

## The Italian Landslide Inventory (IFFI Project)

### Description

#### Objectives:

The Italian Landslide Inventory is a national project that aims at identifying and mapping landslides over the whole Italian territory, based on standardized criteria. The project has been financed with 4.1 Mil. Euro by the Committee of Ministries for the Land Protection, established by the Italian Government (Law n. 183/89).

#### Methods:

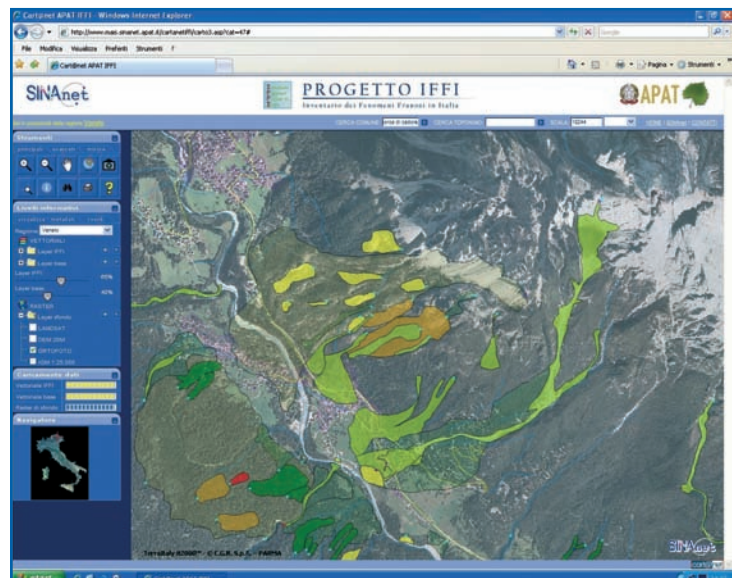
The methodology applied is based on remote sensing and ancillary data sets, such as published sources and historical documents, validated with in-situ data and field surveys. With the aim of homogenize and integrate the landslide data over the whole Italian territory the Landslide Data Sheet has been defined on the basis of International standards of classification: Recommendations of the International Association of Engineering Geology (IAEG), International Geotechnical Societies UNESCO Working Party on World Landslide Inventory (WPWLI), International Union of Geological Science Working Group on Landslides (IUGS/WGL), Cruden & Varnes (1996).

The IFFI Landslide Data Sheet is organised in three information levels of increasing detail:

- 1st level contains the basic data on landslide location, type of movement and state of activity;
- 2nd level provides data on geometry, geological setting, lithology, land use, causes, date of activation;
- 3rd level gives detailed information on damages, investigation process and remedial measures for risk reduction.

#### Data:

The Italian Landslide Inventory currently holds about 460,000 landslides occurred in the Italian territory. The IFFI geo-database contains vector layers of landslides and an alphanumeric archive of attributes. The relational alphanumeric database scheme is based on the Landslide Data Sheet. The mapping scale varies between 1:10,000 and 1:25,000.



*IFFI Project WebGIS*

#### Results:

The IFFI project represents the first homogeneous and updated inventory collecting landslides at national level. The web publishing of the IFFI Inventory (<http://www.sinanet.apat.it/progettoiffi>) is focused on promoting and spreading out the landslide information to national and local institutions, research institutes, geologists, engineers and citizens. It aims at enabling people to make informed decisions such as to choose where living, where purchase properties and locate economic activities. The IFFI Website runs since 2005 allowing to explore the geographical data and to obtain detailed information on the most important parameters of landslides. Over 200.000 hits have been counted to date.

Through a simple and clear navigation, the user can view the landslides of the IFFI Inventory together with other vector layers (the urban areas - Corine Land Cover 2000, the roads and railways, the drainage network) and raster layers (the digital terrain model, digital orthophoto Terraltaly it2000, Landsat satellite images and IGM topographic map at scale 1:25,000). Among the WebGIS functionality, the Identify tool provides attribute information about landslides and the Photo tool allows to view images of more important landslides. Using the Buffer tool, critical points along the communication network can be selected. According to the European Directive INSPIRE 2007/2/CE (Infrastructure for spatial information in Europe) and the Open GIS Consortium specifications, WMS Services of the IFFI Inventory have also been developed. These interoperable Services allow the users to overlay the IFFI landslides theme with additional layers stored in the pc of the user or even provided by external internet servers.

#### Impact:

The IFFI Inventory has a remarkable impact on land use planning at national level and regional level, as it is used on landslide risk mitigation actions (PAI) over the whole Italian territory.

#### Added value

The IFFI Project is a service in the field of natural hazards that uses an international standard (WMS) for dissemination and sharing of spatial data. If implemented at international level, the IFFI methodology will bring a more timely dissemination of information through better coordinated systems for monitoring, predicting, risk assessment, early warning, mitigating, and responding to landslide hazards. Several GEO Tasks, such as the 'Multi-hazard zonation and maps', would potentially benefit from methodologies that remote sensing with in-situ data, is particularly suited for accomplishing the above requirement in accordance with the mission of GEOSS.

#### Relevance to GEO

In accordance with the 'Disasters' SBA the IFFI Project shows, at country level, how earth observation contributes to "reducing loss of life and property from natural and human-induced disasters". The IFFI Project matches with the Task DI-06-07: Multi-hazard Zonation and Maps, lead IGOS-P and WMO, aimed at conducting an inventory of existing geologic and multi-hazard zonation maps, identifying gaps and needs for digitization and progressively develop related products. In agreement with the Capacity Building Strategy 2007-2009, the IFFI Project will contribute to "Enabling Knowledge Sharing for Improved Disaster Management and Emergency Response".

#### Participants

The institutions involved are:

- APAT - Geological Survey of Italy - Land Protection and Georesources Department, with the task of organising and coordinating the activities, developing the guidelines, verifying the data conformity, building up a national geo-database and a WebGIS;
- Regions and Autonomous Provinces of Italy, charged to collect the historical documents, archive data and to map areas affected by landslides.

#### Current Status and Next steps

The IFFI Inventory is updated at 2006. Further updatings will be provided by Regions and Autonomous Provinces in the next years.

The IFFI Project aims at becoming a European standard for collecting and mapping landslides.