ECV IN BRIEF

Glacier changes provide independent and reliable evidence of climate change. Past, current and future glacier changes impact global sea level, the regional water cycle, and may increase local hazard risks.

ECV Products

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>FREQUENCY</th>
<th>RESOLUTION</th>
<th>REQUIRED MEASUREMENT UNCERTAINTY</th>
<th>STABILITY</th>
<th>REFERENCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLACIER AREA</td>
<td>Annual (at end of ablation season)</td>
<td>Horizontal (at the end of the ablation period)</td>
<td>5%</td>
<td>na</td>
<td>IGOS (2009), Paul et al. (2009), Zemp et al. (2013)</td>
</tr>
<tr>
<td>GLACIER ELEVATION CHANGE</td>
<td>Decadal</td>
<td>Horizontal</td>
<td>2 m/decade</td>
<td>1 m/decade</td>
<td>IGOS (2009), Paul et al. (2009), Zemp et al. (2013)</td>
</tr>
<tr>
<td>GLACIER MASS CHANGE</td>
<td>Seasonal to annual (the latter at end of ablation period)</td>
<td>Vertical: 0.01 m per 10 kg/m² (at point location)</td>
<td>Better than 200 kg/m²/year (glacier-wide)</td>
<td>na</td>
<td>IGOS (2009), Paul et al. (2009), Zemp et al. (2013)</td>
</tr>
</tbody>
</table>

Data Sources

In Situ Data:

- WGMS MetaData Browser and Data Access
  [http://wgms.ch/](http://wgms.ch/)

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1 Current Products and Requirements as in the Implementation Plan 2016 (GCOS-200). GCOS is reviewing and will update the requirements as part of their contribution to the UNFCCC Global Stocktake. More information on: climedata.wmo.int.

2 www.gcos.wmo.int gcw@wmo.int @gcw_un
Global Terrestrial Network for Glaciers (GTN-G) Data Explorer
http://www.gtn-g.org/data_catalogue_glims/

Satellite:

- Satellite ECV Inventory by the CEOS/CGMS Working Group on Climate (WGClimate)
  http://climatemonitoring.info/ecvinventory
- GLIMS Glacier Database, NASA
  http://glims.colorado.edu/glacierdata/

Change in Glacier Mass

Annual mass balances of reference glaciers with more than 30 continued years of observations


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2 This list provides sources for openly accessible data sets with worldwide coverage for which metadata is available. It is curated by the respective GCOS ECV Steward(s) and reflects the status as of 10/2018. The list does not claim to be complete. Anyone with a suitable dataset who would like it to be added to this list should contact GCOS.