



FLASH FLOODS AND PLUVIAL FLOODING



ISPRA
Istituto Superiore per la Protezione
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REGIONE AUTONOMA
DELLA SARDEGNA



MINISTERO DELL'AMBIENTE
E DELLA TUTELA DEL TERRITORIO E DEL MARE

Working Group F Thematic Workshop

DEBRIS FLOW AND FLASH FLOOD, ISPRA EXPERIENCES THROUGH MAPPING AND MONITORING OF MITIGATION MEASURES AND RISK REDUCTION IN ITALY

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26th-28th May 2010, Cagliari, Italy



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ReNDiS project

(National List of Land Defence interventions).

3215 records
2386 MI Euros

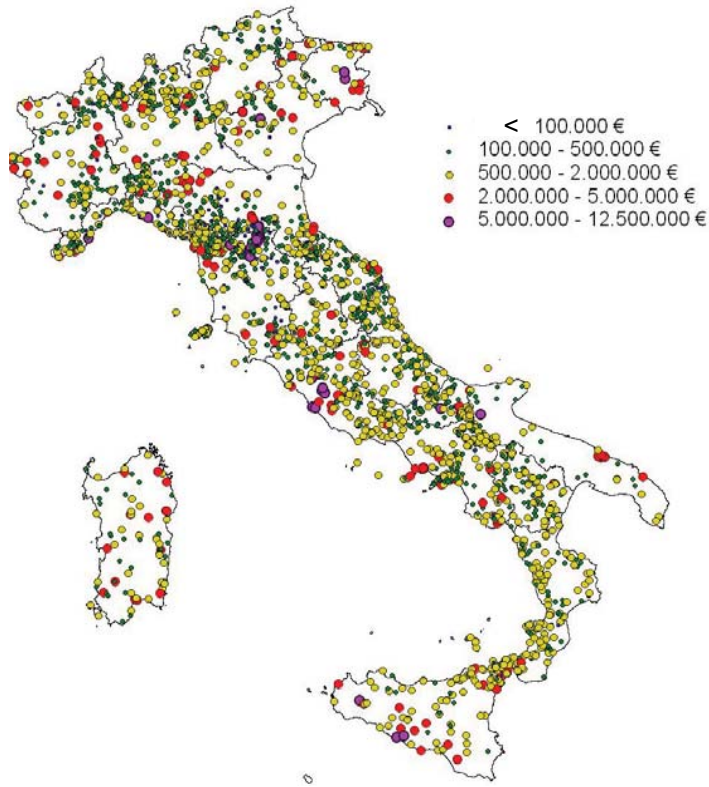


Figure 1. Mitigation measures distribution at national scale categorized by amounts

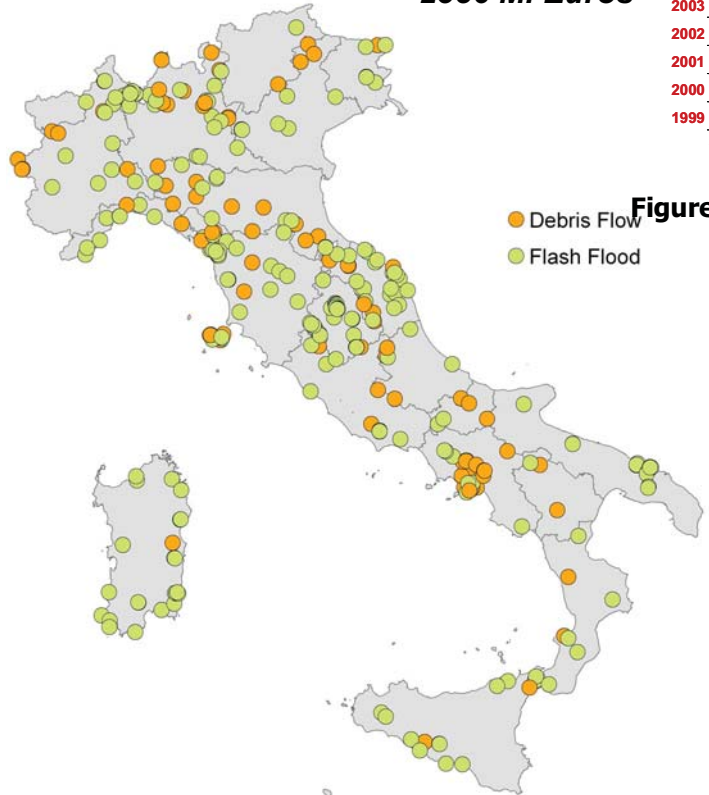


Figure 2. Flash floods and debris flow mitigation measures distribution at national scale

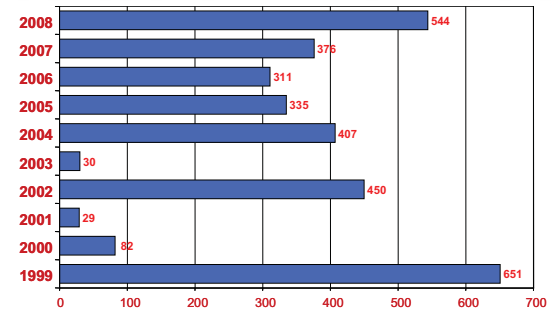


Figure 3. allocated funds during last ten years

| Works typology | % |
|---|------|
| Adjustment of channel flow section | 49,1 |
| Selective cutting vegetation | 25,8 |
| Embankment | 19,5 |
| Cliff | 17,8 |
| Span bridges calibration | 17,4 |
| Gabions | 15,0 |
| Gabions sill | 11,8 |
| Stone covered concrete wall | 10,5 |
| Maintenance | 9,8 |
| Bed sill | 9,4 |
| Accumulation tank | 9,1 |
| Concrete wall | 8,4 |
| Concrete sill | 8,0 |
| Shaped soil | 7,7 |
| Floodway, floodwall, floodchannel | 7,0 |
| Plant cutting | 7,0 |
| Bulkhead, micro-poles | 6,6 |
| Floodplain and flood control reservoir | 6,6 |
| Stone grass covered sill | 6,6 |
| Draining trench | 6,3 |
| Selective sill (with different spans) | 5,6 |
| Flood forecasting models | 5,6 |
| Terraced and reinforced soil, fenced soil | 5,2 |
| Gutter | 5,2 |
| Grass covered cliff | 4,9 |

Figure 4. Mitigation measures typologies distributions



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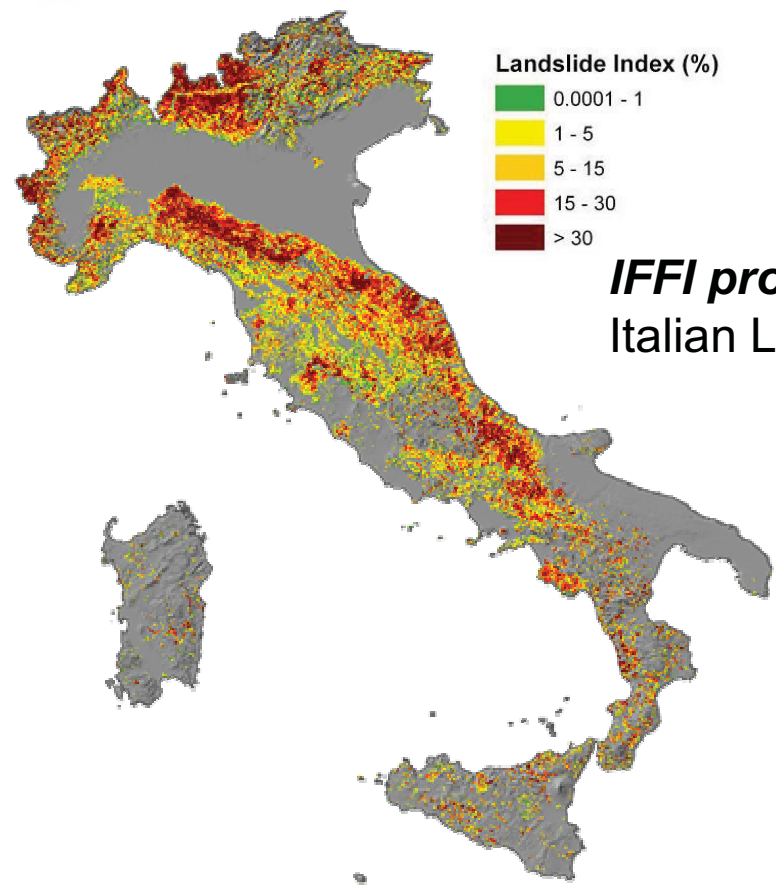
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Monitoring activities of flash flood and pluvial flooding mitigations measures collected in ReNDiS project



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IFFI project
 Italian Landslide Inventory

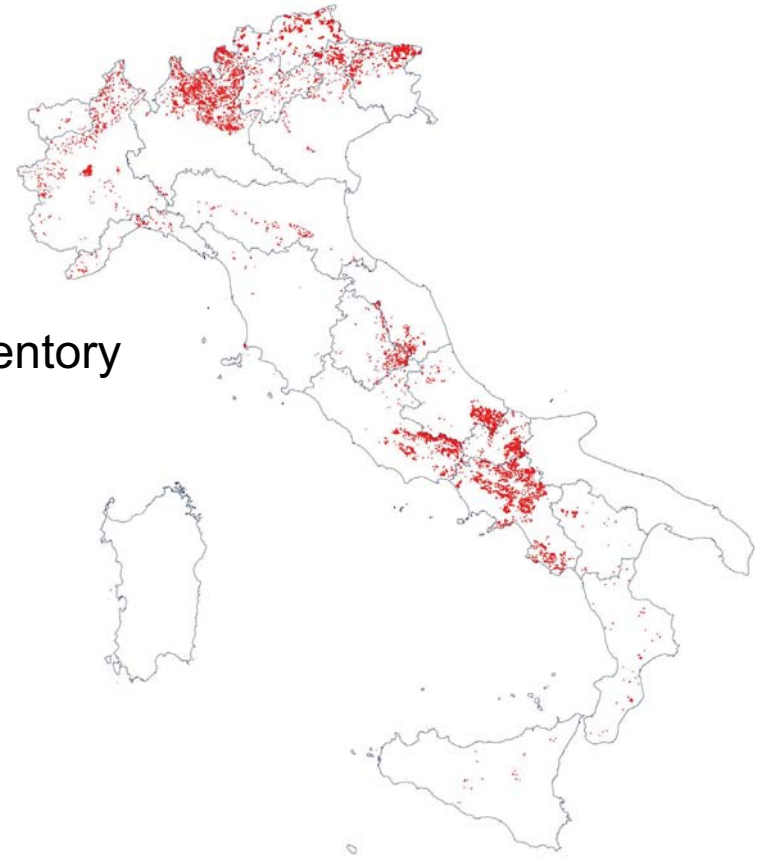


Figure 5. Italian landslide index

Figure 6. debris flow/rapid landslides distribution at national scale



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OUTLINES

- ReNDiS project is one of the main operational tool for the information management on mitigation measures at national scale;
- The ultimate goal is to build up a unified, homogeneous, updated and complete framework of public intervention in the area of land protection and management;
- The ReNDiS geo-database can share information between different local Authorities, improving the knowledge and support land use planning activities for risk reduction;
- IFFI Inventory is an important tool for hazard and risk assessment. Actually the inventory contain more than 480.000 landslides of which 72.000 are classified as debris flow.

Useful Links:

www.sinanet.apat.it/progettoiffi

www.rendisweb.isprambiente.it/rendisweb



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The Projects

In order to monitor urgent works for the reduction of the geological and hydrological risk, and with the purpose of creating a synergy between the land protection bodies concerned, ISPRA developed, since 2000, the ReNDiS project (National List of Land Defence interventions). Together ISPRA carried out, jointly with the Regions and Self-Governing Provinces, the IFFI project (Italian Landslide Inventory), supplying a detailed picture of the distribution of landslide phenomena within Italy.



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ReNDiS DATA

ReNDiS project is currently populated with more than 3,200 records (Fig.1) concerning all the programs of urgent engineering works funded in the last ten years by Ministry of Environment (2,4 billions of euro, Fig.3). Actually the engineering works addressed to flash flood and rapid landslide events risk reduction collected in ReNDiS are more than 280, all over the entire national territory (Fig.2).



IFFI DATA

Till 2007 the Italian Landslide Inventory has recorded almost 485,000 landslide phenomena affecting an area of about 20,721 sq km, or 6.9% of the national territory (Fig.5). The project developed a *WebGIS* with online mapping service able to ***IFFI*** visualise landslides and query, providing a summary of information on landslides. The analysis carried out with the IFFI database shows that: landslides affect an area of approximately 20,700 km² (6.9% of Italy); 70.5% of Italian municipalities are affected by landslides; 992,403 inhabitants are exposed to landslide risk. The rapid mass movement (e.g. debris flow, soil slip) actually contained are more than 72,000 (Fig.6) equal to 15% of the entire data collected, mainly distributed in the Alpine and Campania region.