

Nutrients

ESSENTIAL CLIMATE VARIABLE (ECV) FACTSHEET



GLOBAL CLIMATE
OBSERVING SYSTEM
KEEPING WATCH OVER OUR CLIMATE



ECV IN BRIEF

Domain:	Ocean
Subdomain:	Biogeochemical
Scientific Area:	Biosphere
Products:	Interior Ocean Concentrations of Silicate Phosphate Nitrate



Nutrients

Nutrients are essential for ocean life. Nutrient data provide important biogeochemical information, and provide essential links between physical climate variability and ecosystem variability. They can provide additional information on ocean mixing and climate related phenomena such as changes in primary and export production (nutrient transports regulate new production which is correlated with export production), eutrophication and shifts in phytoplankton community composition. Therefore it is necessary to develop accurate observations of trends in dissolved nutrients in both upper- and deep-ocean waters.

ECV Product¹

PRODUCT	DEFINITION	REQUIREMENTS				
		FREQUENCY	RESOLUTION	REQUIRED MEASUREMENT UNCERTAINTY	STABILITY	STANDARDS/ REFERENCES
INTERIOR OCEAN CONCENTRATIONS OF SILICATE	Concentration of silicate in the water column [$\mu\text{mol kg}^{-1}$]	Decadal	Every 20°	$\pm 0.1 \mu\text{mol}$	Not specified	See EOVS Specification Sheets: www.goosocean.org/eov
PHOSPHATE	Concentration of phosphate in the water column [$\mu\text{mol kg}^{-1}$]	Decadal	Every 20°	$\pm 0.05 \mu\text{mol}$	Not specified	www.goosocean.org/eov
NITRATE	Concentration of nitrate in the water column [$\mu\text{mol kg}^{-1}$]	Decadal	Every 20°	$\pm 0.03 \mu\text{mol}$	Not specified	www.goosocean.org/eov

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.



Data Sources²

- ▶ Global Ocean Data Analysis Project (GLODAPv2):
<http://glodap.info/>
- ▶ CLIVAR and Carbon Hydrographic Data Office (CCHDO):
<http://cchdo.ucsd.edu/>
- ▶ National Centers for Environmental Information Ocean Carbon Data System (NCEI OCADS):
<https://www.nodc.noaa.gov/ocads/>
- ▶ Biogeochemical Argo Global Data Assembly Centres:
<http://biogeochemical-argo.org/data-access.php>

Nutrients in the Ocean

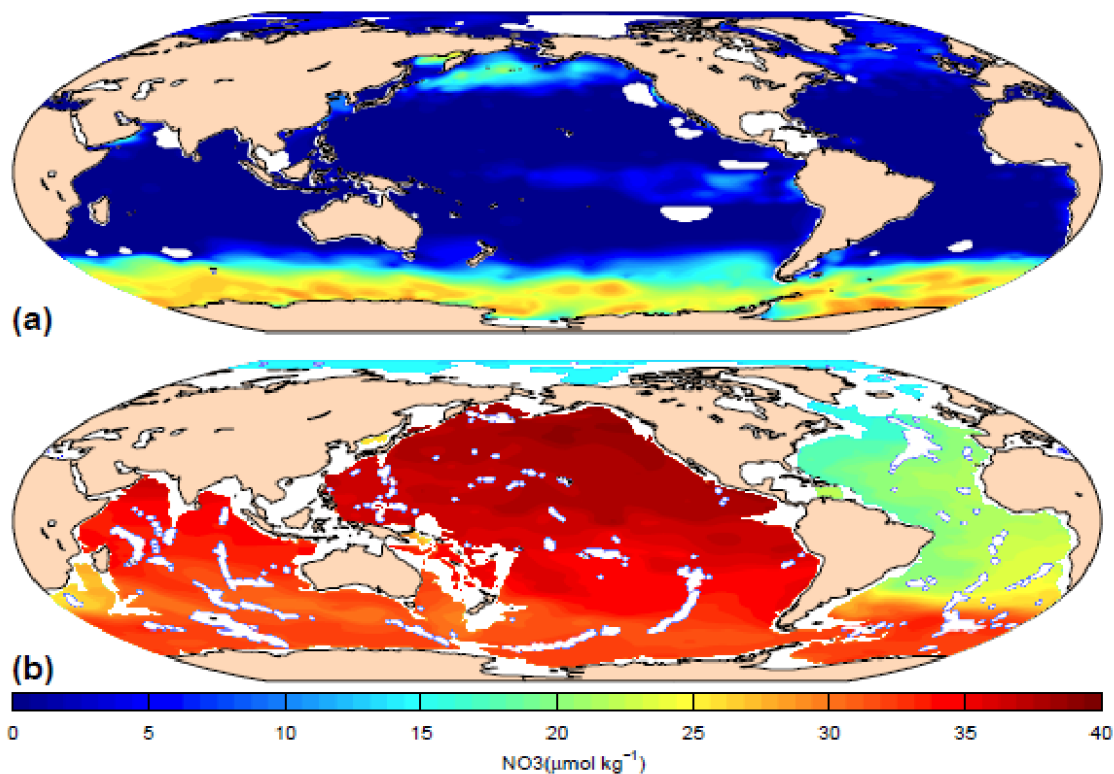


Figure: Global Nitrate concentration [$\mu\text{mol kg}^{-1}$] distributions at (a) 10 m and (b) 3000 m.

Reference: Lauset, S. K., Key, R. M., Olsen, A. R., van Heuven, S. et al. (2016): A new global interior ocean mapped climatology: the $1^\circ \times 1^\circ$ GLODAP version 2, Earth System Science Data, 8, 325-340, www.earth-syst-sci-data.net/8/325/2016/ doi:10.5194/essd-8-325-2016.

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.