

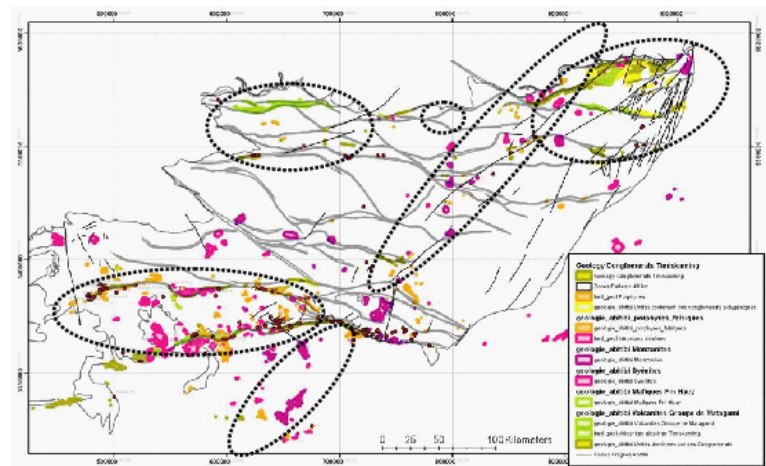
## Project 2006-6: Geological controls on orogenic gold mineralisation in the Abitibi Subprovince – phase 1

The project addressed the fertility of deformation corridors for orogenic gold mineralisation in the Abitibi. The main objective was to assess the existence of known deformation corridors with so far undervalued gold potential. The study excluded the major Cadillac-Larder Lake, Destor-Porcupine and Casa-Berardi corridors.

The Abitibi deformation corridors were first divided into 40 to 80 km long segments. A variety of criteria were used to identify the deformation corridor segments of a crustal scale favourable to the presence of orogenic gold. Lithological, geochemical and structural indicators of deformation corridors in the Abitibi were compiled and compared to the known gold fertility of the corridors (the number of gold occurrences and tonnes of gold produced and known). Statistical associations were identified between the various indicators and gold fertility. The indicators were then used to identify new favourable areas.

The geological information used was taken from SIGÉOM and a litho-geochemical database belonging to the members of CONSOREM. It was used to characterise the alteration indicators in the segments. The typology of the different corridors as established through previous work was also considered.

Statistical analysis of the association between the abundance of lithologies and gold fertility shows that the presence of ultramafic volcanic rocks is the best lithological criterion associated with the fertility of a segment. The abundance of conglomerates and intermediate to felsic porphyry intrusions are also fairly well correlated with the presence of gold. On the scale of regional alterations, a clear association was noted between gold and the presence of anomalies in the values of the 90<sup>th</sup> percentile of the NORMAT IAB index and the carbonate saturation index ( $CO_2/(CaO+MgO+FeO+MnO)$ ). A significant association was also found between the typology of the deformation corridor and gold fertility; the best mineralized segments generally mark the boundaries of the different terrains.



*Identification of deformation corridor segments favorable for gold mineralisation, based on integration of multisource data (on the Abitibi map: favourable lithologies).*

A multiple linear regression was carried out between the known tonnage of gold in each segment and best lithological and geochemical indicators. The most negative residual values help identify the different segments whose lithological and geochemical characteristics are similar to the known segments, but whose known gold tonnage is low. Two areas stand out in particular in this respect, the area of the Parfouru-North and South Fault, north-east of Rouyn-Noranda, and the area located north-west of Chibougamau. In addition, a large NE trending corridor including late faults such as Lamarck seems to exert a significant control on gold mineralisation in the Abitibi.

### Summary: Project 2006-6

<b>Objectives</b>	<ul style="list-style-type: none"> <li>• To recognise deformation corridors in the Abitibi, other than those already known (i.e.: Cadillac, Porcupine, Casa Berardi), that show identified characteristics of deformation corridors on a crustal scale that are favourable for late gold mineralisation.</li> </ul>
<b>Results</b>	<ul style="list-style-type: none"> <li>• Database by deformation corridor segments;</li> <li>• Value of gold tonnage calculated for each segment;</li> <li>• Excellent statistical association between the selected fertility criteria and known gold mineralisations (showings and tonnage of known gold) ;</li> <li>• Identification of 10 new favourable segments showing positive characteristics, but with few known mineralisations and deserving of further investigation;</li> <li>• Identification of a NE trans-Abitibi gold corridor.</li> </ul>
<b>Innovations</b>	<ul style="list-style-type: none"> <li>• New map of deformation corridors in the Abitibi with a calculation of the gold tonnage for each segment ;</li> <li>• New method for assessing the fertility of the deformation corridors in the Abitibi using multiple linear regression analysis.</li> </ul>