



RESEARCH TOPICS



Satellite Monitoring



Technological Development



Emergency Support



Emergency Planning



Cultural Heritage Protection



Risk Education



Centre of Excellence for Landslide Risk Reduction
The International Programme on Landslides
A Programme of ICL for Landslide Disaster Risk Reduction



Ministero dell'Istruzione, dell'Università e della Ricerca
National Programme for Research Infrastructures



INTERNATIONAL
CONSORTIUM
ON LANDSLIDES



THE GENEVA MILESTONE UNITWIN/UNESCO Chair Programme
for the implementation of the 2030
Agenda for Sustainable Development

GEMs Geoengineering Master Programme



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PROTEZIONE CIVILE



United Nations
Educational, Scientific and
Cultural Organization



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- UNESCO Chair on the Prevention and Sustainable Management of Geo-Hydrological Hazards, University of Florence, Italy



Satellite Monitoring



Application of Earth observation imagery for mapping and monitoring geomorphological processes, from local to regional scale. Measurement of ground deformation at high precision with interferometric analysis. Building a **satellite surveillance system** based on Earth Observation data (radar, multi- and hyper-spectral) from multiple constellations of satellites. Algorithms for the early detection of changes and ground motion.



Technological Development

Development of **new technologies** for geo-hydrological hazard risk reduction, including software and hardware development, patent filing and additive manufacturing. Main products: multi-risk information gateway based on a semantic engine for retrieving news on geo-hydrological disasters, algorithm for automatic assessment of rock slope stability, new unmanned aerial vehicles, novel remotely operated underwater vehicles, devices for ground and submarine exploration.



Emergency Planning

Development of actions to reduce the effects of geo-hydrological disasters enhancing **risk understanding and resilience** of geological processes. Knowledge support to the development of applications for alerting and broadcasting information with the active participation of citizens. Design and testing emergency plans at national and local level, for effective vulnerability reduction. Simulation exercises for disaster risk management.



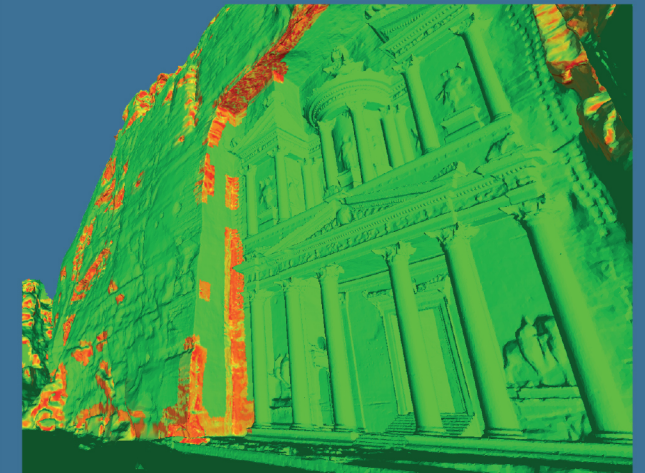
Emergency Support



Application of advanced technologies and methods for the management of geo-hydrological disasters for civil protection purposes. Application of innovative monitoring techniques, such as radar and laser portable devices, in order to assess slope and ground deformations. Design and implementation of **Early Warning Systems**. Synergistic use of rapid mobile units for localized survey based on terrestrial, marine and airborne sensors.



Cultural Heritage Protection



Application of innovative technologies for the **protection of cultural heritage** threatened by geo-hydrological hazards. Field surveys, in collaboration with UNESCO and local authorities, in order to prevent disasters and to promote mitigation strategies for the World Cultural Heritage sites and other locations of high societal value, mainly in developing countries.



Risk Education

Fostering education and training on geo-hydrological hazards aimed at promoting **knowledge and capacity building**. Organization of seminars, conferences and workshops. Promotion of international networking for knowledge sharing and advanced training on geo-hydrological risk management. Dissemination of civil protection culture to citizens and non governmental organizations. Implementation of the 2015-2025 Sendai Partnership for global promotion of understanding and reducing disaster risk.