Abstract # 33
Category: *Technical developments in exploration*

Title: *Predictive Modelling that Works: Big Data Analytics applied to Country-Scale Exploration*

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Abstract: For the past 15 years, Azimut's core strategy has been a proprietary methodology that uses Big Data analytics to identify major mineral targets. Proper processing of large geoscientific databases constitutes a breakthrough to significantly improving success rates in mineral exploration. Azimut's methodology – AZtechMine – has been put into practice under 30 partnership agreements in Quebec (Canada), including 10 with major companies (Rio Tinto, Goldcorp, IAMGOLD, Hecla Mining and SOQUEM).

Processing Concepts
AZtechMine links mineral databases to numerical geoscientific parameters (geochemistry, magnetism, gravity, radioactivity, etc.) acquired at the regional and country scales to identify new targets with high discovery probabilities. The methodology is not limited to any specific geographic area and can be applied wherever the right database exists. The highlights are as follows:

- AZtechMine is based on the assumption that large near-surface deposits generate very distinct and statistically recognizable multiparameter footprints.

- An innovative statistical approach extracts the footprints per selected mineral deposit type or commodity. Results are then ranked according to relative discovery probability.

- The result is precise mappable areas presenting the footprints of already known deposits and, in addition, poorly explored areas showing comparable footprints. The latter represent potentially valuable new targets.

- Compared to other predictive approaches (weight of evidence, fuzzy logic, machine learning, etc.), AZtechMine is a purely data-driven white box expert system that relies exclusively on measured numerical data collected on regular grids, without any weighting or interpretative bias.

Practical Achievements
Azimut has conducted 22 predictive modelling programs at the regional and province scale for specific commodities (gold, copper, nickel, uranium, etc.) resulting in strategic positions in key areas and the discovery of more than 400 new prospects.
The extensive track-record of field validations include the following:

- Munischiwan (James Bay region): Recent discovery of the Maschakw gold-copper-silver zone;

- Eleonore South JV (James Bay region): Discovery of the Moni Trend (including 79.5 g/t Au over 5.8 m) and the Contact Trend (including 3.0 g/t Au over 77.3 m);

- Rex Trend (Nunavik region): Recognition of a new 330-km-long gold-polymetallic mineral province, including five IOCG systems and a large intrusion-hosted Cu-Au-W-Sn mineralized system;

- Ungava Bay Uranium (Nunavik region): Recognition of a new uranium province, including 12 mineralized zones over 17 km with grades from 0.05% to 3.3% U3O8.

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