NEW LAKE-BOTTOM SEDIMENT GEOCHEMISTRY DATA IN THE CÔTE-NORD REGION

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Introduction

The Ministère des Ressources naturelles et de la Faune du Québec (MRNF), in collaboration with the Corporation de promotion du développement minéral de la Côte-Nord (CPDM), announces the publication of new lake-bottom sediment geochemistry data in the Côte-Nord region.

These new data include a regional survey conducted in the Haute-Côte-Nord area (Forestville), as well as 11 detailed surveys targeting gold anomalies scattered throughout the Côte-Nord region (Figure 1).

This project was conducted within the scope of the specific agreement on the development of regional expertise in the acquisition of secondary environment geochemistry data and on the promotion and development of the mineral industry in the Côte-Nord region. This three-year agreement was executed in April 2008 by the CPDM, MRNF, Ministère du Développement économique, de l'Innovation et de l'Exportation (MDEIE), Ministère de l'Emploi et de la Solidarité sociale (MESS), Ministère des Affaires municipales et des Régions (MAMR), the regional conference of elected officials (CRÉ) of the Côte-Nord region, Hydro-Québec, and the regional ACCORD committee.

Methodology

The regional survey in the Haute-Côte-Nord area (No. 12, Figure 1) covers a surface area of about 5,900 km^2 and has a sampling density of about 1 sample per 13 km^2. A total of 460 samples were collected. The 11 detailed surveys were conducted in 2008 (No. 1, Figure 1) and 2009 (Nos. 2 to 11, Figure 1) over gold anomalies that were initially defined based on new data acquired since 2003. These detailed surveys have a sampling density of about 1 sample per 1 or 2 km^2, depending on the density of lakes in the area. A total of 1,832 samples were collected in these 11 study areas that correspond to gold anomalies associated with at least one other anomalous element, among which arsenic.

Sampling for the regional survey and two of the detailed surveys (Nos. 3 and 7, Figure 1) was conducted from August 17, 2009 to September 4, 2009 by IOS Services Géoscientifiques. The remaining detailed surveys were conducted from mid-September to mid-October by a field crew from the CPDM. Samples were analyzed at AcmeLabs facilities in Vancouver. Concentrations for 53 chemical elements were determined by inductively coupled plasma mass spectrometry (ICP-MS) following aqua regia digestion. These data are now available in SIGÉOM, at the following address: http://sigeom.mrnf.gouv.qc.ca/signet/classes/I1102_indexAccueil?l=a, under the tab "Geochemistry – Sediment sample".

A few geochemistry maps are illustrated in this document. These maps were produced with MapInfo (version 10.0) using the inverse distance interpolation method, based on a cell size of 250 m × 250 m and a search radius of 6 km. The maps were built using percentile ranges from 0 to 80, 80 to 90, 90 to 95, 95 to 98, 98 to 99, and 99 to 100.

Problems With Gold

The detailed sampling program raised very serious doubts about the gold results from previous regional surveys. Thus, in 10 of the 11 areas surveyed in detail, previously identified gold anomalies could not be reproduced with new modern ICP-MS analyses. The area located north of Baie-Johan-Beetz in the Wakeham Group (No. 7, Figure 1) is a particularly striking example. This area was selected due to the presence of two linear gold anomalies in a very prospective geological setting. An east-west traverse was sampled in detail in order to further define the anomaly. The vast majority of samples collected in this area show very weak gold values (less than 1.5 ppb) and the expected anomaly

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could not be reproduced. The same holds true in 9 other areas surveyed in detail. Thus, it appears quite likely that regional gold anomalies, in certain cases, may be the result of sample contamination. These new detailed surveys raise important concerns on the regional data for gold in lake-bottom sediments of the Côte-Nord region. We now believe it may be preferable not to rely on these regional data as far as gold is concerned. Further studies may help determine the exact source of this problem. However, for all other chemical elements, the new data are consistent with previous regional data and the latter may thus be considered reliable.

Area Southwest of Schefferville

Nevertheless, one of the 11 areas studied in detail did yield interesting results. The detailed survey conducted southwest of Schefferville (No. 2, figures 1 and 3) confirmed a gold and arsenic anomaly initially defined based on the results of reanalyses conducted in 2006 (CLD de Caniapiscau). This anomaly was also outlined last year when samples in this region were reanalyzed (Maurice and Labbé, 2009). Several gold showings are known to the north of this area in high-grade metamorphic rocks (Clark and Wares, 2006), associated with iron formations, metabasites and graphitic paragneisses. Also, the results of the detailed survey indicate that arsenic shows a good correlation with gold. This area appears to be a very interesting target for gold.

Haute-Côte-Nord Area

Several geochemistry maps were generated for the area covered by the Haute-Côte-Nord regional survey, and two elements show very clearly defined anomalies, namely molybdenum (Figure 4) and uranium (Figure 5). In fact, certain molybdenum and uranium anomalies appear to overlap, which suggests the two elements may be locally associated. Most of these anomalies are located in areas underlain by paragneisses and migmatites.

References

CLARK, T. – WARES, R., 2006 – Lithotectonic and Metallogenic Synthesis of the New Québec Orogen (Labrador Trough). Ministère des Ressources naturelles et de la Faune, Québec; MM 2005-01, 175 pages.

MAURICE, C. – LABBÉ, J.-Y., 2009 – Reanalysis of Lake-Bottom Sediments in Northeastern Québec (Ashuanipi Subprovince, New Québec Orogen, Southeast Churchill Province). Ministère des Ressources naturelles et de la Faune, Québec; PRO 2009-10, 8 pages.

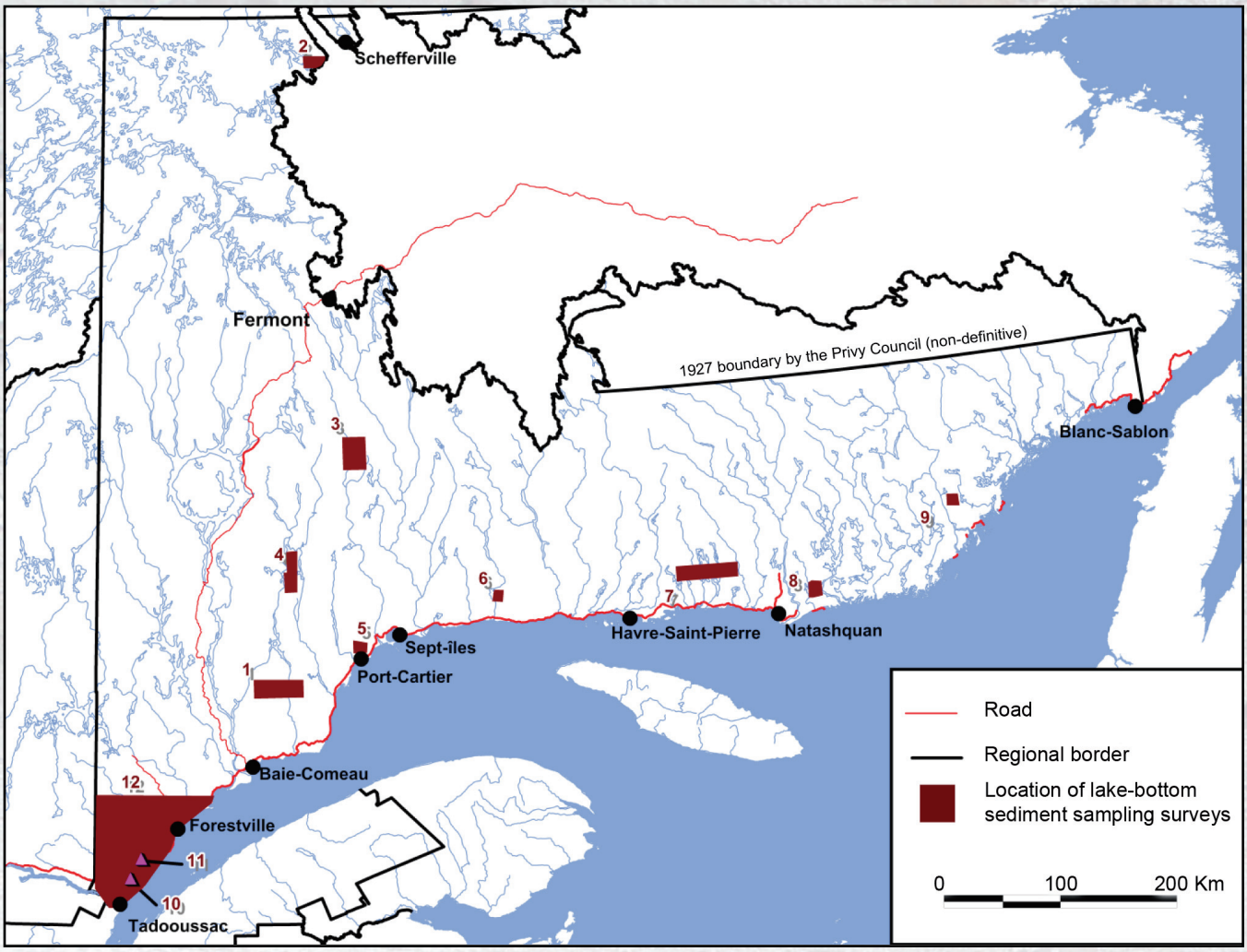

Figure 1 – Location map of geochemistry surveys.

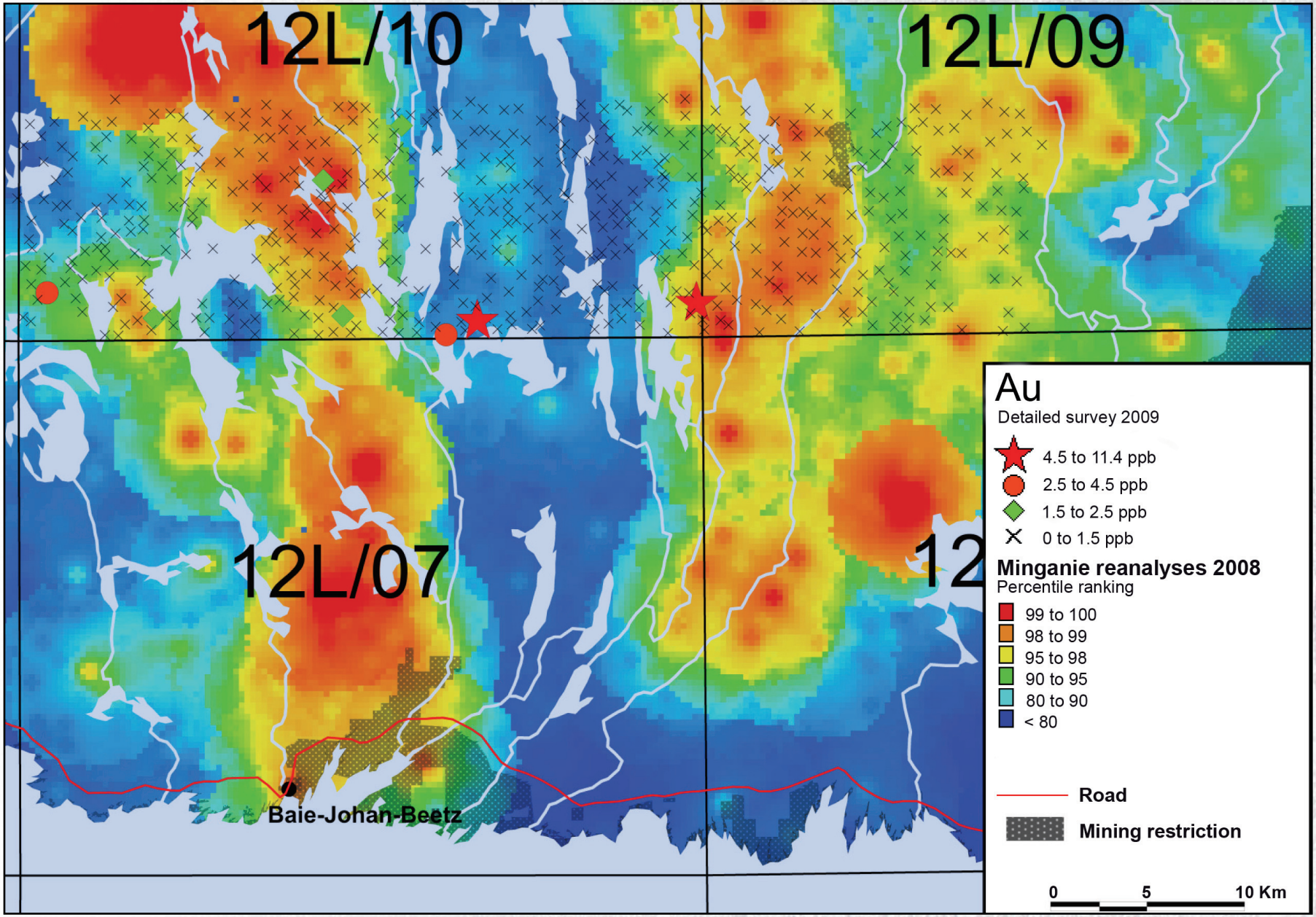

Figure 2 – Map showing gold values from the 2009 detailed survey overlain on the map showing the regional gold anomaly in the area north of Baie-Johan-Beetz. Symbols used to depict gold values in the detailed survey were selected arbitrarily, based on grades deemed significant for the entire regional dataset for the Côte-Nord region.

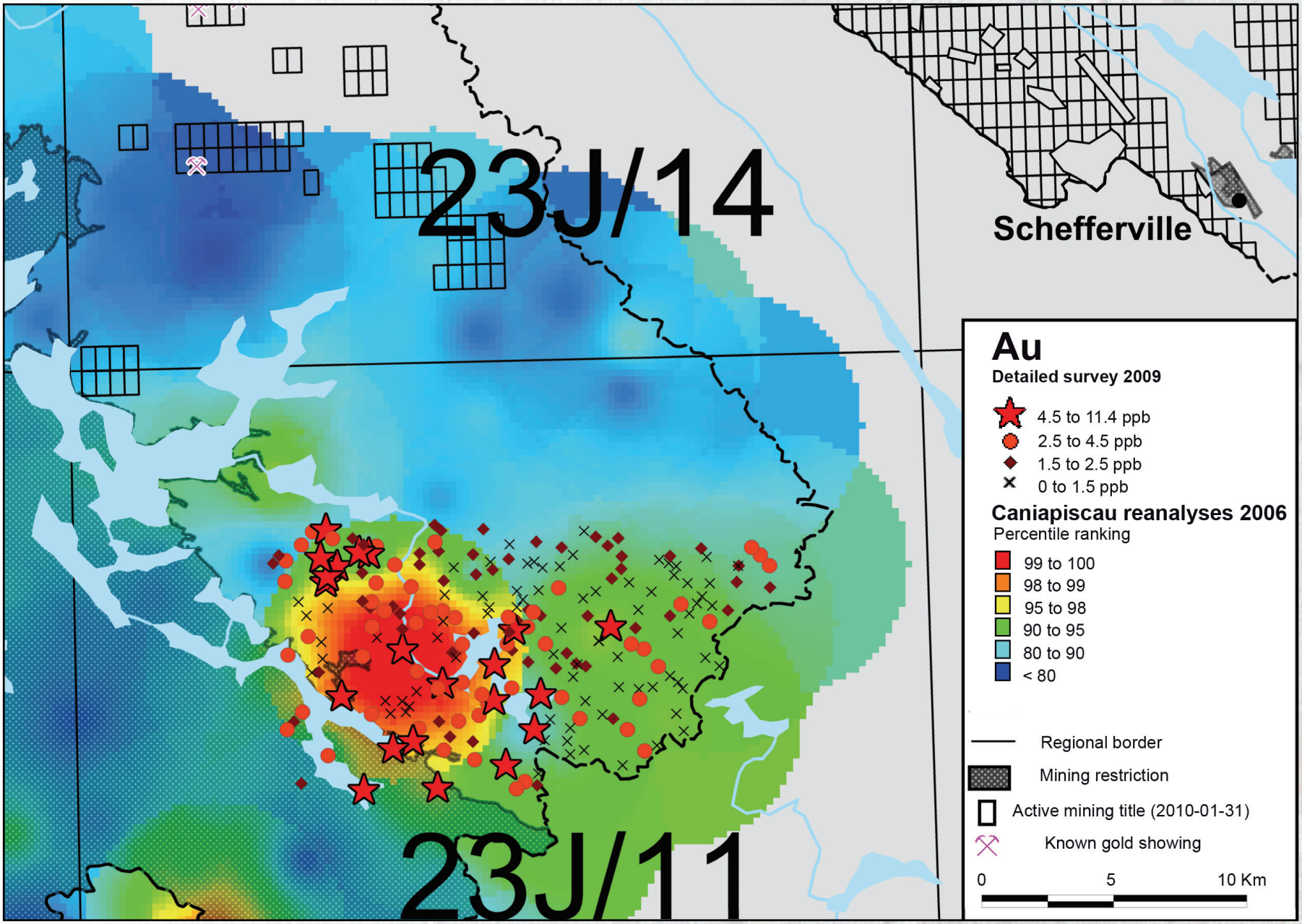

Figure 3 – Map showing gold values from the 2009 detailed survey, overlain on the map showing the regional gold anomaly in the area southwest of Schefferville. Symbols used to depict gold values in the detailed survey were selected arbitrarily, based on grades deemed significant for the entire regional dataset for the Côte-Nord region.

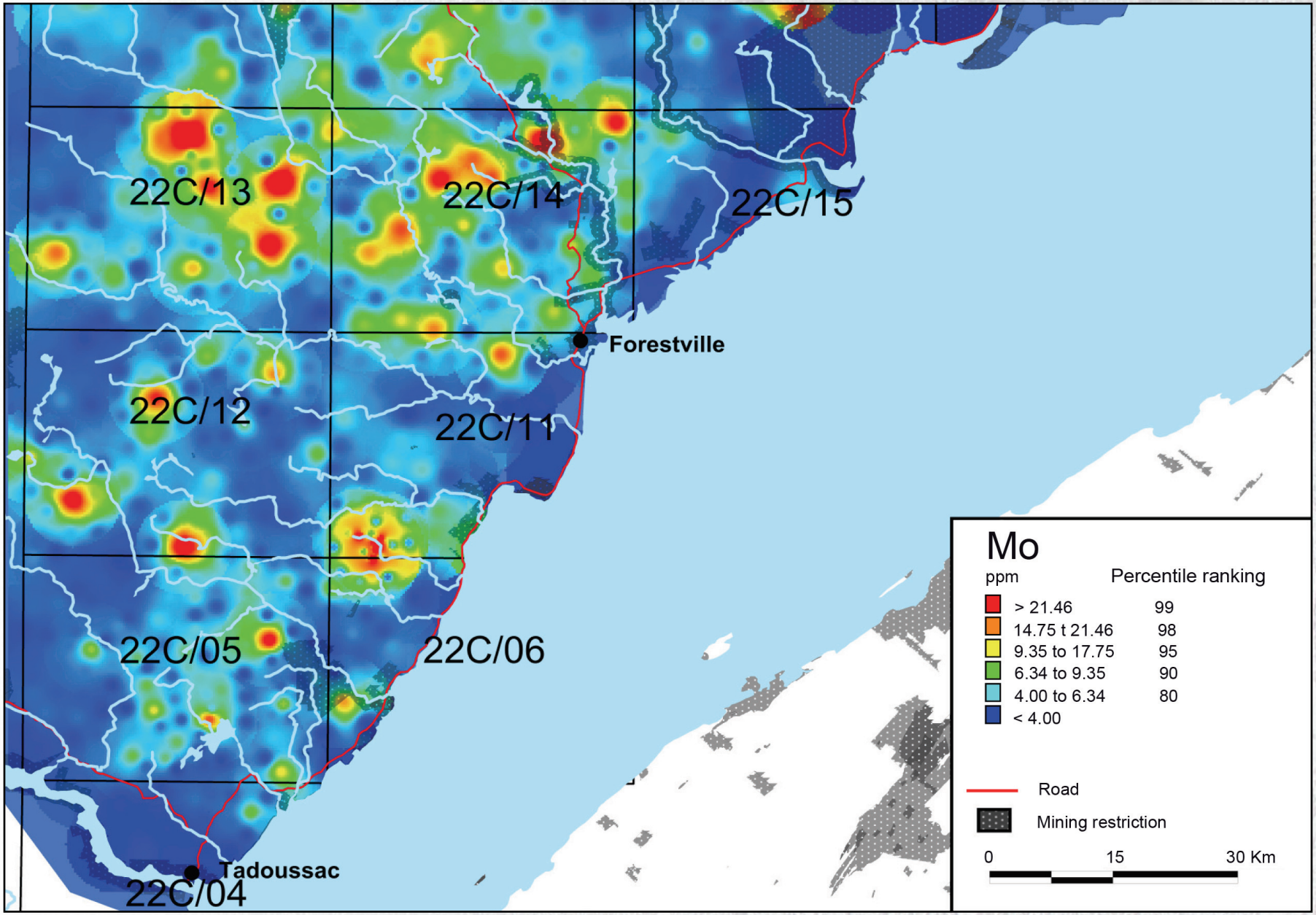

Figure 4 - Map showing molybdenum anomalies in the Haute-Côte-Nord area. Percentile rankings were calculated based on the entire dataset for the Côte-Nord region.

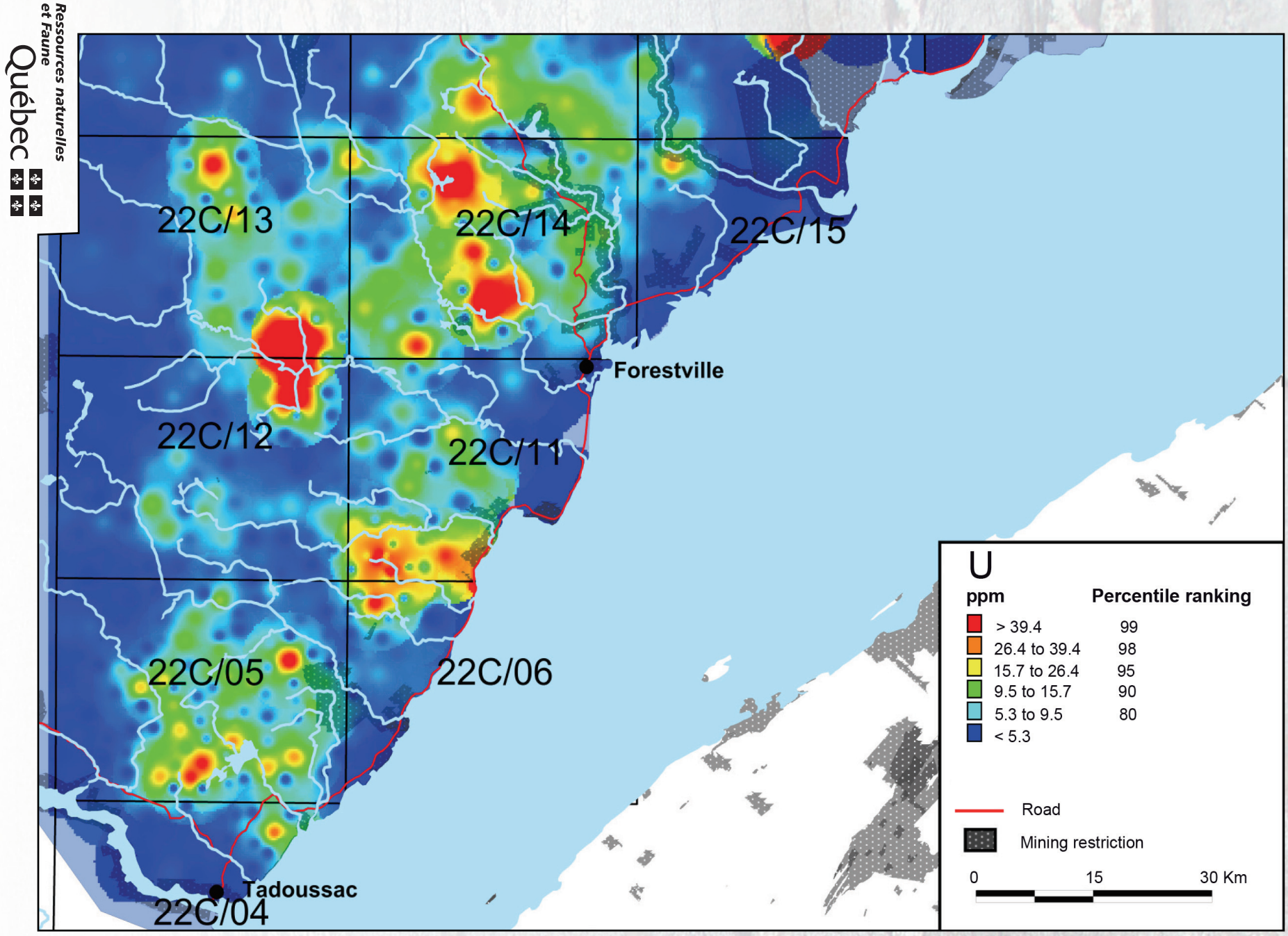

Figure 5 - Map showing uranium anomalies in the Haute-Côte-Nord area. Percentile rankings were calculated based on the entire dataset for the Côte-Nord region.