J Geol Geophys 2017, 6:5 (Suppl)
DOI: 10.4172/2381-8719-C1-0012

The role of heat indicators in early warning and forecasting systems to detect environmental and health hazards

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Heat is a thermodynamic parameter which is the sole source of all matters and energies. In different levels, from micro to macro, the change in temperature leads to the change in matters and conversely the change in a matter results in the change in its temperature, and this mutual interaction governs the world. Heat changes can be a strong indicator to detect many changes in natural phenomena. Therefore, precise measuring of material's temperature and tracing the trend of temperature changes lead to obtain variety of information about different phenomena and assess of health and integrity of living systems, including cells, humans, ecosystems and even all of the world. These temperature anomalies can be regarded as early warning symptoms in natural hazard predicting systems. There are variety of temperature-based hazards including environmental hazards and health hazards. environmental hazards such as hurricanes, heat waves, cold waves, windstorms, droughts, earthquake, and volcanic activities and also health hazards including fever, heatstroke, infections, and many physical and psychological stresses can be recognized by temperature variations detecting tools beforehand or at initial stages. By applying these heat indicators, early warning systems are capable of providing emergency preparedness to prevent catastrophic consequences. This research focuses on the claim that a wide range of thermal anomalies can nowadays be remotely sensed especially in the field of natural hazards by means of thermal remote sensing technologies. In future, when highly precise and advanced heat measurement instruments with developed spectral and radiometric recording abilities, in nano scale, will be possible many of the minute thermal anomalies will be accurately detected in both environmental and health-related applications.

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