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Editorial

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Special Issue

Geo-Hydrological Risks Management

Edited by

Dr. Danilo Godone, Prof. Dr. Changdong Li and Dr. Louise Vick

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https://doi.org/10.3390/geosciences12020068

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Editorial

Editorial of Special Issue "Geo-Hydrological Risks Management"

Danilo Godone [1,*], Changdong Li [2] and Louise Vick [3]

[1] IRPI, National Research Council, Section of Turin, 10135 Turin, Italy
[2] Faculty of Engineering, China University of Geosciences, Wuhan 430074, China; lichangdong@cug.edu.cn
[3] Department of Geosciences, UiT The Arctic University of Norway, 9019 Tromsø, Norway; louise.m.vick@uit.no
* Correspondence: danilo.godone@irpi.cnr.it

Natural hazards deserve the use of state-of-the-art tools and techniques to cope with them. This approach contributes to improve the knowledge of investigated phenomena and, consequently, their risk management. Thanks to the quality and richness of obtained data, risk management is facilitated by and contributes to, among others, risk mitigation and the development of sustainable adaptation strategies.

In this Special Issue, we collect a series of articles dealing with the aforementioned research strategy.

The first paper, by Elíasson and Sæmundsson [1], deals with landslide physics and modelling with the purpose of including the results in geo-hazards prevention procedure for complex landslides. The authors focus on three case studies in Iceland characterized by different features. After the constructions of landslide flow models, the three case studies are explained in detail, and management and mitigation strategies are hypothesized and explained.

Merisalu et al. [2] develop a framework for decision support concerning measures to mitigate hydrogeological risks in underground construction, particularly a railroad tunnel located in an urban area in Sweden. The framework is built according to international standard guidelines. It is focused on risk analysis and evaluation with particular attention to cost benefit analysis. Moreover, the proposed approach is structured to allow a constant update when additional data or knowledge are acquired.

Walczykiewicz and Skonieczna [3] determined flooding risk in urban areas by the employment of GIS-based methods via a case study in Poland. The study is based on the analysis of terrain morphology and its degree of sealing. The results of the model were compared and validated with fire brigade records regarding their interventions in case of flooding. The model outcomes plotted as maps are a key factor in land planning and flood management.

Tsydypov et al. [4] analyze erosion processes in a ravine area of the Selenga Middle Mountains by utilizing aerial photography. The authors exploited the capabilities of UAV to obtain morphological data of the studied area. Those data were coupled with gully border surveys, meteorological, soil, and geobotanical data to obtain an assessment of gullies' evolutions in terms of area and volume. Furthermore, the ancillary data allowed to determine the cause and the timing of the erosion process, such as the occurrence of storm, drought periods, or soil chemical properties. The study, in conclusion, deals with the consequences of this phenomenon on local economic and productive processes.

Abdelkarim et al. [5] cope with the issue of irregular flooding in dry and semiarid environments according to a case study in the city of Qurayyat in the Kingdom of Saudi Arabia. A GIS and a hazard modeling approach are used to define geomorphological ranking. Overall, 24 morphometric criteria—subdivided in three sub-criteria as formal, terrain, and drainage network related—are used to map and calculate the degree of hazards of the investigated area. Additionally, the authors suggest solutions for the mitigation and protection from flood negative impacts with the aim of improving the level of awareness of

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Citation: Godone, D.; Li, C.; Vick, L. Editorial of Special Issue "Geo-Hydrological Risks Management". *Geosciences* **2022**, *12*, 68. https://doi.org/10.3390/geosciences12020068

Received: 27 January 2022
Accepted: 27 January 2022
Published: 1 February 2022

planners and stakeholders. The proposed methodology is also applicable to other basins located in similarly arid areas.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

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