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The effect of climate change and land use transformations on the susceptibility of peatlands to wildfires: A geostatistical risk assessment

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Peatlands cover 3–5% of the global land surface and contain an estimated one-third of the world's soil organic carbon of all terrestrial organic carbon. Human activity and climate change threaten the stability of this large pool, which have been shrinking over the last few decades owing to turf-cutting, drainage and fire. The fire risk is especially growing as wildfires are occurring more frequently and more severely, such as the Indonesian and Russian peatland fires. These fires also account for a large amount of CO2 emissions to the atmosphere. Adding to the destructive scene, the infamous climate change is also likely to make the peatlands more susceptible to fire hazards, as they experience less rainy days and higher temperatures every year. In this research, a risk assessment conceptual framework is employed to draw a perspective of the current situation of Irish peatlands in terms of their vulnerability to fire hazards by considering the land use transformations and climate change data for the past 10 years. A hazard factor was also introduced to the model using data from the previous fire report counts across the Irish wild lands. A multiple regression was first developed for model selection and the final risk map was produced, combining the vulnerability and the hazard map using the Geographically Weighted Regression tool in ArcGIS. In addition to the immediate results, which clearly show the distribution of risk levels across the country's peatlands, the developed method could be used by decision makers to facilitate the prioritization of land use transformation or bog land conservation planning.

Biography

Mehdi Khakpour is a PhD student in geography at the Norwegian University of Science and Technology (NTNU). He is currently a member of Nord-Star, which is the Centre of Excellence for Strategic Adaptation Research within the Scandinavian countries. He is a civil engineer and has a Master's degree in Natural Hazards Management. His research interest is on climate change related current and future hazards. Geo-statistical analysis, multi-hazard risk assessment and the implementation of biological modeling techniques in the understanding of catastrophic events are among his methodological interests.

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