PermaNET: Alpine Space permafrost monitoring network

Target groups
Civil servants / administration; scientists; specific institutions.

Area of application
The network includes 50 key monitoring sites in:

- Austria (5): A1 Hinteres Langtal Hohe Tauern; A2 Weissen Cirque Hohe Tauern; A3 Dösen Valley, Hohe Tauern; A4 Hoher Sonnblick; A5 Goldbergspitze
- France (5): F1 Orelle; F2 Laurichard; F3 Deux Alpes; F4 Aiguille de Midi; F5 Les Drus
- Germany (1): D1 Zugspitze
- Switzerland (2): CH1 Muot da Barba Peider, Pontresina; CH2 Hörnligrat, Matterhorn
- Italy (34): I1 Senales - Grawand (BZ); I2 Senales - Lazaun (BZ); I3 Ultimo - Rossbänk (BZ); I4 Riva di Tures - Napfen (BZ); I5 Braies - Croda Rossa “Cadin del Ghiacciaio” (BZ); I6 Braies - Croda Rossa “Cadin di Croda Rossa” (BZ); I7 Passo Gardena - Lech del Dragon (BZ); I8 Solda - Madritsch (BZ); I9 Cavaion (TN); I10 Cavaion (TN); I11 Lobbie (TN); I12 Presena (TN); I13 Coma Uomo (TN); I14 Matterhorn Carrel South (AO); I15 Matterhorn Carrel North (AO); I16 Matterhorn Cheminée new (AO); I17 Matterhorn Cheminées old (AO); I18 Matterhorn Oriondè - fractures (AO); I19 Matterhorn Oriondè - not fractures (AO); I20 Col d'Entrèves South (AO); I21 Col d'Entrèves North (AO); I22 Grandes Jorasses South - right (AO); I23 Grandes Jorasses South - left (AO); I24 Col de Peuterey North (AO); I25 Aiguille Marbrée (AO); I26 Cime Bianche Pass - shallow (AO); I27 Cime Bianche Pass - deep (AO); I28 Piz Boè (VB); I29 Mt. Moro Pass (VB); I30 Salati Pass - Mosso Inst. (VC); I31 Salati Pass - Corno dei Camosci (VC); I32 Sommeiller Pass (TO); I33 La Colletta Pass (CN); I34 Gardetta Pass (CN).

The handbook for the installation and maintenance of an alpine-wide permafrost monitoring network is suitable and intended for the whole Alps.

Time frame
The network was founded during the project. It's composed of:

- monitoring sites that already existed before the project start (information provided by a census);
- new monitoring sites installed and equipped during the project (the census high lightened areas without monitoring activities).

The metadata of the permafrost monitoring stations are continuously updated. No recent information whether the structure of the network is always the same or if new stations have been added after the project closure.

Keywords
Related to the type of result: network; methodology; metadata; data analysis; measurement techniques.
Related to the thematic of the result: permafrost; permafrost monitoring; monitoring sites; thermal monitoring.

Accessibility
Free access to the table of the permafrost monitoring sites, the map of the permafrost monitoring sites and the handbook for the installation and maintenance of an alpine-wide permafrost monitoring network. Metadata resulting from permafrost thermal monitoring activities in monitoring sites are not available by the public.

The metadata for each monitoring site are accessible from the overview map and provide information for fully understanding in which conditions the data of the monitoring are acquired. It is stated that numerical summaries of the collected parameters are periodically updated in the inventory.

Transferability and re-usability

In the handbook it is specified that the main goal is to develop strong national and transnational permafrost monitoring networks. Transferability is the main issue because a standardized and harmonized dataset of permafrost distribution in the Alps is needed. The setting up of both, national and trans-national structures for the monitoring system is essential to ensure long-term continuation and data quality. The set of guidelines for the maintenance of the monitoring stations has been developed so that the monitoring network can be extended as well as it will be guaranted the comparability of the measured data. In particular, the handbook also details which are the areas where transferring the output. New monitoring sites should be located in regions where gaps occur and, above all, ideally each climate region of the Alps should be covered. 2 principles in identifying new sites: territorial (where permafrost occurs) and climatic (monitoring sites should be installed on all the different types of climatic conditions at regional scale at the least). The project aimed at pushing the Alpine Space to be one of the leading model regions in the field of mountain permafrost research and permafrost monitoring, the guidelines for definition, measurement techniques and data analysis have to be applied, as far as possible to the whole Alpine Space.

Sector policies addressed

Spatial development; land use planning and managing; territorial planning & infrastructure; natural risk management; water resource management; socio-economic activities (tourism; ski resorts, ...) in high mountain areas and also in valleys at long distance from the source area.