1:100 000 regolith geology regimes of Western Australia

by

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Abstract

The 1:100 000 regolith geology regimes of Western Australia digital layer is a compilation of existing Geological Survey of Western Australia (GSWA) regolith and surface geology maps and new regolith interpretation using radiometric ternary KTU (potassium, thorium, uranium) imagery.

This new product incorporates all regolith coverage available at 1:100 000 scale and uses a revised regolith classification scheme. Regolith geology from 1:100 000 and 1:250 000-scale maps has been compiled to produce a seamless digital regolith coverage (Fig. 1). The coding of regolith units in the layer follows GSWA's regolith classification scheme (GSWA, 2013) with the addition of a depositional regime unit (_D-WAD). The suffix (-WAD) represents the Western Australia Division, a major physiographic division based on Pain et al. (2011). Earlier maps that did not conform to the current scheme were recoded accordingly.

Regolith codes consist of two parts: the regolith regime code and the physiographic division (-WAD). Regolith units are assigned to three regolith regime codes: _X-WAD, _R-WAD and _D-WAD based on the RED scheme of Anand et al. (1993), which classifies regolith−landform units as residual−relict (R), exposed bedrock (E) or depositional transported regolith (D).

In this digital map layer, areas of exposed bedrock outcrops are termed _X-WAD. Residual or relict materials are termed R-WAD, representing residual regolith including deposits derived from in situ weathering of underlying rocks, deposits of uncertain origin and relict reworked regolith deposits. Areas of transported depositional regolith are termed D-WAD, which comprise sediments derived from residual or erosional landforms including colluvial, sheetwash, alluvial, lacustrine, sandplain, eolian and marine deposits.

Sources for the digital layer are published in GSWA Geological Information Series (GIS) packages that include digital 1:100 000 and 1:250 000 regolith and/or surface geology. The final product is a digital map layer containing three distinct levels of reliability (Fig. 2). The highest level of reliability is in areas where additional regolith interpretation using radiometric KTU imagery is available, including the southwest Yilgarn Craton and the Far East Yilgarn Craton Accelerated Geoscience Program areas, extending to the Great Victorian Desert, the Gibson Desert, the Great Sandy Desert, and the Albany−Fraser Orogen. High to variable levels of reliability are in areas of 1:100 000 and 1:250 000 regolith-only maps, and 1:100 000 surface geology maps. These maps cover most of the southwestern Capricorn Orogen and the Nicholls 1:100 000 sheet in the eastern Capricorn Orogen; most of the Pilbara Craton and Paterson Orogen; the Tanami−Arunta region; the Kimberley Basin and Halls Creek Orogen; the west Musgrave Province; and the Yilgarn Craton. Reliability and accuracy for the northeast Pilbara polygons are variable, as the digital coverage derives from 1:100 000 to 1:500 000 regolith and surface geology maps.

For performance purposes, large polygons have been split creating long linear lines in the map. This does not affect the interpretation of regolith geology. The nomenclature and hierarchy for the regolith units are based on the Explanatory Notes System, a database that incorporates a seamless, current summary of the regolith, bedrock, tectonic units and events of Western Australia.
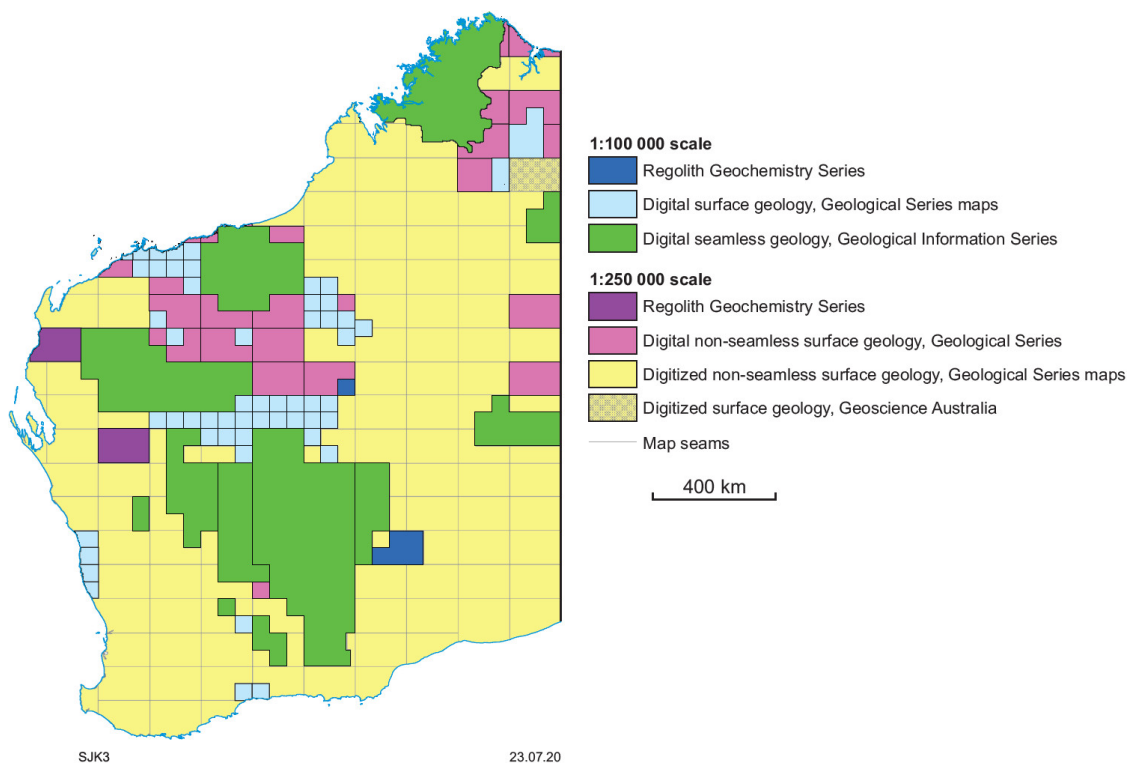
Figure 1.   Map and data sources used to compile the 1:100 000-scale regolith geology regimes of Western Australia digital map layer. Figure source: Jakica et al. (2020)
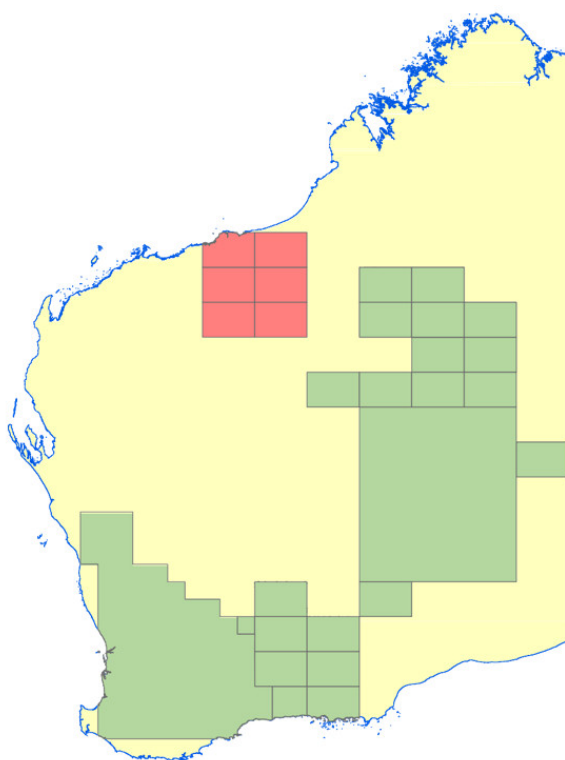

1:100 000 regolith geology regimes of Western Australia — 2021 digital map layer updated areas

NE Pilbara – variable reliability and accuracy, coverage derived from 1:100 000 to 1:500 000 map and data sources

Highest reliability and accuracy — additional interpretation using KTU radiometrics

High to variable reliability and accuracy — compilation from 1:100 000 and 1:250 000 map and data sources as per Figure 1

Figure 2. Updated areas and reliability in 2021 for the 1:100 000 regolith geology regimes of Western Australia digital map layer

How to access

The 1:100 000 regolith geology regimes of Western Australia digital data is available as a free download from the Data and Software Centre.

References

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Recommended reference

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EXPLORATION
INCENTIVE
SCHEME