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**Member of
Geological Surveys
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SHALLOW GEOTHERMAL ENERGY FOR FUTURE-PROOF CITIES

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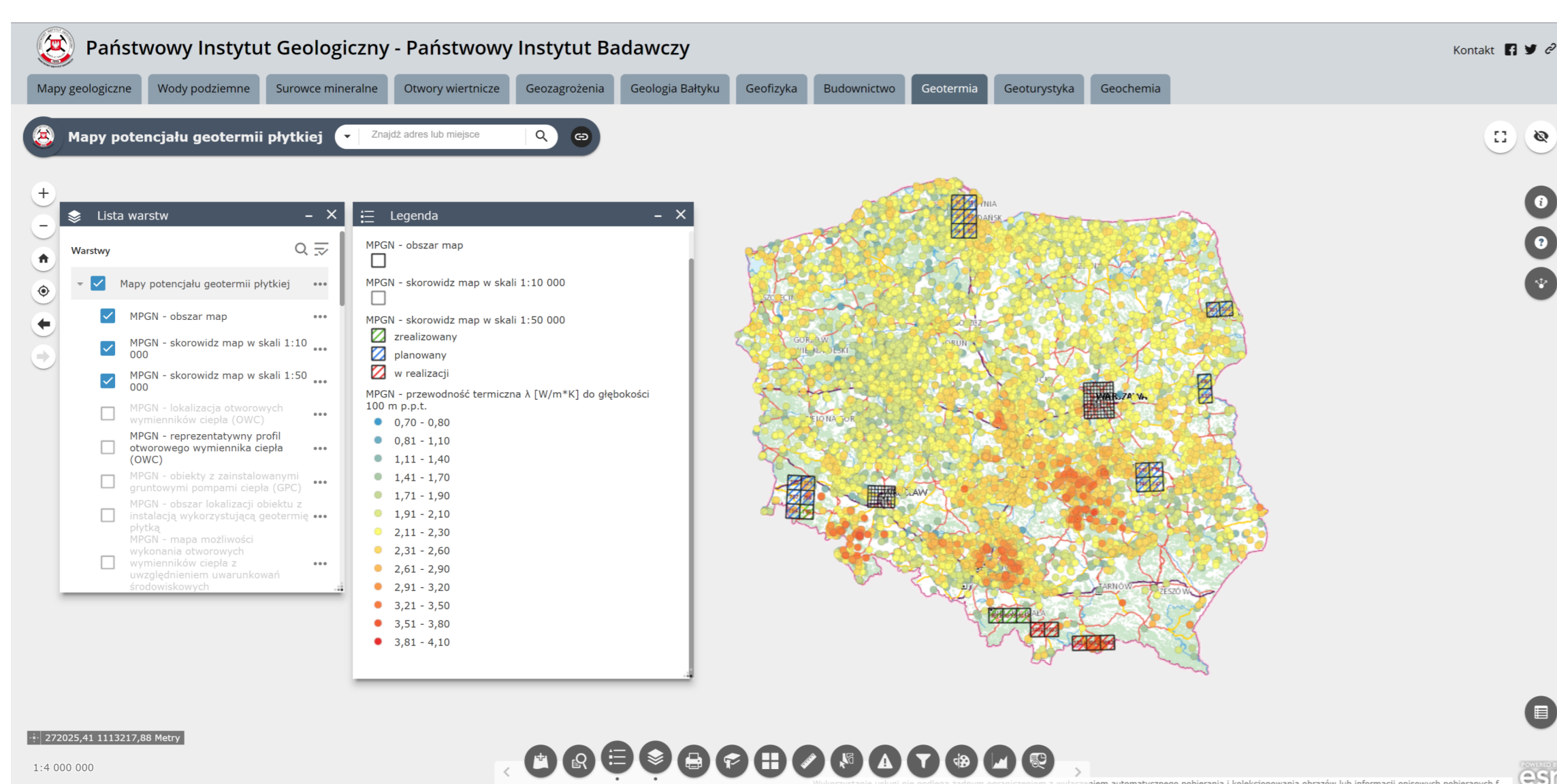
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Green Cities need clean energy. Shallow geothermal energy potential maps are developed by Polish Geological Survey and Geological Survey Organisations (GSO) associated in EuroGeoSurveys community. Such maps can be used to implement ground source heat pumps (GSHP) technology in city areas. Shallow geothermal energy, especially combined with PV systems and borehole thermal energy storage (BTES) technology is a clean and reliable source of renewable heating and cooling for buildings and infrastructure.

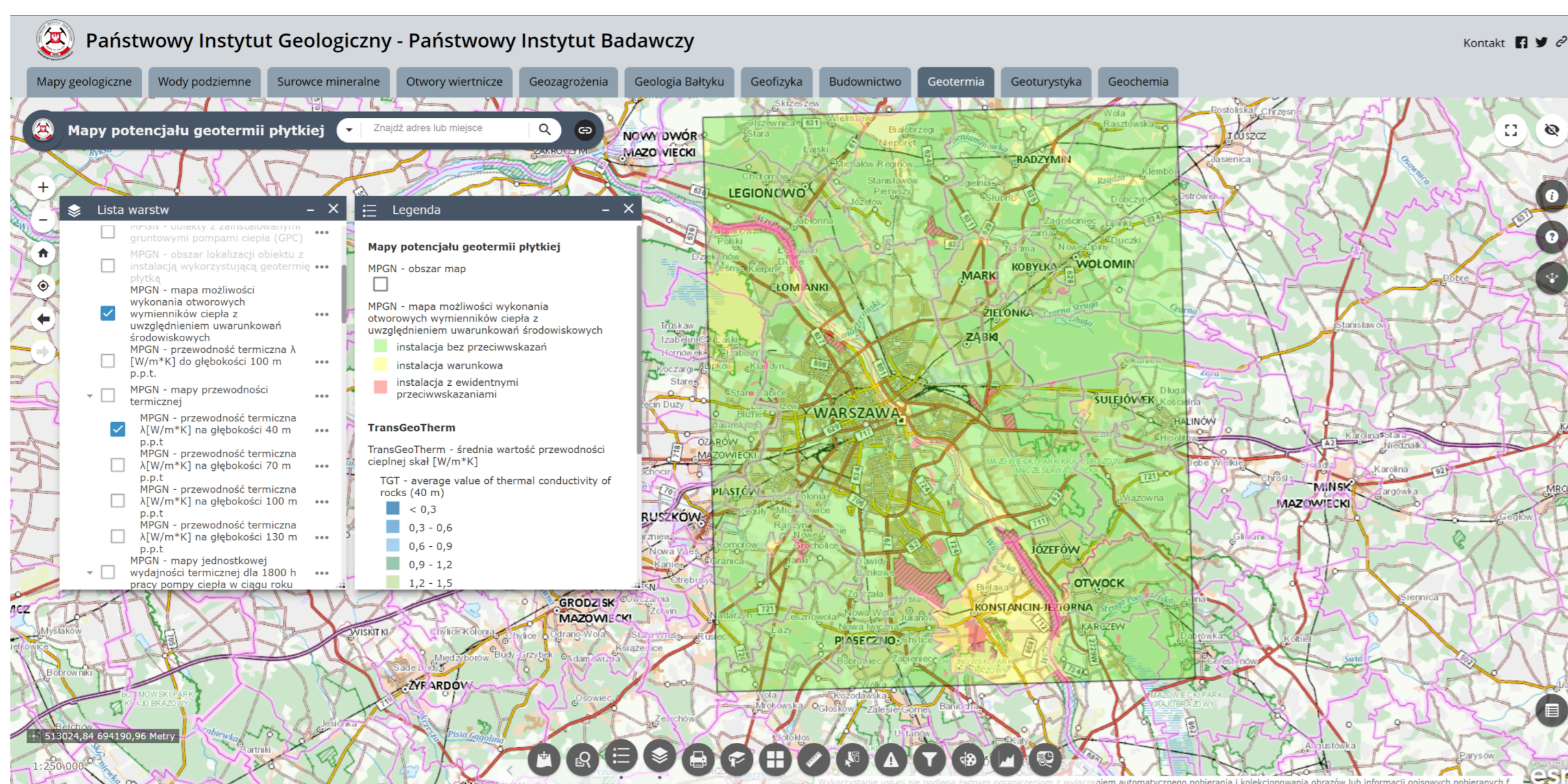
In reaching the EU goals in RES use in the energy mix and to significantly improve the city areas air quality, GSHP technology can play a significant role, however it needs a tools and

guidelines to be successfully implemented. Tools provided by Polish Geological Survey in form of on-line GIS spatial data browsers available for the general public, contain valuable and easy accessible information about shallow geothermal energy potential. Presented tools are available at geologia.pgi.gov.pl and geolog.pgi.gov.pl, in „Geotermia” theme.

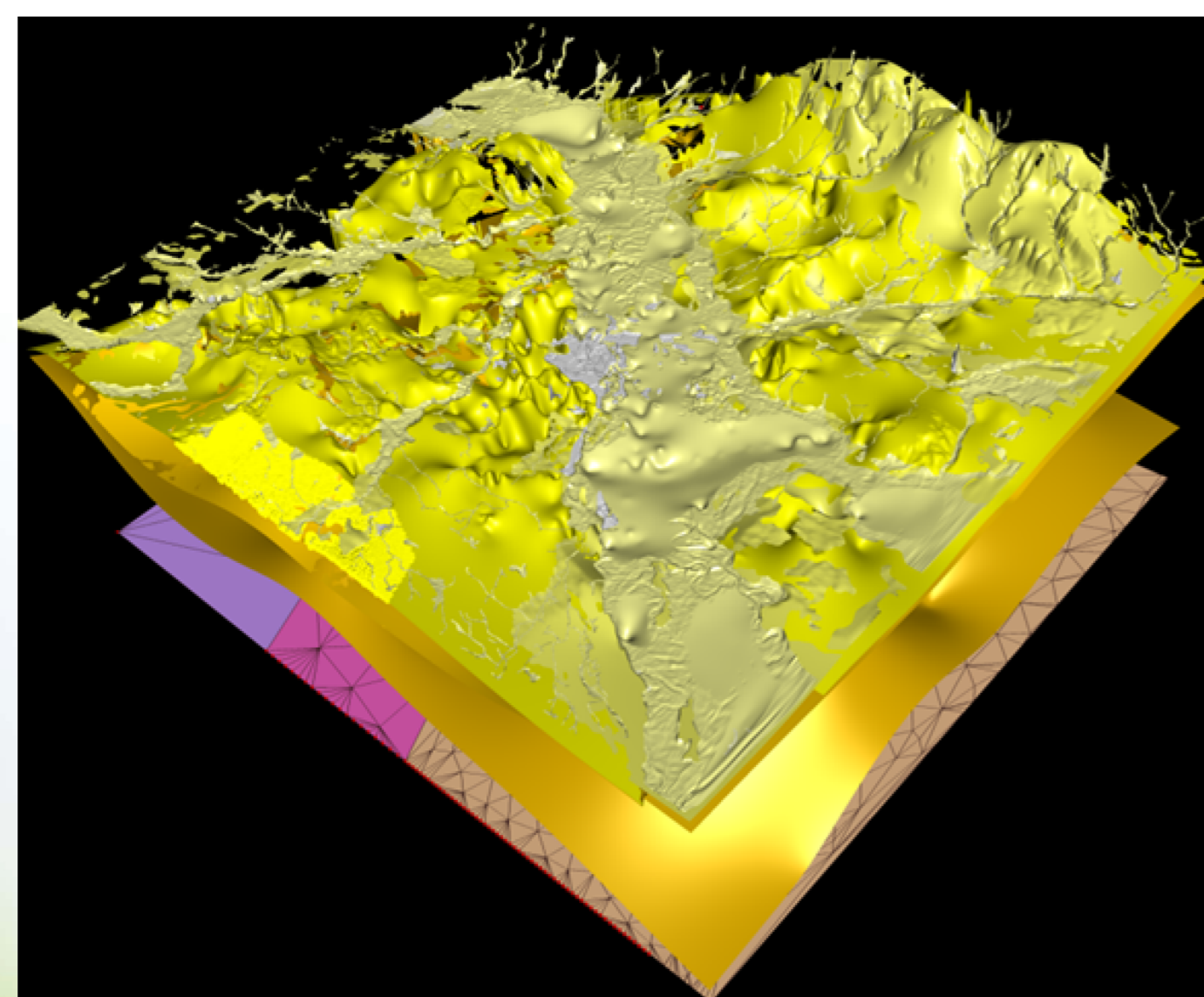
Ground Source Heat Pumps will play an important role in energy transformation of our cities, providing renewable heating and cooling, therefore evaluation of shallow geothermal energy potential of urban areas is essential.



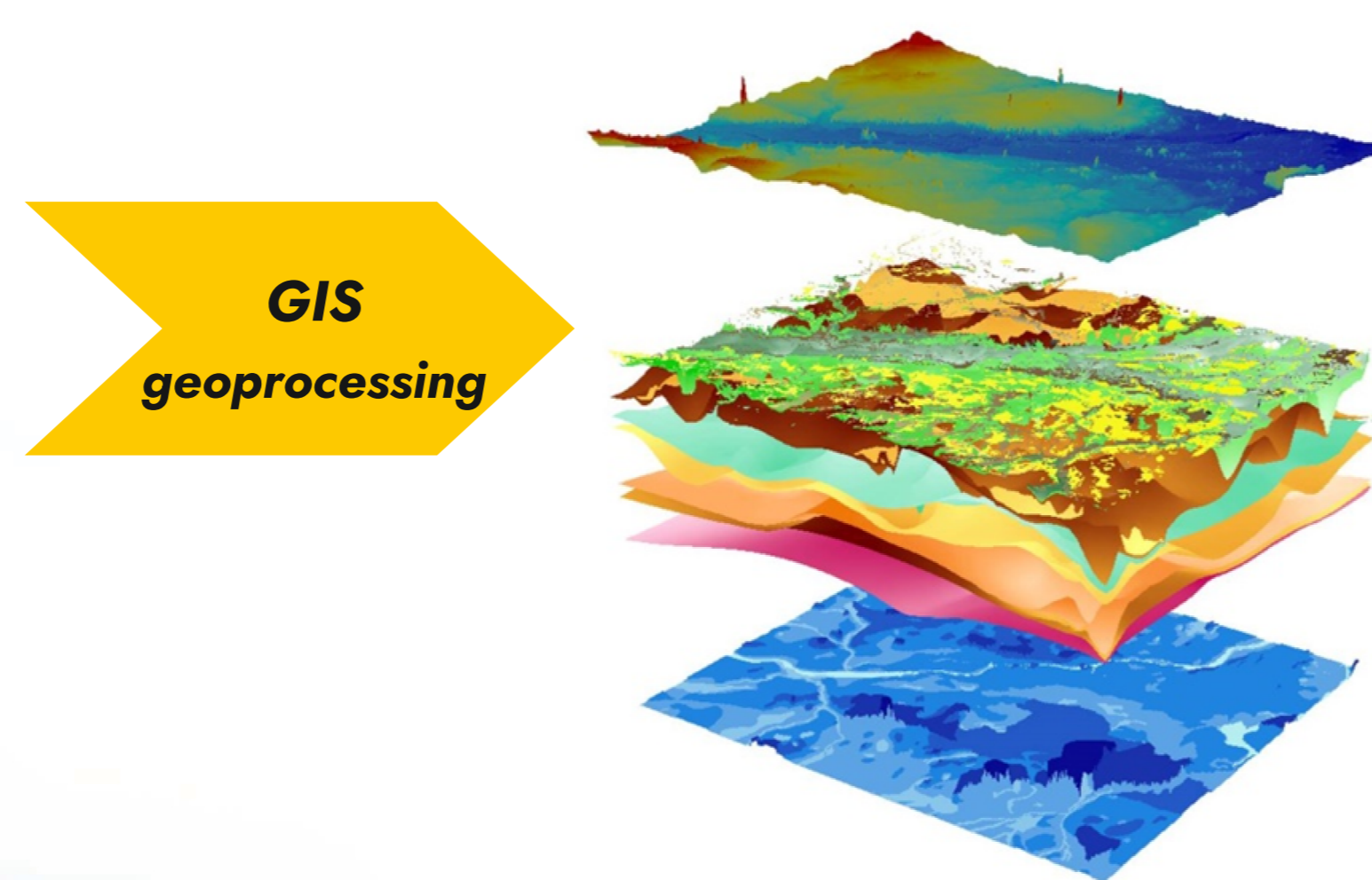
Shallow geothermal energy potential of Poland is evaluated on the basis of over 14000 hydrogeological boreholes and set of 25x25 m resolution maps in selected urban areas (Wrocław, Warszawa, Jelenia Góra, etc.).



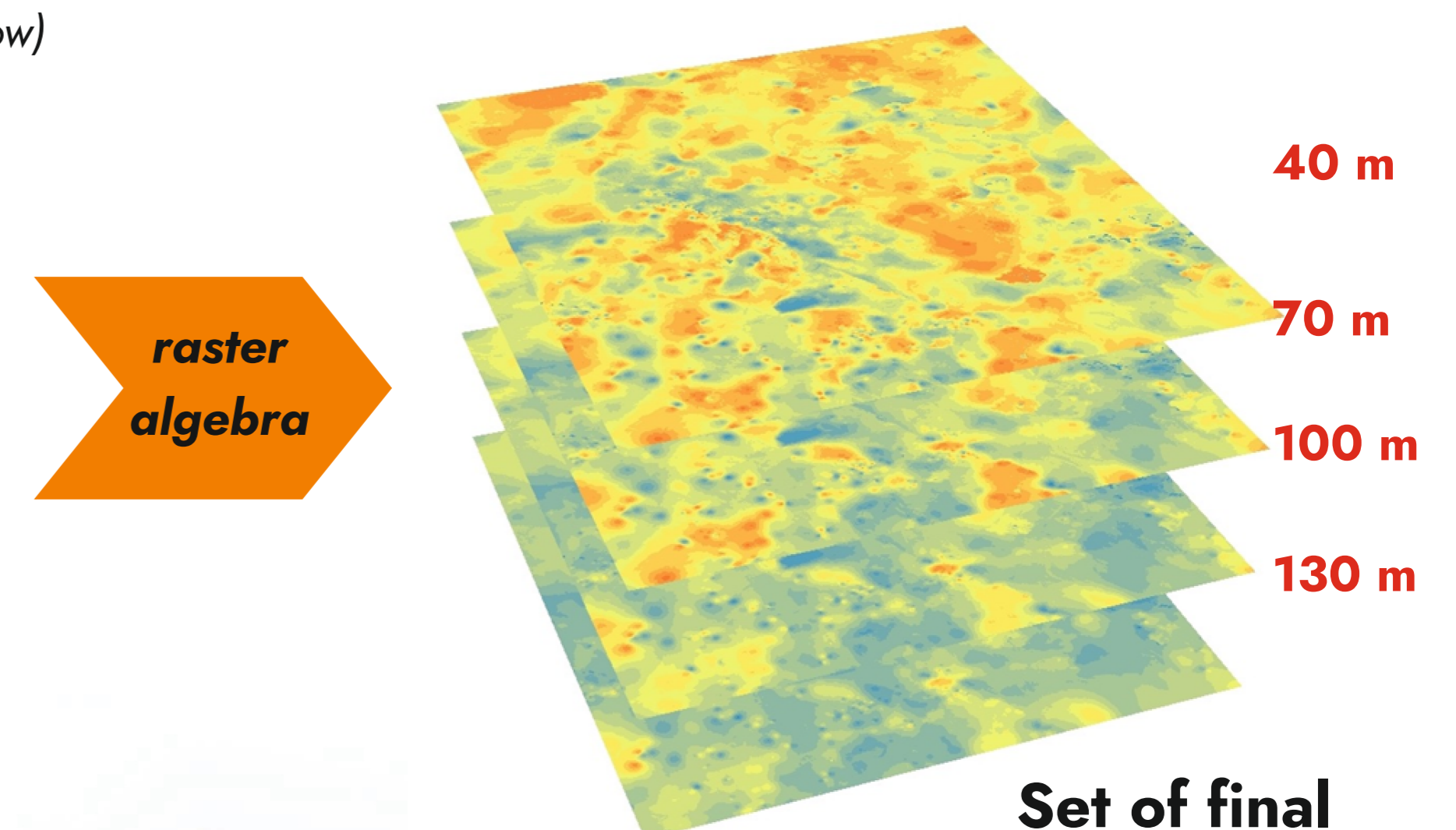
Traffic light maps indicate areas where borehole drilling for GSHPs is limited (yellow areas) or prohibited (red areas) due to environmental conflicts and hazards.



**3D Layered TIN
Geological Model**



**Parametric 3D Model
25 x 25 meter resolution**



**Set of final
Shallow Geothermal Energy
Potential Maps
thermal conductivity [W/m*K]**



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