A multidisciplinary study for geothermal energy sources identification in the Baia Mare area (Romania)

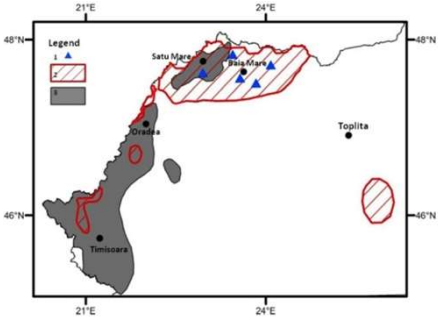
I. Panea[1], C. Gaina[2], V. Mocanu[1], I. Munteanu[1], L. Petrescu[1], L. Matenco[3], D. Scradeanu[1], F. Tuluca[1], M. Scradeanu[1], F. Nache[1], Al. Zlibut[1], C.F. Bouaru[1], Al. Minakov[2] and V. Magni[2]

[1]University of Bucharest, Faculty of Geology and Geophysics, Bucharest, Romania, [2]University of Oslo, Centre for Earth Evolution and Dynamics (CEED), Oslo, Norway, [3]Utrecht University, Utrecht, 3584, Netherlands

Aim of study

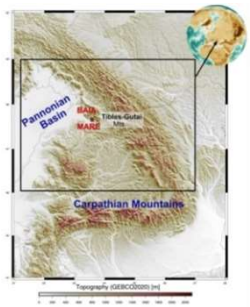
Baia Mare area has the highest values of heat flow recorded to date in Romania. Geothermal gradient is 4.5-5.5°C/100 m. Temperatures higher than 140°C were measured at depths greater than 3 km.

We plan to analyse the geothermal potential in this area using existent and newly acquired geological, geophysical, geochemical and hydrogeological data.



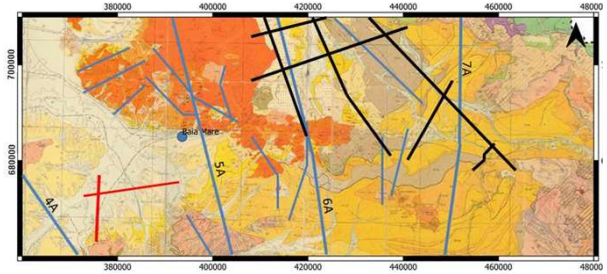
Map of NW Romania showing the distribution of geothermal resources (modif. from Rosca, 2011). 1 – wells, 2 – T > 140°C at 3 km depth, 3 – geothermal water used for heating

Geological setting of Baia Mare area



- Neogene depression located in the Pannonian Basin and developed south of volcanic Gutai-Oas-Tibles Mts
- Pre-Neogene basement made of metamorphic rocks (Precambrian and Paleozoic) and sedimentary rocks (Jurassic, Upper Cretaceous and Paleogene)
- Magmatic activity from Miocene formed a volcanic chain that cuts and interbeds with Neogene sedimentary rocks
- Crossed by a E-W crustal strike-slip fault (Dragos-Bogdan-Voda fault)

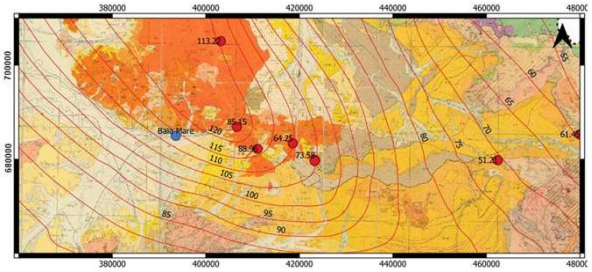
New geo-data acquisition



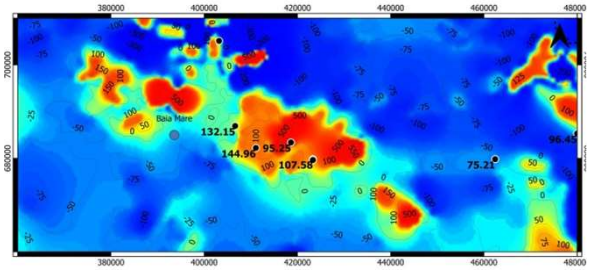
Geological map of Baia Mare. Black lines – existent active seismic data for reprocessing, red lines – new seismic surveys, blue lines – geological sections.
Source of map: Geological Institute of Romania

- active seismic (red lines)
- passive seismic (red lines, 5A, 6A)
- magnetic and magneto-telluric (grid which includes red lines, 5A, 6A)

Existent geo-data in Baia Mare area



Geological map of Baia Mare area showing heat flow values (red lines) and temperatures at 1 km depth (red dots). Source of geological map: Geological Institute of Romania. Heat flow – Demetrescu et al. (1991).



Map of Baia Mare area showing temperatures at 2 km depth and magnetic anomaly, in colors (Airinei et al., 1983)

References

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Acknowledgement

The research leading to these results has received funding from the Norway Grants 2014-2021, under Project Contract no. 12/2020