



National avalanche database on the Internet

Digital maps depicting avalanche events and avalanche hazards are becoming readily available through an Internet gateway. The Geological Survey of Norway (NGU) is co-ordinating web presentations of avalanche data from a number of institutions. A national avalanche database is available to everyone via www.skrednett.no. This service is a result of co-operation with the Norwegian Mapping Authority, the Norwegian Geotechnical Institute (NGI), the Norwegian Water Resources and Energy Administration (NVE), the Norwegian University of Science and Technology (NTNU), the Norwegian Foundation for Scientific and Industrial Research (SINTEF), the Public Roads Administration, the Railway Administration, the Directorate for Civil Defence and Emergency Training, the Armed Forces, the National Agricultural Administration, the Norwegian Natural Disaster Pool, Møre & Romsdal County Council and several local municipal councils.

Each local council is responsible for protecting property in its area from avalanches, while the Public Roads Administration and the Railway Administration are responsible for protecting traffic on roads and railways, respectively. The protection of watercourses is the responsibility of the Norwegian Water Resources and Energy Administration. In addition, privately owned consultancy companies carry out soil mechanics investigations in connection with evaluations of stability. Hence, information surrounding stability and avalanche events is acquired in a number of forms and is kept in different archives.

A total of seven Ministries, along with their subordinate agencies, deal with avalanches and avalanche prevention. Such a spread of responsibility has resulted in poor overall co-ordination. In June 2001, the Ministry of Industry and Trade and the Ministry of the Environment gave the Geological Survey of Norway the task of setting up a national avalanche data base, chiefly for use in municipal planning and hazard evaluation. Examples of the data sets that will be available are:

- Avalanche disasters nationwide
- Areas where clay slides may be triggered, or which risk being affected by them
- Maps showing the risk of rock and snow avalanches
- Avalanches along roads and railways
- Earth and rock avalanches that have been geologically mapped
- Potentially unstable mountainsides

Many data - a web gateway

The Geological Survey of Norway is responsible for mapping the bedrock and superficial deposits. Among other things, this work provides valuable information about potentially unstable parts of mountainsides and areas underlain by clay deposits. Digital geological maps and databases make this information available on the Internet. The Public Roads Administration and the Railway Administration continuously record rock falls and snow avalanches in their data banks. The Norwegian Mapping Authority has given the Norwegian Geotechnical Institute the task of preparing maps showing hazardous areas for rock falls and snow avalanches, a type of general data which the Norwegian Armed Forces also collates. Existing information which is essential for societal planning that is free of avalanche hazards is being gathered together in a single Internet gateway.





Mapping areas that are potentially hazardous

Land uplift since the last Ice Age has brought large areas of marine clay above sea level in south-east Norway and Trøndelag (central Norway). Quick-clay slides are part of the history of disasters in these areas. Following the slide at Rissa (Trondheimsfjord, central Norway) in 1978, the Ministry of Agriculture decided to start a programme to survey "areas of quick clay that are potentially hazardous for slides". The Geological Survey of Norway carried out general Quaternary geological mapping with the aim of pinpointing areas where the Norwegian Geotechnical Institute could subsequently perform geotechnical investigations. Such results also form the basis for assessments of the dangers and risks associated with certain areas underlain by clay, carried out on behalf of the Norwegian Water Resources and Energy Administration. These assessments will now be made more readily available on the Internet.

Large target groups

Each local authority is responsible for ensuring that its inhabited areas are safe from avalanches and that specialist evaluations are performed in connection with the granting of building permits. Planners at municipal and regional levels are the most important target groups for work on the avalanche database. Four local authorities of different size and with different kinds of avalanche problems are providing input for the content and design of the map service. We may envisage that various categories of users will be acquiring information and data on avalanches from the Internet, including:

- Municipal and regional planners
- Universities and colleges: organised information about the data available on avalanches and the risk of avalanches will form a valuable basis for both teaching and research.
- Consultancy companies: firms which give technical advice on avalanches and undertake investigations in connection with development projects depend upon rapidly obtaining knowledge about earlier evaluations and existing background data
- Insurance companies: their needs are particularly linked to the desire to reduce the scale of damage in future disasters
- The general public: since some avalanches are caused by human actions, it is vital that people living in areas that are at risk are aware of the kinds of action which increase the risk of a landslide or avalanche occurring.

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The map service is supported by information pages about avalanches and landslides in general, and by easy-to-read articles written for a non-specialist audience.