

climate change initiative

→ LAKES NEWSLETTER

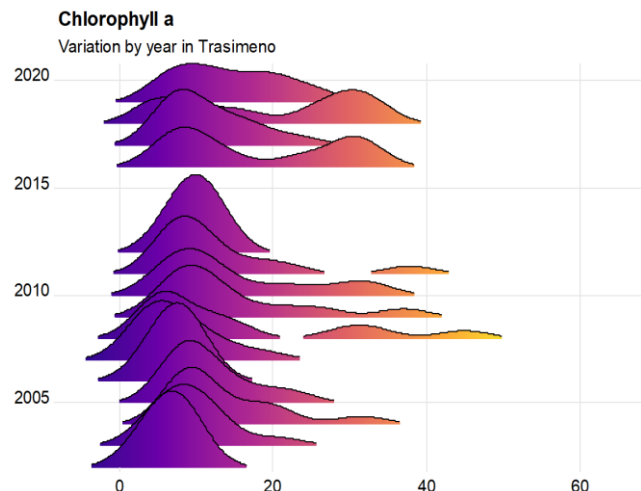
In this newsletter the Lakes_cci team are pleased to share this update after completing the first 3-year project phase and at the start of the second phase. We report on recent progress on datasets, new work planned, and a use case linking the lakes and fire essential climate variables. We also invite you to complete the new user requirements survey to guide the implementation of the project.

Summary of project phase 1 (2018-2022):

The latest Lakes_cci dataset is v2.0.2, available from the CEDA catalogue [here](#).

This dataset contains the Lakes Essential Climate Variable, comprised of processed satellite observations at the global scale, over the period 1992-2020, for over 2000 inland water bodies. Observations from over 30 satellite instruments were used to create the time series at 1-km, daily resolution.

The five thematic climate variables included in this dataset are Lake Water Level (LWL), Lake Water Extent (LWE), Lake Surface Water temperature (LSWT), Lake Ice Cover (LIC), Lake Water-Leaving Reflectance (LWLR). Each variable covers at least two decades of observations.



Example of the v2.0.2 time-series showing the concentration of chlorophyll-a in Lake Trasimeno, Italy.



User requirements survey

Climate scientists, limnologists, modelling experts and other users of Lakes_cci datasets: please share your views as part of the third user consultation of the project, collecting both feedback and requirements to align the project with your needs. The link to this new survey is available [through the project website](#) or by scanning the QR code:

Overview of project phase 2 (2022-2025)

The second implementation phase of the project kicked off in June 2022 and will continue the generation of the **Lakes ECV dataset for 2000+ lakes** over the next three years.

Our **next release, due in 2023**, will **fill existing spatiotemporal gaps**. We will add Lake Water Level and Extent observations for an increased number of lakes and complete the time series of Lake Colour (reflectance and chlorophyll-*a*) in the 2012-2016 period where sensor records provide adequate consistency. Further work is planned to **improve the consistency** between variables (notably Lake Ice Cover, Surface Water Temperature and Water-Leaving Reflectance), particularly in freezing and ice break-up periods.

Furthermore, user-requests to make data more readily available for individual (sets of) lakes are being addressed by **delivering a range of accessibility tools** – updates to follow.

New ECV : Lakes Ice Thickness

Research on methodologies to include Lake Ice Thickness started in the last project phase and we will start to ramp up algorithm validation and data generation work to produce the first lake time series for this final thematic addition to the Lakes ECV.

Planned data releases
 V2.1.0 - Sept, 2023
 V3.0.0 - March 2025

New research objectives: African lakes, dissolved carbon, lake storage change & lake indicators of climate change

In parallel to the data generation process we have started additional research to bring observation data into models of **lake responses to climate change in sub-Sahel Africa**, where data and information gaps are currently pressing. We are also evaluating algorithms 1/ for the quantification of **coloured dissolved organic matter** and its relation to dissolved organic carbon, which constitutes the vast majority of the lake carbon pool. And 2/for the **estimation of lake storage change**. Finally, we are distilling **multi-variable indicators of climate change** from the global dataset to directly inform policy.

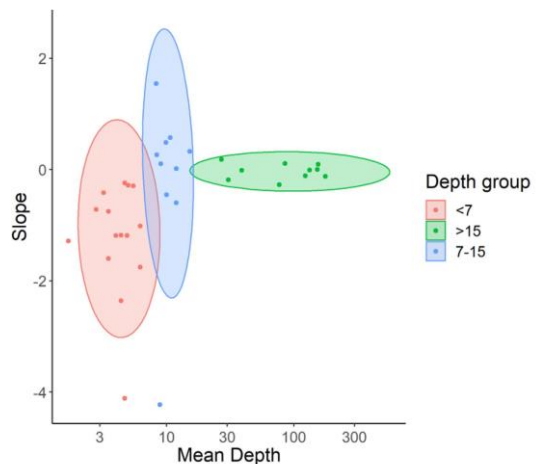
Publication highlights

Free, G., Bresciani, M., Pinardi, M., Simis, S., Liu, X., Albergel, C., & Giardino, C. (2022). Investigating lake chlorophyll-*a* responses to the 2019 European double heatwave using satellite remote sensing. *Ecological Indicators*, 142, 109217. <https://doi.org/10.1016/j.ecolind.2022.109217> (open access)

Lakes and wildfires

Global warming and increasing aridity cause an increase of fires and fire severity, while wildfires are also a cause of reducing forest cover and emitting greenhouse gases. Landscapes exposed to fire often include stream, river and lake catchments, presenting a risk to ecosystem services through nutrient and contaminant release from burned areas.

Within the Lakes_cci project a research activity started to assess potential wildfires impact on water quality variables. Using the Source – Pathway – Receptor (SPR) approach, effects on lakes over a wide trophic range will be studied using a subset of 154 lakes will identified as most vulnerable to wildfires in their catchments. The proportion of the catchment classified as burned area during (2001-2020) was quantified using data from the Fire_cci project, and combined with precipitation data to assess vulnerability.



*Slope of the relation between temperature anomaly and chlorophyll-*a*, as a function of mean lake depth (log scale). From Free et al. 2022.*