



River Discharge
 ESSENTIAL CLIMATE VARIABLE (ECV)
 FACTSHEET



ECV IN BRIEF

- Domain:** Terrestrial
- Subdomain:** Hydrology
- Scientific Area:** Hydrosphere
- ECV Stewards:** Ulrich Looser, Alice Andral, Stephan Dietrich
- Products:** River Discharge
 Water Level
 Flow Velocity
 Cross-Section

 **River Discharge**

River-discharge measurements have essential direct applications for water management and related services, including flood protection. They are needed in the longer term to help identify and adapt to some of the most significant potential effects of climate change. The flow of freshwater from rivers into the oceans also needs to be monitored because it reduces ocean salinity, and changes in flow may thereby influence the thermohaline circulation.

ECV Product¹

PRODUCT	DEFINITION	REQUIREMENTS				
		FREQUENCY	RESOLUTION	REQUIRED MEASUREMENT UNCERTAINTY	STABILITY	STANDARDS/ REFERENCES
River Discharge	Volume of water flowing through a river (or channel) cross-section per unit time	Daily	Per river	10 % (relative)		ISO/TC 113: WMO (2010) WMO (2008a) WMO (2009)
Water Level	Elevation of the free-water surface of a body of water relative to a datum level	Daily	100m	10 cm	1 cm/yr	ISO/TC 113: WMO (2010) WMO (2008a) WMO (2009)
Flow Velocity	Vector indicating the speed and direction, at a point, of a moving liquid	Few times per year for station calibration	Per river	10 % (relative)		ISO/TC 113: WMO (2010) WMO (2008a) WMO (2009)

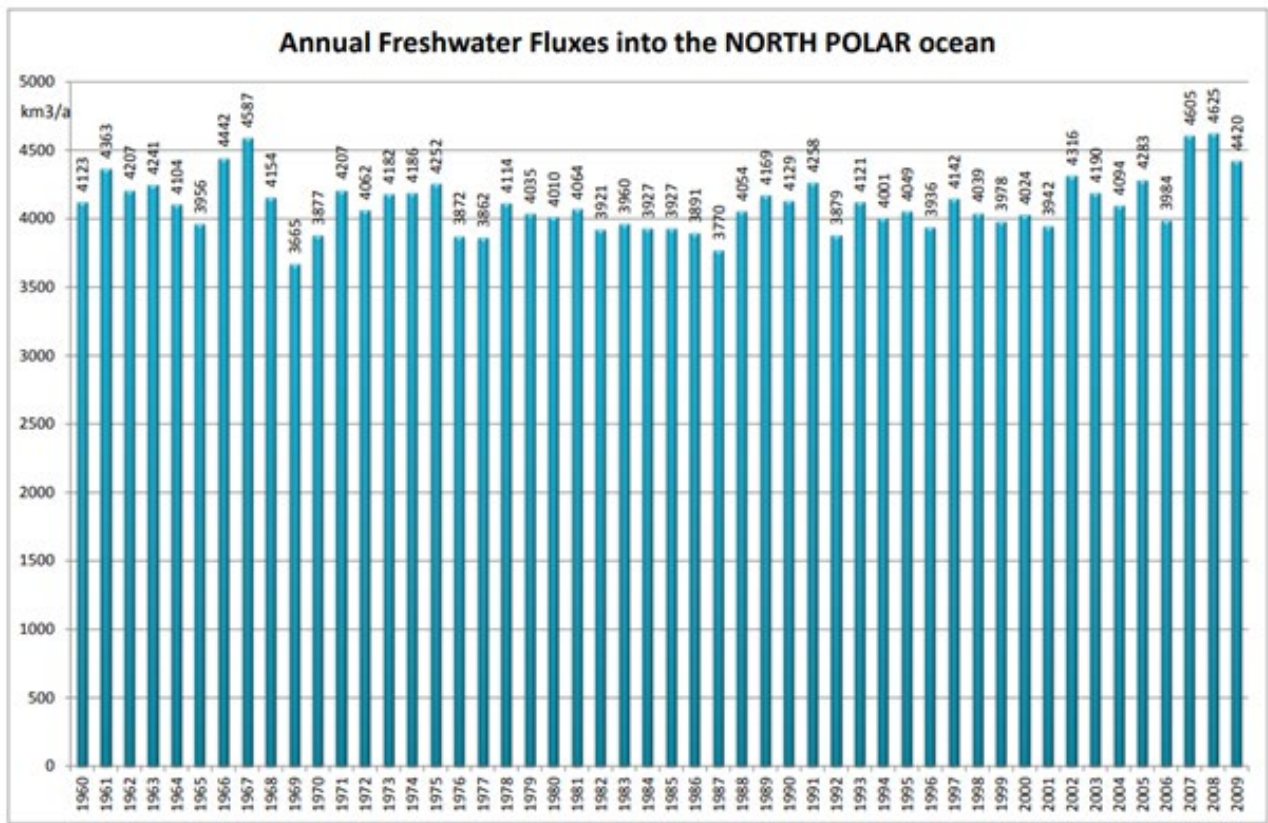
¹ Current Products and Requirements as in the Implementation Plan 2016 (GCOS-200). GCOS is reviewing and will update the requirements until 2022. More information on: gcos.wmo.int and climatedata.wmo.int.

Cross-Section	Section perpendicular to the main direction of flow bounded by the free surface and wetted perimeter of the stream or channel (ISO 772)	Few times per year for station calibration	Per river	10 % (relative)	ISO/TC 113: WMO (2010) WMO (2008a) WMO (2009)
----------------------	--	--	-----------	-----------------	--

Data Sources²

- ▶ WMO Hydrological Observing System
<http://www.wmo.int/pages/prog/hwrrp/chy/whos/index.php>
- ▶ Global Runoff Data Base (GRDC)
http://www.bafg.de/GRDC/EN/01_GRDC/13_dtbse/database_node.html
- ▶ The Global River Discharge (RivDIS) Project
<http://www.rivdis.sr.unh.edu/>

Annual Freshwater Fluxes (1960–2009) into the North Polar Ocean



Koblenz: Global Runoff Data Centre, 2014



Source : https://www.bafg.de/GRDC/EN/03_dtrprdcts/31_FWFLX/FWF_into%20oceans_6009.pdf?__blob=publicationFile

Source for Definitions: International Glossary of Hydrology (2012) WMO-No. 385, © World Meteorological Organization, 2012 (ISBN 978-92-63-03385-8); © United Nations Educational, Scientific and Cultural Organization, 2012 (ISBN 978-92-3-001154-3)

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.



WORLD
METEOROLOGICAL
ORGANIZATION



www.gcos.wmo.int

gcos@wmo.int

[@gcos_un](https://twitter.com/gcos_un)