

# Soil Info / Data



Mark Sugars  
Bundaberg

# Your context:



1. What do you need?
2. What format?
3. Is scale important?
4. Platforms / websites available
5. Possible contacts in QLD for soils info

# Soil info



# Types of Maps



## Soil maps ain't always soil maps

- Land Type (DAF)
- Land System
- Land Resource Area
- Soil

All reports, maps, data available online (site data, GIS shapefiles, pdfs)

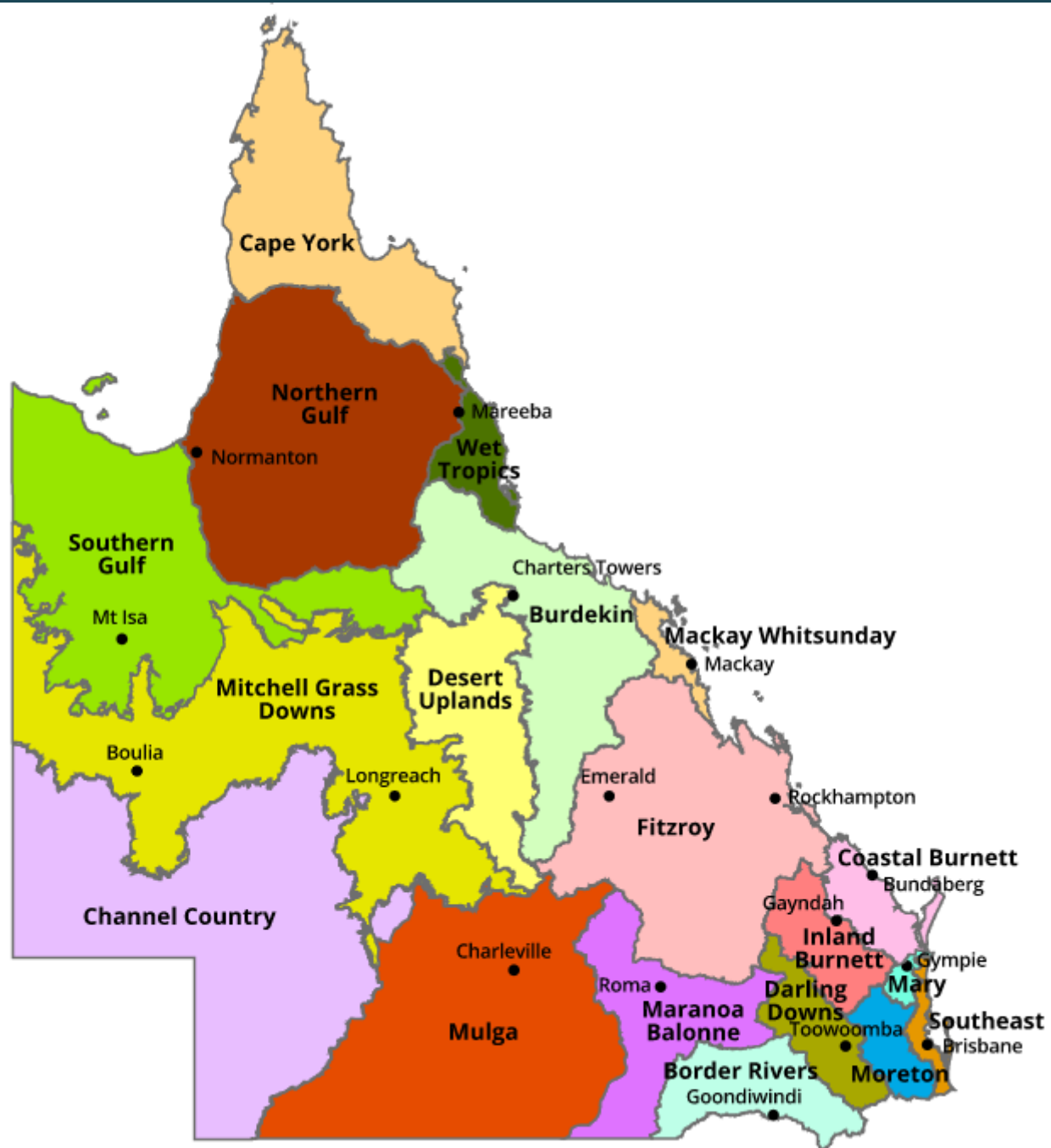
<https://www.publications.qld.gov.au/dataset?q=bab>

# Land Type Mapping



- Grazing land that has characteristic patterns of:
  - soil
  - Vegetation
  - landform that are easily recognisable by landholders in a region
- More than 230 land types from 16 Grazing Land Management (GLM) regions in Queensland
- Updated in 2019
- Check out WALI / Globe

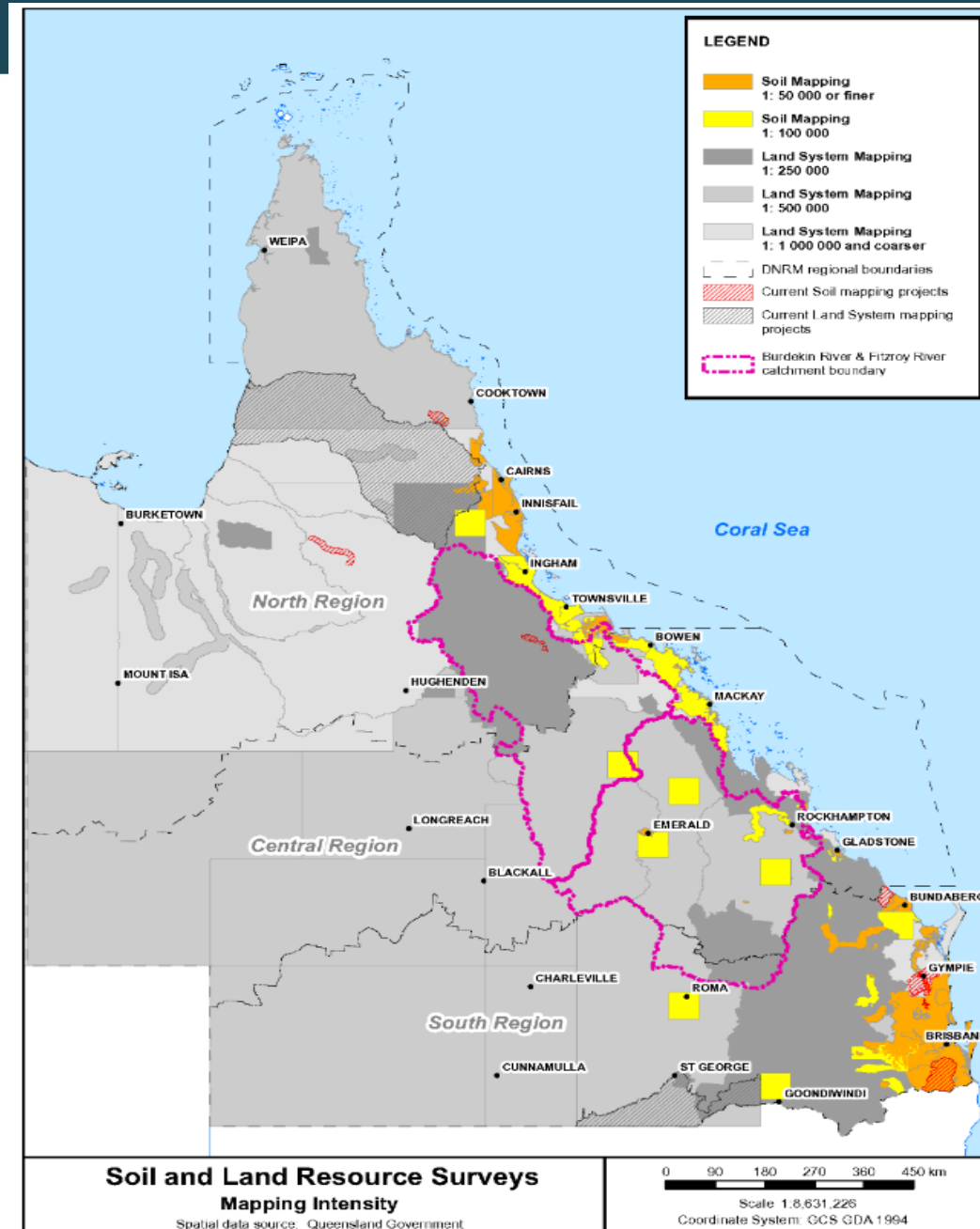
[https://futurebeef.com.au/wp-content/uploads/2011/09/FT01\\_alluvial\\_brigalow\\_V3.1.pdf](https://futurebeef.com.au/wp-content/uploads/2011/09/FT01_alluvial_brigalow_V3.1.pdf)





Questions?

# QLD Soil and Land System Mapping





# Land Systems



- Recurring patterns of geology, topography, soil and vegetation (Land Units)
- Usually mapped at a broad scale (1:250 000 or broader)
- Designed to cover very large areas with limited soils information, often for planning purposes
- Excellent for what they were designed for
- Most of the land systems mapping was done in the 1950s and 60s

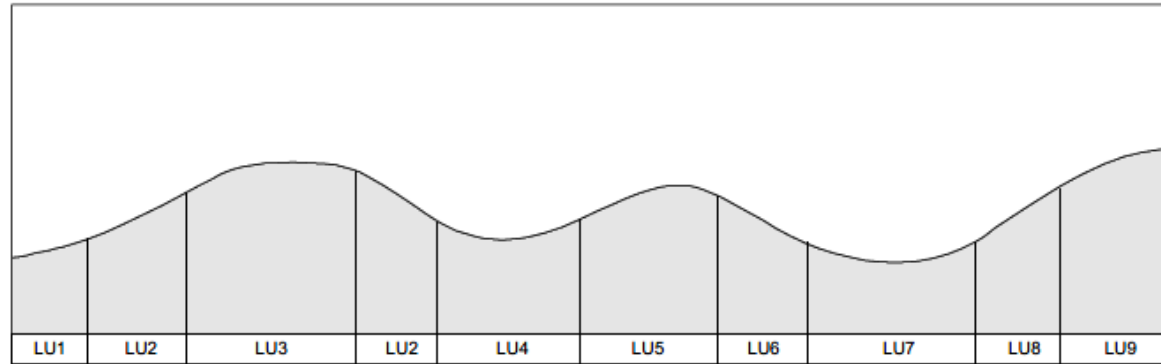
## LAND SYSTEM - MOOCOO (Mo)

**General Description:** Undulating rises to undulating low hills on acid intrusive rocks. Major soils are shallow to moderately deep, brown and grey, sodic duplex soils and moderately deep to deep, brown and black, cracking and non cracking clays (Chromosols, Sodosols, Vertosols and Dermosols).

**Geology:** Moocoorooba Adamellite - Biotite adamellite.

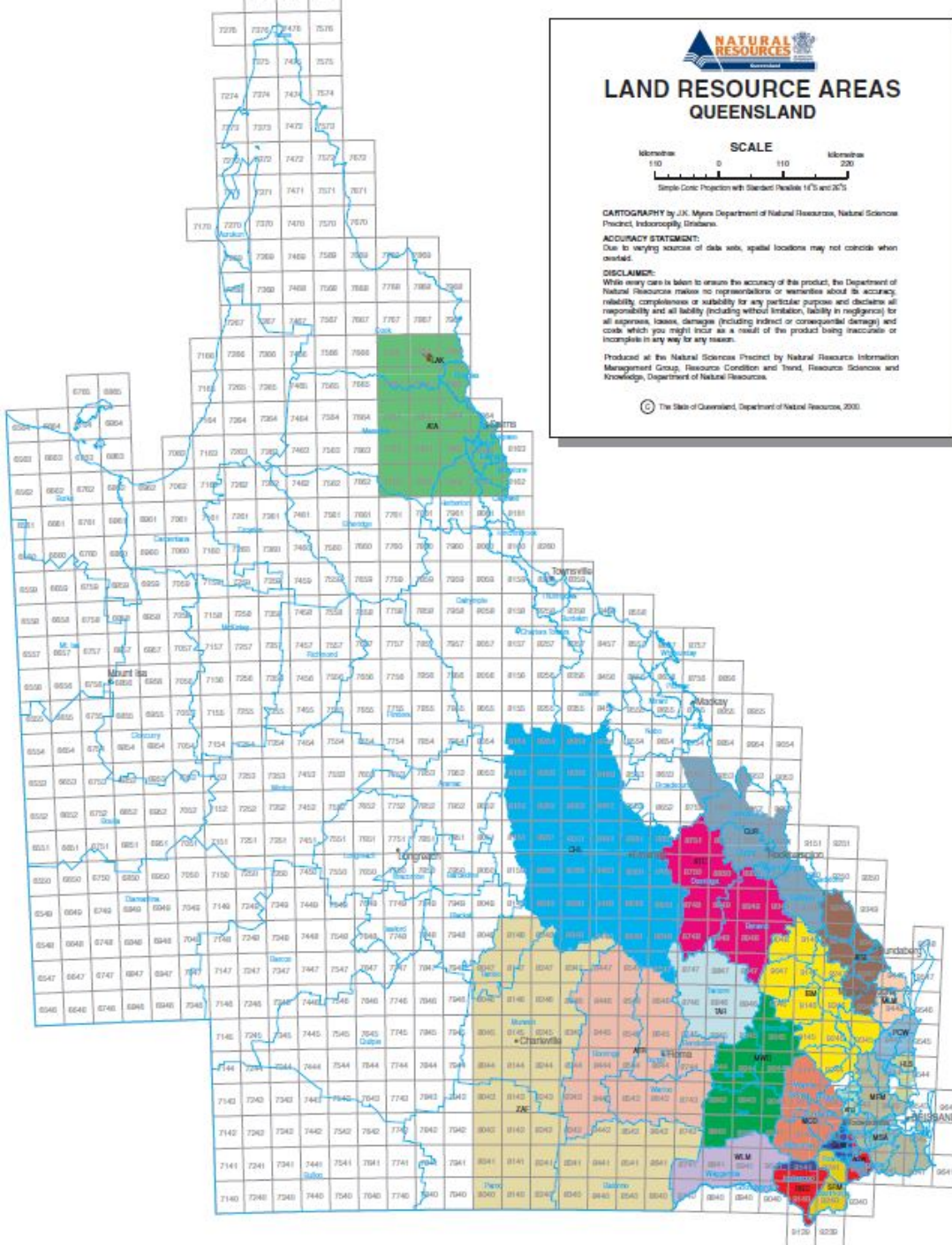
**Landform:** Undulating rises to undulating low hills.

**Vegetation:** Brigalow forest and eucalypt shrubby woodland, limited to complete clearing. Brigalow, wilga, false sandalwood, poplar box, silver-leaved ironbark, gum topped box, narrow-leaved ironbark and bloodwoods.



LandUnit	Area %	Landform Attributes	Soils	Remnant Vegetation	Land Class
LU1	10	Lower concave slopes, 2-3%.	Moderately deep to deep, brown, non cracking and cracking clays with hardsetting surfaces; light clay, medium A horizons; medium clay B horizons; alkaline soil reaction trend. Brown Dermosols and Vertosols.	Eucalypt shrubby woodland. Poplar box and wilga.	III-IV m3-4, ps3, pm3, e2
LU2	10	Mid slopes, 5-8%.	Moderately deep to deep, brown, non cracking and cracking clays with hardsetting to self mulching surfaces; light to light medium clay, medium A horizons; medium clay B horizons; alkaline soil reaction trend. Brown Dermosols and Vertosols.	Eucalypt shrubby woodland. Poplar box, bloodwoods, gum topped box, wilga and brigalow	III-IV m2-4, ps3, pm3, e3
LU3	5	Crests and upper slopes, 3-8%. Rock outcrop may be present.	Shallow to moderately deep, red and brown, sodic duplex soils with hardsetting surfaces; sandy clay loam to clay loam, medium to thick A horizons; medium clay B horizons, usually with many to abundant coarse fragments; acid to neutral soil reaction trend. Red and Brown Chromosols.	Eucalypt shrubby woodland. Poplar box, bloodwoods and wilga.	VI m4 or 6, pd3-4, ps3, r2-4, e3-4

# Land Resource Areas

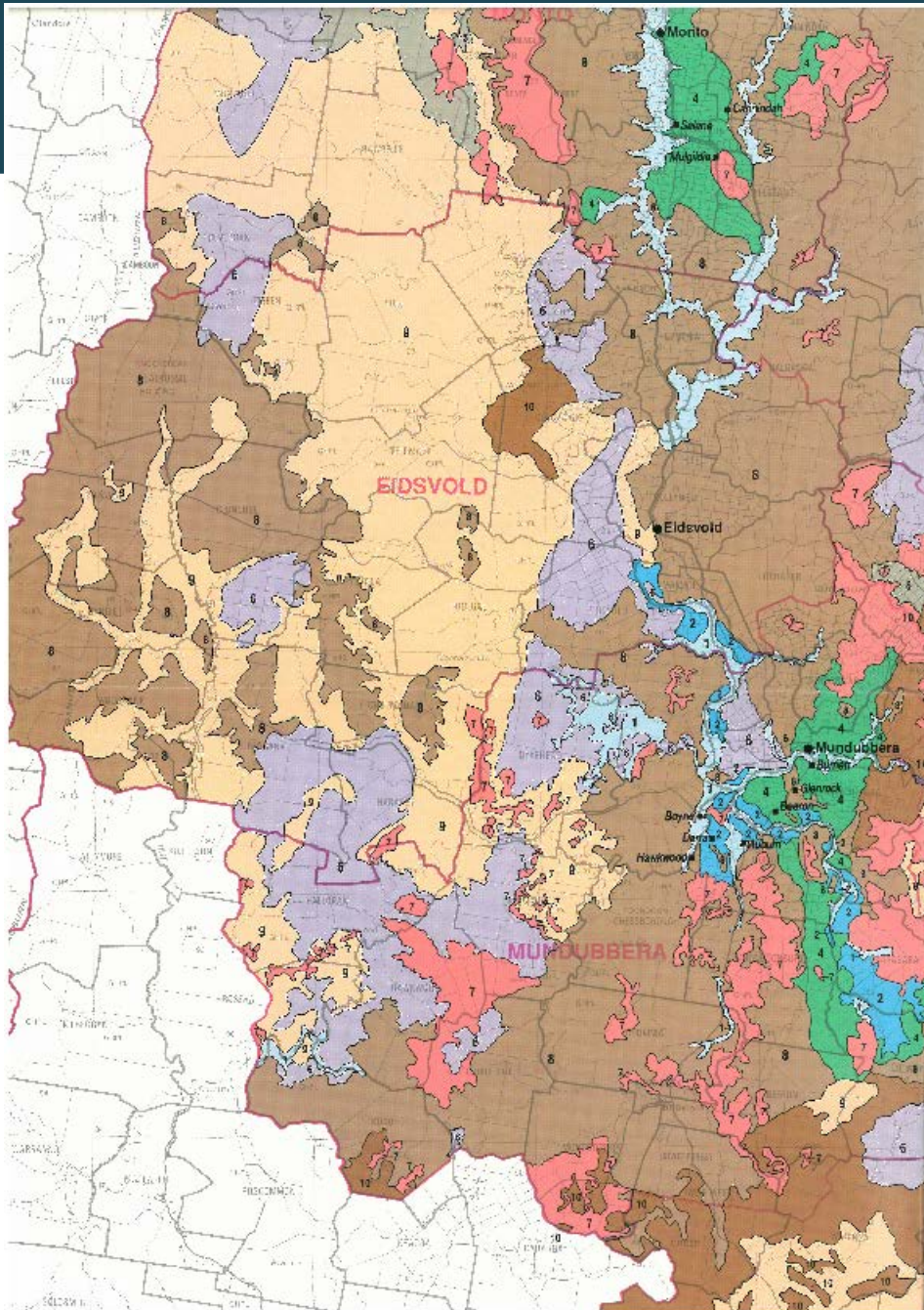


## Land Resource Areas

- Units of land based on geological and landform characteristics with a recurring pattern of soils and vegetation
- Usually conducted to give a broad overview of a region



# Land Resource Areas



## Inland Burnett District Land Resource Areas

Scale 1:500 000

LRA 4 Undulating Plains

**Geology** Sandstones, minor volcanics, granite

**Vegetation** Brigalow, softwood scrubs with areas of poplar box

**Major soils** Deep dark brown cracking and non-cracking clays (Vertosols and Dermosols)

Field manual provides more information on major soils and land suitability for agriculture



Questions?

# Soil Mapping

- 1:100 000 scale or finer
- Land suitability assessment
- Land degradation issues often assessed
- Useful to guide property planning, but will need ground truthing
- Generally Polygons with one dominant soil and a number of sub-dominants
- Polygons usually have soil and land attributes described
- Individual Polygon data available

DNRQ980142

## *Land Resources Bulletin*



### **Soils and Irrigated Land Suitability of the Bundaberg Area, South East Queensland**

T.E. Donnollan, P.R. Wilson,  
P.R. Zund and S.A. Irvine  
Resource Management



Department of Natural Resources  
Brisbane Queensland 1998



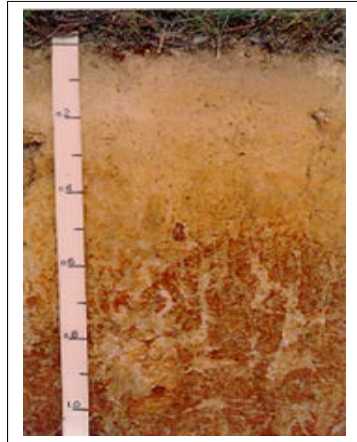




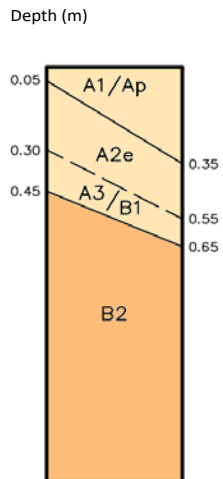


## Keponck (Kp)

<b>CONCEPT</b>	Thick, bleached, loamy to clay loamy surface over acid, mottled, brown or yellow weakly sodic clay on deeply weathered fine grained sedimentary rocks.
<b>ASC</b>	Brown Dermosol, Yellow Dermosol.
<b>LANDFORM</b>	Level plains, hillslopes and hillcrests on gently undulating rises. Slopes 1 – 6%.
<b>GEOLOGY</b>	Mudstones, siltstones, fine grained sandstones of the Burrum Coal Measures (Kb), Elliott Formation (Te), Maryborough Formation (Km).
<b>VEGETATION</b>	Tall, mid-dense trees of <i>Eucalyptus portuensis</i> , <i>Corymbia citriodora</i> , <i>C. intermedia</i> , <i>E. crebra</i> , <i>Angophora leiocarpa</i> . Frequently cleared.
<b>PERMEABILITY</b>	Moderately permeable.
<b>DRAINAGE</b>	Imperfectly drained.
<b>SURFACE</b>	Firm or hard setting.



# SPC – Soil Profile Class



HORIZON	DESCRIPTION
<b>A1 / Ap</b>	Grey or black; loam, sandy clay loam or clay loam (frequently fine sandy or silty); massive; pH 5.0 – 6.0. Clear change to
<b>A2e</b>	Conspicuously bleached; grey or black; loam, sandy clay loam or clay loam (frequently fine sandy or silty); massive; pH 5.0 – 6.0. Clear or gradual change to
<b>A3 / B1</b>	Where present; mottled, brown or yellow; clay loam to light clay (frequently fine sandy or silty); massive or weak polyhedral or blocky structure; occasionally few to many ferruginous nodules; pH 5.5 – 6.5. Clear or gradual change to
<b>B2</b>	Mottled; brown or yellow; light to medium clay; moderate or strong polyhedral or blocky structure; occasionally few to common ferruginous nodules; pH 5.5 – 6.5.



# Soil Limitations

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Report Date: 28/10/2019 09:50

Soil and Land Information

SALI3047

Soil Limitations Crosstab

Project: Soil and land suitability of the Bundaberg area, South East Queensland

Project Code: BAB

Polygon From:

Polygon To:

Polygon List: [230,227,249,242,229,232,250]

Project Code	Poly No	Entity No	Lim Code	Lim Value	Limitation Code Name	Limitation Value Description
BAB	227	1	Cf	1	Frost	none to occasional frosts (Coastal)
BAB	227	1	E	B1	Water erosion	Unstable Soils - 0-1%
BAB	227	1	Ef	B1	Furrow Irrigated Erosion	Erosion - Furrow Irrigated Unstable Soils - 0-1%
BAB	227	1	F	0	Flooding	No flooding
BAB	227	1	If	M7G	Furrow Infiltration - Deep Drainage	Areas within groundwater area -Moderatetly permeable (50 - 500 mm/day), 700 - 800m to drainage outlet
BAB	227	1	Ir	S2M	Soil Profile Recharge	Hardsetting massive soils with loam fine sandy to clays loam fine sandy surface textures with dry very firm consistency - Moderately permeable (50-500)
BAB	227	1	M	4	Water availability	PAWC 75 - 100mm (RAW 50 - 70mm)
BAB	227	1	Nd	P4K3	Nutrient deficiency	P < 10 ppm K < 0.2 meq/100g
BAB	227	1	Nf	0	Nutrient fixation	No nutrient problem
BAB	227	1	NI	3M	Nutrient leaching	Imperfectly drained, Moderatetly permeable (50 - 500 mm/day)
BAB	227	1	Nr	5	Soil reaction trend	pH > 6.5 (30-50 cm)
BAB	227	1	Pa	2	Soil adhesiveness	Moderately adhesive soils
BAB	227	1	Pd	1	Soil depth	>1m
BAB	227	1	Pm	1	Narrow moisture range	Moderate moisture range
BAB	227	1	Ps	2	Surface condition	Hardsetting massive soils with loam fine sandy to clays loam fine sandy surface textures with dry very firm consistency
BAB	227	1	R	R0	Rockiness	No rock
BAB	227	1	Sa	NA	Salinity	No existing salinity
BAB	227	1	Ss	3M7	Outflow potential	Imperfectly drained, Moderatetly permeable (50 - 500 mm/day), 700 - 800m to drainage outlet
BAB	227	1	Tm	0	Microrelief	<0.1 Level
BAB	227	1	Ts	0	Slope	<15%
BAB	227	1	W1	3M7	Wetness to 1m	Imperfectly drained, Moderatetly permeable (50 - 500 mm/day), 700 - 800m to drainage outlet
BAB	227	1	W2	3M	Wetness to 0.5m	Imperfectly drained, Moderatetly permeable (50 - 500 mm/day)
BAB	227	1	W3	3M	Wetness to 1.5m	Imperfectly drained, Moderatetly permeable (50 - 500 mm/day)

# Land management

Soil groups	Major limitations	Management remarks
<i>Red Kandosols and Dermosols on deeply weathered coarse grained and fine grained sedimentary rocks.</i>		
<i>Farnsfield (Ff)</i> <i>Gooburrum (Gb)</i> <i>Gibson (Gs)</i> <i>Howes (Hs)</i> <i>Oakwood (Ok)</i> <i>Otoo (Ot)</i> <i>Watalgan (Wt)</i>	<ul style="list-style-type: none"> <li>• Permeable soils occurring in groundwater recharge areas.</li> <li>• Initially low in nutrients.</li> <li>• Susceptible to erosion on slopes.</li> <li>• Hardsetting surfaces are usually associated with loamy surface soils such as <i>Oakwood</i>, <i>Watalgan</i>, <i>Otoo</i>, <i>Gibson</i> and <i>Howes</i>.</li> </ul>	<p>These soils are deep and are well drained and generally suitable for most crops. Some management options that may be considered to improve production and sustainability include:</p> <ul style="list-style-type: none"> <li>• Using spray and trickle irrigation methods to reduce losses to deep drainage and prevent secondary salinisation downslope.</li> <li>• Using erosion control measures on sloping land.</li> <li>• Avoiding cultivation on slopes greater than 8%.</li> <li>• Incorporating crop residues to improve structure and reduce problems with seedling emergence and crop establishment.</li> </ul>
<i>Yellow and Brown Kandosols and Dermosols with sandy surfaces on deeply weathered coarse grained sedimentary rocks.</i>		
<i>Calavos (Ca)</i> <i>Isis (Is)</i> <i>Meadowvale (Md)</i> <i>Quart (Qr)</i> <i>Rothchild (Rt)</i>	<ul style="list-style-type: none"> <li>• Low to moderate PAWC.</li> <li>• Susceptible to erosion on slopes.</li> <li>• Initially low in nutrients.</li> <li>• Low nutrient retention capacity.</li> </ul>	<p>These soils are generally suitable for the irrigation of most crops although tree crops such as avocado, macadamia and citrus may be affected by the poorer drainage at depth. Some management options that may be considered to improve production and sustainability include:</p> <ul style="list-style-type: none"> <li>• Using erosion control measures on sloping land.</li> <li>• Avoiding cultivation on slopes greater than 8%.</li> <li>• Irrigating more effectively with frequent light irrigations using low volume irrigation techniques.</li> <li>• Incorporating crop residues in topsoils to build up organic matter levels to improve structure, waterholding capacity and nutrient retention ability.</li> </ul>
<i>Yellow and Brown Kandosols and Dermosols with loamy surfaces on deeply weathered fine grained sedimentary rocks.</i>		
<i>Cedars (Cr)</i> <i>Gillen (Gi)</i> <i>Keppock (Kp)</i> <i>Woolmer (Wr)</i>	<ul style="list-style-type: none"> <li>• Susceptible to erosion on slopes.</li> <li>• Initially low in nutrients.</li> <li>• Hardsetting surfaces.</li> <li>• May contain up to 50% iron nodules which reduces PAWC significantly.</li> </ul>	<p>Generally these soils are suitable for irrigation of a range of crops, but marginal or unsuitable for land uses such as irrigated beans, navybeans and tree crops such as grapes, citrus, macadamia and avocado. Some management options to consider to improve production and sustainability include:</p> <ul style="list-style-type: none"> <li>• Using erosion control measures on sloping lands.</li> <li>• Avoiding cultivation on slopes greater than 8%.</li> <li>• Incorporating crop residues to build up organic matter levels to improve structure and reduce problems with seedling emergence and crop establishment.</li> <li>• Irrigating those soils with large amounts of iron nodules more frequently as PAWC is low.</li> </ul>



Questions?

# Accessing information



- Soils and land resource information (data, maps and information)
- Geology info (GeoGlobe)
- Vegetation
- Cadastre
- Imagery

## Other agency platforms:

- DAF – WALI 2.0 / DES - Long Paddock

➤ **Queensland Globe**

## Where to look for **soil** information & **soil** data

### ➤ Queensland Globe

<https://qldglobe.information.qld.gov.au/>

View spatial data, including soil mapping, in Google Earth

### ➤ Spatial Information Network (SPIN)

<http://spatialapps/spin/>

### ➤ Soil Management

<http://www.qld.gov.au/environment/land/soil/>

### ➤ Open Data Portal

<https://data.qld.gov.au/>

Download soil related spatial datasets for use in GIS.

### ➤ Soil conservation

Soil Conservation guidelines for Queensland

<https://publications.qld.gov.au/dataset/soil-conservation-guidelines>

## Other Data Sites

### ➤ Topographic Maps

<http://qtopo.dnrm.qld.gov.au/Mobile/>

Learn how to view topographic maps

### ➤ QDEX – Qld Digital Exploration Reports

Search and download various soils reports, Qld Geological maps, Departmental publications. You will need to get a login & password, which can be found at

<https://publications.qld.gov.au/dataset/geological-survey-queensland-forms-and-guidelines/resource/341cf3cd-5fa6-43b9-aef9-9c8e83c939b8>

### ➤ Qld Spatial Information

<http://qldspatial.information.qld.gov.au/catalogue/custom/index.page>

Spatial and associated data. You will need to register.



# Key Contacts

Location	Name	Number
Mareeba	David Morrison	4017 0127
Bundaberg	Mark Sugars	4131 2339
Nambour	Lauren Eyre	5451 2411
Toowoomba	Andrew Biggs	4529 1213 / 4529 1401





Queensland Government

## Welcome to Queensland Globe

The Queensland Globe provides an online interactive experience to view Queensland's location based information.

The Queensland Globe displays large amounts of data which may impact on your data plan usage. It is best experienced on late model PCs, smartphones or tablets, using modern browsers (Chrome, Edge, Firefox, Safari). For PCs, the home page includes a "Take a Tour" to assist you to best use the Queensland Globe.

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Version 2.10



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Longsight Emerald Rockhampton Gladstone





**All Layers**

Filter layers by name

- Events and incidents
- Farming**
  - Agricultural land audit
  - Biosecurity information
  - Drought declarations
  - Grazing land management**
    - Grazing land management regions
    - Grazing land management types

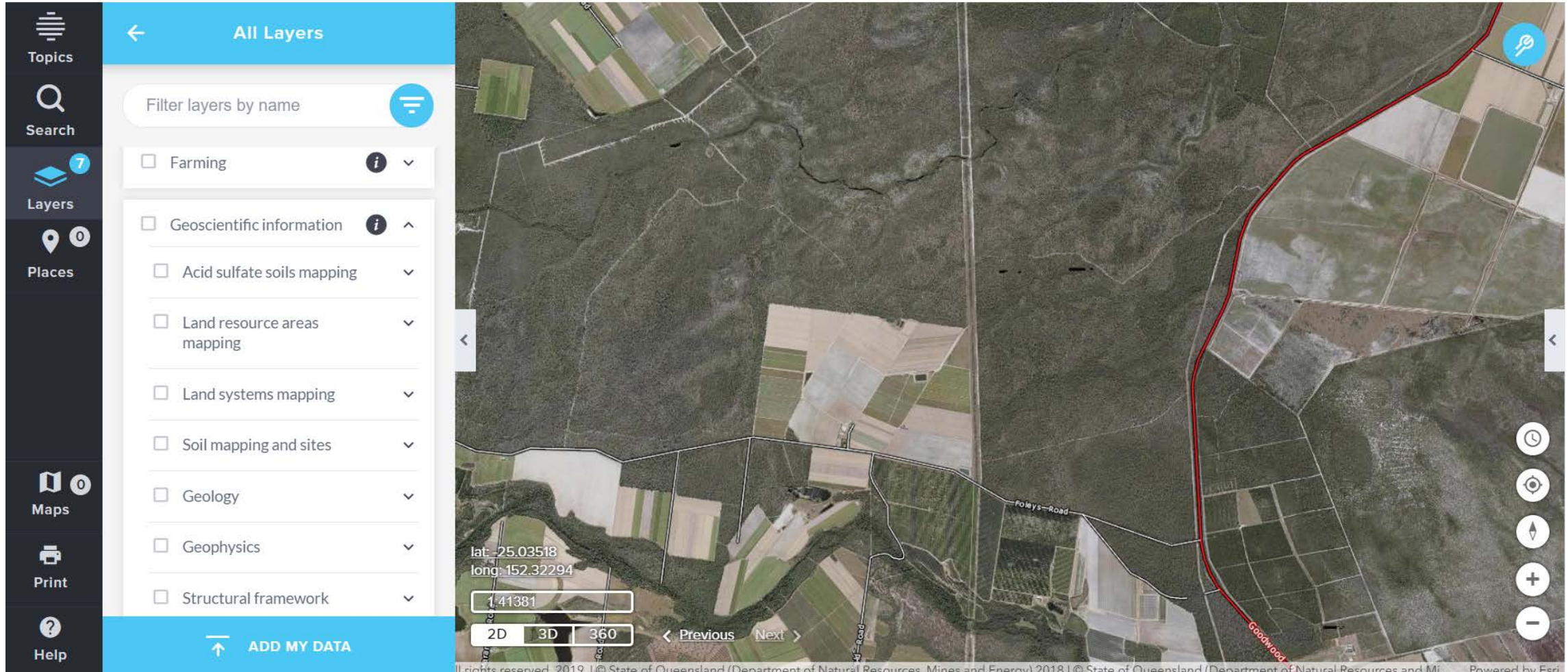
lat: -25.08694  
long: 152.31104

1:41381

2D 3D 360

← Previous Next →

ADD MY DATA



The screenshot displays the Queensland Globe application interface. On the left is a dark sidebar menu with icons for Topics, Search, Layers (7 items), Places (0 items), Maps (0 items), Print, and Help. The main content area is titled "All Layers" and features a search bar for filtering layers by name. A list of layer categories is shown, each with a checkbox and an information icon:

- Farming
- Geoscientific information
- Acid sulfate soils mapping
- Land resource areas mapping
- Land systems mapping
- Soil mapping and sites
- Geology
- Geophysics
- Structural framework

At the bottom of the sidebar is a blue button labeled "ADD MY DATA". The main map area shows a satellite view of a rural landscape with a red boundary line. A coordinate box displays "lat: -25.03518" and "long: 152.32294". Below the coordinates are map controls for scale (1:41381), view (2D, 3D, 360), and navigation (Previous, Next). A vertical toolbar on the right side of the map includes icons for home, location, compass, and zoom in/out.





All Layers

Filter layers by name

- Geoscientific information
- Acid sulfate soils mapping
- Land resource areas mapping
- Land systems mapping
- Soil mapping and sites
  - Atlas of Australia soils
  - Soils - 1:250,000 scale
  - Soils - 1:100,000 scale
  - Soils - 1:50,000 scale

ADD MY DATA

lat: -25.05023  
long: 152.31594

1:21852

2D 3D 360 PP < Previous Next >





All Layers

Filter layers by name

- Land systems mapping
- Soil mapping and sites
- Atlas of Australia soils
- Soils - 1:250,000 scale
- Soils - 1:100,000 scale
- Soils - 1:50,000 scale
- Soils - 1:25,000 scale
- Soils - agricultural research stations
- Soil site locations

ADD MY DATA

lat: -25.05028  
long: 152.31049

1:21852

2D 3D 360

Previous Next





- Topics
- Search
- Layers 9
- Places 0
- Maps 0
- Print
- Help

Attributes

Soil and agricultural suitability of the Childers area CBW 1 of 3

CBW

DOMINANT ENTITY CODE	Md
DOMINANT ENTITY MEANING	Meadowvale
DOMINANT ENTITY PERCENTAGE	60
SUBDOMINANT ENTITIES	AI (30%)
SPC GENERIC GROUP	Friable non-cracking clay or clay loam soils - Dermosols, Ferrosols
CONCEPT	Bleached sandy surface over a yellow massive subsoil over a mottled, structured clay subsoil on deeply weathered coarse grained sedimentary rocks

lat: -25.05791  
long: 152.30104  
1:10538

2D 3D 360

Previous Next



