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Editorial

Anthropogenic and Geo-Environmental Impacts on the Hydrosphere: Diagnosis, Monitoring, Assessment, and Sustainable Management

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A worldwide issue directly affecting human health, resources, and ecosystems concerns the harmful consequences of anthropogenic and geo-environmental influences on the hydrosphere. Anthropogenic activities and geo-environmental processes both have various impacts on the hydrosphere. Changes in land use, industrial, agricultural, and mining operations are some human activities affecting the aquatic environment. There are many geo-environmental influences on the hydrosphere, including geological activity, natural disasters, and geochemical processes that occur in aquatic environments [1–3]. Significant threats to the hydrosphere include, among others, geological hazards, contamination, land use changes, floods, the excessive use of water resources, landslides, infrastructure failures, eutrophication, mudflows, soil erosion, extreme temperatures, rising sea levels, rockfalls, wildfires, technological accidents, livestock farming, agricultural activities, mining, and industrial activities.

Tsitsis et al. [4] combined the driver–pressure–state–impact–response approach and artificial neural network (ANN) for evaluating a Mediterranean lake. The data from three monitoring stations were utilized to examine, identify, and assess the potential origins of chemical and biological changes in a Mediterranean lake. The ANN proved to be a powerful tool for producing water quality-based forecasts. According to Tsitsis et al. [4], the ecological status tends to deteriorate. Tsitsis et al. [4] concluded that actions which are required at an early stage include, among others, a reduction in the point sources of pollution and a decrease in the agrochemicals used to cultivate land in the area studied. Kerpelis et al. [5] used the experts' judgment methodology to investigate the seismic vulnerability of wastewater treatment plants (WWTPs). During seven months, a representative questionnaire was delivered to 116 operators of Greece's WWTPs using proportionate stratified sampling. The survey was designed to cover the significant factors that contribute to seismic susceptibility. Their data also demonstrated that the average seismic sensitivity of the samples was low following a direct query. Non-structural and operational vulnerabilities somewhat enhanced the percentages in the judgements. The findings of Kerpelis et al. [5] can be compared to future surveys for qualitative approaches to catastrophe risks, or they can be utilized in conjunction with quantitative data. Panagopoulos et al. [6] used the Hellenic Centre for Marine Research Water Quality Index (HWQI) as a starting point and also applied the Canadian Council of Ministers of Environment Water Quality Index (CCME WQI) to delineate its potential suitability for Greek rivers, which are characterized by a variety of hydrological, geologic, and climatic conditions and have been impacted by anthropogenic activity. Panagopoulos et al. [6] applied a large dataset of 111 river sites and numerous sampling campaigns for each site from 2018 to 2020, yielding an application of the CCME WQI on a national scale. A modified CCME WQI version from the literature was used in addition to the original CCME WQI equation for generating the classification score. An additional study by Ślósarczyk et al. [7] involved the use of combined isotopic

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and chemical methods for a more precise identification of the anthropogenic variables that control water quality in the Kozowa Góra (Poland) watershed. Samples were gathered from groundwater and surface water bodies in four periods. The research conducted by Ślósarczyk et al. [7] highlighted the impact of agricultural activities and wastewater discharge on the surface water quality of the studied watershed. The findings reported by Ślósarczyk et al. [7] may be applied to future investigations into the origin and migration of additional compounds in water. Bakalar et al. [8] proposed a sustainable management model of a river basin based on evaluating water quality status. Their proposal is mainly based on the qualitative and quantitative analysis of contamination, the monitoring of surface water quality, and a questionnaire survey. A case study of the Hornád river basin (Slovakia) was conducted to provide a more thorough outline using the following approaches: the analytic hierarchy process (AHP) analysis for decision prioritization and strengths, weaknesses, opportunities, and threats (SWOT) analysis. The proposed model primarily included and addressed the following topics: the generally applicable principles of sustainable development, the acceptance of water management legislation, and a consideration of the quality of surface water in the basin. Skilodimou et al. [9] studied the coastline changes in Athens Riviera over the past 76 years of measurements. Changing coastlines are mapped to aid coastal development and monitoring. Significant and severe changes occurred in the Athens Riviera (Greece) in recent decades due to human intervention. The applied methodology included an analysis of aerial photography and satellite images, the use of geographic information system (GIS) tools, and an evaluation of the spatial and temporal fluctuations in the shoreline. According to Skilodimou et al. [9], 60% of the overall length of the coastline was linked to human interventions. The analysis of seven sub-areas revealed that anthropogenic activities significantly altered the coastlines of the Athens Riviera. The surrounding coastal regions near the metropolitan area of Athens exhibited the most significant coastline change.

In conclusion, this Special Issue, titled "Anthropogenic and Geo-environmental Impacts on the Hydrosphere: Diagnosis, Monitoring, Assessment, and Sustainable Management", collates a wide variety of research approaches and environmental topics, containing a variety of cutting-edge methodologies that are of great interest and which significantly contribute to the dissemination of the most recent advancements in geoenvironmental science. The following Special Issue in this collection, "Anthropogenic and Geoenvironmental Impacts on the Hydrosphere: Diagnosis, Monitoring, Assessment, and Sustainable Management 2.0" (https://www.mdpi.com/journal/water/special_issues/1B8Z0721VM; accessed on 20 March 2023), is currently welcoming submissions to facilitate the dissemination of new approaches and discoveries among the scientific community.

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