A CONTEXTUAL FRAMEWORK FOR REGOLITH LANDFORM MAPPING IN AUSTRALIA: MAKING THE MOST OF LEME PRODUCTS

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INTRODUCTION

Since the inception of CRC LEME 1 in 1995 there has been a considerable amount of research into just about all aspects of regolith and its applications, and a large number of publications and maps have been produced. Some of this research has been placed in context, some has not. In this presentation I comment on the context of LEME regolith landform mapping, and present a spatial framework within which to present our work.

A SPATIAL FRAMEWORK

Regolith landform mapping has been undertaken in GA since the early 1990s and in CRC LEME since 1995. Procedures are well established, are taught by Program 5 in LEME, and are generally followed by LEME researchers. The same procedures are also followed by at least three state geological surveys (Western Australia, New South Wales and Victoria), were used by LEME for the regolith map of NT, and are being used by LEME for the regolith map of Queensland. A hierarchy of mapping scales is set out in Table 1. Levels 1, 2 and 3 are already available with the completion of the first part of the Physiographic Regions project being undertaken by LEME for the Australian Soil Resource Information System (ASRIS). Physiographic Regions are equivalent to Regolith-Landform Provinces. The national map of Physiographic Regions is publicly available in draft form on the ASRIS website as ASRIS Level 3 (http://www.asris.csiro.au/index_ie.html) (Figure 1).

The purpose of the "mapping hiatus" between levels 3 and 4 is to allow for problems of scale, especially when higher levels are made up of aggregates of polygons at lower levels. When mapping down from level 1, subsequent levels are simply subdivisions of the next higher level. When mapping up from, say, level 5, higher level polygons are aggregates of lower level polygons. This becomes a problem for three reasons:

1. The detail of lower level polygon boundaries cannot be transferred successfully through to the broad higher levels. The ASRIS experience is that the break between levels 4 and 3 is about as far as detailed polygons can be aggregated up.

2. Subdivision of higher level polygons into smaller lower level polygons reaches a point where the higher level boundaries are no longer detailed enough. This also occurs at the break between levels 3 and 4.

3. Lower level polygons frequently have outliers and inliers – that is, mapping units are not always contiguous. Moreover, parts of lower level mapping units may occur in different higher level polygons.

The mapping hiatus solves these problems by placing a "barrier" to both aggregation and subdivision of polygons.

The LEME legacy GIS project will take all LEME regolith maps, and as many others as we can obtain from state agencies and commercial companies, and put them into a consistent GIS using the best international data and mapping standards. This includes data entry into the standard RTMAP database, and adherence to the spatial data standards set out by the Australia and New Zealand Land Information Council (ANZLIC). Data delivery will be via an ASRIS-style system – ASRIS may even be a suitable vehicle, at least in the short term.

Table 1. Regolith-landform mapping hierarchy

Level	Regolith hierarchy	Characteristic dimension	Descriptive or defining attributes	Appropriate map scale	ASRIS order
1		30 km	Broad physiography (slope and relief) and geology	1:10 million	Division
2		10 km	Physiography, geology	1: 2.5 million	Province
3	Regolith-landform province	3 km	Landforms and regolith materials	1:1 million	Zone
			Mapping hiatus		
4	Regolith-landform association	1 km	Groupings of regolith and landforms related in toposequences	1:250 000	District
5	Regolith-landform unit	300 m 100 m	Local landforms and associated regolith	1:100 000 1:25 000	System
6	Regolith-landform facet	30 m 10 m 3 m	Slope, aspect, regolith class	1:10 000 1:2500 1:1000	Facet
7	Site	10 m	regolith properties, surface condition, microrelief	NA	Site

Note: Physiographic regions fit in at level 3.

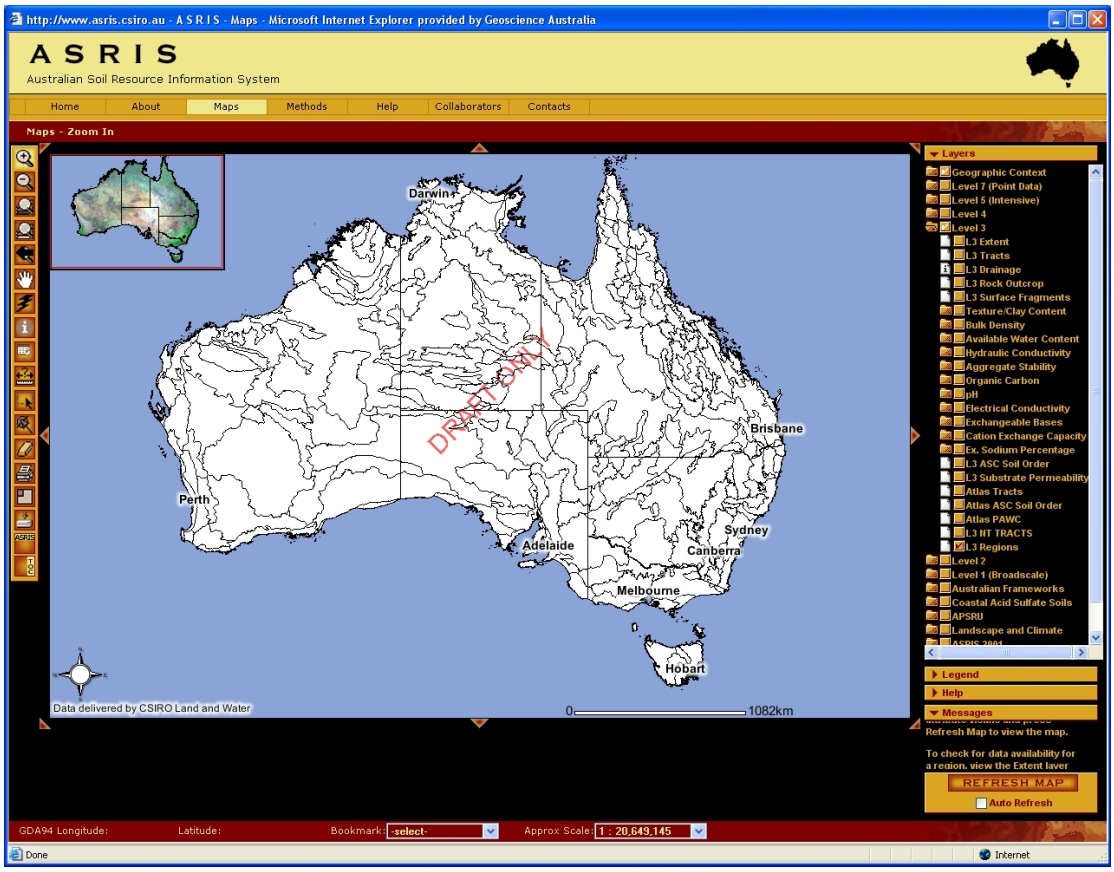

Figure 1. Screen shot of the ASRIS web mapping page with level 3 (physiographic regions) displayed. Log on to http://www.asris.csiro.au/index_ie.html, and go to the mapping page.

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