Geo-communicating avalanche relevant information-EAWS SnoProfiler

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In conjunction with the re-launch of the European Avalanche Warning Center website (EAWS www.avalanches.org), the so called SnoProfiler was introduced. The SnoProfiler is an application for online processing of snow profiles. This application is being developed in a cooperation project between the Avalanche Warning Center of Tyrol and the University of Vienna, Department of Geography and Regional Research and has the goal to communicate and visualize avalanche relevant information to the general public with a strong cartographic spatial focus. The major focal point of research lies in adequate geocommunication of spatial, temporal and thematic content.

Snow profiles are essential for the interpretation and analysis of snow cover in mountainous areas. They also serve as an assessment tool for the prediction of potential avalanche hazards. Therefore avalanche warning services aim to utilize systems that enable online processing of snow profiles. The SnoProfiler permits website users to enter, draw and publish their surveyed data. Snow profile data comprises highly topical content, which needs to reach users quickly.

Snow profiles are diagrams of hardness, stability and temperature of the snow pack. They are built up like stacked bar charts of snow layers, in combination with a graph of the temperature. The content and graphic representation of snow profiles is similar across avalanche warning services, but since there is no unified final standardized way of drawing profiles, it was essential to develop rules for representation based on the conventions of CAAML (Canadian Avalanche Association Markup Language).

The SnoProfiler enables users to enter qualitative and quantitative information, which was surveyed in the field. The data is reproduced automatically as vector (PDF) and raster images. Snow profile data mainly includes information on snow layer height, temperature and meta-data. The essential data for drawing a profile is primarily connected to the snow layers. It includes details on snow pack hardness and height of every layer, which is drawn on the x- and y-axis of the chart. Every layer has additional information like grain shape and size, moistness or rivets. Furthermore snow profile data contains information on air temperature and temperature inside the snow pack, as well as information on potential snow pack stability. The meta-data includes user data, spatial, regional and temporal data, information about the weather conditions and user-comments.

The cartographic challenge of building the SnoProfiler was to present the abundant available information within limited space and to communicate this information in a geographical context. The goal was to avoid overlapping intersections as well as to create an esthetic appealing depiction. Due to these requirements the SnoProfiler has to be very flexible. The major challenges developing the SnoProfiler include the scalability of the chart, the possibility to invert the drawing direction, out of bounds exceptions of the graph and irregular space for caption due to varying snow layer height. Furthermore a legend with standardized symbols was created, and the multi-lingual capability of the system has been considered.

The system that is being adopted to host this content has the goal to spread avalanche relevant facts to the general public with a strong geographical emphasis. The main research task is therefore to develop a framework that can focus on how users interact with the system in an efficient and sustainable way in order to satisfy their needs.