

Glaciers

ESSENTIAL CLIMATE VARIABLE (ECV) FACTSHEET



ECV IN BRIEF

Domain: Terrestrial
Subdomain: Cryosphere
Scientific Area: Snow and Ice
ECV Steward: Huilin Li
Products: Glacier Area
 Glacier Elevation Change
 Glacier Mass Change



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 Products¹

PRODUCT	REQUIREMENTS				
	FREQUENCY	RESOLUTION	REQUIRED MEASUREMENT UNCERTAINTY	STABILITY	REFERENCES
GLACIER AREA	Annual (at end of ablation season)	Horizontal (at the end of the ablation period) 15-30 m	5%	na	IGOS (2009), Paul et al. (2009), Zemp et al. (2013)
GLACIER ELEVATION CHANGE	Decadal	Horizontal 30-100 m x vertical 1 m	2 m/decade	1 m/decade	IGOS (2009), Paul et al. (2009), Zemp et al. (2013)
GLACIER MASS CHANGE	Seasonal to annual (the latter at end of ablation period)	Vertical: 0.01 m per 10 kg/m ² (at point location)	Better than 200 kg/m ² /year (glacier-wide)	na	IGOS (2009), Paul et al. (2009), Zemp et al. (2013)

Data Sources²

In Situ Data:

- ▶ WGMS MetaData Browser and Data Access
<http://wgms.ch/>

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: climatedata.wmo.int.



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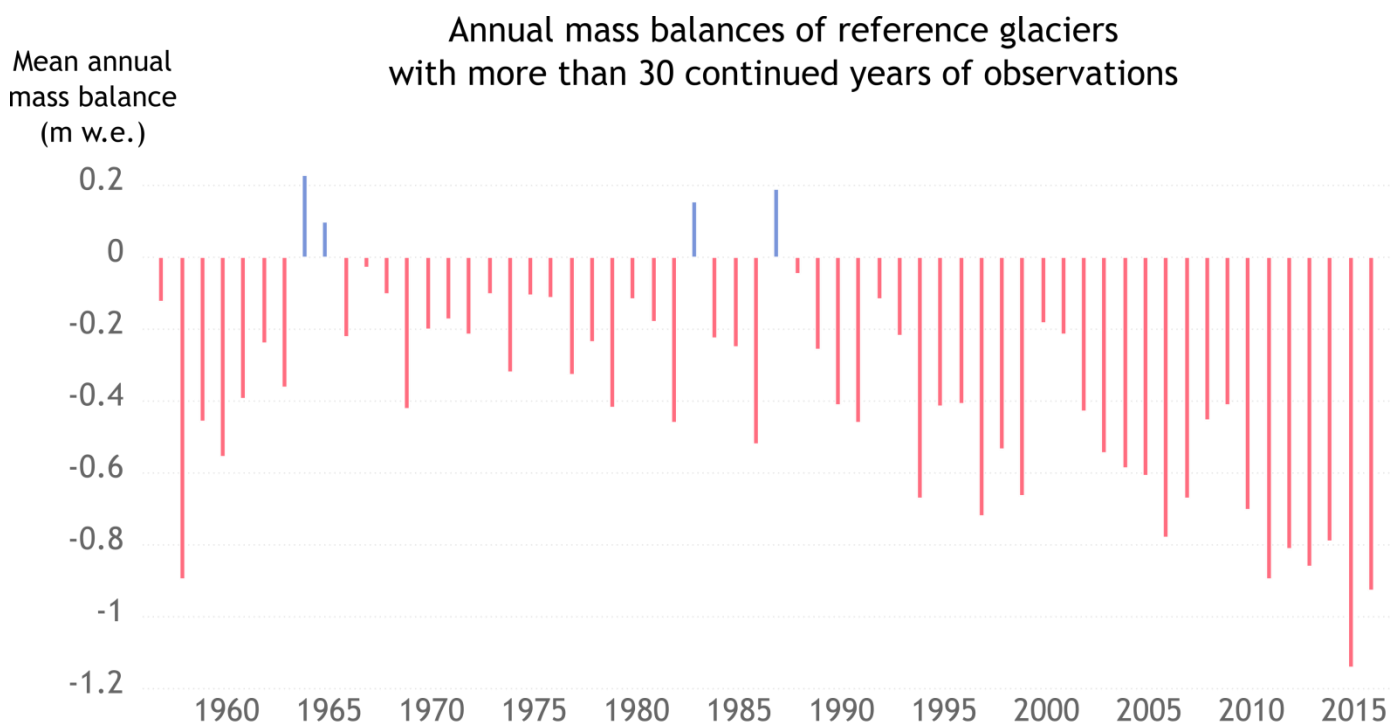


- ▶ Global Terrestrial Network for Glaciers (GTN-G) Data Explorer
http://www.gtn-g.org/data_catalogue_glims/

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



Source graph (24/11/2017): http://geodata.grid.unep.ch/extras/graph_glaciers.php

Source data: WGMS 2017. Global Glacier Change Bulletin No. 2 (2014-2015). Zemp, M., Nussbaumer, S. U., Gärtner-Roer, I., Huber, J., Machguth, H., Paul, F., and Hoelzle, M. (eds.), ICSU(WDS)/IUGG(IACS)/UNEP/UNESCO/WMO, World Glacier Monitoring Service, Zurich, Switzerland, 244 pp., publication based on database version: doi:10.5904/wgms-fog-2017-10. (And earlier reports)

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.



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