Polish Geological Institute
4 Rakowiecka St., 00-975 Warsaw
http://www.pgi.gov.pl/pgi_en/

Landslides in the Polish Carpathians

Major landslides in Poland are most characteristic of the Carpathian Mountains in the southeast part of the country. The location of areas at risk from major landslides is controlled by two main factors: the presence of slopes with a favourable geological structure, and high levels of precipitation. Both of these conditions are fulfilled in the case of the flysch Carpathians, consisting of interbedded shales and sandstones, deeply dissected by numerous valleys. The annual precipitation here reaches 800 – 1100 mm, sometimes concentrated in rainstorms. According to investigations carried out by Polish Geological Institute about 672 km^2, or 4% of the area of the Carpathians within Poland, has been in past, or is being at present, endangered by landslides or other forms of mass movement.

The temporal incidence of mass movement is strongly correlated with climate. During wet years, or soon after, an increasing number of fresh or revitalised landslides is reported. Such situation took place after heavy rainstorms and flood in summer 1997. Since that time numerous landslides in the Polish Carpathians were activated. Serious damages of houses and communication infrastructure were reported.

Polish Geological Institute is developing presently new project including registration of landslides in the Carpathians, monitoring its activity and making prognosis for future. These prognoses are connected with necessity of changing local plans of territorial development. Such plans are prepared in smallest administration units – „gmina". All available modern mapping technologies will be applied during realisation of project, including remote sensing, GIS and GPS measurements.

Landslide in the Polish Carpathian - Jachówka (2002)

During the field works GPS mapping measurements are performed. Pathfinder ProXL instruments enable measurements with accuracy of half metre, which is very good for mapping at the scale 1 : 10 000. For the landslides monitoring purposes the Ashtech geodetic GPS instrument is used, with accuracy < 1 cm.

Finally, on the basis of remote sensing data interpretation and field works and measurements, GIS database will be created. Maps of landslides prone areas will be elaborated, too. Besides that the landslides information system will be organised using INTERNET. There is special questionnaire in PGI web site enabling collection of information concerning new landslides. These information will be processed and verified by PGI specialists. They will be taken into account during preparation and verification of local territorial planning policy.

The main tasks which scientific in Polish Geological Institute engaged upon:

1. Landslides inventory at the scale 1:10 000
2. Landslides database
3. Airphotos and satellite image analysis
4. Digital terrain models (DTM)
5. Geophisical methods and georadar
6. GPS measurements (monitoring) of landslides
7. Map of landslides hazards
8. Preparation of maps for territorial planning

Anna Piatkowska

General Coordinator of Project: Prof. Marek Graniczny,

Geoinformation Director
Polish Geological Institute
4 Rakowiecka St.,
00-975 Warsaw
Tel.: (+48-22) 849 53 51 ext. 384, 849 49 26
e-mail: mgra@pgi.waw.pl