

Lakes

ESSENTIAL CLIMATE VARIABLE (ECV) FACTSHEET



**GLOBAL CLIMATE
OBSERVING SYSTEM**
KEEPING WATCH OVER OUR CLIMATE



ECV IN BRIEF

Domain:	Terrestrial
Subdomain:	Hydrology
Scientific Area:	Hydrosphere
ECV Stewards:	Valery Vuglinsky, Jean-Francois Cretaux, Stephan Dietrich
Products:	Lake Water Level Water Extent Lake Surface Water Temperature Lake Ice Thickness Lake Ice Cover Lake Colour



Lakes

Information on changes in lake level and area is required on a monthly basis for climate assessment purposes. Approximately 95% of the volume of water held globally in approximately 4 000 000 lakes is contained in the world's 80 largest lakes.

ECV Product¹

PRODUCT	DEFINITION	REQUIREMENTS				
		FREQUENCY	RESOLUTION	REQUIRED MEASUREMENT UNCERTAINTY	STABILITY	STANDARDS/REFERENCES
Lake water level	Elevation of the free surface of a lake relative to a specified vertical datum	Daily.	100 m	3 cm for large lakes; 10 cm for the remainder	1 cm/decade	WMO (2006, 2008a)
Water Extent	Area extent of the surface of a lake	Daily	20 m	10 % (relative); 5% (for 70 largest lakes)	5%/%/decade	WMO (2006, 2008a)
Lake surface water temperature	Temperature of the lake surface [K].	Weekly	300 m	1 K	0.1 K/decade	WMO (2006, 2008a)

¹ Current Products and Requirements as in the Implementation Plan 2016 (GCOS-200). GCOS is reviewing and will update the requirements until 2022. More information on: gcos.wmo.int and climatedata.wmo.int.



Lake ice thickness	Thickness of ice of a lake	Monthly	100m	1-2 cm		
Lake Ice Cover	Percentage of lake covered by ice	Daily	300 m	10%	1 % /decade	
Lake Colour	Lake Water Leaving Reflectance	Weekly	300 m	30%	1 %/decade	

Data Sources²

- ▶ International Data Centre on the Hydrology of Lakes and Reservoirs (HYDROLARE):
<http://hydrolare.net/database.php>
- ▶ Laboratory for Studies in Geophysics and Spatial Oceanography (LEGOS)
<http://www.legos.obs-mip.fr>
- ▶ NOAA - Great Lakes Environmental Research Laboratory
<https://www.glerl.noaa.gov/data/>
- ▶ World Lake Database of the International Lake Environment Committee (ILEC)
<http://www.ilec.or.jp/en/>
- ▶ Satellite ECV Inventory by the CEOS/CGMS Working Group on Climate (WGClimate)
<http://climatemonitoring.info/ecvinventory>

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). 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.

