REGOLTIH-LANDFORM MAPPING, YILGARN CRATON

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This presentation provides a brief overview of regolith-landform mapping practices and products, past and present, from the Yilgarn Craton and outlines new data collection techniques currently being developed.

Regolith-landform mapping for mineral exploration in Australia has developed from early approches to land systems mapping in the 1950s to 1960s by CSIRO. Many of the fundamental developments in regolith-landform mapping for mineral exploration have taken place in the Yilgarn Craton of Western Australia during the period between 1980 and the late 1990s by BMR/AGSO, GSWA, CSIRO/AMIRA and, more recently, CRC LEME. The development is driven by a range of needs arising from geochemical exploration, especially for gold. Regolith-landform mapping approaches have developed beyond basic inventories and have also been influenced by needs arising from outside mineral exploration activities. The ready availablility of supplementary and complementary data, and an increasing need to understand and provide more detailed information about the four-dimensional distribution of regolith and landforms have fuelled greater diversity in mapping techniques and map presentation.

Regolith-landform mapping, such as in the Yilgarn Craton, routinely involves multi-dataset integration and analysis, and presentation of maps and initial field data, all within a GIS framework. Landsat Thematic Mapper, HyMap™, Aster, radar, airborne electromagnetics (AEM), geochemistry, biogeochemistry, geological data and digital elevation models (DEM) are becoming standard datasets consulted during the production of regolith maps. These data are critical for a comprehensive understanding of regolith-landforms in relation to mineral exploration. Regolith-landform maps and their complementary databases now routinely include information about the nature and distribution of geochemical sample media, such as surface lag and, increasingly, geobotanical data.

Continued developments in digital data-collection techniques by CRC LEME now provide seemless integration of field data into spatial analytical software for map production and regolith material characterisation. Critical observations can now be recorded readily in the field onto a variety of image backdrops fully integrated with site photography and all wirelessly connected with GPS technology. Hand-held devices are now cabable of storing compressed imagery, tracklogs and site records in excess of 1GB. This automates field data collection in a revolutionary way, and allows for much easier tranfer of field data to larger national databases.

End-users have, in the past, tended to regard a single printed map as the most desirable outcome for characterising the nature and distribution of regolith and landforms. However, increasingly we recognise the restrictions and limitations of one simple product. Multiple thematic regolith-landform maps, digital or hard-copy, that are based on a variety of data associations and correlations now provide us with a wider range of contexts to gain a better understanding of regolith-landforms. Regolith-landform mapping for mineral exploration in the Yilgarn Craton continues to provide the lead especially in GIS-derived thematic maps.