared by numerous Renewable Energy types.
### Table 9. Parameter Characteristics of High Ranking Cross-Cutting Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Coverage/Extent</th>
<th>Temporal resolution</th>
<th>Spatial resolution</th>
<th>Timeliness</th>
<th>Accuracy/Precision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precipitation</td>
<td>Global</td>
<td>Monthly</td>
<td>0.25 degrees x 0.25 degrees</td>
<td>Ranges from unimportant, to needed in advance (forecast)</td>
<td>Unknown</td>
</tr>
<tr>
<td>Elevation/topography</td>
<td>Global to site level</td>
<td>One-time measurement</td>
<td>1 km² to m-scale (5-10 m vertical contours)</td>
<td>Not important</td>
<td>Unknown</td>
</tr>
<tr>
<td>Wind speed</td>
<td>Global land surface and marine coastal zone (5-50 km offshore)</td>
<td>Every 10 – 30 min</td>
<td>1 km² to ~20 km² horizontal, 10-200 m+ vertical</td>
<td>Ranges from unimportant, to needed in advance (forecast)</td>
<td>Within 10% of annual average wind speed, or within 0.3 m/s</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>(Dictated by meteorological models – see Weather SBA Report)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air temperature</td>
<td>(Dictated by meteorological models – see Weather SBA Report)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface temperature</td>
<td>(Dictated by meteorological models – see Weather SBA Report)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land cover</td>
<td>Global land surface</td>
<td>Unknown (depends on timescale of land cover changes)</td>
<td>80 m – 10 km</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>Wind direction</td>
<td>Global land surface and marine coastal zone (5-50 km offshore)</td>
<td>Every 10 – 30 min</td>
<td>&lt;1 km² to ~20 km² horizontal, 10-200 m+ vertical</td>
<td>Ranges from unimportant, to needed in advance (forecast)</td>
<td>Within 3 degrees</td>
</tr>
</tbody>
</table>
Method B
Based on a prioritization method using IEA’s projections of prominent renewable energy types for the 2006 - 2015/2030 timeframes:

The table shows the information according to the highest ranked “Renewable Energy Types” by IEA.

Within each renewable energy type, the “Top Parameters Required” are simply listed and are not ranked.

<table>
<thead>
<tr>
<th>Priority Renewable Energy Type</th>
<th>Top Parameters Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydropower</td>
<td>Precipitation, Reservoir/lake height, Elevation, Water runoff (modeled), Snow water equivalent</td>
</tr>
<tr>
<td>Onshore wind power</td>
<td>Wind speed, Wind direction, Wind shear, Elevation, Land cover</td>
</tr>
<tr>
<td>Bioenergy</td>
<td>Land cover, Net primary productivity, Precipitation, Evapotranspiration, Normalized Difference Vegetation Index (NDVI)</td>
</tr>
<tr>
<td>Offshore wind power</td>
<td>Wind speed, Wind direction, Wind shear, Wave height</td>
</tr>
<tr>
<td>Solar PV and CSP</td>
<td>Global horizontal irradiation (GHI), Direct normal irradiation (DNI), Inclined plane radiation, Air temperature, Wind speed, Wind direction, Relative humidity</td>
</tr>
<tr>
<td>Geothermal</td>
<td>Water temperature at depth, Fluid Pressure, Rock Permeability, Water Chemistry, Land Cover</td>
</tr>
</tbody>
</table>
Method C
Based on a prioritization method using a combination of the results from the two previous methods (A & B):

Shown in 4 tiers:
1 – Parameters from Method A that are also in list of highest renewable energy type in Method A
2 – Parameters from Method A that are also in list of second highest renewable energy type in Method B
3 – Remaining parameters from Method A (which are all included in Method B)
4 – Remaining parameters from Method B not included in Method A

<table>
<thead>
<tr>
<th>Tier</th>
<th>Parameter</th>
<th>Coverage/Extent</th>
<th>Characteristics of the Observations Parameters</th>
<th>Latency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Spatial</td>
<td></td>
</tr>
<tr>
<td>Tier 1</td>
<td>Precipitation</td>
<td>Global</td>
<td>0.25 degrees x 0.25 degrees</td>
<td>Monthly</td>
</tr>
<tr>
<td>Tier 1</td>
<td>Elevation/</td>
<td>Global to site level</td>
<td>1 km² to m-scale (5-10 m vertical contours)</td>
<td>One-time measurement</td>
</tr>
<tr>
<td></td>
<td>topography</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tier 2</td>
<td>Wind speed</td>
<td>Global land surface and marine coastal zone (5-50 km offshore)</td>
<td>&lt;1km² to ~20 km² horizontal, 10-200m³ vertical</td>
<td>Every 10 – 30 min</td>
</tr>
<tr>
<td>Tier 2</td>
<td>Wind direction</td>
<td>Global land surface and marine coastal zone (5-50 km offshore)</td>
<td>&lt;1km² to ~20 km² horizontal, 10-200m³ vertical</td>
<td>Every 10 – 30 min</td>
</tr>
<tr>
<td>Tier 2</td>
<td>Land cover</td>
<td>Global land surface</td>
<td>30m – 10 km</td>
<td></td>
</tr>
</tbody>
</table>
Method C
Based on a prioritization method using a combination of the results from the two previous methods (A & B):

Shown in 4 tiers:
1 – Parameters from Method A that are also in list of highest renewable energy type in Method A
2 – Parameters from Method A that are also in list of second highest renewable energy type in Method B
3 – Remaining parameters from Method A (which are all included in Method B)
4 – Remaining parameters from Method B not included in Method A
**Method C**
Based on a prioritization method using a combination of the results from the two previous methods (A & B):

Shown in 4 tiers:
1 – Parameters from Method A that are also in list of highest renewable energy type in Method A
2 – Parameters from Method A that are also in list of second highest renewable energy type in Method B
3 – Remaining parameters from Method A (which are all included in Method B)
4 – Remaining parameters from Method B not included in Method A

<table>
<thead>
<tr>
<th>Tier</th>
<th>Parameter</th>
<th>Coverage Exist</th>
<th>Spatial</th>
<th>Temporal</th>
<th>Accuracy</th>
<th>Latency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier 4</td>
<td>Direct Normal Irradiation (DNI)</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Hourly to monthly (current)</td>
<td>&lt;= 15-25% rRMSE</td>
<td>Unknown</td>
</tr>
<tr>
<td>Tier 4</td>
<td>Inclined plane radiation</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>Tier 4</td>
<td>Water/ fluid temperature at depth</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>10°C-50°C (current)</td>
<td>Unknown</td>
</tr>
<tr>
<td>Tier 4</td>
<td>Fluid pressure</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>Tier 4</td>
<td>Rock permeability</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>Tier 4</td>
<td>Geologic water chemistry</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
</tbody>
</table>
Future Considerations,
UIC Discussion,
and Decisions
Future Considerations for UIC on Task US-09-01a

When all SBA reports are complete, the Task Lead (with others) will prepare 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*
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></td>
<td>No</td>
</tr>
<tr>
<td>Available in Future</td>
<td></td>
</tr>
<tr>
<td>Planned</td>
<td>Good situation</td>
</tr>
<tr>
<td></td>
<td>In waiting</td>
</tr>
<tr>
<td>No Plan</td>
<td>Possible crisis</td>
</tr>
<tr>
<td></td>
<td>Major gap</td>
</tr>
</tbody>
</table>
Suggested Decisions for UIC on Task US-09-01a

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

2. UIC approach on gap analysis

3. Release of individual SBA reports prior to completion of overall Task Report
   - Should GEO UIC deliver each SBA report as they are finalized?
   - Should GEO UIC release all the SBA reports in conjunction with the over-arching US-09-01a report?

   *Note: Task Lead considers the primary US-09-01a deliverable is the over-arching report with the Earth obs. common to many SBAs.*
Topics for Discussion

Items to include in UIC presentation to GEO Plenary VI
- Initial results?
- Advisory Group composition (potential new recruits for GEO MC/PO)?
- Recommendation for follow-on activities (gap analysis, new task)?
- Recommendation for full presentation at Plenary VII?

Nature of the parameter lists
- Breadth of user types represented/achieved in analyses

Next Steps post US-09-01a Over-arching Report
- Presentations
- Gap analysis

Related activities of other GEO Committees
- Possible STC scientific review of the WP tasks
- Gap analysis