

Satellite applications in the Alpine space: take-up success factors

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Conclusions from “Satellite Applications for the Alps” event held in Berchtesgaden, Germany on 27 Oct. 2016.

Editor: Teodora Secara, Deputy Secretary, User Programme Coordinator, Eurisy

Contributing experts:

Günter Strunz, DLR

Gerd Waizmann, proTime

Florian Albrecht, University of Salzburg, Department of Geoinformatics – Z_GIS

Sebastian d’Oleire-Oltmanns, Department of Geoinformatics - Z_GIS, University of Salzburg

Claudia Notarnicola, EURAC

Daniel Seybold, Teleorbit

Baerbel Deisting, German ESA IAP Ambassador, bavAIRia e.V.

Alina Hriscu, European GNSS Agency

Ines Placido, IAP Ambassador & Space Solutions Austria

Poul Erik Hansen, CENSEC - Center for Defense, Space & Security

Katharina Köhne, Alpine Space Contact Point

Contact: teodora.secara@eurisy.org

Potential and confirmed users of satellite applications (search and rescue organisations, national parks, geological offices and so on), as well as experts and policy makers, discussed the potential of satellite applications in the Alps, and what these could do for users in the environment, risk, and transport sectors. ([Access the presentations here](#)).

This document reflects some of the lessons learnt from the Eurisy conference held in Berchtesgaden on 27 October 2016. These conclusions are drawn from the discussions that took place during the event.

The landscape of the ecosystem of organisations using the services, and the use of satellite applications themselves, are patchy:

I. Users' platforms are not mutually compatible

This means that various users working on topics of connected interest (e.g. risk) each use their own online management platforms or apps that are not necessarily connected with each other. This is especially the case in organisations from across borders, but also in those working on a national level.

For instance, no common tools are used between Italian mountain rescue services ([CNSAS](#)) and Austrian ones ([Styrian Mountain Rescue](#)). The CNSAS (Italy) does not share the same information platform as the Italian Civil Protection either.

One of the consequences is that the CNSAS do not have direct access to the Copernicus Emergency Services (EMS) images and maps, as was recently the case after the earthquakes of 2016. The reason is that since the CNSAS are not an authorised user, they have not received the information from the official authorised agency (the Civil Protection). More often than not, the CNSAS must collect their own information using drones, or field visits, without the benefit of a satellite layer.

During the conference, the question arose on how users can choose between the various apps and digital platforms available for them; or if they should. Deciding on common tools, or on common apps, is complicated. Each user that has tested or implemented an application is not keen to convert to one used by a peer organisation. Beyond the lack of standards for user organisations, people (mountain tourists, or natural park visitors and so on), use different phones with different operating systems. Incidentally, one service provider also experienced that many end users do not differentiate between the services they offered, and those provided by the phone industry, for better or worse. Beyond the applications, the life of the battery charge in phones is often the main problem when out in the field.

Experts present agreed that the first step in sharing tools is to establish common standards, such as a protocol for emergency messages. Furthermore, agencies in Alpine countries could agree on common procedures in case of issues affecting cross-border territories. For example, users will reject using a rescue app they can rely on in the North of the Zugspitze Peak, Germany, but not on the other side of the mountain which happens to be in Austria. Instead, users should be able to rely on the app for their rescue message to be forwarded to the nearest emergency centre, irrespective if located in Austria or Germany.

II. Bottlenecks in data access, flow, navigation signals, telecommunications

In Austria maps used for search and rescue in the Alps were reported to be uniformly complete, accurate, of good quality. However, in Italy the quality of the maps varies depending on the regional authority which carries out the mapping (notably on their budget and processes).

Furthermore, since only one user per country is authorised to trigger the Copernicus Emergency Service (EMS), often the data does not trickle down the whole chain of users (sub-nationally).

Some users receive aerial images for free from their national administrations (typically, every three years). For some applications, having free aerial images every three years makes Copernicus Services satellite images redundant (in the perception of such users).

Some users and participants in the room also flagged the temporal limitation of the Copernicus Emergency Services: for instance, the view of Bernd Noggler, from the Tyrol Regional Operations Centre for Emergency Response and Rescue Operations in Austria, is that satellite images and maps from the Copernicus EMS simply cannot reach them quickly enough when extreme events hit, such as flash floods, landslides or avalanches. In these cases, satellite images can still be used for post-disaster management, but the rescue service is not responsible for that.

To state the obvious, satellite navigation signals are also not available everywhere in the mountains, nor are telecommunication networks. The limited battery life of devices used on the ground further limits these services.

III. Financing continuity: end-users use satellite applications mostly thanks to one-off project funds

With satcom, cost and the willingness of the users to pay was a perceived as a problem by both users and service providers. In the Adamello Park for instance, where the Park has provided satcom broadband in some of its mountain huts, tourists used bandwidth and data as they would unlimited wifi or 4G, not as a back-up option, which was not sustainable for the Park—the paying authority. However, it was not clear if the tourists would be willing to pay for the service themselves.

Project funds have enabled many of the user experiences presented in Berchtesgaden. The informal poll carried out during the event revealed that cost was not perceived as a big obstacle to the set up of satellite services — but as some pointed out during the event, the reason for that perception may be that uses have always been funded by project funding, rather than the users' own budgets.

The question of funding continuity arose in this context as critical. One example was the Pangeo project and one of its results: a database of geo-information on geo-hazards, covering various cities across Europe. The project ended in 2013, and for now no funding is foreseen for updating the maps.

TeleOrbit, a service provider, expressed the view that organisations like the mountain rescue are not sufficiently financed/funded, resulting in them not being able to pay even small amounts (€20-30 per month) for services. Teleorbit thinks it would be helpful if potential customers got the required financing. This would make it easier for them to use the products and services they need (or which would make their jobs easier and less dangerous) and would also allow the service providers to establish a business case for continuing the service after the end of a project.

IV. Governance and the interplay between the public and the private sector

Ultimately, **governance seemed like the most critical factor in enabling the diffusion of the use of satellite applications in the Alpine space.** It impacts a wide range of issues: data sharing, process coordination (including of cross border actions by user organisations), standards and shared tools, joint funding and procurement of services.

One of the prominent questions arising during the debates was how to delineate which services should be carried out by the public sector, and which should be entrusted to private companies (especially when the customers, or the end-users, are public administrations). In either case, the majority of end-users present preferred to work with an external provider for convenience reasons, or for lack of specific skills and time.

Referring back to cost, some companies objected that while they are technically able to produce continuous services for the end-users, the lack of dedicated, stable budget lines, their one-off nature as typically shown in projects, prevent companies from building solid business cases for those services.

Some private companies also argued that the opaqueness of the user needs also hinders business cases. The statement was contrasted by some of the user needs as described by the users in clear terms during the event. It seemed to be a case of the private sector finding it hard to replace well-established, older technologies or tools with satellite-derived applications, to the full satisfaction of the end-users. A typical example is that of nature parks: many have a no-intervention management policy for large areas of those parks, so new services seem redundant.

When it comes to satcom, as mentioned before, broadband is not always used wisely by tourists. The dilemma is how to fund a service that can be used by tourists both for critical information they need for their trip, and for more mundane uses, like using social media —which for now is not sustainable in terms of cost. The necessity of satcom for search and rescue operations, or to organise transport, is much more obvious. However, alternative technologies to satcom have already proved their value to the users, and evolutions are for the moment more experimental in nature.

Competition pressure on private satellite service providers comes not only from established technologies, but also from public-sector providers: indeed, some public organisations (universities, geological surveys, research centres etc.) have a mandate to provide the same services the private sector does. Even public sector providers without a continuous mandate to provide services, do so (albeit on a case-by-case basis) thanks to EC- or institutionally-funded projects. Some of them create spin-offs as a result of research activities (e.g. the University of Salzburg), while others have very clear policies to transfer knowledge to private sector companies.

V. Recommendations

The recommendations for addressing the challenges described above that emerged from the collective contributions can be grouped along three main topics:



Increase cross-border focus in the Alpine space:

End-users from across borders are confronted by issues that affect them collectively (transport, risk, tourism, etc).

Organising cross-border cooperation to tackle common issues would be beneficial to all involved. It would also allow them to mutualise expertise and other resources.

European Commission's end-user support programmes — such as [INTERREG](#), or its [EU Pre-Commercial Procurement](#) mechanism — could

enable end-users to organise such cooperation and to test innovative solutions, including those based on satellite services.

End-users could rely on new ideas emerging from the space community, through interactions with its representatives. Whether regional space clusters (such as the [Berchtesgaden Satellite Navigation Centre](#)), national space agencies, or indeed such programmes as [ESA's IAP Artes](#), or universities and research centres.

Improve data infrastructures and their shared use, introduce common standards:

Being able to use common information (relying on open data) and tools would enhance such cooperation. This would entail:

- creating, populating, updating shared databases, Geographic Information Systems and other IT infrastructures
- organising information flows and working processes in end-user organisations
- introducing the Galileo Search and Rescue service, radar data for cloud-covered areas, etc.

In terms of common **standards**: for instance, protocols for emergency messages in search and rescue, identifying the lowest common denominator in technology systems as a way to reach the highest number of people.

For example, Norway and Sweden recently (15 November 2016) made a joint effort to share the same emergency communications radio-line at the border in the case of a crisis or other emergency.

Organise governance

- organise cross-border procurement for solutions serving critical masses of users, with the possibility to include new ones in the future (and any data they can contribute). This would create economies of scale, making new solutions and risk distribution more affordable.
- stimulate cooperation between the private and public sector, define or clarify their roles in addressing cross-border challenges, with a long-term view

- ensure that any actionable information produced by organisations with a mandate to produce it is effectively included into the work processes of end-users who can act on it, by public mandate or otherwise. This will also ensure that the usefulness of the information produced, and the resources mobilised in producing it, are carefully evaluated

In terms of priorities, the first goal should be to agree upon a common standard. Furthermore, once the benefits of a shared standard are understood by the public and the users themselves, sufficient funds need to be allocated towards equipping the users with the resulting standardised equipment.

VI. Nota bene

The one day event did not set to cover and answer all the questions that arise in the Alpine space, but rather to open a process, or stimulate it where it already exists, where these questions are taken further directly by the regional stakeholders, with continued support from Eurisy only where relevant.