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Editorial

Editorial Board Members' Collection Series: Natural Hazards—Editorial

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1. Introduction

This editorial is a part of the Special Issue (SI) "Editorial Board Members' Collection Series: Natural Hazards" [1,2]; it has attracted international interest since it was viewed by 28,718 scientists worldwide by 1 August 2026 and has published 12 papers [1]. In the following sections, the significance of this SI is described, its aims are given, the published papers are analysed and then presented. Finally, conclusions are brought and future actions are suggested.

2. Significance

This SI aimed to promote the Natural Hazards (NH) section of *Geosciences* to a broader audience and to enhance the inter-collaboration between Editorial Board Members (EBMs). When it comes to the latter aim, five EBMs have collaborated through remote electronic meetings, email exchange and contact via the assigned in-house Editor. This collaboration resulted in the formation of a database of 5500 paper records from which said EBMs contacted potential authors. Finally, the aforementioned twelve papers were published. From this point of view, a posteriori, the SI succeeded both in promoting *Geosciences*' NH section and in achieving collaboration between the five EBMs. Indeed, at least 5500 researchers have been informed about the actions of *Geosciences*, part of whom finally submitted and published works in the journal. Since the contacted researchers are members of scientific teams and groups, the actual number of scientists we reached out to is much bigger. Therefore, the whole approach can serve as a basis for future EMBs' inter-collaborations and strengthening of the partnership between EBMs, Section Editors and *Geosciences* staff, all of which are important for the journal's efficiency and quality, both of which reflect on the journal's impact factor and citescore.

The focus of this SI on NH is cutting-edge in terms of geoscience. Indeed, a search in MDPI's Scilit database for full papers and paper reviews in NH between 2022 and 2026 (the last five years) locates 5941 publications. The scientific keywords include hydrometeorology [3–8], soil and solid-earth sciences [9–16], geomatics [17–21], remote sensing [22–27], environmental remediation [28–34], water and ocean dynamics [35–40], risk management and assessment [41–48] and mixing of the above. All these are found in the description of the NH section of *Geosciences* [2].

3. Aims

Following the specialisation of the collaborating EBMs and the description of the NH section of *Geosciences* [2], the aims of this SI are described by the following keywords: (1) geomatics; (2) soil and solid earth sciences; (3) risk management; (4) hydrometeorol-

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ogy; (5) water and ocean dynamics; (6) environmental remediation; (7) remote sensing; (8) hazards; and (9) hazards modelling.

All are well within the scope of Geosciences.

4. Analysis of the Published Papers

Table 1 presents the collective data of the papers published in the SI. The keywords are adjusted to best fit those of the SI.

Table 1. Distribution of paper per country–region, geographical area, SI keywords, and views and citations.

Paper	Country–Region	Geographical Area	SI Keywords
[49]	New Zealand	Oceania	hazards, solid earth sciences, geomatics, risk management
[50]	China	Asia	solid earth sciences, hazards, risk management
[51]	Pakistan Greece UK USA	Asia Europe United Kingdom America	hazards, soil earth sciences, geomatics, risk management, remote sensing, meteorology
[52]	Russian Federation	Europe	hazards, soil earth sciences, geomatics, risk management, hazards
[53]	Italy	Europe	hazards, solid earth sciences, geomatics, risk management
[54]	Greece	Europe	hazards, solid earth sciences, geomatics, risk management, hazards modelling, soil earth sciences, geomatics
[55]	Italy	Europe	hazards modelling, geomatics, soil and solid earth sciences
[56]	China	Asia	hydrometeorology, water and ocean dynamic, soil and solid earth sciences, environmental remediation, hazards
[57]	Japan	East Asia	water and ocean dynamics, risk management, environmental remediation, hazards
[58]	Pakistan Greece	Asia Europe	hazards modelling, soil and solid earth science, risk management, hazards
[59]	Romania	Europe	hazards modelling, soil and solid earth sciences, risk management
[60]	Brazil Austria	South America Europe	water dynamics, remote sensing, soil and solid earth sciences, risk management, hazards

From Table 1, it is evident that the SI has included collaborations from (A) 11 countries–regions (New Zealand, China, Pakistan, Greece, UK, USA, Russian Federation, Japan, Romania, Brazil, Austria; (B) six geographical areas (Oceania, Asia, Europe, UK, America, South Asia, South America); (C) the keywords of the SI were covered fully; however, the coverage of the entire topic spectrum of the NH section of *Geosciences* was partial [2]; (D) the paper with the greatest number of different countries the collaborators are from (4) is the one written by Rafique et al. [51].

The total citations of the SI are 15 and the total views are 220,745 [1]. The paper with most views is the one by Triantafyllou et al. [54], with 7093 views [1]. The paper with the greatest number of citations (7) [1] is that of Dias et al. [60]. There are both positive and negative aspects to this SI. When it comes to the positives, it succeeded in involving a sufficient number of inter-country collaborations (11) and covering broad geographical areas. Most importantly, the SI succeeded in collecting a great number of publications (twelve). This number is greater than the average number of publications of SIs in MDPI. As for the negative aspects, Africa was not covered and there is partial coverage of all keywords of the NH section of *Geosciences*. Both these negative factors can be attributed to

the fact that more papers should have been published in order to achieve such coverage, but this is a common occurrence in several SIs due to the limited total available time for paper submission. Another negative is the small number of citations and views, yet this is justified because the Issue was closed recently (31 March 2026) and hence, there was very limited time left (4 months) to achieve a sufficient number of citations.

Therefore, on the whole, the assessment of this SI is positive.

5. Paper Presentation

As mentioned in Section 1, the SI [1] to which this editorial belongs, published twelve papers [49–60] which are all briefly presented in this section.

Beginning with the paper by Rustin and Rhoades [49], their report results from the application of the EEPAS model (Every Earthquake a Precursor According to Scale) to the ISC-GEM global earthquake catalogue aiming to test its power to successively locate very strong earthquakes with magnitudes M > 7.5 and estimate the related earthquake hazard. The EEPAS model has been effectively used for low regional seismicity in New Zealand, California, Turkey, Northern Mexico, Greece and Japan and, hence, its use in global and large seismicity is the novelty of this approach. The EEPAS model is used in combination with the PPE model (Proximity to Past Earthquake) that smooths background seismicity. Both models are presented in Equations (1)–(10). Additionally, this paper [49] introduces and tests a non time-varying gridded earthquake likelihood model that is based on a global strain rate model utilising Global Navigation Satellite System data which spanned the 1990–2013 period. The paper reports various model variations (including also Equations (12)–(14)) which are summarised in Section 3.1 as SUP, PPE, GSR-PPE, EEPTV1 (EEPAS & PPE), EEPTV2 (EEPAS & GSR), PPE-EEPAS, GSR-EEPAS and GSR-PPE- $EEPAS_1$. Table 1 reports Gutenberg–Richter b-values and PPE model parameters as best fit values from the data of the period 1964–2013. Table 2 reports the parameters of the EEPTV1 and EEPTV2 models estimated from data between 1994 and 2013. Based on Equations (16) and (17), Table 3 reports the information gain between 1994 and 2013. Figures 3 and 4 provide advanced global earth plots of great earthquake estimations (1994–2013) and Table 4 the expected number of big earthquakes together with the information gain for all model variations. Figures 6–8 provide additional evidence of the claims. The paper concludes that the models were efficient in global earthquake seismicity but have to be further tested.

The paper of Hu et al. [50], reports results of shear stress, roughness and Acoustic Emission (AE) characteristics of rock ice interface. Experiments were conducted in a four-channel strain-controlled automatic direct shear apparatus equipped with an AE monitoring apparatus and associated software. A photograph of samples is shown in Figure 3. The roughness procedure is shown in Figures 1 and 2 and in Equations (1)–(5), using the parameter JRC. Table 1 presents JRC data for various stress values and the storing procedure. A photograph of the sample utilisation is shown in Figure 4. Considering the areas explained in Section 3.1.1, Figure 5 presents several shear-displacement curves. Figure 5 shows the peak stress versus JRC value and Figure 6 is a fit approach of between peak versus normal stress. Several AE curves are shown in Figures 8–11, also taking into account Equation (6). On the basis of Equations (7)–(12), Figures 12–14 present further shear stress and roughness results. Considering Equations (15)–(23), Figures 16 and 17 present the roughness and test curve results. The paper concludes that roughness significantly influences the interface's shear strength and that both roughness and normal stress exert pronounced impacts on AE responses.

In their work, Rafique et al. [51] report applications of kernel density estimation (KDE) and wavelet-based density estimation (WBDE) to detect anomalies in radon, thoron, and meteorological time-series data retrieved by a remote sensing radon thoron station in

Pakistan. As shown in Figure 1, radon and thoron data are fed together with meteorological time series to WBDE and KDE parts to locate anomalies in the data. Thereafter, the detected anomalies are associated with seismic activity of the near area. The geology and the tectonic map of the study are shown in Figure 2. Table 1 shows the earthquakes with epicentral distance less than the Dobrovolsky one. Equations (2)–(5) and Sections 2.2.2 and 2.2.3 present the mathematics and the methods. Table 1 presents KDE and WBDE data from the earthquakes under study, whereas Figures 3–6 show the multiplots of the partials' outcomes. Finally, Table 3 presents the linear correlation matrix of all series of the study. The paper concludes that five out of nine seismic events with anomalies in both radon and thoron time series data were accurately identified by the kernel density estimation technique. WBDE identified four radon anomalies and two thoron anomalies that were associated with the corresponding seismic activity.

The paper by Ostapchuk and Nugmanov [52] reports seismic analysis on the basis of the Seismogenic Patches Detection (SPAD) algorithm so as to analyse background seismicity targeting to reveal tectonic asperities of the Okhotsk plate and its surroundings, all located in the inter-region between the Pacific, Eurasian and North America plates (Figure 1). As a specific case, the paper applies the SPAD algorithm in the Kuril–Kamchatka subduction zone. The paper utilises a regional seismic catalogue and focuses on the events with Mw > 7.0 in the period from January 1990 to July 2025 (Figure 2). The catalogue was declustered according to Equation (2) and values given in Section 4.1 (Figure 3). The localisation of seismicity is presented in Figure 4 in clustered and background mode. In Section 4.1, a set of equations is given (3–8), and the algorithm of fuzzy clustering is described. Figure 5 presents the seismogenic patches for the full catalogue and selected parts, while Figure 6, as a main plot, presents the seismogenic of the shallow Mw > 7.0 earthquakes, where importantly, the patches, the strong earthquakes and the faults show good agreement. Further, similar agreement is found in Figure 7 as well. The paper concludes that the SPAD technique manages to identify seismogenic patches that are associated with tectonic asperities.

As for the paper by Costanzo et al. [53], it discusses results obtained by the SISMIKO emergency group of ING which was installed as a station network to enhance the coverage of the National Seismic Network of Italy. This configuration managed to relocate 1300 aftershocks after a M_w = 5.0 earthquake (Pietrapaola event) located in the Upper Ionian Calabrian region. It also located a seismic swarm which occurred near the town of Cirò (Crotone province). Figure 1 presents the earthquakes of ING (Italy), whereas in Figure 2, a map shows the region of the southern Apennine chain and the Maghrebide thrust belt (Calabrian Arc). Section 2.1 describes the details of the SISMIKO network, where Figure 3 presents the whole network as a cartographic map. Details of the SISMIKO stations are given in Table 1. Further, Section 2.2 presents details of Python scripting to apply ML (Machine Learning) in raw and processed P and S waveform data. Sections 2.2.1–2.2.4 present the collection data, the phase picking processing the event association and the earthquake relocation process. Figure 5 is a complex plot of ML-located earthquakes, their quality factor, and the parameters of this quality factor. Figure 6 shows the temporal distribution of quality factor parameters both for the Pietrapaola earthquake and the Cirò swarm. Gutenberg–Richter (GR) plots are shown in Figure 7 for various scenaria, while Figures 8 and 9 present complex earthquake maps on the basis of quality factor. The paper concludes that, generally, the ML-based catalogue was efficient for real-time analysis of nearby earthquakes, providing new approaches for the analysis tectonic background of the Calabrian Arc.

In their work, Triantafyllou et al. [54] detail a real-time discrimination between foreshocks, aftershocks and swarms via application in a significant seismic activity which

occurred in the Santorini-Amorgos (SA) area during 2025, lying in the vicinity of the Hellenic Trench of Greece. The seismic activity was of great concern in Greece. Figure 1 presents the great seismic activity of the Aegean Sea. Figure 2 shows the evolution of SA activity and the main seismic events from January 2015 to January 2025 (previous decade), as well as the 2025 SA activity. On the basis of the GR law and Equation (2), the flow diagram in Figure 4 explains the strategy to analyse the activity in real-time. The earthquake data are presented in Section 2.4. The catalogue completeness is described in Section 2.5.1, whereas Section 2.5.2 describes modern techniques based on complex networks and Section 2.5.3 the crucial distribution of frequency and magnitude of earthquakes. Figures 5–8 present the background seismicity of the SA area, while Figures 9–14 focus on the evolution of the 2025 SA activity at selected days prior to the main event. The evolution of magnitudes is shown in Figures 14–16. Figure 17 is the concluding figure which shows the activity of the SA earthquakes from day 5 to day 22. The paper concludes that the foreshock activity was possibly the result of a cascade mechanism, and likely due to non-volcanic material softening and diffusion processes in a dense fault network.

Petrillo [55] discusses a multidimensional two order model (Equations (1)–(3)) which is controlled by two parameters θ and σ, the former controlling the stress distribution and the latter the variance of the disorder distribution. In this paper, $\theta = 0.5$, which is associated with empirical seismicity and the degree of viscoelastic or time-dependent coupling in the underlying seismic generating system. The model assumes ideal declustering of earthquakes, no presence of Short-Term Aftershock Incompleteness (STAI) and that there is an idealised seismic catalogue. A first series of simulations investigated the role of fault heterogeneity in foreshock activity, and the results are presented in Figure 1 (mainly the distribution diagrams). Figure 2 presents the foreshock activity for two σ-values and the quantity Ψ of Equation (5). The aftershock activity is shown in Figure 2. The simulations have indicated that foreshock activity is promoted with the increase in the interface disorder, a fact that is in agreement with laboratory experiments. Finally, the paper suggests that the fault complexity influences the seismic precursors.

Chen et al.'s [56] work reports pre-seismic changes in patters of δ_2H and δ_{18}O levels at two sites (WLY well and SS spring) located in the Yan-Huai Basin of Beijing, China, from June 2021 to June 2022. High-resolution sampling was conducted with 59 samples per week per site. Figure 1 presents the earthquake distribution of the study area with box and whisker plots of the earthquake data. The details of the sites of measurements are given in Section 2.1. Section 3.1 describes isotope handling and quality procedures, while the statistical methods are given in Section 3.2. The statistics include ANOVA, Self-Organising Maps-SOMs, a Bayesian mixing model (MixSIAR) and a Tukey–Kramer test. Figure 2 is a complex multiplot providing the time evolution of the two isotope concentrations and the concentrations between the isotopes. Areas of increased and decreased concentrations are identified, as well as several areas in the inter-concentration plot. These are analysed beneath Figure 2 in detail. The results of ANOVA and the Tukey–Kramer test are given in the multi-box and whisker plot of Figure 3. Meanwhile, Figure 4 presents the results from SOMs for both WLY and SS sampling locations. These are analysed in detail following Figure 4. Moreover, Figure 5 shows the proportional contributions of three potential sources of groundwater as the interaction of each source, while Figure 6 is a concept model of the pathways of each source in groundwater. The paper concludes that the differences in the time of rupture between the carbonate in WLY and granite in SS under sustained stress are the most possible mechanisms for stress-induced source mixing of fluid from the surface or deeper groundwater reservoirs.

The paper by Okada et al. [57] reports tsunami deposits in terrestrial and riverine environments after a strong tsunami that hit Japan after a 7.6 magnitude earthquake

occurred on 1 January 2024. The earthquake struck the Noto Peninsula in central Japan, and this paper aimed to conduct field surveys onshore and offshore in sandbars within the river channel in the Nunoura area on the northeastern Noto Peninsula, and also to build a model to simulate these. Figure 1 is a complex plot showing all maps of the Noto Peninsula and the related sample sites. The photographs in Figure 2 characteristically show the catastrophe caused by the tsunami, while Table 1 presents positions of the surveyed locations and related details. Figures 3 and 4 present the plan view of the sampling locations, sampling photos, grain size analysis, spring and gravel content for two selected locations and for both transect A and B. Figure 5 presents photographs of the changes in river width in the Kuri-Kawashiri River, before and after widening. Changes in sandbars in the Kuri-Kawashiri River before and after the Noto Peninsula earthquake are shown in Figure 6. The paper concludes that in a terrestrial tsunami, a substantial silty layer overlying a graded sandy layer is indicative of ponded stagnant water from the tsunami wave. Riverine tsunami deposits are thicker and more extensive than terrestrial ones, containing both gravels and shell fragments.

In their work, Nikolopoulos et al. [58] report rupture propagation, extent, and velocity for two catastrophic earthquakes of $Mw = 7.8$ near Kahramanmaras and $Mw = 7.5$ at Elbistan (main aftershock), Turkey, both occurring on 6 February 2023 in the East Anatolian Fault Zone (EAFZ). The propagation of rupture is modelled with two techniques (beamforming and multichannel signal classification). Figure 1 presents the geology and the epicentres of the two earthquakes and Figure 2 the seismicity of the study area. In Section 2.2, the significance of the two selected events is analysed. Beamforming and the MUSIC backprojection technique are presented in Sections 2.3 and 2.4. The data retrieval and the focused analysis are presented in Section 2.5. Meanwhile, the rupture propagation from beamforming is presented in Figure 3 for both earthquakes, while that from MUSIC backprojection is shown in Figure 4. The delimited rupture's segments for both earthquakes are presented in Figure 5. Table 1 shows the rupture's velocity and associated parameters for sub-sections analysed in the discussion of Figures 3–5. Apart from the velocity values, the paper concludes that beamforming distinguishes the rupture's extent from the fault's geometry but does not estimate the extent and the pattern of the rupture well. MUSIC backprojection identifies three segments for the rupture of the Kahramanmaras earthquake. The paper concludes that both techniques are promising and can be used in combination to estimate values and forecast the evolution of rupture.

Apostol's paper [59] is completely theoretical, discussing the vibrations that may occur in elastic media. The author assumes an isotropic elastic half-space which is related to the so-called Lamps problem. A localised force is supposed to produce variations. Vector plane-wave functions are introduced. Results are given for an isotropic tensorial force and a half-space in respect to free surface. Rayleigh surface waves are analysed for the special case of a temporal-impulse force. The paper suggests a scissor-like double-wall propagating not only in past uses, but also for future applications.

Finally, the paper by Dias et al. [60] reports the influence of different inventories for modelling the susceptibility of shallow landslides using four different methods, namely the LR, SVM, and XGBoost. Figure 1 presents the topography of the study area in Brazil. Figure 2 presents map projections from different satellite inventories, namely manual-Google Earth, manual-RapidEye, semiautomatic-RapidEye and a zoom of these. Meanwhile, Figure 3 shows the susceptibility map versus five morphological and hydrological variables (aspect, plan curvature, elevation, slope, and flow accumulation) that were generated from TanDEM-X (12 m resolution DEM) together with two sub-figures from references (so called, seven thematic variables). Table 1 presents inventory types, total number of landslide polygons, and number of samples used for training of the three in-

ventories (70% of samples) and their testing (30% of samples). Further, Logistic Regression (LR) analysis (Section 3.3.1), Support Vector Machines (SVM) (Section 3.3.2) and Extreme Gradient Boosting (XGBoost) (Section 3.3.3) are presented in detail. Table 2 shows the polygon characteristics for the three inventories under study, and the values are analysed in sub-Section 4.4.1. Figure 4 displays the susceptibility maps derived by the three different inventory algorithms for the LR, SVM and XGBoost approaches. The success and prediction rates for each susceptibility map constructed based on LR, SVM, and XGBoost for each inventory are shown in Table 3. Good percentages are achieved. Meanwhile, Figure 5 is a bar plot of landslide scars organised qualitatively as very low, low, moderate, high and very high—and for the three approaches (LR, SVM, and XGBoost). Finally, Table 4 presents the Cohen's Kappa indexes between the shallow landslide inventories and the models. The paper concludes that LR exhibited the highest agreement (0.79), whereas SVM (0.36) and XGBoost (0.33) showed lower numbers. Conversely, the accuracy numbers suggest that XGBoost achieved the highest success rate in terms of AUC (85–78%), followed by SVM (82–76%) and LR (80–71%). The findings demonstrate the importance of well-established landslide mapping criteria.

6. Conclusions

The SI has fully covered the subject in question. Meanwhile, for the next phase, we propose a second edition of Editorial Board Members' Collection Series: Natural Hazards.

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