International Cartographic Association
Association Cartographique Internationale

The usability of the IdroGEO web platform for the dissemination of information on landslides and floods in Italy

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Keywords: web mapping, usability, open data; open source, landslide inventory, natural hazards

Abstract:

The rapid evolution of web mapping in the last fifteen years, due to the technological development and the increased number of users, has changed the user interaction with geospatial data from passive to active and collaborative mode. Usability is one of the most important key factors for web applications: the ease or difficulty that users experience with web applications determines their success or failure.

The new national IdroGEO web platform allows the navigation, social sharing and download of data, maps, reports of the Italian Landslide Inventory, national hazard maps and risk indicators. It is a tool for communication and dissemination of information to support decisions in risk mitigation policies, land use planning, preliminary design of infrastructures, prioritization of mitigation measures, management of civil protection emergencies and environmental impact assessment. Dissemination of information from government to citizen contributes to increase risk perception, awareness, and informed behaviour about landslides and floods in Italy and to promote the resilience of society.

IdroGEO is an interactive and collaborative web mapping application, and addresses three web mapping functionality categories: viewing, editing, and analysing. In addition to the basic tools (zooming, panning, turning on/off layers), it provides functionalities for queries and reports, uploading of new information (e.g., reporting a new landslide), sharing content on social media, visualization of multimedia content on landslides, up to the possibility of performing spatial analysis (e.g., scenario calculation).

The IdroGEO application has been developed in the following tasks: specification of the context of use, analysis of user requirements, identification of design solutions and evaluation of the usability. Regarding the first point, the following categories of users have been identified: decision makers, land use planners, rail and road companies, professionals, and citizens. The main user requirements were ease of use, accessibility with different types of devices (smartphones, tablets, desktops), landslide data collection and updating, sharing maps on social networks, production of reports and download of data. Usability has been investigated since the beginning of the project through case studies and screen mock-ups, and user interface has been designed to ensure high usability. The IdroGEO has been designed with two sections: one relating to the Italian Landslide Inventory, the other to the landslide and flood Hazard maps and Risk Indicators (HRI). By hovering the mouse over the map (mouseover function) on the desktop or with a tap on a smartphone, the user can view aggregated data on national, regional, provincial, or municipal basis on the information panel, according to the current map scale. These data are presented through dynamic infographics which, in an innovative way compared to similar web map applications, provide immediacy to the content and a significant communicative impact.

IdroGEO simplifies and increases the efficiency of landslide data collection. The landslide reporting tool allows the user to quickly locate and insert the landslide point on the map and to easily enter and submit its main information. On the other hand, the advanced tools of the IFFI inventory management area allow the online editing of point, linear and polygonal geometries, and collection up to 144 parameters into the landslide form, enabling multi-user acquisition and storage of large amounts of data into the national inventory. The online/offline operation of the IdroGEO Progressive Web Application makes in situ landslide mapping possible in areas of limited internet connectivity using a smartphone or tablet, increasing the usage for field activity even during emergencies.

To date, IdroGEO has been used by over 29,000 users.

To evaluate the usability of the IdroGEO platform and user satisfaction, in November 2020 ISPRA promoted the compilation of an online questionnaire. The questionnaire was designed with 16 closed-ended questions with a rating scale from 1 (insufficient) to 4 (excellent). The questions concerned the usability of the main tools (e.g., search, sharing on social media, scenario calculator) and the overall user satisfaction. The results highlighted, an excellent judgment for

https://doi.org/10.5194/ica-abs-3-115-2021

44% of the sample, discreet for 40% and sufficient for 16%, regarding the overall degree of user satisfaction. The most popular features of the platform were the ease of use, the clarity and completeness of the information, the availability and reuse of data, with 54%, 40% and 37% of excellent ratings, respectively. These results may represent a starting point to improve the quality of the map services offered by ISPRA.

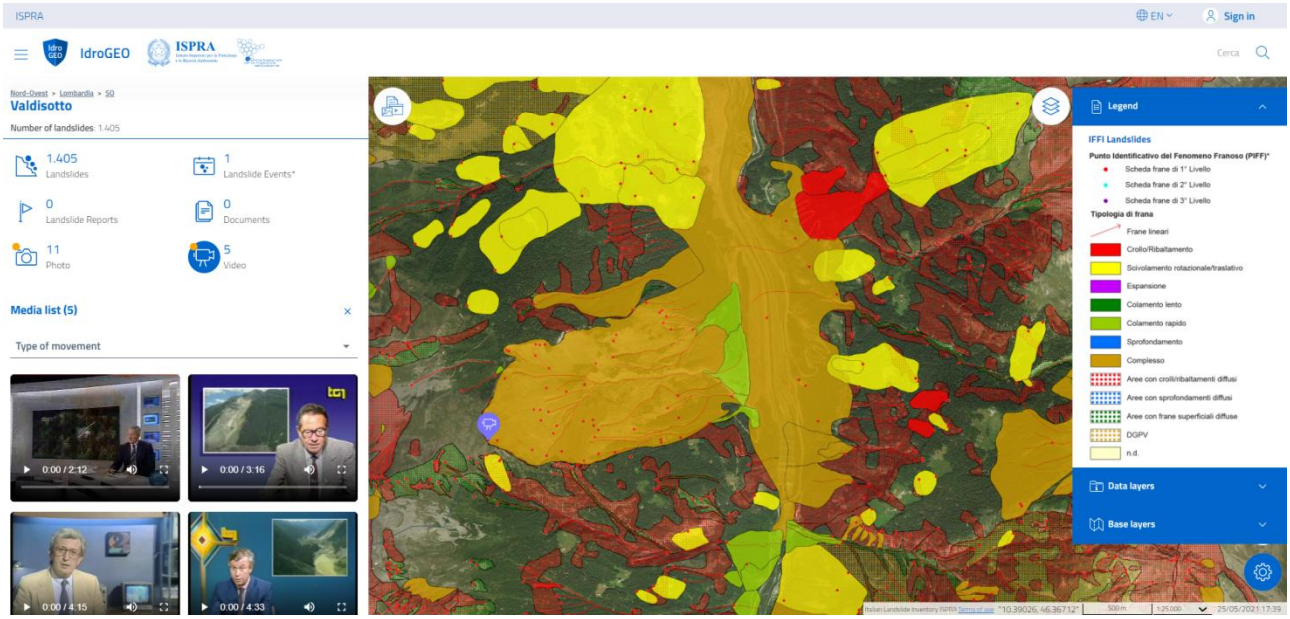

Figure 1. IdroGEO platform – Italian Landslide Inventory section.

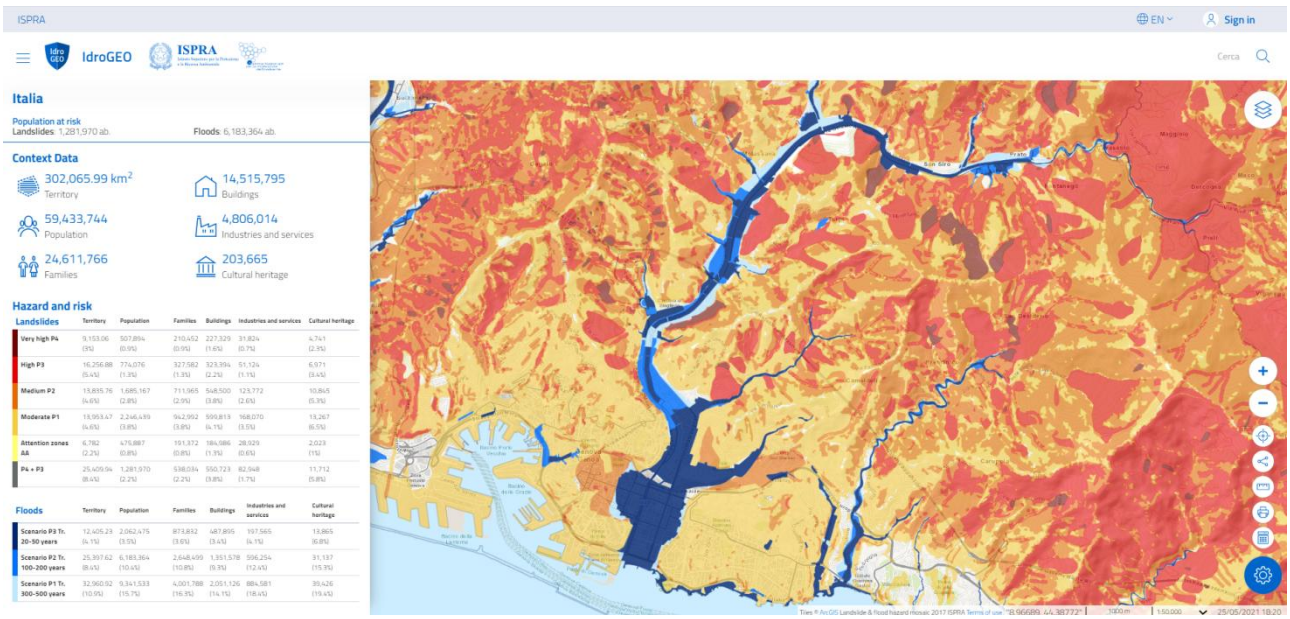

Figure 2. IdroGEO platform – Hazard maps and Risk Indicators section.

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