

# The Permafrost Information System PerSys

An Open Access geospatial data dissemination and visualization portal  
for products from ESA DUE GlobPermafrost

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## PerSys Components

### Introduction

Remote sensing has become an essential tool for quantitatively detecting and monitoring changes in permafrost and associated landscapes over large regions and with repeated observations. The European Space Agency (ESA) has supported permafrost-focused remote sensing activities in two recent projects, ESA DUE Permafrost (2009-2012) and ESA DUE GlobPermafrost (2016-2019; <http://www.globpermafrost.info>). The ESA DUE Permafrost project validated and implemented earth observation to support research communities and international organizations in their work on better understanding permafrost characteristics and dynamics. Now, the GlobPermafrost project expands on this successful approach by including both polar hemispheres as well as mountain permafrost regions.

Here we present the Permafrost Information System (PerSys), which combines a comprehensive data catalogue and a state-of-the art WebGIS within the framework of the ESA DUE GlobPermafrost project.

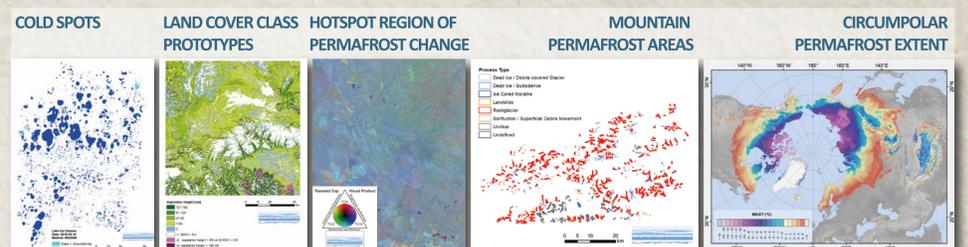


Figure 2: PerSys product examples

### Permafrost Information System

To bring the resulting data products of GlobPermafrost closer to the permafrost user communities, the Permafrost Information System (PerSys) has been conceptualized as an open access geospatial data dissemination and visualization portal for remote sensing derived datasets produced within the GlobPermafrost project. The prototype and final remote sensing products and their metadata will be visualized in the PerSys WebGIS and described via the PerSys Data Catalogue. The WebGIS visualization is managed via the AWI WebGIS infrastructure [maps@awi](http://maps.awi.de) (<http://maps.awi.de>) relying on OGC-standardized Web Mapping Service (WMS) and Web Feature Service (WFS) technologies for data display and visualization. The PerSys WebGIS projects allow visualization of raster and vector products. The PerSys Data Catalogue provides metadata and access to all mature-state and final-state GlobPermafrost products.

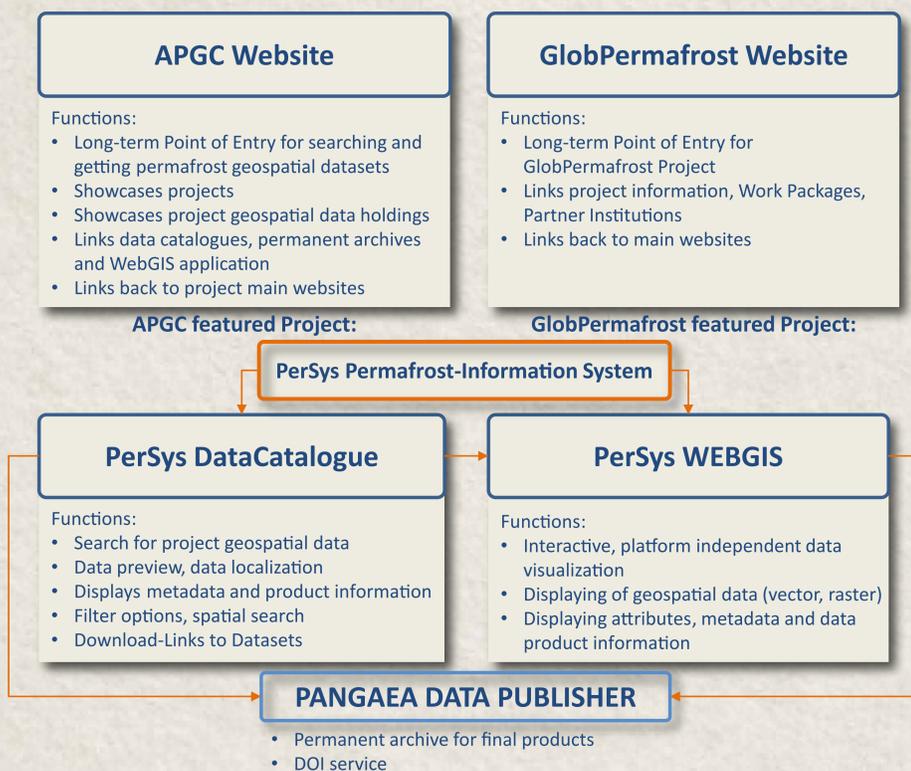


Figure 1: PerSys components and functions

### ESA GlobPermafrost Products

Products in GlobPermafrost cover different aspects of permafrost by integrating in-situ measurements of subsurface properties and surface properties, earth observation, and modelling. Currently, the GlobPermafrost team is creating prototype datasets for defined remote sensing derived products and targeting various user groups across 5 broad themes: permafrost extent (PEX), permafrost-specific land cover classes (LCP), hotspot regions of permafrost change (HOT), local cold spot sites of high research interest in the user community (CSP), and mountain permafrost (MNP). Registered users are able to assess the usability and validity of the products and provide feedback to the GlobPermafrost team. The feedback of the user groups is used to improve the developed remote sensing products.

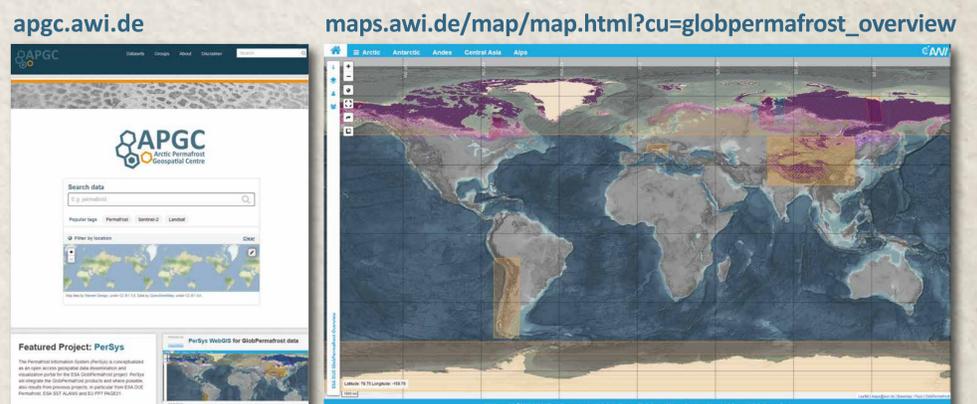


Figure 3: Left: start page of APGC featuring the PerSys Data Catalogue. Right: start page of the PerSys WebGIS

PerSys can be accessed through the GlobPermafrost project webpage. PerSys is also a core component of the Arctic Permafrost Geospatial Center (APGC), a geodata portal for permafrost launched within the framework of the ERC PETA-CARB project at the Alfred Wegener Institute Helmholtz Centre for Polar- and Marine Research. The APGC framework features a range of permafrost-specific geospatial data projects, including PerSys, and will allow searching for project-specific geospatial data by tags, keywords, data type and format, licence type, or by location. PerSys is available within APGC since early 2017.

In addition, the Open Access data library PANGAEA, as a certified member of The International Council for Science (ICSU), serves as permanent archive for the GlobPermafrost final products, providing permanent Digital Object Identifiers (DOIs) for each archived dataset. The ESA DUE Permafrost final products are already published in PANGAEA under DOI [doi:10.1594/PANGAEA.780111](https://doi.org/10.1594/PANGAEA.780111). The final GlobPermafrost remote sensing products published in PANGAEA will remain visualized in the PerSys WebGIS and catalogued, searchable and accessible via the PerSys Data Catalogue.

## Key Features

- Long-term support for all components like Data Catalog, WebGIS or PANGAEA hosted by AWI-infrastructure
- Various catalogue search filters for spatial datasets of the GlobPermafrost project like keywords, regions, resolution, formats or spatial in a map
- WebGIS-visualization of data and attributes due to Open WMS Services of [maps.awi.de](http://maps.awi.de)
- Variety of metadata according to international standards
- Direct download links to data in the permanent DOI-based data repository PANGAEA