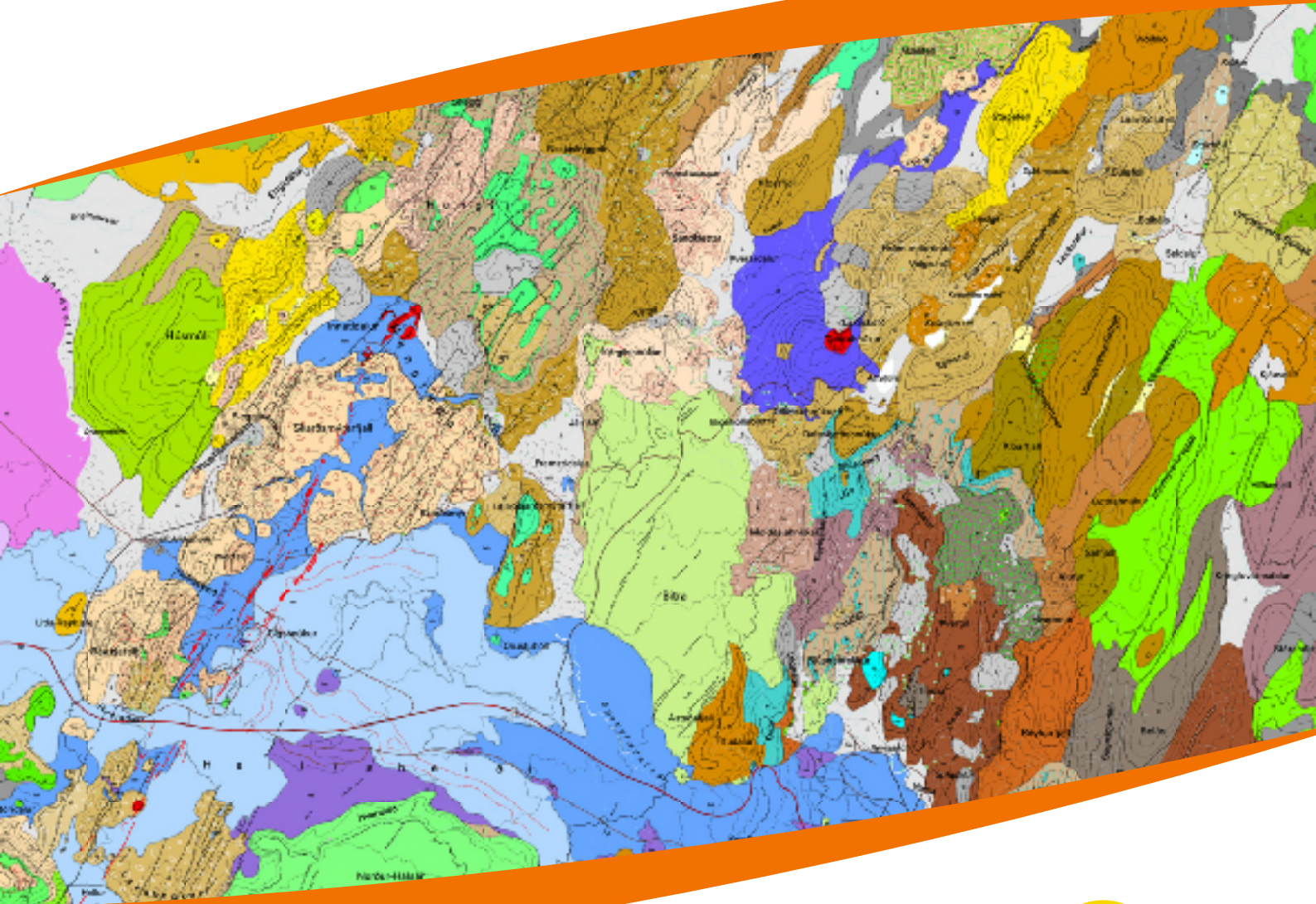


Geothermal

Geological Mapping

Geologists at Iceland GeoSurvey carry out detailed geological mapping of potential geothermal resource areas. These maps include tectonic and stratigraphic features, surface petrology, mineralogy, lithology, and geothermal surface manifestations.



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Geothermal exploration and development require an interdisciplinary approach, involving fields such as geology, geophysics, geochemistry, reservoir physics, and engineering.

Geothermal fields exhibit great diversity, so exploration methods and modes of utilization must be tailored to the characteristics of each field.

Geological mapping forms an essential part of the reconnaissance and exploration phase of a potential geothermal resource area. The fundamental purpose of this phase is to determine whether a commercially viable geothermal resource exists. Geological mapping is also important at other stages of geothermal development, e.g. for well siting, well design, and environmental monitoring.

Iceland GeoSurvey offers a wide range of geological mapping services:

▶ **Geological and stratigraphic mapping**

Iceland GeoSurvey geologists have a long and extensive experience in mapping the geology of stratigraphic structures in volcanic and geothermal areas. All mapping data are GIS-based, and Iceland GeoSurvey specializes in integrating GIS databases and modern scientific data analysis software.

▶ **Structural mapping**

Geothermal maps include faults, major fractures, and young volcanic features such as volcanic craters and eruptive fissures, since a link is usually found to exist between tectonic features and the distribution of geothermal manifestations. Subsurface fluid flow is often structurally controlled.

▶ **Geothermal mapping**

Geothermal maps display various surface thermal manifestations, including features such as steam vents, hot springs, mud pots, and warm ground. Such mapping enables us to distinguish between active and extinct geothermal manifestations.

▶ **Risk assessment**

Most high-temperature geothermal fields are located in or near geologically active areas. Consequently, risk factors such as volcanic hazards, seismic activity, and slope stability must be evaluated. Such assessments frequently call for detailed geological mapping. Iceland GeoSurvey employs specialists in all these fields.

▶ **Environmental aspects**

Geological mapping plays an important role in environmental studies of geothermal areas. Baseline studies of surface thermal manifestations and monitoring of changes in surface activity in producing fields are of particular interest in this context.

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