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European Congress on **REgional GEO**scientific  
Cartography and Information Systems



Freistaat Bayern



Catalunya



# The 3D GeoloGiro

**Francesca Lugeri - ISPRA Servizio Geologico d'Italia**

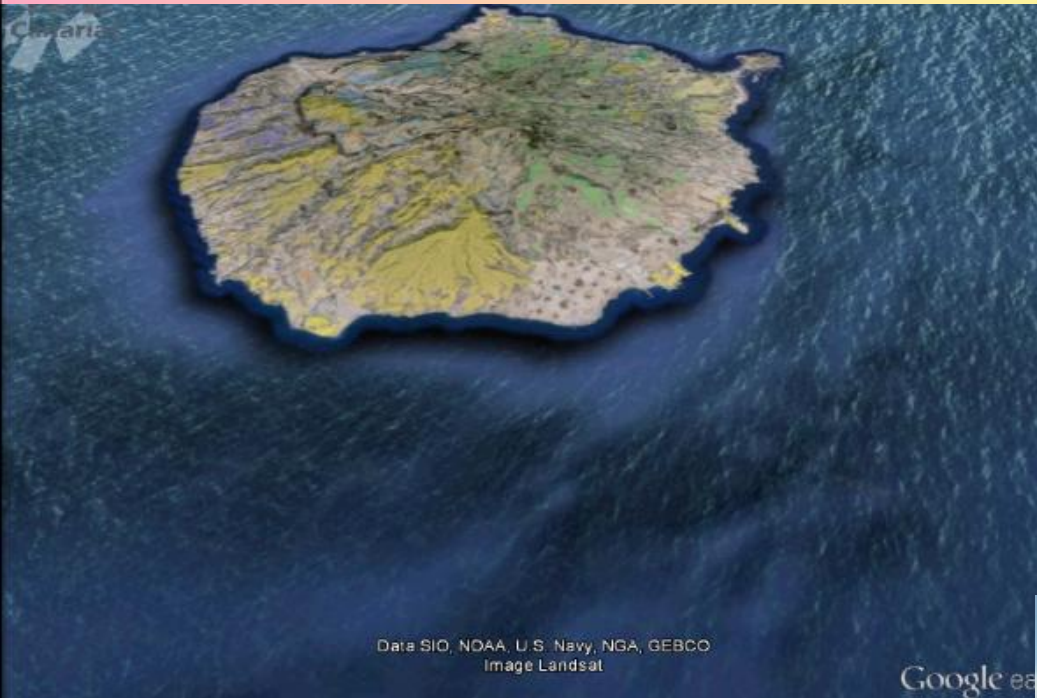
**Piero Farabollini - Università di Camerino**

**Nicola Lugeri ISPRA – Difesa Natura**

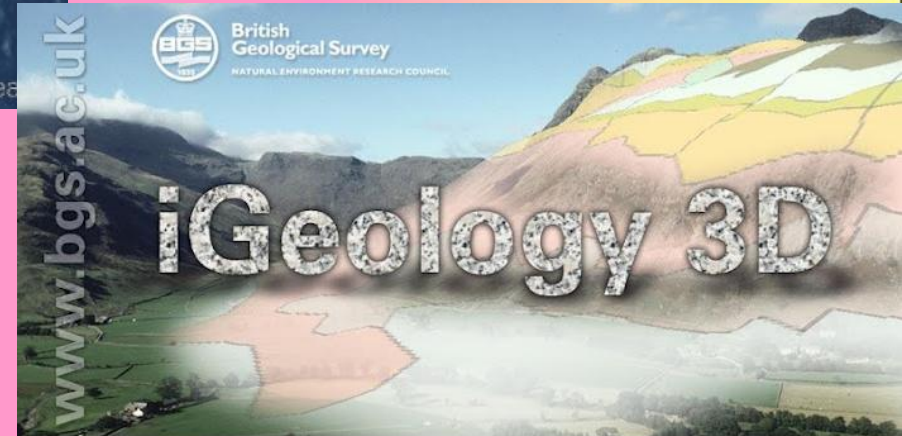
**Gian Vito Graziano – Consiglio Nazionale Geologi**

**Vittorio Amadio - Università Mediterranea Reggio Calabria**

among the many features of 3D, the most representative is the display of significant images. In the field of earth sciences, thanks to these tools it is possible to follow the changes through time of the studied portions of the planet: from the investigable past to the present, from the present to the possible future changes.



The pattern of the changes over time, in addition to bring an extraordinary value in almost all fields of scientific research, is a powerful vector of information, useful to make understandable to the users the differences between science fiction and the invisible real - possible future.





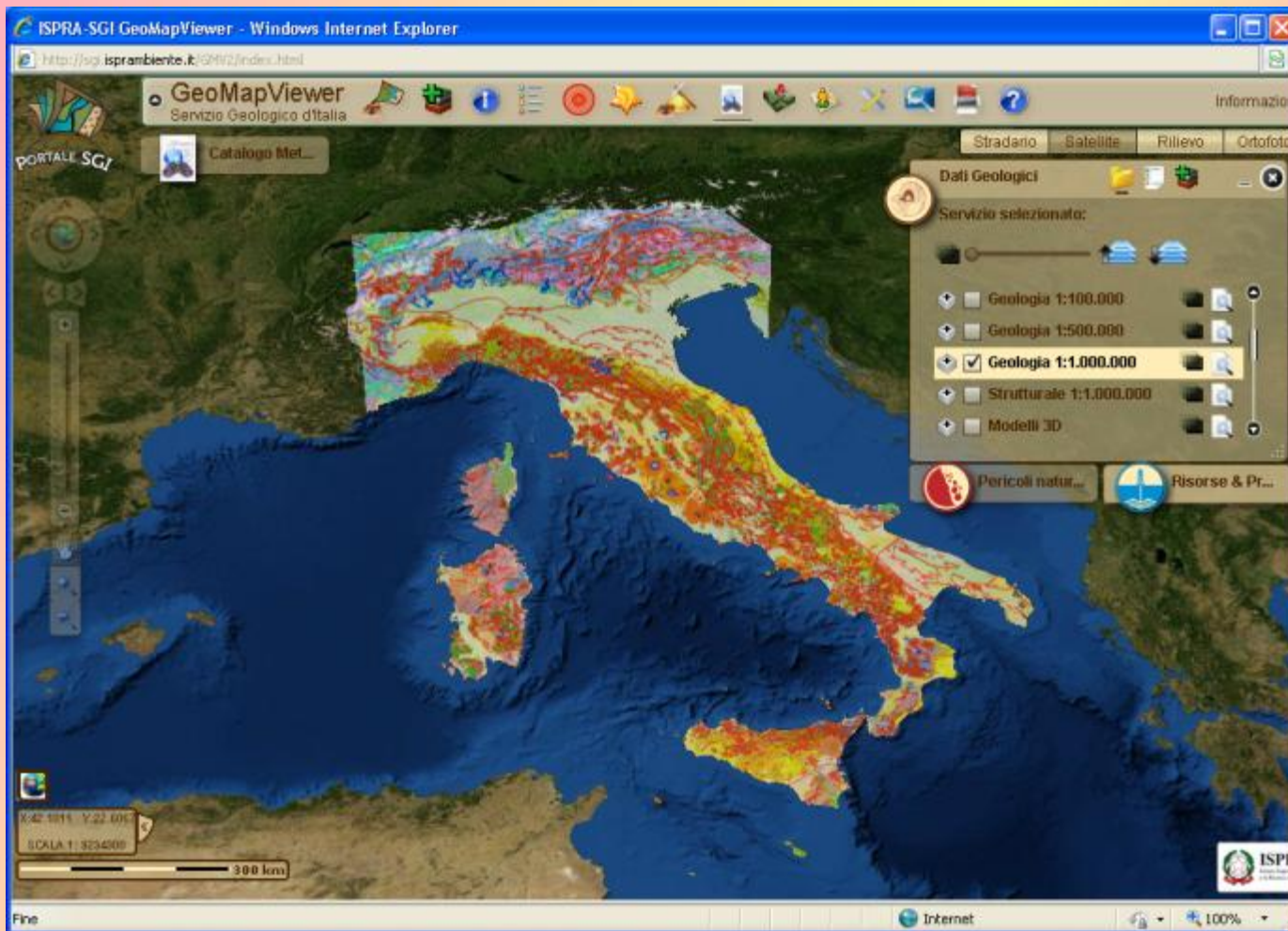
As in the philosophy of GIS, 3D tool is available at different levels of detail and complexity, so it can be effective for teaching as well as for spatial planning, or in the identification and management of resources, or risks.



So, 3D modelling performs an effective function in the scientific communication, playing a key role in the activation of Prevention practices.

It is of fundamental importance to link the modelling to reality, in order to convey the meaning of the model, not only in the spatial dimensions, but also through the diachronic one.

# CARG (Geological Cartography) project Department for Soil Defense – Geological Survey of Italy – ISPRA



geological  
and geo-  
thematic  
sheets on a  
scale of  
1:50,000  
covering the  
entire  
national area

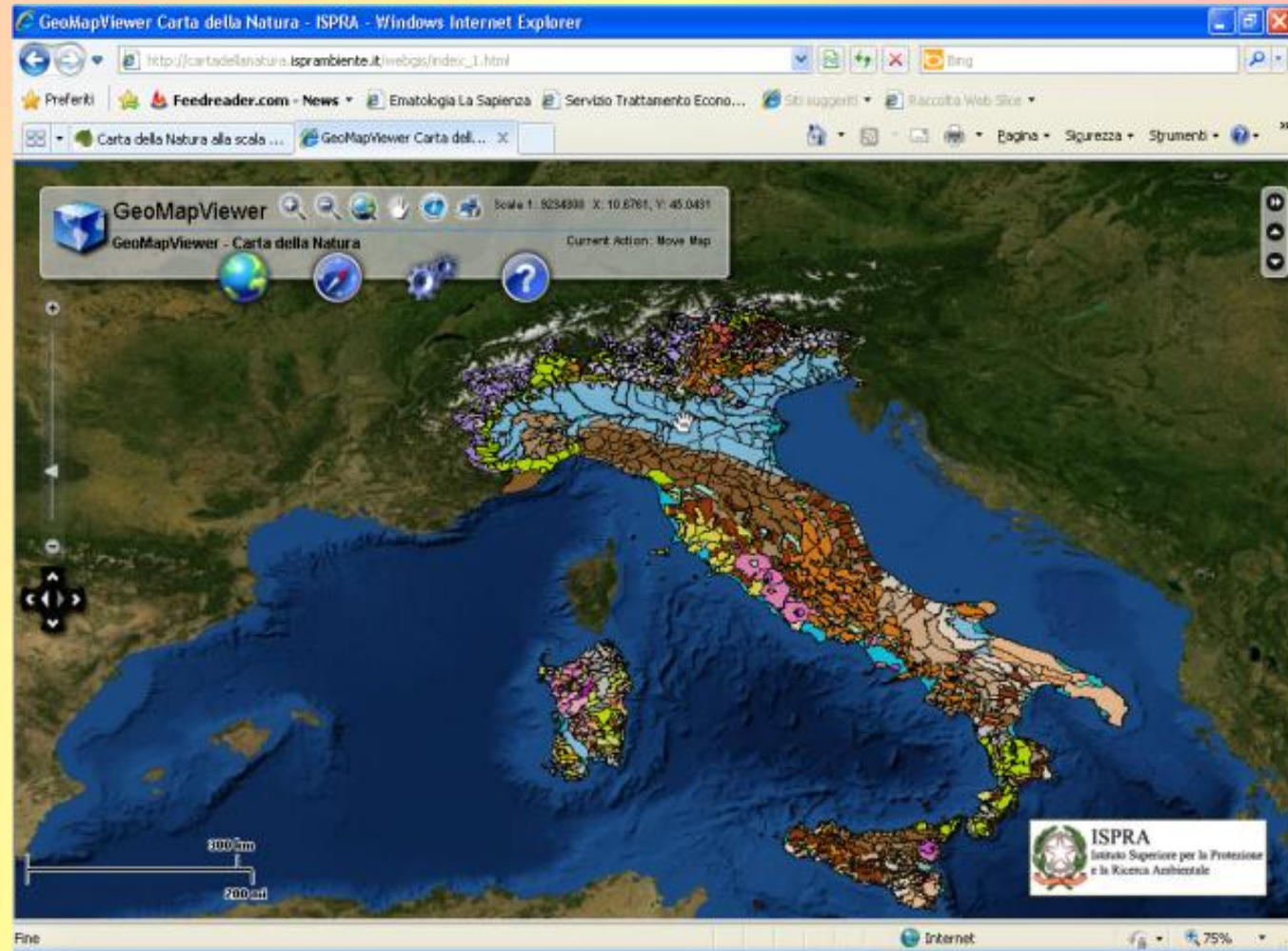
territorial  
planning and  
management

prevention,  
reduction  
and  
mitigation of  
hydro-  
geological  
risk.



# Carta della Natura (law 394/91) ISPRA state of the environment in the whole Italian territory holistic approach

Each individual landscape, studied at different scales, shows distinctive elements at a synthetic scale physiography is the feature that best approximates the results of a landscape classification.



<http://cartadellanatura.isprambiente.it/webis/>

# POPULARIZATION OF GEOLOGY : THE “GEOLOGIRO 3D” PROJECT



Ph: RCS Sport

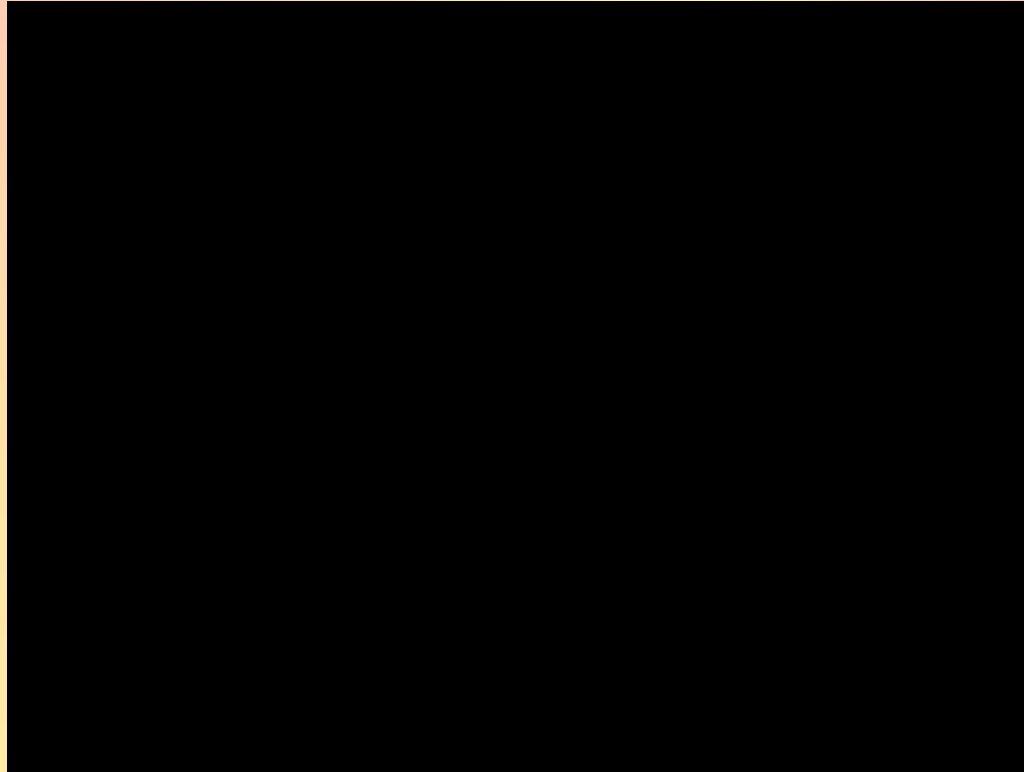
A recent proposal, developed and realized thanks to a cooperation between the ISPRA, the Council of Italian Geologists (CNG) and RaiSport, is the “GeoloGiro” .



*GeoloGiro*

Its main goal is to attract the attention of the general public to the issue of describing the main features of the territory in terms of landscape, soil, and geology, taking as a “testimonial” the area crossed by the Giro stages.

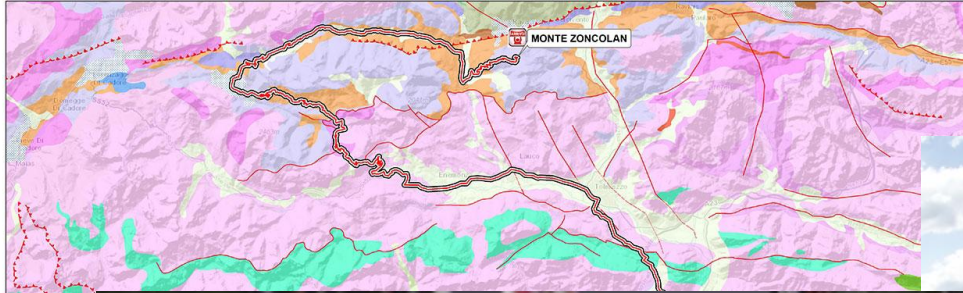
**A “fly-through” video has been prepared trying to highlight the main features of the land; obviously, the most effective results have been obtained in mountain stages, although interesting cues for a geological/geographical readout of the land have been offered also by flatter stages.**



**As a further development of the project, we are planning to extend the processing to a more specific “3D geological modeling”, displaying the information on the ““underground” gathered from the available sources at the national or regional Geological Surveys.**



Therefore, we have prepared for each stage a 3D representation of the land, with different thematic maps draped over the Digital Terrain Model of the portions of territory involved, with particular attention to the selection of the most up-to-date and representative geological or geomorphological maps available.



### TAPPA Legenda

- Faglie
  - contatto tettonico
  - contatto tettonico
  - sovrascorrimento
  - sovrascorrimento
- Carta Geologica alla s
  - Alluvioni terrazzate
  - Calcani e calcari
  - calcaree, mame e intercalazioni di c
  - Calcani e dolomie
  - Calcani e dolomie conglomerati, are
  - Calcani e dolomie marnosi, localme calcarenitiche
  - Calcani, a luoghi
  - Calcani, arenarie metamorfismo di
  - Calcani, calcari di

Photo Susie Hartigan



The choice has been driven in first place by the scale involved (in terms of extent of the land crossed by each stage), and by data availability. In many cases, only old maps at 1:100,000 scale were available, often showing evident differences in colors, even in neighboring tables.

We have chosen to maintain such differences, also in order to stress the problem of uniformity in vast-scale mapping projects. In technical terms, the 3D rendering has been implemented by overlaying thematic and topographic layers over the DTM, using two products of the ESRI "family": Arc Scene and Arc Globe.



