# JOINT INFORMATION PLATFORM FOR NATURAL HAZARDS IN SWITZERLAND

**Ingo Petzold**[1], Josef Hess[2], Franziska Schmid[3], Marco Arpagaus[4] and Sabina Steiner[5]

## INTRODUCTION

Natural hazards cause severe economic loss and fatalities. Organisational measures such as software-based information and warning systems can help to reduce the latter consequences. After the devastating floods in August 2005 in Switzerland, it was decided to strengthen the collaboration of the official Swiss warning centres for natural hazards in order to enhance mitigation of hazardous impact and harm. One outcome of this decision was the establishment of the Joint Information Platform for Natural Hazards, called GIN (German abbreviation for "Gemeinsame Informationsplattform Naturgefahren") as part of the national program OWARNA (Optimisation of Warning and Alerting in the Event of Natural Hazards). The platform is a joint development by the Federal Office for the Environment FOEN (flood events), the Federal Office of Meteorology and Climatology MeteoSwiss and the WSL Institute for Snow and Avalanche Research SLF.

## THE GIN PLATFORM

GIN provides information such as current observational data, forecasts and bulletins in pooled form. Since the beginning of March 2010 the platform is available for natural hazard experts on governmental, cantonal and municipal level. It is a web application, running independent of operating system or web-browser. Besides data from the official warning centres, observational data from cantonal institutions are integrated too. The official warning centres decide which data should be integrated in GIN and if quality of data is acceptable. Currently, GIN visualises data from over 550 automatic measurement stations, delivering information for more than 90 parameters. Besides that, predictions, bulletins and e.g. radar images are available to the users. It is possible to combine this information in an interactive way. As an example, in spring users can merge information about the current runoff, the amount of remaining snow in the mountains and the predicted precipitation in one map. This allows an eased assessment of complex and potentially dangerous situations.
GIN visualises data in the form of maps, diagrams as well as tables. As an example, the interactive platform allows users to select multiple measurement stations in the map and combine their parameters arbitrarily in diagrams or tables. Depicting animated raster images such as precipitation radar or predictions in the form of raster images combined with observational data is possible too. Users can also save customized maps (so-called user-defined views) by defining measurement stations, with dedicated parameters and symbolisations.
Fig. 1 depicts two screenshots of the current GIN version to give an overview of the interface.

[1] Dr. Ingo Petzold. WSL Institute for Snow and Avalanche Research SLF, Flüelastrasse 11, 7270 Davos Dorf, Switzerland (e-mail: petzold@slf.ch)
[2] Dr. Josef Hess, Steering Committee Intervention Against Natural Hazards, c/o Federal Office for the Environment, Switzerland (e-mail: josef.hess@bafu.admin.ch)
[3] Dr. Franziska Schmid, Steering Committee Intervention Against Natural Hazards, c/o Federal Office for the Environment, Switzerland (e-mail: franziska.schmid@bafu.admin.ch)
[4] Dr. Marco Arpagaus. Federal Office of Meteorology and Climatology MeteoSwiss, Switzerland (e-mail: Marco.Arpagaus@meteoswiss.ch)
[5] Sabina Steiner, GIN Secretariat, c/o Federal Office for the Environment, Switzerland (e-mail: sabina.steiner@bafu.admin.ch)

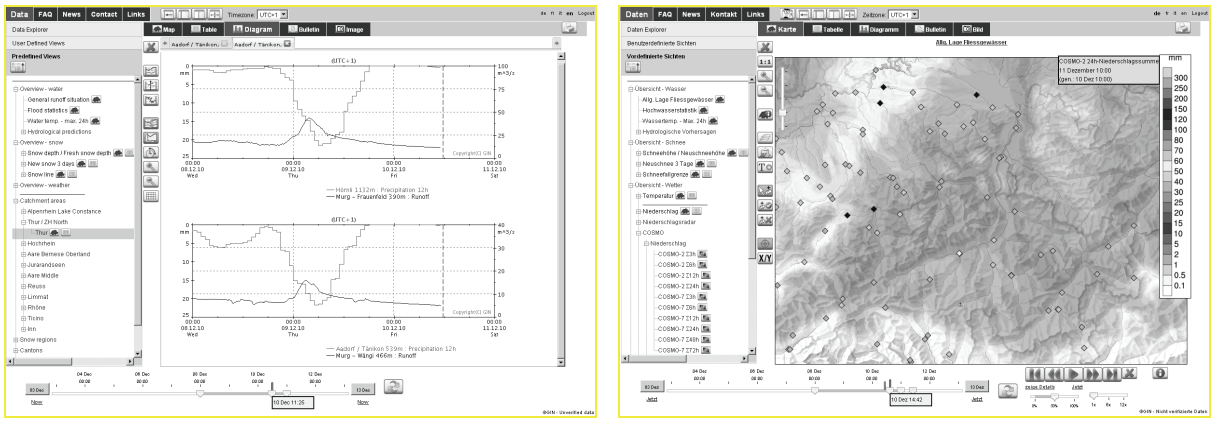

**Fig. 1** left: diagrams in GIN; right: a map in GIN depicting measurement stations coloured according to a parameter, overlaid with a precipitation prediction in form of a raster image.

## CONCLUSIONS AND FUTURE DEVELOPMENT

By launching OWARNA, Switzerland intensifies its effort to reduce risk of natural hazards. In this program GIN is the information hub and thus a major milestone. At this time GIN fulfils the current needs of the natural hazards experts.

Besides several further developments and enhancements, one milestone is the ongoing development of GIN Cockpit. Cockpit allows automatic generation of alert maps, giving an overview on the current and predicted danger in well-defined warning regions, as well for river sections and points. Its predecessor is MAP D-PHASE (Arpagaus et al. 2009), which generates alerts based on deterministic as well as on probabilistic model predictions. In contrast to MAP D-PHASE, Cockpit will also integrate official warnings. Users will be able to interactively choose between different visualisations: official warnings or alerts derived from model predictions. The latter can be based on the exceedance of thresholds from the official warning centres or of own thresholds.

Uninterrupted operation of the platform, especially during natural hazard events, is ensured by redundancy of servers at different locations. Due to the estimated 10.000 users the system architecture of the platform is designed to support a high number of parallel accesses. Managing the high amount of users is a challenge. Therefore, a federal user management was established.

A user-centred design was used to develop an advantageous platform. Users were involved in the development process by regular surveys and especially by workshops.

This paper will outline functions and technology of this state-of-the-art natural hazards information platform as well as present results of the GIN Cockpit development.

## REFERENCES


Arpagaus M., Rotach M.W., Ambrosetti P., Ament F. et al. (2009). MAP D-PHASE: Demonstrating forecast capabilities for flood events in the Alpine region. Veröffentlichungen der MeteoSchweiz, 78, 75pp.



**Keywords**: risk management, natural hazards, decision support, real-time information system