



# FUGRO EARLY WARNING SYSTEM NORWAY

In a remote area of western Norway, steep mountain slopes along deep fjords are a major tourist attraction and a UNESCO world heritage site. Due to the dangers posed by unstable rock slides generating destructive tsunamis, a GeoDin based early warning system was established.

## INSTRUMENTATION

In 2006 Fugro won a contract to monitor the landslides in the Stranda and Tafjord areas. An early warning system was designed to alert the authorities to changes in the fjord topography and subsurface geology. In such an event this would have allowed for the safe & timely evacuation of the local population. GeoDin data management software provided automatic field data collection, transfer from sensors to database and web based analysis & presentation using lasers, GPS sensors, extensometers, borehole sensors, a meteorological station, web cams and a total station.

## DATA MANAGEMENT

Once a sensor supplies a field PC with data, GeoDin handles the data management. At regular intervals GeoDin uploads data from the field to a FTP-server and also archives the raw data on the field PC. From the FTP server the data is then loaded into a database and the status of certain key parameters monitored. Changes in these parameters are automatically classified and emails/ SMS sent out to a selected list of recipients. To access the GeoDin server users must login with a password. This protection prevents the server from being overrun by requests in emergencies.



Meteorological station

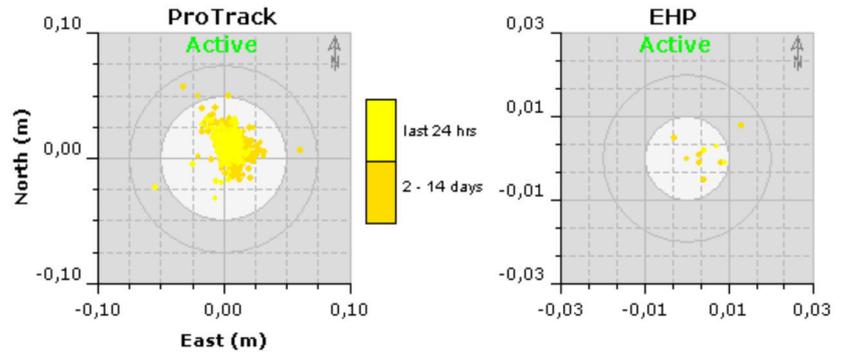


GPS sensor mounted on tower

Overview for GPS: GPS\_7

Åknes/Tafjord-prosjektet

Installation position (17.10.2007) : Northing: 6895288,92 Easting: 395807,09 Elevation: 287,32 First data record : 26.03.2007



Timelines:

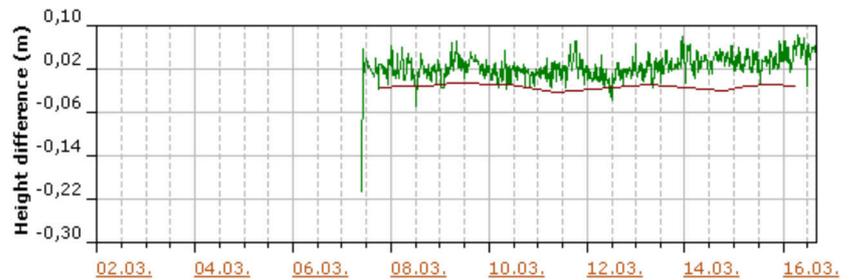
- [Day](#)
- [Week](#)
- [Month](#)
- [Year](#)

XY-plots:

- [Last 48 hours](#)
- [Last 2 weeks](#)
- [Last month](#)
- [Last six months](#)
- [Last year](#)
- [All data](#)

Logs:

- [Alarm log](#)
- [Event log](#)



[Map](#) [List of sensor types](#) [List of GPS sensors](#)

**WORLDWIDE MONITORING**

This project proved a great logistical challenge and generated enormous public interest. The responsibility to provide a fast and reliable information system to cope with the vast amounts of data generated, provide up-to-date monitoring, integrate a web-based GIS and send alerts, alarms & reports to various official organisations and research institutions around the world required new ideas and technologies to be developed for GeoDin. Almost ten years after the initial implementation GeoDin software is now used in many different monitoring environments worldwide, from railway tunnels in Australia, mining operations in Brazil, land reclamation in the United States and water resources in Germany. Please contact our support team for further information and an online demonstration.

**TECHNICAL DETAILS**

The recommended system requirements are PCs with Windows operating system from Windows 10 (64-bit) with 4 GB RAM and a display resolution of 1920 x 1080 px. GeoDin may also be run from a Windows Server 2016 or higher as well as Citrix. Previous Windows operating systems and RAM configurations may work, but these are not supported. When working with client/server databases the appropriate database drivers must also be installed.

GeoDin can be used as a stand-alone program or integrated in a multi-user network. Integrated contextual help is provided in English and German.

GeoDin is designed, programmed and distributed exclusively by Fugro. Visit [info.geodin.com](http://info.geodin.com) or [geodin.com](http://geodin.com) for further information.