The Impact of Rising Global Temperatures on Seismicity: A Case Study in Alaska

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Bikash Sadhukhan ; Somenath Mukherjee ; Raj Kumar Samanta **All Authors**

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Abstract:

Earthquakes are one of the most catastrophic natural disasters that generate abrupt surface shaking. It not only damages buildings and other infrastructure but also has a huge impact on the surrounding environment and our lifestyle. The global temperature is an important part of the climate that impacts Earth's ecology and people. It shows the average temperature for various time periods and geographic locations throughout the world. It relies on how much solar energy Earth absorbs and emits. Earthquakes have been a demanding research topic for decades. Realizing its connection with global temperature changes is also becoming increasingly popular. This study's major objective is to assess the impact of rising global temperatures on earthquakes. In this respect, monthly global land and ocean temperature anomaly data were collected from a dataset published by the National Oceanic and Atmospheric Administration (NOAA). Earthquake data have been compiled using the seismic catalogue of the National Earthquake Information Center of the United States Geological Survey (USGS). Statistical techniques such as temporal variation and correlation were utilized to assess the influence of rising global temperatures on seismicity in the Alaska area, as well as their worldwide implications. The results indicate that global temperature anomalies have a significant effect on minor (3.0 – 3.9 M) and light (4.0 – 4.9 M) earthquakes. These results will aid future researchers in developing an appropriate mathematical model for predicting the future values of each dynamic using the historical data of the others.

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Bikash Sadhukhan
Department of CSE, Techno International New Town, Kolkata, India

Somenath Mukherjee
Nazrul Center of Social and Cultural Studies, Kazi Nazrul University, Asansol, India

Raj Kumar Samanta
Department of CSE, Dr B.C. Roy Engineering College, Durgapur, India

Contents

Authors

Bikash Sadhukhan
Department of CSE, Techno International New Town, Kolkata, India

Somenath Mukherjee
Nazrul Center of Social and Cultural Studies, Kazi Nazrul University, Asansol, India

Raj Kumar Samanta
Department of CSE, Dr B.C. Roy Engineering College, Durgapur, India