

# Using the East Yilgarn Geoscience Database in exploration targeting

by

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The East Yilgarn Geoscience Database (EYGD) is the culmination of more than 100 person-years of mapping and interpretation in 150 000 km<sup>2</sup> of the Eastern Goldfields region, the richest gold and nickel metallogenic province in Australia. As an enormous seamless coverage, this geographic information system (GIS) comprises spatially precise geological, structural, mineralization, tenement, aeromagnetic, and cadastral information for fifty-seven 1:100 000 map sheets (Fig. 1). It thus provides a cornerstone for mineral exploration targeting in the region.

In detail, the EYGD comprises information coverages as follows:

- geological mapping of observed rock types, with definitions of lithological subdivisions, and lithostratigraphic and structural relationships. Field data points provide records of measured structural orientations;
- interpreted geology — extent, distribution, and structural relationships in the bedrock beneath the regolith cover that obscures 90% of the region;
- mineralization information from the MINEDEX and WAMIN databases, which represent operating or developing mines and mineral occurrences, respectively;
- tenements — incorporating tenement identifiers, type, status, extent, and location;
- aeromagnetic data, comprising the best available free raster data and vector interpretation;
- Landsat imagery, either as decorrelation stretch or principal component images; and,
- cadastral information, such as roads, tracks, bores, wells, and topographic features.

The wealth of data in the EYGD allows conceptual exploration targeting, at regional or local scales, using the best available information on rock types, their orientation, structural characteristics, and existing mineralization types. The database can be used as a brownfields tool, or in greenfields exploration planning such as, for example, the analysis of rock type distribution and structural features required to do comparative searches for mineralization settings equivalent to those identified in known deposits. Alternatively, the search could be for parameters that satisfy a process model for mineralization.

Regionally extensive and detailed databases such as the EYGD can act as a technological bonus whereby exploration success for a company can be achieved at reduced expenditure levels because the difficult and time-consuming compilation work is already done. Further work on the EYGD will include mapping of metamorphic and alteration characteristics to enhance understanding of deposit settings and provide previously unrecognized vectors to ore deposits. Another data enhancement in progress is the inclusion of more information on mineralization and exploration activities, which is of key importance in the analysis of existing deposits and the distribution of mineral occurrences.

Ongoing development of GIS packages such as the EYGD will greatly optimize exploration targeting and enhance the mineral prospectivity of Western Australia.



**Figure 1. 1:100 000 maps covered by the East Yilgarn Geoscience Database**