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Editorial

A Special Issue of *Geosciences*: Groundwater Pollution

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Of all the fresh water available for human use, about 4% is surface water, while the rest lies underground. Nevertheless, groundwater is still one of the least understood natural resources. In fact, even though a large part of the world's population is directly dependent on groundwater, groundwater pollution is not immediately recognized by people as a compelling issue, since it is not as visible as surface water pollution.

Groundwater contamination is becoming a critical environmental issue, because pollutants often reach higher concentrations in groundwater than in surface water due to the fact there is little mixing and dispersal of toxic substances underground. Moreover, a long-term monitoring plan is usually needed to assess the fate and transport of pollutants in aquifers. Hence, once contaminated, groundwater may remain so for many years, since polluted groundwater can be impractical and even impossible to remediate with existing technology, posing threats to public health and limiting current and future use of this invaluable resource. Obviously, the best solution to the problem is prevention, which is generally based on two pillars, the understanding of the processes governing the pollutants in the subsurface environment and a good regulation.

The main aim of this Special Issue of Geosciences is to focus on different methodological approaches to improve the understanding of the interactions among groundwater, the aquifer matrix, and inorganic pollutants, which may derive from point sources (like industrial sites or hazardous waste disposals) or non-point pollution sources (like agrochemicals).

This Special Issue of Geosciences marks an important contribution by collecting and presenting contemporary applications of field-based studies of groundwater pollution using numerical modelling, GIS spatial analyses, environmental tracers, statistical analyses, or combined approaches.

For example, numerical flow and transport modelling tools have been successfully applied to quantify different remediation scenarios of Cr(VI) sourced from a steelworks area within an alluvial aquifer exploited for drinking purposes [1]. The spatial analyses of both horizontal and vertical distribution of compound-specific stable isotopes in an industrial site located in a coastal aquifer turned out to be pivotal to unravelling the main biogeochemical processes acting at the site [2]. Specifically, in this issue, advanced applications and discussion of geospatial and geostatistical tools in large-scale pollution studies are related to mapping, monitoring, and assessing the trends of widespread contaminants like nitrate [3] or arsenic using reliable predictors to forecast their geogenic or anthropogenic origin [4], or to map the risk and vulnerability of aquifers [5]. Finally, a case study from an historical dumpsite in South Africa with a long term monitoring of a leachate dissolved plume gives an overview of the impact of such activities on groundwater resources [6].

We believe that, with the articles published in this special issue, the topic of groundwater pollution will receive more attention by the wider Geosciences community, and that the urgently need to tackle groundwater pollution problems will be better understood and shared.

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

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