



ESA Climate Change Initiative (CCI) Permafrost – AWI WebGIS visualisation of Permafrost_cci timeseries data

The European Space Agency (ESA) Climate Change Initiative (CCI) is a global monitoring program which aims to provide long-term satellite-based products to serve the climate modelling and climate user community. Building on GlobPermafrost (2016-2019), **Permafrost_cci** data products are elaborated during Phase 1 CCI+ (2018-2021) and continued during Phase 2 of CCI+ (2022-2026).

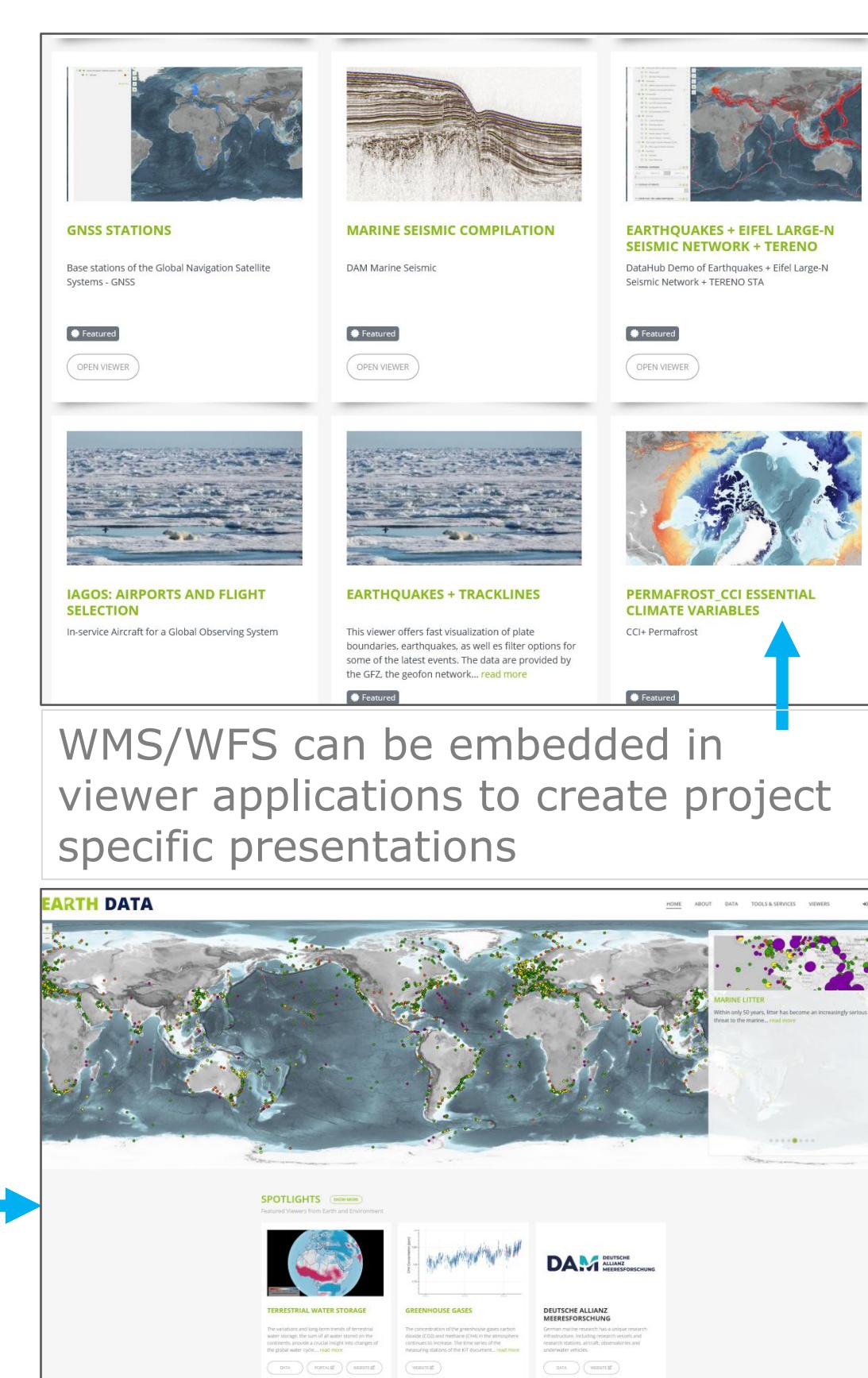
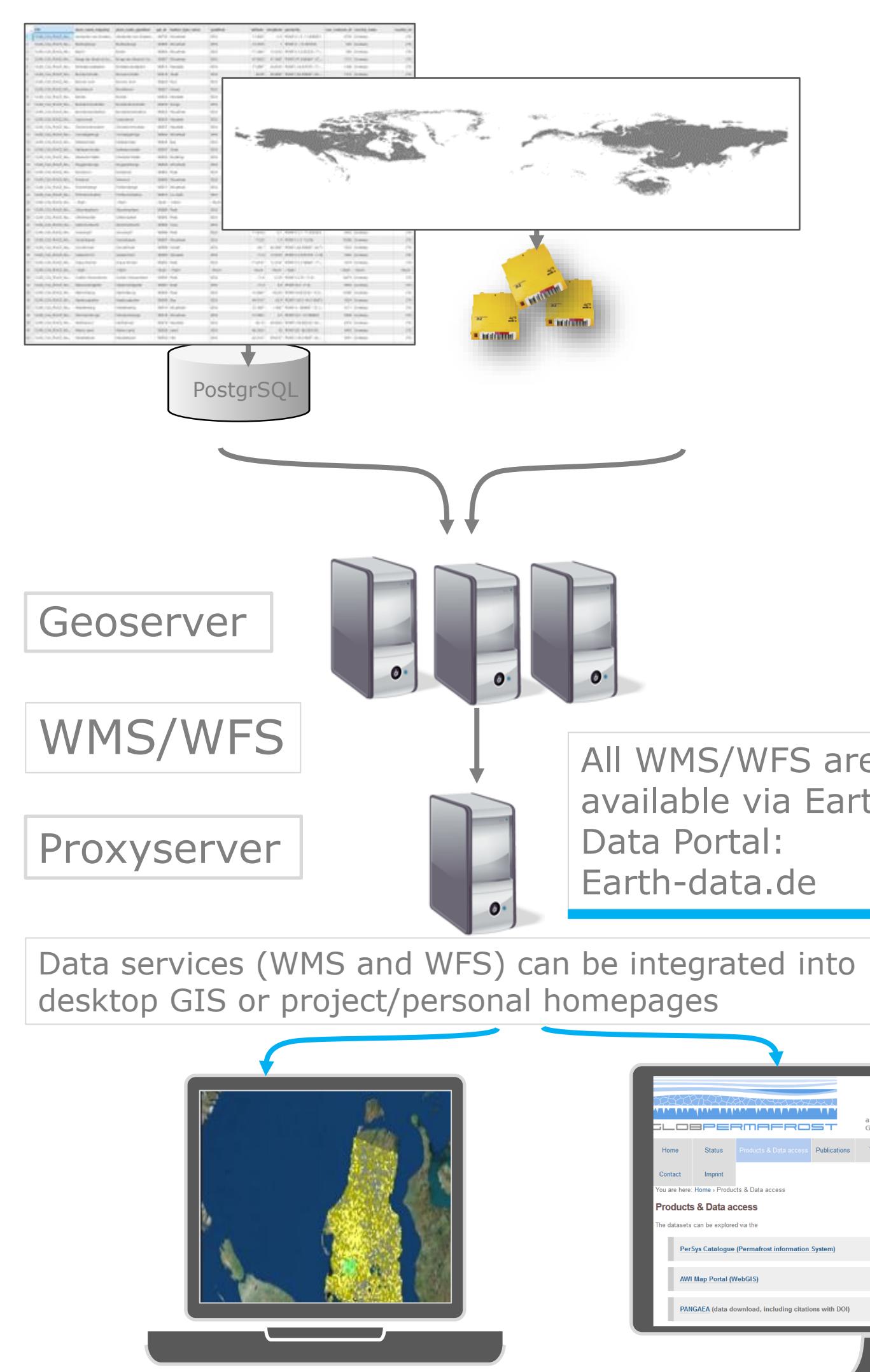
Permafrost_cci timeseries products from 1997 to 2023 in 1km resolution are:

- Permafrost Temperature
- Active Layer Thickness
- Permafrost Fraction

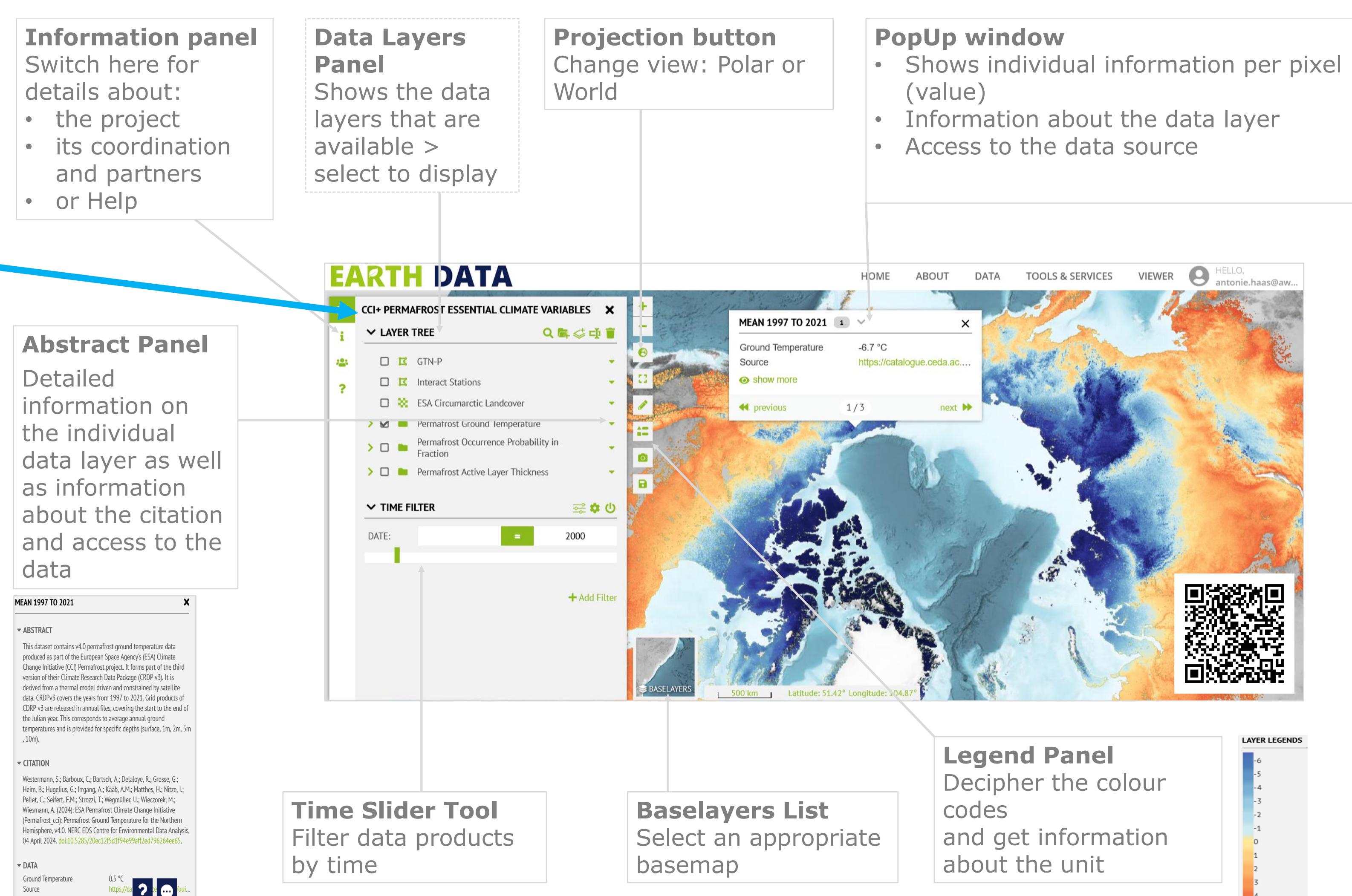
ESA Circumpolar Landcover (Additional product service)

Earth-data.de is a frontend and point of access to data viewers that show data published as digital data services based and realised upon GIS (Geographical Information Systems)-based geodata infrastructure at AWI. GIS server technology enables the digital publication and therefore visualization of multidisciplinary project data in the World Wide Web. **Permafrost_cci timeseries** datasets have been published as WebGIS services relying on OGC-standardized Web Mapping Services (WMS) and Web Feature Services (WFS). **Permafrost_cci timeseries** WMS are embedded in a JavaScript GIS viewer application based on a leaflet library. All services are interoperable and can be integrated into various desktop GIS applications.

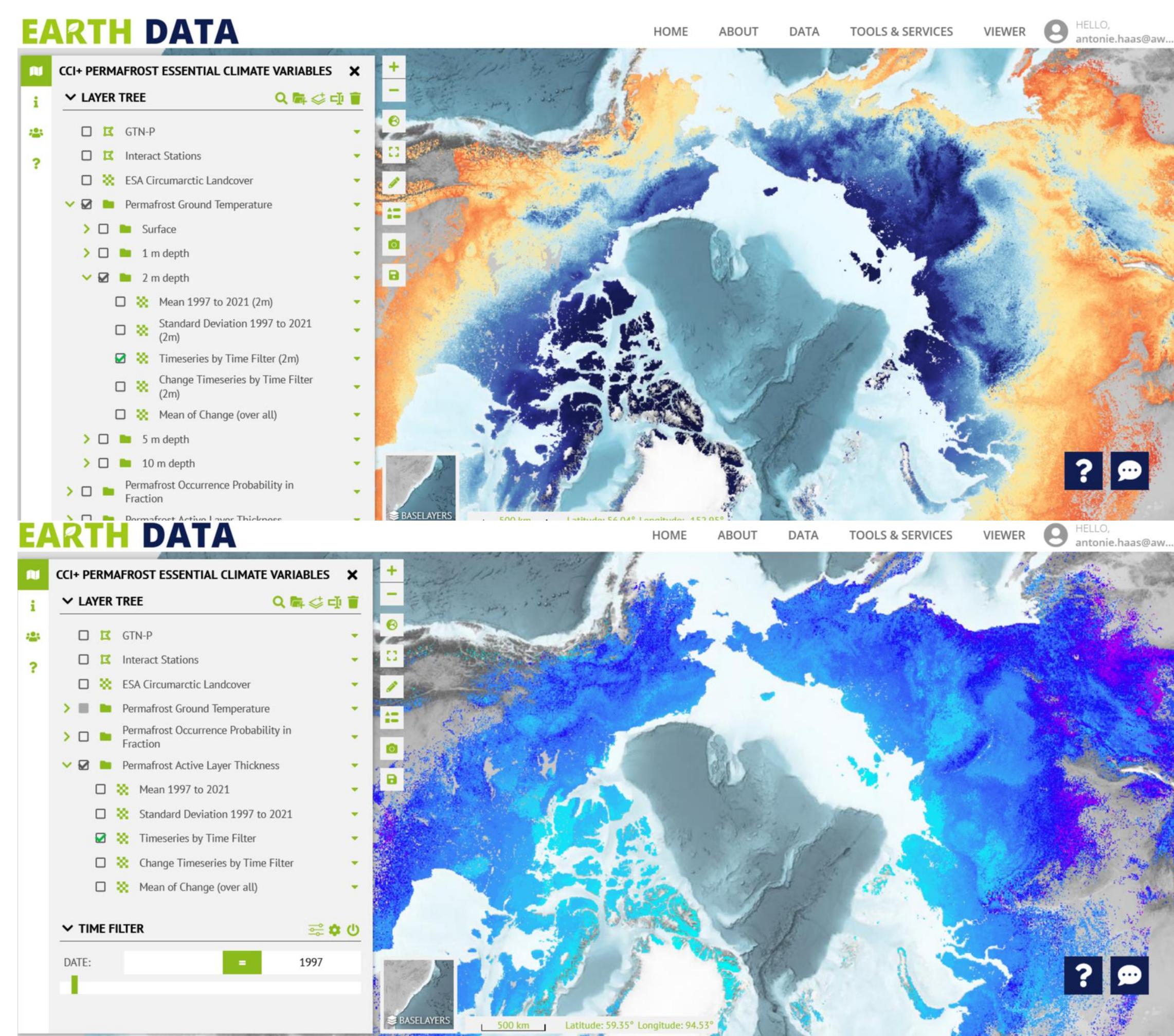
O2A Infrastructure Framework



Permafrost_cci timeseries Viewer Functionalities



Permafrost_cci Data Products



Ground Temperature per Depth (GTD) [°C]

Surface, 1, 2, 5, 10m Depth
Yearly, Yearly Mean, Yearly Std

Permafrost Occurrence Probability in Fraction (PFR) [%]

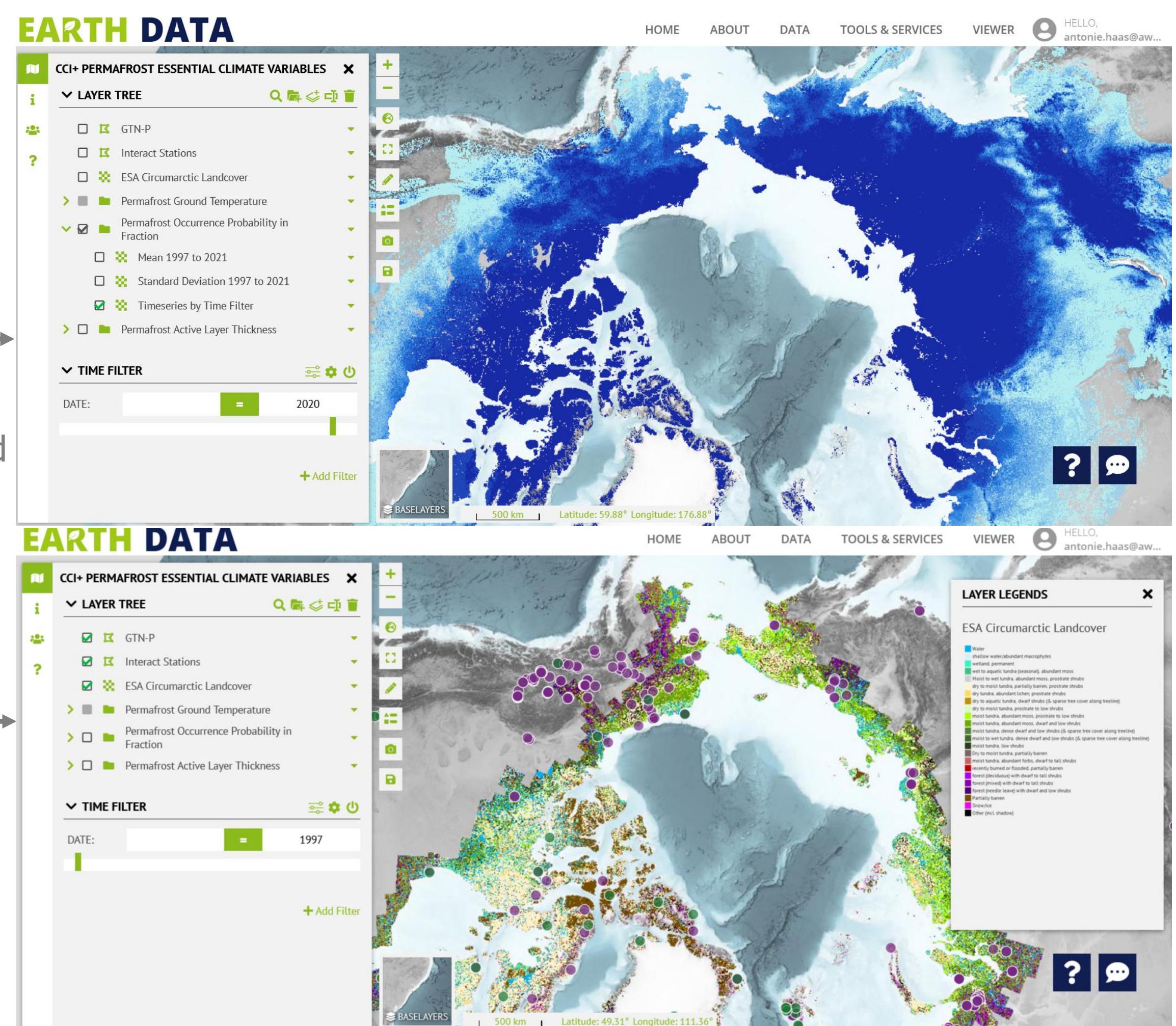
Yearly, Yearly Mean, Yearly Std

Active Layer Thickness (ALT) [m]

Yearly, Yearly Mean, Yearly Std

additional product service

- Permafrost Circumarctic Landcover
- Global Terrestrial Network for Permafrost (GTN-P) permafrost temperature mean annual ground temperature compilation (depths 0 to 10 m)
- Interact Research Stations



Data access:

Permafrost_cci timeseries: Westermann et al. (2024): Permafrost_cci: Permafrost v4 data product <http://catalogue.ceda.ac.uk/uuid/7479606004d9465bad9>

Permafrost_cci Circumarctic Landcover: Bartsch et al. (2024): <https://doi.org/10.5281/zenodo.14235736>

Global Terrestrial Network for Permafrost (GTN-P) permafrost temperature mean annual ground temperature compilation (depths 0 to 10 m) for assessment of Permafrost_cci products

<https://doi.pangaea.de/10.1594/PANGAEA.972992>

The ESA GlobPermafrost final product data set is published under doi:10.1594/PANGAEA.780111



UiO: University of Oslo

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esa

H2O Geomatics

GAMMA REMOTE SENSING

DATA SCIENCE SUPPORT

AWI

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HELMHOLTZ-ZENTRUM FÜR POLAR-
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