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Underground paleo volcanic zones: Understudied and under recognized sources of global warming

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Statement of the problem: It is known that Global Warming and Climate Change phenomena on the planet are caused by thermal pollution and greenhouse gas emissions. Many believe that humans are enhancing this overall warming trend. Meanwhile, less attention is paid to natural sources of pollution which are capable of creating definite areas of thermal anomalies across the world. For example, ancient underground volcanic zones are insufficiently studied and are underestimated sources of global warming. The purpose of this study is to analyze thermal pollution in the territory of the industrial city of Volzhsky (Volgograd region, Russia) and its immediate surroundings.

Methodology & theoretical orientation: Thermal anomalies were identified using the Landsat-8 program OLI Level 1 data products, made freely available online by USGS Findings: A map of thermal pollution on the territory of Volzhsky and its vicinities with enterprises of the chemical industry, mechanical engineering, metallurgy, etc. was built. It was established that most thermal anomalies are situated on agricultural land of the steppe, where nothing is cultivated and nobody lives. Small point thermal anomalies are observed in Volzhsky. These facts indicate a powerful natural source of thermal anomalies in the steppe in the form of an active ancient underground volcanic zone located on the Precambrian platform. This was recently discovered by the author.

Conclusion: The author pays attention to the world community about underground ancient volcanic areas as they are obvious suppliers of both heat and volcanic greenhouse gases in Earth's atmosphere. This phenomenon is not properly studied by scientists, it is not reflected in the legislation of any country in the world, and it is not the subject of international discussions. Therefore, additional actions are required for the sustainable development of territories and their climate change risk reduction.

Keywords: Volzhsky, Volcanic zones, Thermal pollution, Thermal anomalies.

Biography

Irina Glinyanova (PhD) is a specialist in the fields of natural pollution, land surface temperature, and land relief and has experience in identifying underground zones of ancient volcanism in Russia (Volgograd and Saratov regions). Her technique is a comprehensive assessment of the environmental state of a territory based on Earth remote sensing data, field studies using aerosol indicators (acidity, electrical conductivity, toxicity, etc.), analysis of local geological structures, etc. Her research methodology is based on the principles of holistic concept and is a comprehensive analysis of the territory.

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