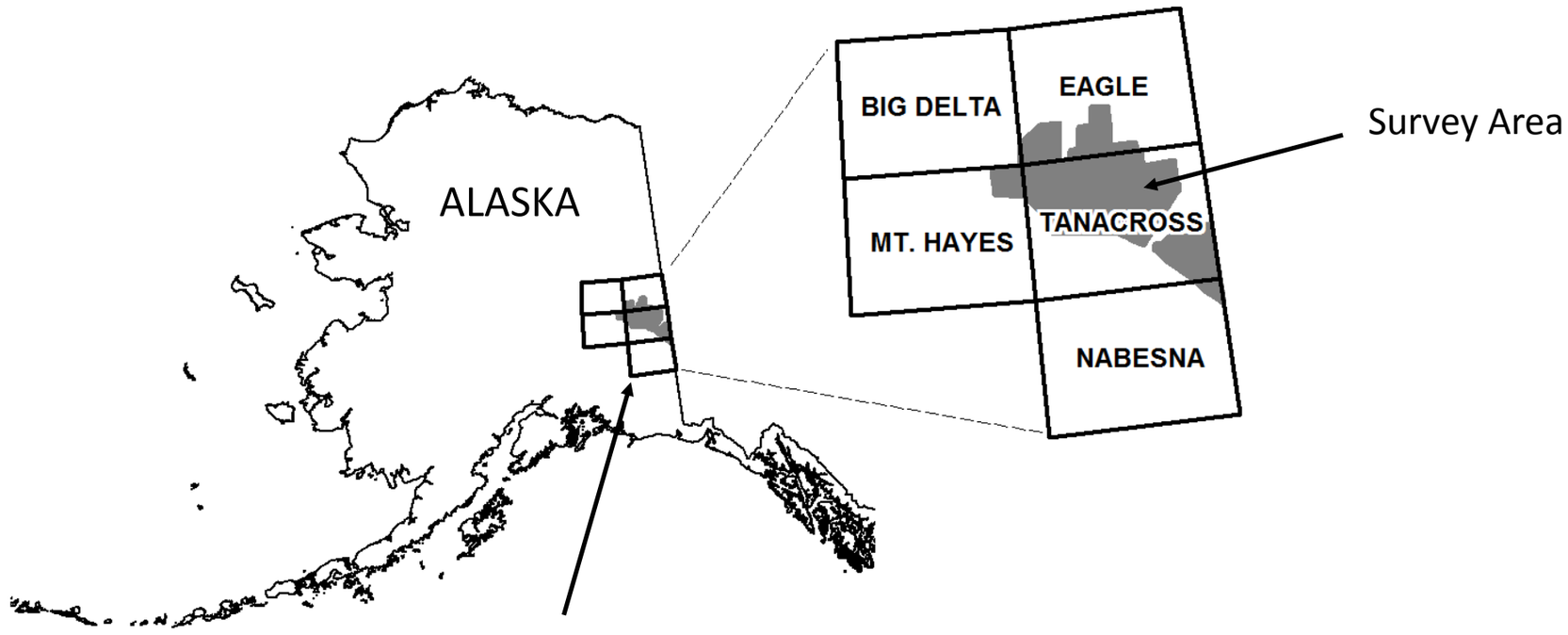
Airborne magnetic geophysical survey of the Tanacross region, Alaska

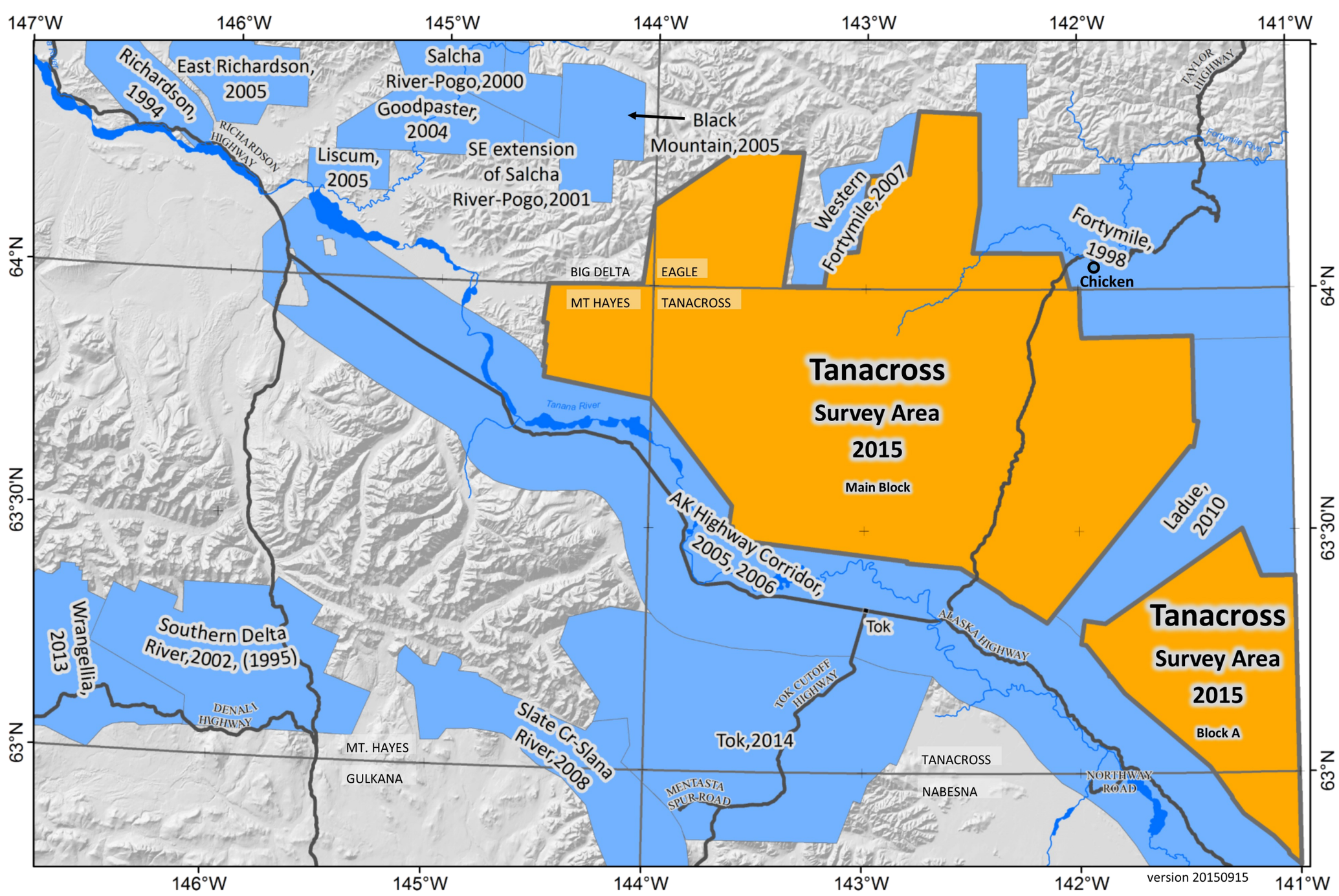
Alaska Division of Geological & Geophysical Surveys

http://dx.doi.org/14509/29514

Map Catalog



Big Delta, Eagle, Mt. Hayes, Tanacross,
and Nabesna 1:250,000 Quadrangles

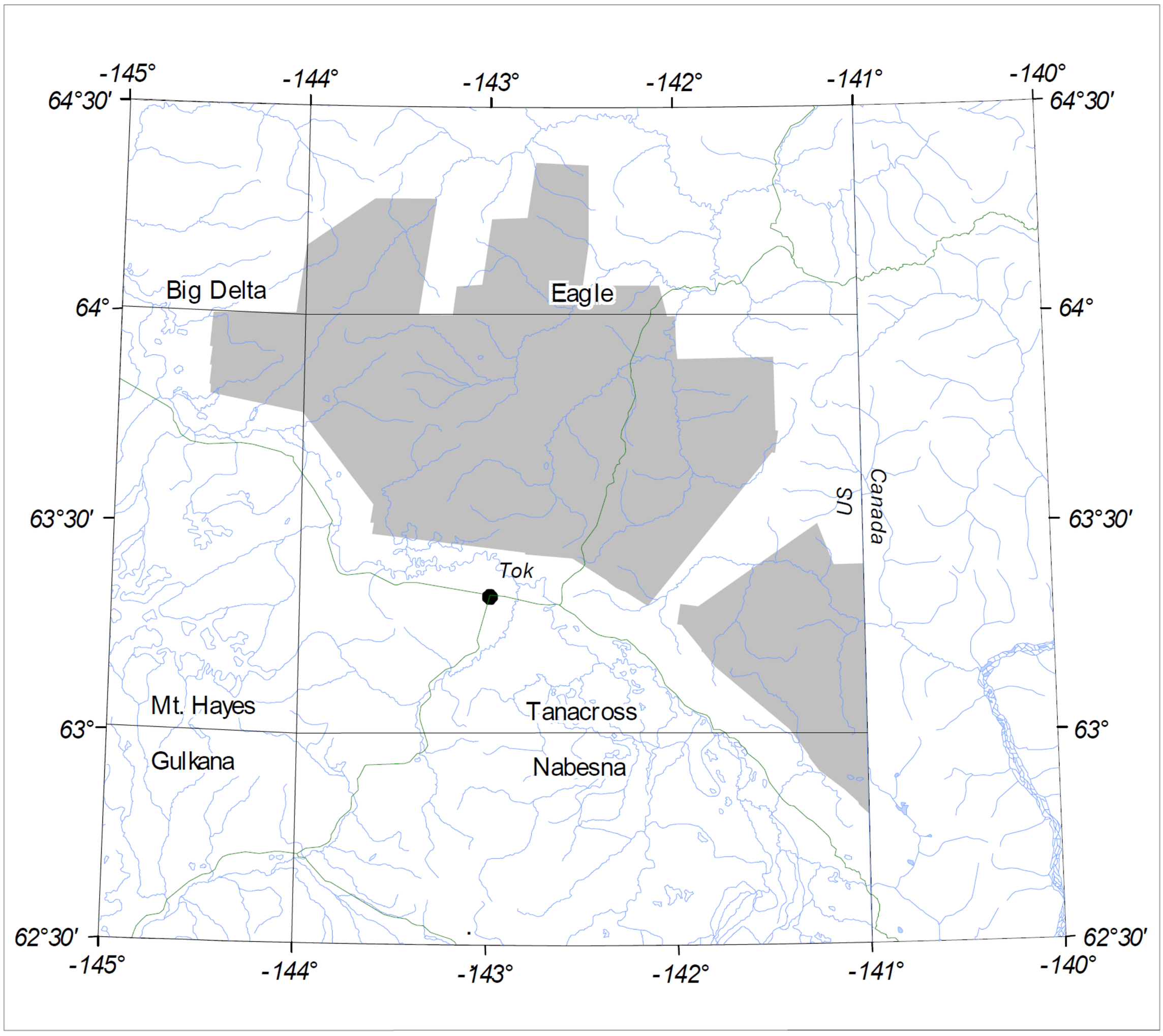


Tanacross survey area, nearby and adjacent DGGS 400m line spacing electromagnetic and magnetic surveys, relevant 1:250,000-scale USGS quadrangle boundaries, major highways, major rivers, and shaded relief

1:250,000-Scale Maps

Page	Grid Layer	Vector Layer	Background Layer
4	None	Flightlines	Topography
5	Residual magnetic intensity	Flightlines	Topography

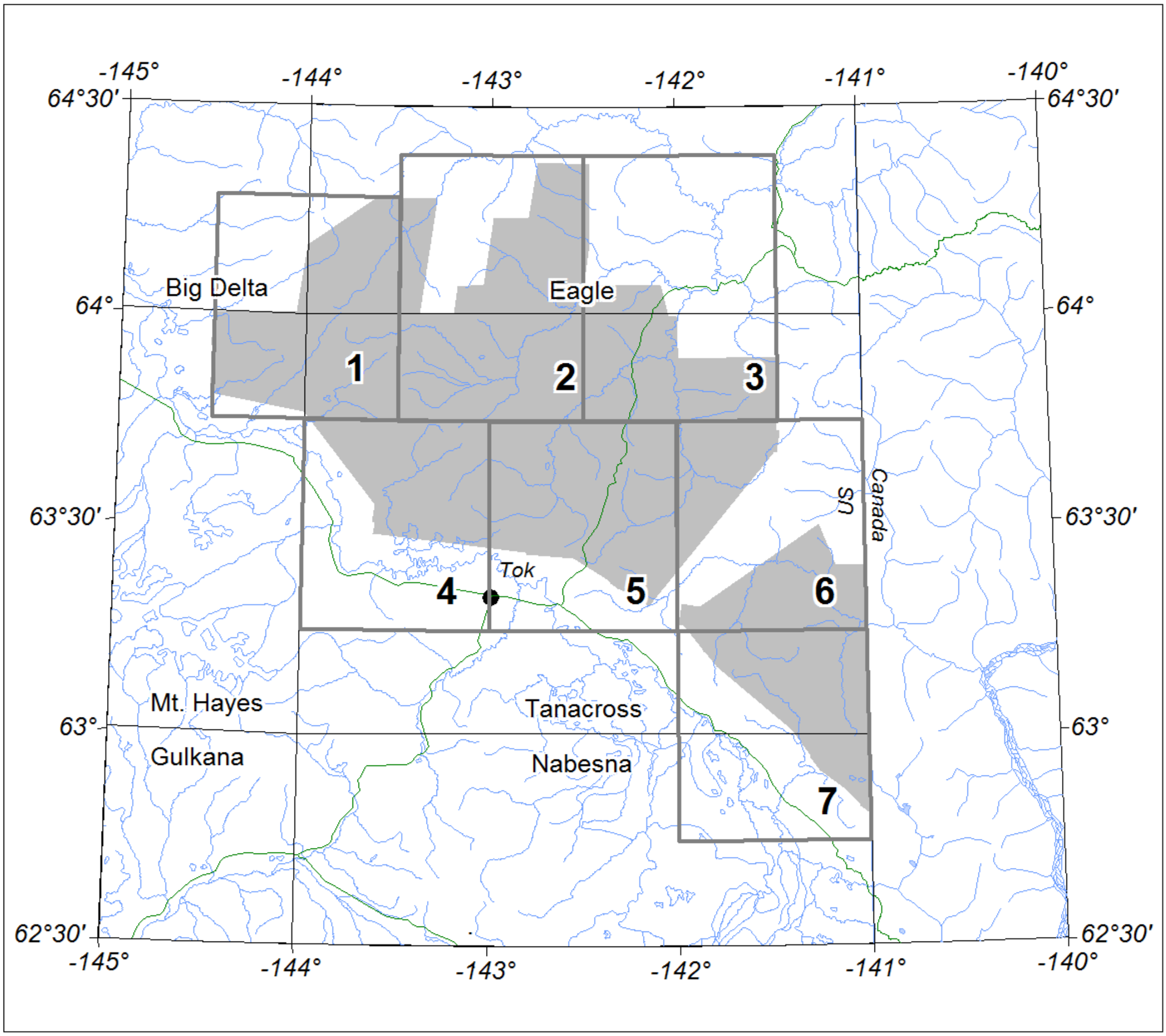
Approximate area of 1:250,000-scale maps, 1:250,000-scale quadrangle boundaries, major roads, rivers, and towns



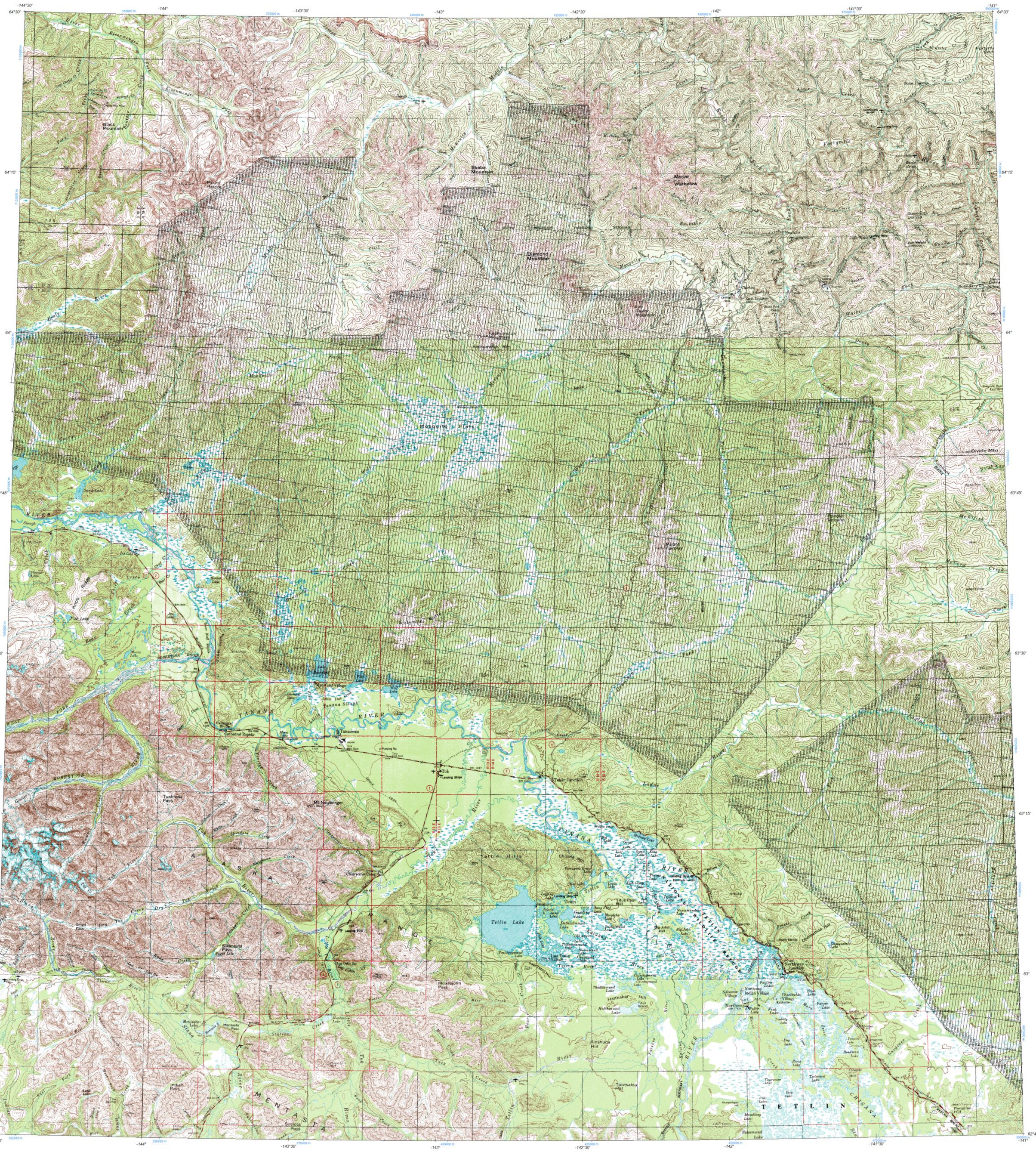
1:63,360-Scale Maps

Pages	Grid Layer	Vector Layer	Background Layer
6-12	Analytic Signal	Data contours	Township, range, and section (trs)
13-19	Analytic Signal	Flightlines	Topography (topo)
20-26	Calculated First Vertical Derivative	Flightlines	Topography
27-33	Calculated Second Vertical Derivative	Flightlines	Topography
34-40	Horizontal gradient - azimuth 10 degrees	Flightlines	Topography
41-47	Horizontal gradient - azimuth 100 degrees	Flightlines	Topography
48-54	Residual magnetic intensity	Data contours	Township, range, and section
55-61	Residual magnetic intensity	Flightlines	Topography
62-68	Residual magnetic intensity	Tilt derivative data contours	Township, range, and section
69-75	Tilt Derivative	Flightlines	Topography

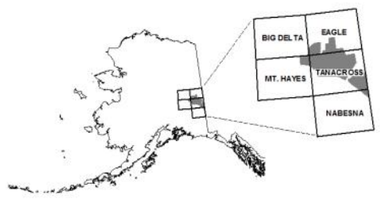
Index map for 1:63,360-scale maps, 1:250,000-scale quadrangle boundaries, major roads, rivers, and towns. Seven sheets cover the survey area; sheets are numbered 1 through 7 as shown below.



GEOPHYSICAL REPORT 2015-6
Flightlines with topography; scale 1:250,000
Quadrangles: Parts of Big Delta, Eagle, Mt. Hayes, Tanacross, and Nabesna



SURVEY LOCATION



AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE TANACROSS REGION, ALASKA

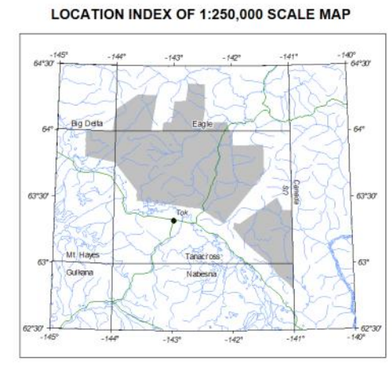
USGS
science for a changing world

FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

STATE OF ALASKA
DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

LOCATION INDEX OF 1:250,000 SCALE MAP



DESCRIPTIVE NOTES

This map was derived from data acquired during an aeromagnetic survey carried out by Goldak Airborne Surveys from June 17 to July 31, 2015 using a Piper PA-31 Navajo aircraft (registration C-GJBG). The magnetic data were recorded at 10 Hz using three Geometrics cesium vapour magnetometers mounted in the tail boom and wing-tip pods of the aircraft. This array of magnetometers form a horizontal gradiometer with a transverse separation of 14.78 m and longitudinal separation of 9.75 m. GNSS positioning data were recorded at 1 Hz using a Novatel OEMV Propak GNSS receiver. The final flight path was recovered following post-flight differential corrections which improve positioning accuracy to the sub-meter level. Additional on-board equipment included a Thompson CFS 530A radar altimeter, a Setra 270 barometric altimeter and a vertically mounted video camera. Ground based systems included three GEM Systems GSM-19W proton procession magnetometers and a Novatel OEMV GNSS receiver.

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SCALE 1 / 250,000

5 0 5 10 15 MILES

5 0 5 10 15 20 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L1600.142 — Line Type; Line Number; Flight Number; Line Direction

63970 — Fiducial

SURVEY HISTORY

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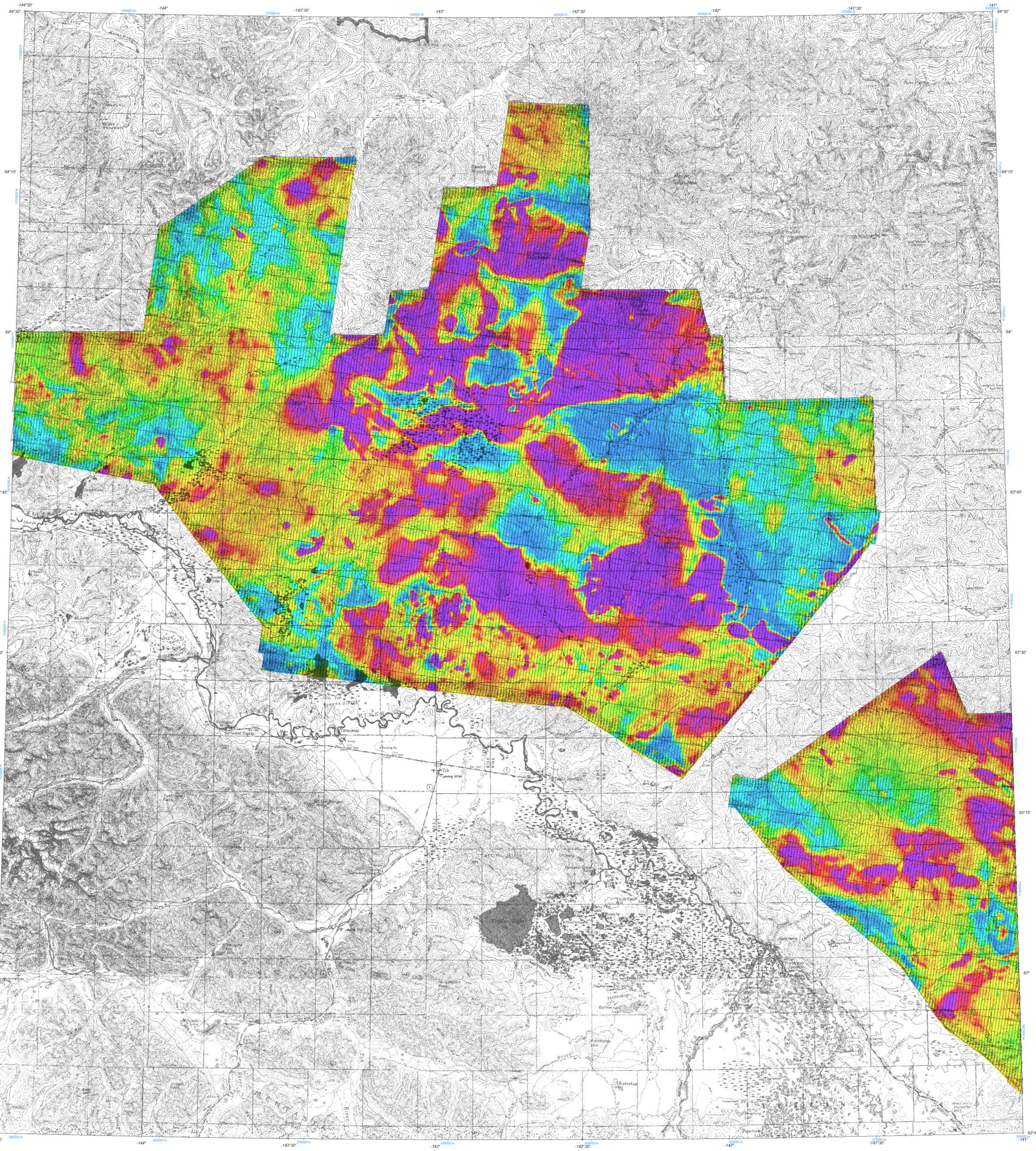
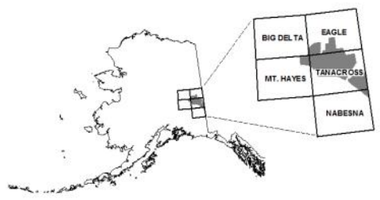
Residual magnetic intensity grid and flightlines with topography; scale 1:250,000
Quadrangles: Parts of Big Delta, Eagle, Mt. Hayes, Tanacross, and Nabesna



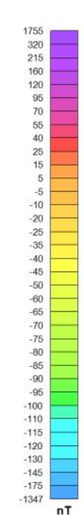
SURVEY LOCATION



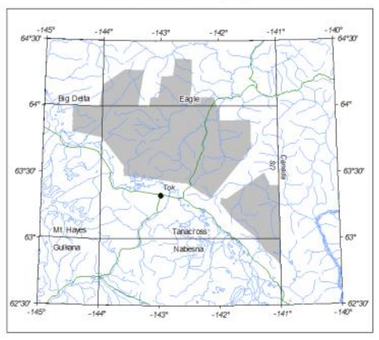
AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE TANACROSS REGION, ALASKA

RESIDUAL MAGNETIC INTENSITY GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015



LOCATION INDEX OF 1:250,000 SCALE MAP



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RESIDUAL MAGNETIC INTENSITY

The residual magnetic field represents the component of the total magnetic field related almost entirely to the magnetic properties the Earth's crust. The data presented here were derived from the recorded data by: (1) application of a lag to accommodate system latency (2) application of a diurnal correction derived from the magnetic base station data (3) application of a height correction to account for line-to-line deviations from the pre-planned flight surface (4) analysis of the remaining differences between the traverse and control line values at intersection points to obtain a correction profile that results in mutually levelled line data (5) application of a micro-levelling correction to further reduce any remaining flight line noise (6) removal of The International Geomagnetic Reference Field (IGRF) values defined at the average mean sea-level height of 1048.5 m for the year 2015.52 to obtain the residual magnetic intensity. These final values were then interpolated on to a 100 m grid using the measured local horizontal gradients to guide between-line splines.

SCALE 1 / 250,000

5 0 5 10 15 MILES

5 0 5 10 15 20 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L1600.142 — Line Type, Line Number, Flight Number, Line Direction

63970 — Fiducial

SURVEY HISTORY

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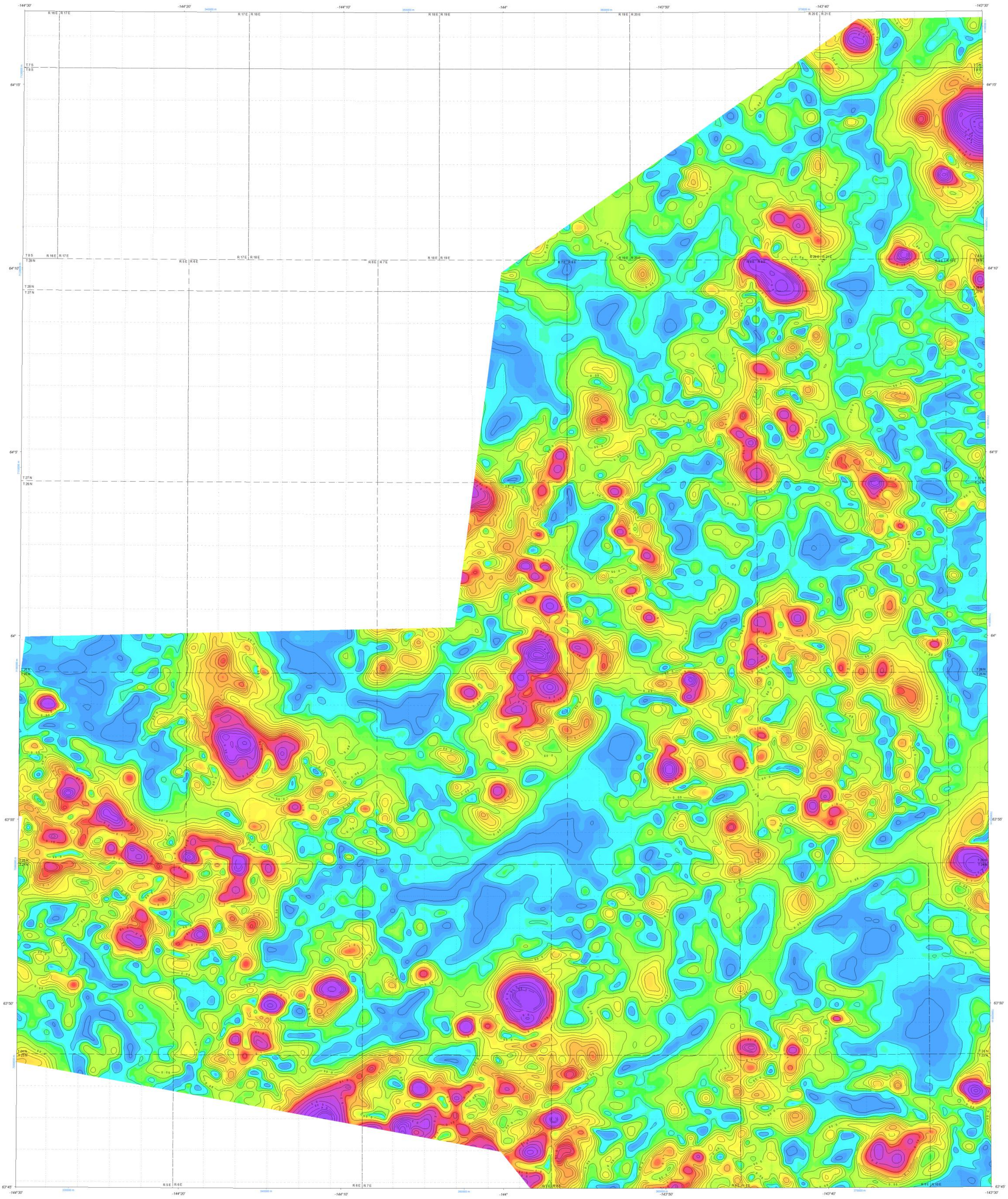
GEOPHYSICAL REPORT 2015-6
Analytic signal grid and contours with Township, Range, and Section; scale 1:63,360; Sheet 1 of 7
Quadrangles: Big Delta A-1, B-1; Mt. Hayes D-1; Eagle A-6, B-6; Tanacross D-6

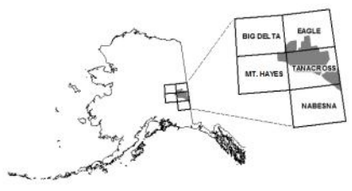


AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE TANACROSS REGION, ALASKA

ANALYTIC SIGNAL GRID AND CONTOURS

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

SURVEY LOCATION



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ANALYTIC SIGNAL

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SCALE 1 / 63,360

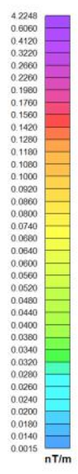
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

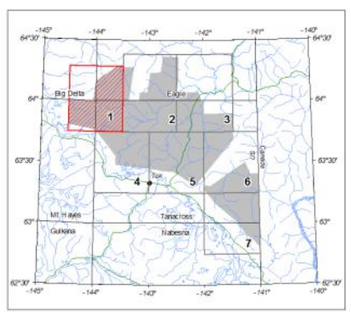
NAD27 Zone 7N

CONTOUR LEGEND

0.25 nT/m
0.05 nT/m
0.01 nT/m



LOCATION INDEX OF 1:63,360 SCALE MAP



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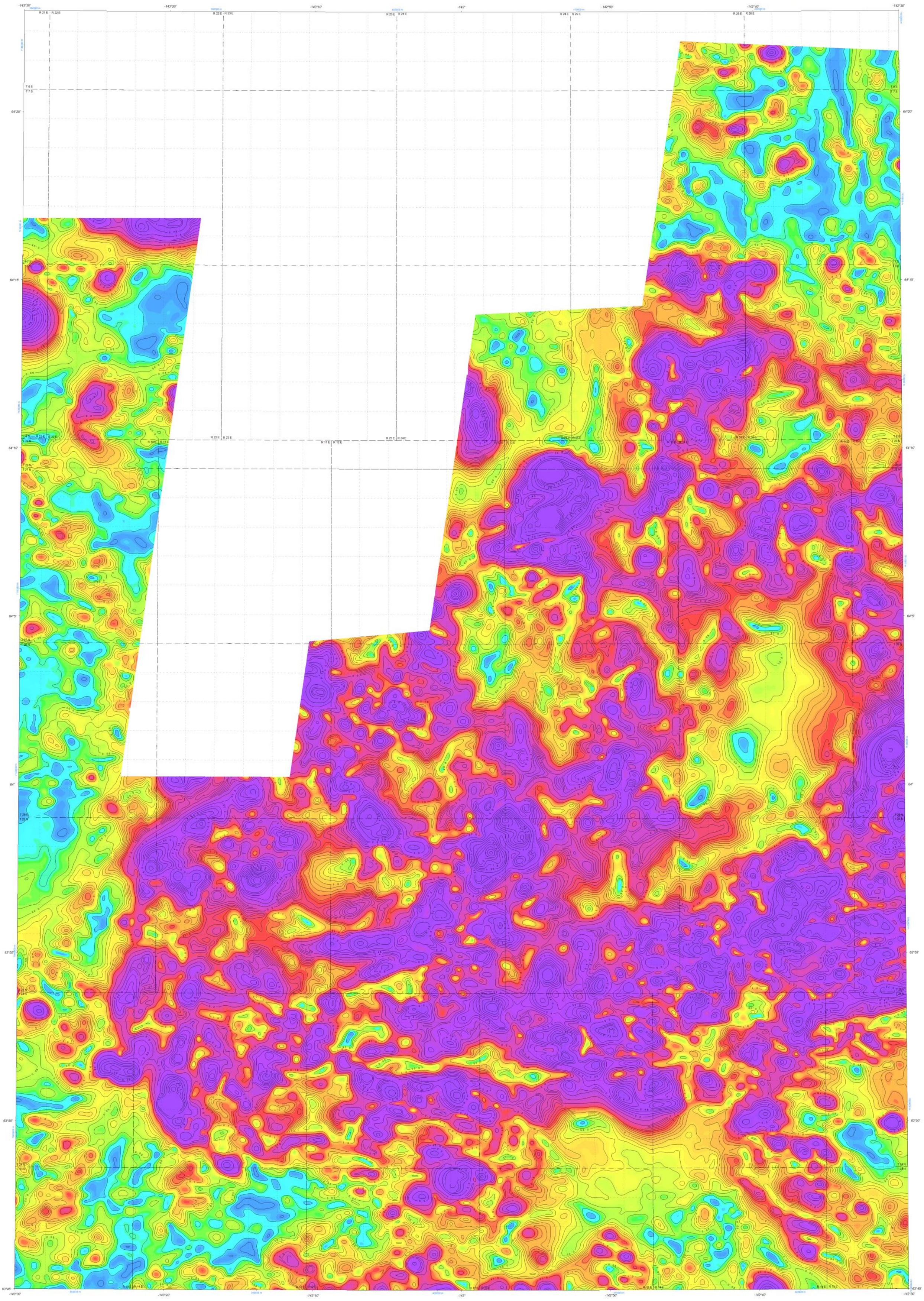
Analytic signal grid and contours with Township, Range, and Section; scale 1:63,360; Sheet 2 of 7
Quadrangles: Eagle A-4, A-5, B-4, B-5; Tanacross D-4, D-5

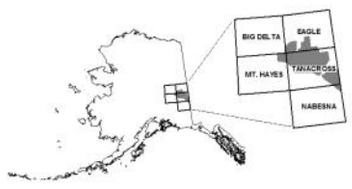


AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE TANACROSS REGION, ALASKA

ANALYTIC SIGNAL GRID AND CONTOURS

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

SURVEY LOCATION



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SCALE 1 / 63,360

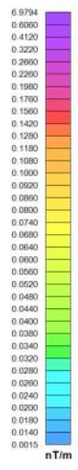
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

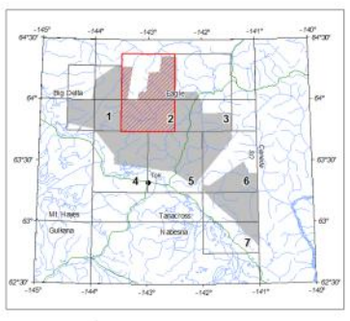
NAD27 Zone 7N

CONTOUR LEGEND

0.25 nT/m
0.05 nT/m
0.01 nT/m



LOCATION INDEX OF 1:63,360 SCALE MAP



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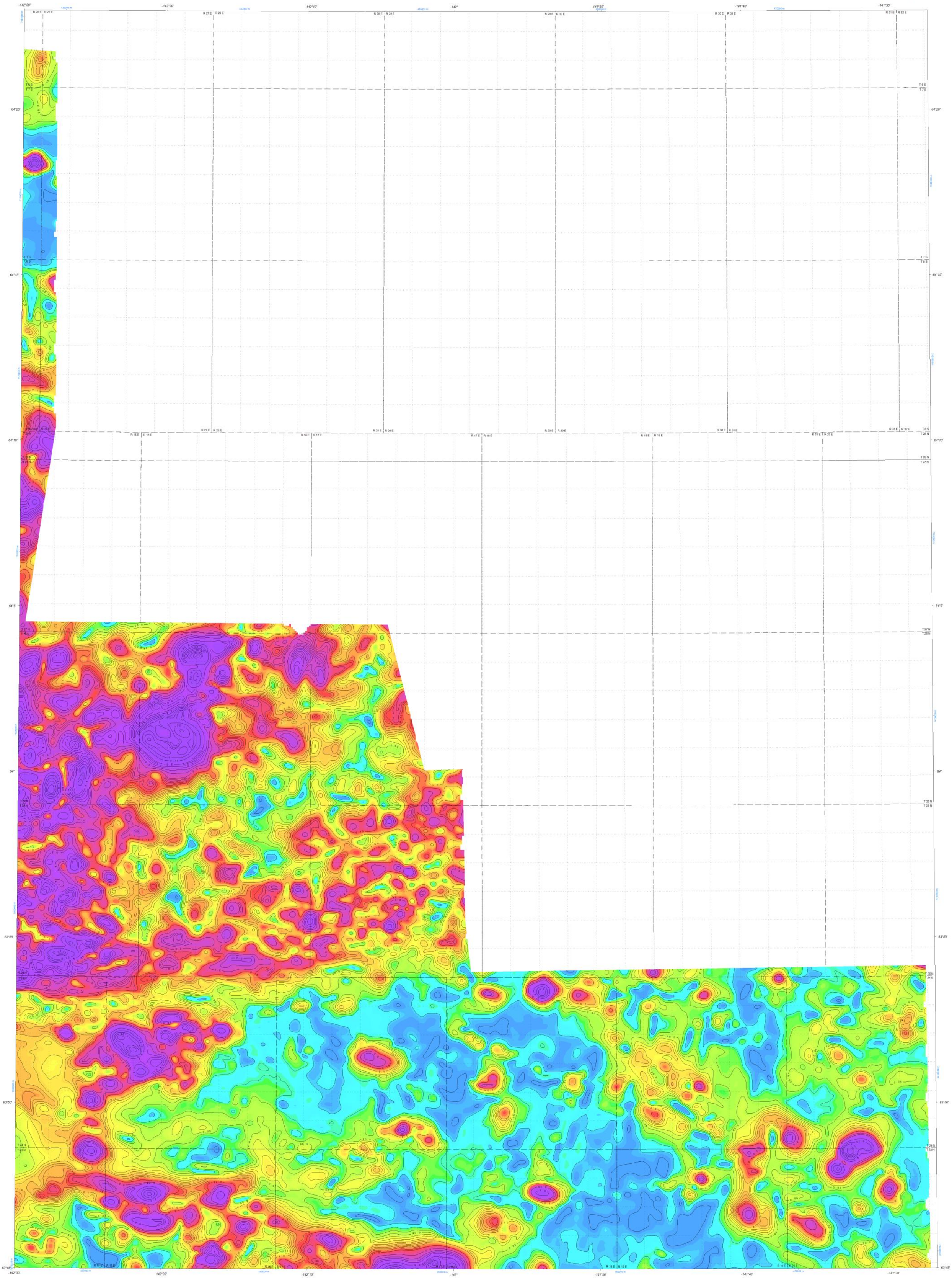
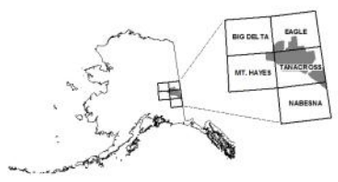
Analytic signal grid and contours with Township, Range, and Section; scale 1:63,360; Sheet 3 of 7
Quadrangles: Eagle A-1, A-2, A-3, B-1, B-2, B-3; Tanacross D-1, D-2, D-3



SURVEY LOCATION



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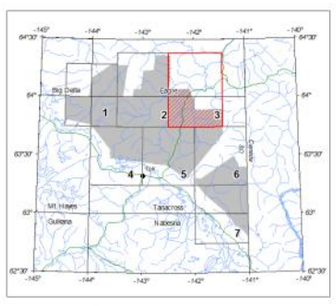
LOCATION INDEX OF 1:63,360 SCALE MAP



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SCALE 1 / 63,360

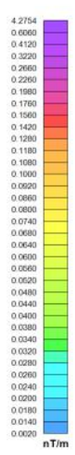
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

CONTOUR LEGEND

0.25 nT/m
0.05 nT/m
0.01 nT/m



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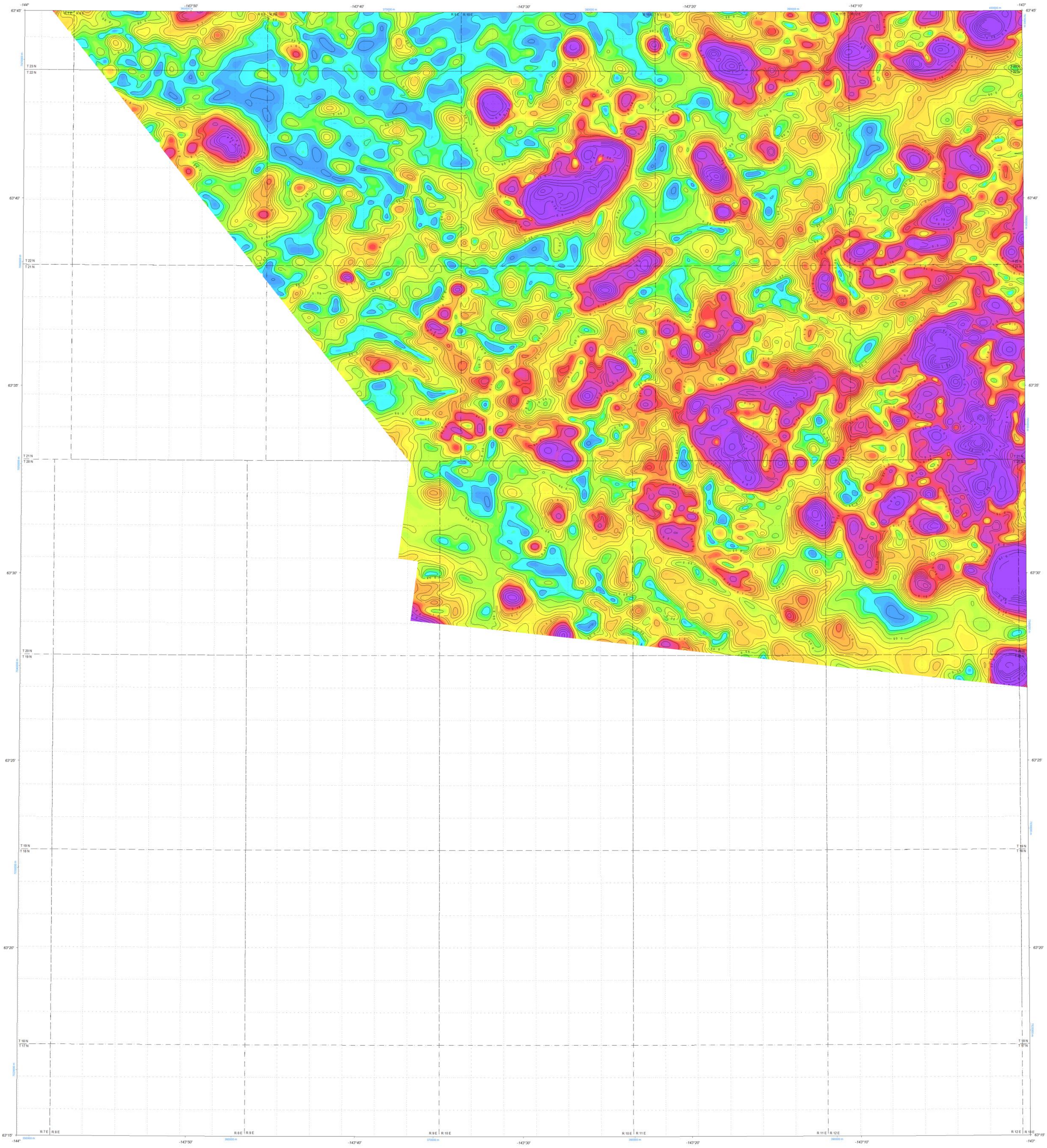
Quadrangles: Tanacross B-5, B-6, C-5, C-6



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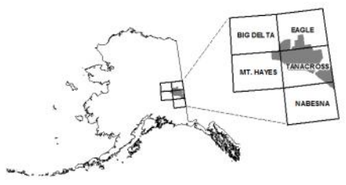
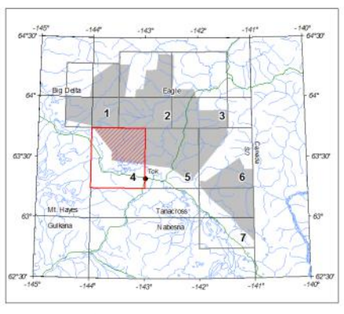


LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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SCALE 1 / 63,360

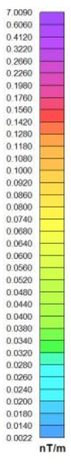
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

CONTOUR LEGEND

0.25 nT/m
0.05 nT/m
0.01 nT/m



SURVEY HISTORY

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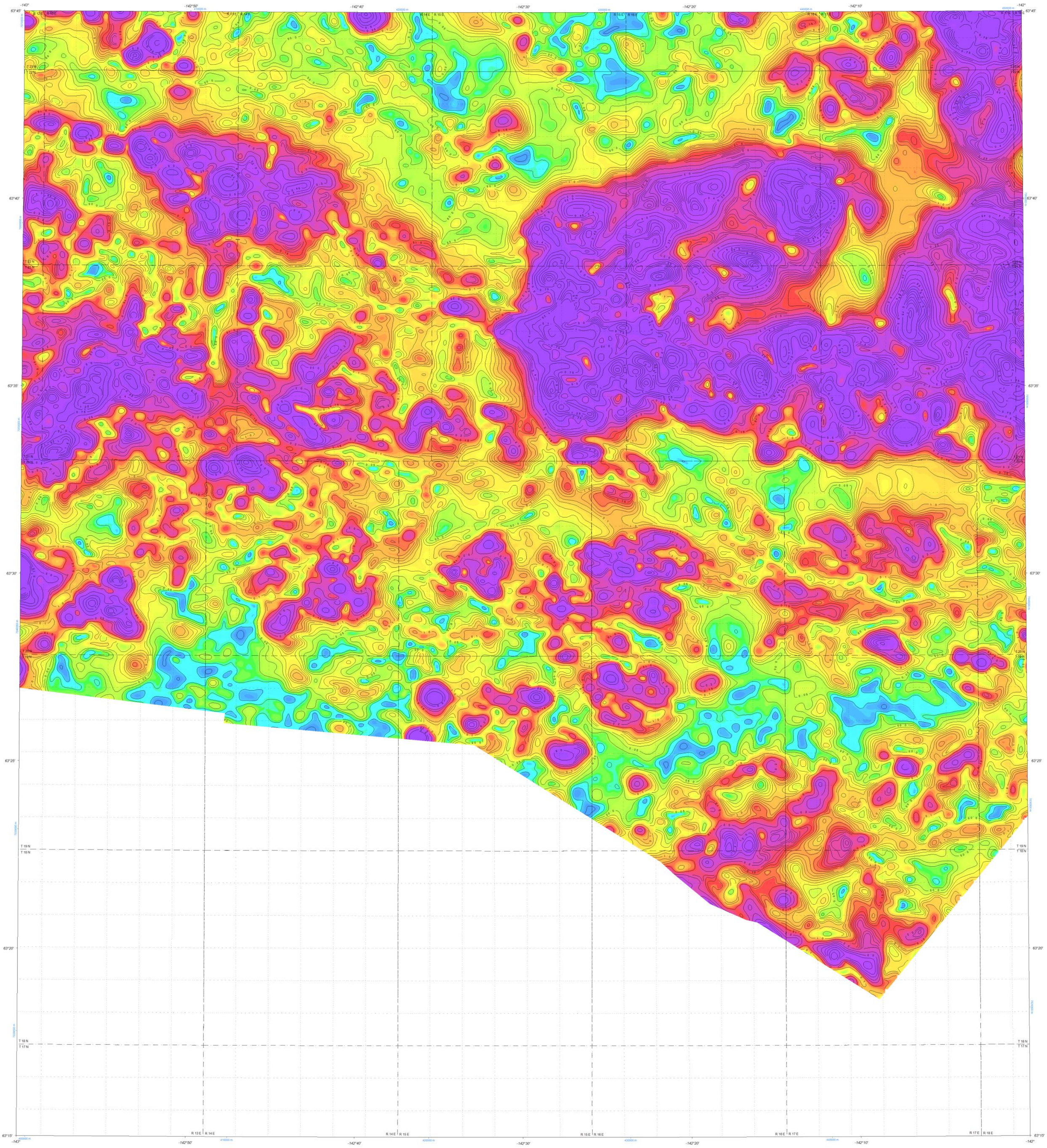
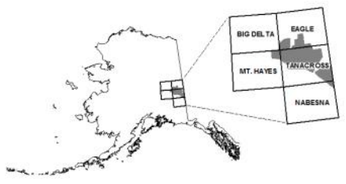
GEOPHYSICAL REPORT 2015-6
Analytic signal grid and contours with Township, Range, and Section; scale 1:63,360; Sheet 5 of 7
Quadrangles: Tanacross B-3, B-4, C-3, C-4



SURVEY LOCATION



AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE TANACROSS REGION, ALASKA

ANALYTIC SIGNAL GRID AND CONTOURS

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

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SCALE 1 / 63,360

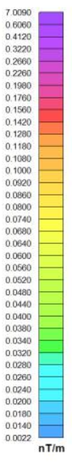
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

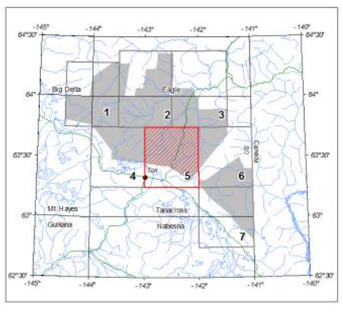
NAD27 Zone 7N

CONTOUR LEGEND

0.25 nT/m
0.05 nT/m
0.01 nT/m



LOCATION INDEX OF 1:63,360 SCALE MAP



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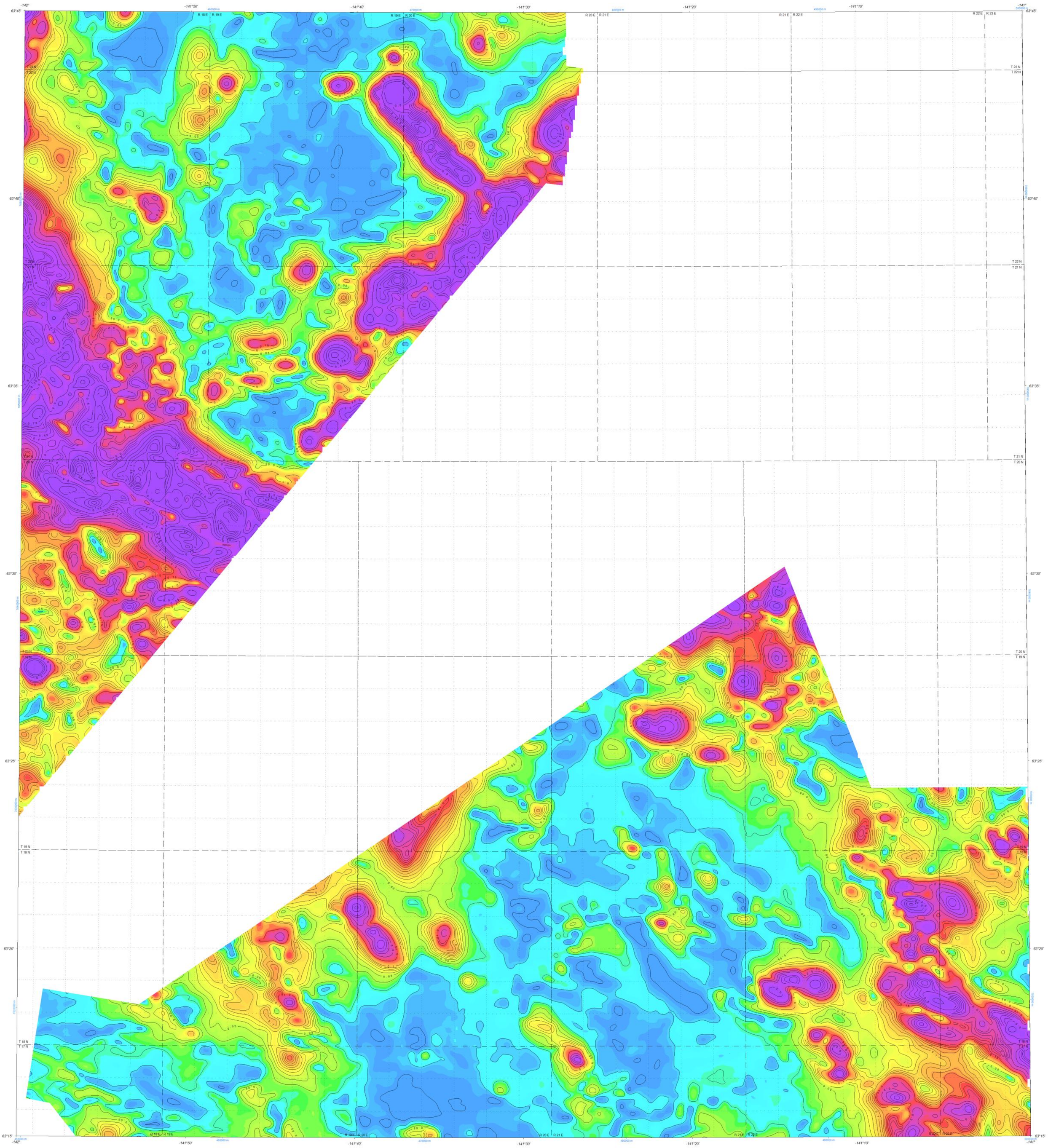
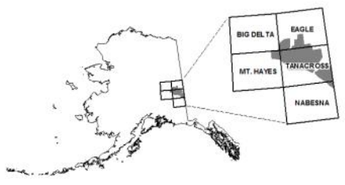
GEOPHYSICAL REPORT 2015-6
Analytic signal grid and contours with Township, Range, and Section; scale 1:63,360; Sheet 6 of 7
Quadrangles: Tanacross B-1, B-2, C-1, C-2



SURVEY LOCATION



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SCALE 1 / 63,360

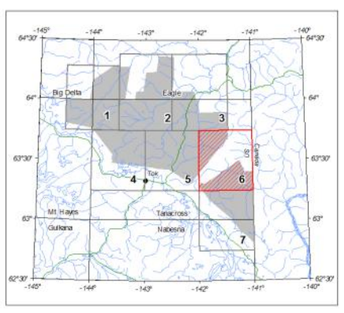
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

CONTOUR LEGEND

0.25 nT/m
0.05 nT/m
0.01 nT/m



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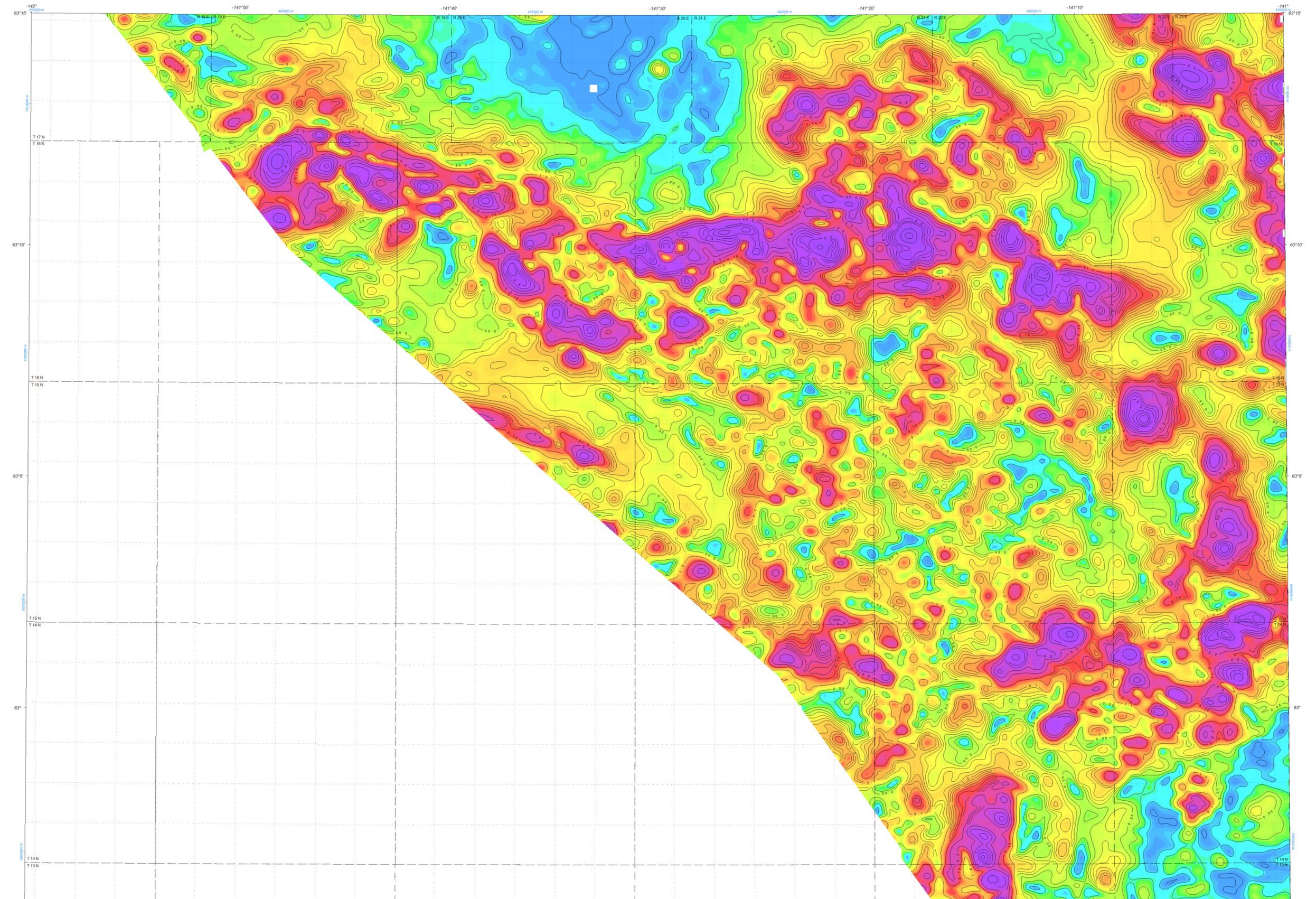
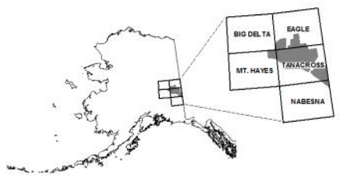
Quadrangles: Tanacross A-1, A-2; Nabesna D-1, D-2



SURVEY LOCATION



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SCALE 1 / 63,360

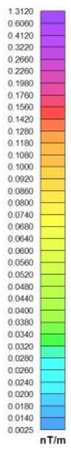
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

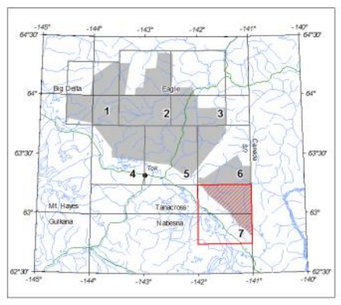
NAD27 Zone 7N

CONTOUR LEGEND

0.25 nT/m
0.05 nT/m
0.01 nT/m



LOCATION INDEX OF 1:63,360 SCALE MAP



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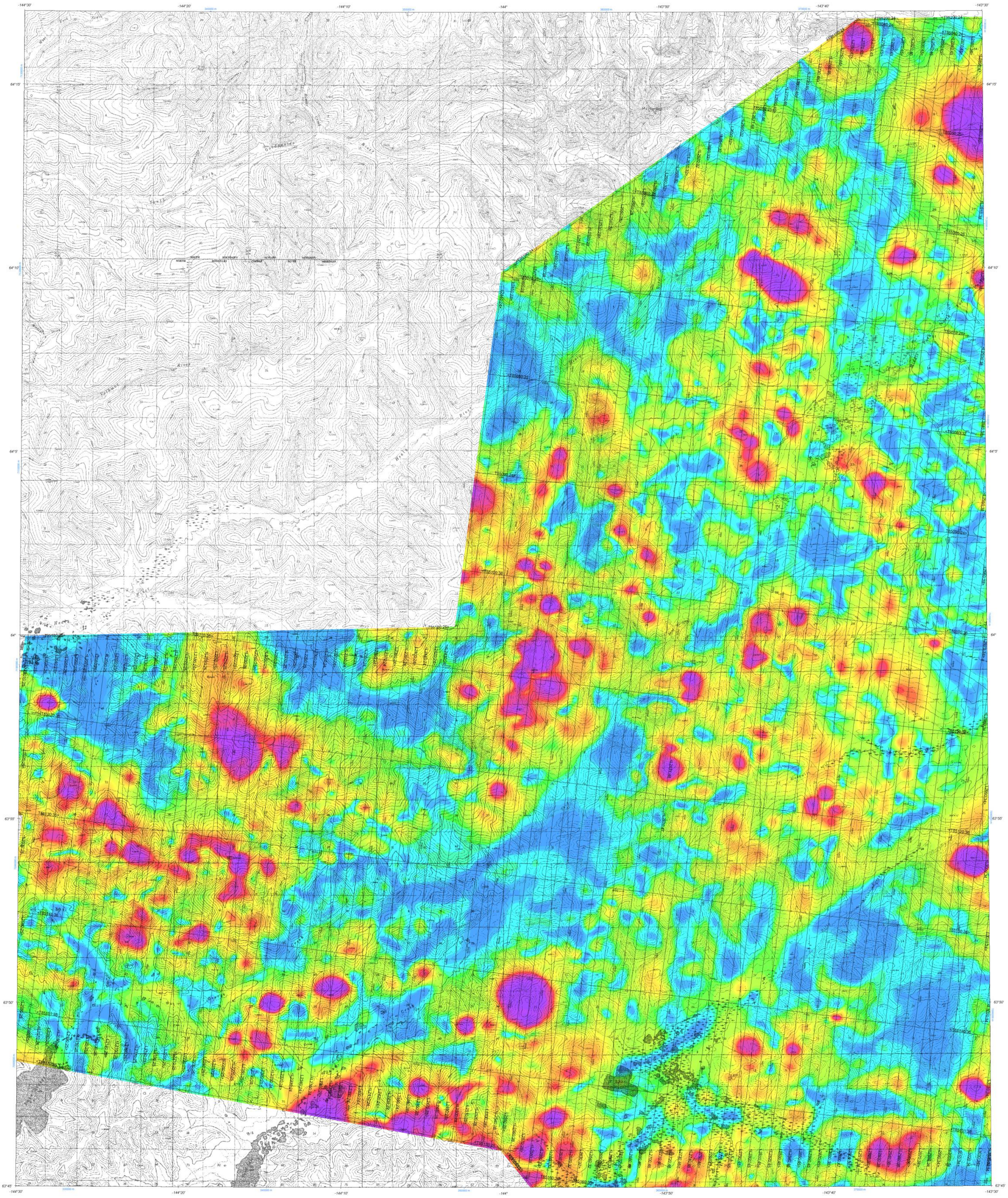
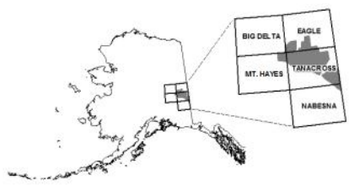


SURVEY LOCATION



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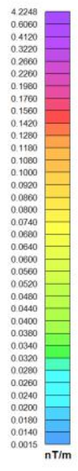
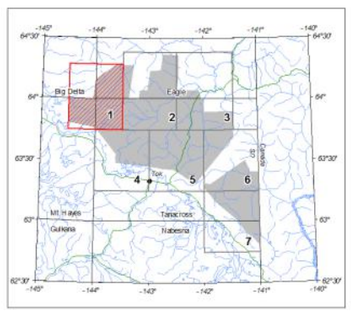


LOCATION INDEX OF 1:63,360 SCALE MAP



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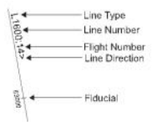
SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND



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Analytic signal grid and flightlines with topography; scale 1:63,360; Sheet 2 of 7
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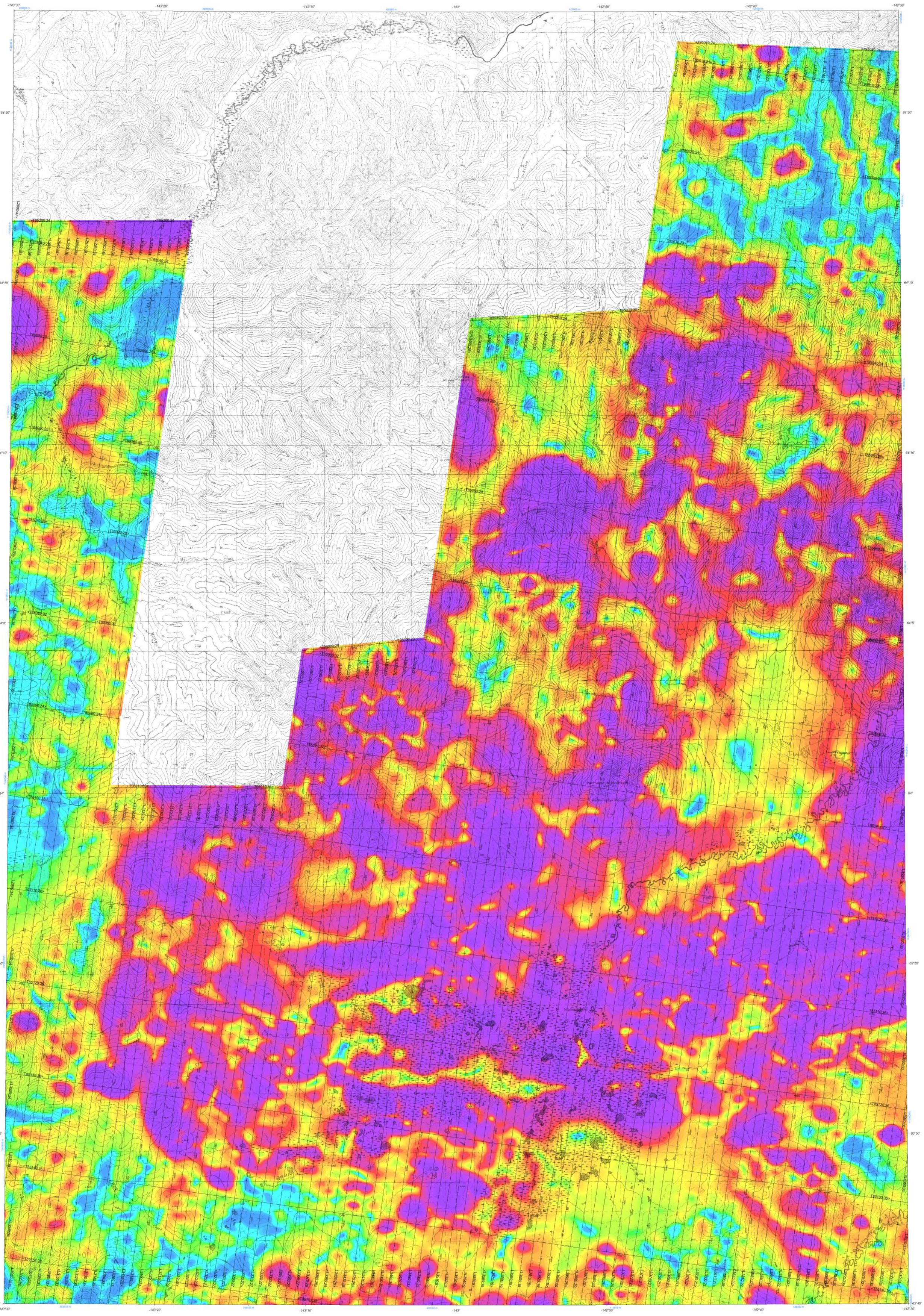

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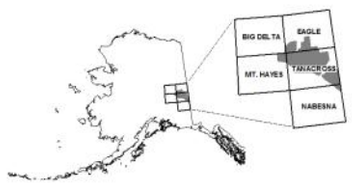
SURVEY LOCATION



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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

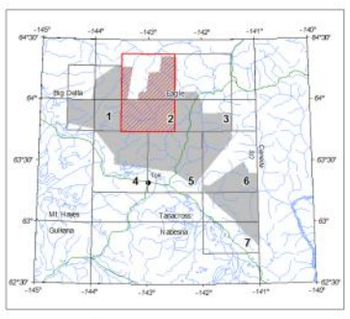
FLIGHT PATH LEGEND

L1910.142 — Line Type, Line Number, Flight Number, Line Direction

0000 — Fiducial

6.9794
0.6060
0.4120
0.3220
0.2660
0.2260
0.1980
0.1760
0.1560
0.1420
0.1280
0.1180
0.1080
0.1000
0.0920
0.0860
0.0800
0.0740
0.0680
0.0640
0.0600
0.0560
0.0520
0.0480
0.0440
0.0400
0.0380
0.0340
0.0320
0.0280
0.0260
0.0240
0.0200
0.0180
0.0140
0.0015
nT/m

LOCATION INDEX OF 1:63,360 SCALE MAP



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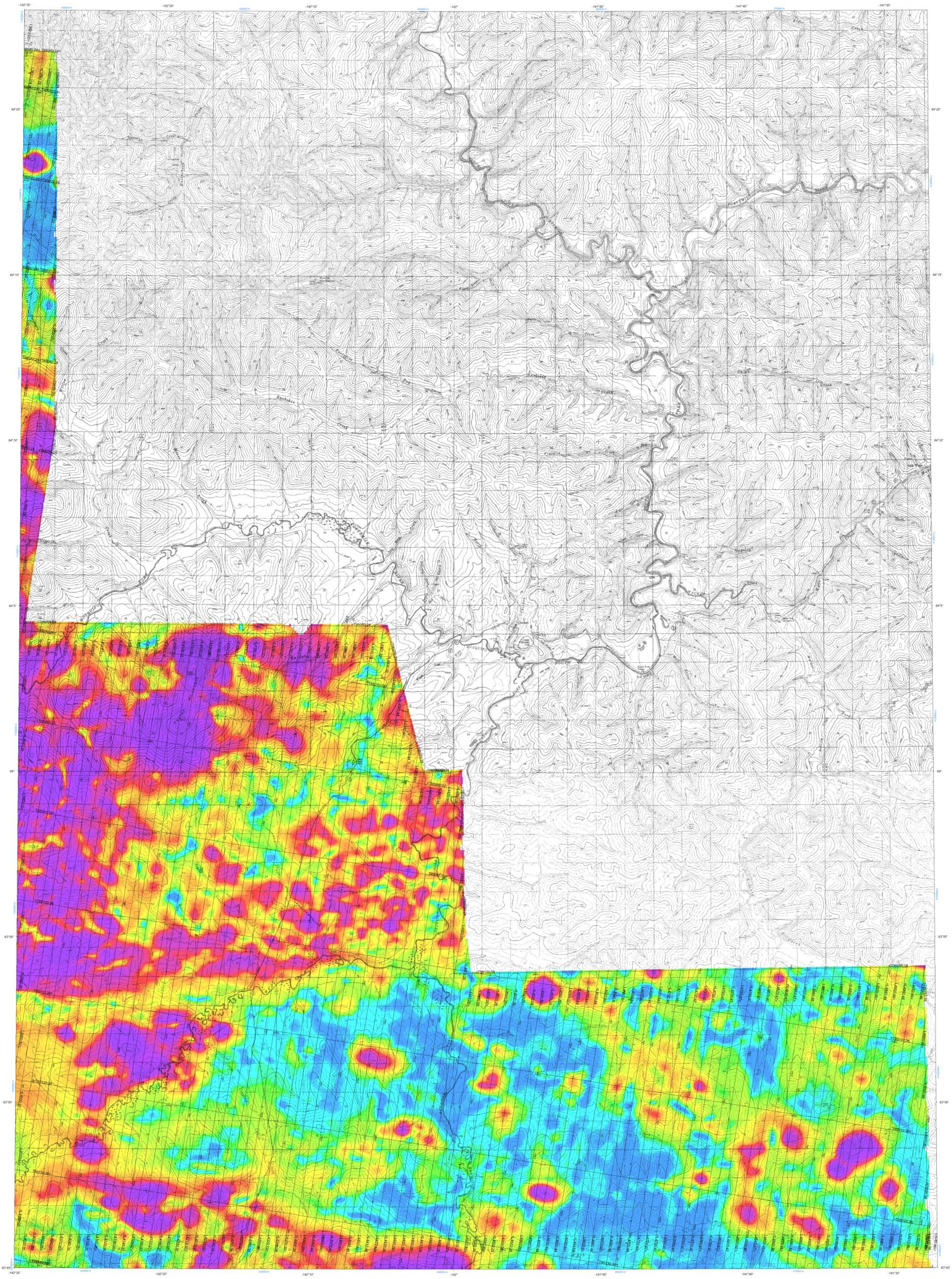
Analytic signal grid and flightlines with topography; scale 1:63,360; Sheet 3 of 7
Quadrangles: Eagle A-1, A-2, A-3, B-1, B-2, B-3; Tanacross D-1, D-2, D-3



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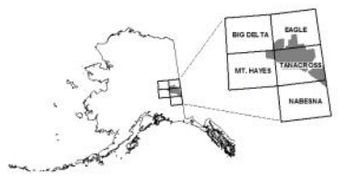

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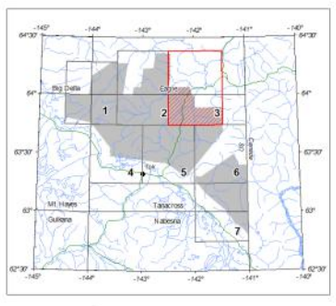

DESCRIPTIVE NOTES

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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

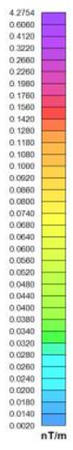
1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L1600:14 — Line Type, Line Number, Flight Number, Line Direction

5000 — Fiducial



SURVEY HISTORY

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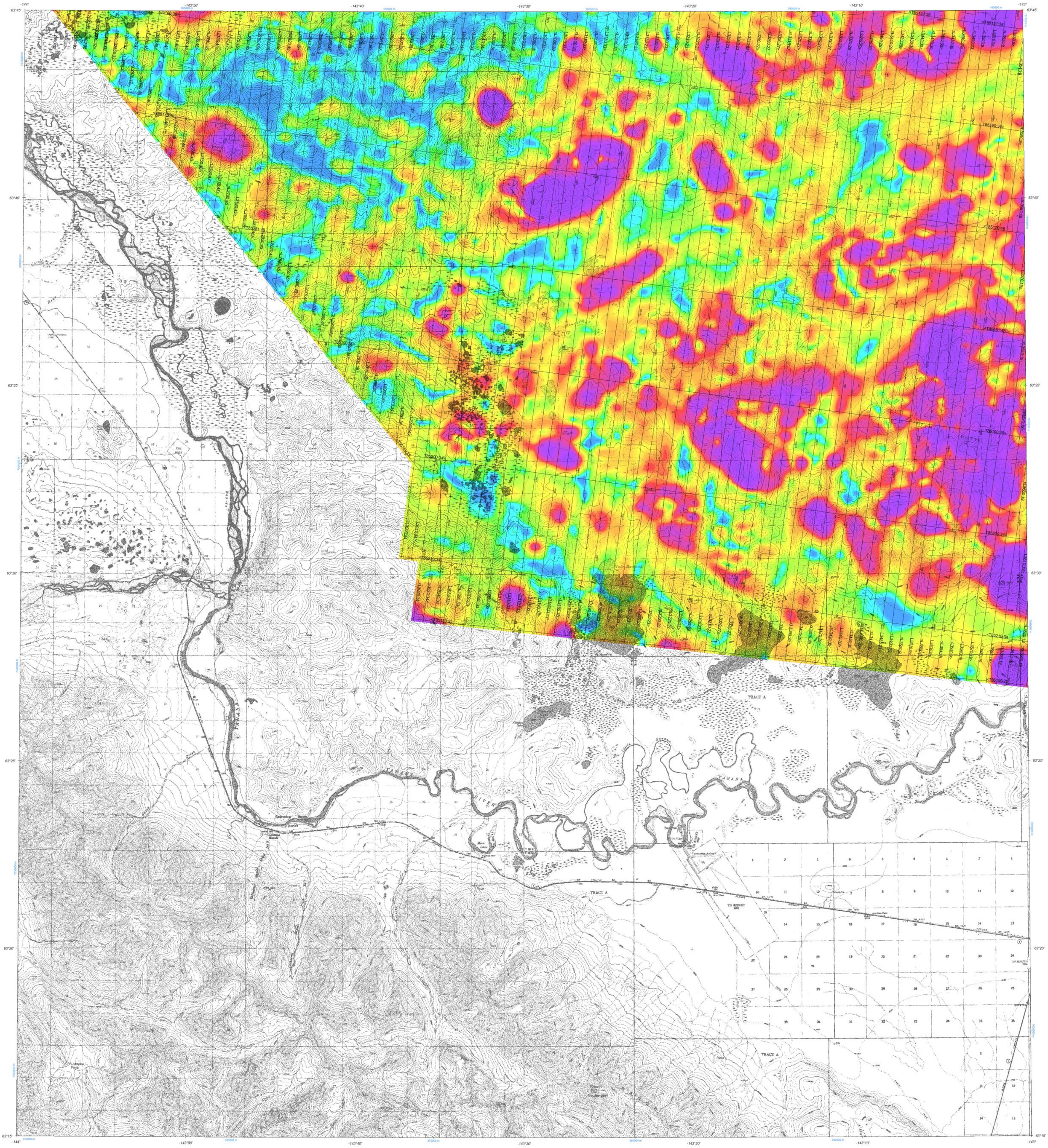
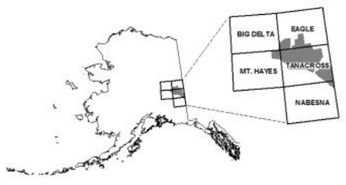
GEOPHYSICAL REPORT 2015-6
Analytic signal grid and flightlines with topography; scale 1:63,360; Sheet 4 of 7
Quadrangles: Tanacross B-5, B-6, C-5, C-6



SURVEY LOCATION

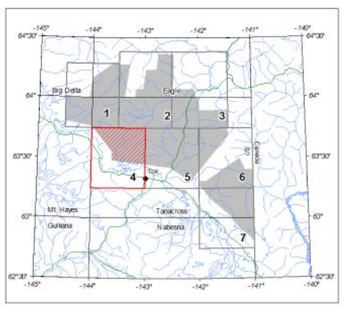


AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE TANACROSS REGION, ALASKA

ANALYTIC SIGNAL GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

LOCATION INDEX OF 1:63,360 SCALE MAP



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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L1000 143 — Line Type, Line Number, Flight Number, Line Direction

60000 — Fiducial

SURVEY HISTORY

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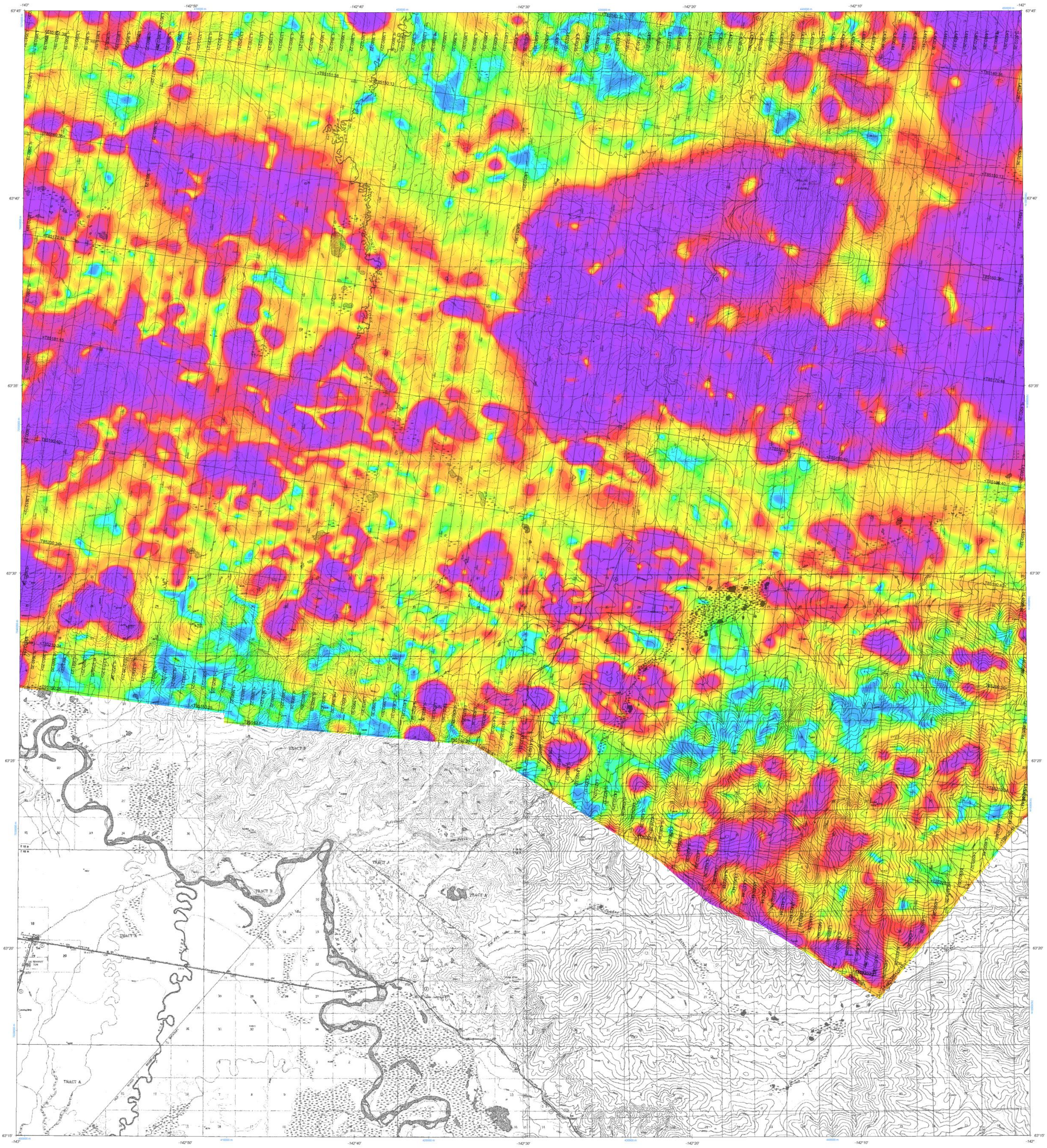
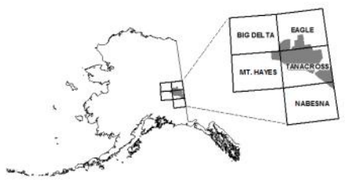
GEOPHYSICAL REPORT 2015-6
Analytic signal grid and flightlines with topography; scale 1:63,360; Sheet 5 of 7
Quadrangles: Tanacross B-3, B-4, C-3, C-4



SURVEY LOCATION



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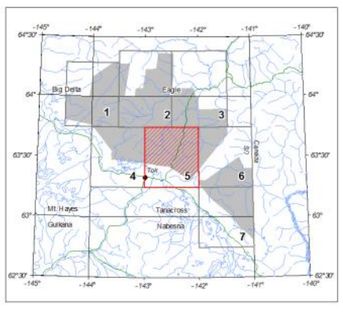
ANALYTIC SIGNAL GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

LOCATION INDEX OF 1:63,360 SCALE MAP



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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L 400 - 149 - 1 — Line Type, Line Number, Flight Number, Line Direction

5000 — Fiducial

SURVEY HISTORY

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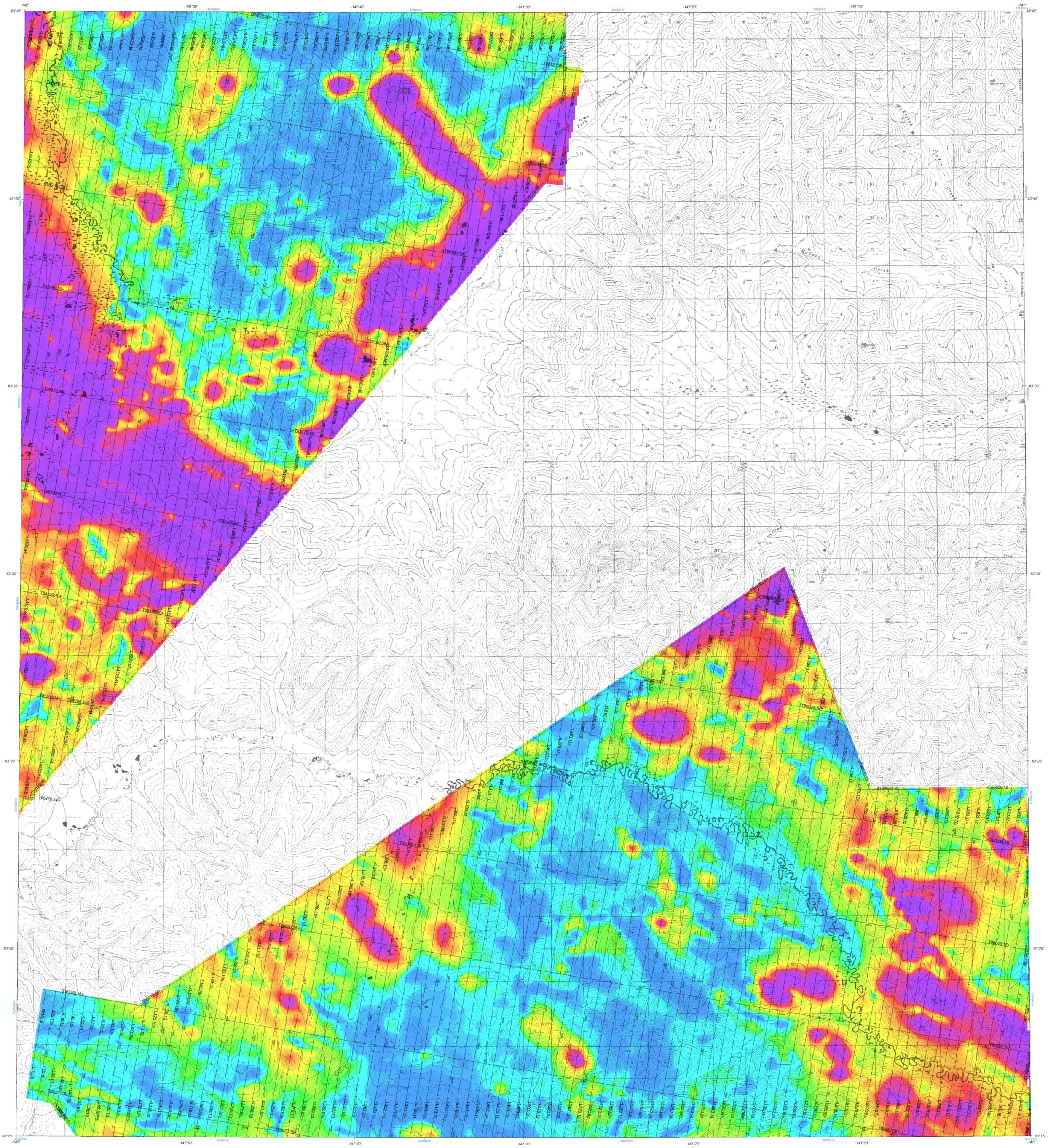
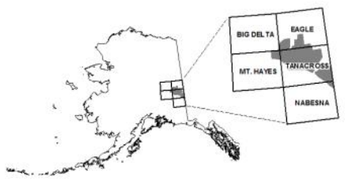
GEOPHYSICAL REPORT 2015-6
Analytic signal grid and flightlines with topography; scale 1:63,360; Sheet 6 of 7
Quadrangles: Tanacross B-1, B-2, C-1, C-2



SURVEY LOCATION



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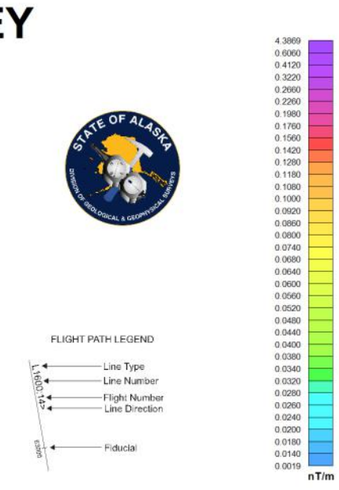
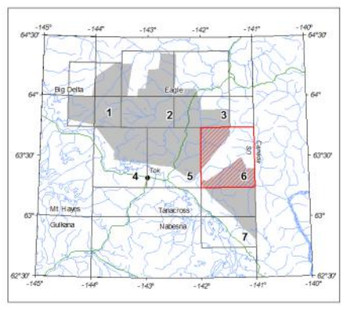
ANALYTIC SIGNAL GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015



LOCATION INDEX OF 1:63,360 SCALE MAP



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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L1000 — Line Type
L10 — Line Number
+45° — Flight Number
Line Direction
0.0000 — Fiducial

SURVEY HISTORY

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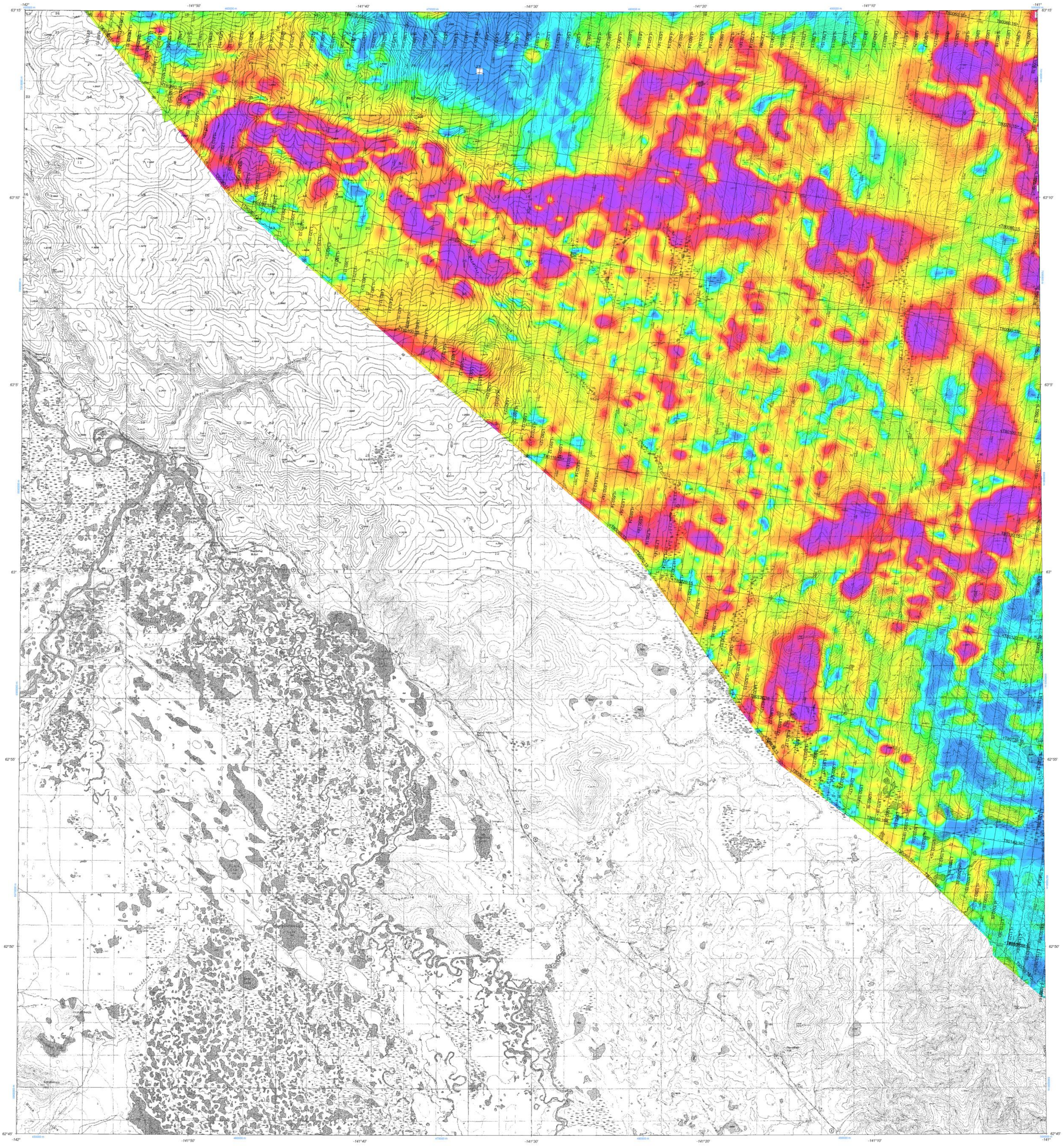
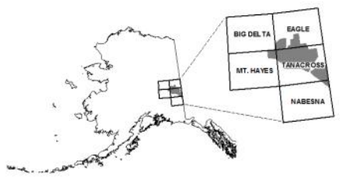
GEOPHYSICAL REPORT 2015-6
Analytic signal grid and flightlines with topography; scale 1:63,360; Sheet 7 of 7
Quadrangles: Tanacross A-1, A-2; Nabesna D-1, D-2



SURVEY LOCATION



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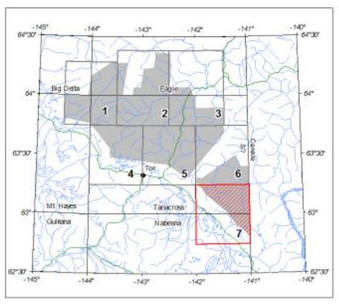
ANALYTIC SIGNAL GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

LOCATION INDEX OF 1:63,360 SCALE MAP



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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

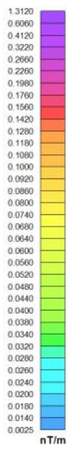
1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L16620 142 — Line Type, Line Number, Flight Number, Line Direction

5000 — Fiducial



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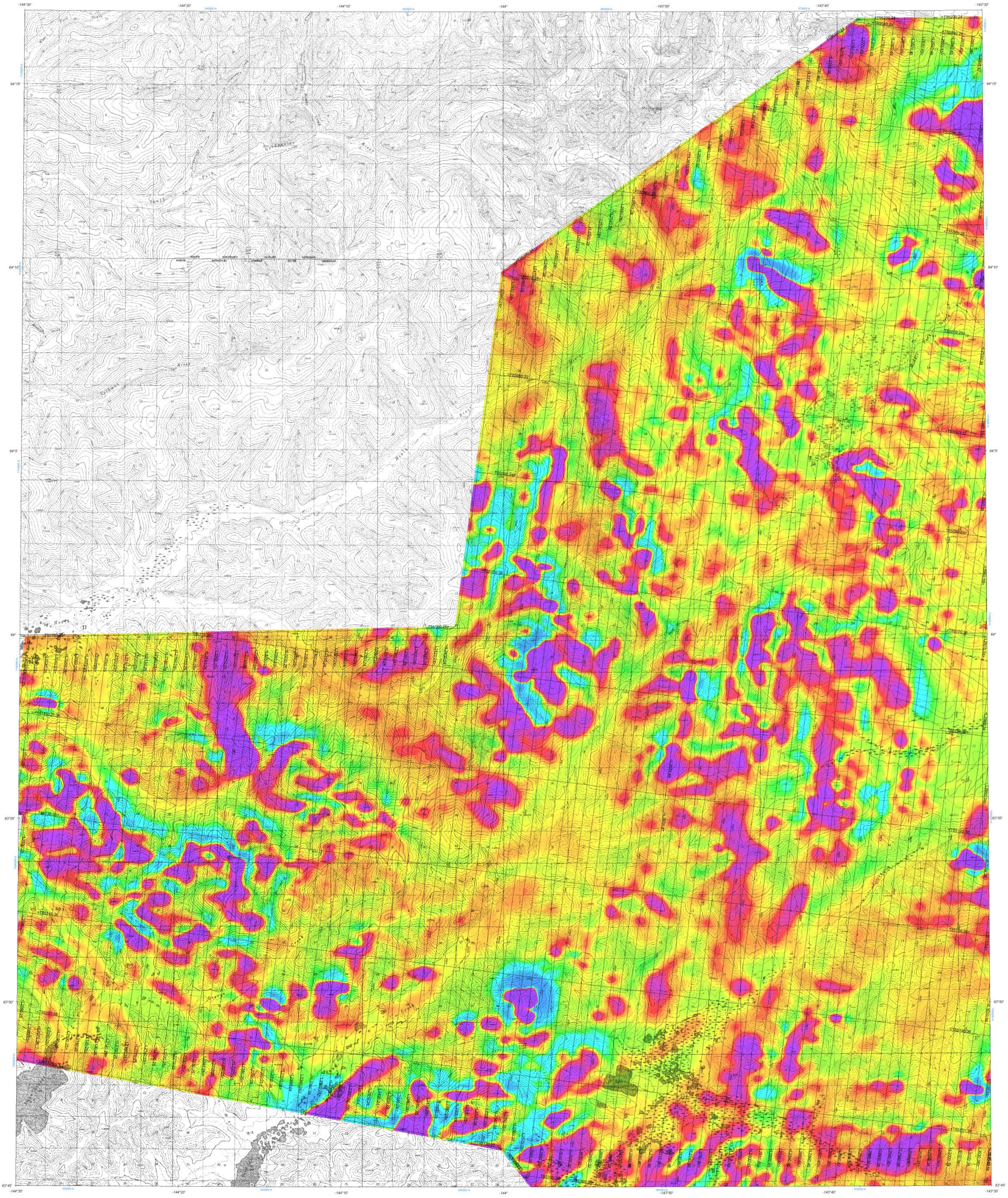
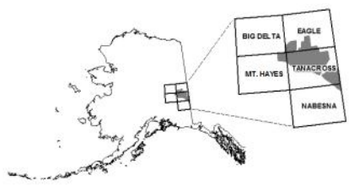
GEOPHYSICAL REPORT 2015-6
Calculated first vertical derivative grid and flightlines with topography; scale 1:63,360; Sheet 1 of 7
Quadrangles: Big Delta A-1, B-1; Mt. Hayes D-1; Eagle A-6, B-6; Tanacross D-6



SURVEY LOCATION



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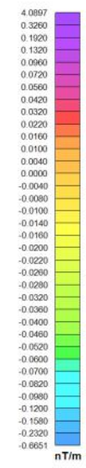
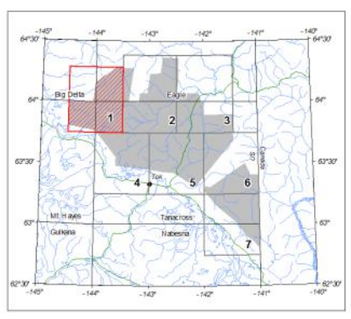
CALCULATED FIRST VERTICAL DERIVATIVE GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015



LOCATION INDEX OF 1:63,360 SCALE MAP



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CALCULATED FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

The first vertical derivative of the magnetic field is the rate of change of the magnetic field in the vertical direction. Computation of the first vertical derivative removes long wavelength features and improves resolution of closely spaced and superimposed anomalies. The data presented here were calculated from the residual magnetic intensity grid by application of a FFT-based vertical derivative transfer function.

SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

Line Type
Line Number
Flight Number
Line Direction
Fiducial

SURVEY HISTORY

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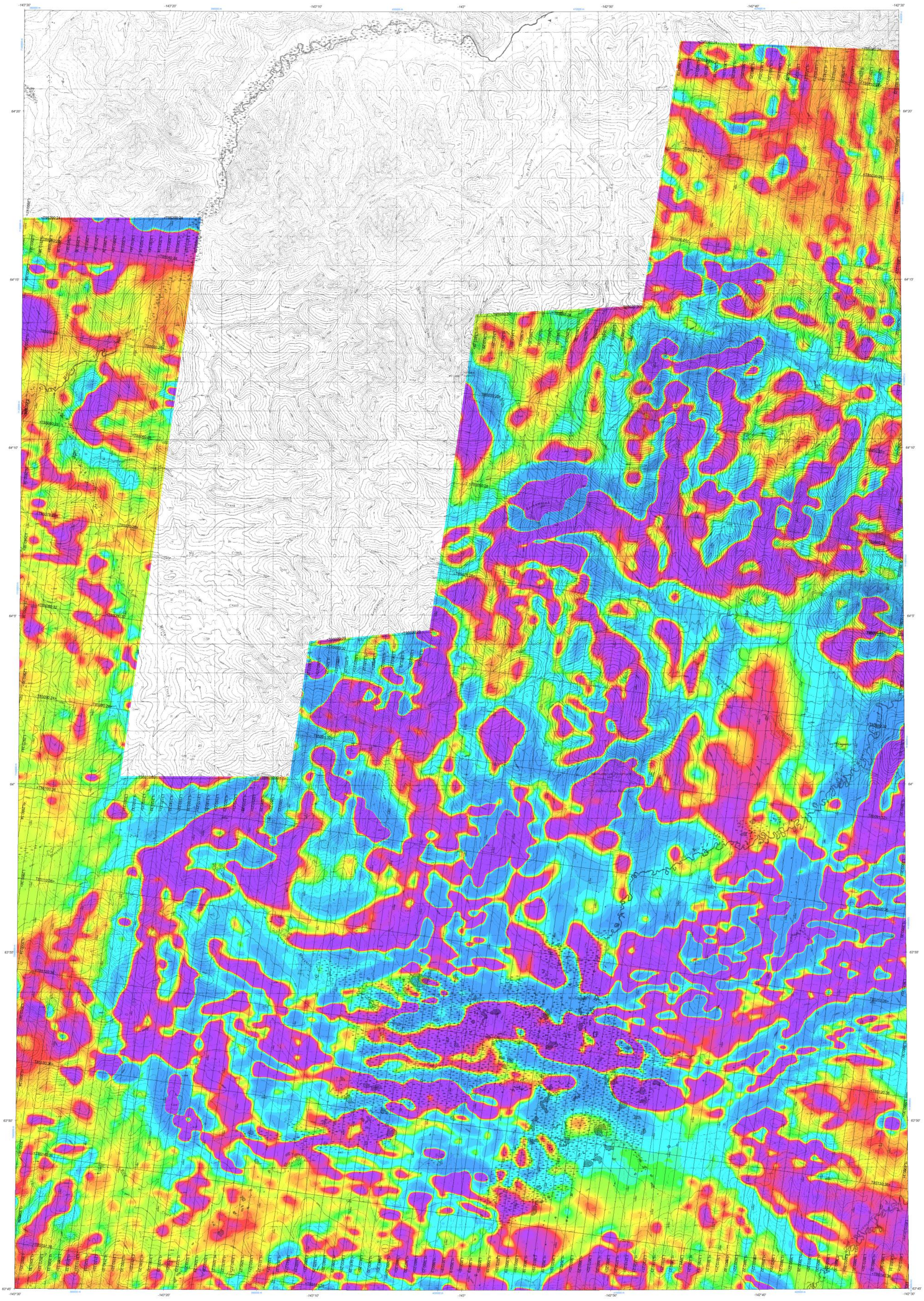
GEOPHYSICAL REPORT 2015-6
Calculated first vertical derivative grid and flightlines with topography; scale 1:63,360; Sheet 2 of 7
Quadrangles: Eagle A-4, A-5, B-4, B-5; Tanacross D-4, D-5



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by
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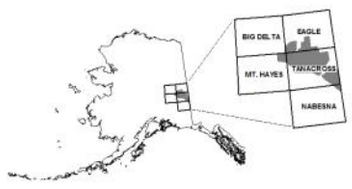
and Goldak Airborne Surveys
2015

SURVEY LOCATION



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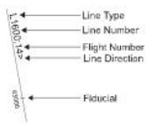
SCALE 1 / 63,360

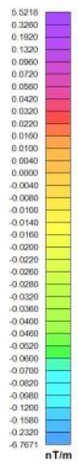
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

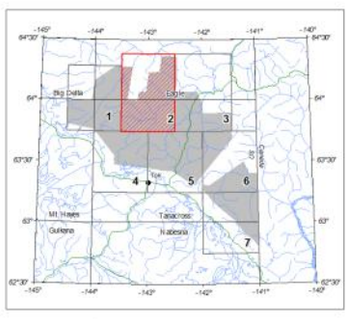
NAD27 Zone 7N

FLIGHT PATH LEGEND





LOCATION INDEX OF 1:63,360 SCALE MAP



SURVEY HISTORY

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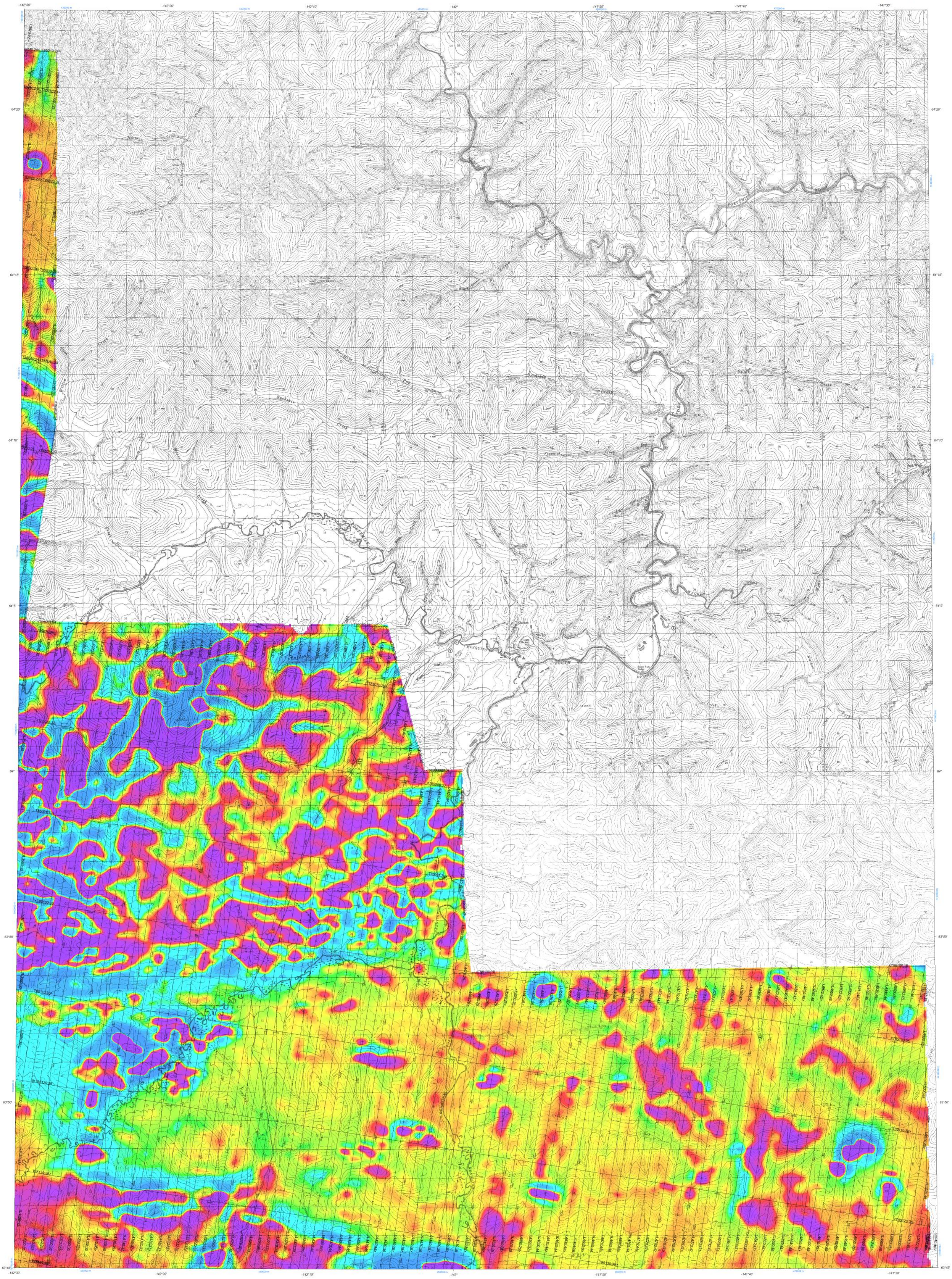
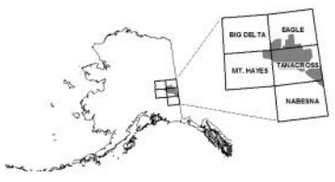
GEOPHYSICAL REPORT 2015-6
Calculated first vertical derivative grid and flightlines with topography; scale 1:63,360; Sheet 3 of 7
Quadrangles: Eagle A-1, A-2, A-3, B-1, B-2, B-3; Tanacross D-1, D-2, D-3



SURVEY LOCATION

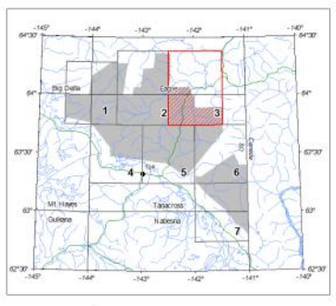


AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE TANACROSS REGION, ALASKA

CALCULATED FIRST VERTICAL DERIVATIVE GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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CALCULATED FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

The first vertical derivative of the magnetic field is the rate of change of the magnetic field in the vertical direction. Computation of the first vertical derivative removes long wavelength features and improves resolution of closely spaced and superimposed anomalies. The data presented here were calculated from the residual magnetic intensity grid by application of a FFT-based vertical derivative transfer function.

SCALE 1 / 63,360

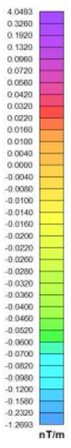
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

Line Type
Line Number
Flight Number
Line Direction
Fiducial



SURVEY HISTORY

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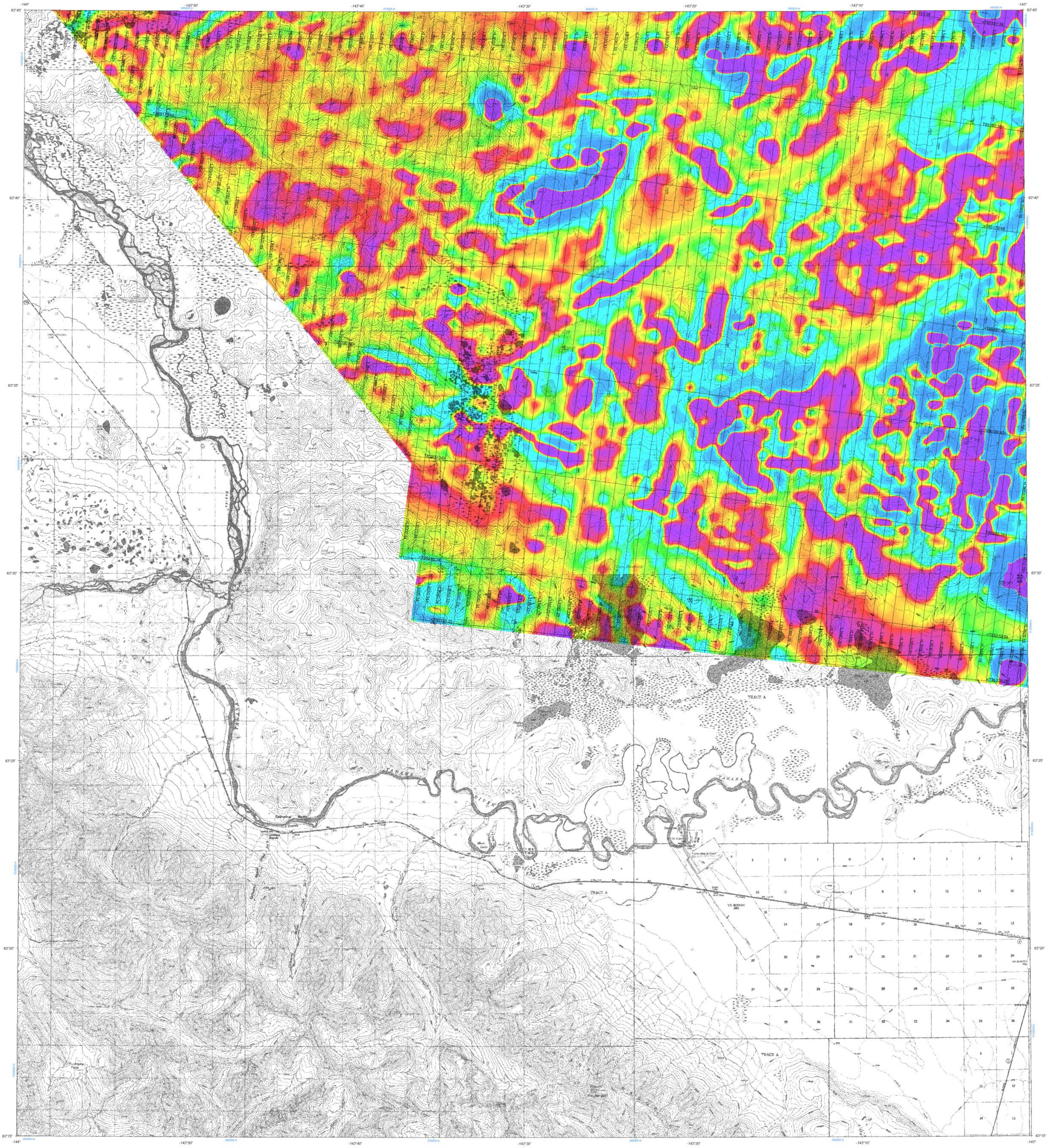
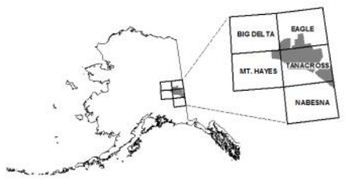
GEOPHYSICAL REPORT 2015-6
Calculated first vertical derivative grid and flightlines with topography; scale 1:63,360; Sheet 4 of 7
Quadrangles: Tanacross B-5, B-6, C-5, C-6



SURVEY LOCATION



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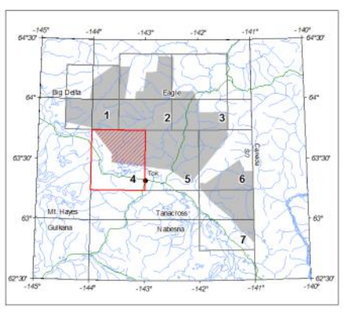
CALCULATED FIRST VERTICAL DERIVATIVE GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

LOCATION INDEX OF 1:63,360 SCALE MAP



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SCALE 1 / 63,360

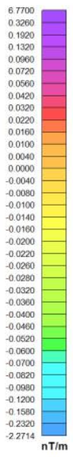
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L1000 T45
Line Type
Line Number
Flight Number
Line Direction
Fiducial



SURVEY HISTORY

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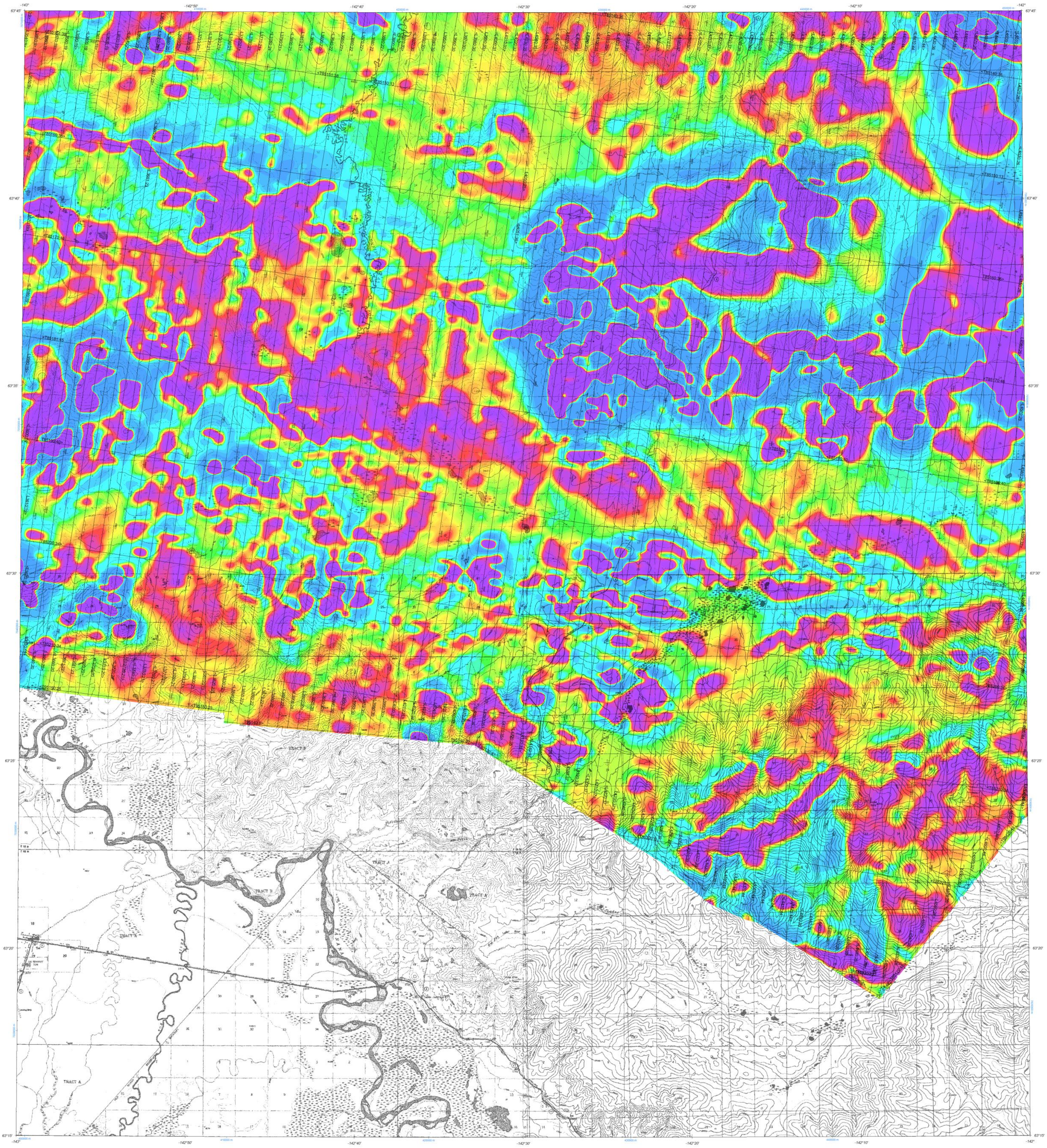
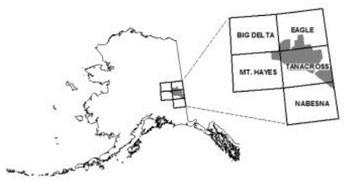
GEOPHYSICAL REPORT 2015-6
Calculated first vertical derivative grid and flightlines with topography; scale 1:63,360; Sheet 5 of 7
Quadrangles: Tanacross B-3, B-4, C-3, C-4



SURVEY LOCATION



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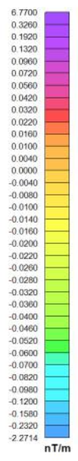
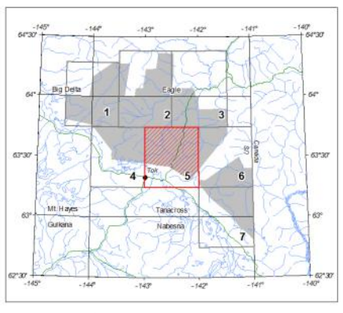
CALCULATED FIRST VERTICAL DERIVATIVE GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015



LOCATION INDEX OF 1:63,360 SCALE MAP



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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L 100 - 1 - 5 - 1000

Line Type
Line Number
Flight Number
Line Direction

Fiducial

SURVEY HISTORY

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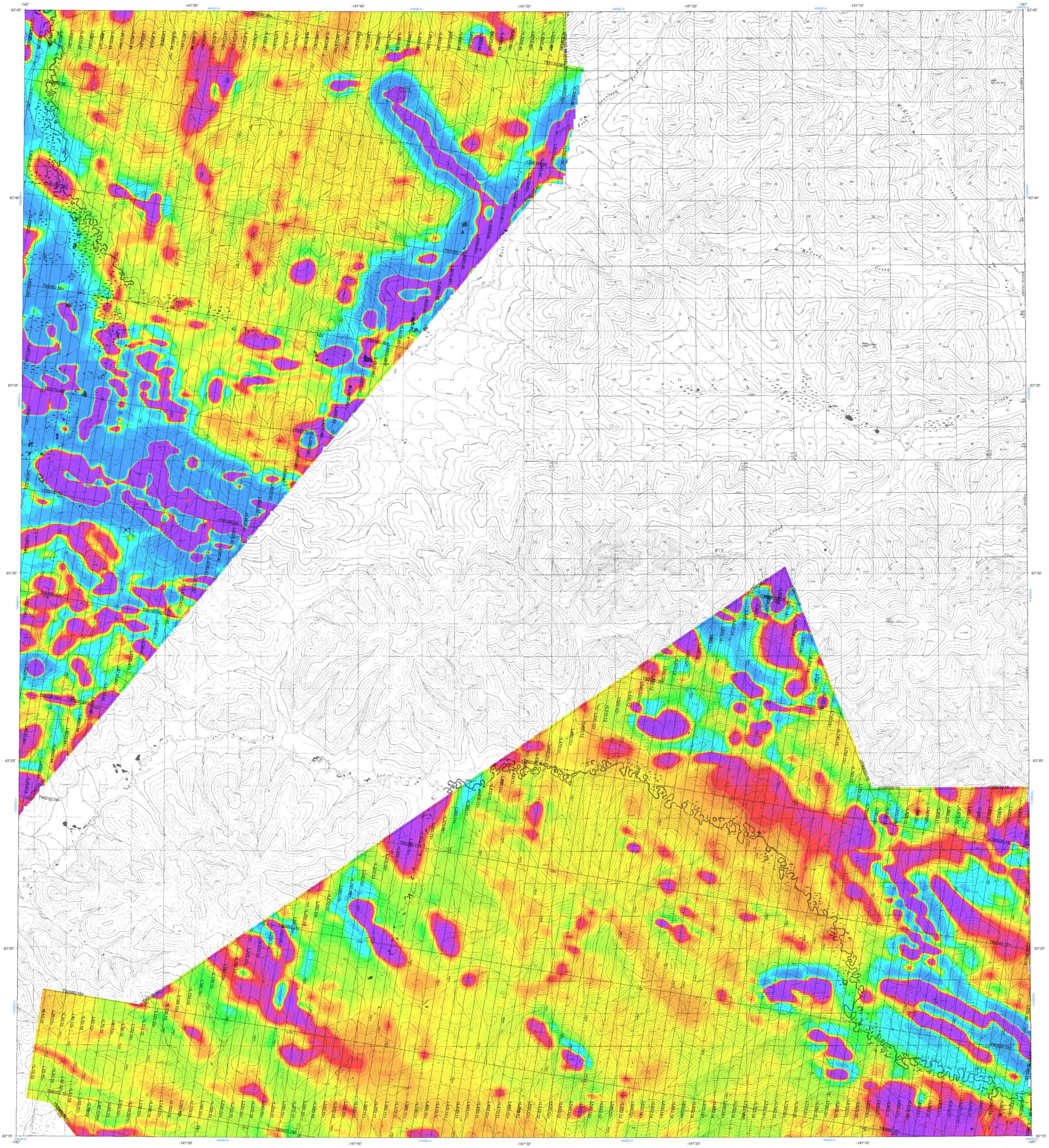
GEOPHYSICAL REPORT 2015-6
Calculated first vertical derivative grid and flightlines with topography; scale 1:63,360; Sheet 6 of 7
Quadrangles: Tanacross B-1, B-2, C-1, C-2



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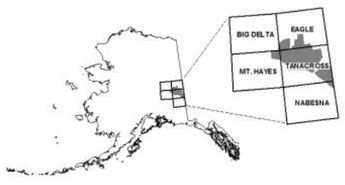
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

SURVEY LOCATION



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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

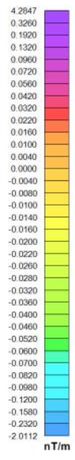
1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

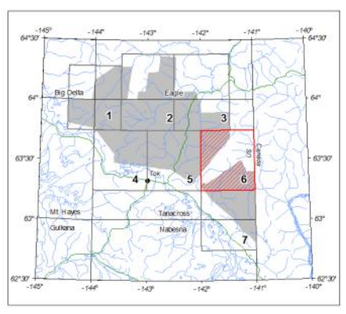
FLIGHT PATH LEGEND

L1000.10 — Line Type, Line Number, Flight Number, Line Direction

5000 — Fiducial



LOCATION INDEX OF 1:63,360 SCALE MAP



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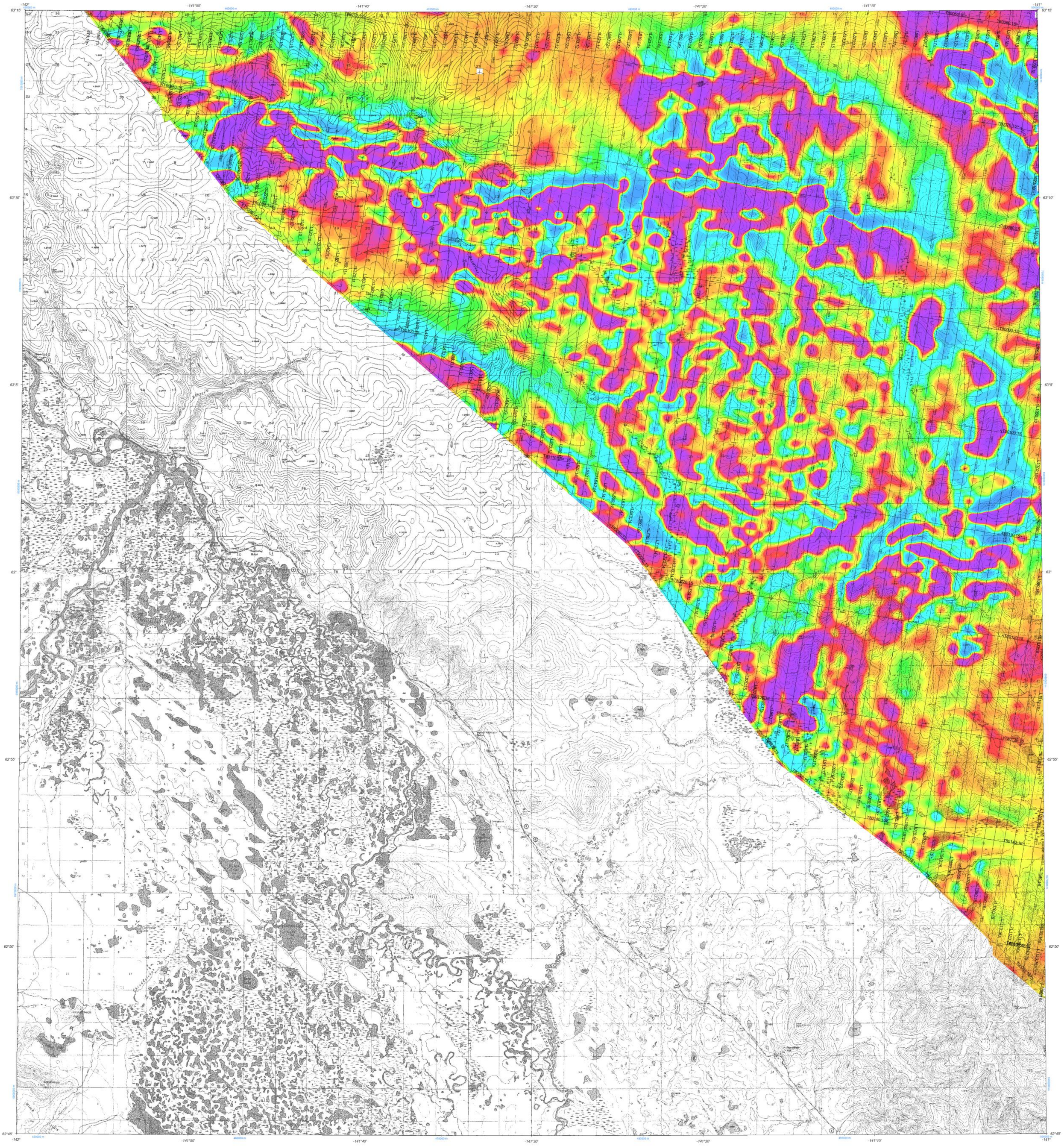
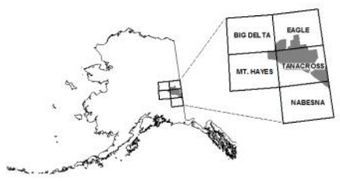
Calculated first vertical derivative grid and flightlines with topography; scale 1:63,360; Sheet 7 of 7
Quadrangles: Tanacross A-1, A-2; Nabesna D-1, D-2



SURVEY LOCATION



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A.M. Emond, R.W. Saltus, G.R.C. Graham,
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2015

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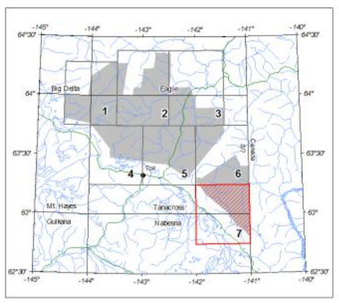

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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

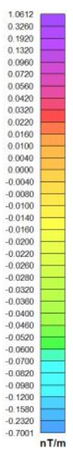
1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L16020:242 — Line Type, Line Number, Flight Number, Line Direction

5000m — Fiducial



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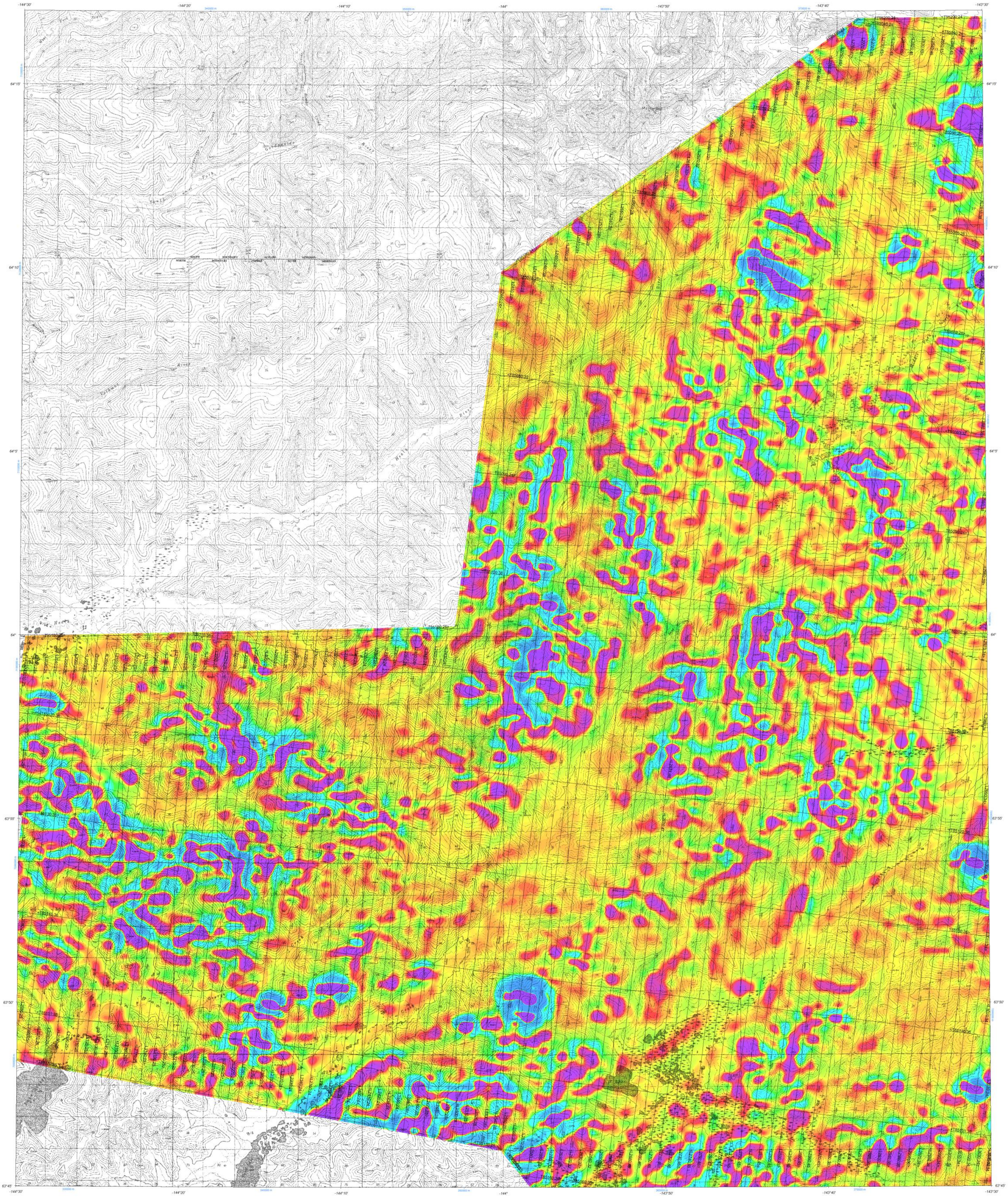
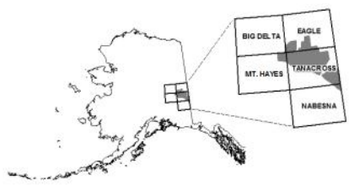
GEOPHYSICAL REPORT 2015-6
Calculated second vertical derivative grid and flightlines with topography; scale 1:63,360; Sheet 1 of 7
Quadrangles: Big Delta A-1, B-1; Mt. Hayes D-1; Eagle A-6, B-6; Tanacross D-6



SURVEY LOCATION



AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE TANACROSS REGION, ALASKA

CALCULATED SECOND VERTICAL DERIVATIVE GRID AND FLIGHTLINES

by
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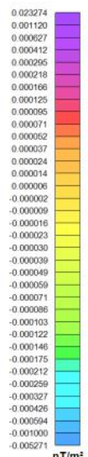
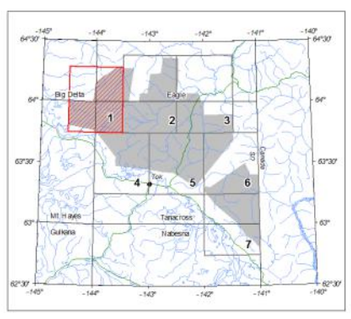
and Goldak Airborne Surveys
2015



LOCATION INDEX OF 1:63,360 SCALE MAP



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CALCULATED SECOND VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

The second vertical derivative of the magnetic field is the rate of change of the magnetic field in the vertical direction. Computation of the second vertical derivative removes long wavelength features and improves resolution of closely spaced and superimposed anomalies. The data presented here were calculated from the residual magnetic intensity grid by application of FFT-based transfer functions of the second vertical derivative and a fifth order Butterworth lowpass filter. The latter (lowpass filter) aimed at attenuating unwanted high frequencies enhanced by the derivative operator.

SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

Line Type
Line Number
Flight Number
Line Direction
Fiducial

SURVEY HISTORY

Airborne geophysical data for the area were acquired and processed by Goldak Airborne Surveys under contract with the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS). Project funded by the US Geological Survey, Mineral Resources Program.

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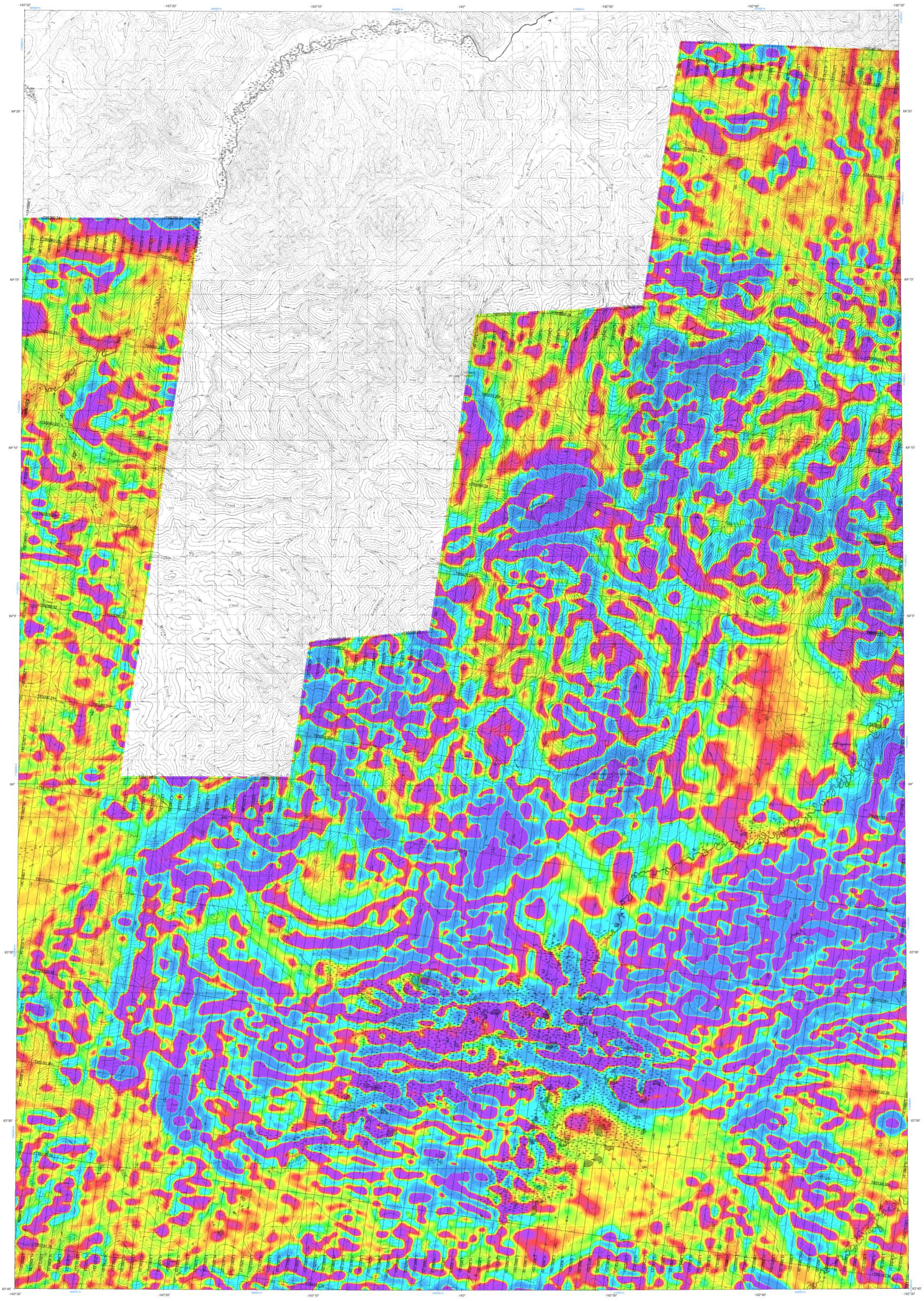
GEOPHYSICAL REPORT 2015-6
Calculated second vertical derivative grid and flightlines with topography; scale 1:63,360; Sheet 2 of 7
Quadrangles: Eagle A-4, A-5, B-4, B-5; Tanacross D-4, D-5

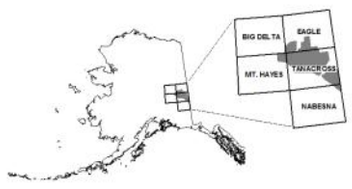


AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE TANACROSS REGION, ALASKA

CALCULATED SECOND VERTICAL DERIVATIVE GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

SURVEY LOCATION



DESCRIPTIVE NOTES

This map was derived from data acquired during an aeromagnetic survey carried out by Goldak Airborne Surveys from June 17 to July 31, 2015 using a Piper PA-31 Navajo aircraft (registration C-GJBG). The magnetic data were recorded at 10 Hz using three Geometrics cesium vapour magnetometers mounted in the tail boom and wing-tip pods of the aircraft. This array of magnetometers form a horizontal gradiometer with a transverse separation of 14.78 m and longitudinal separation of 9.75 m. GNSS positioning data were recorded at 1 Hz using a Novatel OEMV Propak GNSS receiver. The final flight path was recovered following post-flight differential corrections which improve positioning accuracy to the sub-meter level. Additional on-board equipment included a Thompson CFS 530A radar altimeter, a Setra 270 barometric altimeter and a vertically mounted video camera. Ground based systems included three GEM Systems GSM-19W proton procession magnetometers and a Novatel OEMV GNSS receiver.

The nominal traverse and control line spacings were, respectively, 500 m and 5000 m, and the aircraft flew predetermined flight surface with a target terrain clearance of 100 m and a mean terrain clearance of 290 m. Traverse lines were oriented at N10°E with both orthogonal and boundary control lines.

CALCULATED SECOND VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

The second vertical derivative of the magnetic field is the rate of change of the magnetic field in the vertical direction. Computation of the second vertical derivative removes long wavelength features and improves resolution of closely spaced and superimposed anomalies. The data presented here were calculated from the residual magnetic intensity grid by application of FFT-based transfer functions of the second vertical derivative and a fifth order Butterworth lowpass filter. The latter (lowpass filter) aimed at attenuating unwanted high frequencies enhanced by the derivative operator.

SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

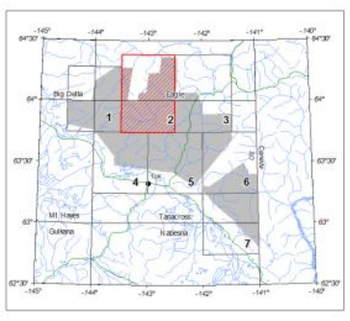
NAD27 Zone 7N

FLIGHT PATH LEGEND

Line Type
Line Number
Flight Number
Line Direction
Fiducial

0.032592
0.001120
0.000627
0.000412
0.000295
0.000218
0.000166
0.000125
0.000095
0.000071
0.000052
0.000037
0.000024
0.000014
0.000006
-0.000002
-0.000009
-0.000016
-0.000023
-0.000030
-0.000039
-0.000049
-0.000059
-0.000071
-0.000086
-0.000103
-0.000122
-0.000146
-0.000175
-0.000212
-0.000259
-0.000327
-0.000426
-0.000594
-0.001000
-0.039876
nT/m²

LOCATION INDEX OF 1:63,360 SCALE MAP



SURVEY HISTORY

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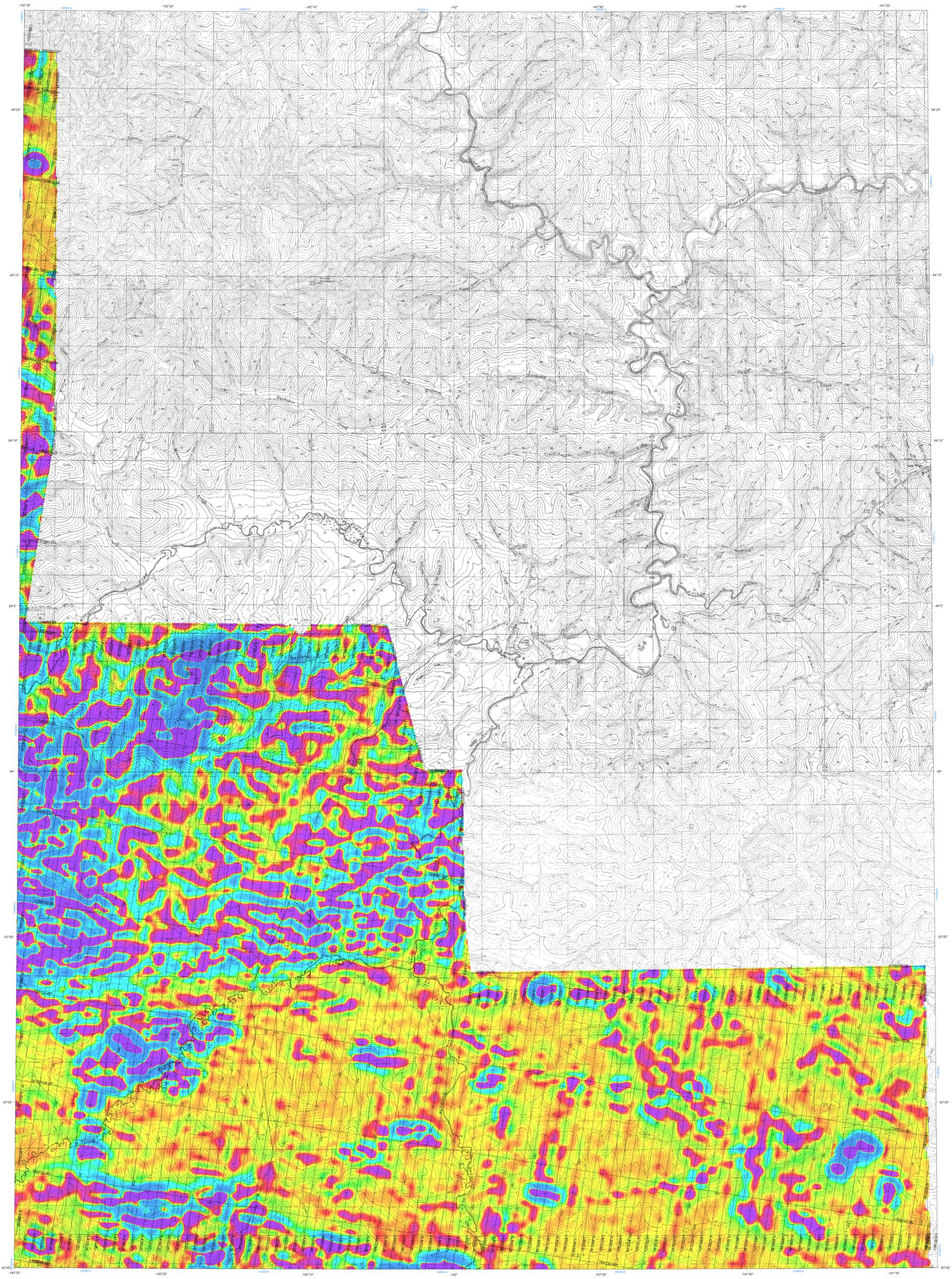
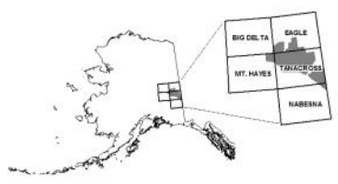
GEOPHYSICAL REPORT 2015-6
Calculated second vertical derivative grid and flightlines with topography; scale 1:63,360; Sheet 3 of 7
Quadrangles: Eagle A-1, A-2, A-3, B-1, B-2, B-3; Tanacross D-1, D-2, D-3



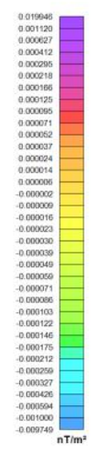
SURVEY LOCATION



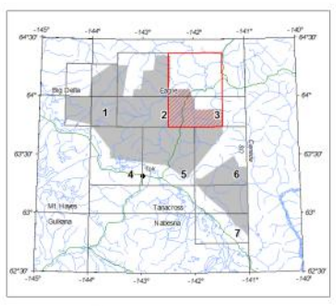
AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE TANACROSS REGION, ALASKA

CALCULATED SECOND VERTICAL DERIVATIVE GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015



LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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CALCULATED SECOND VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L16010-24 — Line Type, Line Number, Flight Number, Line Direction

12256 — Fiducial

SURVEY HISTORY

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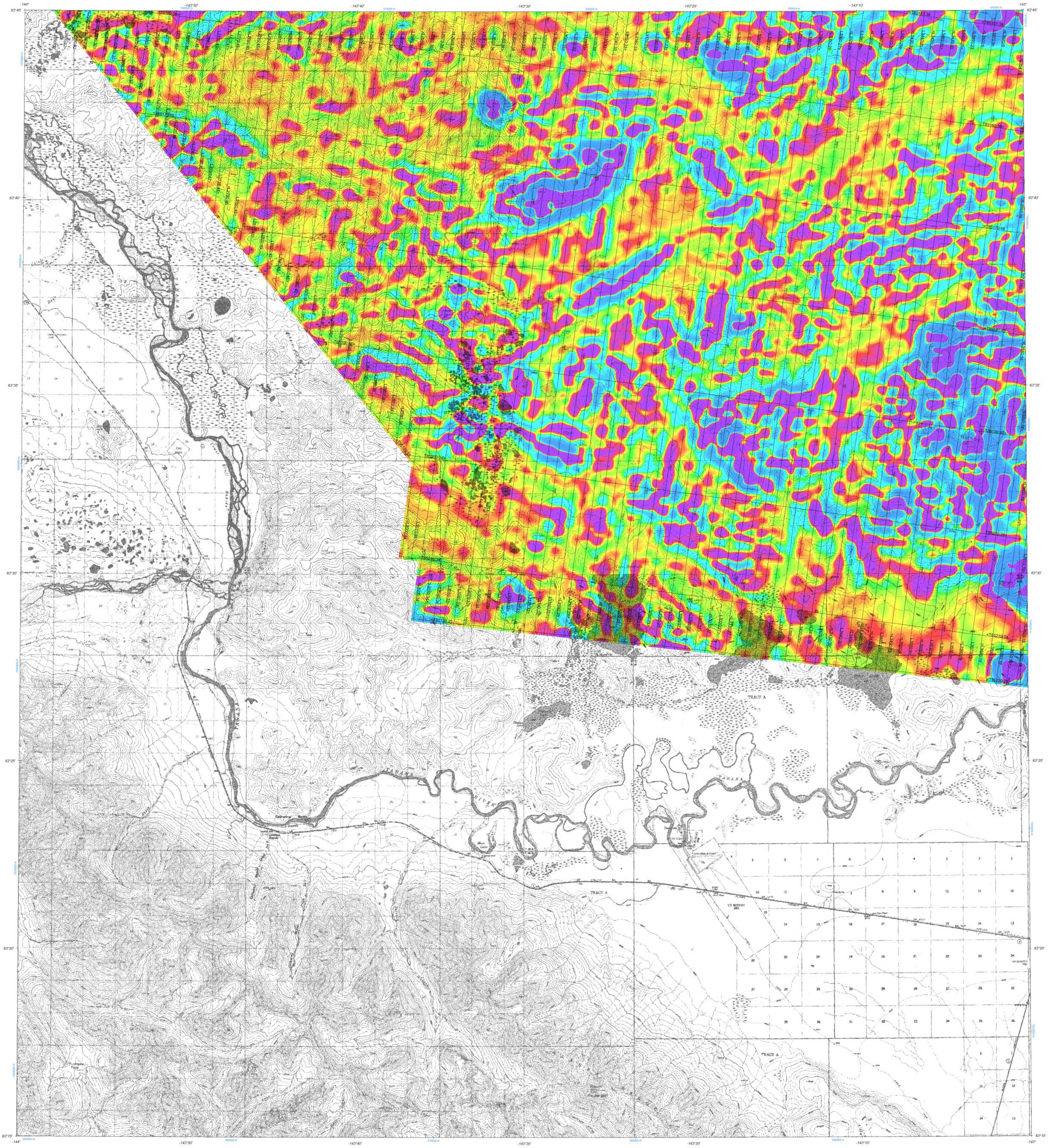
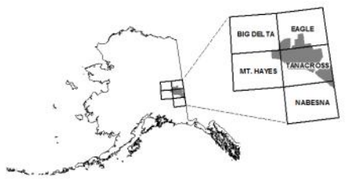
GEOPHYSICAL REPORT 2015-6
Calculated second vertical derivative grid and flightlines with topography; scale 1:63,360; Sheet 4 of 7
Quadrangles: Tanacross B-5, B-6, C-5, C-6



SURVEY LOCATION



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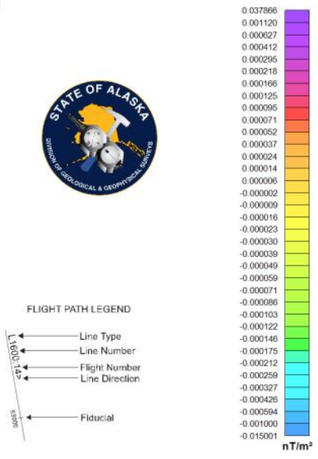
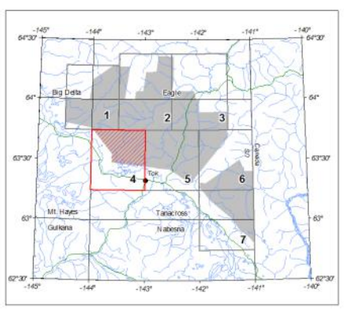
CALCULATED SECOND VERTICAL DERIVATIVE GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015



LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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The nominal traverse and control line spacings were, respectively, 500 m and 5000 m, and the aircraft flew predetermined flight surface with a target terrain clearance of 100 m and a mean terrain clearance of 290 m. Traverse lines were oriented at N10°E with both orthogonal and boundary control lines.

CALCULATED SECOND VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

The second vertical derivative of the magnetic field is the rate of change of the magnetic field in the vertical direction. Computation of the second vertical derivative removes long wavelength features and improves resolution of closely spaced and superimposed anomalies. The data presented here were calculated from the residual magnetic intensity grid by application of FFT-based transfer functions of the second vertical derivative and a fifth order Butterworth lowpass filter. The latter (lowpass filter) aimed at attenuating unwanted high frequencies enhanced by the derivative operator.

SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L1000 N45 — Line Type, Line Number, Flight Number, Line Direction

0.0000 — Fiducial

SURVEY HISTORY

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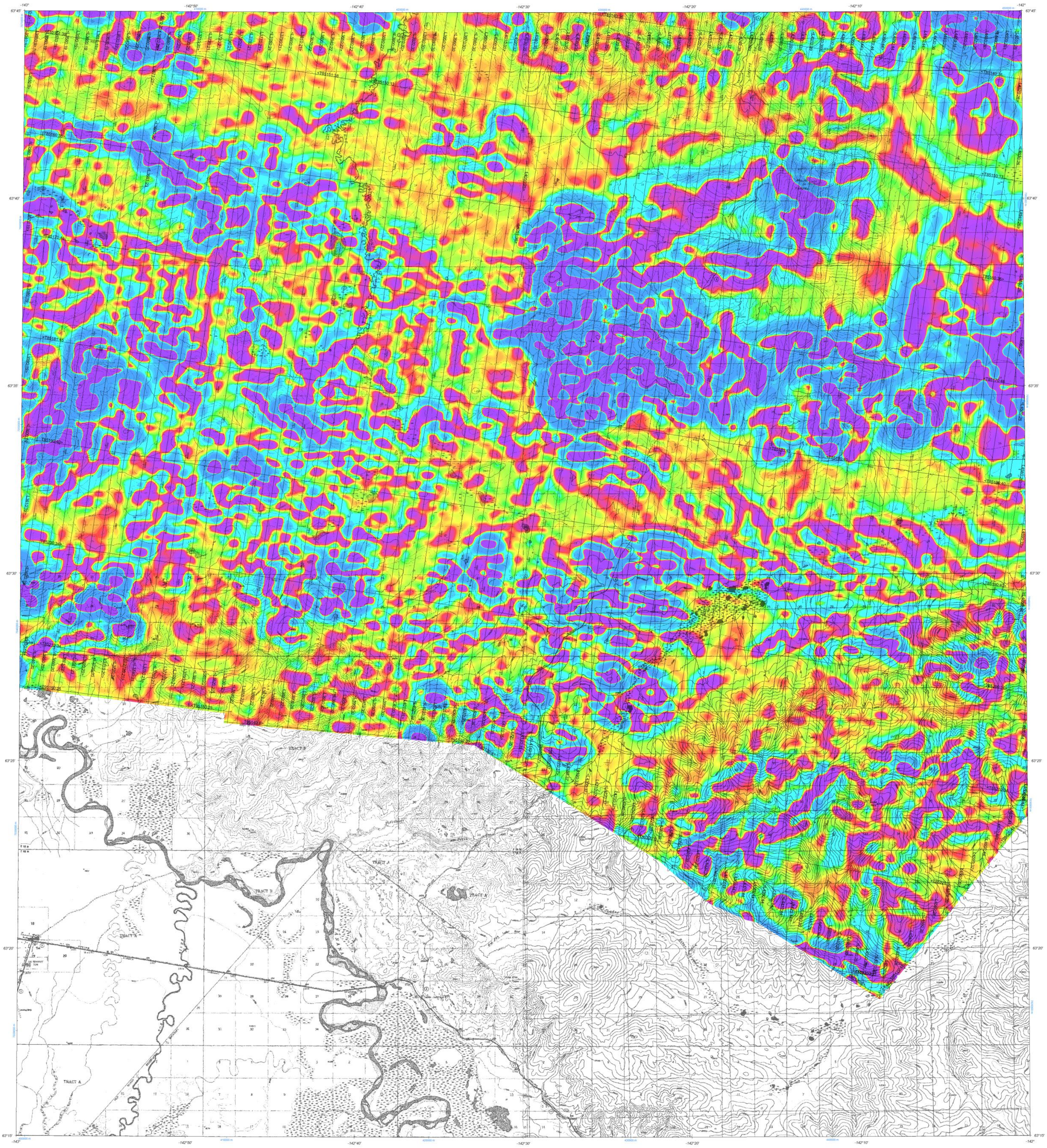
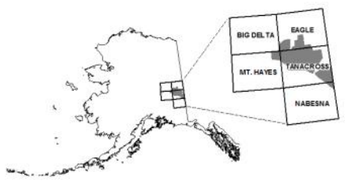
GEOPHYSICAL REPORT 2015-6
Calculated second vertical derivative grid and flightlines with topography; scale 1:63,360; Sheet 5 of 7
Quadrangles: Tanacross B-3, B-4, C-3, C-4



SURVEY LOCATION



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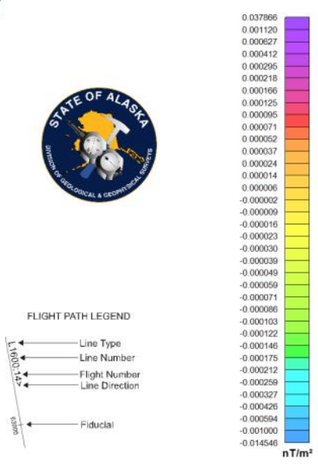
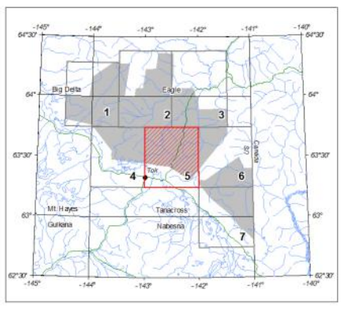
CALCULATED SECOND VERTICAL DERIVATIVE GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015



LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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CALCULATED SECOND VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

SURVEY HISTORY

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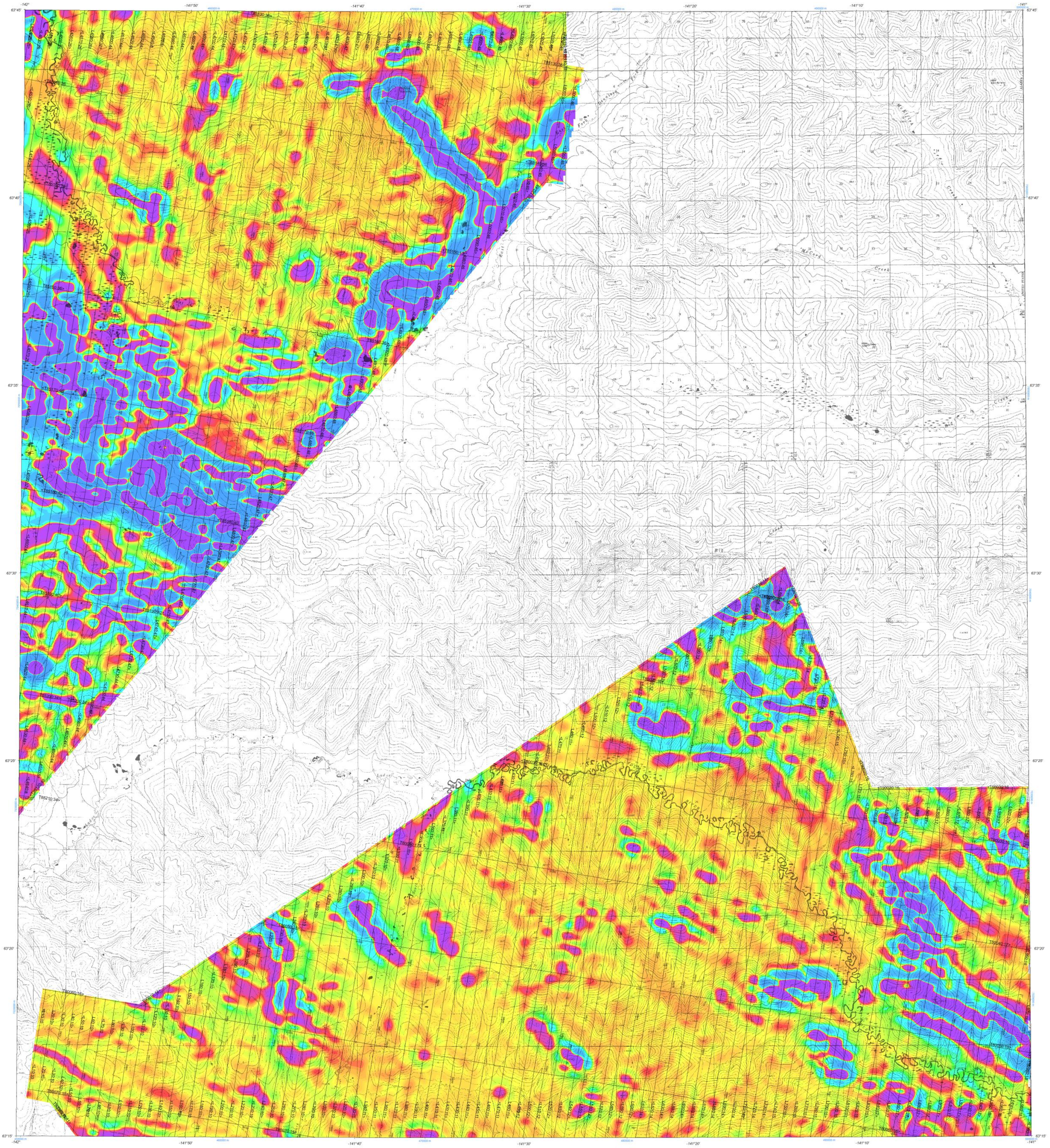
GEOPHYSICAL REPORT 2015-6
Calculated second vertical derivative grid and flightlines with topography; scale 1:63,360; Sheet 6 of 7
Quadrangles: Tanacross B-1, B-2, C-1, C-2



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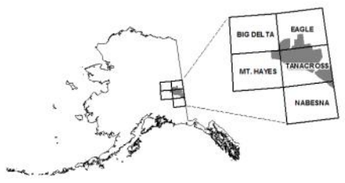
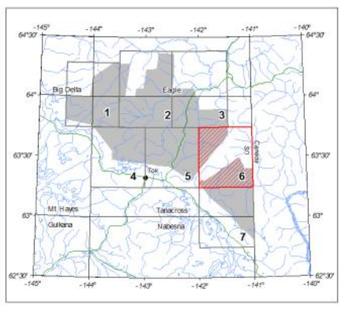
and Goldak Airborne Surveys
2015

SURVEY LOCATION



LOCATION INDEX OF 1:63,360 SCALE MAP



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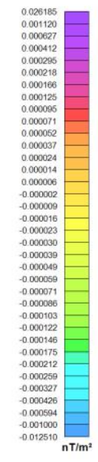
SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N



FLIGHT PATH LEGEND

L100010 — Line Type
L100010 — Line Number
L100010 — Flight Number
L100010 — Line Direction
5000 — Fiducial

SURVEY HISTORY

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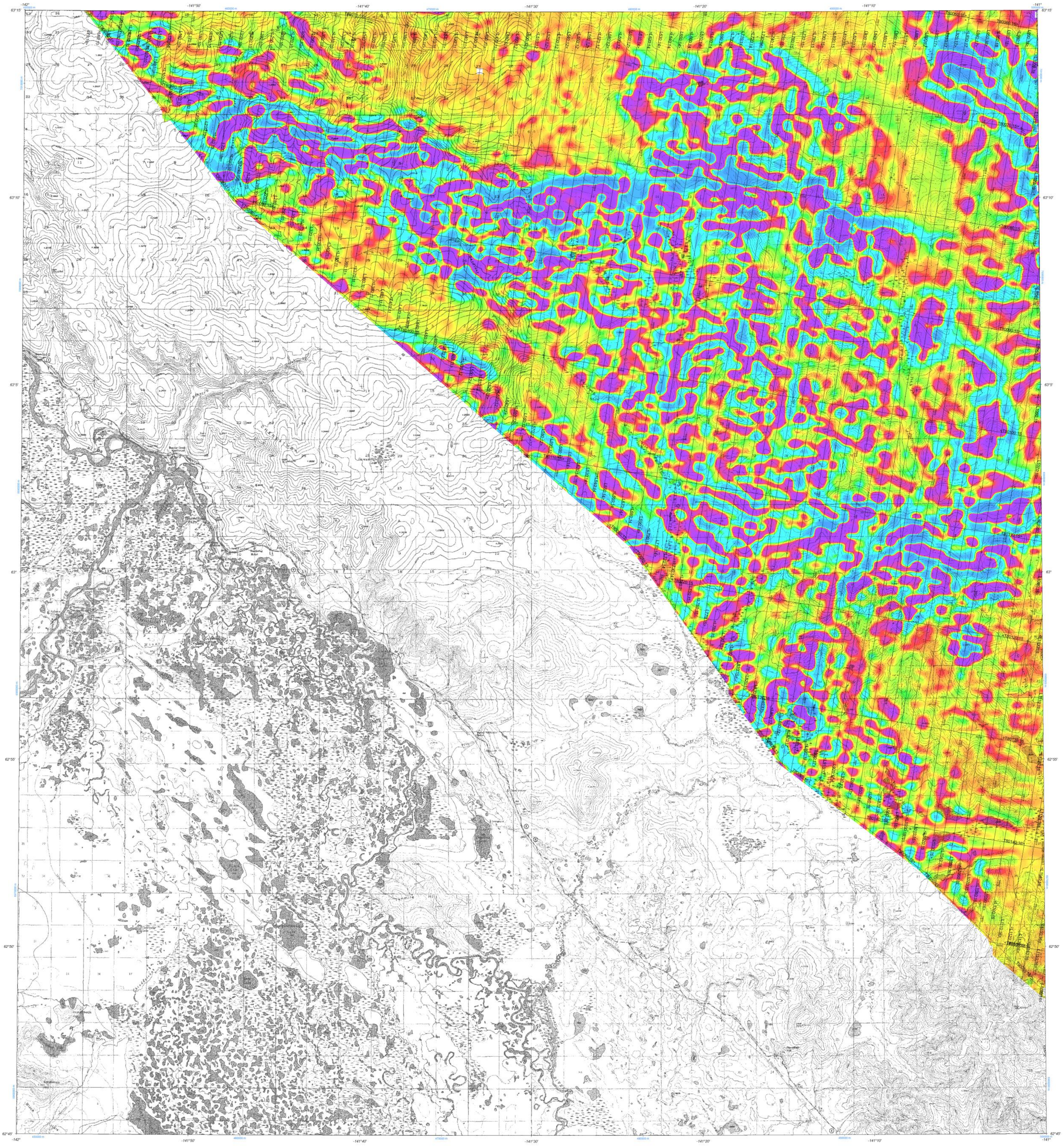
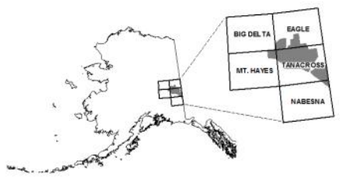
GEOPHYSICAL REPORT 2015-6
Calculated second vertical derivative grid and flightlines with topography; scale 1:63,360; Sheet 7 of 7
Quadrangles: Tanacross A-1, A-2; Nabesna D-1, D-2



SURVEY LOCATION



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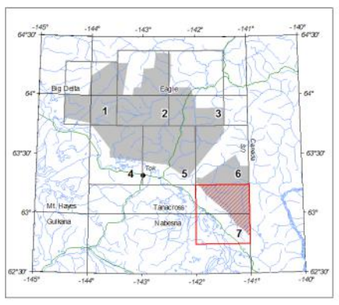
by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

LOCATION INDEX OF 1:63,360 SCALE MAP



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CALCULATED SECOND VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

The second vertical derivative of the magnetic field is the rate of change of the magnetic field in the vertical direction. Computation of the second vertical derivative removes long wavelength features and improves resolution of closely spaced and superimposed anomalies. The data presented here were calculated from the residual magnetic intensity grid by application of FFT-based transfer functions of the second vertical derivative and a fifth order Butterworth lowpass filter. The latter (lowpass filter) aimed at attenuating unwanted high frequencies enhanced by the derivative operator.

SCALE 1 / 63,360

1 0 1 2 3 4 MILES

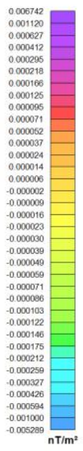
1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L1650.142 — Line Type, Line Number, Flight Number, Line Direction

T0000.15 — Fiducial



SURVEY HISTORY

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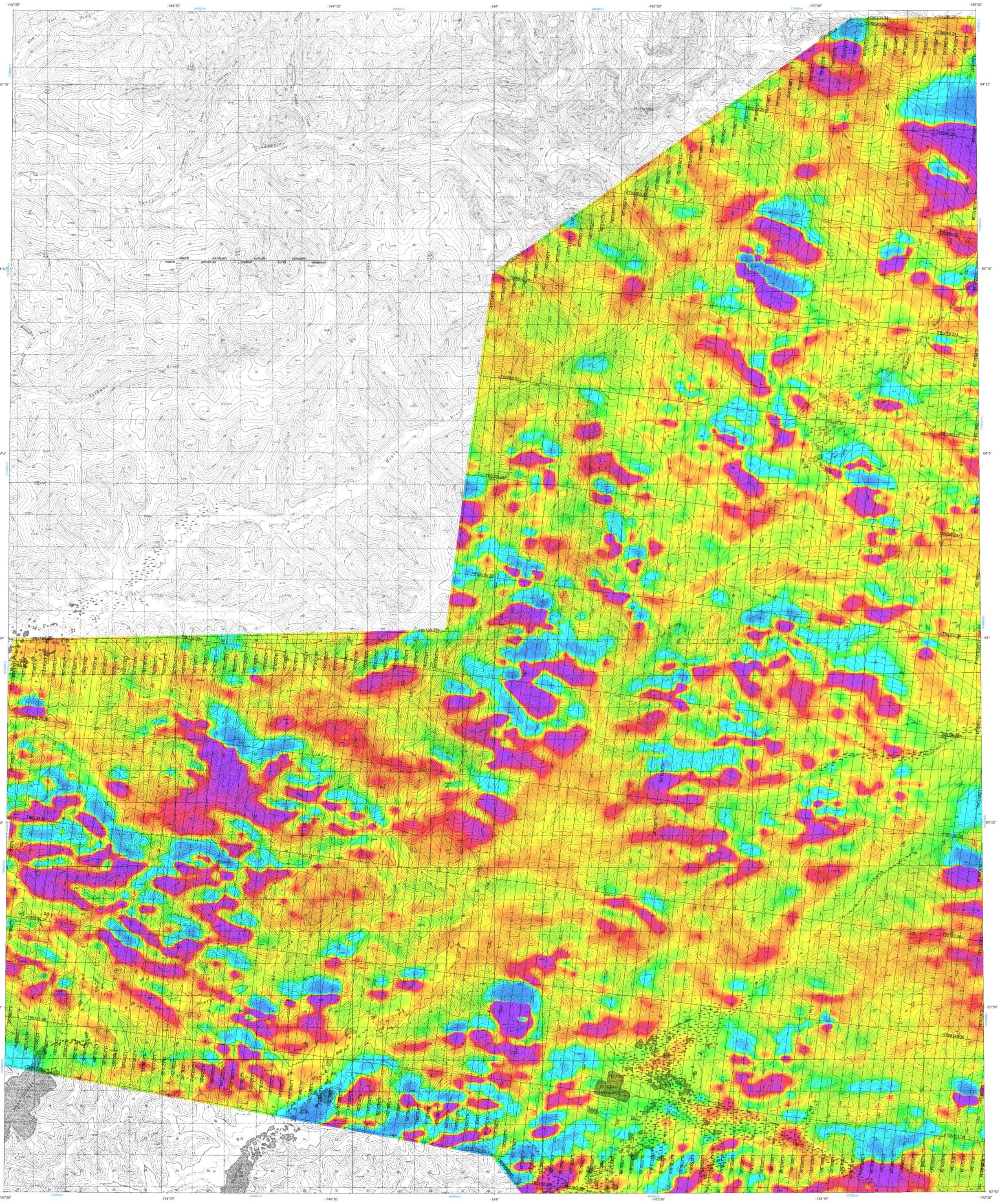
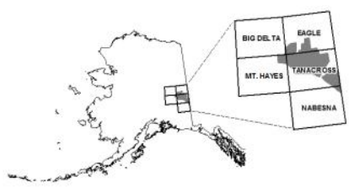
GEOPHYSICAL REPORT 2015-6
Horizontal gradient - azimuth 10 degrees, grid and flightlines with topography; scale 1:63,360; Sheet 1 of 7
Quadrangles: Big Delta A-1, B-1; Mt. Hayes D-1; Eagle A-6, B-6; Tanacross D-6



SURVEY LOCATION

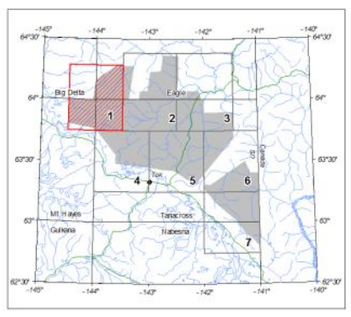


AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE TANACROSS REGION, ALASKA

HORIZONTAL GRADIENT - AZIMUTH 10 DEGREES GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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HORIZONTAL MAGNETIC GRADIENT AZIMUTH 10 DEGREES

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SCALE 1 / 63,360

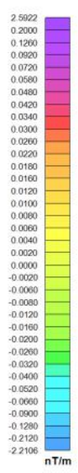
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

Line Type
Line Number
Flight Number
Line Direction
Fiducial



SURVEY HISTORY

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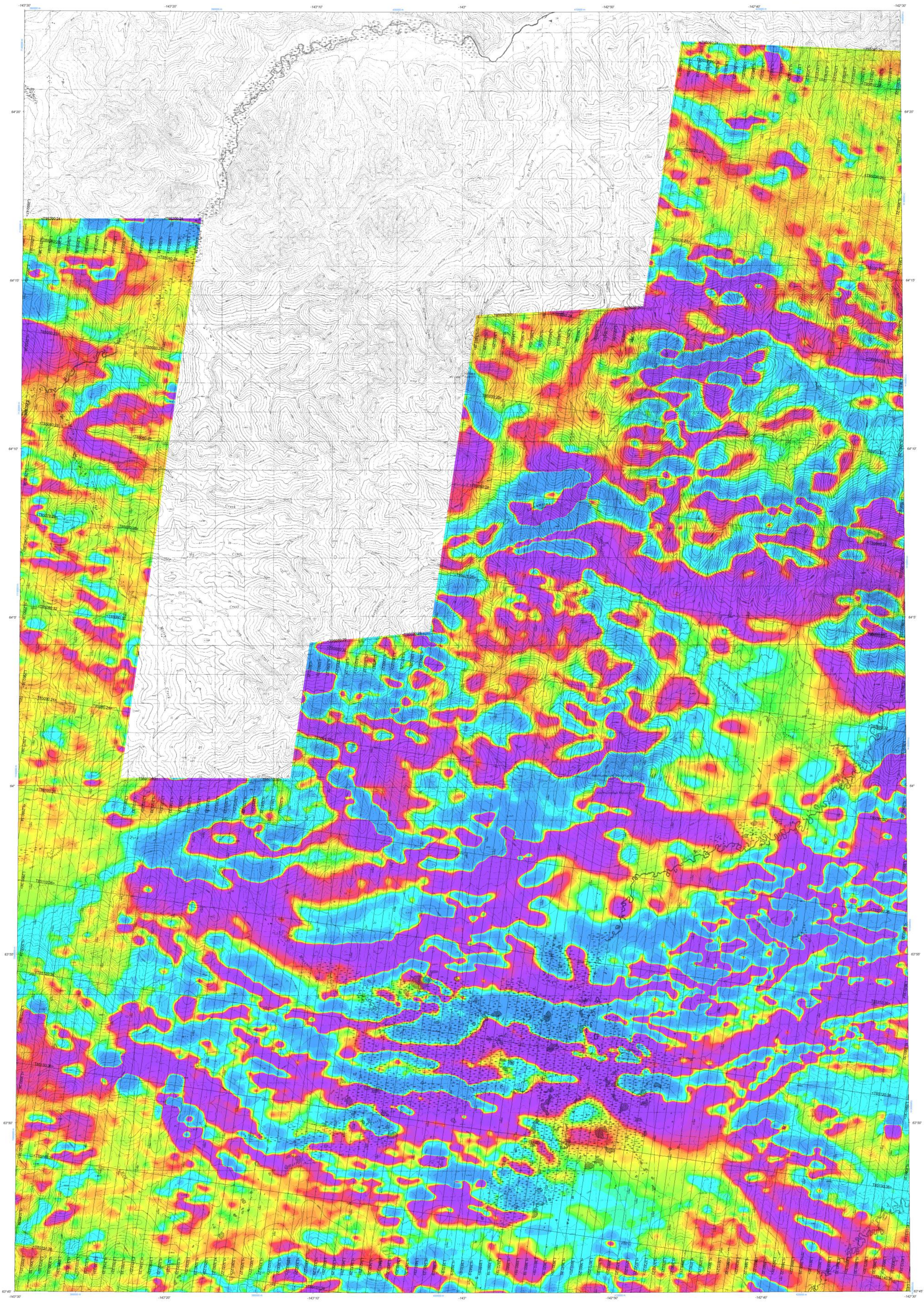
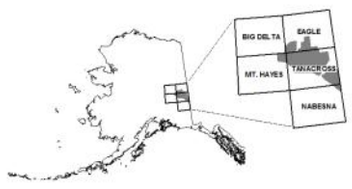
GEOPHYSICAL REPORT 2015-6
Horizontal gradient - azimuth 10 degrees, grid and flightlines with topography; scale 1:63,360; Sheet 2 of 7
Quadrangles: Eagle A-4, A-5, B-4, B-5; Tanacross D-4, D-5



SURVEY LOCATION



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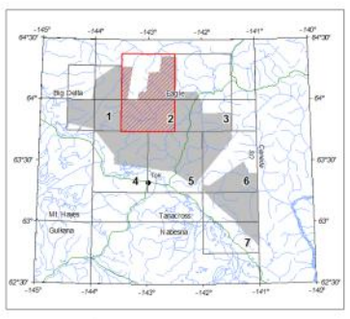
HORIZONTAL GRADIENT - AZIMUTH 10 DEGREES GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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HORIZONTAL MAGNETIC GRADIENT AZIMUTH 10 DEGREES

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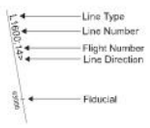
SCALE 1 / 63,360

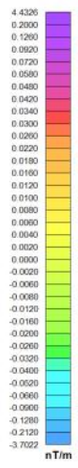
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND





SURVEY HISTORY

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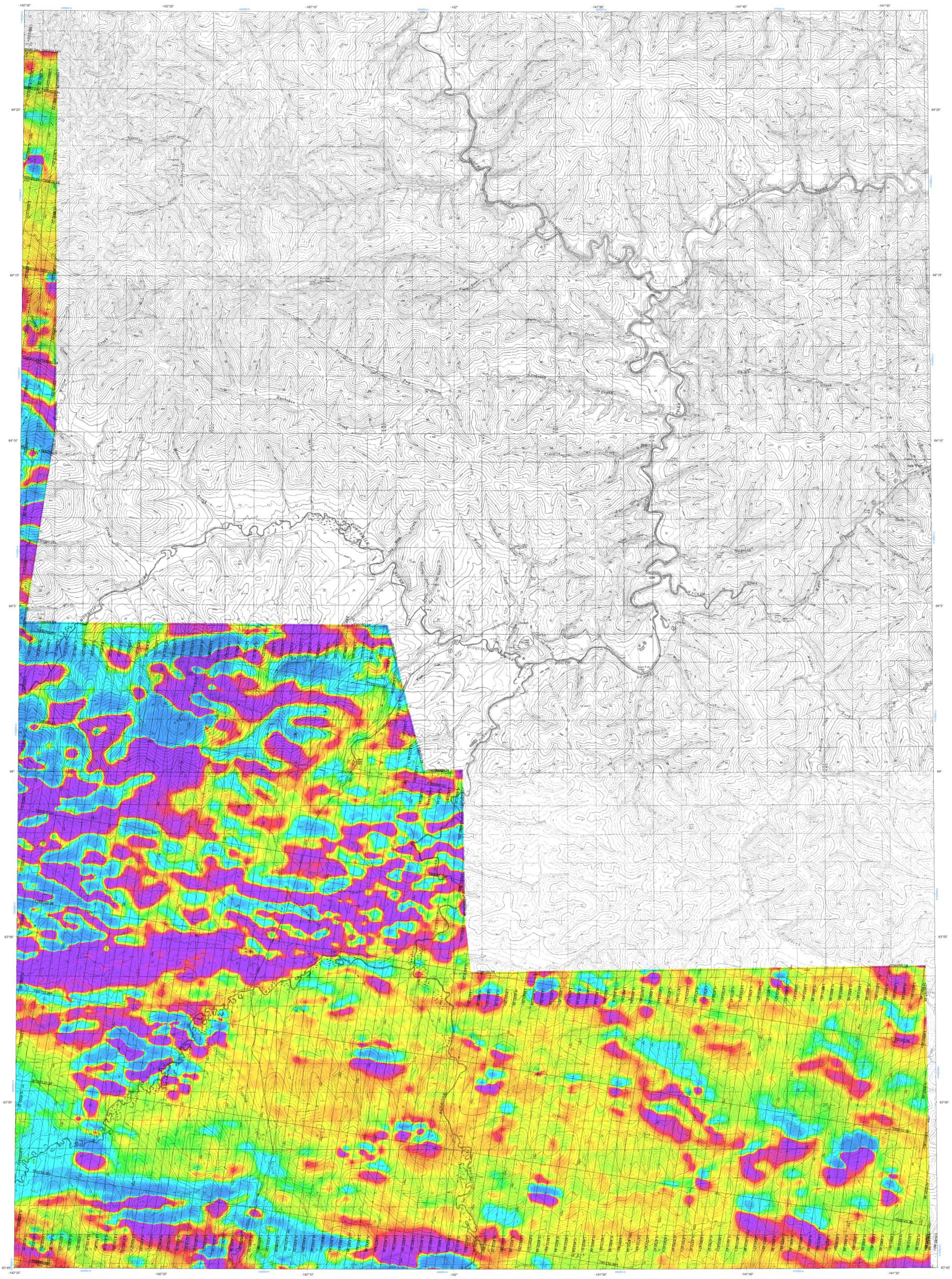
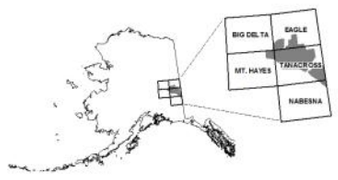
GEOPHYSICAL REPORT 2015-6
Horizontal gradient - azimuth 10 degrees, grid and flightlines with topography; scale 1:63,360; Sheet 3 of 7
Quadrangles: Eagle A-1, A-2, A-3, B-1, B-2, B-3; Tanacross D-1, D-2, D-3



SURVEY LOCATION

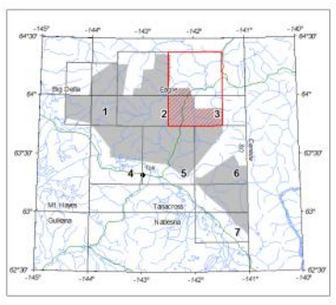


AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE TANACROSS REGION, ALASKA

HORIZONTAL GRADIENT - AZIMUTH 10 DEGREES GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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HORIZONTAL MAGNETIC GRADIENT AZIMUTH 10 DEGREES

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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

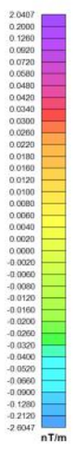
1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L1610.12 — Line Type, Line Number, Flight Number, Line Direction

Fiducial



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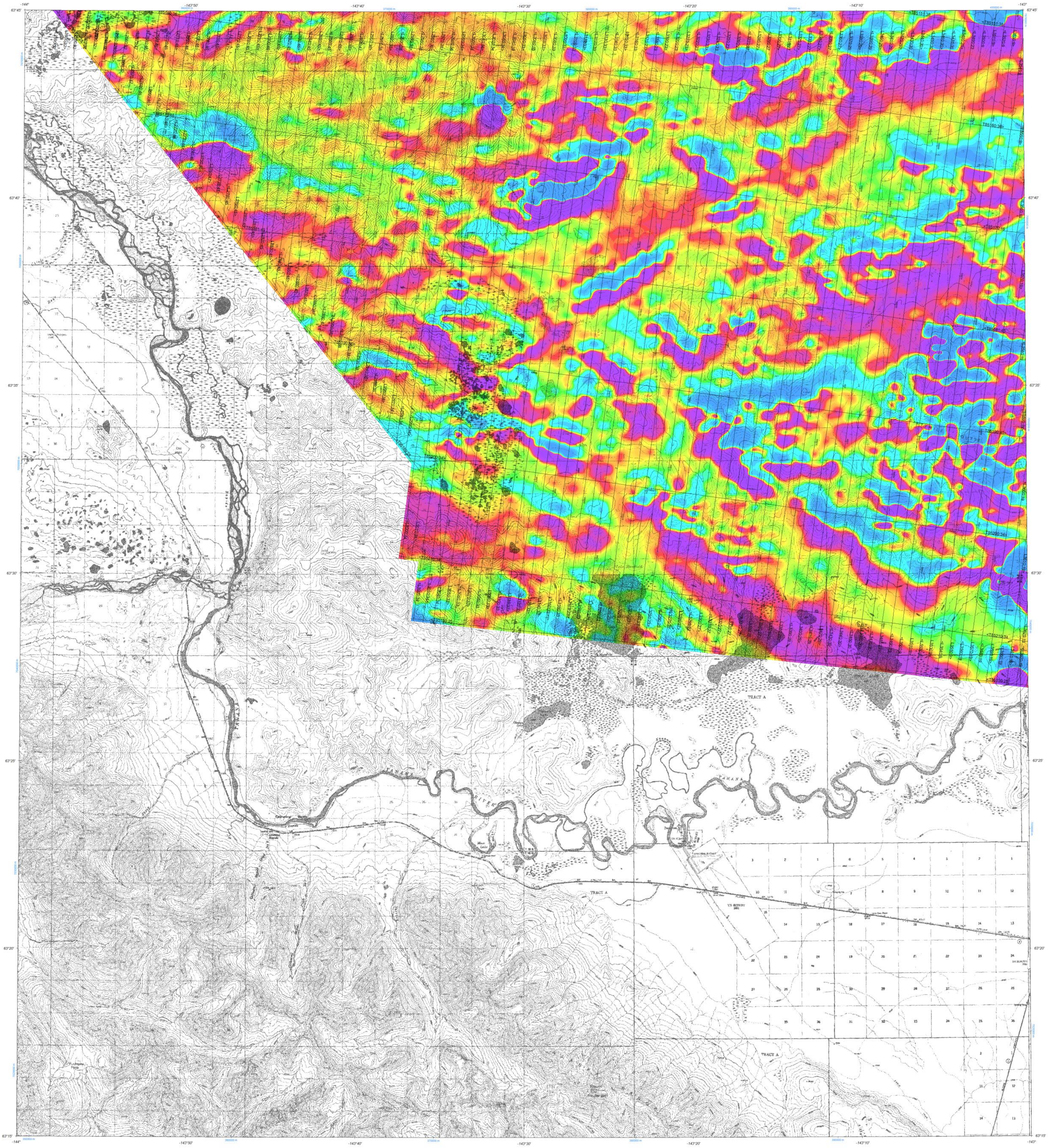
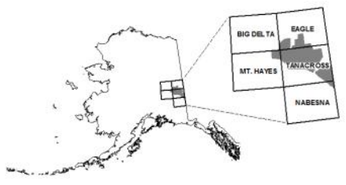
GEOPHYSICAL REPORT 2015-6
Horizontal gradient - azimuth 10 degrees, grid and flightlines with topography; scale 1:63,360; Sheet 4 of 7
Quadrangles: Tanacross B-5, B-6, C-5, C-6



SURVEY LOCATION



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HORIZONTAL GRADIENT - AZIMUTH 10 DEGREES GRID AND FLIGHTLINES

by
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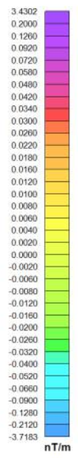
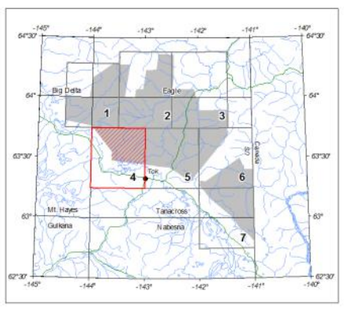
2015



LOCATION INDEX OF 1:63,360 SCALE MAP



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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L1000 145 40000

Line Type
Line Number
Flight Number
Line Direction

Fiducial

SURVEY HISTORY

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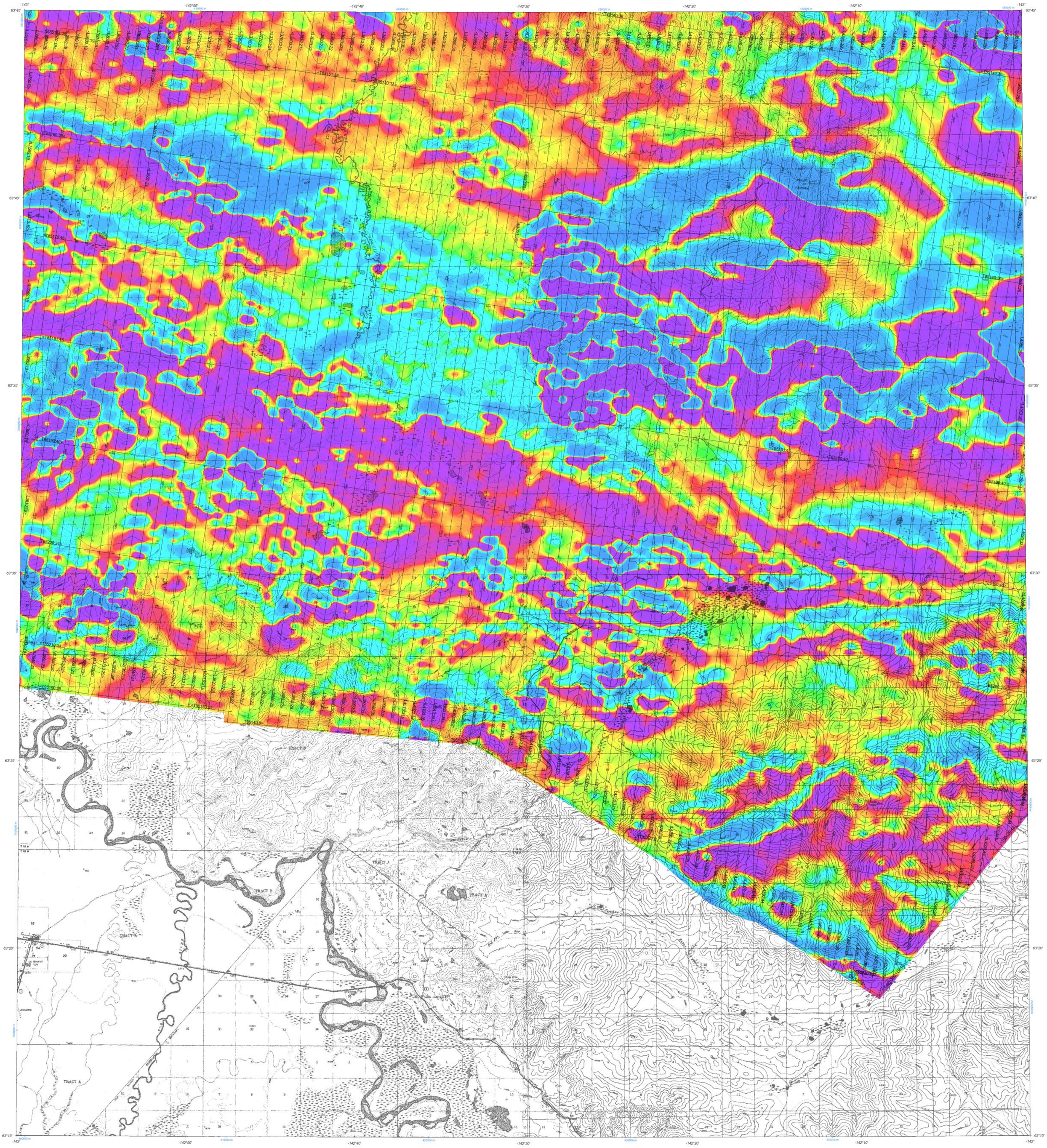
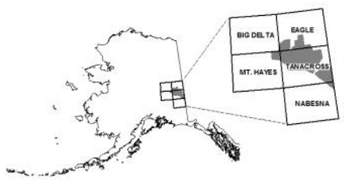
GEOPHYSICAL REPORT 2015-6
Horizontal gradient - azimuth 10 degrees, grid and flightlines with topography; scale 1:63,360; Sheet 5 of 7
Quadrangles: Tanacross B-3, B-4, C-3, C-4



SURVEY LOCATION



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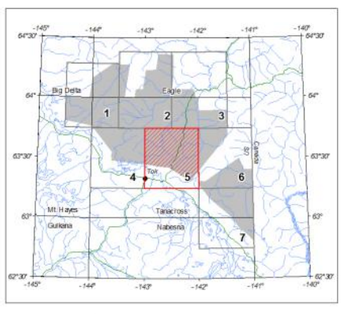
HORIZONTAL GRADIENT - AZIMUTH 10 DEGREES GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

LOCATION INDEX OF 1:63,360 SCALE MAP



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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L 100 1-5-7 — Line Type, Line Number, Flight Number, Line Direction

5000 — Fiducial

SURVEY HISTORY

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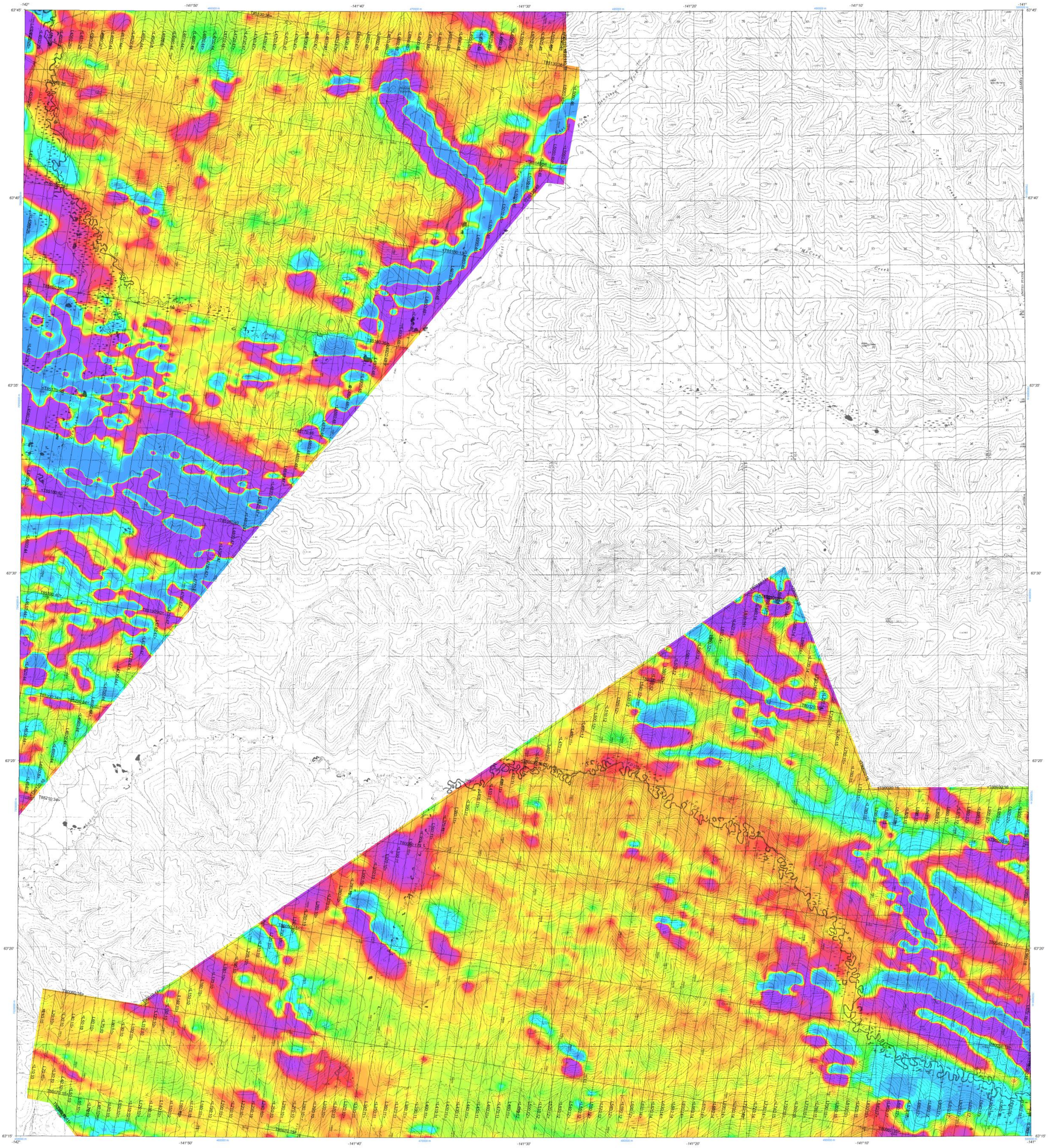
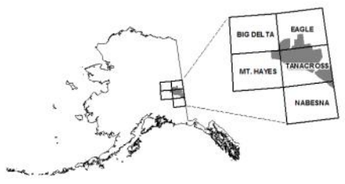
GEOPHYSICAL REPORT 2015-6
Horizontal gradient - azimuth 10 degrees, grid and flightlines with topography; scale 1:63,360; Sheet 6 of 7
Quadrangles: Tanacross B-1, B-2, C-1, C-2



SURVEY LOCATION



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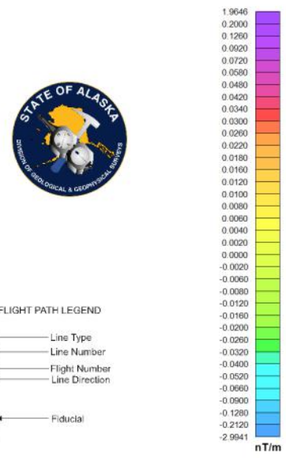
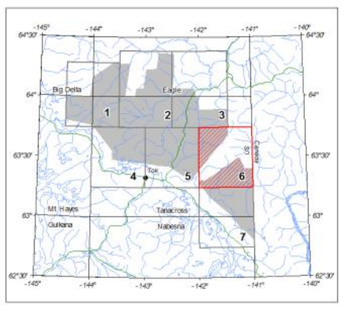


LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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The nominal traverse and control line spacings were, respectively, 500 m and 5000 m, and the aircraft flew predetermined flight surface with a target terrain clearance of 100 m and a mean terrain clearance of 290 m. Traverse lines were oriented at N10°E with both orthogonal and boundary control lines.

HORIZONTAL MAGNETIC GRADIENT AZIMUTH 10 DEGREES

The horizontal magnetic gradient is change in the magnetic field in the horizontal plane along the axis of measurement. The data presented here were derived from the recorded data by: (1) application of a lag to accommodate system latency (2) application of unit and directional normalization factors (3) application of a scaling factor to account for the degree of deviation of the aircraft orientation relative to the ideal line direction (4) application of a levelling correction derived from the calculated horizontal gradients (5) application of a micro-levelling correction to further reduce any remaining flight line noise. The final values were then interpolated on to a 100 m grid using minimum curvature techniques..

SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L1000 — Line Type
L1000 — Line Number
1-12 — Flight Number
EAST — Line Direction
5000 — Fiducial

SURVEY HISTORY

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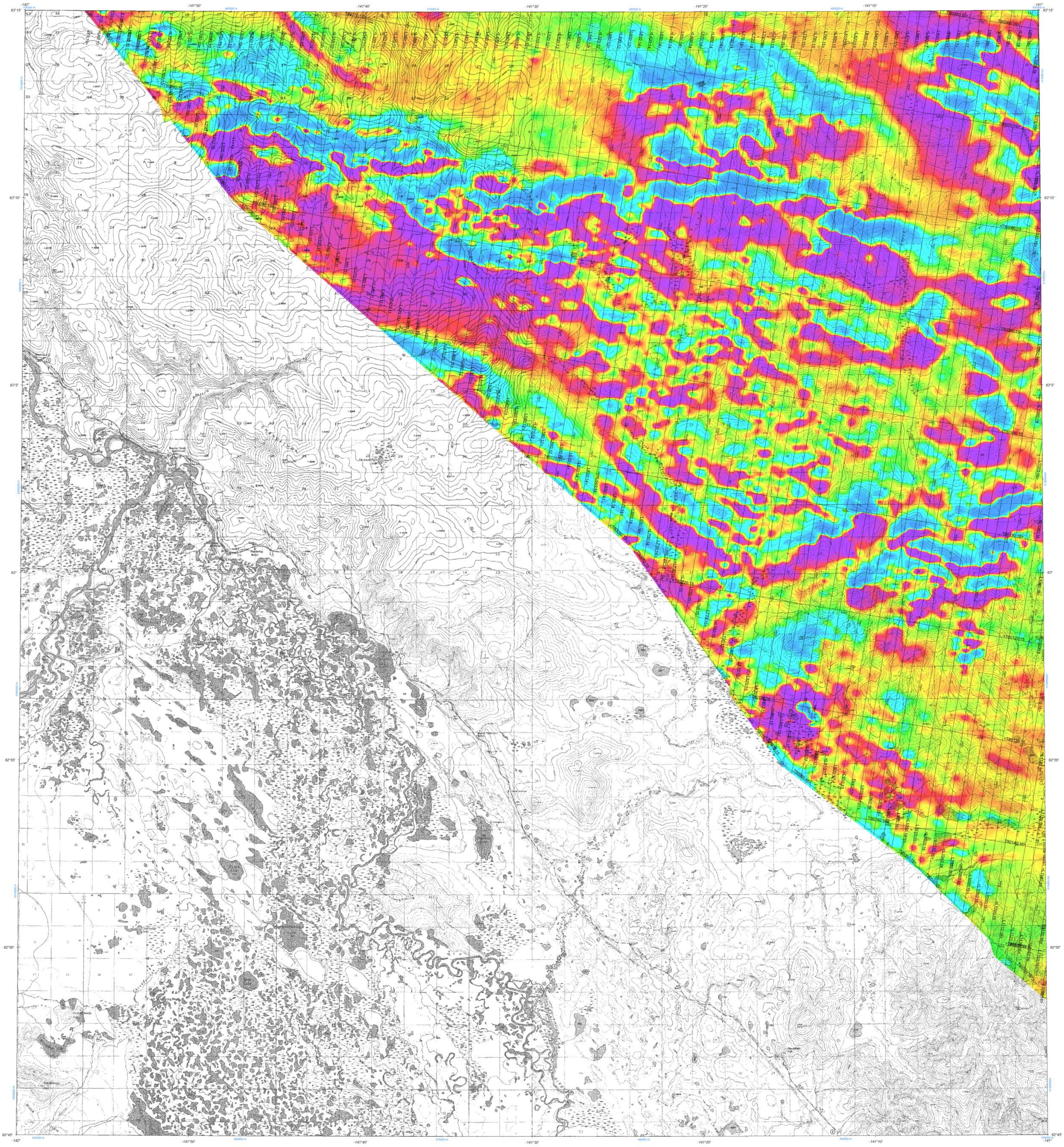
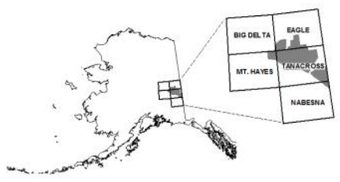
GEOPHYSICAL REPORT 2015-6
Horizontal gradient - azimuth 10 degrees, grid and flightlines with topography; scale 1:63,360; Sheet 7 of 7
Quadrangles: Tanacross A-1, A-2; Nabesna D-1, D-2



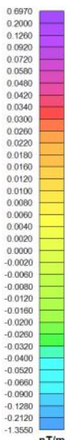
SURVEY LOCATION



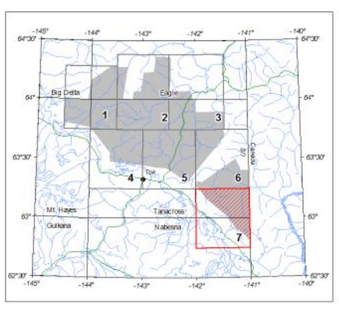
AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE TANACROSS REGION, ALASKA

HORIZONTAL GRADIENT - AZIMUTH 10 DEGREES GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015



LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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The nominal traverse and control line spacings were, respectively, 500 m and 5000 m, and the aircraft flew predetermined flight surface with a target terrain clearance of 100 m and a mean terrain clearance of 290 m. Traverse lines were oriented at N10°E with both orthogonal and boundary control lines.

HORIZONTAL MAGNETIC GRADIENT AZIMUTH 10 DEGREES

The horizontal magnetic gradient is change in the magnetic field in the horizontal plane along the axis of measurement. The data presented here were derived from the recorded data by: (1) application of a lag to accommodate system latency (2) application of unit and directional normalization factors (3) application of a scaling factor to account for the degree of deviation of the aircraft orientation relative to the ideal line direction (4) application of a levelling correction derived from the calculated horizontal gradients (5) application of a micro-levelling correction to further reduce any remaining flight line noise. The final values were then interpolated on to a 100 m grid using minimum curvature techniques..

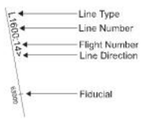
SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND



SURVEY HISTORY

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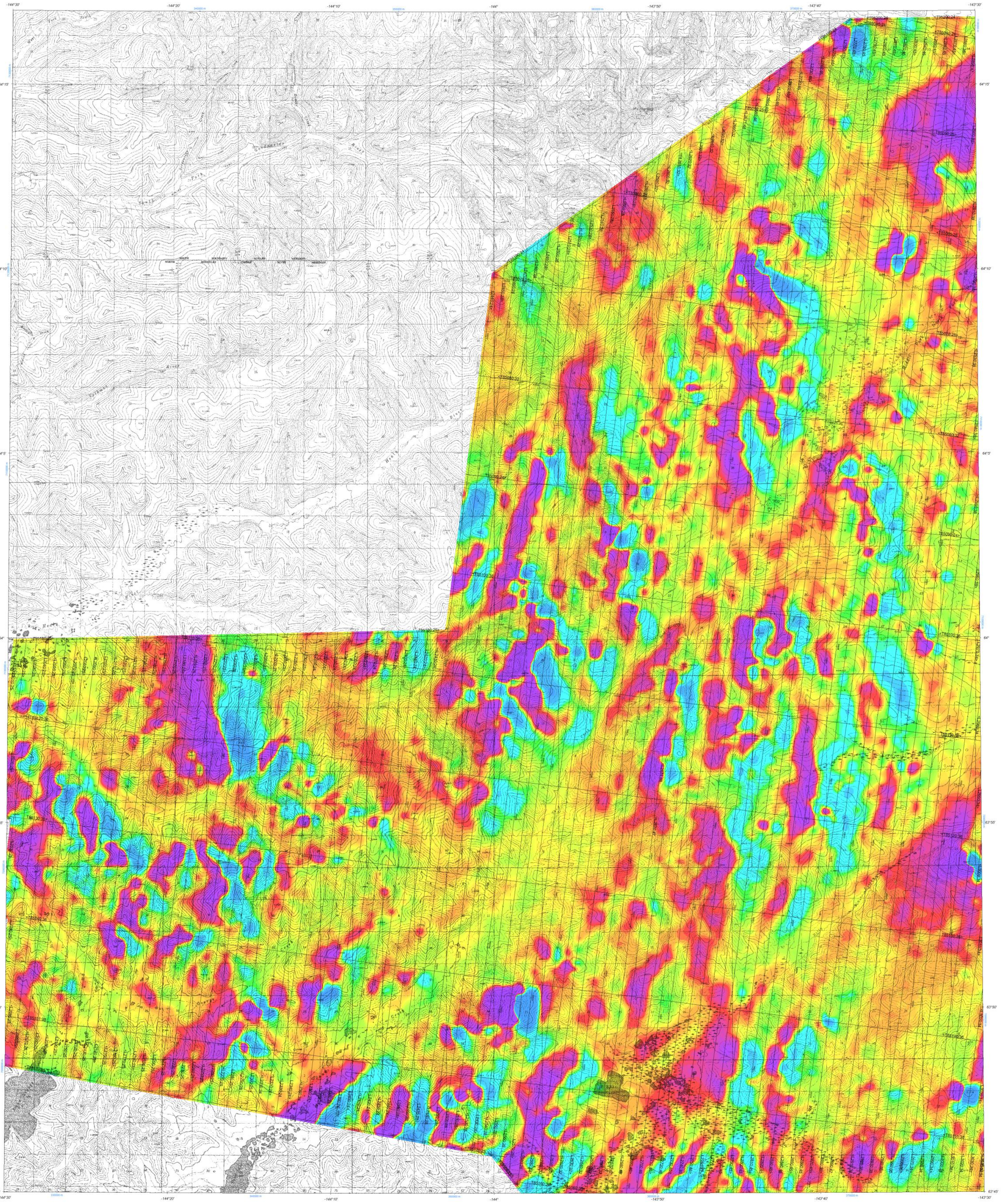
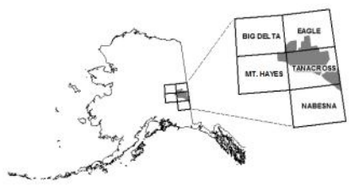
GEOPHYSICAL REPORT 2015-6
Horizontal gradient - azimuth 100 degrees, grid and flightlines with topography; scale 1:63,360; Sheet 1 of 7
Quadrangles: Big Delta A-1, B-1; Mt. Hayes D-1; Eagle A-6, B-6; Tanacross D-6



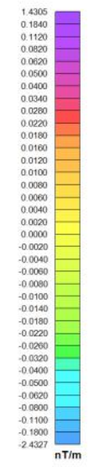
SURVEY LOCATION



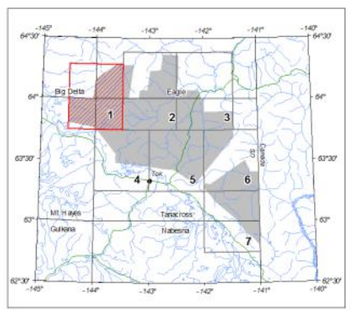
AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE TANACROSS REGION, ALASKA

HORIZONTAL GRADIENT - AZIMUTH 100 DEGREES GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015



LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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HORIZONTAL MAGNETIC GRADIENT AZIMUTH 100 DEGREES

The horizontal magnetic gradient is change in the magnetic field in the horizontal plane along the axis of measurement. The data presented here were derived from the recorded data by: (1) application of a lag to accommodate system latency (2) application of unit and directional normalization factors (3) application of a scaling factor to account for the degree of deviation of the aircraft orientation relative to the ideal line direction (4) application of a levelling correction derived from the calculated horizontal gradients (5) application of a micro-levelling correction to further reduce any remaining flight line noise. The final values were then interpolated on to a 100 m grid using minimum curvature techniques..

SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

Line Type
Line Number
Flight Number
Line Direction
Fiducial

SURVEY HISTORY

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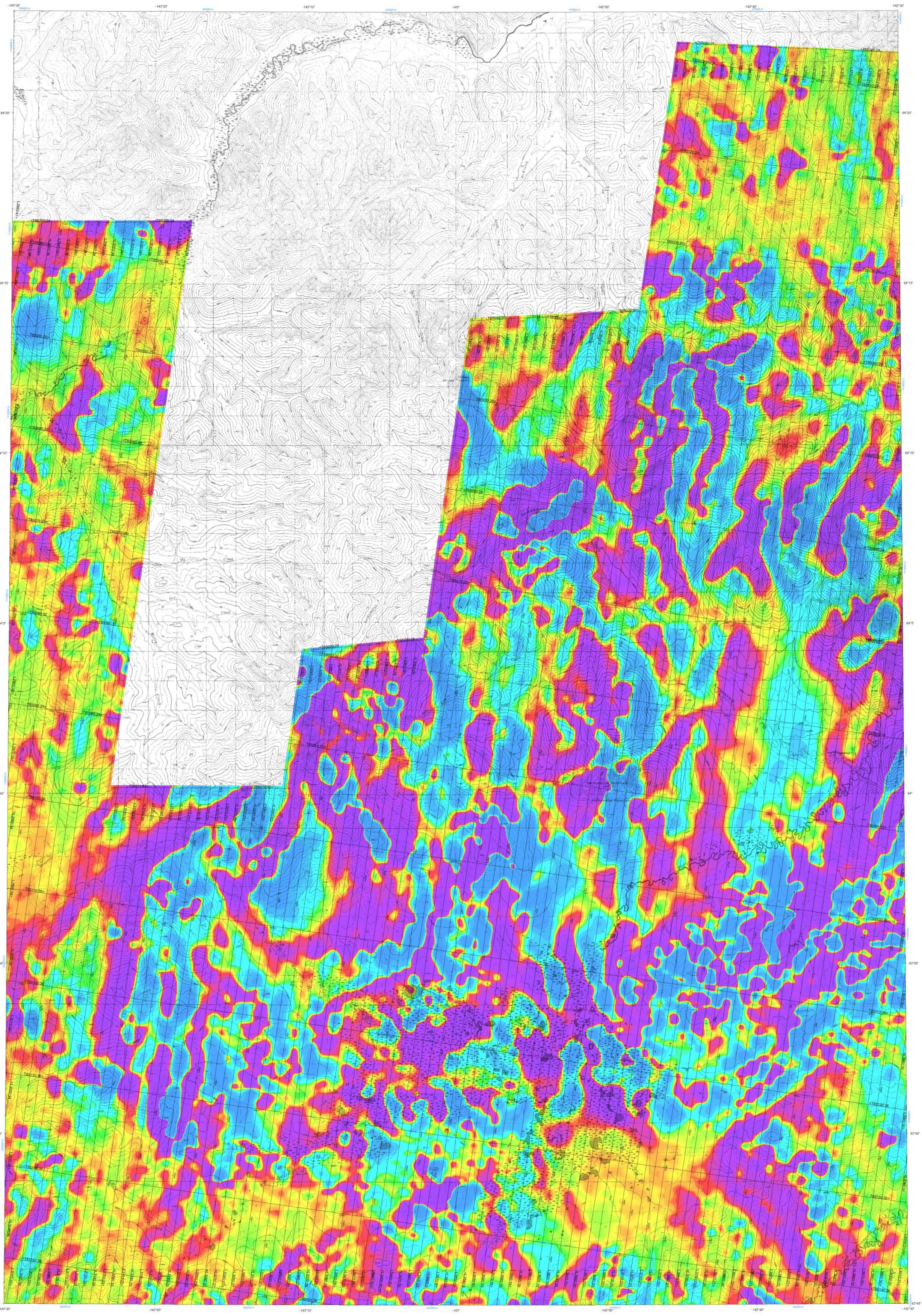
GEOPHYSICAL REPORT 2015-6
Horizontal gradient - azimuth 100 degrees, grid and flightlines with topography; scale 1:63,360; Sheet 2 of 7
Quadrangles: Eagle A-4, A-5, B-4, B-5; Tanacross D-4, D-5



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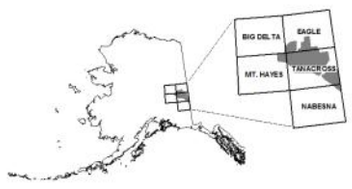
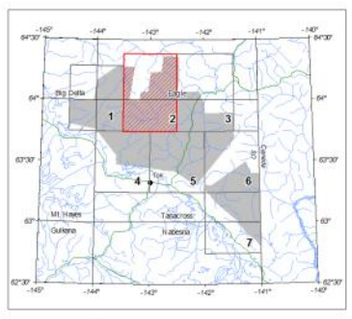
HORIZONTAL GRADIENT - AZIMUTH 100 DEGREES GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

SURVEY LOCATION



LOCATION INDEX OF 1:63,360 SCALE MAP



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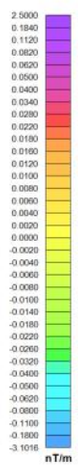
SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND



SURVEY HISTORY

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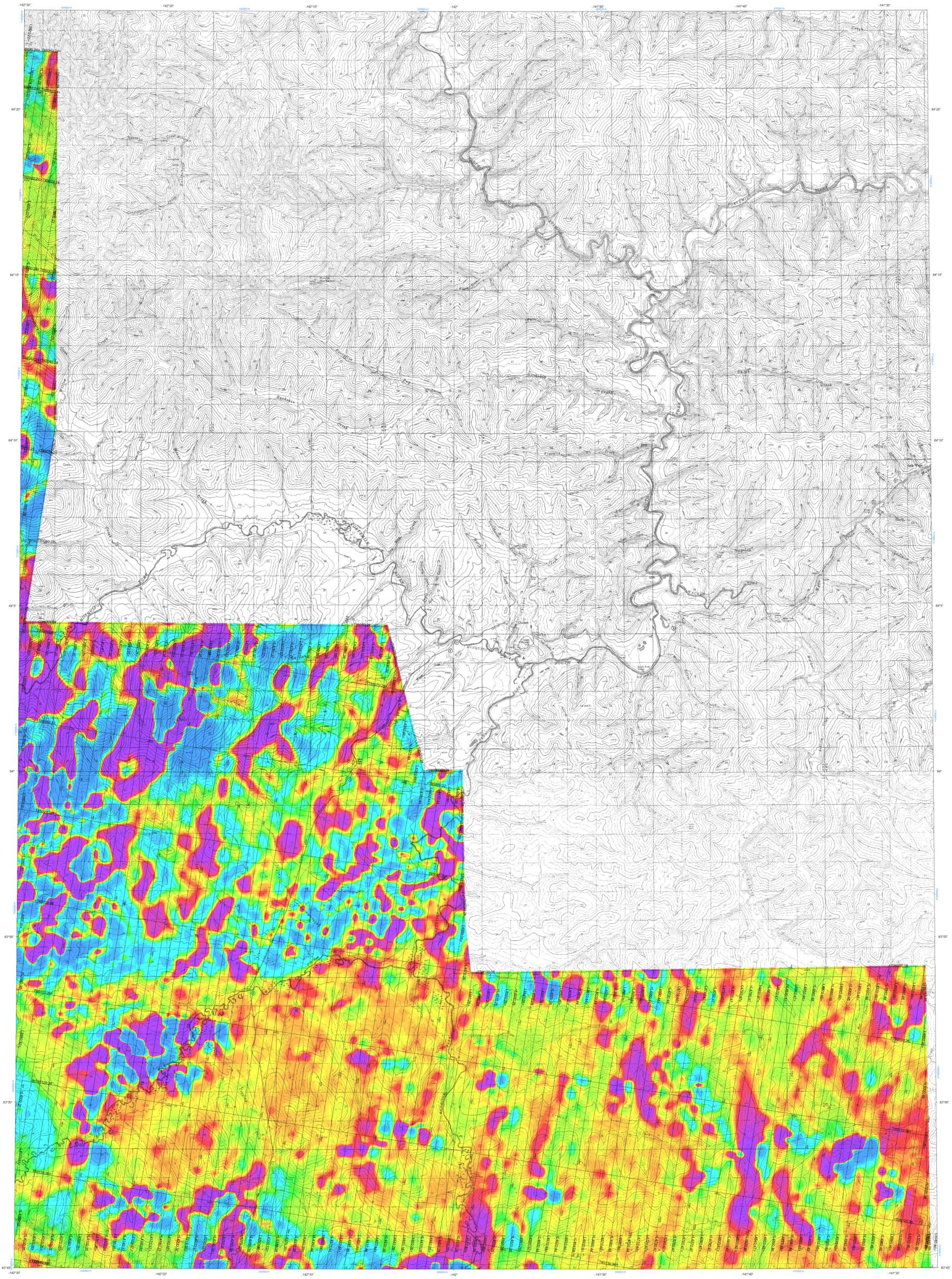
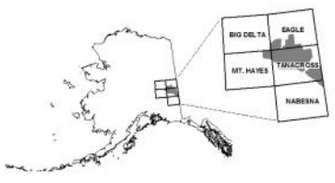
GEOPHYSICAL REPORT 2015-6
Horizontal gradient - azimuth 100 degrees, grid and flightlines with topography; scale 1:63,360; Sheet 3 of 7
Quadrangles: Eagle A-1, A-2, A-3, B-1, B-2, B-3; Tanacross D-1, D-2, D-3



SURVEY LOCATION



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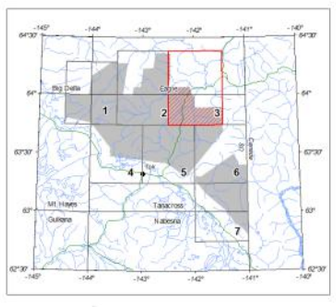
HORIZONTAL GRADIENT - AZIMUTH 100 DEGREES GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

LOCATION INDEX OF 1:63,360 SCALE MAP



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HORIZONTAL MAGNETIC GRADIENT AZIMUTH 100 DEGREES

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SCALE 1 / 63,360

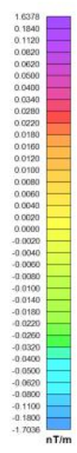
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

Line Type
Line Number
Flight Number
Line Direction
Fiducial



SURVEY HISTORY

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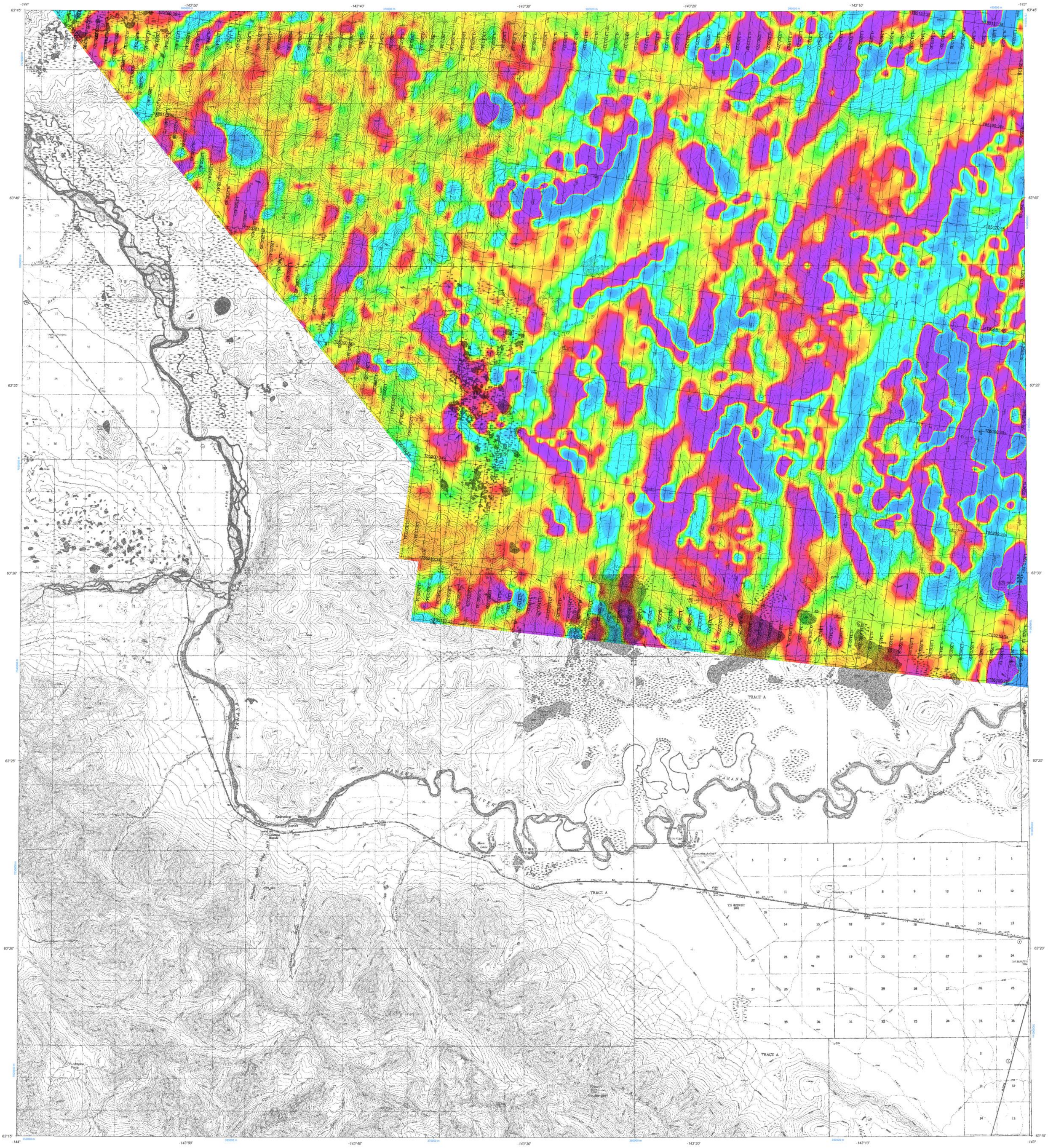
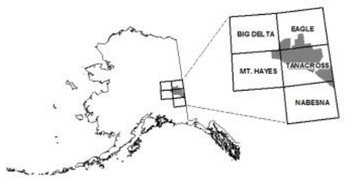
GEOPHYSICAL REPORT 2015-6
Horizontal gradient - azimuth 100 degrees, grid and flightlines with topography; scale 1:63,360; Sheet 4 of 7
Quadrangles: Tanacross B-5, B-6, C-5, C-6



SURVEY LOCATION



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HORIZONTAL GRADIENT - AZIMUTH 100 DEGREES GRID AND FLIGHTLINES

by
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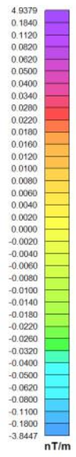
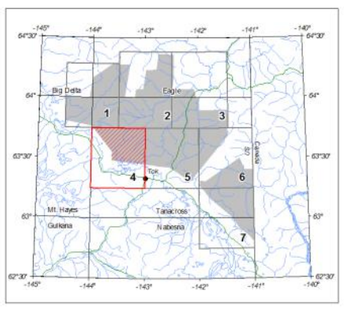
and Goldak Airborne Surveys
2015



LOCATION INDEX OF 1:63,360 SCALE MAP



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HORIZONTAL MAGNETIC GRADIENT AZIMUTH 100 DEGREES

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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L100145 — Line Type, Line Number, Flight Number, Line Direction

60000 — Fiducial

SURVEY HISTORY

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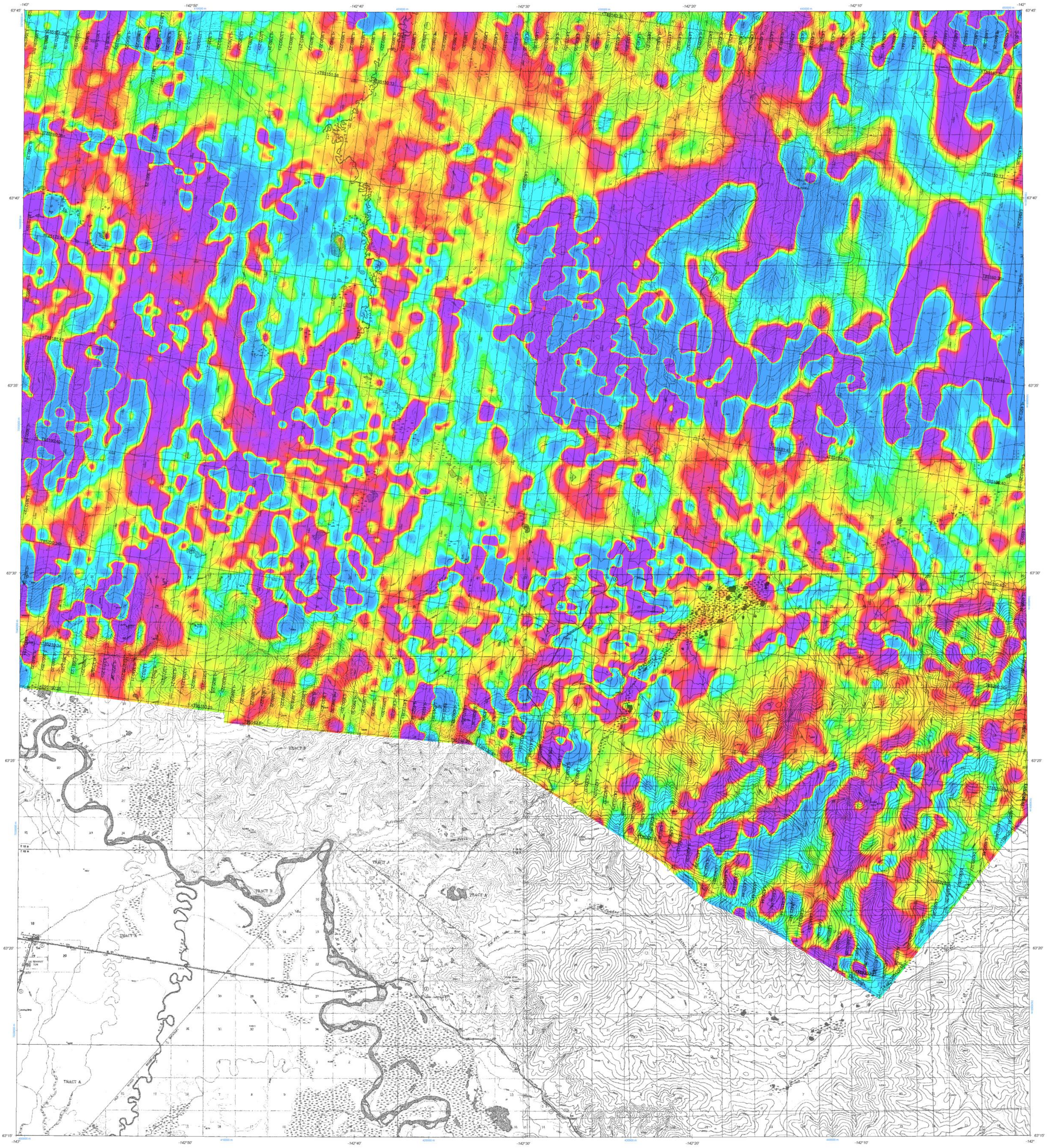
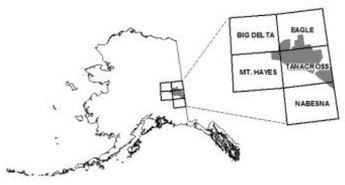
GEOPHYSICAL REPORT 2015-6
Horizontal gradient - azimuth 100 degrees, grid and flightlines with topography; scale 1:63,360; Sheet 5 of 7
Quadrangles: Tanacross B-3, B-4, C-3, C-4



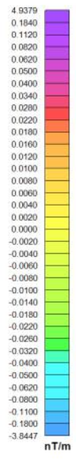
SURVEY LOCATION



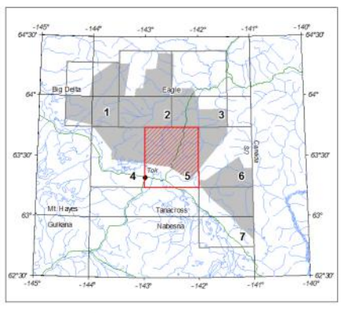
AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE TANACROSS REGION, ALASKA

HORIZONTAL GRADIENT - AZIMUTH 100 DEGREES GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015



LOCATION INDEX OF 1:63,360 SCALE MAP



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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L 1000 T 57 — Line Type, Line Number, Flight Number, Line Direction

Fiducial

SURVEY HISTORY

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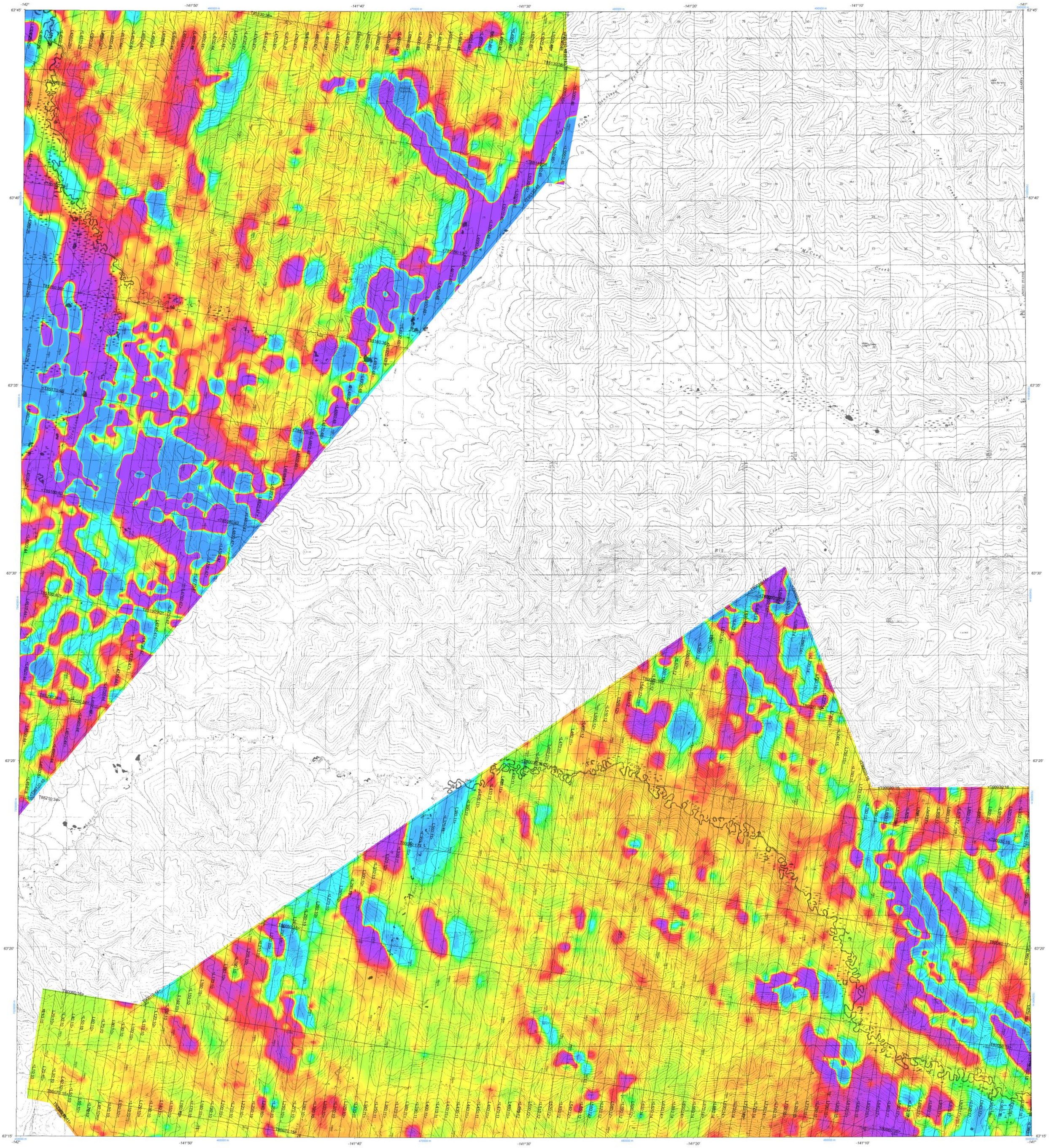
GEOPHYSICAL REPORT 2015-6
Horizontal gradient - azimuth 100 degrees, grid and flightlines with topography; scale 1:63,360; Sheet 6 of 7
Quadrangles: Tanacross B-1, B-2, C-1, C-2



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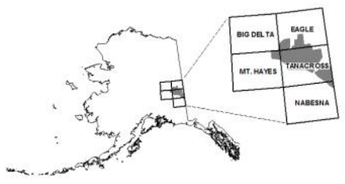
2015

SURVEY LOCATION



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SCALE 1 / 63,360

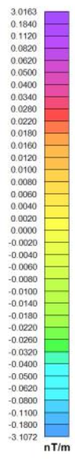
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

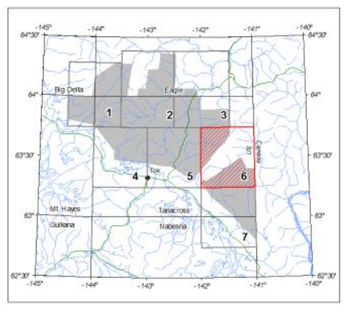
NAD27 Zone 7N

FLIGHT PATH LEGEND

L1000 — Line Type
L1000 — Line Number
1-47 — Flight Number
EWS — Line Direction
2000 — Fiducial



LOCATION INDEX OF 1:63,360 SCALE MAP



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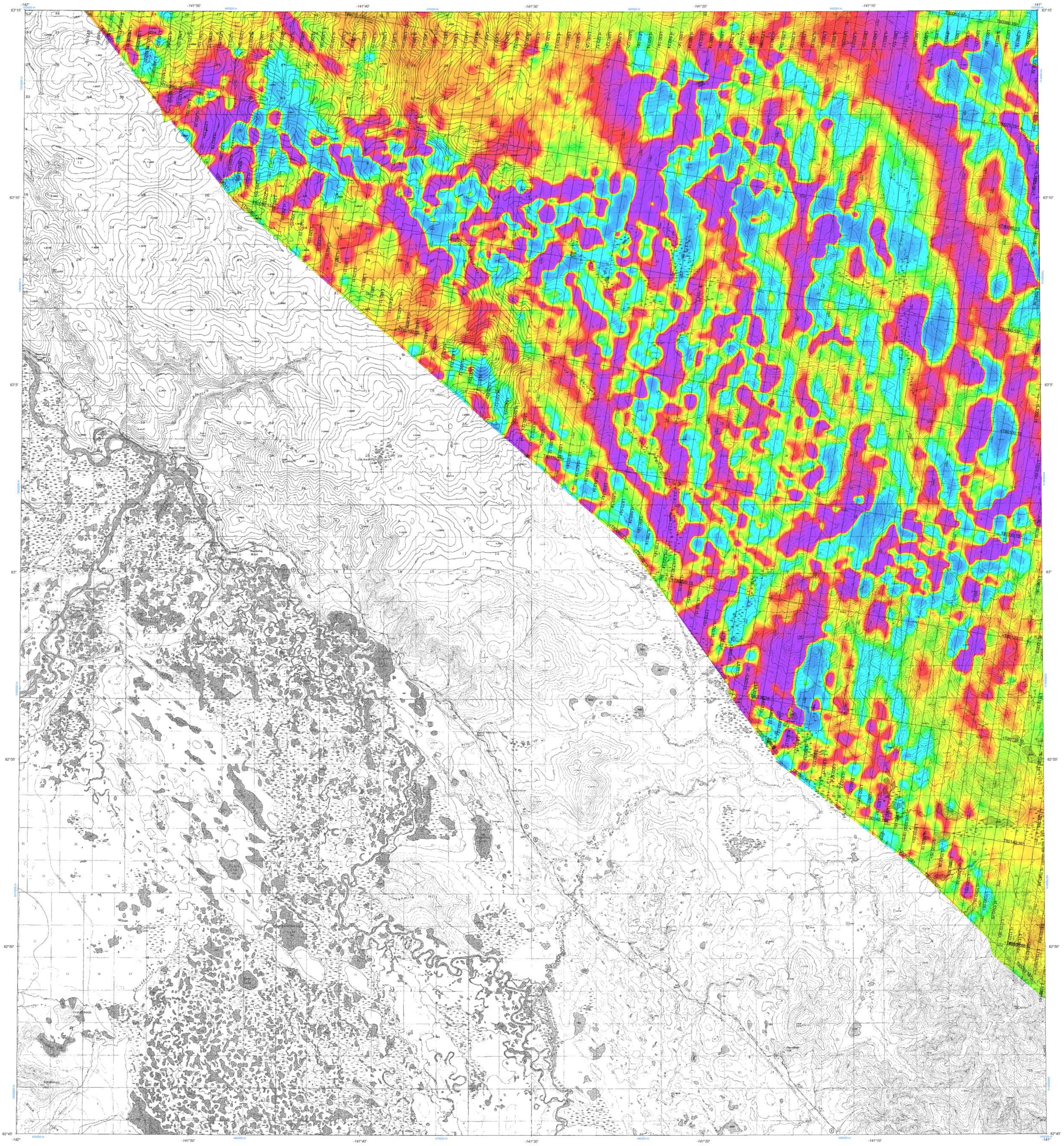
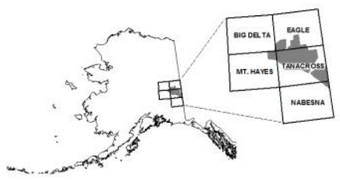
GEOPHYSICAL REPORT 2015-6
Horizontal gradient - azimuth 100 degrees, grid and flightlines with topography; scale 1:63,360; Sheet 7 of 7
Quadrangles: Tanacross A-1, A-2; Nabesna D-1, D-2



SURVEY LOCATION



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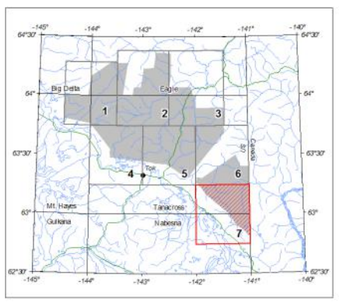

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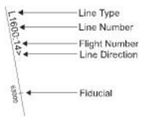
SCALE 1 / 63,360

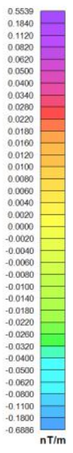
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND





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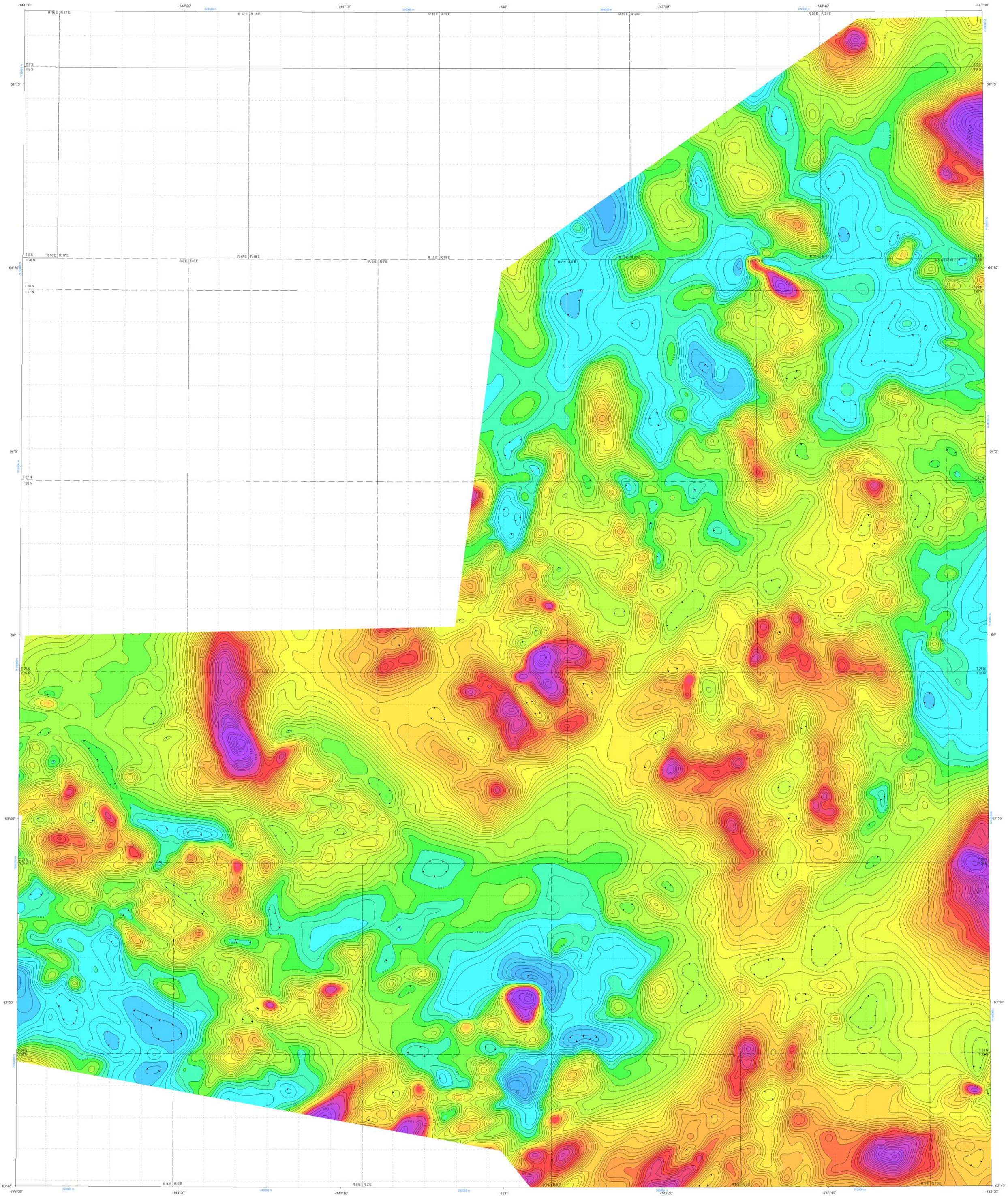
Quadrangles: Big Delta A-1, B-1; Mt. Hayes D-1; Eagle A-6, B-6; Tanacross D-6



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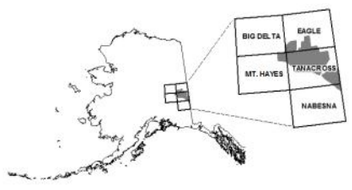
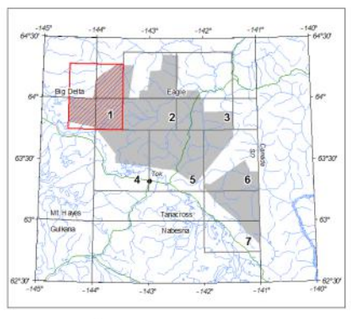
2015

SURVEY LOCATION



LOCATION INDEX OF 1:63,360 SCALE MAP



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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

CONTOUR LEGEND

250 nT
50 nT
10 nT
5 nT
Magnetic Depression

907 320 215 160 120 95 70 55 40 25 15 5 -5 -10 -20 -25 -35 -40 -45 -50 -60 -65 -70 -75 -80 -85 -90 -95 -100 -110 -115 -120 -130 -145 -175 -163

nT

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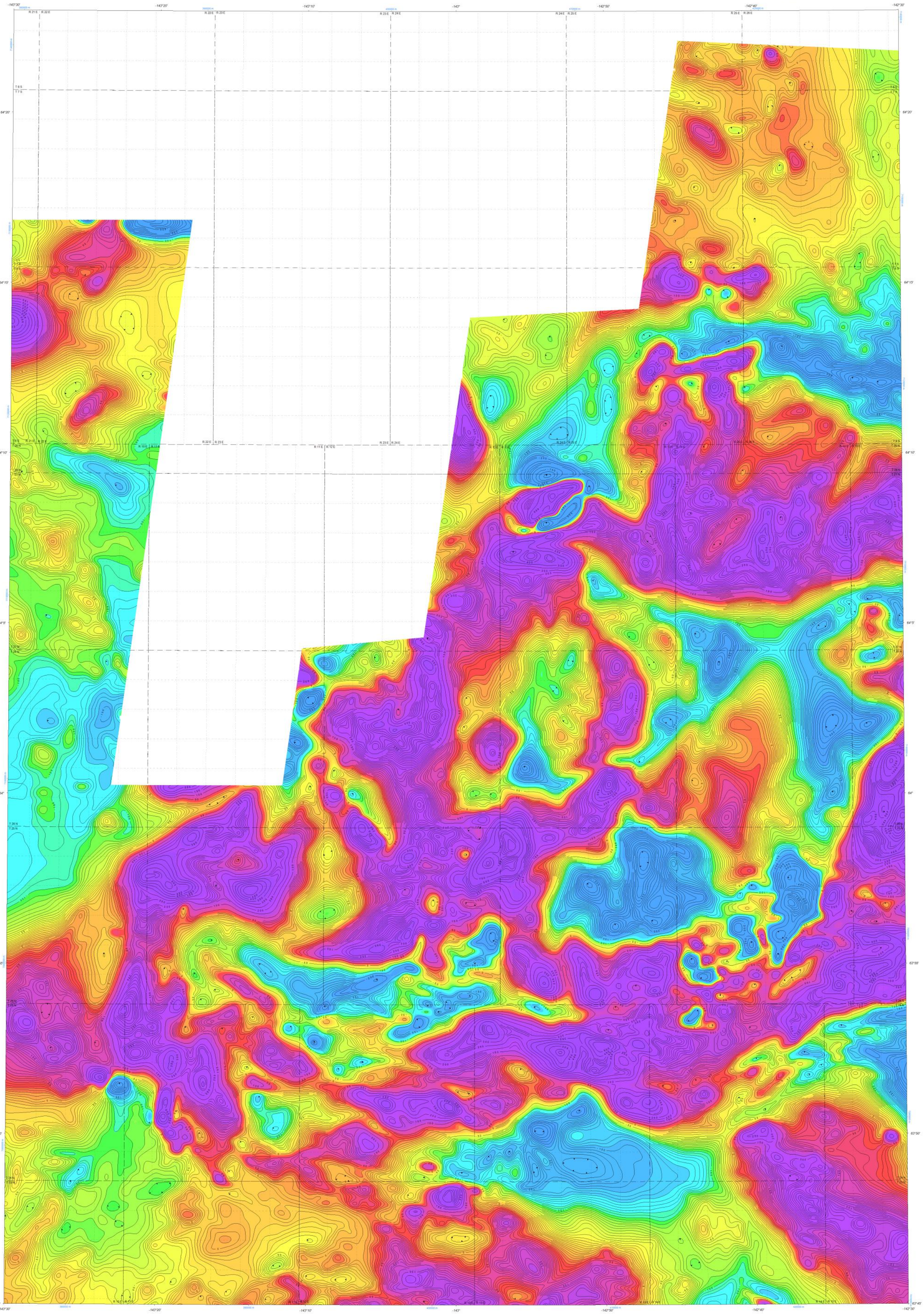
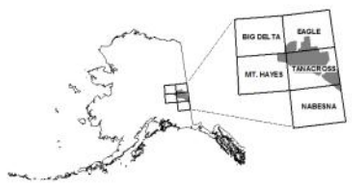


SURVEY LOCATION



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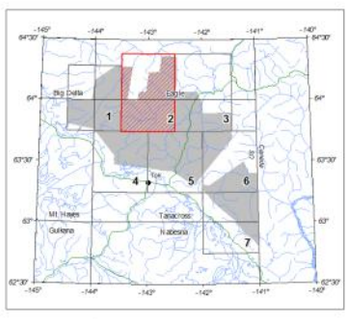
LOCATION INDEX OF 1:63,360 SCALE MAP



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SCALE 1 / 63,360

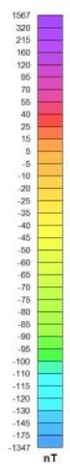
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

CONTOUR LEGEND

250 nT
50 nT
10 nT
5 nT
Magnetic Depression



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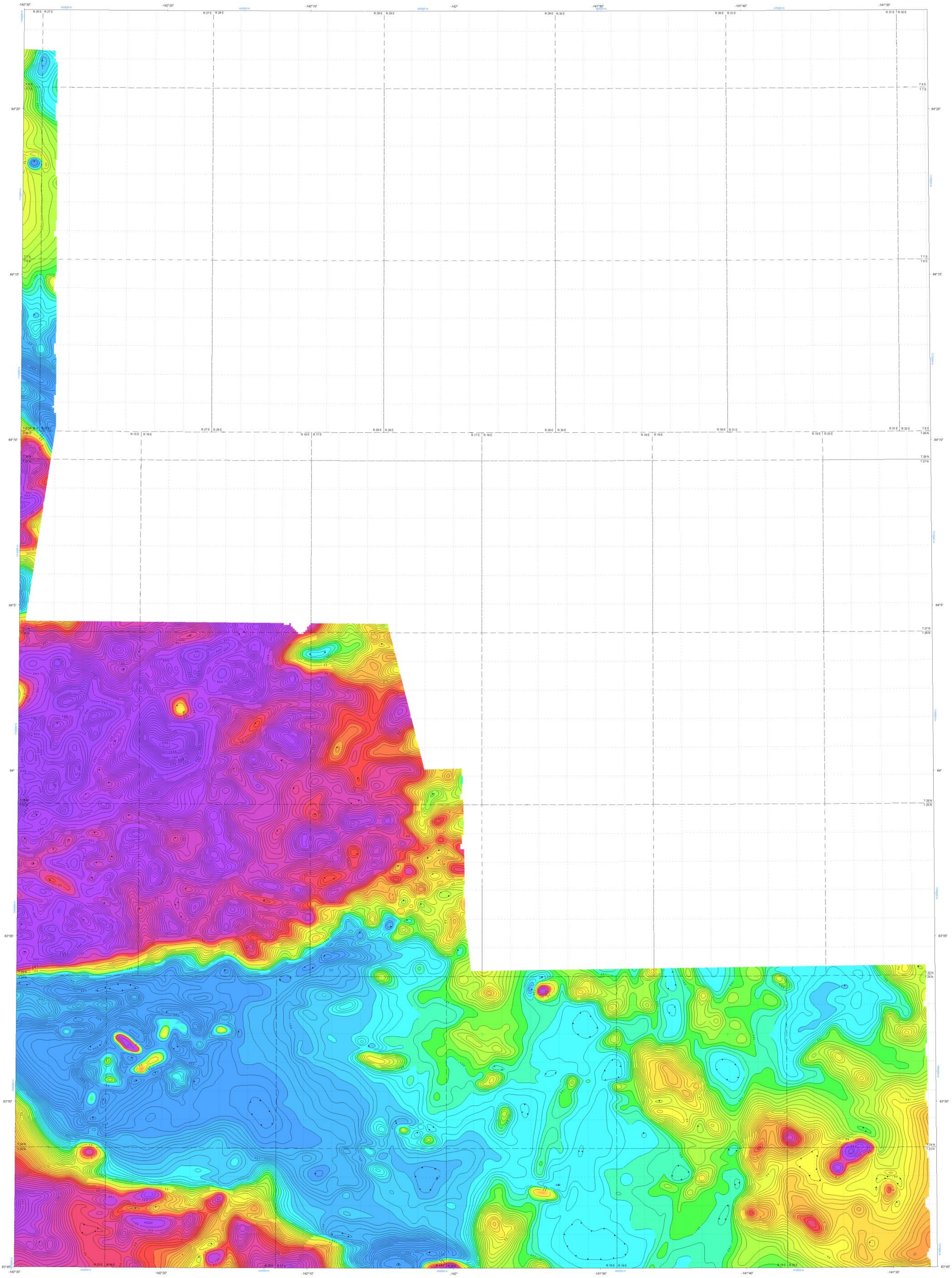
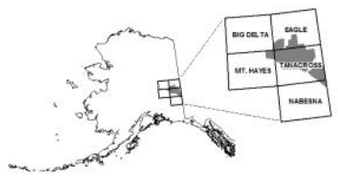


SURVEY LOCATION



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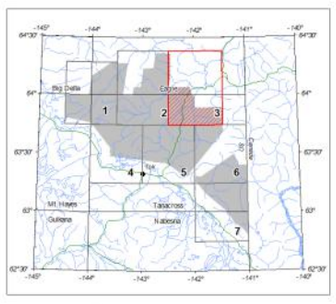

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CONTOUR LEGEND

250 nT
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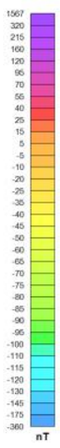
10 nT
5 nT
Magnetic Depression



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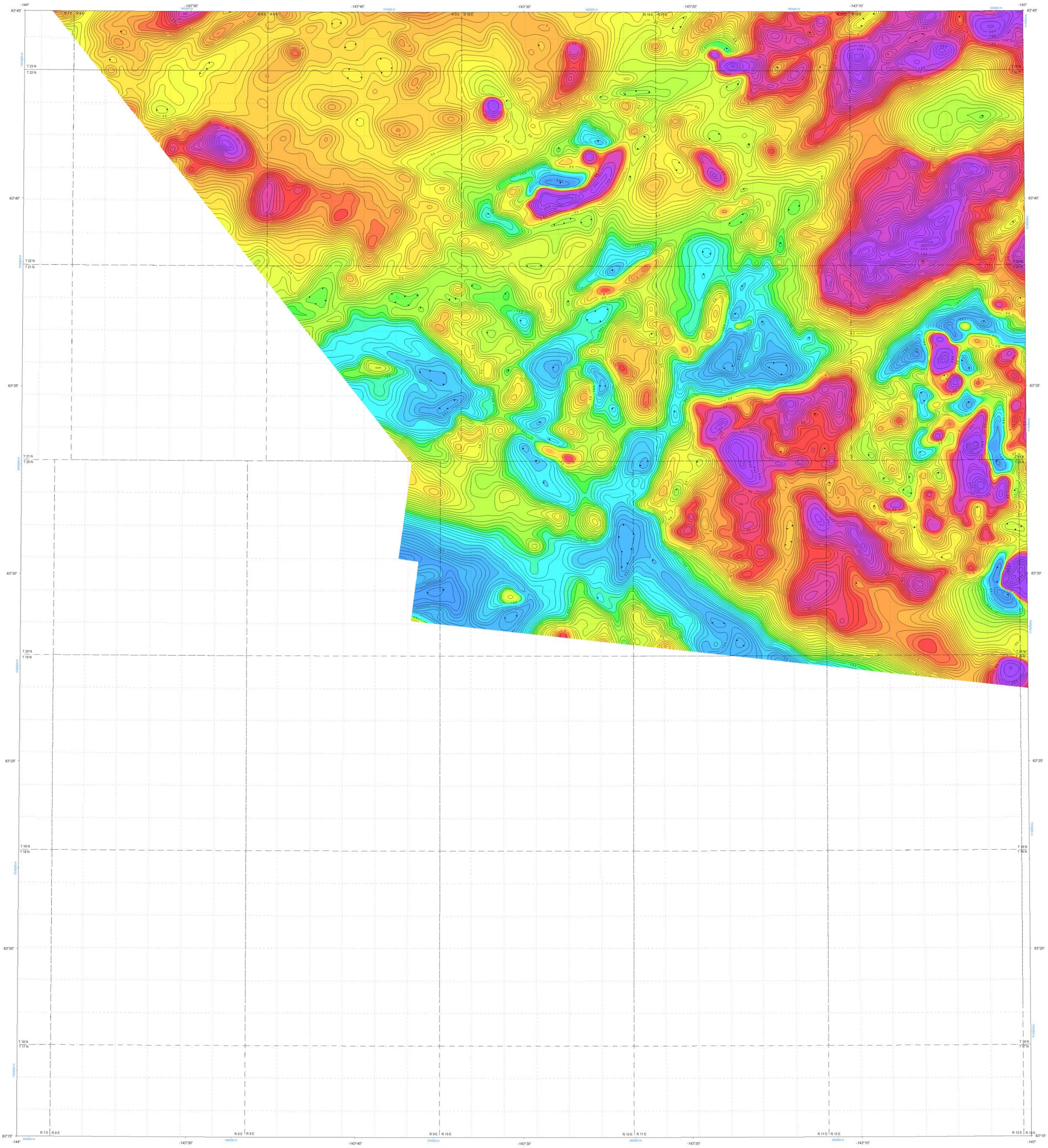
GEOPHYSICAL REPORT 2015-6
Residual magnetic intensity grid and contours with Township, Range, and Section; scale 1:63,360; Sheet 4 of 7
Quadrangles: Tanacross B-5, B-6, C-5, C-6

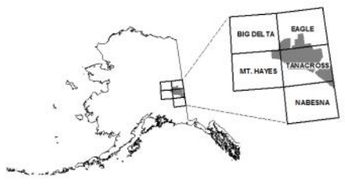


AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE TANACROSS REGION, ALASKA

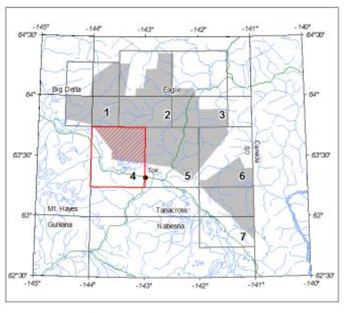
RESIDUAL MAGNETIC INTENSITY GRID AND CONTOURS

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

SURVEY LOCATION



LOCATION INDEX OF 1:63,360 SCALE MAP



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SCALE 1 / 63,360

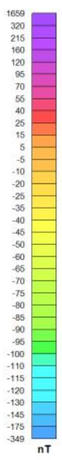
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

CONTOUR LEGEND

250 nT
50 nT
10 nT
5 nT
Magnetic Depression



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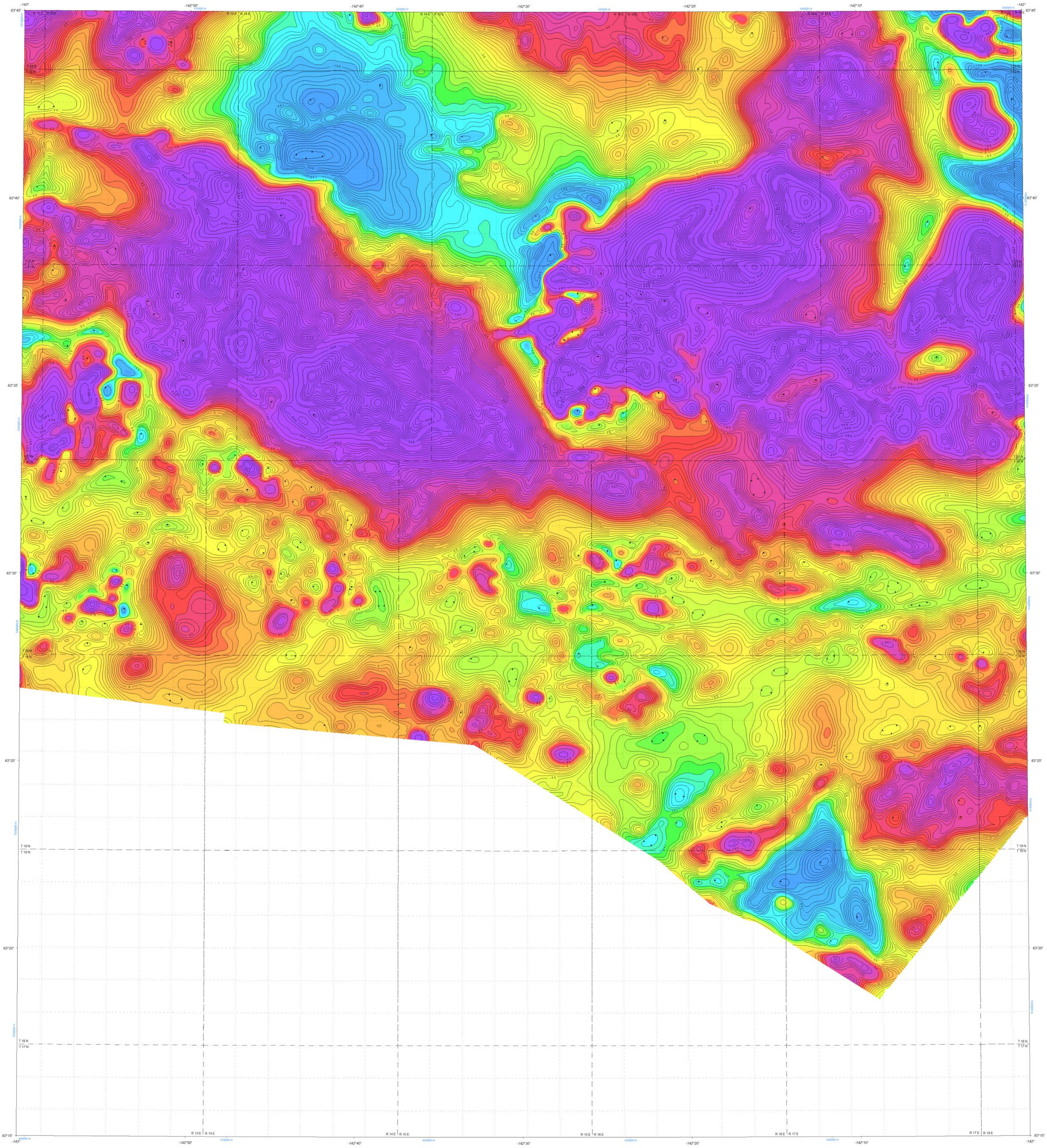
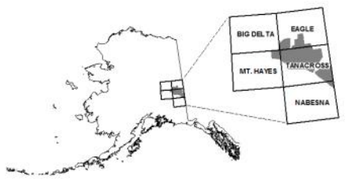
GEOPHYSICAL REPORT 2015-6
Residual magnetic intensity grid and contours with Township, Range, and Section; scale 1:63,360; Sheet 5 of 7
Quadrangles: Tanacross B-3, B-4, C-3, C-4



SURVEY LOCATION



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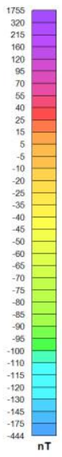
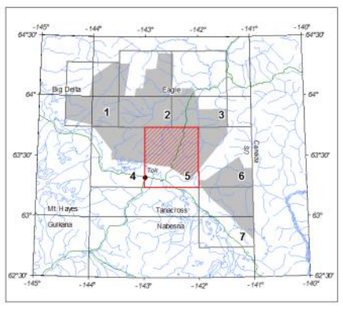


LOCATION INDEX OF 1:63,360 SCALE MAP



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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

CONTOUR LEGEND

250 nT
50 nT
10 nT
5 nT
Magnetic Depression

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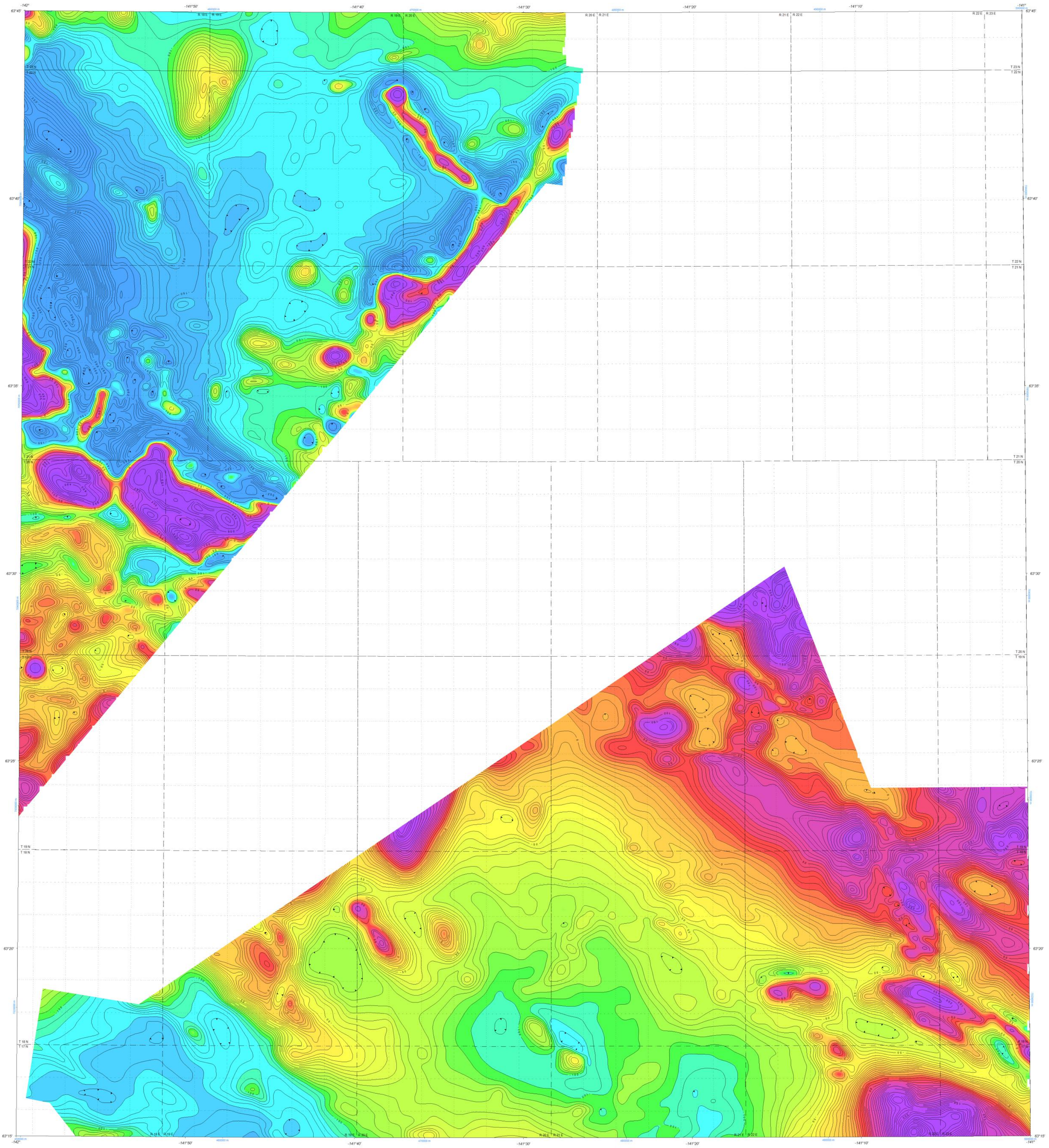
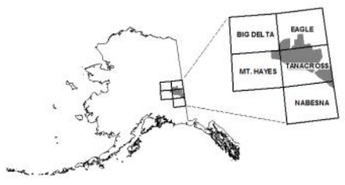


SURVEY LOCATION



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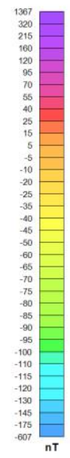
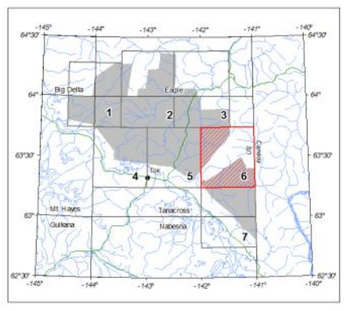


LOCATION INDEX OF 1:63,360 SCALE MAP



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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

CONTOUR LEGEND

250 nT
50 nT
10 nT
5 nT
Magnetic Depression

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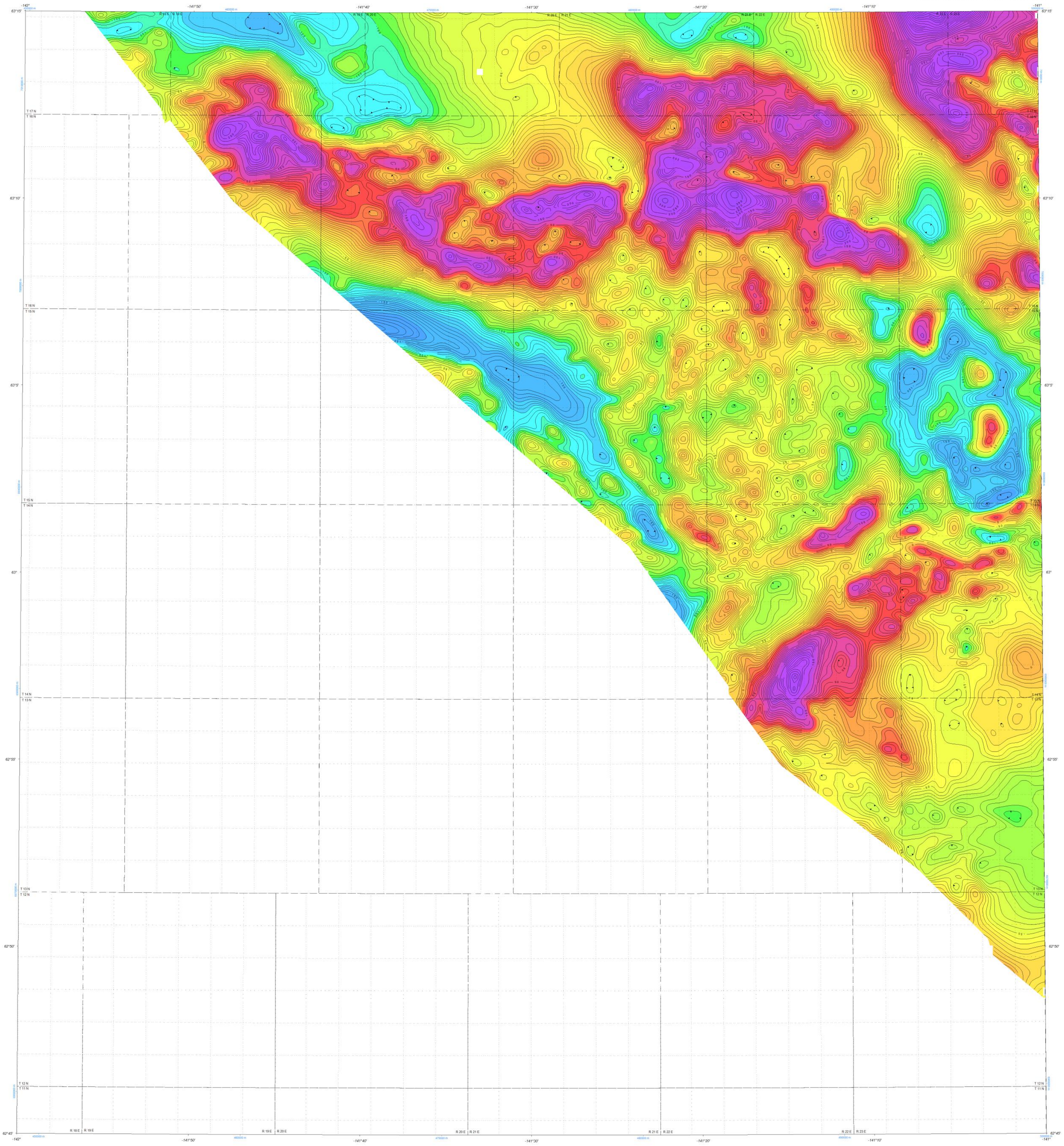
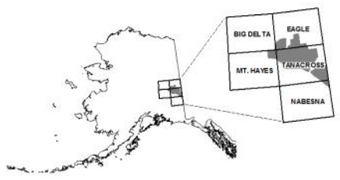
GEOPHYSICAL REPORT 2015-6
Residual magnetic intensity grid and contours with Township, Range, and Section; scale 1:63,360; Sheet 7 of 7
Quadrangles: Tanacross A-1, A-2; Nabesna D-1, D-2



SURVEY LOCATION



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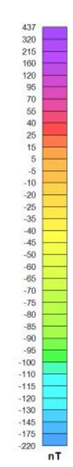
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

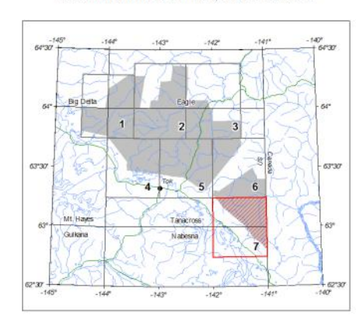
NAD27 Zone 7N

CONTOUR LEGEND

250 nT
50 nT
10 nT
5 nT
Magnetic Depression



LOCATION INDEX OF 1:63,360 SCALE MAP



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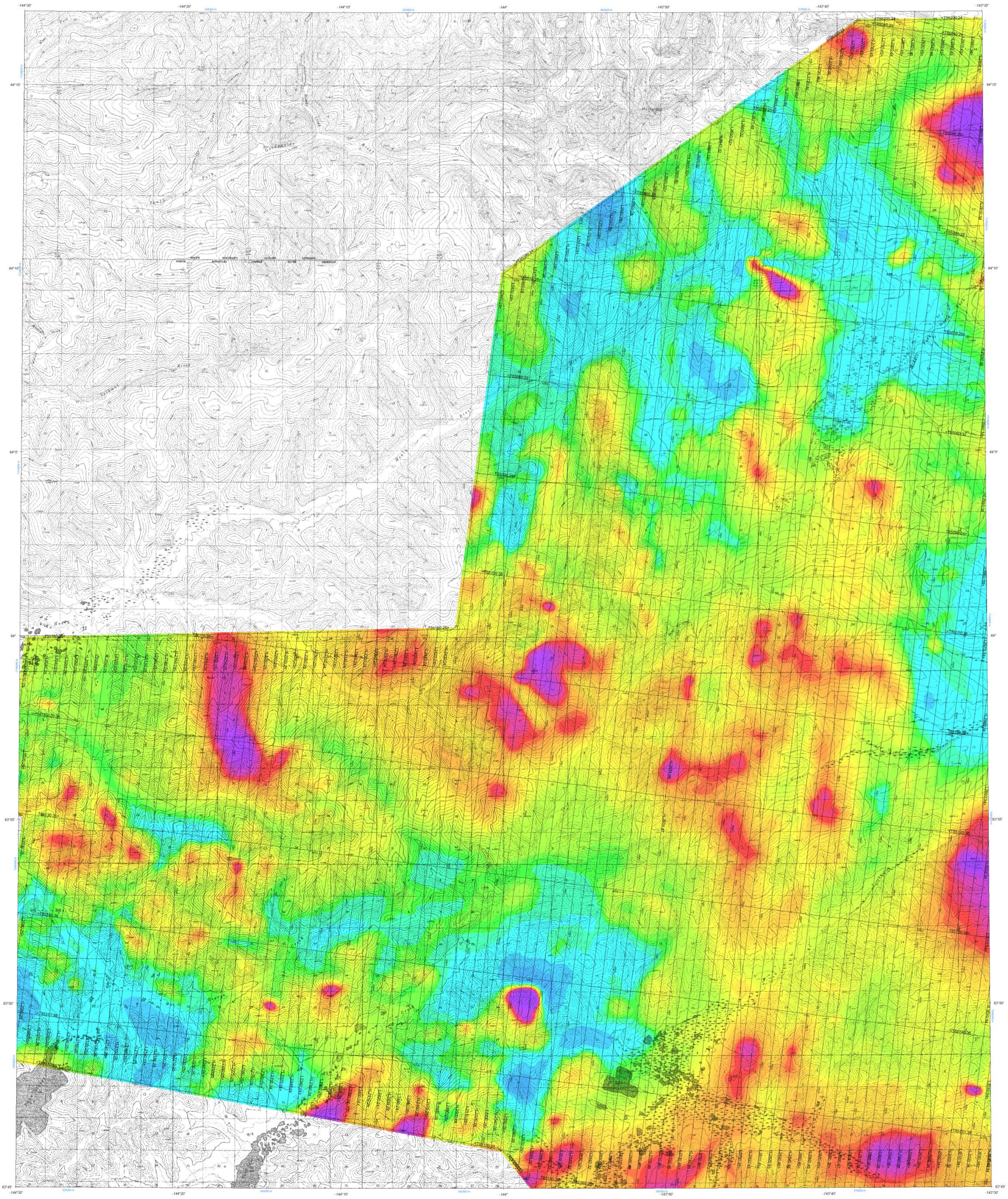
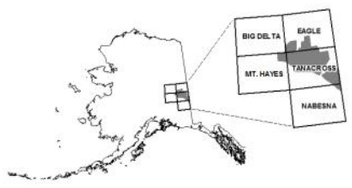
Quadrangles: Big Delta A-1, B-1; Mt. Hayes D-1; Eagle A-6, B-6; Tanacross D-6



SURVEY LOCATION



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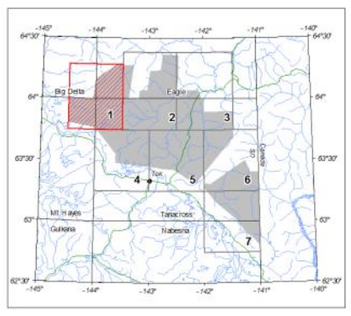
LOCATION INDEX OF 1:63,360 SCALE MAP



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SCALE 1 / 63,360

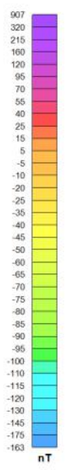
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

Line Type
Line Number
Flight Number
Line Direction
Fiducial



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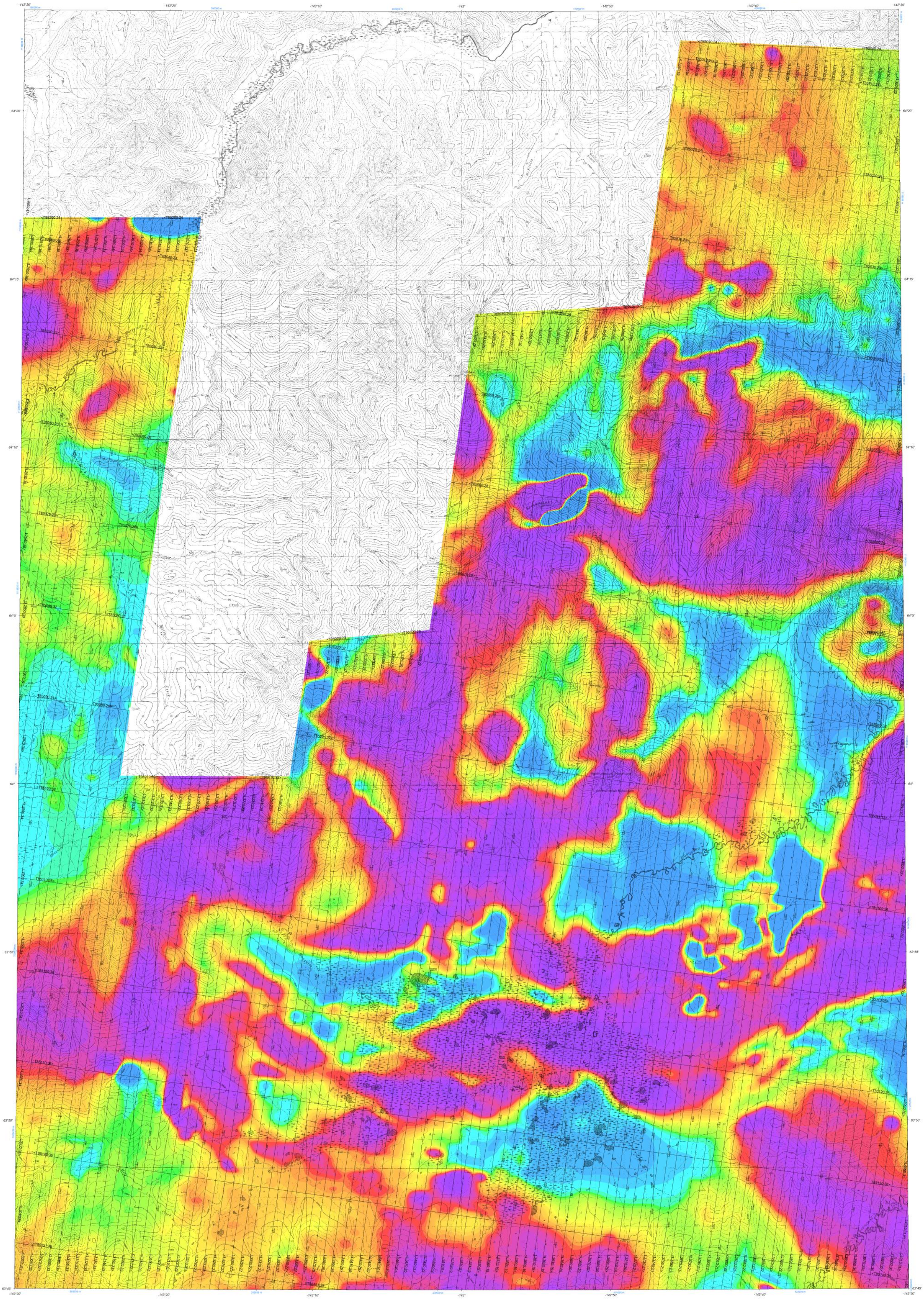

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2015

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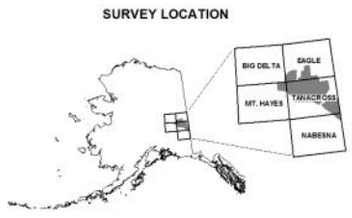

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1 0 1 2 3 4 MILES

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NAD27 Zone 7N

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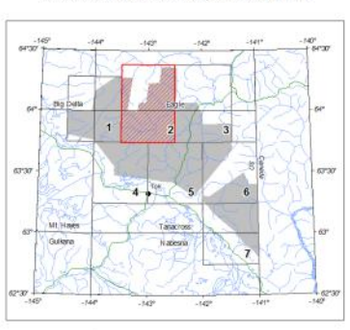
Line Type
Line Number
Flight Number
Line Direction
Fiducial

1567 320 215 160 120 95 70 55 40 25 15 5 -5 -10 -20 -25 -35 -40 -45 -50 -60 -65 -70 -75 -80 -85 -90 -95 -100 -110 -115 -120 -130 -145 -175 -1347 nT

LOCATION INDEX OF 1:63,360 SCALE MAP



SURVEY HISTORY

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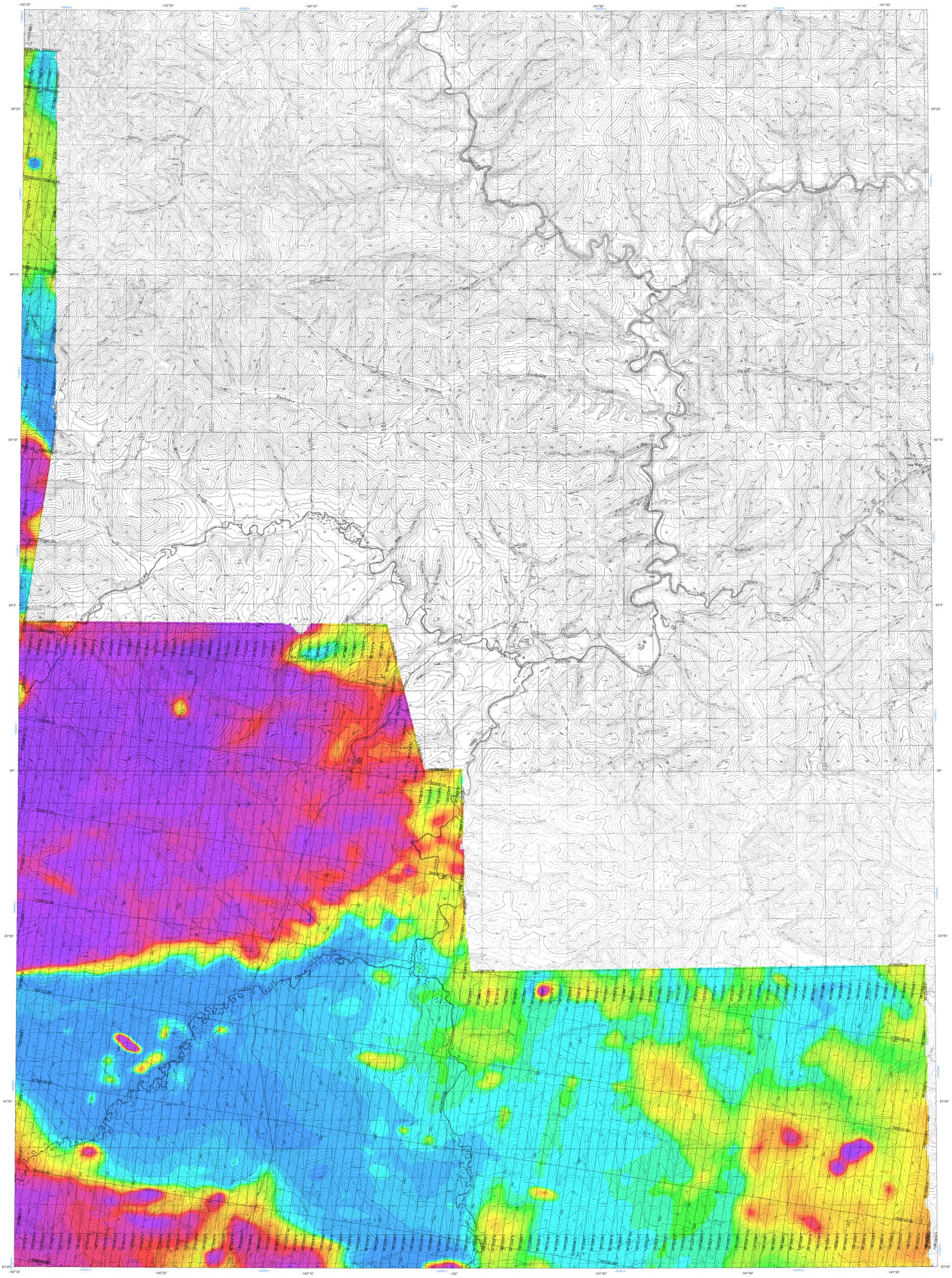
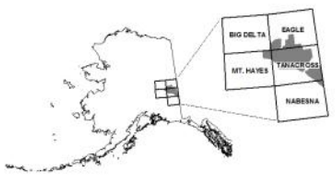
GEOPHYSICAL REPORT 2015-6
Residual magnetic intensity grid and flightlines with topography; scale 1:63,360; Sheet 3 of 7
Quadrangles: Eagle A-1, A-2, A-3, B-1, B-2, B-3; Tanacross D-1, D-2, D-3



SURVEY LOCATION

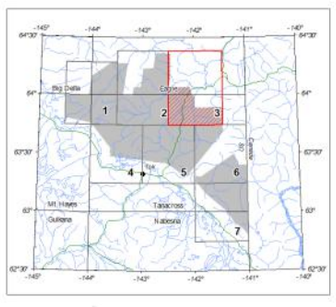


AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE TANACROSS REGION, ALASKA

RESIDUAL MAGNETIC INTENSITY GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

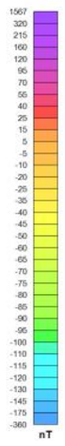
1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L1600 04 — Line Type, Line Number, Flight Number, Line Direction

1000 — Fiducial



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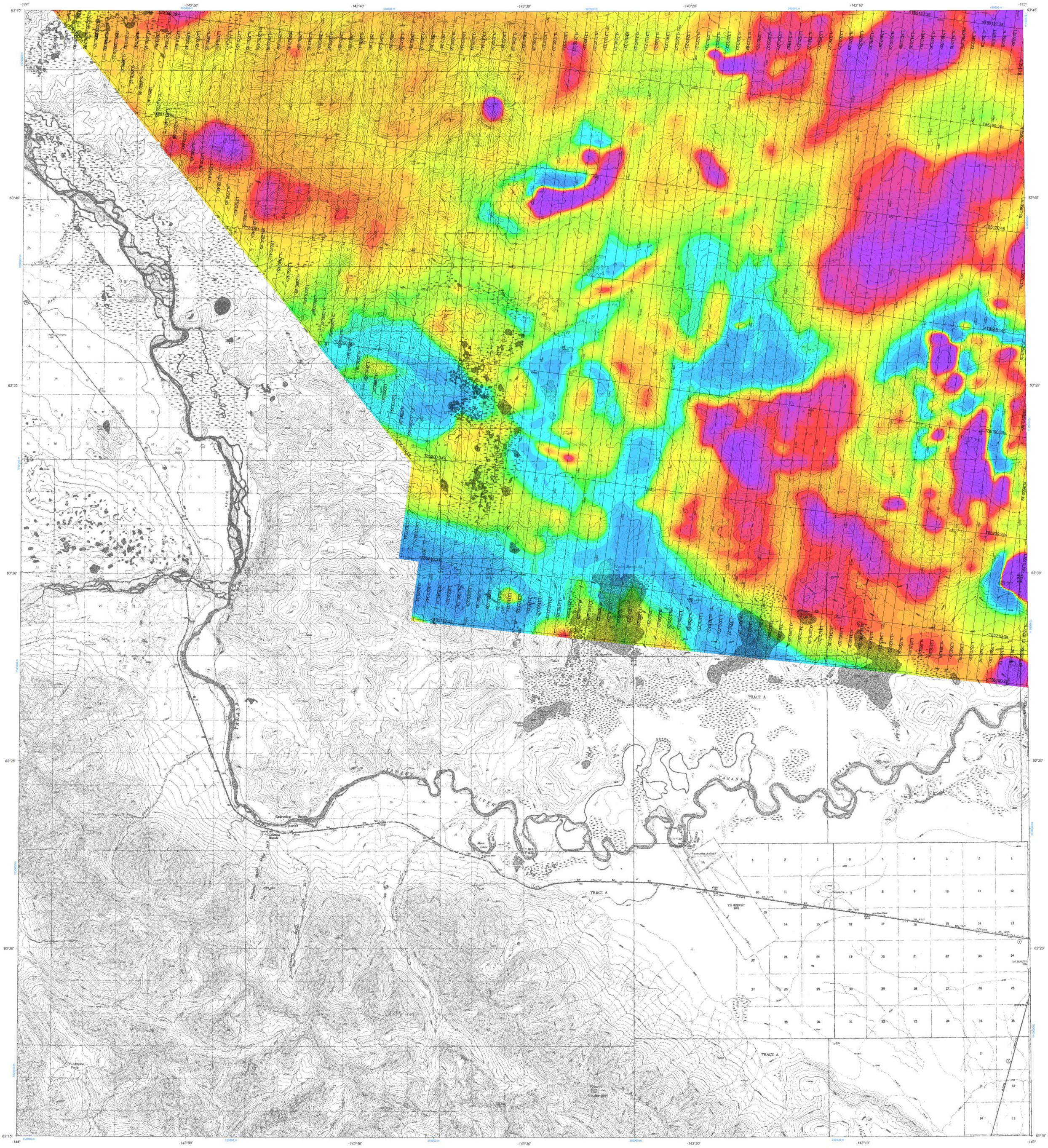
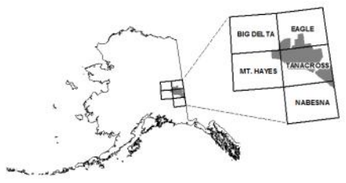
GEOPHYSICAL REPORT 2015-6
Residual magnetic intensity grid and flightlines with topography; scale 1:63,360; Sheet 4 of 7
Quadrangles: Tanacross B-5, B-6, C-5, C-6



SURVEY LOCATION



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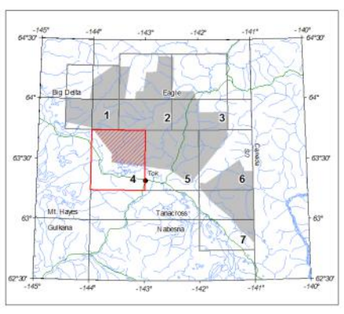
RESIDUAL MAGNETIC INTENSITY GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

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SCALE 1 / 63,360

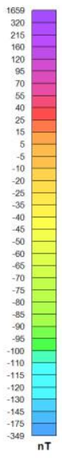
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L1000 145°
Line Type
Line Number
Flight Number
Line Direction
Fiducial



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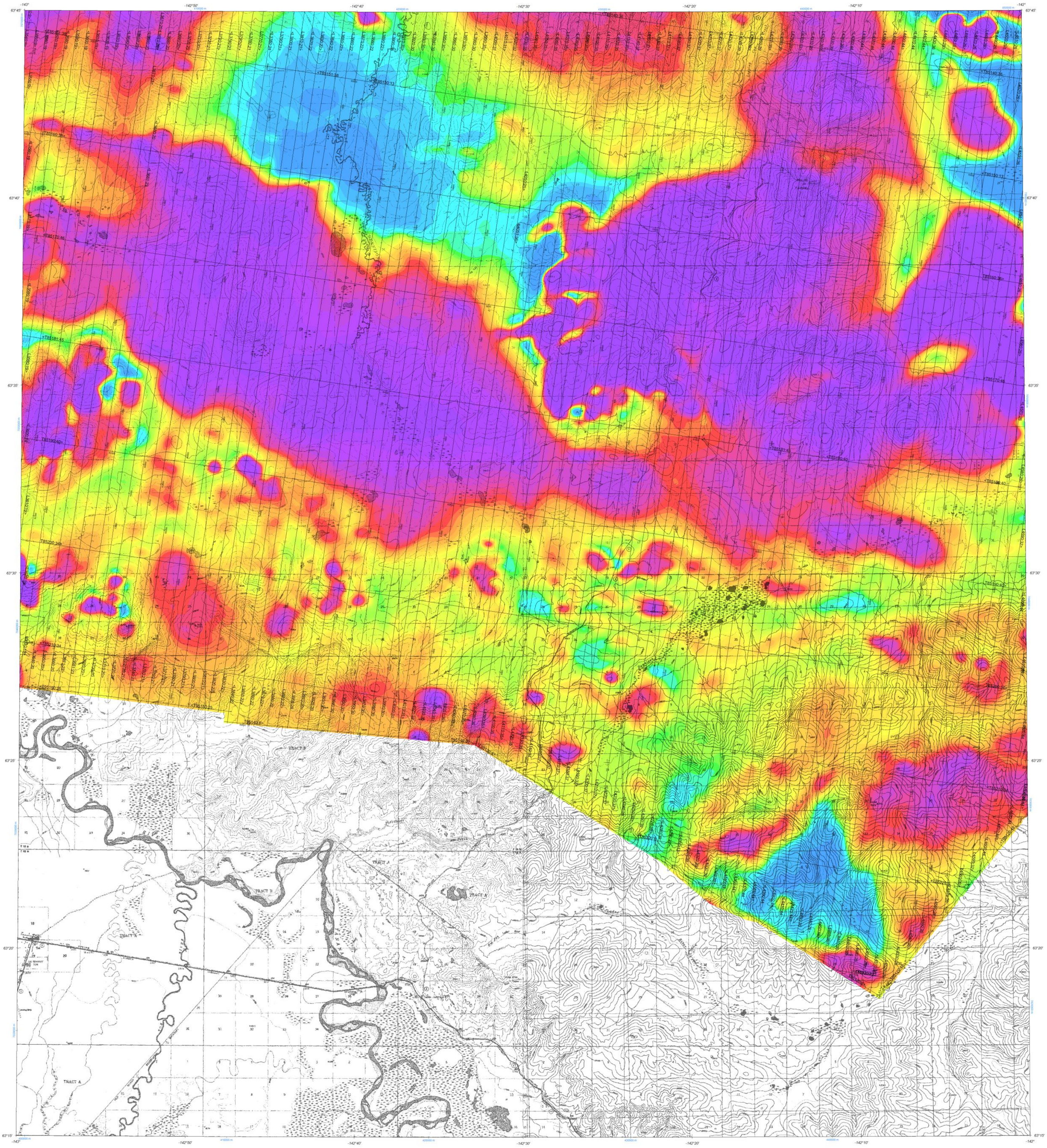
GEOPHYSICAL REPORT 2015-6
Residual magnetic intensity grid and flightlines with topography; scale 1:63,360; Sheet 5 of 7
Quadrangles: Tanacross B-3, B-4, C-3, C-4



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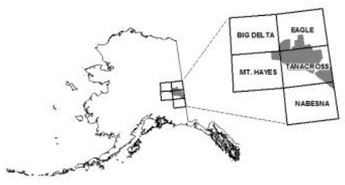
RESIDUAL MAGNETIC INTENSITY GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

SURVEY LOCATION



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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

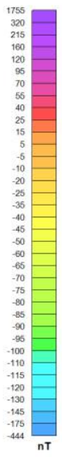
NAD27 Zone 7N

FLIGHT PATH LEGEND

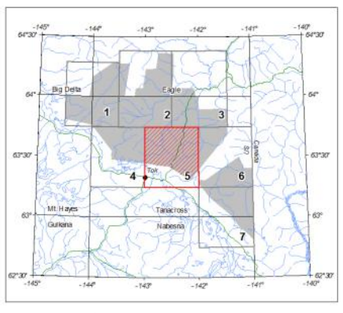
L 1000 T 147 2005

Line Type
Line Number
Flight Number
Line Direction

Fiducial



LOCATION INDEX OF 1:63,360 SCALE MAP



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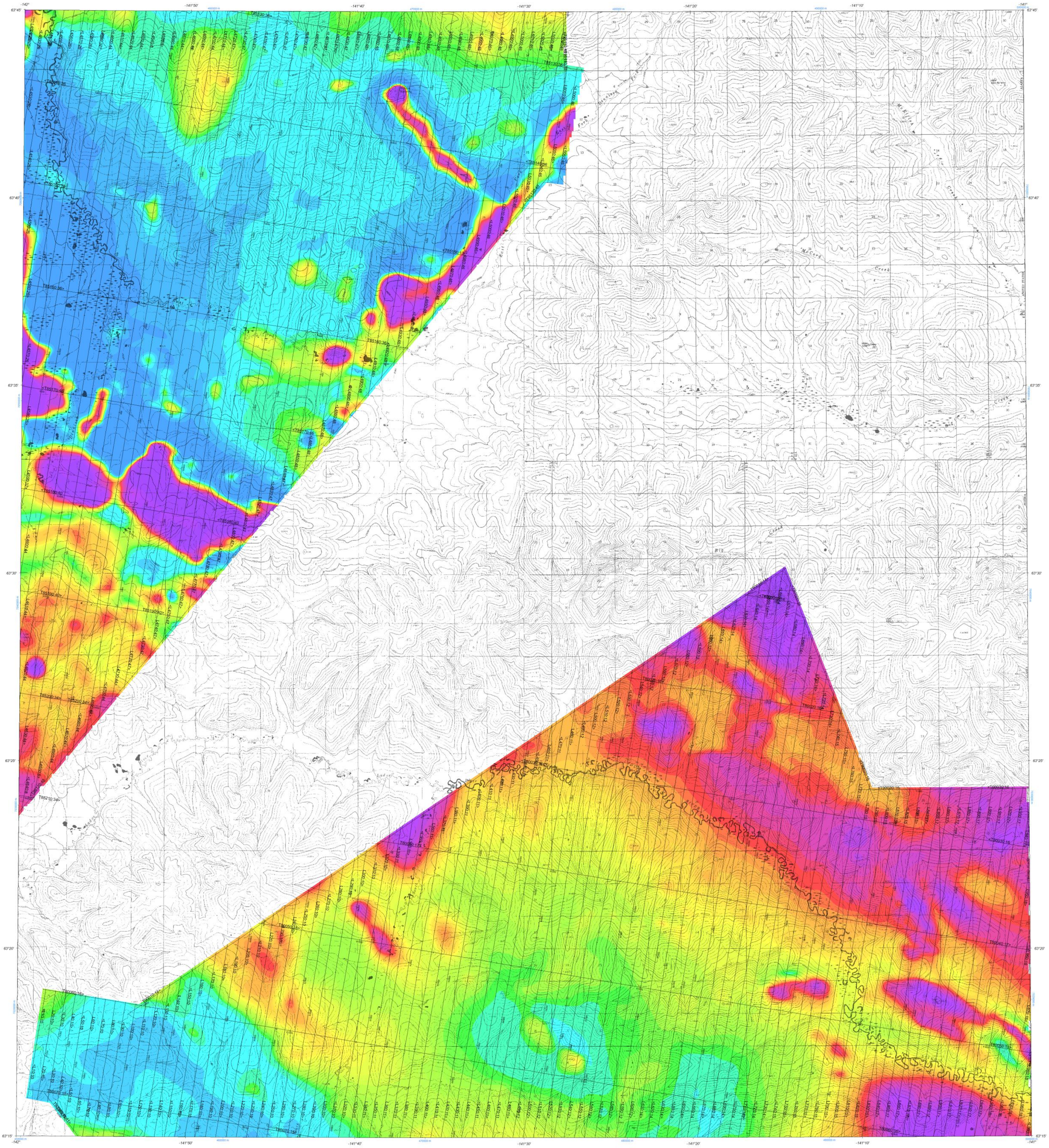
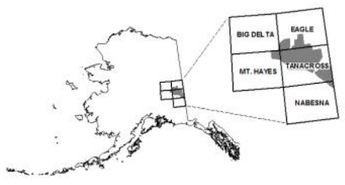
GEOPHYSICAL REPORT 2015-6
Residual magnetic intensity grid and flightlines with topography; scale 1:63,360; Sheet 6 of 7
Quadrangles: Tanacross B-1, B-2, C-1, C-2



SURVEY LOCATION



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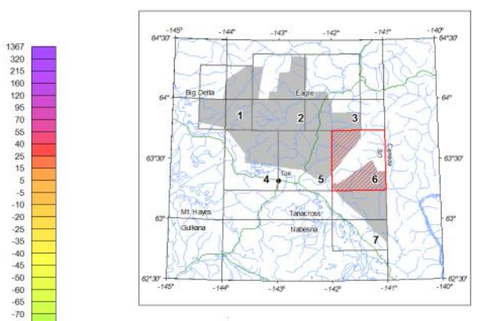
by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015



LOCATION INDEX OF 1:63,360 SCALE MAP

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SCALE 1 / 63,360

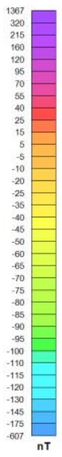
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L1000 Line Type
L1000 Line Number
Flight Number
Line Direction
Fiducial



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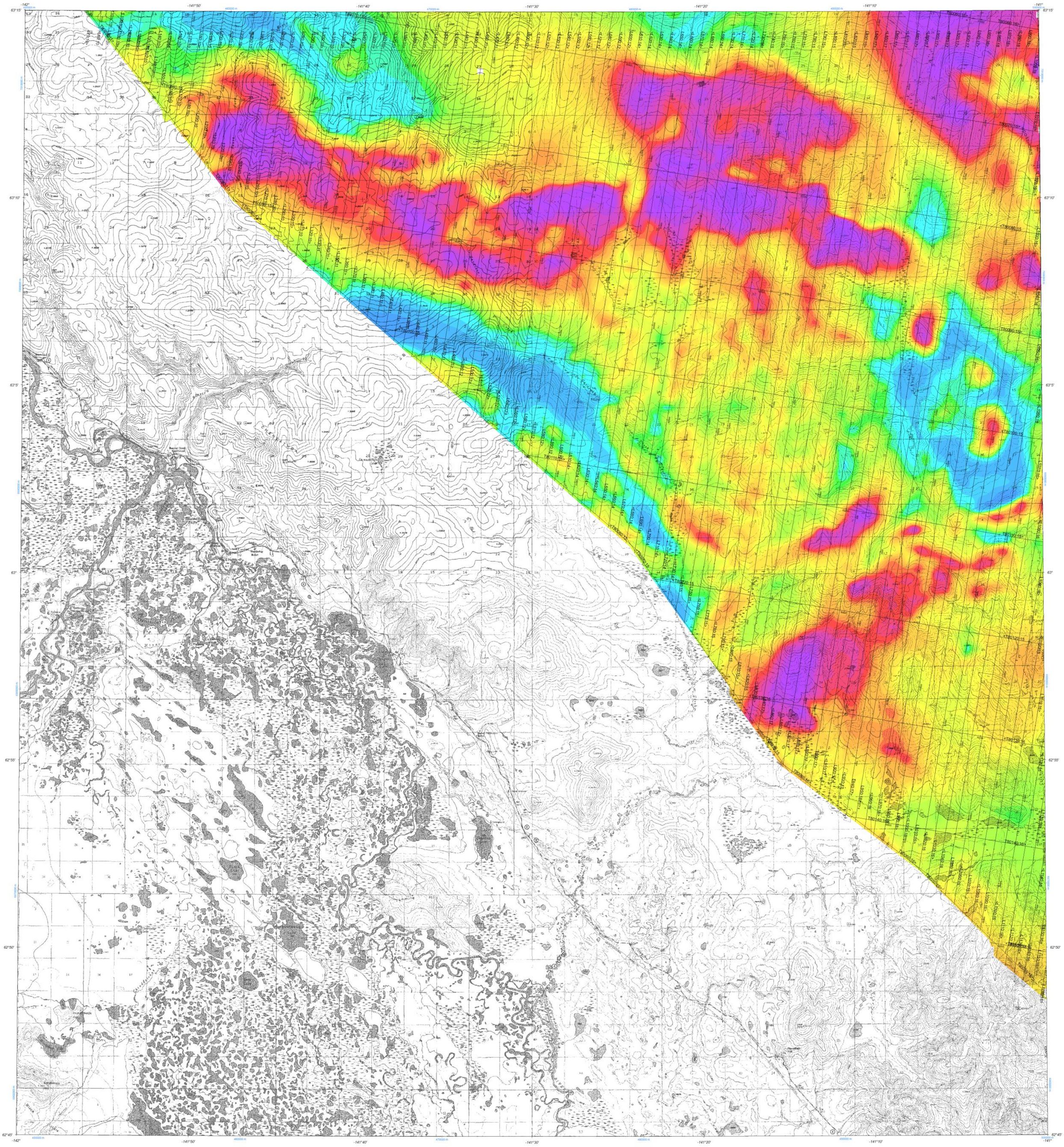
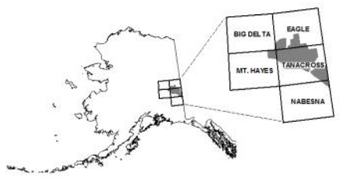
Quadrangles: Tanacross A-1, A-2; Nabesna D-1, D-2



SURVEY LOCATION



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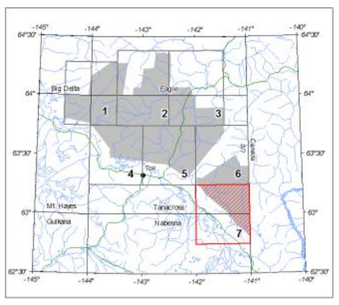
2015

LOCATION INDEX OF 1:63,360 SCALE MAP



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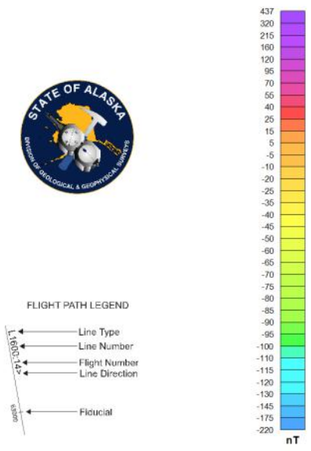
SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N



FLIGHT PATH LEGEND

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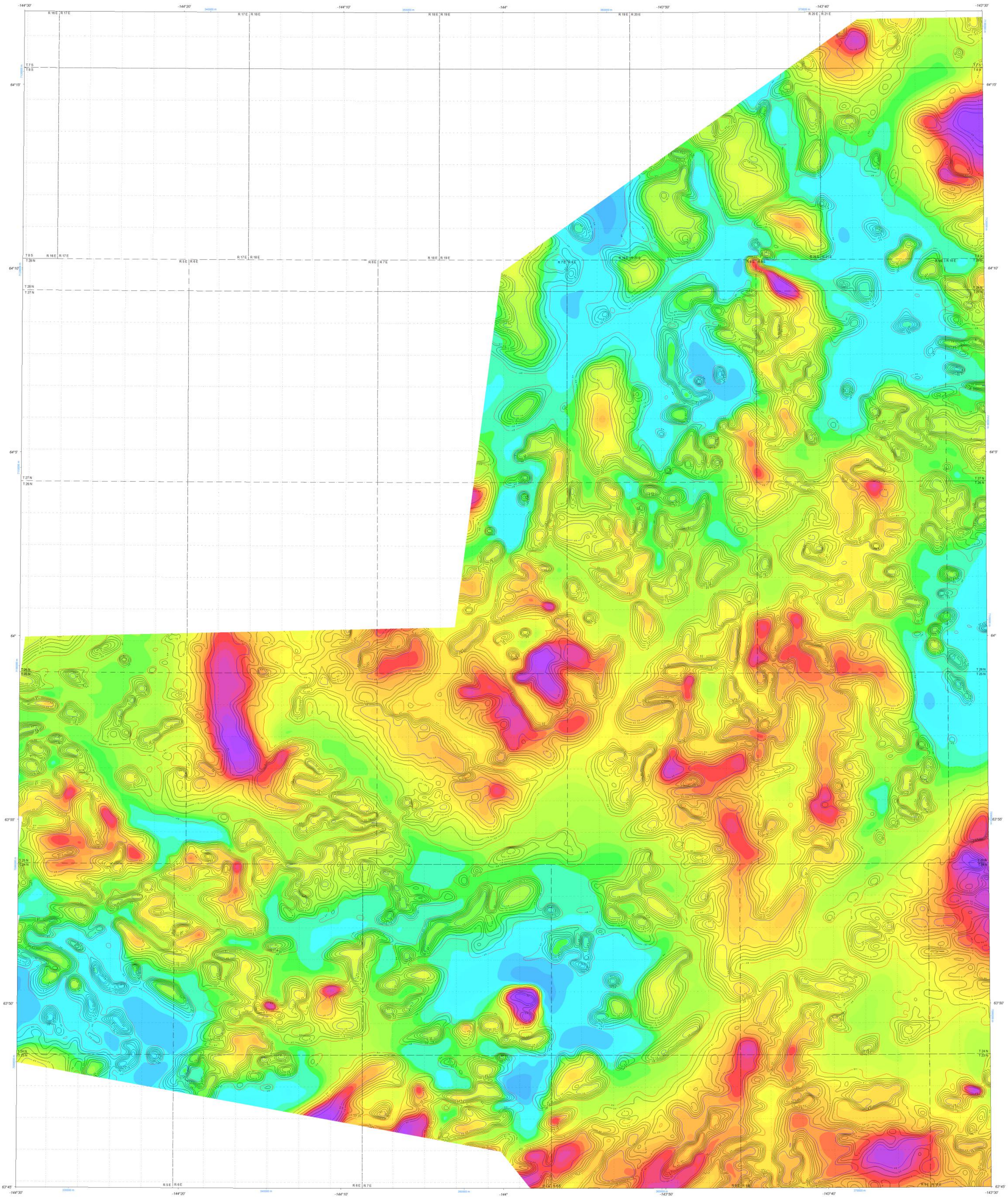
GEOPHYSICAL REPORT 2015-6
Residual magnetic intensity grid and tilt derivative contours with Township, Range, and Section; scale 1:63,360; Sheet 1 of 7
Quadrangles: Big Delta A-1, B-1; Mt. Hayes D-1; Eagle A-6, B-6; Tanacross D-6



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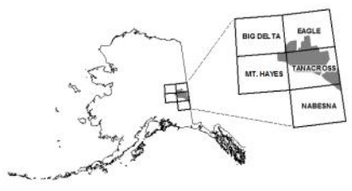
RESIDUAL MAGNETIC INTENSITY GRID AND TILT DERIVATIVE CONTOURS

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

SURVEY LOCATION



DESCRIPTIVE NOTES

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SCALE 1 / 63,360

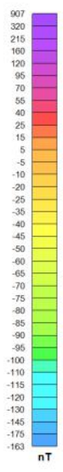
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

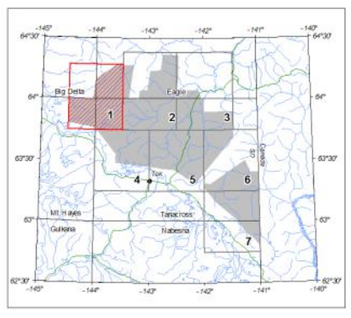
NAD27 Zone 7N

CONTOUR LEGEND

45°
30°
15°
0°
-15°
-30°
-45°



LOCATION INDEX OF 1:63,360 SCALE MAP



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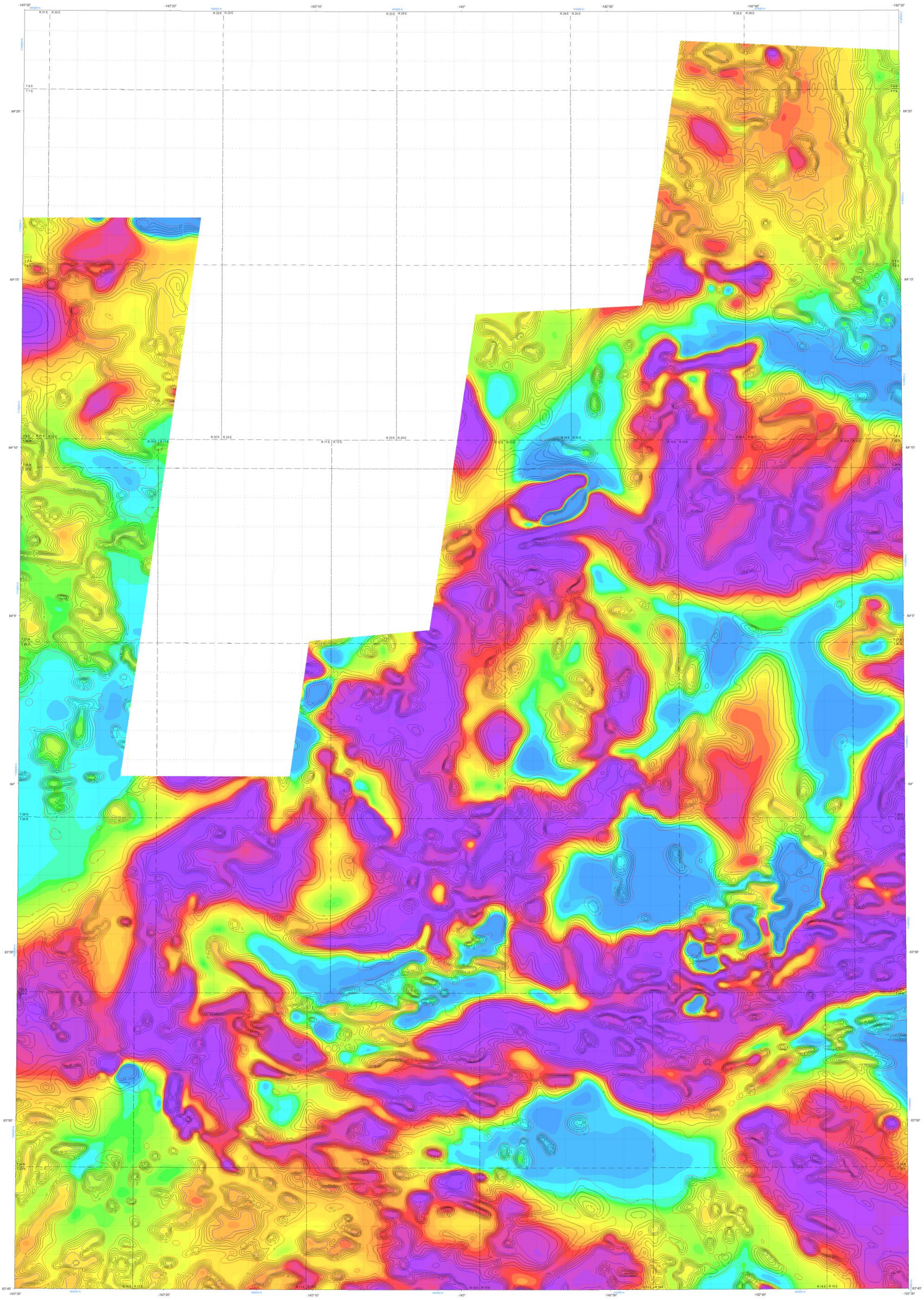
GEOPHYSICAL REPORT 2015-6
Residual magnetic intensity grid and tilt derivative contours with Township, Range, and Section; scale 1:63,360; Sheet 2 of 7
Quadrangles: Eagle A-4, A-5, B-4, B-5; Tanacross D-4, D-5



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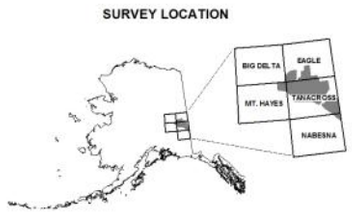
RESIDUAL MAGNETIC INTENSITY GRID AND TILT DERIVATIVE CONTOURS

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

SURVEY LOCATION



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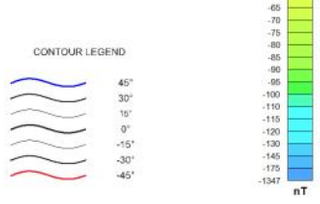
SCALE 1 / 63,360

1 0 1 2 3 4 MILES

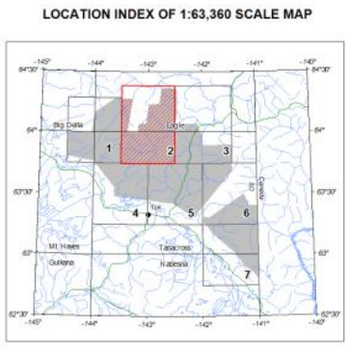
1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

CONTOUR LEGEND



LOCATION INDEX OF 1:63,360 SCALE MAP



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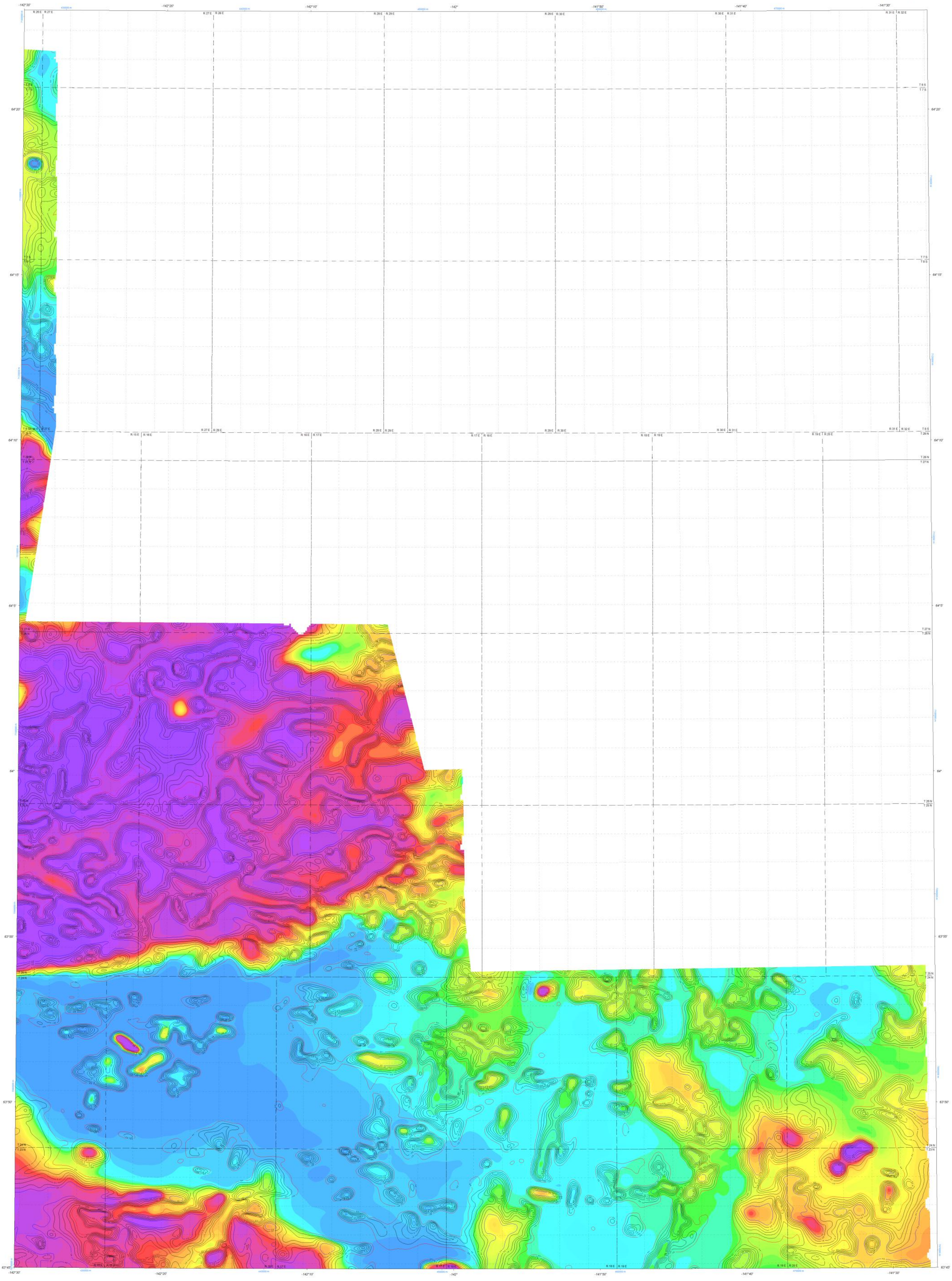
Residual magnetic intensity grid and tilt derivative contours with Township, Range, and Section; scale 1:63,360; Sheet 3 of 7
Quadrangles: Eagle A-1, A-2, A-3, B-1, B-2, B-3; Tanacross D-1, D-2, D-3



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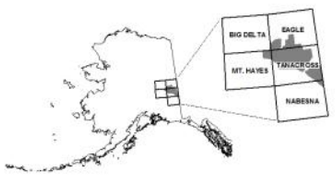

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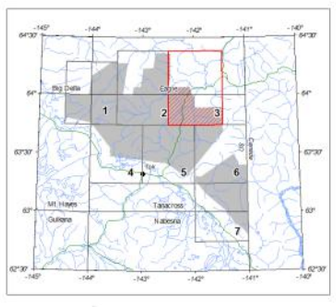
RESIDUAL MAGNETIC INTENSITY GRID AND TILT DERIVATIVE CONTOURS

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

LOCATION INDEX OF 1:63,360 SCALE MAP



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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

CONTOUR LEGEND

45°
30°
15°
0°
-15°
-30°
-45°

1567
320
215
160
120
95
70
55
40
25
15
5
-5
-10
-20
-25
-35
-40
-45
-50
-60
-65
-70
-75
-80
-85
-90
-95
-100
-110
-115
-120
-130
-145
-175
-360
nT

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GEOPHYSICAL REPORT 2015-6
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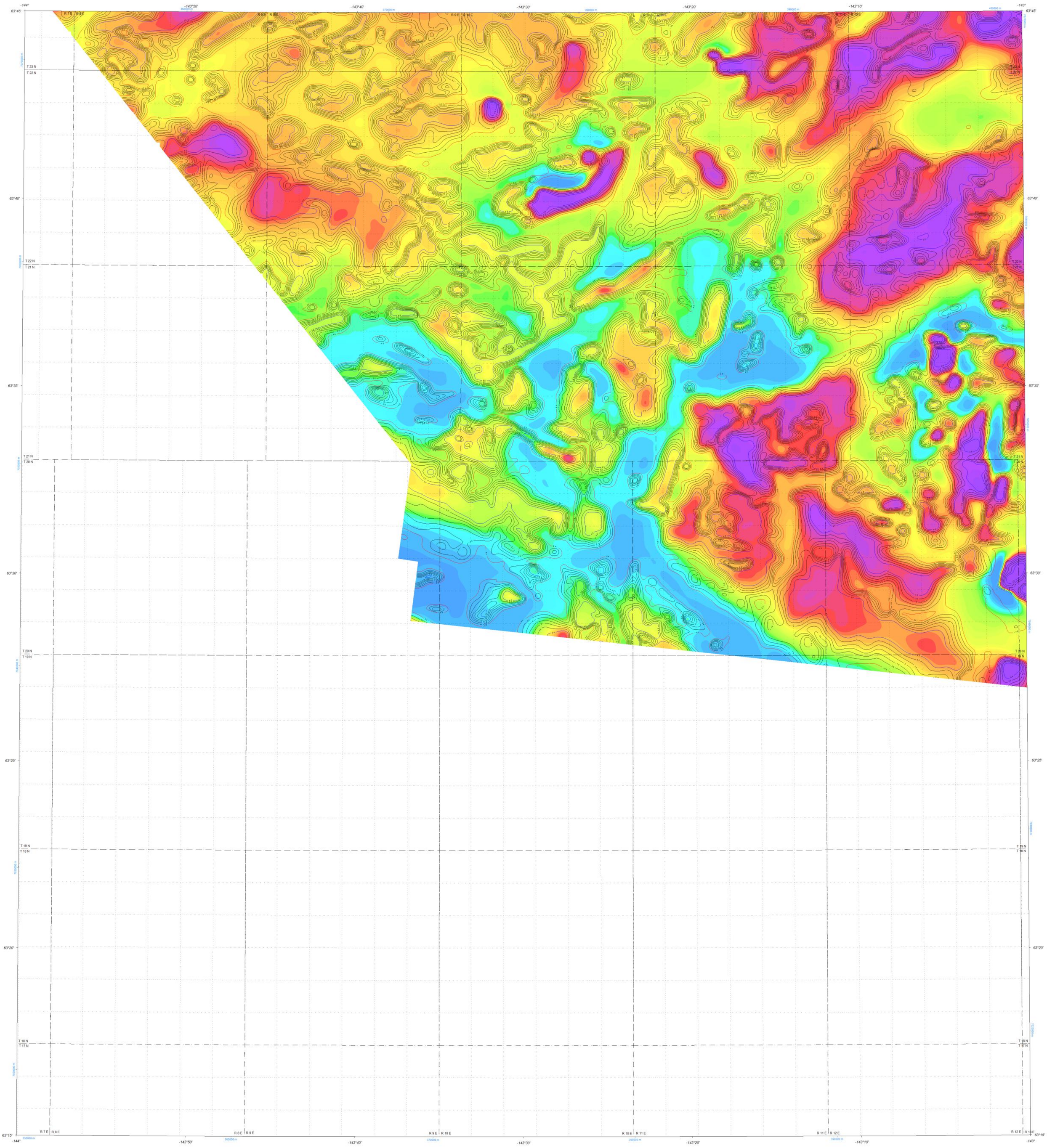
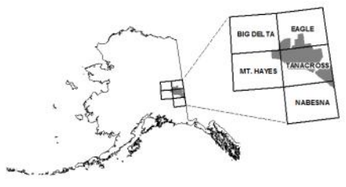
Quadrangles: Tanacross B-5, B-6, C-5, C-6



SURVEY LOCATION



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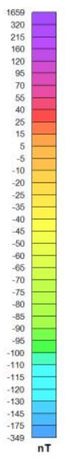
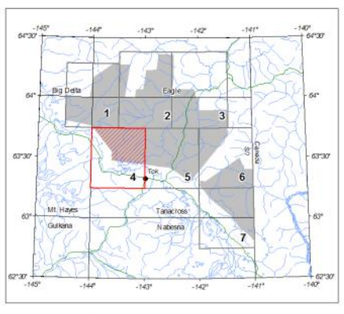


LOCATION INDEX OF 1:63,360 SCALE MAP



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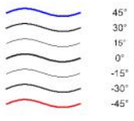
SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

CONTOUR LEGEND



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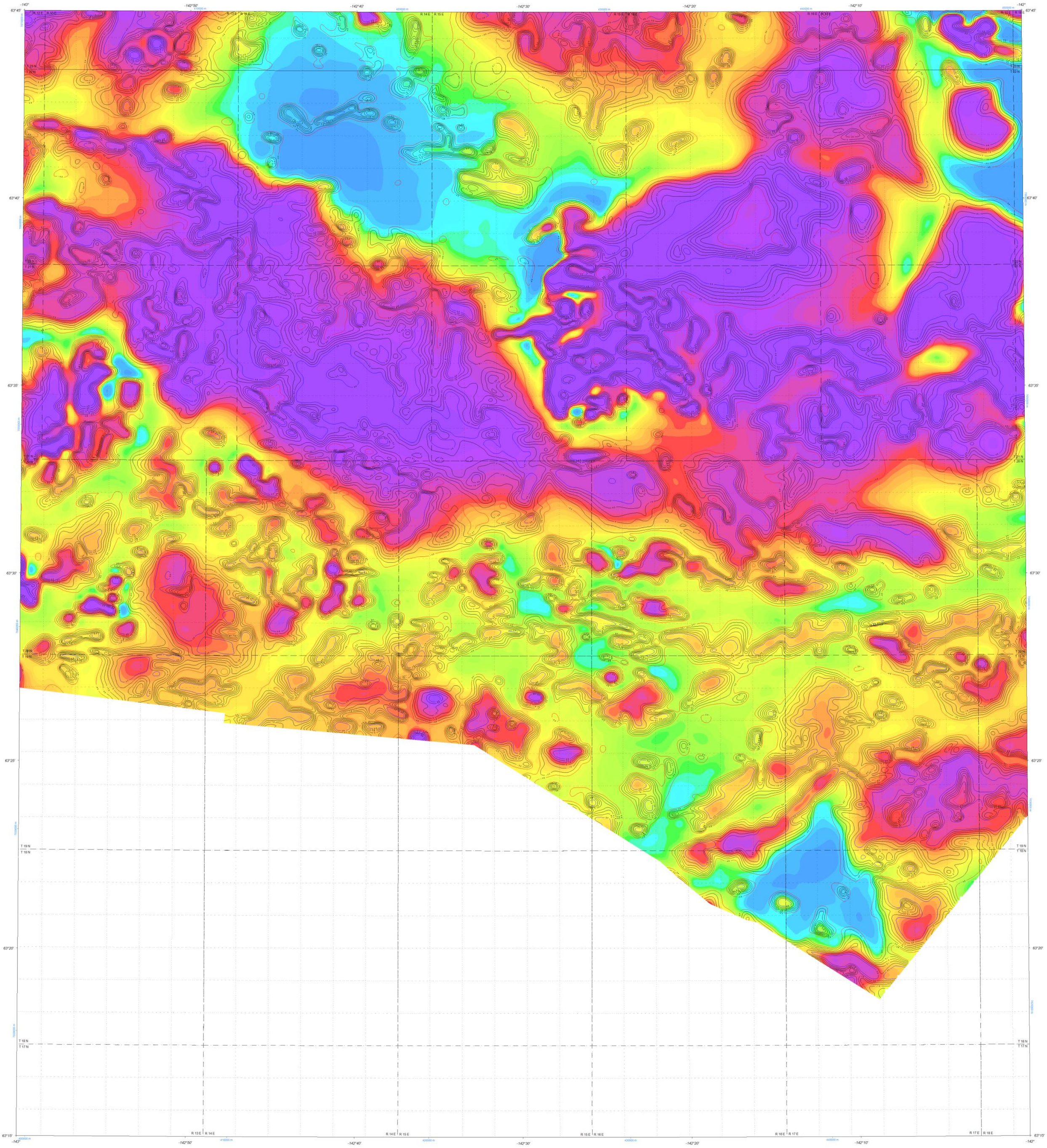
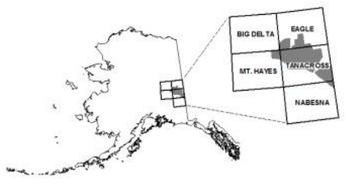
Residual magnetic intensity grid and tilt derivative contours with Township, Range, and Section; scale 1:63,360; Sheet 5 of 7
Quadrangles: Tanacross B-3, B-4, C-3, C-4



SURVEY LOCATION



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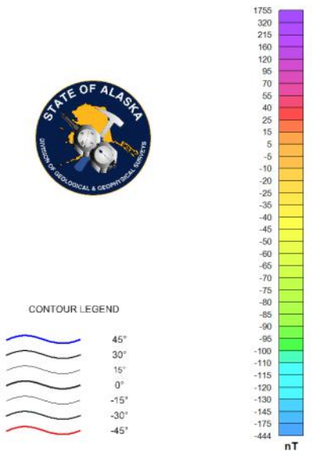
2015

CONTOUR LEGEND



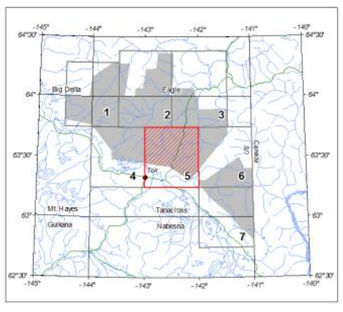
SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

LOCATION INDEX OF 1:63,360 SCALE MAP



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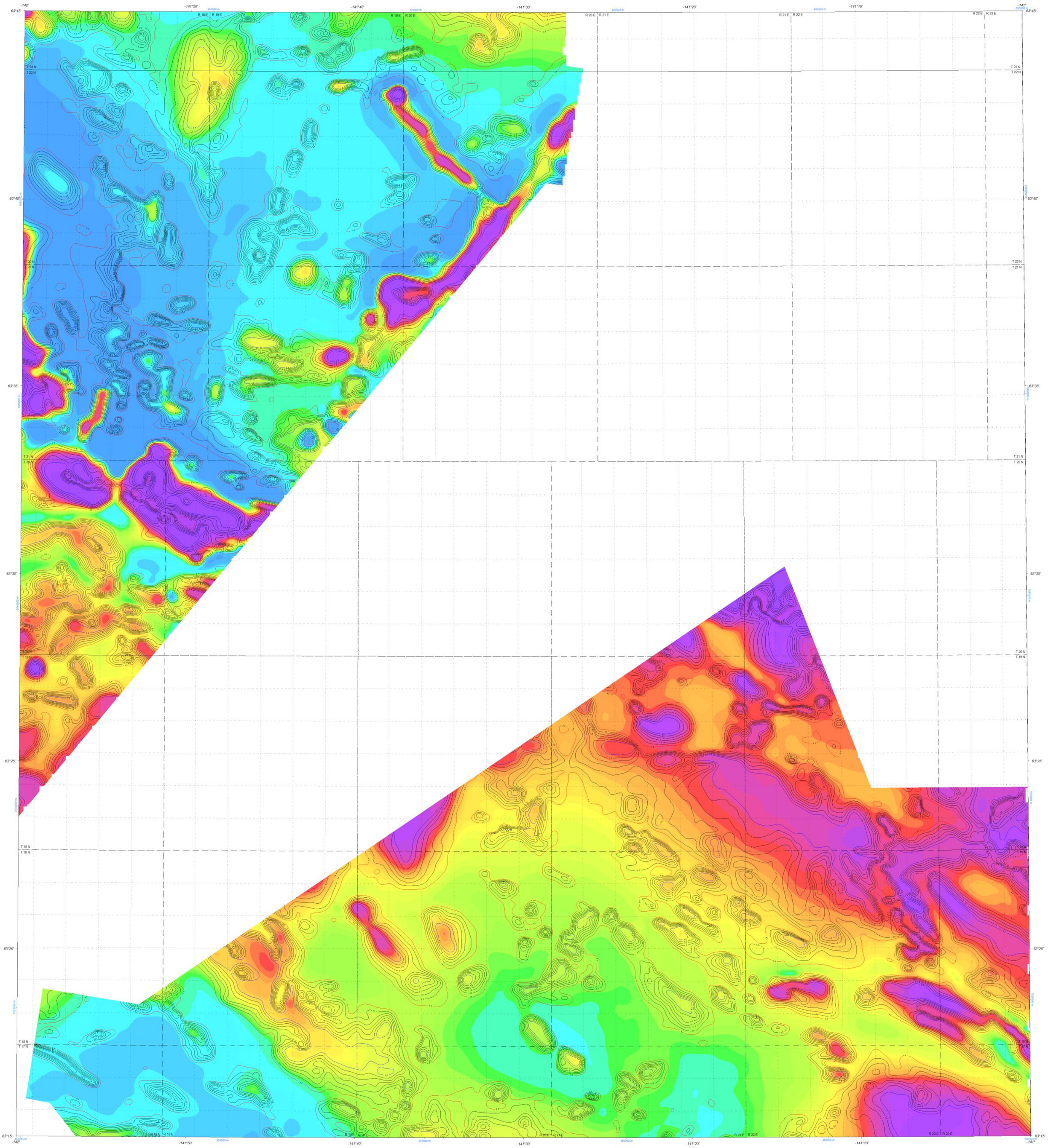

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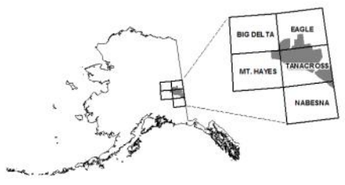

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SCALE 1 / 63,360

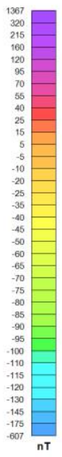
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

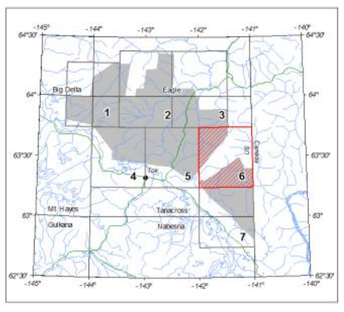
NAD27 Zone 7N

CONTOUR LEGEND

45°
30°
15°
0°
-15°
-30°
-45°



LOCATION INDEX OF 1:63,360 SCALE MAP



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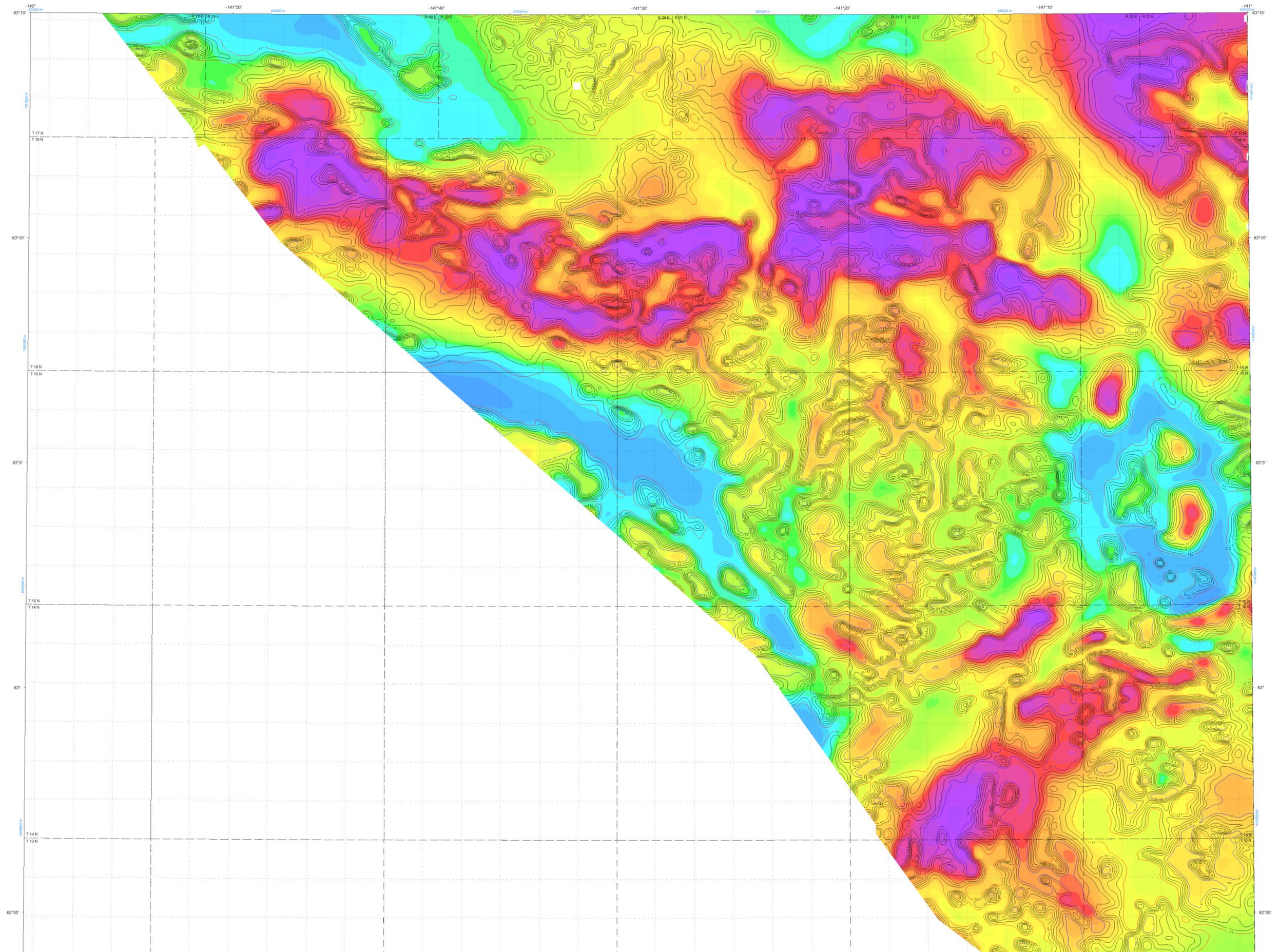

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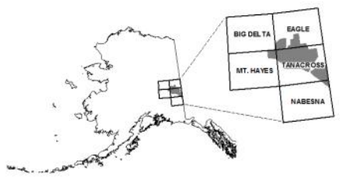

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2015

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SCALE 1 / 63,360

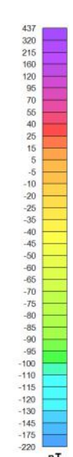
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

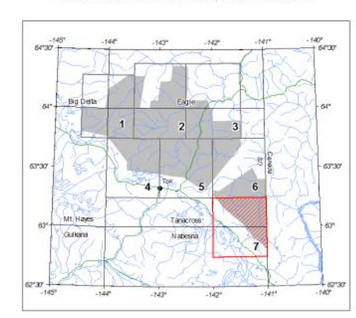
NAD27 Zone 7N

CONTOUR LEGEND

45°
30°
15°
0°
-15°
-30°
-45°



LOCATION INDEX OF 1:63,360 SCALE MAP



SURVEY HISTORY

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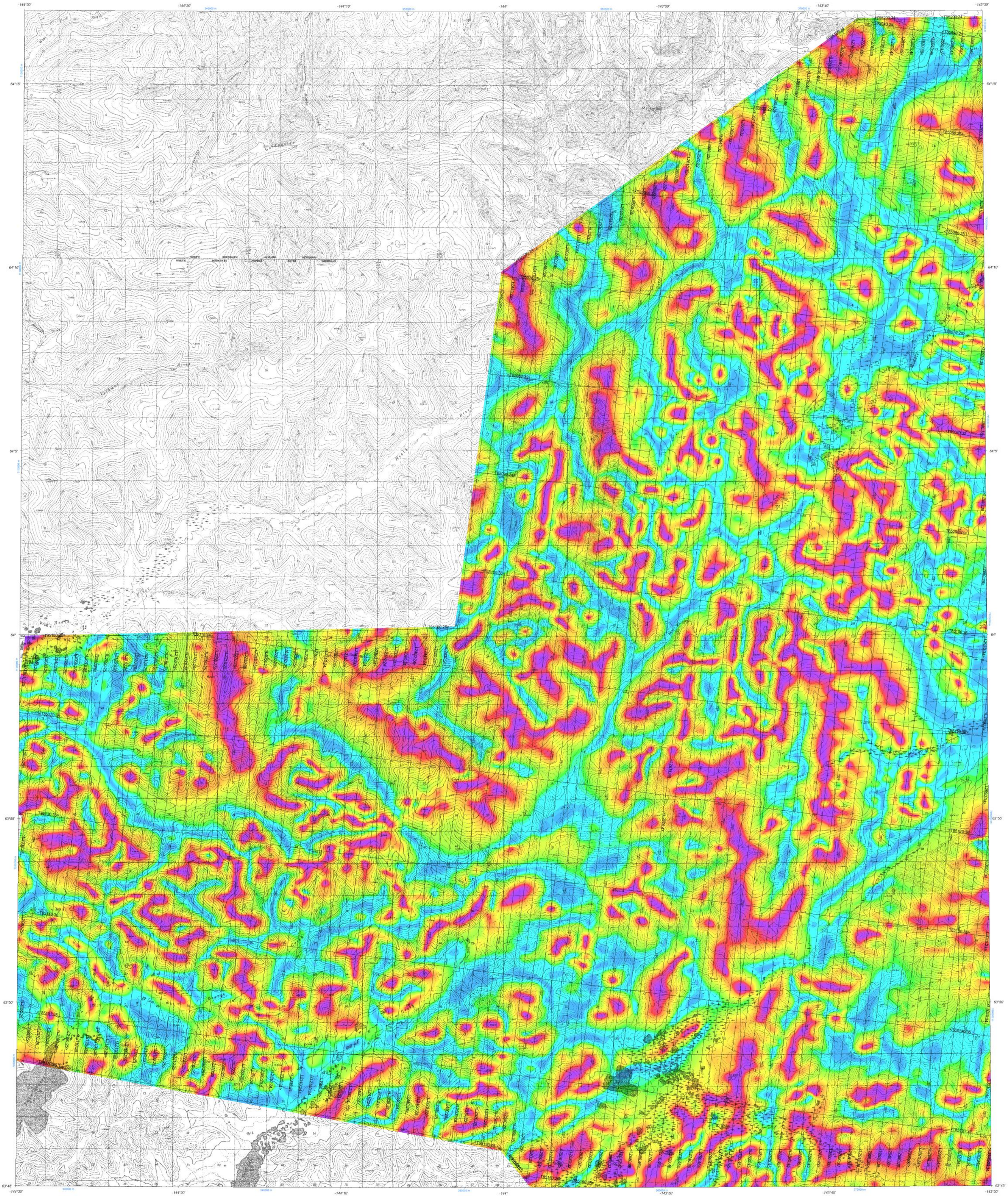
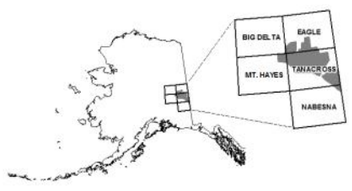
GEOPHYSICAL REPORT 2015-6
Tilt derivative grid and flightlines with topography; scale 1:63,360; Sheet 1 of 7
Quadrangles: Big Delta A-1, B-1; Mt. Hayes D-1; Eagle A-6, B-6; Tanacross D-6



SURVEY LOCATION

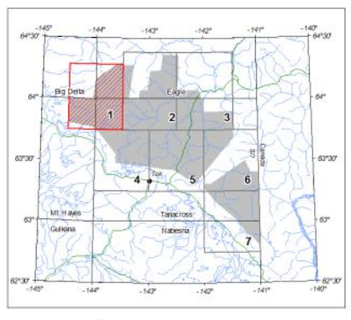


AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE TANACROSS REGION, ALASKA

TILT DERIVATIVE GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

LOCATION INDEX OF 1:63,360 SCALE MAP



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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L1000 1-42 — Line Type, Line Number, Flight Number, Line Direction

2000 — Fiducial

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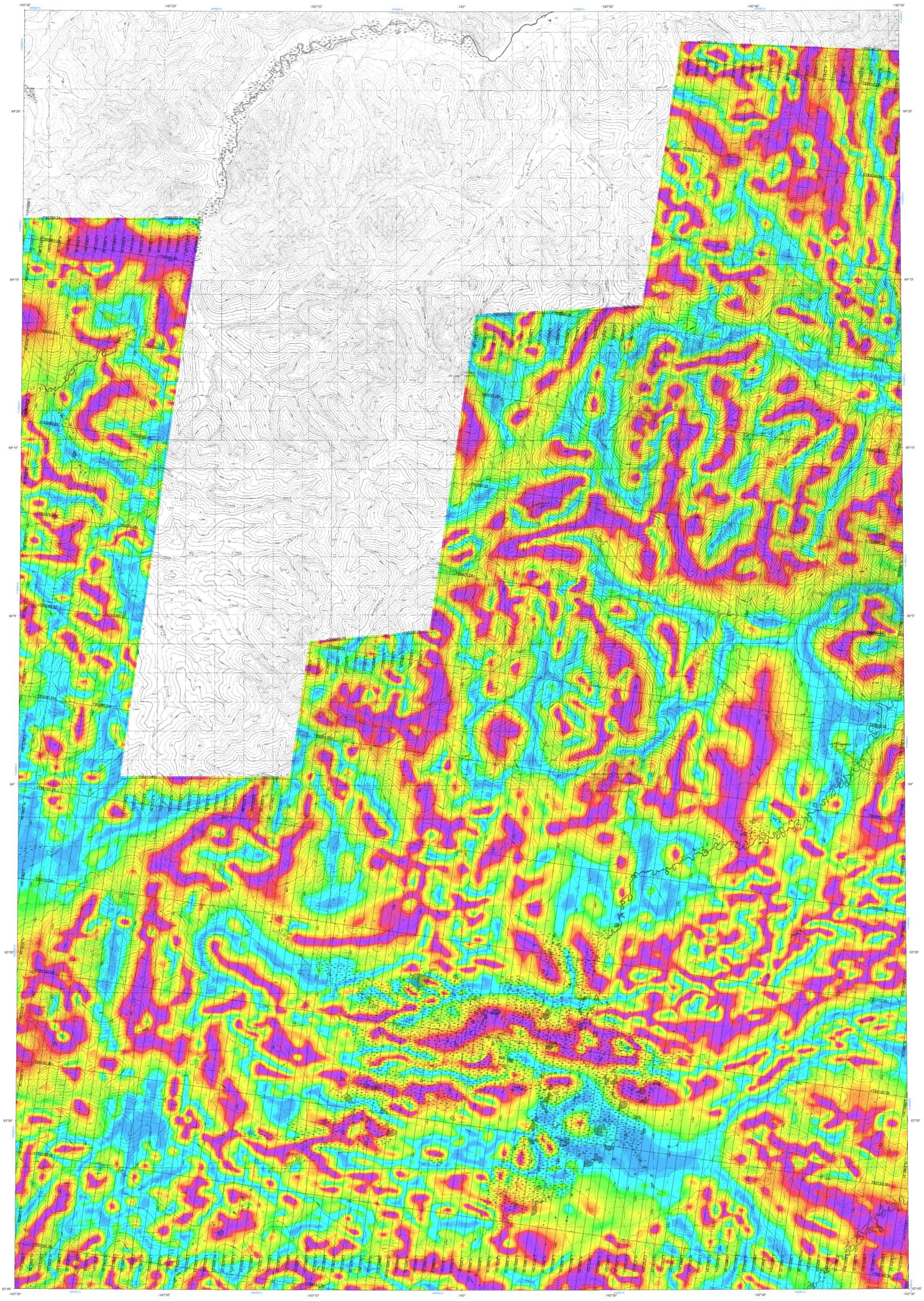
Tilt derivative grid and flightlines with topography; scale 1:63,360; Sheet 2 of 7
Quadrangles: Eagle A-4, A-5, B-4, B-5; Tanacross D-4, D-5



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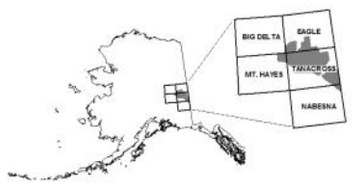
by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

SURVEY LOCATION



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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

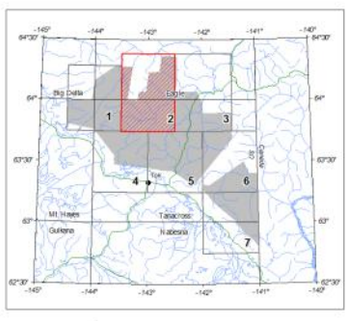
1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

Line Type
Line Number
Flight Number
Line Direction
Fiducial

LOCATION INDEX OF 1:63,360 SCALE MAP



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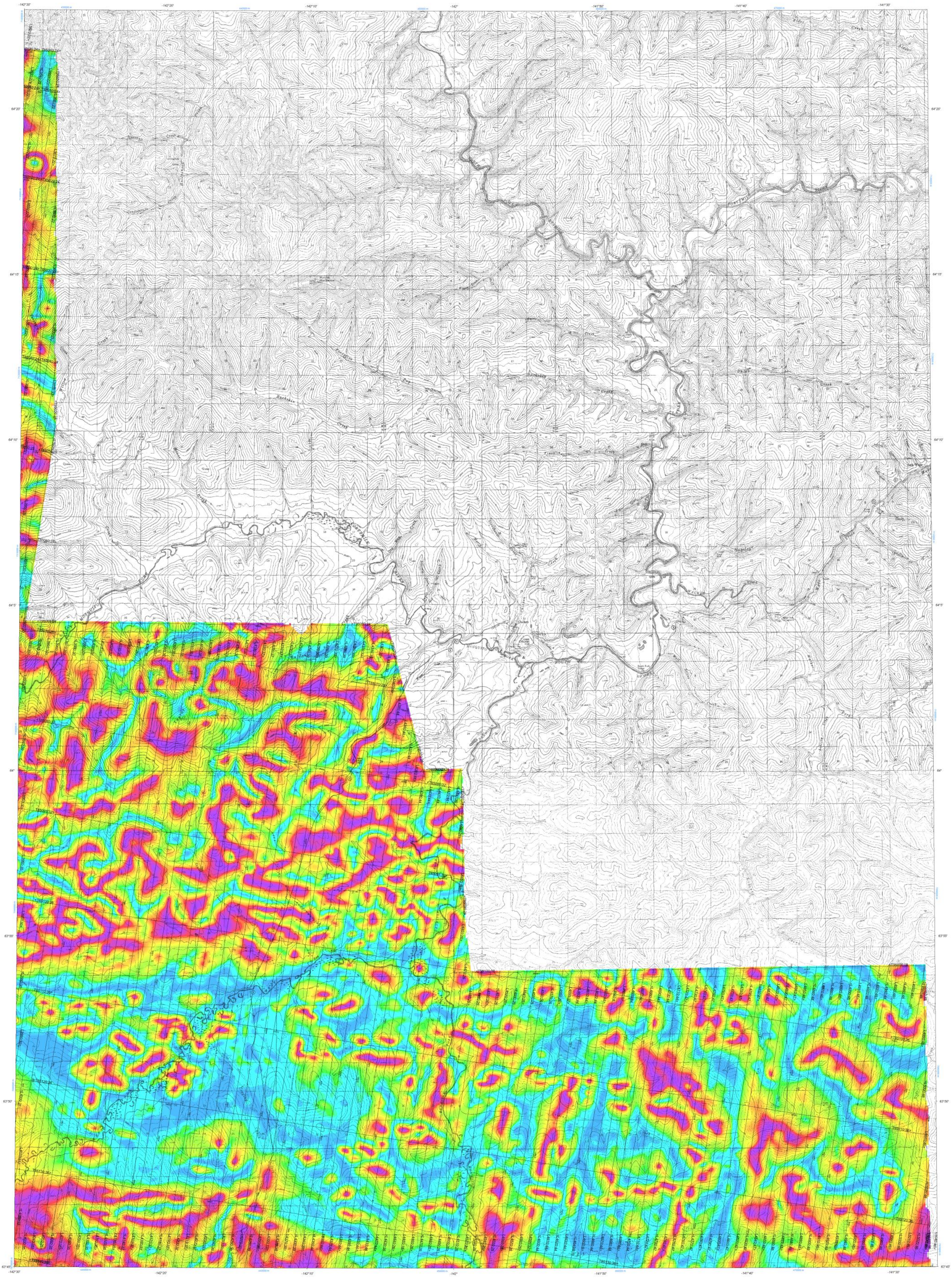
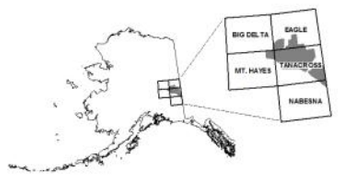
GEOPHYSICAL REPORT 2015-6
Tilt derivative grid and flightlines with topography; scale 1:63,360; Sheet 3 of 7
Quadrangles: Eagle A-1, A-2, A-3, B-1, B-2, B-3; Tanacross D-1, D-2, D-3



SURVEY LOCATION



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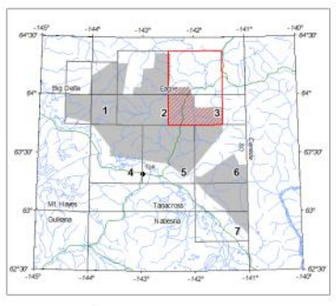
TILT DERIVATIVE GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

LOCATION INDEX OF 1:63,360 SCALE MAP



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SCALE 1 / 63,360

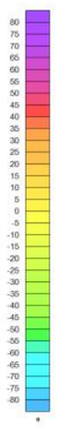
1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

FLIGHT PATH LEGEND

L1600 (24) — Line Type
Line Number
Flight Number
Line Direction
9999 — Fiducial



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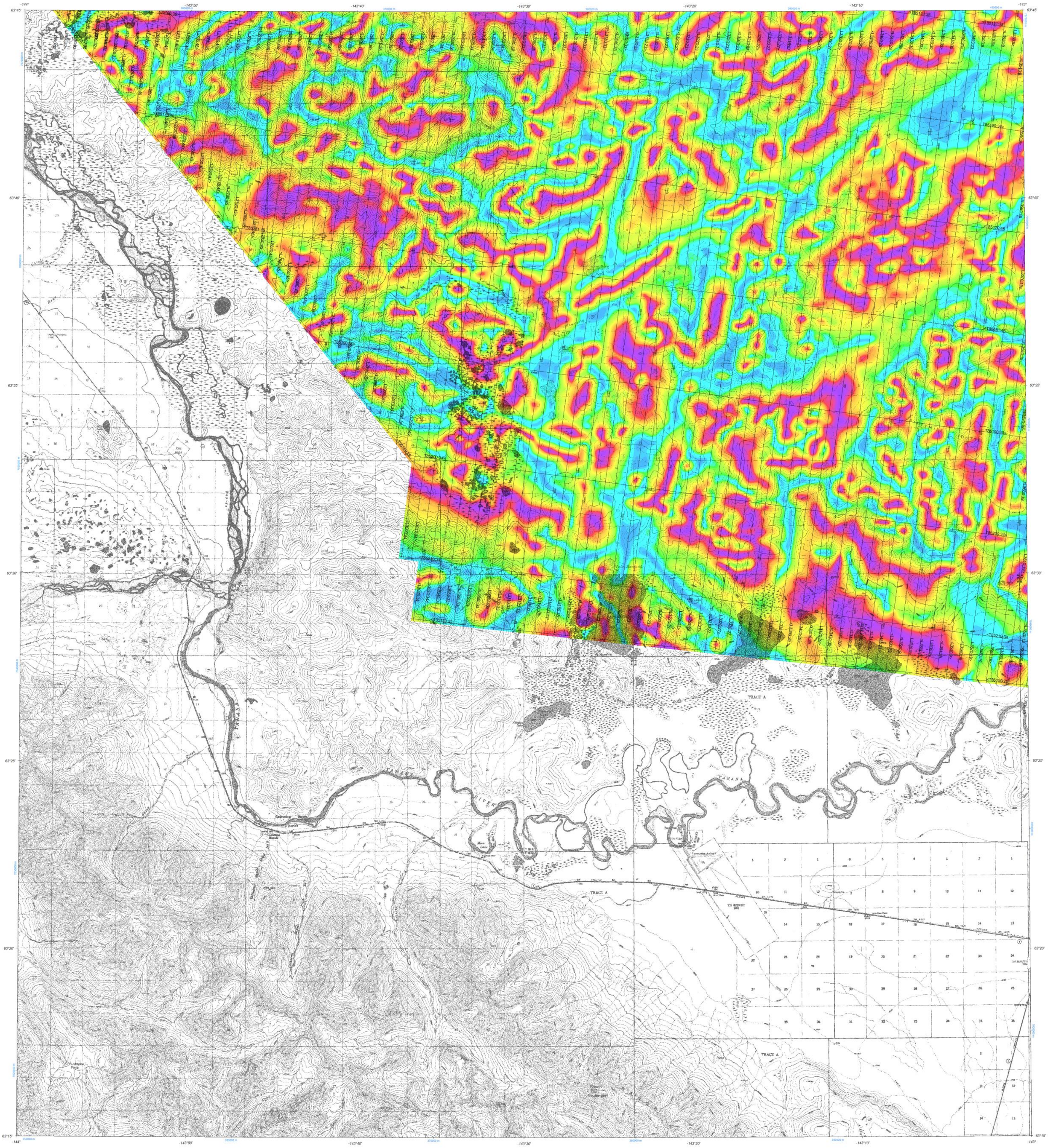
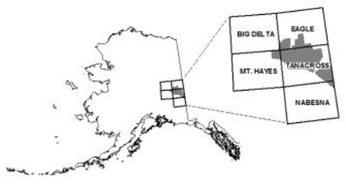
GEOPHYSICAL REPORT 2015-6
Tilt derivative grid and flightlines with topography; scale 1:63,360; Sheet 4 of 7
Quadrangles: Tanacross B-5, B-6, C-5, C-6



SURVEY LOCATION



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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

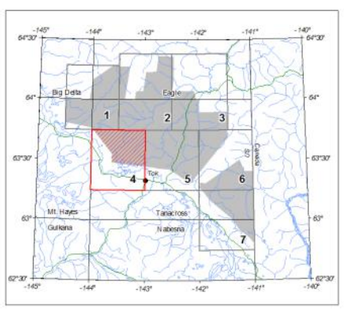
NAD27 Zone 7N

FLIGHT PATH LEGEND

L1000 145 — Line Type, Line Number, Flight Number, Line Direction

60000 — Fiducial

LOCATION INDEX OF 1:63,360 SCALE MAP



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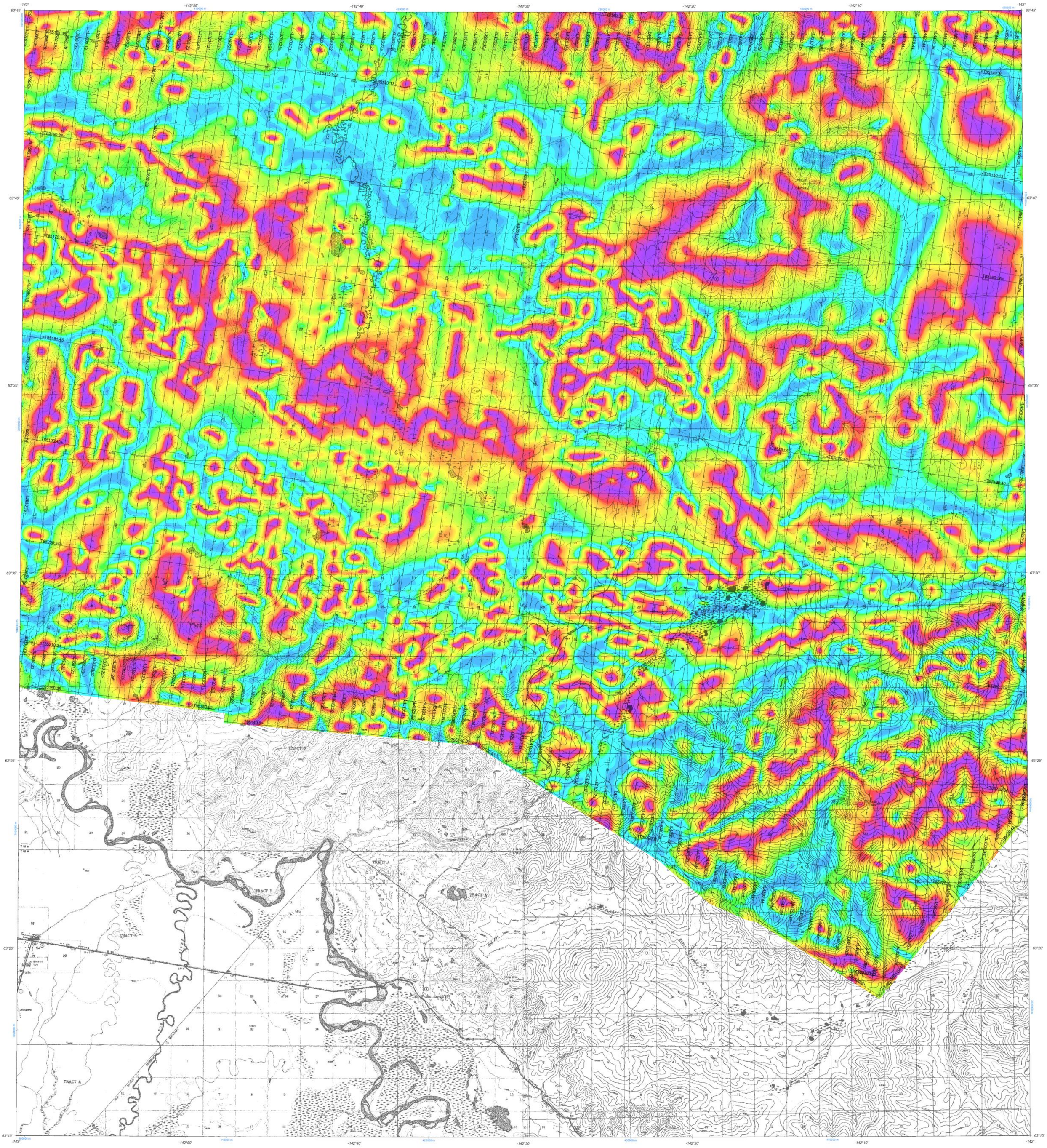
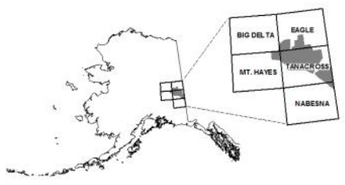
GEOPHYSICAL REPORT 2015-6
Tilt derivative grid and flightlines with topography; scale 1:63,360; Sheet 5 of 7
Quadrangles: Tanacross B-3, B-4, C-3, C-4



SURVEY LOCATION



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SCALE 1 / 63,360

1 0 1 2 3 4 MILES

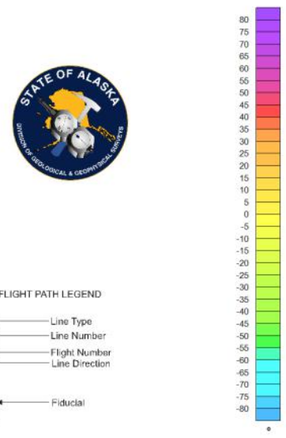
1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N

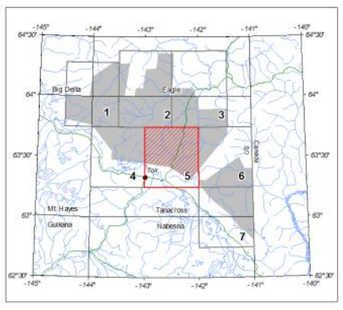
FLIGHT PATH LEGEND

L1000 T67 — Line Type, Line Number, Flight Number, Line Direction

5000 — Fiducial



LOCATION INDEX OF 1:63,360 SCALE MAP



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GEOPHYSICAL REPORT 2015-6
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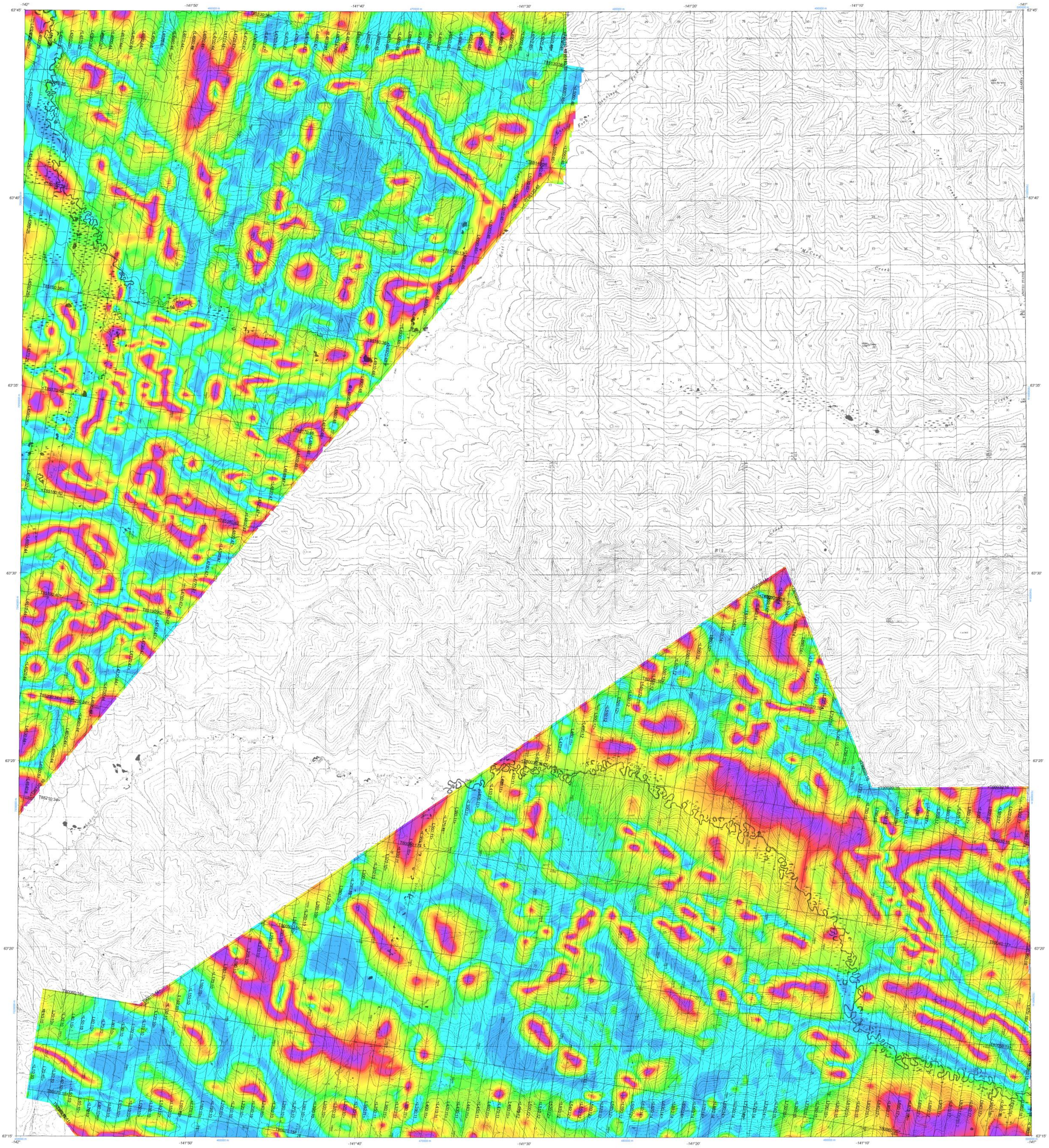

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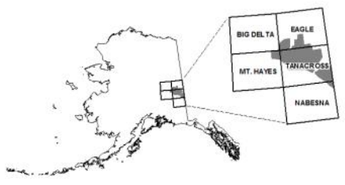
SURVEY LOCATION



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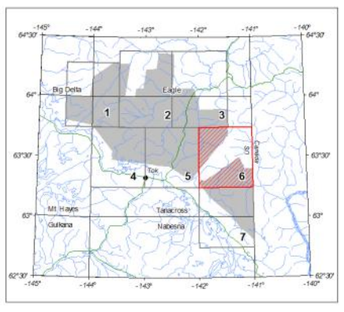

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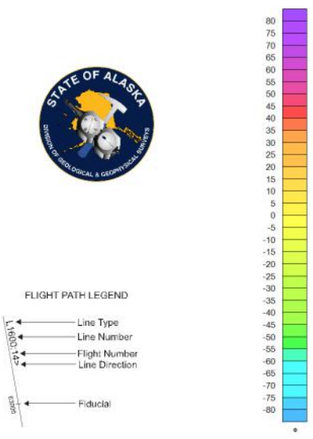
SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N



FLIGHT PATH LEGEND

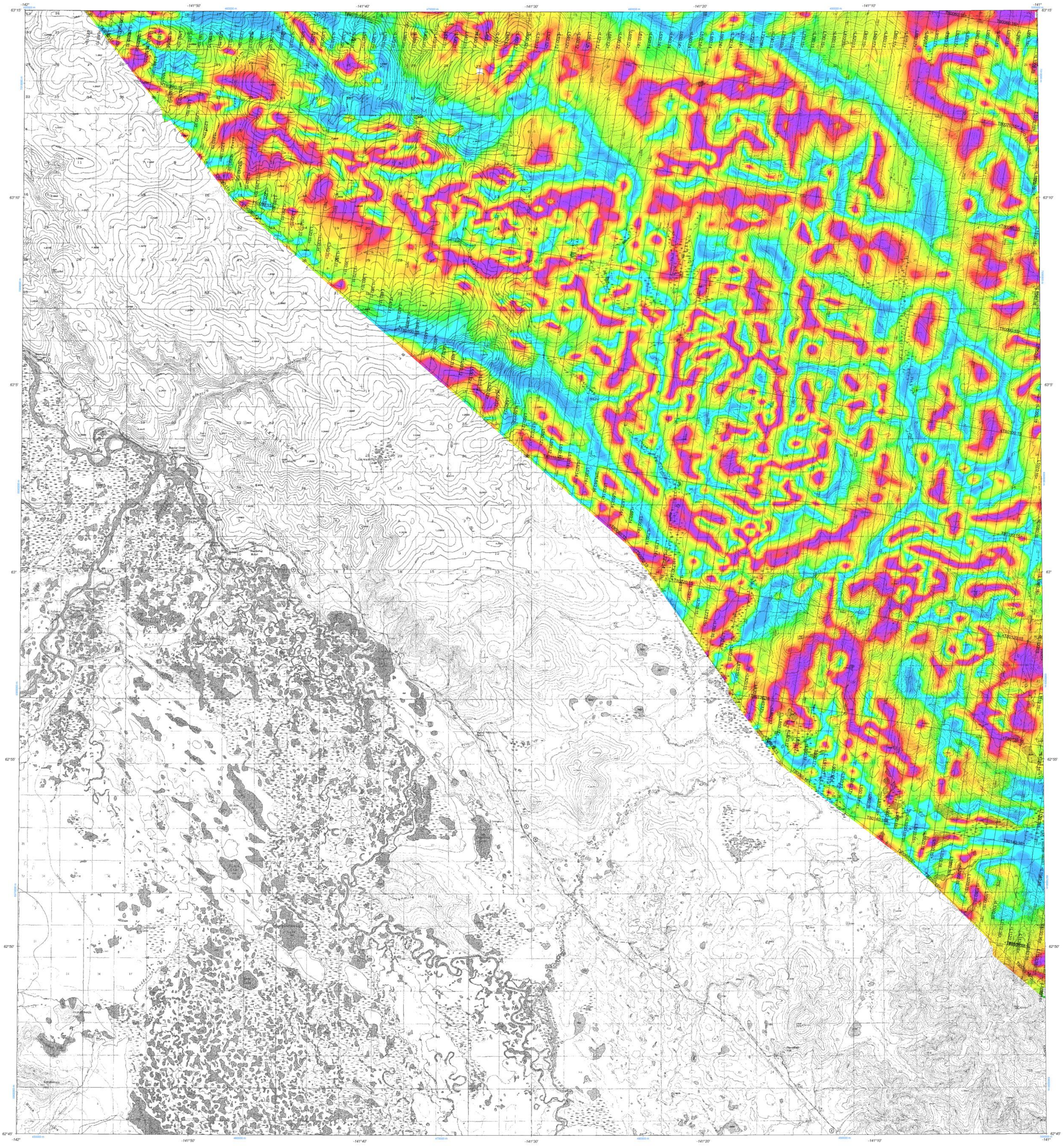
L1000.13 — Line Type
L1000.13 — Line Number
L1000.13 — Flight Number
L1000.13 — Line Direction
5000 — Fiducial

SURVEY HISTORY

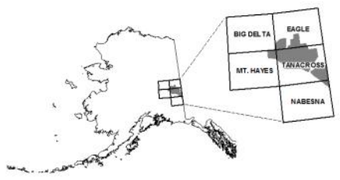
Airborne geophysical data for the area were acquired and processed by Goldak Airborne Surveys under contract with the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS). Project funded by the US Geological Survey, Mineral Resources Program.

All data and maps produced from this survey are downloadable from the DGGS website (http://dggs.alaska.gov). Products are also available in digital format and maps are available on paper from the DGGS office, 3354 College Road, Fairbanks, Alaska, 99709-3307 (phone 907-451-5010; email dggspubs@alaska.gov).

GEOPHYSICAL REPORT 2015-6
Tilt derivative grid and flightlines with topography; scale 1:63,360; Sheet 7 of 7
Quadrangles: Tanacross A-1, A-2; Nabesna D-1, D-2



SURVEY LOCATION

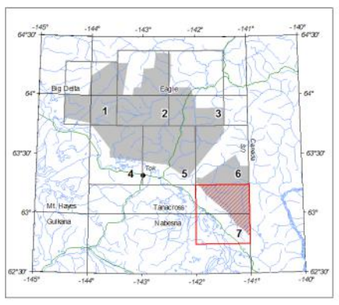


AIRBORNE MAGNETIC GEOPHYSICAL SURVEY OF THE TANACROSS REGION, ALASKA

TILT DERIVATIVE GRID AND FLIGHTLINES

by
A.M. Emond, R.W. Saltus, G.R.C. Graham,
and Goldak Airborne Surveys
2015

LOCATION INDEX OF 1:63,360 SCALE MAP



DESCRIPTIVE NOTES

This map was derived from data acquired during an aeromagnetic survey carried out by Goldak Airborne Surveys from June 17 to July 31, 2015 using a Piper PA-31 Navajo aircraft (registration C-GJBG). The magnetic data were recorded at 10 Hz using three Geometrics cesium vapour magnetometers mounted in the tail boom and wing-tip pods of the aircraft. This array of magnetometers form a horizontal gradiometer with a transverse separation of 14.78 m and longitudinal separation of 9.75 m. GNSS positioning data were recorded at 1 Hz using a Novatel OEMV Propak GNSS receiver. The final flight path was recovered following post-flight differential corrections which improve positioning accuracy to the sub-meter level. Additional on-board equipment included a Thompson CFS 530A radar altimeter, a Setra 270 barometric altimeter and a vertically mounted video camera. Ground based systems included three GEM Systems GSM-19W proton procession magnetometers and a Novatel OEMV GNSS receiver.

The nominal traverse and control line spacings were, respectively, 500 m and 5000 m, and the aircraft flew predetermined flight surface with a target terrain clearance of 100 m and a mean terrain clearance of 290 m. Traverse lines were oriented at N10°E with both orthogonal and boundary control lines.

TILT DERIVATIVE

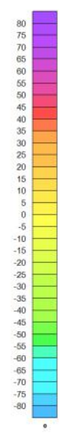
The tilt derivative of the magnetic field is its angle in the vertical direction with respect to the horizontal gradient. Computation of the tilt derivative minimizes variation in anomaly amplitude with respect to the depth to source. The data presented here were calculated by resolving the residual magnetic field grid to horizontal and vertical components by use of frequency domain operators and computing angle between the resulting components.

SCALE 1 / 63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

NAD27 Zone 7N



FLIGHT PATH LEGEND

L1600.142 — Line Type, Line Number, Flight Number, Line Direction

5000 — Fiducial

SURVEY HISTORY

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