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Editorial

Special Issue on Soil Erosion: Dust Control and Sand Stabilization (Volume II)

Itzhak Katra

Department of Geography and Environmental Development, Ben Gurion University of the Negev, Beersheba 8410501, Israel; katra@bgu.ac.il

1. Introduction

This is the second volume of the Special Issue on Soil Erosion: Dust Control and Sand Stabilization, following the first volume published in 2020 [1]. Many soils throughout the world are subjected to the impacts of extensive land use on soils, including agricultural areas, unpaved roads, mines and quarries, waste soils, and active sand dunes and sand sheets. There is a strong interest in understanding the factors and processes of soil erosion by wind, as well as in developing and applying methods to control dust emissions from soils and to stabilize active sands.

Eleven papers were accepted for publication: two review papers and nine research papers, one of which was selected as a featured paper. The review papers by Lal provide us with a complete picture of soil carbon transported by erosional processes. One review paper [2] deliberates the fate of soil carbon due to soil erosion by wind and water being transported over the landscape. The second review paper [3] concerns the biophysical controls that make erosion-transported soil carbon a source of greenhouse gases. Conversely, three of the research papers focus on sand stabilization. The featured paper, by Bar-Kutiel and Dorman [4], demonstrates the importance of studying vegetation at multiple entity-defined scales through analyses of the annual vegetation on coastal Mediterranean sand dunes. The paper by Bird et al. [5] concerns the effects of environmental degradation on ecosystem stability and productivity, which have destabilizing consequences beyond biodiversity loss in Mediterranean coastal dunes. Dun et al. [6] explored sand transport around a high-speed railway using three models of wind-break walls in a wind tunnel experiment with the reproduced movement process of windblown sand. The other papers in this Special Issue focus on dust emissions from soils and control methods. The papers of Raveh-Amit et al. [7] and Magnuson et al. [8] are two parts of a project on limiting dust resuspension by wind and soil stabilization of radiologically contaminated surfaces. Another research project is represented here by the two papers of Freer et al. [9] and Sieger et al. [10] on the effectiveness of biopolymers from food processing by-products as dust suppressants in mine soils through laboratory and field experiments. The environmental risk of applying dust suppressants in soils was investigated by Ben-Hur et al. [11], providing an evaluation of groundwater salinization risk following application of brine on calcareous soil in an arid region. The last paper on dust, by Rubinstein et al. [12], is a study on the role of soil particle size distribution in dust emission rates in Loess soils through laboratory wind tunnel experiments.

A wide range of dust control products have been tested for soil stabilization and dust control. However, there is a need to investigate the possible environmental impacts of diverse dust suppression substances, including the toxicity of atmospheric particulate matter, when dust is emitted from the treated soils.

Citation: Katra, I. Special Issue on Soil Erosion: Dust Control and Sand Stabilization (Volume II). *Appl. Sci.* **2023**, *13*, 1727. https://doi.org/10.3390/app13031727

Received: 18 January 2023
Accepted: 21 January 2023
Published: 29 January 2023

Funding: This research received no external funding.

Acknowledgments: This Special Issue is the result of the long-term efforts of the authors, the reviewers, and the editorial team. Special thanks to the Section Managing Editor, Applied Sciences, MDPI.

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

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