

Analyzing multi-temporal series of optical and microwave satellite data for hydrogeological risk mitigation: the MITIGO Project experience.


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Landslides and floods are the most evident representations of the hydrogeological risk. Their frequency of occurrence has seriously grown in recent years, with a consequent increase in related damage, both in terms of human life loss and effects on the involved infrastructures. Among the main causes behind these events, the increased occurrence of extreme weather episodes as a result of climate changes, but also the indiscriminate and careless use of the territory, should be mentioned.

In order to reduce the impact of landslides and flood, it is fundamental implementing effective damage monitoring and mitigation actions. To this aim, recent satellite systems, thanks to their global coverage and high space-time resolution (from 1km to 10 meters, from 5 days to a few minutes), can represent valuable tools to complement traditional techniques based on in situ measurements.

In this paper the advanced multi-temporal satellite data analysis techniques developed within the MITIGO project (funded by MIUR PON R&I 2014-2020 Program), will be presented. Their capability to: i) provide early identification of anomalous soil moisture conditions useful for improving hydrogeological risk assessment; ii) recognize and monitor significant changes in land cover associated with incipient and / or ongoing landslides, will be investigated by analyzing spectral radiances collected in the optical and microwave spectral regions. The case of recent landslides occurred in Basilicata Region (Southern Italy) will be used as main test cases to evaluate such capabilities, and results achieved so far will be shown in this work.

Publication: AGU Fall Meeting 2022, held in Chicago, IL, 12-16 December 2022, id. NH23C-02.
Pub Date: December 2022
Bibcode: 2022AGUFMNH23C..02T

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