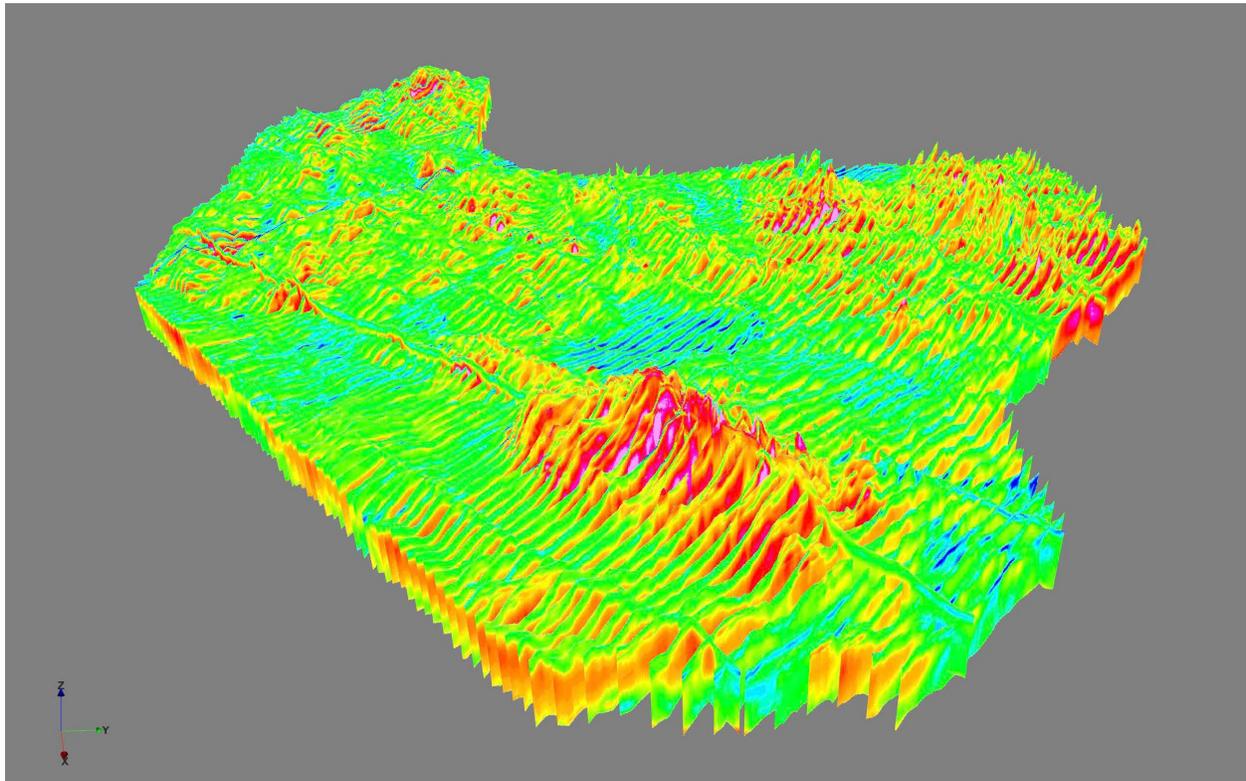


# GRANITE MOUNTAIN AIRBORNE ELECTROMAGNETIC SURVEY, KUSKOKWIM REGION, ALASKA

Petersen, E.I., Fusso, L.A., Geotech Ltd., and Aqua Geo Frameworks LLC

## Geophysical Report 2026-4



3D Fence diagram of inverted subsurface resistivity values resulting from the Granite Mountain EM survey. Perspective view from the northeast.

2026

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS



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# **GRANITE MOUNTAIN AIRBORNE ELECTROMAGNETIC SURVEY, KUSKOKWIM REGION, ALASKA**

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## **INTRODUCTION**

The Granite Mountain airborne electromagnetic survey covers a portion of the Iditarod Quadrangle across part of the Kuskokwim Mountains in western interior Alaska, southwest of McGrath (fig. 1). The Iditarod Quadrangle is a prime exploration target, which includes historically productive mining districts and contains geologic structures and rock units known to host gold and other metallic mineral deposits (Bundtzen and Miller, 1996; Bundtzen and others, 2004; Miller and others, 2005). The survey was conducted to characterize subsurface electrical resistivity variations and to support geologic mapping and mineral resource evaluation. These data provide a framework for identifying concealed lithologic contacts, structural features, and alteration zones that may indicate areas of elevated mineral potential.

Time-domain electromagnetic data were acquired using the helicopter-mounted VTEM Terrain system from August 12 to September 14, 2025, by Geotech Ltd. A total of 2516 line-kilometers were flown over a single survey block measuring 916.5 square kilometers. The block was flown with northwest–southeast line orientation and a nominal spacing of 400 meters, along with northeast-southwest oriented tie lines with a nominal spacing of 4000 meters. Mean ground clearance was 47 meters, with a nominal survey speed of 87 km/hr.

Geotech Ltd. provided initial resistivity models produced via simple inversion using a technique termed Resistivity Depth Imaging (RDI). These models are referred to in the provided data files as “geotech\_rdi.” Aqua Geo Frameworks then produced a spatially constrained inversion model (referred to in the data files as “agf\_sci”), which incorporates both along-track and cross-track constraints. The Aqua Geo Frameworks model is recommended for end-users as it resolves finer-scale structures, including faults. We also provide a 3D voxel dataset registered to elevation rather than raw depth for the agf\_sci model.

These data are provided as a Geophysical Report under an open end-user license and are available on the DGGS website, <https://doi.org/10.14509/31964>. This survey was flown under the same contract/in conjunction with the Candle Hills airborne electromagnetic survey (Petersen and others, 2026, <https://doi.org/10.14509/31963>).

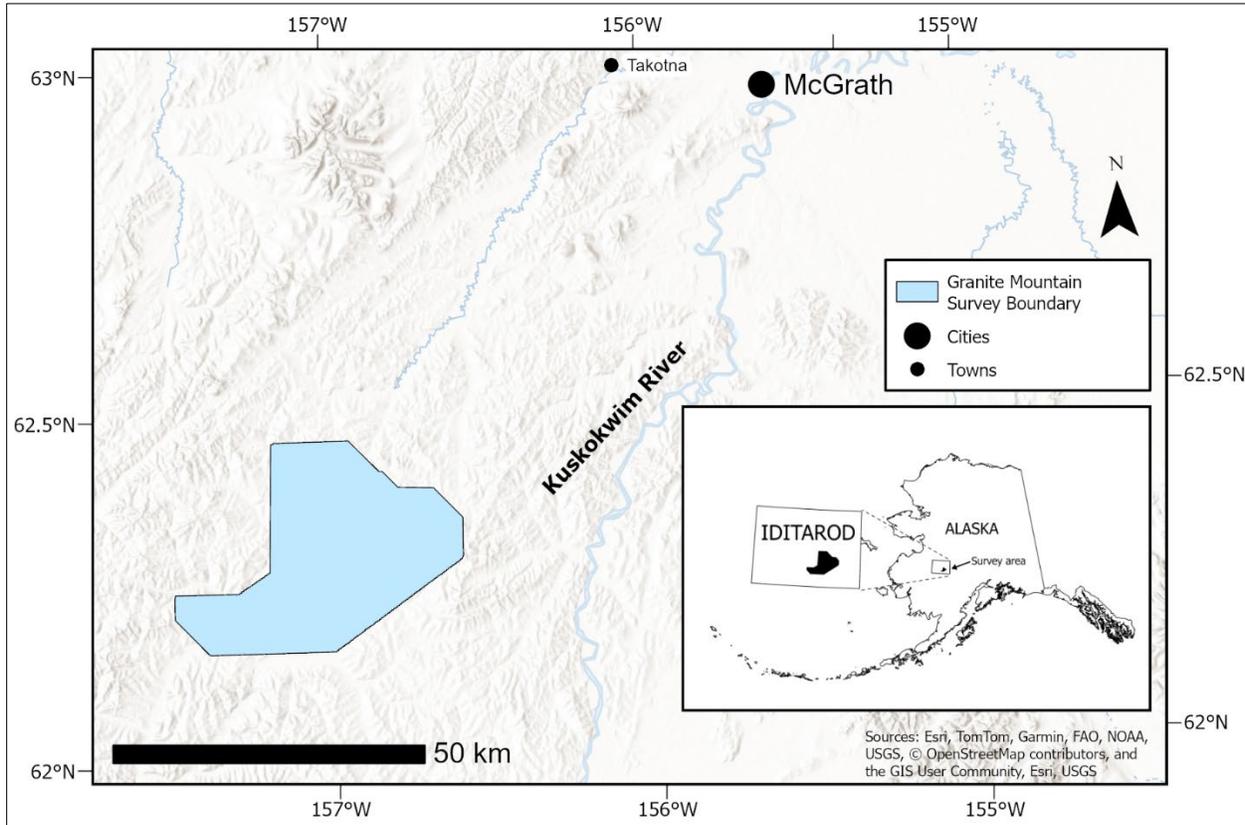
<sup>1</sup>Alaska Division of Geological & Geophysical Surveys, 3354 College Road, Fairbanks, AK 99709

<sup>2</sup>Geotech Ltd., 270 Industrial Parkway South, Aurora, Ontario, Canada, L4G 3T9

<sup>3</sup>Aqua Geo Frameworks LLC, 10848 Ridge Road, Fort Laramie, WY 82212

**DELIVERABLES**

This document provides an overview of the survey and includes text and figures of selected primary and derivative products. Table 1 lists available data packages. Table 2 lists full-scale maps available for download. Please consult the metadata, project report, and digital data packages for more information and data.



**Figure 1:** Regional map of survey area. (Inset) Survey location within Alaska, with relevant 1:250,000-scale quadrangle labeled.

**Table 1.** Data available for download

Data Package	Description
ascii_data	ASCII format line data, other ASCII data
databases_geosoft	Geosoft format database of final line data, other Geosoft format databases
documents	Project report, calibration reports
grids_geosoft	Oasis montaj Geosoft GRD format gridded data
grids_tif	Geographically registered data value rasters of gridded data, GeoTiff format
maps_pdf	Printable and geographically registered maps in PDF format.
models_resistivity	Models of subsurface resistivity inverted from measured EM response; agf_sci is the recommended model for end-users.
vector_data	Line path and survey boundary in Esri shapefile (shp) format

**Table 2.** Full-scale printable maps are available in Portable Document Format (\*.pdf) with a resolution of 300 dpi. See Appendix A for previews of these maps in reduced-resolution page-sized format. The page-sized format is intended for reference and search purposes only.

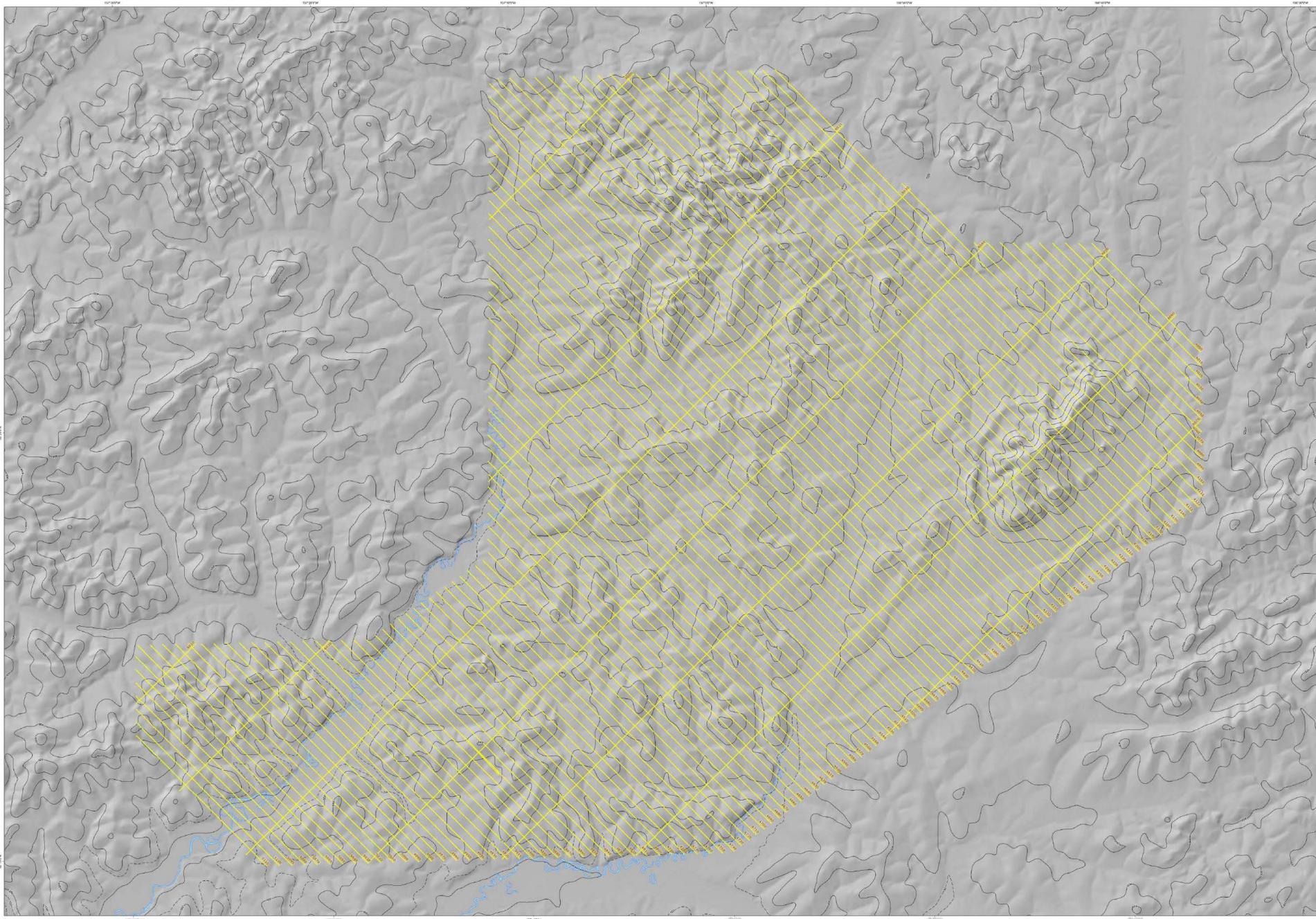
Map Title	File Name
Flight path	sheet01_granite_mtn_flightpath.pdf
<b>Resistivity</b>	
Modeled Resistivity, Voxel Layer at 280 m Above Sea Level	sheet02_granite_mtn_agf_sci_resistivity_voxel_280m_elev.pdf
Modeled Resistivity, Voxel Layer at 160 m Above Sea Level	sheet03_granite_mtn_agf_sci_resistivity_voxel_160m_elev.pdf
Modeled Resistivity, Voxel Layer at 60 m Above Sea Level	sheet04_granite_mtn_agf_sci_resistivity_voxel_60m_elev.pdf
Modeled Resistivity, Voxel Layer at 40 m Below Sea Level	sheet05_granite_mtn_agf_sci_resistivity_voxel_-40m_elev.pdf

## ACKNOWLEDGMENTS

This work was supported by the State of Alaska capital improvement project funds.

## REFERENCES

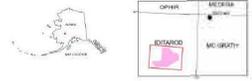
- Bundtzen, T.K., and Miller, M.L., 1996, Precious metals associated with Late Cretaceous-early Tertiary igneous rocks of southwestern Alaska: Alaska Division of Geological & Geophysical Surveys Public Data File 96-15, 85 p. <https://doi.org/10.14509/1739>
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**Flight path**  
 Granite Mountain airborne electromagnetic survey, Kuskokwim Region, Alaska

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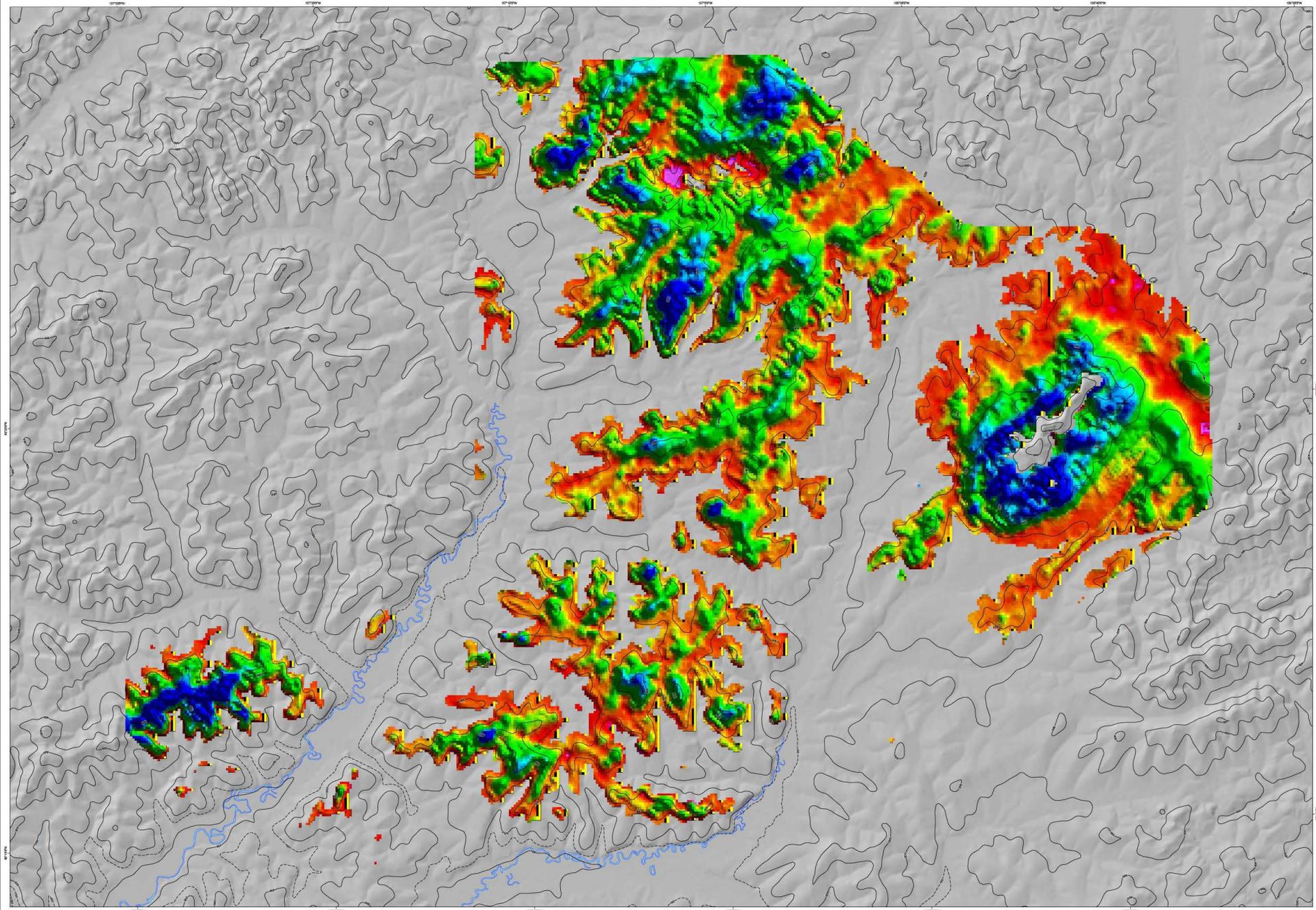
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Note: All survey line numbers are shown. Line numbers are displayed to the north of labeled lines. Labels are situated at the northeast end of NE-SW oriented lines and the south end of NW-SE oriented lines.

This work was supported by the State of Alaska capital improvement project funds. Dogon. Limited funded survey lines acquired over their land holdings.

Basemap data and vectorized from:  
 National Hydrography Dataset, U.S. Geological Survey  
 Reston, Virginia, 2010-2016  
 Basemap metadata and contours from:  
 U.S. Geological Survey (CRG) Base Center, 2013  
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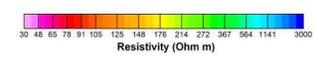
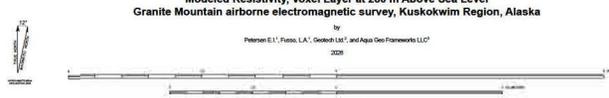


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**Modeled Resistivity, Voxel Layer at 280 m Above Sea Level**  
**Granite Mountain airborne electromagnetic survey, Kuskokwim Region, Alaska**

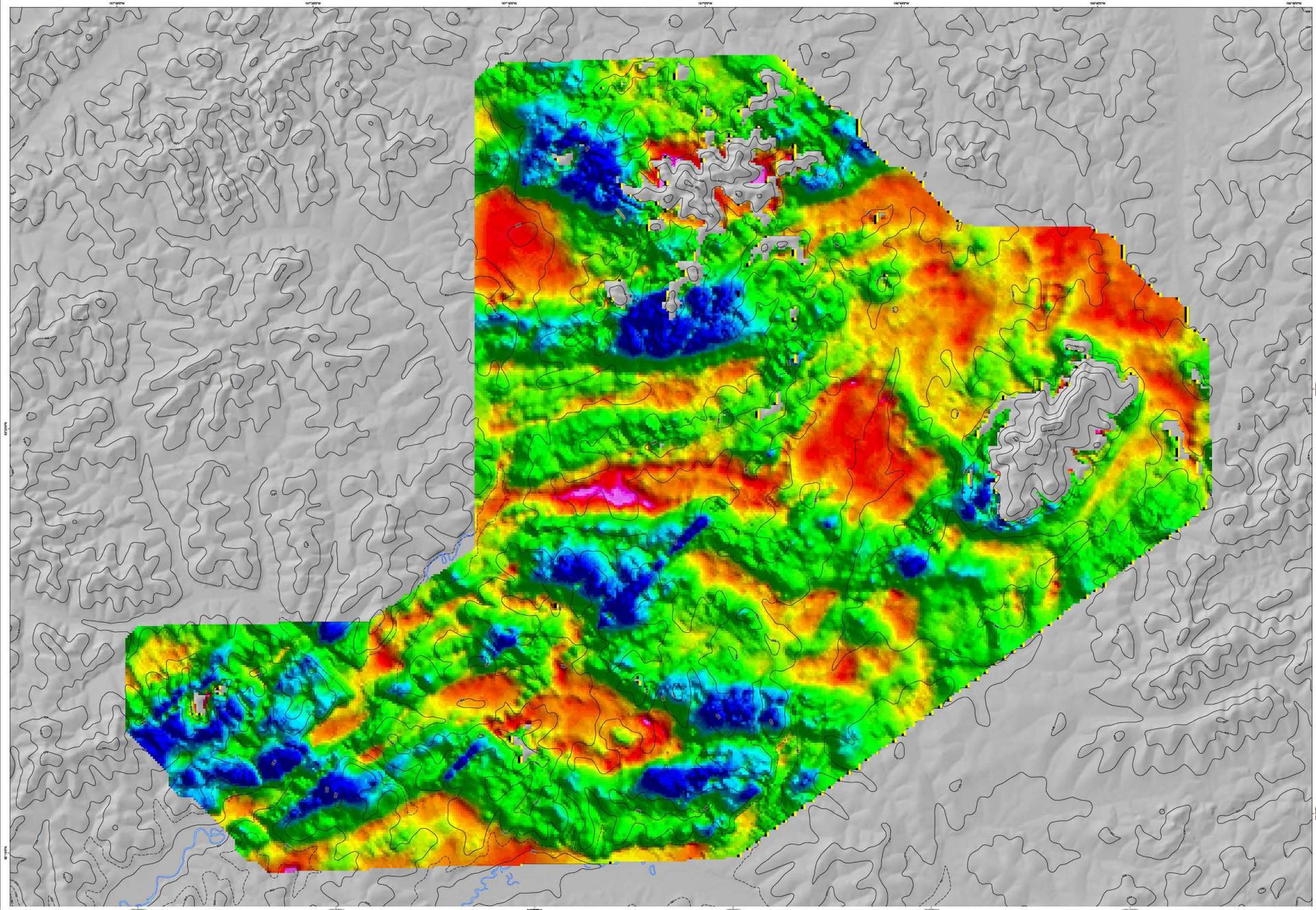
by  
 Petersen E.L., Fazio, L.A., Geotech LLC<sup>1</sup>, and Aqua Geo Frameworks LLC<sup>2</sup>  
 2020



Basemap streams and waterbodies from:  
 National Hydrography Dataset, U.S. Geological Survey, Reston, Virginia, 2002-2016  
 Basemap hillshade and contours from:  
 U.S. Geological Survey, EROS Data Center, 2013  
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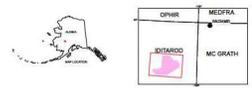


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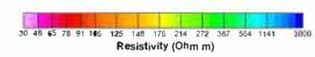
**Modeled Resistivity, Voxel Layer at 60 m Above Sea Level**  
**Granite Mountain airborne electromagnetic survey, Kuskokwim Region, Alaska**

by  
 Petermann E.J., Fritsch, L.A., Oswald, L.M., and Peter Geophysical Services LLC

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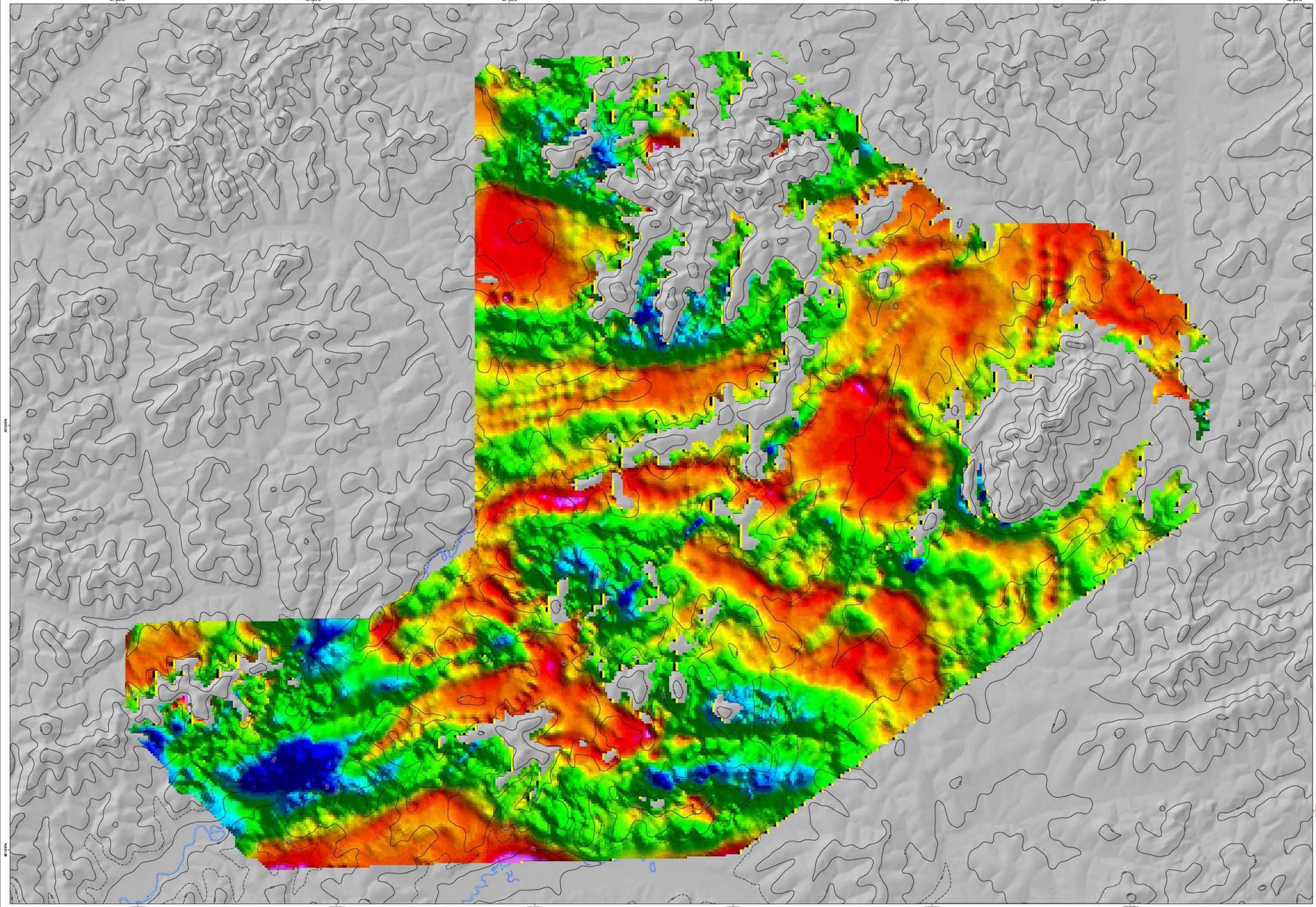
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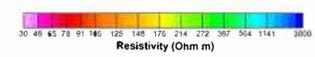
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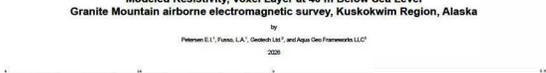


Modeled Resistivity, Voxel Layer at 40 m Below Sea Level  
 Granite Mountain airborne electromagnetic survey, Kuskokwim Region, Alaska

by  
 Petersen E.L., Funes, L.A., Gorch L.M., and Aqua Geo Frameworks LLC



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