Geofluids

Special Issue on

Remote Sensing as Tool in Geofluids Dynamics and Related Risks

CALL FOR PAPERS

Fluids are fundamental in many aspects of geology. First of all, fluids are responsible for the formation of both geothermal fields and hydrocarbon deposits. The exploitation of ground water, which is a fundamental resource, can lead to subsidence or uplift phenomena that can affect the Earth surface. Fluids can also play an important role in natural disasters such as floods, and they can modify the slope stability by triggering landslides. Pressure changes in magma chambers and/or hydrothermal systems and magma/ hydrothermal fluids migration can promote volcano deformation, eventually anticipating destructive eruptions.

During the last decades, the importance of satellite and/or airborne remote sensing data and related products increased strongly together with the sensors spatial and temporal resolutions. Fluid migration could be successfully assessed using geodetic techniques and, among all, the one that is showing the best benefits appears to be the use of Synthetic Aperture Radar (SAR) data. SAR remote sensing products are extensively used to detect, measure, and monitor over time ground deformation related to water extraction and aquifer recharge, exploitation of geothermal and oil reservoir, as well as landslide phenomena (rainfall infiltration and runoff), and magma/hydrothermal fluids in volcanic and geothermal environments.

Optical (multispectral) imageries have a great potential to characterize surface physical properties. Even more, with future hyperspectral satellite systems (e.g., EnMap, launch is scheduled for 2019) it will be possible to move to a level of quantitative modelling.

Thermal data can be used to evaluate top-surface temperature, emissivity, and thermal capacity. The combined use of both optical and thermal multitemporal imageries can be thus used to map a complex terrestrial surface property, as well as detect dynamic changes.

Considering the first priority of the Sendai Framework for Disaster Risk Reduction 2015-2030 (*disaster risk management should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics, and the environment. Such knowledge can be used for risk assessment, prevention, mitigation, preparedness, and response*), the above-mentioned multisensor EO technologies can be profitably used to map and monitor wide areas affected by fluids migration related hazards, such as landslide and subsidence dynamics, soil degradation and contamination due to anthropogenic activities, and volcanic monitoring.

Manuscripts may describe new remote sensing methodologies or applications of well-known remote sensing processing techniques for the dynamics related to subsurface fluids in the field of risk monitoring, preparedness, and prevention. Contribution related to the integration of different monitoring records with conventional field observations and new modelling frameworks for the interpretation of the observed data are welcome.

Potential topics include but are not limited to the following:

- Monitoring of geothermal energy, oil and gas extraction, and production
- Monitoring surface deformation related to fluid injection in the subsurface (including hydrofracturing)
- Map, monitor, and forecast subsidence phenomena induced by water extraction
- Assess the effects of rainfall and/or water table variation in slope stability
- Assess the role of magmatic fluids in crustal deformation

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/geofluids/retg/.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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