EAST STYX ELECTROMAGNETIC, MAGNETIC, AND RADIOMETRIC AIRBORNE GEOPHYSICAL SURVEY DATA COMPILATION

L.E. Burns, G.R.C. Graham, A.M. Emond, J.D. Barefoot, CGG, and Fugro GeoServices Inc.

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EAST STYX ELECTROMAGNETIC, MAGNETIC, AND RADIOMETRIC AIRBORNE GEOPHYSICAL SURVEY DATA COMPILATION

Burns, L.E.[1] , Graham, G.R.C.[1], Emond, A.M.[1], Barefoot, J.D.[1], CGG, and Fugro GeoServices Inc.

ABSTRACT

The East Styx electromagnetic, magnetic, and radiometric airborne geophysical survey is located about 150 kilometers northwest of Anchorage, Alaska in the upper Skwentna River drainage and surrounds the Rainy Pass Airport. The survey is in the Yentna, Redoubt, and McGrath mining districts of south-central Alaska. Frequency domain electromagnetic, magnetic, and radiometric data were collected with the DIGHEM system from June 24th to September 24th, 2013. A total of 7865.6 line kilometers were collected covering 2791.2 square kilometers. Line spacing was 400 meters (m). Data were collected 30 m above the ground surface from a helicopter towed sensor platform ("bird") on a 30 m long line.

PURPOSE

This airborne geophysical survey is part of a program to acquire data on Alaska's most promising mineral belts and districts. The information acquired is aimed at catalyzing new private-sector exploration, discovery, and ultimate development and production. Mineralization in the survey area includes the Island Mountain porphyry copper-gold deposit and the Oxide intrusion-related gold prospects, as well as other polymetallic vein and epithermal vein-type prospects.

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

Funding was provided by the Alaska State Legislature as part of the DGGS Airborne Geophysical/Geological Mineral Inventory (AGGMI) program and Strategic and Critical Minerals Assessment Capital Improvement (SCMA) program.

[1] Alaska Division of Geological & Geophysical Surveys, 3354 College Road, Fairbanks, Alaska 99709-3707

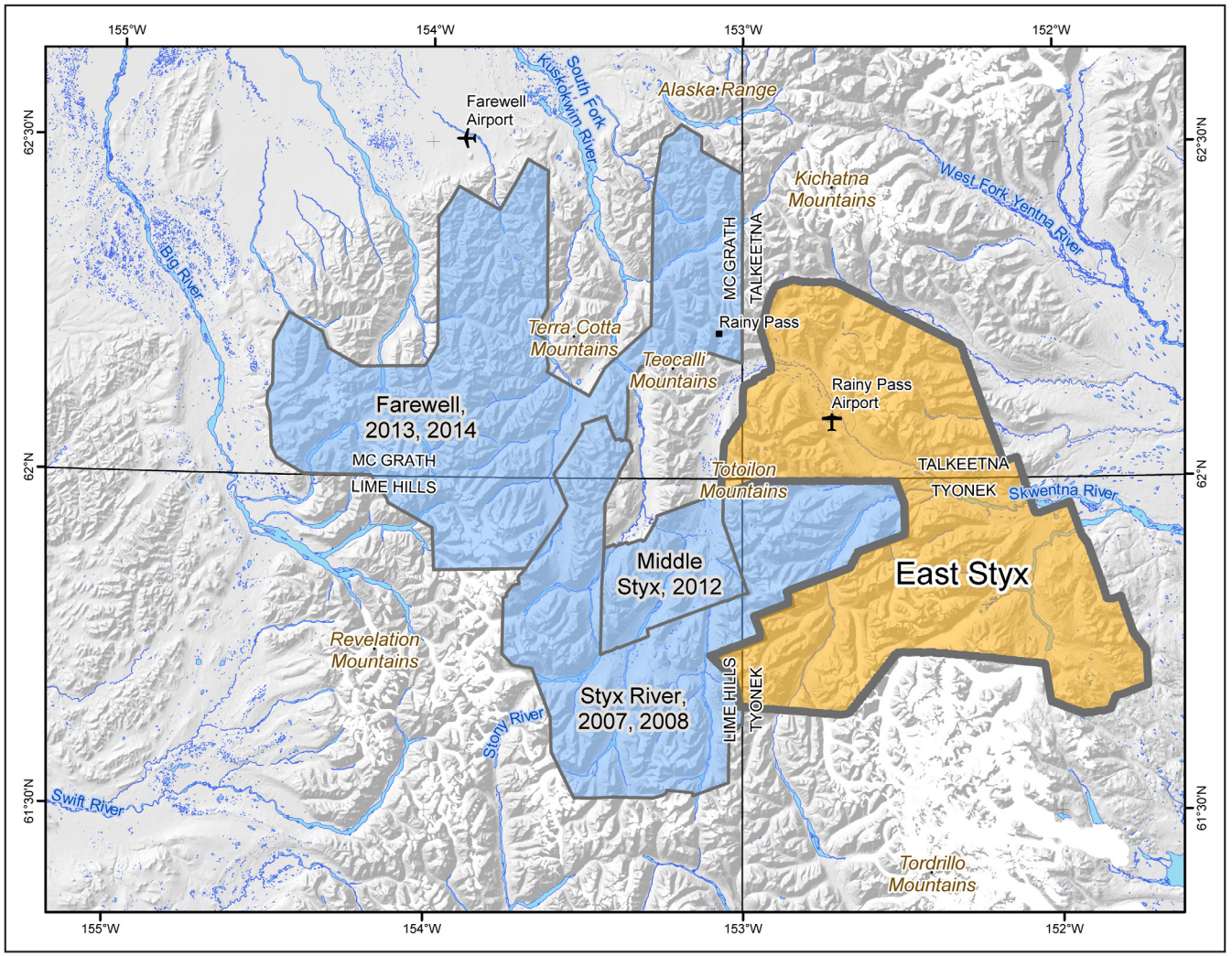
AVAILABLE DATA

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 and DGGS	Project and field reports, survey background information, gridded data explanations, other documentation
grids_ermapper	contractor	Geographically registered gridded data, ER Mapper ERS format
grids_geosoft	contractor	Geosoft-format grids, these grids can be viewed in ESRI ArcMap using a free plugin from Geosoft or the free viewer available from Geosoft
images_registered	DGGS	GeoTiff format images of all gridded data
kmz	DGGS	keyhole markup language (kml) kmz archive files of project data. Viewable in Google Earth and other compatible programs
maps_pdf_format	contractor and DGGS	Printable maps in pdf format
maps_prn_format	contractor	Printable maps in HPGL/2 printer file format with extension .prn
profiles_stacked	contractor	Distance-based profiles of the digitally recorded geophysical data are generated and plotted at an appropriate scale. The profiles display electromagnetic anomalies with their respective interpretive symbols. Printable in pdf format
vector_data	contractor and DGGS	Line path, data contours, and survey boundary in ESRI shapefile (SHP) format, ESRI Geodatabase format, and/or AutoCAD dxf format
video_flightpath	contractor	Survey flight path downward facing video

REFERENCES

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, n. 4, p. 589–602.

Burns, L.E., CGG, and Fugro GeoServices, Inc., 2014, East Styx survey area: Airborne magnetic, electromagnetic and radiometric data in line (point), grid, vector, and map formats, Talkeetna, Tyonek, McGrath, and Lime Hills quadrangles, south-central Alaska: Alaska Division of Geological & Geophysical Surveys Geophysical Report 2014-5, scale 1:63,360, 1 DVD. http://doi.org/10.14509/29142



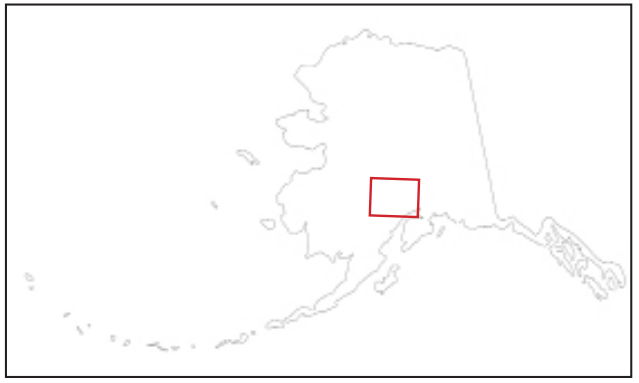


Figure 1. East Styx electromagnetic and magnetic airborne geophysical survey location shown in southcentral Alaska (inset). East Styx survey area shown with adjacent DGGS geophysical surveys, landmarks, relevant 1:250,000-scale quadrangle boundaries, mountain ranges, rivers, glaciers, and elevation hillshade.

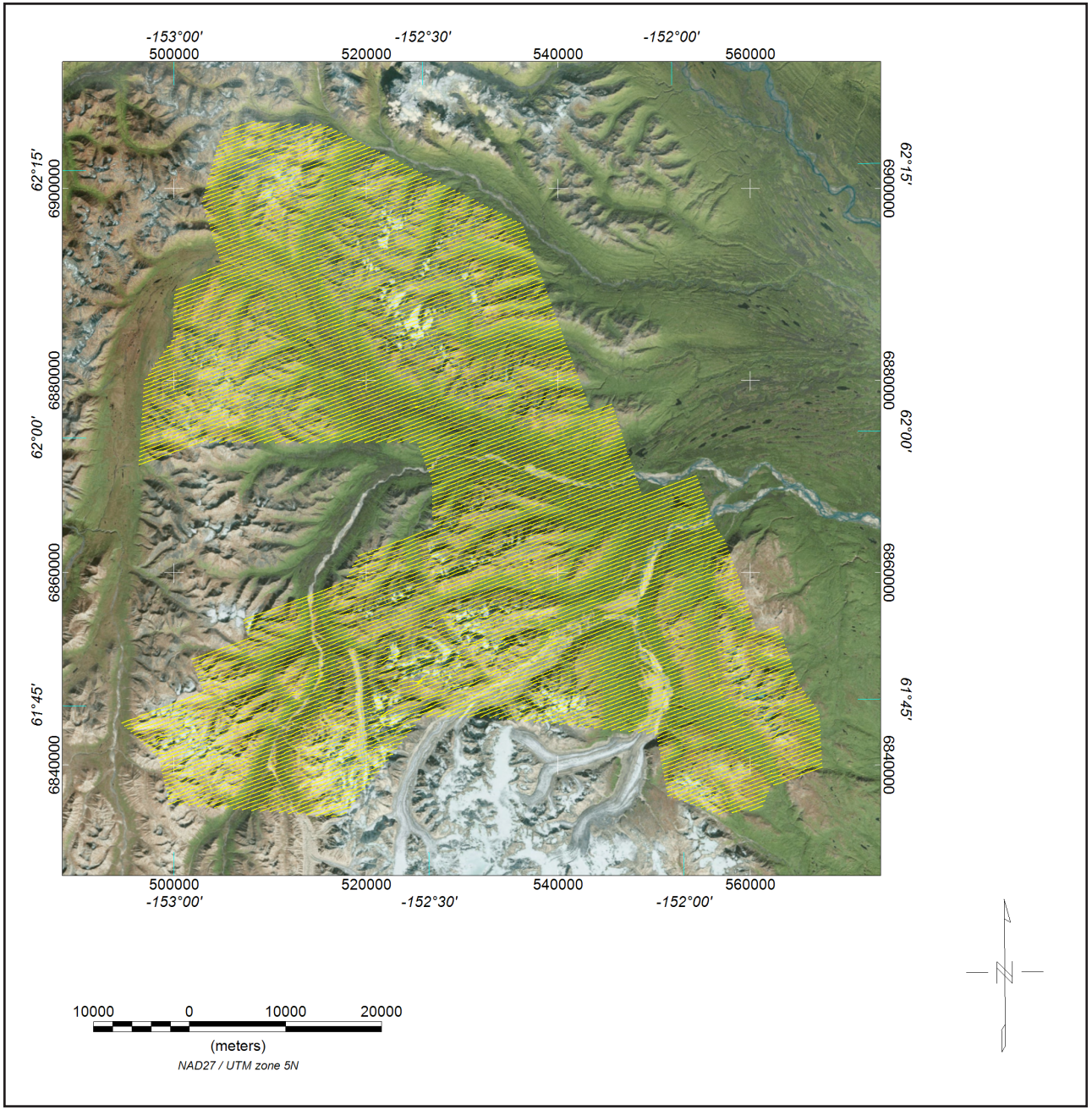


Figure 2. Flight path with orthometric image.

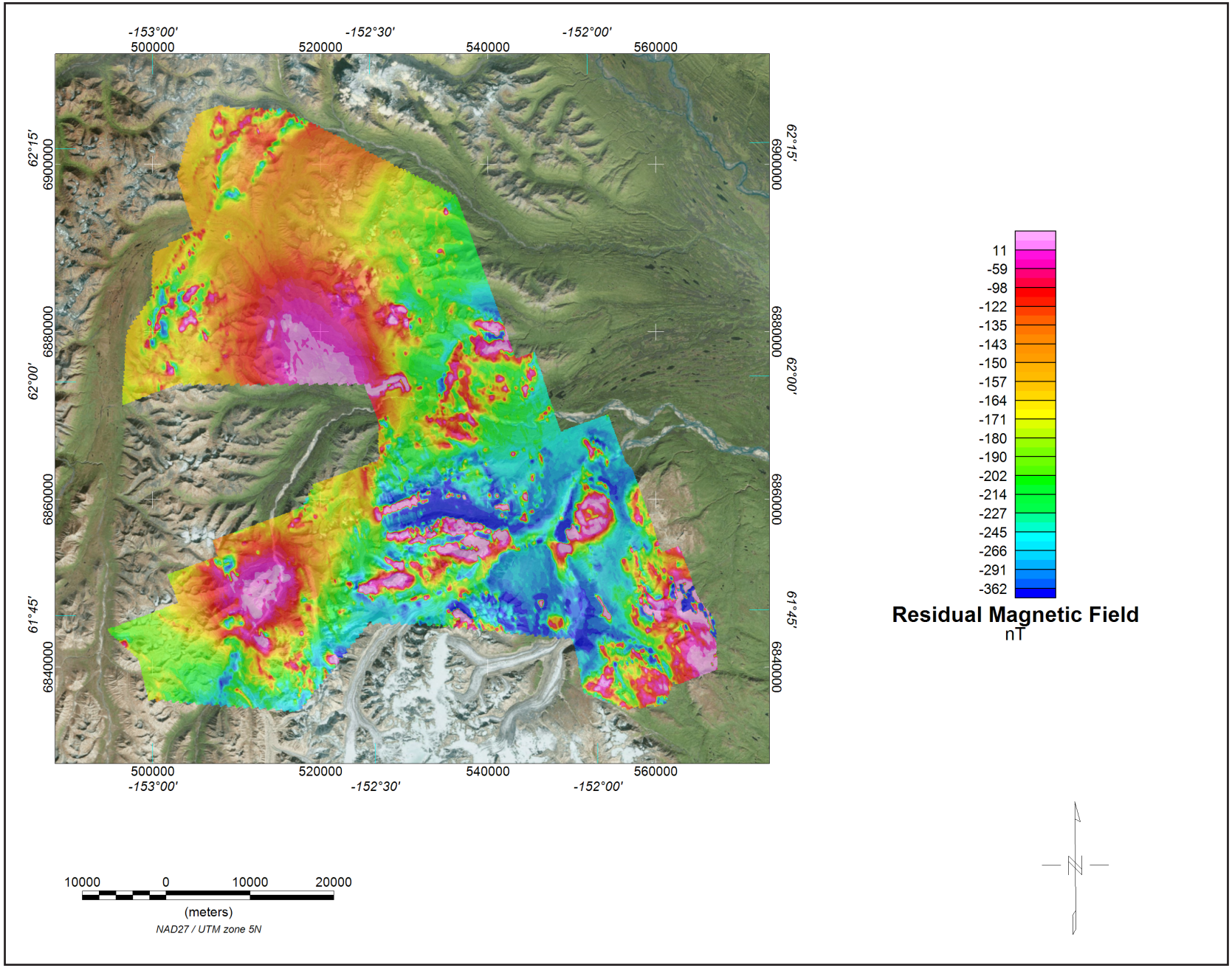


Figure 3. Residual magnetic field grid with orthometric image. The magnetic total field data were created using digitally recorded data from a Fugro D1344 magnetometer with a Scintrex CS3 cesium sensor. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtracting the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2010, updated for date of flight and altimeter variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 80 m grid using a modified Akima (1970) technique.

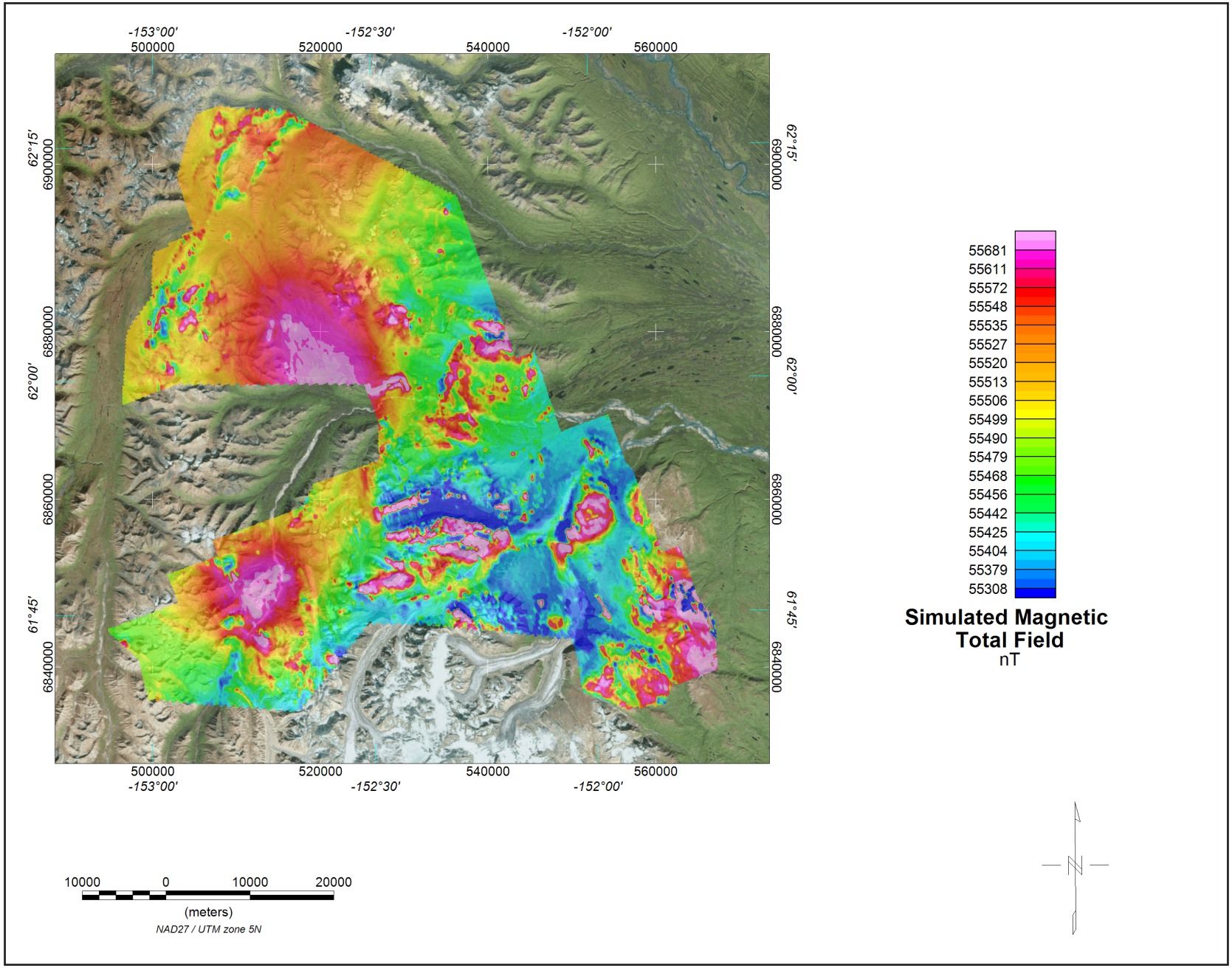


Figure 4. Simulated magnetic total field grid with orthometric image. The simulated magnetic total field data were created using digitally recorded data from a Fugro D1344 magnetometer with a Scintrex CS3 cesium sensor. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtracting the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2010, updated for date of flight and altimeter variations), (3) leveled to the tie line data, (4) a constant value of approximately 55,000 nT was added to all data, and (5) interpolated onto a regular 80 m grid using a modified Akima (1970) technique.

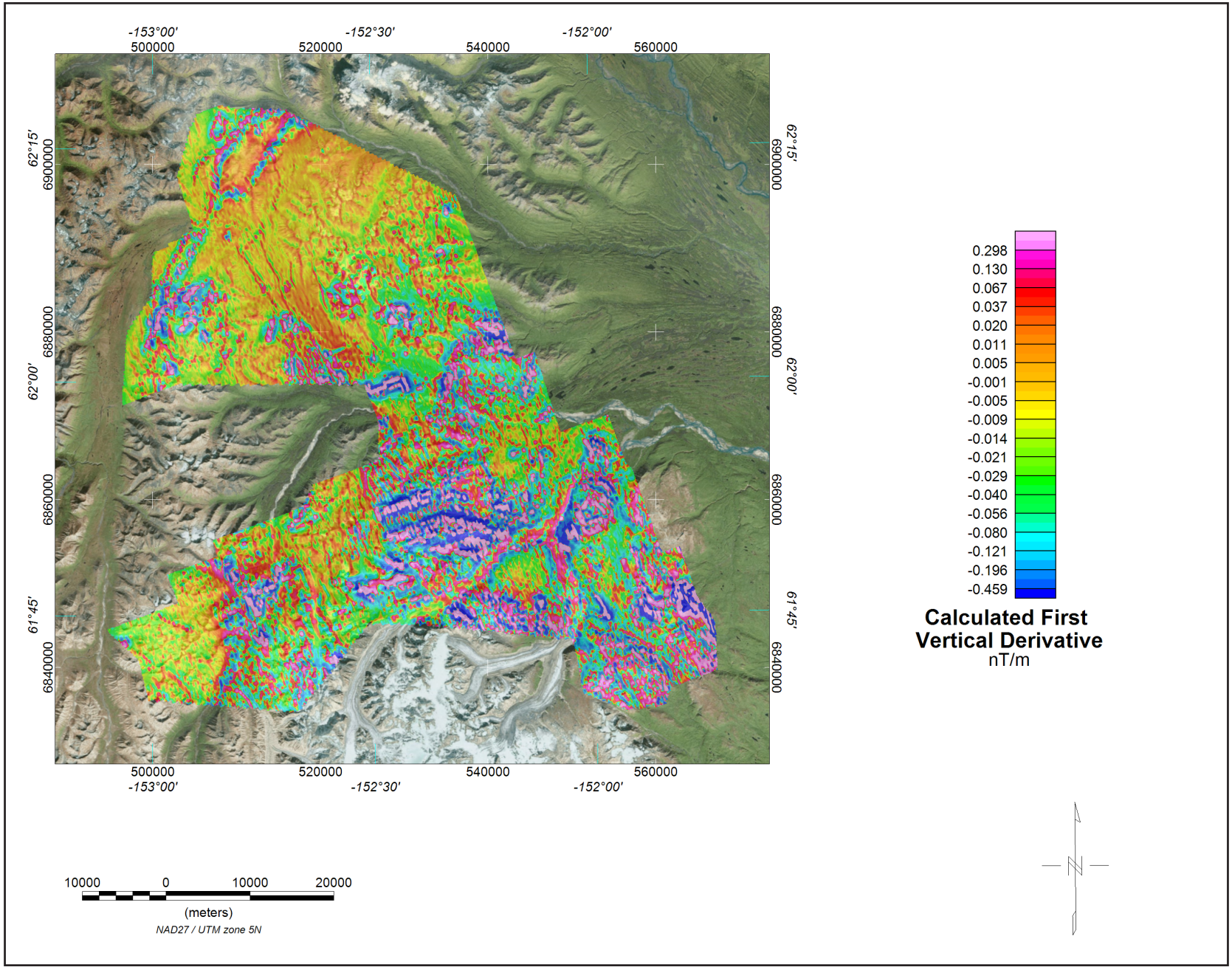


Figure 5. Calculated first vertical derivative grid with orthometric image. The first vertical derivative grid was calculated from the diurnally-corrected, IGRF-corrected total magnetic field grid using a FFT base frequency domain filtering algorithm. The resulting first vertical derivative grid provides better definition and resolution of near- surface magnetic units and helps to identify weak magnetic features that may not be evident on the total field data.

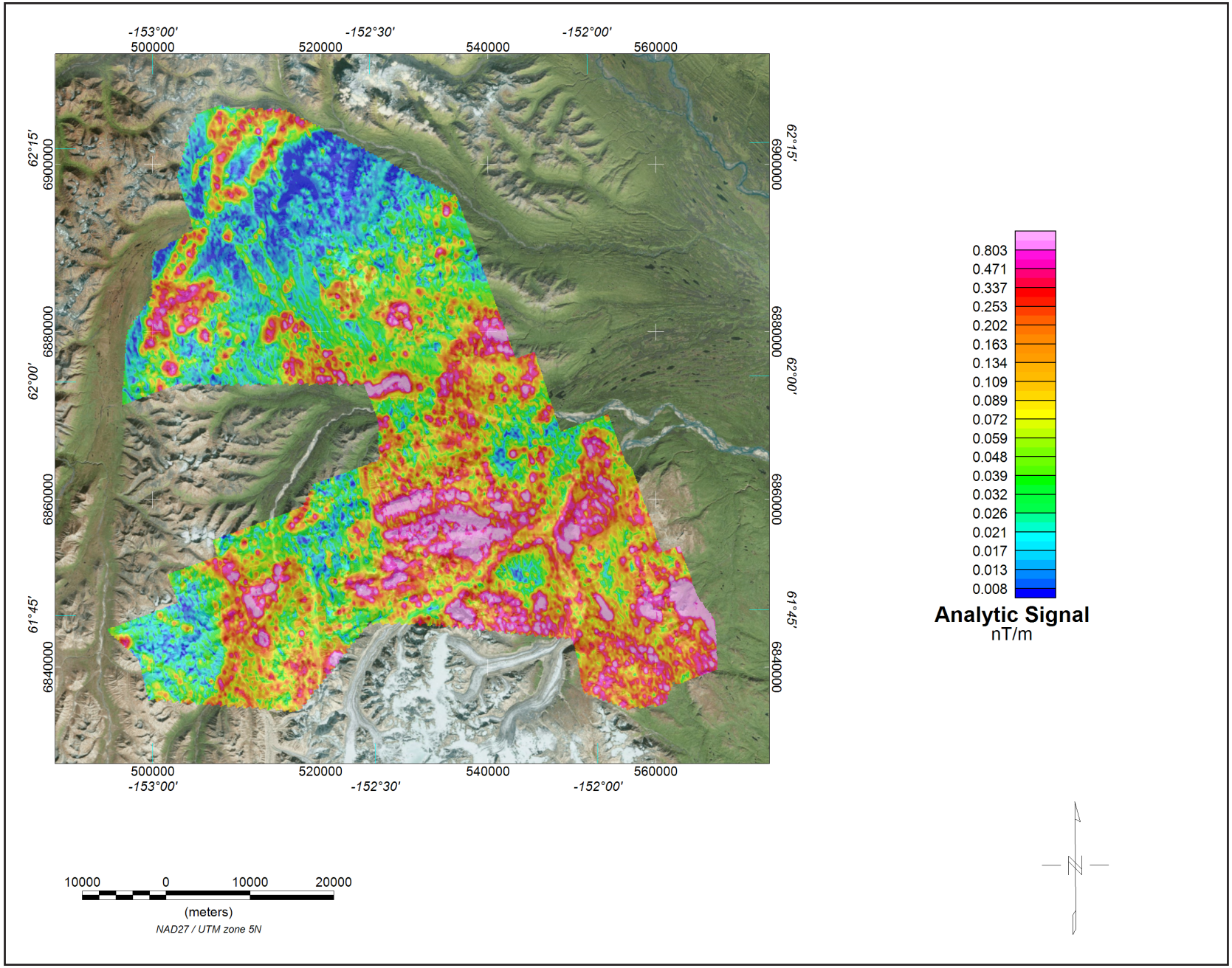


Figure 6. Analytic signal grid with orthometric image. Analytic signal is the total amplitude of all directions of magnetic gradient calculated from the sum of the squares of the three orthogonal gradients. Mapped highs in the calculated analytic signal of magnetic parameter locate the anomalous source body edges and corners (such as contacts, fault/shear zones, etc.). Analytic signal maxima are located directly over faults and contacts, regardless of structural dip, and independent of the direction of the induced and/or remanent magnetizations.

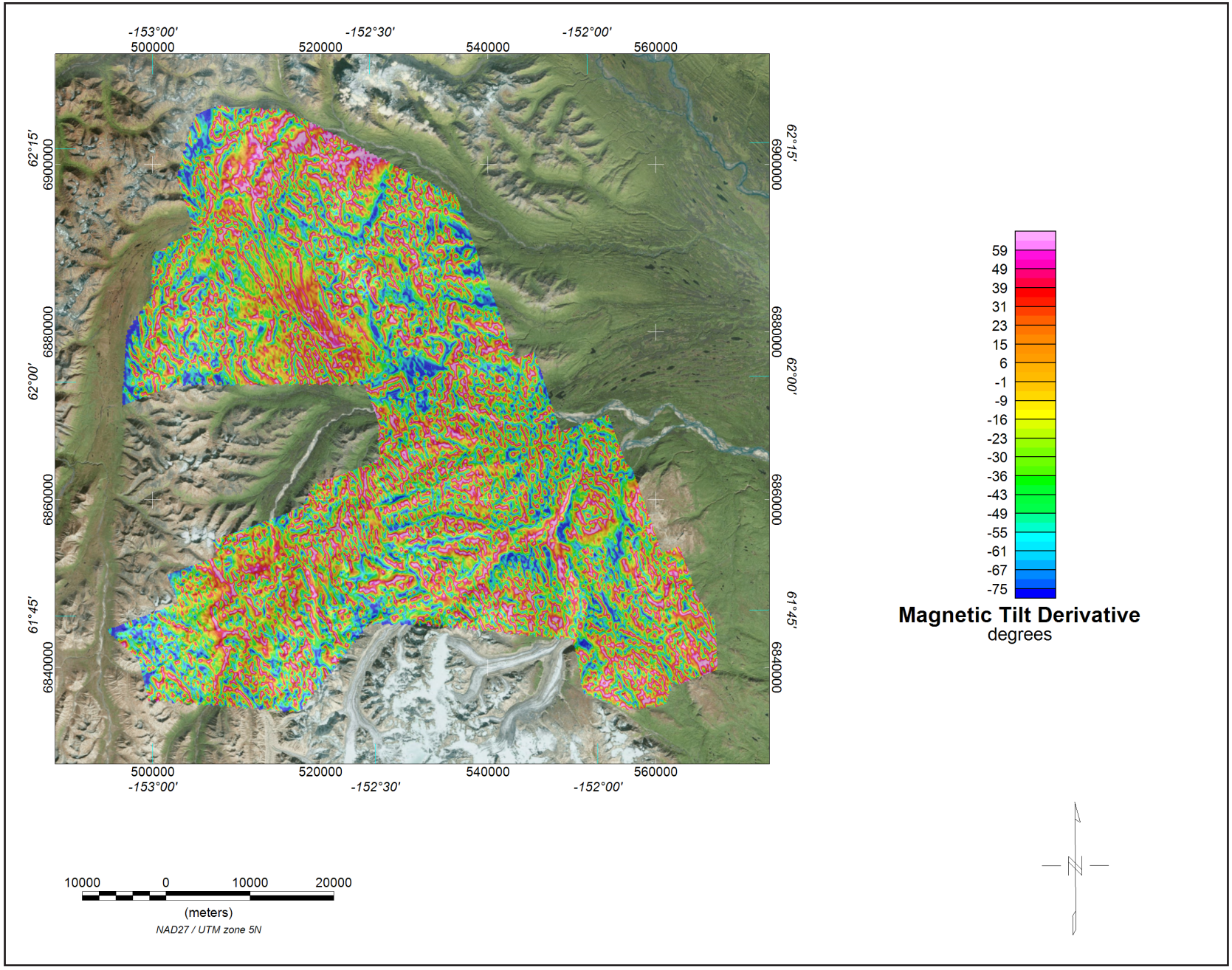


Figure 7. Magnetic tilt derivative grid with orthometric image. The tilt derivative is the angle between the horizontal gradient and the total gradient, which is useful for identifying the depth and type of source. The tilt angle is positive over the source, crosses through zero at, or near, the edge of a vertical sided source, and is negative outside the source region. It has the added advantage of responding equally well to shallow and deep sources and is able to resolve deeper sources that may be masked by larger responses from shallower sources.

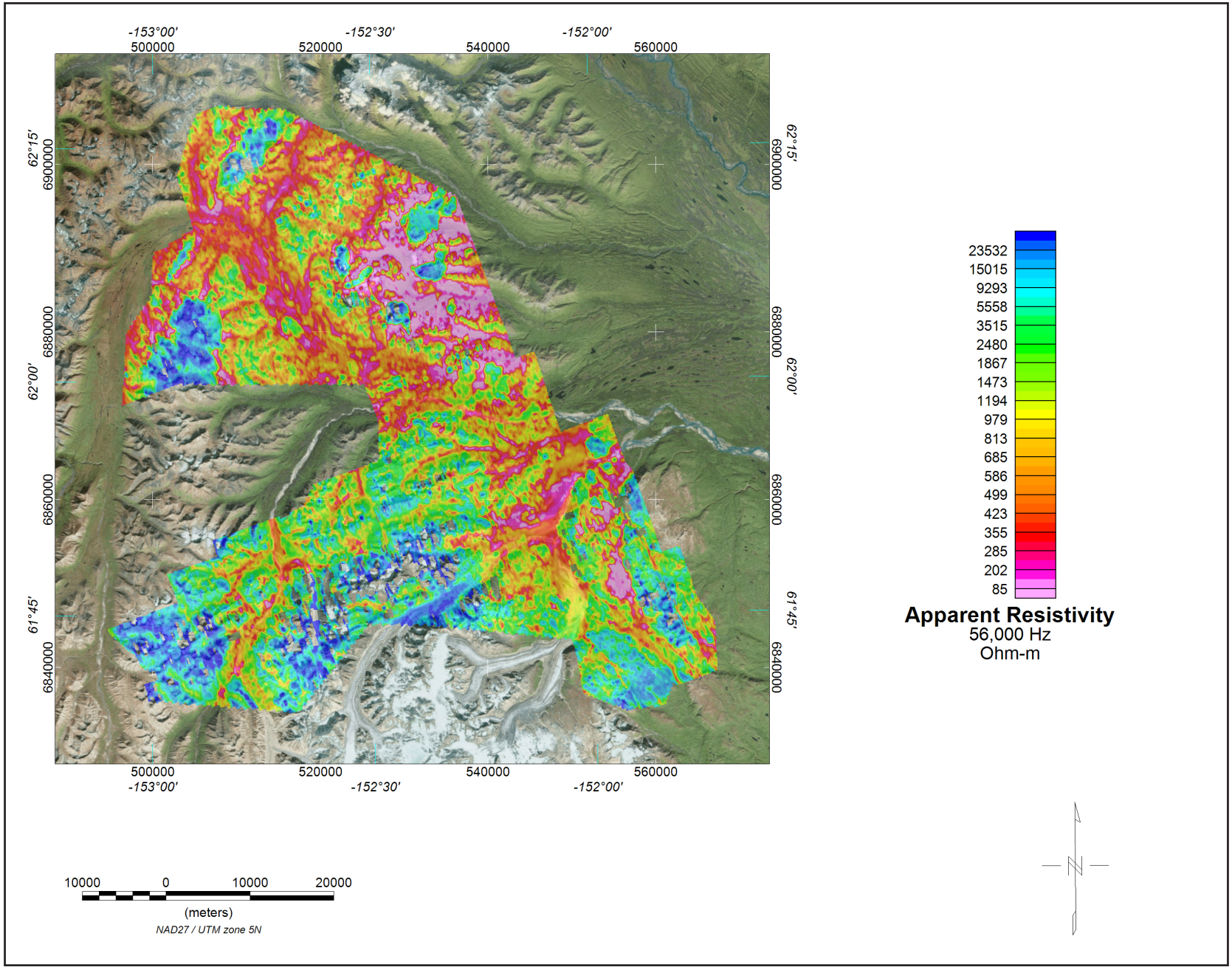


Figure 8. 56,000 Hz coplanar apparent resistivity grid with orthometric image. The DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 56,000 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique.

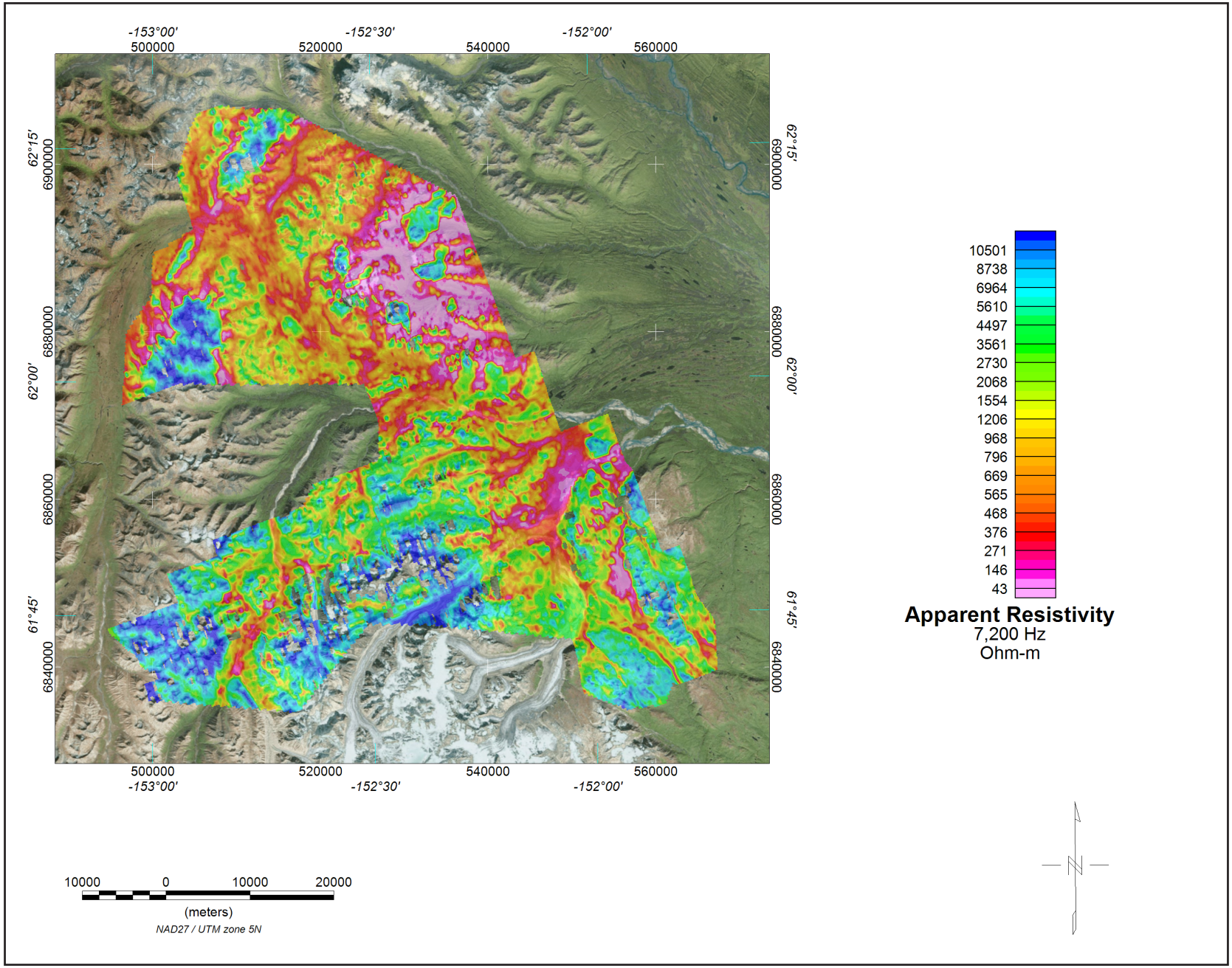


Figure 9. 7,200 Hz coplanar apparent resistivity grid with orthometric image. The DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 7,200 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique.

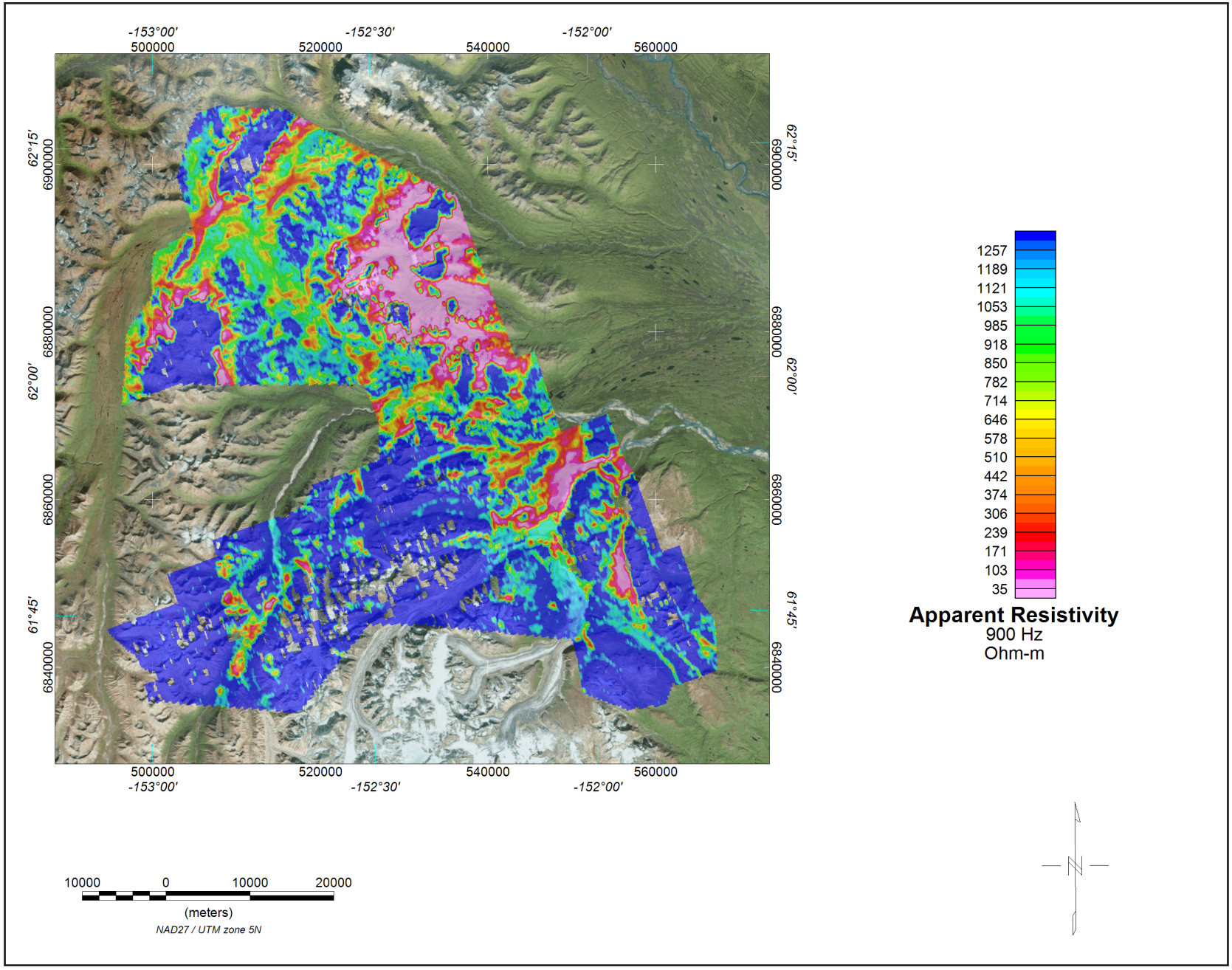


Figure 10. 900 Hz coplanar apparent resistivity grid with orthometric image. The DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7,200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 900 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique.

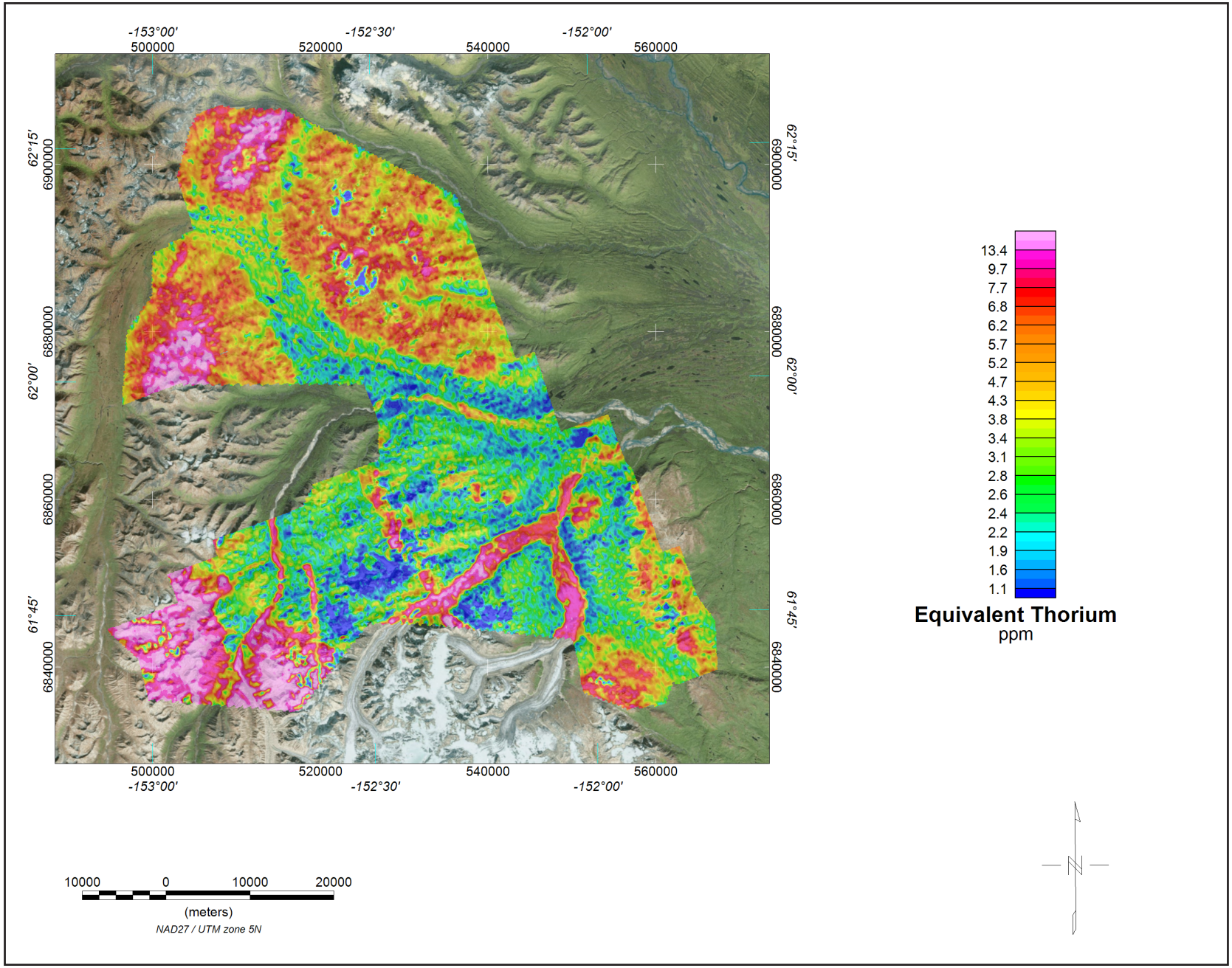


Figure 11. Equivalent thorium grid with orthometric image. The gamma-ray spectrometry data were recorded at a 1.0 second sample rate into a 256 channel main and radon spectra using primarily a Radiation Solutions RS-500 gamma-ray spectrometer, but an Exploranium GR-820 spectrometer was used on some flights. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 60 m. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique.

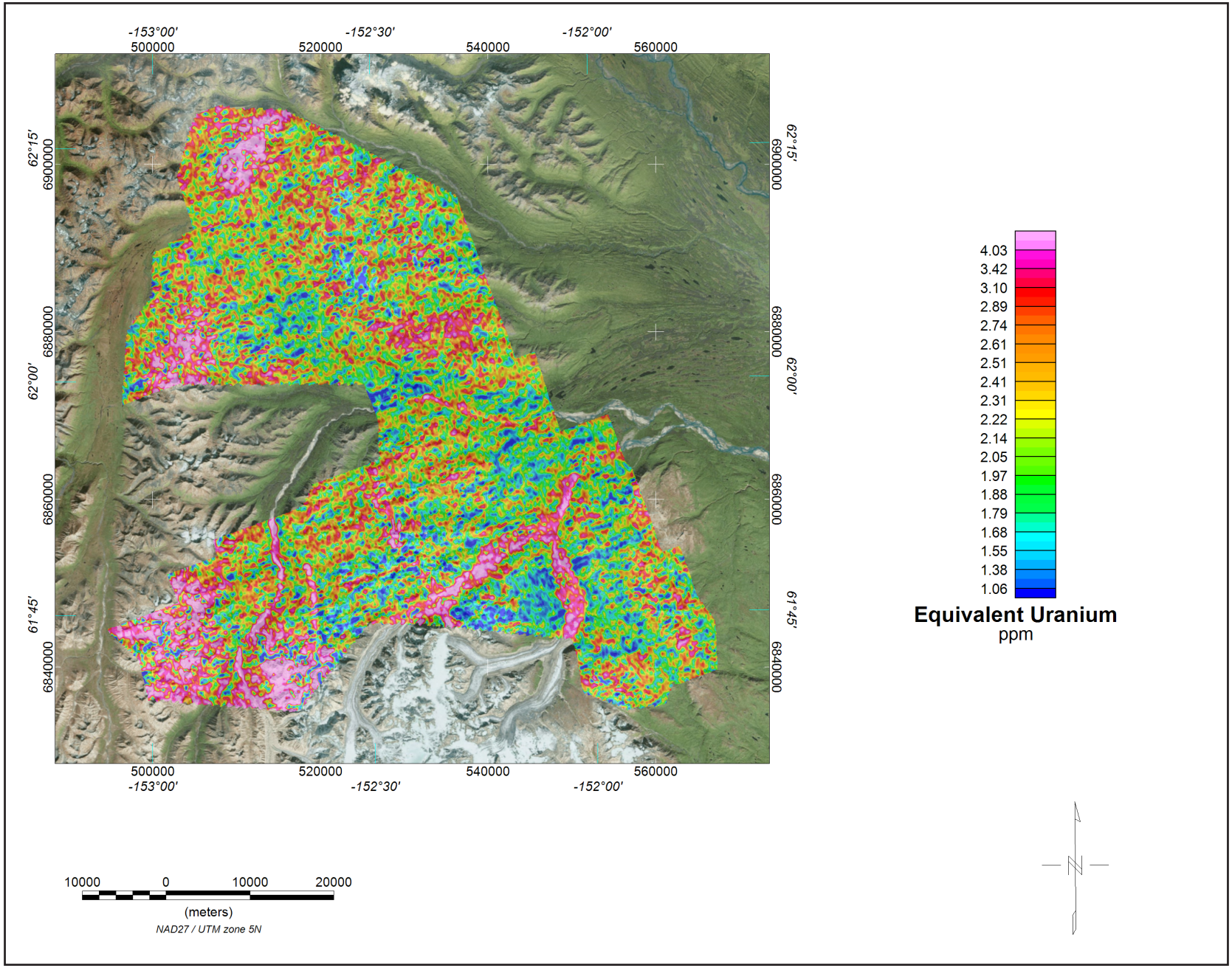


Figure 12. Equivalent uranium grid with orthometric image. The gamma-ray spectrometry data were recorded at a 1.0 second sample rate into a 256 channel main and radon spectra using primarily a Radiation Solutions RS-500 gamma-ray spectrometer, but an Exploranium GR-820 spectrometer was used on some flights. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 60 m. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique.

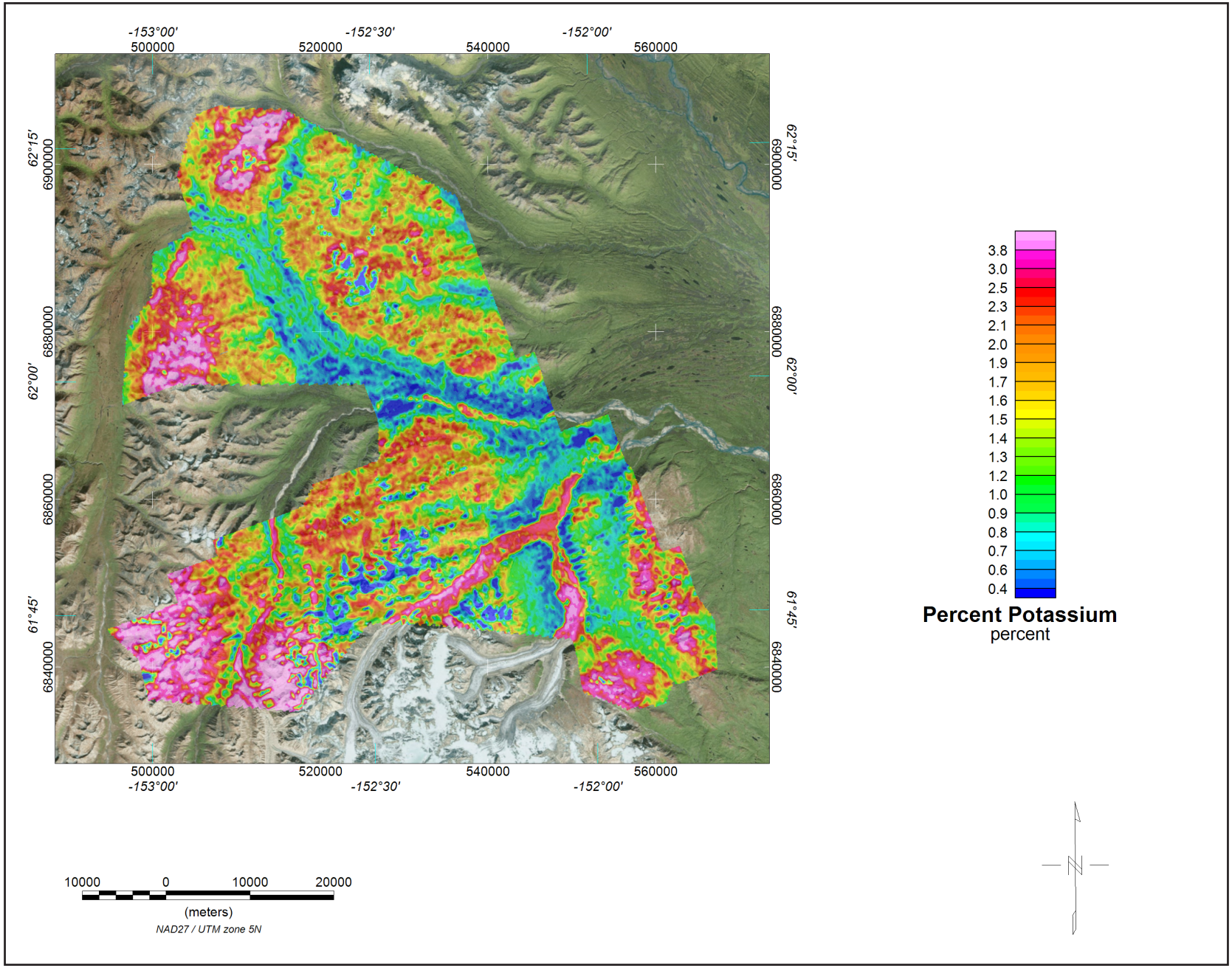


Figure 13. Percent potassium grid with orthometric image. The gamma-ray spectrometry data were recorded at a 1.0 second sample rate into a 256 channel main and radon spectra using primarily a Radiation Solutions RS-500 gamma-ray spectrometer, but an Exploranium GR-820 spectrometer was used on some flights. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 60 m. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique.

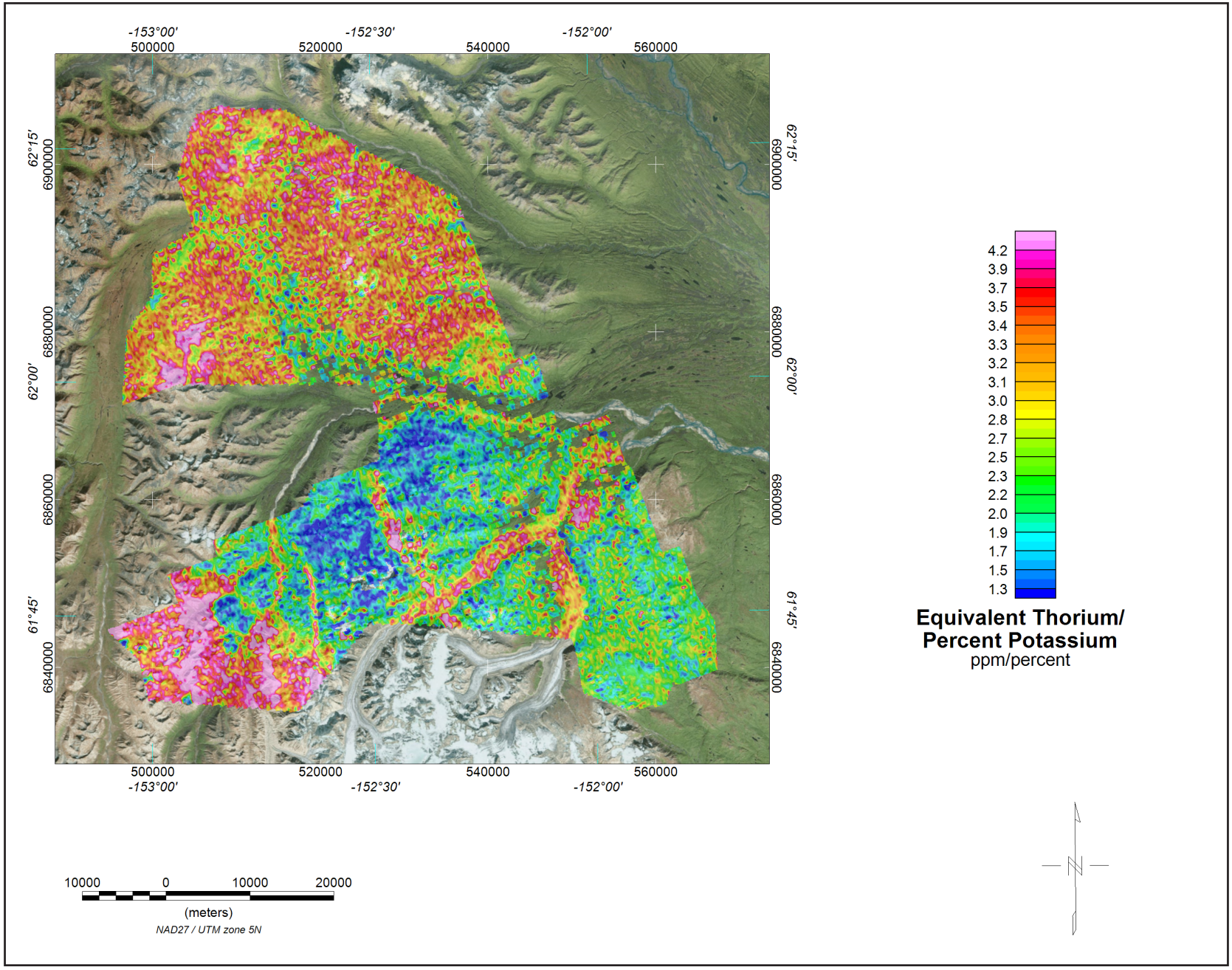


Figure 14. Ratio of equivalent thorium to percent potassium grid with orthometric image. The gamma-ray spectrometry data were recorded at a 1.0 second sample rate into a 256 channel main and radon spectra using primarily a Radiation Solutions RS-500 gamma-ray spectrometer, but an Exploranium GR-820 spectrometer was used on some flights. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 60 m. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique.

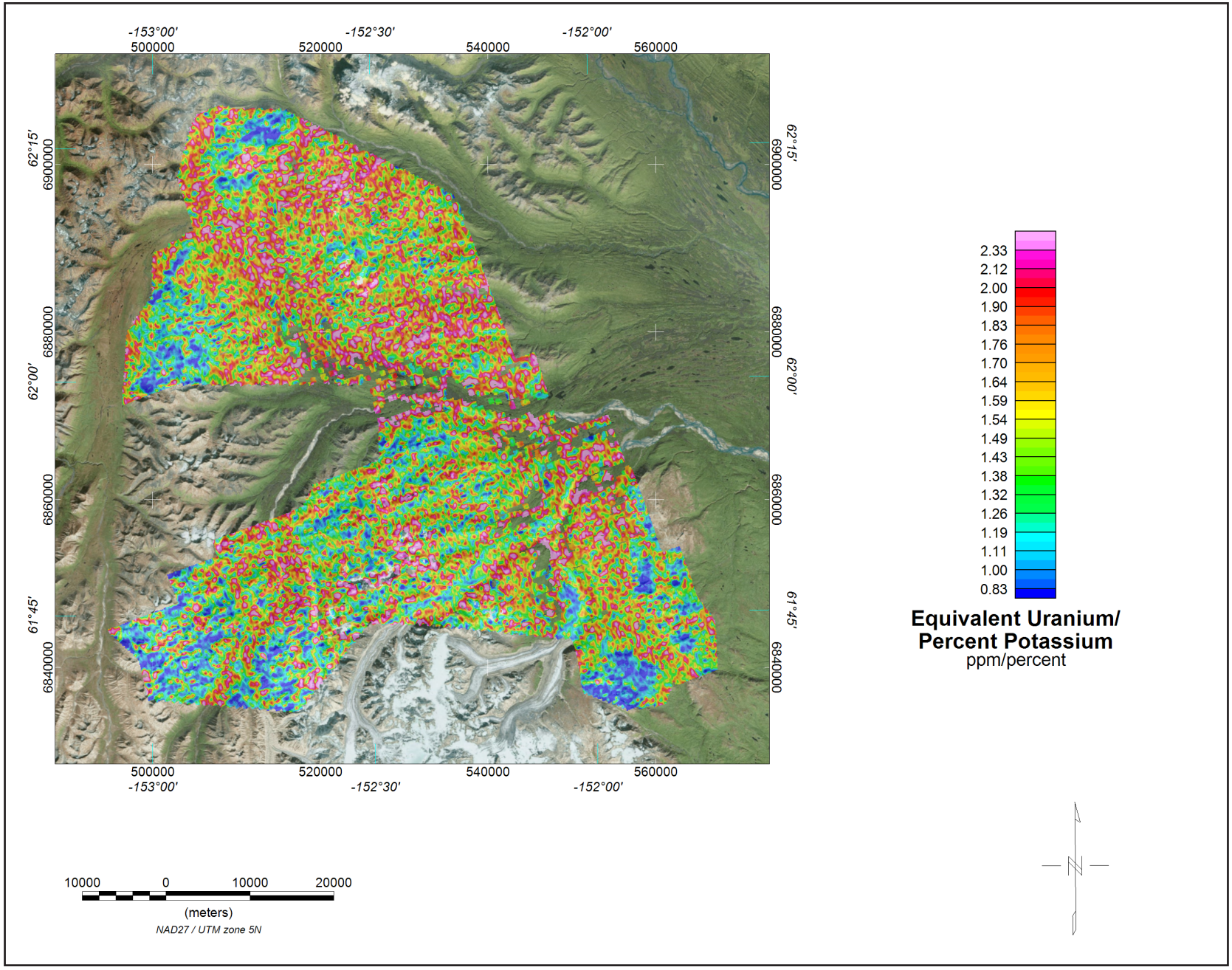


Figure 15. Ratio of equivalent uranium to percent potassium grid with orthometric image. The gamma-ray spectrometry data were recorded at a 1.0 second sample rate into a 256 channel main and radon spectra using primarily a Radiation Solutions RS-500 gamma-ray spectrometer, but an Exploranium GR-820 spectrometer was used on some flights. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 60 m. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique.

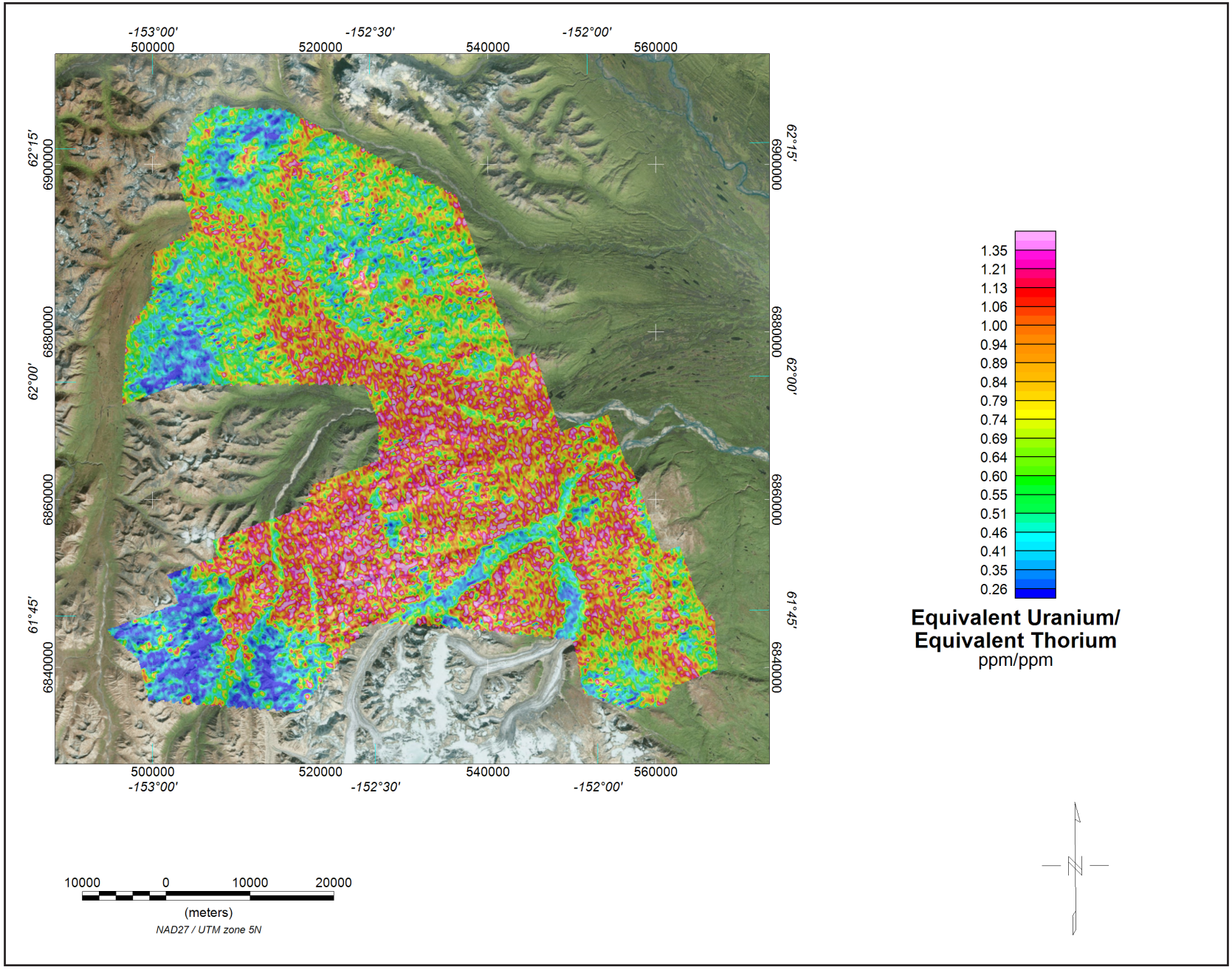


Figure 16. Ratio of equivalent uranium to equivalent thorium grid with orthometric image. The gamma-ray spectrometry data were recorded at a 1.0 second sample rate into a 256 channel main and radon spectra using primarily a Radiation Solutions RS-500 gamma-ray spectrometer, but an Exploranium GR-820 spectrometer was used on some flights. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 60 m. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique.

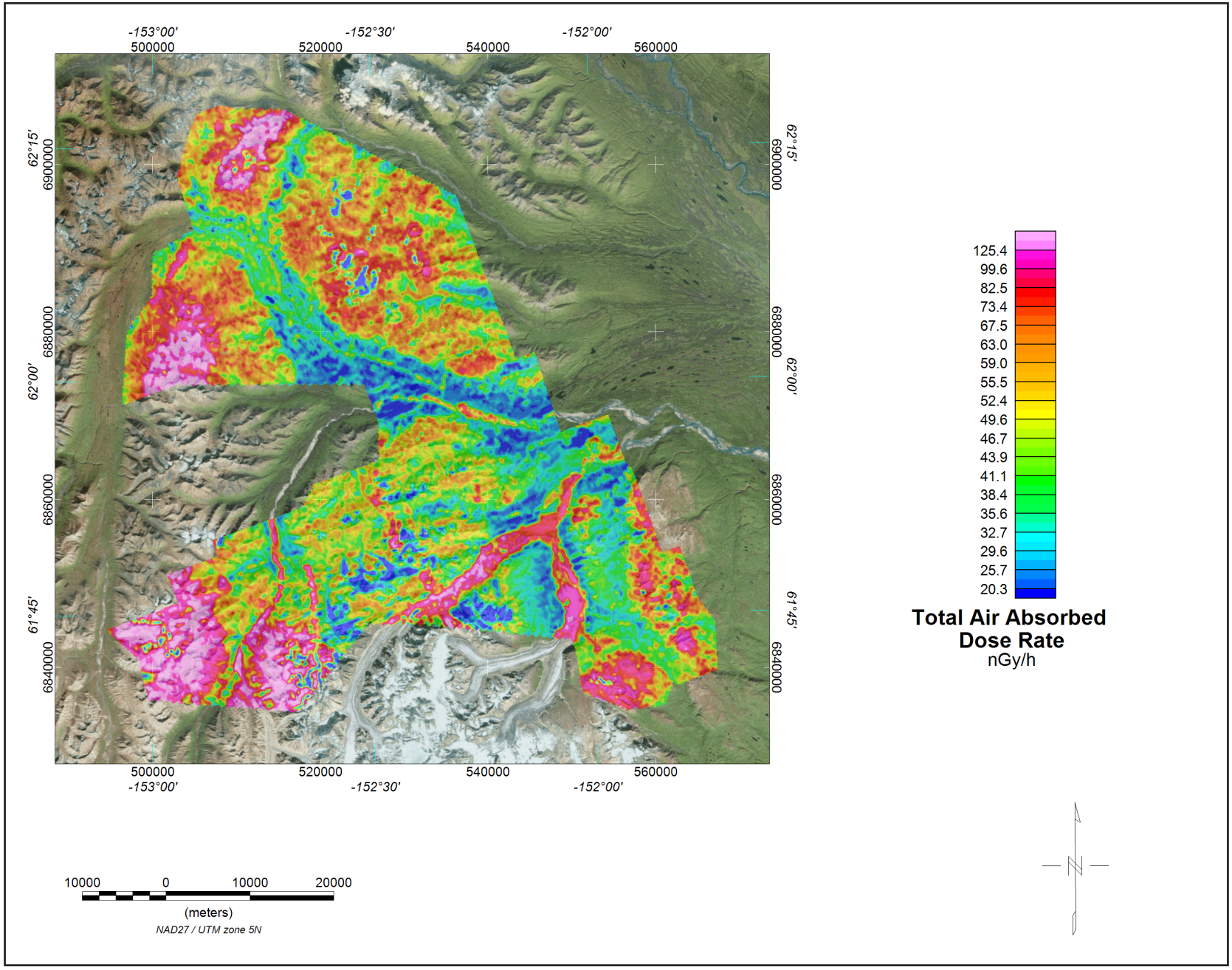


Figure 17. Total air absorbed dose rate grid with orthometric image. The gamma-ray spectrometry data were recorded at a 1.0 second sample rate into a 256 channel main and radon spectra using primarily a Radiation Solutions RS-500 gamma-ray spectrometer, but an Exploranium GR-820 spectrometer was used on some flights. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 60 m. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique.

Table 1. Copies of the following maps 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: http://doi.org/10.14509/30412

Map Title	Description
eaststyx_flightpath_topo_map_1of3.pdf	flightpath grid with topographic base map
eaststyx_flightpath_topo_map_2of3.pdf	flightpath grid with topographic base map
eaststyx_flightpath_topo_map_3of3.pdf	flightpath grid with topographic base map
eaststyx_residualmag_topo_map_1of3.pdf	residual magnetic intesity grid with topographic base map
eaststyx_residualmag_topo_map_2of3.pdf	residual magnetic intesity grid with topographic base map
eaststyx_residualmag_topo_map_3of3.pdf	residual magnetic intesity grid with topographic base map
eaststyx_residualmag_contours_plss_map_1of3.pdf	residual magnetic intesity grid and contours with public land survey system base layer
eaststyx_residualmag_contours_plss_map_2of3.pdf	residual magnetic intesity grid and contours with public land survey system base layer
eaststyx_residualmag_contours_plss_map_3of3.pdf	residual magnetic intesity grid and contours with public land survey system base layer
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eaststyx_residualmag_shaded_tiltderivative_contours_topo_map_3of3.pdf	residual magnetic intensity grid and magnetic tilt derivative with topographic base map

Table 1, continued. Copies of the following maps 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: http://doi.org/10.14509/30412

Map Title	Description
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eaststyx_res56khz_topo_map_2of3.pdf	56,000 Hz apparent resitivity grid with topographic base map
eaststyx_res56khz_topo_map_3of3.pdf	56,000 Hz apparent resitivity grid with topographic base map
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eaststyx_res56khz_contours_plss_map_3of3.pdf	56,000 Hz apparent resitivity grid and contours with public land survey system base layer
eaststyx_res7200hz_topo_map_1of3.pdf	7,200 Hz apparent resitivity grid with topographic base map
eaststyx_res7200hz_topo_map_2of3.pdf	7,200 Hz apparent resitivity grid with topographic base map
eaststyx_res7200hz_topo_map_3of3.pdf	7,200 Hz apparent resitivity grid with topographic base map
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eaststyx_res900hz_contours_plss_map_1of3.pdf	900 Hz apparent resitivity grid and contours with public land survey system base layer
eaststyx_res900hz_contours_plss_map_2of3.pdf	900 Hz apparent resitivity grid and contours with public land survey system base layer
eaststyx_res900hz_contours_plss_map_3of3.pdf	900 Hz apparent resitivity grid and contours with public land survey system base layer
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eaststyx_emanomalies_residualmag_detailed_topo_map_5of11.pdf	em anomalies and residual magnetic intensity grid with topographic base map

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Map Title	Description
eaststyx_emanomalies_residualmag_detailed_topo_map_6of11.pdf	em anomalies and residual magnetic intensity grid with topographic base map
eaststyx_emanomalies_residualmag_detailed_topo_map_7of11.pdf	em anomalies and residual magnetic intensity grid with topographic base map
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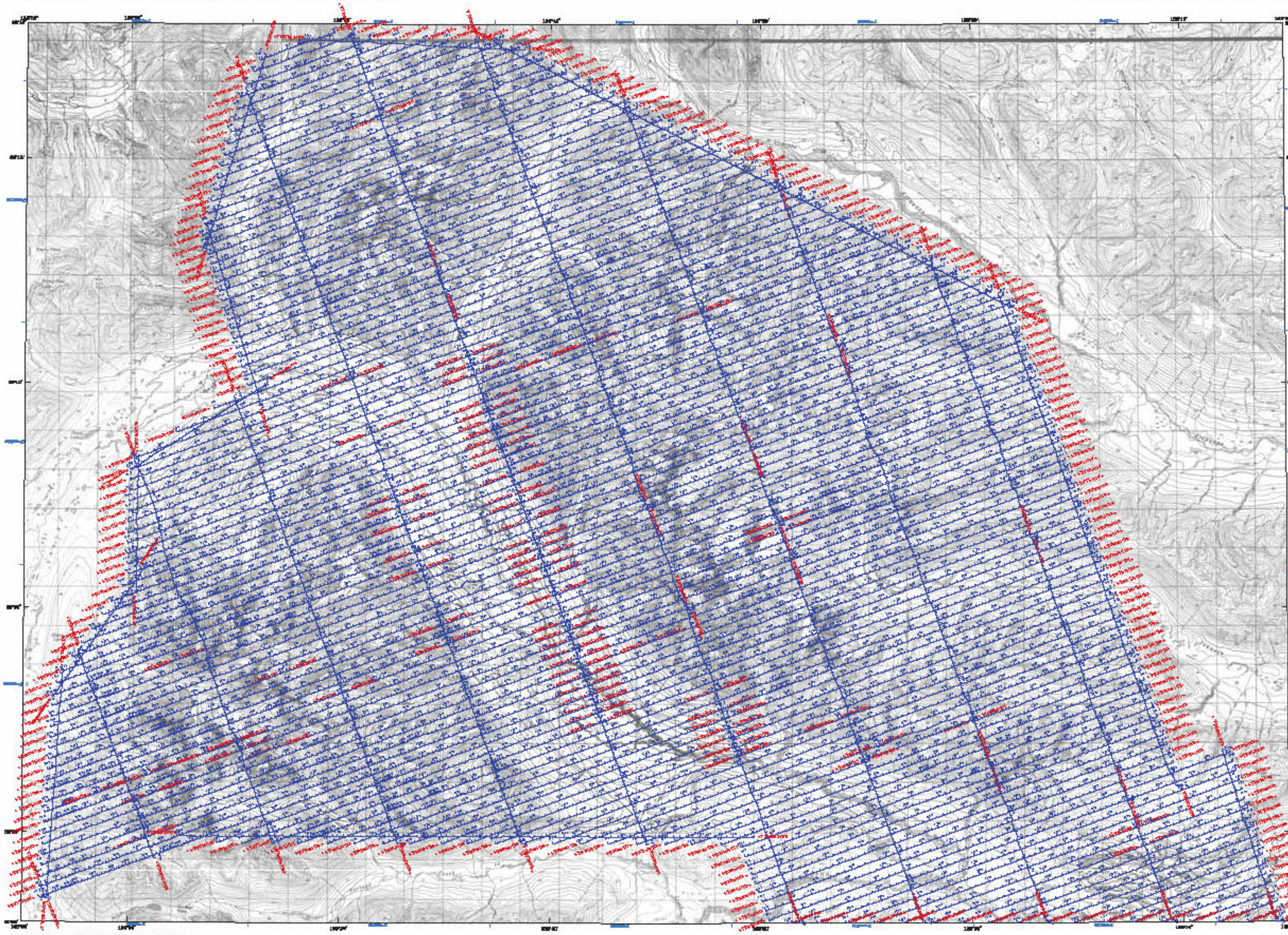
eaststyx_emanomalies_residualmag_detailed_topo_map_9of11.pdf	em anomalies and residual magnetic intensity grid with topographic base map
eaststyx_emanomalies_residualmag_detailed_topo_map_10of11.pdf	em anomalies and residual magnetic intensity grid with topographic base map
eaststyx_emanomalies_residualmag_detailed_topo_map_11of11.pdf	em anomalies and residual magnetic intensity grid with topographic base map
eaststyx_interpretation_plss_map_1of3.pdf	interpretation grid and contours with public land survey system base layer
eaststyx_interpretation_plss_map_2of3.pdf	interpretation grid and contours with public land survey system base layer
eaststyx_interpretation_plss_map_3of3.pdf	interpretation grid and contours with public land survey system base layer
eaststyx_interpretation_residualmag_plss_map_1of3.pdf	interpretation and residual magnetic intensity grid and contours with public land survey system base layer
eaststyx_interpretation_residualmag_plss_map_2of3.pdf	interpretation and residual magnetic intensity grid and contours with public land survey system base layer
eaststyx_interpretation_residualmag_plss_map_3of3.pdf	interpretation and residual magnetic intensity grid and contours with public land survey system base layer
eaststyx_rad_equiv_th_topo_map_1of3.pdf	equivalent thorium grid with topographic base map
eaststyx_rad_equiv_th_topo_map_2of3.pdf	equivalent thorium grid with topographic base map
eaststyx_rad_equiv_th_topo_map_3of3.pdf	equivalent thorium grid with topographic base map
eaststyx_rad_equiv_th_contours_plss_map_1of3.pdf	equivalent thorium grid and contours with public land survey system base layer
eaststyx_rad_equiv_th_contours_plss_map_2of3.pdf	equivalent thorium grid and contours with public land survey system base layer
eaststyx_rad_equiv_th_contours_plss_map_3of3.pdf	equivalent thorium grid and contours with public land survey system base layer
eaststyx_rad_equiv_u_topo_map_1of3.pdf	equivalent uranium grid with topographic base map
eaststyx_rad_equiv_u_topo_map_2of3.pdf	equivalent uranium grid with topographic base map
eaststyx_rad_equiv_u_topo_map_3of3.pdf	equivalent uranium grid with topographic base map

Table 1, continued. Copies of the following maps 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: http://doi.org/10.14509/30412

Map Title	Description
eaststyx_rad_equiv_u_contours_plss_map_1of3.pdf	equivalent uranium grid and contours with public land survey system base layer
eaststyx_rad_equiv_u_contours_plss_map_2of3.pdf	equivalent uranium grid and contours with public land survey system base layer
eaststyx_rad_equiv_u_contours_plss_map_3of3.pdf	equivalent uranium grid and contours with public land survey system base layer
eaststyx_rad_pct_k_topo_map_1of3.pdf	percent potassium grid with topographic base map
eaststyx_rad_pct_k_topo_map_2of3.pdf	percent potassium grid with topographic base map
eaststyx_rad_pct_k_topo_map_3of3.pdf	percent potassium grid with topographic base map
eaststyx_rad_pct_k_contours_plss_map_1of3.pdf	percent potassium grid and contours with public land survey system base layer
eaststyx_rad_pct_k_contours_plss_map_2of3.pdf	percent potassium grid and contours with public land survey system base layer
eaststyx_rad_pct_k_contours_plss_map_3of3.pdf	percent potassium grid and contours with public land survey system base layer
eaststyx_rad_ratio_th_k_topo_map_1of3.pdf	equivalent thorium percent potassium ratio grid with topographic base map
eaststyx_rad_ratio_th_k_topo_map_2of3.pdf	equivalent thorium percent potassium ratio grid with topographic base map
eaststyx_rad_ratio_th_k_topo_map_3of3.pdf	equivalent thorium percent potassium ratio grid with topographic base map
eaststyx_rad_ratio_th_k_contours_plss_map_1of3.pdf	equivalent thorium percent potassium ratio grid and contours with public land survey system base layer
eaststyx_rad_ratio_th_k_contours_plss_map_2of3.pdf	equivalent thorium percent potassium ratio grid and contours with public land survey system base layer
eaststyx_rad_ratio_th_k_contours_plss_map_3of3.pdf	equivalent thorium percent potassium ratio grid and contours with public land survey system base layer
eaststyx_rad_ratio_u_k_topo_map_1of3.pdf	equivalent uranium percent potassium ratio grid with topographic base map
eaststyx_rad_ratio_u_k_topo_map_2of3.pdf	equivalent uranium percent potassium ratio grid with topographic base map
eaststyx_rad_ratio_u_k_topo_map_3of3.pdf	equivalent uranium percent potassium ratio grid with topographic base map
eaststyx_rad_ratio_u_k_contours_plss_map_1of3.pdf	equivalent uranium percent potassium ratio grid and contours with public land survey system base layer
eaststyx_rad_ratio_u_k_contours_plss_map_2of3.pdf	equivalent uranium percent potassium ratio grid and contours with public land survey system base layer
eaststyx_rad_ratio_u_k_contours_plss_map_3of3.pdf	equivalent uranium percent potassium ratio grid and contours with public land survey system base layer
eaststyx_rad_ratio_u_th_topo_map_1of3.pdf	equivalent uranium equivalent thorium ratio grid with topographic base map
eaststyx_rad_ratio_u_th_topo_map_2of3.pdf	equivalent uranium equivalent thorium ratio grid with topographic base map
eaststyx_rad_ratio_u_th_topo_map_3of3.pdf	equivalent uranium equivalent thorium ratio grid with topographic base map

Table 1, continued. Copies of the following maps 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: http://doi.org/10.14509/30412

Map Title	Description
eaststyx_rad_ratio_u_th_contours_plss_map_1of3.pdf	equivalent uranium equivalent thorium ratio grid and contours with public land survey system base layer
eaststyx_rad_ratio_u_th_contours_plss_map_2of3.pdf	equivalent uranium equivalent thorium ratio grid and contours with public land survey system base layer
eaststyx_rad_ratio_u_th_contours_plss_map_3of3.pdf	equivalent uranium equivalent thorium ratio grid and contours with public land survey system base layer
eaststyx_rad_taadr_topo_map_1of3.pdf	total air absorbed dose rate grid with topographic base map
eaststyx_rad_taadr_topo_map_2of3.pdf	total air absorbed dose rate grid with topographic base map
eaststyx_rad_taadr_topo_map_3of3.pdf	total air absorbed dose rate grid with topographic base map
eaststyx_rad_taadr_contours_plss_map_1of3.pdf	total air absorbed dose rate grid and contours with public land survey system base layer
eaststyx_rad_taadr_contours_plss_map_2of3.pdf	total air absorbed dose rate grid and contours with public land survey system base layer
eaststyx_rad_taadr_contours_plss_map_3of3.pdf	total air absorbed dose rate grid and contours with public land survey system base layer
eaststyx_rad_ternary_topo_map_1of3.pdf	radioelement ternary grid with topographic base map
eaststyx_rad_ternary_topo_map_2of3.pdf	radioelement ternary grid with topographic base map
eaststyx_rad_ternary_topo_map_3of3.pdf	radioelement ternary grid with topographic base map



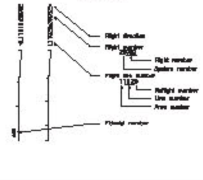
SCALE 1:63,360

FLIGHT PATH WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

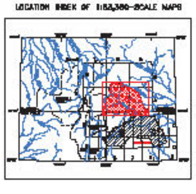
PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2014

FLIGHT LINES



LOCATION INDEX OF 1:63,360-SCALE MAPS



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CCS 01344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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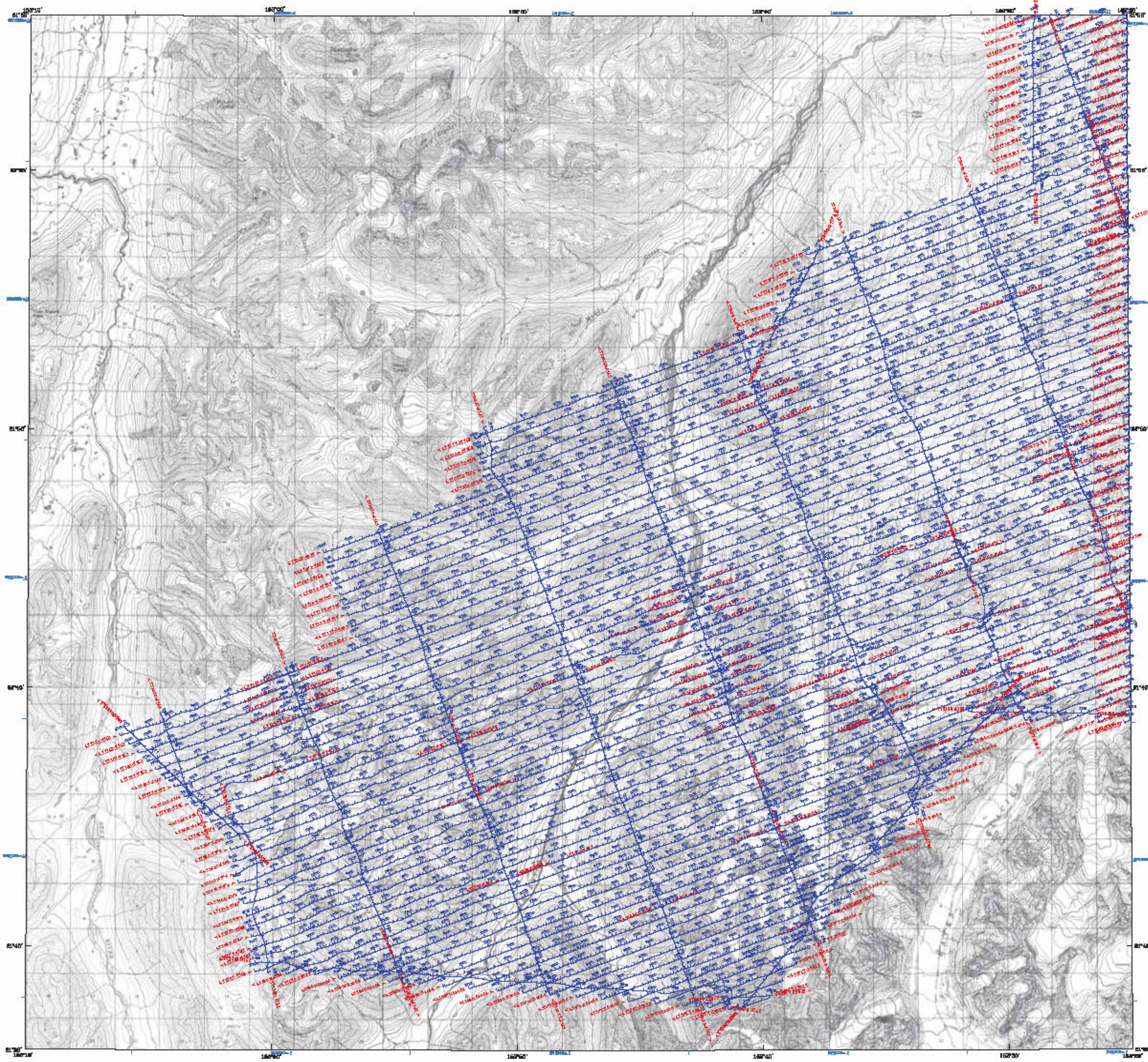
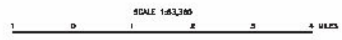
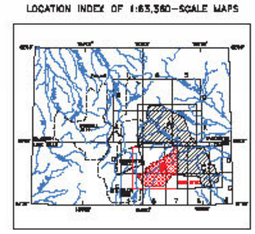
GEOPHYSICAL REPORT 2014-5-29B





LOCATION INDEX OF 1:63,360-SCALE MAPS



FLIGHT PATH WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

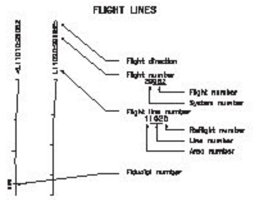
by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEMV Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM5-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

FLIGHT LINES



SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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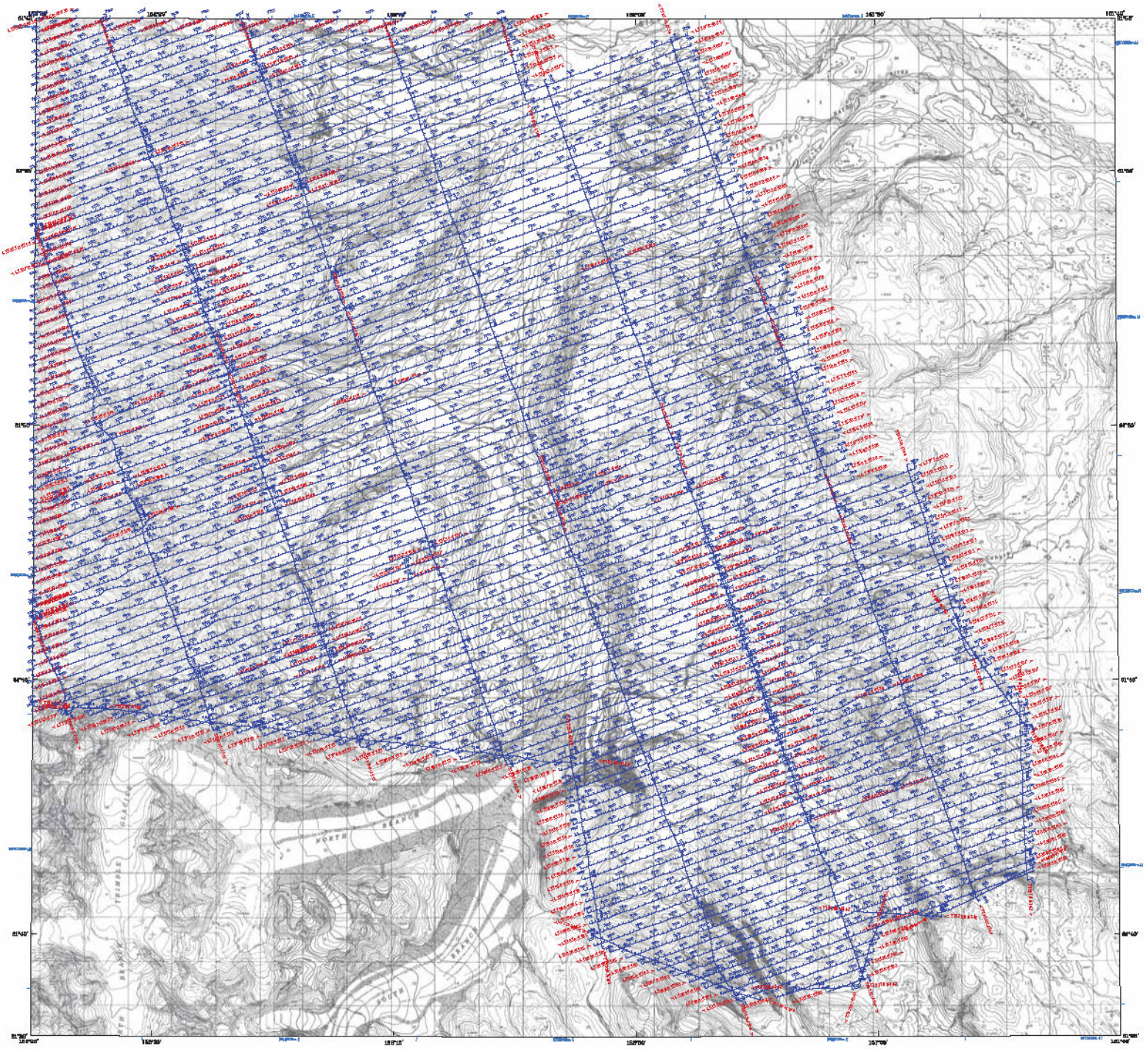


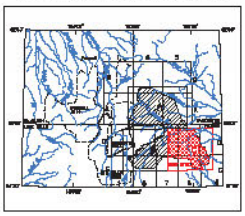
SURVEY AREA

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



FLIGHT PATH WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LINE HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

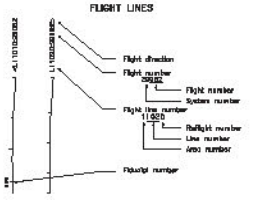
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM V Electromagnetic (EM) system, a CS5 01344 cesium magnetometer with a Solmtrek GS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#8-GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

FLIGHT LINES



SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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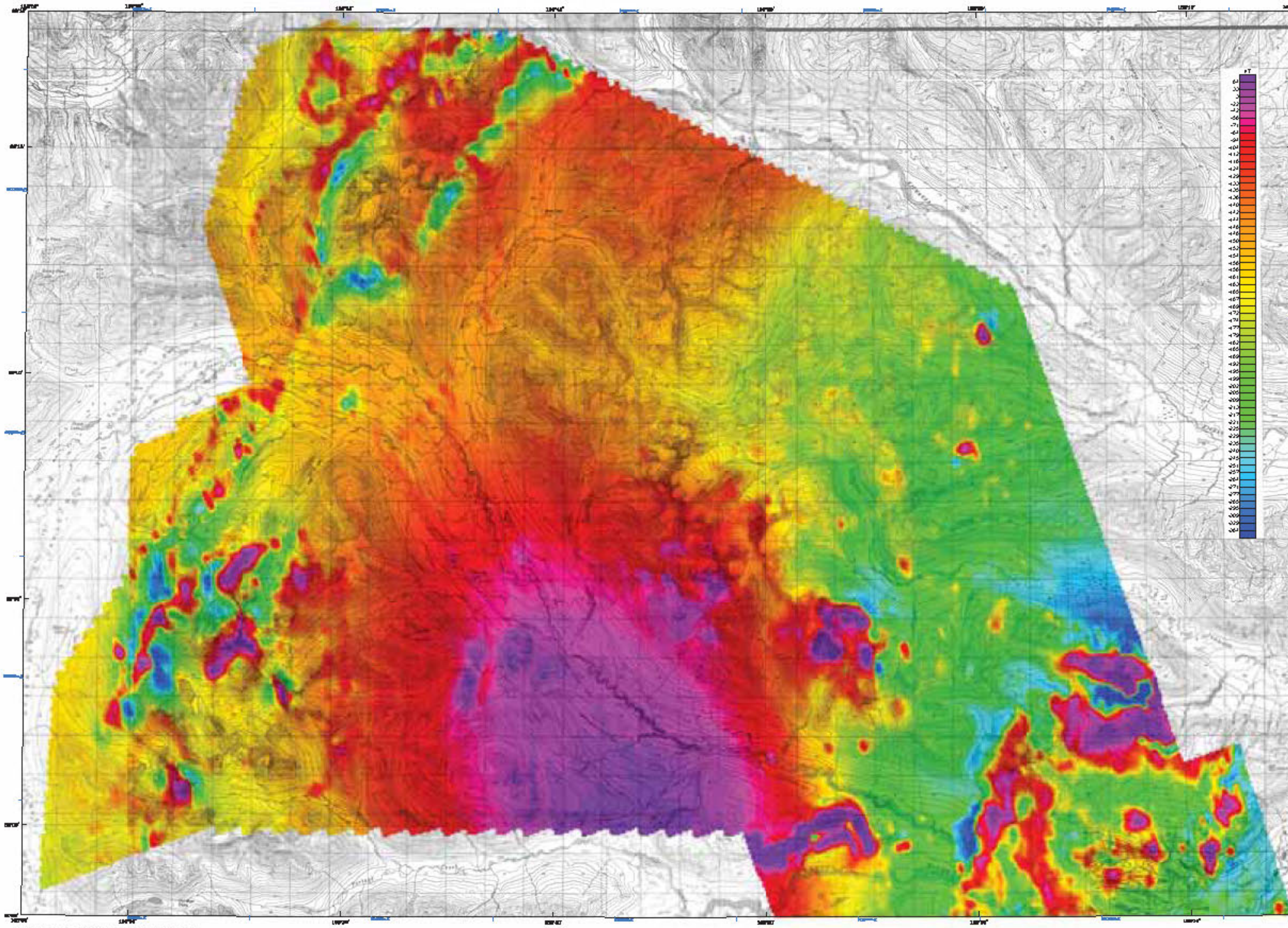
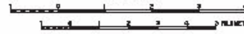
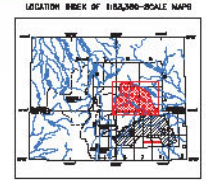



SCALE 1:63,360


LOCATION INDEX OF 1:63,360-SCALE MAPS

RESIDUAL MAGNETIC FIELD WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CCS C1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (?) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESIDUAL MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a CCS C1344 magnetometer with a Scintrex CS3 cesium sensor. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2010, updated for date of flight and altimeter variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 50 m grid using a modified Akima (1970) technique. All grids were then resampled from the 50 m cell size down to a 12.5 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

SURVEY HISTORY

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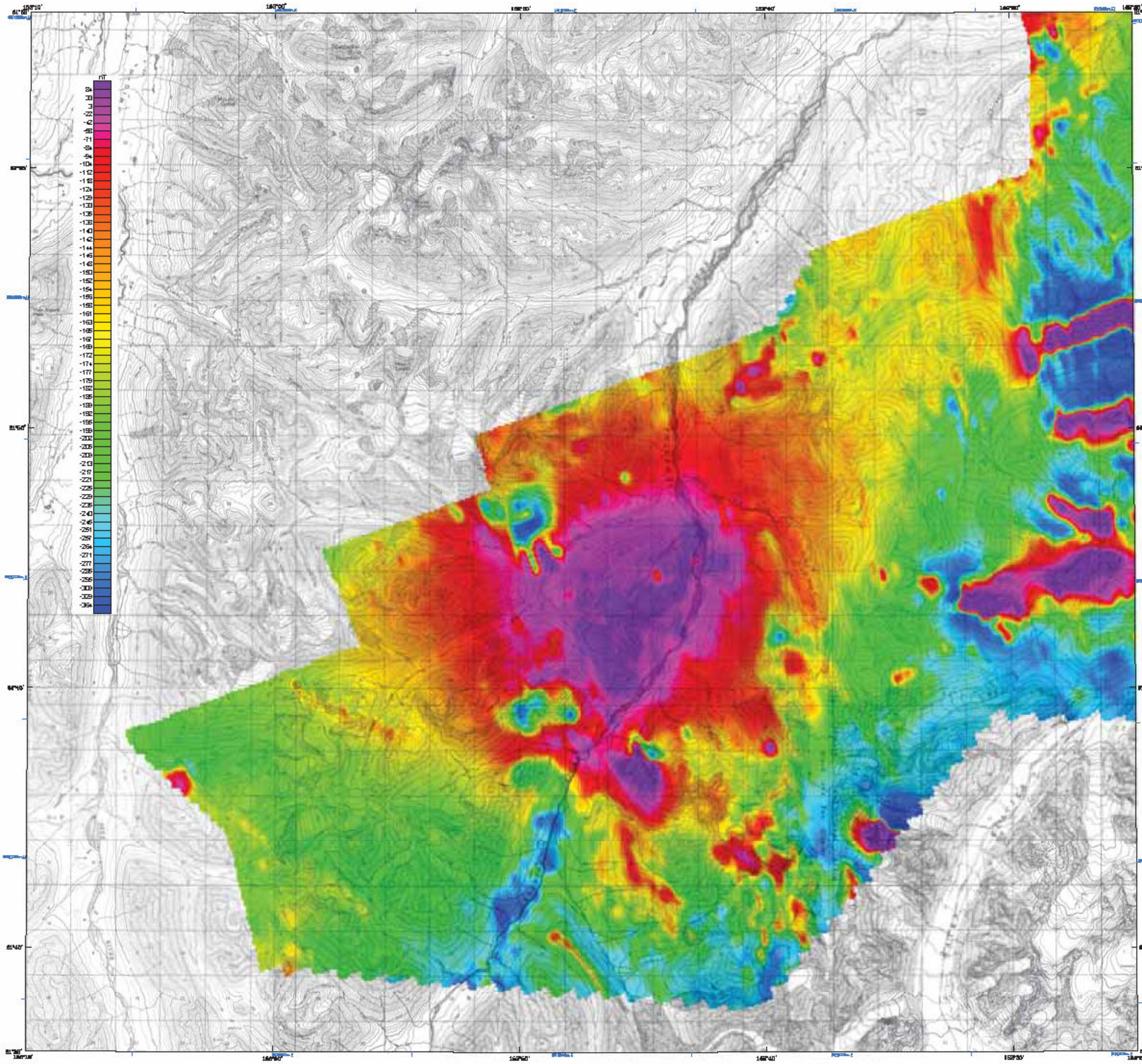
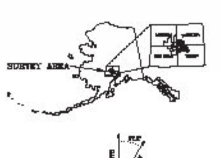


Base from U.S. Geological Survey Tyonek D-7, 1958; D-8, 1958; B-7, 1958; A-4, 1958; Line Hills D-5, 1958; D-4, 1958 Quadrangles, Alaska.

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

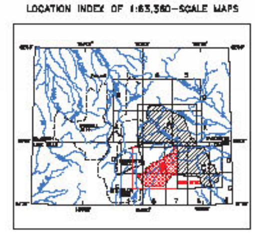


RESIDUAL MAGNETIC FIELD WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2014

LOCATION INDEX OF 1:63,360-SCALE MAPS



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL4B-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

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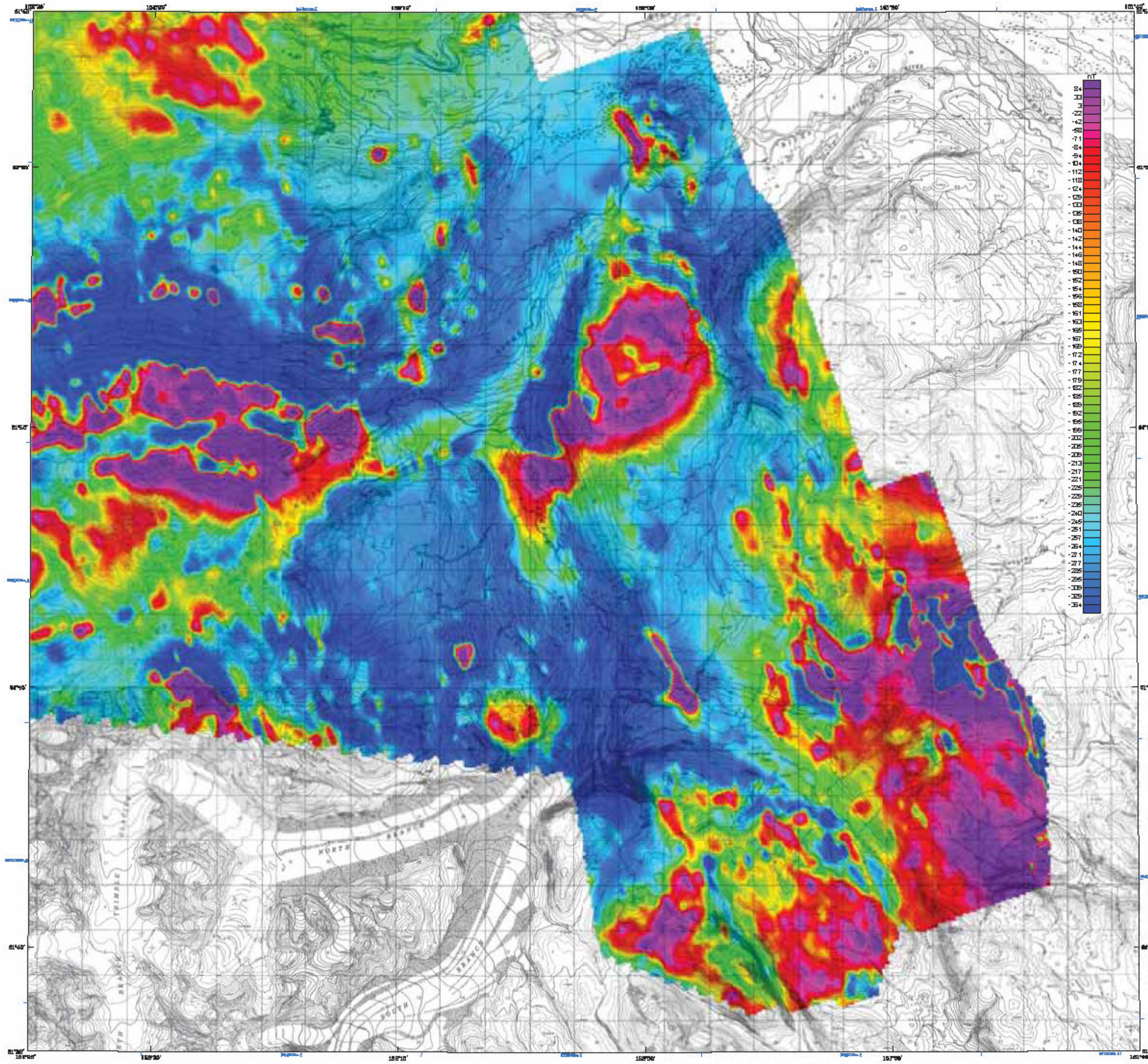
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2014-5-1C

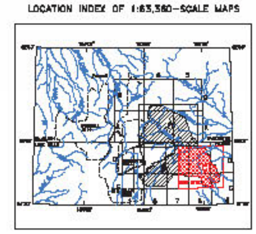


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



RESIDUAL MAGNETIC FIELD WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM5-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESIDUAL MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a CGG D1344 magnetometer with a Scintrex CS3 cesium sensor. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2010, updated for date of flight and altimeter variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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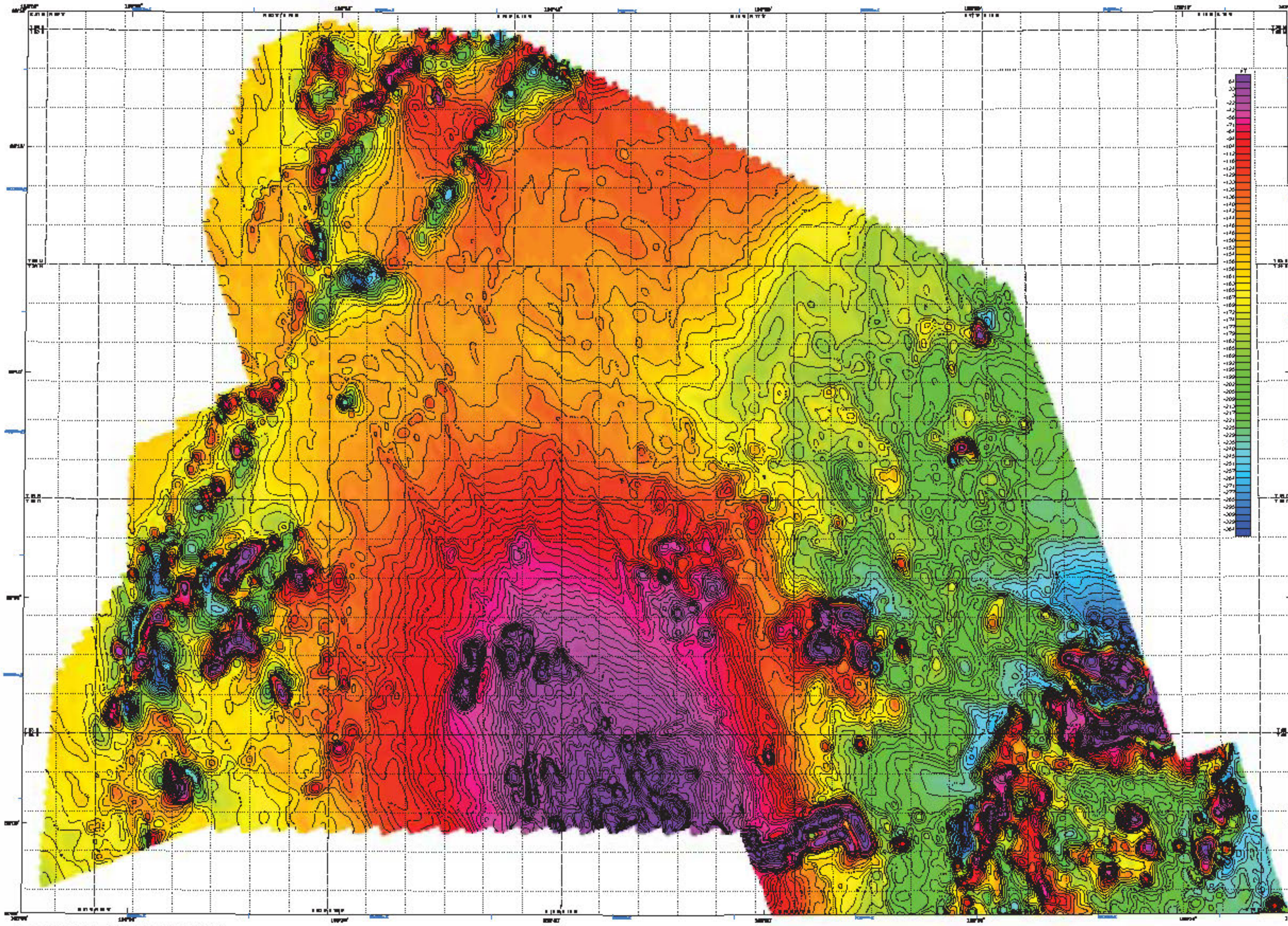
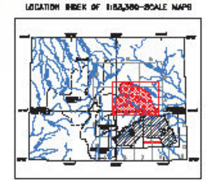


SCALE 1:63,360

LOCATION INDEX OF 1:63,360-SCALE MAPS



RESIDUAL MAGNETIC FIELD WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CCS 01344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESIDUAL MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a CCS 01344 magnetometer with a Scintrex CS3 cesium sensor. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2010, updated for date of flight and altimeter variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 50 m grid using a modified Akima (1970) technique. All grids were then resampled from the 50 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

MAGNETIC CONTOURS

500 nT
50 nT
10 nT
5 nT

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by FGS in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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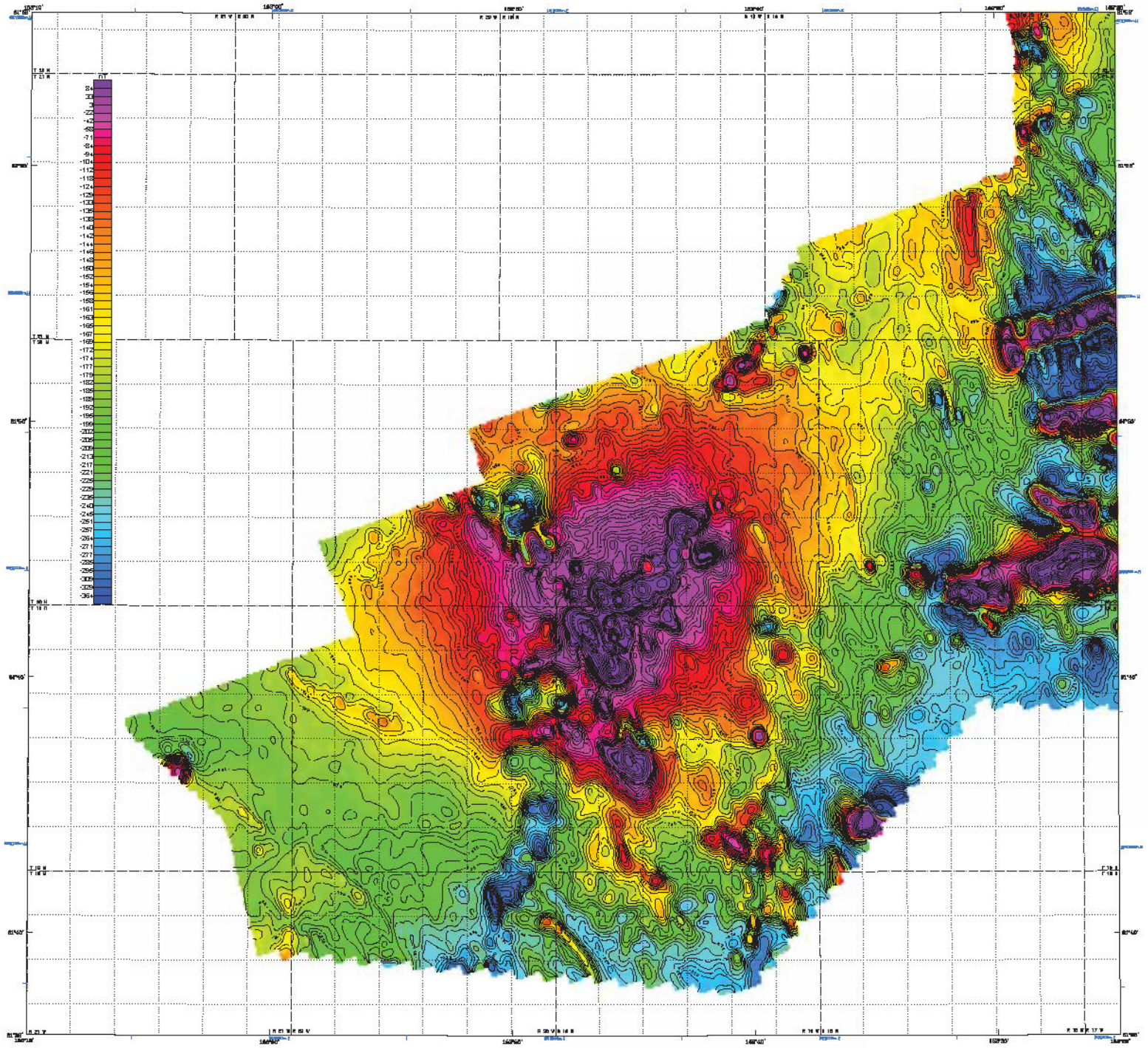
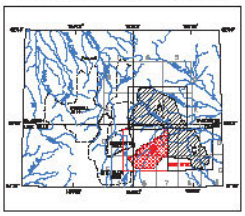


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



RESIDUAL MAGNETIC FIELD WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM V Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation systems, 50/60 Hz monitors and video cameras. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#8-GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESIDUAL MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a CGG D1344 magnetometer with a Scintrex CS3 cesium sensor. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2010, updated for date of flight and altimeter variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 40 m grid using a modified Akima (1970) technique. All grids were then resampled from the 40 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1974, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

MAGNETIC CONTOURS

250 nT

50 nT

10 nT

5 nT

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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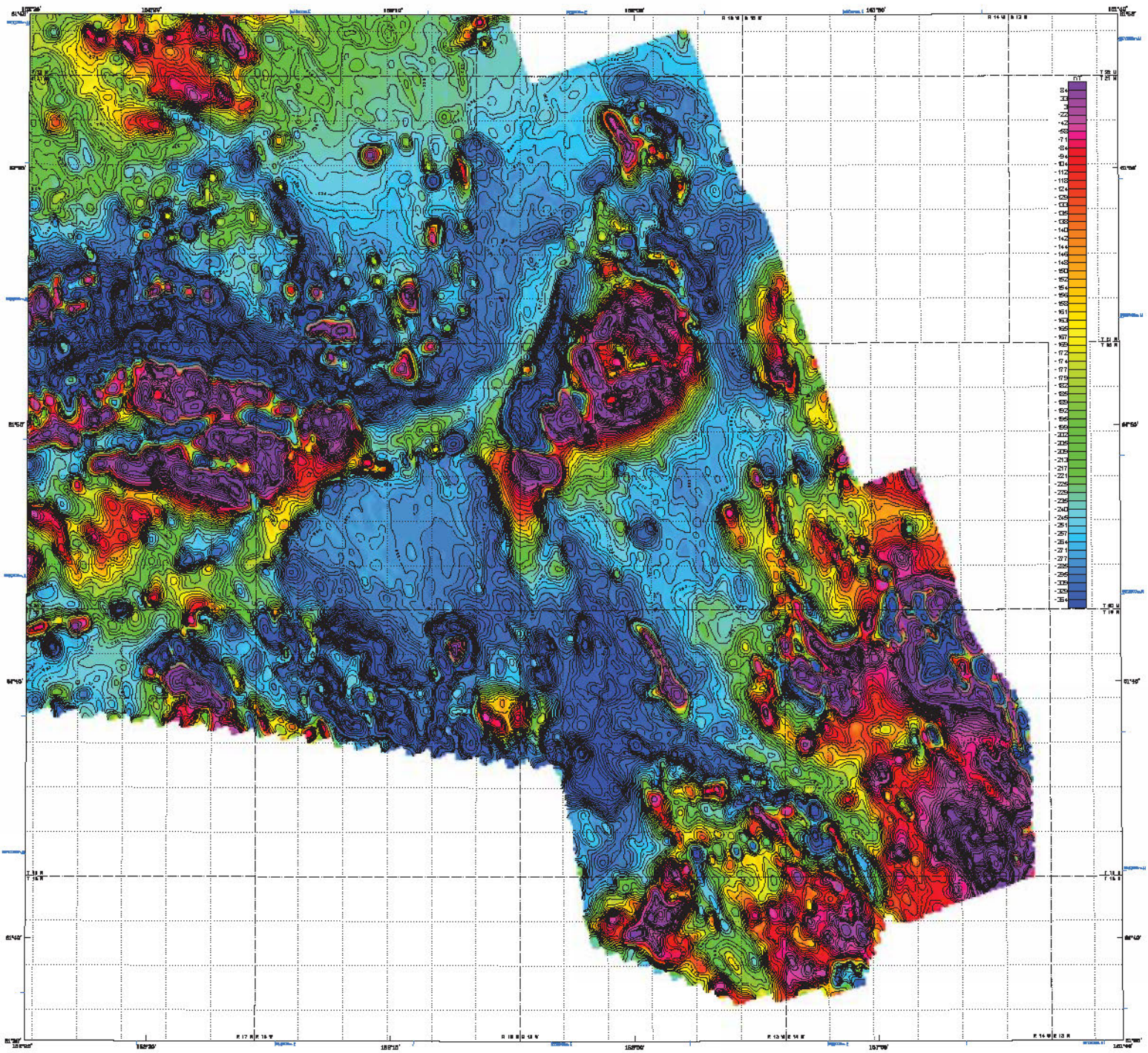
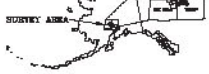


SURVEY AREA

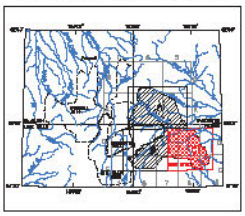


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



RESIDUAL MAGNETIC FIELD WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#8-GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESIDUAL MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a CGG D1344 magnetometer with a Scintrex CS3 cesium sensor. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2010, updated for date of flight and altimeter variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 60 m grid using a modified Akima (1970) technique. All grids were then resampled from the 60 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

MAGNETIC CONTOURS

250 nT

50 nT

10 nT

5 nT

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the grey area acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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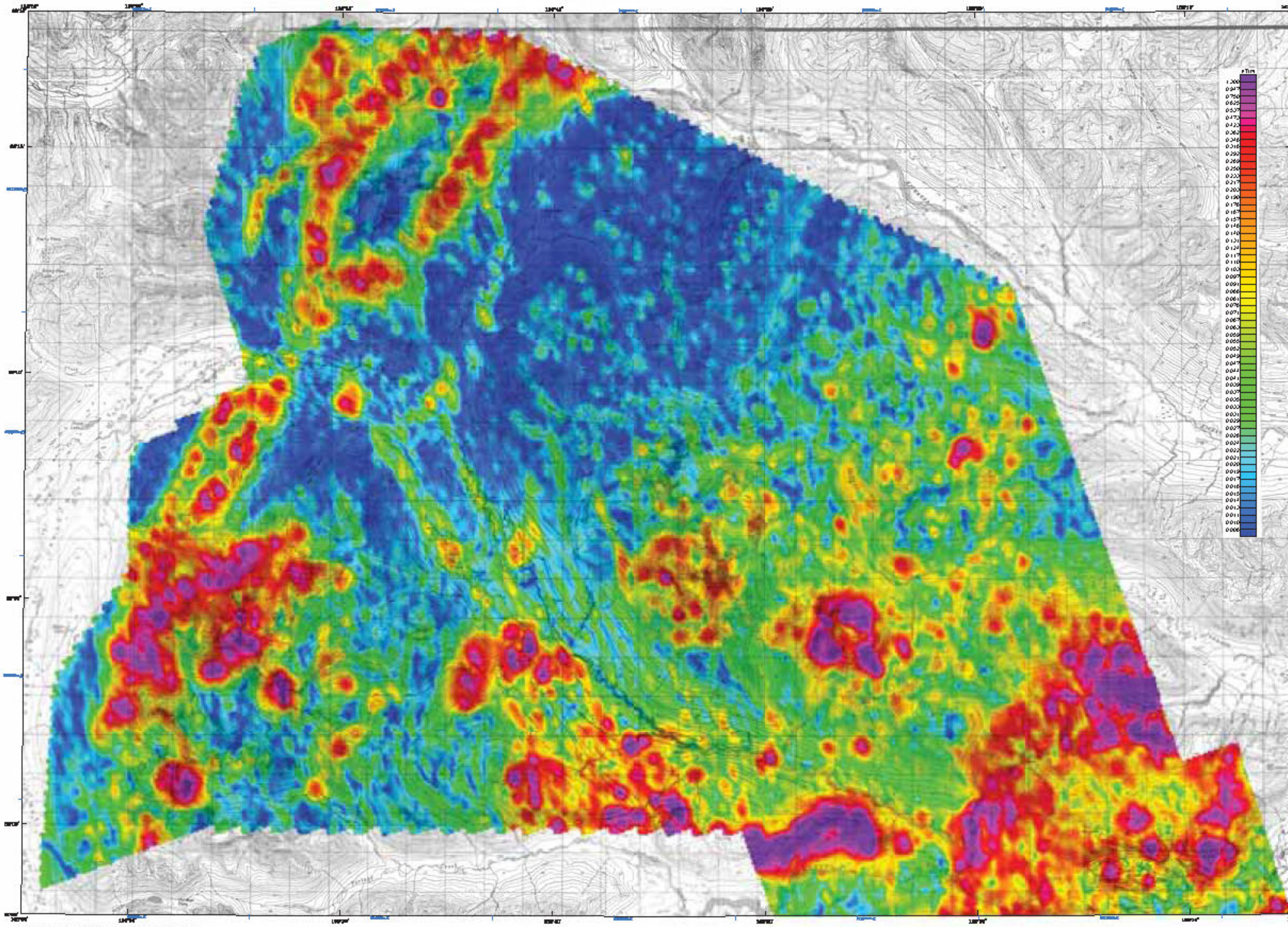

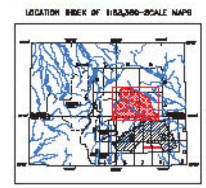

ANALYTIC SIGNAL WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a DGC 01344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-DGL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

ANALYTIC SIGNAL

Analytic signal is the total amplitude of all directions of magnetic gradient calculated from the sum of the squares of the three orthogonal gradients. Mapped highs in the calculated analytic signal of magnetic parameter locate the anomalous source body edges and corners (e.g., contacts, fault/shear zones, etc.). Analytic signal maxima are located directly over faults and contacts, regardless of structural dip, and independently of the direction of the induced and/or remanent magnetizations.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by DGC in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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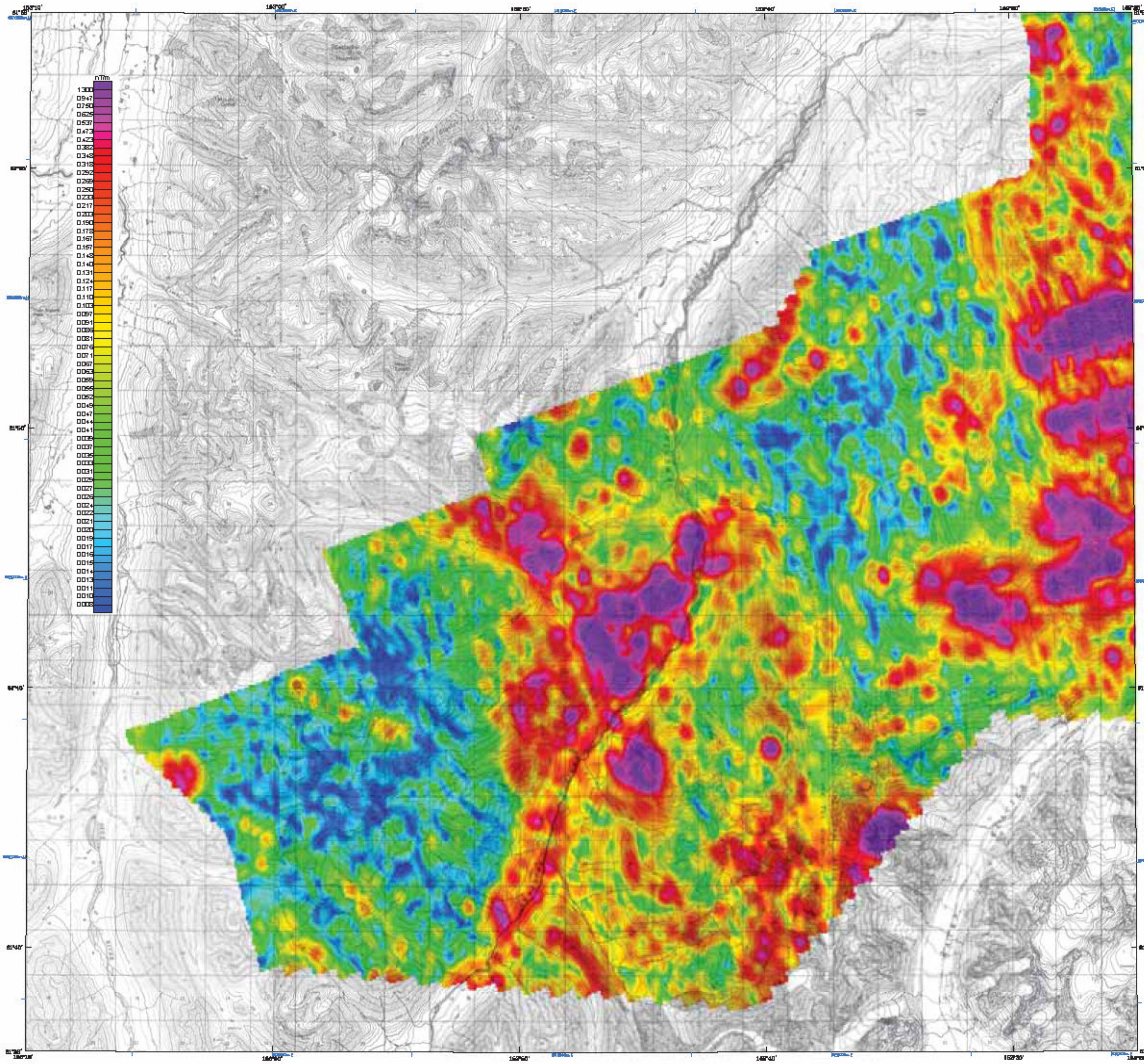
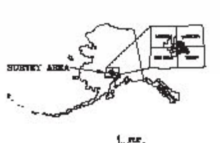


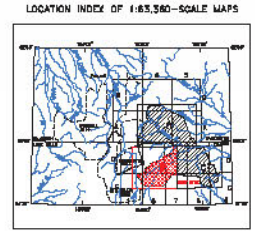


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



ANALYTIC SIGNAL WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEMV-3L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

ANALYTIC SIGNAL

Analytic signal is the total amplitude of all directions of magnetic gradient calculated from the sum of the squares of the three orthogonal gradients. Mapped highs in the calculated analytic signal of magnetic parameter locate the anomalous source body edges and corners (e.g., contacts, fault/shear zones, etc.). Analytic signal maxima are located directly over faults and contacts, regardless of structural dip, and independently of the direction of the induced and/or remanent magnetizations.

SURVEY HISTORY

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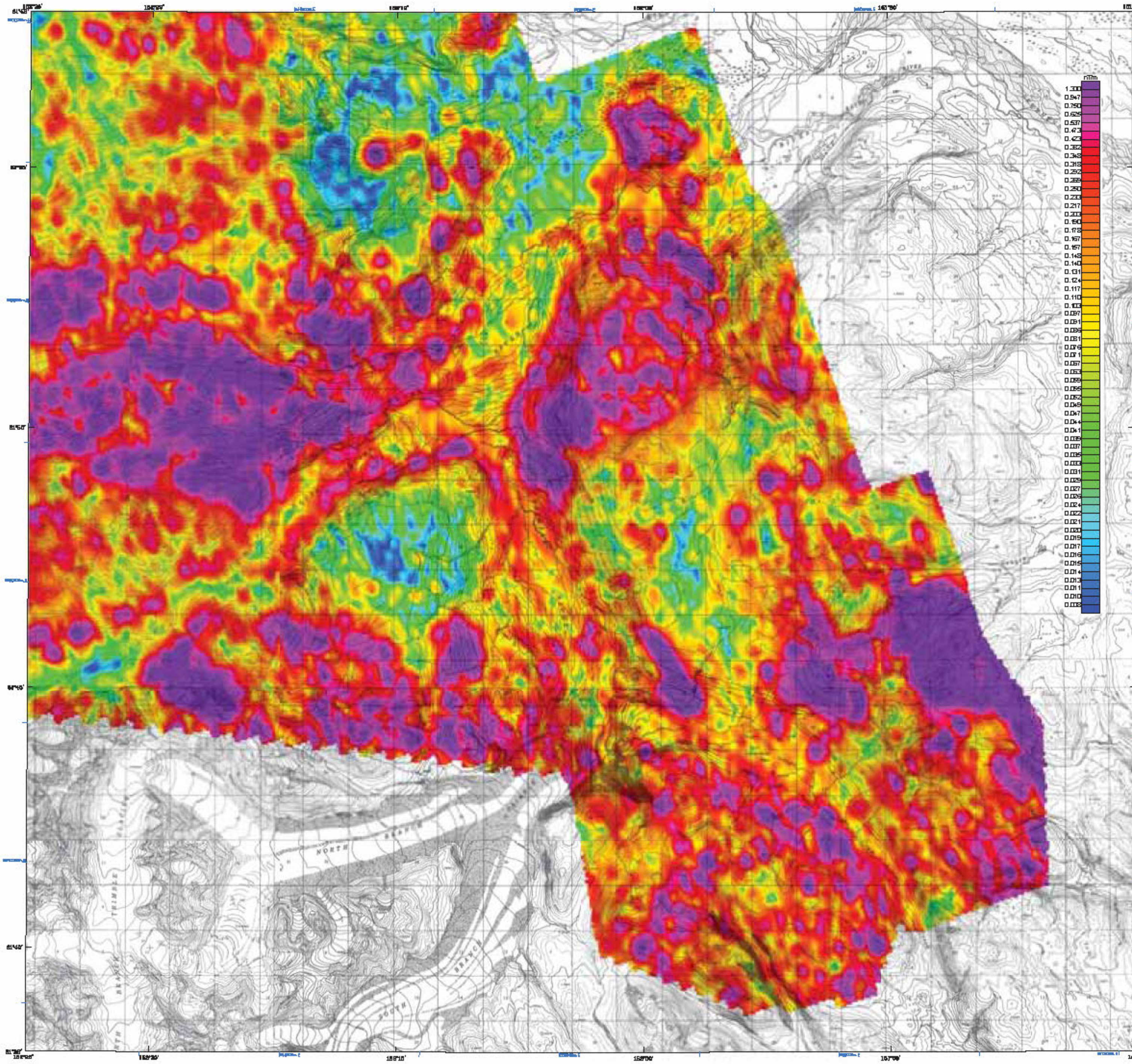
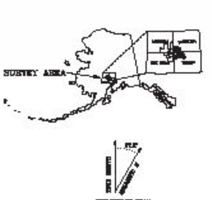
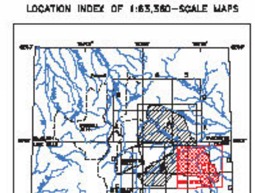


SCALE 1:63,360



LOCATION INDEX OF 1:63,360-SCALE MAPS



ANALYTIC SIGNAL WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

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ANALYTIC SIGNAL

Analytic signal is the total amplitude of all directions of magnetic gradient calculated from the sum of the squares of the three orthogonal gradients. Mapped highs in the calculated analytic signal of magnetic parameter locate the anomalous source body edges and corners (e.g., contacts, fault/shear zones, etc.). Analytic signal maxima are located directly over faults and contacts, regardless of structural dip, and independently of the direction of the induced and/or remanent magnetizations.

SURVEY HISTORY

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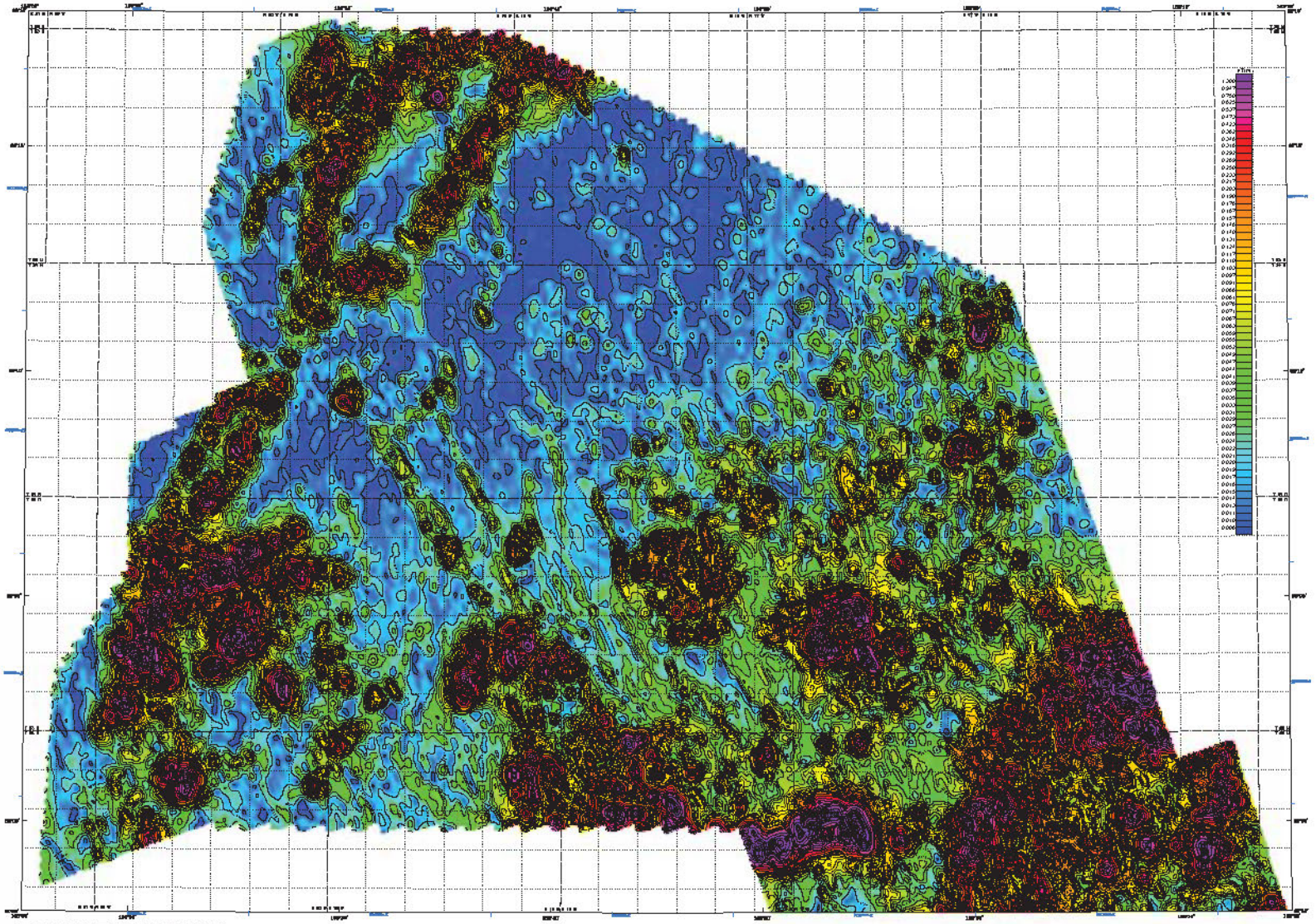


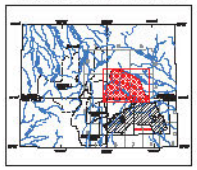
ANALYTIC SIGNAL WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, DGS, and Fugro GeoServices, Inc.

2014



DESCRIPTIVE NOTES

The geophysical data were acquired with a GEM-GSX Electromagnetic (EM) system, a DGS DIGHM medium magnetometer with a Sentrex CSI cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM system, magnetometer, and Radon at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 35/50 tie numbers and video cameras. Flights were performed with an AS-350-B3 Skybird helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel GPS6R-GGL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 3 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 3) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

ANALYTIC SIGNAL

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ANALYTIC SIGNAL CONTOURS

0.35 nT/metre

0.10 nT/metre

0.05 nT/metre

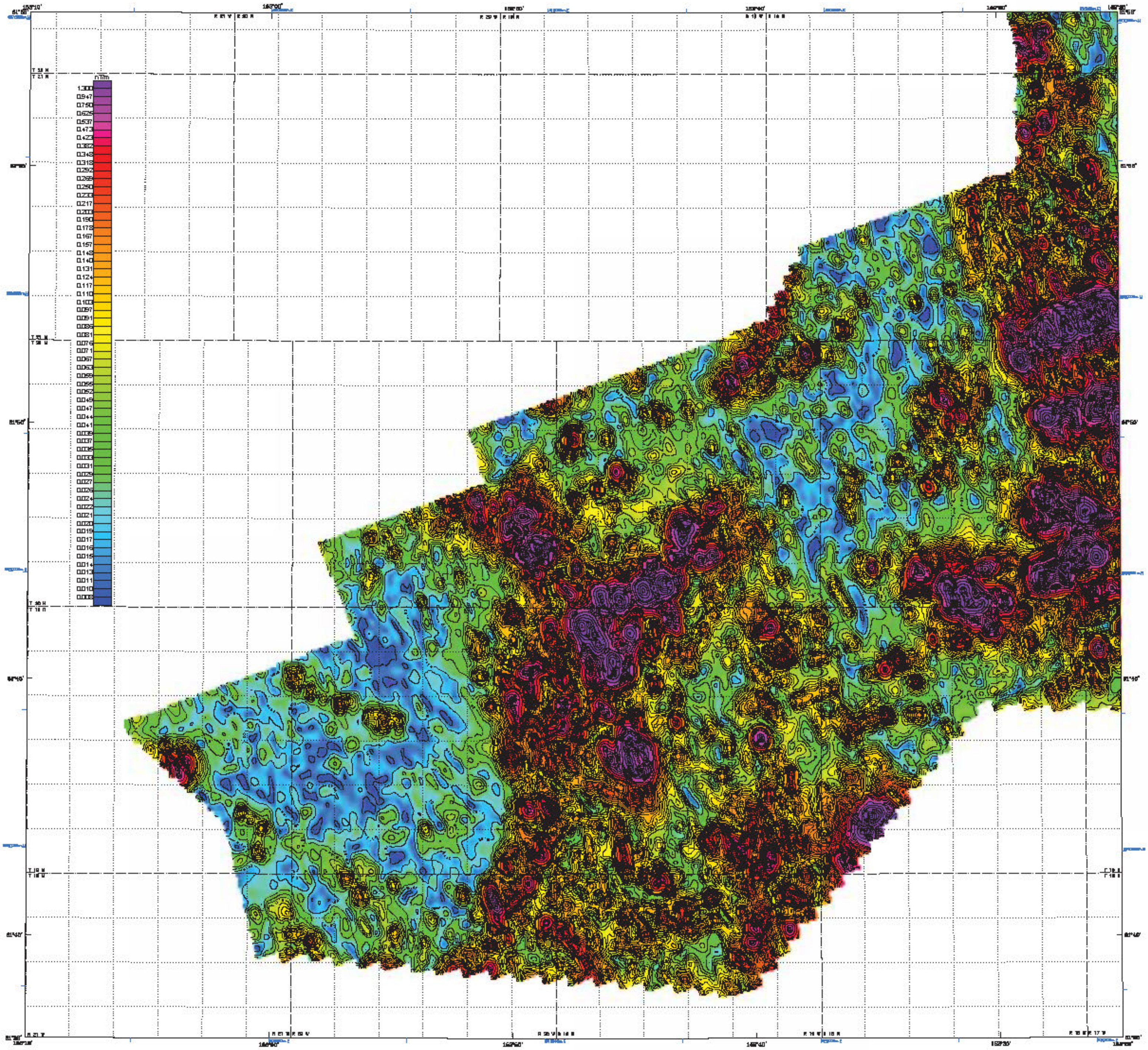
0.01 nT/metre

LOCATION INDEX OF 1:63,360-SCALE MAPS

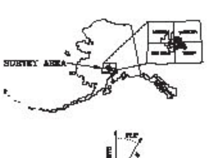
SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Aeromagnetic geophysical data for this area were acquired and processed by DGS in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

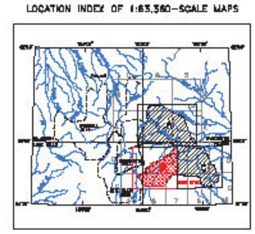
All data and maps produced in this Open File survey are available in digital format on DVD or scanned via through DGGS, 3354 College Road, Fairbanks, Alaska, 99709–3707, and are downloadable for free from the DGGS website (www.dggs.alaska.gov/pubs). Maps are also available on paper through the DGGS office, and are viewable online at the website in Adobe Acrobat .PDF file format.



SCALE 1:63,360



LOCATION INDEX OF 1:63,360-SCALE MAPS



ANALYTIC SIGNAL WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

ANALYTIC SIGNAL

Analytic signal is the total amplitude of all directions of magnetic gradient calculated from the sum of the squares of the three orthogonal gradients. Mapped highs in the calculated analytic signal of magnetic parameter locate the anomalous source body edges and corners (e.g., contacts, fault/shear zones, etc.). Analytic signal maxima are located directly over faults and contacts, regardless of structural dip, and independently of the direction of the induced and/or remanent magnetizations.

ANALYTIC SIGNAL CONTOURS

————	0.50 nT/metre
————	0.10 nT/metre
————	0.02 nT/metre
— — — —	0.01 nT/metre

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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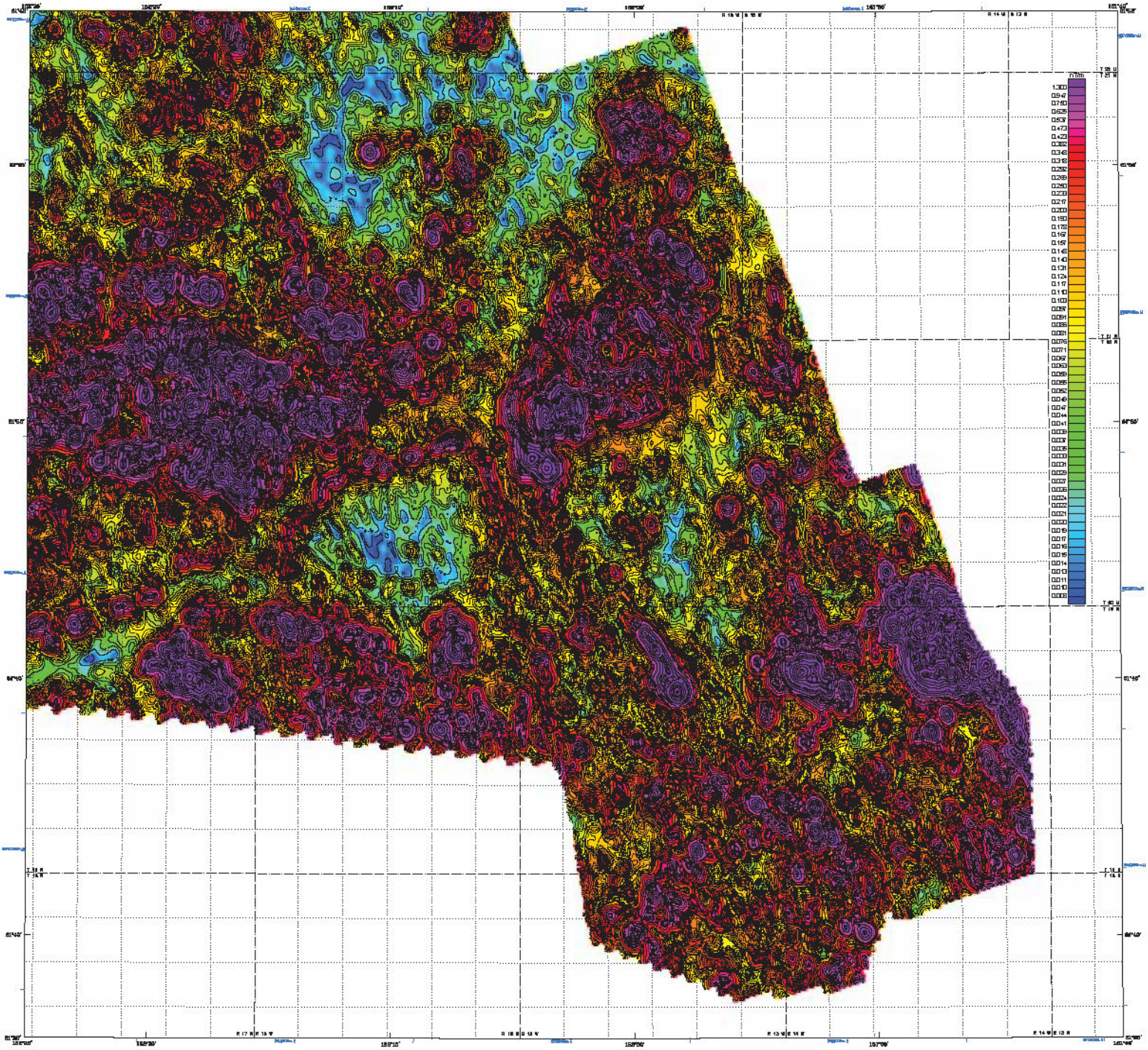
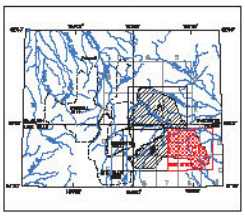


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



ANAYLTIC SIGNAL WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM V Electromagnetic (EM) system, a CS5 01344 cesium magnetometer with a Sonotrek GS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#8-GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

ANALYTIC SIGNAL

Analytic signal is the total amplitude of all directions of magnetic gradient calculated from the sum of the squares of the three orthogonal gradients. Mapped highs in the calculated analytic signal of magnetic parameter locate the anomalous source body edges and corners (e.g., contacts, fault/shear zones, etc.). Analytic signal maxima are located directly over faults and contacts, regardless of structural dip, and independently of the direction of the induced and/or remanent magnetizations.

ANALYTIC SIGNAL CONTOURS

0.50 nT/metre

0.10 nT/metre

0.02 nT/metre

0.01 nT/metre

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the grey area acquired and processed by DGS in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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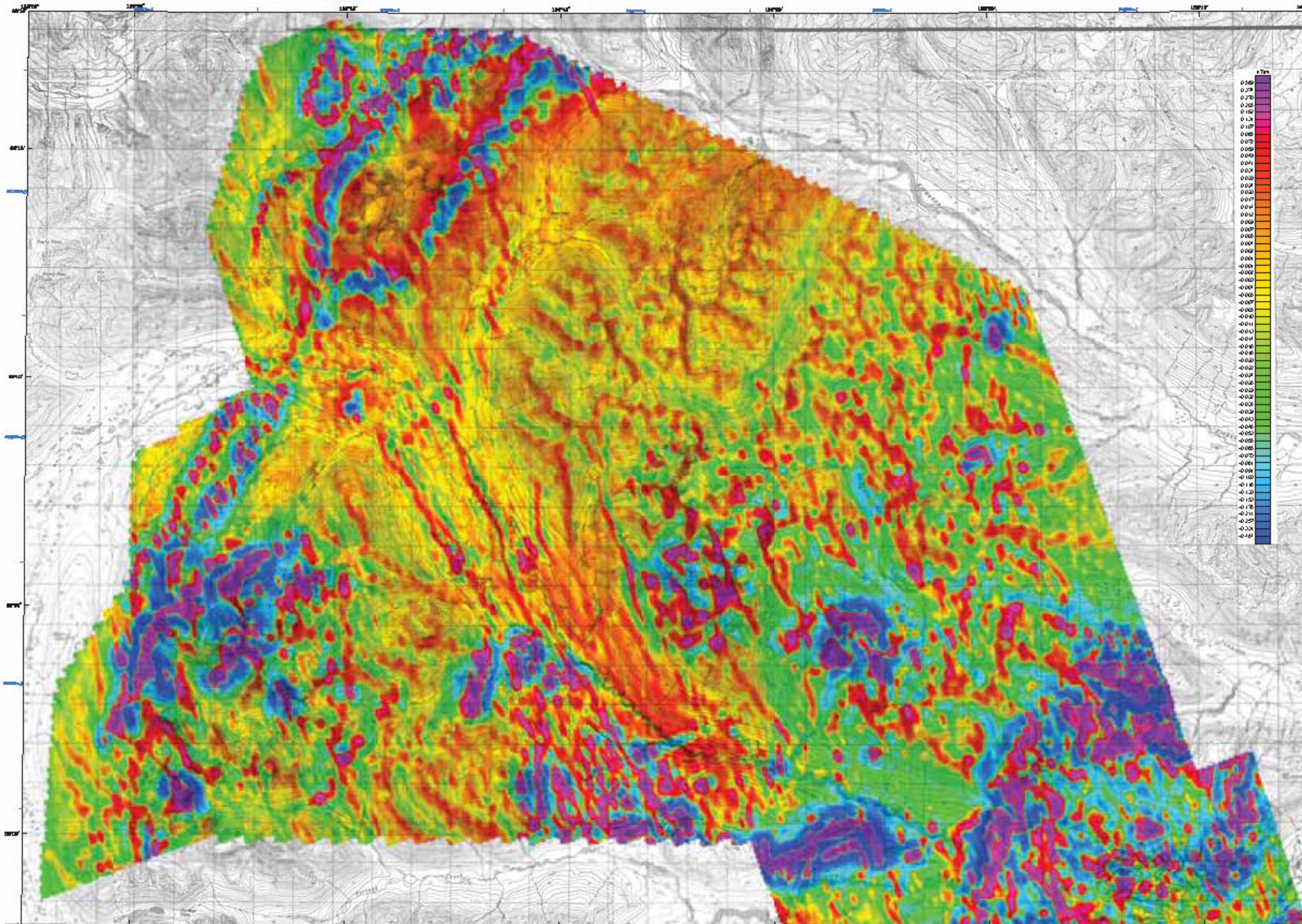
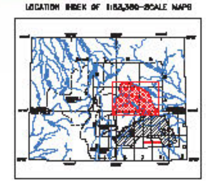


SCALE 1:63,360

LOCATION INDEX OF 1:63,360-SCALE MAPS



FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CSC 01344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

COLOR BAR HISTOGRAM

Approximately 98% of the first vertical derivative of the magnetic field for the East Styx Survey Area dataset lie within the range displayed on the color bar. Data values actually range from -18.364 nT/m (dark blue) to about 13.113 nT/m (magenta).

FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a CSC 01344 magnetometer with a Scintrex CS3 cesium sensor. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2010, updated for date of flight and altimeter variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 50 m grid using a modified Akima (1970) technique. All grids were then resampled from the 50 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication. The first vertical derivative grid was calculated from the processed total magnetic field grid using a FFT base frequency domain filtering algorithm. The resulting first vertical derivative grid provides better definition and resolution of near-surface magnetic units and helps to identify weak magnetic features that may not be evident on the total field data.

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by FGI in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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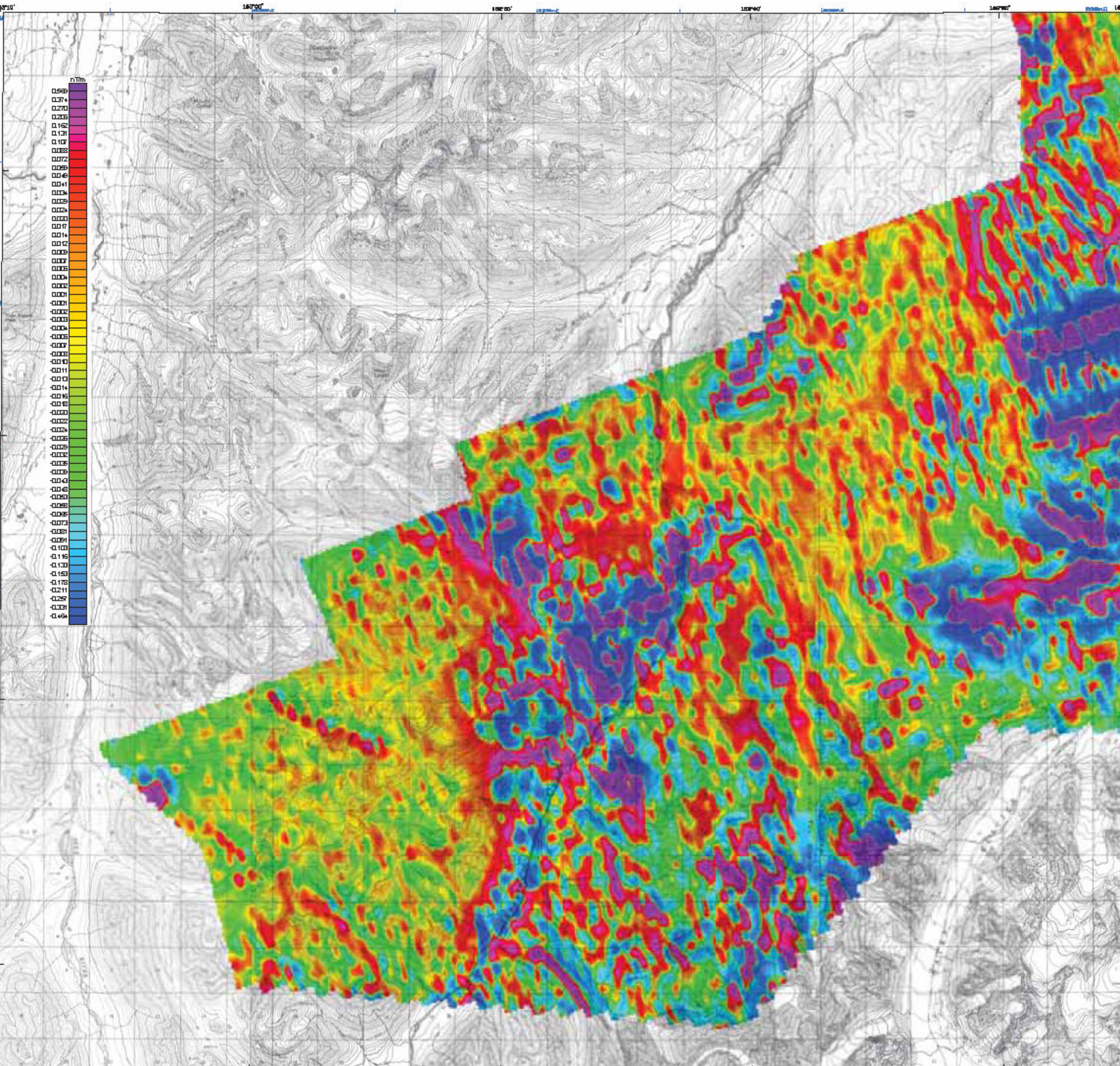


SCALE 1:63,360

1 0 1 2 3 4 MILES

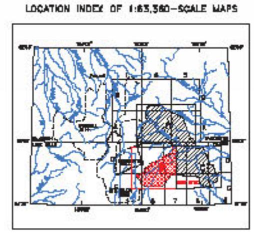
1 0 1 2 3 4 5 KILOMETERS

FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2014

LOCATION INDEX OF 1:63,360-SCALE MAPS



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM5-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

COLOR BAR HISTOGRAM

Approximately 86% of the first vertical derivative of the magnetic field for the East Styx Survey Area dataset lie within the range displayed on the color bar. Data values actually range from −12.804 nT/m (dark blue) to about 13.115 nT/m (magenta).

FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a CGG D1344 magnetometer with a Scintrex CS3 cesium sensor. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2010, updated for date of flight and altimeter variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 50 m grid using a modified Akima (1970) technique. All grids were then resampled from the 50 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication. The first vertical derivative grid was calculated from the processed total magnetic field grid using a FFT base frequency domain filtering algorithm. The resulting first vertical derivative grid provides better definition and resolution of near-surface magnetic units and helps to identify weak magnetic features that may not be evident on the total field data.

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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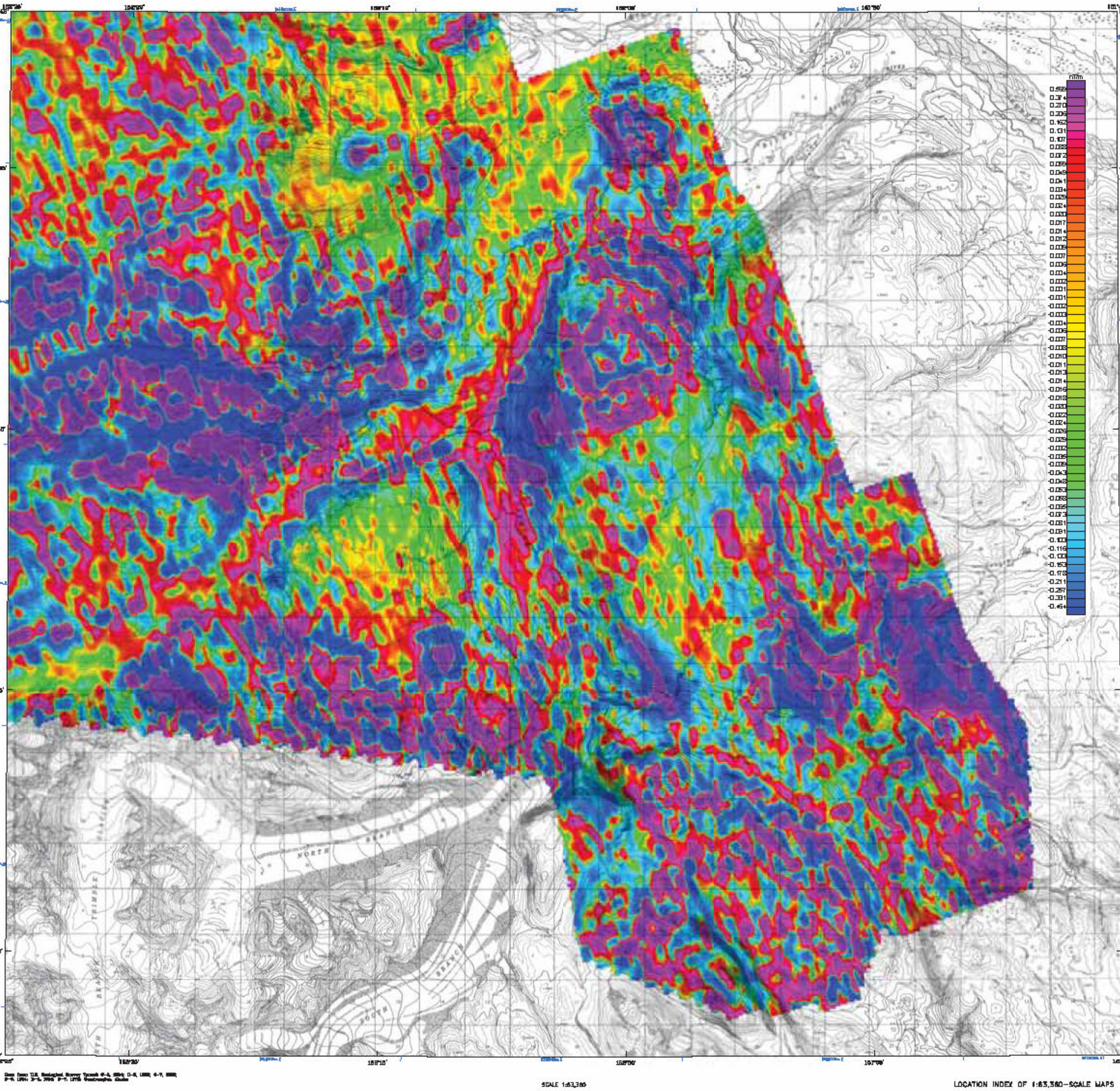
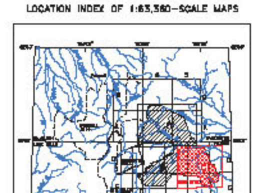
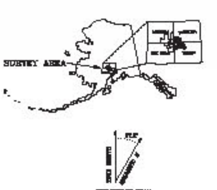


LOCATION INDEX OF 1:63,360-SCALE MAPS





FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

COLOR BAR HISTOGRAM

Approximately 88% of the first vertical derivative of the magnetic field for the East Styx Survey Area dataset lie within the range displayed on the color bar. Data values actually range from −12.864 nT/m (dark blue) to about 13.115 nT/m (magenta).

FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a CGG D1344 magnetometer with a Scintrex CS3 cesium sensor. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2010, updated for date of flight and altimeter variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication. The first vertical derivative grid was calculated from the processed total magnetic field grid using a FFT base frequency domain filtering algorithm. The resulting first vertical derivative grid provides better definition and resolution of near-surface magnetic units and helps to identify weak magnetic features that may not be evident on the total field data.

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

SURVEY HISTORY

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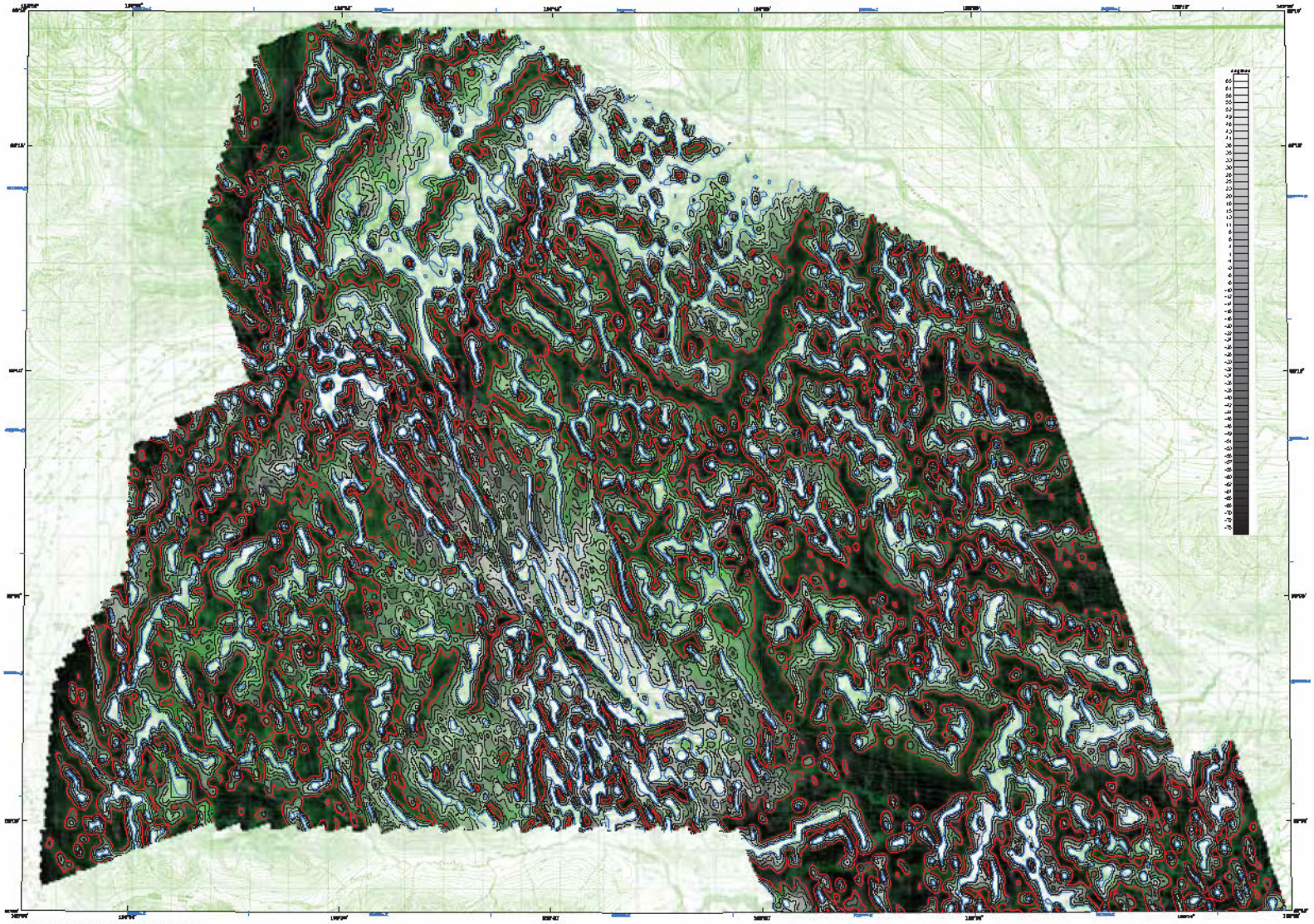


MAGNETIC TILT DERIVATIVE WITH TOPOGRAPHY AND DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

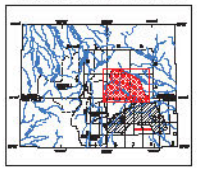
PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, DGS, and Fugro GeoServices, Inc.

2014

LOCATION INDEX OF 1:63,360-SCALE MAPS



DESCRIPTIVE NOTES

The aeromagnetic data were acquired with a DIGHEM Electromagnetic (EM) system, a DGS CS94 cesium sensor magnetometer with a Sensys GSS cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM, magnetic and radar sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 35/40 tie reserve and video cameras. Flights were performed with an AS-350-B3 Skyhawk helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel GPS6-GGL Global Positioning System was used for navigation. The helicopter position was sensed every 0.5 seconds using a post-flight differential positioning to a relative accuracy of better than 3 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 3) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north increment of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

MAGNETIC TILT DERIVATIVE

The tilt derivative is the angle between the horizontal gradient of the total gradient which is useful for identifying the depth & type of source. The tilt angle is positive over the source, crosses through zero at, or near, the edge of a vertical sided source, and is negative outside the source region. It has the added advantage of responding equally well to shallow and deep sources and is able to resolve deeper sources that may be masked by larger responses from shallower sources.

MAGNETIC TILT DERIVATIVE CONTOURS

- +45 degrees
- +30 degrees
- +15 degrees
- 0 degrees
- -15 degrees
- -30 degrees
- -45 degrees

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Aeromagnetic geophysical data for this area were acquired and processed by DGS in 2013 and 2014. Previously flown DGS surveys adjacent to the current survey are shown in the Assertion map by dashed lines, survey name, and date of publication. The project was flown by the Anchorage Alaska Laydistrict as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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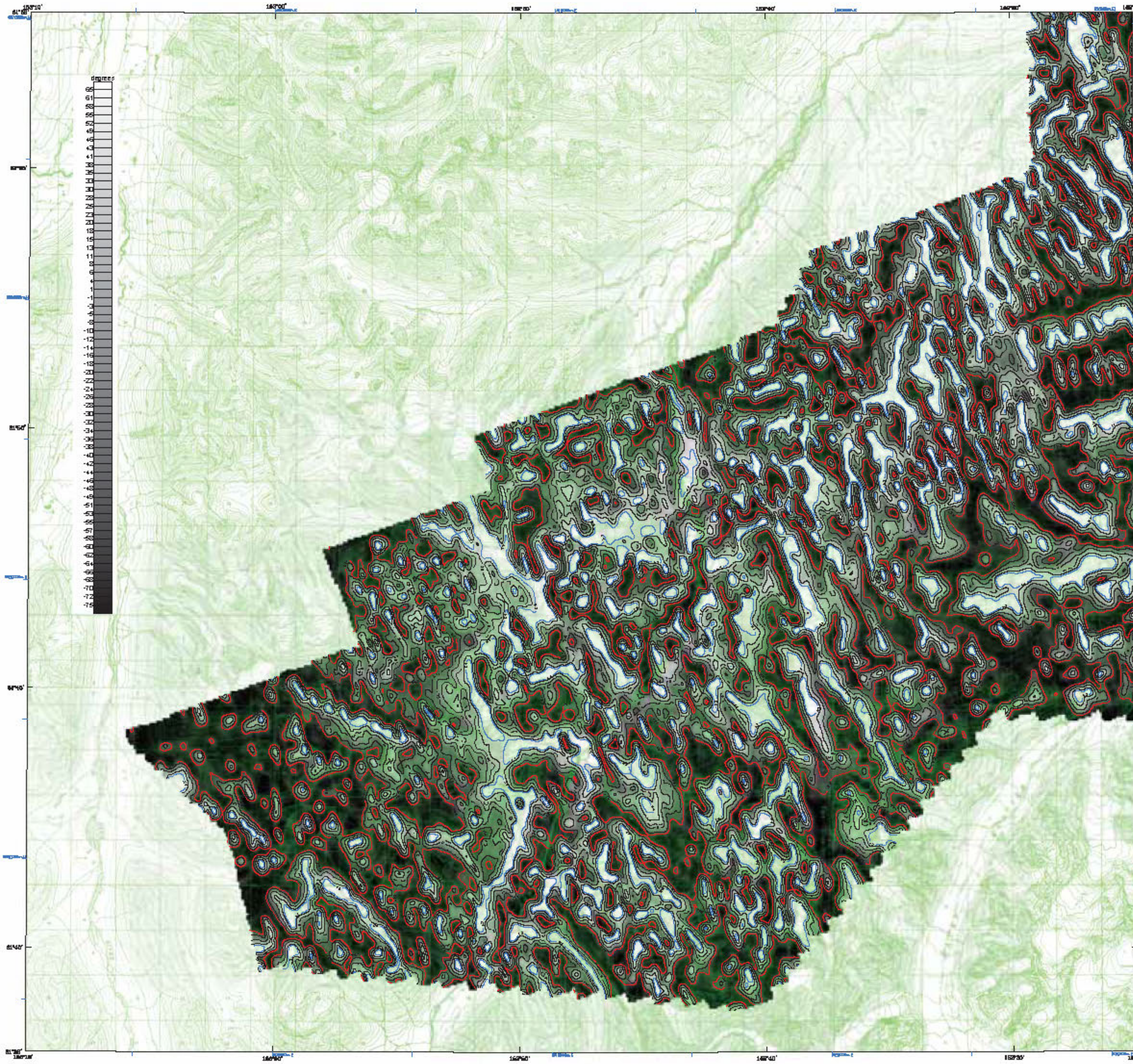
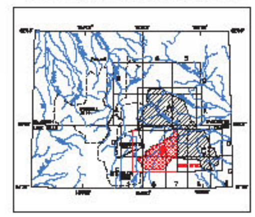


SCALE 1:63,360

LOCATION INDEX OF 1:63,360-SCALE MAPS



MAGNETIC TILT DERIVATIVE WITH TOPOGRAPHY AND DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

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A Novatel OEMV-2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

MAGNETIC TILT DERIVATIVE

The tilt derivative is the angle between the horizontal gradient & the total gradient, which is useful for identifying the depth & type of source. The tilt angle is positive over the source, crosses through zero at, or near, the edge of a vertical sided source, and is negative outside the source region. It has the added advantage of responding equally well to shallow and deep sources and is able to resolve deeper sources that may be masked by larger responses from shallower sources.

MAGNETIC TILT DERIVATIVE CONTOURS

(blue line)	+45 degrees
(black line)	+30 degrees
(black line)	+15 degrees
(black line)	0 degrees
(black line)	-15 degrees
(black line)	-30 degrees
(red line)	-45 degrees

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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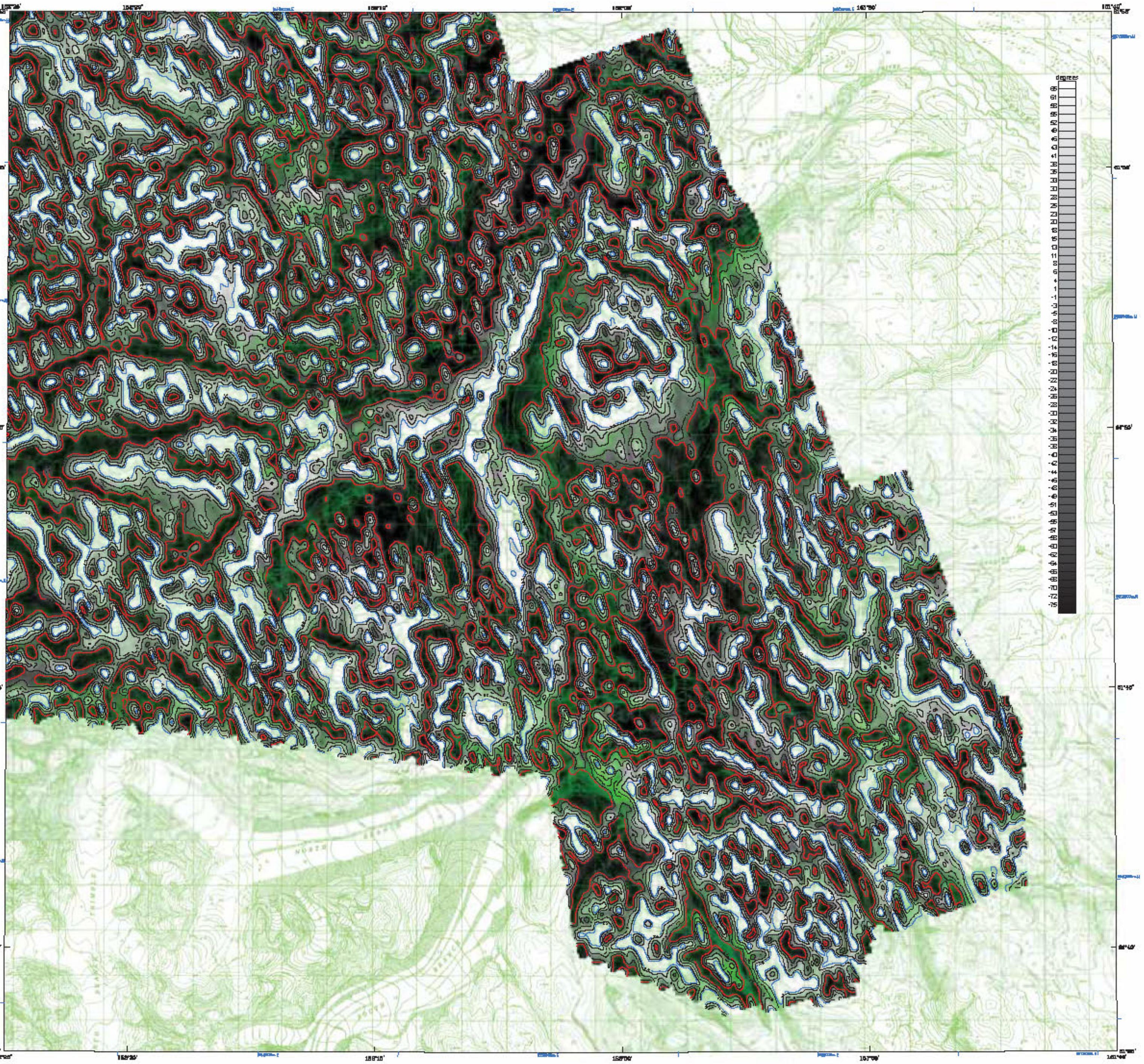
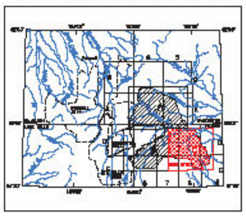


SCALE 1:63,360



MAGNETIC TILT DERIVATIVE WITH TOPOGRAPHY AND DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

MAGNETIC TILT DERIVATIVE

The tilt derivative is the angle between the horizontal gradient & the total gradient, which is useful for identifying the depth & type of source. The tilt angle is positive over the source, crosses through zero at, or near, the edge of a vertical sided source, and is negative outside the source region. It has the added advantage of responding equally well to shallow and deep sources and is able to resolve deeper sources that may be masked by larger responses from shallower sources.

MAGNETIC TILT DERIVATIVE CONTOURS

Line	Value
blue	+45 degrees
black	+30 degrees
black	+15 degrees
black	0 degrees
black	-15 degrees
black	-30 degrees
red	-45 degrees

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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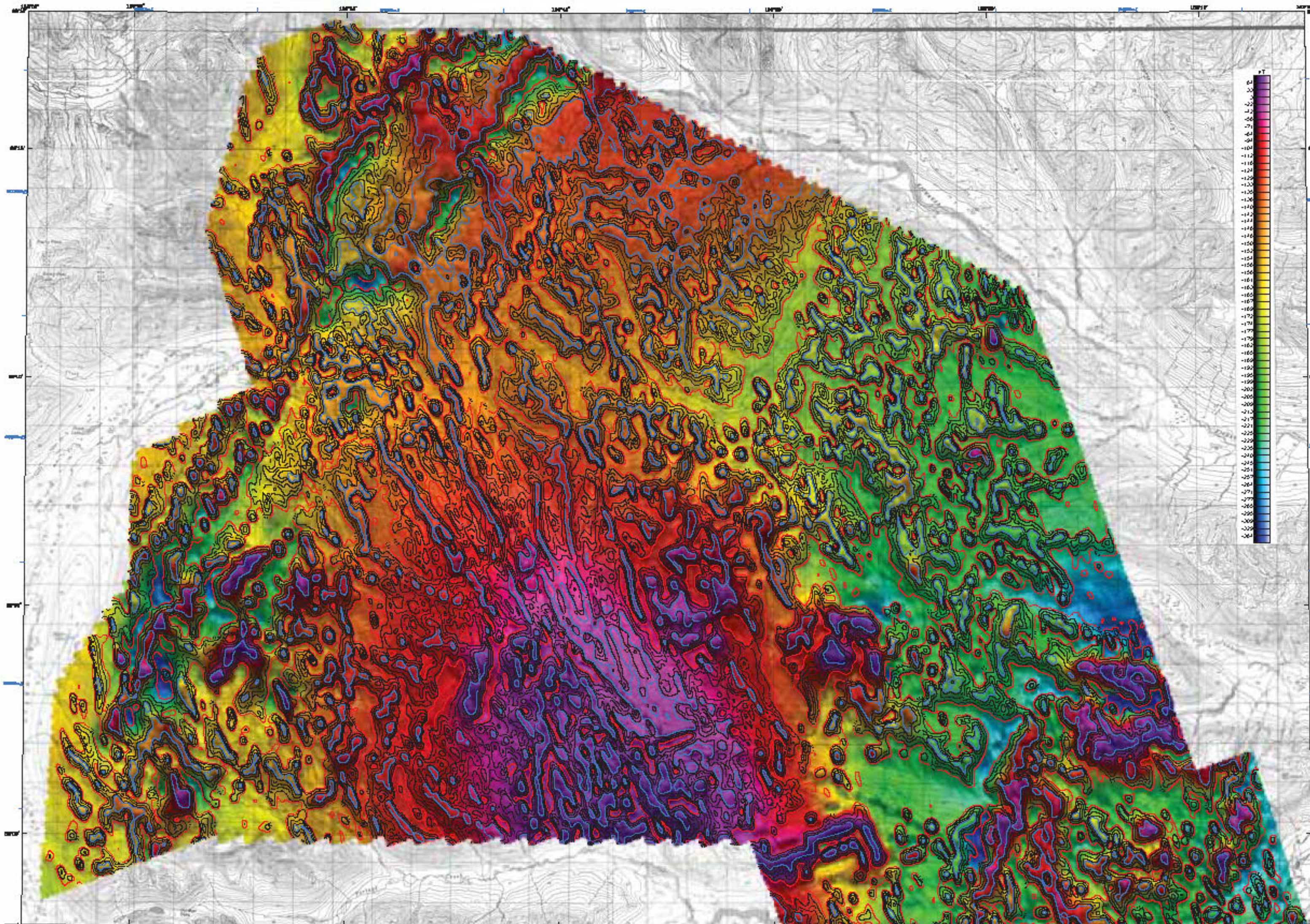
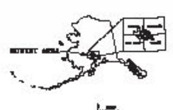
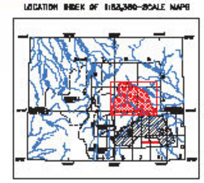


SCALE 1:63,360



LOCATION INDEX OF 1:63,360-SCALE MAPS



COLOR SHADOW RESIDUAL MAGNETIC FIELD WITH MAGNETIC TILT DERIVATIVE DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2014

Sun Azimuth: 0 degrees; Sun Inclination: 45 degrees

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, a CCS 01344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESIDUAL MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a CCS 01344 magnetometer with a Scintrex CS3 cesium sensor. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2010, updated for date of flight and altimeter variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 50 m grid using a modified Akima (1970) technique. All grids were then resampled from the 50 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

MAGNETIC TILT DERIVATIVE

The tilt derivative is the angle between the horizontal gradient & the total gradient, which is useful for identifying the depth & type of source. The tilt angle is positive over the source, crosses through zero at, or near, the edge of a vertical sided source, and is negative outside the source region. It has the added advantage of responding equally well to shallow and deep sources and is able to resolve deeper sources that may be masked by larger responses from shallower sources.

MAGNETIC TILT DERIVATIVE CONTOURS

- +45 degrees
- +30 degrees
- +15 degrees
- 0 degrees
- −15 degrees
- −30 degrees
- −45 degrees

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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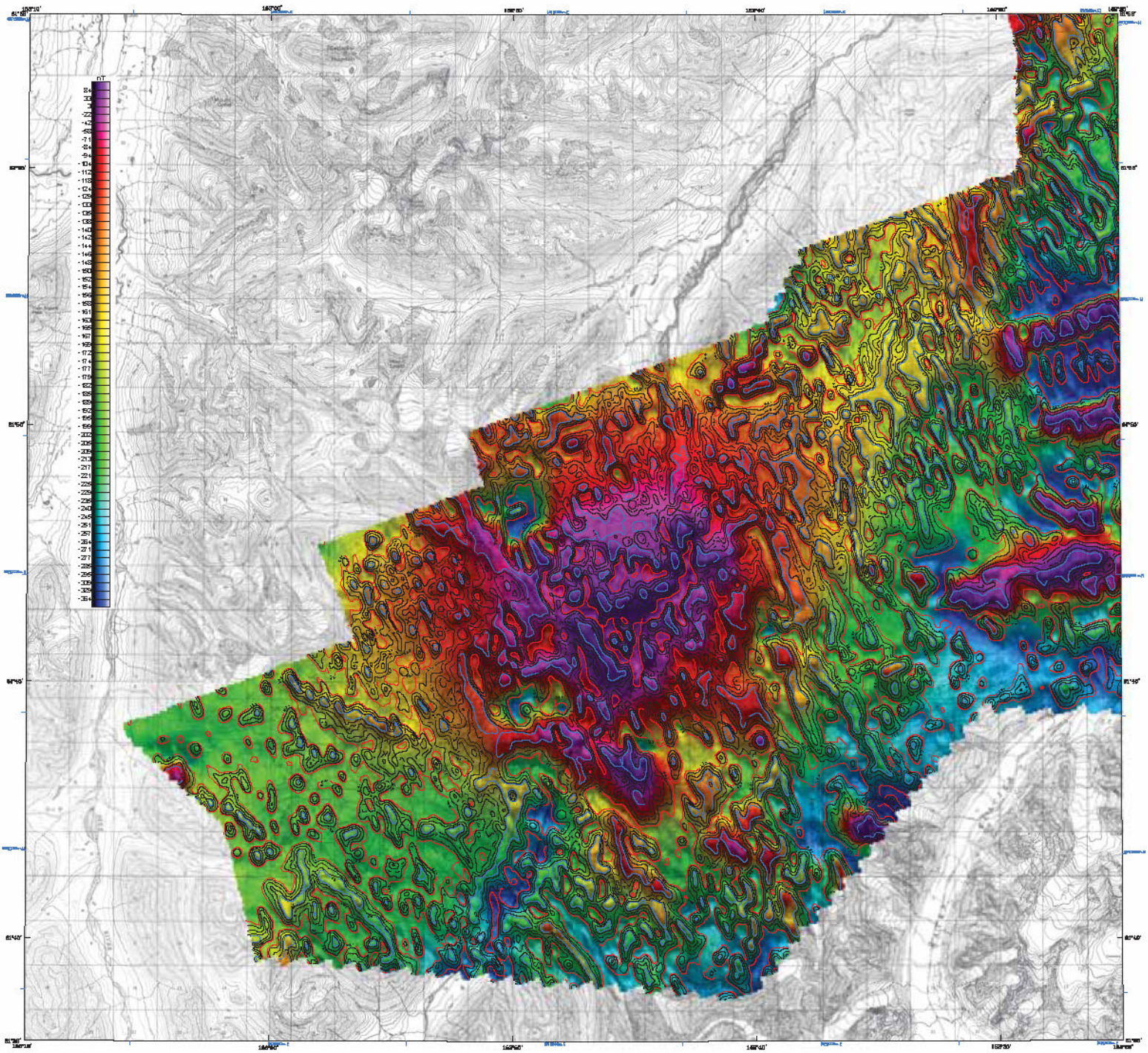
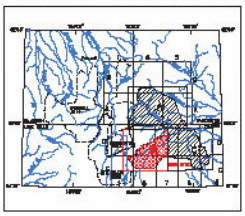


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



COLOR SHADOW RESIDUAL MAGNETIC FIELD WITH MAGNETIC TILT DERIVATIVE DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LINE HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

Sun Azimuth: 0 degrees; Sun Inclination: 45 degrees

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE–SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#3–GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESIDUAL MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a CGG D1344 magnetometer with a Scintrex CS3 cesium sensor. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2010, updated for date of flight and altimeter variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size given by a 25 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

MAGNETIC TILT DERIVATIVE

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MAGNETIC TILT DERIVATIVE CONTOURS

+45 degrees

+30 degrees

+15 degrees

0 degrees

-15 degrees

-30 degrees

-45 degrees

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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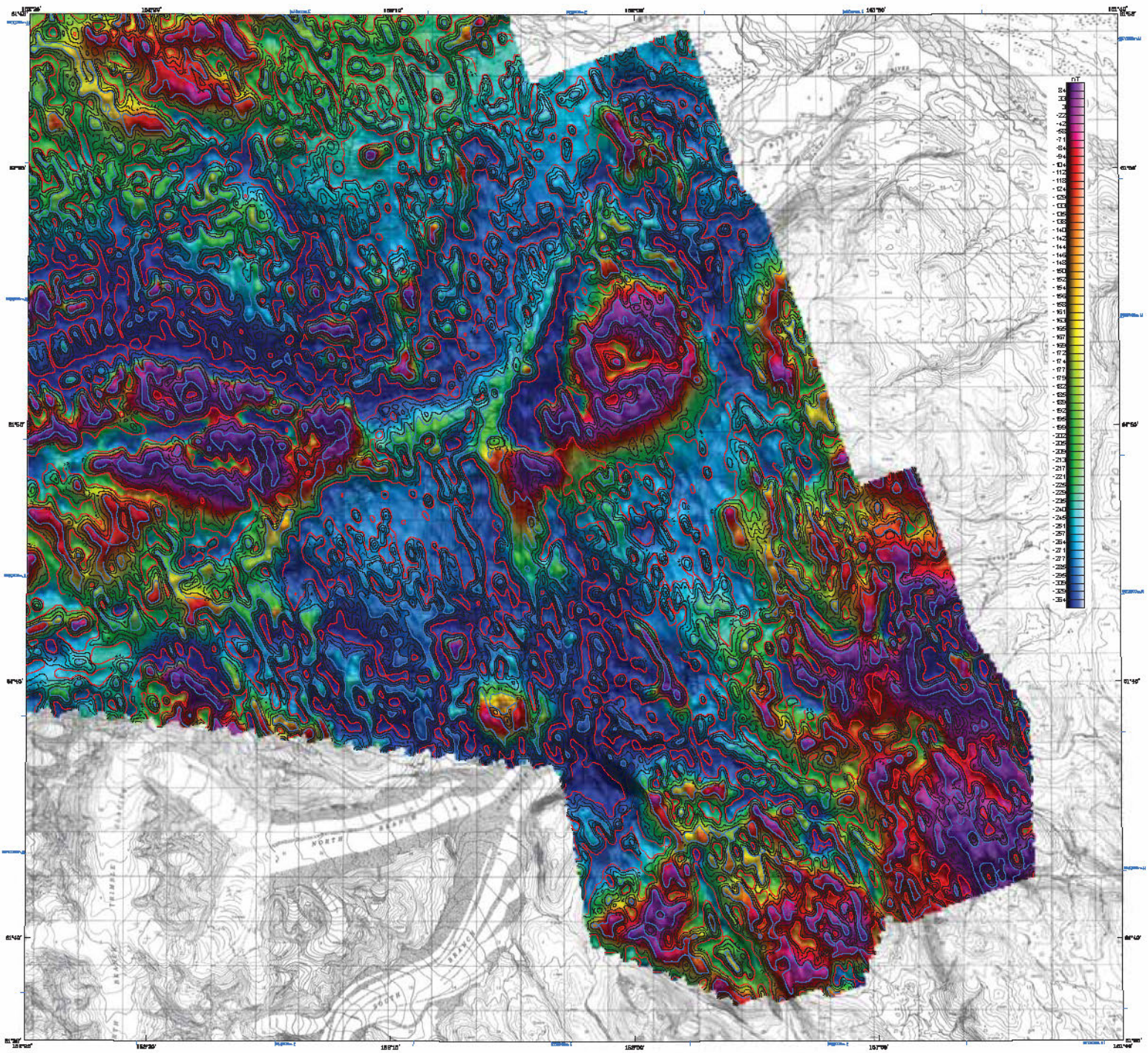
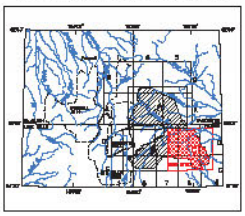


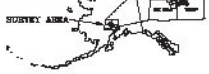
SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS





COLOR SHADOW RESIDUAL MAGNETIC FIELD WITH MAGNETIC TILT DERIVATIVE DATA CONTOURS EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LINE HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

Sun Azimuth: 0 degrees; Sun Inclination: 45 degrees

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, a CGG D1344 magnetometer with a Schiltek CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic data were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation systems, 50/60 Hz monitors and video cameras. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#3-RT2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESIDUAL MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a CGG D1344 magnetometer with a Schiltec CS3 cesium sensor. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2010, updated for date of flight and altimeter variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 50 m grid using a modified Akima (1978) technique. All grids were then resampled from the 50 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1978, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589-602.

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MAGNETIC TILT DERIVATIVE CONTOURS

+45 degrees

+30 degrees

+15 degrees

0 degrees

-15 degrees

-30 degrees

-45 degrees

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the grey area acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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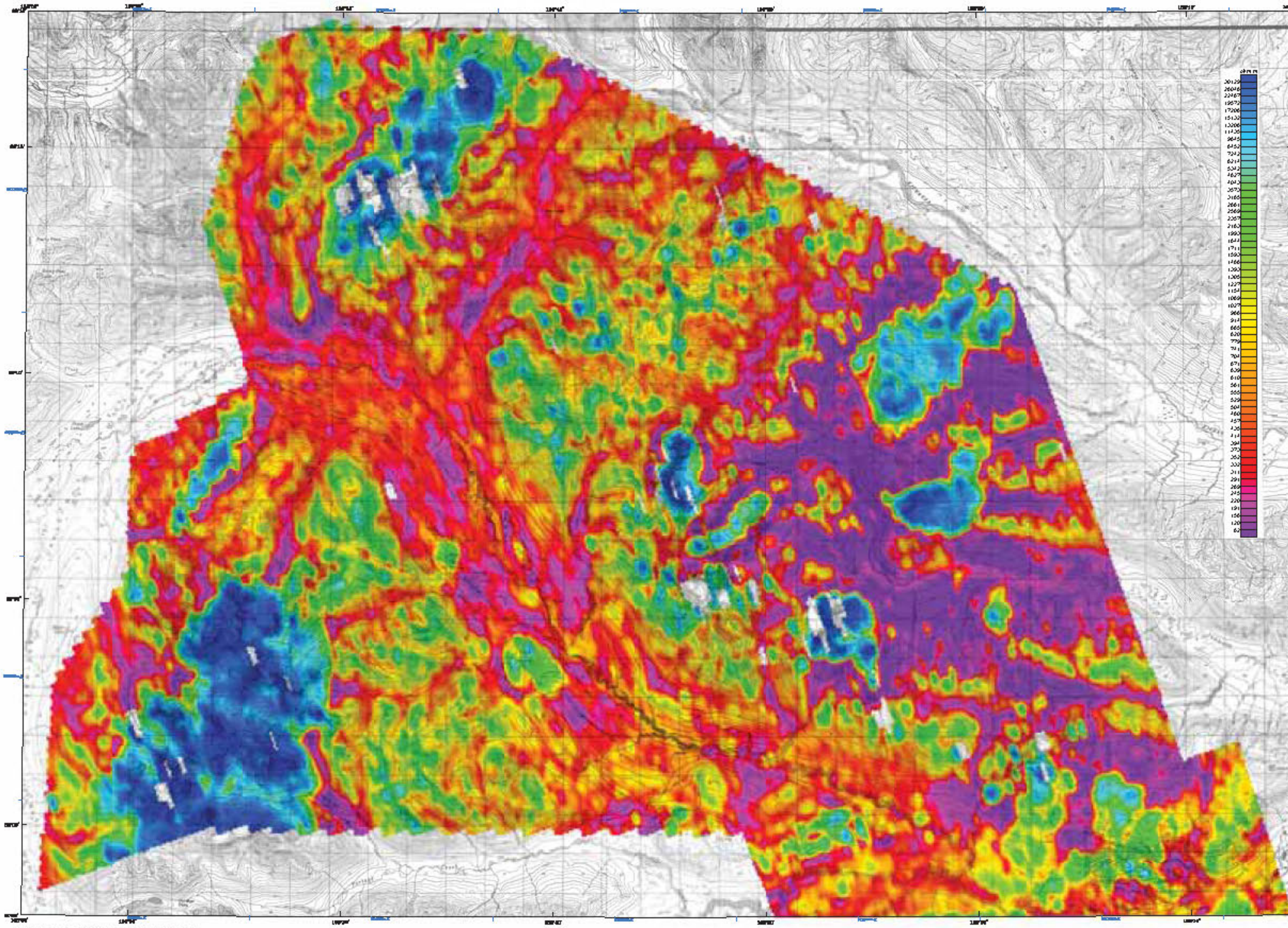
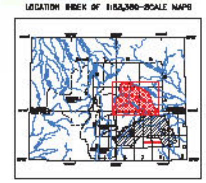


SCALE 1:63,360

LOCATION INDEX OF 1:63,360-SCALE MAPS



56,000 Hz COPLANAR APPARENT RESISTIVITY WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a DGS 01344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM[V] EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 56,000 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 50 m grid using a modified Akima (1970) technique. All grids were then resampled from the 50 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

RESISTIVITY ALTITUDE LIMITS

In areas where the EM bird height exceeded 120 m, resistivity was not calculated. This avoids meaningless resistivity calculations due to small signals where the helicopter flew higher to avoid cultural objects or for safety reasons. Blank areas in the grids were created where zones of high flying extended over more than one survey line.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by FGI in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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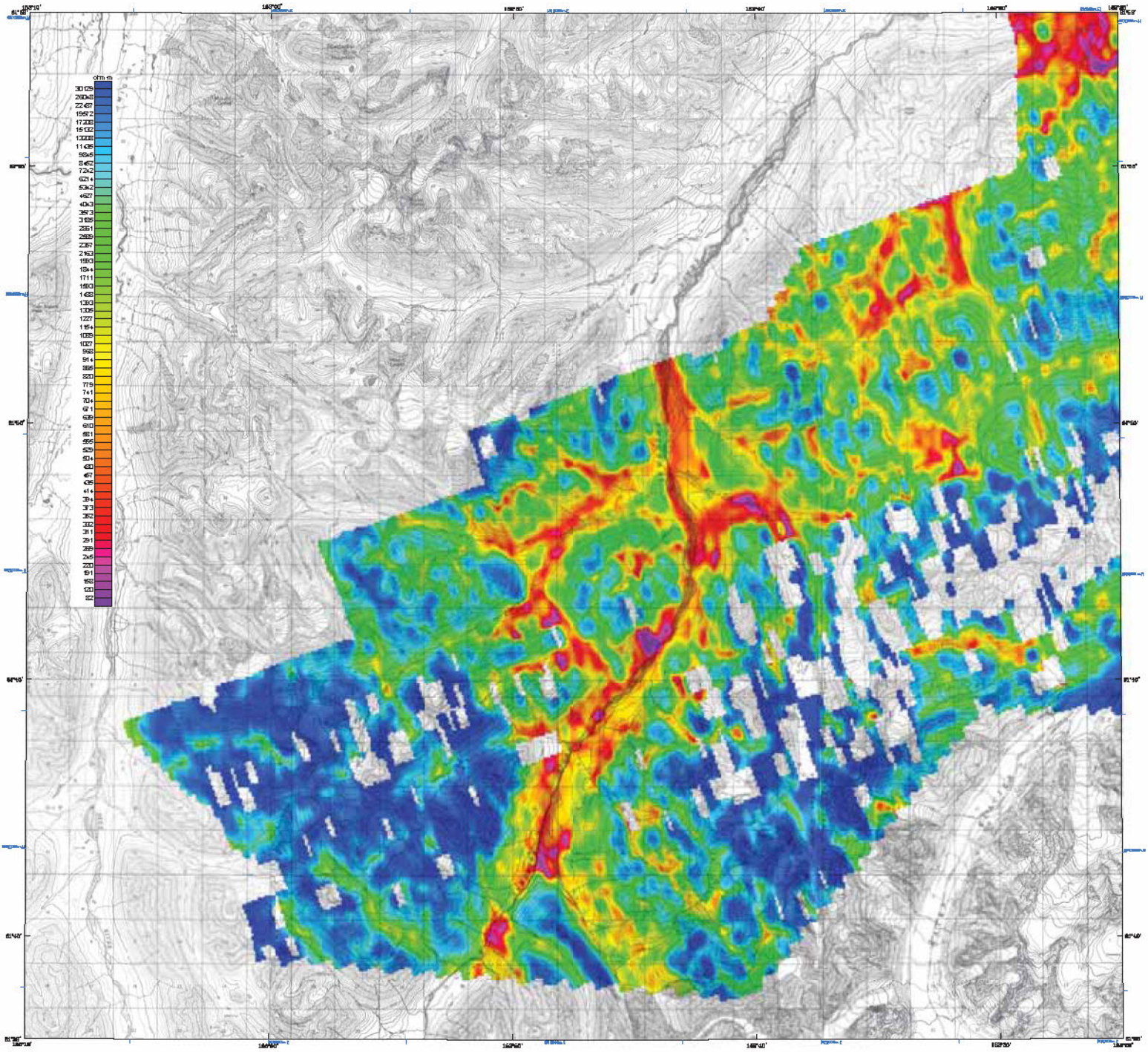
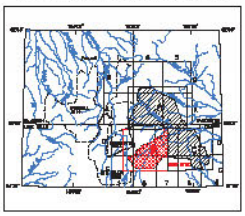


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



56,000 Hz COPLANAR APPARENT RESISTIVITY WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LINE HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM V Electromagnetic (EM) system, a CS-3 Cesium magnetometer with a Gemtrex G-53 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 60/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE–SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL-V3–GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM V EM system measured inphase and quadrature components at five frequencies, two vertical coaxial coil-pairs sampled at 1000 and 5000 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 56,000 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 20 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1978, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

RESISTIVITY ALTITUDE LIMITS

In areas where the EM bird height exceeded 130 m, resistivity was not calculated. This avoids meaningless resistivity calculations due to small signals where the helicopter flew higher for cycle cultural objects or for safety reasons. Blank areas in the grids were created where zones of high flying correlated over more than one survey line.

SURVEY HISTORY

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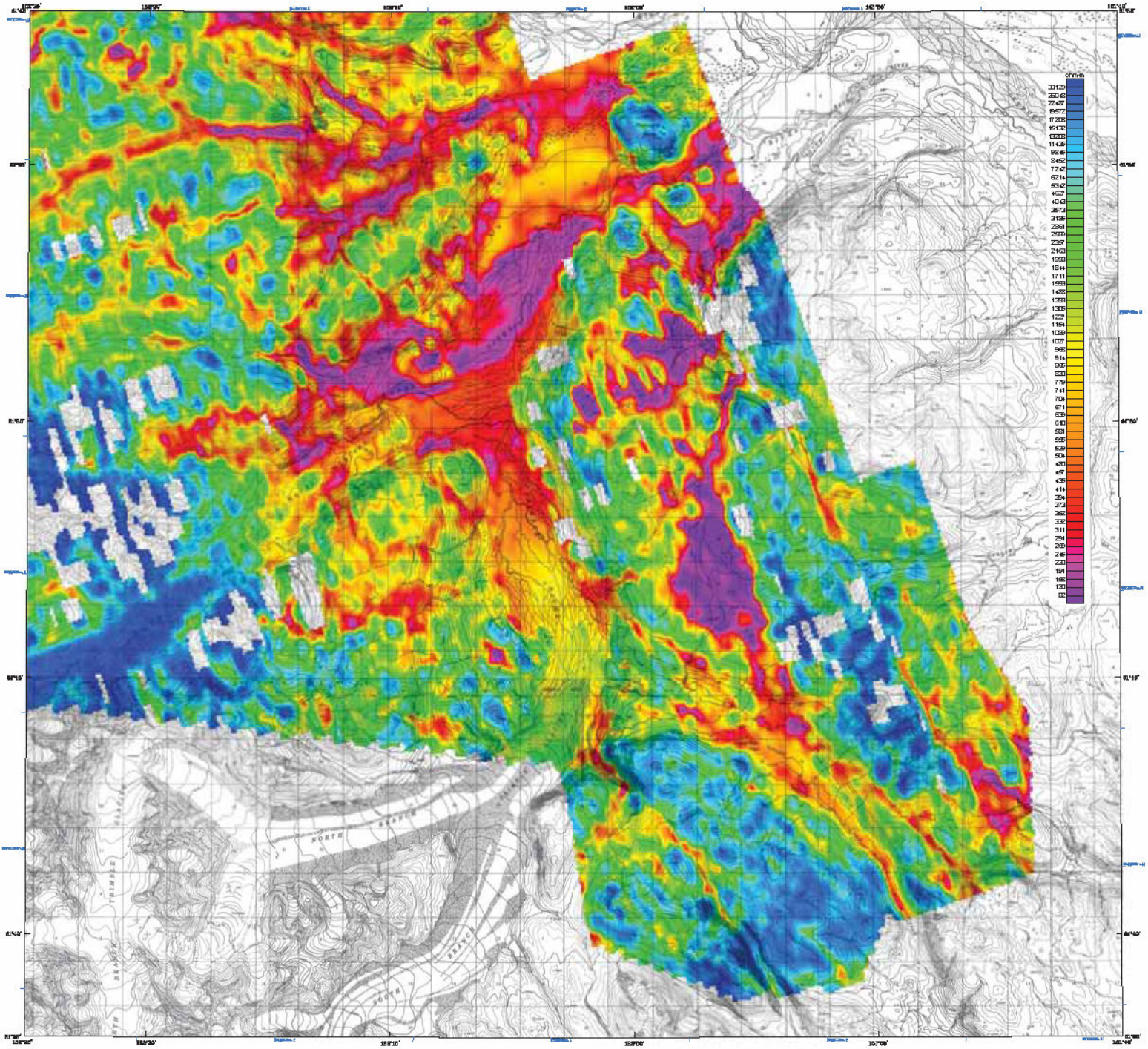


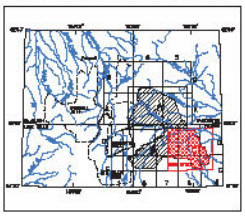
Base from USA Geological Survey Topomap 6-4, 2014; 6-5, 2014; 6-6, 2014; 6-7, 2014; P-5, 1954; P-6, 1954; P-7, 1954 Tyonek, Alaska

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 6 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



56,000 Hz COPLANAR APPARENT RESISTIVITY WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM V Electromagnetic (EM) system, a CS-3 cesium magnetometer with a Sonntek CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL-V3-GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM V EM system measured inphase and quadrature components at five frequencies, two vertical coaxial coil-pairs sampled at 1000 and 5000 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 56,000 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 20 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1978, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589-602.

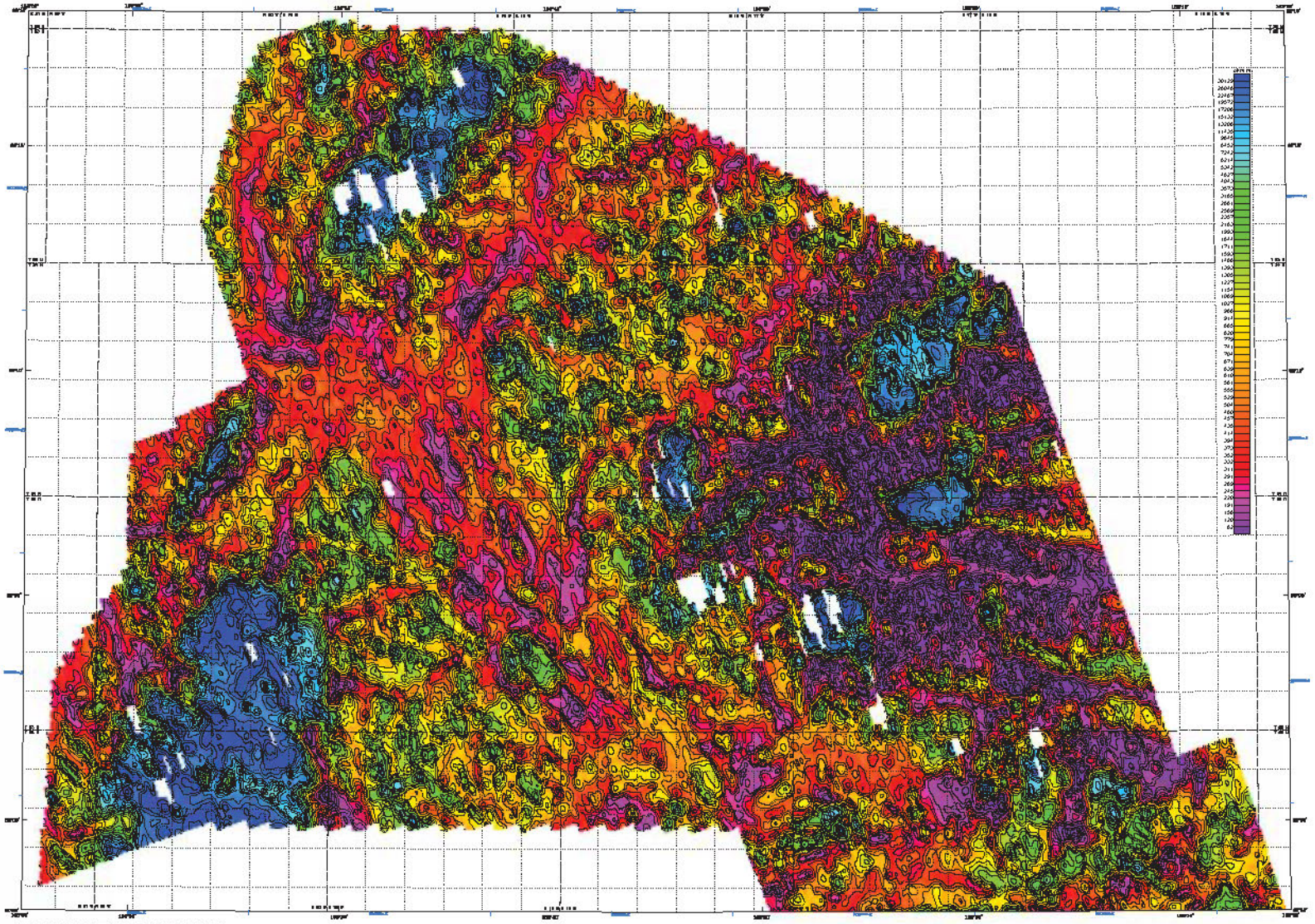
RESISTIVITY ALTITUDE LIMITS

In areas where the EM bird height exceeded 130 m, resistivity was not calculated. This avoids meaningless resistivity calculations due to small signals where the helicopter flew higher to avoid cultural objects or for safety reasons. Blank areas in the grids were created where zones of high flying correlated over more than one survey line.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the grey area acquired and processed by DGS in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGS website (www.dggs.alaska.gov/pubs). Maps are also available on paper through the DGGS office, and are viewable online at the website in Adobe Acrobat PDF file format.



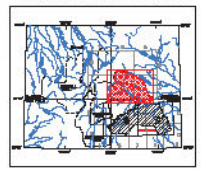
56,000 Hz COPLANAR APPARENT RESISTIVITY WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, DOG, and Fugro GeoServices, Inc.

2014



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system, a DGS CS1304 cesium magnetometer with a Sensys GSS cesium sensor, and a Radiation Solutions RSX-5000 gamma-ray spectrometer with a 256 channel analyzer. Data were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 35/140 hi resolution and video cameras. Flights were performed with an AS-350-B3 Skybird helicopter at a mean terrain clearance of 330 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel GPS6-GGL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 3 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 3) spheroid, 1927 North American datum using a central meridian (CM) of 150°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM^V EM system measured in-phase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1005 and 5594 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, overburden conductors and cultural sources. Apparent resistivity is generated from the in-phase and quadrature components of the coplanar 56,000 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 50 m grid using a modified Akima (1978) technique. All grids were then resampled from the 50 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1978, A new method of interpolation and smooth curve fitting based on local procedures: Journal of Computing Machinery, v. 17, no. 4, p. 589-602.

RESISTIVITY ALTITUDE LIMITS

In areas where the EM bird height exceeded 150 m, resistivity was not calculated. This avoids meaningless resistivity calculations due to aircraft objects where the helicopter flew higher to avoid cultural objects or for safety reasons. Blank areas in the grids were created where areas of high flying coincided over more than one survey line.

RESISTIVITY CONTOURS

Contours is shown at 10 intervals per decade

resistivity low

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for this area were acquired and processed by DGS in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the Assertion map by dashed lines, survey names, and dates of publication. The project was flown by the Airdale Skyte Corporation as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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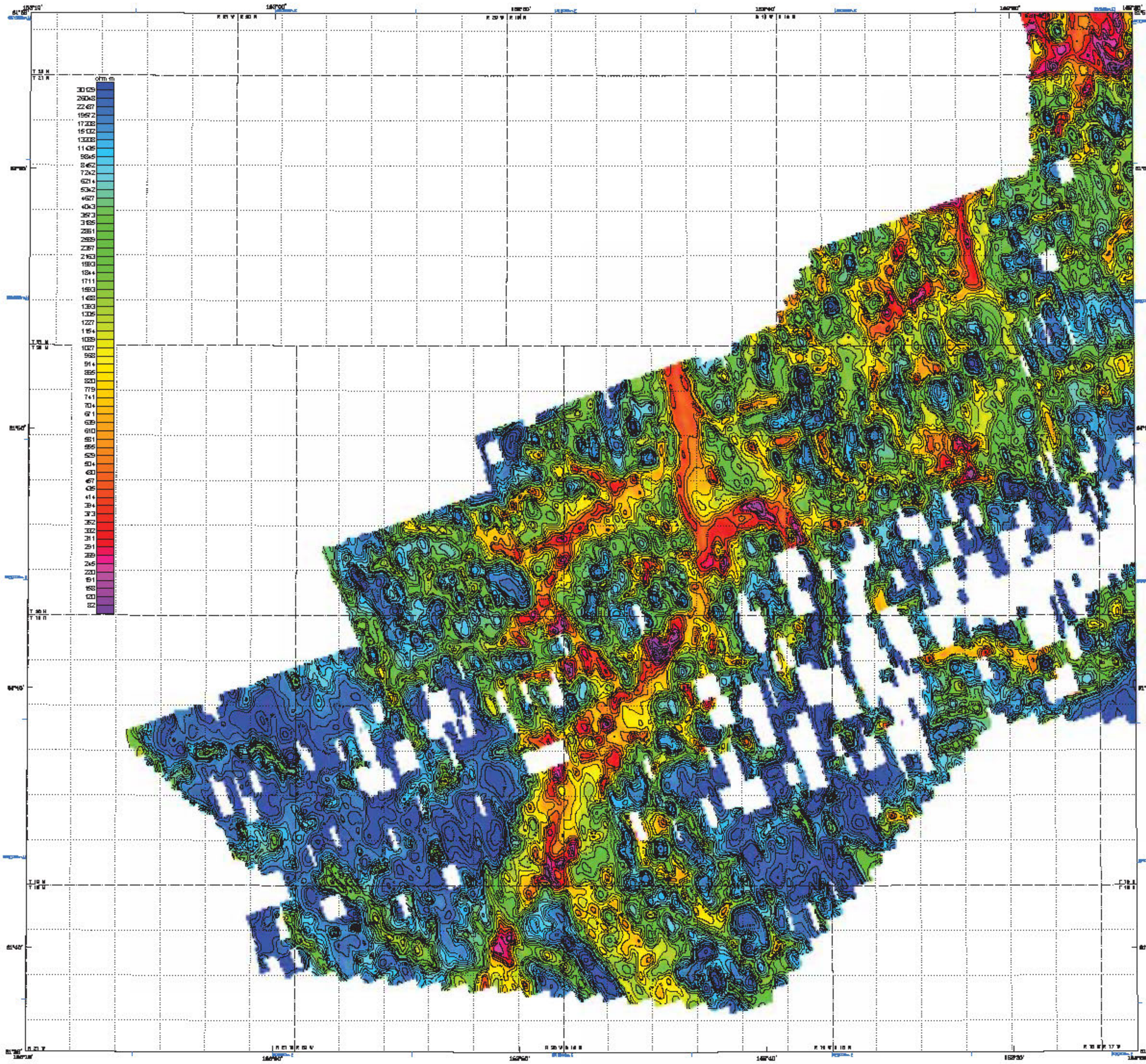
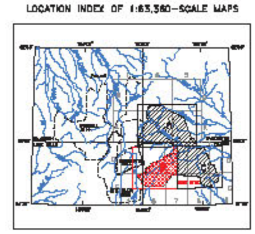


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



56,000 Hz COPLANAR APPARENT RESISTIVITY WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^{V} Electromagnetic (EM) system, a CCG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM5-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 56,000 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589-602.

RESISTIVITY ALTITUDE LIMITS

In areas where the EM bird height exceeded 130 m, resistivity was not calculated. This avoids meaningless resistivity calculations due to small signals where the helicopter flew higher to avoid cultural objects or for safety reasons. Blank areas in the grids were created where zones of high flying correlated over more than one survey line.

RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm-m at 10 intervals per decade

. . . . resistivity low

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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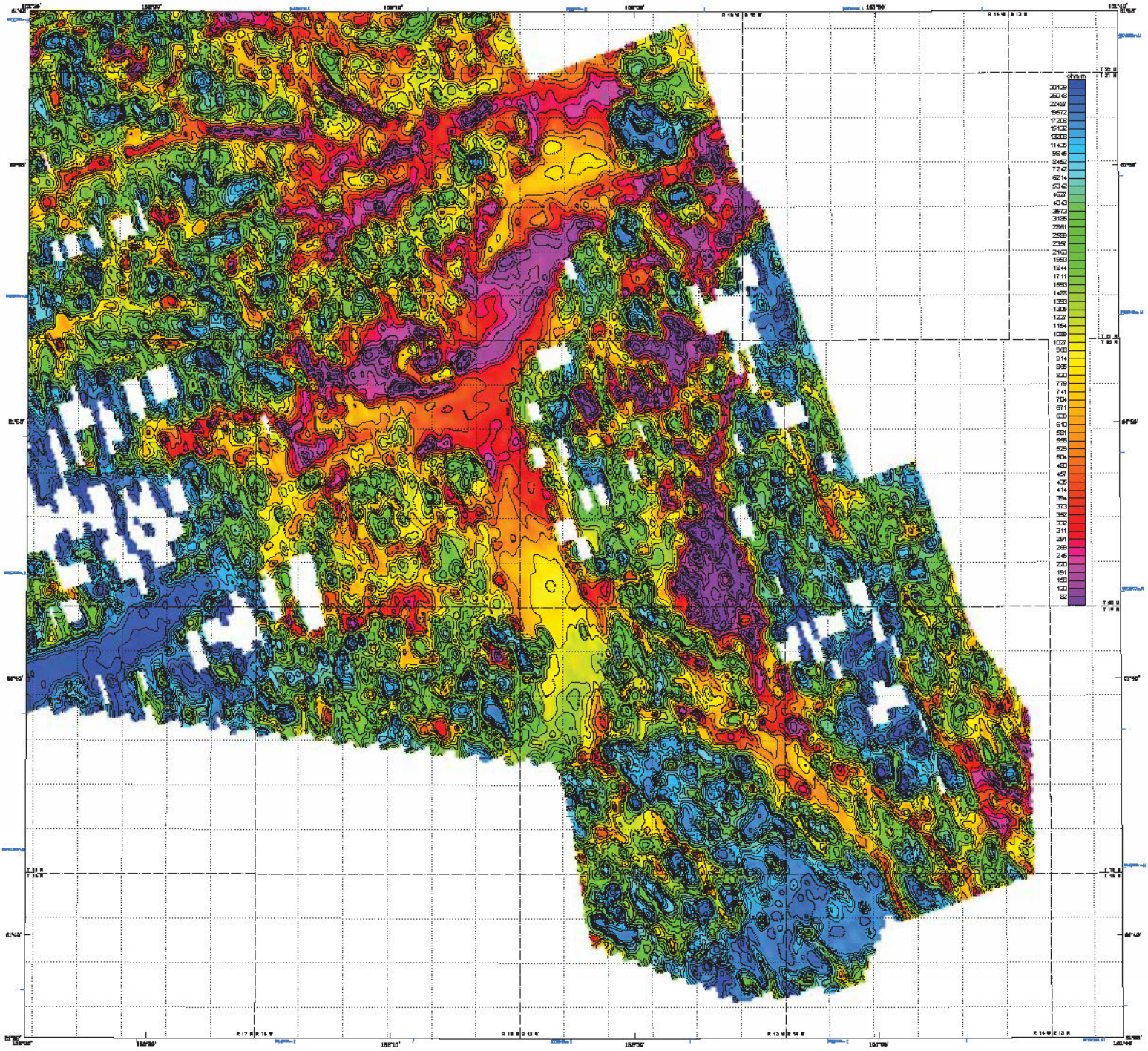
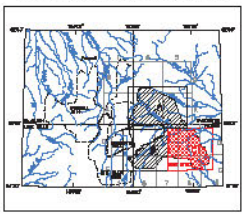


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



SURVEY AREA

56,000 Hz COPLANAR APPARENT RESISTIVITY WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LINE HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system, a GDS DI344 magnetometer with a Sintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation systems, 50/60 Hz monitors and video cameras. Flights were performed with an AS-350-B2 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#3-GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM^V EM system measured inphase and quadrature components at five frequencies, two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 56,000 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 20 m cell size to produce the maps and final grids contained in this publication.

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RESISTIVITY ALTITUDE LIMITS

In areas where the EM bird height exceeded 150 m, resistivity was not calculated. This avoids meaningless resistivity calculations due to small signals where the helicopter flies higher to avoid cultural objects or for safety reasons. Blank areas in the grids were created where zones of high flying coincided over more than one survey line.

RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm-m at 10 intervals per decade

resistivity low

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the grey area acquired and processed by DGS in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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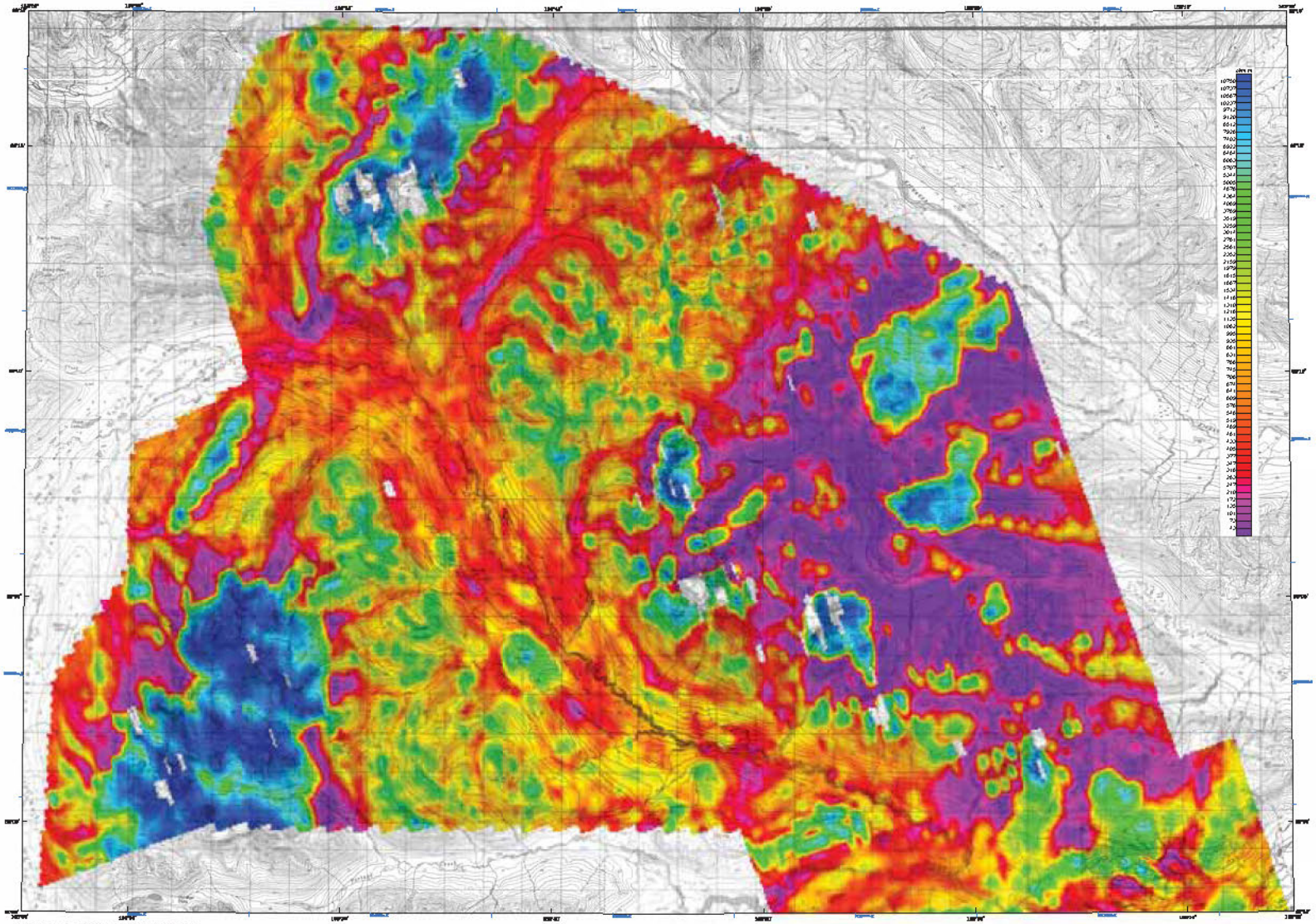

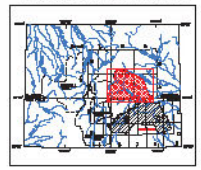

7200 Hz COPLANAR APPARENT RESISTIVITY WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, DGS, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^V (Electromagnetic (EM) system, a DGS D1344 cesium magnetometer with a Sensys GSC cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The survey was flown with a helicopter at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 35mm flight path video camera. Flights were performed with an AS-350-B3 Eurocopter helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel GPS4B-GGL Global Positioning System was used for navigation. The helicopter position was sensed every one second using a post-flight differential positioning to a relative accuracy of better than 3 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 3) spheroid, 1927 North American datum using a central meridian (CM) of 150°, a north increment of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM^V EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1005 and 5554 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, overburden conductors and cultural sources. Apparent resistivity is generated from the inphase and quadrature components of the coplanar 56,000 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 50 m grid using a modified Akima (1978) technique. All grids were then resampled from the 50 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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RESISTIVITY ALTITUDE LIMITS

In areas where the EM bird height exceeded 150 m, resistivity was not calculated. This results in erroneously resistivity calculations due to small signals since the helicopter has higher to avoid cultural objects or for safety reasons. Grids made in the grids with shaded where areas of high flying normalized were more than are survey line.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for this area were acquired and processed by DGS in 2013 and 2014. Previously flown DGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was flown by the Anchorage Alaska Laboratories as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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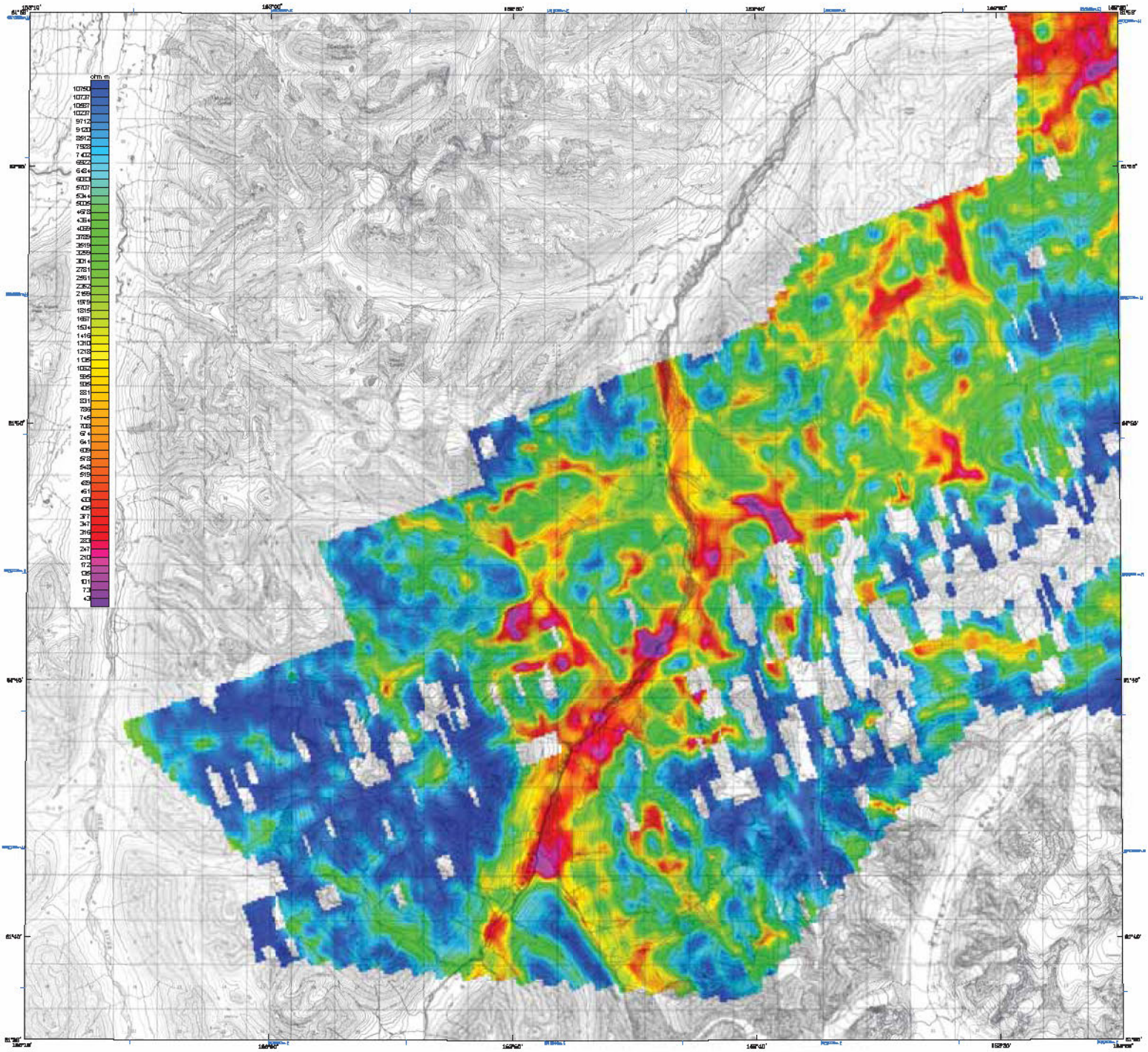
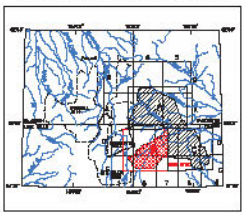


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



7200 Hz COPLANAR APPARENT RESISTIVITY WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

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2014

DESCRIPTIVE NOTES

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A Novatel DL#6-RT2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

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SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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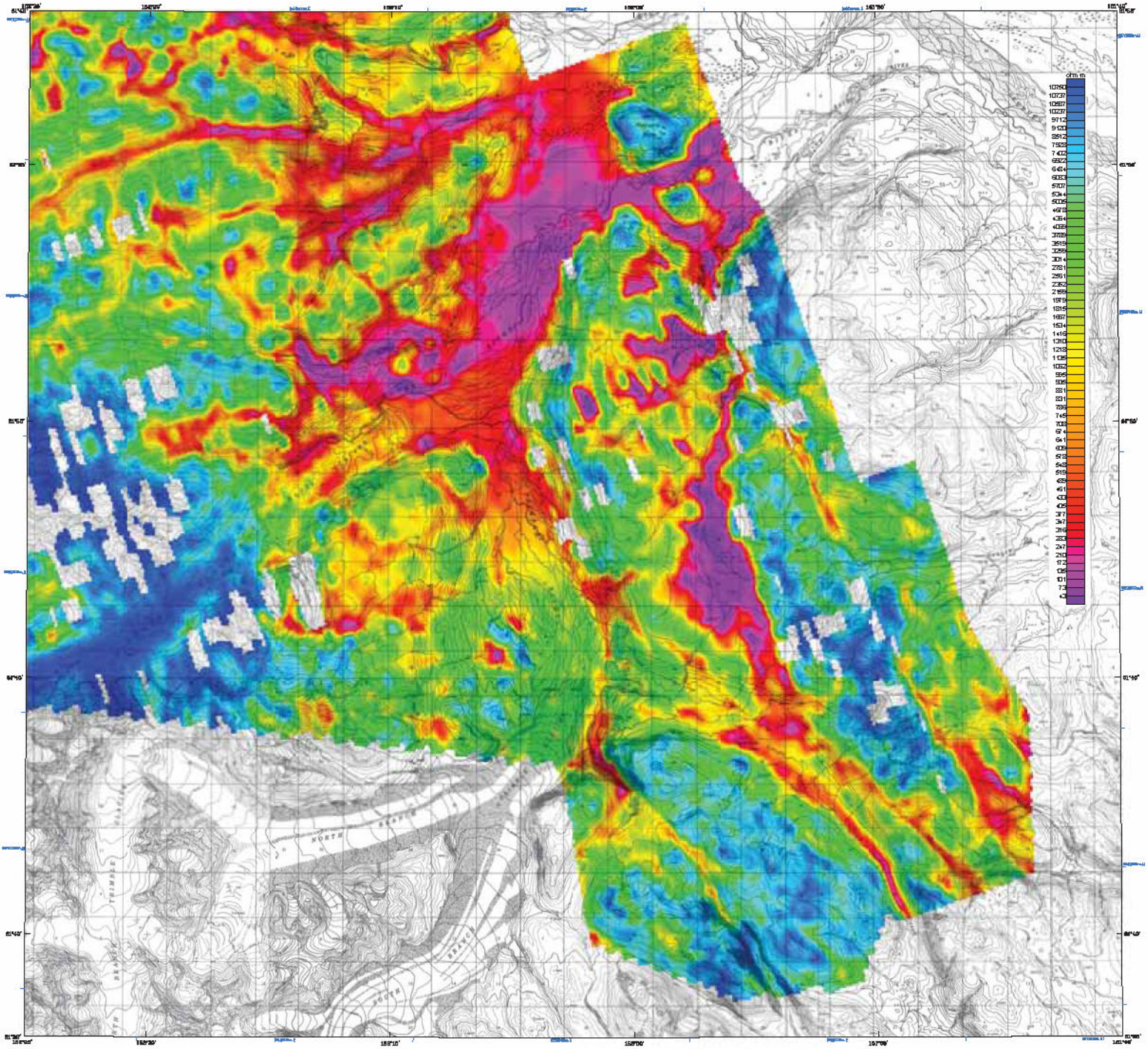

7200 Hz COPLANAR APPARENT RESISTIVITY WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

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2014

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A Novatel DL-V3—GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

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In areas where the EM bird height exceeded 130 m, resistivity was not calculated. This avoids meaningless resistivity calculations due to small signals where the helicopter flew higher to avoid cultural objects or for safety reasons. Blank areas in the grids were created where zones of high flying correlated over more than one survey line.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the grey area acquired and processed by DGS in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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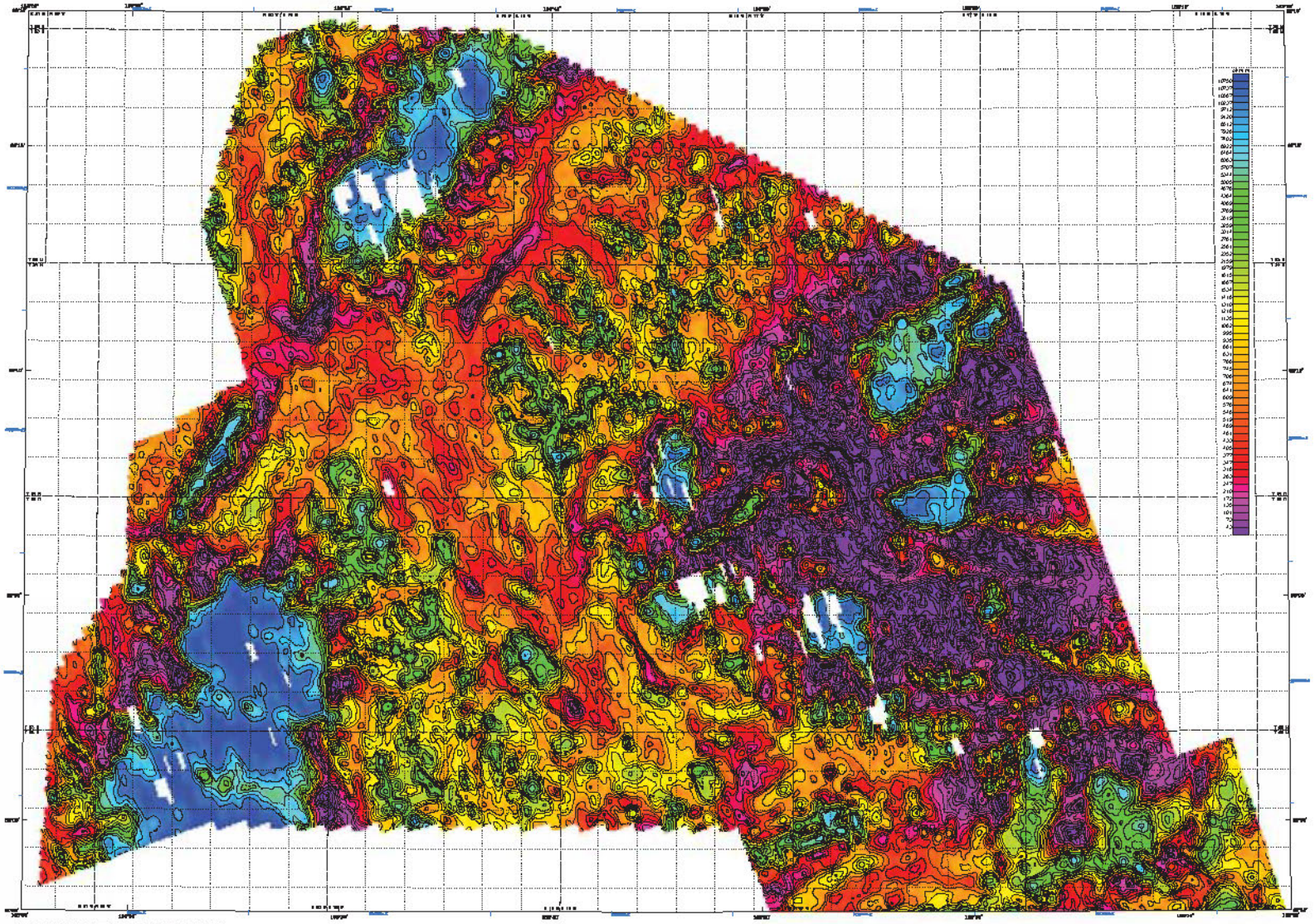


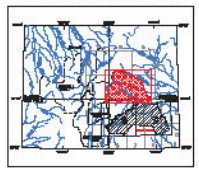
7200 Hz COPLANAR APPARENT RESISTIVITY WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, DOG, and Fugro GeoServices, Inc.

2014



LOCATION INDEX OF 1:63,360-SCALE MAPS

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^{V} Electromagnetic (EM) system, a DGS CS24 cesium sensor magnetometer with a Sensys GSS cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM system, stinger, and magnetometer were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 35mm to capture and video camera. Flights were performed with an AS-350-B3 Skybird helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel GPS6-951 Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential processing to a relative accuracy of better than 3 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 3) spheroid, 1927 North American datum using a central meridian (CM) of 150°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM^{V} EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1005 and 5554 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 56,509 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, overburden conductors, and cultural sources. Apparent resistivity is generated from the inphase and quadrature responses of the coplanar 7,200 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 20 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1978, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association for Computing Machinery, v. 17, no. 4, p. 589–602.

RESISTIVITY ALTITUDE LIMITS

In areas where the EM bird height exceeded 150 m, resistivity was not calculated. This avoids presenting inaccurately calculations due to aircraft objects where the helicopter flew higher to avoid cultural objects or for safety reasons. Blank areas in the grids were created where areas of high flying correlated over more than one survey line.

RESISTIVITY CONTOURS

1000
500
250
125
63
32
16
8
4
2
1
0.5

Contours is shown at 16 intervals per decade

resistivity low

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for this area were acquired and processed by DGS in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey names, and dates of publication. The project was funded by the Airbody Skyta Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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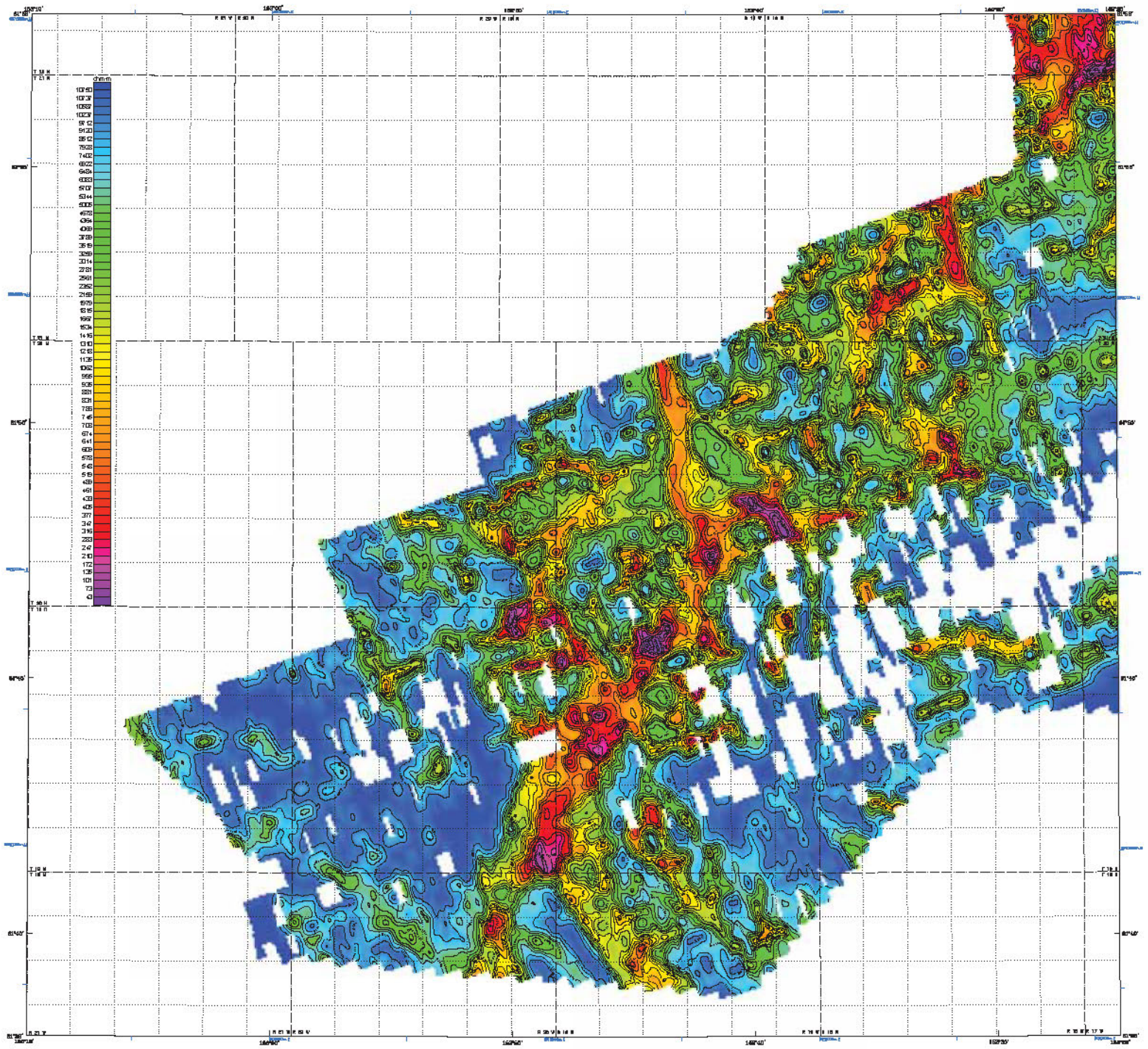
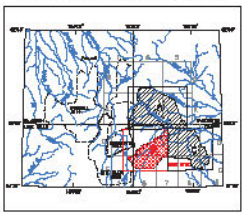


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



7200 Hz COPLANAR APPARENT RESISTIVITY WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system, a CGS D1344 cesium magnetometer with a Sahtrek G53 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic systems were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation systems, 50/60 Hz monitors and video cameras. Flights were performed with an AS-350-B2 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#6-GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM^V EM system measured inphase and quadrature components at five frequencies, two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 56,000 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 20 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589-602.

RESISTIVITY ALTITUDE LIMITS

In areas where the EM bird height exceeded 150 m, resistivity was not calculated. This avoids meaningless resistivity calculations due to small signals where the helicopter flies higher to avoid cultural objects or for safety reasons. Blank areas in the grids were created where zones of high flying coincided over more than one survey line.

RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm-m at 10 intervals per decade

resistivity low

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the grey area acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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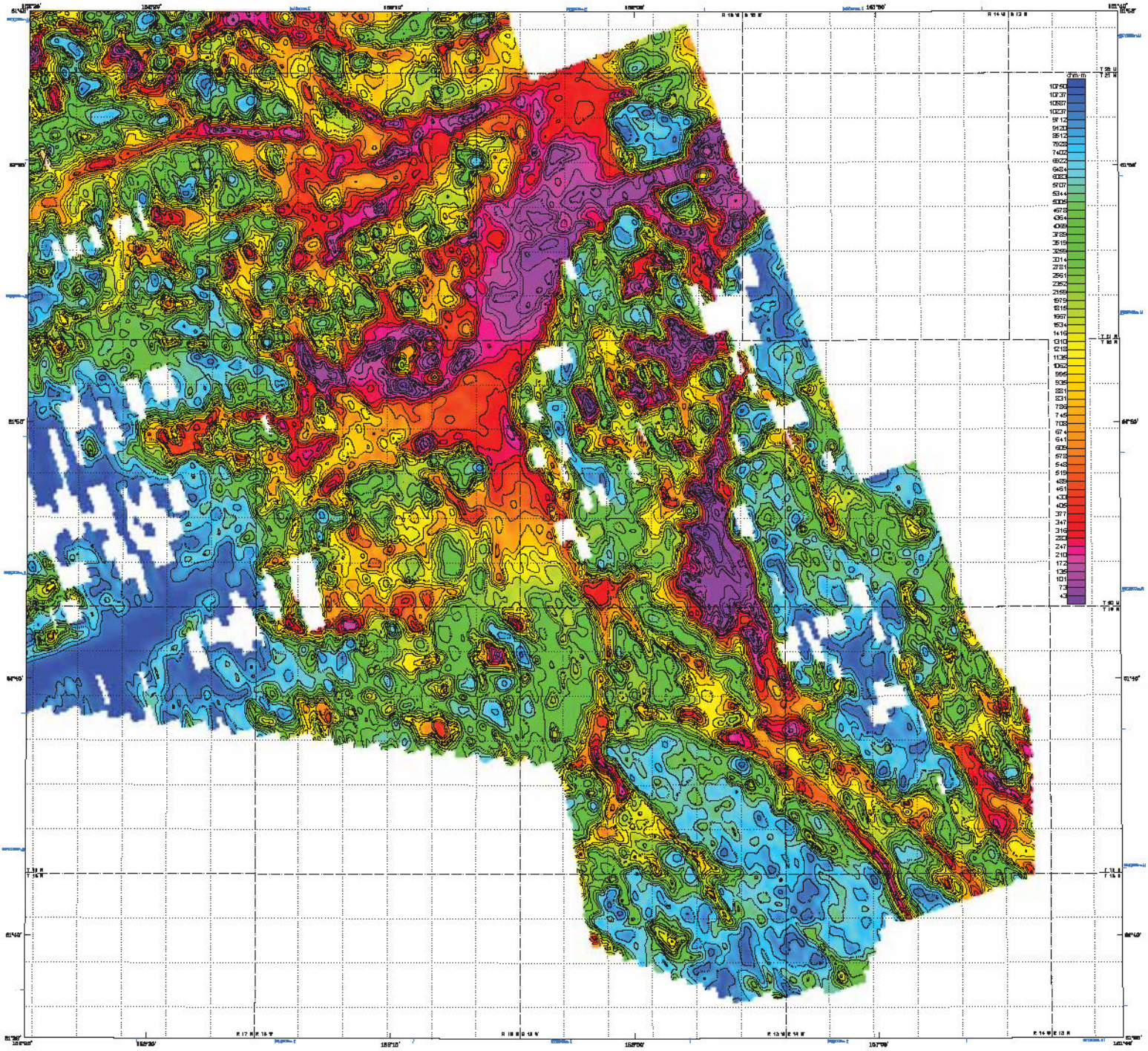
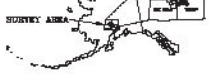


SURVEY AREA

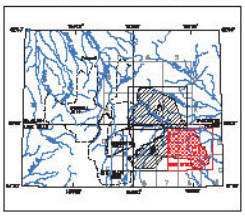


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



7200 Hz COPLANAR APPARENT RESISTIVITY WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system, a GDS 013A4 cesium magnetometer with a Sonntek GS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation systems, 50/60 Hz monitors and video cameras. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#3-RT2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM^V EM system measured inphase and quadrature components at five frequencies, two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 56,000 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 20 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1970, a new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589-602.

RESISTIVITY ALTITUDE LIMITS

In areas where the EM bird height exceeded 150 m, resistivity was not calculated. This avoids meaningless resistivity calculations due to small signals where the helicopter flies higher to avoid cultural objects or for safety reasons. Blank areas in the grids were created where zones of high flying coincided over more than one survey line.

RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

Contours in ohm-m at 10 intervals per decade

resistivity low

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the grey area acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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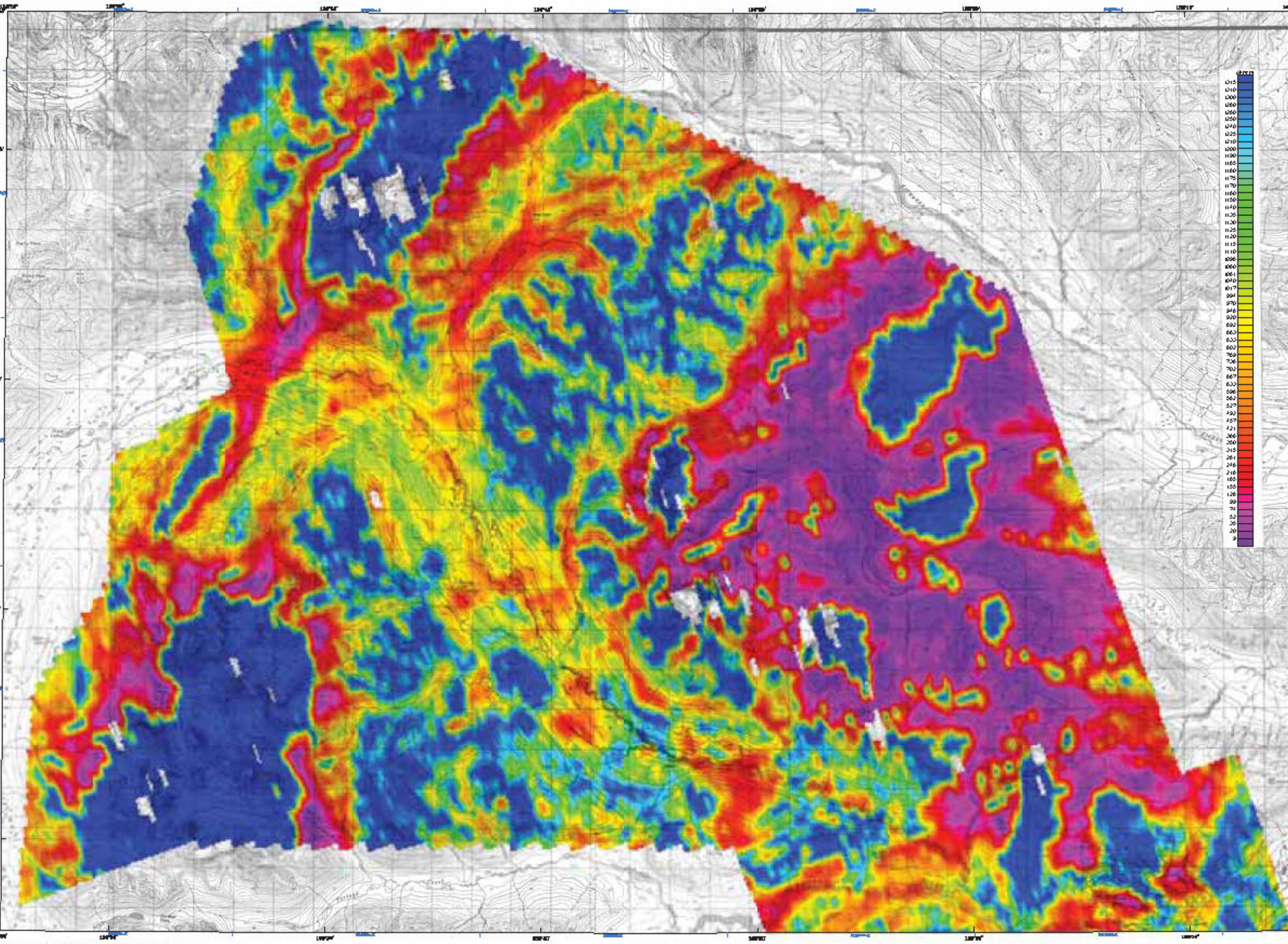

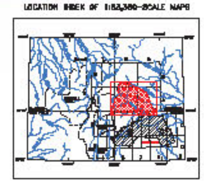

LOCATION INDEX OF 1:63,360-SCALE MAPS

SCALE 1:63,360

900 Hz COPLANAR APPARENT RESISTIVITY WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a Scintrex CS3 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM[V] EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 56,000 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 50 m grid using a modified Akima (1970) technique. All grids were then resampled from the 50 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

RESISTIVITY ALTITUDE LIMITS

In areas where the EM bird height exceeded 120 m, resistivity was not calculated. This avoids meaningless resistivity calculations due to small signals where the helicopter flew higher to avoid cultural objects or for safety reasons. Blank areas in the grids were created where zones of high flying exceeded more than one survey line.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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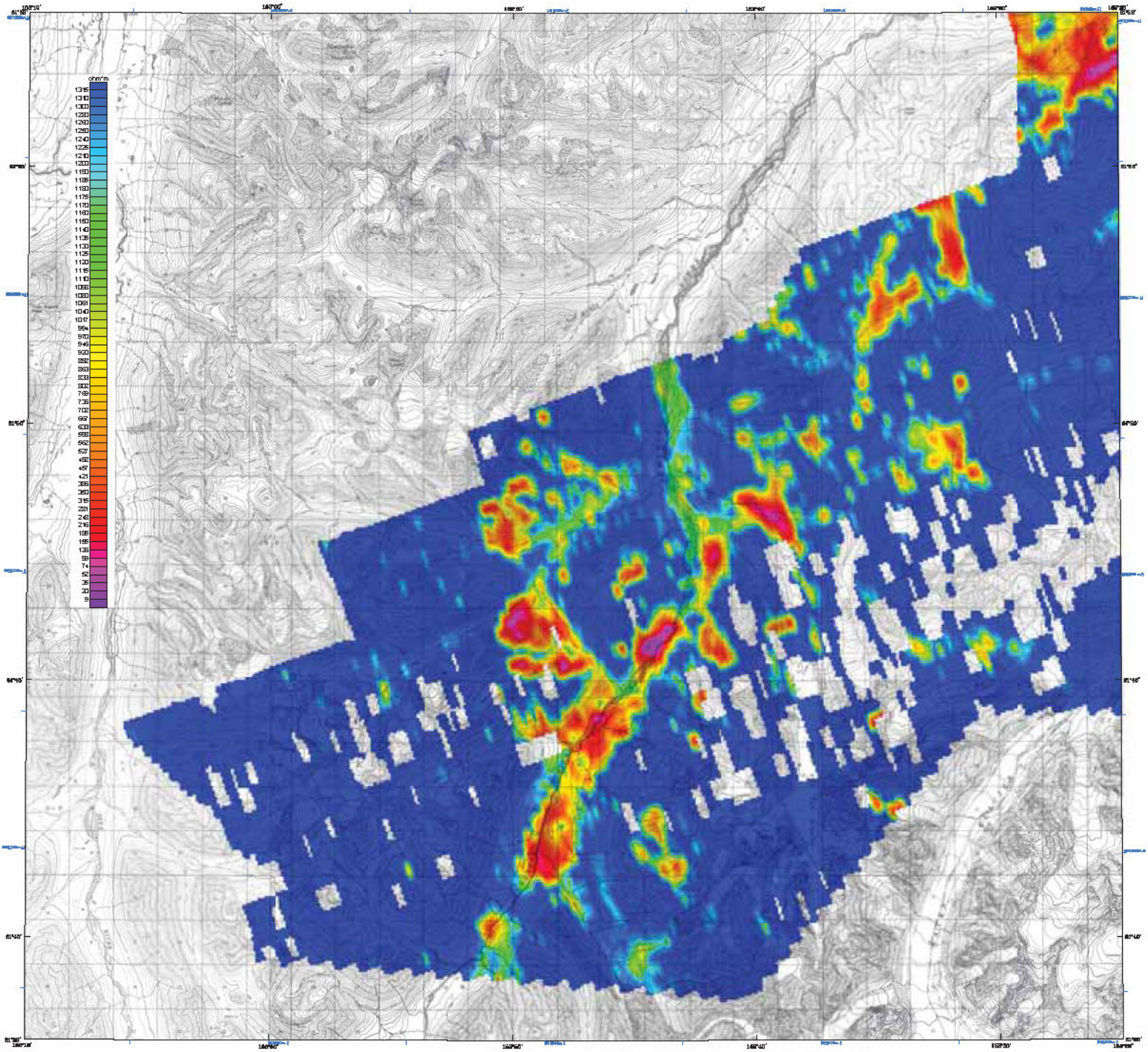
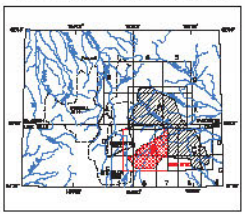


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



900 Hz COPLANAR APPARENT RESISTIVITY WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system, a CGS D1344 cesium magnetometer with a Gohtrek G53 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DGPS-RT2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM^V EM system measured inphase and quadrature components at five frequencies, two vertical coaxial coil-pairs sampled at 1000 and 5000 Hz and three horizontal coplanar coil-pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 56,000 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 20 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1978, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589-602.

RESISTIVITY ALTITUDE LIMITS

In areas where the EM bird height exceeded 130 m, resistivity was not calculated. This avoids meaningless resistivity calculations due to small signals where the helicopter flew higher for cycle cultural objects or for safety reasons. Blank areas in the grids were created where zones of high flying correlated over more than one survey line.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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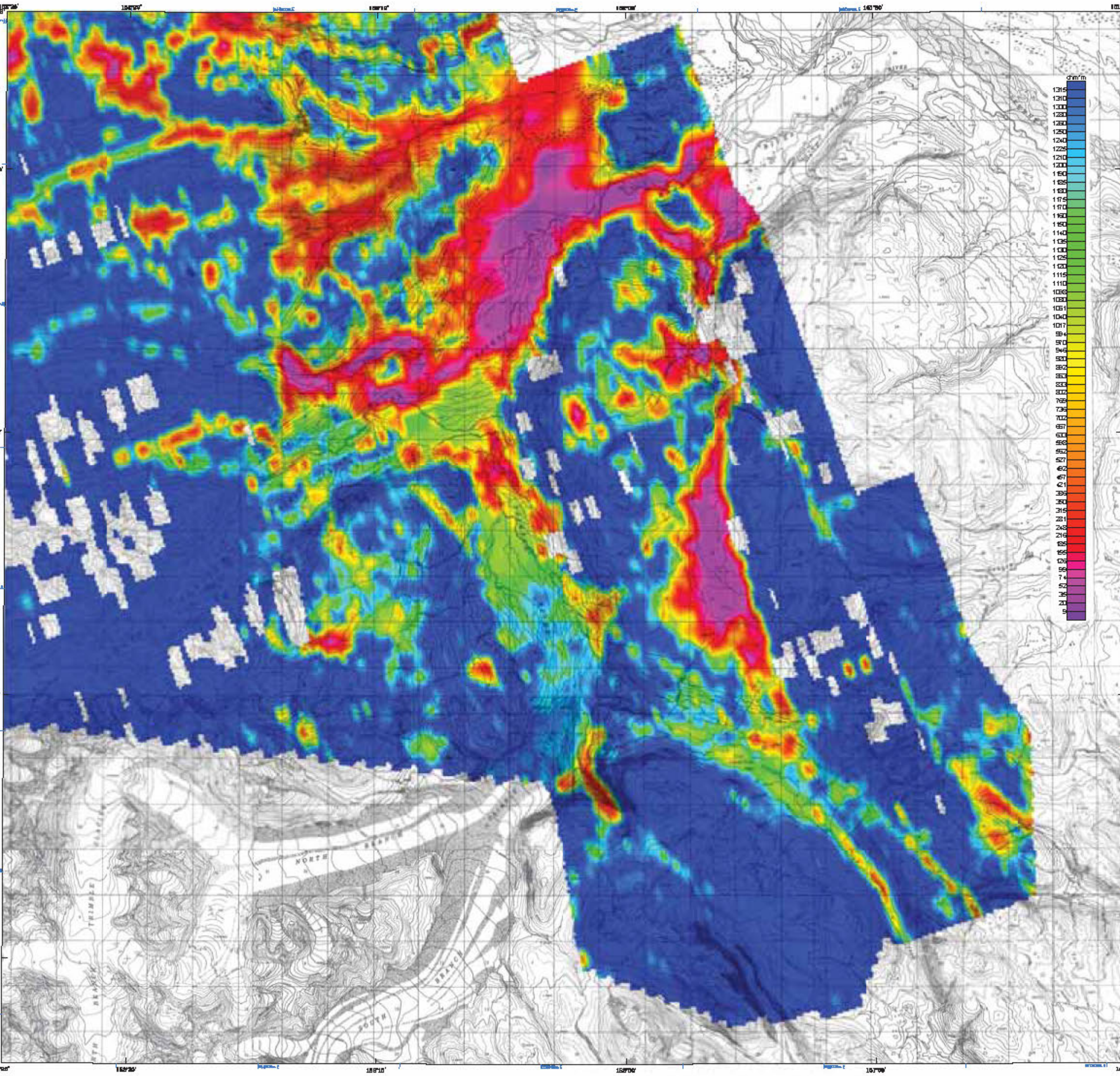
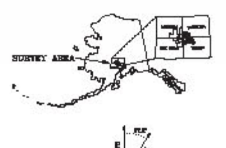


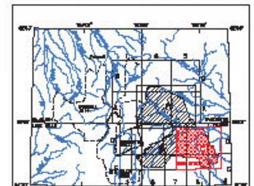


900 Hz COPLANAR APPARENT RESISTIVITY WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2014

SCALE 1:63,360



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEMV-3L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM^V EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 56,000 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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RESISTIVITY ALTITUDE LIMITS

In areas where the EM bird height exceeded 150 m, resistivity was not calculated. This avoids meaningless resistivity calculations due to small signals where the helicopter flew higher to avoid cultural objects or for safety reasons. Blank areas in the grids were created where zones of high flying correlated over more than one survey line.

SURVEY HISTORY

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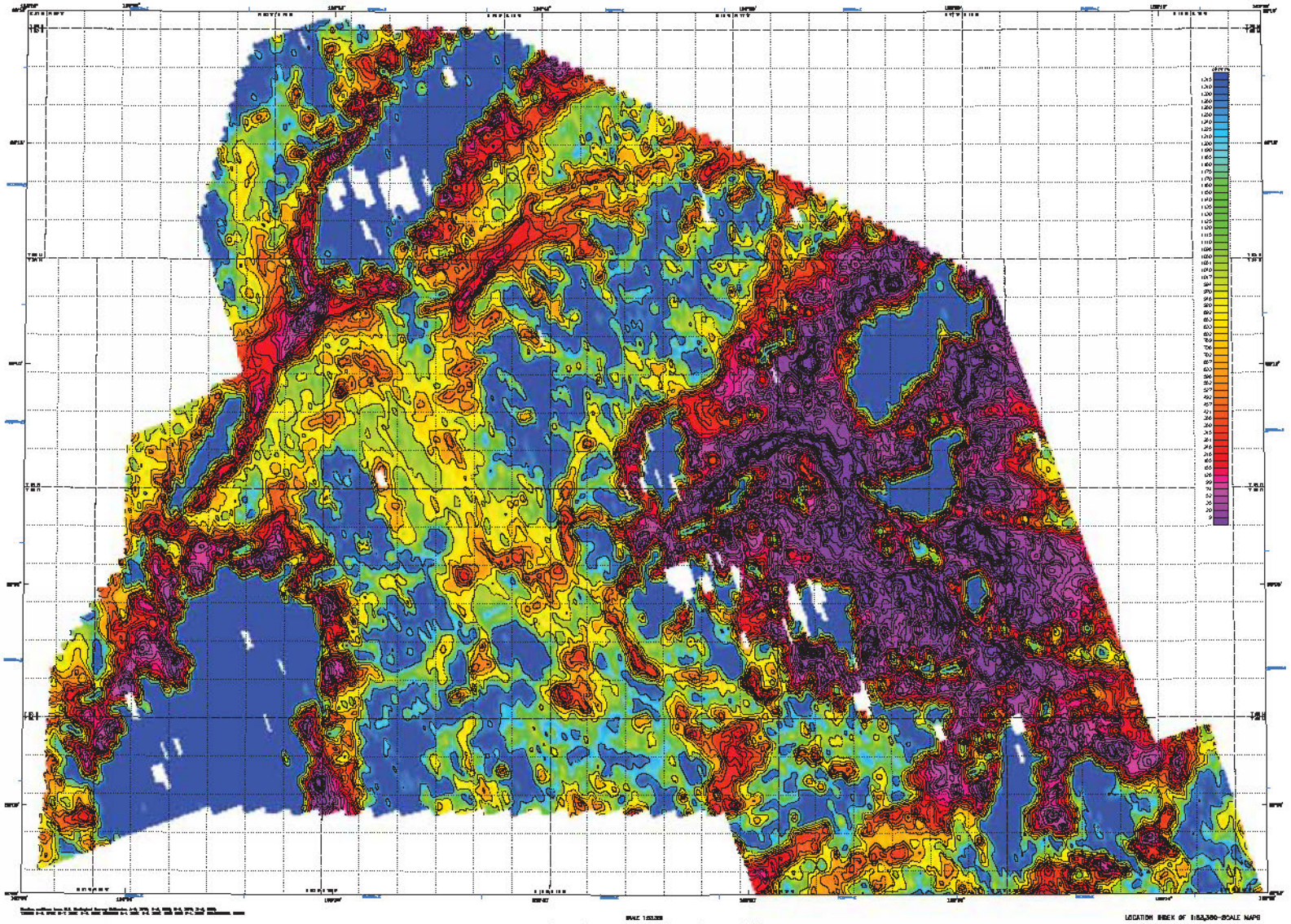
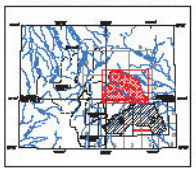


SCALE 1:63,360

0 1 2 3 4 MILES

0 1 2 3 4 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



900 Hz COPLANAR APPARENT RESISTIVITY WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

By

Laurel E. Burns, DOG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^{V} Electromagnetic (EM) system, a DGS CS-3 cesium magnetometer with a Sensys GSS cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The survey was flown by Fugro Airborne Surveys at a height of 100 feet. The magnetometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation systems, 35/140 mm frame and video cameras. Flights were performed with an AS-350-B3 Skybird helicopter at a mean ground clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel GPS6-951 Global Positioning System was used for navigation. The helicopter position was sampled every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 3 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 3) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM^{V} EM system measured in-phase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1005 and 5594 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, overburden conductors, and airborne sources. Apparent resistivity is generated from the in-phase and quadrature components of the coplanar 34,500 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 20 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association for Computing Machinery, v. 17, no. 4, p. 589–602.

RESISTIVITY ALTITUDE LIMITS

In areas where the EM bird height exceeded 155 m, resistivity was not calculated. This avoids presenting resistivity calculations due to aircraft objects where the helicopter flew higher to avoid cultural objects or for safety reasons. Blank areas in the grids were created where areas of high flying coincided over more than one survey line.

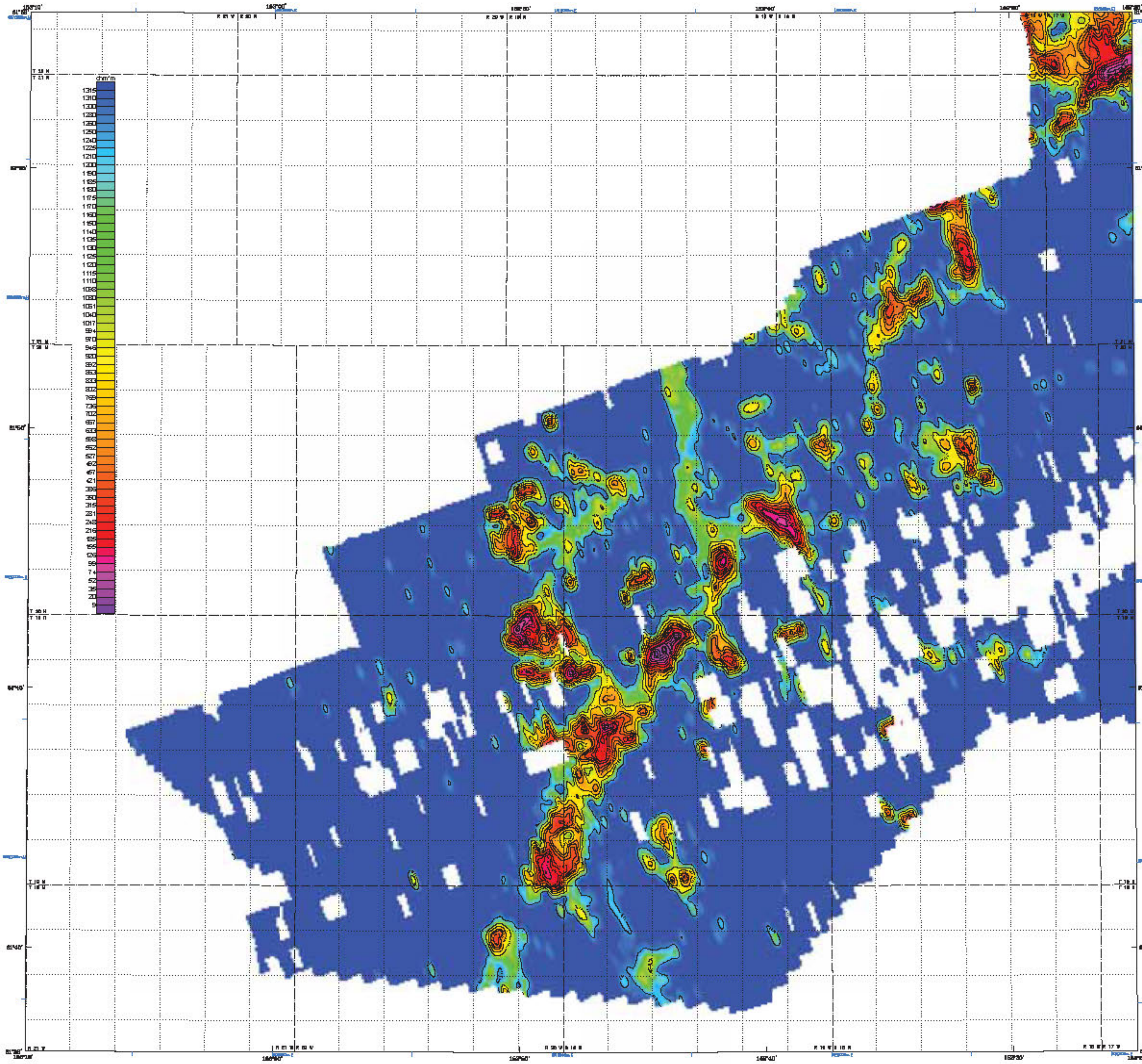
RESISTIVITY CONTOURS

1005
5594
900
7200
56000
Contours in ohm-m at 10 intervals per decade
resistivity low

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc., Airborne geophysical data for this area were acquired and processed by DGS in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the Assertion map by dashed lines, survey names, and dates of publication. The project was flown by the Anchorage Alaska Laboratories as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

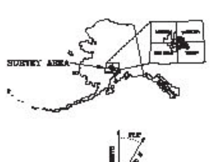
All data and maps produced by this fixed wing survey are available in digital format on DVD or a series of two through DGGS, 3354 College Road, Fairbanks, Alaska, 99709–3707, and are downloadable for free from the DGGS website (www.dggs.alaska.gov/pubs). Maps are also available on paper through the DGGS office, and are viewable online at the website in Adobe Acrobat .PDF file format.

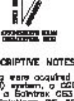


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS





900 Hz COPLANAR APPARENT RESISTIVITY WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

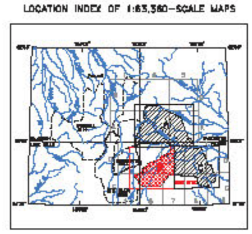
PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

LOCATION INDEX OF 1:63,360-SCALE MAPS



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CCG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM[V] EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial coil-pairs operated at 1000 and 5500 Hz while three horizontal coplanar coil-pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 56,000 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

RESISTIVITY ALTITUDE LIMITS

In areas where the EM bird height exceeded 130 m, resistivity was not calculated. This avoids meaningless resistivity calculations due to small signals where the helicopter flew higher to avoid cultural objects or for safety reasons. Blank areas in the grids were created where zones of high flying correlated over more than one survey line.

RESISTIVITY CONTOURS

- 1000
- 800
- 600
- 500
- 400
- 300
- 250
- 200
- 150
- 125
- 100

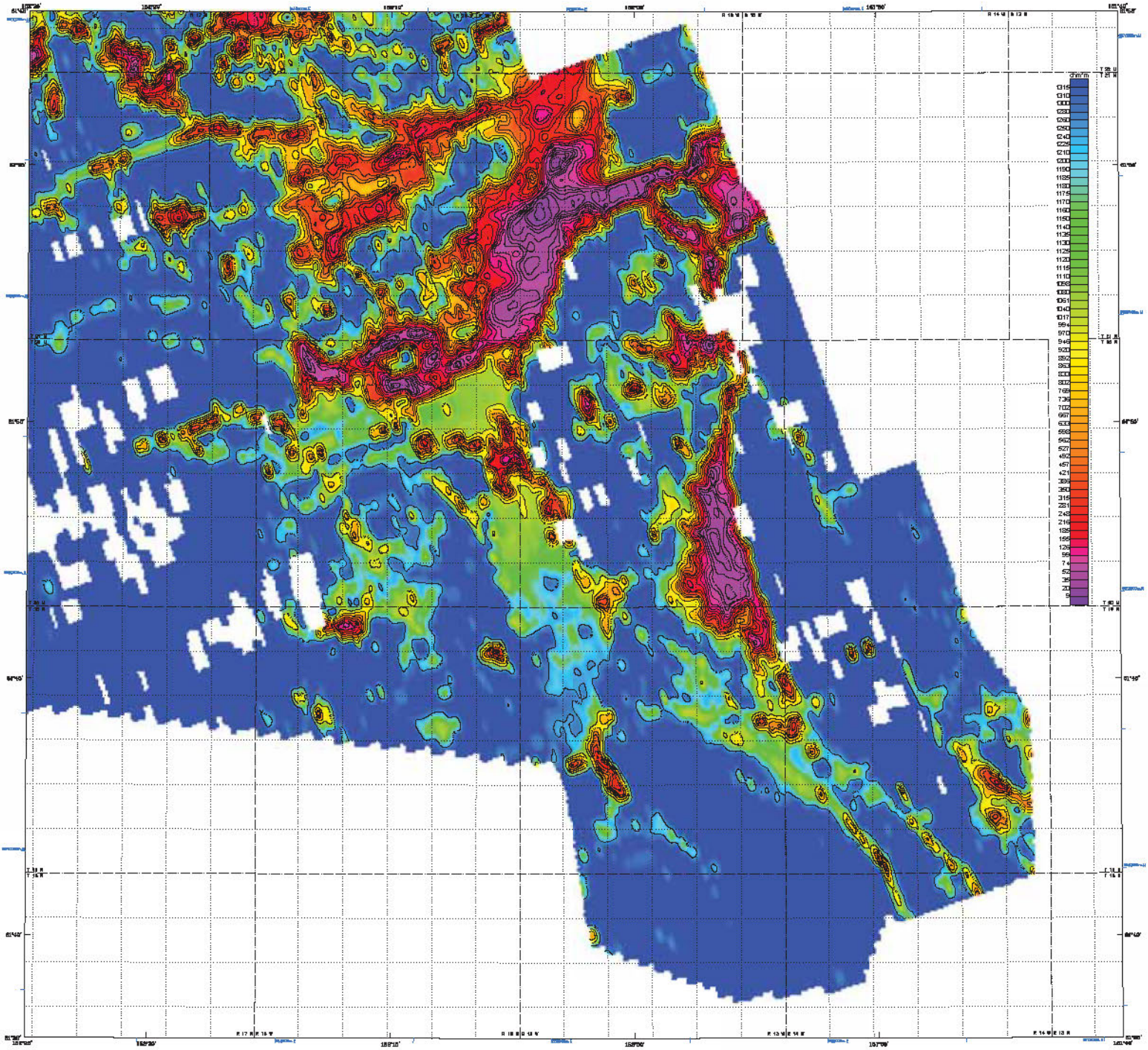
Contours in ohm-m at 10 intervals per decade

resistivity low

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGS website (www.dggs.alaska.gov/pubs). Maps are also available on paper through the DGGS office, and are viewable online at the website in Adobe Acrobat .PDF file format.

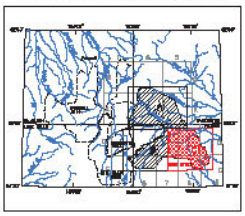


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



900 Hz COPLANAR APPARENT RESISTIVITY WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system, a GSC 01344 magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation systems, 60/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#3-RT2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RESISTIVITY

The DIGHEM^V EM system measured inphase and quadrature components at five frequencies, two vertical coaxial coil-pairs operated at 900, 7200 and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. Apparent resistivity is generated from the inphase and quadrature component of the coplanar 56,000 Hz using the pseudo-layer half space model. The data were interpolated onto a regular 80 m grid using a modified Akima (1970) technique. All grids were then resampled from the 80 m cell size down to a 20 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1970, a new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589-602.

RESISTIVITY ALTITUDE LIMITS

In areas where the EM bird height exceeded 150 m, resistivity was not calculated. This avoids meaningless resistivity calculations due to small signals where the helicopter flies higher to avoid cultural objects or for safety reasons. Blank areas in the grids were created where zones of high flying coincided over more than one survey line.

RESISTIVITY CONTOURS

1000
800
600
500
400
300
250
200
150
125
100

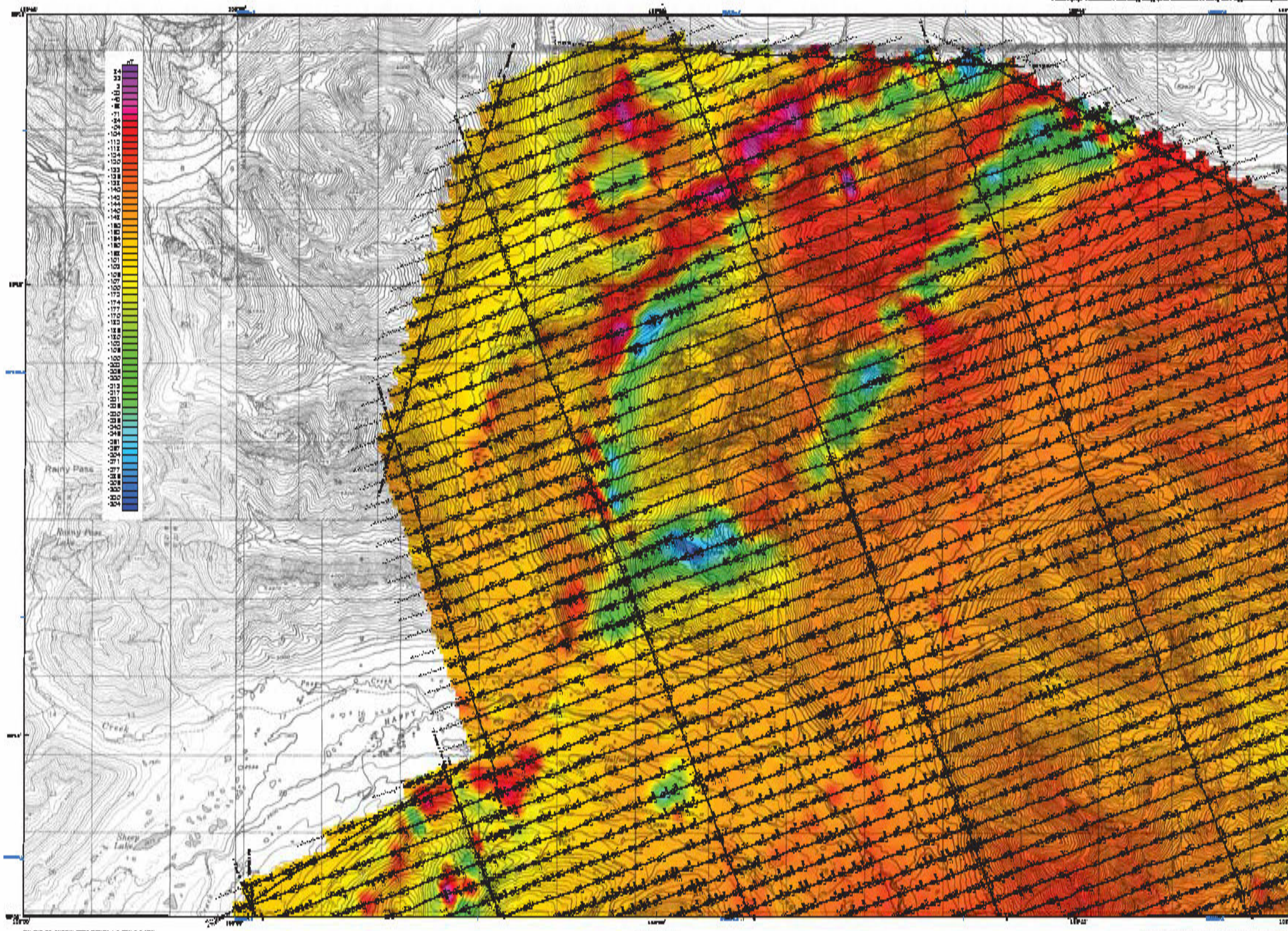
Contours in ohm-m at 10 intervals per decade

resistivity low

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the grey area acquired and processed by DGS in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGS website (www.dggs.alaska.gov/pubs). Maps are also available on paper through the DGGS office, and are available online at the website in Adobe Acrobat .PDF file format.



RESIDUAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES WITH TOPOGRAPHY OF THE EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS of TALKEETNA A-6, B-6, and McGRATH A-1, B-1 QUADRANGLES

by

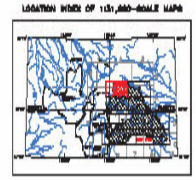
DESCRIPTIVE NOTES

ELECTROMAGNETIC ANOMALIES

ELECTROMAGNETICS

RESIDUAL MAGNETIC FIELD

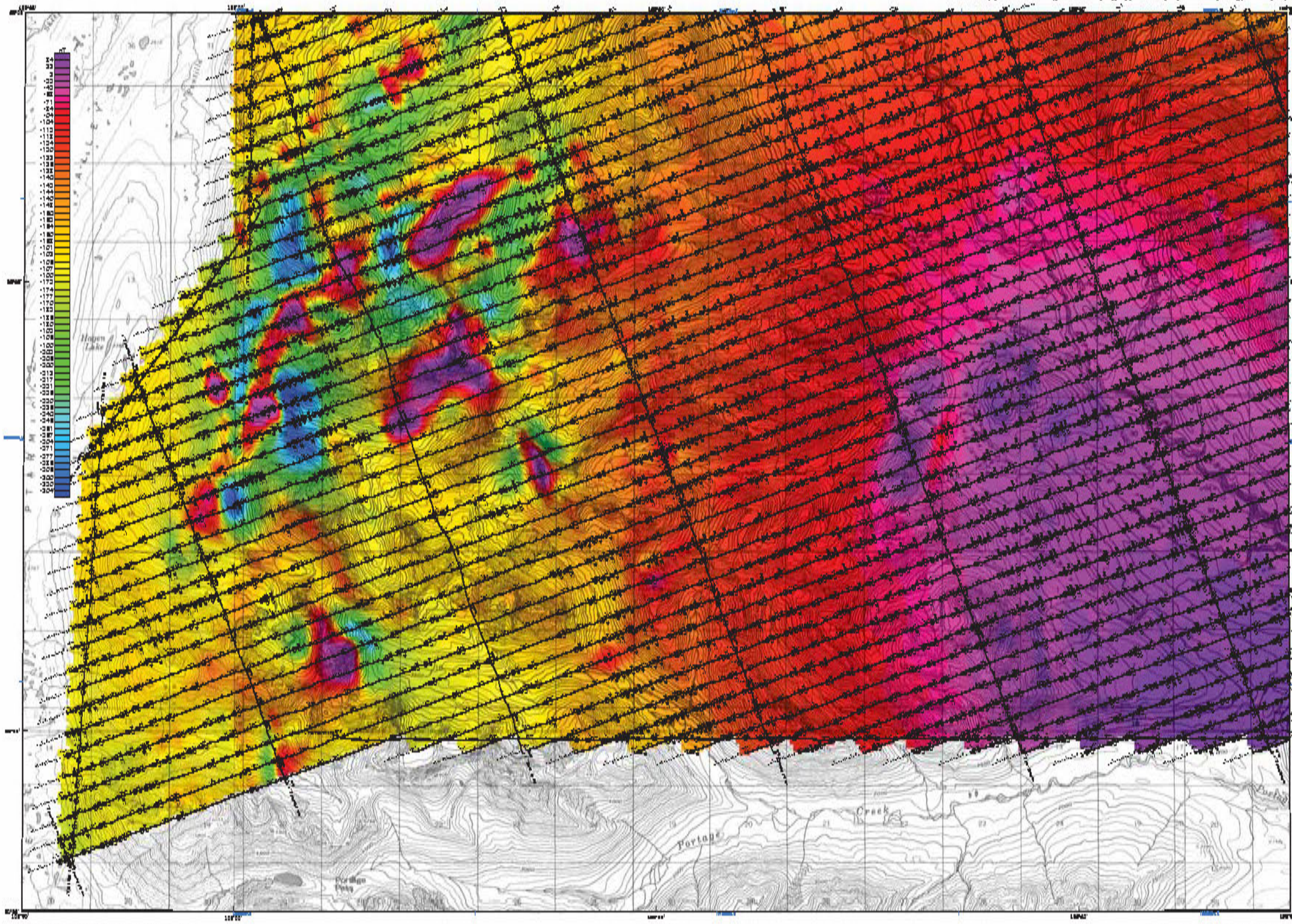
LOCATION INDEX OF 1:31,680-SCALE MAPS



SURVEY HISTORY

ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2014-5-30b



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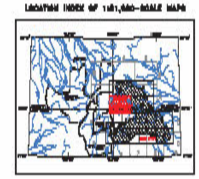


LOCATION INDEX OF 1:31,680-SCALE MAPS

RESIDUAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES WITH TOPOGRAPHY OF THE EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS of TALKEETNA A-6, TYONEK D-7, D-8, McGRATH A-1, and LIME HILLS D-1 QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro Geoservices, Inc.

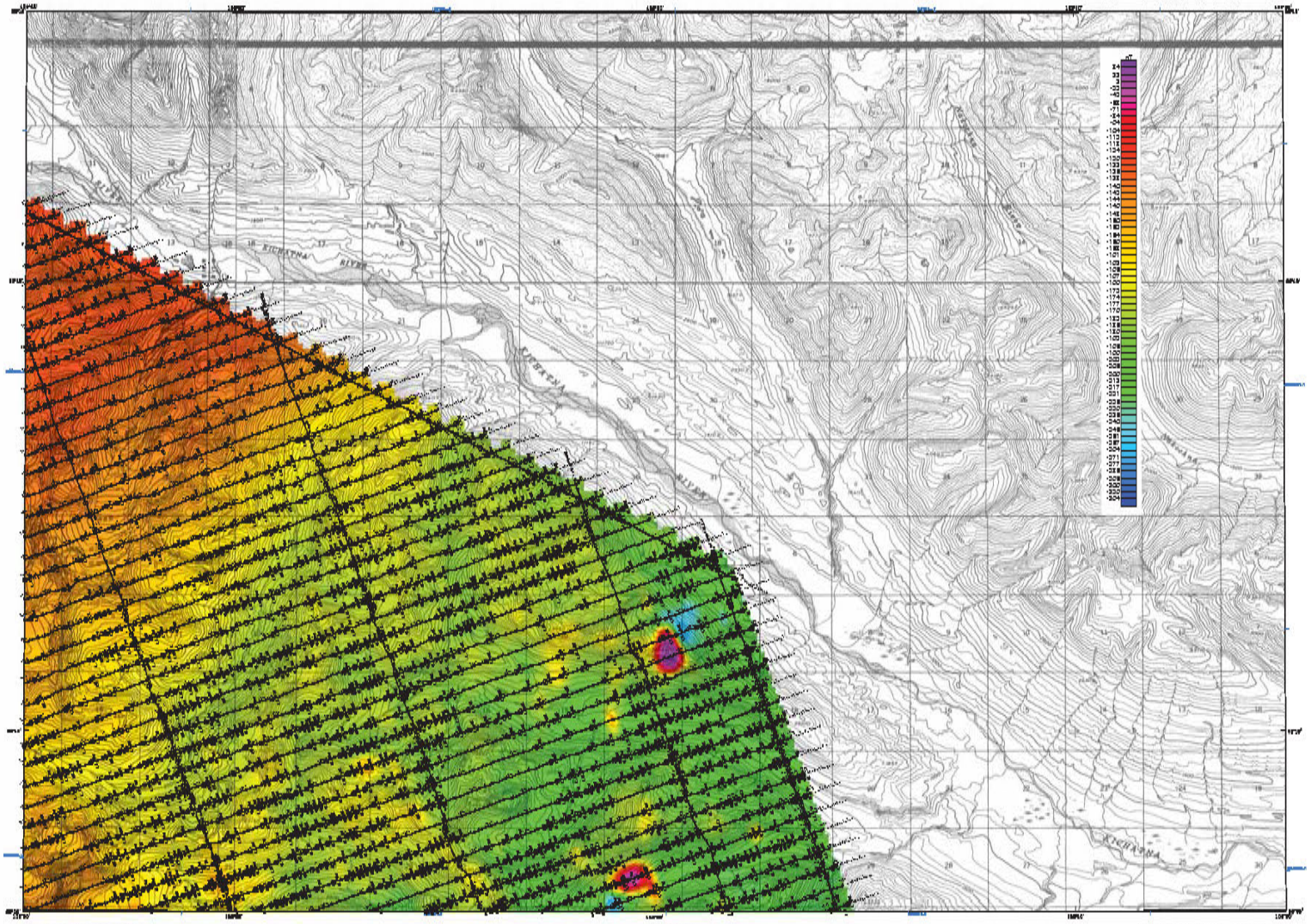
DESCRIPTIVE NOTES

ELECTROMAGNETIC ANOMALIES

ELECTROMAGNETICS

RESIDUAL MAGNETIC FIELD

SURVEY HISTORY



SURVEY AREA

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RESIDUAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES WITH TOPOGRAPHY OF THE EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS of TALKEETNA A-5, A-6, B-5, and B-6 QUADRANGLES

by
Lionel E. Stevens, CWDS, and Fugro GeoServices, Inc.
2015

SCALE 1:31,680

LOCATION INDEX OF 1:63,360-SCALE MAPS

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DESCRIPTIVE NOTES

ELECTROMAGNETIC ANOMALIES

ELECTROMAGNETICS

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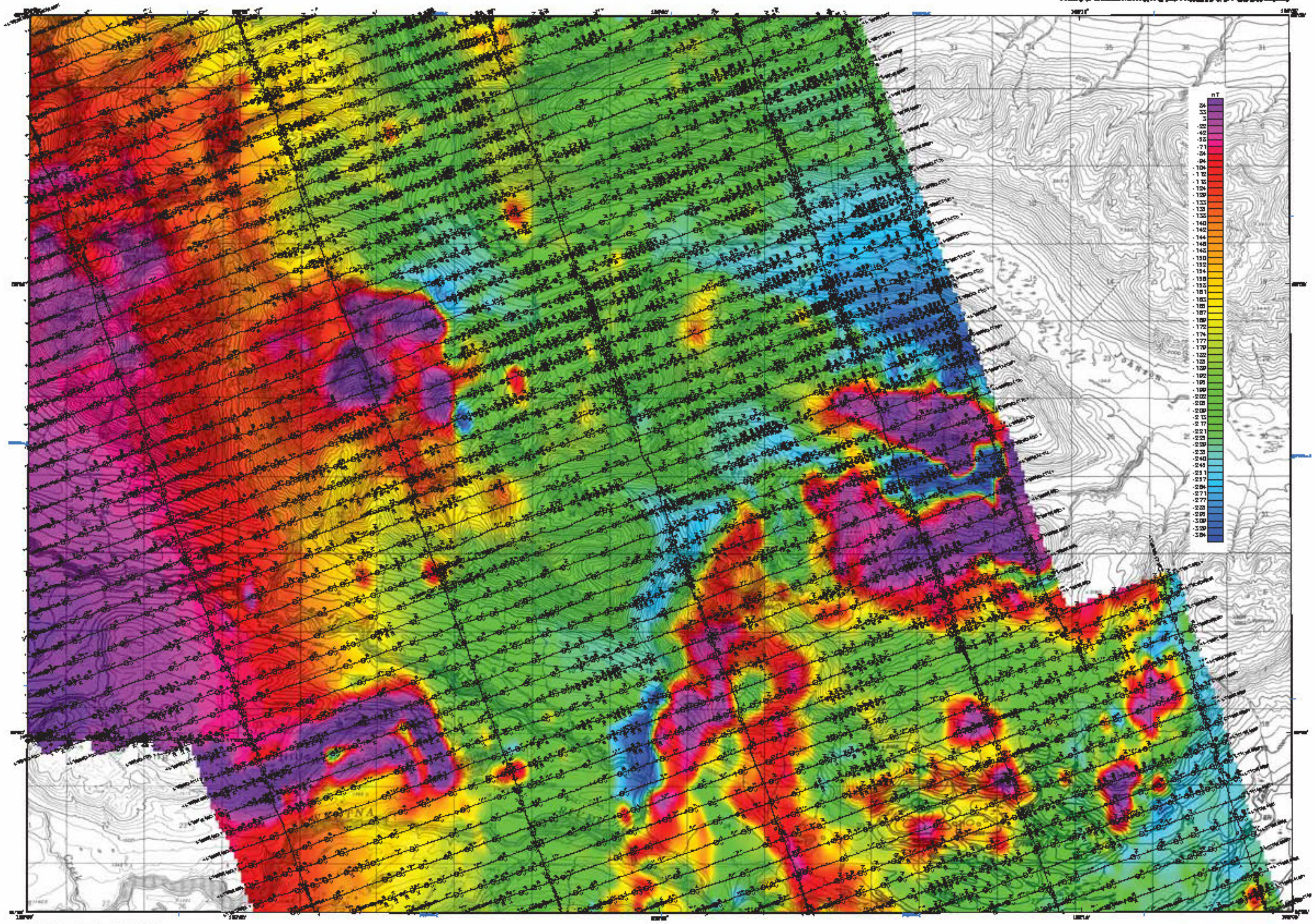
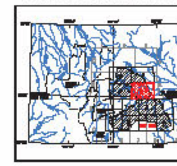
SURVEY HISTORY





RESIDUAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES WITH TOPOGRAPHY OF THE EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS of TALKEETNA A-5, A-6, and TYONEK D-6, D-7 QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2015

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, a CS3 01344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel 4GNB-03L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 6) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

ELECTROMAGNETIC ANOMALIES

[illegible]

ELECTROMAGNETICS

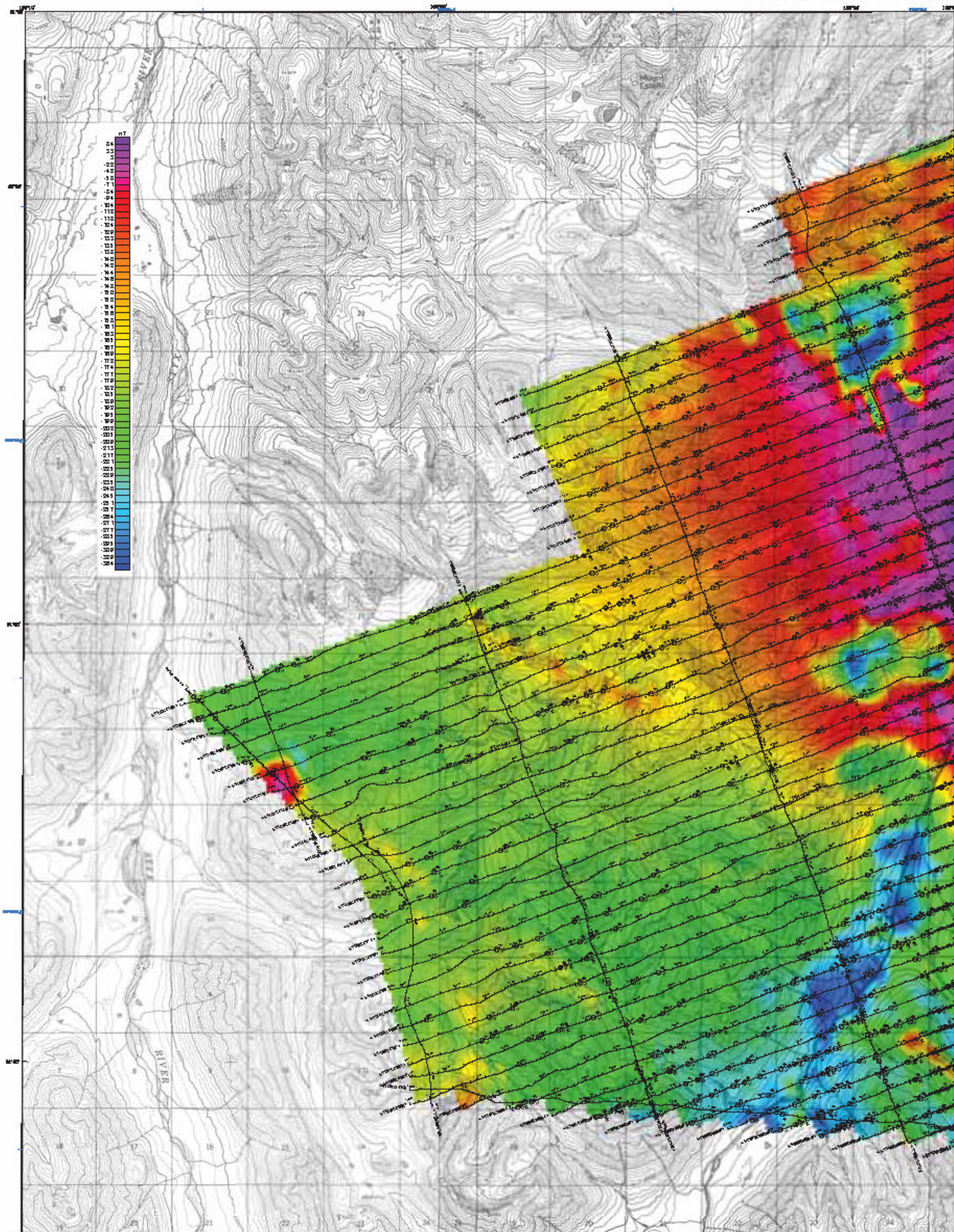
[illegible]

RESIDUAL MAGNETIC FIELD

[illegible]

SURVEY HISTORY

[illegible]



SCALE 1:31,680

0.5 0 0.5 1 1.5 2 MILES

0.5 0 0.5 1 1.5 2 2.5 KILOMETERS

RESIDUAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES WITH TOPOGRAPHY OF THE EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

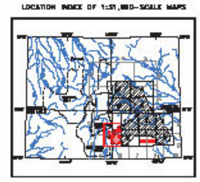
PARTS of TYONEK C-8, D-8, and LIME HILLS C-1, D-1 QUADRANGLES

by

Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.

2015

LOCATION INDEX OF 1:31,680-SCALE MAPS



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEMV Electromagnetic (EM) system, a Scintrex CS3 cesium magnetometer, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEMV-3 Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

ELECTROMAGNETIC ANOMALIES

Anomaly	Conductance
●	>100 siemens
●	50–100 siemens
●	20–50 siemens
●	10–20 siemens
●	5–10 siemens
○	1–5 siemens
○	<1 siemens
✧	Questionable anomaly
△	EM magnetite response
□	Culture

Arcs indicate the conductor has a thickness >10 m

Dip direction

Magnetic correlation in nT

Anomaly identifier

Interpretive symbol

Interpretive symbol	Conductor model
B	Bedrock conductor
D	Narrow bedrock conductor ("thin dike")
S	Conductive cover ("horizontal thin sheet")
H	Broad conductive rock unit, deep conductive weathering, thick conductive cover ("half-space")
E	Edge of broad conductor ("edge of half space")
L	Culture, e.g. power line, metal building or fence
M	Magnetite
?	Indicates some uncertainty as to the most appropriate EM source model, but does not question the validity of the EM anomaly.

ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGHEMV EM system measured inphase and quadrature components of five frequencies. Two vertical coaxial-coil pairs operated at 1000 and 5500 Hz while three horizontal coplanar-coil pairs operated at 900, 7200, and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. The type of conductor is indicated on the electromagnetic map by the interpretive symbol attached to each EM anomaly. Determination of the type of conductor is based on EM anomaly shapes of the coaxial- and coplanar-coil responses, together with conductor and magnetic patterns and topography. The power line monitor and the flight track video were examined to locate cultural sources.

RESIDUAL MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a CS3 magnetometer with a Scintrex CS3 cesium sensor. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2010, updated for date of flight and altimeter variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 50 m grid using a modified Akima (1970) technique. All grids were then resampled from the 50 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

SURVEY HISTORY

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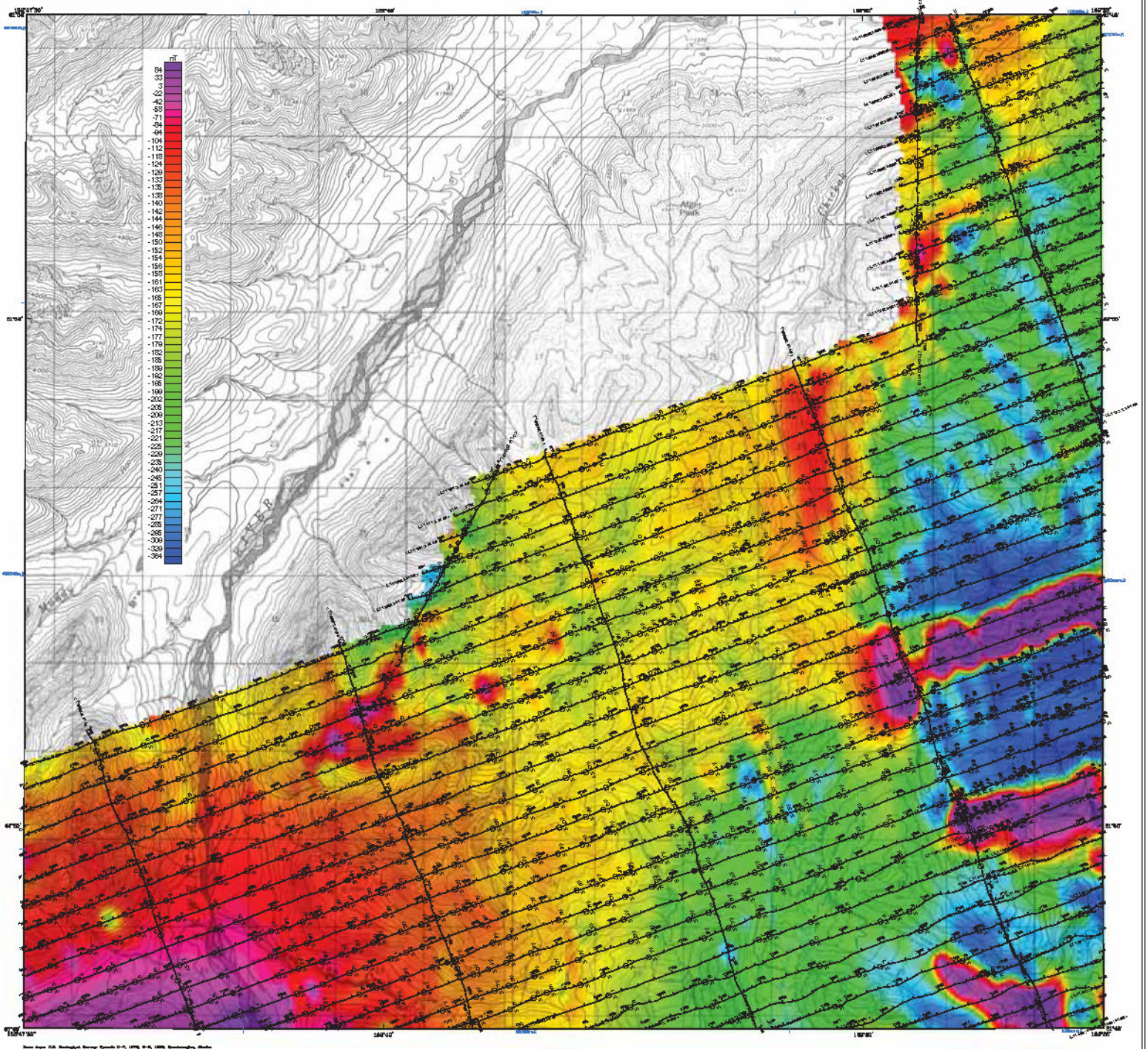

SCALE 1:31,680

0.5 0 0.5 1 1.5 2 MILES

0.5 0 0.5 1 1.2 2 2.5 KILOMETERS

SURVEY AREA

LOCATION INDEX OF 1:31,680-SCALE MAPS

RESIDUAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES WITH TOPOGRAPHY OF THE EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS of TYONEK D-7 and D-8 QUADRANGLES

by

Laurel B. Burns, CGG, and Fugro GeoServices, Inc.

2015

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM V Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz mainframe and video camera. Flights were performed with an AS-350-B3 Skyfall helicopter at a mean terrain clearance of 200 feet along NE–SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM6-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 3 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

ELECTROMAGNETIC ANOMALIES

Arrow indicates the conductor dips a direction >10m

Dip direction

Magnetic correlation in RT

Amplitude	Conductance
	>100 siemens
	50–100 siemens
	20–50 siemens
	10–20 siemens
	5–10 siemens
	1–5 siemens
	< 1 siemens
	Questionable anomaly
	EM magnetite response
	Culture

Interpretive symbol	Conductor model
B	Bedrock conductor
N	Narrow bedrock conductor ("thin dike")
S	Conductive cover ("horizontal thin sheet")
H	Broad conductive rock unit, deep conductive overburden, thick conductive cover ("half-space")
E	Edge of broad conductor ("edge of half space")
L	Culture, e.g. power line, metal building or fence
N	Magnetite

Indicates some uncertainty as to the most appropriate EM source model, but does not question the validity of the EM anomaly.

ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGHEM^V EM system measured inphase and quadrature components of the frequencies. Two vertical coaxial-coil pairs operated at 1000 and 5500 Hz while three horizontal coplanar-coil pairs operated at 900, 7200, and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. The type of conductor is indicated on the electromagnetic map by the interpretive symbol attached to each EM anomaly. Determination of the type of conductor is based on EM anomaly shapes of the coaxial- and coplanar-coil responses, together with conductor and magnetic patterns and topography. The power line monitor and the flight track video were examined to locate cultural sources.

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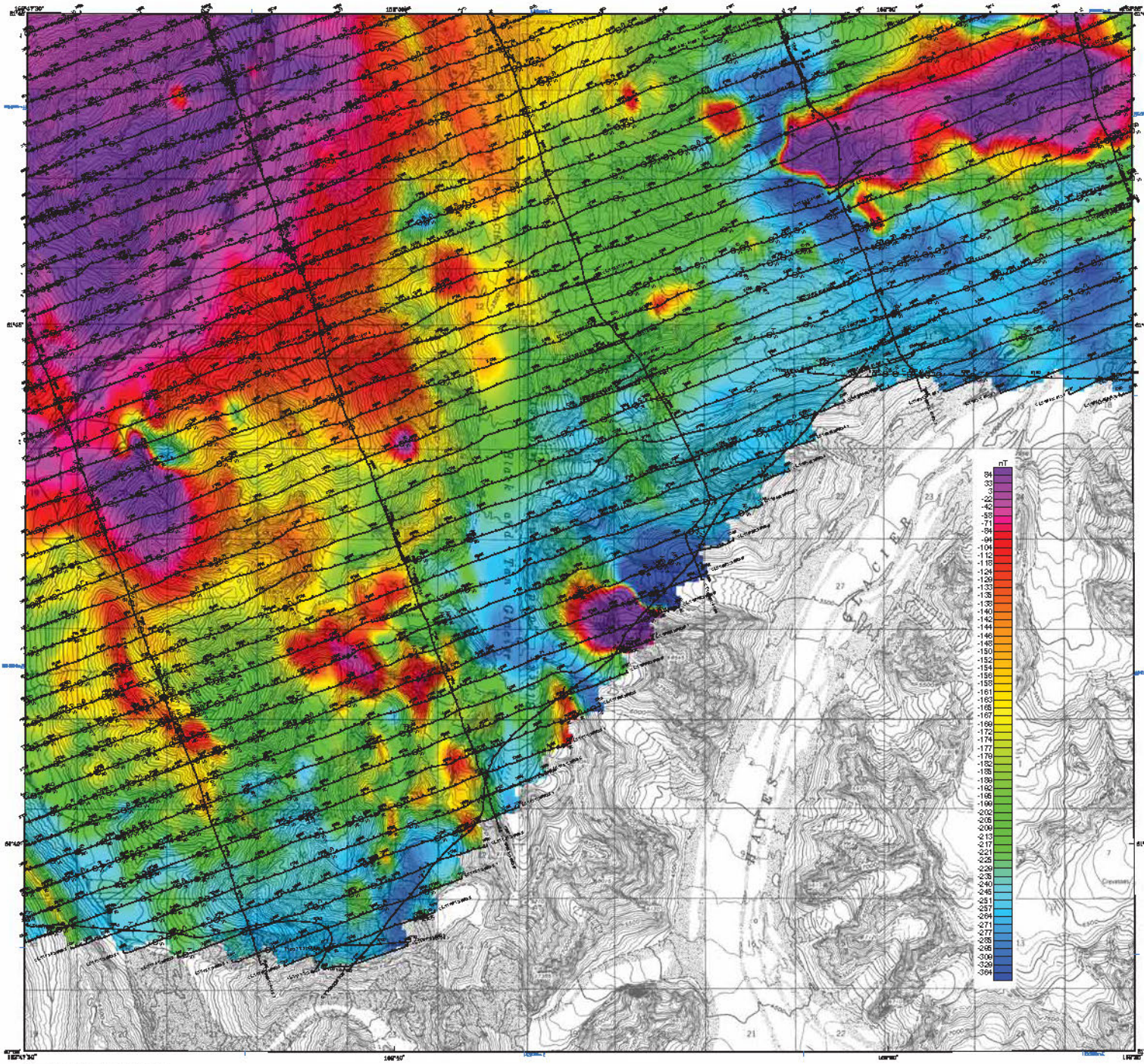


Base from USGS, Geological Survey Tyonek C-7, 1955; C-8, 1956; D-7, 1955; D-8, 1956; Tyonek, Alaska

SCALE 1:31,680

0.5 0 0.5 1 1.5 2 MILES

0.5 0 0.5 1 1.5 2 2.5 KILOMETERS

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

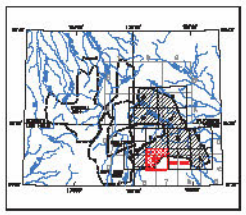
RESIDUAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES WITH TOPOGRAPHY OF THE EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS of TYONEK C-7, C-8, D-7, and D-8 QUADRANGLES

by
Lowell H. Burns, CEGS, and Fugro GeoServices, Inc.

2015

LOCATION INDEX OF 1:31,680-SCALE MAPS



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM V Electromagnetic (EM) system, a CSK D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 250 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation systems, 50/60 Hz monitors and video cameras. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE–SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM5-42L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

ELECTROMAGNETIC ANOMALIES

Amplitude — Conductance

- >100 siemens
- 50–100 siemens
- 20–50 siemens
- 10–20 siemens
- 6–10 siemens
- 1–6 siemens
- < 1 siemens
- Questionable anomaly
- EM magnetic response
- Future

Area indicate the conductor has a thickness >10m

Dip direction

Magnetic correlation in nT

Interpretive symbol — Conductor model

- B — Bedrock conductor
- O — Narrow bedrock conductor ("thin sheet")
- S — Conductive cover (surficial conductor, "flat-lying")
- H — Broad conductive rock unit, deep overburden weathering, thick conductive cover ("half-space")
- E — Edge of broad conductor ("edge of half space")
- L — Culture, e.g. power line, metal building or fence
- M — Magnetite
- ? — Indicates some uncertainty as to the most appropriate EM source model, but does not question the validity of the EM anomaly.

ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGHEM EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial-coil pairs operated at 1000 and 5500 Hz while three horizontal coplanar-coil pairs operated at 880, 7200, and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. The type of conductor is indicated on the aeromagnetic map by the interpretive symbol attached to each EM anomaly. Determination of the type of conductor is based on EM anomaly shapes at the coaxial- and coplanar-coil responses, together with conductor and magnetic patterns and topography. The power line monitor and the flight track video were examined to locate cultural sources.

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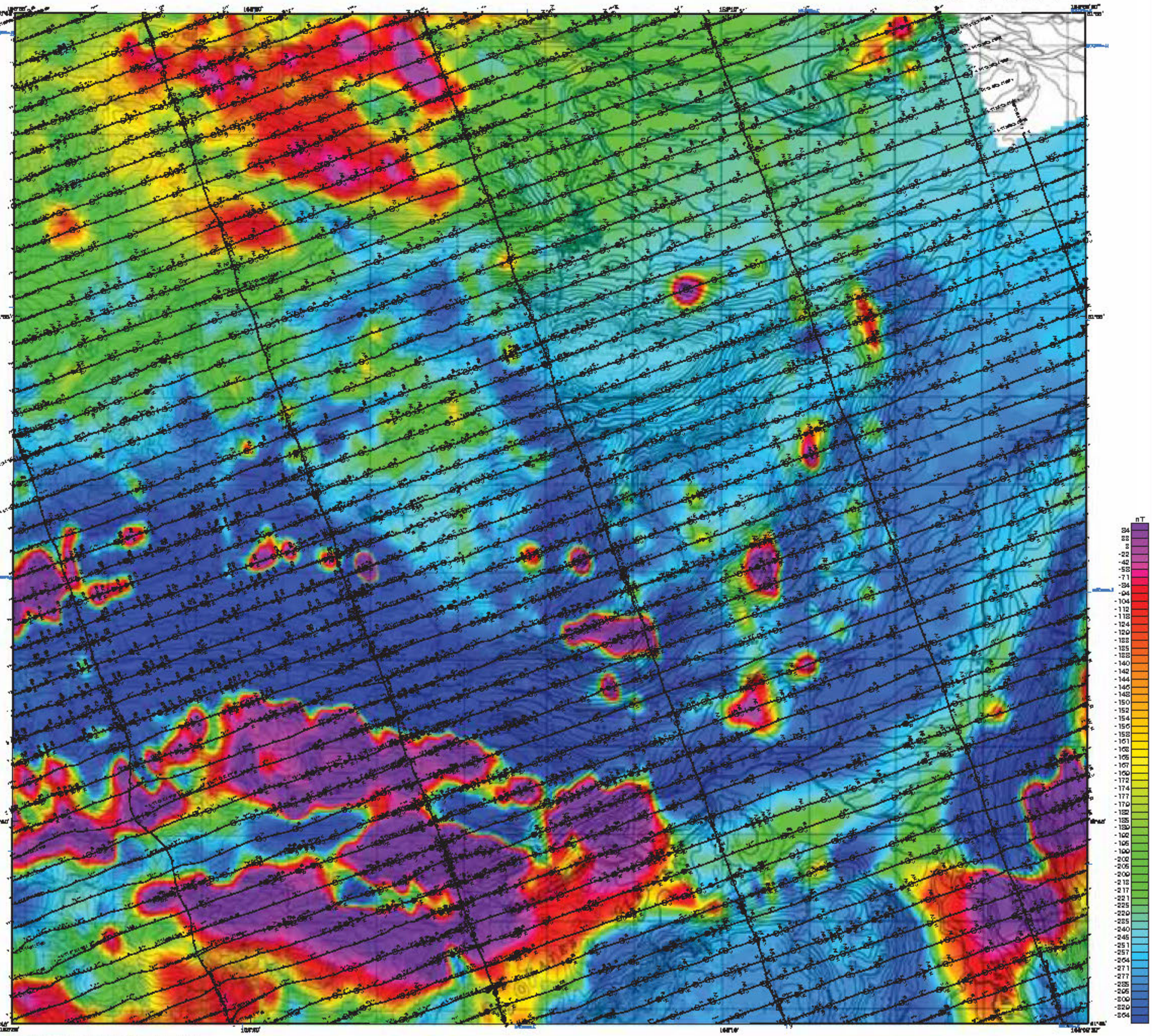

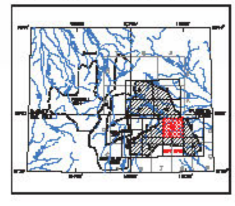

SCALE 1:31,680

RESIDUAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES WITH TOPOGRAPHY OF THE EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS of TYONEK D-6 and D-7 QUADRANGLES

by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2015

ELECTROMAGNETIC ANOMALIES

Anomaly	Conductance
●	>100 siemens
●	50–100 siemens
●	20–50 siemens
●	10–20 siemens
●	5–10 siemens
○	1–5 siemens
○	< 1 siemens
✳	Questionable anomaly
△	EM magnetic response
□	Culture

Arc indicates the conductor has a thickness >10 m
Dip direction
Magnetic correlation in nT

Anomaly identifier
Interpretive symbol

Interpretive symbol	Conductor model
B	Bedrock conductor
D	Narrow bedrock conductor ("thin dike")
S	Conductive cover ("horizontal thin sheet")
H	Broad conductive rock unit, deep conductive weathering, thick conductive cover ("half-space")
E	Edge of broad conductor ("edge of half space")
L	Culture, e.g. power line, metal building or fence
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A Novatel OEMV-3RT Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

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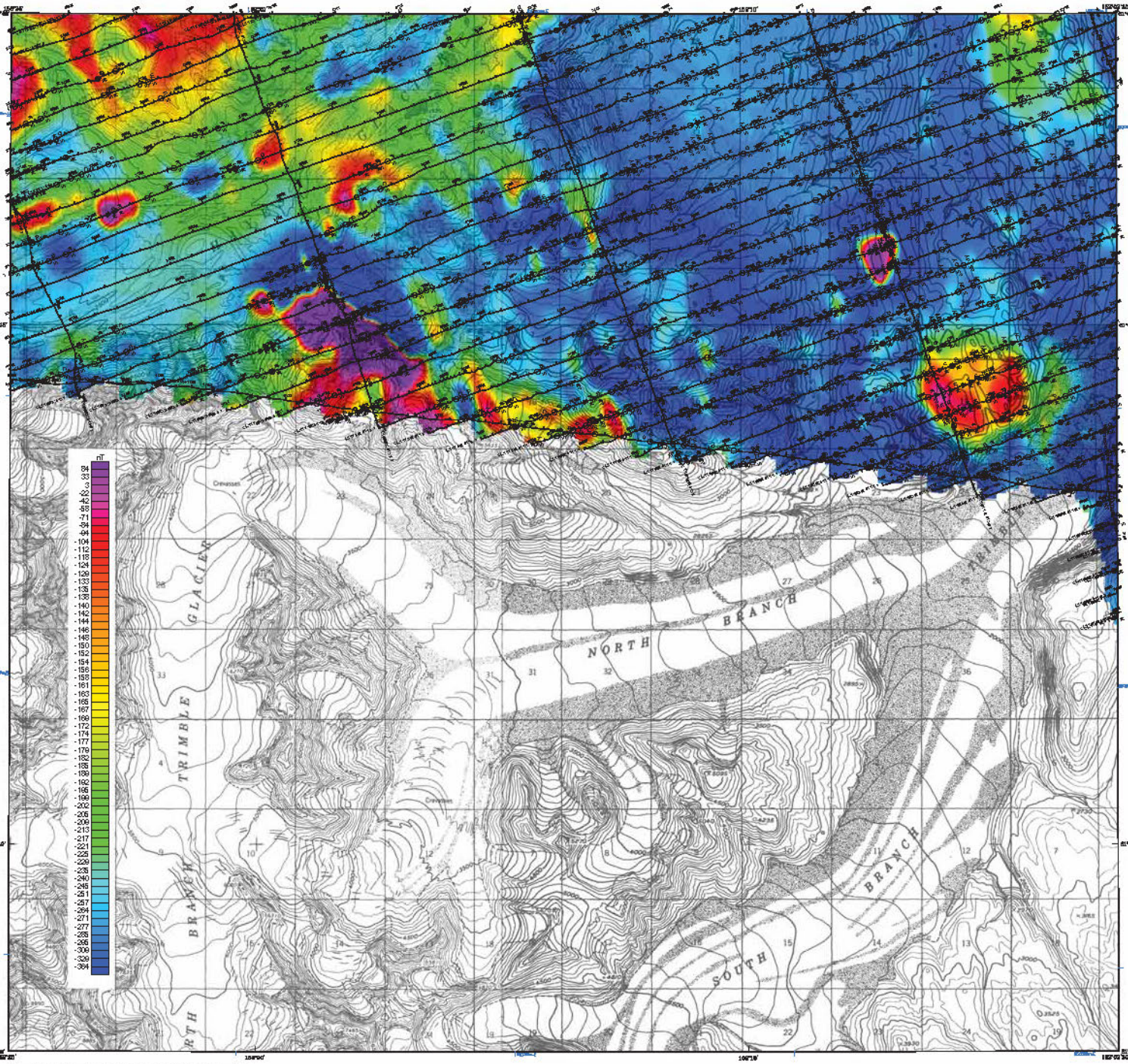
ALASKA DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

GEOPHYSICAL REPORT 2014-6-38I

PARTS of Tyonek C-6, C-7, D-6, and D-7 QUADRANGLES



Base from U.S. Geological Survey Tyonek C-6, 1955; C-7, 1955; D-6, 1955; D-7, 1955; Cook Inlet, Alaska

SCALE 1:31,680

0.5 0 0.5 1 1.5 2 MILES

0.5 0 0.5 1 1.5 2 2.5 KILOMETERS

CONTOUR INTERVAL 100 FEET
DATUM IS MEAN SEA LEVEL

SURVEY AREA

APPROXIMATE MEAN DECLINATION, 2015

RESIDUAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES WITH TOPOGRAPHY OF THE EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

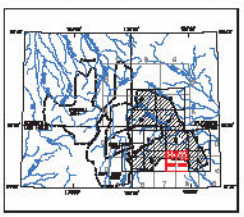
PARTS of TYONEK C-6, C-7, D-6, and D-7 QUADRANGLES

by

Lionel H. Burns, CEGS, and Fugro GeoServices, Inc.

2015

LOCATION INDEX OF 1:31,680-SCALE MAPS



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Amplitude — Conductance

- >100 siemens
- 50–100 siemens
- 20–50 siemens
- 10–20 siemens
- 6–10 siemens
- 1–6 siemens
- < 1 siemens
- Questionable anomaly
- EM magnetic response
- Culture

Area inflicts the conductor has a thickness >10m

Dip direction

Magnetic correlation in nT

Interpretive symbol — Conductor model

- Bedrock conductor
- Narrow bedrock conductor ("thin sheet")
- Conductive zone (reflected the sheet")
- Broad conductive rock unit, deep overburden weathering, thick conductive cover ("half-space")
- Edge of broad conductor ("edge of half space")
- Culture, e.g. power line, metal building or fence
- Magnetite

Anomaly identifier

Interpretive symbol

Indicates some uncertainty as to the most appropriate EM source model, but does not question the validity of the EM anomaly.

ELECTROMAGNETICS

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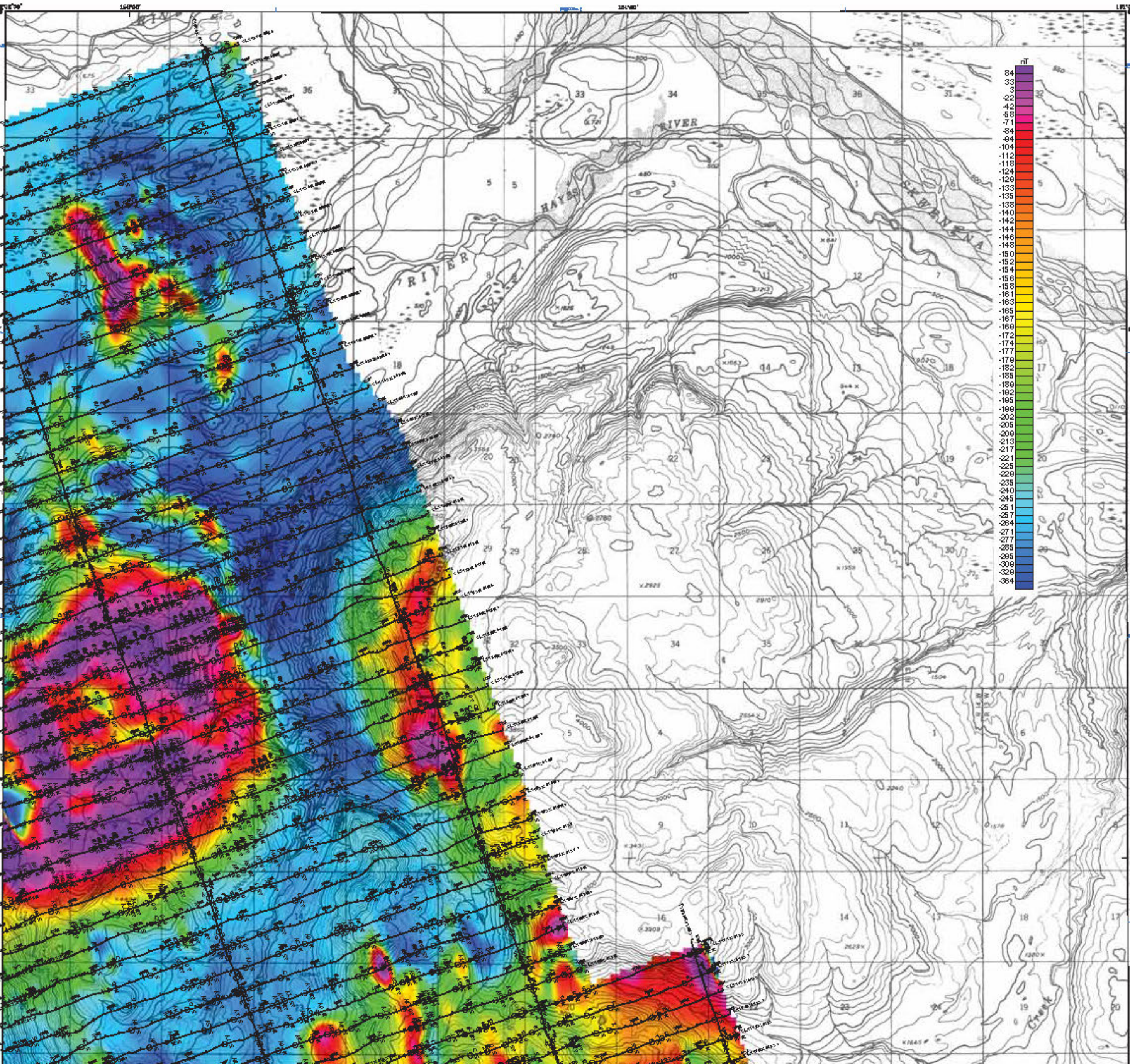
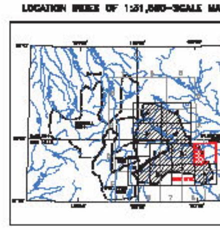


SCALE 1:31,680

0.5 0 0.5 1 1.5 2 MILES

0.5 0 0.5 1 1.5 2 2.5 KILOMETERS

LOCATION INDEX OF 1:31,680-SCALE MAPS



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PARTS of TYONEK D-6 and D-5 QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2015

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●	>100 siemens
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●	20–50 siemens
●	10–20 siemens
⊕	5–10 siemens
○	1–5 siemens
○	< 1 siemens
✳	Questionable anomaly
△	EM magnetic response
□	Culture

Arrow indicates the conductor has a thickness >10 m

Dip direction

Magnetic correlation in nT

Anomaly identifier

Interpretive symbol

Interpretive symbol	Conductor model
B	Bedrock conductor
D	Narrow bedrock conductor ("thin dike")
S	Conductive cover ("horizontal thin sheet")
H	Broad conductive rock unit, deep conductive weathering, thick conductive cover ("half-space")
E	Edge of broad conductor ("edge of half space")
L	Culture, e.g. power line, metal building or fence
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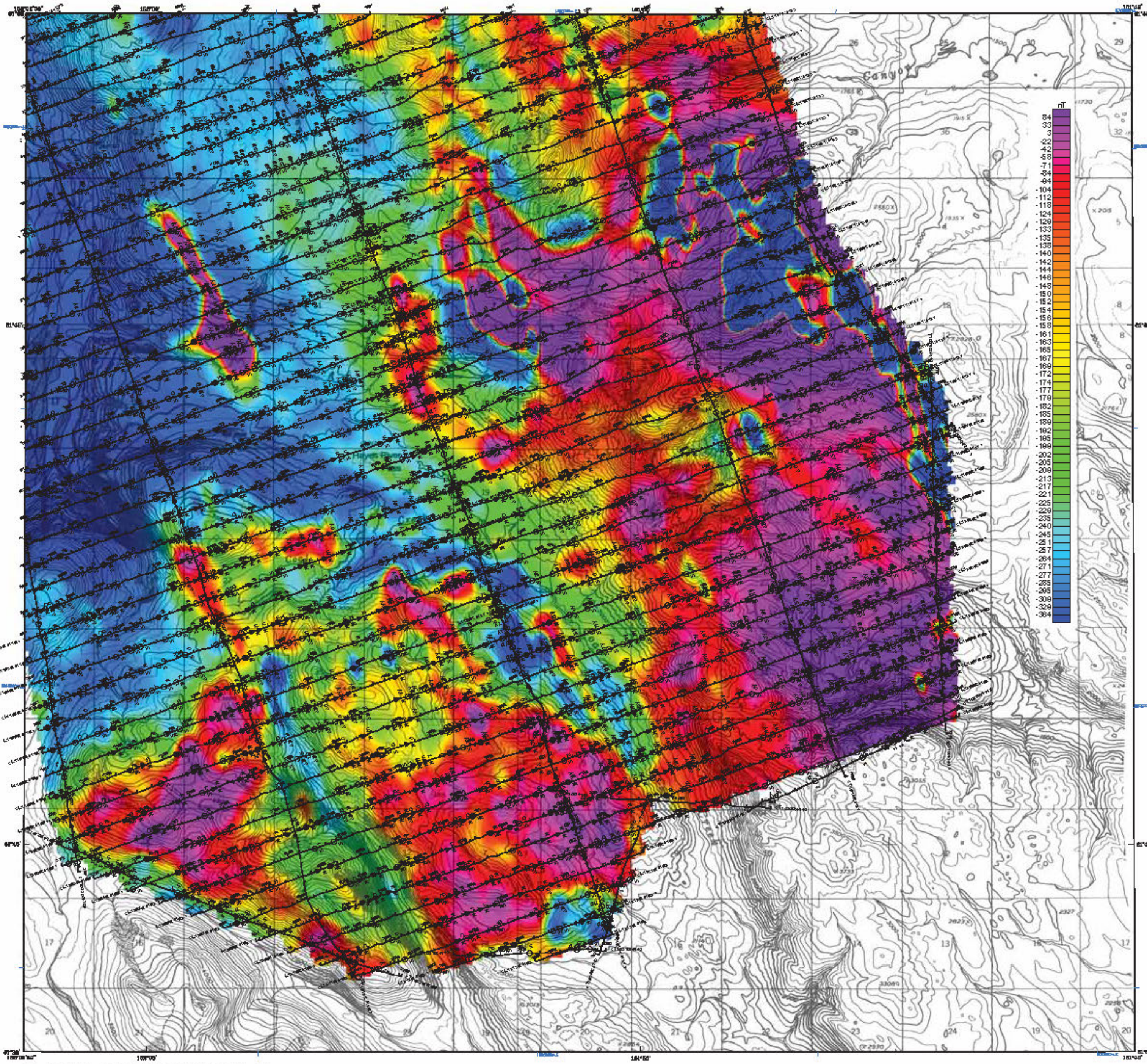

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0.5 0 0.5 1 1.5 2 MILES

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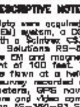
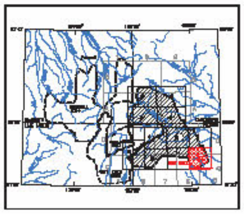


LOCATION INDEX OF 1:31,680–SCALE MAPS



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PARTS of TYONEK C-5, C-6, D-5, and D-6 QUADRANGLES

by
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2015

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Dip direction
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A Novatel OEM5-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

ELECTROMAGNETICS

To determine the location of EM anomalies or their boundaries, the DIGHEM[V] EM system measured inphase and quadrature components of five frequencies. Two vertical coaxial-coil pairs operated at 1000 and 5500 Hz while three horizontal coplanar-coil pairs operated at 900, 7200, and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. The type of conductor is indicated on the aeromagnetic map by the interpretive symbol attached to each EM anomaly. Determination of the type of conductor is based on EM anomaly shapes of the coaxial- and coplanar-coil responses, together with conductor and magnetic patterns and topography. The power line monitor and the flight track video were examined to locate cultural sources.

RESIDUAL MAGNETIC FIELD

The magnetic total field data were processed using digitally recorded data from a CGG D1344 magnetometer with a Scintrex CS3 cesium sensor. Data were collected at a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) IGRF corrected (IGRF model 2010, updated for date of flight and altimeter variations), (3) leveled to the tie line data, and (4) interpolated onto a regular 50 m grid using a modified Akima (1970) technique. All grids were then resampled from the 50 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures: Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589–602.

SURVEY HISTORY

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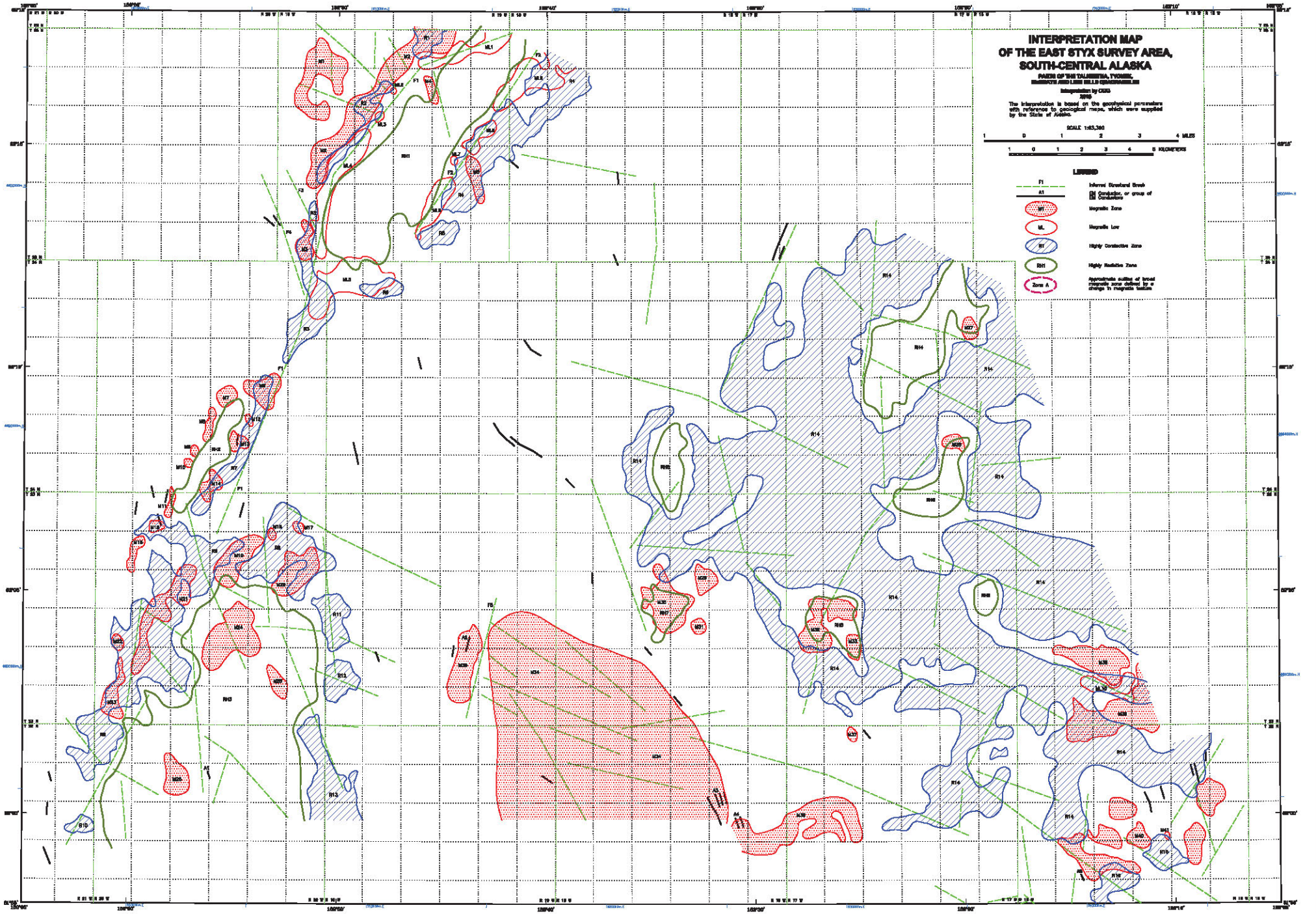
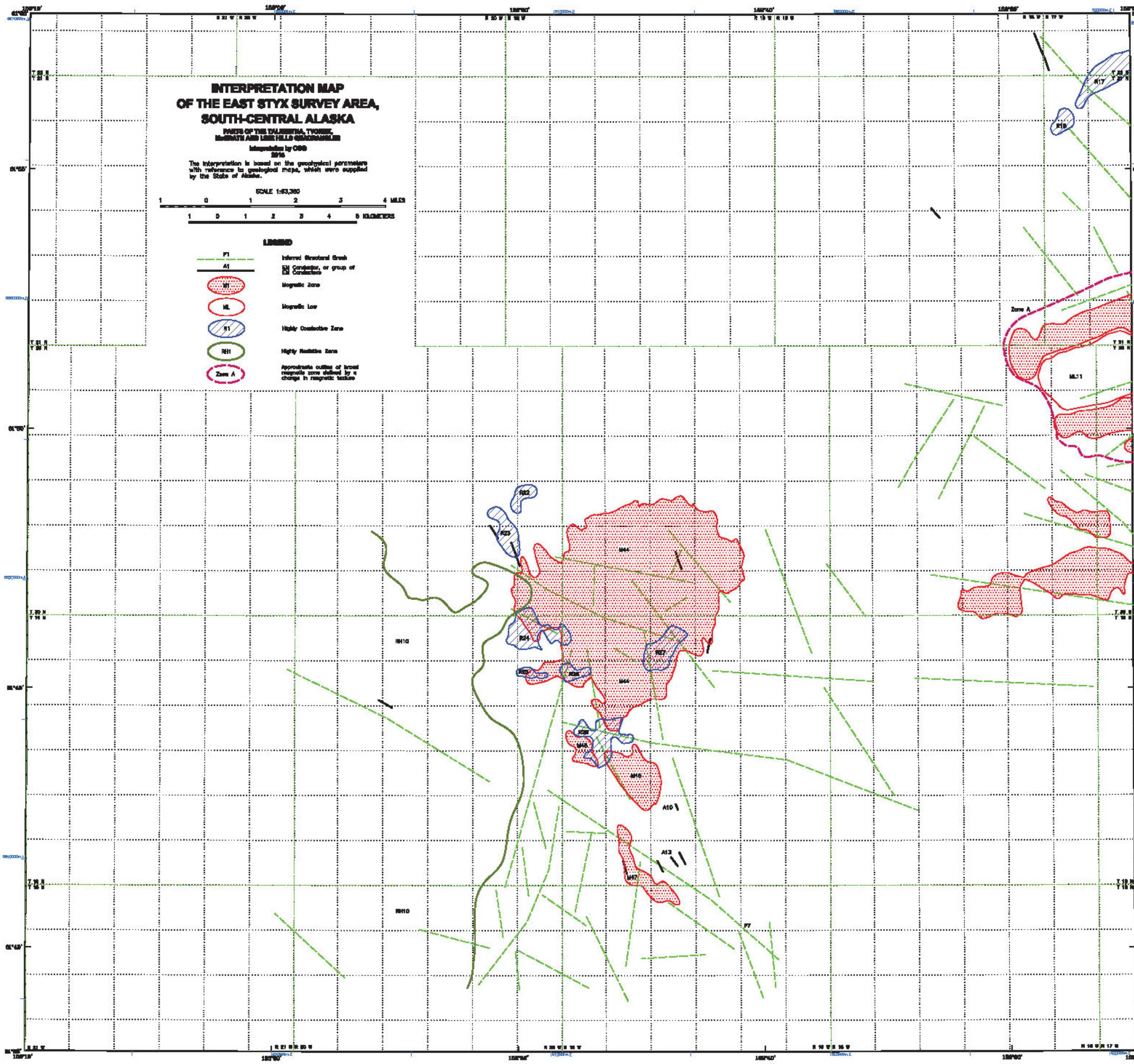
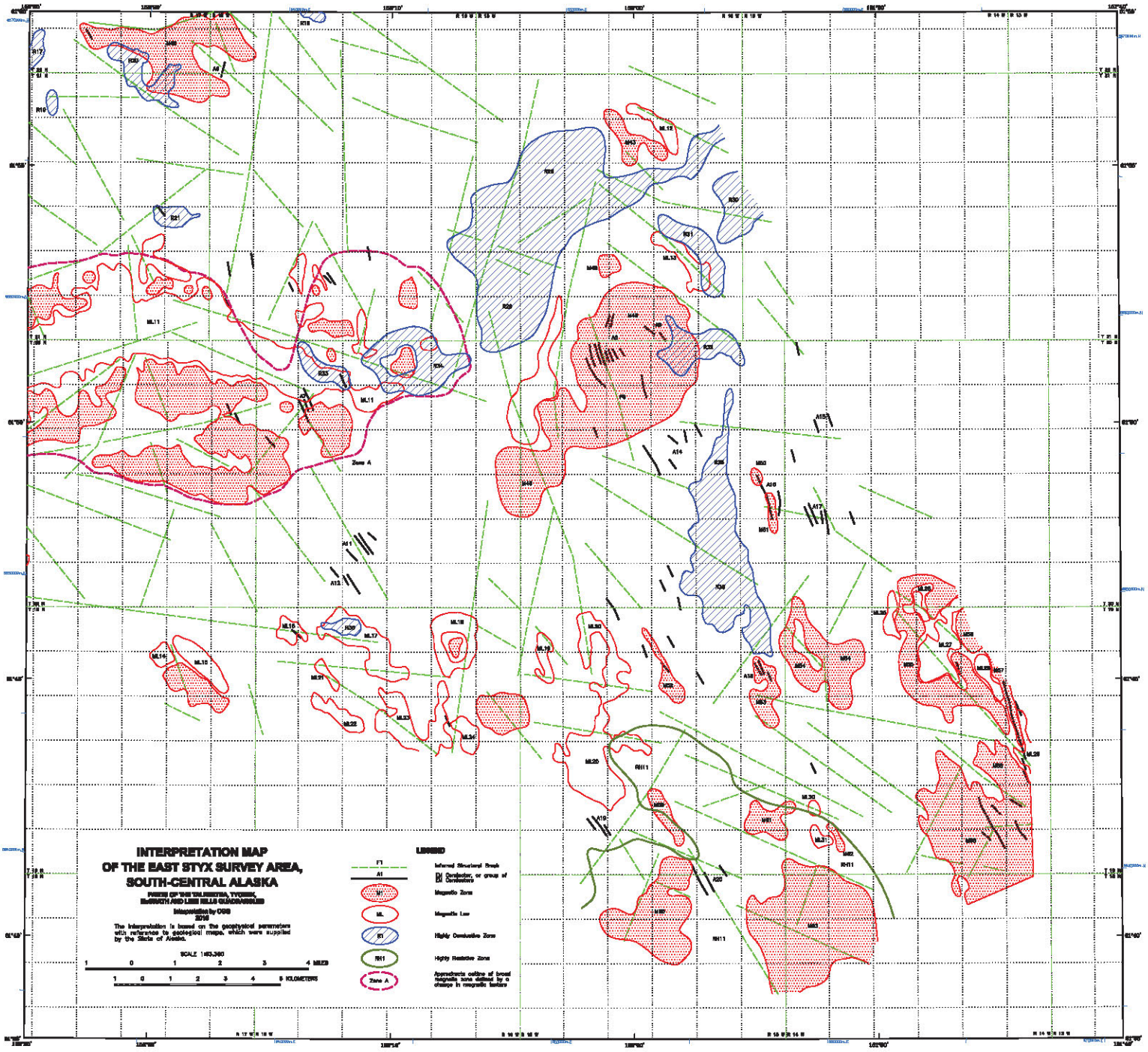
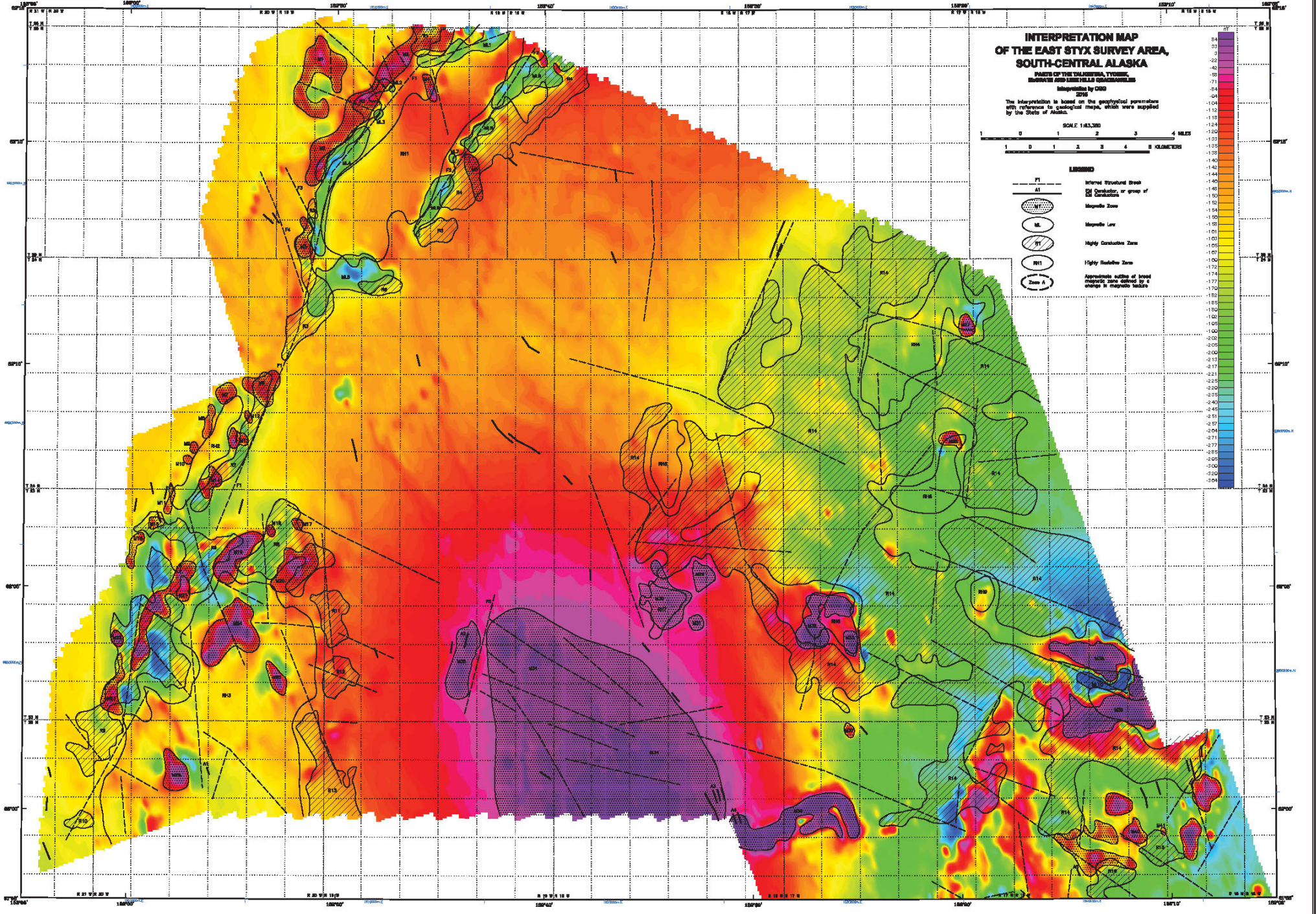
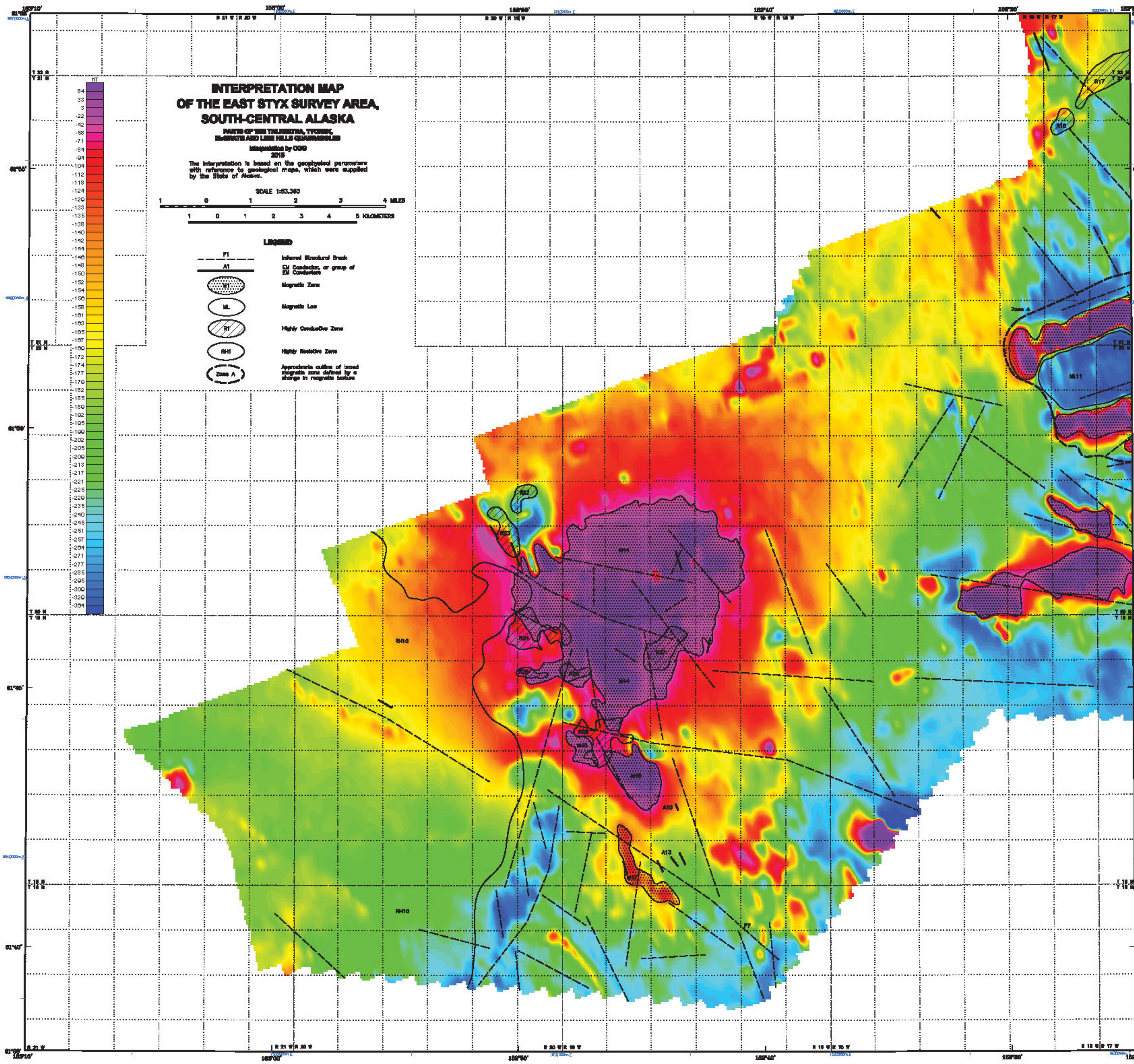
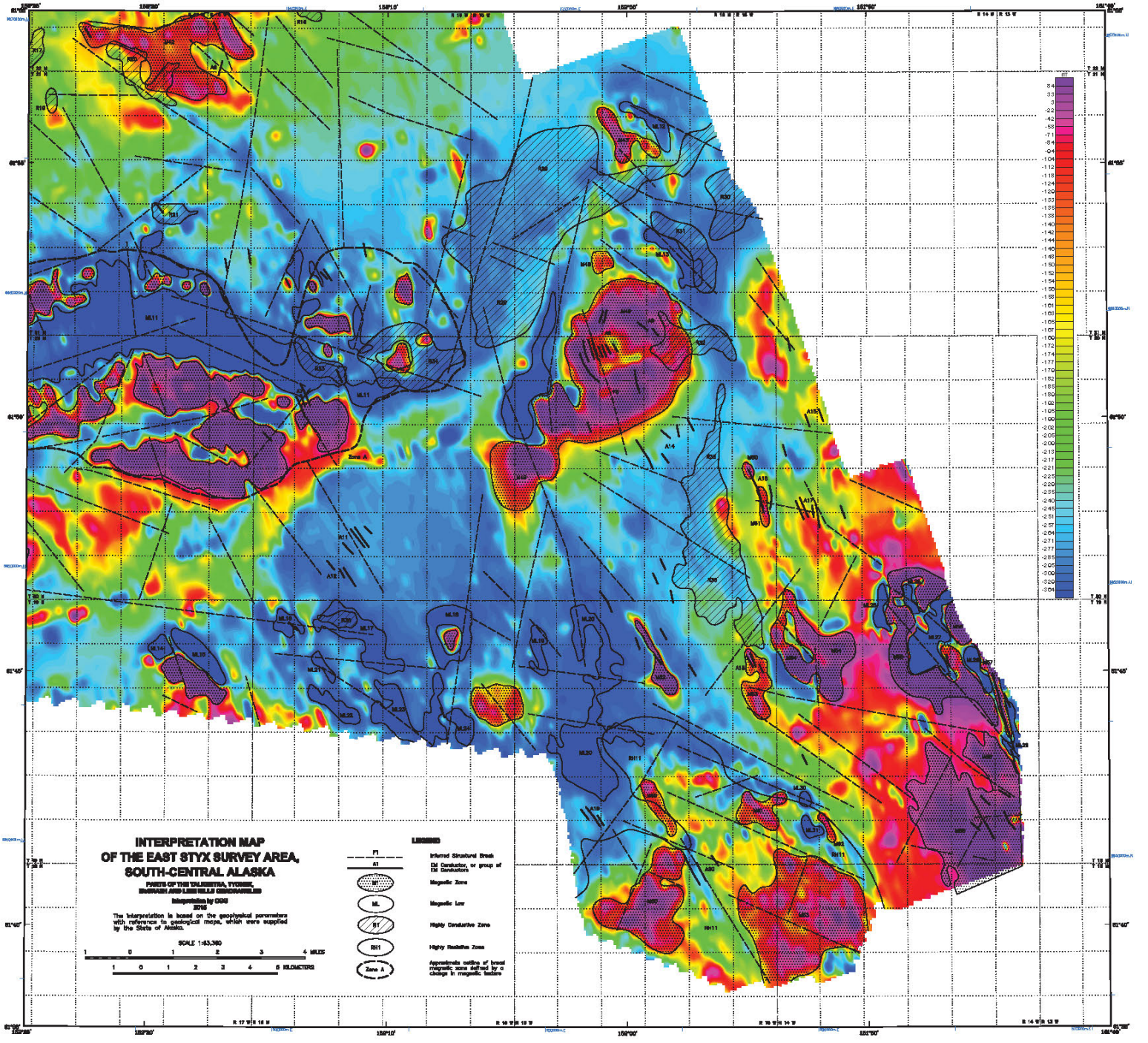

INTERPRETATION MAP
OF THE EAST STYX SURVEY AREA,
SOUTH-CENTRAL ALASKA
Interpretation by DGS
2015
The interpretation is based on the geophysical parameters with reference to geological maps, which were supplied by the State of Alaska.
SCALE 1:63,360
1 0 1 2 3 4 MILES
1 0 1 2 3 4 5 KILOMETERS
LEGEND
Inferred Structural Break
Conductor, or group of Conductors
Magnetic Zone
Magnetic Low
Highly Conductive Zone
Highly Radiative Zone
Approximate outline of broad magnetic zone defined by a change in magnetic texture
Zone A

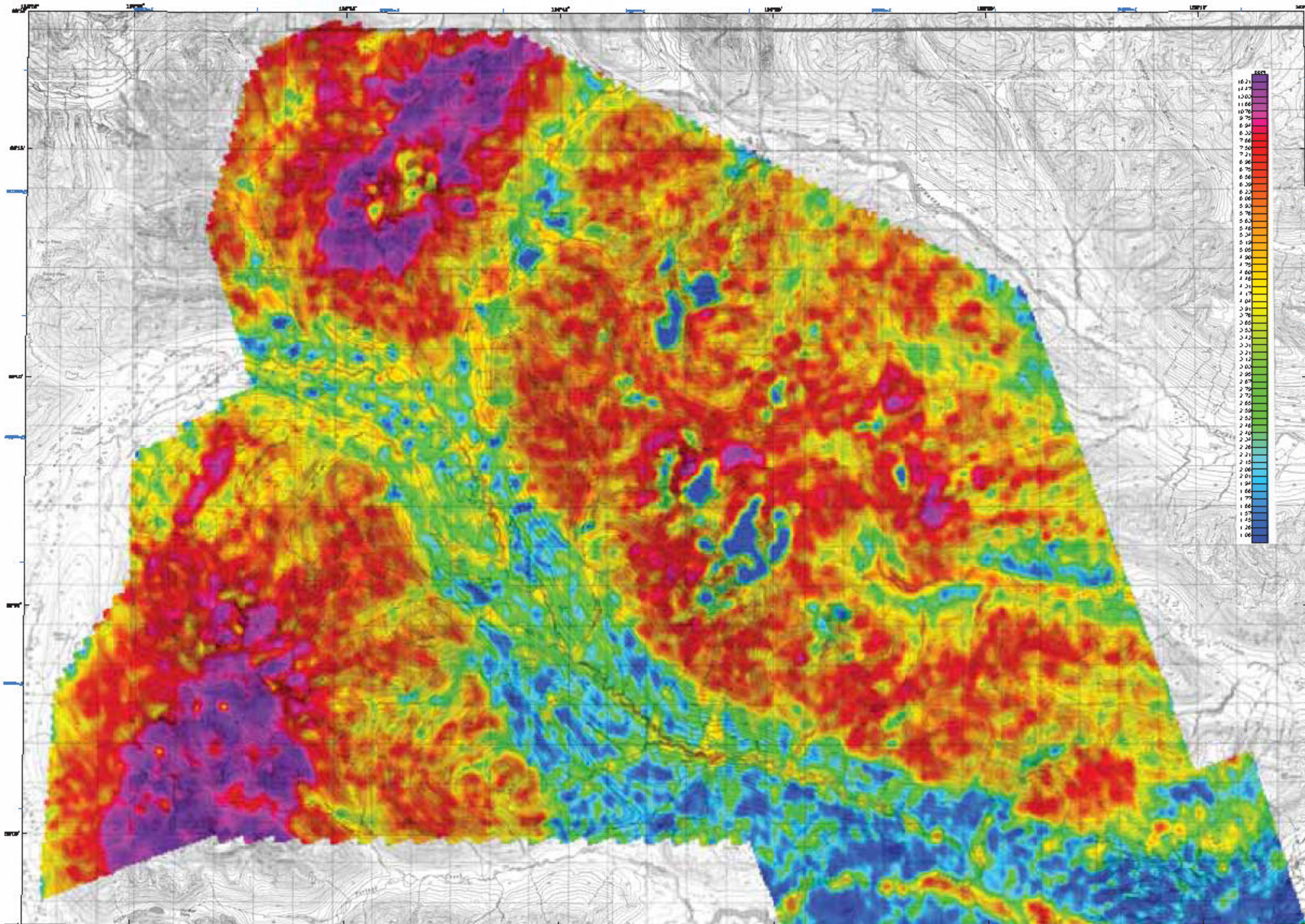

INTERPRETATION MAP
OF THE EAST STYX SURVEY AREA,
SOUTH-CENTRAL ALASKA
The interpretation is based on the geophysical parameters with reference to geological maps, which were supplied by the State of Alaska.
1 0 1 2 3 4 MILES
1 0 1 2 3 4 5 KILOMETERS
F1
A1
Magnetic Zone
ML
Magnetic Low
Highly Conductive Zone
RH1
Highly Resistive Zone
Zone A
Approximate outline of broad magnetic zone defined by a change in magnetic texture
ML11
RH10
F7


INTERPRETATION MAP
OF THE EAST STYX SURVEY AREA,
SOUTH-CENTRAL ALASKA
FROM OF THE TALKEETNA, TYONEK,
BARRETT AND LIME HILLS QUADRANGLES
Interpretation by CGG
2013
The interpretation is based on the geophysical parameters with reference to geological maps, which were supplied by the State of Alaska.
SCALE 1:63,360
1 0 1 2 3 4 MILES
1 0 1 2 3 4 5 KILOMETERS
LEGEND
Inferred Structural Break
Conductor, or group of Conductors
Magnetic Zone
Magnetic Low
Highly Conductive Zone
Highly Resistive Zone
Approximate outline of broad magnetic zone defined by a change in magnetic texture
Zone A

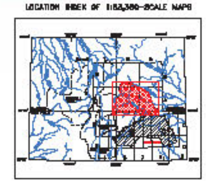

INTERPRETATION MAP
OF THE EAST STYX SURVEY AREA,
SOUTH-CENTRAL ALASKA
PARTS OF THE TALKEETNA, TYONEK,
MARKHAM AND LAKE CLARK QUADRANGLES
Interpretation by DGS
2013
The interpretation is based on the geophysical parameters with reference to geological maps, which were supplied by the State of Alaska.
SCALE 1:63,360
1 0 1 2 3 4 MILES
1 0 1 2 3 4 5 KILOMETERS
LEGEND
Inferred Structural Break
Dot Conductor, or group of Dot Conductors
Magnetite Zone
Magnetite Low
Highly Conductive Zone
Highly Resistive Zone
Approximate outline of broad magnetic zone defined by a change in magnetic texture
nT
84
33
-3
-22
-42
-61
-80
-99
-118
-137
-156
-175
-194
-213
-232
-251
-270
-289
-308
-327
-346


INTERPRETATION MAP
OF THE EAST STYX SURVEY AREA,
SOUTH-CENTRAL ALASKA
Interpretation by CGG
2015
The interpretation is based on the geophysical parameters with reference to geological maps, which were supplied by the State of Alaska.
SCALE 1:63,360
1 0 1 2 3 4 MILES
1 0 1 2 3 4 5 KILOMETERS
LEGEND
F1 Inferred Structural Break
A1 EM Conductor, or group of EM Conductors
M1 Magnetic Zone
ML Magnetic Low
R1 Highly Conductive Zone
RH1 Highly Resistive Zone
Zone A Approximate outline of broad magnetic zone defined by a change in magnetic texture
nT
RH10
ML11
Zone A
R17
A10
A13


nT
INTERPRETATION MAP
OF THE EAST STYX SURVEY AREA,
SOUTH-CENTRAL ALASKA
Interpretation by DGS
2015
The interpretation is based on the geophysical parameters with reference to geological maps, which were supplied by the State of Alaska.
SCALE 1:63,360
1 0 1 2 3 4 MILES
1 0 1 2 3 4 5 KILOMETERS
LEGEND
Inferred Structural Break
EM Conductor, or group of EM Conductors
Magnetic Zone
Magnetic Low
Highly Conductive Zone
Highly Resistive Zone
Approximate outline of broad magnetic zone defined by a change in magnetic texture
Zone A



LOCATION INDEX OF 1:63,360-SCALE MAPS



SCALE 1:63,360

THORIUM (eTh) WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CS-3 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEMV-3GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in the windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2810 keV) and cosmic radiation (3000–>6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 50 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying: Technical Report 323, International Atomic Energy Agency, Vienna.

SURVEY HISTORY

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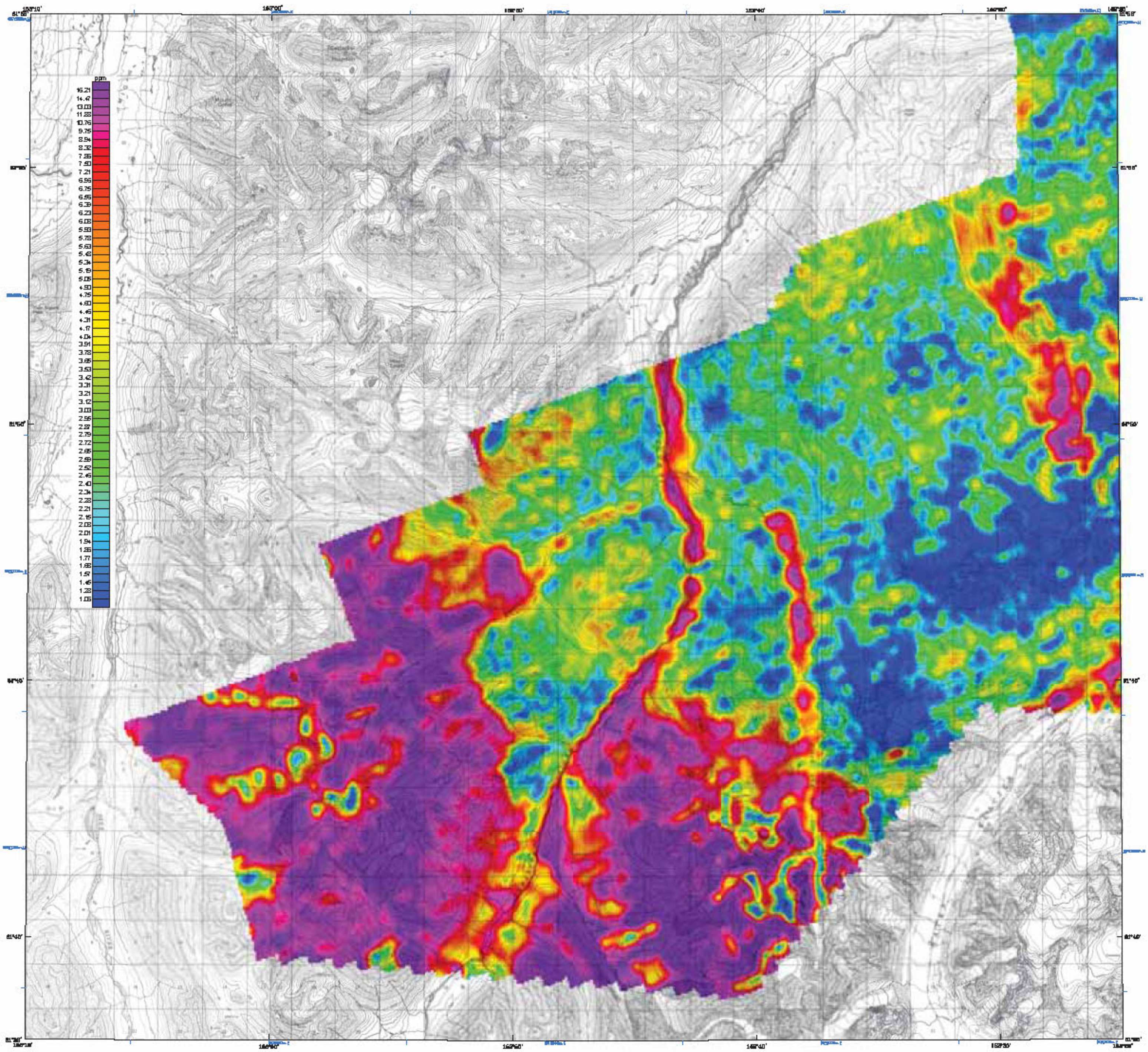
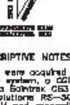


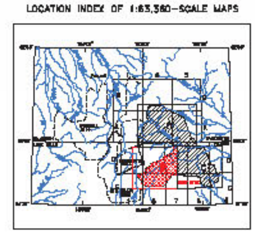
SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS



LOCATION INDEX OF 1:63,360-SCALE MAPS



THORIUM (eTh) WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2014

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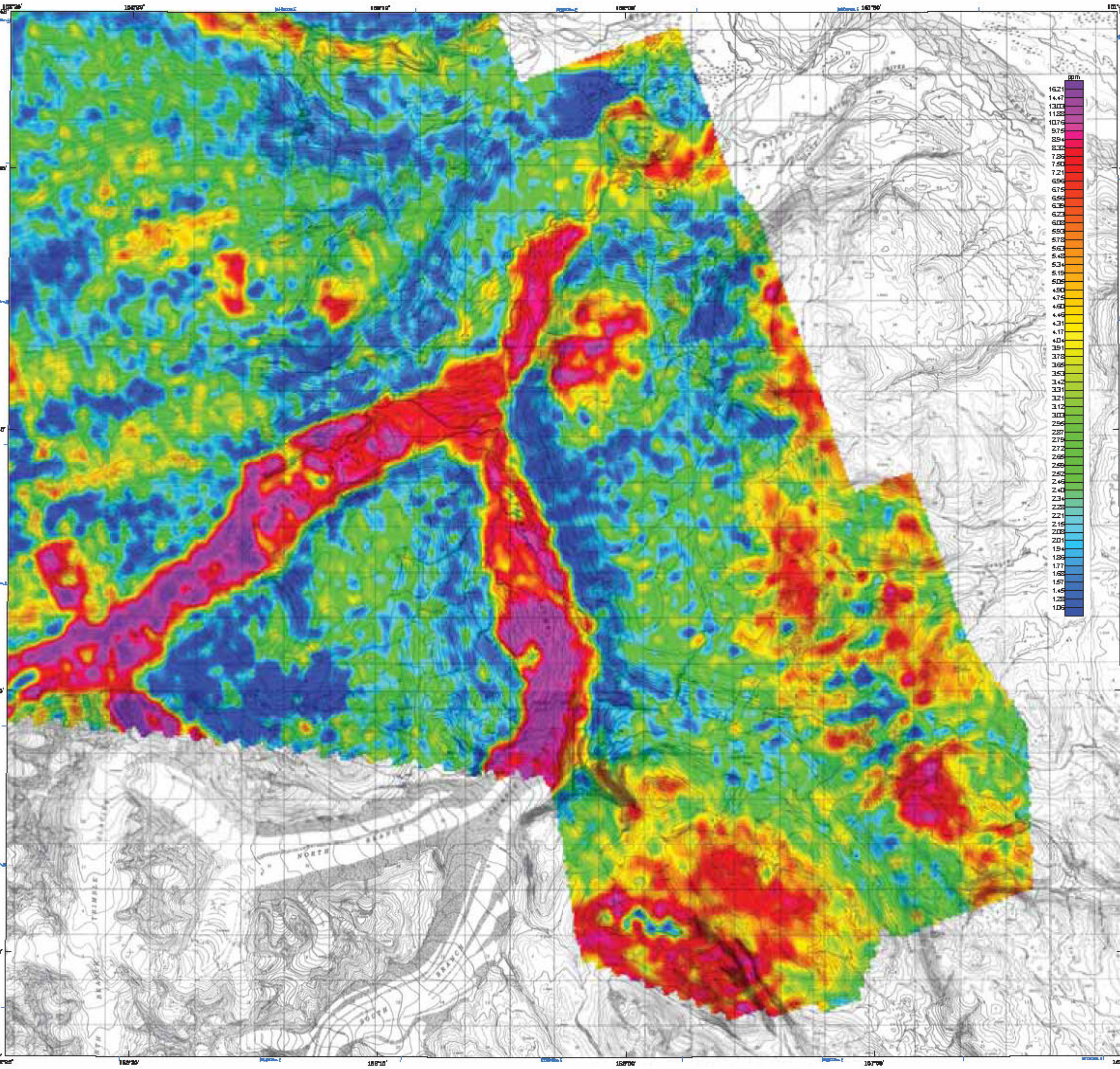


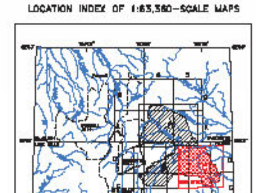
SCALE 1:63,360

THORIUM (eTh) WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2014

LOCATION INDEX OF 1:63,360-SCALE MAPS



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A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

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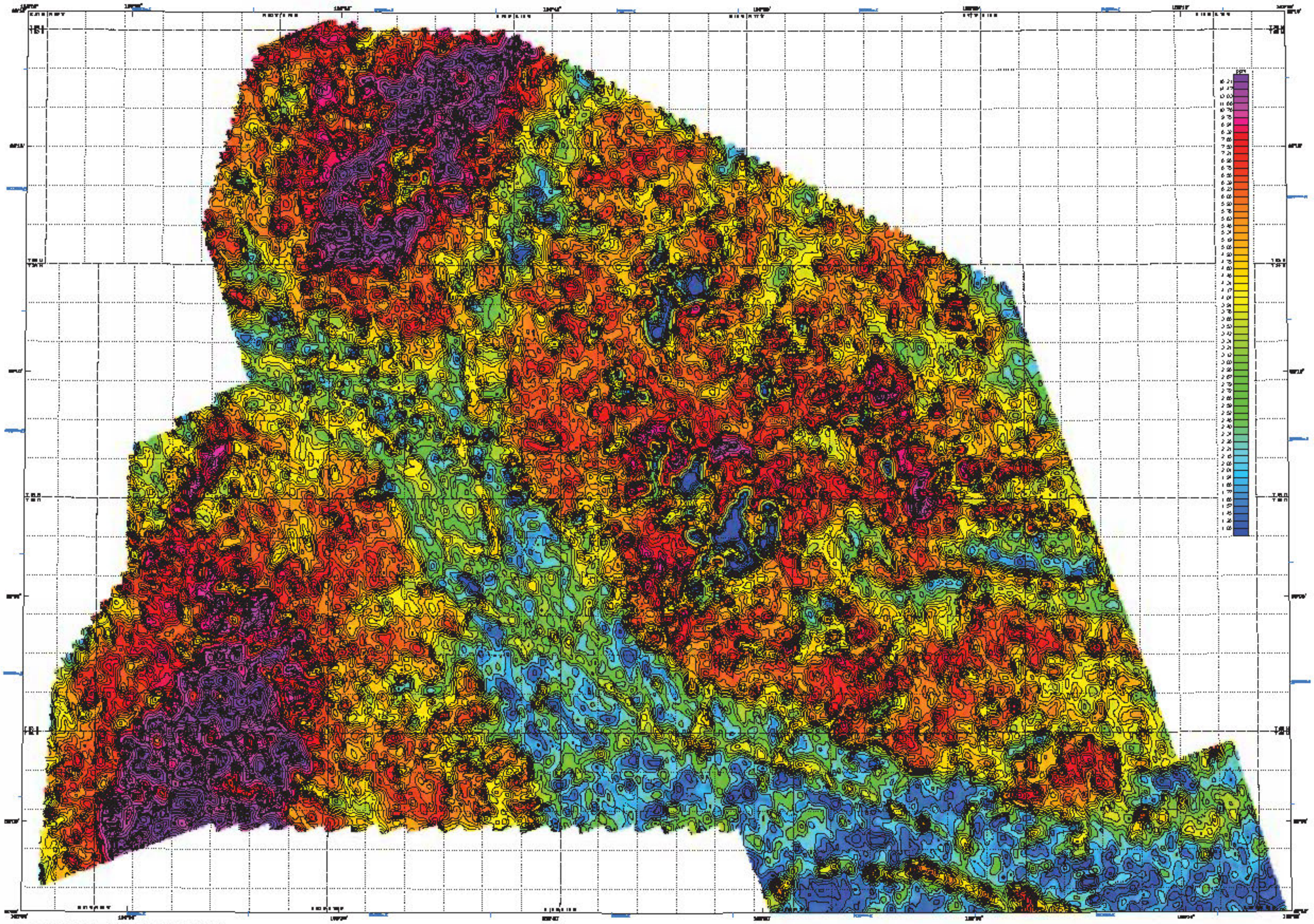


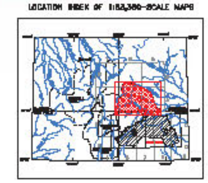
SCALE 1:63,360

THORIUM (eTh) WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGS, and Fugro GeoServices, Inc.
2014

LOCATION INDEX OF 1:63,360-SCALE MAPS



DESCRIPTIVE NOTES

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International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

CONTOUR INTERVAL

10.00 ppm

1.00 ppm

0.40 ppm

SURVEY HISTORY

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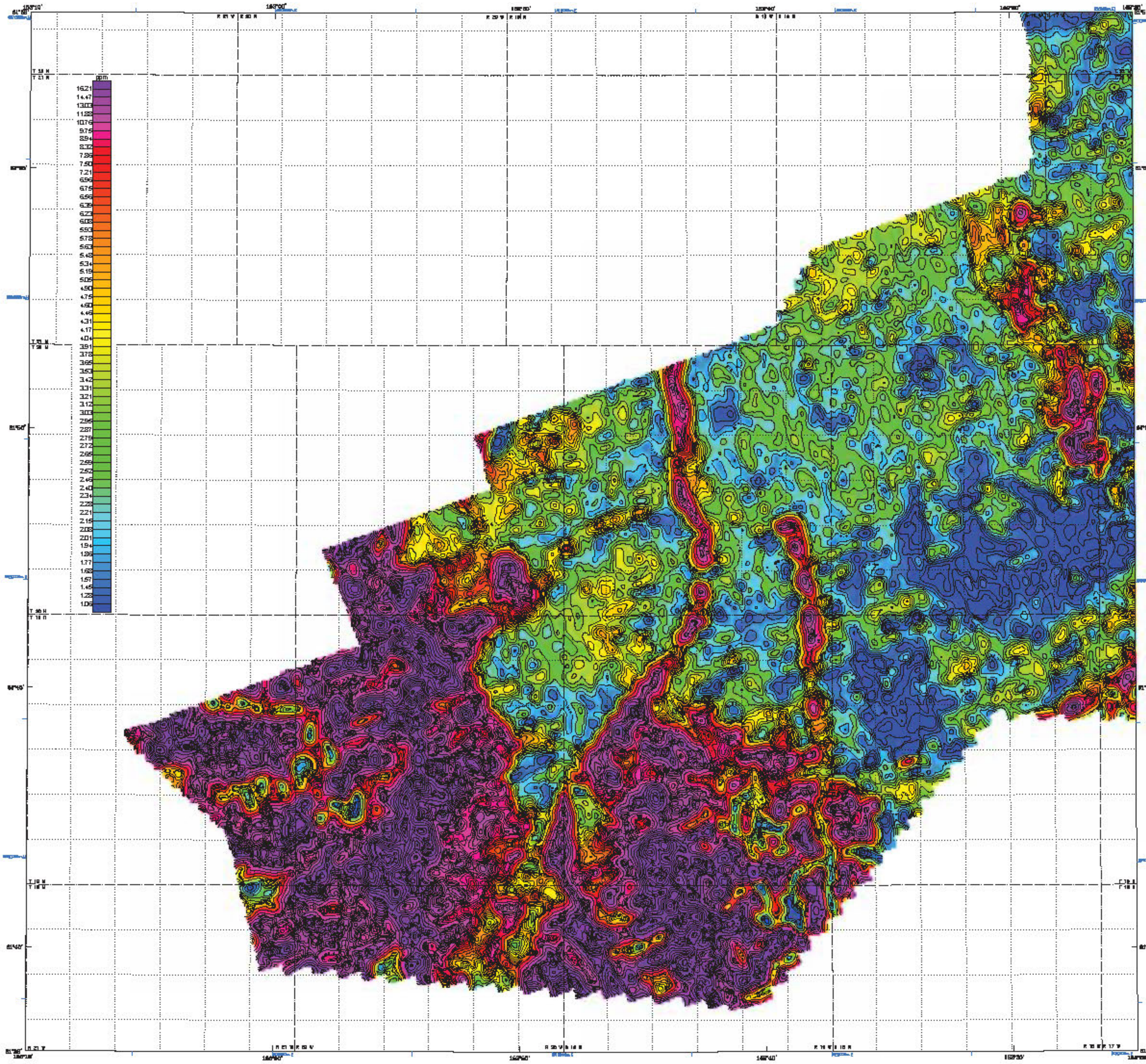
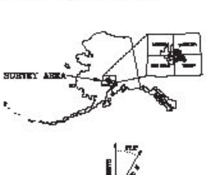


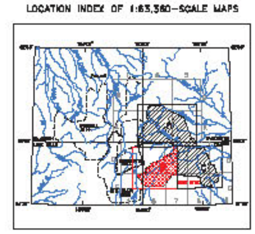
SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS



LOCATION INDEX OF 1:63,360-SCALE MAPS



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by
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2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM5-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2810 keV) and cosmic radiation (3000–>6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

CONTOUR INTERVAL

. . . . 10.00 ppm
. . . . 2.00 ppm
. . . . 0.40 ppm

SURVEY HISTORY

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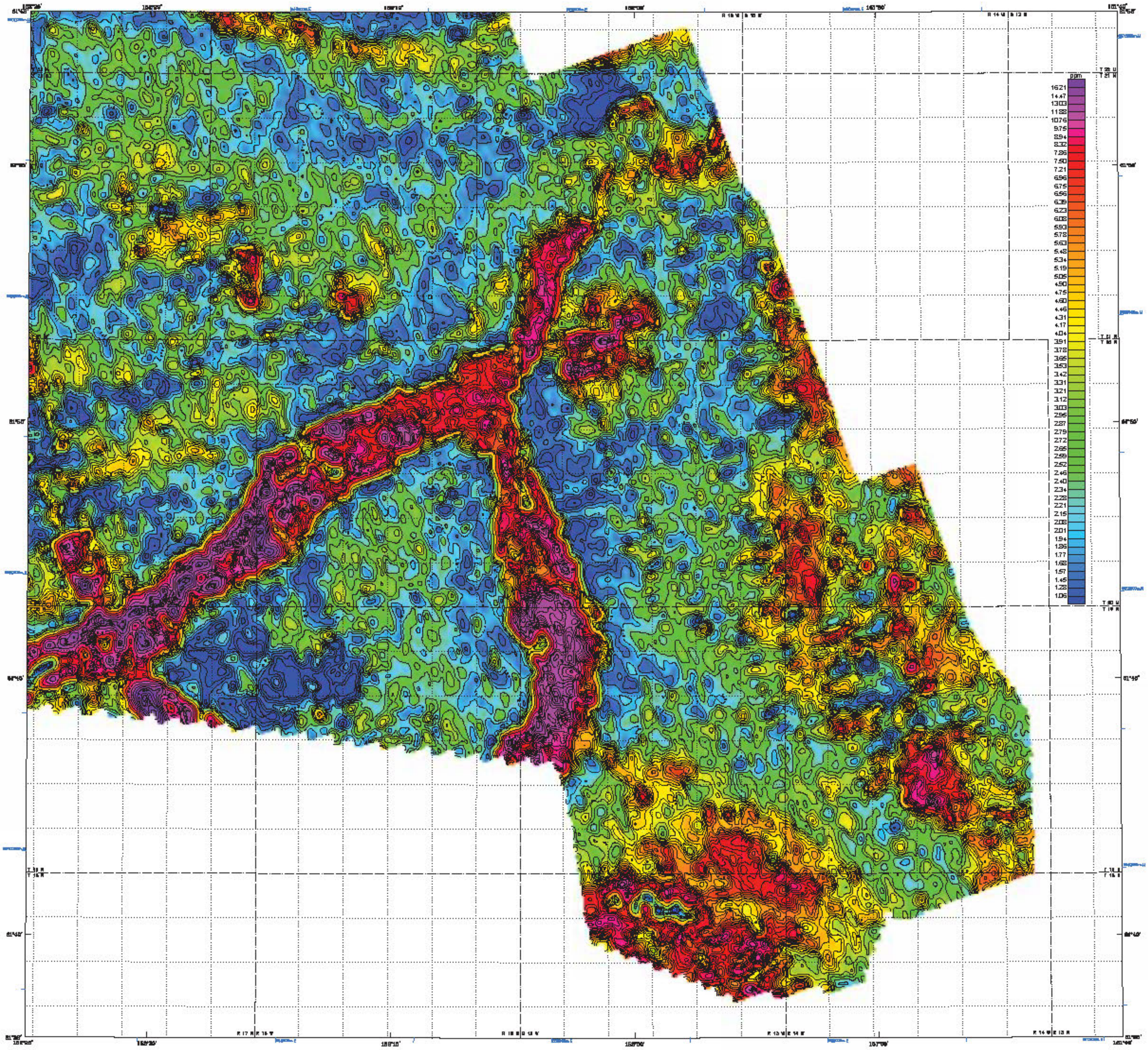


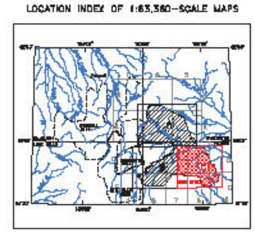
SCALE 1:63,360

THORIUM (eTh) WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2014

LOCATION INDEX OF 1:63,360-SCALE MAPS



DESCRIPTIVE NOTES

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RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2815 keV) and cosmic radiation (3000–>6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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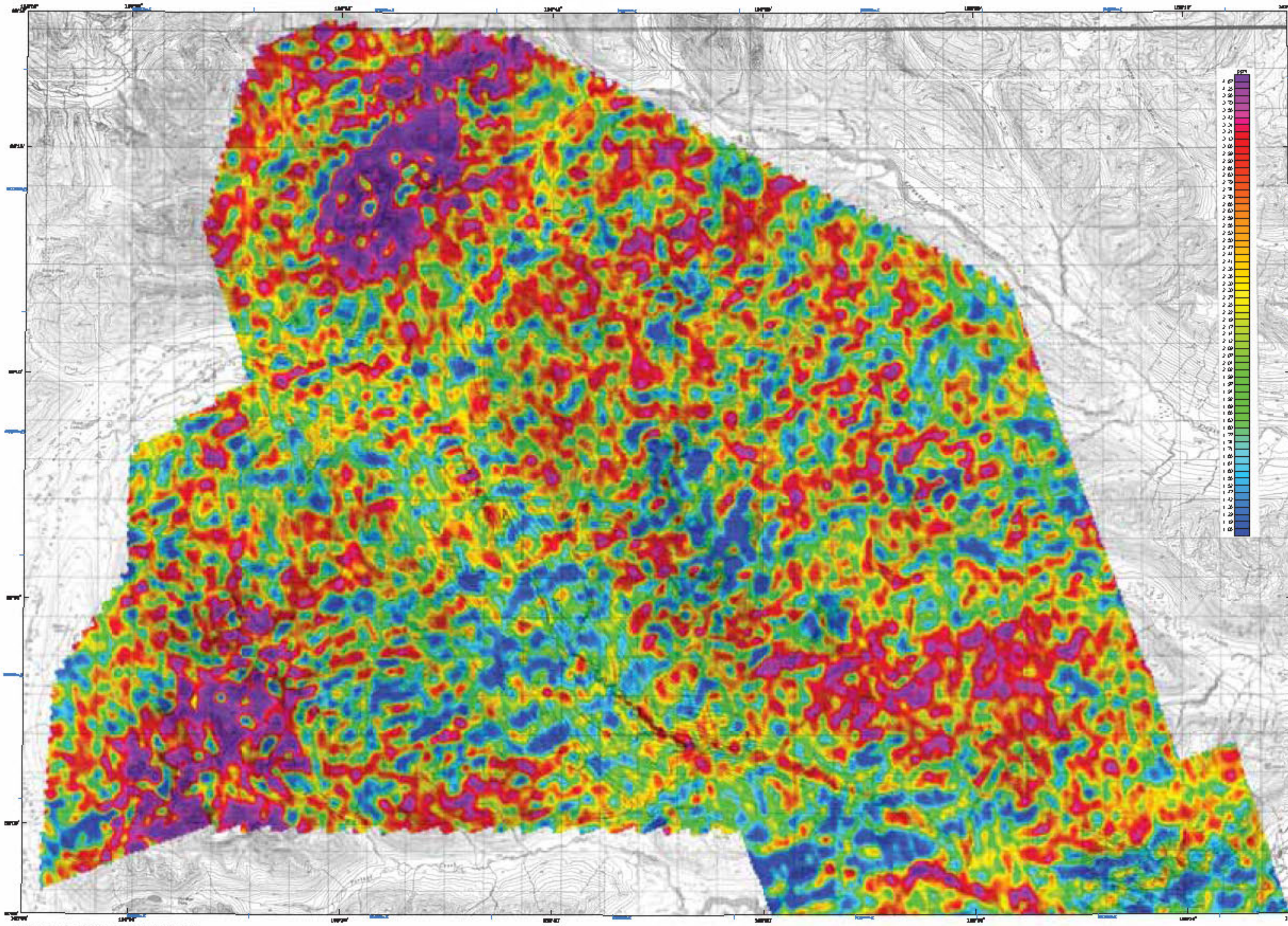
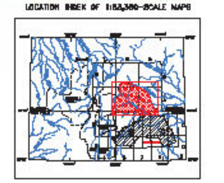


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



URANIUM (eU) WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a Scintrex CS3 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of NaI (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in the windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2810 keV) and cosmic radiation (3000–>6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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SURVEY HISTORY

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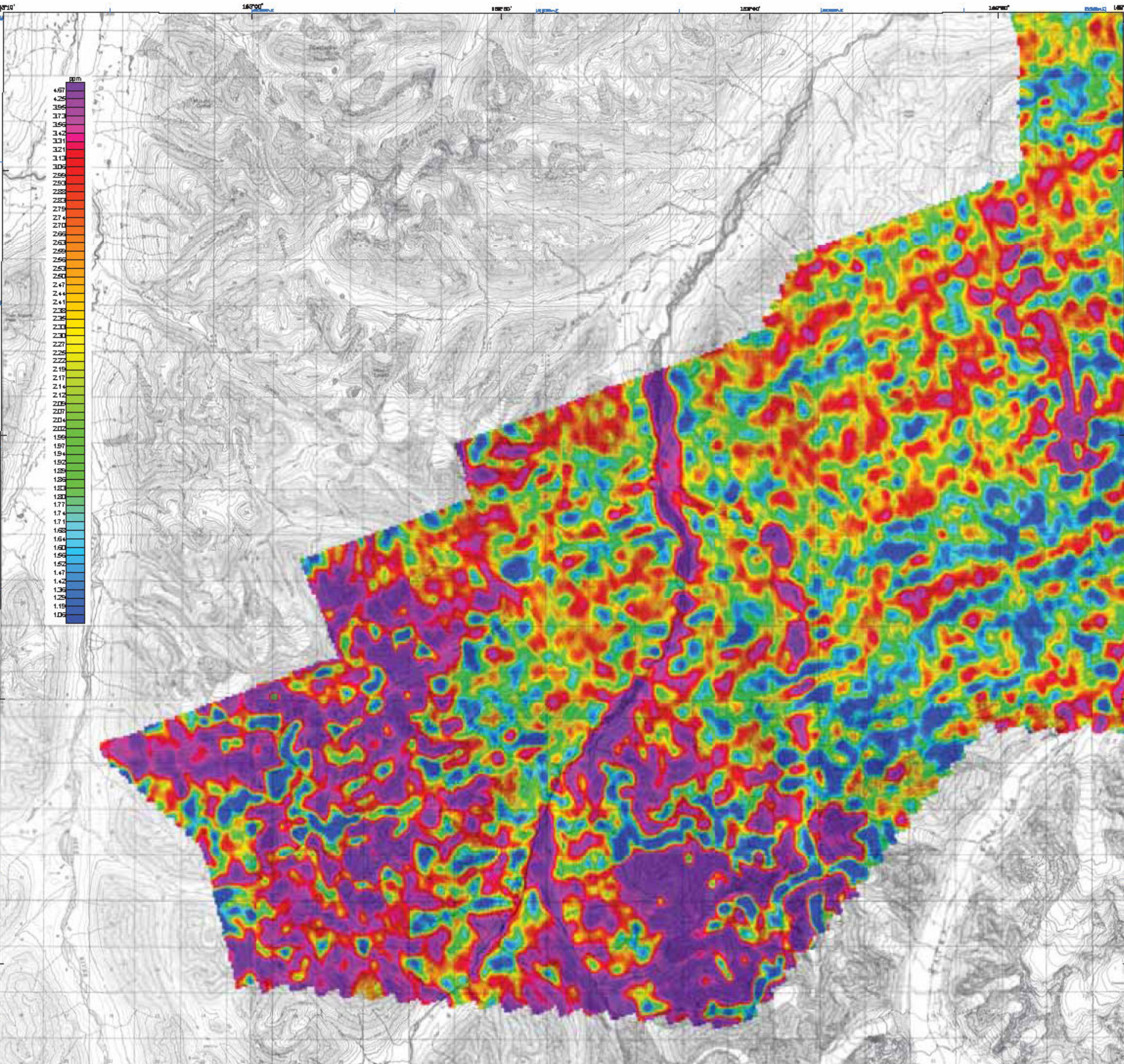


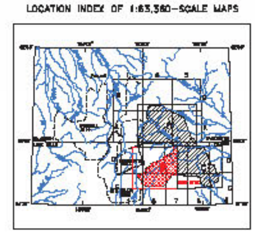
SCALE 1:63,360

URANIUM (eU) WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2014

LOCATION INDEX OF 1:63,360-SCALE MAPS



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM5-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2815 keV) and cosmic radiation (3000–>6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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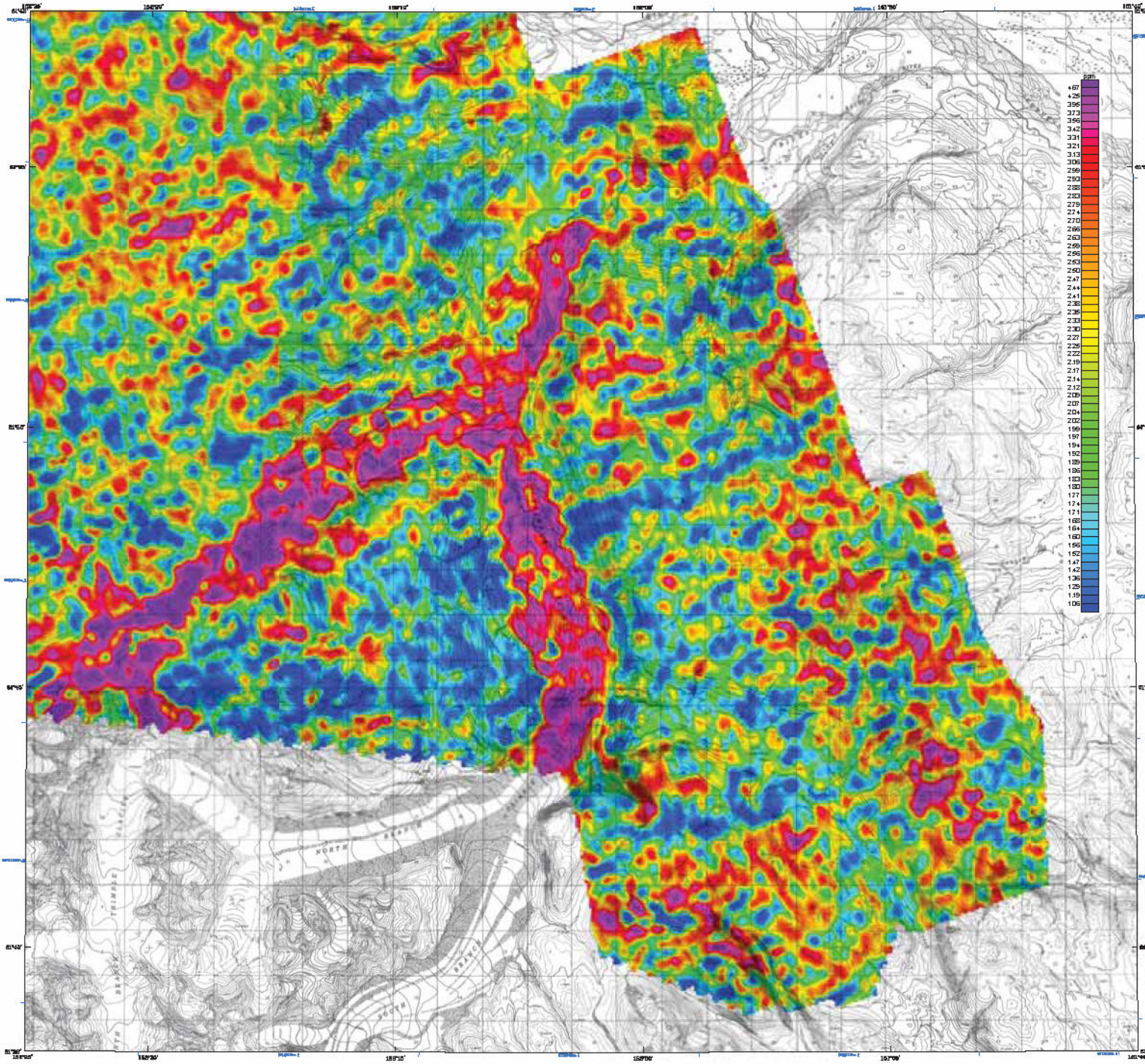


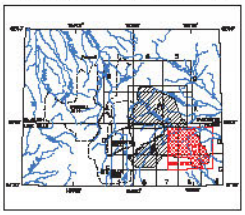
Base from USA Geological Survey Topomk 6-4, 2014; 6-5, 1955; 6-6, 1955; 6-7, 1955; 6-8, 1955; 7-5, 1955; 7-6, 1955; 7-7, 1955; 7-8, 1955

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



URANIUM (eU) WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, a GSI 01344 cesium magnetometer with a Sonntek GS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation systems, 50/60 Hz monitors and video cameras. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#3-62L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 18.81. (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (258 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1880 keV), potassium (1370–1570 keV), total radioactivity (400–2810 keV) and cosmic radiation (3000–6000 keV). Counts from the radon detector were recorded in the radon window (1660–1880 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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SURVEY HISTORY

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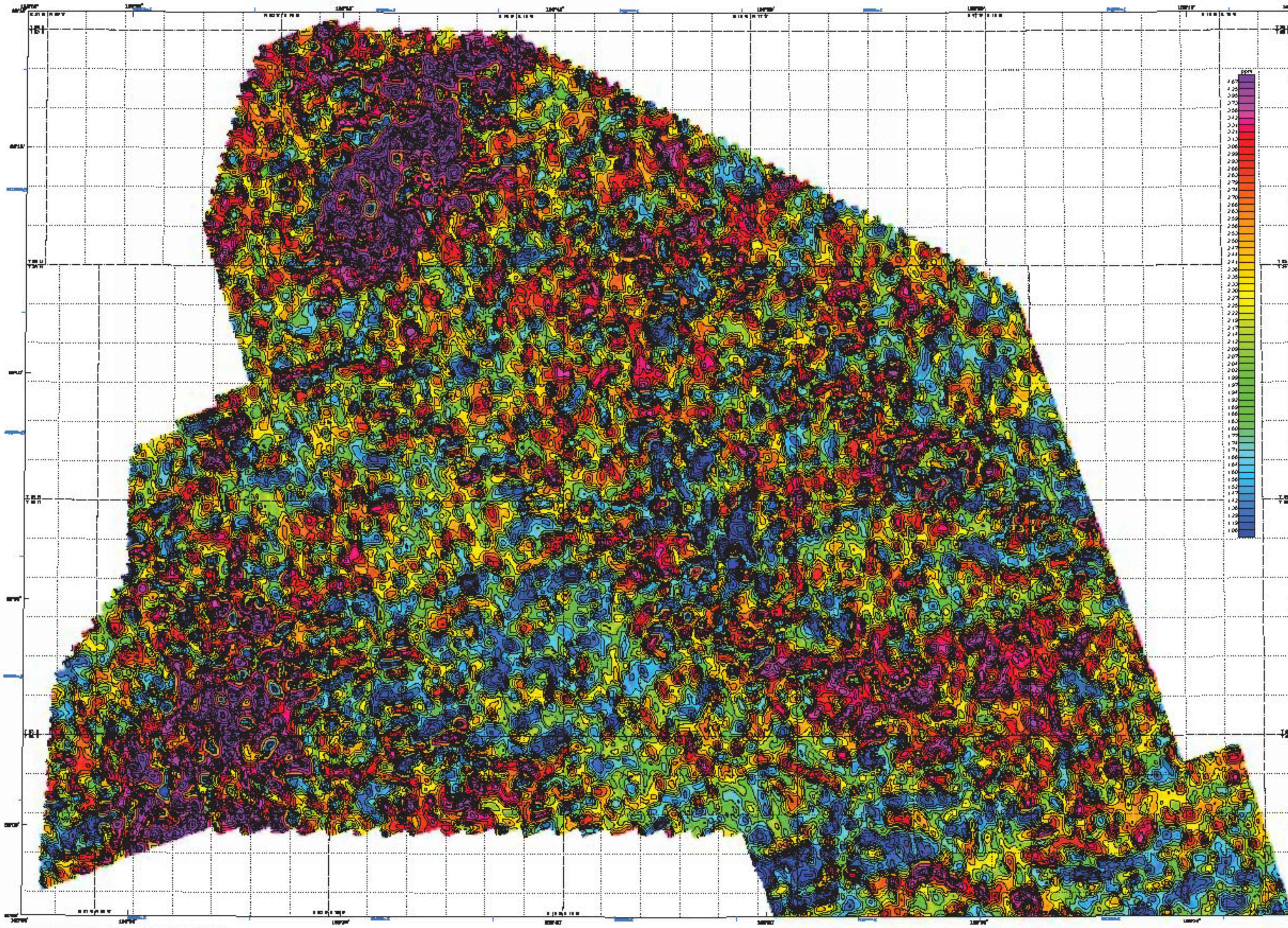
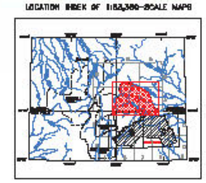


SCALE 1:63,360



LOCATION INDEX OF 1:63,360-SCALE MAPS

URANIUM (eU) WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

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A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

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CONTOUR INTERVAL

[illegible] ppm
1.00 ppm
4.00 ppm

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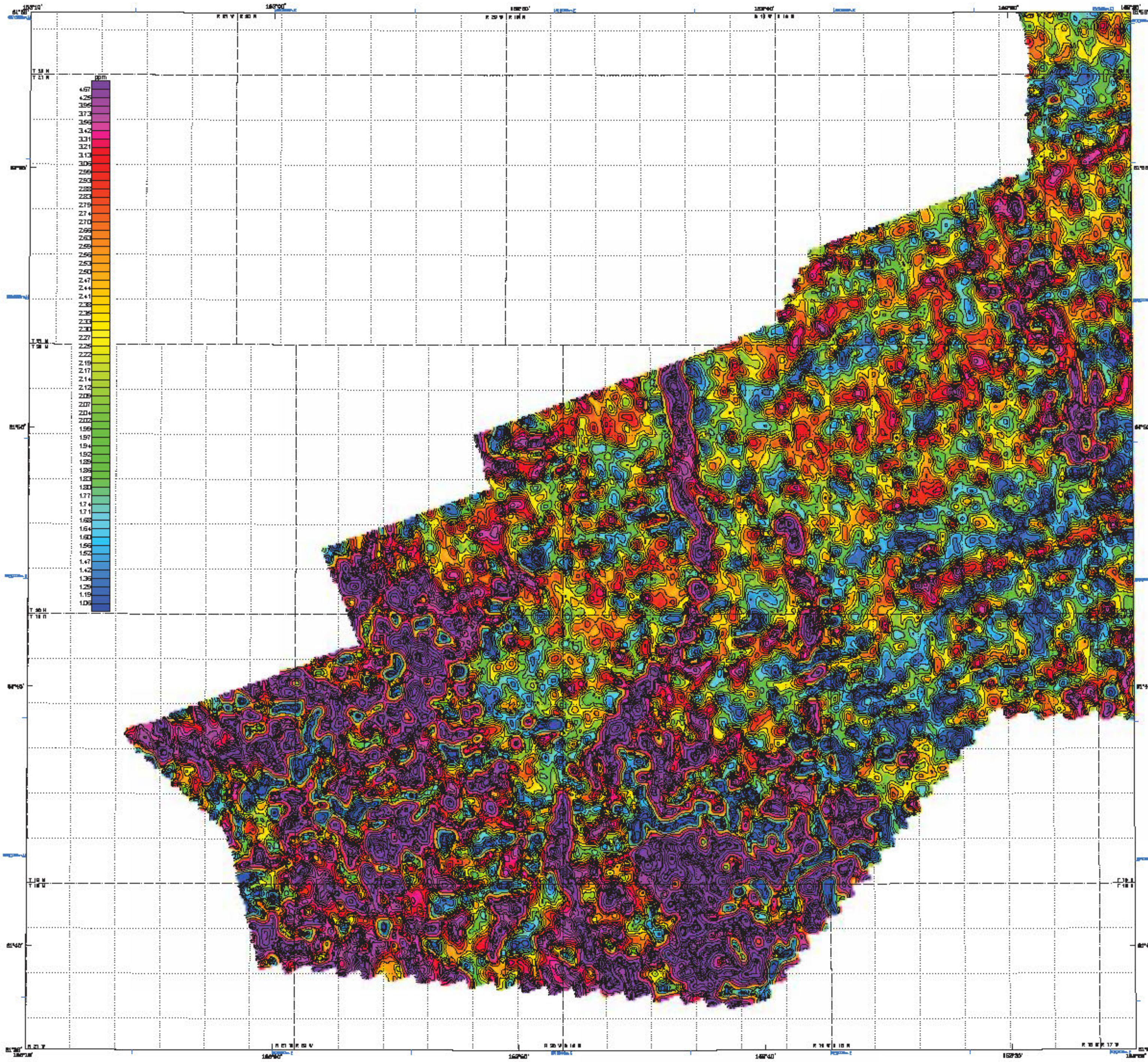
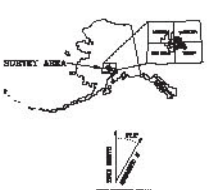
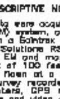


SCALE 1:63,360

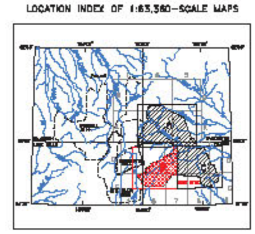
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS





LOCATION INDEX OF 1:63,360-SCALE MAPS



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by

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2014

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CONTOUR INTERVAL

.... 5.00 ppm

.... 1.00 ppm

.... 0.20 ppm

SURVEY HISTORY

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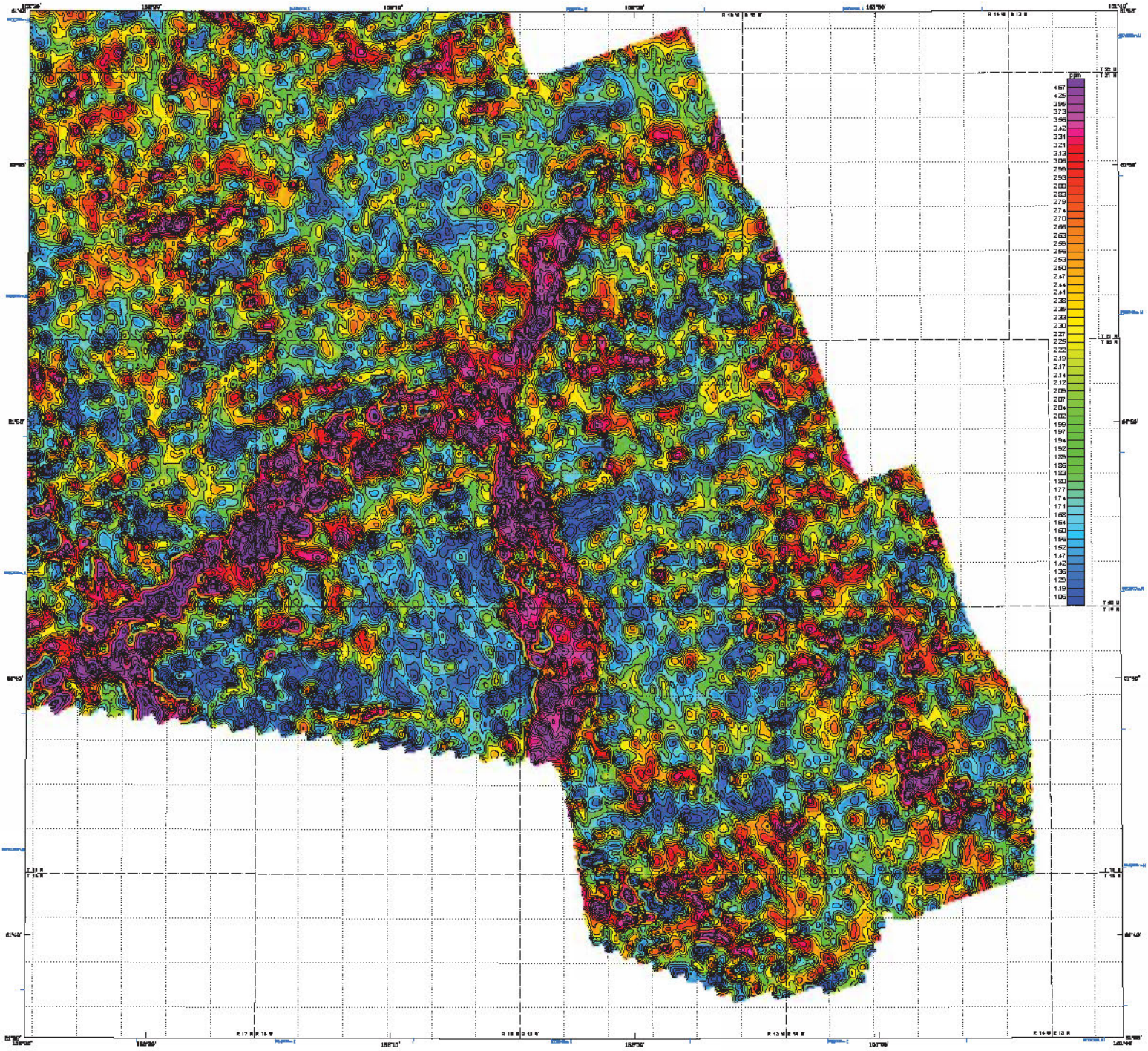
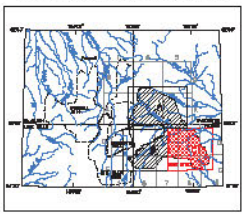


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



URANIUM (eU) WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LINE HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM V Electromagnetic (EM) system, a CGS 01344 cesium magnetometer with a Sonntek CSJ cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation systems, 50/60 Hz monitors and video cameras. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE–SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#8–GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2815 keV) and cosmic radiation (3065–6600 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 300 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveys, Technical Report 323, International Atomic Energy Agency, Vienna.

CONTOUR INTERVAL

0.50 ppm . . . . . 5.00 ppm

0.20 ppm . . . . . 1.00 ppm

0.20 ppm . . . . . 0.20 ppm

SURVEY HISTORY

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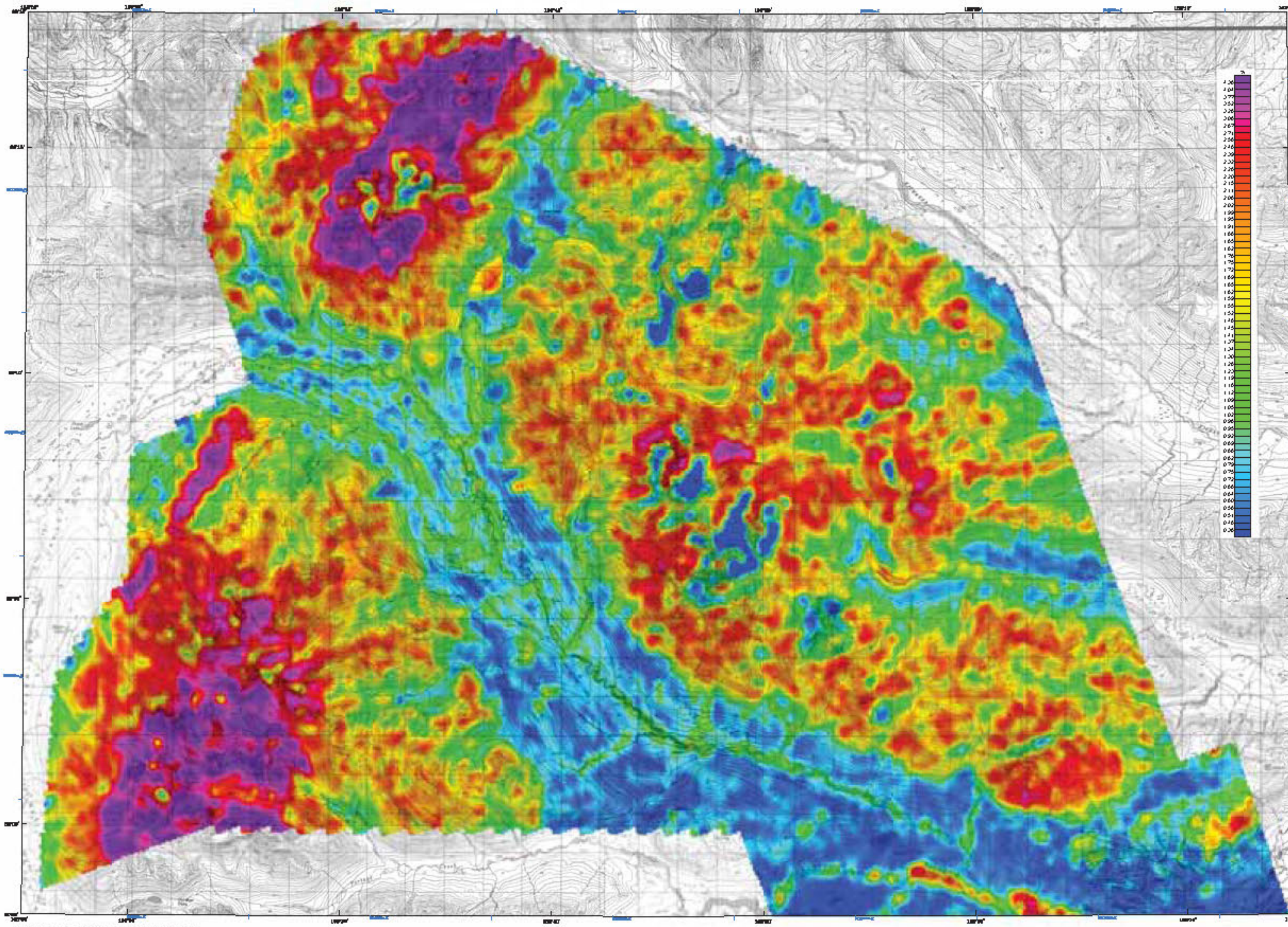
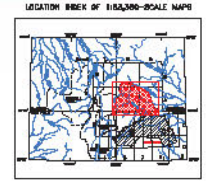


SCALE 1:63,360

LOCATION INDEX OF 1:63,360-SCALE MAPS



POTASSIUM (%K) WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CSC 01344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

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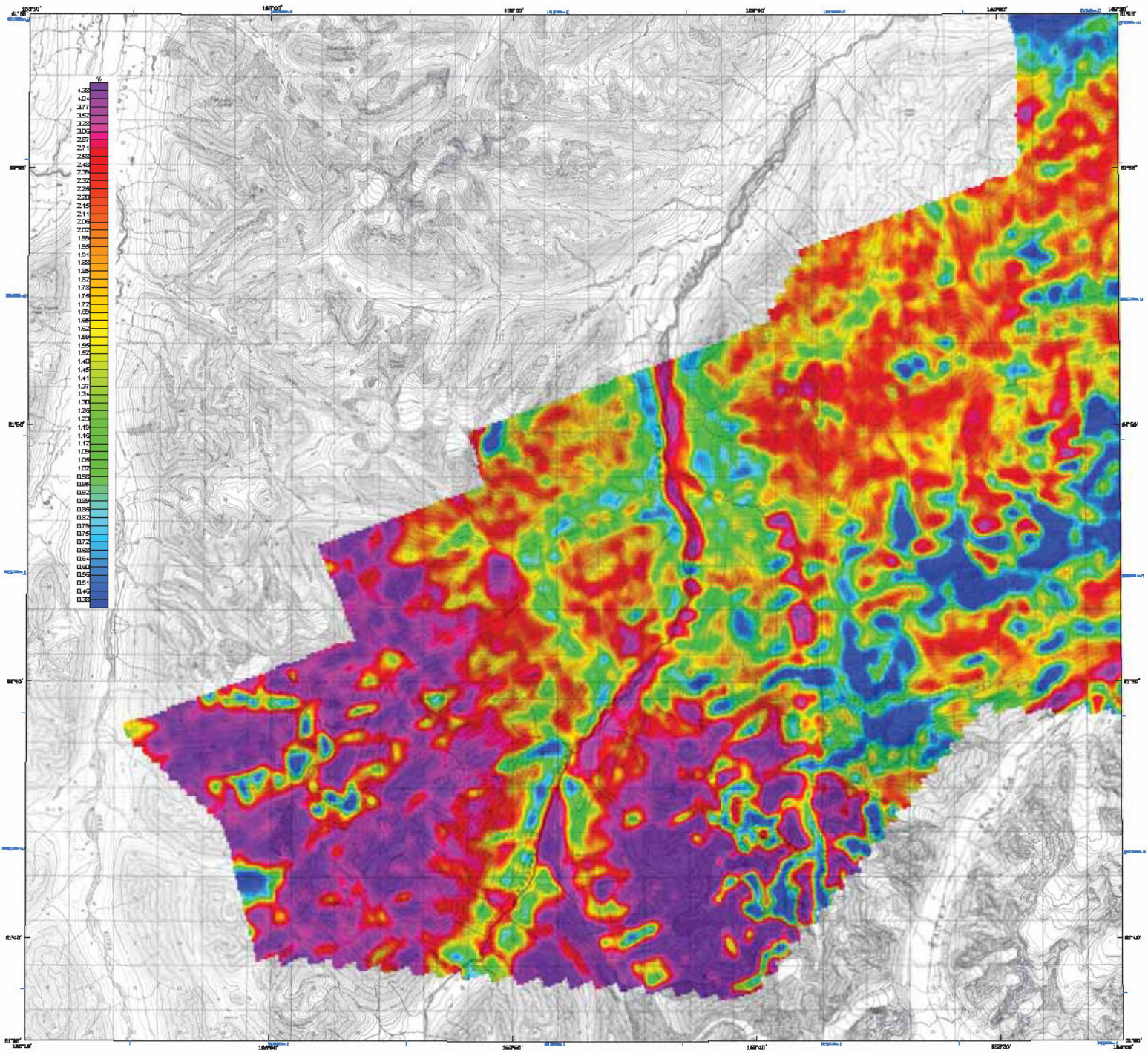
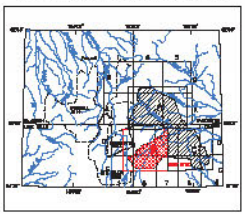


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



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by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

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A Novatel DL-V3-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 18.81. (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1880 keV), potassium (1370–1570 keV), total radioactivity (400–2810 keV) and cosmic radiation (3005–6600 keV). Counts from the radon detector were recorded in the radon window (1660–1880 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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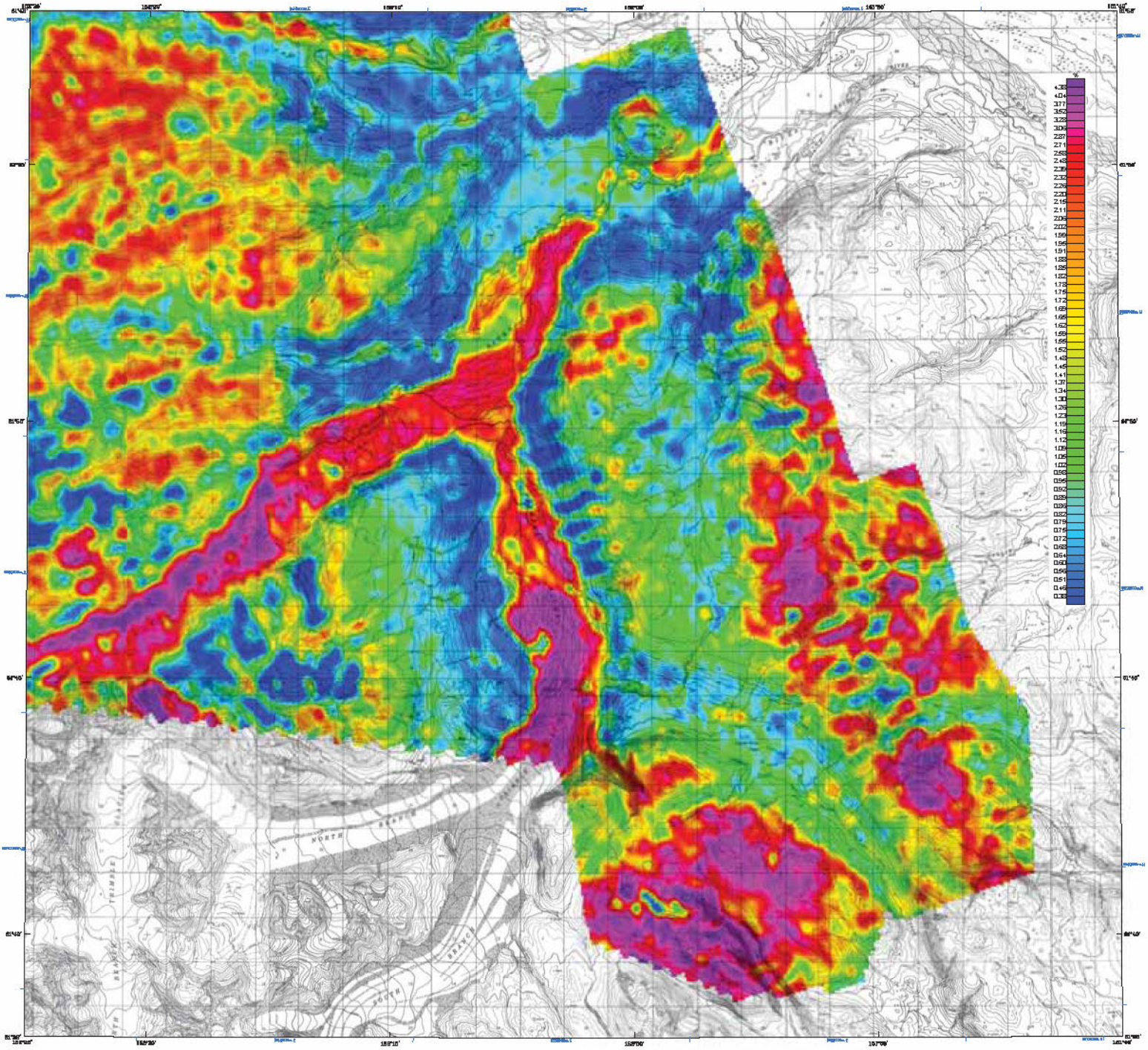


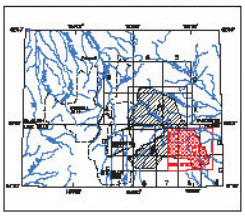
SURVEY AREA

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



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by

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A Novatel DL#3-RT2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 18.81. (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L. (258 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1880 keV), potassium (1370–1570 keV), total radioactivity (400–2810 keV) and cosmic radiation (3000–6000 keV). Counts from the radon detector were recorded in the radon window (1660–1880 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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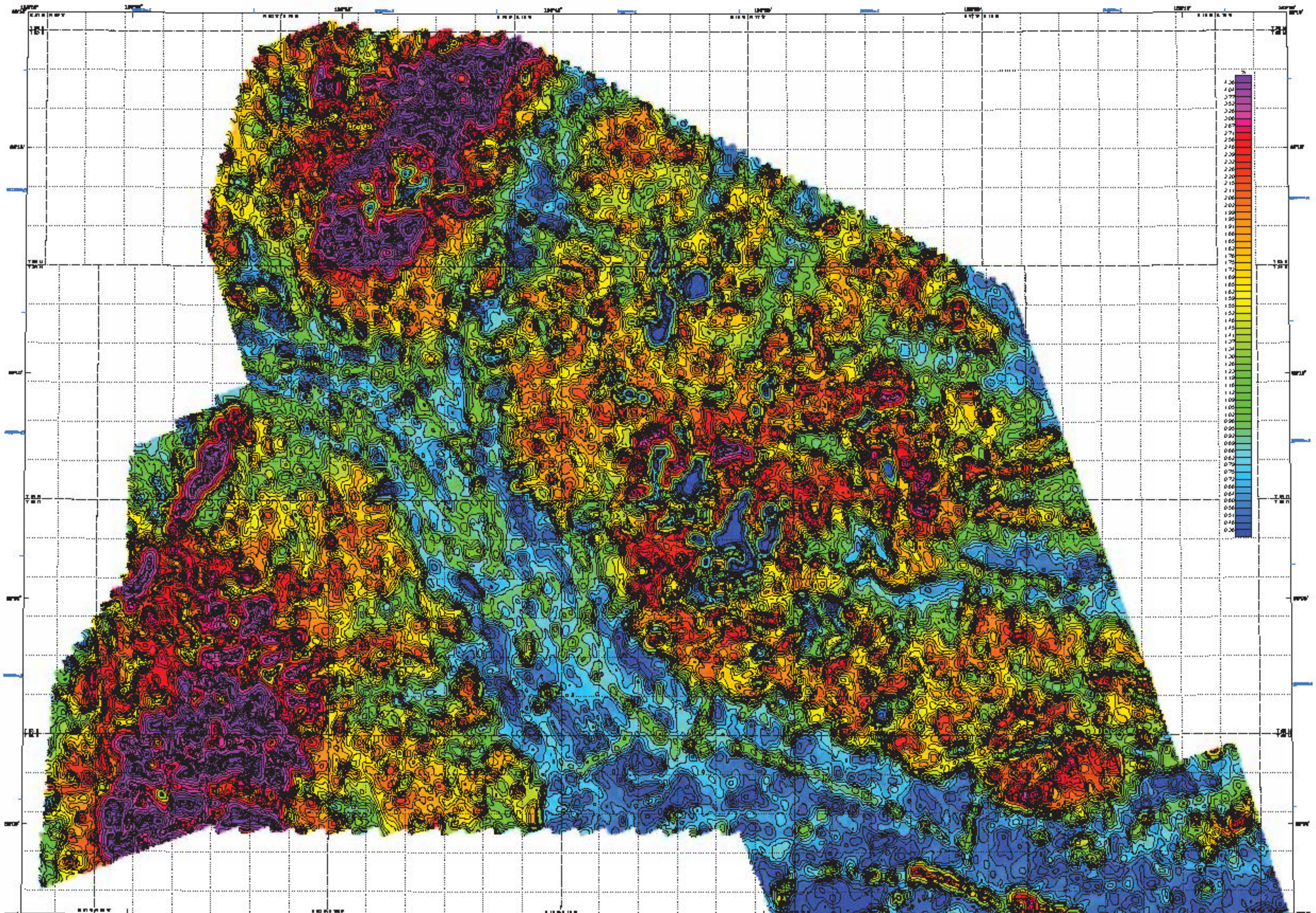

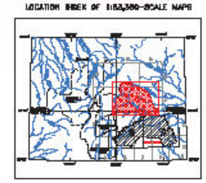

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by
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2014

DESCRIPTIVE NOTES

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A Novatel OEMV-3GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

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CONTOUR INTERVAL

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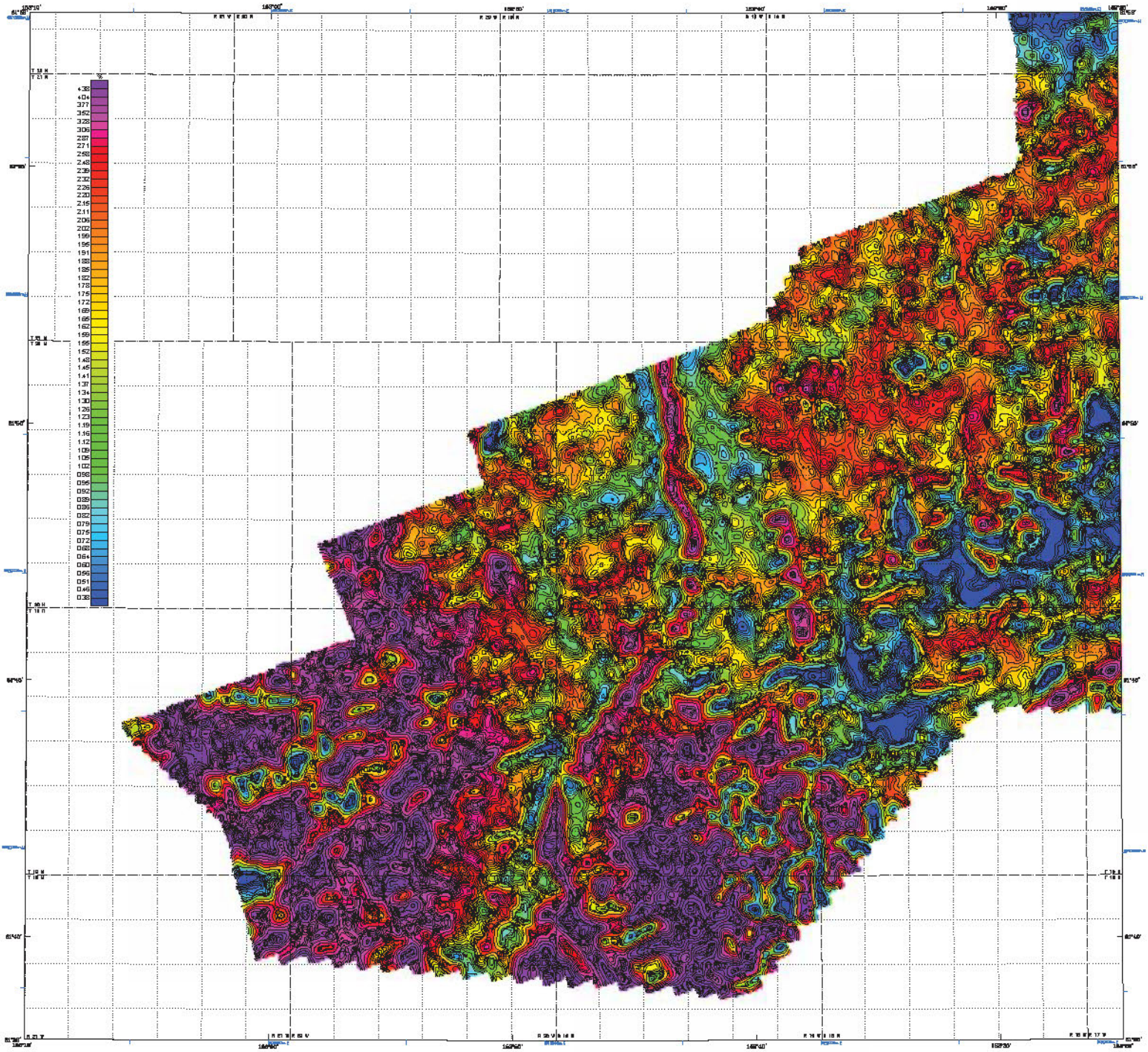

SCALE 1:63,360

1 0 1 2 3 4 MILES

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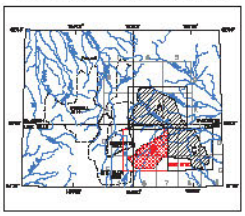
LOCATION INDEX OF 1:63,360-SCALE MAPS



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CONTOUR INTERVAL

0.60 %

0.30 %

0.10 %

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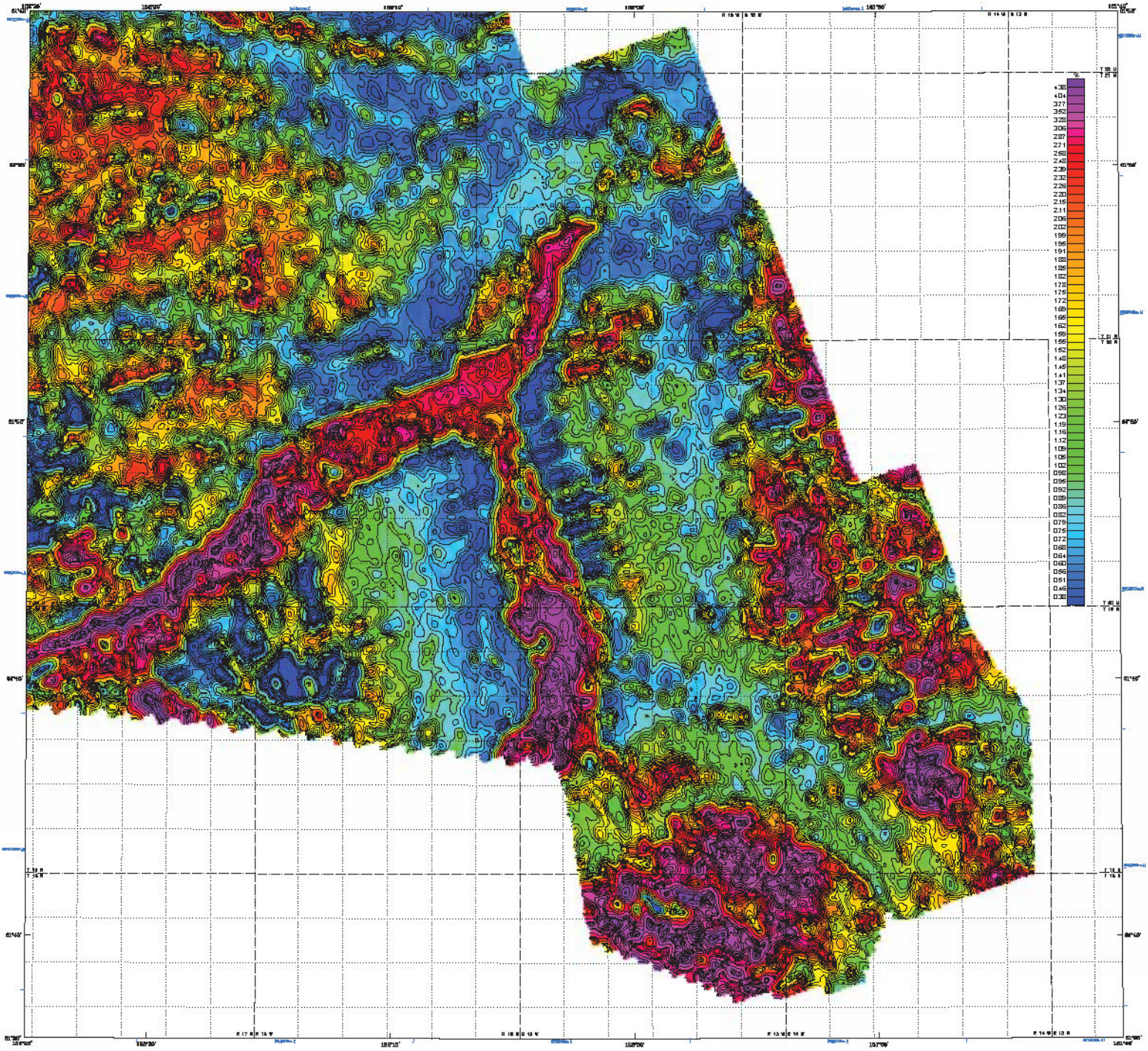

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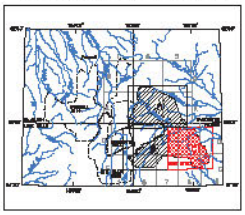
LOCATION INDEX OF 1:63,360-SCALE MAPS



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2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, a GDS 01344 cesium magnetometer with a Sohntrek GS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation systems, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#3-RT2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2815 keV) and cosmic radiation (3065–6600 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 300 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

CONTOUR INTERVAL

0.40 %

0.20 %

0.10 %

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the grey area acquired and processed by DGS in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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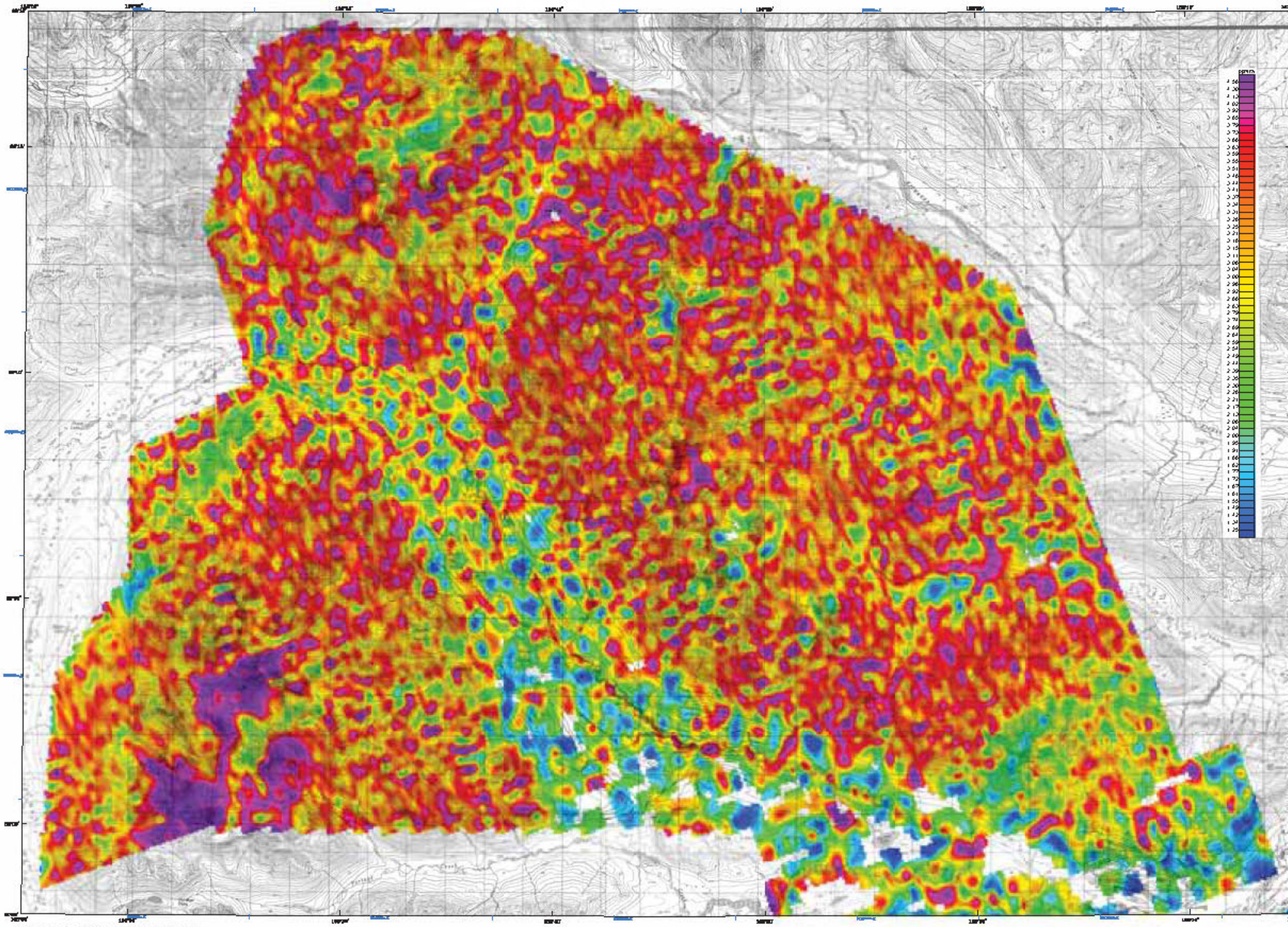


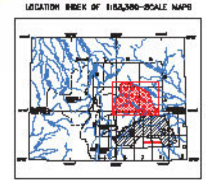
SCALE 1:63,360

THORIUM / POTASSIUM (eTh / %K) WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2014

LOCATION INDEX OF 1:63,360-SCALE MAPS



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, a CCS 01344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

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International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

THORIUM / POTASSIUM (eTh / %K)

Measured radioelement concentrations for potassium and thorium will vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another.

A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio.

SURVEY HISTORY

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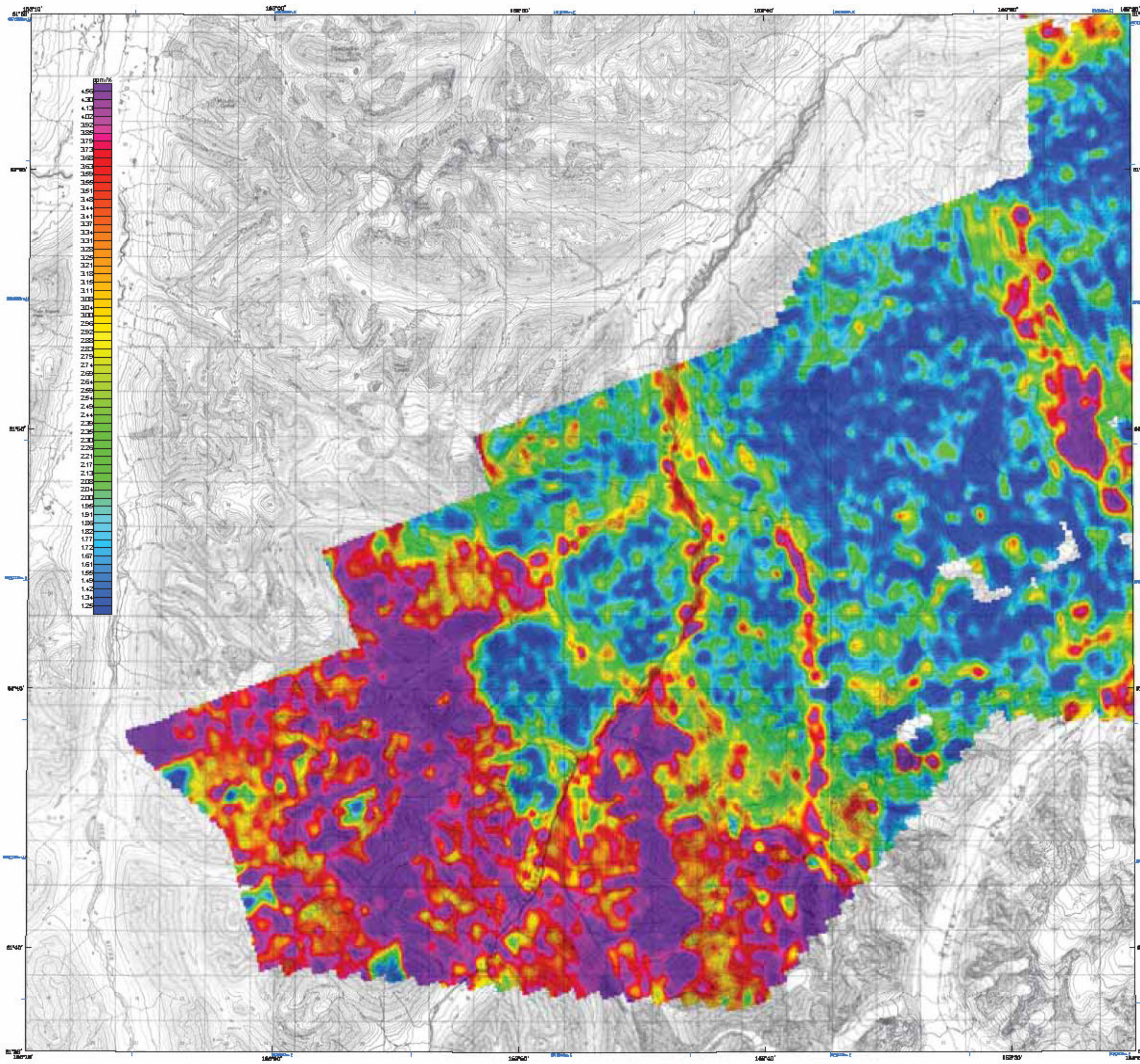


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

THORIUM / POTASSIUM (eTh / %K) WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

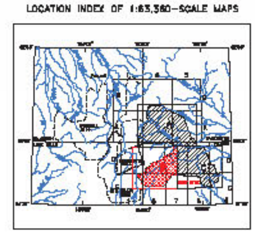
PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

LOCATION INDEX OF 1:63,360-SCALE MAPS



DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM5-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2815 keV) and cosmic radiation (3000–>6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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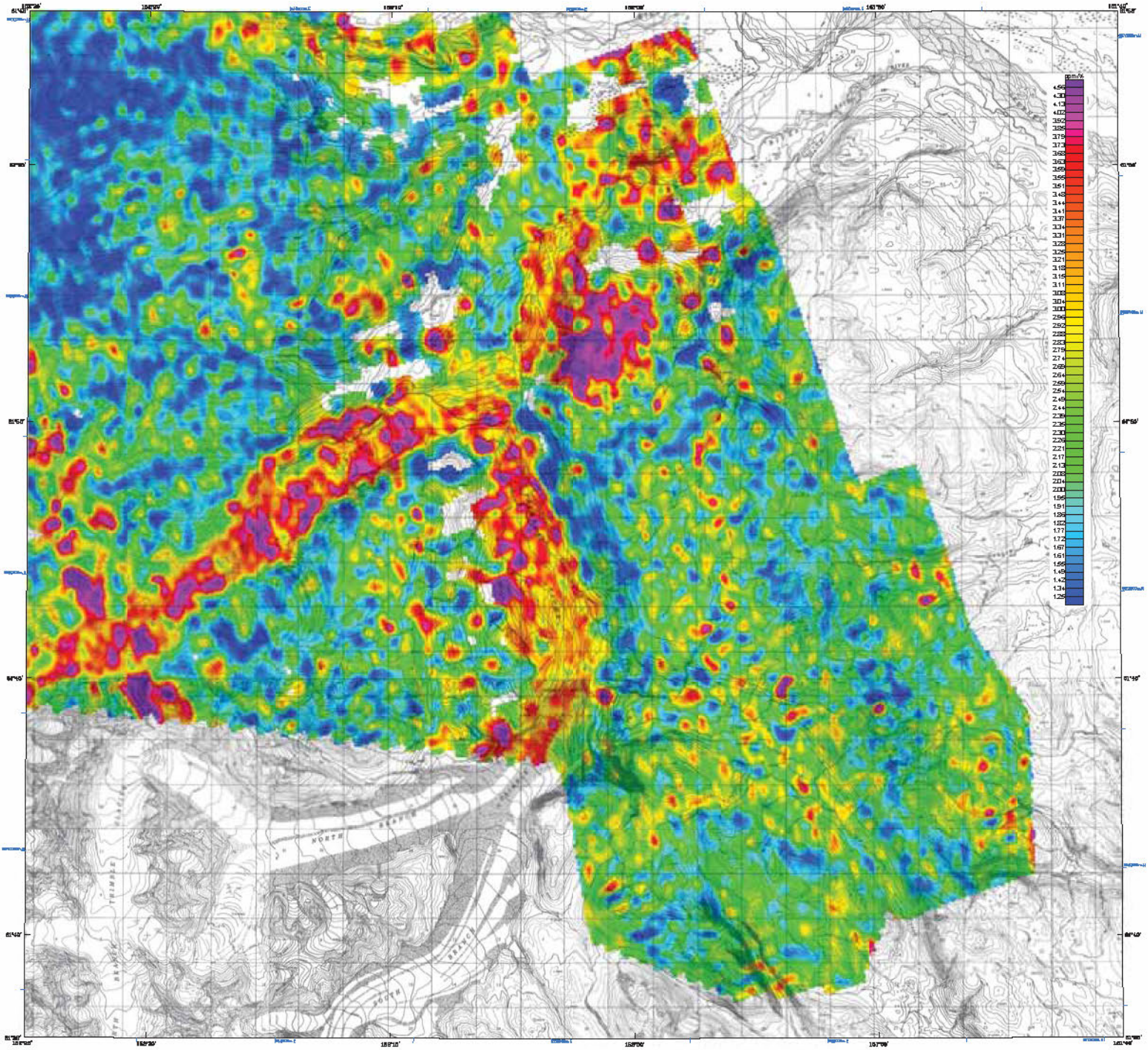
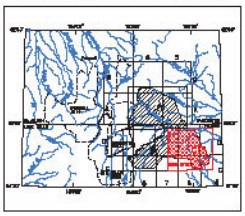


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 6 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



THORIUM / POTASSIUM (eTh / %K) WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, a CSA G-823 cesium magnetometer with a Sabritek GSJ cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation systems, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#8-GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cu/in. inches) of main (downward) NaI crystal detector, and 4.2L (256 cu/in inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1890 keV), potassium (1370–1570 keV), total radioactivity (400–2810 keV) and cosmic radiation (3000–6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 250 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

THORIUM / POTASSIUM (eTh / %K)

Measured radioelement concentrations for potassium and thorium will vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another.

A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by DGS in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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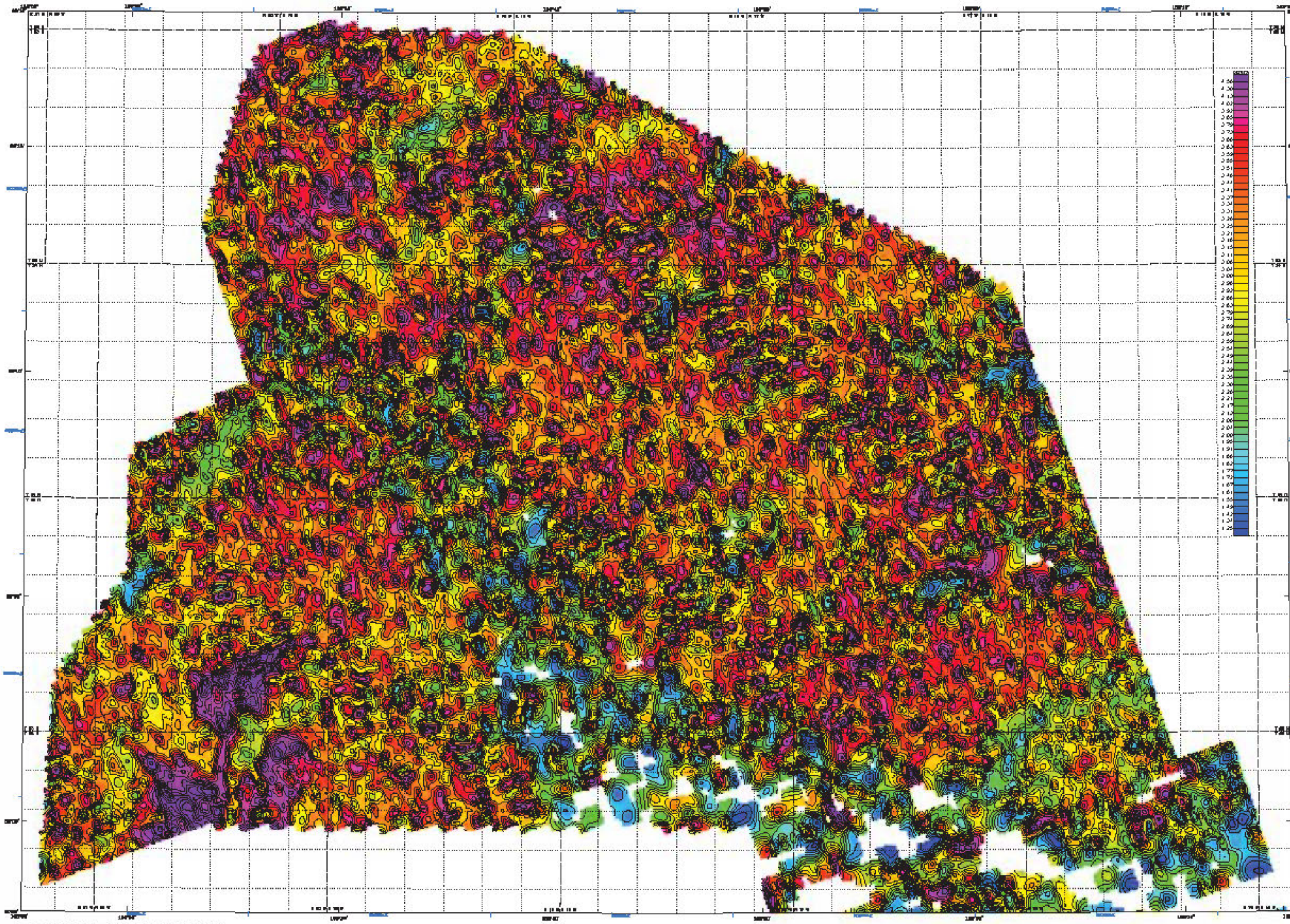
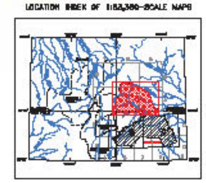


SCALE 1:63,360



THORIUM / POTASSIUM (eTh / %K) WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CCS 01344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEMV-3GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

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CONTOUR INTERVAL

0.2 ppm/%
0.1 ppm/%
0.05 ppm/%

SURVEY HISTORY

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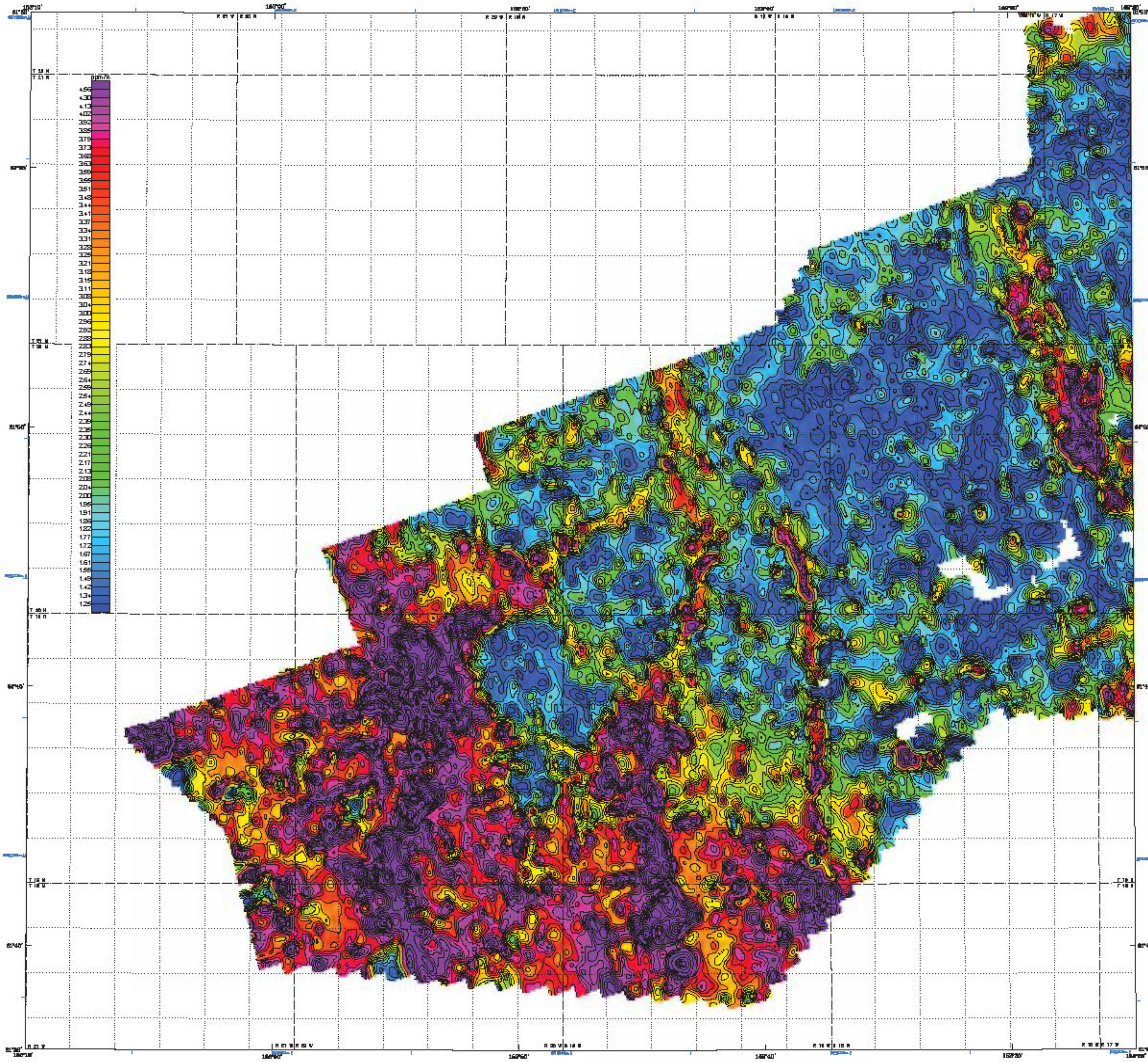

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PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

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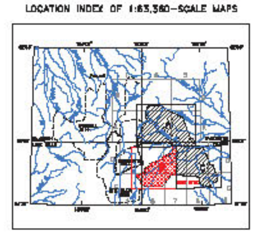
2014

SCALE 1:63,360

LOCATION INDEX OF 1:63,360-SCALE MAPS



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CONTOUR INTERVAL

5.0 ppm/%
1.0 ppm/%
0.2 ppm/%

SURVEY HISTORY

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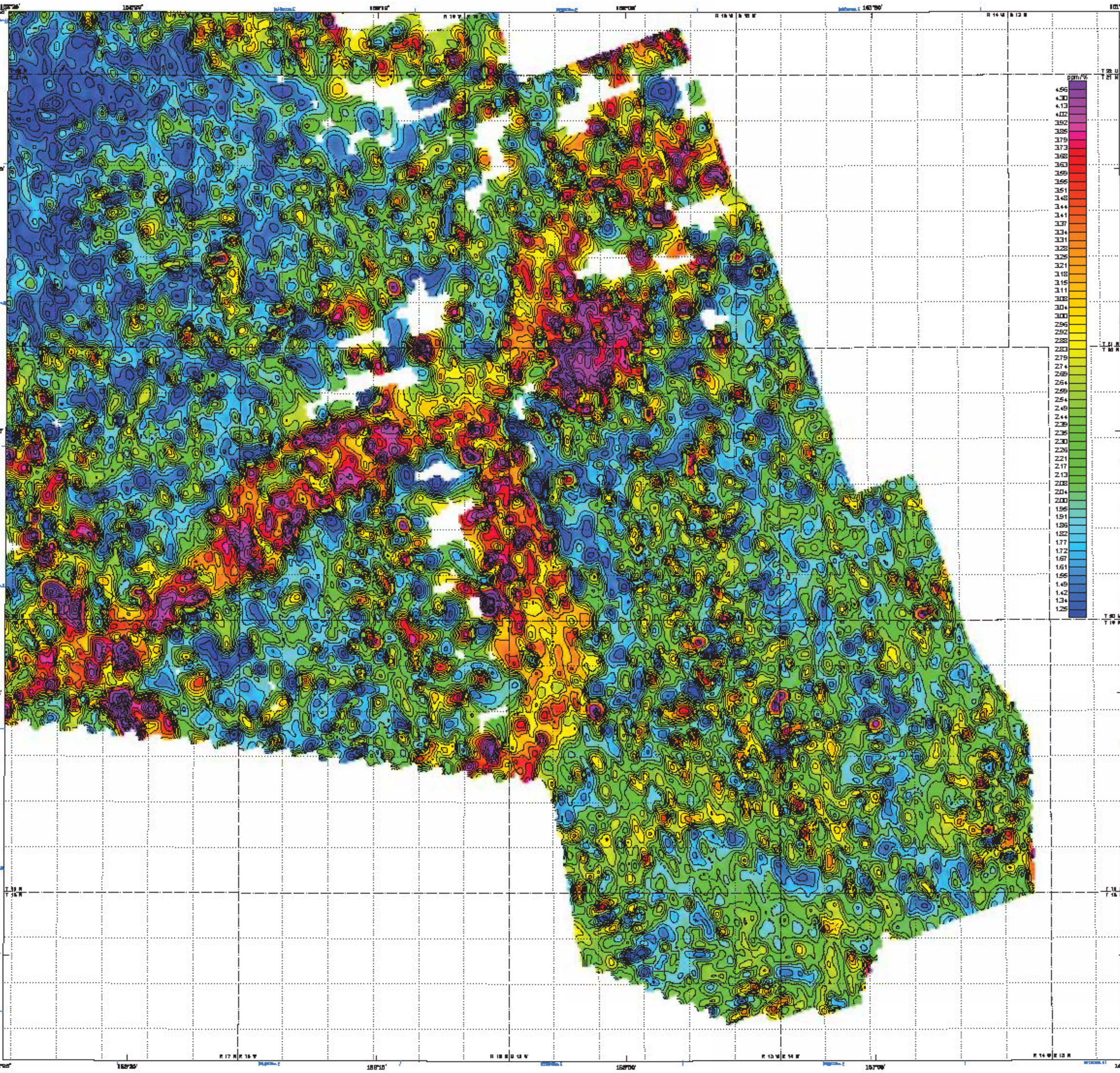
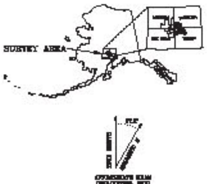
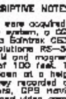
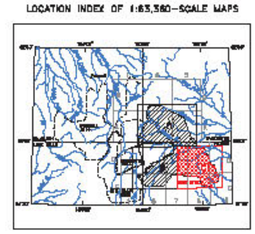






LOCATION INDEX OF 1:63,360-SCALE MAPS



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RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2815 keV) and cosmic radiation (3000–>6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying. Technical Report 323, International Atomic Energy Agency, Vienna.

THORIUM / POTASSIUM (eTh / %K)

Measured radioelement concentrations for potassium and thorium will vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another.

A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio.

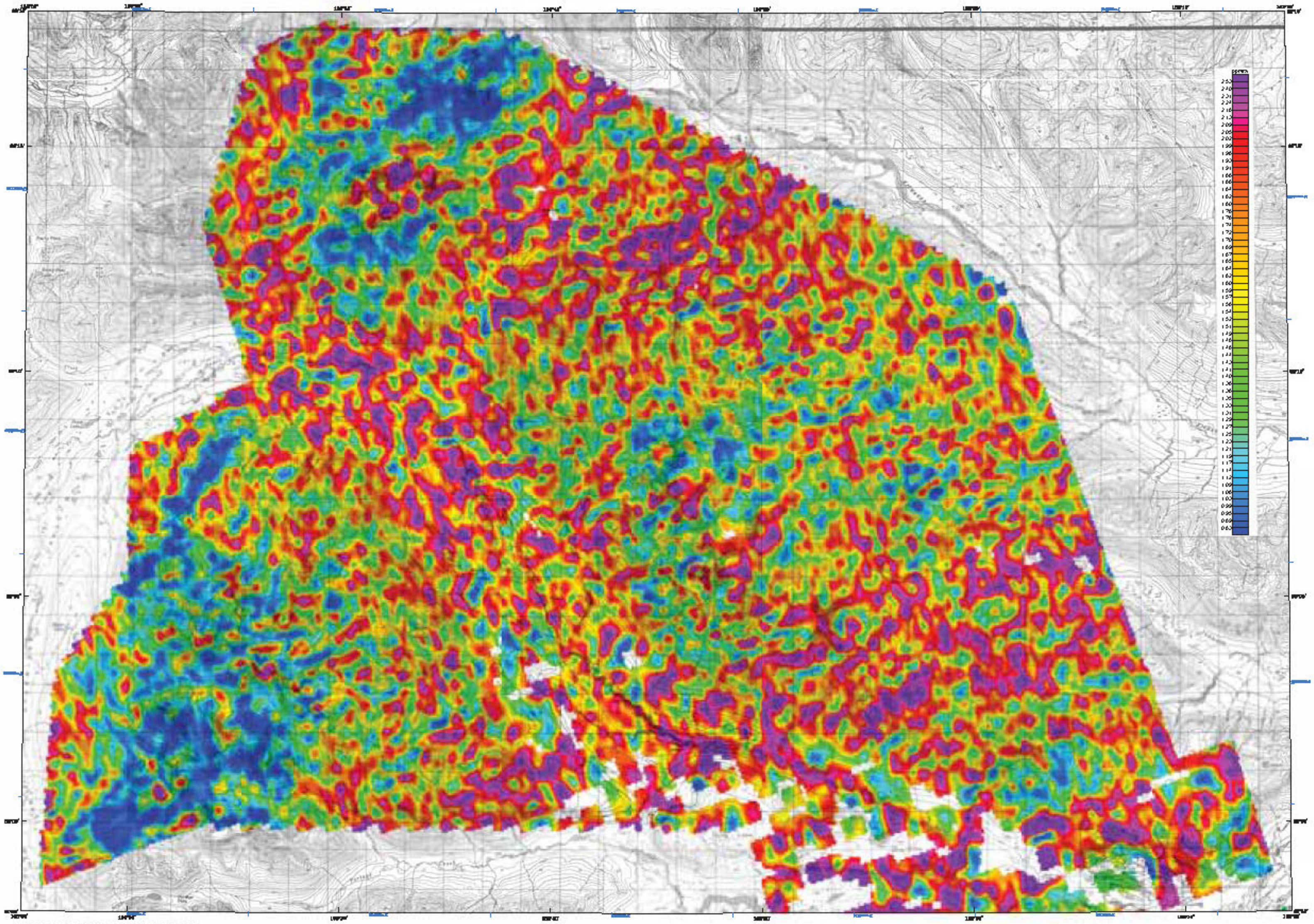
CONTOUR INTERVAL

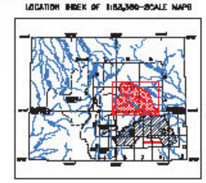
————	5.0 ppm/%
————	1.0 ppm/%
————	0.2 ppm/%

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGS website (www.dggs.alaska.gov/pubs). Maps are also available on paper through the DGGS office, and are viewable online at the website in Adobe Acrobat .PDF file format.





URANIUM / POTASSIUM (eU / %K) WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEMV-3DL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2810 keV) and cosmic radiation (3000–>6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

URANIUM / POTASSIUM (eU / %K)

Measured radioelement concentrations for uranium and potassium will vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another.

A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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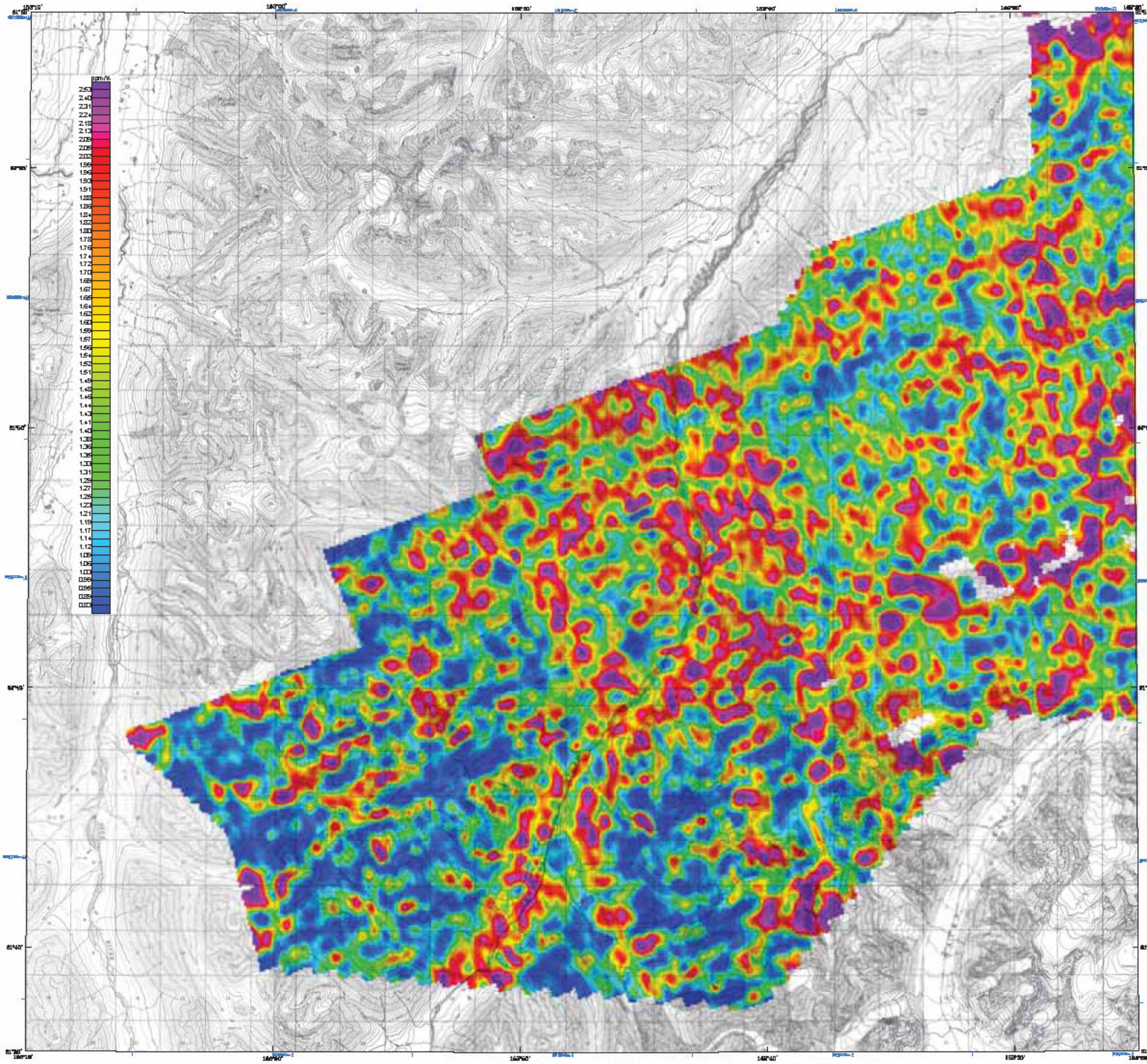
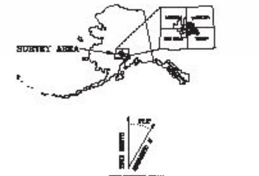
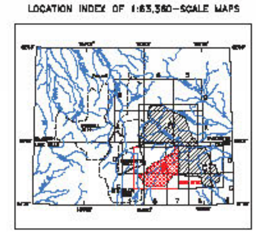




LOCATION INDEX OF 1:63,360-SCALE MAPS



SCALE 1:63,360

URANIUM / POTASSIUM (eU / %K) WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2815 keV) and cosmic radiation (3000–>6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

URANIUM / POTASSIUM (eU / %K)

Measured radioelement concentrations for uranium and potassium will vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another.

A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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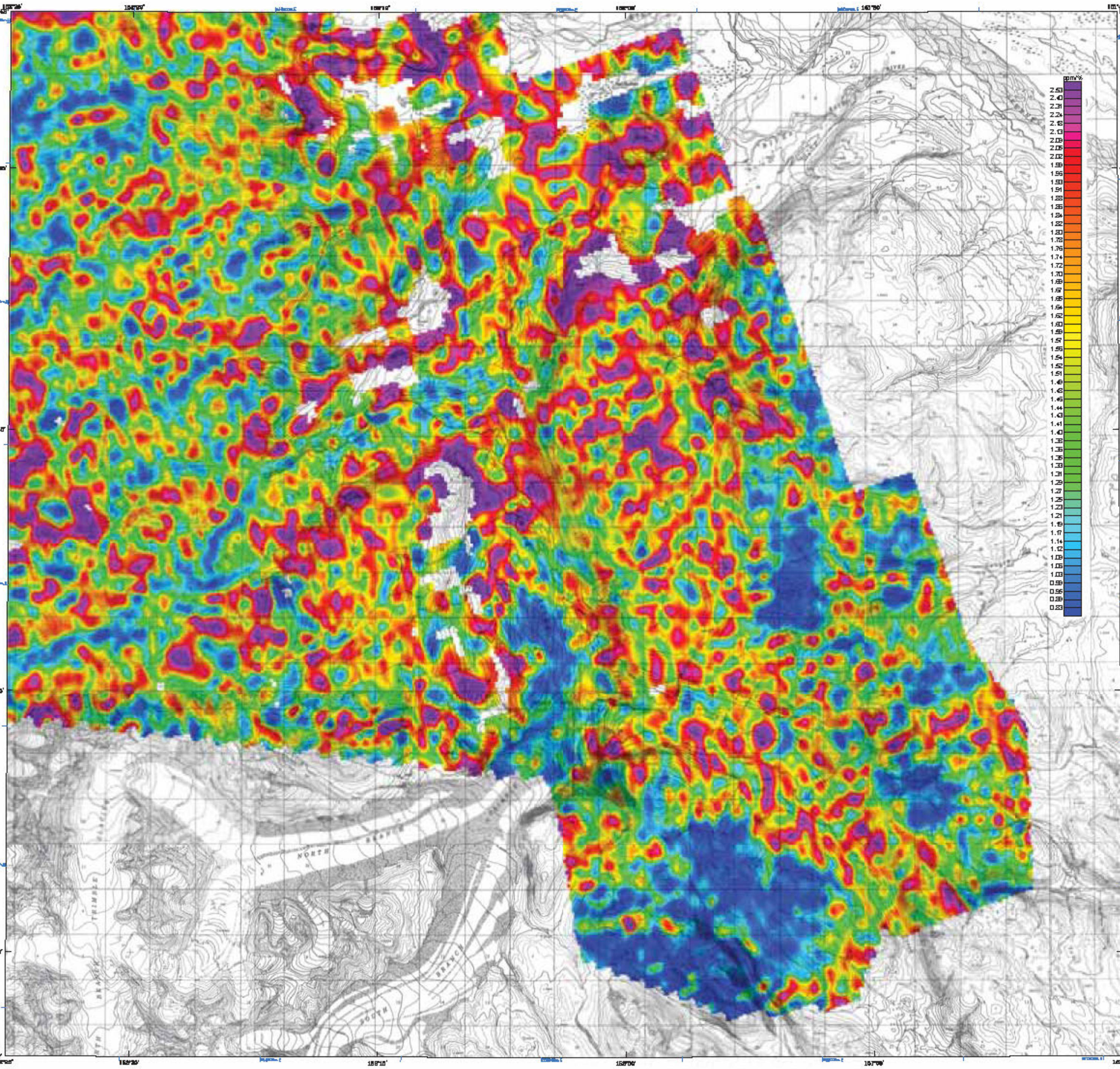
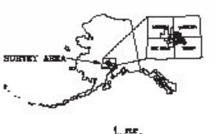
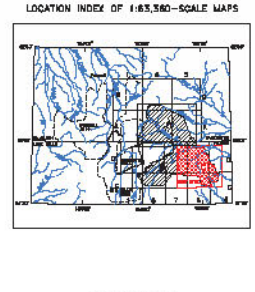


SCALE 1:63,360



LOCATION INDEX OF 1:63,360-SCALE MAPS



URANIUM / POTASSIUM (eU / %K) WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^{V} Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEMV-3L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2815 keV) and cosmic radiation (3000–>6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying. Technical Report 323, International Atomic Energy Agency, Vienna.

URANIUM / POTASSIUM (eU / %K)

Measured radioelement concentrations for uranium and potassium will vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another.

A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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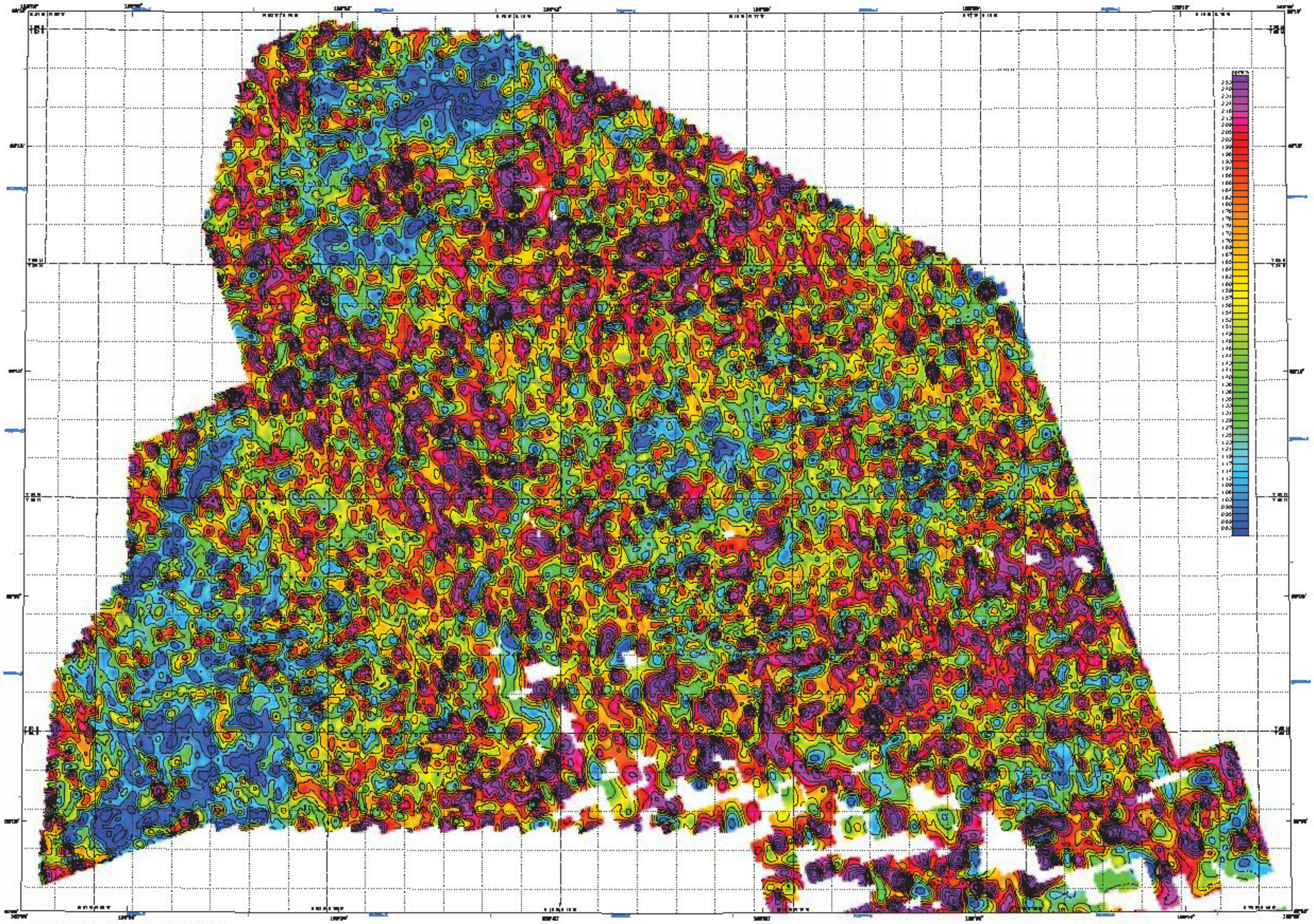

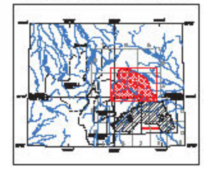

URANIUM / POTASSIUM (eU / %K) WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a DGC D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

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URANIUM / POTASSIUM (eU / %K)

Measured radioelement concentrations for uranium and potassium all vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another.

A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio.

CONTOUR INTERVAL

0.2 ppm/%

1.0 ppm/%

0.1 ppm/%

SURVEY HISTORY

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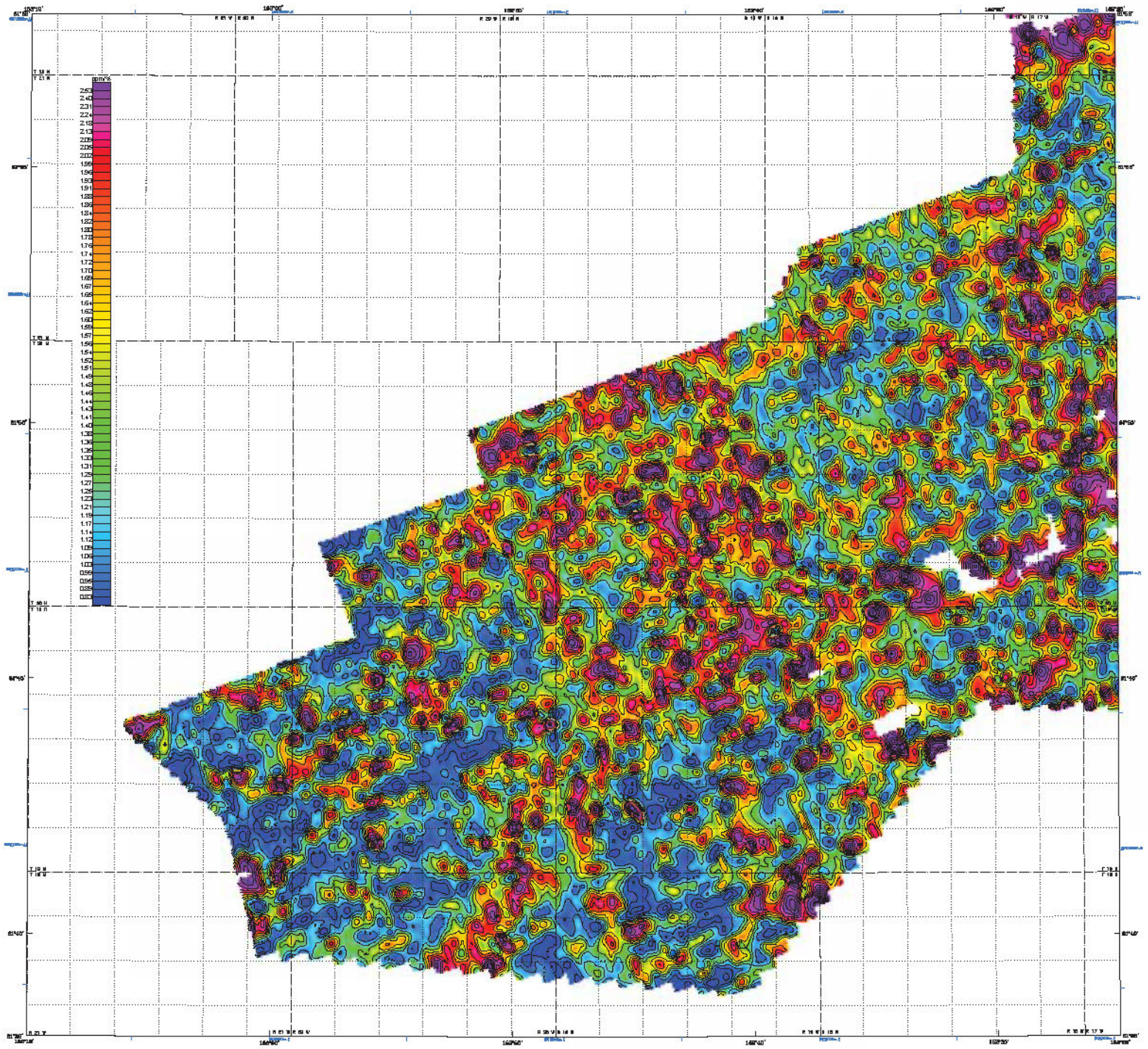
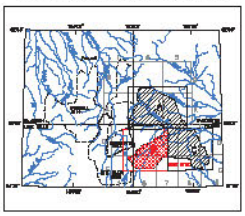


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



URANIUM / POTASSIUM (eU / %K) WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LINE HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, a CGS D1344 cesium magnetometer with a Gohtrek G53 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation systems, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE–SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#3–GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

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A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio.

CONTOUR INTERVAL

0.6 ppm/%

1.9 ppm/%

0.2 ppm/%

SURVEY HISTORY

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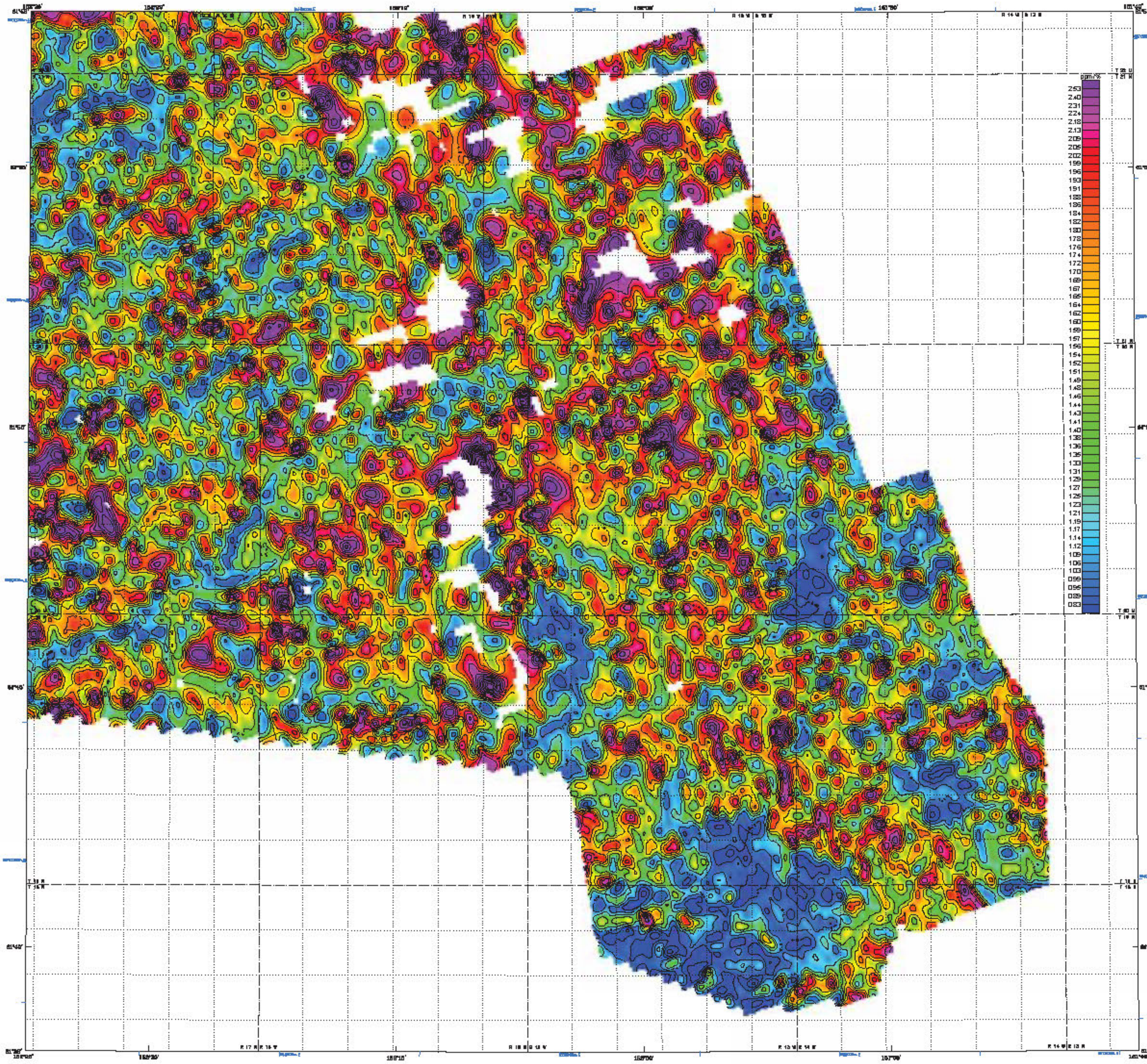
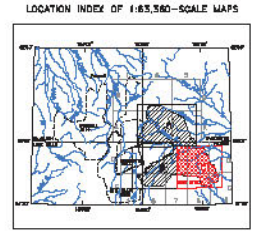


SCALE 1:63,360

LOCATION INDEX OF 1:63,360-SCALE MAPS



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RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2810 keV) and cosmic radiation (3000–>6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying. Technical Report 323, International Atomic Energy Agency, Vienna.

URANIUM / POTASSIUM (eU / %K)

Measured radioelement concentrations for uranium and potassium will vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another.

A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio.

CONTOUR INTERVAL

————	. . . . 5.0 ppm/%
————	. . . . 1.0 ppm/%
————	. . . . 0.2 ppm/%

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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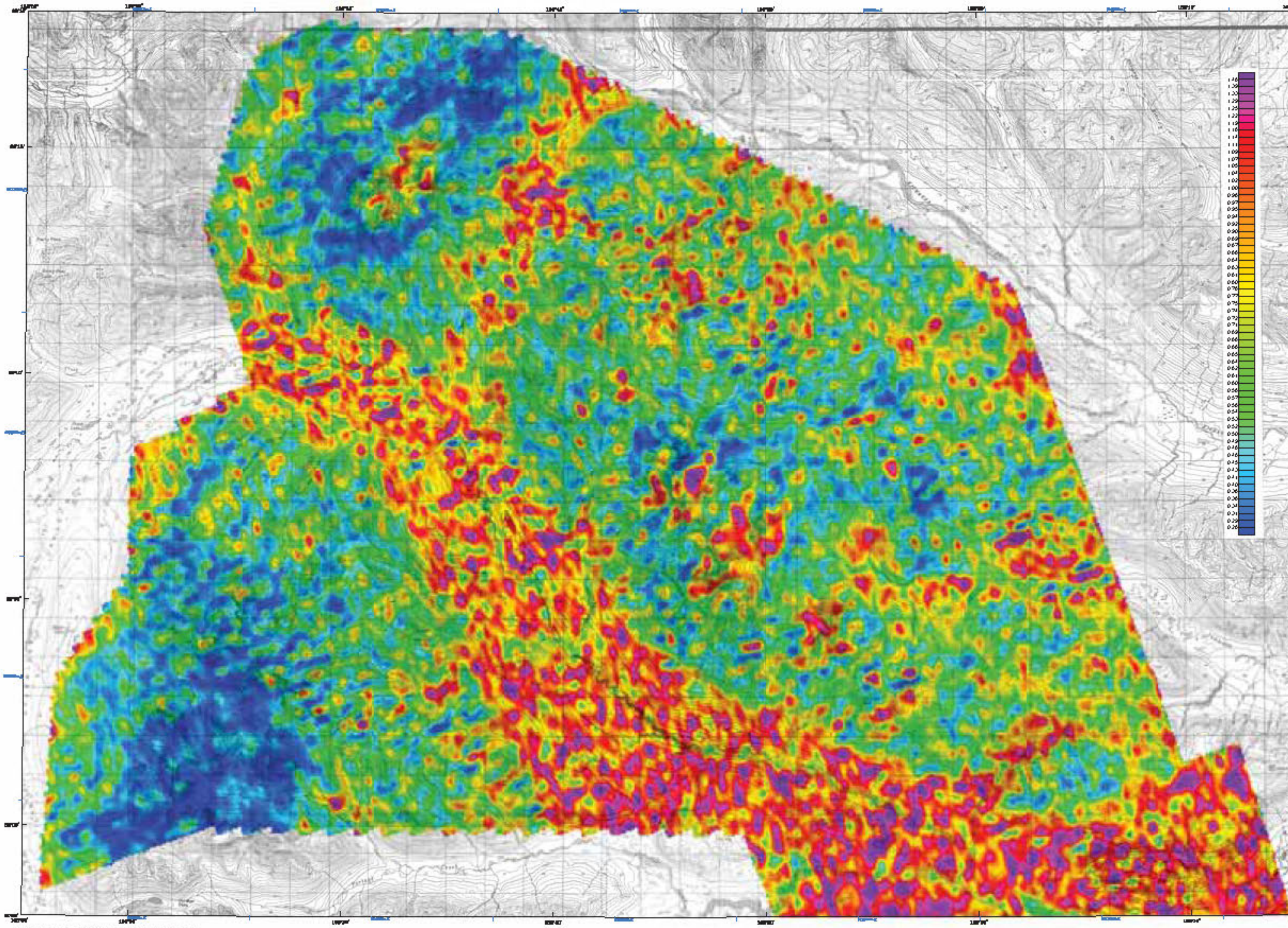

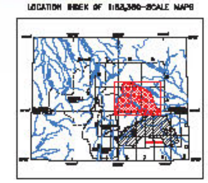

URANIUM / THORIUM (eU / eTh) WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CCS 01344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2810 keV) and cosmic radiation (3000–>6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

URANIUM / THORIUM (eU / eTh)

Measured radioelement concentrations for uranium and thorium all vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another.

A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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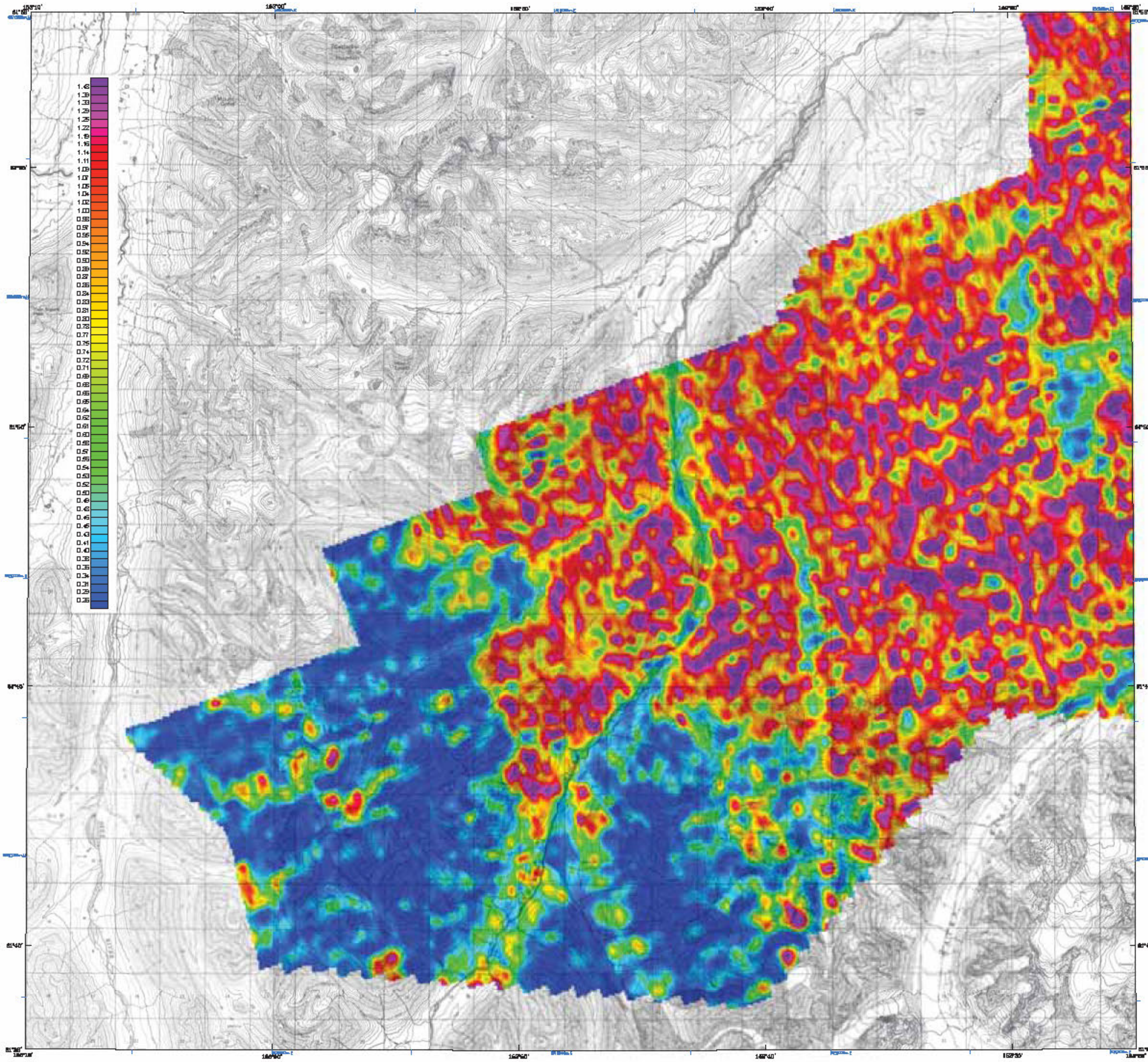
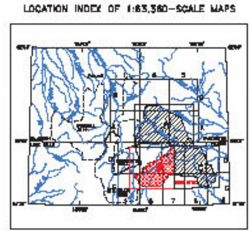


SCALE 1:63,360



URANIUM / THORIUM (eU / eTh) WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, CGG, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM^V Electromagnetic (EM) system, a CGG D1344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM5-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2815 keV) and cosmic radiation (3000–>6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying. Technical Report 323, International Atomic Energy Agency, Vienna.

URANIUM / THORIUM (eU / eTh)

Measured radioelement concentrations for uranium and thorium will vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another.

A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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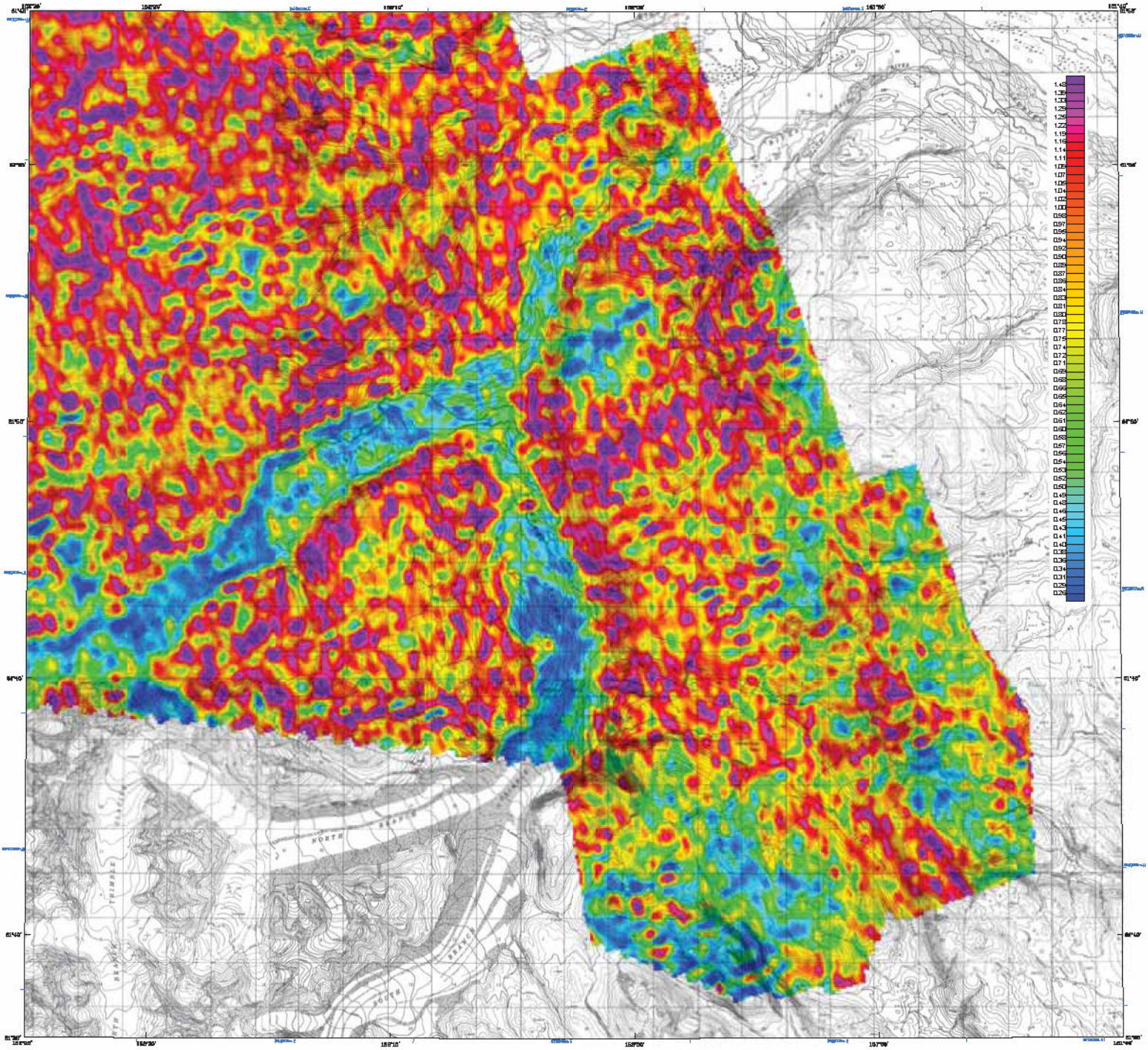
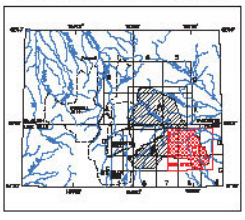


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



URANIUM / THORIUM (eU / eTh) WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, a CGS D1344 cesium magnetometer with a Sabritek GSJ cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation systems, 50/60 Hz monitors and video cameras. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#8-GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 1838. (1024 cu/in. inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1890 keV), potassium (1370–1570 keV), total radioactivity (400–2810 keV) and cosmic radiation (3000–6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 250 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

URANIUM / THORIUM (eU / eTh)

Measured radioelement concentrations for uranium and thorium will vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another.

A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio.

SURVEY HISTORY

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Fugro GeoServices, Inc. Airborne geophysical data for the area were acquired and processed by CGG in 2013 and 2014. Previously flown DGGS surveys adjacent to the current survey are shown in the location map by dashed lines, survey name, and date of publication. The project was funded by the Alaska State Legislature as part of the Alaska Airborne Geophysical and Geological Mineral Inventory Program.

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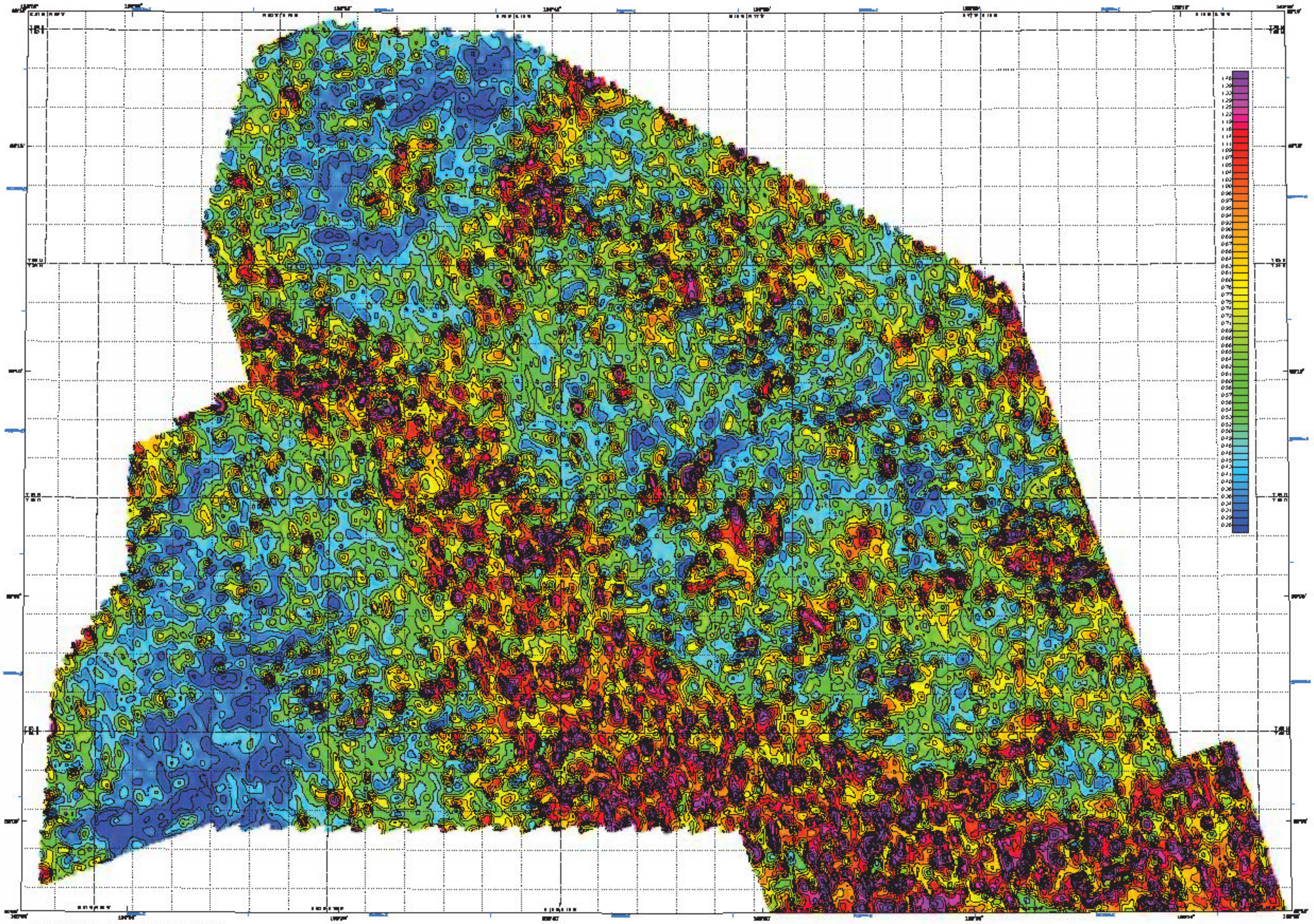
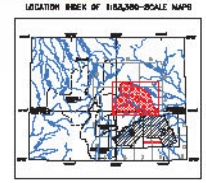


SCALE 1:63,360

LOCATION INDEX OF 1:63,360-SCALE MAPS



URANIUM / THORIUM (eU / eTh) WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CGG 01344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2810 keV) and cosmic radiation (3000–>6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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URANIUM / THORIUM (eU / eTh)

Measured radioelement concentrations for uranium and thorium will vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another.

A black region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio.

CONTOUR INTERVAL

————	1.0
————	0.5
————	0.1

SURVEY HISTORY

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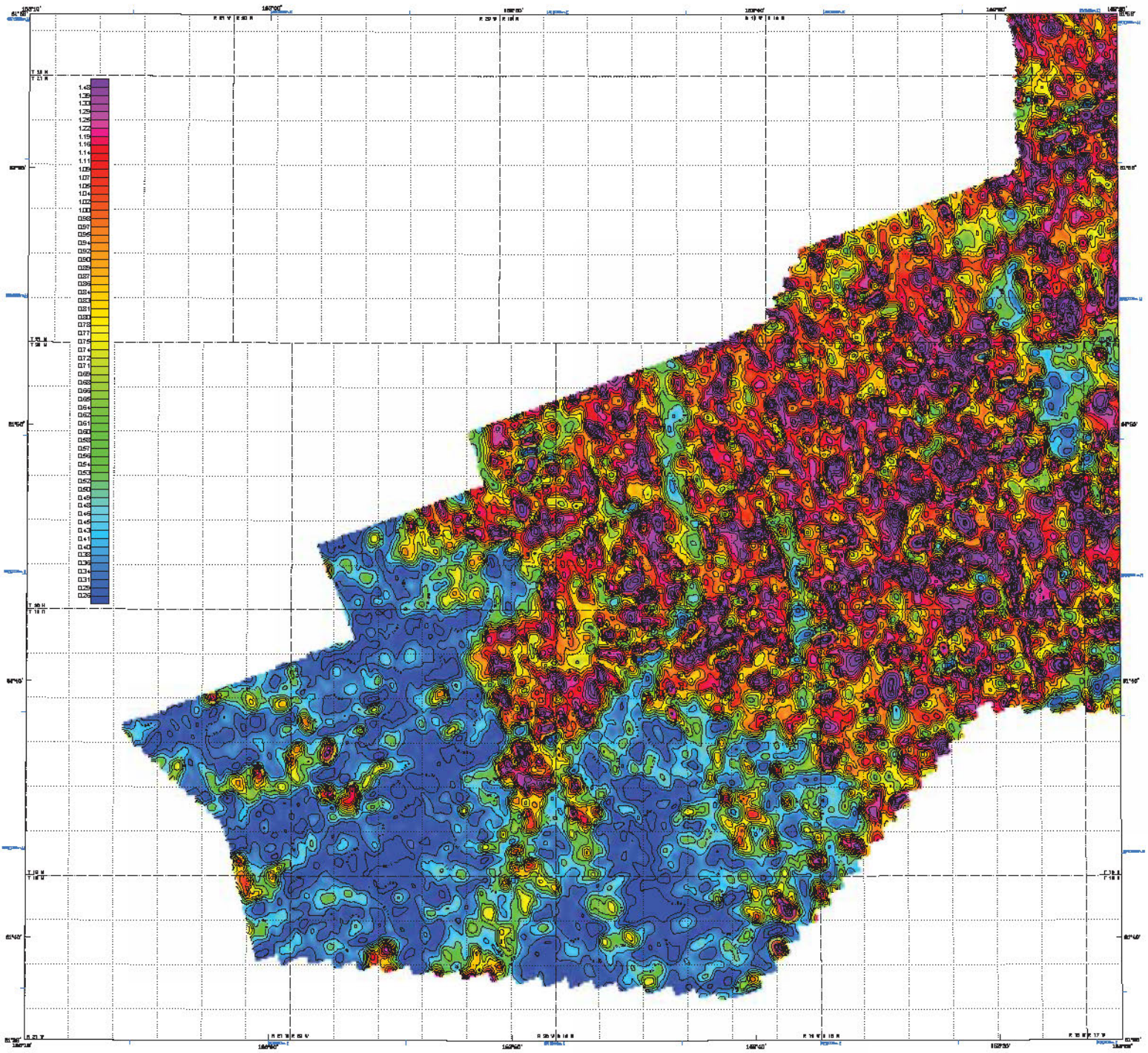
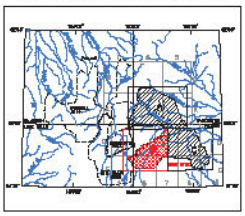


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



URANIUM / THORIUM (eU / eTh) WITH DATA CONTOURS, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LINE HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, a CGS 01344 cesium magnetometer with a Gohtrek G53 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation systems, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#6-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1880 keV), potassium (1370–1570 keV), total radioactivity (400–2810 keV) and cesium radiation (5060–5800 keV). Counts from the radon detector were recorded in the radon window (1660–1880 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departure from the planned survey elevation of 300 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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URANIUM / THORIUM (eU / eTh)

Measured radioelement concentrations for uranium and thorium will vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another.

A blank region indicates an area where the surveyed concentrations fall below thresholds required for a meaningful calculation of the ratio.

CONTOUR INTERVAL

0.6

0.3

0.1

SURVEY HISTORY

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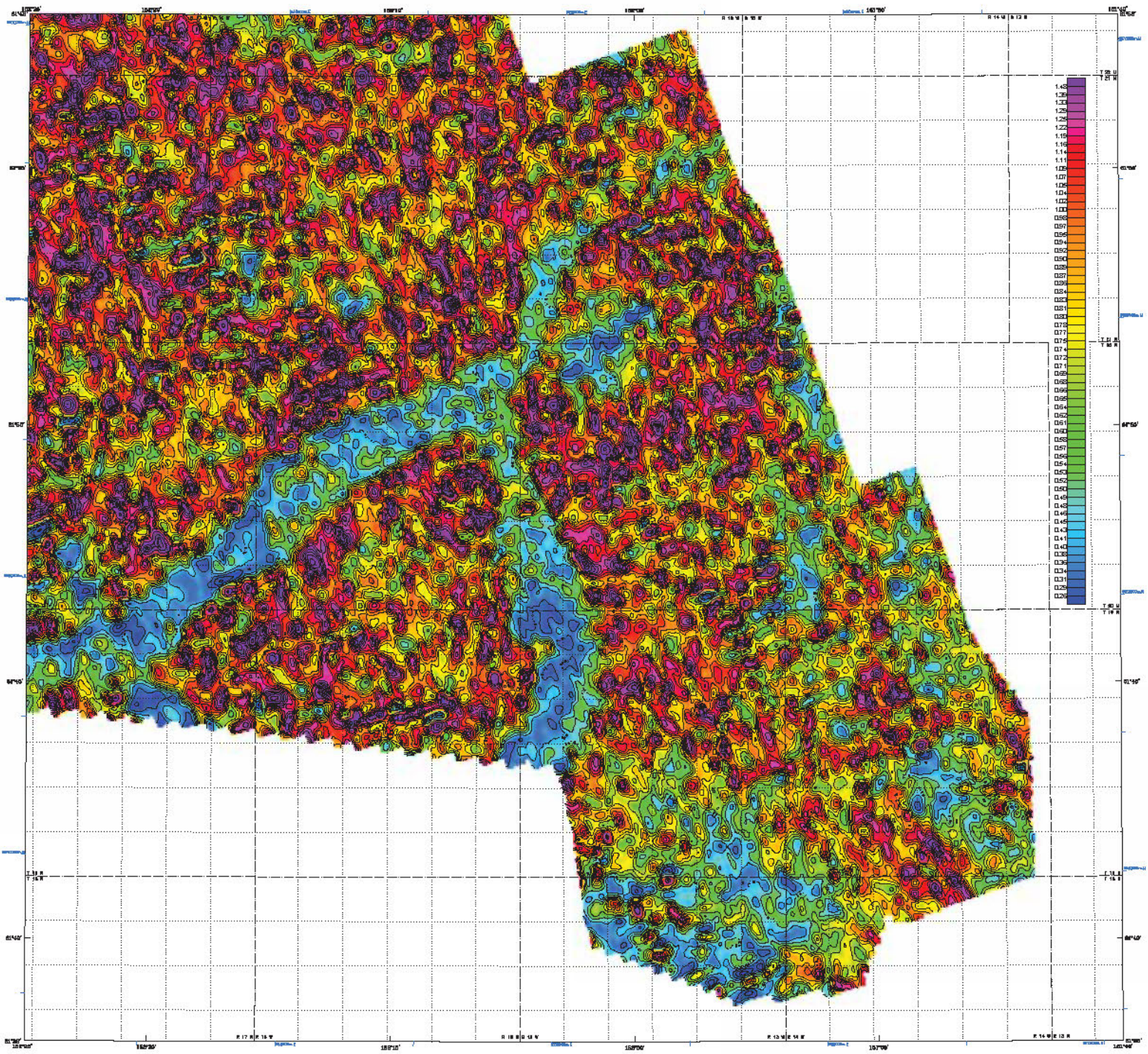
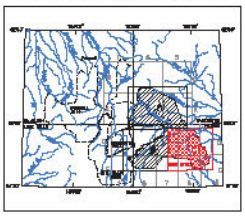


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



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by

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2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, a GDS 01344 cesium magnetometer with a Sahtrek G33 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation systems, 50/60 Hz monitors and video cameras. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#3-RT2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2810 keV) and cosmic radiation (3000–6000 keV). Counts from the radon detector were recorded in the radon window (1860–1960 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 300 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

URANIUM / THORIUM (eU / eTh)

Measured radioelement concentrations for uranium and thorium will vary sympathetically with variations in soil thickness and moisture content. The ratio parameter isolates areas of enrichment of one radioelement relative to another.

A blank region indicates an area where the summed concentrations fall below thresholds required for a meaningful calculation of the ratio.

CONTOUR INTERVAL

3.0

0.3

0.1

SURVEY HISTORY

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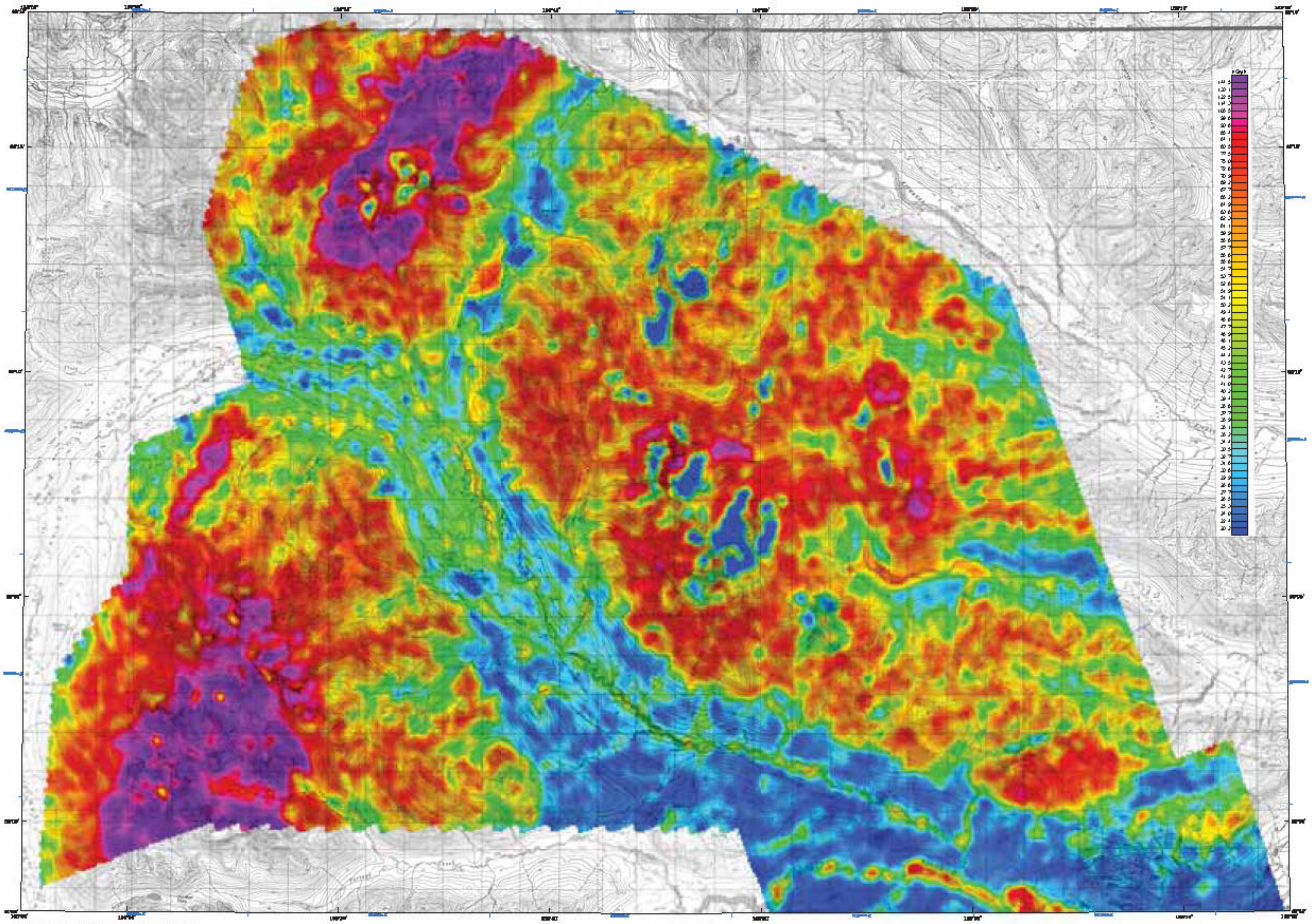
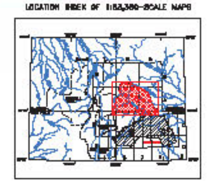


SCALE 1:63,360

LOCATION INDEX OF 1:63,360-SCALE MAPS



NATURAL AIR ABSORBED DOSE RATE (nGy/h) WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a CCS 01344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (?) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2810 keV) and cosmic radiation (3000–>6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveying, Technical Report 323, International Atomic Energy Agency, Vienna.

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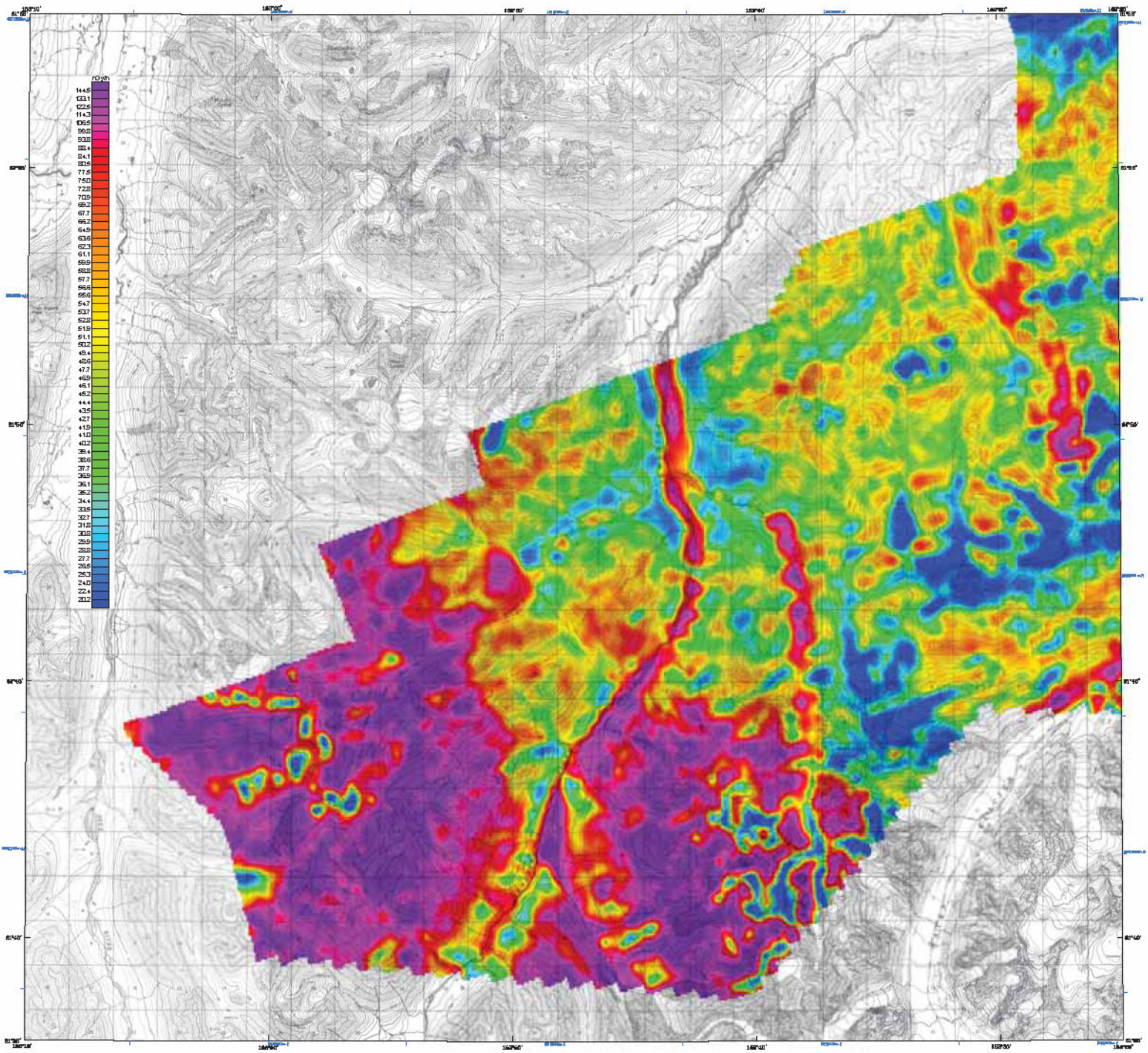
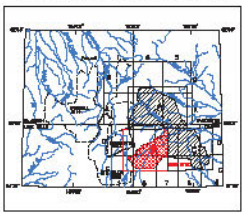


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



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PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, a GSC DI344 cesium magnetometer with a Sohtrek GS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#8-GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1890 keV), potassium (1370–1570 keV), total radioactivity (400–2810 keV) and cosmic radiation (3000–9000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 250 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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NATURAL AIR ABSORBED DOSE RATE

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SURVEY HISTORY

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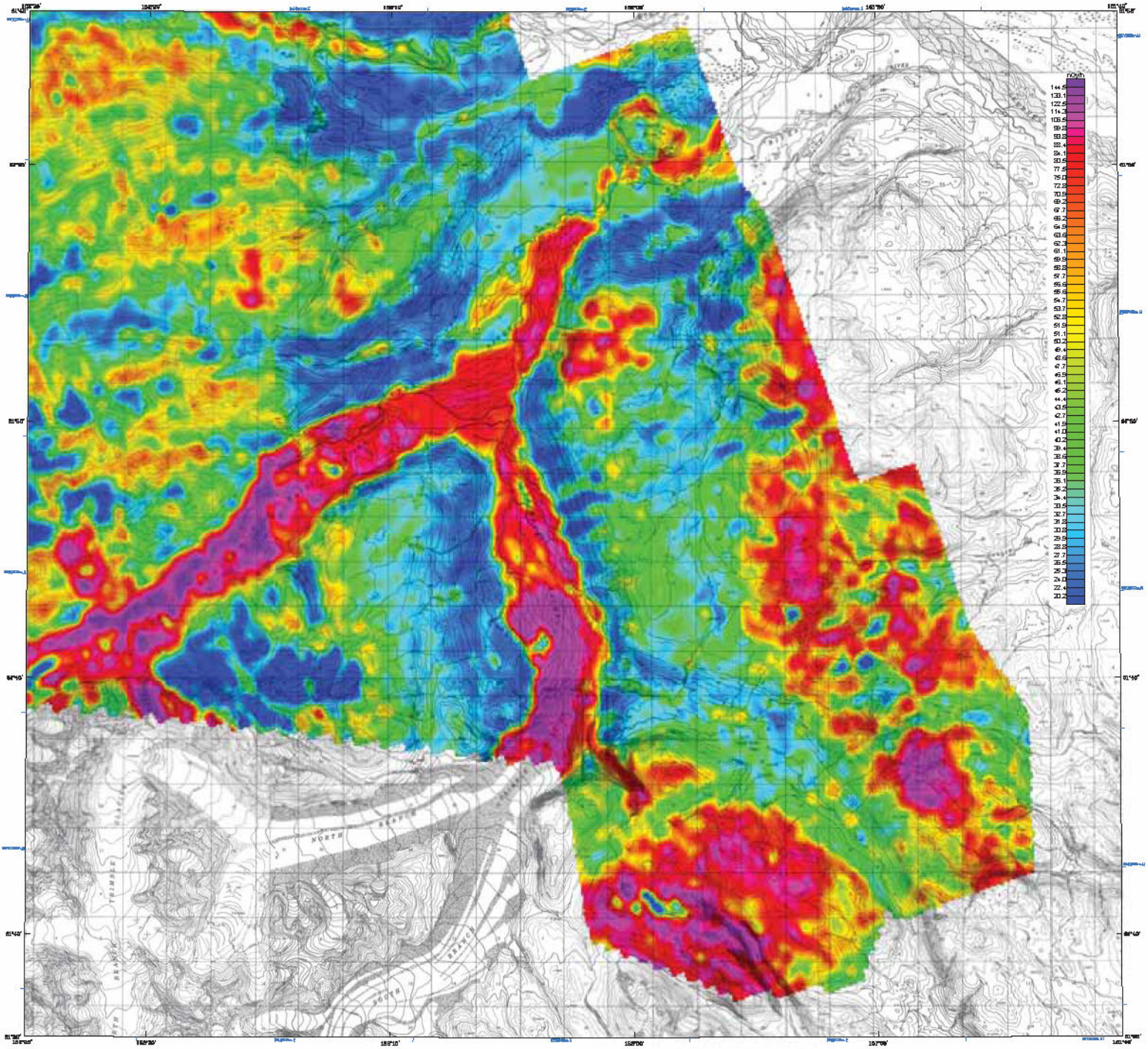


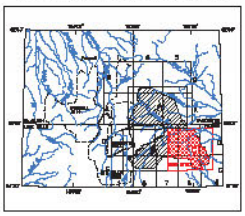
Base from U.S. Geological Survey Topomk 6-3, 2014; 6-4, 2014; 6-5, 2014; 6-6, 2014; 6-7, 2014; 6-8, 2014; 6-9, 2014; 6-10, 2014; 7-5, 2014; 7-6, 2014; 7-7, 2014; 7-8, 2014; 7-9, 2014; 7-10, 2014; 8-5, 2014; 8-6, 2014; 8-7, 2014; 8-8, 2014; 8-9, 2014; 8-10, 2014; 9-5, 2014; 9-6, 2014; 9-7, 2014; 9-8, 2014; 9-9, 2014; 9-10, 2014; P-5, 1954; P-6, 1954; P-7, 1954; P-8, 1954; P-9, 1954; P-10, 1954; Talkeetna, Alaska

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



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PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, a GSC 01344 cesium magnetometer with a Sahtrek GS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation systems, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#8-GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 1638. (1024 cu/in, inches) of main (downward) NaI crystal detector, and 4.2L (256 cu/in inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1890 keV), potassium (1370–1570 keV), total radioactivity (400–2810 keV) and cosmic radiation (3000–6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 250 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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SURVEY HISTORY

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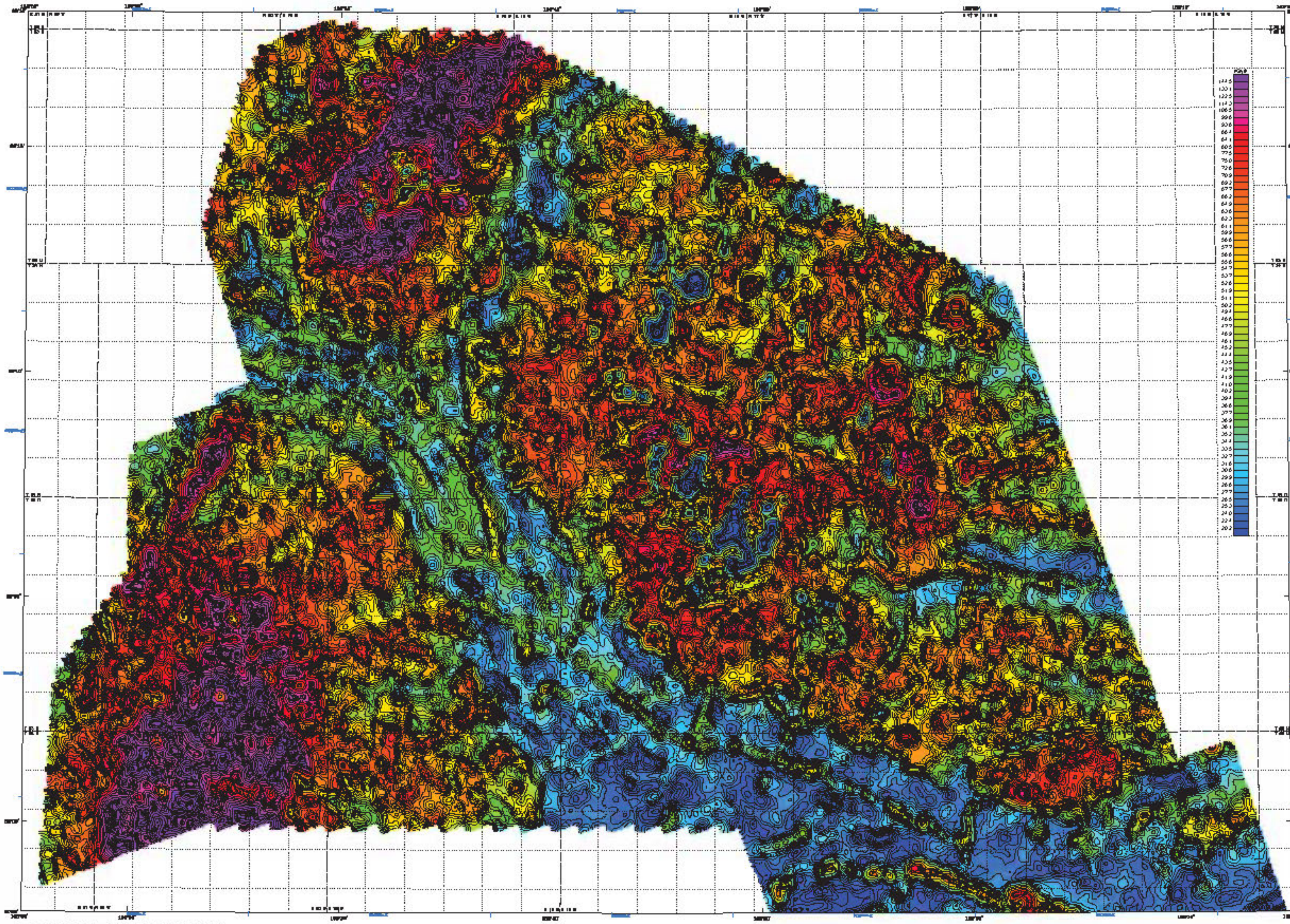
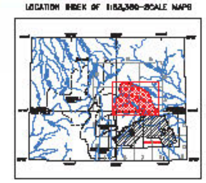


SCALE 1:63,360

LOCATION INDEX OF 1:63,360-SCALE MAPS



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PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
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2014

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CONTOUR INTERVAL

50 nGy/h
10 nGy/h
2 nGy/h

SURVEY HISTORY

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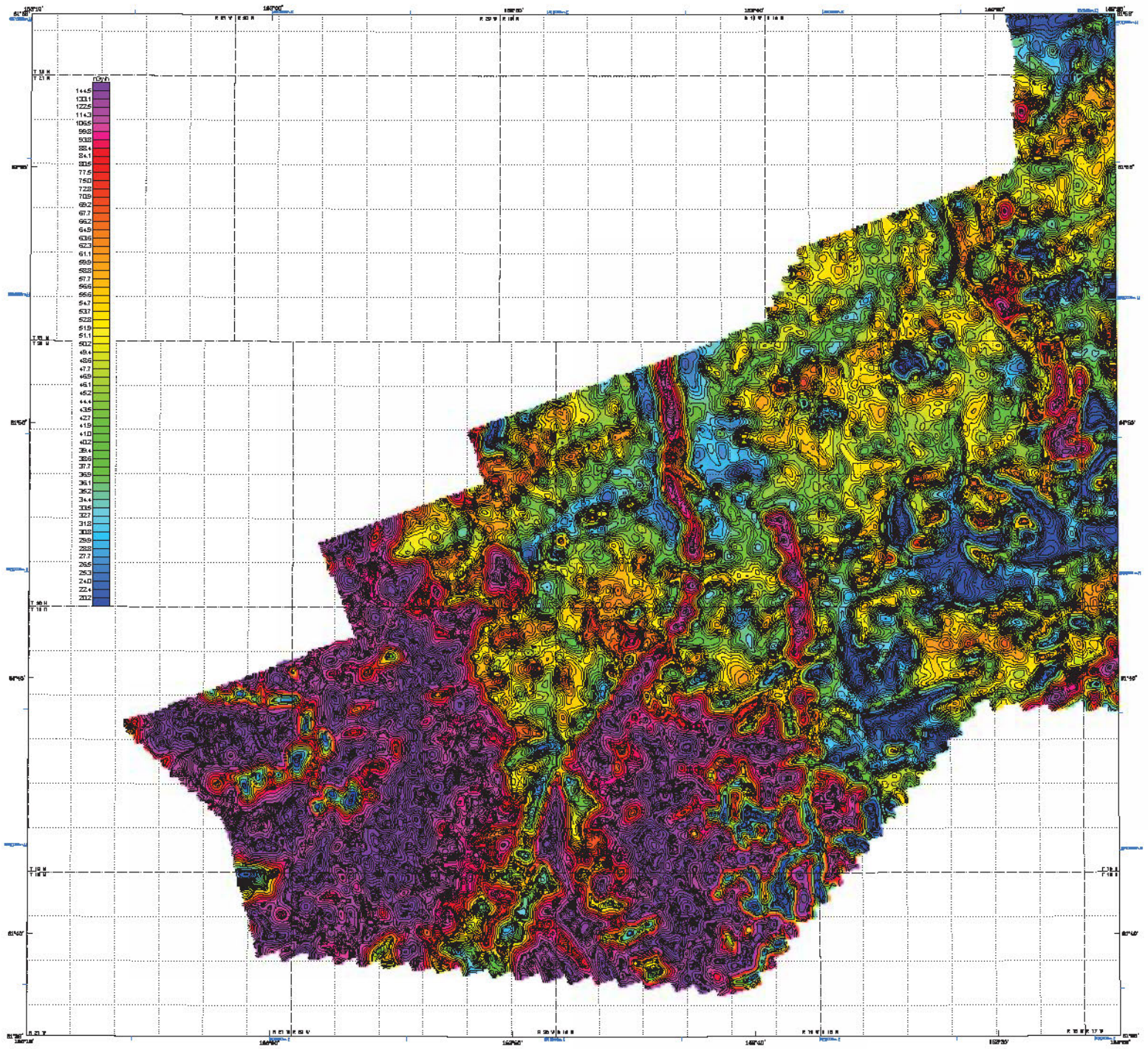


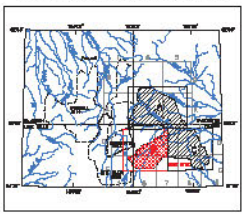
Base from USGS 1:63,360 Topographic Maps

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



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PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LINE HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM V Electromagnetic (EM) system, a CGS 01344 cesium magnetometer with a Sohtrek CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation systems, 50/60 Hz monitors and video cameras. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

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_____ ..... 50 nGy/h

_____ ..... 10 nGy/h

_____ ..... 2 nGy/h

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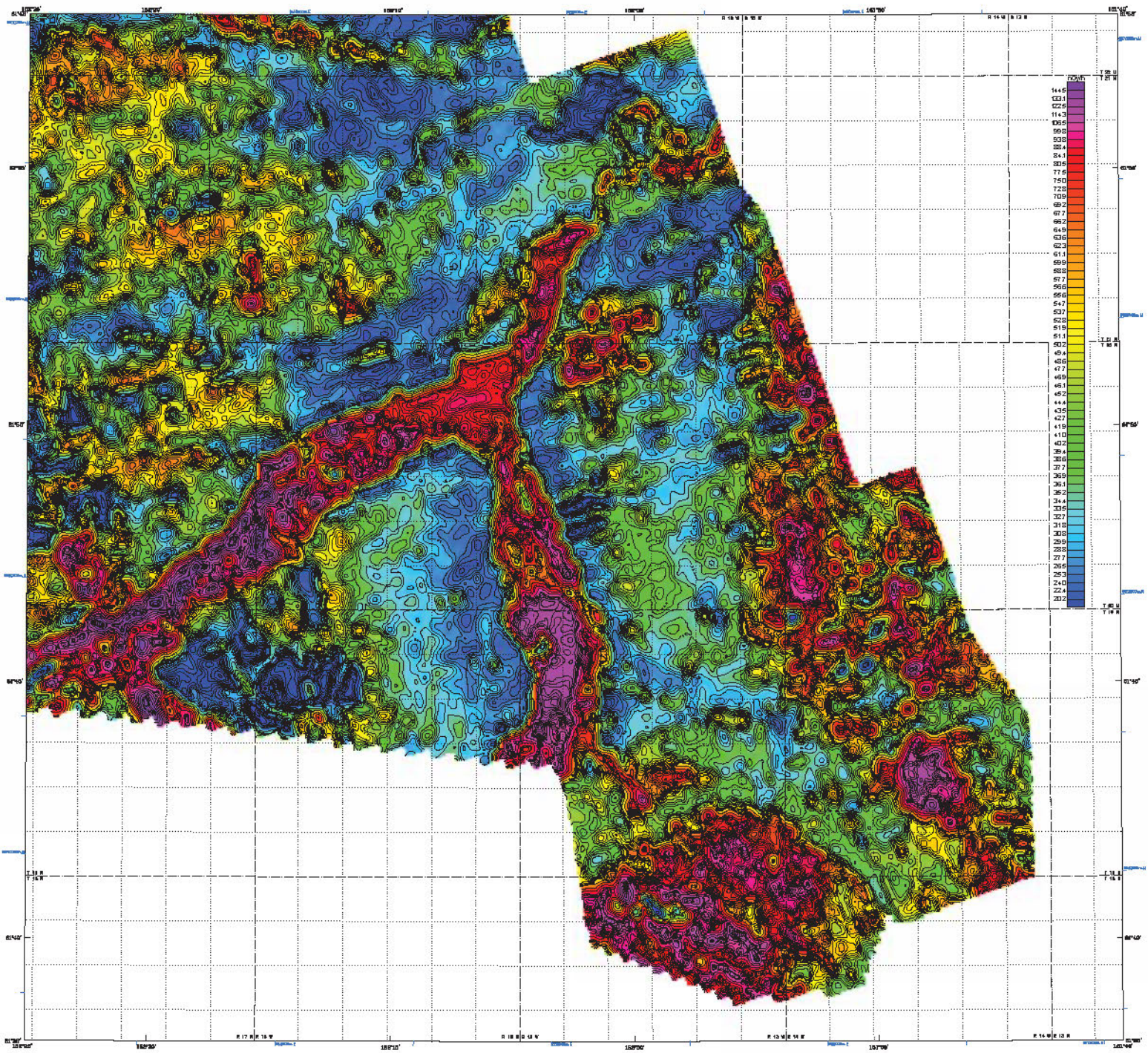
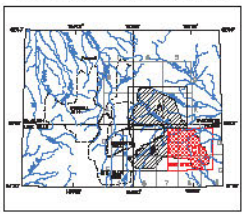


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



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DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, a CGS 01344 cesium magnetometer with a Sonntek CSJ cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation systems, 50/60 Hz monitors and video cameras. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DL#8-GL Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of nais (downward) Nal crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2815 keV) and cosmic radiation (3000–6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 300 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

International Atomic Energy Agency, 1991, Airborne Gamma Ray Spectrometer Surveys, Technical Report 323, International Atomic Energy Agency, Vienna.

NATURAL AIR ABSORBED DOSE RATE

Raw counts have been converted to radioelement concentrations, and combined to produce natural air-absorbed dose rate, so that the results are independent of crystal volume and planned survey height. This facilitates comparisons to other surveys and ground data. Measurements are nanograys per hour (nGy/h).

CONTOUR INTERVAL

_____ . . . . . 50 nGy/h

_____ . . . . . 10 nGy/h

_____ . . . . . 2 nGy/h

SURVEY HISTORY

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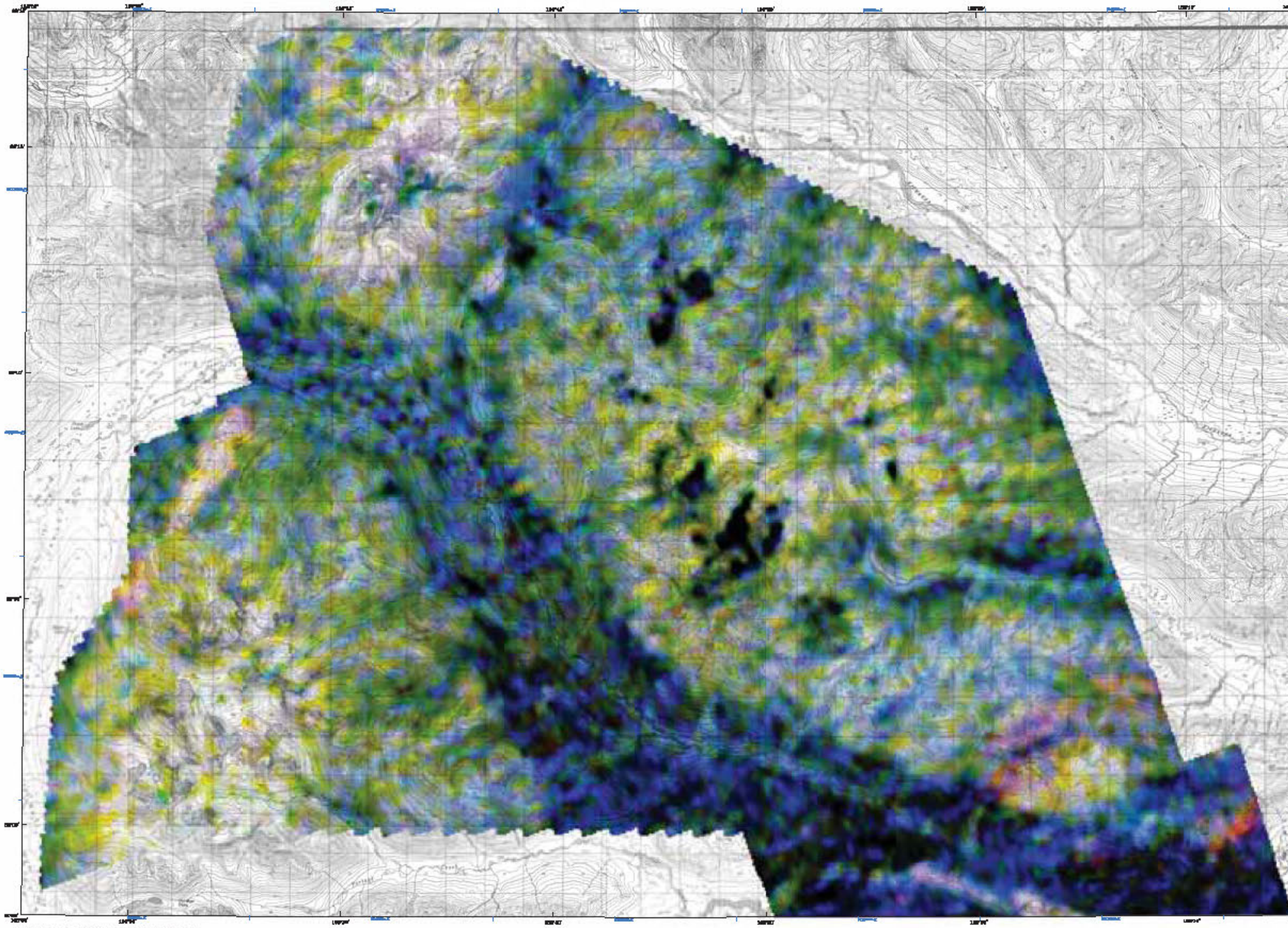
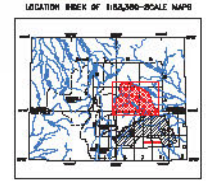
All data and maps produced to date from this survey are available in digital format on DVD for a nominal fee through DGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707, and are downloadable for free from the DGGS website (www.dggs.alaska.gov/pubs). Maps are also available on paper through the DGGS office, and are available online at the website in Adobe Acrobat .PDF file format.



SCALE 1:63,360



LOCATION INDEX OF 1:63,360-SCALE MAPS

RADIOELEMENT - TERNARY WITH TOPOGRAPHY, EAST STYX SURVEY AREA, SOUTH-CENTRAL ALASKA

PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by
Laurel E. Burns, DGGS, and Fugro GeoServices, Inc.
2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM[V] Electromagnetic (EM) system, a DGC 01344 cesium magnetometer with a Scintrex CS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 200 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 200 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel OEM4-G2L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

The gamma-ray spectrometry data were recorded at a 1.0 second sample rate using a Radiation Solutions RS-500 gamma-ray spectrometer. It was configured with 16.8L (1024 cubic inches) of main (downward) NaI crystal detector, and 4.2L (256 cubic inches) of upward looking (radon) detector. After application of Noise Adjusted Singular Value Decomposition to the spectra, counts from the main detector were recorded in five windows corresponding to thorium (2410–2810 keV), uranium (1660–1860 keV), potassium (1370–1570 keV), total radioactivity (400–2810 keV) and cosmic radiation (3000–6000 keV). Counts from the radon detector were recorded in the radon window (1660–1860 keV). The radon detection system was calibrated following methods outlined in IAEA Report 323. After removal of the background, the data were corrected for spectral interferences, changes in temperature, pressure, and departures from the planned survey elevation of 200 feet. The data were then converted to standard concentration units which were interpolated to a 100 m grid using a minimum curvature technique. All grids were then resampled from the 100 m cell size down to a 25 m cell size to produce the maps and final grids contained in this publication.

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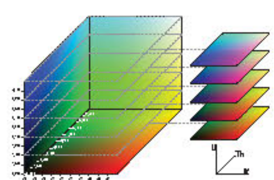

SURVEY HISTORY

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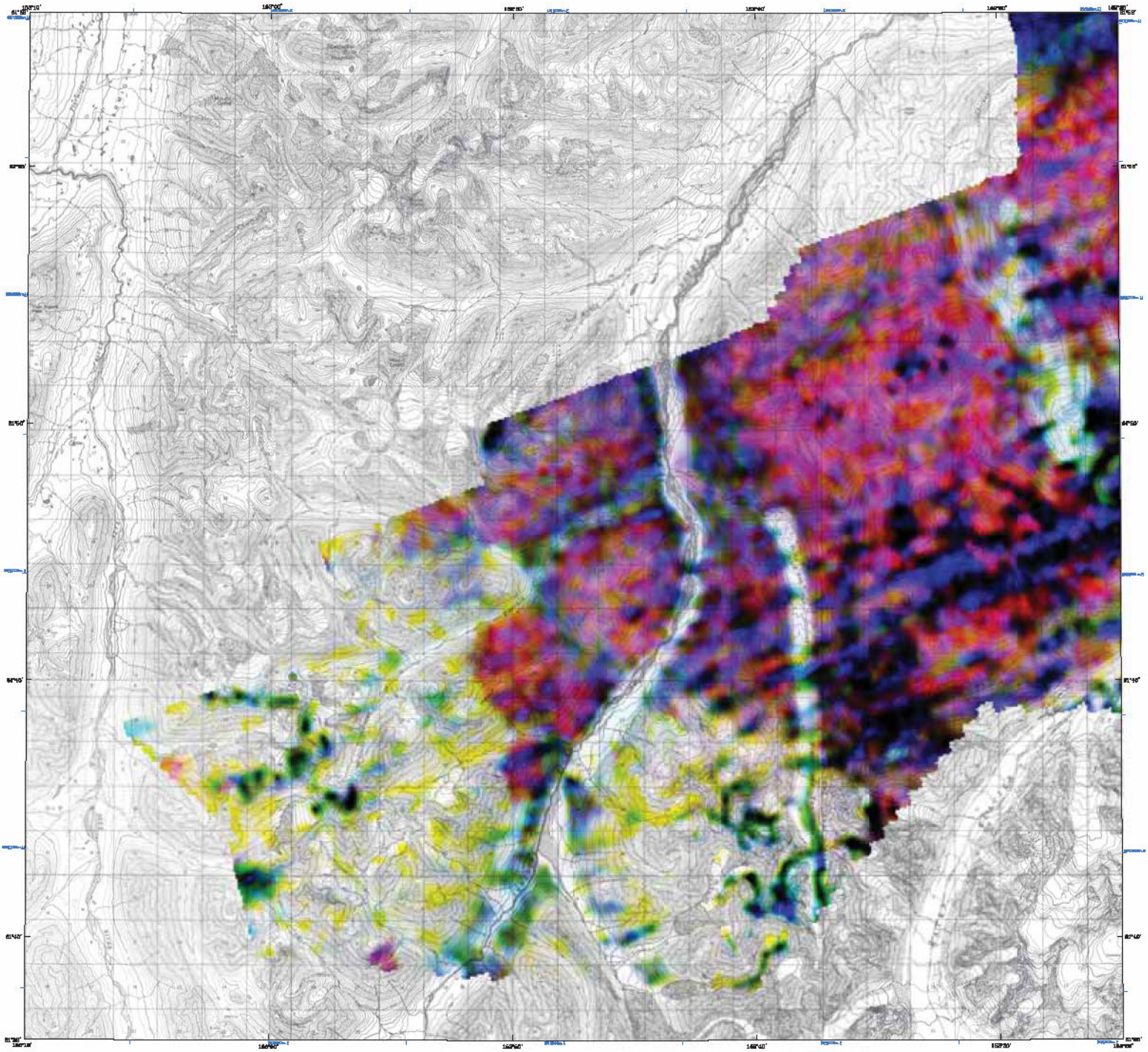
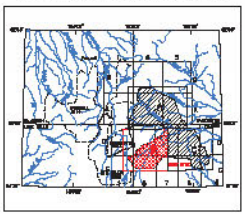


SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



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PARTS OF THE TALKEETNA, TYONEK, McGRATH AND LIME HILLS QUADRANGLES

by

Laurel E. Burns, CGG, and Fugro GeoServices, Inc.

2014

DESCRIPTIVE NOTES

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system, a GSS D1344 cesium magnetometer with a Solmtrek GS3 cesium sensor, and a Radiation Solutions RS-500 gamma-ray spectrometer. The EM and magnetic sensors were flown at a height of 100 feet. The gamma-ray spectrometer was flown at a height of 300 feet. In addition the survey recorded data from radar and laser altimeters, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS-350-B3 Squirrel helicopter at a mean terrain clearance of 300 feet along NE-SW (70°) survey flight lines with a spacing of a quarter of a mile. The lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

A Novatel DGNS-952L Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 5) spheroid, 1927 North American datum using a central meridian (CM) of 153°, a north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m with respect to the UTM grid.

RADIOMETRICS

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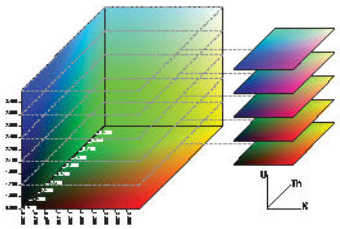

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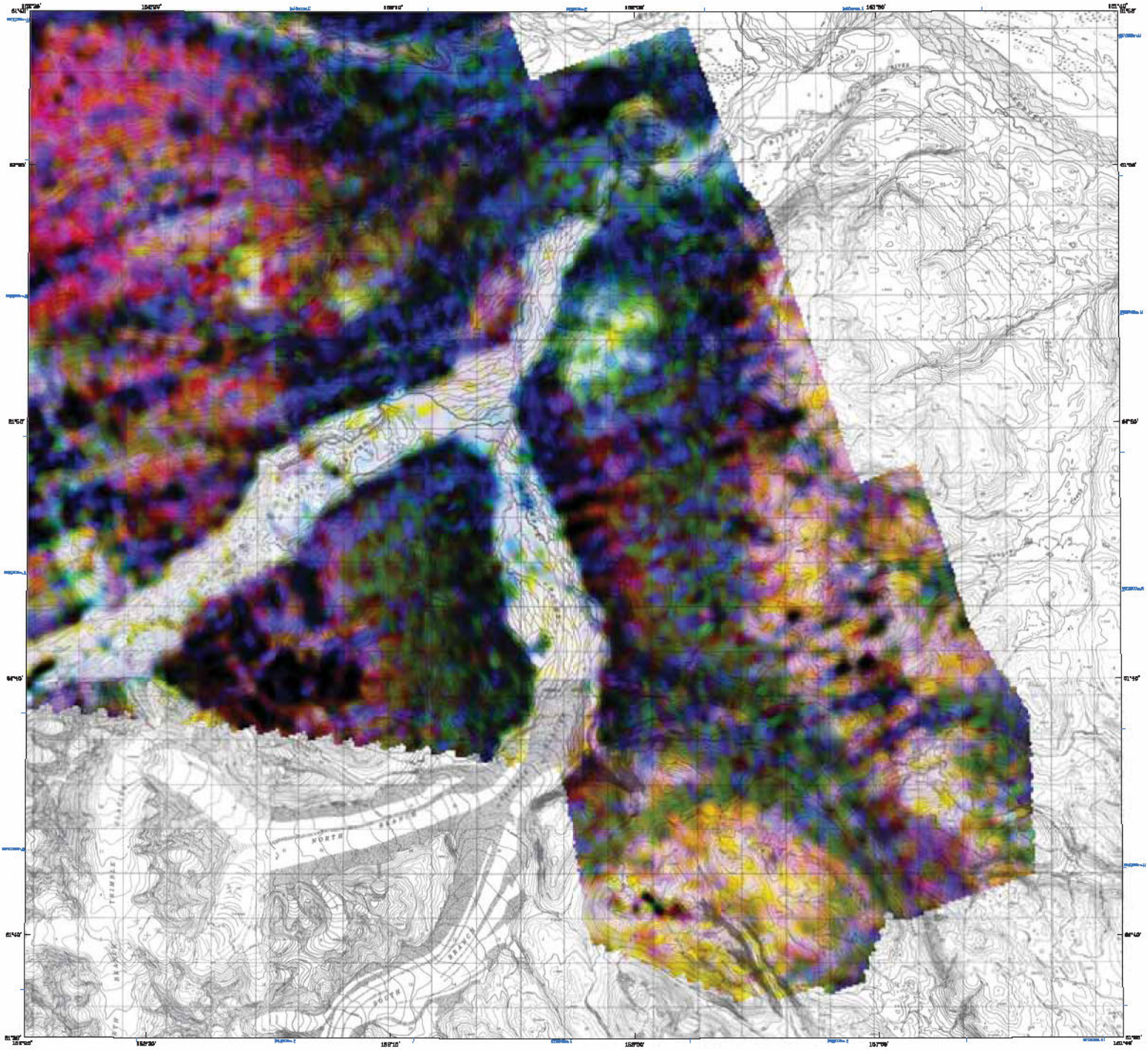


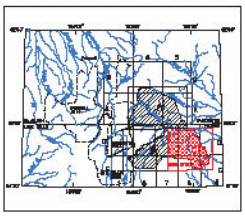
SURVEY AREA

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

LOCATION INDEX OF 1:63,360-SCALE MAPS



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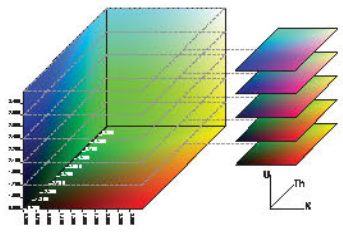

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