

Airborne Geophysics

The Alberta Geological Survey (AGS) conducted an airborne geophysics program between 2021 and 2023. The data is now available for download on the AGS website. Four airplanes equipped with specialized instruments collected geophysical data about the magnetic and gravitational properties of rock in regions of Alberta where the information was outdated, missing, or incomplete. The AGS will use the information to create new maps and to update the [Interactive Mineral Map](#) viewer.

Airborne geophysics is often the first step in exploration because magnetic and density data can be used together to identify rock types, potential faults, and fractures in the subsurface geology. Faults and fractures are geological features that can help to reveal mineral resource potential. Until now, this information was incomplete for areas within north-central Alberta and outdated for regions including the Canadian Shield in northeast Alberta and parts of southern Alberta.

The aircraft travelled over 730 000 km in a criss-cross pattern. The airplanes overflew the survey areas passing back and forth from east to west, generally, and then north to south, travelling 200 m above the ground. The distance between passes was optimized to ensure that the data set was comprehensive and consistent.

Each plane was equipped with state-of-the-art magnetic and gravity instruments. The instruments are precise and sensitive to environmental conditions like natural fluctuations in weather, both on the ground and in space. In fact, space weather, including magnetic diurnals (the phenomenon responsible for aurora borealis), was accounted for and managed during data collection.

The airborne geophysics program conducted by the AGS is the largest, most advanced survey of its type in modern Canadian history.

Highlights

Airborne geophysics is an environmentally friendly way to survey large areas as it does not disturb the land.

The
**weather
in space**

was accounted for during the survey.

732 422 line-km

of new data were collected and filled in missing data for regions including the Canadian Shield in northeast Alberta and north-central Alberta.

Magnetic properties of rocks vary based on composition, current state, and previous geologic history.



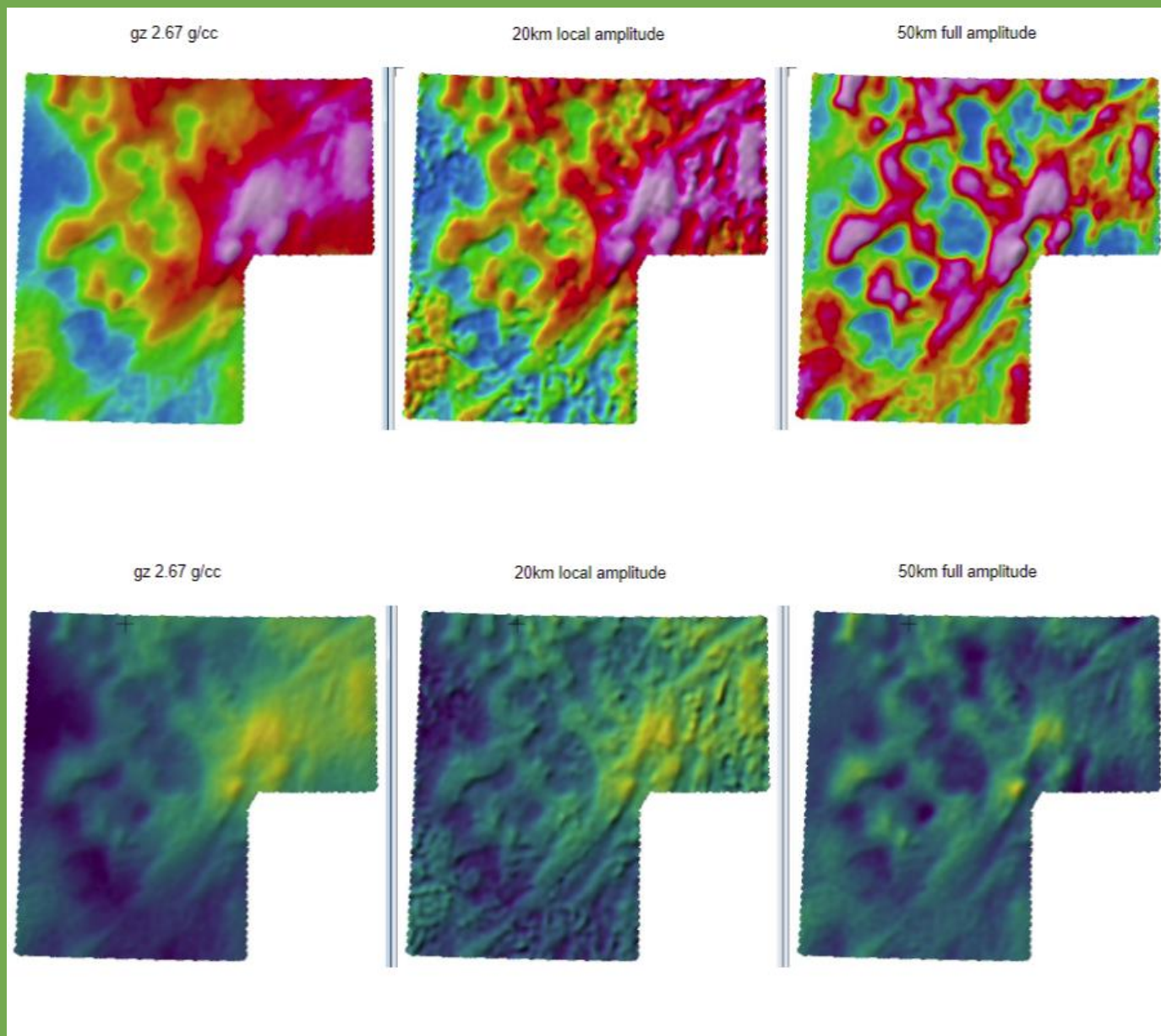
Gravitational properties depend on rocks density.



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Selected gravity maps along the Great Slave Lake Shear Zone (GSLSZ) in northwestern Alberta. The colour gradients reflect rock density variation. Warm colours (orange to violet) reflect higher densities measured in grams per cubic centimeter (g/cc).

GSLSZ Gravity Automatic Gain Control



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