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Editorial

Special Issue "GIS Applications in Green Development"

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In the context of climate change, the role of Geographic Information Systems (GIS) in green developments cannot be overstated. The application of smart GIS is the linchpin for decision makers tasked with designing and monitoring climate-conscious solutions at local, national, and international scales. With 75% of the Earth's surface now impacted by human activities, it is imperative to expand the use of smart GIS to predict and mitigate the impact of these activities across forests, oceans, urban and rural areas, transportation networks, and production sites. This Special Issue of Applied Sciences, titled "GIS Applications in Green Development", explores the pivotal role of GIS in advancing sustainability across diverse domains.

The five papers presented in this Special Issue consider the potential intersection of GIS and green developments in urban planning, renewable energy integration, disaster management, and the energy sector. According to Ostapenko et al. [1], the potential to implement renewable energy sources in Ukraine is scrutinized using global and local Geographic Information Systems (GIS). The study highlights GIS's prowess in identifying suitable territories for renewable energy development, assessing technical potential and facilitating the integration of renewable energy technologies in Ukraine's energy sector. Zorzano-Alba et al. [2] addressed the sensitive issue of the visual impact associated with renewable energy infrastructure, introducing a novel methodology for identifying optimal locations for photovoltaic power plants, especially in areas of cultural or scenic significance. Maniatis et al. [3] focused on fire risk mapping in the context of climate change. The authors presented an innovative approach, incorporating recent land cover changes, to highlight regions with a high fire risk. Through the integration of a support vector machine (SVM) algorithm and the analytic hierarchy process (AHP) within a GIS framework, the authors created a robust fire risk estimation model. The model identifies high-risk areas in the Dadia-Lefkimi-Soufli National Forest Park, Greece, (although it can be adapted for other regions) reinforcing the vital role of GIS in disaster management. Pinna et al. [4] offer a comprehensive assessment of Sardinia's rooftop photovoltaic potential using GIS data and an efficient shadow calculation algorithm. Their innovative approach provides a high-resolution, full census evaluation of the photovoltaic potential, which can be applied on a regional scale. By estimating not only the geographic but also the technical and economic potential, the paper exemplifies how GIS facilitate large-scale renewable energy planning. Yildiz [5] explores the wind energy potential of Balıkesir Province, Turkey, through GIS functions. The study employs wind speed data from meteorological stations and extrapolates it to create a wind speed map, enhancing this methodology by using an equation for turbine placement that is compliant with national regulations. This innovative approach enables the calculation of wind energy potential across the province, contributing to the knowledge regarding renewable energy assessments using GIS.

The collection of papers in this Special Issue emphasizes that GIS are more than a technology; in fact, they are an indispensable tool in the quest for green developments and sustainable management. By providing insights, data-driven decision support, and innovative methodologies, GIS empower us to address the profound environmental challenges of our time.

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