

Figure 1: Magnetic residual total field (Threshold > 500).

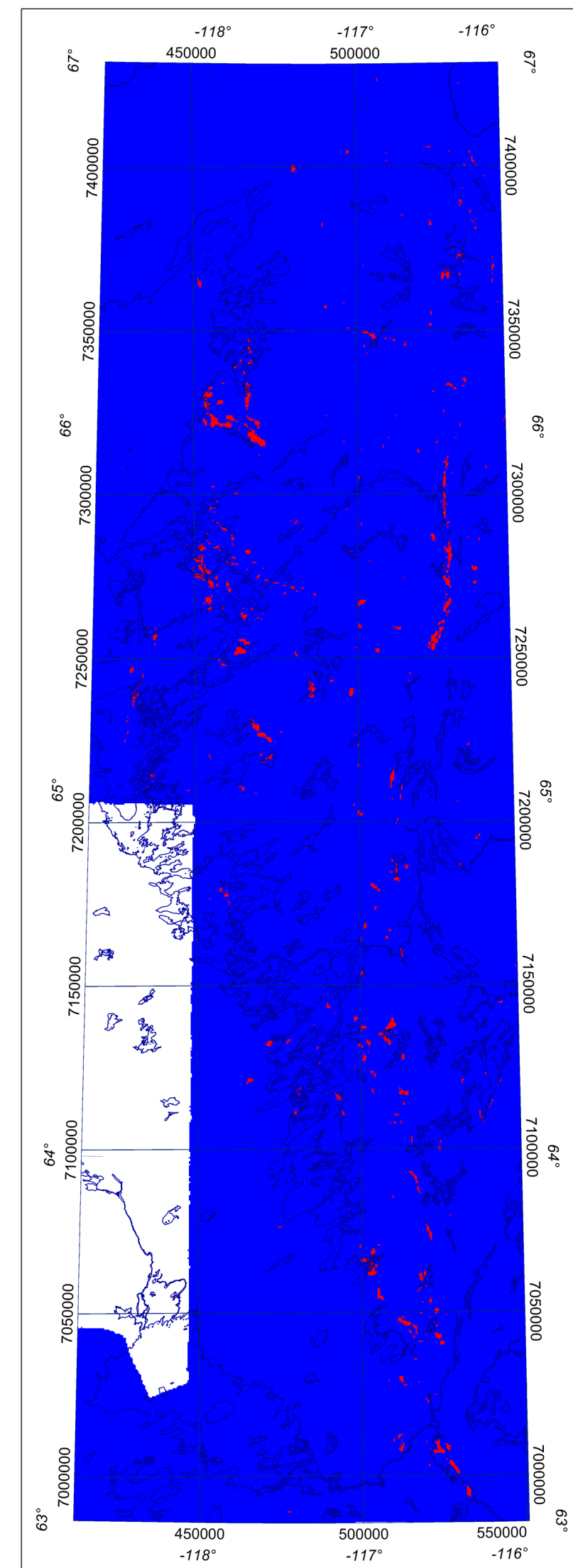


Figure 2: Magnetic vertical derivative (Threshold > 0.3).

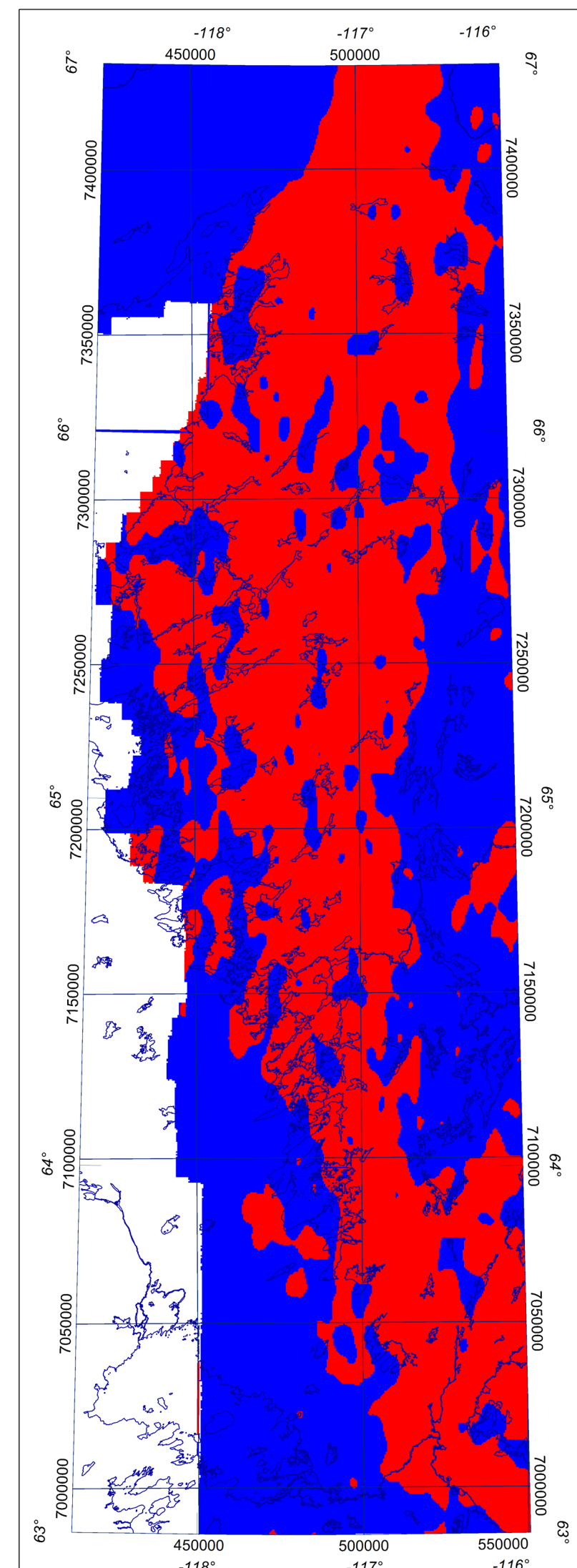


Figure 3: Uranium (Threshold > 1.5).

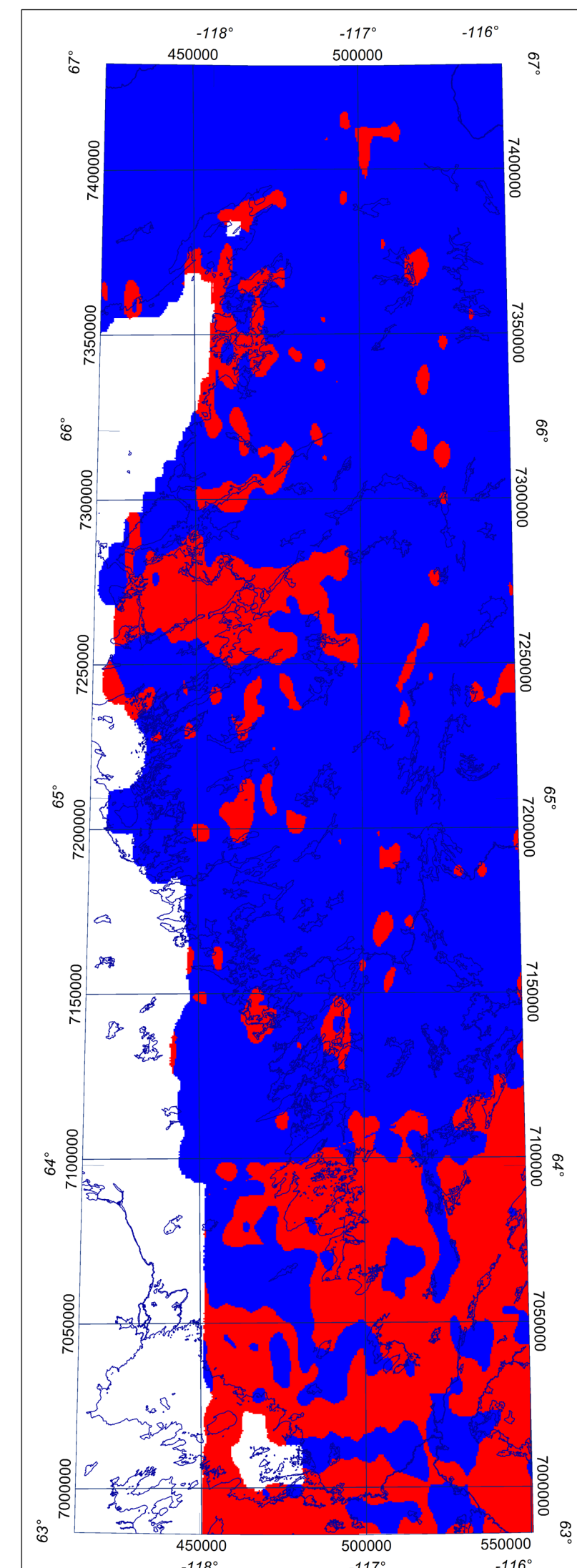


Figure 4: Uranium / Thorium ratio (Threshold < 0.2).

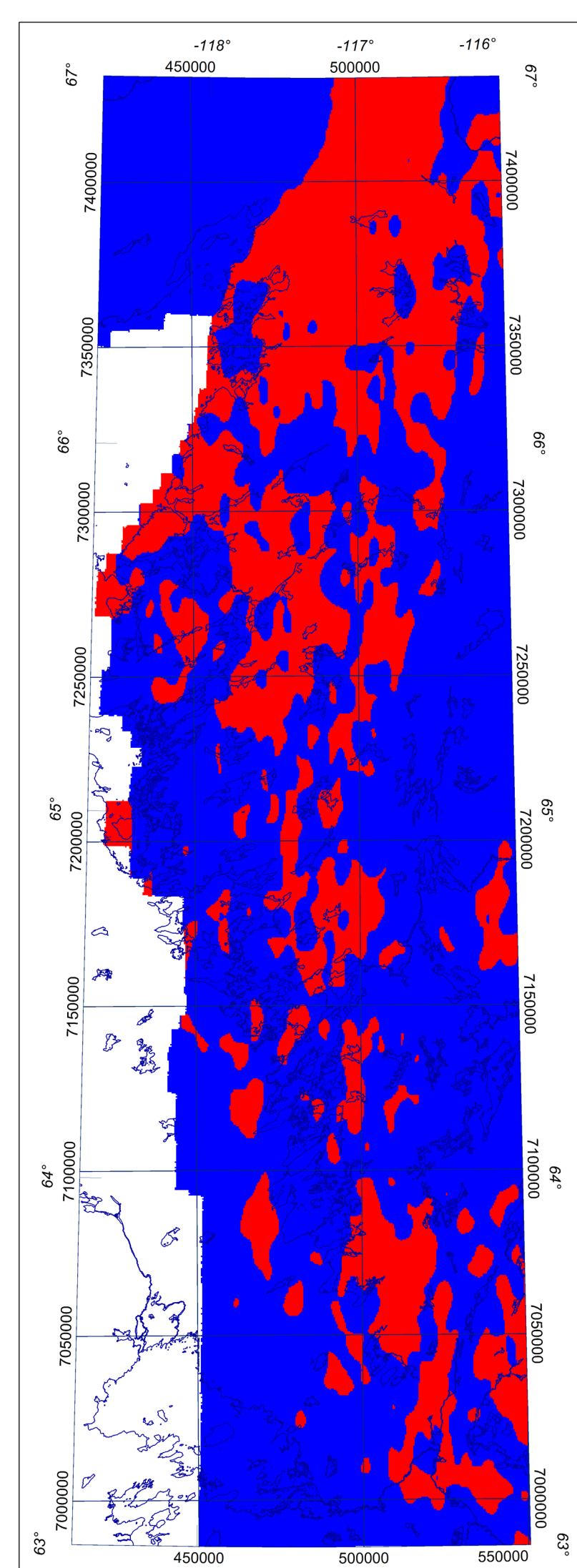


Figure 5: Potassium (Threshold > 2.0).

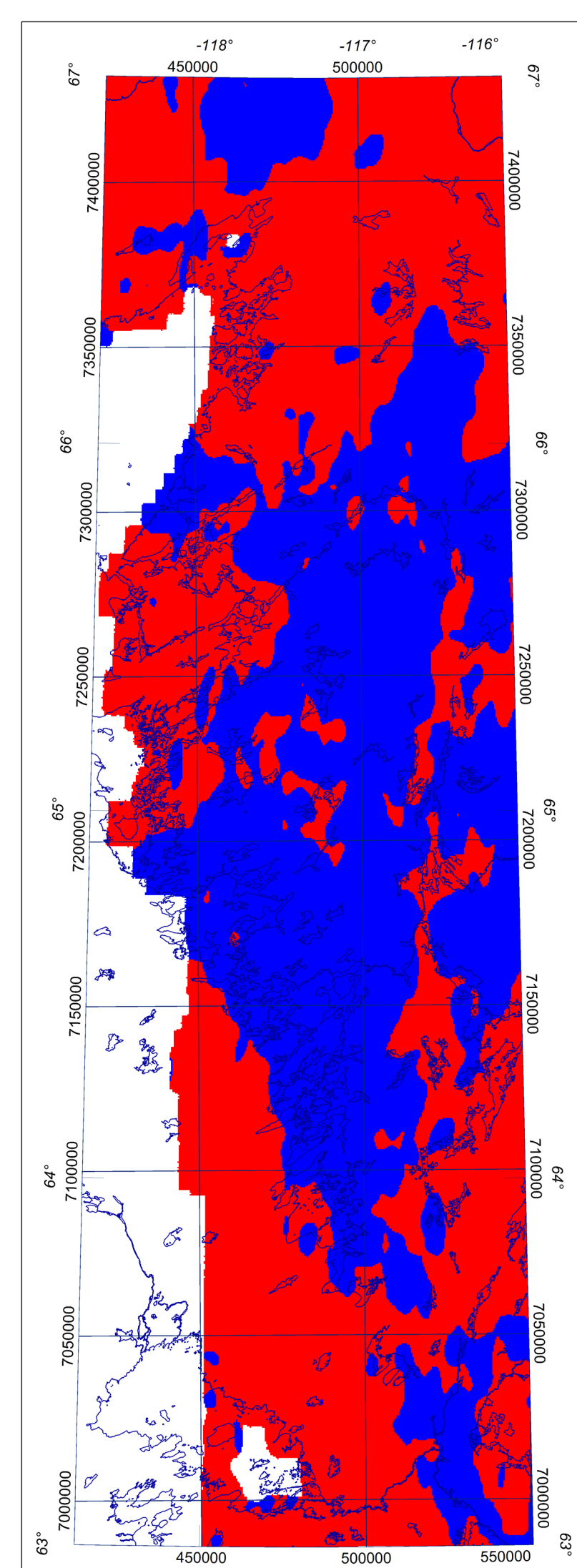


Figure 6: Thorium / Potassium ratio (Threshold < 5.0).

Descriptive Notes

The knowledge-driven, weights of evidence, prospectivity model (e.g., Bonham-Carter et al., 1989) for the Great Bear magmatic zone was generated using the Arc-WeE software (Kemp et al., 1999). Six geophysical vectors were input into the model: Magnetic residual total field, Magnetic vertical derivative, Uranium/Thorium ratio, Potassium, and Thorium/Potassium ratio, as shown prospectively in figures 1 to 6. These geophysical data were extracted from publicly available regional databases (digital data are available from Natural Resources Canada's Geoscience Data Repository at <http://gdg.aggr.nrcan.gc.ca>). No formal training set was used, but thresholds for the individual vectors (Figs. 1 to 6) were largely determined based on values for the Port Radium and NICO occurrences.

The scores (0-6) displayed in the prospectivity map represent the sum of all vectors (Figs. 1 to 6) with values greater than their thresholds. A score of 6 (red) indicates that all six vectors had anomalous values; a score of 0 (dark blue) indicates that none of the vectors were anomalous. The majority of the known iron-oxide copper-gold (IOCG) occurrences in the Great Bear magmatic zone fall in high scoring areas with values of greater than or equal to 4.

Of the sixty-one IOCG occurrences (extracted from the NCRMIN database), sixteen (26.2%) fall within the highly prospective red areas (1590 of 27951 cells). These included all seven of the principal Port Radium zones, six of the nine NICO zones, the Sue Dianne deposit, and two zones in the Grouard Lake area. Ten occurrences (16.4%) fall within the moderately prospective orange zones (8001 cells), including two additional NICO zones, the three NCO zones, the Mile Lake Main Zone, two zones in the Cole Lake area, and zones near Ron Lake and Hump Lake Islands. Twelve occurrences (19.7%) fall within the prospective yellow zones (9562 cells), including the remaining NICO zone (Southern Breccia), the three Contact Lake zones, the Silver Bear Mine (Terra Mine), two additional zones in the Grouard Lake area, an additional zone in the Cole Lake area, the Hump Lake North and Devil's Lake West areas, and the Damp and Fab A-7 properties.

In summary, with respect to known occurrences, thirty-eight or 62.3%, including all Port Radium and NICO zones, fall within just 3.75% of the total area covered by this prospectivity map. There are at least thirty areas with no known occurrences that have a score of 6 on the prospectivity map, which may represent high priority targets for additional exploration. There are at least 96 areas with no known occurrences that score 5, which may also represent valid exploration targets.

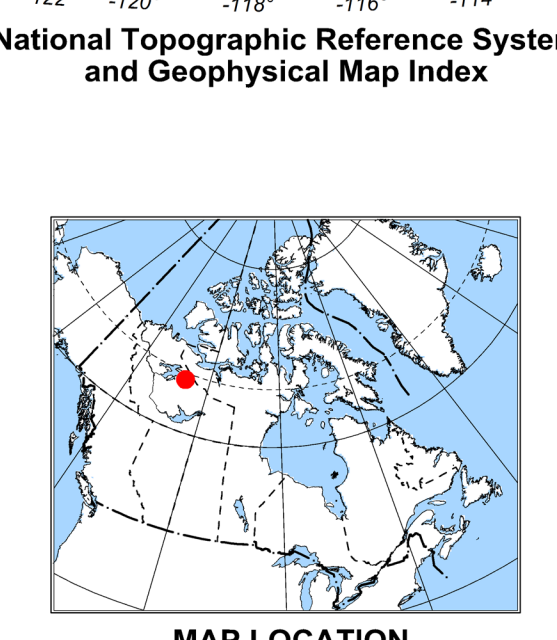
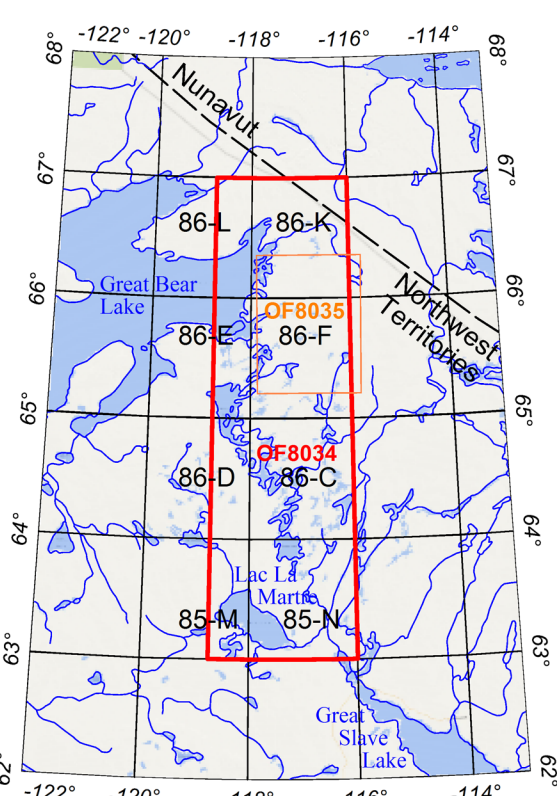
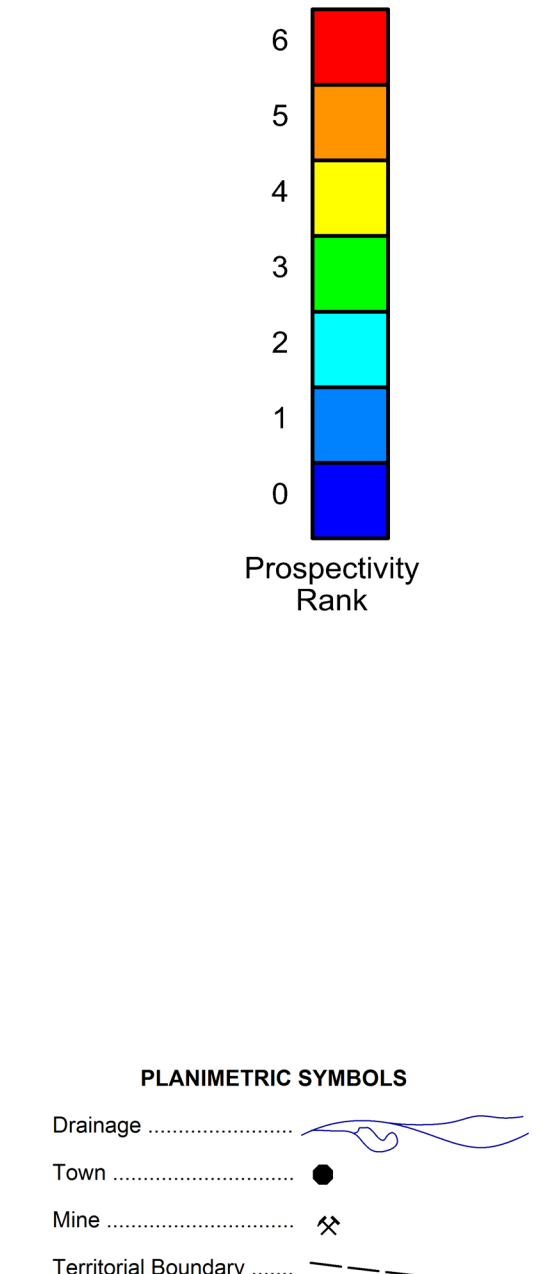
This open file accompanies open file 8035, "Knowledge-driven (KD) Prospectivity Model for IOCG Deposits in the Northern Great Bear Magmatic Zone" and is available for free download through GEOSCAN (<http://geoscan.nrcan.gc.ca>). Alternative prospectivity models for the Great Bear magmatic zone and the vicinity of the NICO deposit can be found in Hayward et al. (2013).

References

Bonham-Carter, G.F., Agterberg, F.P. and Wight, D.F., 1989. Weights of evidence modeling: a new approach to mapping mineral potential. In: Agterberg, F.P., Bonham-Carter, G.F. (Eds.), Statistical Applications in the Earth Sciences. Geological Survey of Canada, Paper 89-2, p. 171-183.

Hayward, N., Erkin, R., Coriveau, L., and Monreuil, J.-F., 2013. The application of semi-quantitative methods for the targeting of IOCG mineralisation in the Great Bear Magmatic Zone, Northwest Territories, Canada, from potential field and physical property data. Journal of Applied Geophysics, 94, 42-58.

Kemp, L.D., Bonham-Carter, G.F. and Raines, G.L., 1999. Arc-WeE: ArcView extension for weights of evidence mapping. <http://www.ige.unimip.it/wee/>



KNOWLEDGE-DRIVEN (KD) PROSPECTIVITY MODEL FOR IOCG DEPOSITS IN THE GREAT BEAR MAGMATIC ZONE

OPEN FILE DOSSIER PUBLIC 8034

2016

KNOWLEDGE-DRIVEN (KD) PROSPECTIVITY MODEL FOR IOCG DEPOSITS IN THE GREAT BEAR MAGMATIC ZONE

Northwest Territories and Nunavut
NTS 85-N and 86-C, F and K, and parts of NTS 85-M and 86-D, E and L

Scale 1:500 000

Universal Transverse Mercator, zone 11, North American Datum 1983

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Base map at the scale of 1:250 000 from Natural Resources Canada, with modifications

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