

TANANA RIVER AND BIG DELTA AIRBORNE MAGNETIC AND RADIOMETRIC SURVEY

Emond, A.M., and MPX Geophysics LTD

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DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS



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TANANA RIVER AND BIG DELTA AIRBORNE MAGNETIC AND RADIOMETRIC SURVEY

Emond, A.M.¹, and MPX Geophysics TLD²

ABSTRACT

The Tanana River and Big Delta airborne magnetic and radiometric geophysical survey covers parts of the Big Delta, Charley River, Circle, Eagle, Fairbanks, Kantishna River, Livengood, Mount Hayes, and Tanacross quadrangles near Fairbanks and Delta Junction, Alaska (fig. 1). Magnetic and radiometric data were collected with a fixed-wing aircraft from May 14 to August 4, 2022, by MPX Geophysics LTD. The survey contains six individual blocks. A total of 97,386 line kilometers were collected. The six blocks total 33,095 km²; they cover 32,944 km² due to overlap. The magnetometer was mounted to a rear-facing fixed boom (“tail stinger”). The radiometric crystals were located in the cabin of the aircraft. The Tanana, Chena, Healy, Eisen, and North Pole blocks were flown with a line spacing of 400 meters (m). Mean ground clearances were: Tanana, 188 m; Chena, 352 m; Healy, 295 m; Eisen, 430 m; North Pole, 180 m. The Eisen Infill block was flown with a line spacing of 200 m and a mean ground clearance of 422 m.

PURPOSE

The data from the Tanana River and Big Delta airborne magnetic and radiometric geophysical survey will be used for improving the understanding of the geology and mineral potential, promoting resource exploration, and be a part of the continuous regional magnetic data coverage of the Yukon Tanana Uplands.

SURVEY OVERVIEW DESCRIPTION

This document provides an overview of the survey and includes text and figures of select primary and derivative products of this survey. A table of digital data packages available for download is provided to assist users in data selection. For reference, a catalog of the available maps is presented in reduced resolution. Please consult the metadata, project report, and digital data packages for more information and data.

ACKNOWLEDGMENTS

This work was supported by the U.S. Geological Survey’s Earth MRI program grants G19AC00263, G21AC10326, and G22AC00475. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government.

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AVAILABLE DATA

Data Type	Provider	Description
ascii_data	contractor	ASCII format line data, other ASCII data
databases_geosoft	contractor	Geosoft format database of final line data, other Geosoft format databases
documents	contractor	Project report
grids_ermapper	contractor	Geographically registered gridded data, ER Mapper ERS format
grids_geosoft	contractor	Geosoft-format gridded data
images_registered	contractor	RGB GeoTiff format images of gridded data
kmz	contractor	Keyhole markup language (kml) kmz archive files of project data. Viewable in Google Earth and other compatible programs
maps_pdf_format	contractor	Printable and geographically registered maps in pdf format. Compatible with mobile device navigation and desktop mapping applications.
maps_geosoft_for mat	contractor	Maps as Geosoft packed map files
photos_flightpath	contractor	Survey flight path downward facing photos with GPS location in exif data
vector_data	contractor	Line path and survey boundary in ESRI shapefile (SHP) format

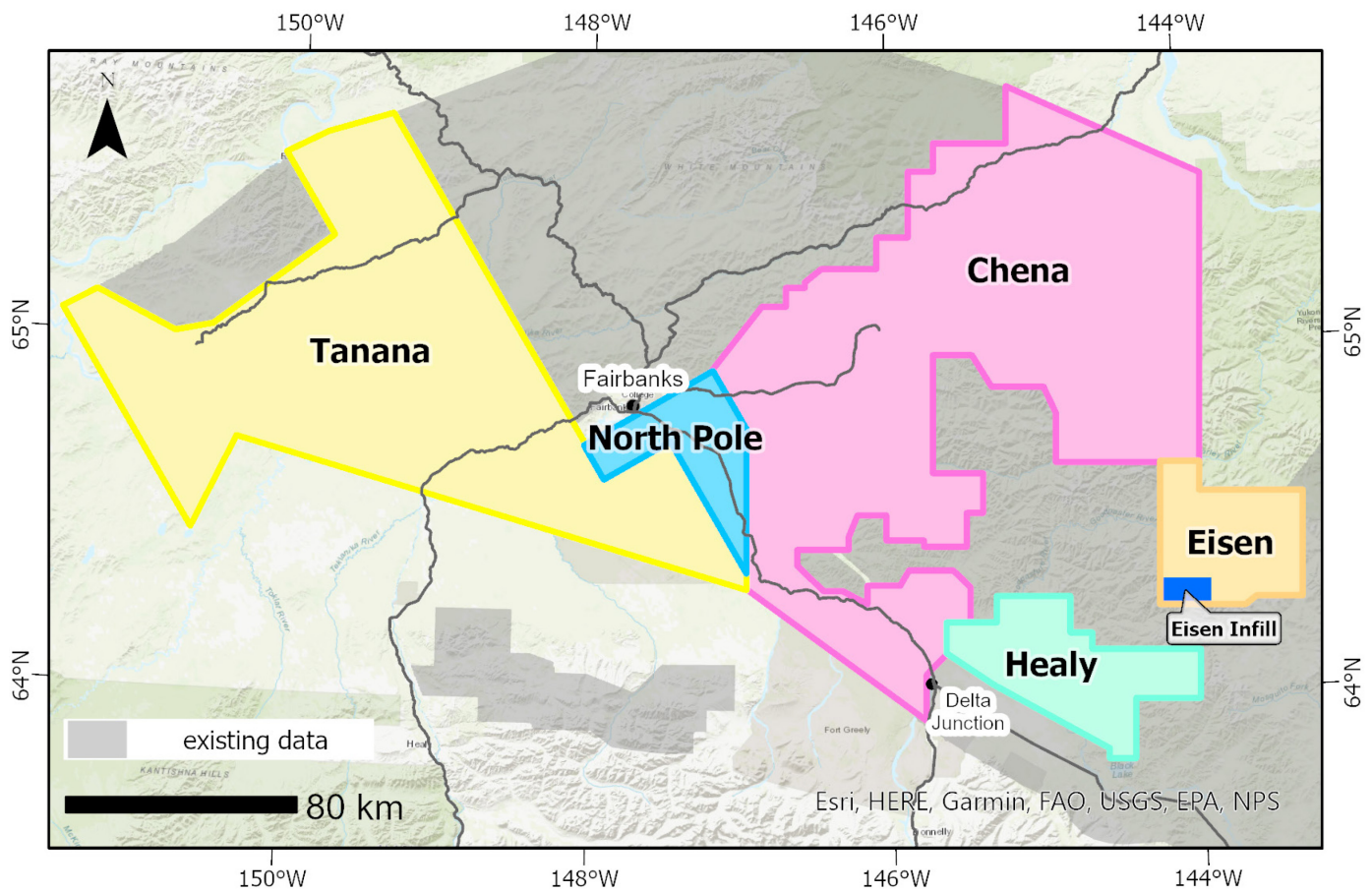
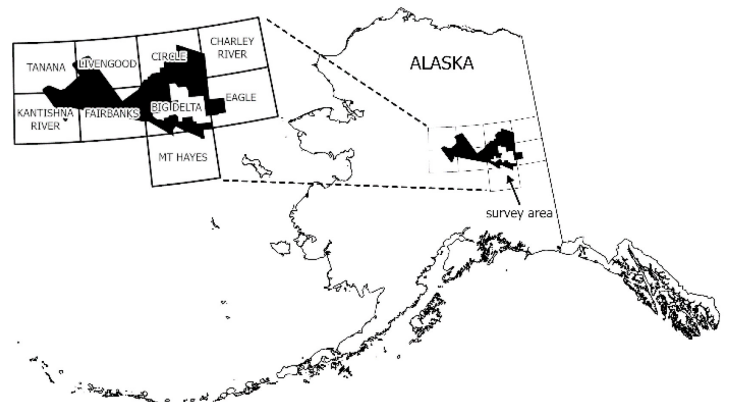


Figure 1. (Above) Tanana River and Big Delta survey location map with major roads, towns, and 1:250,000-scale USGS quadrangle boundaries. Prior DGGs surveys shown in gray. (Right) Tanana River and Big Delta airborne geophysical survey location shown in interior Alaska with relevant 1:250,000-scale quadrangles.



MAPS

The contractor-provided maps are made available as Geosoft Packed Map (*.map), Joint Photographic Experts Group (*.jpeg), GeoTIFF images (*.tif), and Portable Document Format (*.pdf) formats at a resolution of 400 dpi. All use WGS84 datum and UTM zone 6N projection. Copies of the following maps for each block are included at the end of this booklet. The low-resolution, page-size maps included in this booklet are intended to be used as a search tool and are not the final product. Large-scale, full-resolution versions of each map are available to download on this publication's citation page: <https://doi.org/10.14509/30899>. All maps have a USGS topographic map basemap.

General

Flown flight path

Magnetics

Total Magnetic Intensity, International Geomagnetic Reference Field (IGRF) removed (TMI-IGRF) - nT

Calculated analytic signal of the residual magnetic field - nT/m

Computed 1st vertical derivative of the residual magnetic field - nT/m

Radiometrics

Total Air Absorbed Dose Rate - nGy/h

Equivalent concentration of Potassium - %K

Equivalent concentration of Thorium - eqTh ppm

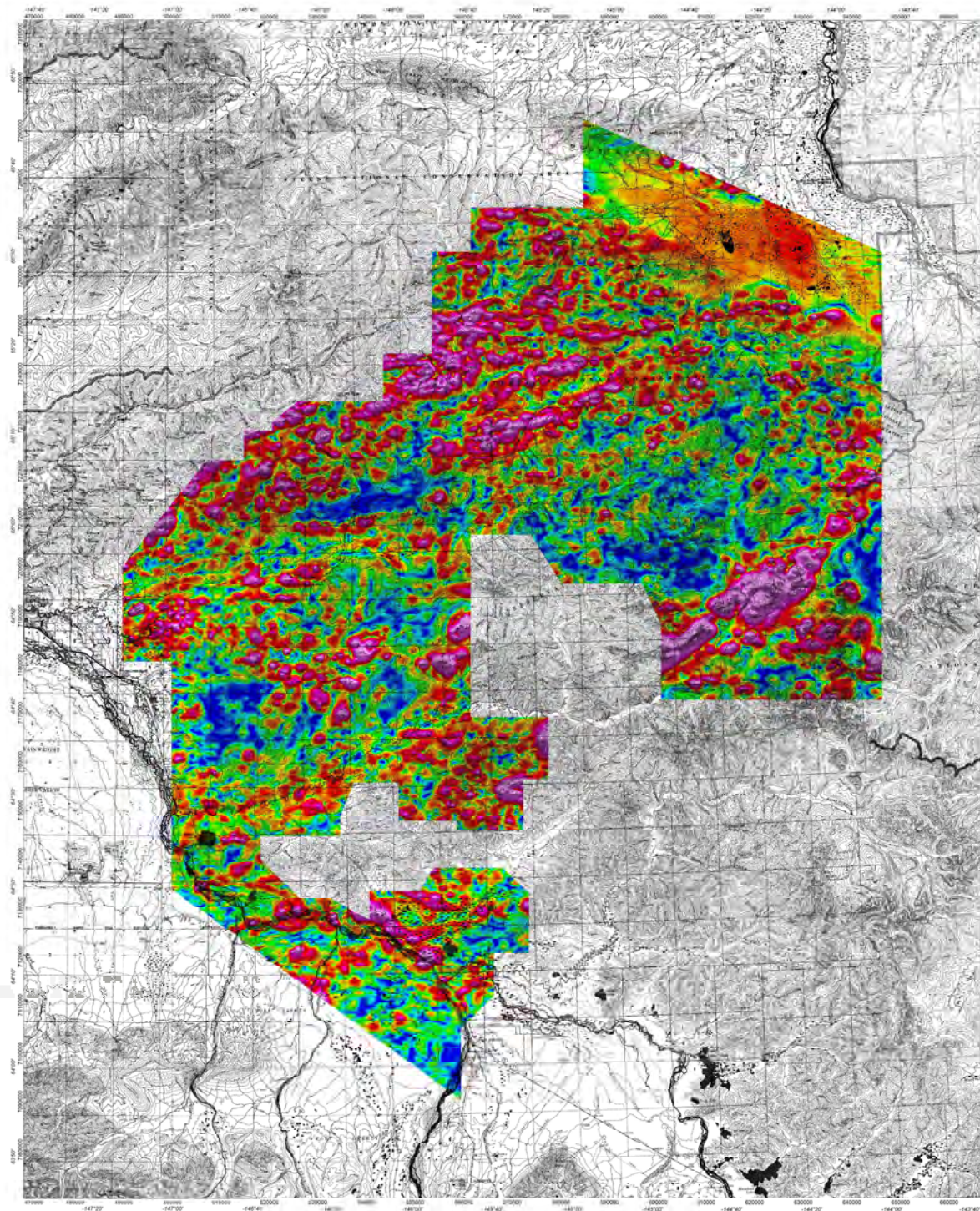
Equivalent concentration of Uranium - eqU ppm

U/Th Ratio (eqU ppm / eqTh ppm)

Th/K Ratio (eqTh ppm / %K)

U/K Ratio (eqU ppm / %K)

Ternary - %K-eqU-eqTh – RGB



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Website: <https://dgs.alaska.gov/>

LEGEND

Survey Date: May-August 2022
Track-Wing Aircraft Type: C-540YP

Map: August 2022
Paper: Pacific P331
C-540YP

SURVEY PARAMETERS:
Altitude Survey Mode:
Transverse Line Direction/Spacing:
Longitudinal Line Direction/Spacing:

(Shape 310) (contour) at 100 m
100 (N-S) / 400 m
100 (E-W) / 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintrex CS-3

Configuration: Tail-Singer
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

GAMMA-RAY SPECTROMETER:

RSS-5 multi-channel NaI sensors with
33 in. L "downward looking" and 8.4 in.
"upward looking"

Sampling Rate: 1 reading/second

NAVIGATION: Novatel LBL GPS

Real-time differentially corrected
Sampling Rate: 10 readings/second

ALTIMETERS:

Sensor: 2 x pressure transducer

Sampling Rate: 10 readings/second

BASE STATION

MAGNETOMETER:

Model: GEM GSM-117W
Sampling Rate: 1 reading/second
Sensitivity: 0.022 nT

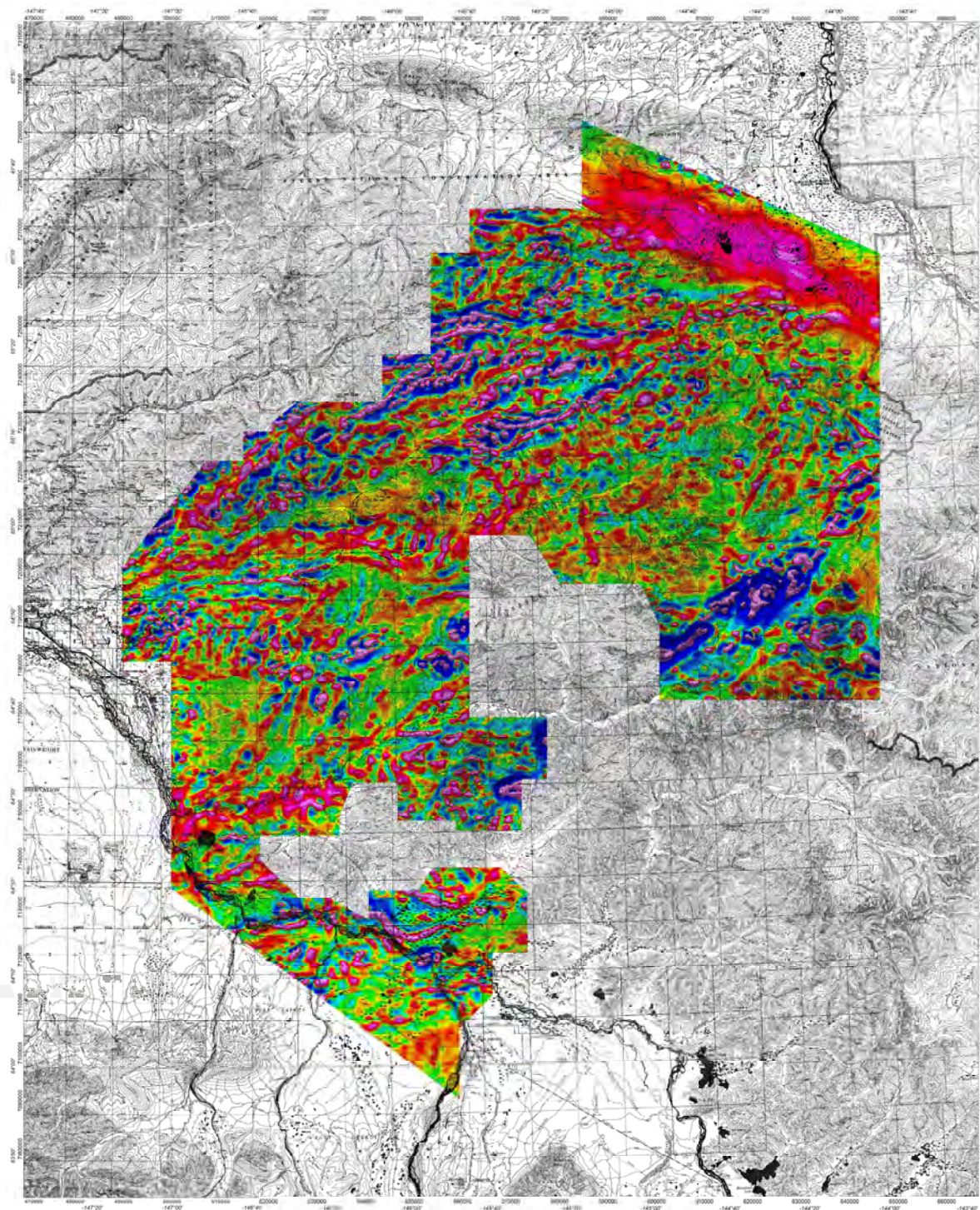
Radar: Benthos King KRA-15A

Sampling Rate: 20 readings/second

This work was supported by the U.S. Geological Survey's Earth MRI program
Emond, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne
magnetic and radiometric survey: Alaska Division of Geological & Geophysical Surveys
Geophysical Report 2022-1, <https://doi.org/10.14509/30899>

Scale 1:250,000
0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
Meters

Analytic Signal
(nT/m)
0.000 0.005 0.010 0.015 0.020 0.025 0.030 0.035 0.040 0.045 0.050 0.055 0.060 0.065 0.070 0.075 0.080 0.085 0.090 0.095 0.100 0.105 0.110 0.115 0.120 0.125 0.130 0.135 0.140 0.145 0.150 0.155 0.160 0.165 0.170 0.175 0.180 0.185 0.190 0.195 0.200 0.205 0.210 0.215 0.220 0.225 0.230 0.235 0.240 0.245 0.250 0.255 0.260 0.265 0.270 0.275 0.280 0.285 0.290 0.295 0.300 0.305 0.310 0.315 0.320 0.325 0.330 0.335 0.340 0.345 0.350 0.355 0.360 0.365 0.370 0.375 0.380 0.385 0.390 0.395 0.400 0.405 0.410 0.415 0.420 0.425 0.430 0.435 0.440 0.445 0.450 0.455 0.460 0.465 0.470 0.475 0.480 0.485 0.490 0.495 0.500 0.505 0.510 0.515 0.520 0.525 0.530 0.535 0.540 0.545 0.550 0.555 0.560 0.565 0.570 0.575 0.580 0.585 0.590 0.595 0.600 0.605 0.610 0.615 0.620 0.625 0.630 0.635 0.640 0.645 0.650 0.655 0.660 0.665 0.670 0.675 0.680 0.685 0.690 0.695 0.700 0.705 0.710 0.715 0.720 0.725 0.730 0.735 0.740 0.745 0.750 0.755 0.760 0.765 0.770 0.775 0.780 0.785 0.790 0.795 0.800 0.805 0.810 0.815 0.820 0.825 0.830 0.835 0.840 0.845 0.850 0.855 0.860 0.865 0.870 0.875 0.880 0.885 0.890 0.895 0.900 0.905 0.910 0.915 0.920 0.925 0.930 0.935 0.940 0.945 0.950 0.955 0.960 0.965 0.970 0.975 0.980 0.985 0.990 0.995 1.000 1.005 1.010 1.015 1.020 1.025 1.030 1.035 1.040 1.045 1.050 1.055 1.060 1.065 1.070 1.075 1.080 1.085 1.090 1.095 1.100 1.105 1.110 1.115 1.120 1.125 1.130 1.135 1.140 1.145 1.150 1.155 1.160 1.165 1.170 1.175 1.180 1.185 1.190 1.195 1.200 1.205 1.210 1.215 1.220 1.225 1.230 1.235 1.240 1.245 1.250 1.255 1.260 1.265 1.270 1.275 1.280 1.285 1.290 1.295 1.300 1.305 1.310 1.315 1.320 1.325 1.330 1.335 1.340 1.345 1.350 1.355 1.360 1.365 1.370 1.375 1.380 1.385 1.390 1.395 1.400 1.405 1.410 1.415 1.420 1.425 1.430 1.435 1.440 1.445 1.450 1.455 1.460 1.465 1.470 1.475 1.480 1.485 1.490 1.495 1.500 1.505 1.510 1.515 1.520 1.525 1.530 1.535 1.540 1.545 1.550 1.555 1.560 1.565 1.570 1.575 1.580 1.585 1.590 1.595 1.600 1.605 1.610 1.615 1.620 1.625 1.630 1.635 1.640 1.645 1.650 1.655 1.660 1.665 1.670 1.675 1.680 1.685 1.690 1.695 1.700 1.705 1.710 1.715 1.720 1.725 1.730 1.735 1.740 1.745 1.750 1.755 1.760 1.765 1.770 1.775 1.780 1.785 1.790 1.795 1.800 1.805 1.810 1.815 1.820 1.825 1.830 1.835 1.840 1.845 1.850 1.855 1.860 1.865 1.870 1.875 1.880 1.885 1.890 1.895 1.900 1.905 1.910 1.915 1.920 1.925 1.930 1.935 1.940 1.945 1.950 1.955 1.960 1.965 1.970 1.975 1.980 1.985 1.990 1.995 2.000 2.005 2.010 2.015 2.020 2.025 2.030 2.035 2.040 2.045 2.050 2.055 2.060 2.065 2.070 2.075 2.080 2.085 2.090 2.095 2.100 2.105 2.110 2.115 2.120 2.125 2.130 2.135 2.140 2.145 2.150 2.155 2.160 2.165 2.170 2.175 2.180 2.185 2.190 2.195 2.200 2.205 2.210 2.215 2.220 2.225 2.230 2.235 2.240 2.245 2.250 2.255 2.260 2.265 2.270 2.275 2.280 2.285 2.290 2.295 2.300 2.305 2.310 2.315 2.320 2.325 2.330 2.335 2.340 2.345 2.350 2.355 2.360 2.365 2.370 2.375 2.380 2.385 2.390 2.395 2.400 2.405 2.410 2.415 2.420 2.425 2.430 2.435 2.440 2.445 2.450 2.455 2.460 2.465 2.470 2.475 2.480 2.485 2.490 2.495 2.500 2.505 2.510 2.515 2.520 2.525 2.530 2.535 2.540 2.545 2.550 2.555 2.560 2.565 2.570 2.575 2.580 2.585 2.590 2.595 2.600 2.605 2.610 2.615 2.620 2.625 2.630 2.635 2.640 2.645 2.650 2.655 2.660 2.665 2.670 2.675 2.680 2.685 2.690 2.695 2.700 2.705 2.710 2.715 2.720 2.725 2.730 2.735 2.740 2.745 2.750 2.755 2.760 2.765 2.770 2.775 2.780 2.785 2.790 2.795 2.800 2.805 2.810 2.815 2.820 2.825 2.830 2.835 2.840 2.845 2.850 2.855 2.860 2.865 2.870 2.875 2.880 2.885 2.890 2.895 2.900 2.905 2.910 2.915 2.920 2.925 2.930 2.935 2.940 2.945 2.950 2.955 2.960 2.965 2.970 2.975 2.980 2.985 2.990 2.995 3.000 3.005 3.010 3.015 3.020 3.025 3.030 3.035 3.040 3.045 3.050 3.055 3.060 3.065 3.070 3.075 3.080 3.085 3.090 3.095 3.100 3.105 3.110 3.115 3.120 3.125 3.130 3.135 3.140 3.145 3.150 3.155 3.160 3.165 3.170 3.175 3.180 3.185 3.190 3.195 3.200 3.205 3.210 3.215 3.220 3.225 3.230 3.235 3.240 3.245 3.250 3.255 3.260 3.265 3.270 3.275 3.280 3.285 3.290 3.295 3.300 3.305 3.310 3.315 3.320 3.325 3.330 3.335 3.340 3.345 3.350 3.355 3.360 3.365 3.370 3.375 3.380 3.385 3.390 3.395 3.400 3.405 3.410 3.415 3.420 3.425 3.430 3.435 3.440 3.445 3.450 3.455 3.460 3.465 3.470 3.475 3.480 3.485 3.490 3.495 3.500 3.505 3.510 3.515 3.520 3.525 3.530 3.535 3.540 3.545 3.550 3.555 3.560 3.565 3.570 3.575 3.580 3.585 3.590 3.595 3.600 3.605 3.610 3.615 3.620 3.625 3.630 3.635 3.640 3.645 3.650 3.655 3.660 3.665 3.670 3.675 3.680 3.685 3.690 3.695 3.700 3.705 3.710 3.715 3.720 3.725 3.730 3.735 3.740 3.745 3.750 3.755 3.760 3.765 3.770 3.775 3.780 3.785 3.790 3.795 3.800 3.805 3.810 3.815 3.820 3.825 3.830 3.835 3.840 3.845 3.850 3.855 3.860 3.865 3.870 3.875 3.880 3.885 3.890 3.895 3.900 3.905 3.910 3.915 3.920 3.925 3.930 3.935 3.940 3.945 3.950 3.955 3.960 3.965 3.970 3.975 3.980 3.985 3.990 3.995 4.000 4.005 4.010 4.015 4.020 4.025 4.030 4.035 4.040 4.045 4.050 4.055 4.060 4.065 4.070 4.075 4.080 4.085 4.090 4.095 4.100 4.105 4.110 4.115 4.120 4.125 4.130 4.135 4.140 4.145 4.150 4.155 4.160 4.165 4.170 4.175 4.180 4.185 4.190 4.195 4.200 4.205 4.210 4.215 4.220 4.225 4.230 4.235 4.240 4.245 4.250 4.255 4.260 4.265 4.270 4.275 4.280 4.285 4.290 4.295 4.300 4.305 4.310 4.315 4.320 4.325 4.330 4.335 4.340 4.345 4.350 4.355 4.360 4.365 4.370 4.375 4.380 4.385 4.390 4.395 4.400 4.405 4.410 4.415 4.420 4.425 4.430 4.435 4.440 4.445 4.450 4.455 4.460 4.465 4.470 4.475 4.480 4.485 4.490 4.495 4.500 4.505 4.510 4.515 4.520 4.525 4.530 4.535 4.540 4.545 4.550 4.555 4.560 4.565 4.570 4.575 4.580 4.585 4.590 4.595 4.600 4.605 4.610 4.615 4.620 4.625 4.630 4.635 4.640 4.645 4.650 4.655 4.660 4.665 4.670 4.675 4.680 4.685 4.690 4.695 4.700 4.705 4.710 4.715 4.720 4.725 4.730 4.735 4.740 4.745 4.750 4.755 4.760 4.765 4.770 4.775 4.780 4.785 4.790 4.795 4.800 4.805 4.810 4.815 4.820 4.825 4.830 4.835 4.840 4.845 4.850 4.855 4.860 4.865 4.870 4.875 4.880 4.885 4.890 4.895 4.900 4.905 4.910 4.915 4.920 4.925 4.930 4.935 4.940 4.945 4.950 4.955 4.960 4.965 4.970 4.975 4.980 4.985 4.990 4.995 5.000 5.005 5.010 5.015 5.020 5.025 5.030 5.035 5.040 5.045 5.050 5.055 5.060 5.065 5.070 5.075 5.080 5.085 5.090 5.095 5.100 5.105 5.110 5.115 5.120 5.125 5.130 5.135 5.140 5.145 5.150 5.155 5.160 5.165 5.170 5.175 5.180 5.185 5.190 5.195 5.200 5.205 5.210 5.215 5.220 5.225 5.230 5.235 5.240 5.245 5.250 5.255 5.260 5.265 5.270 5.275 5.280 5.285 5.290 5.295 5.300 5.305 5.310 5.315 5.320 5.325 5.330 5.335 5.340 5.345 5.350 5.355 5.360 5.365 5.370 5.375 5.380 5.385 5.390 5.395 5.400 5.405 5.410 5.415 5.420 5.425 5.430 5.435 5.440 5.445 5.450 5.455 5.460 5.465 5.470 5.475 5.480 5.485 5.490 5.495 5.500 5.505 5.510 5.515 5.520 5.525 5.530 5.535 5.540 5.545 5.550 5.555 5.560 5.565 5.570 5.575 5.580 5.585 5.590 5.595 5.600 5.605 5.610 5.615 5.620 5.625 5.630 5.635 5.640 5.645 5.650 5.655 5.660 5.665 5.670 5.675 5.680 5.685 5.690 5.695 5.700 5.705 5.710 5.715 5.720 5.725 5.730 5.735 5.740 5.745 5.750 5.755 5.760 5.765 5.770 5.775 5.780 5.785 5.790 5.795 5.800 5.805 5.810 5.815 5.820 5.825 5.830 5.835 5.840 5.845 5.850 5.855 5.860 5.865 5.870 5.875 5.880 5.885 5.890 5.895 5.900 5.905 5.910 5.915 5.920 5.925 5.930 5.935 5.940 5.945 5.950 5.955 5.960 5.965 5.970 5.975 5.980 5.985 5.990 5.995 6.000 6.005 6.010 6.015 6.020 6.025 6.030 6.035 6.040 6.045 6.050 6.055 6.060 6.065 6.070 6.075 6.080 6.085 6.090 6.095 6.100 6.105 6.110 6.115 6.120 6.125 6.130 6.135 6.140 6.145 6.150 6.155 6.160 6.165 6.170 6.175 6.180 6.185 6.190 6.195 6.200 6.205 6.210 6.215 6.220 6.225 6.230 6.235 6.240 6.245 6.250 6.255 6.260 6.265 6.270 6.275 6.280 6.285 6.290 6.295 6.300 6.305 6.310 6.315 6.320 6.325 6.330 6.335 6.340 6.345 6.350 6.355 6.360 6.365 6.370 6.375 6.380 6.385 6.390 6.395 6.400 6.405 6.410 6.415 6.420 6.425 6.430 6.435 6.440 6.445 6.450 6.455 6.460 6.465 6.470 6.475 6.480 6.485 6.490 6.495 6.500 6.505 6.510 6.515 6.520 6.525 6.530 6.535 6.540 6.545 6.550 6.555 6.560 6.565 6.570 6.575 6.580 6.585 6.590 6.595 6.600 6.605 6.610 6.615 6.620 6.625 6.630 6.635 6.640 6.645 6.650 6.655 6.660 6.665 6.670 6.675 6.680 6.685 6.690 6.695 6.700 6.705 6.710 6.715 6.720 6.725 6.730 6.735 6.740 6.745 6.750 6.755 6.760 6.765 6.770 6.775 6.780 6.785 6.790 6.795 6.800 6.805 6.810 6.815 6.820 6.825 6.830 6.835 6.840 6.845 6.850 6.855 6.860 6.865 6.870 6.875 6.880 6.885 6.890 6.895 6.900 6.905 6.910 6.915 6.920 6.925 6.930 6.935 6.940 6.945 6.950 6.955 6.960 6.965 6.970 6.975 6.980 6.985 6.990 6.995 7.000 7.005 7.010 7.015 7.020 7.025 7.030 7.035 7.040 7.045 7.050 7.055 7.060 7.065 7.070 7.075 7.080 7.085 7.090 7.095 7.100 7.105 7.110 7.115 7.120 7.125 7.130 7.135 7.140 7.145 7.150 7.155 7.160 7.165 7.170 7.175 7.180 7.185 7.190 7.195 7.200 7.205 7.210 7.215 7.220 7.225 7.230 7.235 7.240 7.245 7.250 7.255 7.260 7.265 7.270 7.275 7.280 7.285 7.290 7.295 7.300 7.305 7.310 7.315 7.320 7.325 7.330 7.335 7.340 7.345 7.350 7.355 7.360 7.365 7.370 7.375 7.380 7.385 7.390 7.395 7.400 7.405 7.410 7.415 7.420 7.425 7.430 7.435 7.440 7.445 7.450 7.455 7.460 7.465 7.470 7.475 7.480 7.485 7.490 7.495 7.500 7.505 7.510 7.515 7.520 7.525 7.530 7.535 7.540 7.545 7.550 7.555 7.560 7.565 7.570 7.575 7.580 7.585 7.590 7.595 7.600 7.605 7.610 7.615 7.620 7.625 7.630 7.635 7.640 7.645 7.650 7.655 7.660 7.665 7.670 7.675 7.680 7.685 7.690 7.695 7.700 7.705 7.710 7.715 7.720 7.725 7.730 7.735 7.740 7.745 7.750 7.755 7.760 7.765 7.770 7.775 7.780 7.785 7.790 7.795 7.800 7.805 7.810 7.815 7.820 7.825 7.830 7.835 7.840 7.845 7.850 7.855 7.860 7.865 7.870 7.875 7.880 7.885 7.890 7.895 7.900 7.905 7.910 7.915 7.920 7.925 7.930 7.935 7.940 7.945 7.950 7.955 7.960 7.965 7.970 7.975 7.980 7.985 7.990 7.995 8.000 8.005 8.010 8.015 8.020 8.025 8.030 8.035 8.040 8.045 8.050 8.055 8.060 8.065 8.070 8.075 8.080 8.085 8.090 8.095 8.100 8.105 8.110 8.115 8.120 8.125 8.130 8.135 8.140 8.145 8.150 8.155 8.160 8.165 8.170 8.175 8.180 8.185 8.190 8.195 8.200 8.205 8.210 8.215 8.220 8.225 8.230 8.235 8.240 8.245 8.250 8.255 8.260 8.265 8.270 8.275 8.280 8.285 8.290 8.295 8.300 8.305 8.310 8.315 8.320 8.325 8.330 8.335 8.340 8.345 8.350 8.355 8.360 8.365 8.370 8.375 8.380 8.385 8.390 8.395 8.400 8.405 8.410 8.415 8.420 8.425 8.430 8.435 8.440 8.445 8.450 8.455 8.460 8.465 8.470 8.475 8.480 8.485 8.490 8.495 8.500 8.505 8.510 8.515 8.520 8.525 8.530 8.535 8.540 8.545 8.550 8.555 8.560 8.565 8.570 8.575 8.580 8.585 8.590 8.595 8.600 8.605 8.610 8.615 8.620 8.625 8.630 8.635 8.640 8.645 8.650 8.655 8.660 8.665 8.670 8.675 8.680 8.685 8.690 8.695 8.700 8.705 8.710 8.715 8.720 8.725 8.730 8.735 8.740 8.745 8.75



ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

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LEGEND

Survey Date: May-August 2022
Track-Wing Aircraft Type: C-540YP

Map: August 2022
Paper: Nacpac PA31
Projection: C-540YP

SURVEY PARAMETERS:

Altitude Survey Mode: (Shape 31) (contour) at 100 m
Transverse Line Direction Spacing: 100 (N-S) / 400 m
Longitudinal Line Direction Spacing: 300 (E-W) / 2400 m

Shape 31 (contour) at 100 m
100 (N-S) / 400 m
300 (E-W) / 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintrex CS-3

Configuration: Tail-Singer

Sampling Rate: 20 readings/second

Sensitivity: 0.01 nT

GAMMA-RAY SPECTROMETER:

RSS-5 multi-channel NaI sensors with

33 in. L "downwards looking" and 8 in. L

"upwards looking"

Sampling Rate: 1 reading/second

NAVIGATION: Novatel LBL GPS

Real-time differentially corrected

Sampling Rate: 10 readings/second

ALTIMETERS:

Sensor: 2 x pressure transducer

Sampling Rate: 10 readings/second

BASE STATION

MAGNETOMETER:

CEM GSM-117W

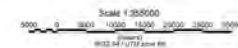
Sampling Rate: 1 reading/second

Sensitivity: 0.022 nT

Radars: Bosch KRM-15A

Sampling Rate: 20 readings/second

This work was supported by the U.S. Geological Survey's Earth MRI program
Emond, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne
magnetic and radiometric survey: Alaska Division of Geological & Geophysical Surveys
Geophysical Report 2022-1, <https://doi.org/10.14509/30899>

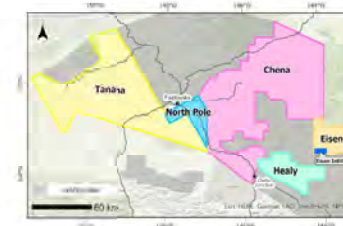


Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



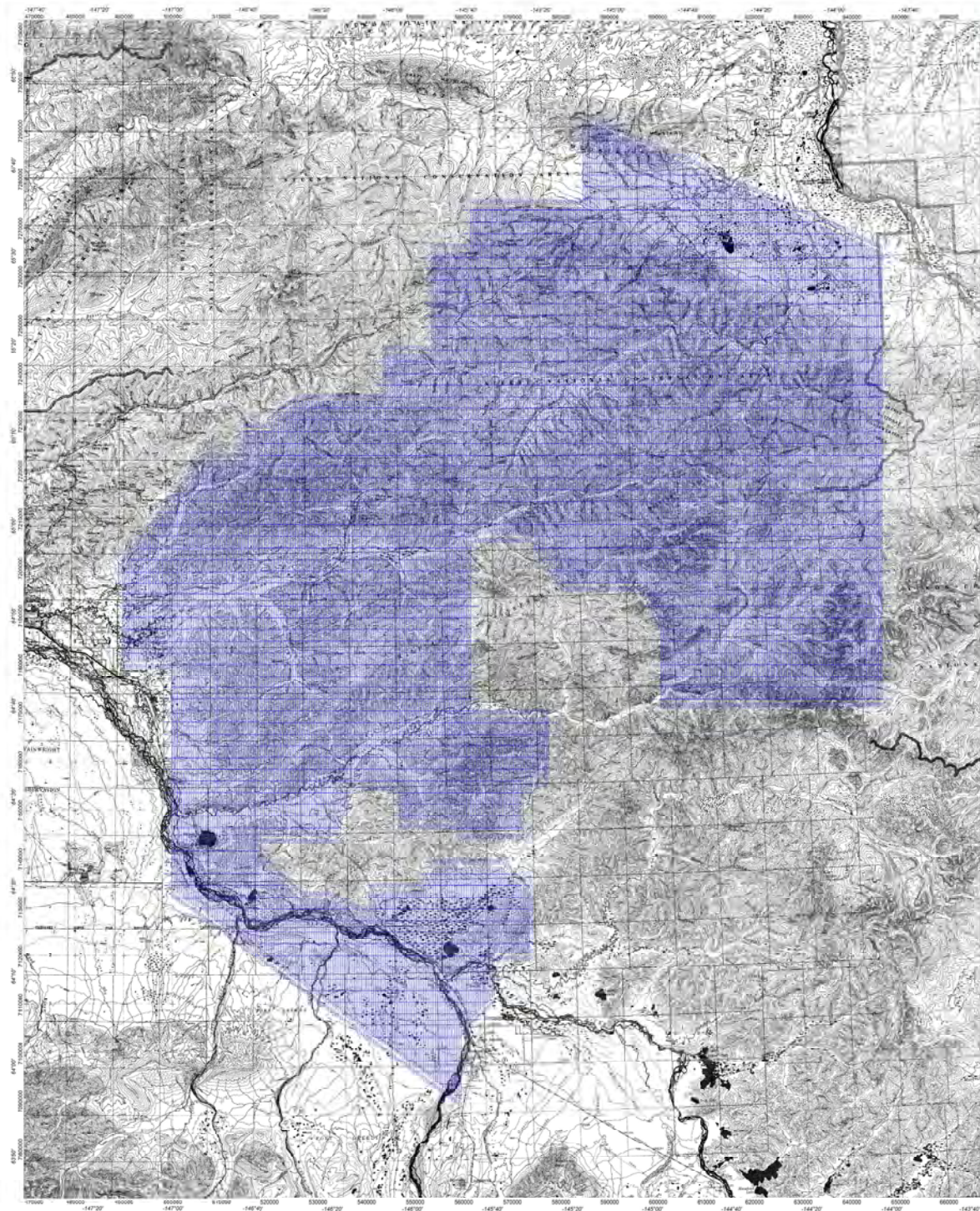
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Calculated 1st Vertical Derivative Map

Chena Survey Block

Geophysical Report 2022-1



ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Address: 1354 College Rd., Fairbanks, AK 99709, United States of America
Phone: +1 (907) 451-5446
Website: <https://dgs.alaska.gov/>

LEGEND

Survey Date: May-August 2022
Fixed-Wing Aircraft Type: Piper Navajo P3A
Registration: C54QVP

Map August 2022
Paper Navajo P3A
C54QVP

SURVEY PARAMETERS:
Altitude Survey Mode:
Transverse Line Direction/Spacing:
Control Line Direction/Spacing:

Diaga 3D compensated at 100 m
100 (5x5) / 400 m
101 (E-W) / 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintrex CS-3

Configuration: Tail-Stinger
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

GAMMA-RAY SPECTROMETER:

RS26-6 passive-shield NaI scintillator with
3 LxL "downwards looking" and 8 LxL
"upwards looking".
Sampling Rate: 1 reading/second

NAVIGATION: Novatel LBL GPS

Real-time differentially corrected
Sampling Rate: 10 readings/second

ALTIMETERS:

Senec 276 Pressure Transmitter:
Sampling Rate: 10 readings/second
Radar: Benthic King K&S-10A
Sampling Rate: 20 readings/second

BASE STATION MAGNETOMETER:

GEM GEM-RTW
Sampling Rate: 1 reading/second
Sensitivity: 0.022 nT

This work was supported by the U.S. Geological Survey's Earth MRI program
Emond, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne
magnetic and radiometric survey; Alaska Division of Geological & Geophysical Surveys
Geophysical Report 2022-1, <https://doi.org/10.14509/30899>



Flown Flight Path

<1,000,000, 0-30

Flown Direction (<>) Line Type (L/T); Line Number - Version ; Flight Number

Base map: USGS 1:250,000-scale isographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



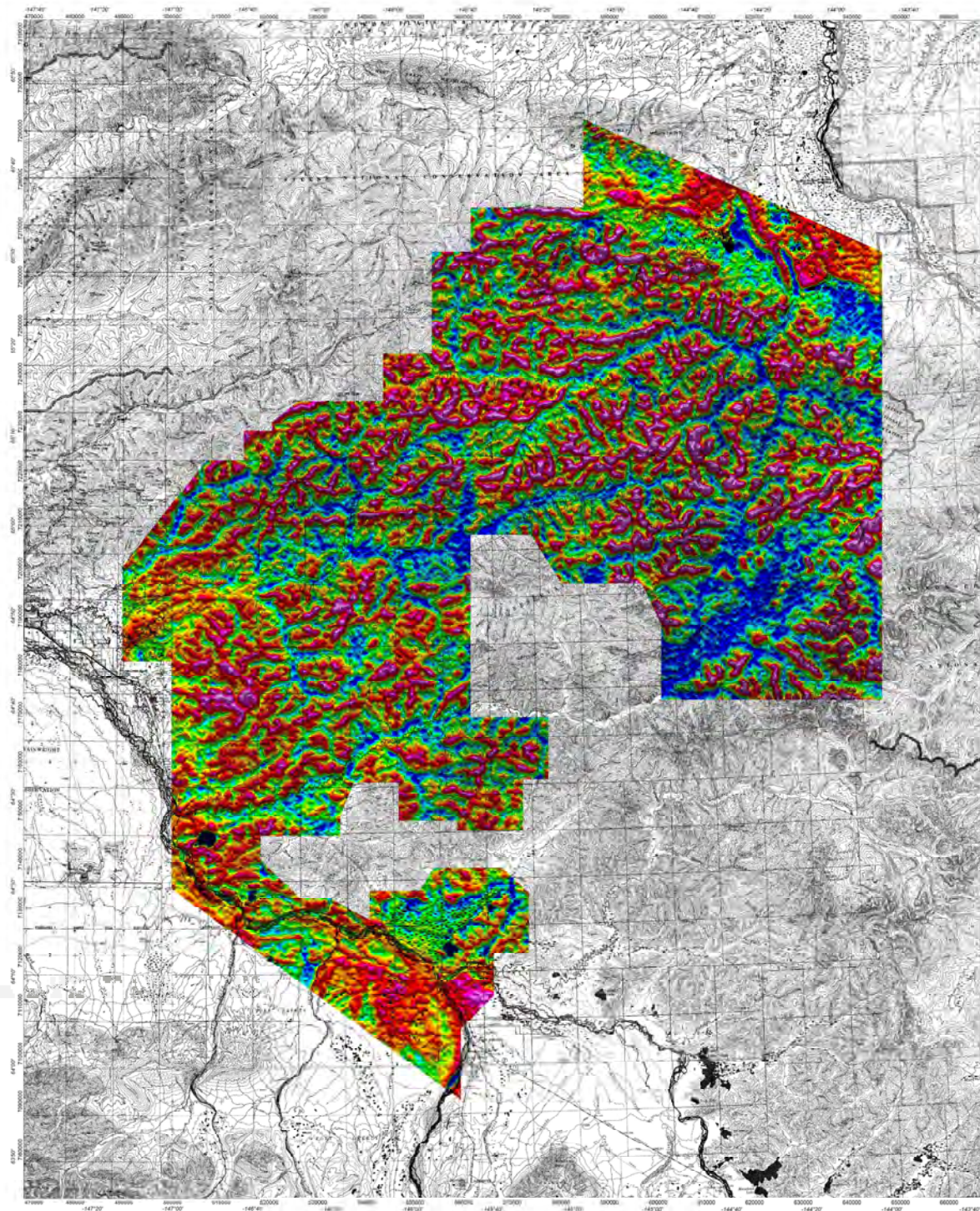
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Flown Flight Path Map

Chena Survey Block

Geophysical Report 2022-1



ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Address: 3255 College Rd., Fairbanks, AK 99709, United States of America

Phone: +1 907-451-5600

Website: <https://dggp.alaska.gov/>

LEGEND

Survey Date: May-August 2022
Track-Wing Aircraft Type: C-540YP
Registration:

SURVEY PARAMETERS:

Altitude Survey Mode: (Shape 32) (contour) at 100 m
Transverse Line Direction/Spacing: 180° (N-S) / 400 m
Control Line Direction/Spacing: 90° (E-W) / 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintrex CS-3

Configuration: Tail-Stinger
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

NAVIGATION: Novatel LBL GPS

Real-time differentially corrected
Sampling Rate: 10 readings/second

BASE STATION MAGNETOMETER:

CEM GSM-1FTW
Sampling Rate: 1 reading/second
Sensitivity: 0.022 nT

Map: August 2022
Paper Name: P831
C-540YP

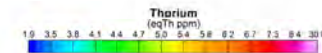
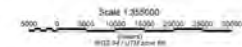
GAMMA-RAY SPECTROMETER:

RSS-5 multi-channel NaI sensors with
33 in. L "downwards looking" and 8.4 L
"upwards looking"
Sampling Rate: 1 reading/second

ALTIMETERS:

Sensor: 2 x pressure transducer
Sampling Rate: 10 readings/second
Radar: Benthos King KRS-15A
Sampling Rate: 20 readings/second

This work was supported by the U.S. Geological Survey's Earth MRI program
Emond, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne
magnetic and radiometric survey; Alaska Division of Geological & Geophysical Surveys
Geophysical Report 2022-1, <https://doi.org/10.14509/30899>

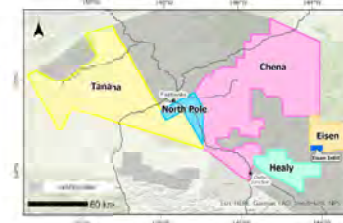


Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



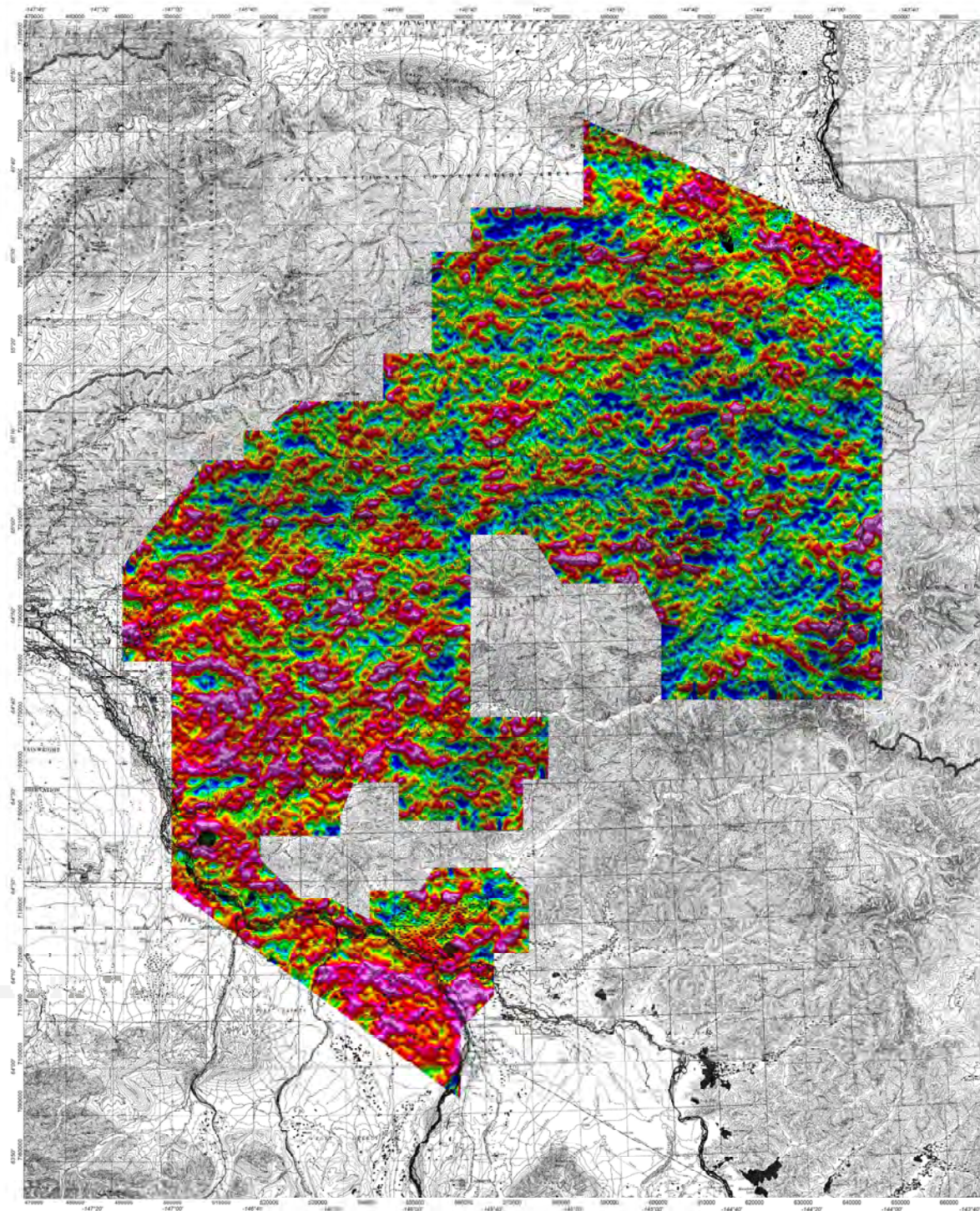
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Thorium Map

Chena Survey Block

Geophysical Report 2022-1



ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Address: 3255 College Rd., Fairbanks, AK 99709, United States of America

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Website: <https://dgs.alaska.gov/>

LEGEND

Survey Date: May-August 2022
Track-Wing Aerial Type: C-54QFP

Map: August 2022
Paper Name: P831
Registration:

SURVEY PARAMETERS:

Altitude Survey Mode: (Shape 31) (contour) at 100 m
Transverse Line Direction Spacing: 100 (N-S) / 400 m
Longitudinal Line Direction Spacing: 300 (E-W) / 2400 m

Shape 31 (contour) at 100 m
100 (N-S) / 400 m
300 (E-W) / 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintrex CS-3

Configuration: Tail-Stinger
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

GAMMA-RAY SPECTROMETER:

RSS-5 multi-channel NaI sensors with 33 in. L "downwards looking" and 8 in. L "upwards looking"

Sampling Rate: 1 reading/second

NAVIGATION: Novatel LBL GPS

Real-time differentially corrected
Sampling Rate: 10 readings/second

ALTIMETERS:

Sensor: 2 x pressure transducer

Sampling Rate: 10 readings/second

BASE STATION:

MAGNETOMETER: GEM GSM-14TW

Sampling Rate: 1 reading/second
Sensitivity: 0.022 nT

Radars: Boreas King KRS-15A

Sampling Rate: 20 readings/second

This work was supported by the U.S. Geological Survey's Earth MRI program
Emond, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne magnetic and radiometric survey; Alaska Division of Geological & Geophysical Surveys
Geophysical Report 2022-1, <https://doi.org/10.14509/30899>

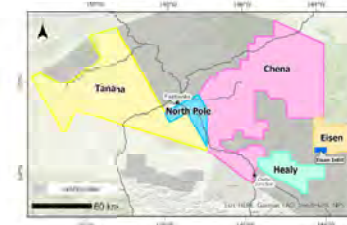


Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



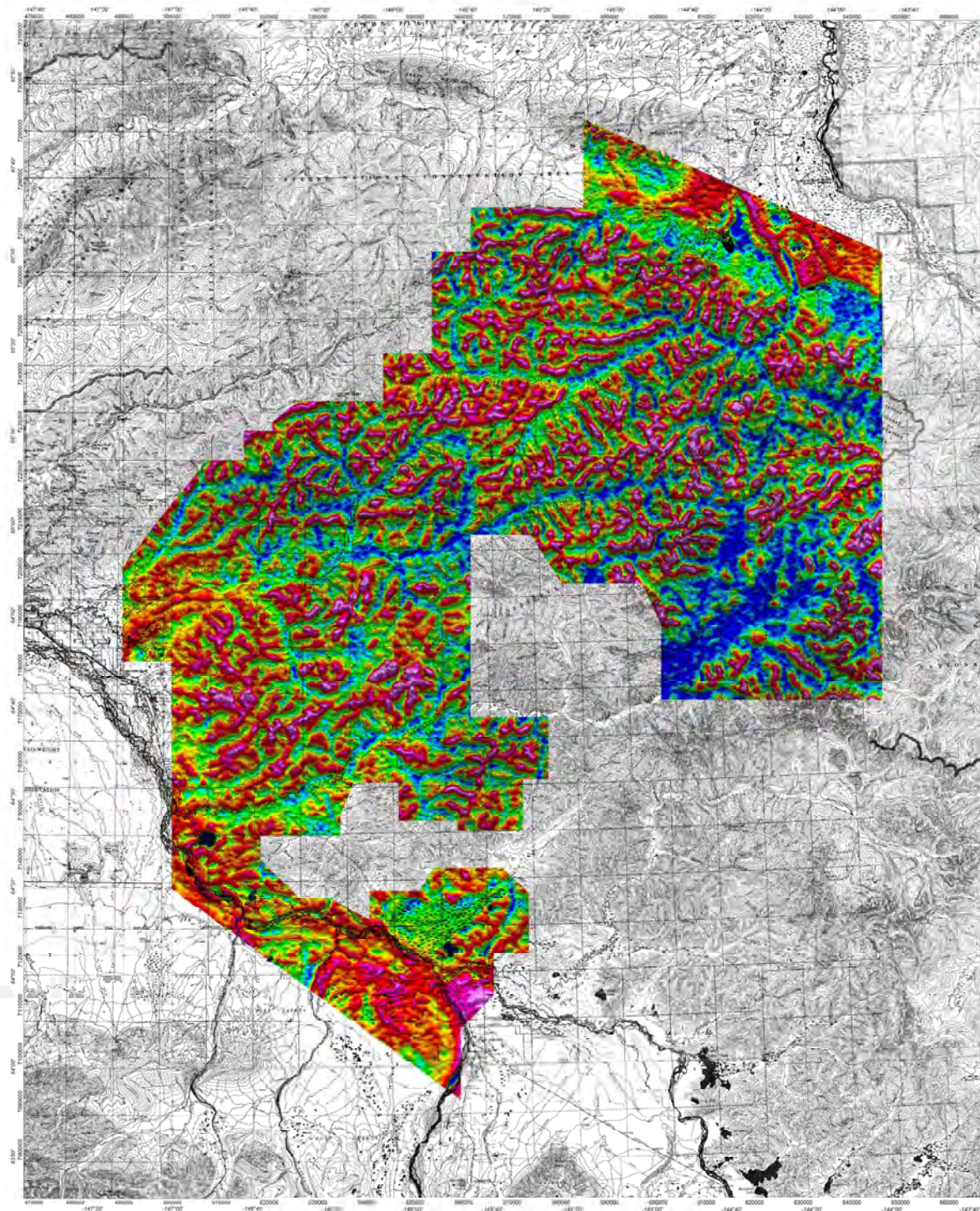
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Uranium Map

Chena Survey Block

Geophysical Report 2022-1



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 Address: 3254 College Rd., Fairbanks, AK 99709, United States of America
 Phone: +1 907-451-5600
 Website: <https://dgs.alaska.gov/>

LEGEND

Survey Date: May-August 2022
 Flight-Wing Aircraft Type: C-540YP

Map: August 2022
 Paper Name: P331
 C-540YP

SURVEY PARAMETERS:
 Altitude Survey Mode: (Shape 310 compressed to 180 ft)
 Transverse Line Direction/Spacing: 180°(N-S) / 400 ft
 Contour Line Direction/Spacing: 90°(E-W) / 2400 ft

(Shape 310 compressed to 180 ft)
 180°(N-S) / 400 ft
 90°(E-W) / 2400 ft

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintrex CS-3
 Configuration: Tail-Stinger
 Sampling Rate: 20 readings/second
 Sensitivity: 0.01 nT

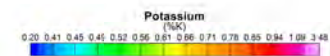
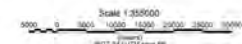
GAMMA-RAY SPECTROMETER:
 RSX-5 multi-channel NaI sensors with
 33 in. L "downwards looking" and 8.4 in.
 "upwards looking"
 Sampling Rate: 1 reading/second

NAVIGATION: Novatel L1/L2 GPS
 Real-time differentially corrected
 Sampling Rate: 10 readings/second

ALTIMETERS:
 Sennova 2 re pressure transducer
 Sampling Rate: 10 readings/second
 Radar: Benthos King KRA-15A
 Sampling Rate: 20 readings/second

BASE STATION MAGNETOMETER:
 GEM GSM-1FTW
 Sampling Rate: 1 reading/second
 Sensitivity: 0.022 nT

This work was supported by the U.S. Geological Survey's Earth MRI program
 Emend, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne
 magnetic and radiometric survey: Alaska Division of Geological & Geophysical Surveys
 Geophysical Report 2022-1, <https://doi.org/10.14509/30899>



Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



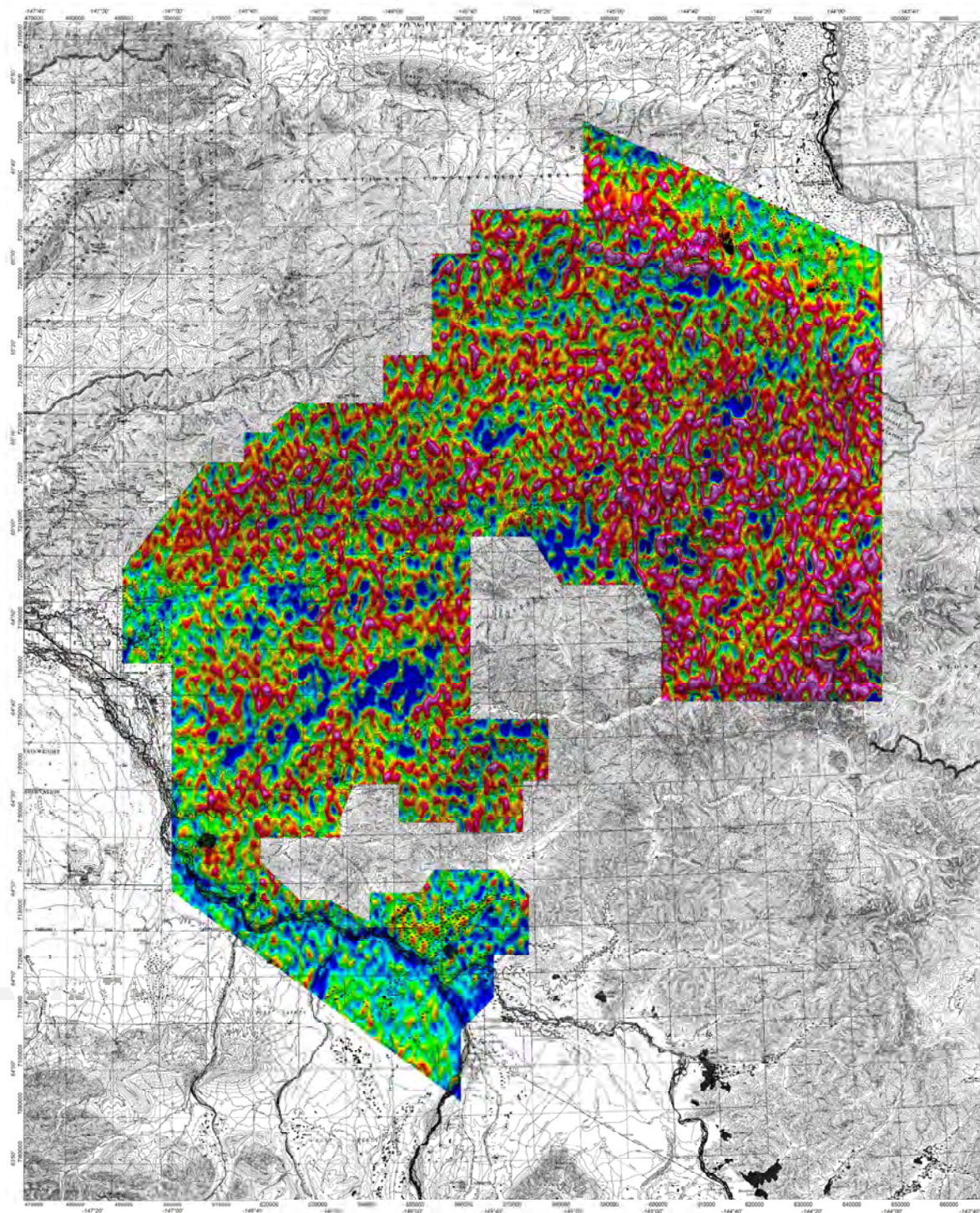
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Potassium Map

Chena Survey Block

Geophysical Report 2022-1



ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Address: 3255 College Rd., Fairbanks, AK 99709, United States of America

Phone: +1 907-451-5600

Website: <https://dgs.alaska.gov/>

LEGEND

Survey Date: May-August 2022
 Track-Wing Aircraft Type: C-540YP
 Registration:

SURVEY PARAMETERS:
 Altitude Survey Mode: (Shape 310 compressed to 180 ft)
 Transverse Line Direction/Spacing: 180°(N-S) / 400 m
 Contour Line Direction/Spacing: 90°(E-W) / 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintrex CS-3

Configuration: Tail-Stinger

Sampling Rate: 20 readings/second

Sensitivity: 0.01 nT

NAVIGATION: Novatel LBL GPS

Real-time differentially corrected

Sampling Rate: 10 readings/second

BASE STATION

MAGNETOMETER:

CEM GSM-117N

Sampling Rate: 1 reading/second

Sensitivity: 0.022 nT

Map: August 2022

Paper Number: PA-31

Registration:

Shape 310 compressed to 180 ft

180°(N-S) / 400 m

90°(E-W) / 2400 m

GAMMA-RAY SPECTROMETER:

RSS-5 multi-channel NaI sensors with

33 in. L "downwards looking" and 8.4 in.

"upwards looking"

Sampling Rate: 1 reading/second

ALTIMETERS:

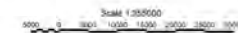
Sensor: 2 x pressure transducer

Sampling Rate: 10 readings/second

Radar: Benthos King KRS-15A

Sampling Rate: 20 readings/second

This work was supported by the U.S. Geological Survey's Earth MRI program
 Emond, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne
 magnetic and radiometric survey: Alaska Division of Geological & Geophysical Surveys
 Geophysical Report 2022-1, <https://doi.org/10.14509/30899>

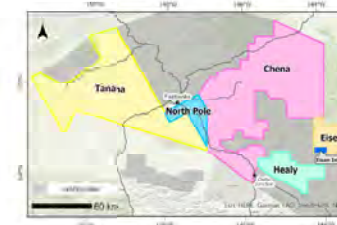


Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



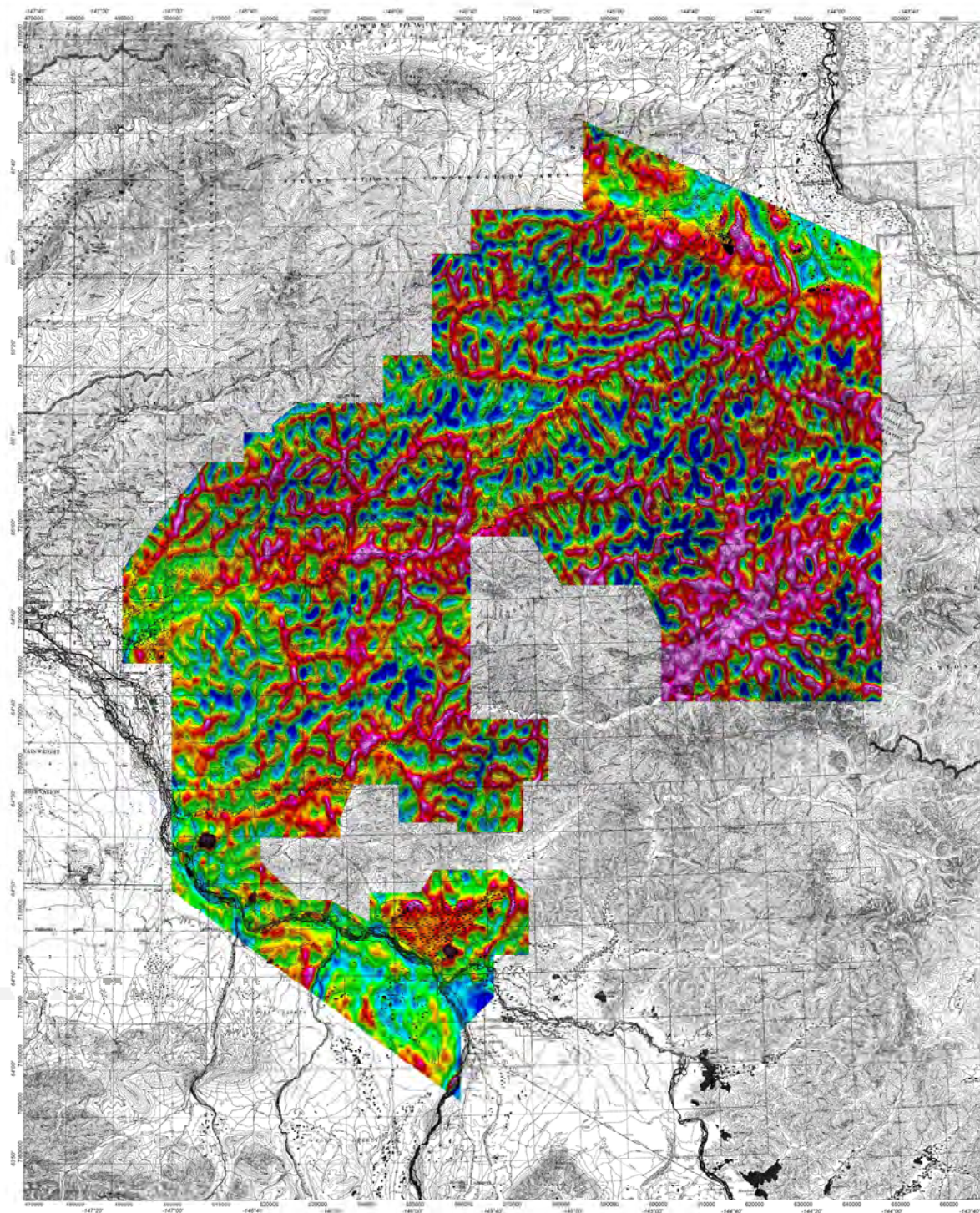
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ratio Thorium / Potassium Map

Chena Survey Block

Geophysical Report 2022-1



ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Address: 3254 College Rd., Fairbanks, AK 99709, United States of America
Phone: +1 907-451-5400
Website: <https://dgs.alaska.gov/>

LEGEND

Survey Date: May-August 2022
Track-Wing Aircraft Type: C-54QYP

SURVEY PARAMETERS:
Altitude Survey Mode: (Shape 310 compressed to 180 ft)
Transverse Line Direction Spacing: 100 (N-S) / 400 (E-W)
Contour Line Direction Spacing: 300 (E-W) / 2400 (N-S)

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintrex CS-3

Configuration: Tail-Singer
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

NAVIGATION: Novatel L1/L2 GPS

Real-time differentially corrected
Sampling Rate: 10 readings/second

BASE STATION MAGNETOMETER:

CEM GSM-1FTW
Sampling Rate: 1 reading/second
Sensitivity: 0.022 nT

Map: August 2022
Paper: P-31
C-54QYP

Shape 310 compressed to 180 ft
100 (N-S) / 400 (E-W)
300 (E-W) / 2400 (N-S)

GAMMA-RAY SPECTROMETER:

RSS-5 multi-channel NaI sensors with
33 in. L "downwards looking" and 8.4 in.
"upwards looking"

Sampling Rate: 1 reading/second

ALTIMETERS:

Sensor: 2 x pressure transducer

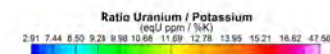
Sampling Rate: 10 readings/second

Radar: Benthos King KRS-15A

Sampling Rate: 20 readings/second

This work was supported by the U.S. Geological Survey's Earth MRI program
Emond, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne
magnetic and radiometric survey; Alaska Division of Geological & Geophysical Surveys
Geophysical Report 2022-1, <https://doi.org/10.14509/30899>

Scale 1:250,000
0 1000 2000 3000 4000 5000
Meters

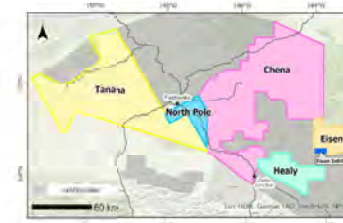


Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



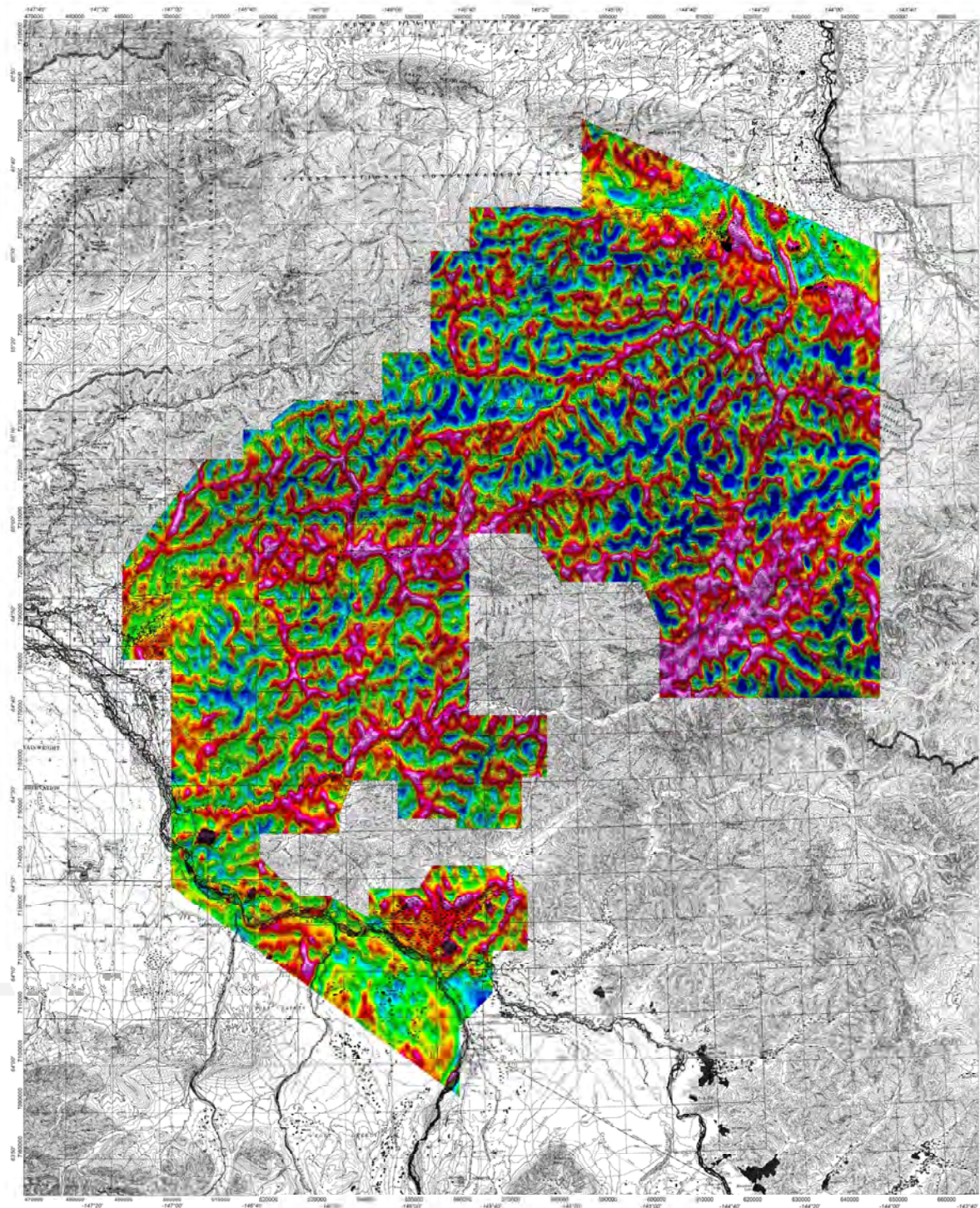
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ratio Uranium / Potassium Map

Chena Survey Block

Geophysical Report 2022-1



ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Address: 3255 College Rd., Fairbanks, AK 99709, United States of America
Phone: +1 907-451-5600
Website: <https://dgs.alaska.gov/>

LEGEND

Survey Date: May-August 2022
Track-Wing Aircraft Type: C-540YP
Registration:

SURVEY PARAMETERS:
Altitude Survey Mode: (Shape 310 compressed to 180 ft)
Transverse Line Direction Spacing: 100 (15-5) = 400 ft
Control Line Direction Spacing: 300 (15-5) = 2400 ft

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintrex CS-3
Configuration: Tail-Stinger
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

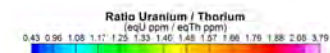
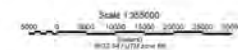
NAVIGATION: Novatel LBL GPS
Real-time differentially corrected
Sampling Rate: 10 readings/second

BASE STATION
MAGNETOMETER:
GEM GSM-1FTW
Sampling Rate: 1 reading/second
Sensitivity: 0.022 nT

GAMMA-RAY SPECTROMETER:
RSX-5 multi-channel NaI sensors with
33 in. L "downwards looking" and 8 in. L
"upwards looking"
Sampling Rate: 1 reading/second

ALTIMETERS:
Senno 2 x pressure transducer
Sampling Rate: 10 readings/second
Radar: Benthos King KRS-15A
Sampling Rate: 20 readings/second

This work was supported by the U.S. Geological Survey's Earth MRI program
Emond, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne
magnetic and radiometric survey: Alaska Division of Geological & Geophysical Surveys
Geophysical Report 2022-1, <https://doi.org/10.14509/30899>

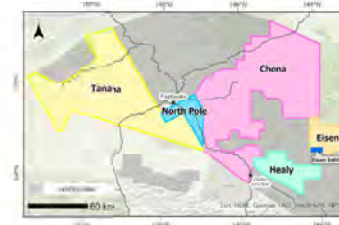


Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



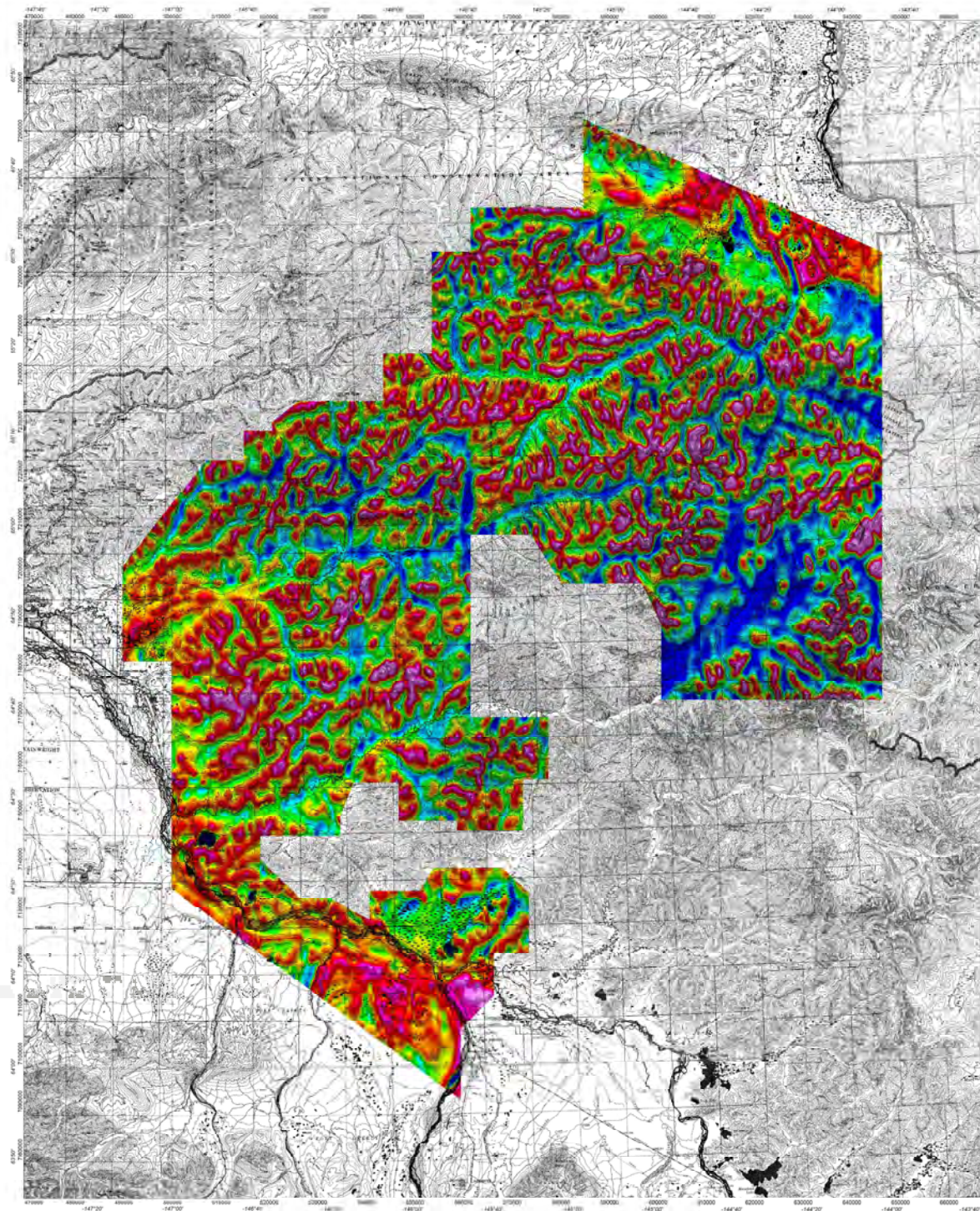
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ratio Uranium / Thorium Map

Chena Survey Block

Geophysical Report 2022-1



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Phone: +1 907-451-5600
Website: <https://dgs.alaska.gov/>

LEGEND

Survey Date: May-August 2022
Track-Wing Aircraft Type: C-540YP
Registration:

SURVEY PARAMETERS:
Altitude Survey Mode: (Shape 310 compressed at 1800 m)
Transverse Line Direction Spacing: 180° (N-S) / 400 m
Longitudinal Line Direction Spacing: 90° (E-W) / 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintrex CS-3

Configuration: Tail-Singer
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

NAVIGATION: Novatel L1/L2 GPS

Real-time differentially corrected
Sampling Rate: 10 readings/second

BASE STATION MAGNETOMETER:

Model: GEM GSM-1FTW
Sampling Rate: 1 reading/second
Sensitivity: 0.022 nT

Map: August 2022
Paper: NAD83 / UTM
Projection: UTM

Shape 310 compressed at 1800 m
180° (N-S) / 400 m
90° (E-W) / 2400 m

GAMMA-RAY SPECTROMETER:

RSS-5 multi-channel NaI sensors with
33 in. L "downwards looking" and 8 in. L
"upwards looking"

Sampling Rate: 1 reading/second

ALTIMETERS:

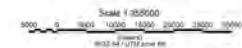
Sensor: 2 x pressure transducer

Sampling Rate: 10 readings/second

Radar: Benthos King KRS-15A

Sampling Rate: 20 readings/second

This work was supported by the U.S. Geological Survey's Earth MRI program
Emond, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne
magnetic and radiometric survey: Alaska Division of Geological & Geophysical Surveys
Geophysical Report 2022-1, <https://doi.org/10.14509/30899>

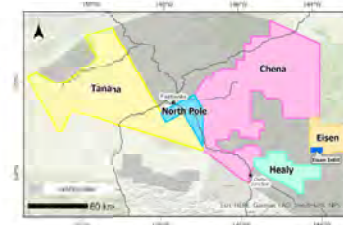


Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



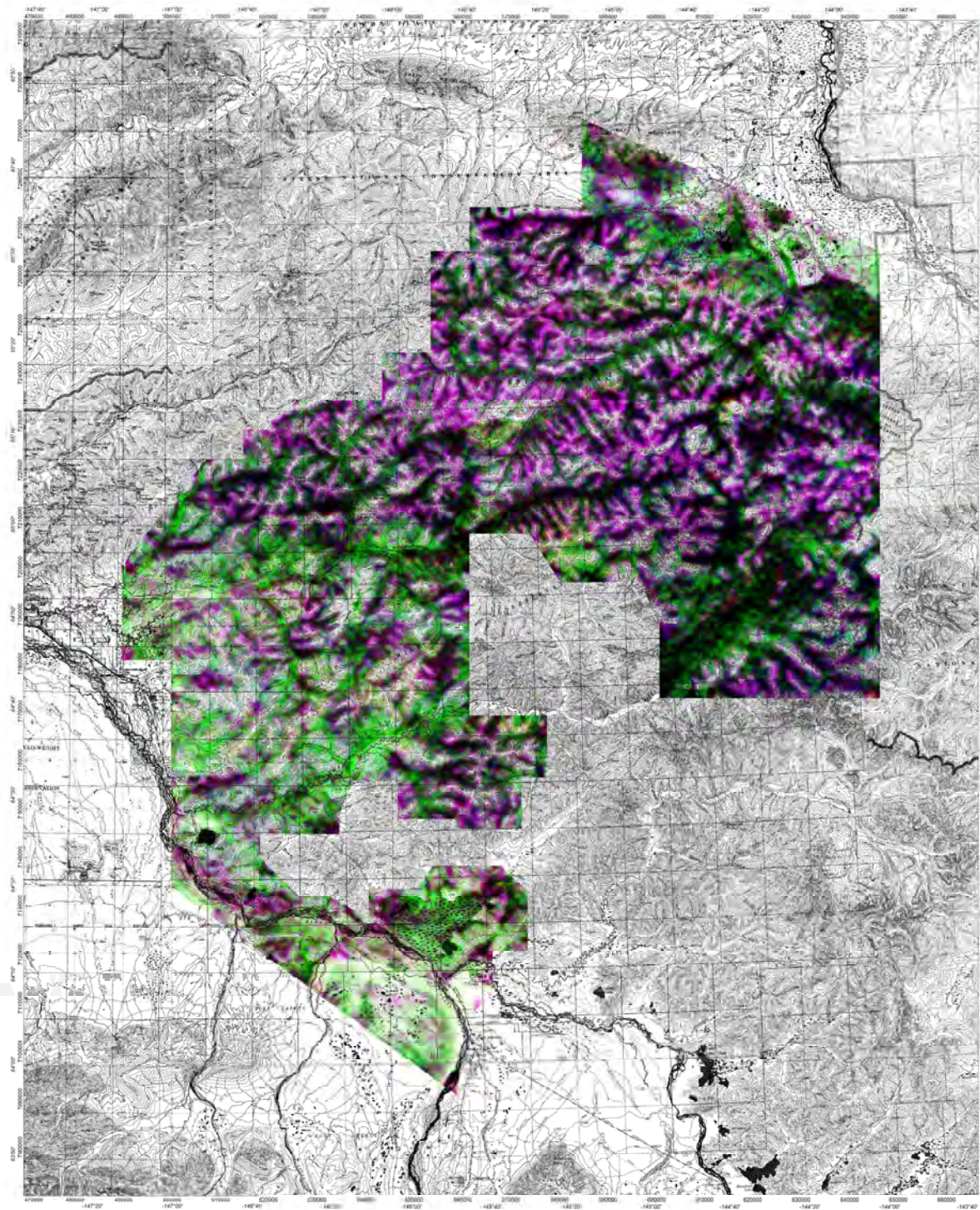
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Total Air Absorbed Dose Rate Map

Chena Survey Block

Geophysical Report 2022-1



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 Address: 3254 College Rd., Fairbanks, AK 99709, United States of America
 Phone: +1 907-451-5400
 Website: <https://dgs.alaska.gov/>

LEGEND

Survey Date: May-August 2022
 Flight-Wing Aircraft Type: C-540P
 Registration:

Map: August 2022
 Paper Name: P531
 C-540P

SURVEY PARAMETERS:
 Altitude Survey Mode: (Shape 31) computed at 100 m
 Transverse Line Direction Spacing: 100 (N-S) / 400 m
 Contour Line Direction Spacing: 100 (E-W) / 2400 m

(Shape 31) computed at 100 m
 100 (N-S) / 400 m
 100 (E-W) / 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintrex CS-3

Configuration: Tail-Singer

Sampling Rate: 20 readings/second

Sensitivity: 0.01 nT

GAMMA-RAY SPECTROMETER:

RSS-5 multi-channel NaI sensors with

33 B.L. "downwards looking" and 8 B.L.

"upwards looking"

Sampling Rate: 1 reading/second

NAVIGATION: Novatel LBL GPS

Real-time differentially corrected

Sampling Rate: 10 readings/second

ALTIMETERS:

Sensor: 2 x pressure transducer

Sampling Rate: 10 readings/second

BASE STATION

MAGNETOMETER:

GEM GSM-19TW

Sampling Rate: 1 reading/second

Sensitivity: 0.022 nT

Radar: Boreas King KRA-15A

Sampling Rate: 20 readings/second

This work was supported by the U.S. Geological Survey's Earth MRI program
 Emond, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne
 magnetic and radiometric survey: Alaska Division of Geological & Geophysical Surveys
 Geophysical Report 2022-1, <https://doi.org/10.14509/30899>

Scale 1:350,000
 0 5000 10000 15000 20000 25000 30000
 0 5 10 15 20 25 30 km

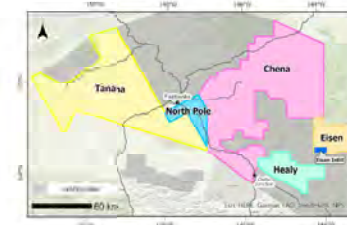


Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



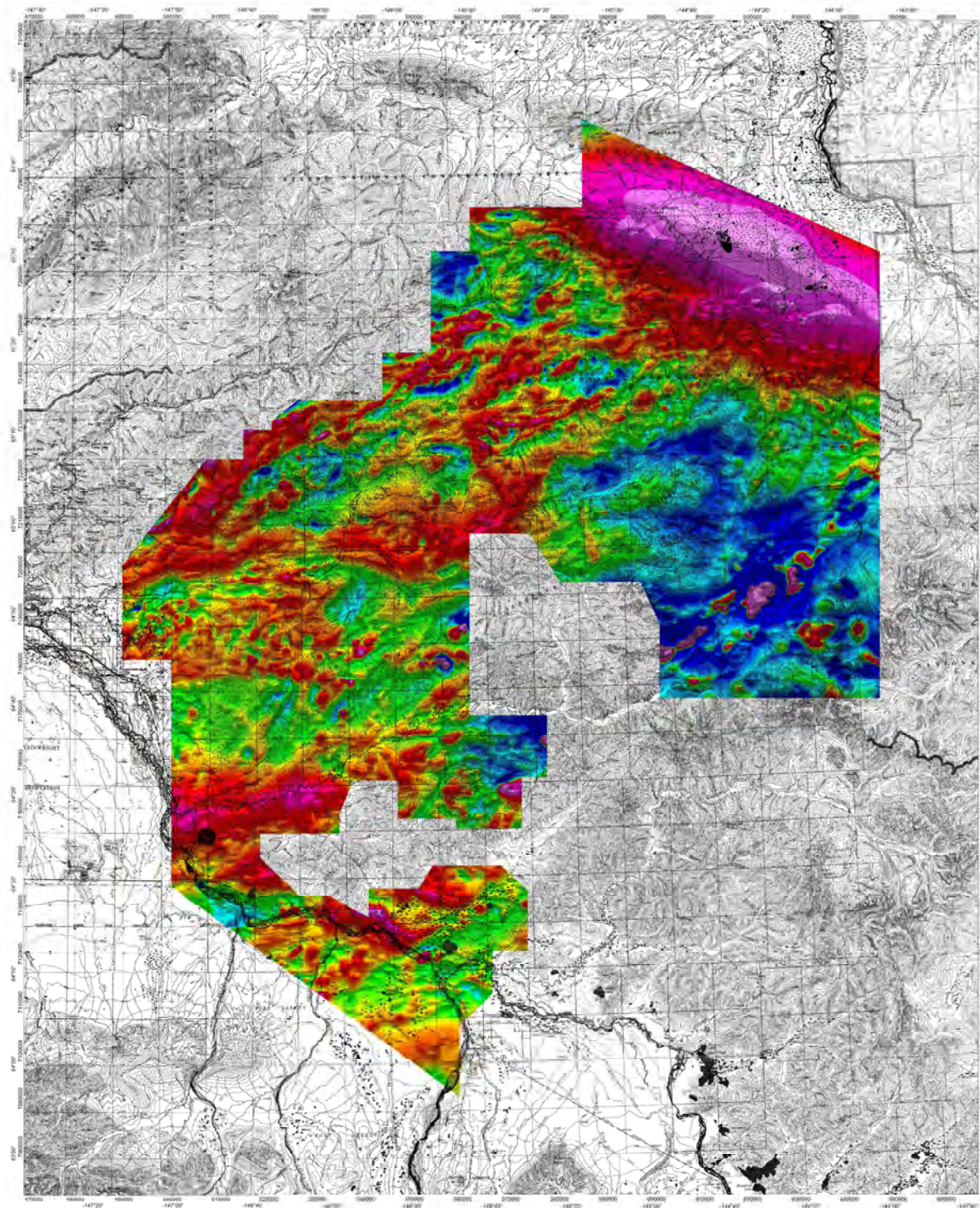
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ternary Map

Chena Survey Block

Geophysical Report 2022-1



ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
 Address: 2354 Cordova Rd., Fairbanks, AK 99709, United States of America
 Phone: +1 (907) 451-5600
 Website: <https://dgs.alaska.gov/>

LEGEND

Survey Date: May-August 2022
 Field Wing Aerial Type: C-130P
 Acquisition: C-130P

SURVEY PARAMETERS:
 Altitude Survey Mode: Single 3D compound or 100m
 Transverse Line Direction/Spacing: 100°(25-5) / 400m
 Control Line Direction/Spacing: 001°(1-3) / 2400m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintrex CS-3

Configuration: Tail-Stinger

Sampling Rate: 20 readings/second

Sensitivity: 0.01 nT

NAVIGATION: Novatel LBL GPS

Real-time differentially corrected

Sampling Rate: 10 readings/second

BASE STATION MAGNETOMETER:

GEM GEM-100W

Sampling Rate: 1 reading/second

Sensitivity: 0.002 nT

GAMMA-RAY SPECTROMETER:

RSN-6 (multi-channel NaI scintillator with 3.16 L "downwards looking" and 8.4 L "upwards looking")

Sampling Rate: 1 reading/second

ALTIMETERS:

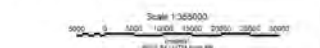
Servo 270 Pressure Transducer

Sampling Rate: 10 readings/second

Radar: Bushnell King KRA-10A

Sampling Rate: 20 readings/second

This work was supported by the U.S. Geological Survey's Earth MRI program
 Emond, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne
 magnetic and radiometric survey; Alaska Division of Geological & Geophysical Surveys
 Geophysical Report 2022-1, <https://doi.org/10.14509/30899>



Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



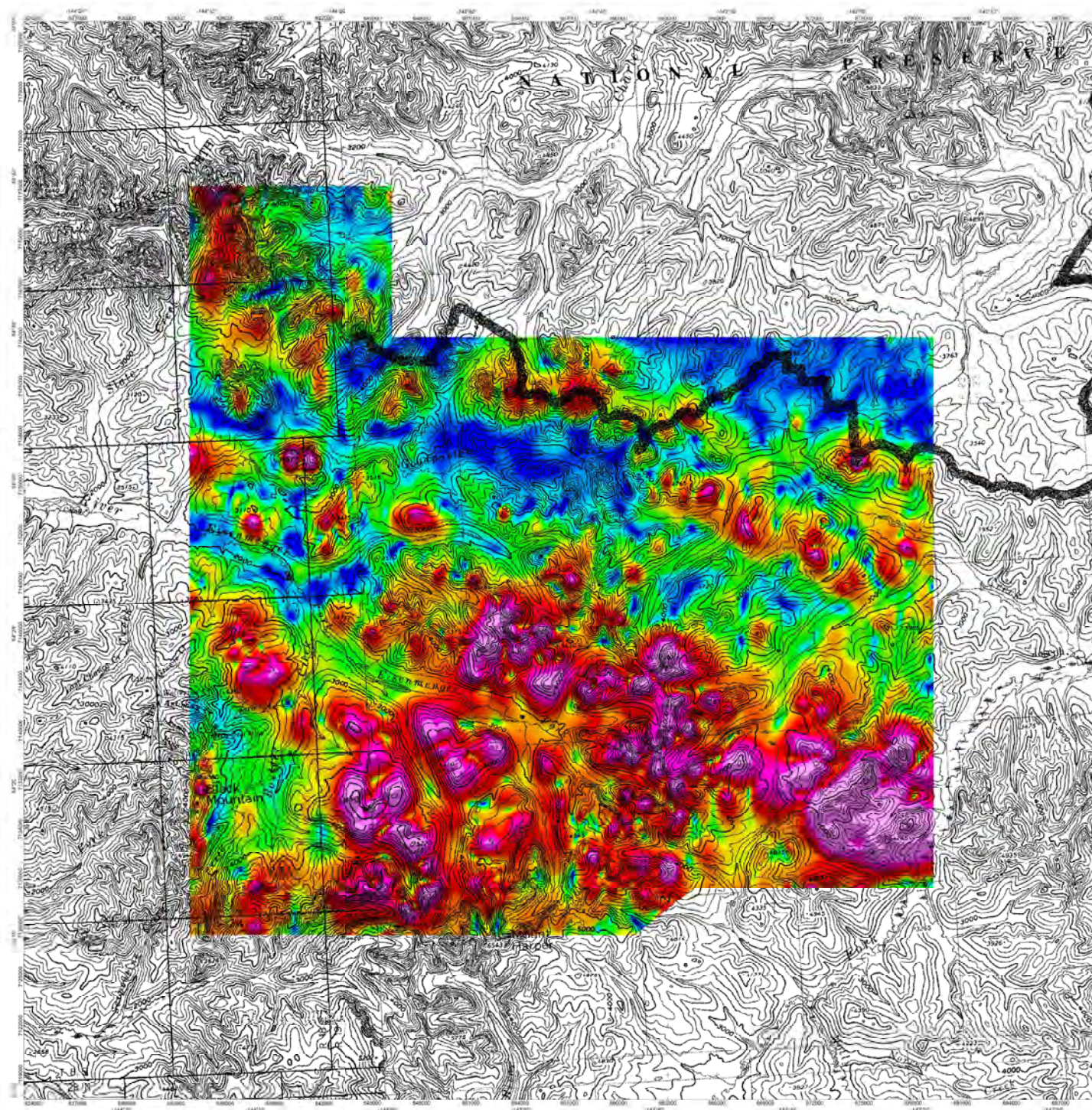
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Residual Magnetic Intensity Map

Chena Survey Block

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Phone: +1 907 451-5000
Website: <https://dggg.alaska.gov/>

LEGEND

Survey Date: May-August 2021
Form-Wing Aircraft Type: Piper Navajo PA31
Registration: C40JVP

SURVEY PARAMETERS:
Magnetic Survey Mode: Drone 3D compound at 100 m
Inverse Line Direction Spacing: 90°(E-W) / 400 m
Control Line Direction Spacing: 180°(N-S) / 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scaires CS-2
Configuration: Tail-Mounted
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

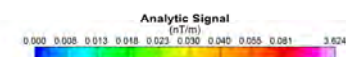
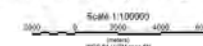
GAMMA-RAY SPECTROMETER:
RSX-5 multi-channel NaI scintillators with
73.6 L "downward looking" and 8.1 L
"upward looking"
Sampling Rate: 1 reading/second

NAVIGATION: Novad L1/L2 GPS
Real-time differentially corrected
Sampling Rate: 10 readings/second

ALTIMETERS:
Sears 276 Pressure Transducer
Sampling Rate: 10 readings/second
Radar: Benthos King KKA-10A
Sampling Rate: 20 readings/second

BASE STATION MAGNETOMETER:
GEM USM-01FW
Sampling Rate: 1 reading/second
Sensitivity: 0.002 nT

This work was supported by the U.S. Geological Survey's Earth MRI program
Enond, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne
magnetic and radiometric survey; Alaska Division of Geological & Geophysical Surveys
Geophysical Report 2022-1. <https://doi.org/10.14509/30899>



Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



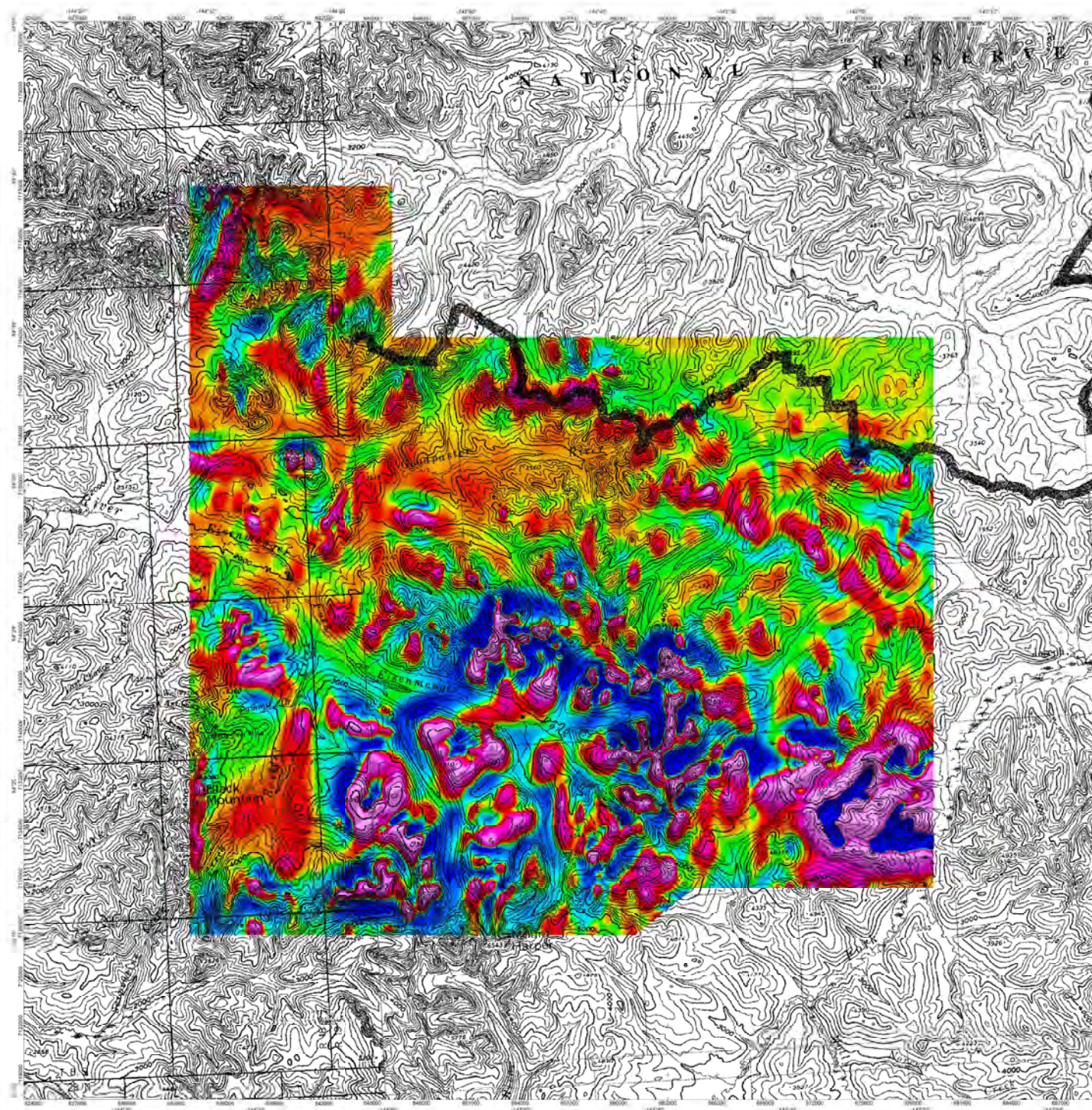
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Analytic Signal Map

Eisen Survey Block

Geophysical Report 2022-1



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Phone: +1 907 451 5000
Website: <https://dggg.alaska.gov/>

LEGEND

Survey Date: May-August 2021
Form-Wing Aircraft Type: Piper Navajo PA31
Registration: C40JVP

SURVEY PARAMETERS:
Magnetic Survey Mode: Drone 3D compound at 100 m
Inverse Line Direction Spacing: 90°(E-W) / 400 m
Control Line Direction Spacing: 180°(N-S) / 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintrex CS-2
Configuration: Tail-Mounted
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

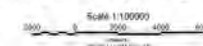
GAMMA-RAY SPECTROMETER:
RSX-5 multi-channel NaI scintillators with
73.6 L "downward looking" and 8.1 L
"upward looking"
Sampling Rate: 1 reading/second

NAVIGATION: Novad L1/L2 GPS
Real-time differentially corrected
Sampling Rate: 10 readings/second

ALTIMETERS:
Scintrex 276 Pressure Transducer
Sampling Rate: 10 readings/second
Radar: Benthos King KKA-10A
Sampling Rate: 20 readings/second

RADIO STATION MAGNETOMETER:
GEM US50-017W
Sampling Rate: 1 reading/second
Sensitivity: 0.02 nT

This work was supported by the U.S. Geological Survey's Earth MRI program
Enmond, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne
magnetic and radiometric survey; Alaska Division of Geological & Geophysical Surveys
Geophysical Report 2022-1. <https://doi.org/10.14509/30899>



Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



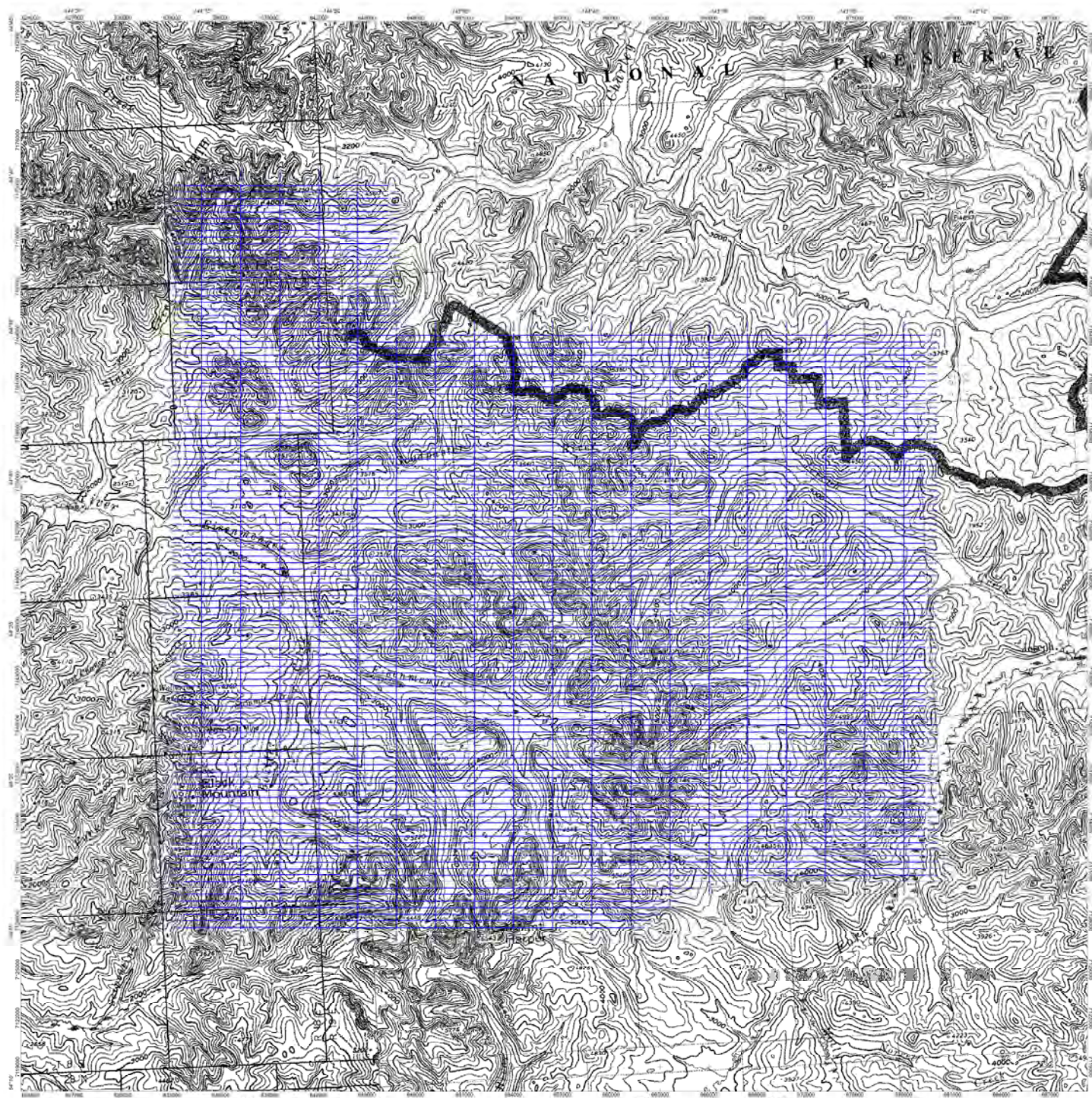
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Calculated 1st Vertical Derivative Map

Eisen Survey Block

Geophysical Report 2022-1



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Address: 3354 College Rd, Fairbanks, AK 99709, United States of America
Phone: +1 907-451-5000
Website: <https://dggp.alaska.gov/>

LEGEND

Survey Date: May-August 2022
Fixed-Wing Aircraft Type: Piper Navajo PA31
Registration: C-GOVP

SURVEY PARAMETERS:
Altitude/Survey Mode: Dups 3D compound at 100 m
Inverse Line Direction Spacing: 80° (E-W) / 400 m
Control Line Direction Spacing: 180° (N-S) / 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintrex CS-3
Configuration: Tail-Swing
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

NAVIGATION: Novatel L1/L2 GPS
Antennae differentially corrected
Sampling Rate: 10 readings/second

BASE STATION MAGNETOMETER:
GEM GSM-01FW
Sampling Rate: 1 reading/second
Sensitivity: 0.002 nT

GAMMA-RAY SPECTROMETER:
RS3x-5 multi-channel NaI scintillators with 33x4.1 "downward-looking" and 3x4.1 "upward-looking"
Sampling Rate: 1 reading/second

ALTIMETERS:
Sectra 276 Pressure Transducer
Sampling Rate: 10 readings/second
Radar: Heath King KRA-16A
Sampling Rate: 20 readings/second

This work was supported by the U.S. Geological Survey's Earth MRI program
Emond, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne magnetic and radiometric survey; Alaska Division of Geological & Geophysical Surveys
Geophysical Report 2022-1. <https://doi.org/10.14509/30899>

Scale 1:100,000
WGS 84 / UTM zone 18N

Flown Flight Path

<1,000,0:00

Flown Direction (<>); Line Type (L/T); Line Number, Version : Flight Number

Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



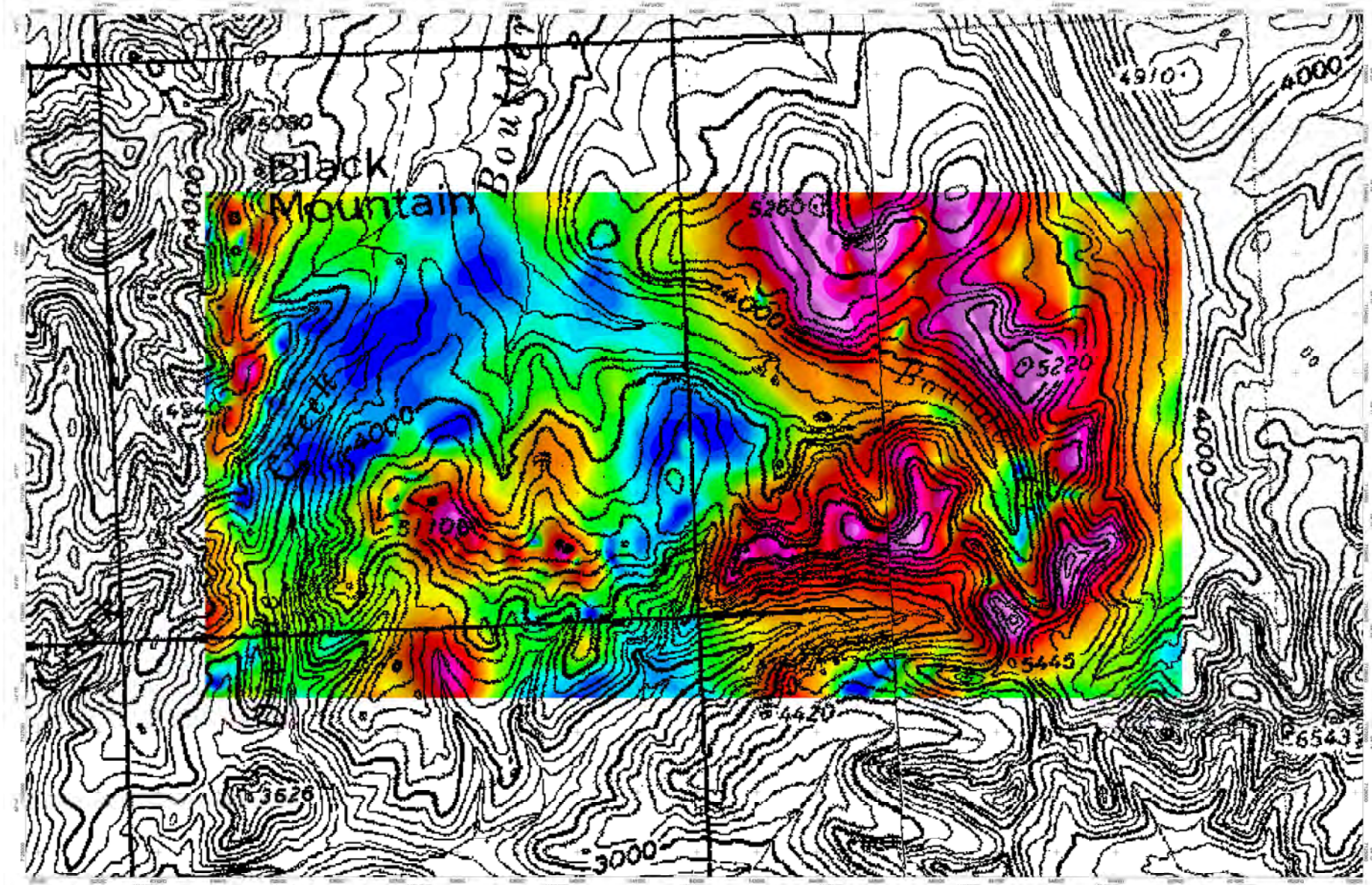
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Flown Flight Path Map

Eisen Survey Block

Geophysical Report 2022-1



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Website: <https://alaska.dgs.gov/>

This work was supported by the U.S. Geological Survey's Earth MRI program

Ennsel, A.M., and MPX Geophysics LTD, 2022. Tanana River and Big Delta airborne magnetic and radiometric survey. Alaska Division of Geological & Geophysical Surveys Contribution Report 2022-1. <https://doi.org/10.14309/38099>

LEGEND

Survey Date: May-August 2022
Fixed-Wing Aircraft Type: Piper Navajo PA31
Registration: C-AGNP

SURVEY PARAMETERS

Aircraft Survey Mode: Towed Line Direction/Spacing
Control Line Direction/Spacing

AIRBORNE SYSTEMS:

MAGNETOMETER: SQUID CS-2
Cryogenic Unit: YSI-804
Sampling Rate: 20 readings/second
Geometric: 10 ft x 1 ft

NAVIGATION: SQUID L1/L2 GPS

Total error differential: corrected
Sampling Rate: 10 readings/second

GAMMA-RAY SPECTROMETER:
RSS-3 multi-channel NaI sensors with
20 ft L-structure for tracking and 8 ft L-
"separate tracking"

ALTIMETERS: SQUID L1/L2 GPS

Total error differential: corrected
Sampling Rate: 10 readings/second

Analytic Signal

0.001 0.014 0.027 0.039 0.047 0.053 0.064 0.124 0.891

Scale 1:25000

0 500 1000 1500

Feet (1:125000 scale)

Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



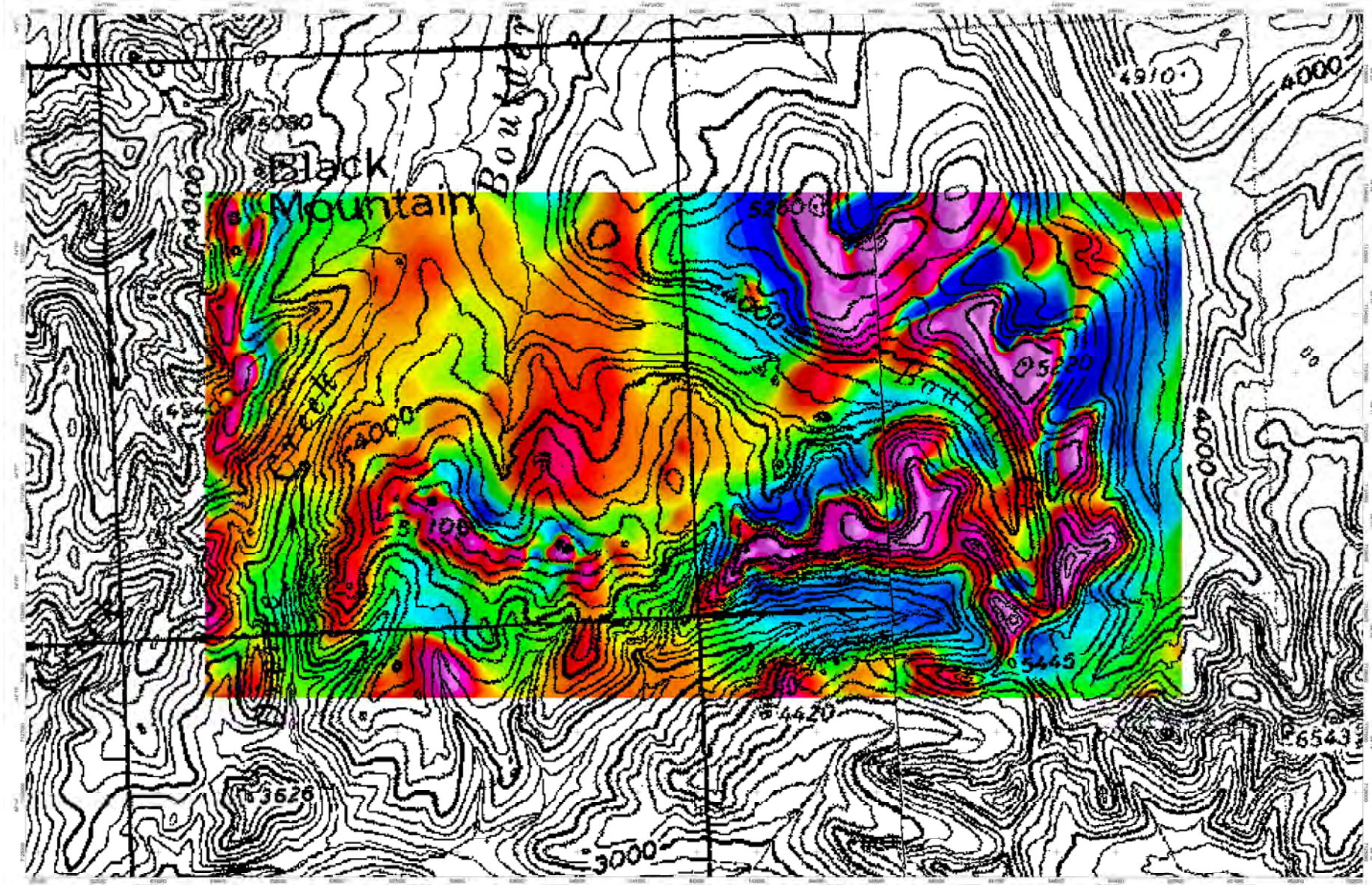
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Analytic Signal Map

Eisen Infill Survey Block

Geophysical Report 2022-1



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Website: <https://alaska.dgs.gov/>

This work was supported by the U.S. Geological Survey's Earth MRI program

Unusual, 4-M, and MPX Geophysics LTD. 2022. Tanana River and Big Delta airborne magnetic and radiometric survey. Alaska Division of Geological & Geophysical Surveys Geophysical Report 2022-1. <https://doi.org/10.14309/50099>

LEGEND

Survey Date: May-August 2022
Fixed-Wing Aircraft Type: Piper Navajo PA31
Registration: C-AGNP

SURVEY PARAMETERS

Aircraft Survey Mode: Terrain Line Direction/Spacing
Control Line Direction/Spacing

AIRBORNE SYSTEMS:

MAGNETOMETER: Sauer C-2
Credentialed: Yes/Single
Sampling Rate: 20 readings/second
Geometric: 30 ft +/-

NAVIGATION: Sauer L112 GPS

Real-time differential corrected
Sampling Rate: 10 readings/second

GAMMA-RAY SPECTROMETER:

RSS-3 multi-channel NaI sensors with
2.0 m L-shaped sensors looking east and west
Sampling Rate: 1 reading/second

ALTIMETER:

Sears 216 Pressure Transducer
Sampling Rate: 10 readings/second

BASE STATION MAGNETOMETER:

GEOMUS-1919
Sampling Rate: 1 reading/second
Sensitivity: 0.02 nT

Calculated 1st Vertical Derivative

(nT/m)

-0.93 -0.92 -0.91 -0.90 -0.89 -0.88 -0.87 -0.86 -0.85 -0.84 -0.83 -0.82 -0.81 -0.80 -0.79 -0.78 -0.77 -0.76 -0.75 -0.74 -0.73 -0.72 -0.71 -0.70 -0.69 -0.68 -0.67 -0.66 -0.65 -0.64 -0.63 -0.62 -0.61 -0.60 -0.59 -0.58 -0.57 -0.56 -0.55 -0.54 -0.53 -0.52 -0.51 -0.50 -0.49 -0.48 -0.47 -0.46 -0.45 -0.44 -0.43 -0.42 -0.41 -0.40 -0.39 -0.38 -0.37 -0.36 -0.35 -0.34 -0.33 -0.32 -0.31 -0.30 -0.29 -0.28 -0.27 -0.26 -0.25 -0.24 -0.23 -0.22 -0.21 -0.20 -0.19 -0.18 -0.17 -0.16 -0.15 -0.14 -0.13 -0.12 -0.11 -0.10 -0.09 -0.08 -0.07 -0.06 -0.05 -0.04 -0.03 -0.02 -0.01 0.00 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.10 0.11 0.12 0.13 0.14 0.15 0.16 0.17 0.18 0.19 0.20 0.21 0.22 0.23 0.24 0.25 0.26 0.27 0.28 0.29 0.30 0.31 0.32 0.33 0.34 0.35 0.36 0.37 0.38 0.39 0.40 0.41 0.42 0.43 0.44 0.45 0.46 0.47 0.48 0.49 0.50 0.51 0.52 0.53 0.54 0.55 0.56 0.57 0.58 0.59 0.60 0.61 0.62 0.63 0.64 0.65 0.66 0.67 0.68 0.69 0.70 0.71 0.72 0.73 0.74 0.75 0.76 0.77 0.78 0.79 0.80 0.81 0.82 0.83 0.84 0.85 0.86 0.87 0.88 0.89 0.90 0.91 0.92 0.93

Scale 1:25000

0 500 1000 1500

Feet 0 1500 3000 4500

Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



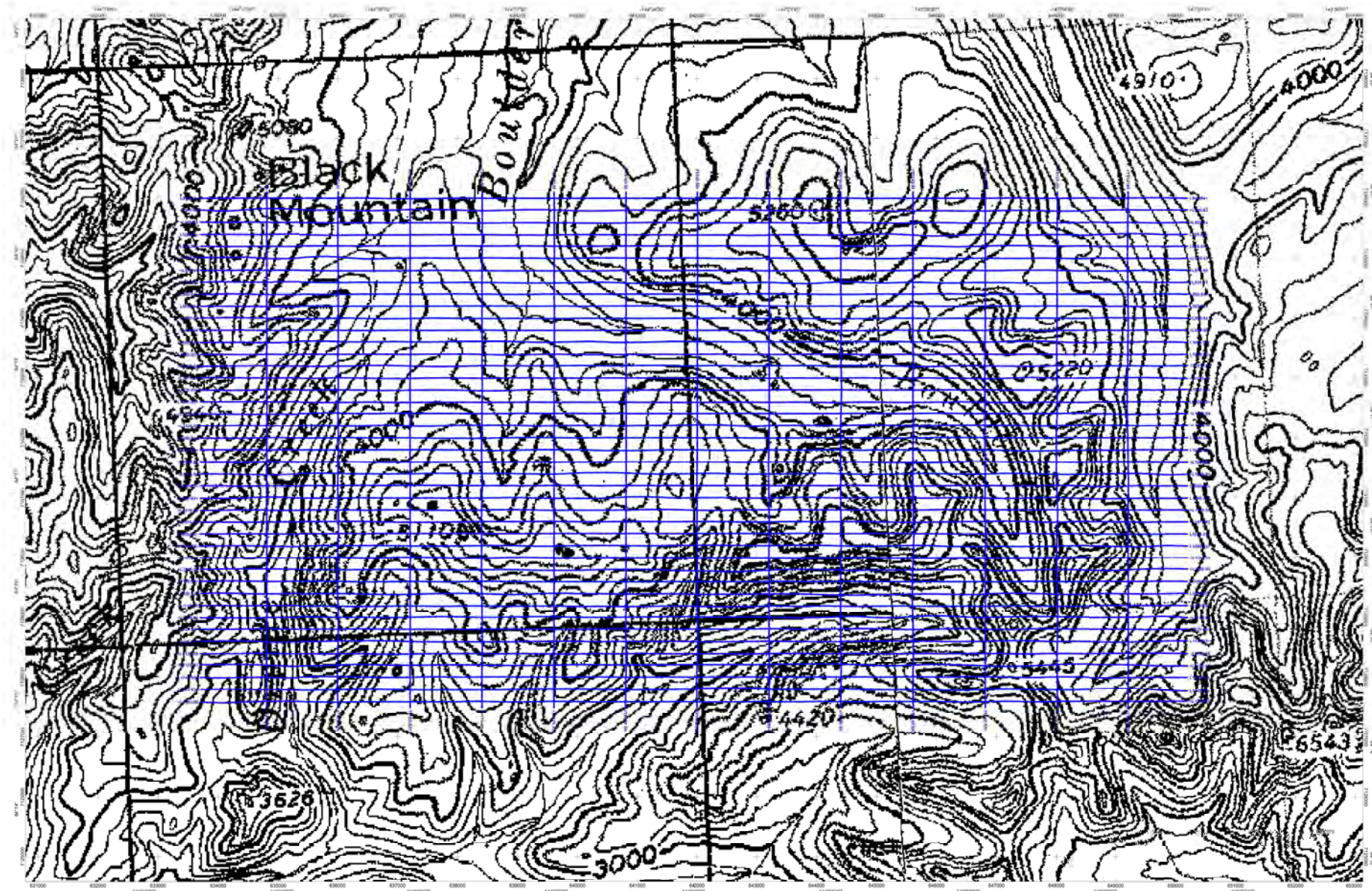
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Calculated 1st Vertical Derivative Map

Eisen Infill Survey Block

Geophysical Report 2022-1



ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

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Phone: +1 907-451-5000
Website: <https://aggs.alaska.gov/>

This work was supported by the U.S. Geological Survey's Earth MRI program

Ennos, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne magnetic and radiometric survey, Alaska Division of Geological & Geophysical Surveys Geophysical Report 2022-1, <https://doi.org/10.14359/20899>

LEGEND

Survey Date: May-August 2022
Field-Wing Aeronaut Type: Piper Navajo PA31
Registration: C-AGVP

SURVEY PARAMETERS

Altitude/Survey Mode: Drone 70 command at 100m
Towline Line Direction/Spacing: 90°(N-W) / 200m
Control Line Direction/Spacing: 180°(N-E) / 1200m

AIRBORNE SYSTEMS:

MAGNETOMETER: Sauer C-2
Configuration: Yali-Singer
Sampling Rate: 30 readings/second
Sensitivity: 0.01 nT

NAVIGATION: Novad L112 GPS

Real-time differential correction
Sampling Rate: 10 readings/second

GAMMA-RAY SPECTROMETER:
RSS-5 multi-channel NaI sensors with
25.6 L downwards looking and 6.4 L
"upwards looking"
Sampling Rate: 1 reading/second

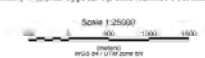
ALTIMETERS:

Sears 218 Pressure Transducer

Flown Flight Path

Line Type (L-T): Line Number, Version (Flight Number)

Flown Direction (→): Line Type (L-T): Line Number, Version (Flight Number)



Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



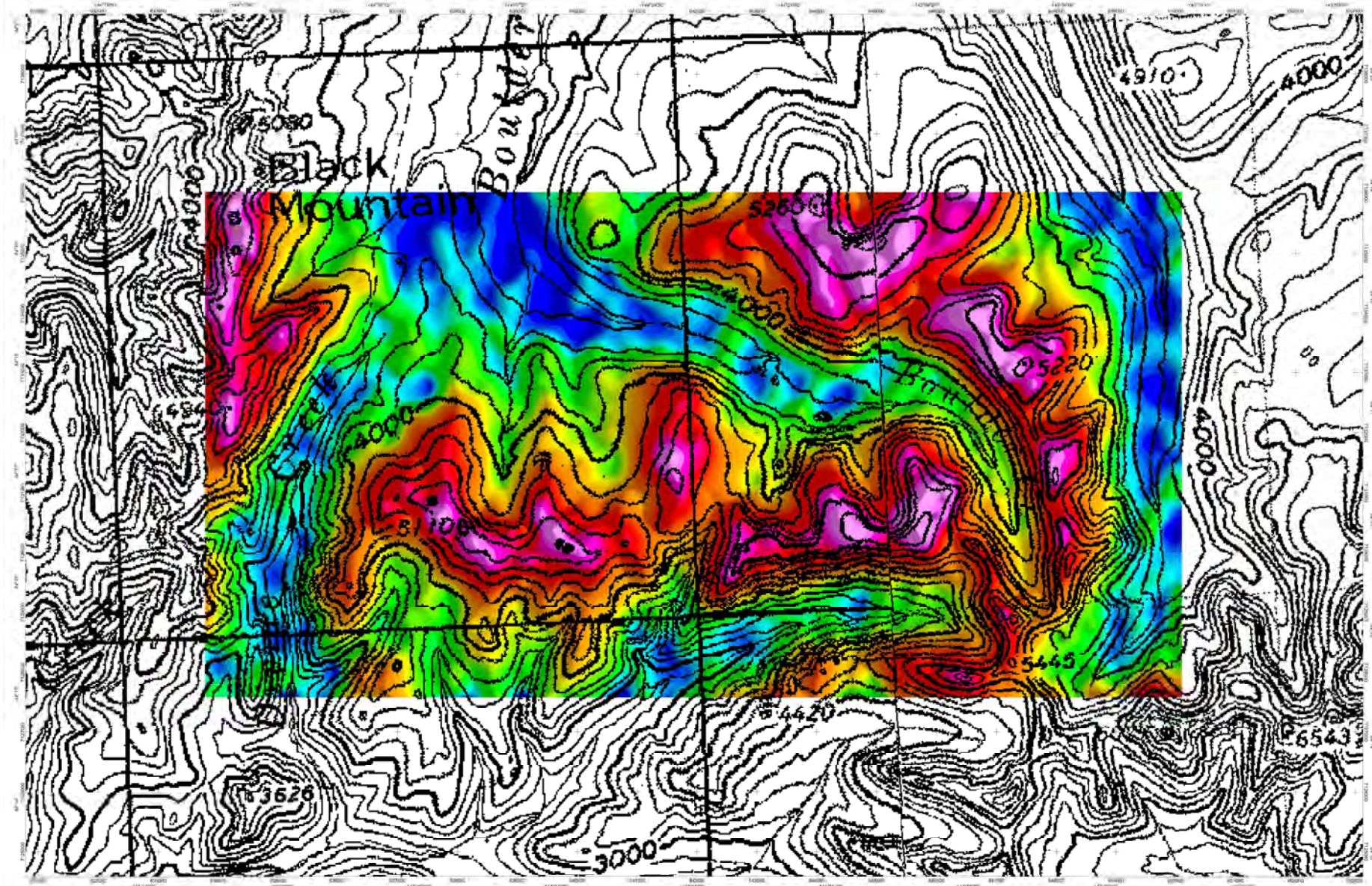
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Flown Flight Path Map

Eisen Infill Survey Block

Geophysical Report 2022-1



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Ennsel, A.M., and M.P. Geophysics LTD, 2022. Tanana River and Big Delta airborne magnetic and radiometric survey. Alaska Division of Geological & Geophysical Surveys Contribution Report 2022-1. <https://doi.org/10.14309/30009>

LEGEND

Survey Date: May-August 2022
Fixed-Wing Aircraft Type: Piper Navajo PA31
Registration: C-AGNP

SURVEY PARAMETERS

Altitude/Survey Mode: Drone-10 ground at 100 m

Turns/Lane Direction/Spacing: 90°/L/R/1/200 m

Control Line Direction/Spacing: 00°/N/S/1/100 m

AIRBORNE SYSTEMS:

MAGNETOMETER: SQUID CS-2
Cryostat/Cable: Yoti-Singer
Sampling Rate: 20 readings/second
Geometric: 30 m x 1 m

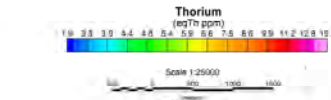
NAVIGATION: SQUID L1/L2 GPS

Real-time differential corrected

Sampling Rate: 10 readings/second

Altitude: SQUID L1/L2 GPS

Sampling Rate: 10 readings/second



Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



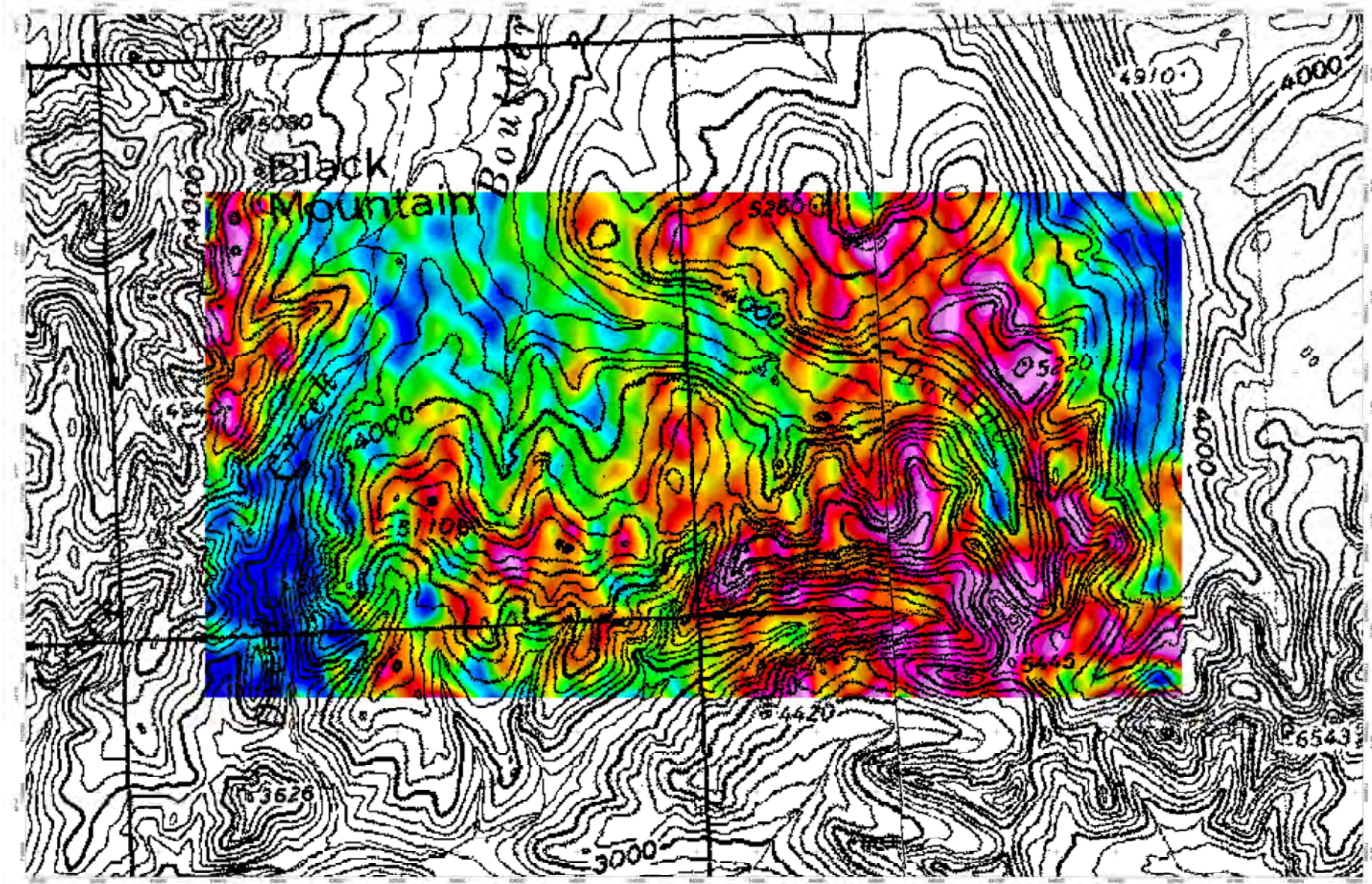
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Thorium Map

Eisen Infill Survey Block

Geophysical Report 2022-1



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Website: <https://alaska.dgk.usgs.gov/>

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Ennsel, A.M., and M.P. Geophysics LTD, 2022. Tanana River and Big Delta airborne magnetic and radiometric survey. Alaska Division of Geological & Geophysical Surveys (unpublished report 2022-1. <https://doi.org/10.14309/50099>)

LEGEND

Survey Date: May-August 2022
Fixed-Wing Aircraft Type: Piper Navajo PA31
Registration: C-AGNP

SURVEY PARAMETERS

Altitude/Survey Mode: Trips 10 ground at 100 m
Trimble Line Direction/Spacing: 90°/10 m / 200 m
Control Line Direction/Spacing: 00°/10 m / 100 m

AIRBORNE SYSTEMS:

MAGNETOMETER: SQUID CS-2
Cryogenic Unit: Yuki-Singer
Sampling Rate: 20 readings/second
Geometric: 10 m / s

NAVIGATION: SQUID L1/L2 GPS

Real-time differential correction
Sampling Rate: 10 readings/second

GAMMA-RAY SPECTROMETER:

RSS-3 multi-channel NaI sensors with
2.0 m L-shaped sensor housing and 6 x 1
"square collimator"
Sampling Rate: 1 reading/second

ALTIMETER:

Sets 216 Pressure Transducer
Sampling Rate: 10 readings/second

Uranium

(ppm)

30 43 47 48 50 51 52 53 55 58 61 64 64

Scale 1:25000

0 500 1000 1500

WGS 84 UTM Zone 18N

Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



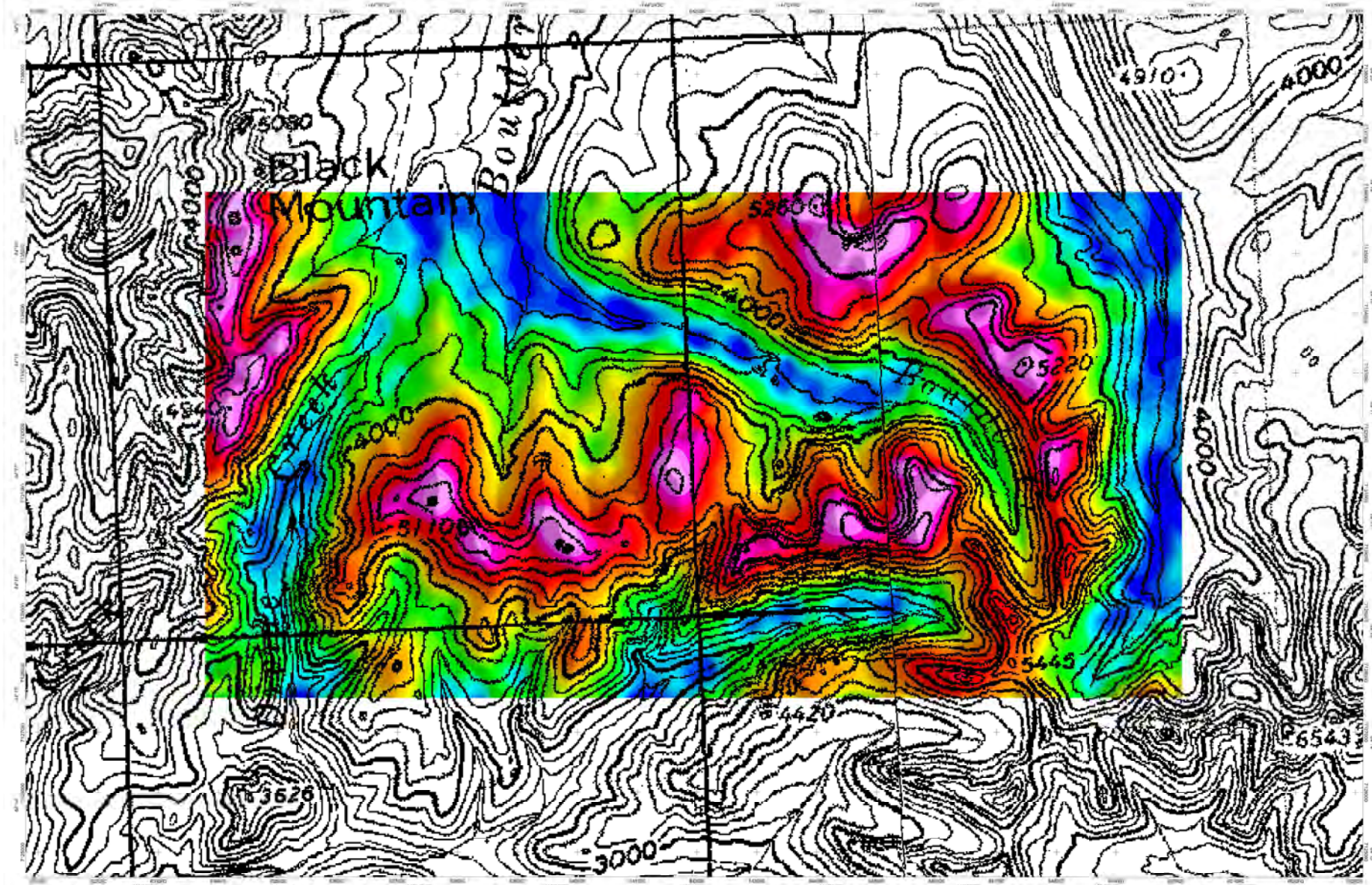
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Uranium Map

Eisen Infill Survey Block

Geophysical Report 2022-1



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Ennsel, A.M., and M.P. Geophysics LTD, 2022. Tanana River and Big Delta airborne magnetic and radiometric survey. Alaska Division of Geological & Geophysical Surveys (unpublished report 2022-1. <https://doi.org/10.14309/50099>

LEGEND

Survey Date: May-August 2022
Fixed-Wing Aircraft Type: Piper Navajo PA31
Registration: C-AGNP

SURVEY PARAMETERS

Altitude/Survey Mode: Trips 10 surveyed at 100 m
Trimble Line Direction/Spacing: 90°/10 m / 200 m
Control Line Direction/Spacing: 90°/10 m / 100 m

AIRBORNE SYSTEMS:

MAGNETOMETER: SQUID CS-2
Cryogenic Unit: Yuki-Singer
Sampling Rate: 20 readings/second
Geometric: 10 m / s

NAVIGATION: SQUID L1/L2 GPS

Real-time differential corrected
Sampling Rate: 10 readings/second

GAMMA-RAY SPECTROMETER:

RSS-3 multi-channel NaI sensors with
2.0 m L-shaped sensor housing and 6 x 1
"square collimator"
Sampling Rate: 1 reading/second

ALTIMETER:

Sets 216 Pressure Transducer
Sampling Rate: 10 readings/second

Potassium

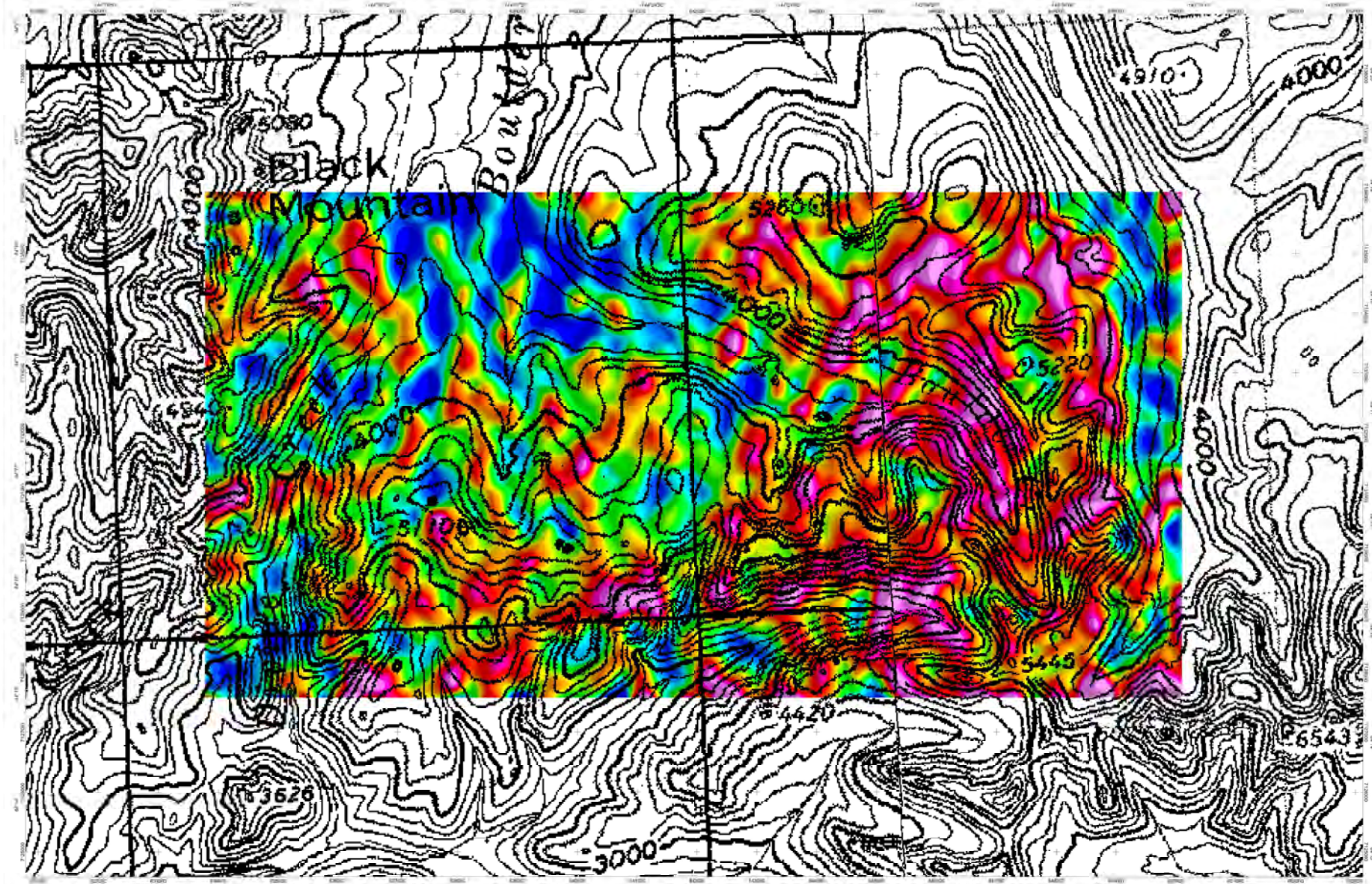
(%)

0.97 0.70 0.75 0.80 0.85 0.94 1.03 1.18 1.28 1.47 1.69 1.96 2.28 3.62

Scale 1:25000

0 500 1000 1500

0.00 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.10 0.11 0.12 0.13 0.14 0.15 0.16 0.17 0.18 0.19 0.20 0.21 0.22 0.23 0.24 0.25 0.26 0.27 0.28 0.29 0.30 0.31 0.32 0.33 0.34 0.35 0.36 0.37 0.38 0.39 0.40 0.41 0.42 0.43 0.44 0.45 0.46 0.47 0.48 0.49 0.50 0.51 0.52 0.53 0.54 0.55 0.56 0.57 0.58 0.59 0.60 0.61 0.62 0.63 0.64 0.65 0.66 0.67 0.68 0.69 0.70 0.71 0.72 0.73 0.74 0.75 0.76 0.77 0.78 0.79 0.80 0.81 0.82 0.83 0.84 0.85 0.86 0.87 0.88 0.89 0.90 0.91 0.92 0.93 0.94 0.95 0.96 0.97 0.98 0.99 1.00 1.01 1.02 1.03 1.04 1.05 1.06 1.07 1.08 1.09 1.10 1.11 1.12 1.13 1.14 1.15 1.16 1.17 1.18 1.19 1.20 1.21 1.22 1.23 1.24 1.25 1.26 1.27 1.28 1.29 1.30 1.31 1.32 1.33 1.34 1.35 1.36 1.37 1.38 1.39 1.40 1.41 1.42 1.43 1.44 1.45 1.46 1.47 1.48 1.49 1.50 1.51 1.52 1.53 1.54 1.55 1.56 1.57 1.58 1.59 1.60 1.61 1.62 1.63 1.64 1.65 1.66 1.67 1.68 1.69 1.70 1.71 1.72 1.73 1.74 1.75 1.76 1.77 1.78 1.79 1.80 1.81 1.82 1.83 1.84 1.85 1.86 1.87 1.88 1.89 1.90 1.91 1.92 1.93 1.94 1.95 1.96 1.97 1.98 1.99 2.00 2.01 2.02 2.03 2.04 2.05 2.06 2.07 2.08 2.09 2.10 2.11 2.12 2.13 2.14 2.15 2.16 2.17 2.18 2.19 2.20 2.21 2.22 2.23 2.24 2.25 2.26 2.27 2.28 2.29 2.30 2.31 2.32 2.33 2.34 2.35 2.36 2.37 2.38 2.39 2.40 2.41 2.42 2.43 2.44 2.45 2.46 2.47 2.48 2.49 2.50 2.51 2.52 2.53 2.54 2.55 2.56 2.57 2.58 2.59 2.60 2.61 2.62 2.63 2.64 2.65 2.66 2.67 2.68 2.69 2.70 2.71 2.72 2.73 2.74 2.75 2.76 2.77 2.78 2.79 2.80 2.81 2.82 2.83 2.84 2.85 2.86 2.87 2.88 2.89 2.90 2.91 2.92 2.93 2.94 2.95 2.96 2.97 2.98 2.99 3.00 3.01 3.02 3.03 3.04 3.05 3.06 3.07 3.08 3.09 3.10 3.11 3.12 3.13 3.14 3.15 3.16 3.17 3.18 3.19 3.20 3.21 3.22 3.23 3.24 3.25 3.26 3.27 3.28 3.29 3.30 3.31 3.32 3.33 3.34 3.35 3.36 3.37 3.38 3.39 3.40 3.41 3.42 3.43 3.44 3.45 3.46 3.47 3.48 3.49 3.50 3.51 3.52 3.53 3.54 3.55 3.56 3.57 3.58 3.59 3.60 3.61 3.62 3.63 3.64 3.65 3.66 3.67 3.68 3.69 3.70 3.71 3.72 3.73 3.74 3.75 3.76 3.77 3.78 3.79 3.80 3.81 3.82 3.83 3.84 3.85 3.86 3.87 3.88 3.89 3.90 3.91 3.92 3.93 3.94 3.95 3.96 3.97 3.98 3.99 4.00 4.01 4.02 4.03 4.04 4.05 4.06 4.07 4.08 4.09 4.10 4.11 4.12 4.13 4.14 4.15 4.16 4.17 4.18 4.19 4.20 4.21 4.22 4.23 4.24 4.25 4.26 4.27 4.28 4.29 4.30 4.31 4.32 4.33 4.34 4.35 4.36 4.37 4.38 4.39 4.40 4.41 4.42 4.43 4.44 4.45 4.46 4.47 4.48 4.49 4.50 4.51 4.52 4.53 4.54 4.55 4.56 4.57 4.58 4.59 4.60 4.61 4.62 4.63 4.64 4.65 4.66 4.67 4.68 4.69 4.70 4.71 4.72 4.73 4.74 4.75 4.76 4.77 4.78 4.79 4.80 4.81 4.82 4.83 4.84 4.85 4.86 4.87 4.88 4.89 4.90 4.91 4.92 4.93 4.94 4.95 4.96 4.97 4.98 4.99 5.00 5.01 5.02 5.03 5.04 5.05 5.06 5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14 5.15 5.16 5.17 5.18 5.19 5.20 5.21 5.22 5.23 5.24 5.25 5.26 5.27 5.28 5.29 5.30 5.31 5.32 5.33 5.34 5.35 5.36 5.37 5.38 5.39 5.40 5.41 5.42 5.43 5.44 5.45 5.46 5.47 5.48 5.49 5.50 5.51 5.52 5.53 5.54 5.55 5.56 5.57 5.58 5.59 5.60 5.61 5.62 5.63 5.64 5.65 5.66 5.67 5.68 5.69 5.70 5.71 5.72 5.73 5.74 5.75 5.76 5.77 5.78 5.79 5.80 5.81 5.82 5.83 5.84 5.85 5.86 5.87 5.88 5.89 5.90 5.91 5.92 5.93 5.94 5.95 5.96 5.97 5.98 5.99 6.00 6.01 6.02 6.03 6.04 6.05 6.06 6.07 6.08 6.09 6.10 6.11 6.12 6.13 6.14 6.15 6.16 6.17 6.18 6.19 6.20 6.21 6.22 6.23 6.24 6.25 6.26 6.27 6.28 6.29 6.30 6.31 6.32 6.33 6.34 6.35 6.36 6.37 6.38 6.39 6.40 6.41 6.42 6.43 6.44 6.45 6.46 6.47 6.48 6.49 6.50 6.51 6.52 6.53 6.54 6.55 6.56 6.57 6.58 6.59 6.60 6.61 6.62 6.63 6.64 6.65 6.66 6.67 6.68 6.69 6.70 6.71 6.72 6.73 6.74 6.75 6.76 6.77 6.78 6.79 6.80 6.81 6.82 6.83 6.84 6.85 6.86 6.87 6.88 6.89 6.90 6.91 6.92 6.93 6.94 6.95 6.96 6.97 6.98 6.99 7.00 7.01 7.02 7.03 7.04 7.05 7.06 7.07 7.08 7.09 7.10 7.11 7.12 7.13 7.14 7.15 7.16 7.17 7.18 7.19 7.20 7.21 7.22 7.23 7.24 7.25 7.26 7.27 7.28 7.29 7.30 7.31 7.32 7.33 7.34 7.35 7.36 7.37 7.38 7.39 7.40 7.41 7.42 7.43 7.44 7.45 7.46 7.47 7.48 7.49 7.50 7.51 7.52 7.53 7.54 7.55 7.56 7.57 7.58 7.59 7.60 7.61 7.62 7.63 7.64 7.65 7.66 7.67 7.68 7.69 7.70 7.71 7.72 7.73 7.74 7.75 7.76 7.77 7.78 7.79 7.80 7.81 7.82 7.83 7.84 7.85 7.86 7.87 7.88 7.89 7.90 7.91 7.92 7.93 7.94 7.95 7.96 7.97 7.98 7.99 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11.66 11.67 11.68 11.69 11.70 11.71 11.72 11.73 11.74 11.75 11.76 11.77 11.78 11.79 11.80 11.81 11.82 11.83 11.84 11.85 11.86 11.87 11.88 11.89 11.90 11.91 11.92 11.93 11.94 11.95 11.96 11.97 11.98 11.99 12.00 12.01 12.02 12.03 12.04 12.05 12.06 12.07 12.08 12.09 12.10 12.11 12.12 12.13 12.14 12.15 12.16 12.17 12.18 12.19 12.20 12.21 12.22 12.23 12.24 12.25 12.26 12.27 12.28 12.29 12.30 12.31 12.32 12.33 12.34 12.35 12.36 12.37 12.38 12.39 12.40 12.41 12.42 12.43 12.44 12.45 12.46 12.47 12.48 12.49 12.50 12.51 12.52 12.53 12.54 12.55 12.56 12.57 12.58 12.59 12.60 12.61 12.62 12.63 12.64 12.65 12.66 12.67 12.68 12.69 12.70 12.71 12.72 12.73 12.74 12.75 12.76 12.77 12.78 12.79 12.80 12.81 12.82 12.83 12.84 12.85 12.86 12.87 12.88 12.89 12.90 12.91 12.92 12.93 12.94 12.95 12.96 12.97 12.98 12.99 13.00 13.01 13.02 13.03 13.04 13.05 13.06 13.07 13.08 13.09 13.10 13.11 13.12 13.13 13.14 13.15 13.16 13.17 13.18 13.19 13.20 13.21 13.22 13.23 13.24 13.25 13.26 13.27 13.28 13.29 13.30 13.31 13.32 13.33 13.34 13.35 13.36 13.37 13.38 13.39 13.40 13.41 13.42 13.43 13.44 13.45 13.46 13.47 13.48 13.49 13.50 13.51 13.52 13.53 13.54 13.55 13.56 13.57 13.58 13.59 13.60 13.61 13.62 13.63 13.64 13.65 13.66 13.67 13.68 13.69 13.70 13.71 13.72 13.73 13.74 13.75 13.76 13.77 13.78 13.79 13.80 13.81 13.82 13.83 13.84 13.85 13.86 13.87 13.88 13.89 13.90 13.91 13.92 13.93 13.94 13.95 13.96 13.97 13.98 13.99 14.00 14.01 14.02 14.03 14.04 14.05 14.06 14.07 14.08 14.09 14.10 14.11 14.12 14.13 14.14 14.15 14.16 14.17 14.18 14.19 14.20 14.21 14.22 14.23 14.24 14.25 14.26 14.27 14.28 14.29 14.30 14.31 14.32 14.33 14.34 14.35 14.36 14.37 14.38 14.39 14.40 14.41 14.42 14.43 14.44 14.45 14.46 14.47 14.48 14.49 14.50 14.51 14.52 14.53 14.54 14.55 14.56 14.57 14.58 14.59 14.60 14.61 14.62 14.63 14.64 14.65 14.66 14.67 14.68 14.69 14.70 14.71 14.72 14.73 14.74 14.75 14.76 14.77 14.78 14.79 14.80 14.81 14.82 14.83 14.84 14.85 14.86 14.87 14.88 14.89 14.90 14.91 14.92 14.93 14.94 14.95 14.96 14.97 14.98 14.99 15.00 15.01 15.02 15.03 15.04 15.05 15.06 15.07 15.08 15.09 15.10 15.11 15.12 15.13 15.14 15.15 15.16 15.17 15.18 15.19 15.20 15.21 15.22 15.23 15.24 15.25 15.26 15.27 15.28 15.29 15.30 15.31 15.32 15.33 15.34 15.35 15.36 15.37 15.38 15.39 15.40 15.41 15.42 15.43 15.44 15.45 15.46 15.47 15.48 15.49 15.50 15.51 15.52 15.53 15.54 15.55 15.56 15.57 15.58 15.59 15.60 15.61 15.62 15.63 15.64 15.65 15.66 15.67 15.68 15.69 15.70 15.71 15.72 15.73 15.74 15.75 15.76 15.77 15.78 15.79 15.80 15.81 15.82 15.83 15.84 15.85 15.86 15.87 15.88 15.89 15.90 15.91 15.92 15.93 15.94 15.95 15.96 15.97 15.98 15.99 16.00 16.01 16.02 16.03 16.04 16.05 16.06 16.07 16.08 16.09 16.10 16.11 16.12 16.13 16.14 16.15 16.16 16.17 16.18 16.19 16.20 16.21 16.22 16.23 16.24 16.25 16.26 16.27 16.28 16.29 16.30 16.31 16.32 16.33 16.34 16.35 16.36 16.37 16.38 16.39 16.40 16.41 16.42 16.43 16.44 16.45 16.46 16.47 16.48 16.49 16.50 16.51 16.52 16.53 16.54 16.55 16.56 16.57 16.58 16.59 16.60 16.61 16.62 16.63 16.64 16.65 16.66 16.67 16.68 16.69 16.70 16.71 16.72 16.73 16.74 16.75 16.76 16.77 16.78 16.79 16.80 16.81 16.82 16.83 16.84 16.85 16.86 16.87 16.88 16.89 16.90 16.91 16.92 16.93 16.94 16.95 16.96 16.97 16.98 16.99 17.00 17.01 17.02 17.03 17.04 17.05 17.06 17.07 17.08 17.09 17.10 17.11 17.12 17.13 17.14 17.15 17.16 17.17 17.18 17.19 17.20 17.21 17.22 17.23 17.24 17.25 17.26 17.27 17.28 17.29 17.30 17.31 17.32 17.33 17.34 17.35 17.36 17.37 17.38 17.39 17.40 17.41 17.42 17.43 17.44 17.45 17.46 17.47 17.48 17.49 17.50 17.51 17.52 17.53 17.54 17.55 17.56 17.57 17.58 17.59 17.60 17.61 17.62 17.63 17.64 17.65 17.66 17.67 17.68 17.69 17.70 17.71 17.72 17.73 17.74 17.75 17.76 17.77 17.78 17.79 17.80 17.81 17.82 17.83 17.84 17.85 17.86 17.87 17.88 17.89 17.90 17.91 17.92 17.93 17.94 17.95 17.96 17.97 17.98 17.99 18.00 18.01 18.02 18.03 18.04 18.05 18.06 18.07 18.08 18.09 18.10 18.11 18.12 18.13 18.14 18.15 18.16 18.17 18.18 18.19 18.20 18.21 18.22 18.23 18.24 18.25 18.26 18.27 18.28 18.29 18.30 18.31 18.32 18.33 18.34 18.35 18.36 18.37 18.38 18.39 18.40 18.41 18.42 18.43 18.44 18.45 18.46 18.47 18.48 18.49 18.50 18.51 18.52 18.53 18.54 18.55 18.56 18.57 18.58 18.59 18.60 18.61 18.62 18.63 18.64 18.65 18.66 18.67 18.68 18.69 18.70 18.71 18.72 18.73 18.74 18.75 18.76 18.77 18.78 18.79 18.80 18.81 18.82 18.83 18.84 18.85 18.86 18.87 18.88 18.89 18.90 18.91 18.92 18.93 18.94 18.95 18.96 18.97 18.98 18.99 19.00 19.01 19.02 19.03 19.04 19.05 19.06 19.07 19.08 19.09 19.10 19.11 19.12 19.13 19.14 19.15 19.16 19.17 19.18 19.19 19.20 19.21 19.22 19.23 19.24 19.25 19.26 19.27 19.28 19.29 19.30 19.31 19.32 19.33 19.34 19.35 19.36 19.37 19.38 19.39 19.40 19.41 19.42 19.43 19.44 19.45 19.46 19.47 19.48 19.49 19.50 19.51 19.52 19.53 19.5



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Ennsel, A.M., and M.P. Geophysics LTD, 2022. Tanana River and Big Delta airborne magnetic and radiometric survey. Alaska Division of Geological & Geophysical Surveys Contribution Report 2022-1. <https://doi.org/10.14309/50099>

LEGEND

Survey Date: May-August 2022
Fixed-Wing Aircraft Type: Piper Navajo PA31
Registration: C-AGNP

SURVEY PARAMETERS

Aircraft Survey Mode: Drags (1) mounted at 100 m
Trimmed Line Orientation/Spacing: 90°/10 m
Control Line Orientation/Spacing: 180°/10 m

AIRBORNE SYSTEMS:

MAGNETOMETER: SQUID C-2
Cryostatization: Yuki-Singer
Sampling Rate: 20 readings/second
Geometric: 10 m x 1 m

NAVIGATION: SQUID L1/L2 GPS

Real-time differential corrected
Sampling Rate: 10 readings/second

GAMMA-RAY SPECTROMETER:

RSS-3 multi-channel NaI sensors with
20 m L-Scintiscan backing and 6 x 1
"Scintiscan backing"

BASE STATION MAGNETOMETER:

GENESYS-100 W
Sampling Rate: 1 readings/second
Sensitivity: 0.02 nT

Ratio Thorium / Potassium

log₁₀ (Th ppm / K ppm)

2.80 4.50 4.80 5.07 5.20 5.42 5.50 5.60 5.67 5.73 5.74 5.77 5.80

5.83 5.86 5.89 5.92 5.95 5.98 6.01 6.04 6.07 6.10 6.13 6.16 6.19 6.22 6.25 6.28 6.31 6.34 6.37 6.40 6.43 6.46 6.49 6.52 6.55 6.58 6.61 6.64 6.67 6.70 6.73 6.76 6.79 6.82 6.85 6.88 6.91 6.94 6.97 7.00 7.03 7.06 7.09 7.12 7.15 7.18 7.21 7.24 7.27 7.30 7.33 7.36 7.39 7.42 7.45 7.48 7.51 7.54 7.57 7.60 7.63 7.66 7.69 7.72 7.75 7.78 7.81 7.84 7.87 7.90 7.93 7.96 7.99 8.02 8.05 8.08 8.11 8.14 8.17 8.20 8.23 8.26 8.29 8.32 8.35 8.38 8.41 8.44 8.47 8.50 8.53 8.56 8.59 8.62 8.65 8.68 8.71 8.74 8.77 8.80 8.83 8.86 8.89 8.92 8.95 8.98 9.01 9.04 9.07 9.10 9.13 9.16 9.19 9.22 9.25 9.28 9.31 9.34 9.37 9.40 9.43 9.46 9.49 9.52 9.55 9.58 9.61 9.64 9.67 9.70 9.73 9.76 9.79 9.82 9.85 9.88 9.91 9.94 9.97 10.00

Scale 1:25000

0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 6000 6500 7000 7500 8000 8500 9000 9500 10000

0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



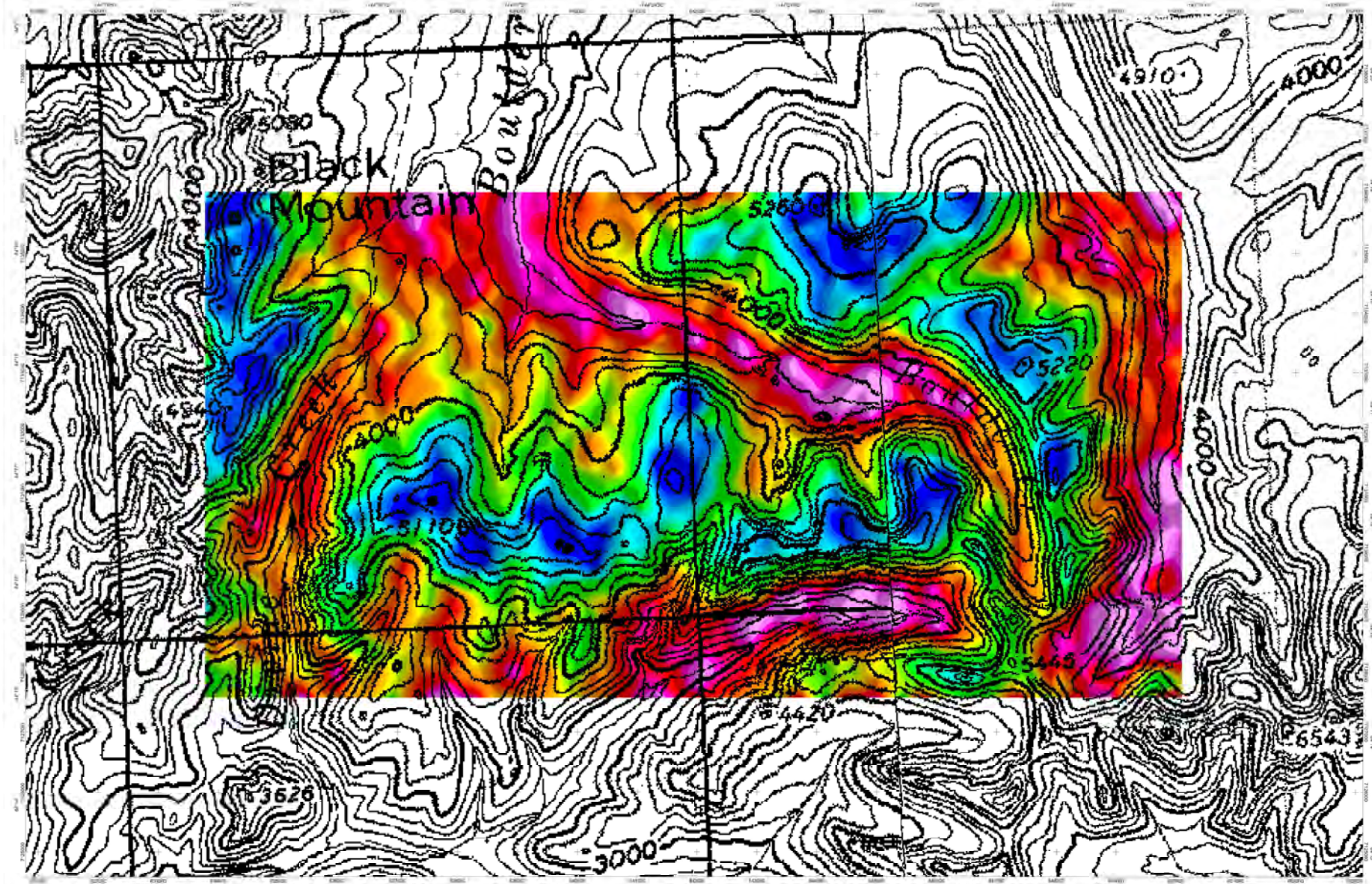
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ratio Thorium / Potassium Map

Eisen Infill Survey Block

Geophysical Report 2022-1



ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

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Ennsel, A.M., and M.P. Geophysics LTD, 2022. Tanana River and Big Delta airborne magnetic and radiometric survey. Alaska Division of Geological & Geophysical Surveys (unpublished report 2022-1). <https://doi.org/10.14309/50099>

LEGEND

Survey Date: May-August 2022
Fixed-Wing Aircraft Type: Piper Navajo PA31
Registration: C-AGNP

SURVEY PARAMETERS

Aircraft Survey Mode: Topographic
Terrain Line Direction/Spacing: 100 m
Control Line Direction/Spacing: 100 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Sauer C-2
Cryogenic: Yes/Single
Sampling Rate: 20 readings/second
Gain: 100 nT

NAVIGATION: Sauer L112 GPS

Real-time differential corrected.
Sampling Rate: 10 readings/second

GAMMA-RAY SPECTROMETER:

RSS-3 multi-channel NaI sensors with
20 nT electronic tracking and 0.1 nT
"zero-drift" tracking

BASE STATION MAGNETOMETER:

GM 1550-1570
Sampling Rate: 1 reading/second
Sensitivity: 0.02 nT

Ratio Uranium / Potassium

(ppm ppm) %K

1.00 2.01 2.00 3.01 4.26 4.54 4.99 5.34 5.72 5.14 5.97 7.20 9.70

100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000 4100 4200 4300 4400 4500 4600 4700 4800 4900 5000 5100 5200 5300 5400 5500 5600 5700 5800 5900 6000 6100 6200 6300 6400 6500 6600 6700 6800 6900 7000 7100 7200 7300 7400 7500 7600 7700 7800 7900 8000 8100 8200 8300 8400 8500 8600 8700 8800 8900 9000 9100 9200 9300 9400 9500 9600 9700 9800 9900 10000

Scale 1:25000

100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000 4100 4200 4300 4400 4500 4600 4700 4800 4900 5000 5100 5200 5300 5400 5500 5600 5700 5800 5900 6000 6100 6200 6300 6400 6500 6600 6700 6800 6900 7000 7100 7200 7300 7400 7500 7600 7700 7800 7900 8000 8100 8200 8300 8400 8500 8600 8700 8800 8900 9000 9100 9200 9300 9400 9500 9600 9700 9800 9900 10000

100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000 4100 4200 4300 4400 4500 4600 4700 4800 4900 5000 5100 5200 5300 5400 5500 5600 5700 5800 5900 6000 6100 6200 6300 6400 6500 6600 6700 6800 6900 7000 7100 7200 7300 7400 7500 7600 7700 7800 7900 8000 8100 8200 8300 8400 8500 8600 8700 8800 8900 9000 9100 9200 9300 9400 9500 9600 9700 9800 9900 10000

Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



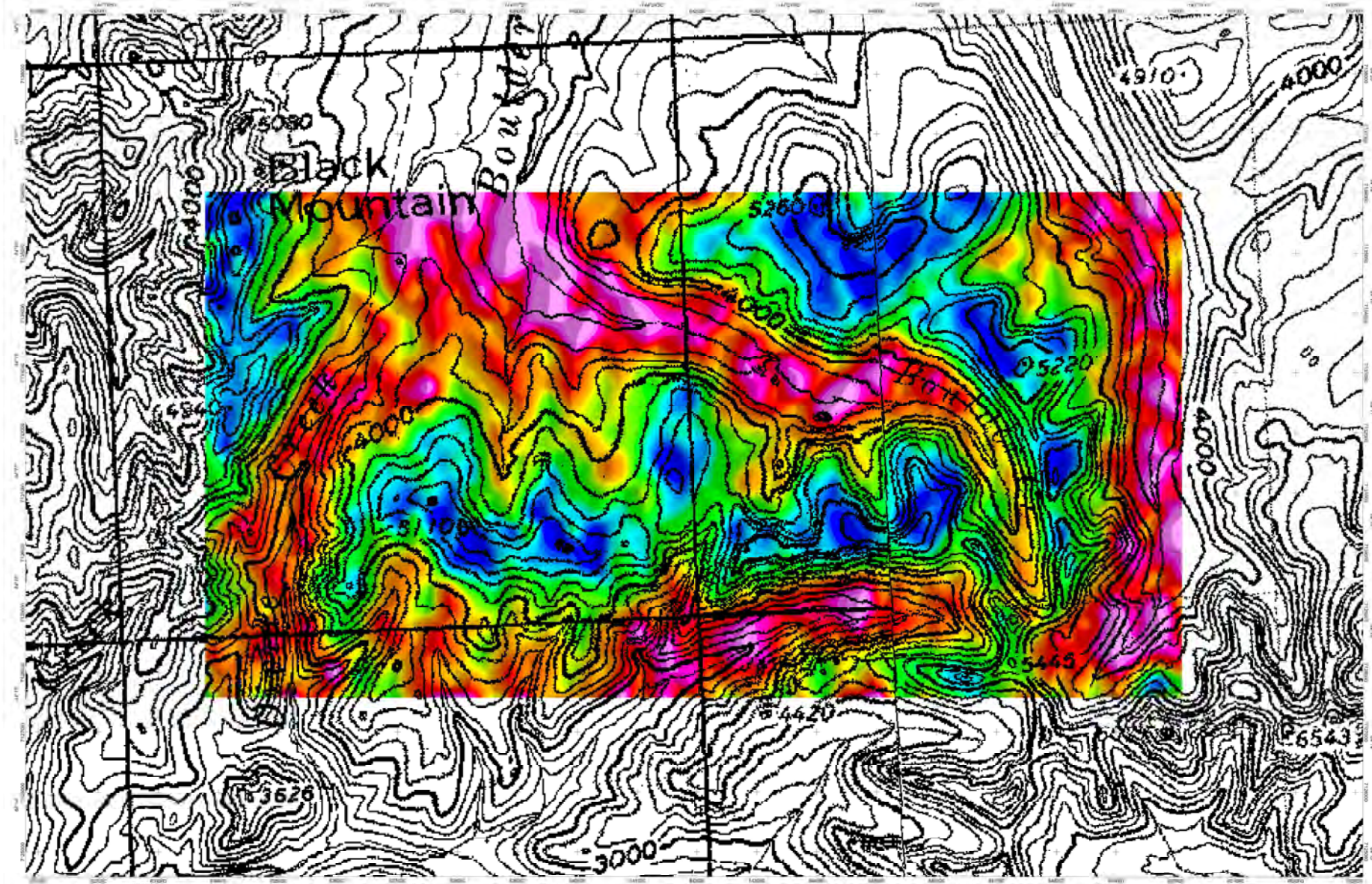
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ratio Uranium / Potassium Map

Eisen Infill Survey Block

Geophysical Report 2022-1



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Ennsel, A.M., and M.P. Geophysics LTD. 2022. Tanana River and Big Delta airborne magnetic and radiometric survey. Alaska Division of Geological & Geophysical Surveys Contribution Report 2022-1. <https://doi.org/10.14309/50099>

LEGEND

Survey Date: May-August 2022
Fixed-Wing Aircraft Type: Piper Navajo PA31
Registration: C-AGNP

SURVEY PARAMETERS

Aircraft Survey Mode: Topcon Line Direction/Spacing
Control Line Direction/Spacing

AIRBORNE SYSTEMS:

MAGNETOMETER: Sauer C-2
Configuration: Yagi-Stinger
Sampling Rate: 20 readings/second
Gain: 10.0 x1

NAVIGATION: Sauer L11.2 GPS

Real-time differential correction
Sampling Rate: 10 readings/second

GAMMA-RAY SPECTROMETER:

RSS-3 multi-channel NaI sensors with
2.0 x 1.0 "electronic binning" and 6 x 1.0
"superbin binning"
Sampling Rate: 1 reading/second

ALTIMETER:

Sears 216 Pressure Transducer
Sampling Rate: 10 readings/second

Ratio Uranium / Thorium

u/gm / mgTh/gpm

0.31 0.47 0.52 0.58 0.65 0.73 0.80 0.87 0.96 1.04 1.14 1.26 1.42 2.61

Scale 1:25000

Scale 1:25000

Scale 1:25000

Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



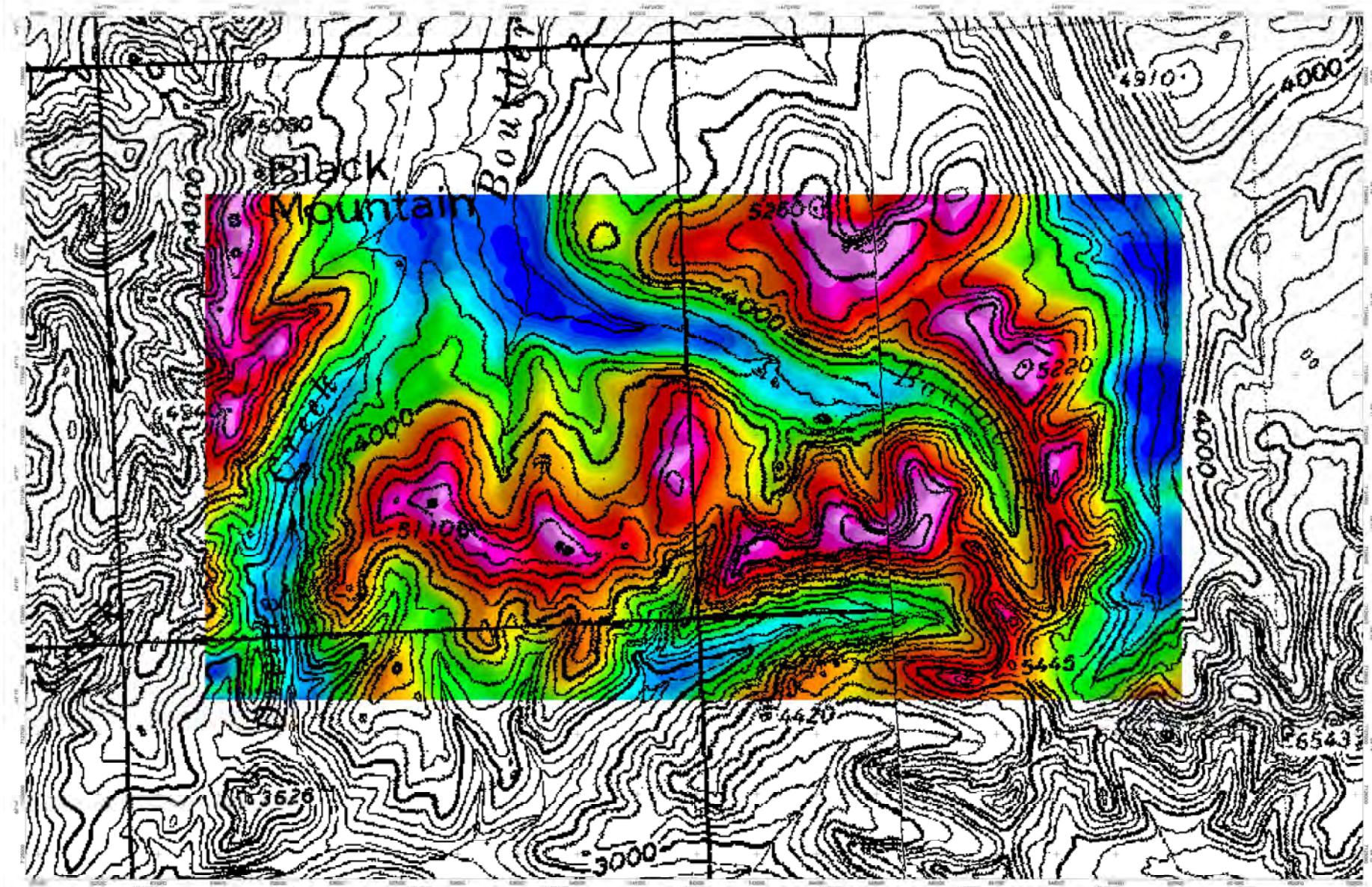
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ratio Uranium / Thorium Map

Eisen Infill Survey Block

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LEGEND

Survey Date: May-August 2022
Fixed-Wing Aircraft Type: Piper Navajo PA31
Registration: C-AGNP

SURVEY PARAMETERS

Aircraft Survey Mode: Topcon Line Direction/Spacing
Control Line Direction/Spacing

AIRBORNE SYSTEMS:

MAGNETOMETER: Sauer C-2
Cryogenic Unit: Yoti-Singer
Sampling Rate: 20 readings/second
Geometric: 30 ft x 1 ft

NAVIGATION: Sauer L11.2 GPS

Real-time differential correction
Sampling Rate: 10 readings/second

GAMMA-RAY SPECTROMETER:

RSS-3 multi-channel NaI sensors with
2.0 m L-shaped collimator and 6.5 ft
"seawater" tanking
Sampling Rate: 1 reading/second

ALTIMETERS:

Sears 216 Pressure Transducer
Sampling Rate: 10 readings/second

Total Air Absorbed Dose Rate

(mGy/yr)

18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72

Scale 1:25000

0 500 1000 1500

Vertical scale 1:100000

Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



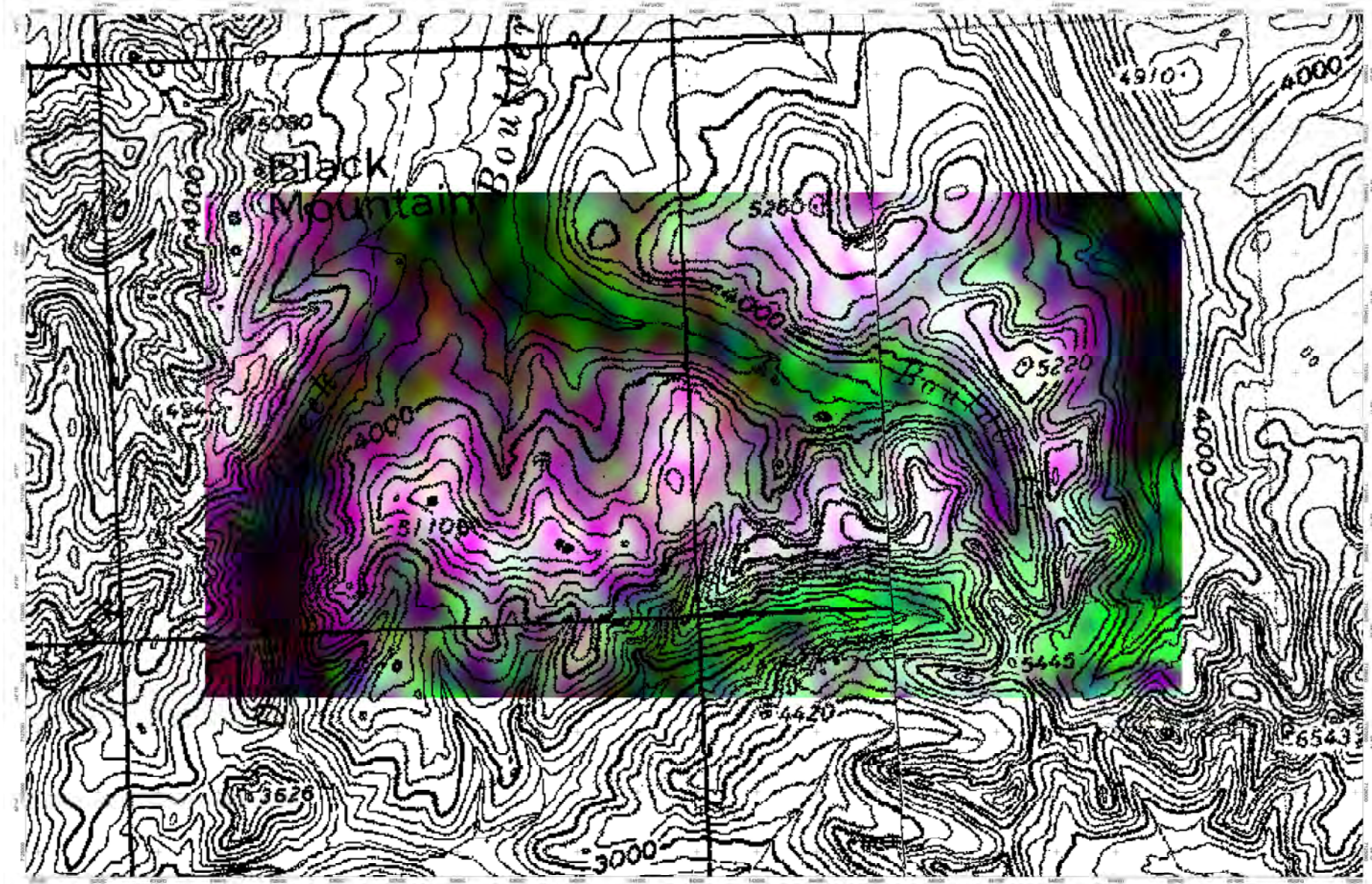
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Total Air Absorbed Dose Rate Map

Eisen Infill Survey Block

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Unusual, 4-M, and MPX Geophysics LTD. 2022. Tanana River and Big Delta airborne magnetic and radiometric survey. Alaska Division of Geological & Geophysical Surveys (Geophysical Report 2022-1. <https://doi.org/10.14300/30009>

LEGEND

Survey Date: May-August 2022
Fixed-Wing Aircraft Type: Piper Navajo PA31
Registration: C-AGNP

SURVEY PARAMETERS

Aircraft Survey Mode: Topcon Line Director/Spacing
Control Line Director/Spacing

AIRBORNE SYSTEMS:

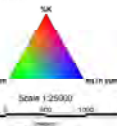
MAGNETOMETER: SQUID CS-2
Configuration: Yaw-Steer
Sampling Rate: 20 readings/second
Geometric: 10 ft x 1 ft

NAVIGATION: SQUID L1/L2 GPS

Real-time differential corrected
Sampling Rate: 10 readings/second

GAMMA-RAY SPECTROMETER:
RSS-3 multi-channel NaI sensors with
2.0 ft L-shaped sensors (backing: lead 8 ft L
"seawater backing")
Sampling Rate: 1 reading/second

ALTIMETER: SQUID 276 Pressure Transducer



Base map: USGS 1:250,000-scale topographic map
Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



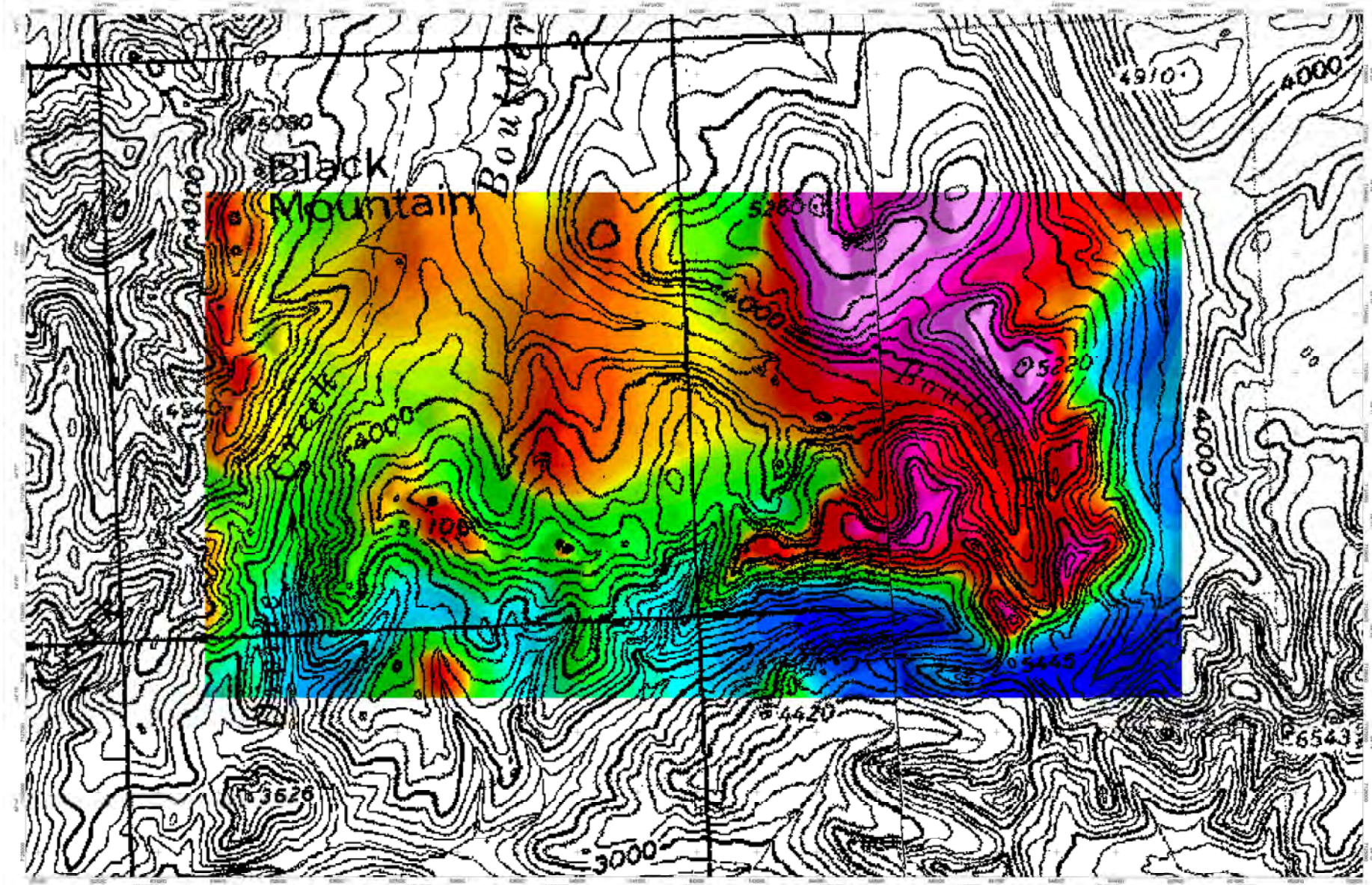
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ternary Map

Eisen Infill Survey Block

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LEGEND

Survey Date: May-August 2022
Fixed-Wing Aircraft Type: Piper Navajo PA31
Registration: C-AGNP

SURVEY PARAMETERS

Aircraft Survey Mode: Dragside
Terrain Line Direction/Spacing: 90°/100 m
Control Line Direction/Spacing: 90°/100 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Sauer C-2
Cryogenic: Yes/Single
Sampling Rate: 20 readings/second
Gain: 10.0 nT

NAVIGATION: Swad 111.2 GPS

Real-time differential corrected
Sampling Rate: 10 readings/second

GAMMA-RAY SPECTROMETER:
RSS-3 multi-channel NaI sensors with
2.0 m L-shaped sensors (backing: lead 9.1 m)
Sampling Rate: 1 reading/second

ALTIMETER: Sauer 216 Pressure Transducer

Sampling Rate: 10 readings/second

Residual Magnetic Intensity

(nT)

Scale 1:25000

Scale 1:25000

Scale 1:25000

Scale 1:25000

Scale 1:25000

Scale 1:25000

Scale 1:25000

Scale 1:25000

Scale 1:25000

Scale 1:25000

Scale 1:25000

Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



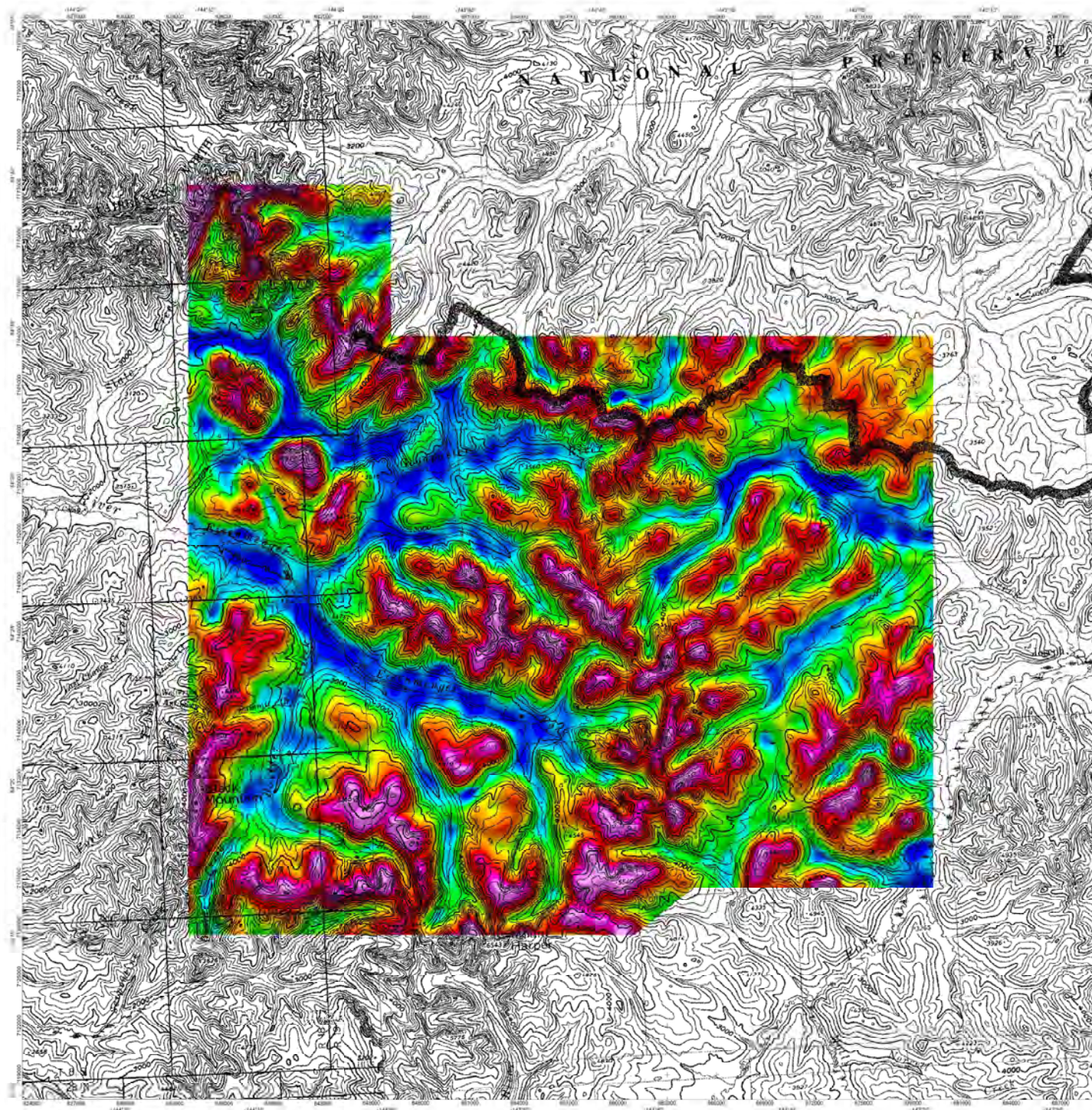
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Residual Magnetic Intensity Map

Eisen Infill Survey Block

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Website: <https://dggs.alaska.gov/>

LEGEND

Survey Date: May-August 2021
Form-Wing Aircraft Type: Piper Navajo PA31
Registration: C40JVP

SURVEY PARAMETERS:
Magnetic Survey Mode: Drone 3D compound at 100 m
Inverse Line Direction Spacing: 90°(E-W) / 400 m
Control Line Direction Spacing: 180°(N-S) / 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scaires CS-2
Configuration: Tail-Mounted
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

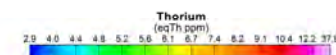
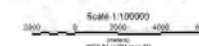
NAVIGATION: Novad L1/L2 GPS
Real-time differentially corrected
Sampling Rate: 10 readings/second

BASE STATION MAGNETOMETER:
GEM USM-01FW
Sampling Rate: 1 reading/second
Sensitivity: 0.02 nT

GAMMA-RAY SPECTROMETER:
RSX-5 multi-channel NaI scintillators with
73.6 L "downward looking" and 8.1 L
"upward looking"
Sampling Rate: 1 reading/second

ALTIMETERS:
Sears 276 Pressure Transducer
Sampling Rate: 10 readings/second
Radar: Benthos King KKA-10A
Sampling Rate: 20 readings/second

This work was supported by the U.S. Geological Survey's Earth MRI program
Enond, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne
magnetic and radiometric survey; Alaska Division of Geological & Geophysical Surveys
Geophysical Report 2022-1. <https://doi.org/10.14509/30899>



Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



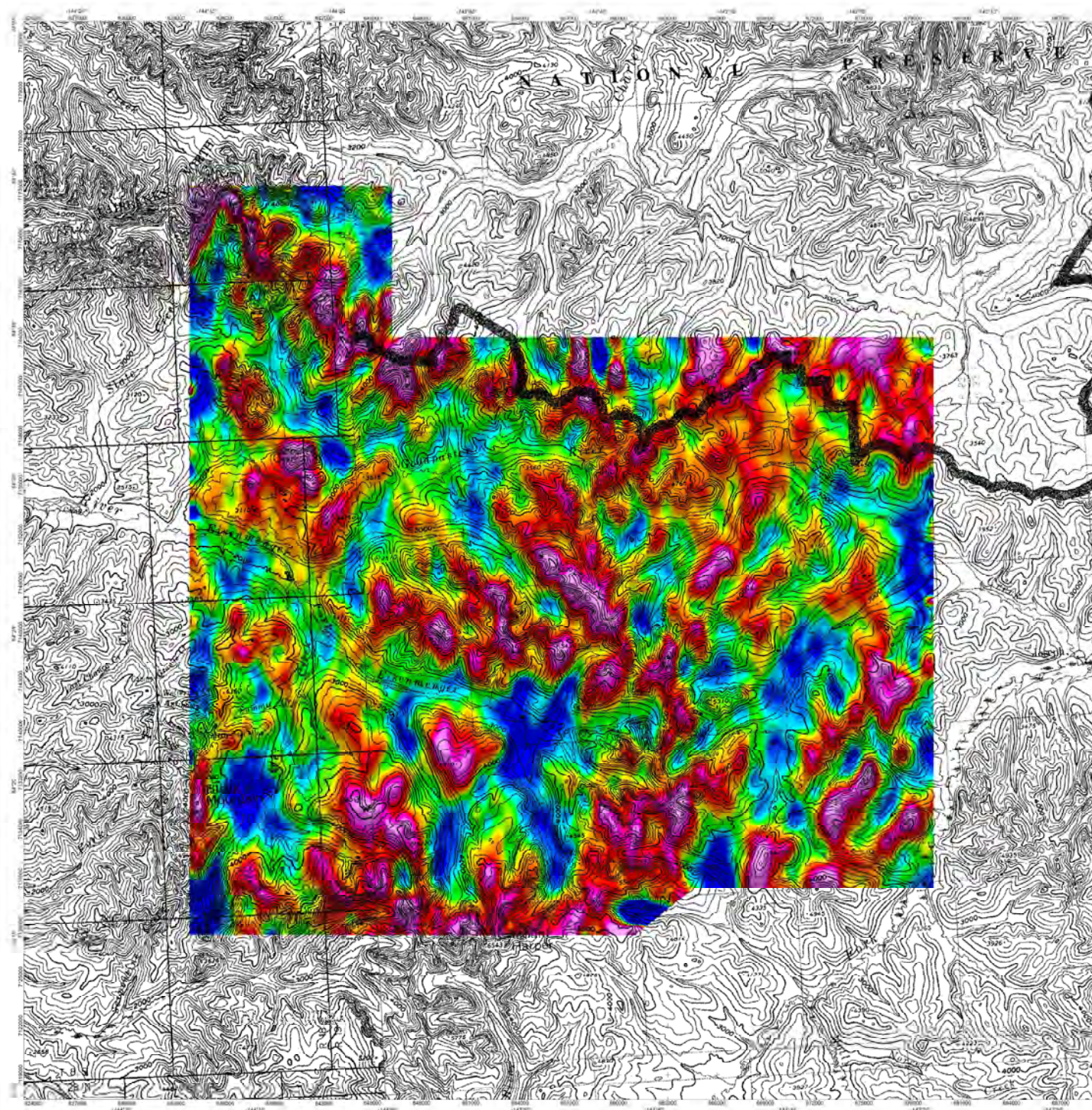
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Thorium Map

Eisen Survey Block

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LEGEND

Survey Date: May-August 2021
Form-Wing Aircraft Type: Piper Navajo PA31
Registration: C40JVP

SURVEY PARAMETERS:
Magnetic Survey Mode: Drone 3D compound at 100 m
Inverse Line Direction Spacing: 90°(E-W) / 400 m
Control Line Direction Spacing: 180°(N-S) / 2400 m

AIRBORNE SYSTEMS:

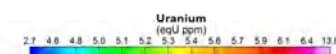
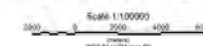
MAGNETOMETER: Scaires CS-2
Configuration: Tail-Mounted
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

GAMMA-RAY SPECTROMETER:
RSX-5 multi-channel NaI scintillators with
13.6 L "downward looking" and 8.1 L
"upward looking"
Sampling Rate: 1 reading/second

NAVIGATION: Novad L1/L2 GPS
Real-time differentially corrected
Sampling Rate: 10 readings/second

ALTIMETERS:
Sears 276 Pressure Transducer
Sampling Rate: 10 readings/second
RADIO STATION MAGNETOMETER:
GEM USM-01FW
Sampling Rate: 1 reading/second
Sensitivity: 0.02 nT

This work was supported by the U.S. Geological Survey's Earth MRI program
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Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



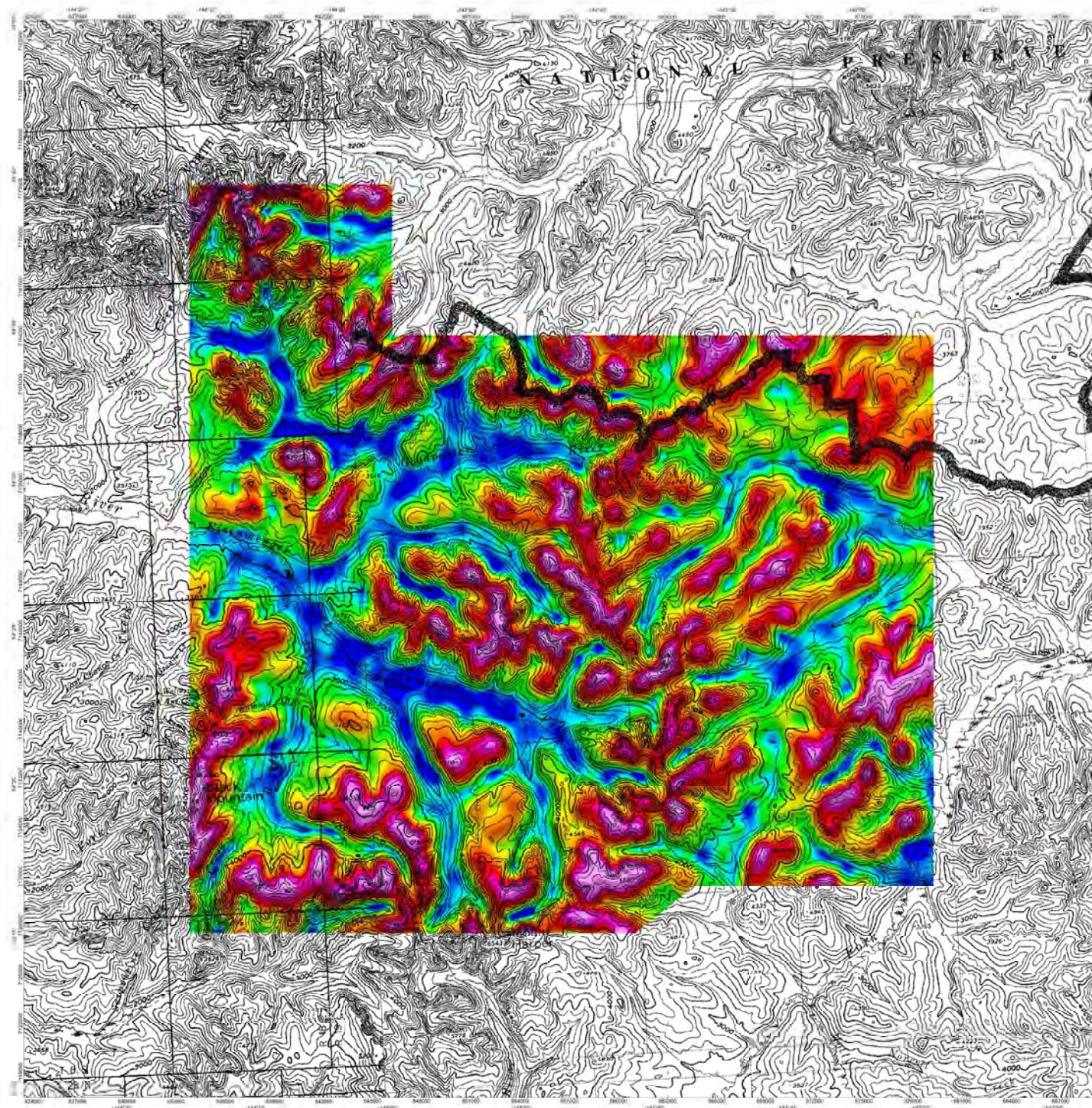
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Uranium Map

Eisen Survey Block

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Website: <https://dggs.alaska.gov/>

LEGEND

Survey Date: May-August 2021
Form-Wing Aircraft Type: Piper Navajo PA31
Registration: C40JVP

SURVEY PARAMETERS:
Magnetic Survey Mode: Drone 3D compound at 100 m
Inverse Line Direction Spacing: 90°(E-W) / 400 m
Control Line Direction Spacing: 180°(N-S) / 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scaires CS-2
Configuration: Tail-Mounted
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

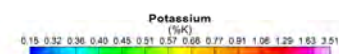
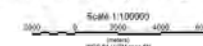
GAMMA-RAY SPECTROMETER:
RSX-5 multi-channel NaI scintillators with
73.6 L "downward looking" and 8.1 L
"upward looking"
Sampling Rate: 1 reading/second

NAVIGATION: Novad L1/L2 GPS
Real-time differentially corrected
Sampling Rate: 10 readings/second

ALTIMETERS:
Scaires 276 Pressure Transducer
Sampling Rate: 10 readings/second
Radar: Benthos King KKA-10A
Sampling Rate: 20 readings/second

RADIO STATION MAGNETOMETER:
GEM USM-01FW
Sampling Rate: 1 reading/second
Sensitivity: 0.002 nT

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Enmond, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne
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Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



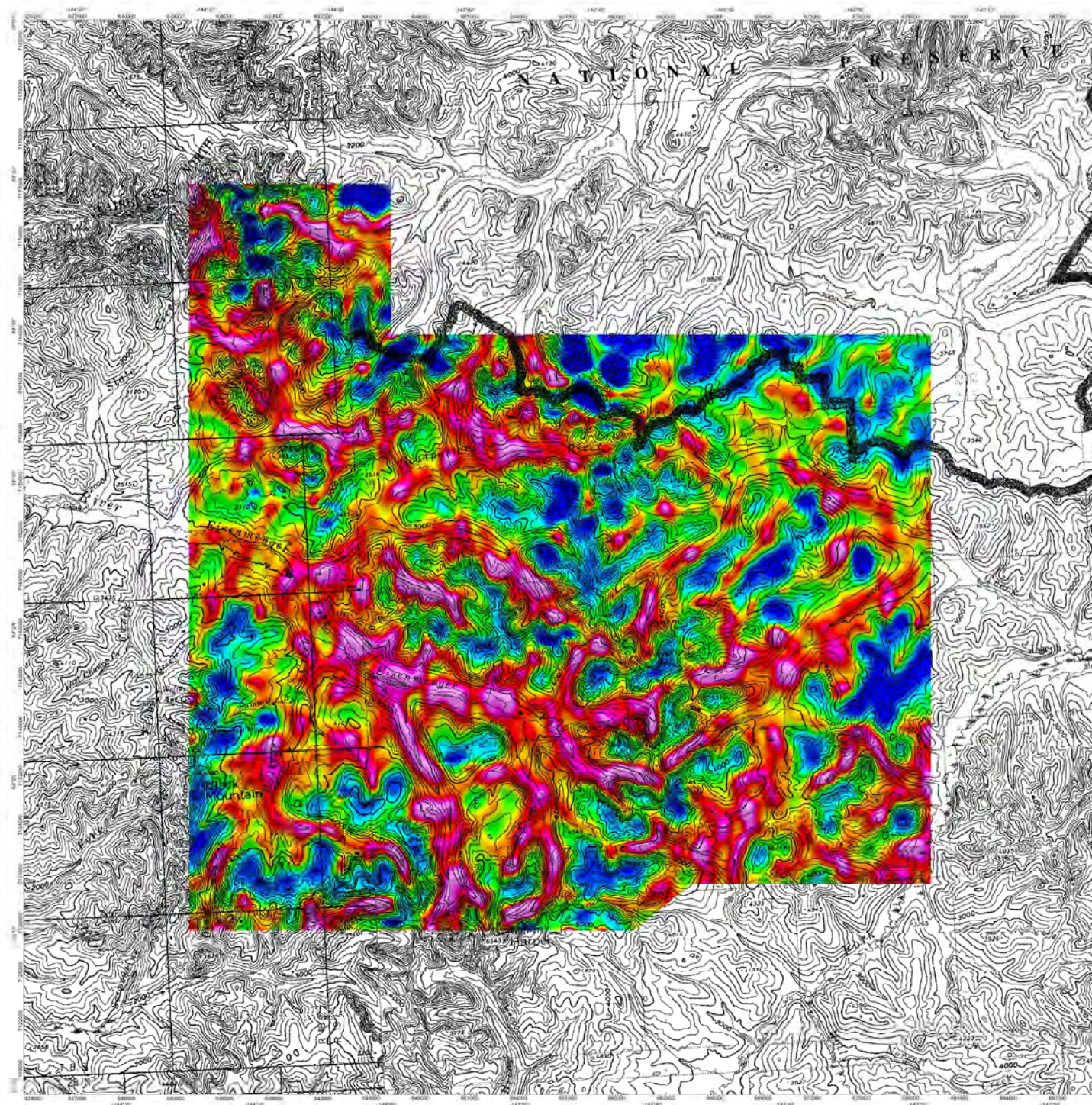
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Potassium Map

Eisen Survey Block

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Phone: +1 907 451-5000
Website: <https://dggg.alaska.gov/>

LEGEND

Survey Date: May-August 2021
Form-Wing Aircraft Type: Piper Navajo PA31
Registration: C40JVP

SURVEY PARAMETERS:
Magnetic Survey Mode: Drape 3D compound at 100 m
Inverse Line Direction Spacing: 90°(E-W) / 400 m
Control Line Direction Spacing: 180°(N-S) / 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintrex CS-2
Configuration: Tail-Mounted
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

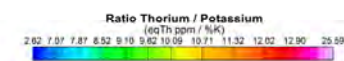
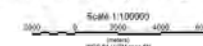
GAMMA-RAY SPECTROMETER:
RSX-5 multi-channel NaI scintillators with
13.6 L "downward looking" and 8.1 L
"upward looking"
Sampling Rate: 1 reading/second

NAVIGATION: Novatel L1/L2 GPS
Real-time differentially corrected
Sampling Rate: 10 readings/second

ALTIMETERS:
Scintrex 276 Pressure Transducer
Sampling Rate: 10 readings/second
Radar: Benthos King KKA-10A
Sampling Rate: 20 readings/second

RADIO STATION MAGNETOMETER:
GEM USM-01FW
Sampling Rate: 1 reading/second
Sensitivity: 0.002 nT

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Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
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Regional Location Map



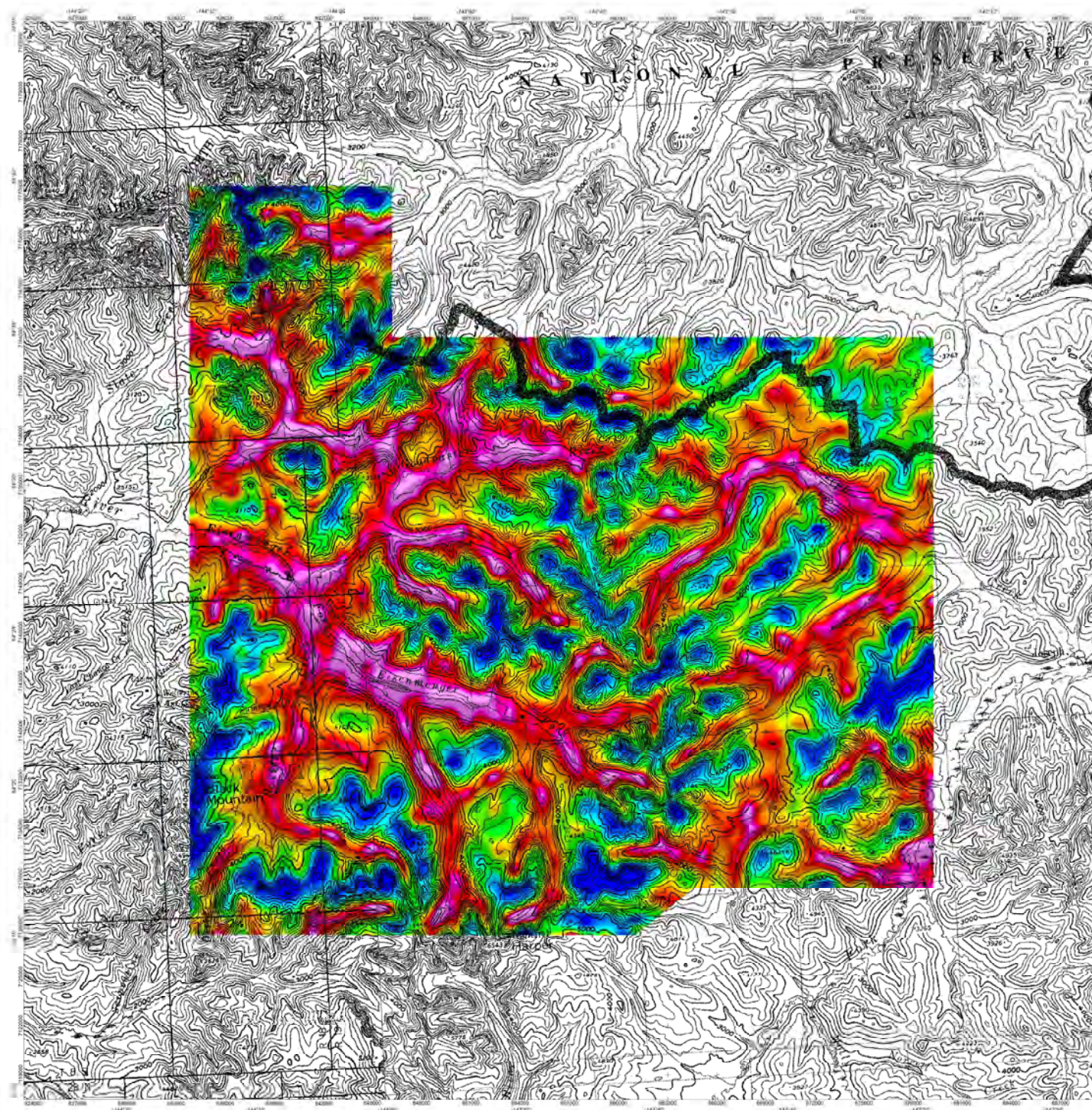
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ratio Thorium / Potassium Map

Eisen Survey Block

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LEGEND

Survey Date: May-August 2021
Form-Wing Aircraft Type: Piper Navajo PA31
Registration: C40JVP

SURVEY PARAMETERS:
Magnetic Survey Mode: Drone 3D compound at 100 m
Inverse Line Direction Spacing: 90°(E-W) / 400 m
Control Line Direction Spacing: 180°(N-S) / 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintrex CS-2
Configuration: Tail-Mounted
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

GAMMA-RAY SPECTROMETER:
RSNA-5 multiscanned NaI scintillators with
73.6 L "downward looking" and 8.1 L
"upward looking"
Sampling Rate: 1 reading/second

NAVIGATION: Novatel L1/L2 GPS
Real-time differentially corrected
Sampling Rate: 10 readings/second

ALTIMETERS:
Scintrex 276 Pressure Transducer
Sampling Rate: 10 readings/second
Radar: Benthos King KKA-10A
Sampling Rate: 20 readings/second

**RADIO STATION
MAGNETOMETER:**
GEM USM-01FW
Sampling Rate: 1 reading/second
Sensitivity: 0.002 nT

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Scale 1:100,000
0 2000 4000 6000
Meters / Feet

Ratio Uranium / Potassium
(eqU ppm / %K)
1.06 3.72 4.56 5.34 6.19 7.12 8.10 9.12 10.17 11.64 13.20 31.41

Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



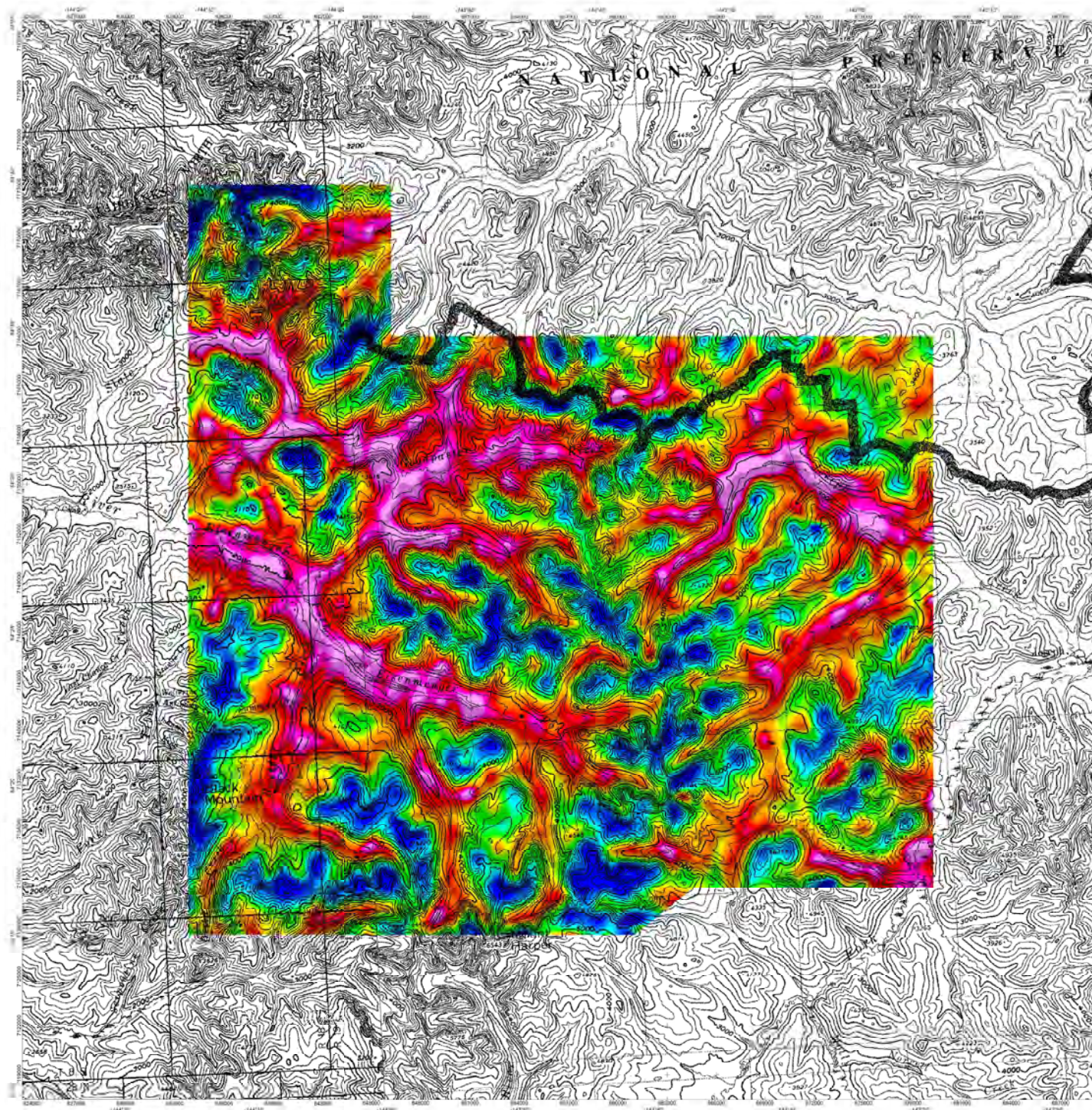
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ratio Uranium / Potassium Map

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 Website: <https://dggg.alaska.gov/>

LEGEND

Survey Date: May-August 2021
 Form: Wing Aircraft Type: Piper Navajo PA31
 Registration: C40JVP

SURVEY PARAMETERS:
 Aircraft Survey Mode: Drone 3D compound at 100 m
 Offense Line Direction/Spacing: 90°(E-W) / 400 m
 Control Line Direction/Spacing: 180°(N-S) / 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scaires CS-2
 Configuration: Tail-Mounted
 Sampling Rate: 20 readings/second
 Sensitivity: 0.01 nT

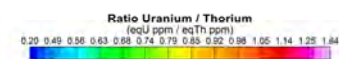
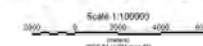
NAVIGATION: Novatel L1/L2 GPS
 Real-time differentially corrected
 Sampling Rate: 10 readings/second

BASE STATION MAGNETOMETER:
 GEM USM-01FW
 Sampling Rate: 1 reading/second
 Sensitivity: 0.002 nT

GAMMA-RAY SPECTROMETER:
 RSX-5 multi-channel NaI scintillators with
 13.6 L "downward looking" and 8.1 L
 "upward looking"
 Sampling Rate: 1 reading/second

ALTIMETERS:
 Scaires 276 Pressure Transducer
 Sampling Rate: 10 readings/second
 Radar: Benthos King KKA-10A
 Sampling Rate: 20 readings/second

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Base map: USGS 1:250,000-scale topographic map.

Location of the Tanana River and Big Delta survey areas in Alaska and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



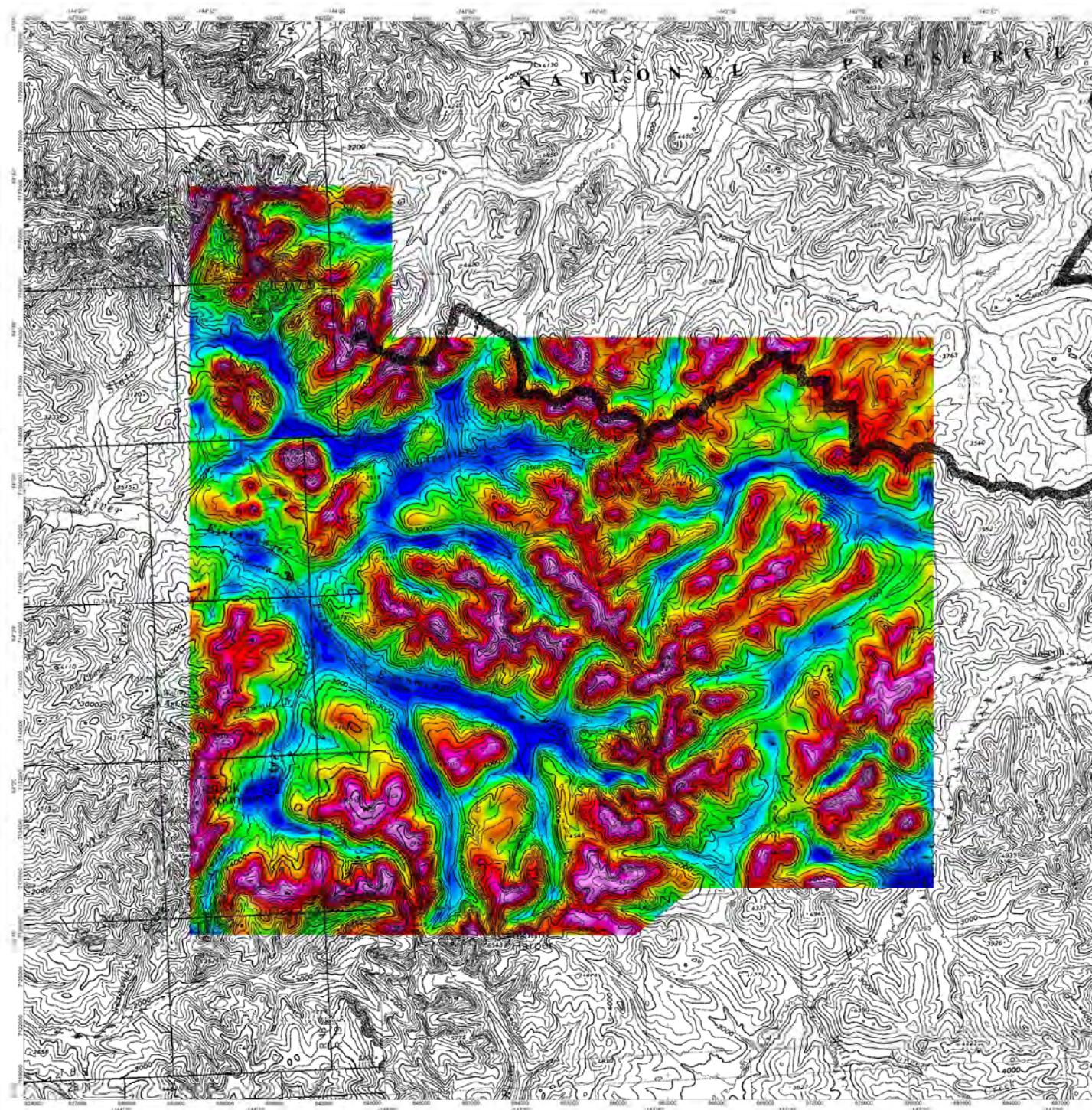
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ratio Uranium / Thorium Map

Eisen Survey Block

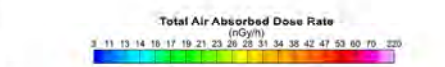
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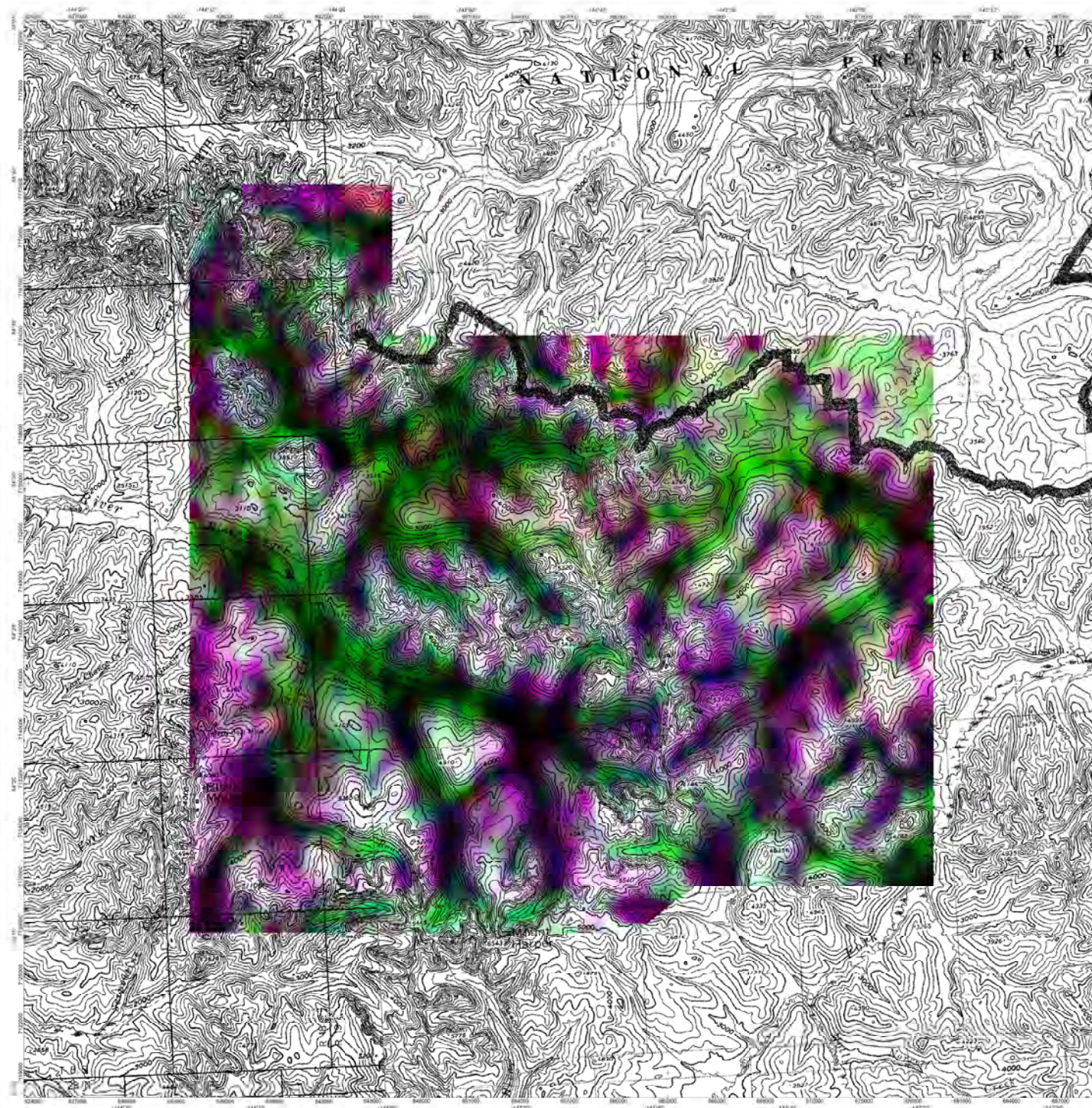
LEGEND	
Survey Date:	May-August 2021
Fixed-Wing Aircraft Type:	Piper Navajo PA31
Registration:	C40JVP
SURVEY PARAMETERS:	
Altitude Survey Mode:	Drift 3D computed at 100 m
Offshore Line Direction/Spacing:	90°(E-W) / 400 m
Control Line Direction/Spacing:	180°(N-S) / 2400 m
AIRBORNE SYSTEMS:	
MAGNETOMETER: Scaires CS-2	
Configuration:	Tail-Mounted
Sampling Rate:	20 readings/second
Sensitivity:	0.01 nT
NAVIGATION: Novad L1/L2 GPS	
Real-time differentially corrected	
Sampling Rate:	10 readings/second
RADIO STATION MAGNETOMETER:	
GEM USM-01FW	
Sampling Rate:	1 reading/second
Sensitivity:	0.002 nT
GAMMA-RAY SPECTROMETER:	
RSX-5 multi-channel NaI scintillators with 13 x 1 "downward looking" and 8 x 11 "upward looking"	
Sampling Rate:	1 reading/second
ALTIMETERS:	
Sears 276 Pressure Transducer	
Sampling Rate:	10 readings/second
Radar: Benthos King KKA-10A	
Sampling Rate:	20 readings/second

This work was supported by the U.S. Geological Survey's Earth MRI program
 Enond, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne
 magnetic and radiometric survey; Alaska Division of Geological & Geophysical Surveys
 Geophysical Report 2022-1. <https://doi.org/10.14509/30899>



Base map: USGS 1:250,000-scale topographic map
 Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles





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LEGEND

Survey Date: May-August 2021
Form-Wing Aircraft Type: Piper Navajo PA31
Registration: C40JVP

SURVEY PARAMETERS:
Magnetic Survey Mode: Drape 3D computed at 100 m
Inverse Line Direction Spacing: 90° (E-W) / 400 m
Control Line Direction Spacing: 180° (N-S) / 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scaires CS-2
Configuration: Tail-Stinger
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

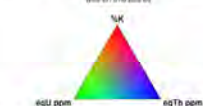
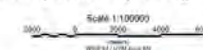
GAMMA-RAY SPECTROMETER:
RSX-5 multichannel NaI scintillators with
73.6 L "downward looking" and 8.1 L
"upward looking"
Sampling Rate: 1 reading/second

NAVIGATION: Novatel L1/L2 GPS
Real-time differentially corrected
Sampling Rate: 10 readings/second

ALTIMETERS:
Sears 276 Pressure Transducer
Sampling Rate: 10 readings/second
Radar: Benthos King KKA-10A
Sampling Rate: 20 readings/second

**RADIO STATION
MAGNETOMETER:**
GEM USM-01FW
Sampling Rate: 1 reading/second
Sensitivity: 0.002 nT

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Geophysical Report 2022-1, <https://doi.org/10.14509/30899>



Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



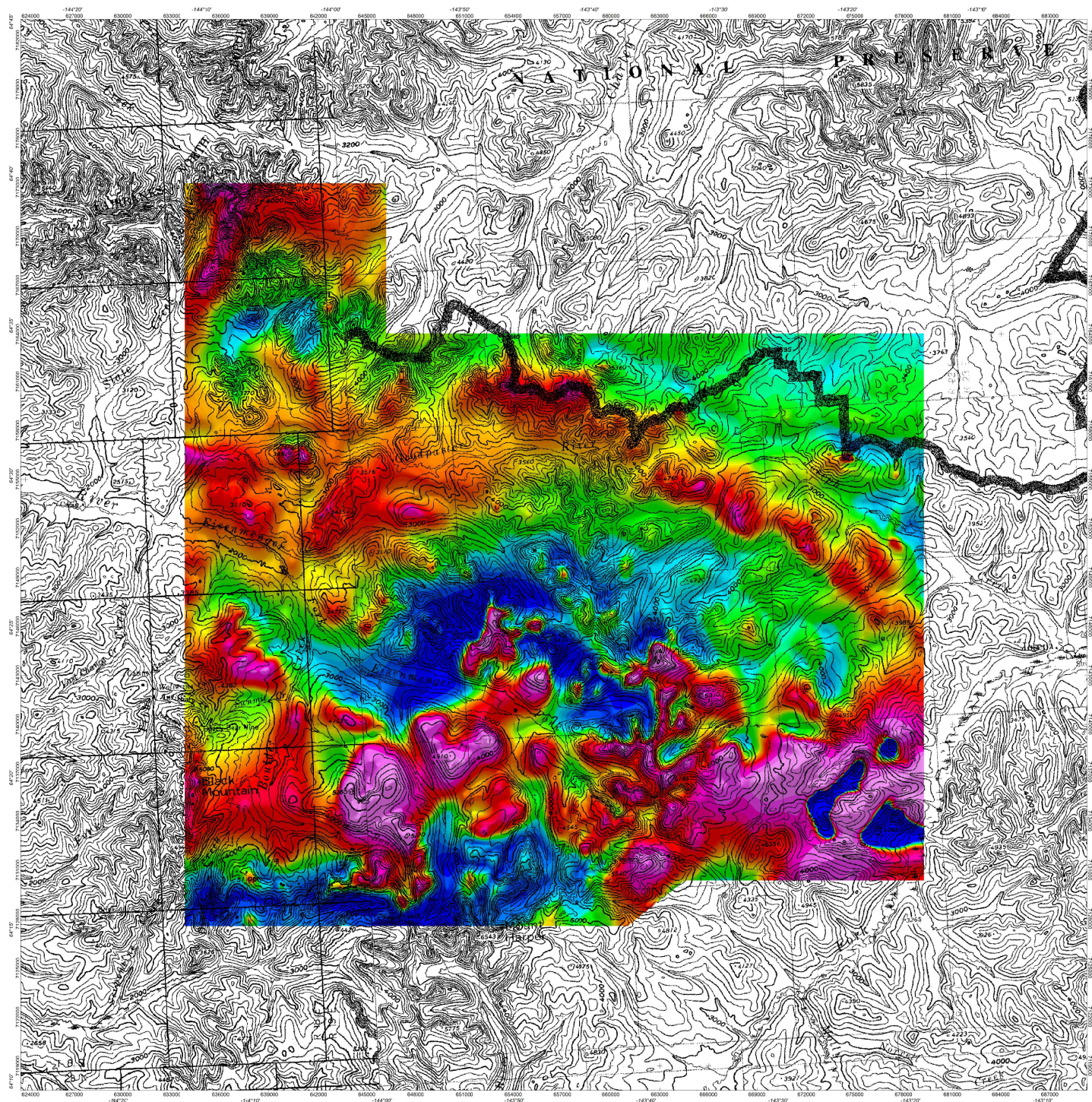
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ternary Map

Eisen Survey Block

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Phone: +1 907 451-5000
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LEGEND

Survey Date: May-August 2022
Fixed-Wing Aircraft Type: Piper Navajo PA31
Registration: C-GQVP

SURVEY PARAMETERS:
Altitude Survey Mode: Drone 3D computed at 100 m
Traverse Line Direction/Spacing: 90°(E-W) / 400 m
Control Line Direction/Spacing: 180°(N-S) / 1400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scaintex CS-3

Configuration: Tail-Stinger
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel NaI sensors with
33 s L "downwards looking" and 8.1 L
"upwards looking"

Sampling Rate: 1 reading/second

NAVIGATION: Novat L1/L2 GPS

Real-time differentially corrected
Sampling Rate: 10 readings/second

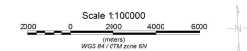
BASE STATION

MAGNETOMETER:
GEM GSM-19TW
Sampling Rate: 1 reading/second
Sensitivity: 0.022 nT

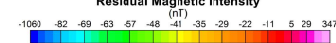
ALTIMETERS:

Sotra 276 Pressure Transducer
Sampling Rate: 10 readings/second
Radar: Bendix King 8RA-10A
Sampling Rate: 20 readings/second

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Residual Magnetic Intensity

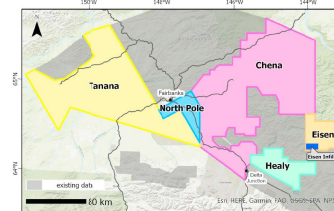


Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



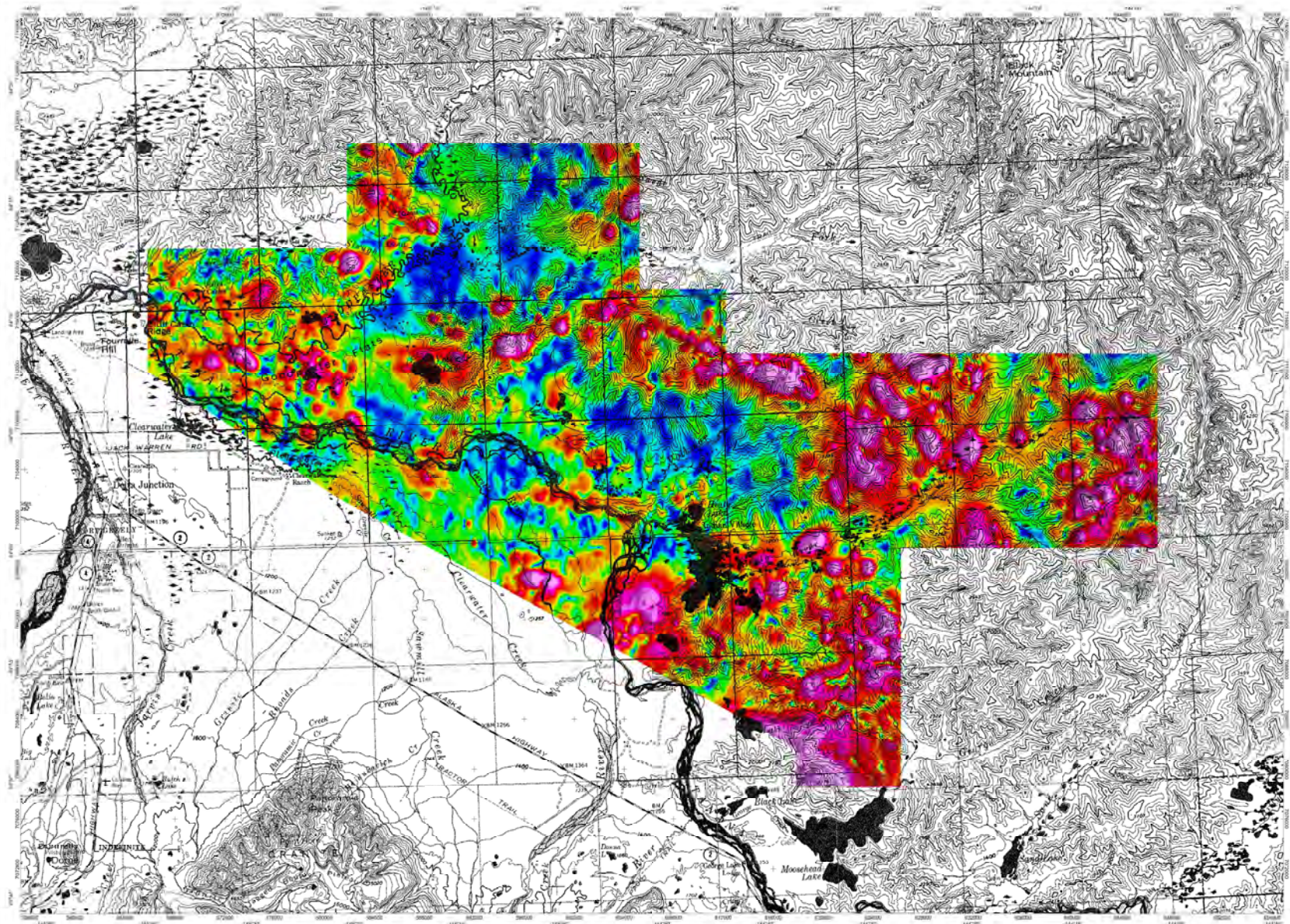
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Residual Magnetic Intensity Map

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LEGEND

Survey Date: May-August 2022
Field Area: Arctic Time
Registration: C-0077

SURVEY PARAMETERS

Altitude Survey Mode: UTM
Trimble Line Direction/Spacing: 100/150 ft
100/150 ft - 2000 ft

AIRBORNE SYSTEMS:

MAGNETOMETER: SQUID CS-3
Configuration: 1 m/10 m
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

NAVIGATION: Novatel L1/L2 GPS

Real-time differentially corrected
Sampling Rate: 50 readings/second

Analytic Signal
nT (mT)



Scale 1:25000

WGS 84 / UTM zone 18N

Base map: USGS 1:370,000 scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska

and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



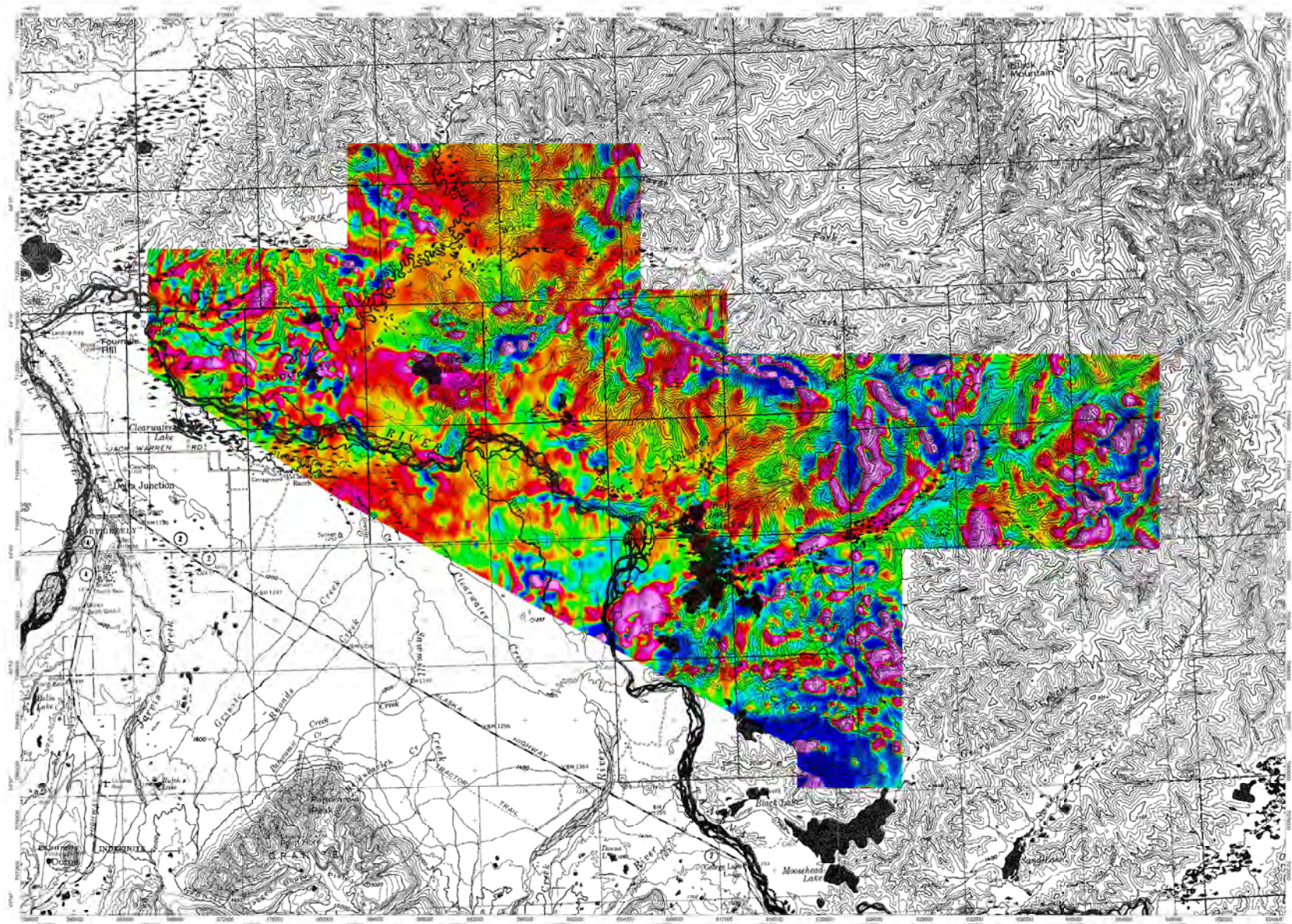
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Analytic Signal Map

Healy Survey Block

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LEGEND

Survey Date: May-August 2022
Field Area: Arctic Time
Registration: C-0077

SURVEY PARAMETERS:
Altitude Survey Mode: UTM 1000m x 1000m
Terrain Line Direction/Spacing: 100/100m - 2000m

AIRBORNE SYSTEMS:

MAGNETOMETER: SQUID CS-3
Configuration: 1m/10m
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

NAVIGATION: Novatel L1/L2 GPS
Real-time differential correction
Sampling Rate: 50 readings/second

GAMMA RAY SPECTROMETER:
PSS-3 (multi-channel) bed sensors with
13.6 L "downward looking" and 8.1 L
"upward looking".
Sampling Rate: 1 reading/second

ALTIMETER:
Sona 276 Pressure Transducer

Calculated 1st Vertical Derivative
(nT/m)
-0.073 -0.029 -0.015 -0.008 -0.003 0.002 0.006 0.014 0.189

Scale 1:125000
WGS 84 / UTM zone 6N

Base map: USGS 1:370,000 scale topographic map
Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



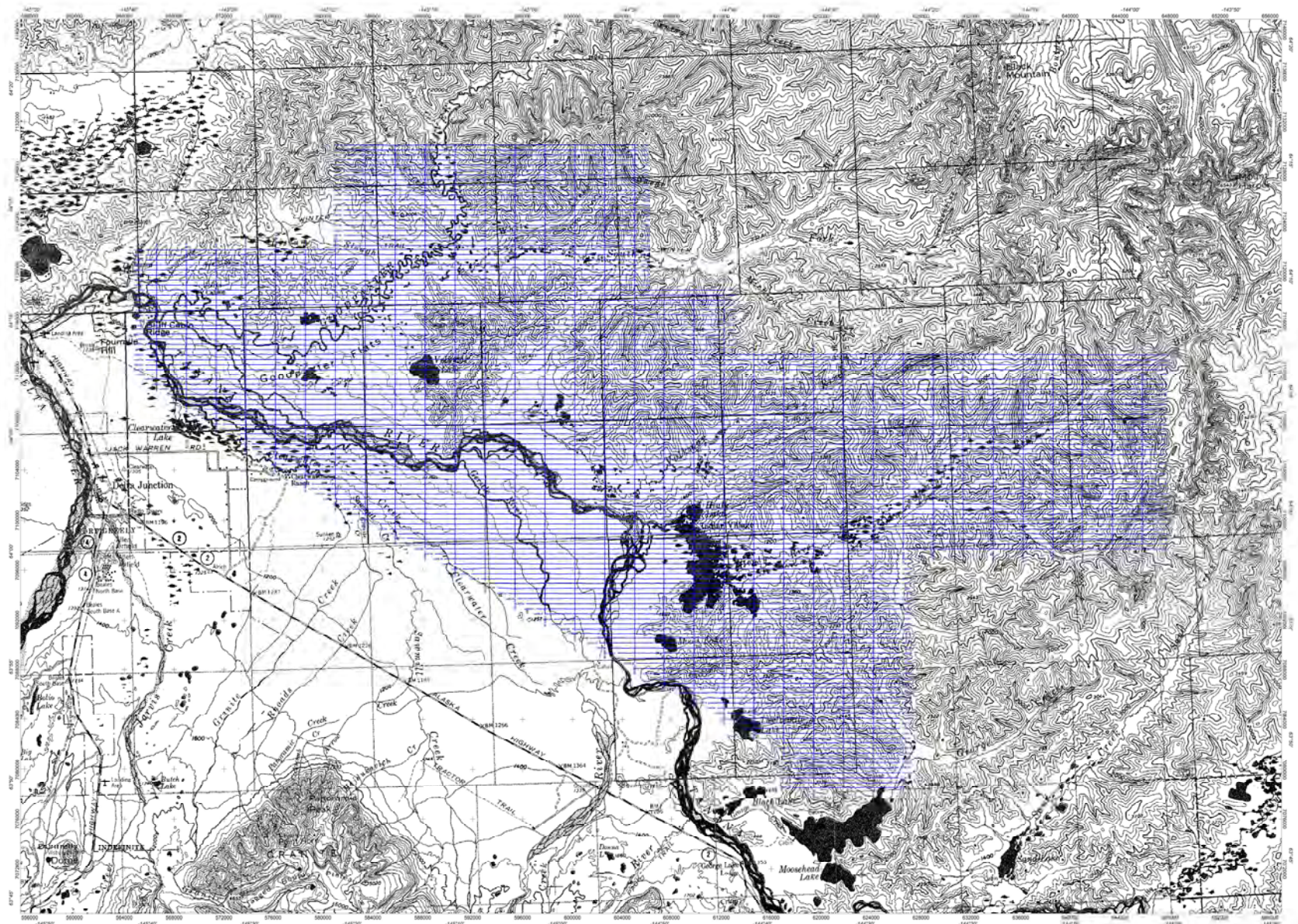
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Calculated 1st Vertical Derivative Map

Healy Survey Block

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LEGEND

Survey Date: May–August 2022
Field Name: Alaska Time
Registration: C-000/F

SURVEY PARAMETERS:
Altitude Survey Mode: UTM 18 UTM 18 UTM 18
Tangent Line Direction/Spacing: 180°/100 m
Control Line Direction/Spacing: 180°/100 m

AIRBORNE SYSTEMS:

MAGNETOMETER: SENTRY CS-3
Configuration: Tilt-Sensor
Sampling Rate: 25 readings/second
Sensitivity: 0.01 nT

NAVIGATION: Novatel L1/L2 GPS
Real-time differential correction
Sampling Rate: 10 readings/second

Flown Flight Path
Legend: (---) Line Type (D/V), Line Number, X-Y-Z (Flight Number)

Scale 1:125000
2500 0 2500 5000 7500
MGS 84 / UTM zone 6N

Base map: USGS 1:250,000 scale topographic map
Location of the Tanana River and Big Delta survey areas in Alaska and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



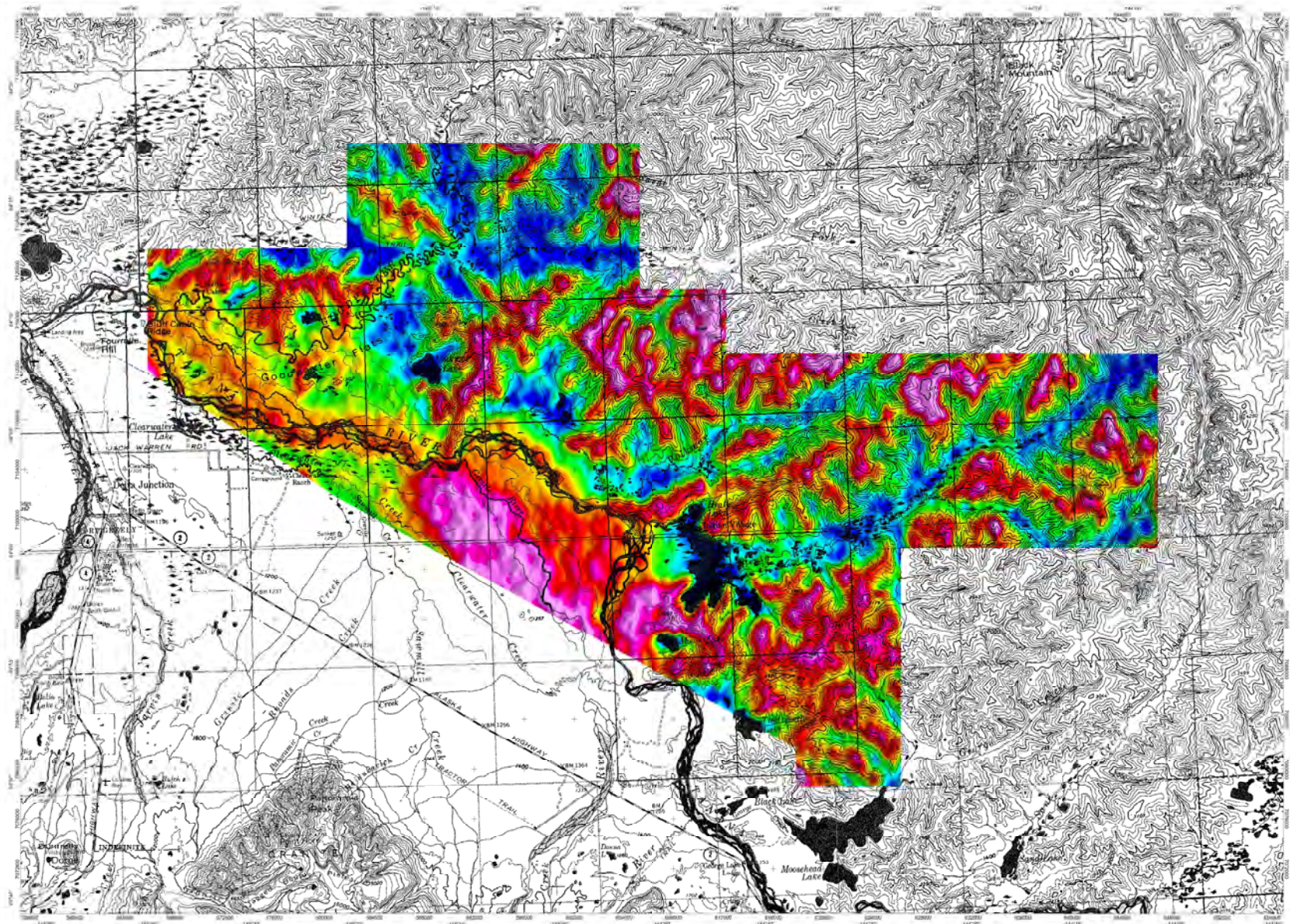
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Flown Flight Path Map

Healy Survey Block

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LEGEND

Survey Date: May-August 2022
Field Area: Arctic Time
Registration: C-0077

SURVEY PARAMETERS

Altitude Survey Mode: UTM
Terrain Line Direction/Spacing: 100/100 ft
Line Direction/Spacing: 100/100 ft

AIRBORNE SYSTEMS:

MAGNETOMETER: SQUID
MAGNETOMETER: SQUID
MAGNETOMETER: SQUID

NAVIGATION: SQUID

Real-time differential correction
Sampling Rate: 10 readings/second

Thorium
(ppm by weight)

20 45 51 56 61 66 70 75 78 82 87 93 101 241

Scale 1:25000

WGS 84 / UTM zone 18N

Base map: USGS 1:250,000 scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska

and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



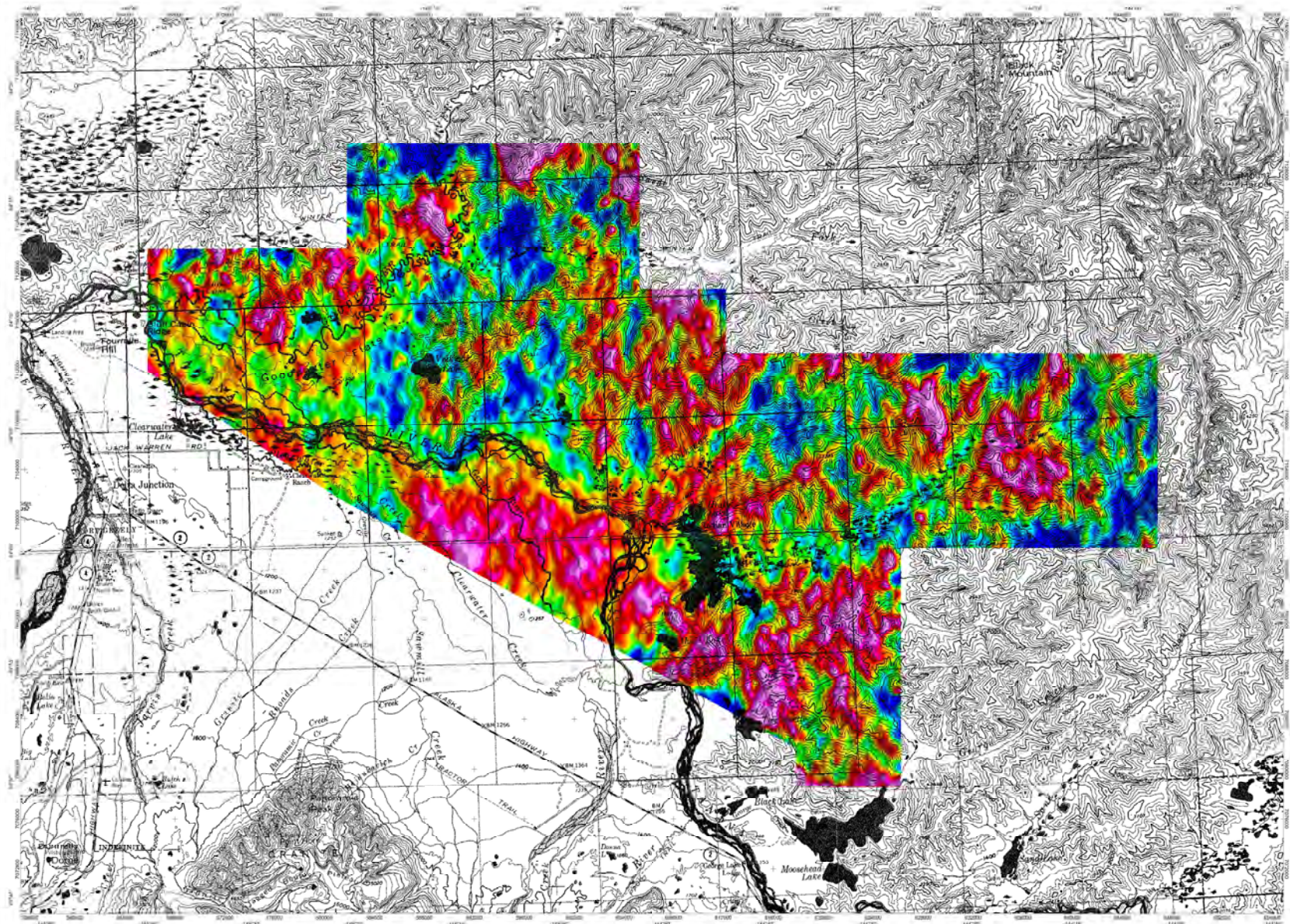
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Thorium Map

Healy Survey Block

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LEGEND

Survey Date: May-August 2022
Field Area: Arctic Time
Registration: C-0077

SURVEY PARAMETERS

Altitude Survey Mode: UTM
Terrain Line Direction/Spacing: 100/100 ft
Line Direction/Spacing: 100/100 ft

AIRBORNE SYSTEMS

MAGNETOMETER: SQUID CS-3
Configuration: 1 m/sec
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

NAVIGATION: Novatel L1/L2 GPS

Real-time differential correction
Sampling Rate: 50 readings/second

Uranium (eU com)
25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

Scale 1:25000

WGS 84 / UTM zone 18N

Base map: USGS 1:250,000 scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska and in relation to the USGS 1:250,000-scale quadrangle



Regional Location Map



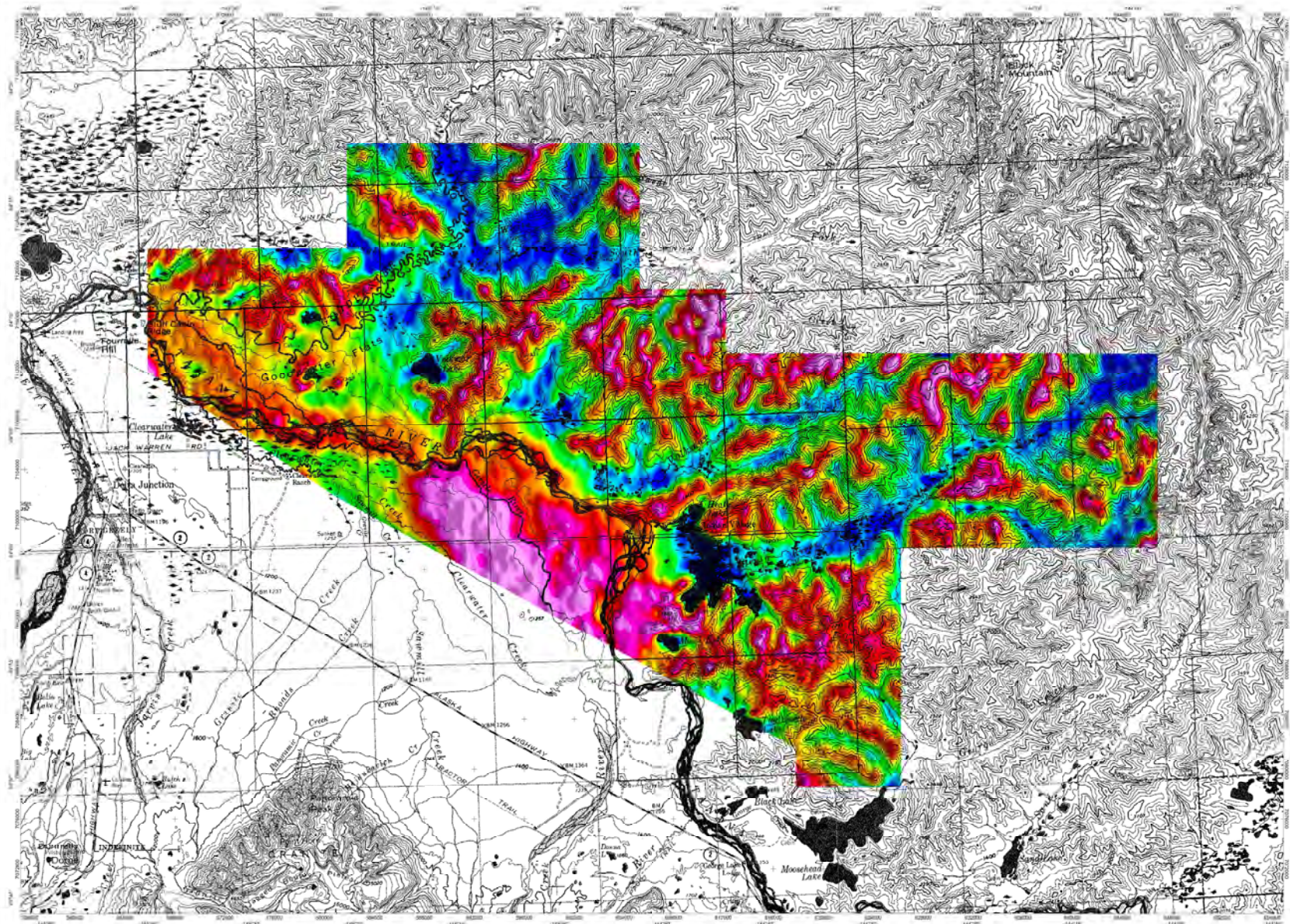
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Uranium Map

Healy Survey Block

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LEGEND

Survey Date: May-August 2022
Field Area: Arctic Time
Registration: C-0077

SURVEY PARAMETERS:

Altitude Survey Mode: UTM 103 (approx) at 100 m
Trimble Line Direction/Spacing: 100°/50 m - 200 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Sauer CS-3
Configuration: 1 m/10 m
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

NAVIGATION: Novatel L1/L2 GPS

Real-time differential correction
Sampling Rate: 50 readings/second



Scale 1:125000

WGS 84 / UTM zone 18N

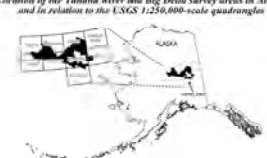
GAMMA RAY SPECIOMETER: PCS-3 (multi-channel) bed sensors with 13.6 L "downward looking" and 3.6 L "upward looking"
Sampling Rate: 1 reading/second

ALTIMETER:

Sesa 276 Pressure Transducer
Sampling Rate: 1 reading/second
Sensitivity: 0.022 nT

Base map: USGS 1:375,000 scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



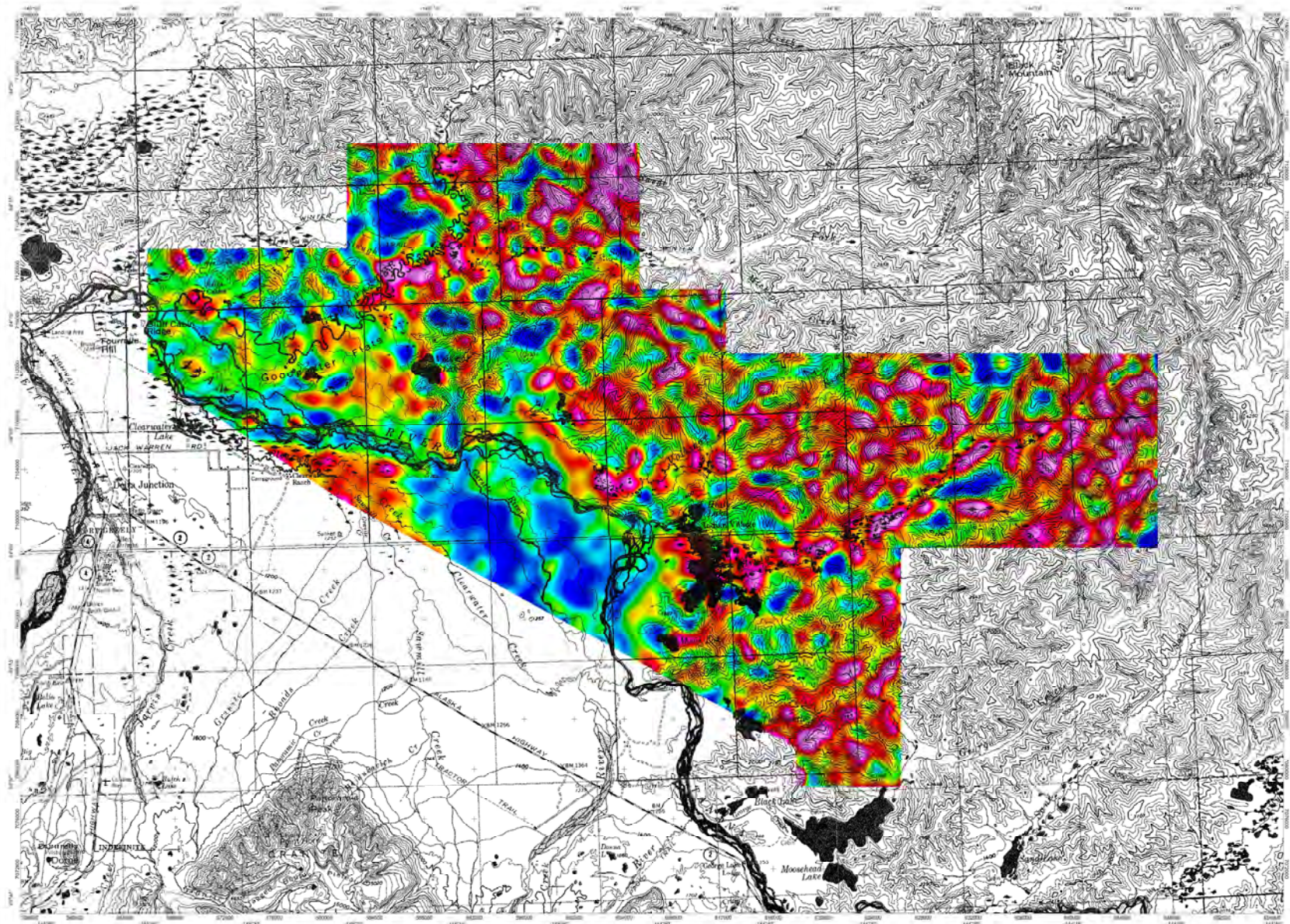
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Potassium Map

Healy Survey Block

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LEGEND

Survey Date: May-August 2022
Field Area: Arctic Time
Registration: C-0077

SURVEY PARAMETERS

Altitude Survey Mode: UTM 103 (approx) at 100 m
Trimble Line Direction/Spacing: 100°/50 m - 200 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Sauer CS-3
Configuration: 1 m/10 m
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

NAVIGATION: Novatel L1/L2 GPS

Real-time differential correction
Sampling Rate: 50 readings/second

Ratio Thorium / Potassium
($\text{eqTh ppm} \pm 1\%$)



Scale 1:125000

WGS 84 / UTM zone 5N

Base map: USGS 1:370,000 scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska and in relation to the USGS 1:250,000-scale quadrangle



Regional Location Map



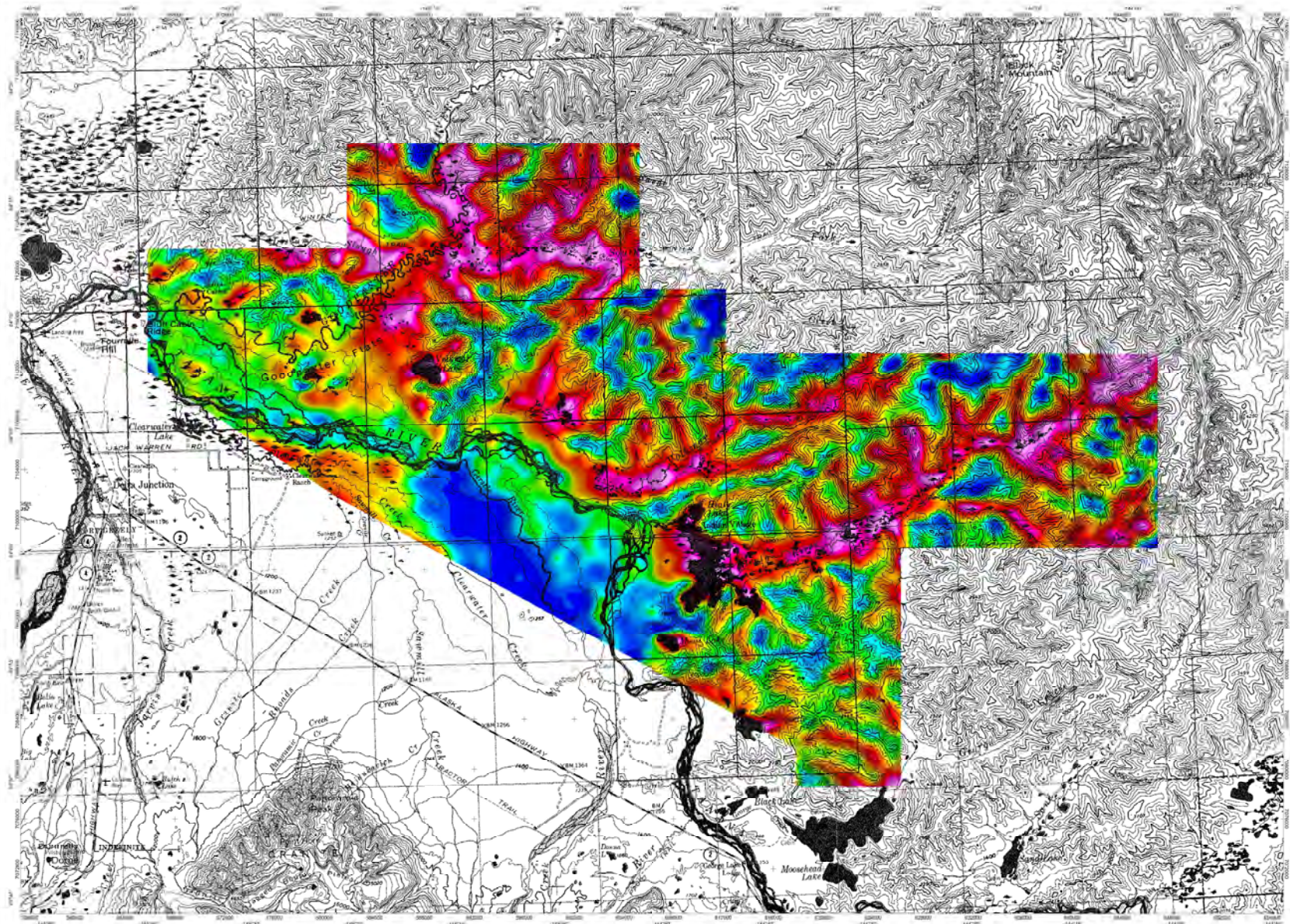
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ratio Thorium / Potassium Map

Healy Survey Block

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LEGEND

Survey Date: May-August 2022
Field Area: Arctic Time
Registration: C-0077

SURVEY PARAMETERS:
Altitude Survey Mode: UTM
Trimmed Line Direction/Spacing: 100/150 ft
UAV: 100 ft
UAV: 100 ft
UAV: 100 ft

AIRBORNE SYSTEMS:

MAGNETOMETER: Sauer CS-3
Configuration: 1 m/s
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

NAVIGATION: Novatel L1/L2 GPS
Real-time differential correction
Sampling Rate: 50 readings/second

GAMMA RAY SPECTROMETER:
PSS-3 (multi-channel) had sensors with
13.6 L "downward looking" and 8.1 L
"upward looking".
Sampling Rate: 1 reading/second

ALTIMETER:
Sauer 276 Pressure Transducer

Ratio Uranium / Potassium
(log scale) (1000)

3.45 5.00 6.50 8.00 9.50 11.00 12.50 14.00 15.50 17.00 18.50

Scale 1:125000

WGS 84 / UTM zone 18N

Base map: USGS 1:375,000 scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska

and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



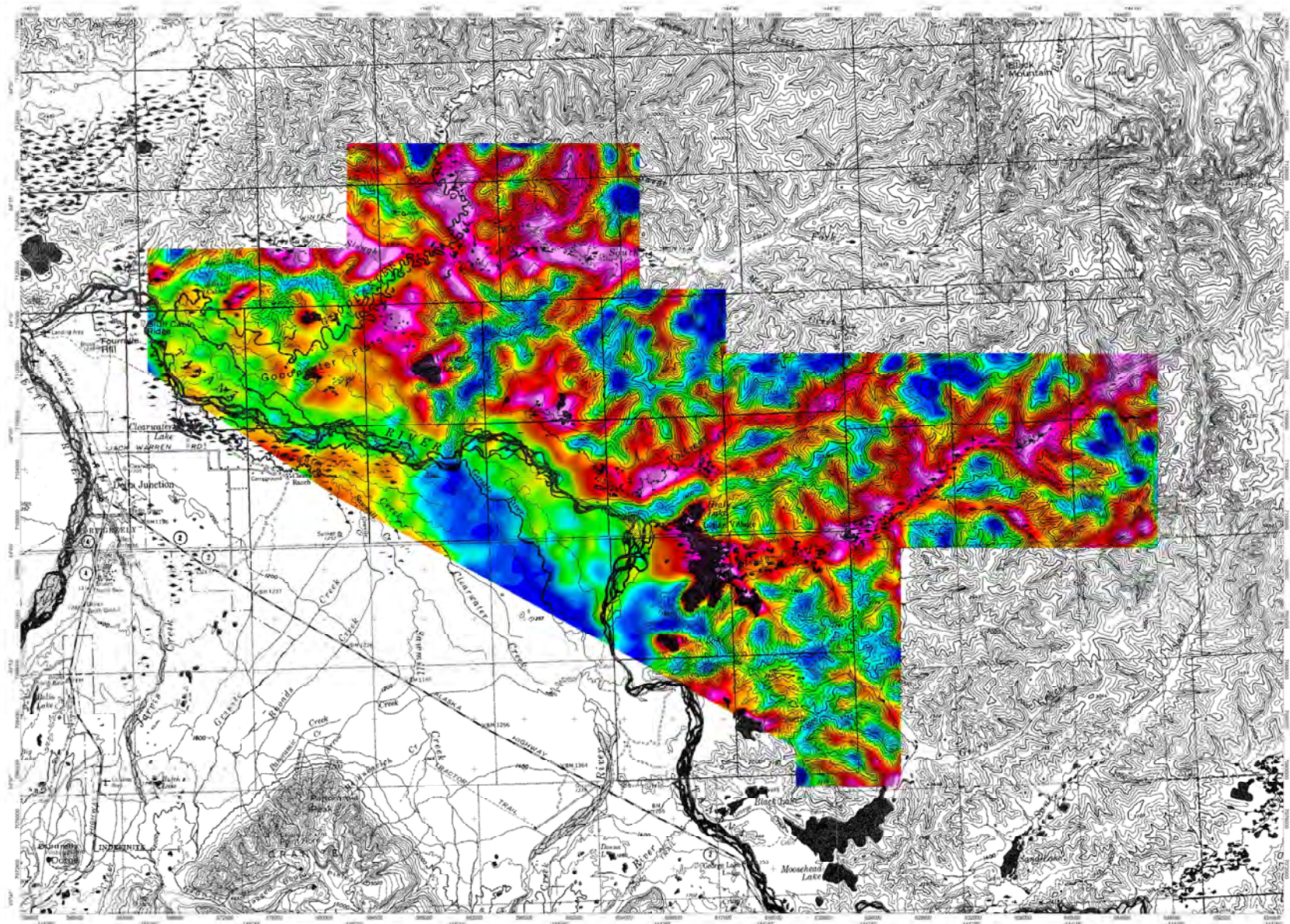
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Ratio Uranium / Potassium Map

Healy Survey Block

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LEGEND

Survey Date: May-August 2022
Field Area: Arctic Time
Registration: C-0077

SURVEY PARAMETERS:
Altitude Survey Mode: UTM 103 (approx) at 100 m
Trimmed Line Direction/Spacing: 100°/50 m - 200 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Sources CS-3
Configuration: 1 m/10 m
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

NAVIGATION: Novatel L1/L2 GPS
Real-time differential correction
Sampling Rate: 50 readings/second

Ratio Uranium / Thorium

(ratio open / ratio ppm)

0.47 0.79 0.96 0.91 0.95 0.98 1.03 1.08 1.14 1.22 1.32 1.44 1.62 2.87

Scale 1:125000

WGS 84 / UTM zone 18N

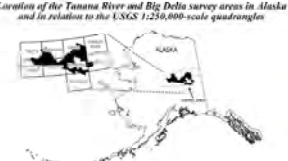
Base map: USGS 1:350,000 scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska and in relation to the USGS 1:250,000-scale quadrangles



Base map: USGS 1:350,000 scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



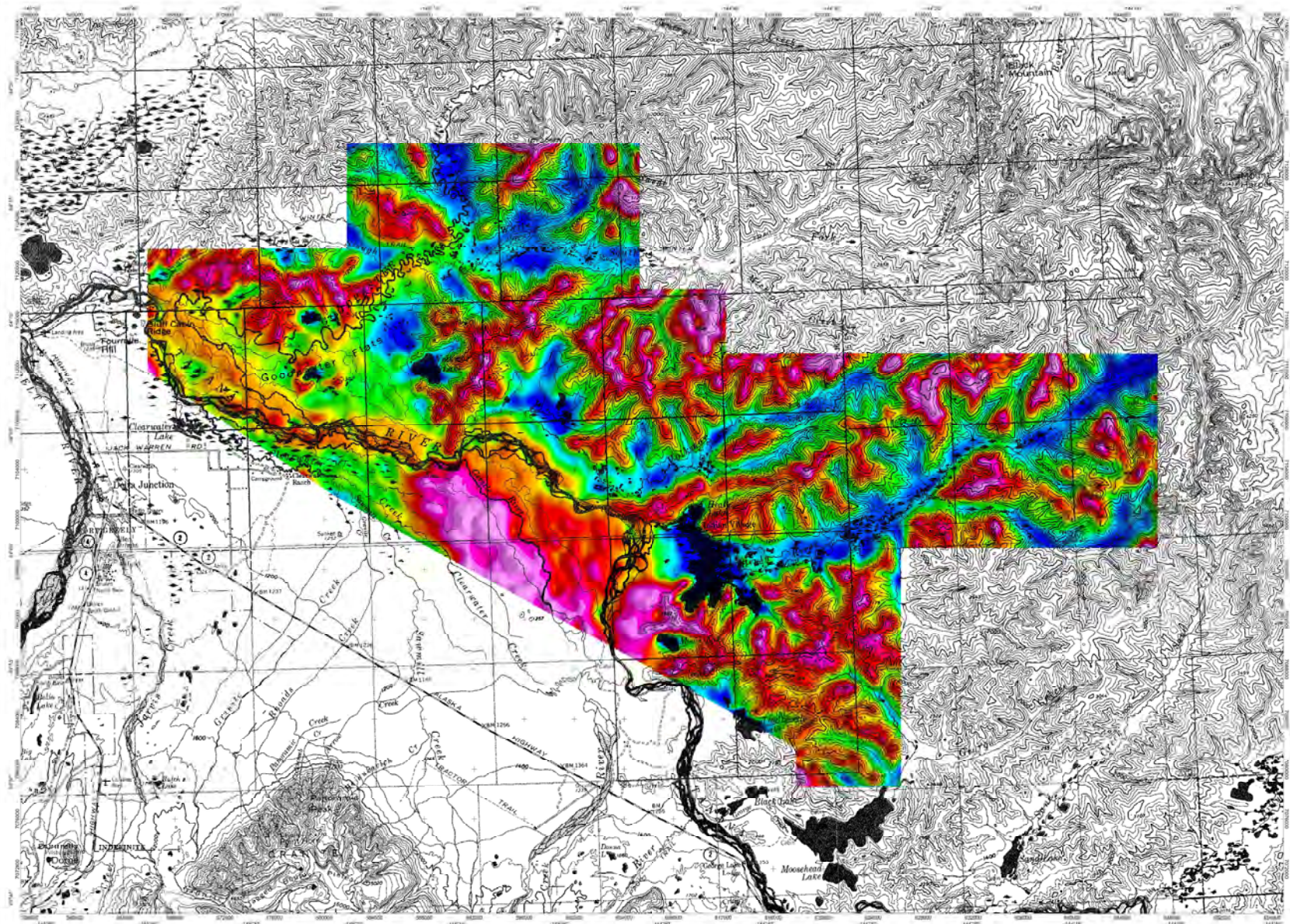
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Ratio Uranium / Thorium Map

Healy Survey Block

Geophysical Report 2022-1



ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Address: 3354 College Rd, Fairbanks, AK 99709, United States of America
Phone: +1 907-451-5000
Website: <https://dgs.alaska.gov/>

This work was supported by the U.S. Geological Survey's Earth MRI program

Emond, A.M., and MPX Geosciences LTD. 2022. Tanana River and Big Delta airborne magnetic and radiometric survey. Alaska Division of Geological & Geophysical Surveys. Geophysical Report 2022-1. <https://doi.org/10.14108/36209>

LEGEND

Survey Date: May-August 2022
Field Area: Arctic Time
Registration: C-0077

SURVEY PARAMETERS:

Altitude Survey Mode: UTM 13 UTM zone 18 N
Trimble Line Direction/Spacing: 100/150 ft - 200 ft

AIRBORNE SYSTEMS:

MAGNETOMETER: Sauer CS-3
Configuration: 1 m/10 m
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

NAVIGATION: Novatel L1/L2 GPS

Real-time differential correction
Sampling Rate: 50 readings/second

GAMMA RAY SPECTROMETER:
PSS-1 (multi-channel) had sensors with
13.6 L "downwards looking" and 3.1 L
"upwards looking".
Sampling Rate: 1 reading/second

ALTIMETER:

Sauer 276 Pressure Transducer

Total Air Absorbed Dose Rate— (mGy/h)



Scale 1:125000

WGS 84 / UTM zone 18 N

Base map: USGS 1:375,000 scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska

and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



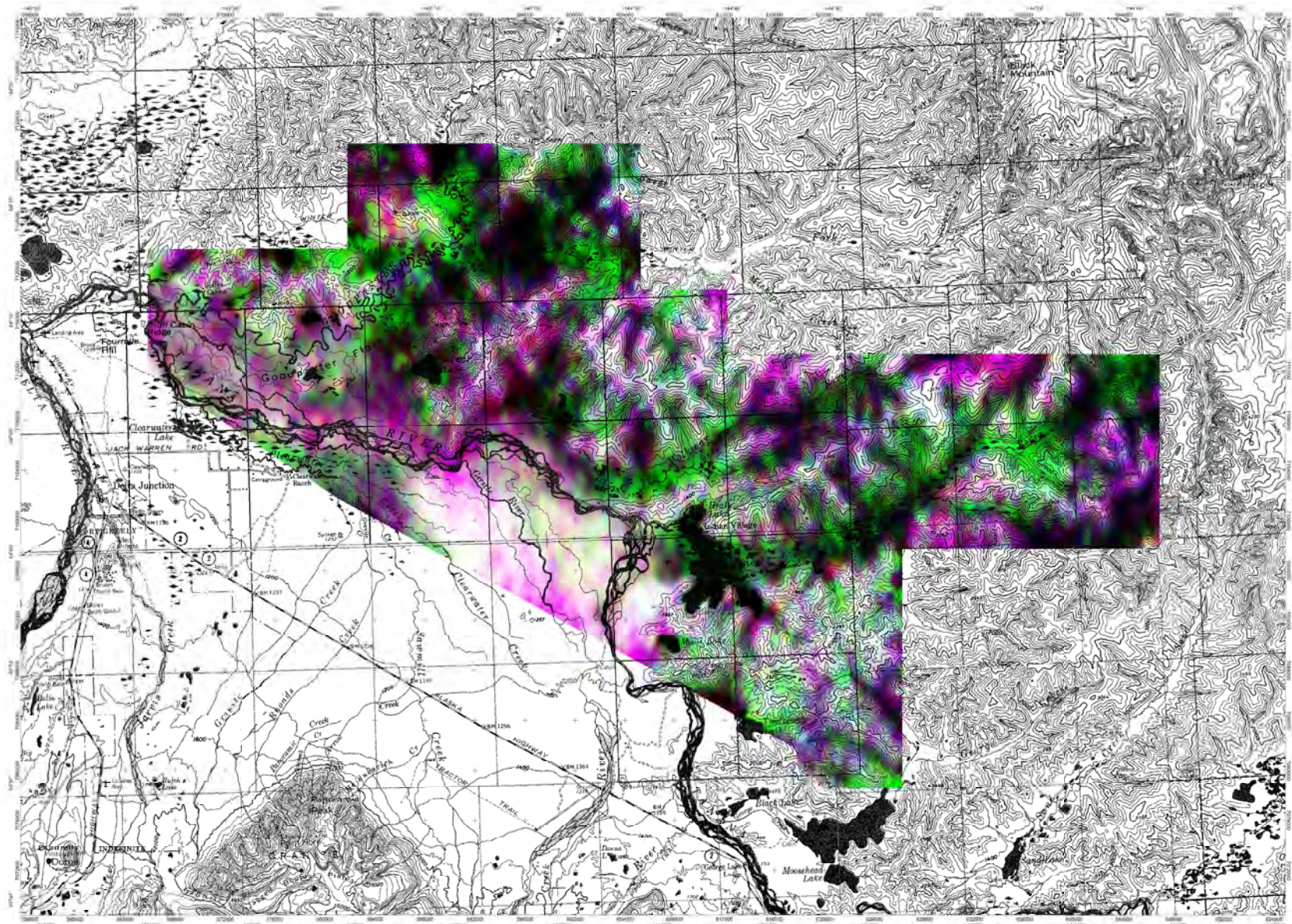
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Total Air Absorbed Dose Rate Map

Healy Survey Block

Geophysical Report 2022-1



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Website: <https://dgs.alaska.gov/>

This work was supported by the U.S. Geological Survey's Earth MRI program

Emond, A.M., and MPX Geosciences LTD. 2022. Tanana River and Big Delta airborne magnetic and radiometric survey. Alaska Division of Geological & Geophysical Surveys. Geophysical Report 2022-1. <https://doi.org/10.14108/36299>

LEGEND

Survey Date: May-August 2022
Field Area: Arctic Time
Registration: C-0077

SURVEY PARAMETERS

Airborne Survey Mode: Omega 333 (unpublished) at 100 m
Trimmed Line Direction/Spacing: 100°/15 m
Trimmed Line Direction/Spacing: 100°/15 m - 2000 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Sources CS-3
Configuration: 1 m/10 m
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

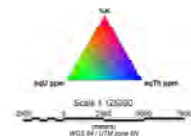
NAVIGATION: Novatel L1/L2 GPS

Real-time differentially corrected
Sampling Rate: 50 readings/second

GAMMA RAY SPECTROMETER:
PSS-1 (multi-channel) had sensors with
13 x 1 "downwards looking" and 3 x 1
"upwards looking".
Sampling Rate: 1 reading/second

ALTIMETER:

Sony 276 Pressure Transducer



Base map: USGS 1:250,000 scale topographic map
Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



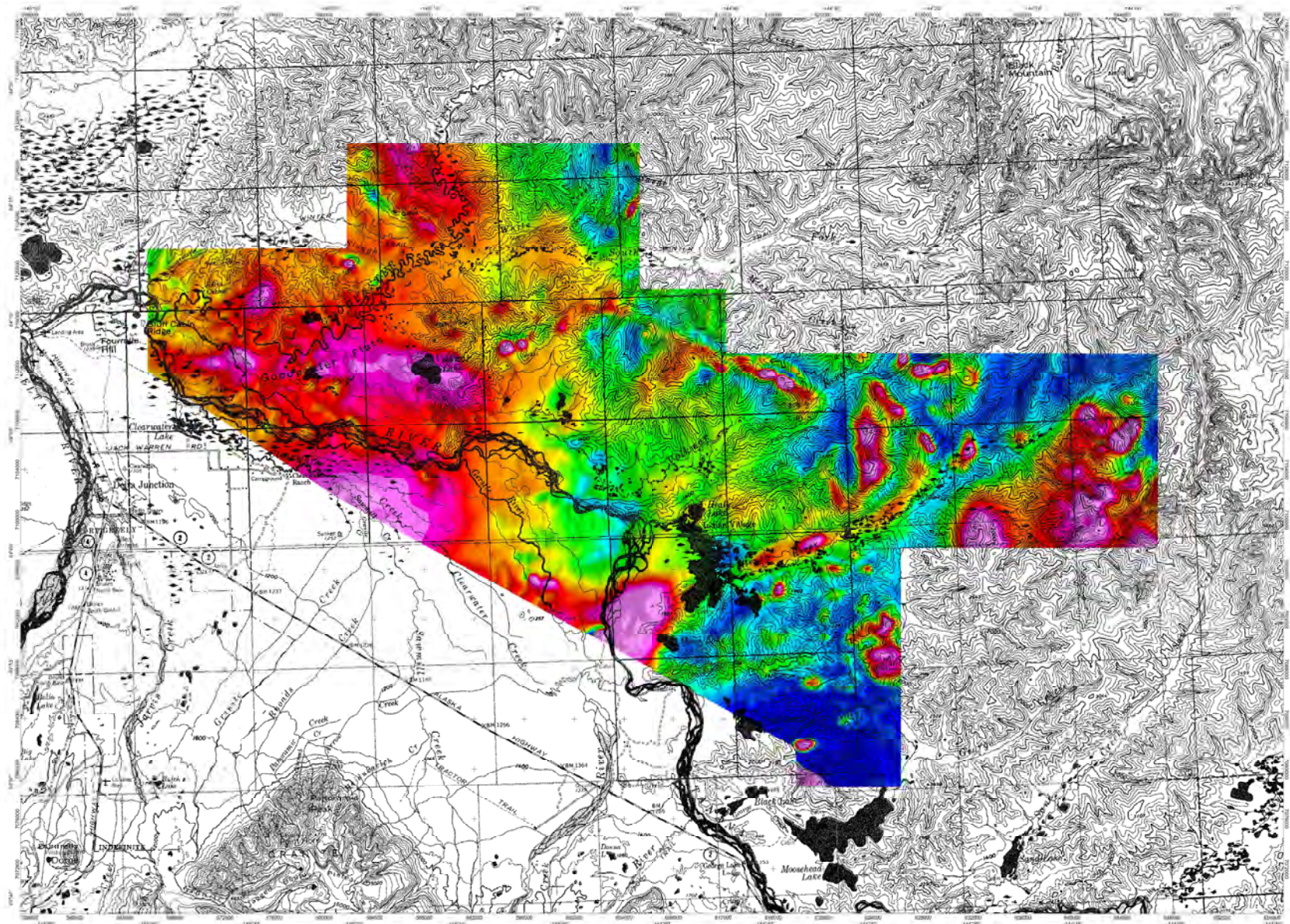
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ternary Map

Healy Survey Block

Geophysical Report 2022-1



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LEGEND

Survey Date: May-August 2022
Field Area: Arctic Time
Registration: C-0007

SURVEY PARAMETERS:
Altitude Survey Mode: UTM 103 (meters) at 100 m
Trimmed Line Direction/Spacing: 100°/50 m - 200 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Sauer CS-3
Configuration: 1 m/10 m
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

NAVIGATION: Novatel L1/L2 GPS
Real-time differential correction
Sampling Rate: 50 readings/second

GAMMA RAY SPECTROMETER:
PSS-3 (multi-channel) real-time with
13 x 1 "downwards looking" and 3 x 1
"upwards looking"

ALTIMETER:
Sona 276 Pressure Transducer

Sampling Rate: 20 readings/second
Sensitivity: 0.002 nT

Base Station MAGNETOMETER:
GEM (GEM-177)
Sampling Rate: 1 reading/second
Sensitivity: 0.002 nT

Residual Magnetic Intensity (mT)



Scale 1:25000

WGS 84 / UTM zone 6N

Base map: USGS 1:370,000 scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska

and in relation to the USGS 1:250,000-scale quadrangle



Regional Location Map



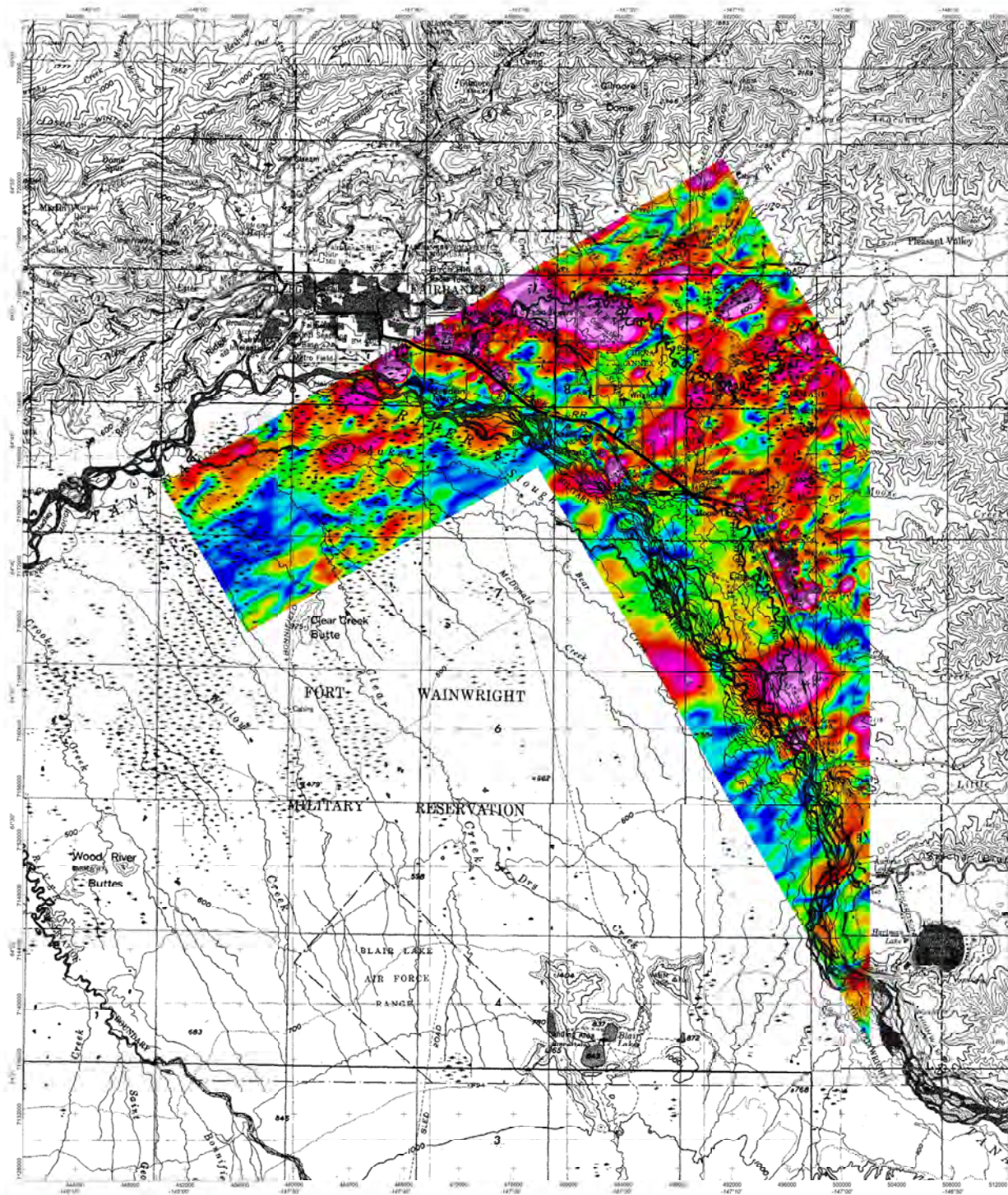
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Residual Magnetic Intensity Map

Healy Survey Block

Geophysical Report 2022-1



ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

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LEGEND

Survey Date: 1 June-18 Aug. 2022
 Project Name: PAX1
 Project: C-GGY2

Map: August 2022
 Project Name: PAX1
 Project: C-GGY2

SURVEY PARAMETERS:

Altitude: Survey: 155 m
 Traverse Line Direction: 150° (N20°W)
 Current Line Distance: 400 m

Drop: 3D computed at 155 m
 150° (N20°W) : 400 m
 60° (S40°E) : 500 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Sinter CS-3

Configuration: Full-Stage
 Sampling Rate: 20 readings/second
 Sensitivity: 0.01 nT

GAMMA-RAY SPECTROMETER:

RSS-5 multi-channel NaI sensor with
 33.6 L "downward-looking" and 9.4 L
 "upward-looking"
 Sampling Rate: 1 reading/second

NAVIGATION: Novatel LEL GPS

Real-time differentially corrected
 Sampling Rate: 10 readings/second

ALTIMETERS:

Sony 276 Pressure Transducer
 Sampling Rate: 10 readings/second
 Radar: Bathy King KRA-10A
 Sampling Rate: 10 readings/second

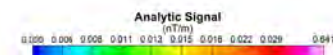
BASE STATION

MAGNETOMETER:

CEM-10M-107M
 Sampling Rate: 1 reading/second
 Sensitivity: 0.02 nT

This work was supported by the U.S. Geological Survey's Earth MRI program

Donor: A.M. and MPX Geophysics LTD. 2022, Tanana River and Big Delta airborne
 magnetic and radiometric survey; Alaska Division of Geological & Geophysical Surveys;
 Geophysical Report 2022-1. <https://doi.org/10.14309/90899>



Base map: USGS 1:250,000 scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



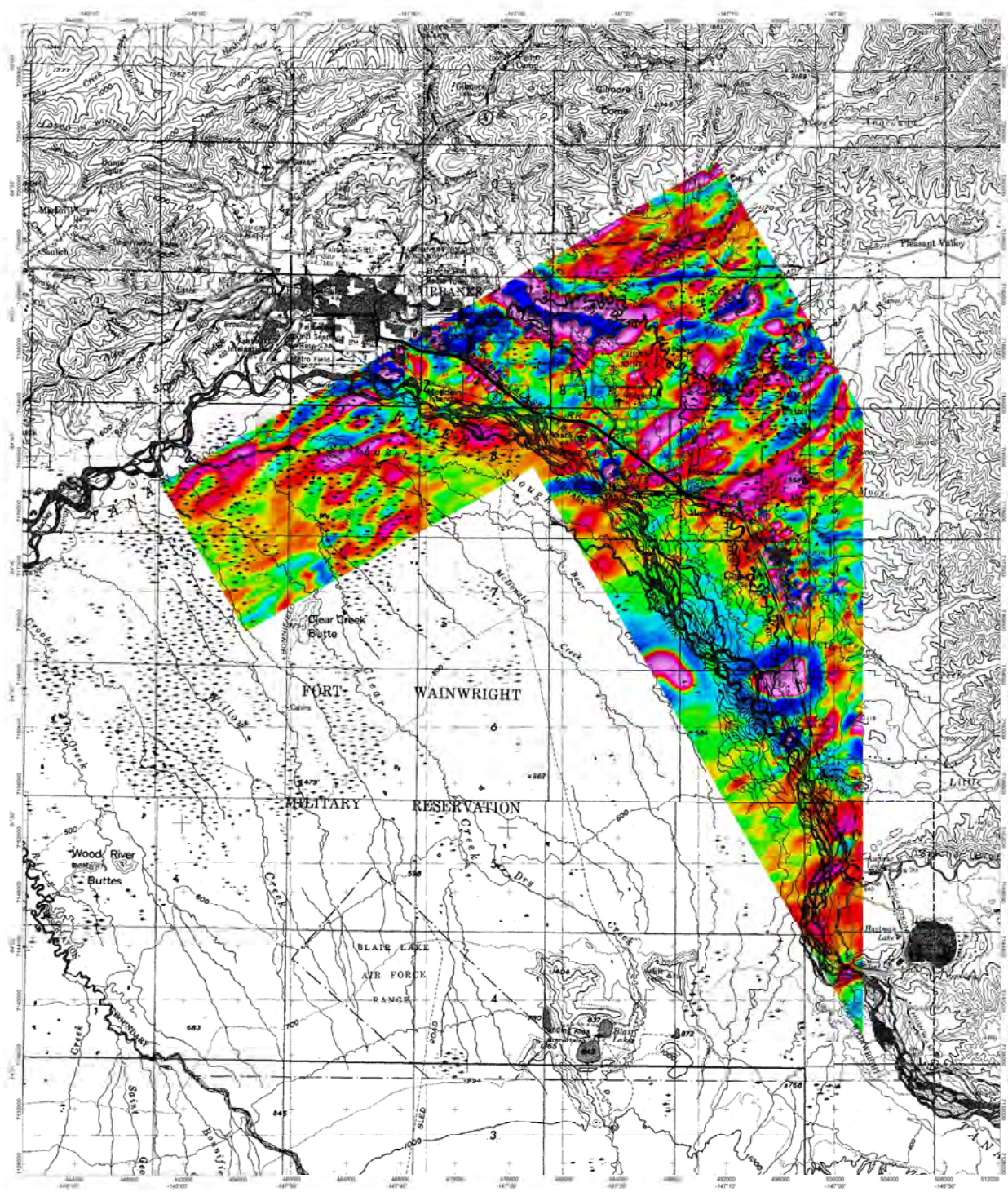
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Analytic Signal Map

North Pole Survey Block

Geophysical Report 2022-1



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Website: <http://alaska.dgcr.state.ak.us>

LEGEND

Survey Date: 1 June-1 Aug. 2022
Elevation: 100m
Projection: UTM

Map: August 2022
Data Source: FAS
U-GOV

SURVEY PARAMETERS:
Altitude: 100m
Tilt: 10°
Tilt: 10°
Tilt: 10°

Drop: 3D computed at 155 m
150° (N20°W) : 400 m
60° (S40°E) : 500 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintex CS-3
Configuration: Full-Range
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

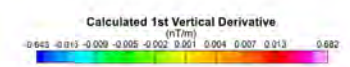
GAMMA-RAY SPECTROMETER:
RSS-3 multi-channel NaI sensor with
33 6 L "downward-looking" and 9 4 L
"upward-looking".
Sampling Rate: 1 reading/second

NAVIGATION: Garmin 182 GPS
Real-time differentially corrected
Sampling Rate: 10 readings/second

ALTIMETERS:
Sona 276 Pressure Transducer
Sampling Rate: 10 readings/second
Radar: Bathy King KRA-10A
Sampling Rate: 10 readings/second

BASE STATION:
MAGNETOMETER:
GEM GSM-107M
Sampling Rate: 1 reading/second
Sensitivity: 0.02 nT

This work was supported by the U.S. Geological Survey's Earth MRI program
Dennis A. M. and MPX Geophysics LTD. 2022, Tanana River and Big Delta airborne
magnetic and radiometric survey; Alaska Division of Geological & Geophysical Surveys
Geophysical Report 2022-1. <https://doi.org/10.14309/90899>



Base map: USGS 1:250,000 scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



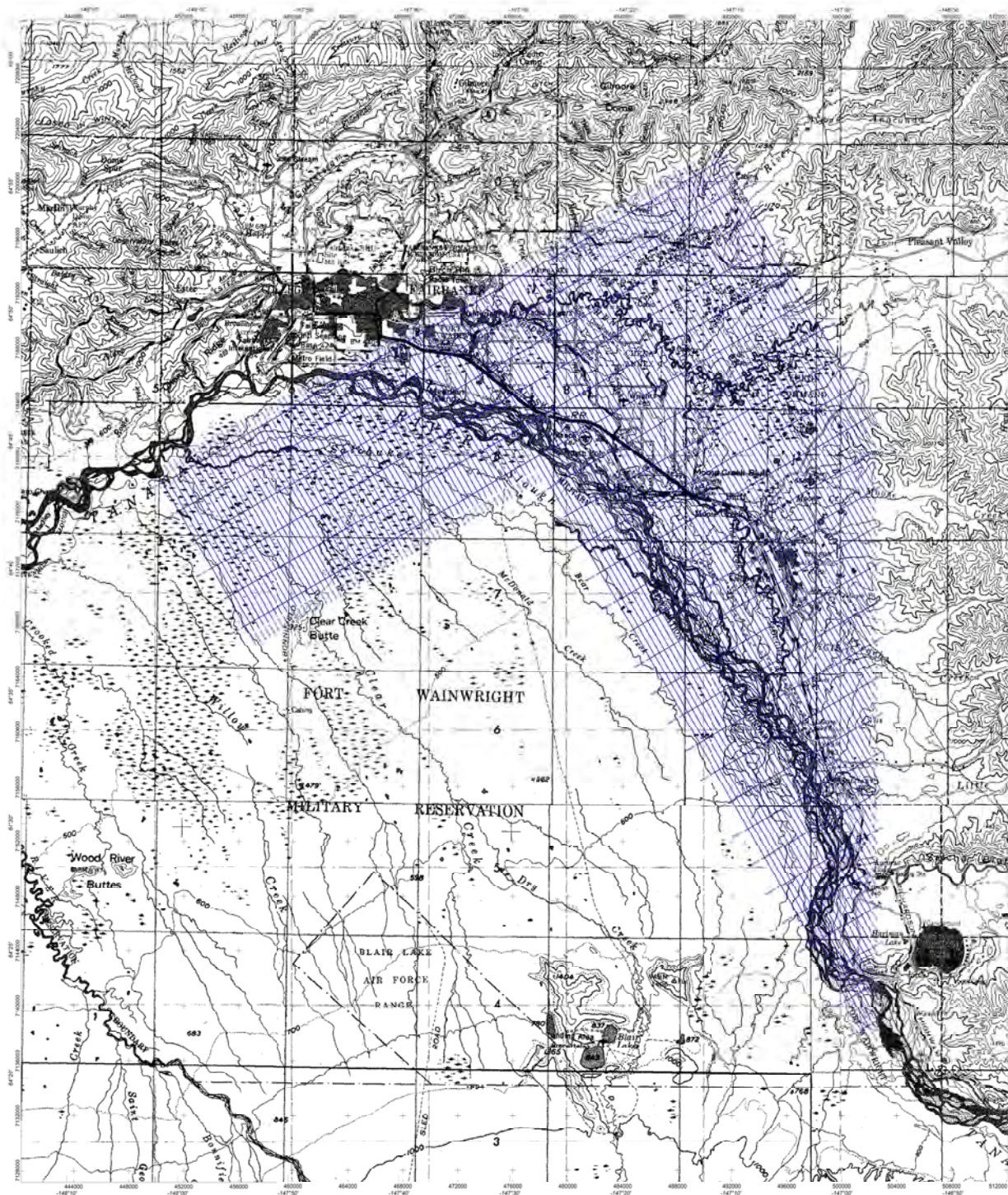
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Calculated 1st Vertical Derivative Map

North Pole Survey Block

Geophysical Report 2022-1



ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

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Phone: (907) 451-5081
Website: alaska.dgsc.usgs.gov

LEGEND

Survey Date: 2022
Flown/Run: Aerom 1000
Projection: UTM

Map: August 2022
Paper: NAD83
C: GGV

SURVEY PARAMETERS:

Altitude: 1000 m
Traverse Line Direction: 1000 m
Crossed Line Direction: 1000 m

Drops: 2D computed at 155 m
150 (NAD83) / 400 m
80 (NAD83) / 300 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintrex CS-3

Configuration: Full-Range
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

GAMMA-RAY SPECTROMETER:

RSS-5 multi-channel NaI sensor with
23.6 L "downward looking" and 0.4 L
"upward looking"

NAVIGATION: Novatel FLL GPS

Real-time differential correction
Sampling Rate: 10 readings/second

ALTIMETERS:

Sony 276 Pressure Transducer
Sampling Rate: 10 readings/second
Radar: Bathy King KRA-10A

RANGE STATION:

MAGNETOMETER:
CORA 100A-100W
Sampling Rate: 1 reading/second
Sensitivity: 0.002 nT

ALTIMETERS:

Sony 276 Pressure Transducer
Sampling Rate: 10 readings/second
Radar: Bathy King KRA-10A

This work was supported by the U.S. Geological Survey's Earth MRI program

Erwood, A.M., and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne
magnetic and radiometric survey: Alaska Division of Geological & Geophysical Surveys
Geophysical Report 2022-1. <https://doi.org/10.14509/30899>



Flown Flight Path

<1,000,000.000

Flown Direction (°): Line Type (L/T): Line Number, Version: Flight Number

Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



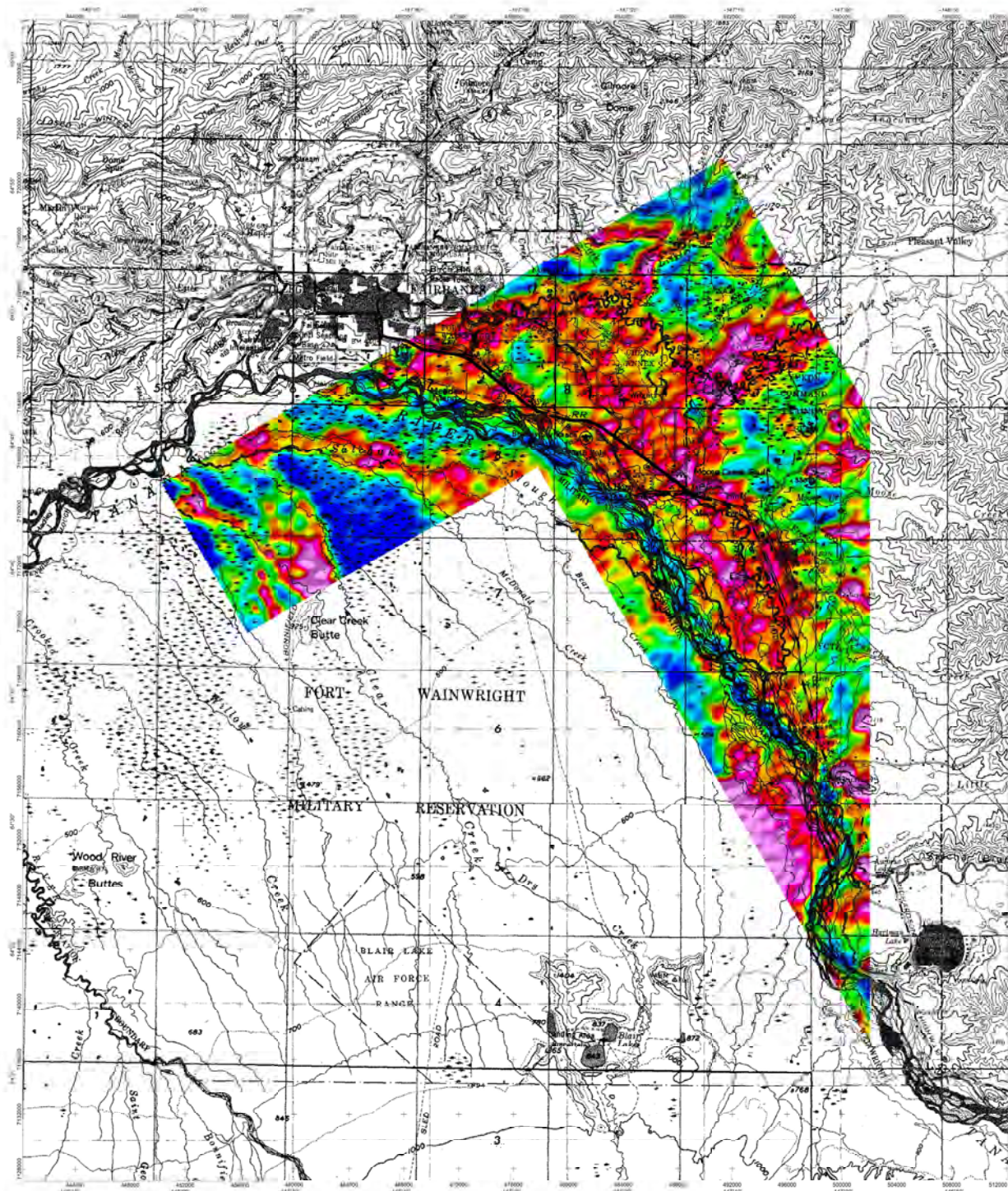
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Flown Flight Path Map

North Pole Survey Block

Geophysical Report 2022-1



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Address: 3254 College Rd., Fairbanks, AK, 99709, United States of America
Phone: +1 907/451-5400
Website: <http://www.dnr.state.ak.us>

LEGEND

Survey Date: _____
Fixed-Wing Aircraft Type: _____
Registration: _____

May–August 2012
Piper Navajo (PA)
C-GOV*

SURVEY PARAMETERS:

Thyristor Line Direction Synthesis
Control Line Direction/Spacing

Drape 3D-composed in 155 m
150°(N30°W) / 400 m
60°(N60°E) / 3000 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Sceptre 4 C

Configuration: Tail-Stinger
Sampling Rate: 20 readings/minute
Sensitivity: 0.01 nT

GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel NaI sensors with 33.6 L "downwards-looking" and 34.1 L "upwards-looking".

NAVIGATION: Novatel EULI GPS

- Real-time differentially corrected
- Sampling Rate: 10 readings/second

ALTIMETERS:

Sampling Rate: 10 readings/sec

BASE STATION

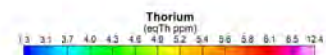
Sampling Rate: 1 reading/second
Sensitivity: 0.022 nT

Sampling Rate: 10 readings/sec

Copyright Date: 2014/05/20

This work was supported by the U.S. Geological Survey's Earth MRI program

Geophysical Report 2022-1, <https://doi.org/10.14509/30899>



Base map: USGS 1:250,000-scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map

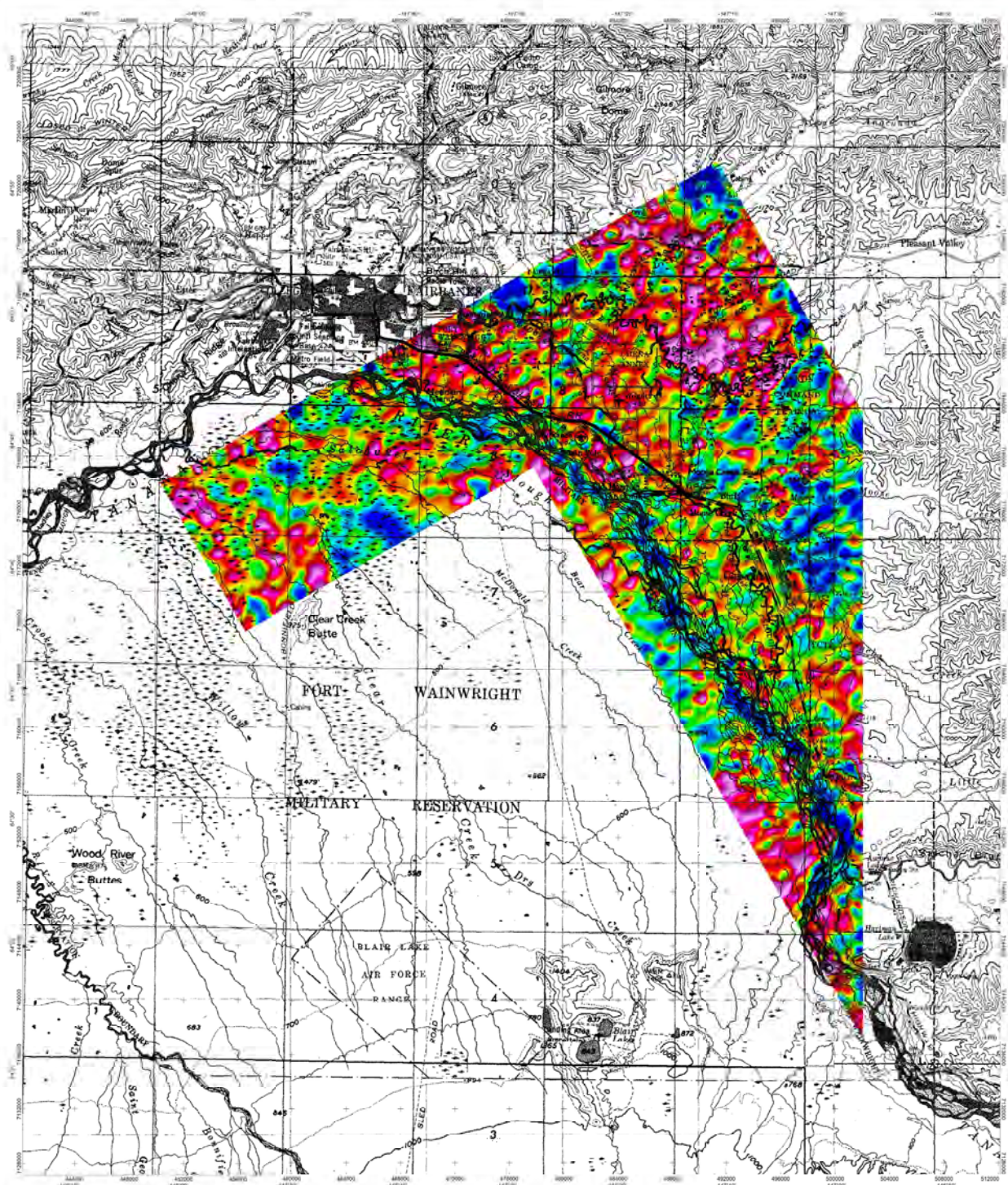
ALASKA DIVISION OF GEOLOGICAL &
GEOPHYSICAL SURVEYS

Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Thorium Map

North Pole Survey Block

Geophysical Report 2022-1



ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
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LEGEND

Survey Date: May–August 2022
 Data-File: Arctic Elys
 Projection: UTM
 Map: August 2022
 Data-File: Arctic Elys
 Projection: UTM

SURVEY PARAMETERS:
 Altitude: Sea Level
 Traverse Line Orientation: Struck
 Current Line Distance: 1000 m
 Drop: 3D computed at 155 m
 150° (N20°W) : 400 m
 60° (S40°E) : 500 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintex CS-3
 Configuration: Tail-Stinger
 Sampling Rate: 20 readings/second
 Sensitivity: 0.01 nT

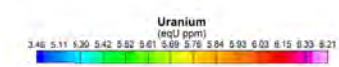
GAMMA-RAY SPECTROMETER:
 RSS-3 multi-channel NaI sensor with
 33.6 L "downward-looking" and 9.4 L
 "upward-looking"
 Sampling Rate: 1 reading/second

NAVIGATION: Novatel LBL GPS
 Real-time differentially corrected
 Sampling Rate: 10 readings/second

BASE STATION:
MAGNETOMETER:
 GEM CS-3M-107M
 Sampling Rate: 1 reading/second
 Sensitivity: 0.02 nT

ALTIMETERS:
 Sona 276 Pressure Transducer
 Sampling Rate: 10 readings/second
 Radar: Bathy King KRA-10A
 Sampling Rate: 10 readings/second

This work was supported by the U.S. Geological Survey's Earth MRI program
 Daniel A. M. and MPX Geophysics LTD. 2022. Tanana River and Big Delta airborne
 magnetic and radiometric survey. Alaska Division of Geological & Geophysical Surveys
 Geophysical Report 2022-1. <https://doi.org/10.14309/90899>



Base map: USGS 1:250,000 scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



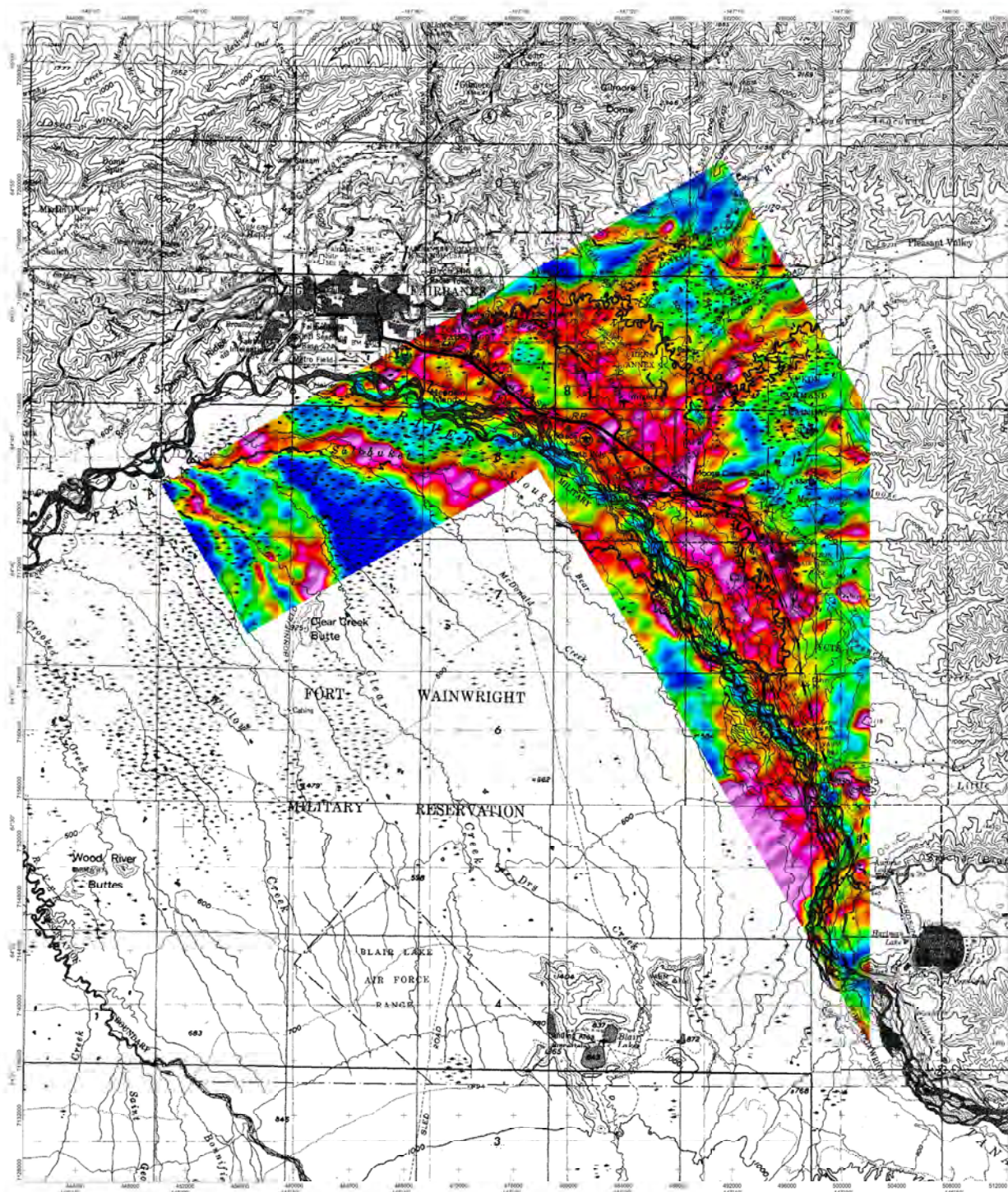
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Uranium Map

North Pole Survey Block

Geophysical Report 2022-1



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LEGEND

Survey Date: _____
Fixed-Wing Aircraft Type: _____
Registration: _____

May–August 2012
Piper Navarin FAJ
C-GQVP

SURVEY PARAMETERS:

Attitude: Strongly Male
Thrust: Line Direction: Strongly
Control: Line Direction: Strongly

Drops 3D-composed at 155 m
150°(N30°W) / 400 m
60°(N60°E) / 5000 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Solitrea CS-3

Configurations: Tail-Stinger
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

GAMMA-RAY SPECTROMETER:

RSX-5 multi-channel NaI sensors @ (0) 33.6 L "downwards looking" and (1) 1. "upwards looking".

NAVIGATION: Novard LULU GPS

- Real-time differentially corrected
- Sampling Rate: 10 readings/second

ALTIMETERS:

Sampling Rate: 10 readings/second

BASE STATION

Model: 1440
MAGNETOMETER
CUMULISM: 107W
Sampling Rate: 1 reading/second
Sensitivity: 0.022 nT

This work was supported by the U.S. Geological Survey's Earth MRI program

Emmett, A.M., and MPX Geophysics LTD. 2022. Tanana River and Big Delta airborne magnetic and radiometric survey; Alaska Division of Geological & Geophysical Surveys. Geophysical Report 2022-1. <https://doi.org/10.14509/38898>



Base map: USGS 1:250,000 scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map

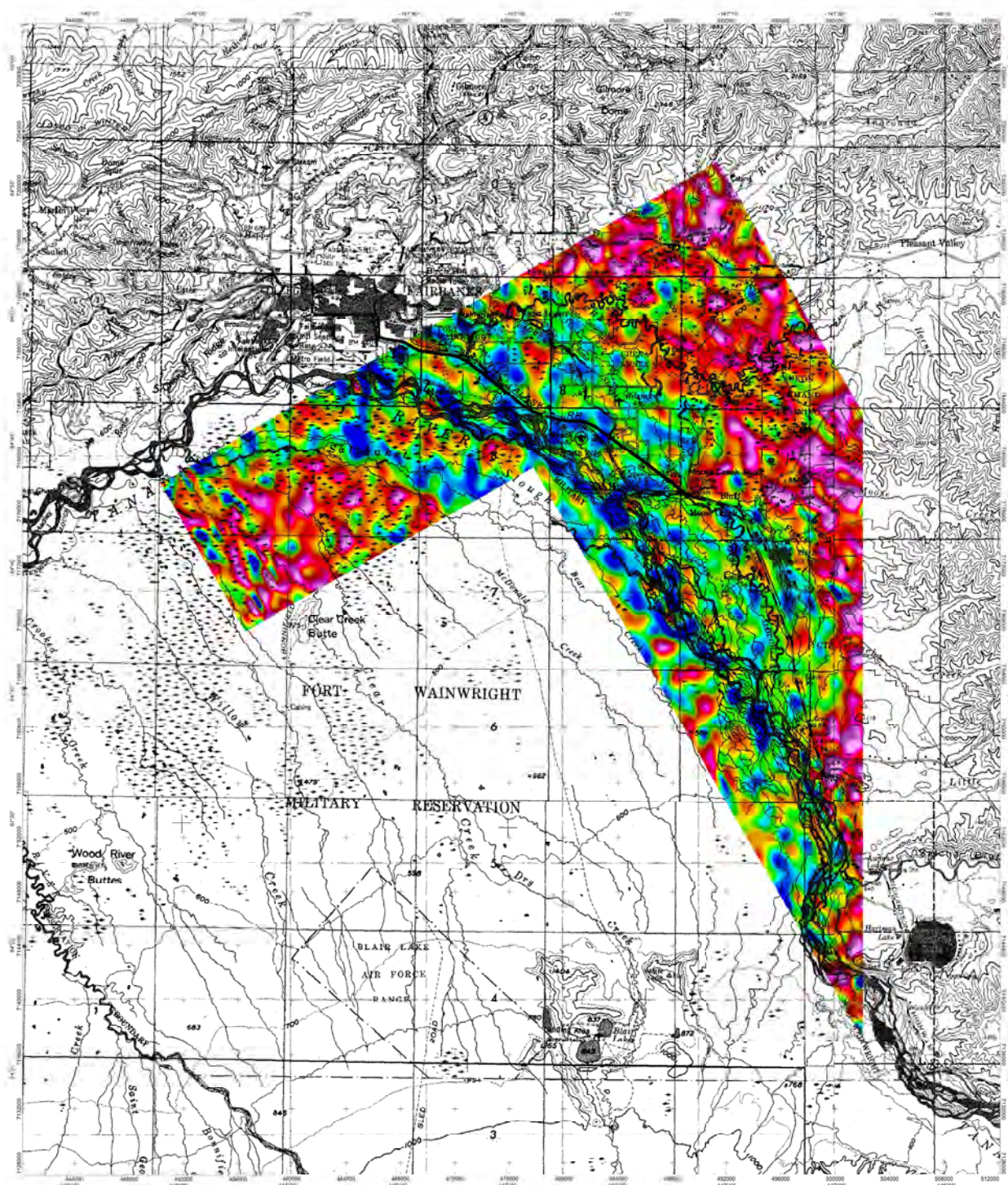
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Potassium Map

North Pole Survey Block

Geophysical Report 2022-1



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 Website: alaska.dgsc.usgs.gov

LEGEND

Survey Date: May–August 2022
 Data-File: Arctic Elys
 Projection: UTM
 Map: August 2022
 Data-File: Arctic Elys
 Projection: UTM

SURVEY PARAMETERS:

Altitude: Surveyed
 Traverse Line Direction: Slightly
 Current Line Distance: 1000 m
 Drop: 3D computed at 155 m
 150° (N20°W) : 400 m
 60° (S40°E) : 500 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintex CS-3
 Configuration: Full-Stage
 Sampling Rate: 20 readings/second
 Sensitivity: 0.01 nT
GAMMA-RAY SPECTROMETER:
 RSS-3 multi-channel NaI sensor with
 33.6 L "downward-looking" and 9.1 L
 "upward-looking"
 Sampling Rate: 1 reading/second

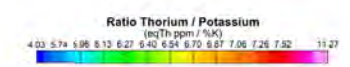
NAVIGATION: Novatel LEL GPS

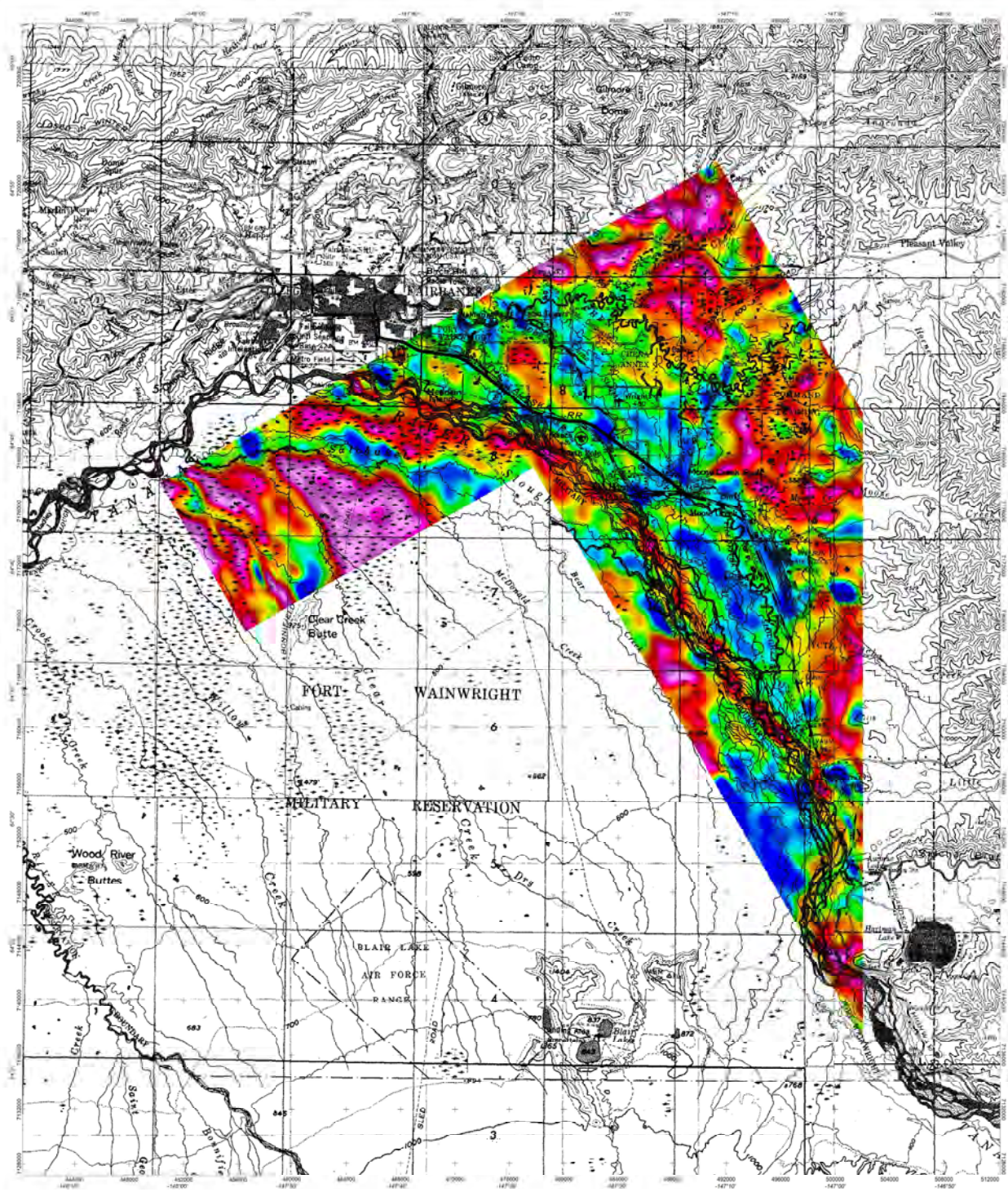
Real-time differentially corrected
 Sampling Rate: 10 readings/second

BASE STATION:

MAGNETOMETER:
 GEM GSM-107M
 Sampling Rate: 1 reading/second
 Sensitivity: 0.02 nT
ALTIMETERS:
 Sona 276 Pressure Transducer
 Sampling Rate: 10 readings/second
 Radar: Bathy King KRA-10A
 Sampling Rate: 10 readings/second

This work was supported by the U.S. Geological Survey's Earth MRI program
 Grant: A.M. and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne
 magnetic and radiometric survey; Alaska Division of Geological & Geophysical Surveys;
 Geophysical Report 2022-1. <https://doi.org/10.14309/90899>





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 Website: alaska.dgsc.usgs.gov

LEGEND

Survey Date: May–August 2022
 Data-File: Arcvrti Epp
 Projection: UTM
 Map: August 2022
 Data-File: P33
 UTM

SURVEY PARAMETERS:

Altitude: Survey Mode: Drape 3D computed at 155 m
 Traverse Line Direction: Strips
 Contour Line Distance: 500 m
 150° (N20°W) : 400 m
 60° (S40°E) : 500 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintex CS-3
 Configuration: Full-Strip
 Sampling Rate: 20 readings/second
 Sensitivity: 0.01 nT
GAMMA-RAY SPECTROMETER:
 RSS-3 multi-channel NaI sensor with
 33.6 L "downward-looking" and 9.1 L
 "upward-looking"
 Sampling Rate: 1 reading/second

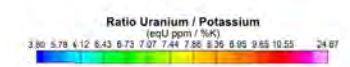
NAVIGATION: Garmin L2L GPS

Real-time differentially corrected
 Sampling Rate: 10 readings/second
ALTIMETERS:
 Sonar 276 Pressure Transducer
 Sampling Rate: 10 readings/second
 Radar: Bathy King KRA-10A
 Sampling Rate: 10 readings/second

BASE STATION

MAGNETOMETER:
 GEM CS-3
 Sampling Rate: 1 reading/second
 Sensitivity: 0.02 nT

This work was supported by the U.S. Geological Survey's Earth MRI program
 Conrad, A.M., and MPX Geophysics LTD. 2022. Tanana River and Big Delta airborne
 magnetic and radiometric survey: Alaska Division of Geological & Geophysical Surveys
 Geophysical Report 2022-1. <https://doi.org/10.14309/90899>



Base map: USGS 1:250,000 scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



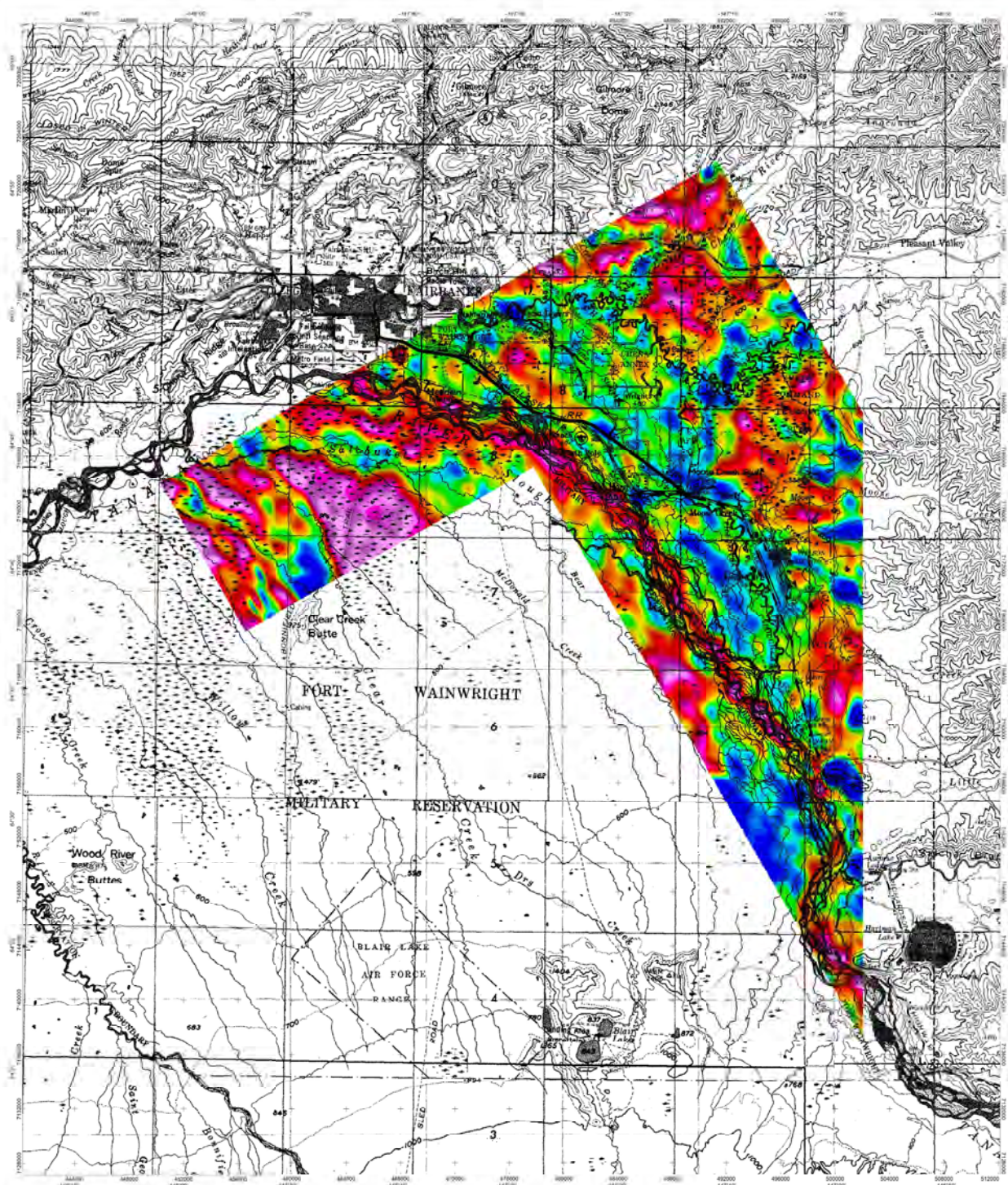
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ratio Uranium / Potassium Map

North Pole Survey Block

Geophysical Report 2022-1



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 Website: adgs.adg.gov

LEGEND

Survey Date: May–August 2022
 Data-File: AeromGis
 Projection: UTM
 Map: August 2022
 Data-File: AeromGis
 Projection: UTM

SURVEY PARAMETERS:

Altitude: Sea Level
 Traverse Line Direction: South
 Current Line Distance: 1000 m
 Drop: 3D computed at 155 m
 150° (N20°W) : 400 m
 60° (S40°E) : 500 m

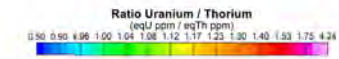
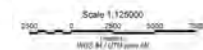
AIRBORNE SYSTEMS:

MAGNETOMETER: Scintex CS-3
 Configuration: Full-Range
 Sampling Rate: 20 readings/second
 Sensitivity: 0.01 nT
GAMMA-RAY SPECTROMETER:
 RSS-3 multi-channel NaI sensor with
 33.6 L "downward-looking" and 9.1 L
 "upward-looking"
 Sampling Rate: 1 reading/second

NAVIGATION: Garmin L2L GPS

Real-time differentially corrected
 Sampling Rate: 10 readings/second
ALTIMETERS:
 Sona 276 Pressure Transducer
 Sampling Rate: 10 readings/second
BASE STATION:
MAGNETOMETER:
 GEM GSM-107M
 Sampling Rate: 1 reading/second
 Sensitivity: 0.02 nT

This work was supported by the U.S. Geological Survey's Earth MRI program
 Grant: A.M. and MPX Geophysics LTD, 2022, Tanana River and Big Delta airborne
 magnetic and radiometric survey; Alaska Division of Geological & Geophysical Surveys;
 Geophysical Report 2022-1. <https://doi.org/10.14309/90899>



Base map: USGS 1:250,000 scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



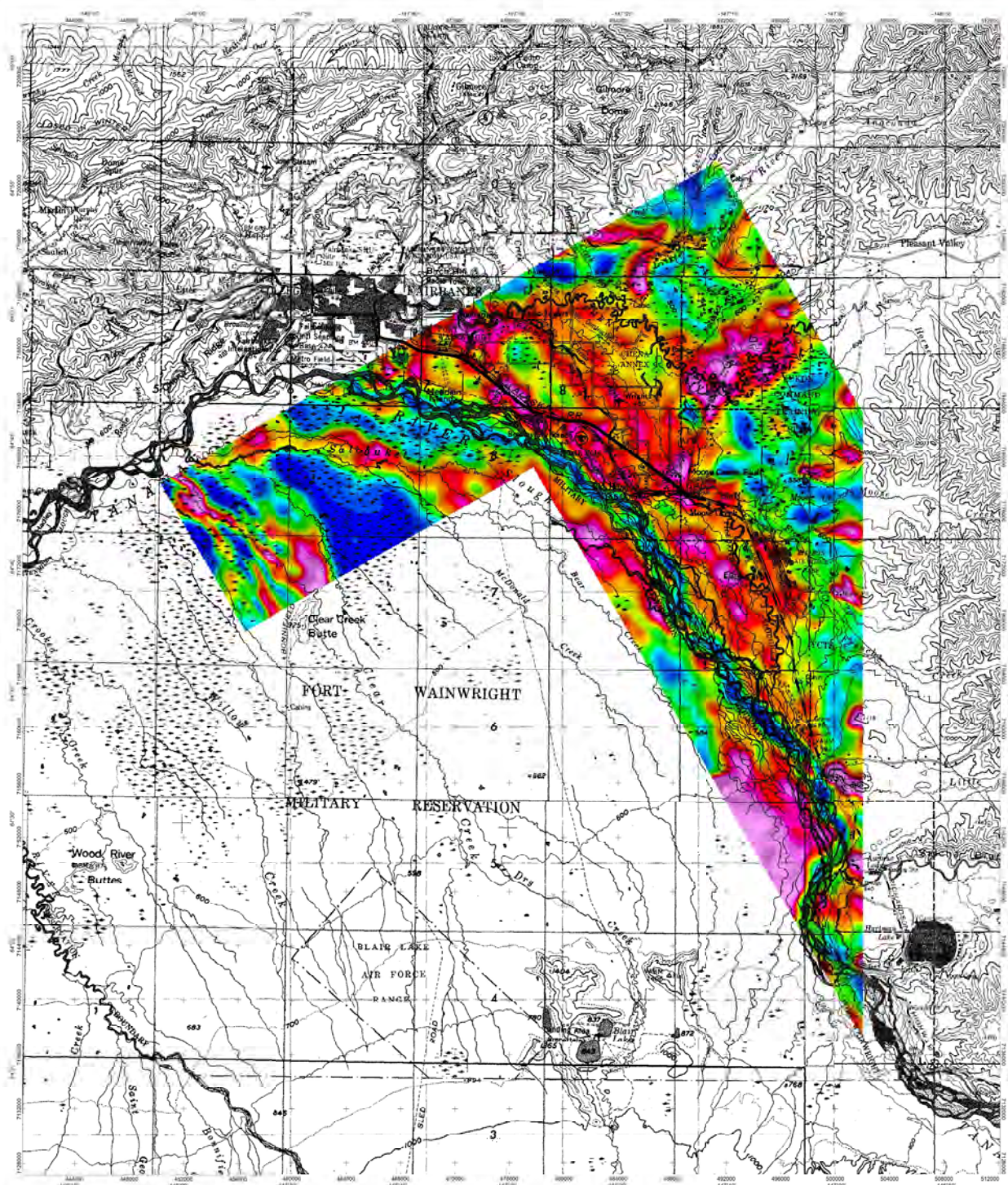
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ratio Uranium / Thorium Map

North Pole Survey Block

Geophysical Report 2022-1



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 Address: 2354 College Rd., Fairbanks, AK 99709, United States of America
 Phone: (+1) 907-451-5488
 Website: adgs.adg.gov

LEGEND

Survey Date: May–August 2022
 Data-File: Airborne Elys
 Projection: UTM
 Map: August 2022
 Data-File: Airborne Elys
 Projection: UTM

SURVEY PARAMETERS:

Altitude: Sea Level
 Traverse Line Direction: Stratos
 Current Line Distance: 1000 m
 Drop: 3D computed at 155 m
 150° (N20°W) : 400 m
 60° (S40°E) : 500 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintex CS-3
 Configuration: Full-Range
 Sampling Rate: 20 readings/second
 Sensitivity: 0.01 nT
GAMMA-RAY SPECTROMETER:
 RSS-3 multi-channel NaI sensor with
 33 6 L "downward-looking" and 3 4 L
 "upward-looking"
 Sampling Rate: 1 reading/second

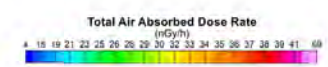
NAVIGATION: Novatel LEL GPS

Real-time differentially corrected
 Sampling Rate: 10 readings/second
ALTIMETERS:
 Sona 276 Pressure Transducer
 Sampling Rate: 10 readings/second
 Radar: Bathy King KRA-10A
 Sampling Rate: 10 readings/second

BASE STATION:

MAGNETOMETER:
 GEM CS-3
 Sampling Rate: 1 reading/second
 Sensitivity: 0.02 nT

This work was supported by the U.S. Geological Survey's Earth MRI program
 Grant: A.M. and MPX Geophysics LTD. 2022, Tanana River and Big Delta airborne
 magnetic and radiometric survey; Alaska Division of Geological & Geophysical Survey
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Base map: USGS 1:250,000 scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



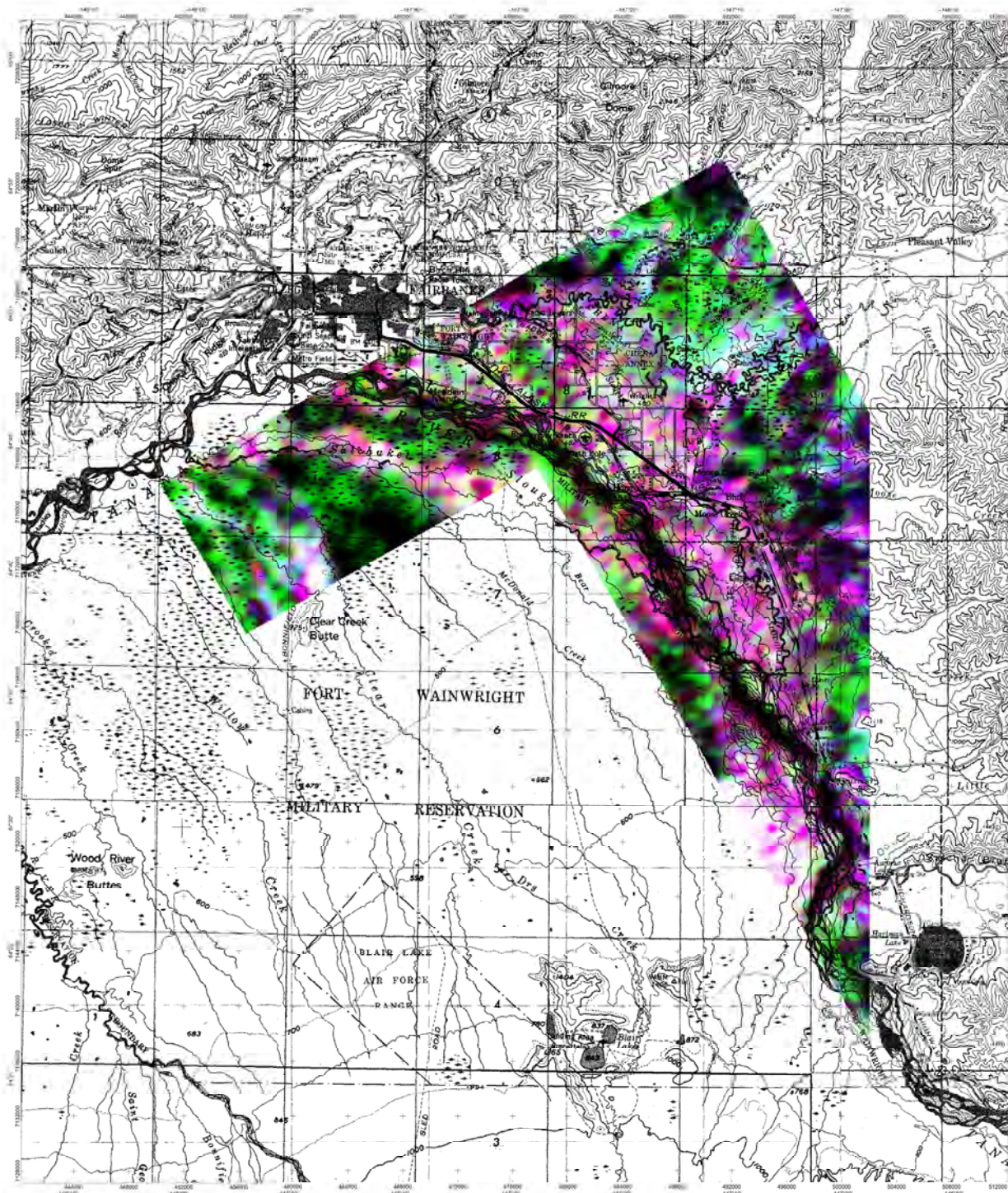
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Total Air Absorbed Dose Rate Map

North Pole Survey Block

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Website: alaska.dgsc.usgs.gov

LEGEND

Survey Date: 1 June-1 Aug. 2022
Project Name: PAX1

Map: August 2022
Project Name: PAX1
C-400V2

SURVEY PARAMETERS:

Aircraft: Stearman
Thrust: 1.0 m
Altitude: 1500 ft
Ground Speed: 150 mph

Drop: 3D computed at 155 m
150° (N20°W) : 400 m
60° (S40°E) : 500 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scintec CS-3

Configuration: Tail-Stinger
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

GAMMA-RAY SPECTROMETER:

RSS-3 multi-channel NaI sensor with
33.6 L "downward-looking" and 3.1 L
"upward-looking".
Sampling Rate: 1 reading/second

NAVIGATION: Garmin LUL GPS

Real-time differentially corrected
Sampling Rate: 10 readings/second

ALTIMETERS:

Sony 276 Pressure Transducer
Sampling Rate: 10 readings/second
Radar: Bathy King KRA-10A
Sampling Rate: 10 readings/second

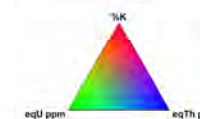
BASE STATION

MAGNETOMETER:

CEM-10M-107M
Sampling Rate: 1 reading/second
Sensitivity: 0.002 nT

This work was supported by the U.S. Geological Survey's Earth MRI program

Contract A.M. and MPX Geophysics LTD. 2022, Tanana River and Big Delta airborne
magnetic and radiometric survey; Alaska Division of Geological & Geophysical Surveys
Geophysical Report 2022-1. <https://doi.org/10.14309/30899>

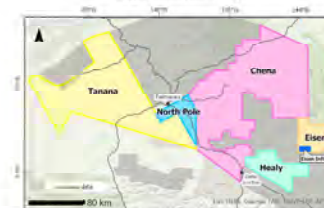


Base map: USGS 1:250,000 scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



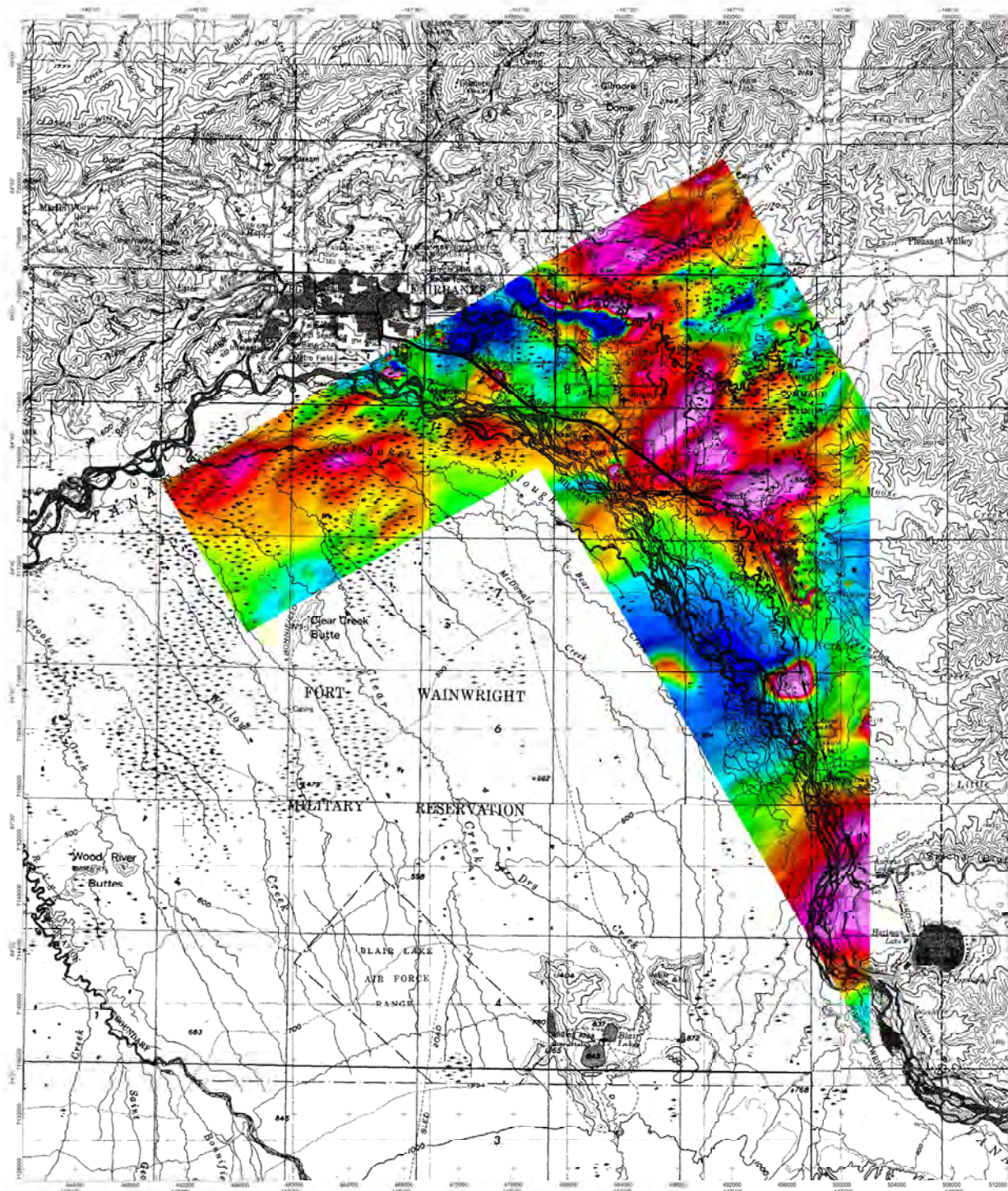
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ternary Map

North Pole Survey Block

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Website: alaska.dgsc.usgs.gov

LEGEND

Survey Date: 1 June-1 Aug. 2022
Elevation: 1000 ft

Map: August 2022
Data Source: FAS
C-4000

SURVEY PARAMETERS:

Altitude: 1000 ft
Tireless Line Direction: 1000 ft
Current Line Direction: 1000 ft

Drop: 3D computed at 155 m
150° (N20°W) : 400 m
60° (S40°E) : 500 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Sinter CS-3

Configuration: Full-Stage
Sampling Rate: 20 readings/second
Sensitivity: 0.01 nT

GAMMA-RAY SPECTROMETER:

RSS-3 multi-channel NaI sensor with
33.6 L "downward-looking" and 3.4 L
"upward-looking".
Sampling Rate: 1 reading/second

NAVIGATION: Garmin LUL GPS

Real-time differentially corrected
Sampling Rate: 10 readings/second

ALTIMETERS:

Sony 276 Pressure Transducer
Sampling Rate: 10 readings/second
Radar: Bathy King KRA-10A
Sampling Rate: 10 readings/second

BASE STATION:

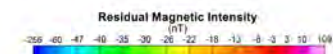
MAGNETOMETER:

GEOMAG-100M

Sampling Rate: 1 reading/second
Sensitivity: 0.02 nT

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Contract A.M. and MPX Geophysics LTD. 2022, Tanana River and Big Delta airborne
magnetic and radiometric survey; Alaska Division of Geological & Geophysical Surveys
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Base map: USGS 1:250,000 scale topographic map

Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



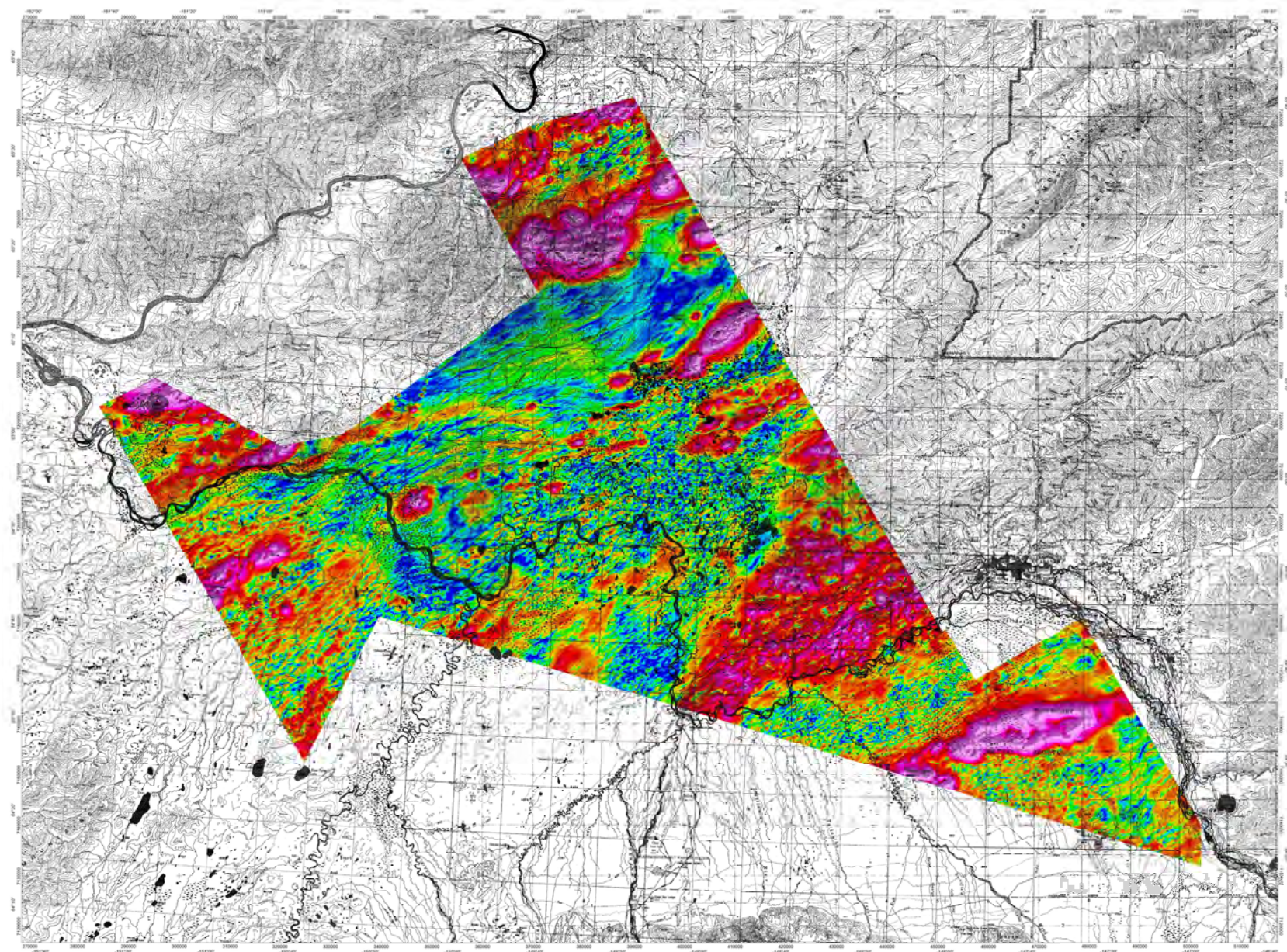
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Residual Magnetic Intensity Map

North Pole Survey Block

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 Geophysical Report 2022-1. <https://doi.org/10.14559/30899>

LEGEND

Survey Date:
 Project/Work Approval Type:
 Registration:

Map: August 2023
 Project/Work Approval Type:
 C-GQVP

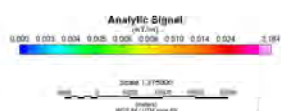
SURVEY PARAMETERS:
 Aerial Survey Mode:
 Traverse Line Direction/Spacing:
 Control Line Direction/Spacing:

Drops (30) completed at 100 m
 130°N/20°W, 400 m
 MPV(SMTC): 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETRIC SYSTEMS:
 Configuration: Tri-tilt
 Sampling Rate: 20 readings/second
 Sensitivity: 0.02 nT

NAVIGATION SYSTEMS:
 Real-time differential correction
 Sampling Rate: 10 readings/second



Base map: USGS 1:250,000-scale topographic map
 Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



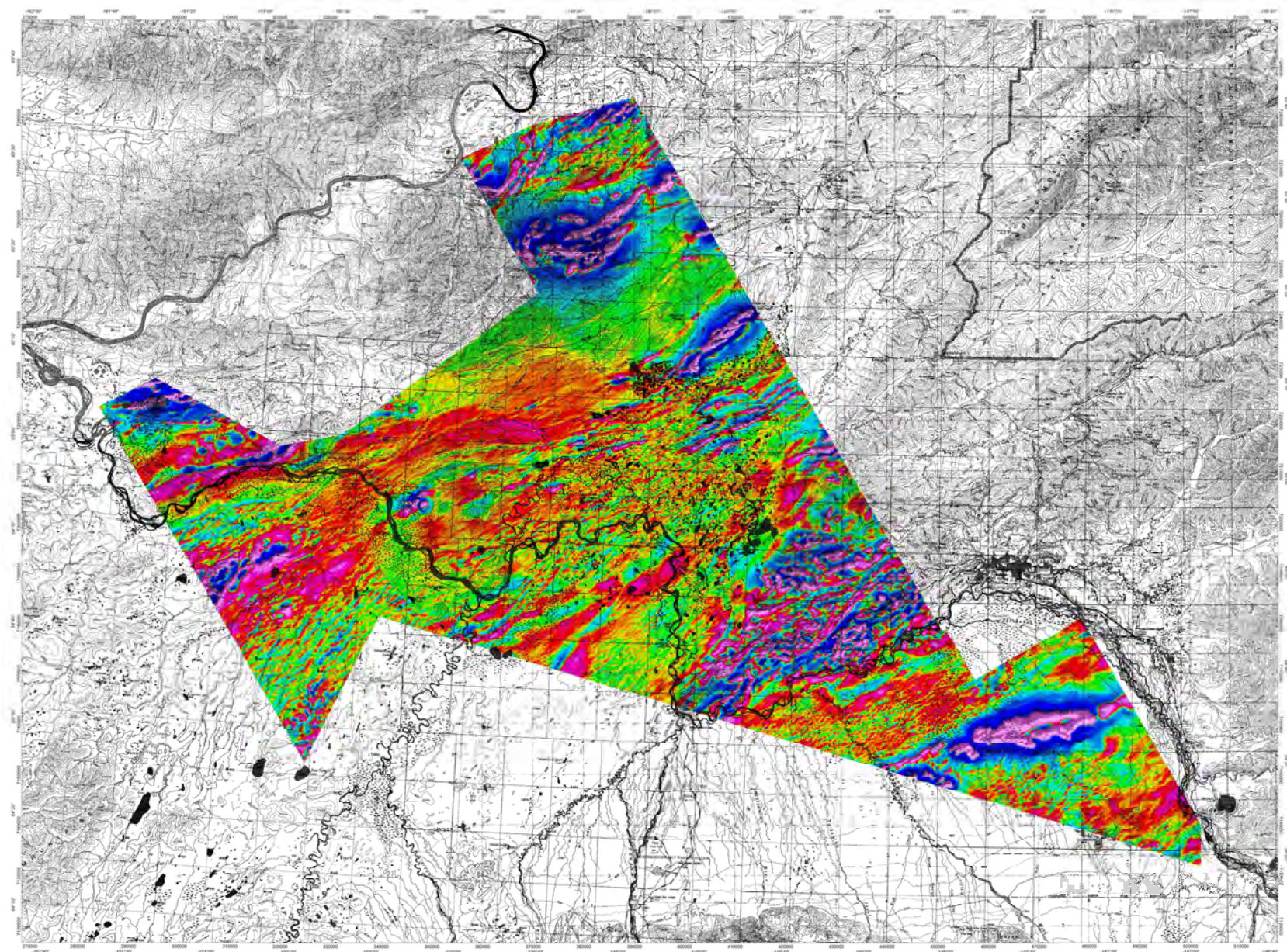
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Analytic Signal Map

Tanana Survey Block

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LEGEND

Survey Date: May-August 2023
 Platform/Aircraft Type: Piper Navajo PA31
 Registration: C-GQVY

SURVEY PARAMETERS:
 Airborne Survey Mode: Drops (30) completed at 100 m
 Traverse Line Direction/Spacing: 130°/0.25° W, 400 m
 Control Line Direction/Spacing: MPV(SMTC): 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: Scripps C-S
 Configuration: Tri-tilt
 Sampling Rate: 2 readings/second
 Sensitivity: 0.01 nT

NAVIGATION: AURAL L1/L2 GPS
 Real-time differential correction
 Sampling Rate: 10 readings/second

Calculated 1st Vertical Derivative
 (nT/km)
 -0.010 -0.007 -0.004 -0.001 0.001 0.003 0.006 0.008

Scale: 1:250,000
 MGS 84 / UTM Zone 5N

Base map: USGS 1:250,000-scale topographic map
 Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



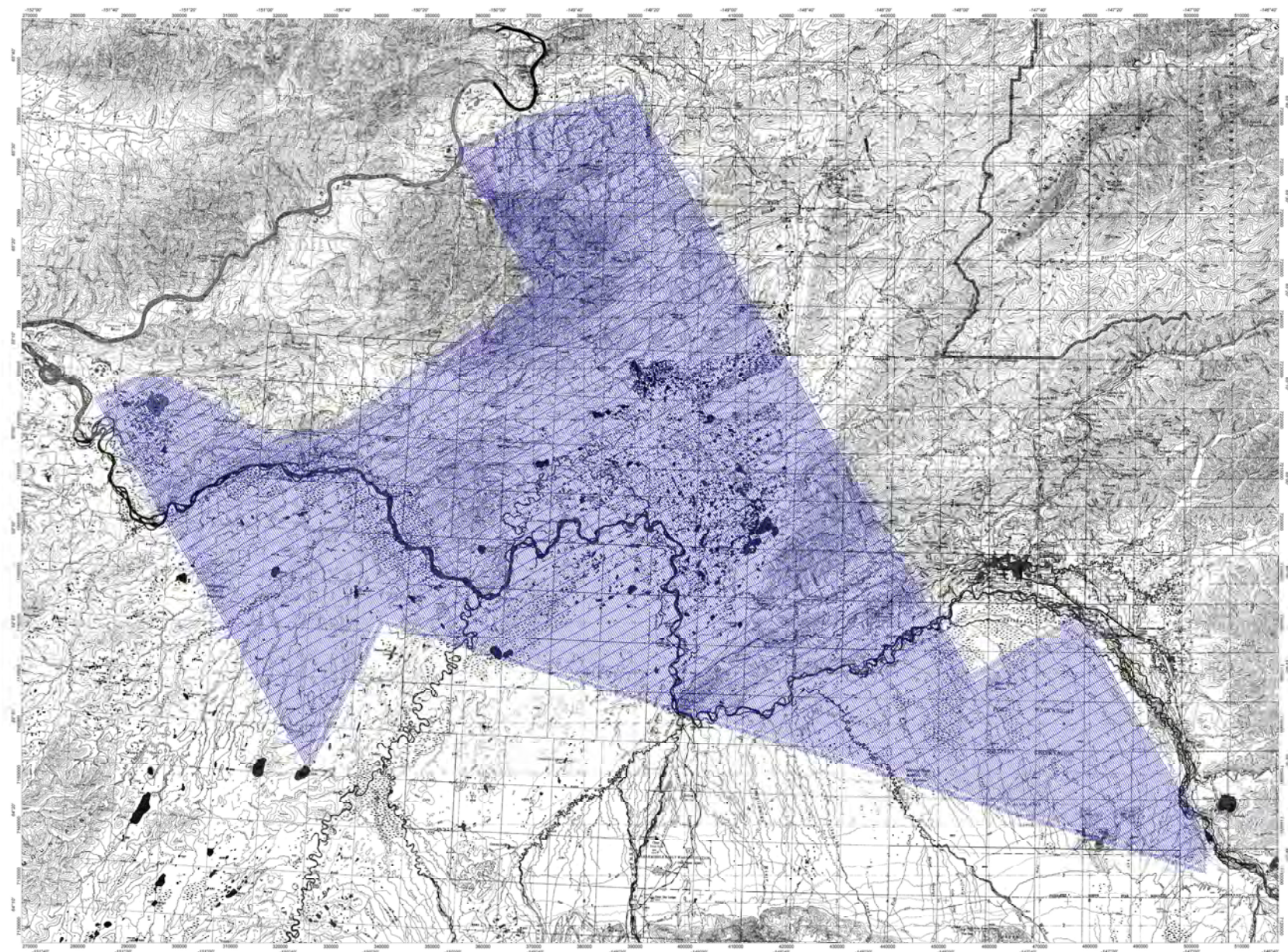
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Calculated 1st Vertical Derivative Map

Tanana Survey Block

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Geophysical Report 2022-1. <https://doi.org/10.14559/30899>

LEGEND

Survey Date: May - August 2022
Platform: Fixed Wing Aircraft Type: C-47QVP

SURVEY PARAMETERS:
Altitude Survey Mode: 100m
Throttle Line Altitude/Speed: 400m
Control Line Direction/Speed: 2400 m

AIRBORNE SYSTEMS:
MAGNETOMETER: SPECTRA CS-3
Configuration: De-Offset
Sampling Rate: 20 readings/second
Sensitivity: 0.02 nT

NAVIGATION: NOVA L1/L2 GPS
Real-time differential correction
Sampling Rate: 10 readings/second

CAMMA-RAY SPECTROMETER:
RS2C 5 meter diameter fast scanner, south
33.6 L "downwards looking" and 8.4 L "upwards looking"
Sampling Rate: 1 reading/second

ALTIMETERS:
Seth 276 Pressure Transducer

Flown Flight Path

Flown direction (°): Line type (L/L): Line Number - Version / Flight Number



Base map: USGS 1:250,000-scale topographic map
Location of the Tanana River and Big Delta survey areas in Alaska
and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



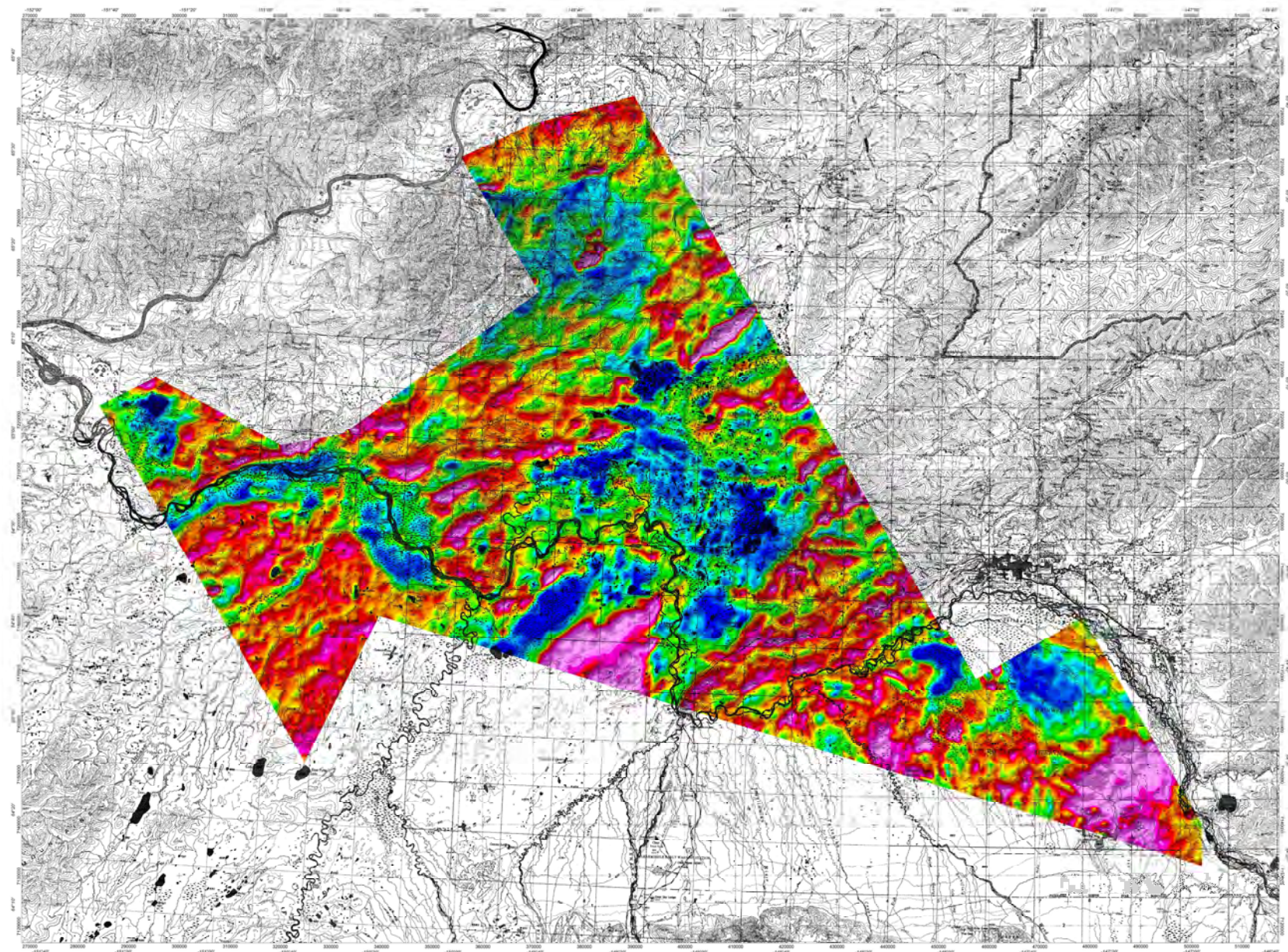
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Flown Flight Path Map

Tanana Survey Block

Geophysical Report 2022-1



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 Website: <https://alaska.dgsc.gov/>

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 magnetic and radiometric survey. Alaska Division of Geological & Geophysical Surveys
 Geophysical Report 2022-1. <https://doi.org/10.14509/30899>

LEGEND

Survey Date: May-August 2022
 Project/Map Sheet Type: Paper Map (PAX)
 Registration: C-0000

SURVEY PARAMETERS:
 Aerial Survey Mode: Drops (D) completed at 100 ft
 Traverse Line Direction/Spacing: 130° (N 20° W), 400 m
 Control Line Direction/Spacing: MPV (MPE): 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: SENTRY C-S
 Configuration: Tri-tilt
 Sampling Rate: 20 readings/second
 Sensitivity: 0.02 nT

NAVIGATION: NAVIOLITE GPS
 Real-time differential correction
 Sampling Rate: 10 readings/second



Base map: USGS 1:250,000-scale topographic map
 Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



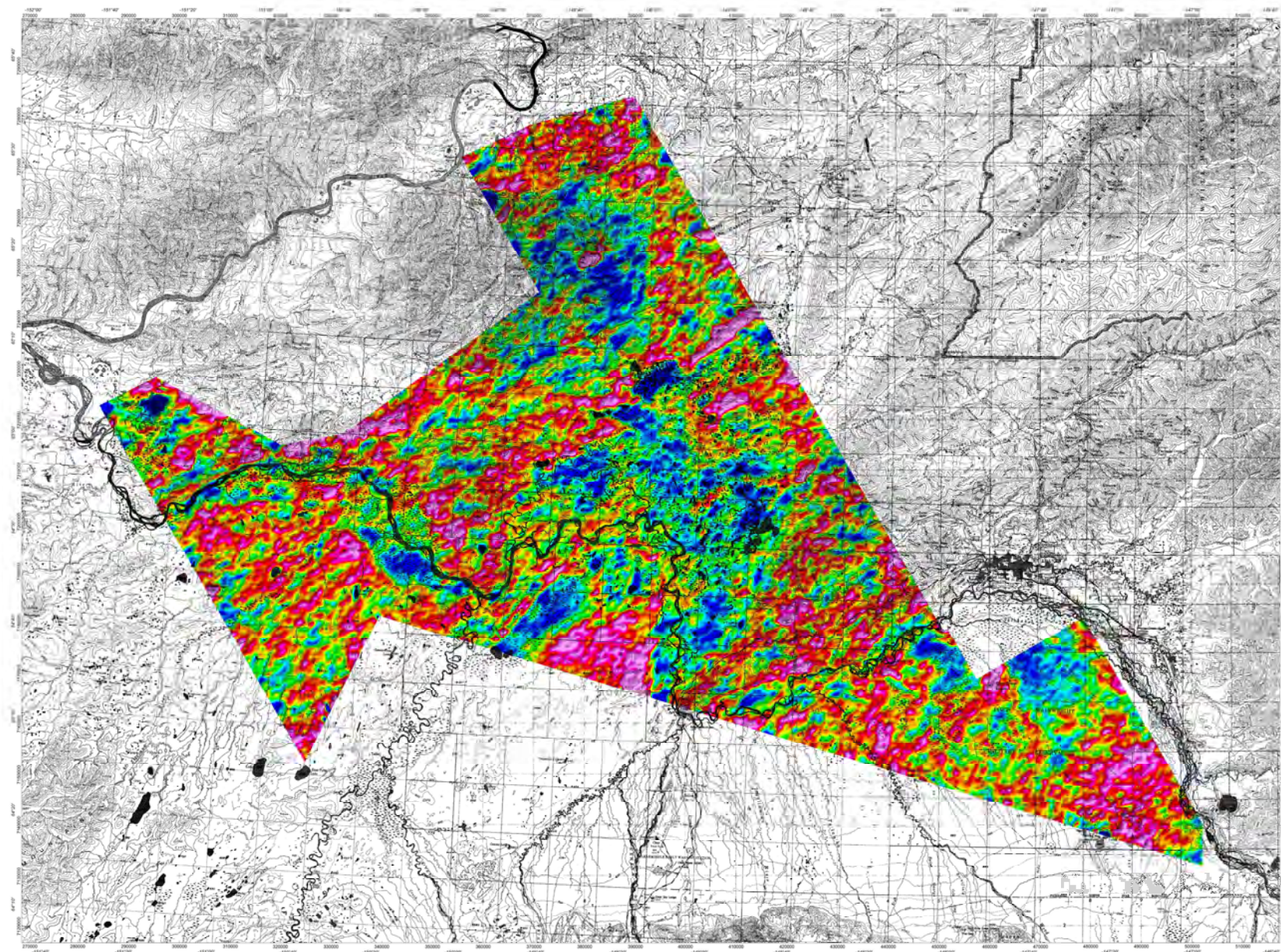
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Thorium Map

Tanana Survey Block

Geophysical Report 2022-1



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 magnetic and radiometric survey. Alaska Division of Geological & Geophysical Surveys
 Geophysical Report 2022-1. <https://doi.org/10.14559/30899>

LEGEND

Survey Date: May-August 2022
 Platform/Aircraft Type: Piper Navajo PA31
 Registration: C-GQVY

SURVEY PARAMETERS:
 Airborne Survey Mode: Drifts (D) corrected at 100 m
 Traverse Line Direction/Spacing: 130° (N 20° W); 400 m
 Control Line Direction/Spacing: MPV(MPV): 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETRIC SYSTEMS:
 Configuration: Tri-tilt
 Sampling Rate: 2 readings/second
 Sensitivity: 0.02 nT

NAVIGATION SYSTEMS:
 Real-time differential correction
 Sampling Rate: 10 readings/second



Base map: USGS 1:250,000-scale topographic map
 Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



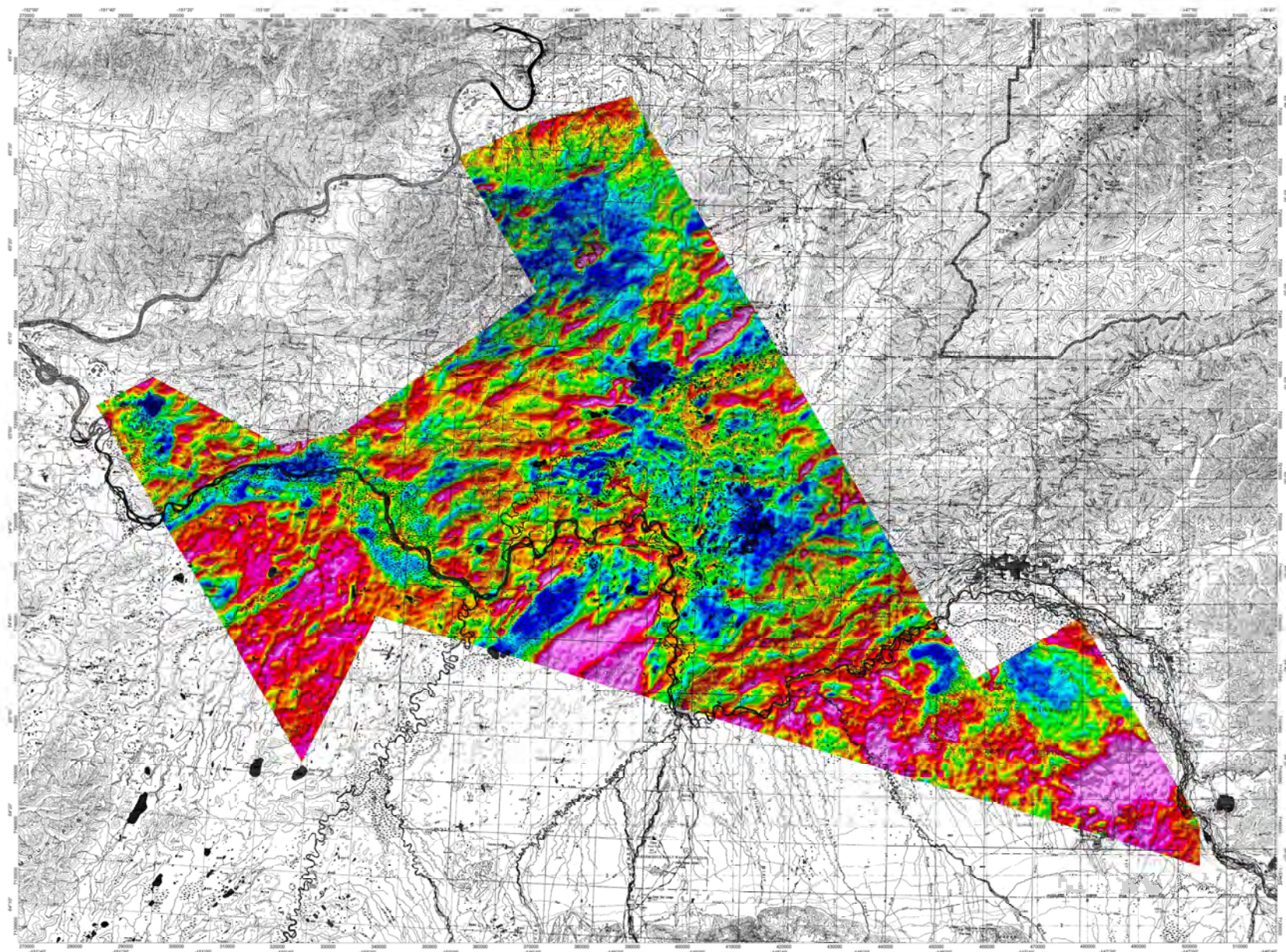
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Uranium Map

Tanana Survey Block

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 magnetic and radiometric survey. Alaska Division of Geological & Geophysical Surveys
 Geophysical Report 2022-1. <https://doi.org/10.14509/30899>

LEGEND

Survey Date: May-August 2022
 Platform/Aircraft Type: Piper Navajo PA31
 Registration: C-GQVY

SURVEY PARAMETERS:
 Airborne Survey Mode: Drops 300 collected at 100 m
 Traverse Line Direction/Spacing: 130° (N 20° W) / 400 m
 Control Line Direction/Spacing: 60° (N 60° E) / 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETRIC SYSTEMS:
 Configuration: Tri-tilt
 Sampling Rate: 20 readings/second
 Sensitivity: 0.02 nT

NAVIGATION/AIRBORNE GPS:
 Real-time differential corrected
 Sampling Rate: 10 readings/second

Potassium
 (ppm)
 0.12 0.45 0.53 0.58 0.65 0.68 0.74 0.78 0.84 0.88 0.90 1.03 1.13 3.39

Scale: 1:250,000
 NAD 83 / UTM Zone 18N

Base map: USGS 1:250,000-scale topographic map
 Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



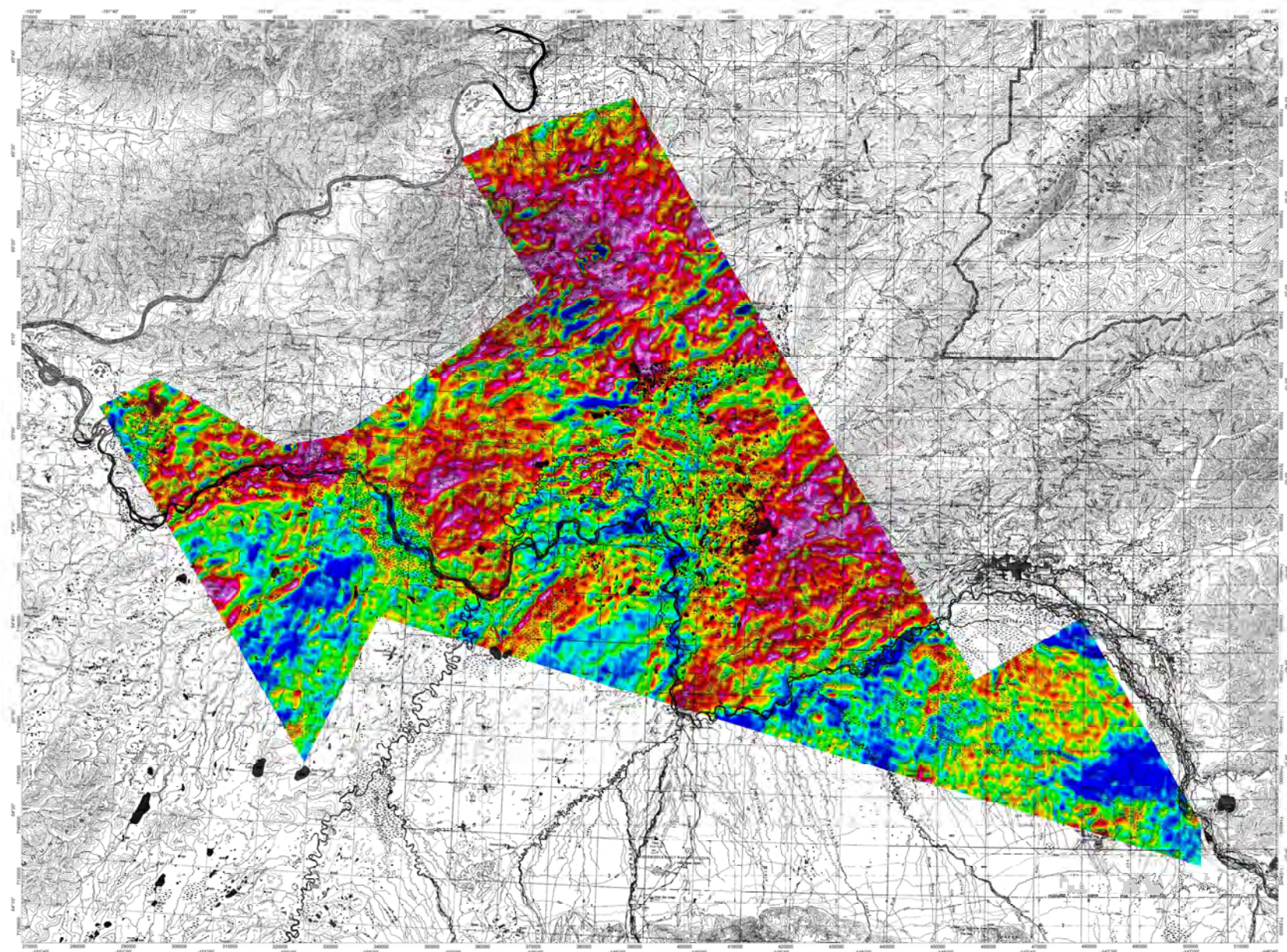
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Potassium Map

Tanana Survey Block

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 Geophysical Report 2022-1. <https://doi.org/10.14509/30099>

LEGEND

Survey Date:
 Project/Study Approval Type:
 Registration:

Map: August 2023
 Project/Study Approval Type:
 C-0000

SURVEY PARAMETERS:
 Aerial Survey Mode:
 Traverse Line Direction/Spacing:
 Control Line Direction/Spacing:

Drops: 300 collected at 100 m
 130°N/80°W, 400 m
 MPV(SPACE): 2400 m

AIRBORNE SYSTEMS:

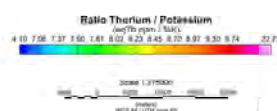
MAGNETOMETER: SENTRY C-S
 Configuration: Tri-tilt
 Sampling Rate: 20 readings/second
 Sensitivity: 0.01 nT

NAVIGATION: AURAL L1/L2 GPS
 Real-time differential correction
 Sampling Rate: 10 readings/second

GAMMA-RAY SPECTROMETER:
 RS25 5 multi-channel total gamma with
 33 x 1 "diameter hole" and 8 x 1
 "diameter hole"
 Sampling Rate: 1 reading/second

BASE STATION MAGNETOMETER:
 (10 M) (0.01-10 nT)
 Sampling Rate: 1 reading/second
 Sensitivity: 0.002 nT

ALTIMETERS:
 Setra 275 Pressure Transducer



Base map: USGS 1:250,000-scale topographic map
 Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



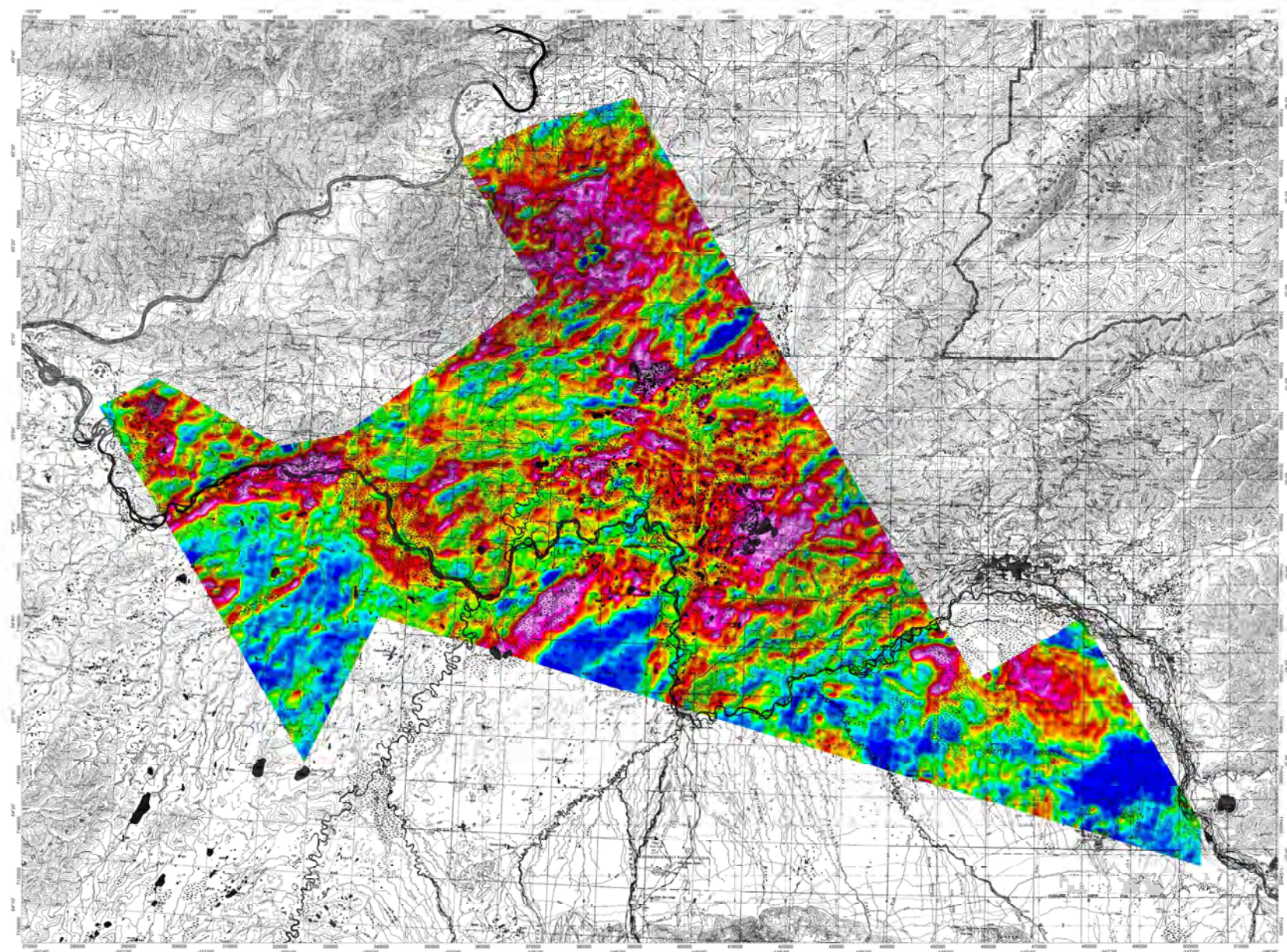
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ratio Thorium / Potassium Map

Tanana Survey Block

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 magnetic and radiometric survey. Alaska Division of Geological & Geophysical Surveys
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LEGEND

Survey Date:
 Project/Study Area/Type:
 Registration:

Map: August 2023
 Project/Study Area/Type:
 C-0000

SURVEY PARAMETERS:
 Airborne Survey Mode:
 Traverse Line Direction/Spacing:
 Ground Line Direction/Spacing:

Drugs: 301 completed at 100 m
 130°N/80°W; 400 m
 MPV(MPE): 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETRIC: SENTRY C-S
 Configuration: Tri-tilt
 Sampling Rate: 20 readings/second
 Sensitivity: 0.01 nT

NAVIGATION: AURAL L1/L2 GPS
 Real-time differential correction
 Sampling Rate: 10 readings/second

Ratio Uranium / Potassium
 (log10 scale, 1:1000)
 2.00 4.00 5.38 6.71 8.00 9.32 10.65 11.95 13.25 14.55 15.85 17.15 18.45 19.75 21.05 22.35

Scale: 1:250,000
 UTM 50N UTM Zone 50N

Base map: USGS 1:250,000-scale topographic map
 Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



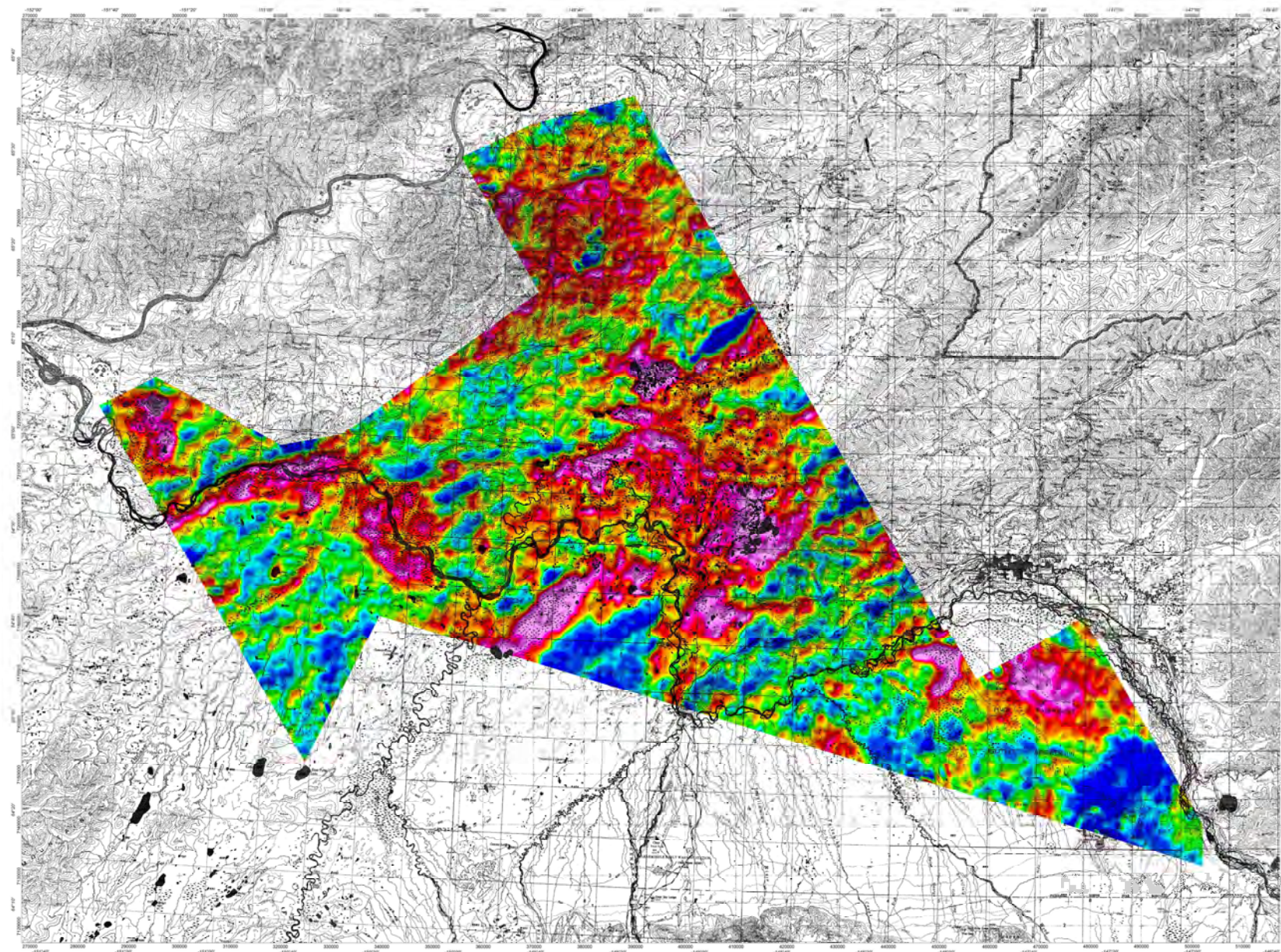
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ratio Uranium / Potassium Map

Tanana Survey Block

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 Zoned, 4 M, and MPV Geophysics FYD 2022 Tanana River and Big Delta airborne
 magnetic and radiometric survey, Alaska Division of Geological & Geophysical Surveys
 Geophysical Report 2022-1. <https://doi.org/10.14509/30899>

LEGEND

Survey Date:
 Project/Work Approval Type:
 Registration:

Map: August 2023
 Paper Storage (PAJ):
 C-0000

SURVEY PARAMETERS:
 Aerial Survey Mode:
 Traverse Line Direction/Spacing:
 Control Line Direction/Spacing:

Drops: 30 collected at 100 m
 150°N/0°W; 400 m
 MPV(SMTC): 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: SENTRY C-S
 Configuration: Tri-tilt
 Sampling Rate: 2 readings/second
 Sensitivity: 0.01 nT

NAVIGATION: NAVTECH L2 GPS
 Real-time differential correction
 Sampling Rate: 10 readings/second

GAMMA-RAY SPECTROMETER:

RS2C 5 multi-channel total gamma with
 33.6 L "downward looking" and 8 L L
 "upward looking"
 Sampling Rate: 1 reading/second

ALTIMETERS:
 Setra 275 Pressure Transducer

Ratio Uranium / Thorium
 (mg/g) (ppm) (wt%) (ppm)
 0.10 0.05 0.01 0.72 0.72 0.78 0.80 0.84 0.87 0.90 0.94 1.00 1.10 2.40

Base map: USGS 1:250,000-scale topographic map
 Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



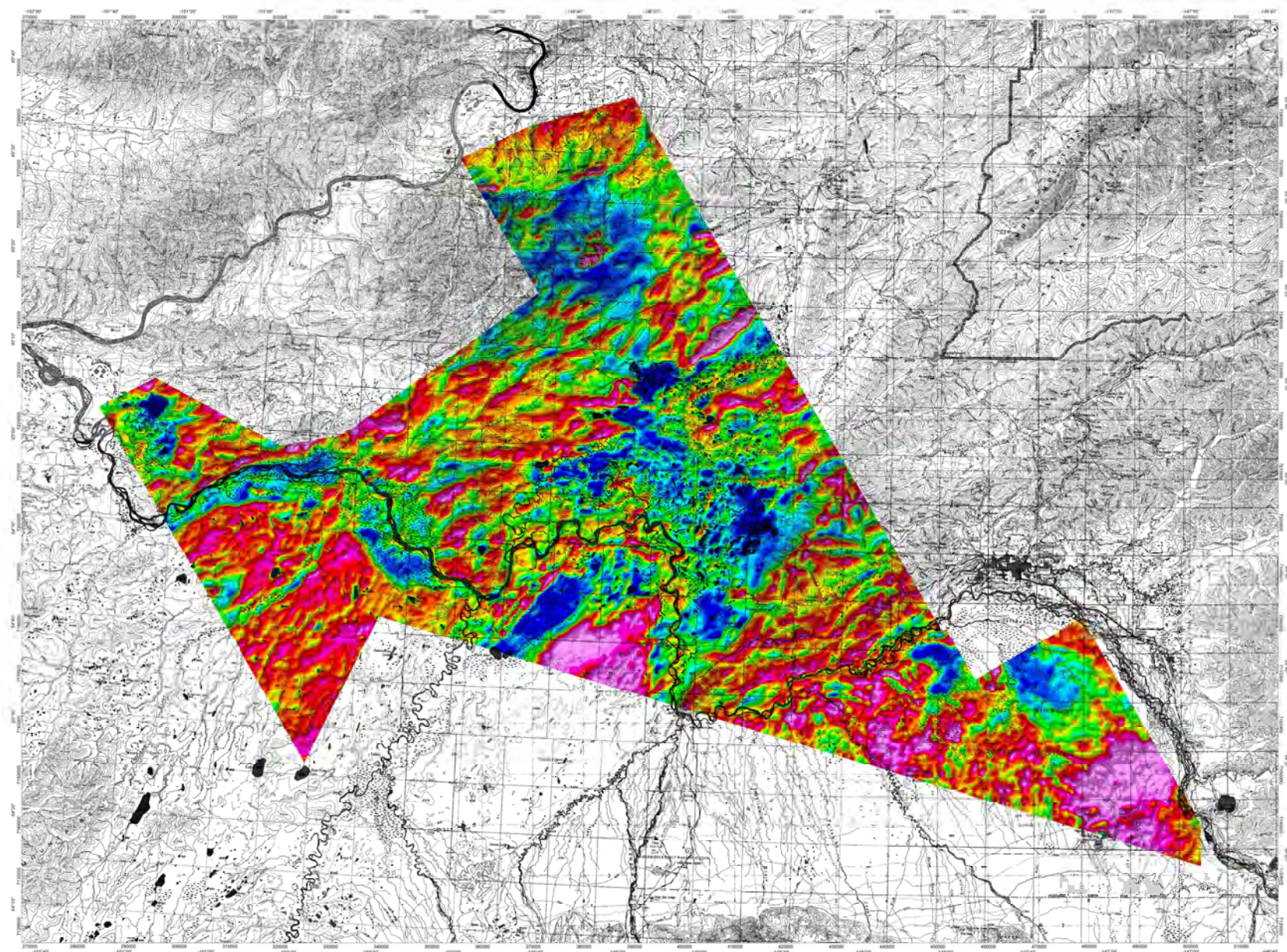
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ratio Uranium / Thorium

Tanana Survey Block

Geophysical Report 2022-1



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This work was supported by the U.S. Geological Survey's Earth MRI program:
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LEGEND

Survey Date: May-August 2022
 Plot/Map System Type: UTM
 Projection: UTM

SURVEY PARAMETERS:
 Aerial Survey Mode: Drops (1) completed at 100 m
 Traverse Line Direction/Spacing: 130°/0.25 mi, 400 m
 Control Line Direction/Spacing: 10°/0.25 mi, 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETER: SENTRY CS-5
 Configuration: Tri-tilt
 Sampling Rate: 2 readings/second
 Sensitivity: 0.01 nT

NAVIGATION: NAVIOLITE GPS
 Real-time differential correction
 Sampling Rate: 10 readings/second

Total Air Absorbed Dose Rate
 (mR/hr)
 10 15 20 25 30 35 40 45 50 55

Scale: 1:250,000
 UTM 50N 12E Zone 50

Base map: USGS 1:250,000-scale topographic map
 Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



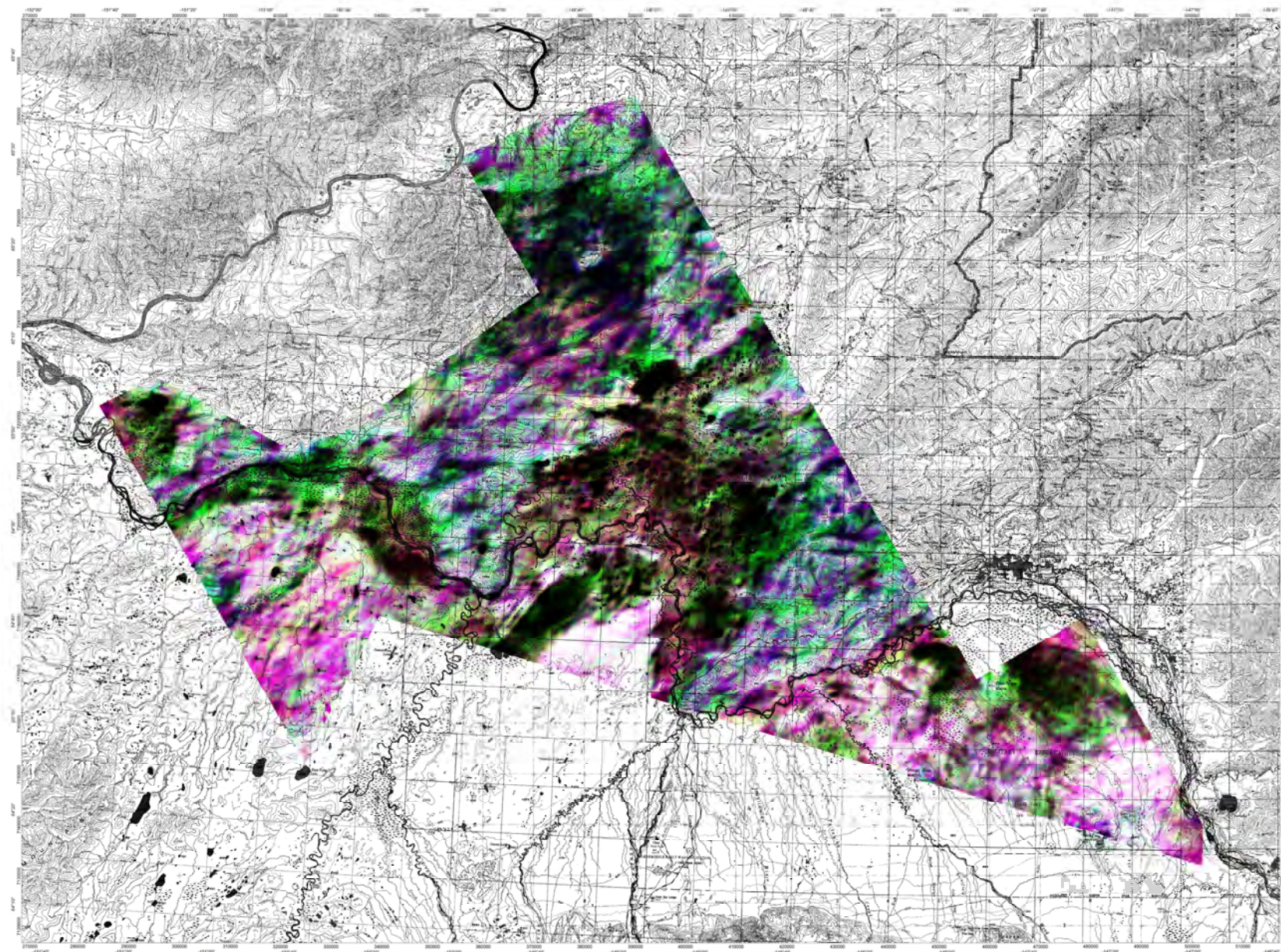
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Total Air Absorbed Dose Rate Map

Tanana Survey Block

Geophysical Report 2022-1



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LEGEND

Survey Date:
 Project/Study Aerial Type:
 Registration:

Map: August 2023
 Paper: Nevada FAXJ
 C-000V

SURVEY PARAMETERS:
 Aerial Survey Mode:
 Traverse Line Direction/Spacing:
 Ground Line Direction/Spacing:

Drops: 301 completed at 100 m
 1307 (N 80° W) = 400 m
 MPV(SMTC): 2400 m

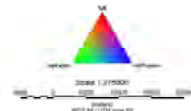
AIRBORNE SYSTEMS:

MAGNETOMETER: SENTRY C-S
 Configuration: Tri-tilt
 Sampling Rate: 20 readings/second
 Sensitivity: 0.02 nT

NAVIGATION: NAVI 402 GPS
 Real-time differential correction
 Sampling Rate: 10 readings/second

GAMMA-RAY SPECTROMETER:
 RS2C 5 multi-channel total gamma with
 33 x 1.5" detectors (looking "up" & "down")
 Sampling Rate: 1 reading/second

ALTIMETERS:
 Setra 275 Pressure Transducer



Base map: USGS 1:250,000-scale topographic map
 Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



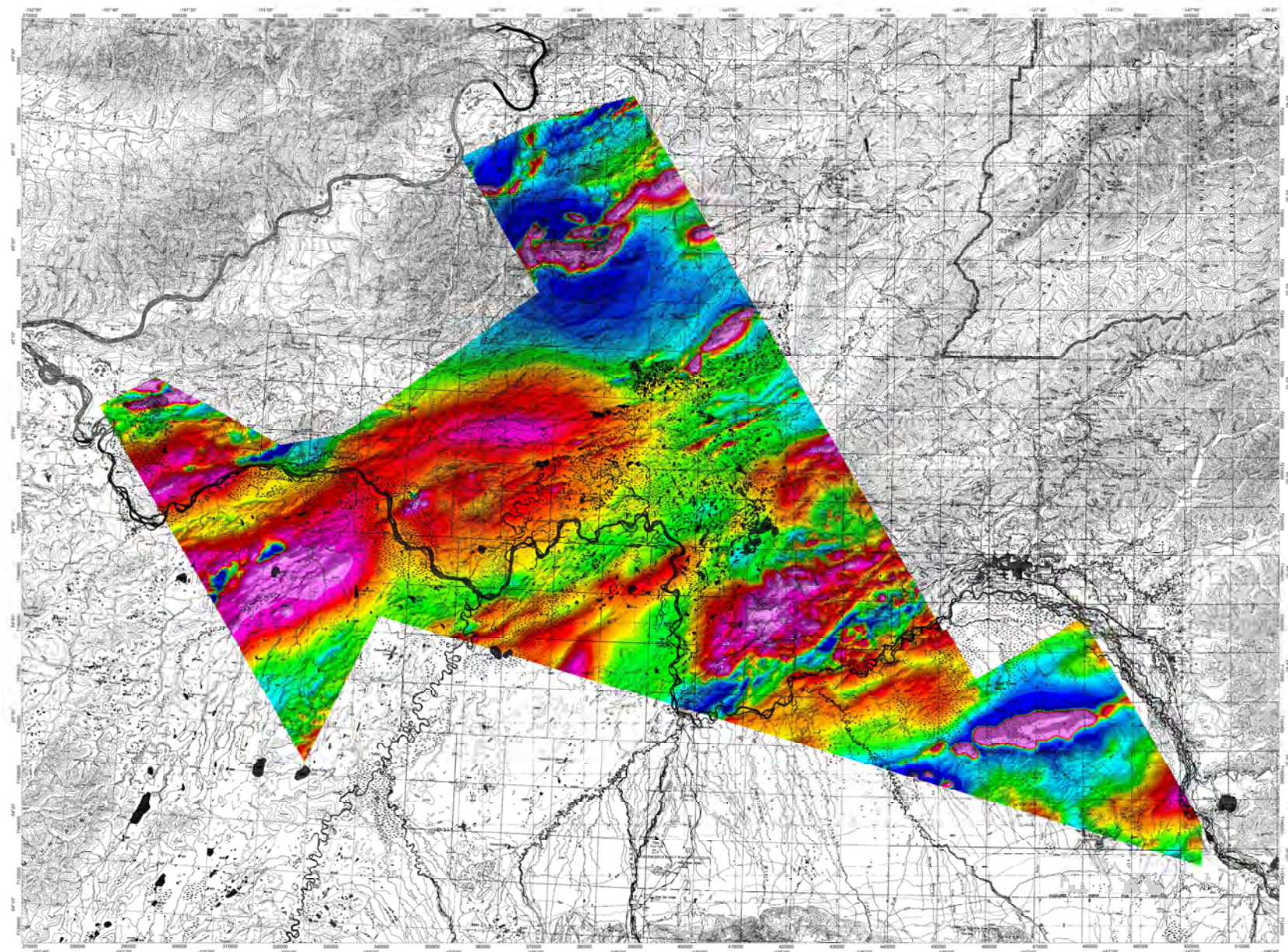
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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Ternary Map

Tanana Survey Block

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LEGEND

Survey Date:
 Project/Work Approval Type:
 Registration:

Map: August 2023
 Paper: NAD83
 C-0000

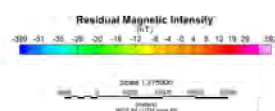
SURVEY PARAMETERS:
 Aerial Survey Mode:
 Traverse Line Direction/Spacing:
 Control Line Direction/Spacing:

Drops: 30 collected at 100 m
 150 m (NAD83) 400 m
 MPV(SITE): 2400 m

AIRBORNE SYSTEMS:

MAGNETOMETRIC SYSTEMS:
 Configuration: T-tilt
 Sampling Rate: 2 readings/second
 Sensitivity: 0.02 nT

NAVIGATION: AURAL L1/L2 GPS
 Real-time differential correction
 Sampling Rate: 1 readings/second



Base map: USGS 1:250,000-scale topographic map
 Location of the Tanana River and Big Delta survey areas in Alaska
 and in relation to the USGS 1:250,000-scale quadrangles



Regional Location Map



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Tanana River and Big Delta Airborne Magnetic and Radiometric Survey

Residual Magnetic Intensity Map

Tanana Survey Block

Geophysical Report 2022-1