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Developing state of the art web cartography tools to evaluate the socioeconomic impact of climate change in the Arctic

Georgios-Nektarios Tselos[1], Spyridon E. Detsikas[1], Konstantina Petropoulou[2], Antonis Litke[2], George P. Petropoulos[1,*]

[1]*Department of Geography, Harokopio University of Athens, Greece; gs21966@hua.gr; sdetsikas@hua.gr; gpetropoulos@hua.gr*
[2]*Innov-Acts, Nicosia, Cyprus; Petropoulou.konstantina@gmail.com; alitke@innov-acts.com*

* Corresponding author: gpetropoulos@hua.gr

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Abstract:

In today's changing climate, permafrost regions in the Arctic are highly vulnerable to global warming, impacting both the environment and socioeconomic aspects. Thus, systematic monitoring of such environments, is of paramount significance, particularly so given the pressures of climate change worldwide.

In the era of the rapid technological developments during the last decades in particular, significant advancements have taken also place in geoinformation technologies which create new opportunities and challenges for Arctic research. the exponential growth of geospatial data collected from Earth Observation (EO) sensors and other sources has created immense opportunities, as well as challenges, in managing, processing, and delivering these datasets. In addition, advances in Geographical Information Systems (GIS) and cartography, including web cartography, have redefined how information is visualized and presented, particularly in the field of geographic analysis. Through the integration of GIS and web cartography, it becomes possible to develop tools that facilitate the comprehension of complex information, enabling researchers, policymakers, and citizens to access geospatial insights in an intuitive and efficient manner. This progress highlights the need for innovative presentation techniques that transform raw data into actionable knowledge.

In purview of the above, the present contribution has a two-fold objective: (1) to provide an overview of "EO-PERSIST" Marie Curie Staff Exchanges EU-funded research project (http://www.eo-persist.eu); (2), to showcase the use of state-of-the-art software tools and geospatial analysis approaches employed in the visualization, presentation and analysis of geospatial data results related to permafrost monitoring in the Arctic obtained from EO-PERSIST. Additionally, in this context it is also demonstrated how the developed tools and the webGIS enable all together an efficient approach to the investigation of the relationship between permafrost changes and demographic shifts observed in specific municipalities within the Arctic.

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