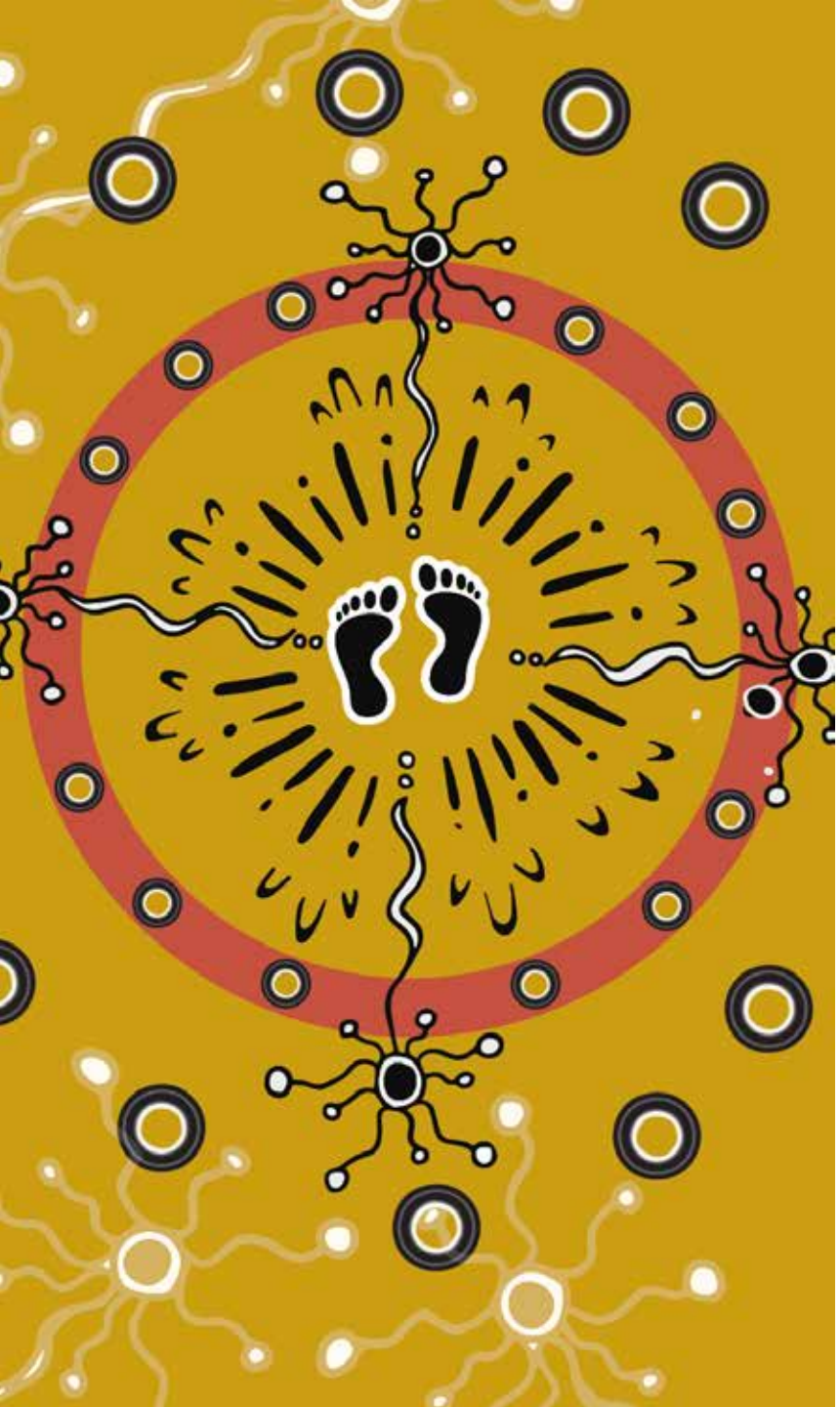
Title: The Arenosols of New South Wales (NSW): their identification and some implications for land use planning.

Dr Linda Henderson and Dr David Morand, Soil and Landscape Assessment, DCCEEW



NSW Department of Climate Change, Energy the Environment and Water acknowledges the traditional custodians of the land and pays respect to Elders past, present and future.

We recognise Australian Aboriginal and Torres Strait Islander peoples' unique cultural and spiritual relationships to place and their rich contribution to society.

Artist and designer Nikita Ridgeway from Aboriginal design agency – Boss Lady Creative Designs, created the People and Community symbol.

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Why re-examine NSW soil data to identify Arenosols?

- Australian Soil Classification (ASC) version 3 (2021) introduced the Arenosol Order
- NSW Soil and Land Information System (SALIS) contains over 80 000 soil profile descriptions.
- Examining the SALIS database to identify Arenosols will improve current state-wide spatial soil information, including;
  - inherent soil fertility mapping
  - land and soil capability mapping
- Improve regional land use planning, including for Hunter and North Coast
- Improve the identification of deep sandy soils in NSW

Arenosol study locations

ASC definition of Arenosols:

- Soils that have, within the upper 1.0 m of the soil profile:
- A sandy field texture (field texture of sand, loamy sand, or clayey sand) in one or more layers or horizons, with a combined thickness of at least 0.8 m AND
- No layer or horizon with a clay content that exceeds 15% (sandy loam+), excluding argic horizons AND
- ≤ 10% of coarse fragments and hard segregations > 2mm in size AND
- No hard layers (cemented pans, rock, saprolite)

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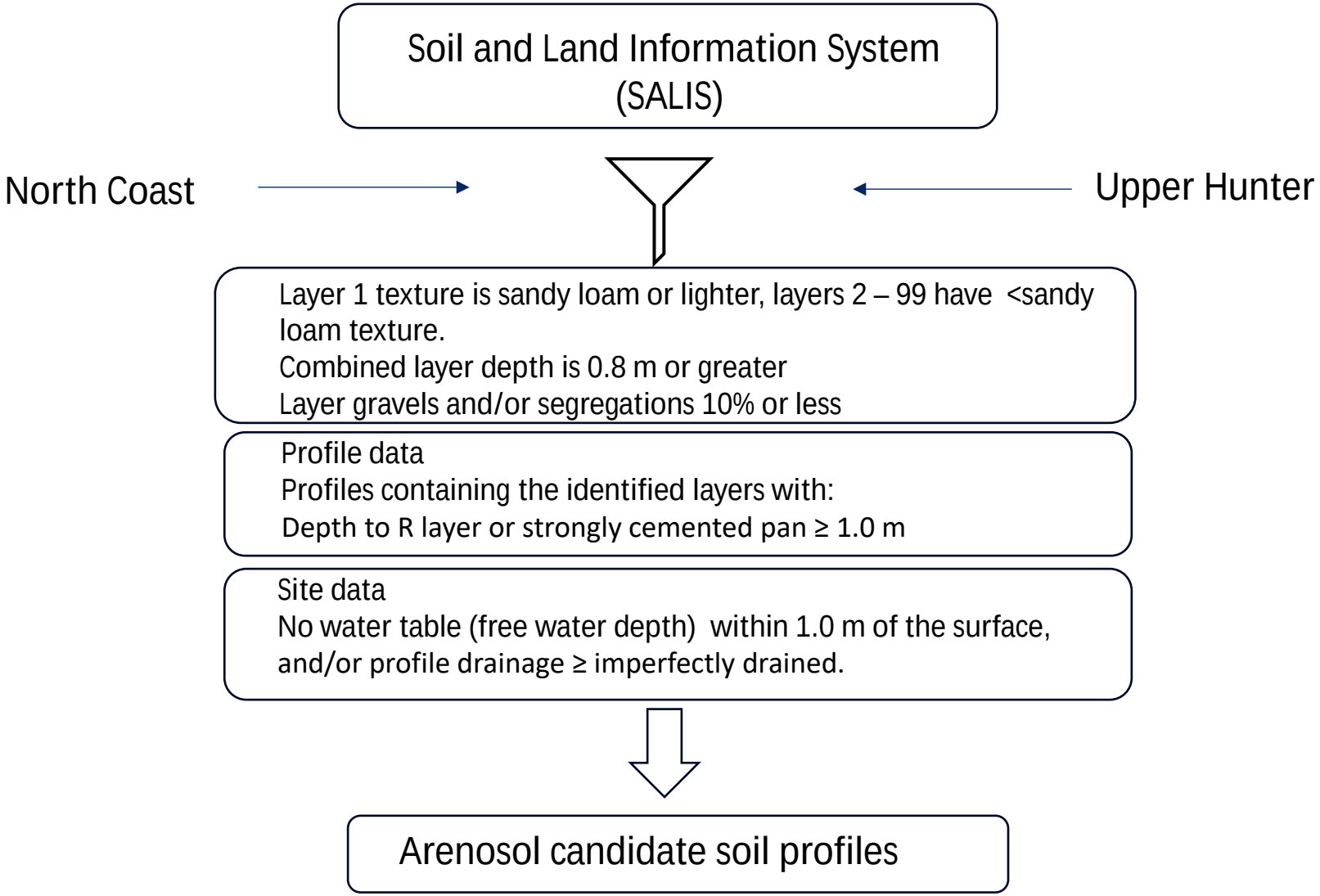
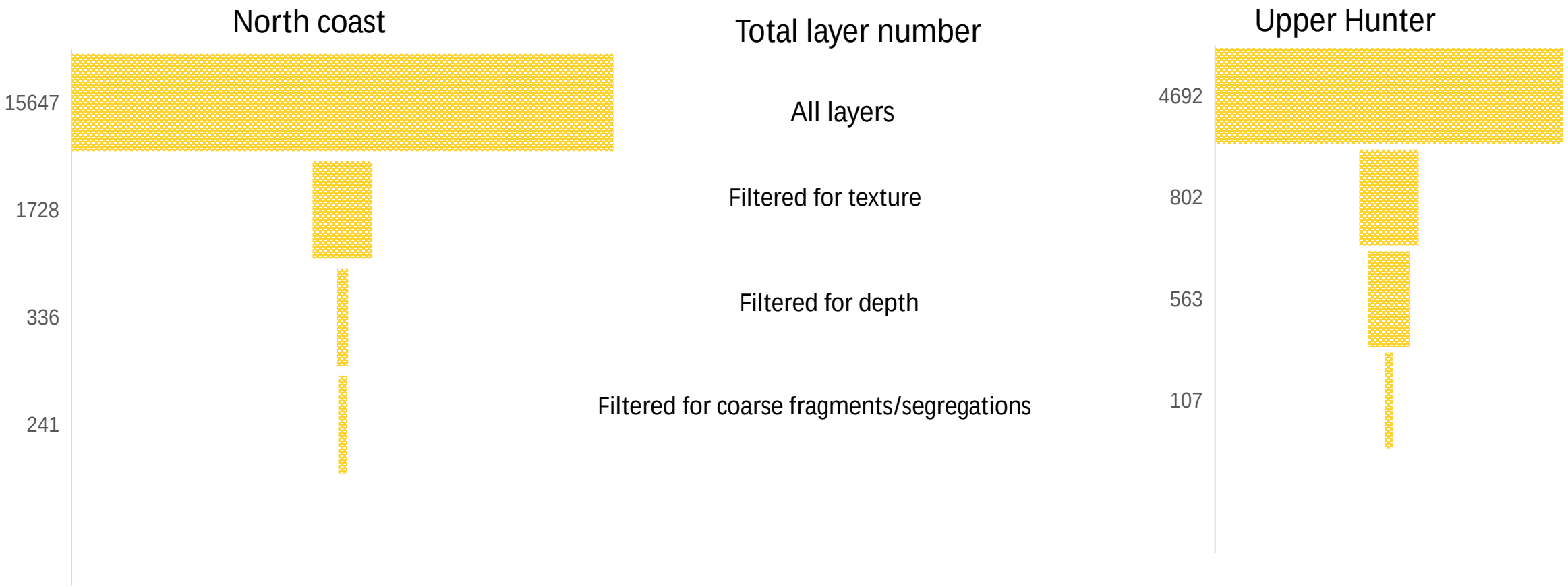
Methods

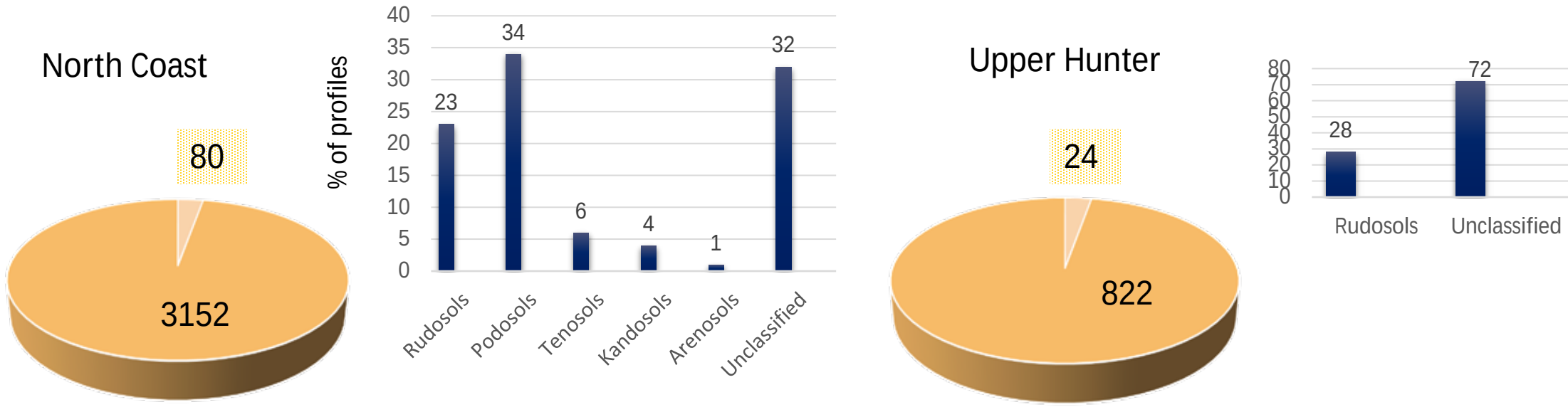

Soil and Land Information System (SALIS)
North Coast
Upper Hunter
Layer 1 texture is sandy loam or lighter, layers 2 – 99 have <sandy loam texture.
Combined layer depth is 0.8 m or greater
Layer gravels and/or segregations 10% or less
Profile data
Profiles containing the identified layers with:
Depth to R layer or strongly cemented pan ≥ 1.0 m
Site data
No water table (free water depth) within 1.0 m of the surface, and/or profile drainage ≥ imperfectly drained.
Arenosol candidate soil profiles

Results: Layers filtered



Results: Potential Arenosol profiles

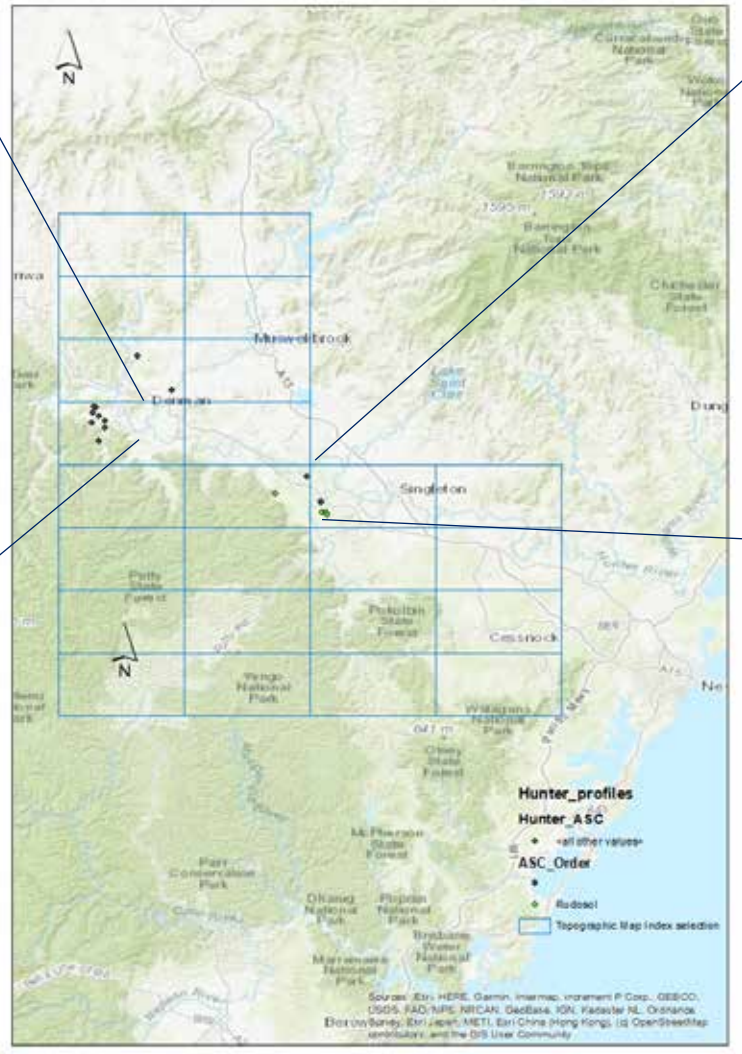
Layer data re-assembled into profiles. Profiles then filtered for depth and hydrology

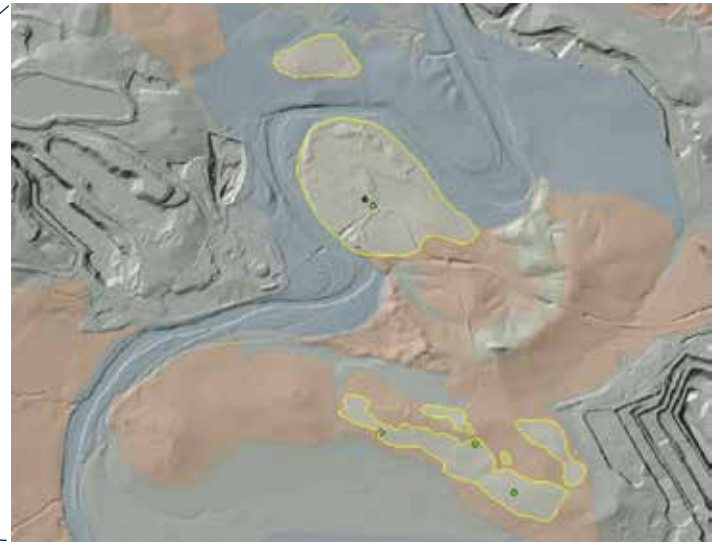


But, how to differentiate Arenosol from Podosol profiles?

- Podosol diagnostic horizons, filter for pan type: ortstein, organic, ironpan

Spatial Distribution Hunter





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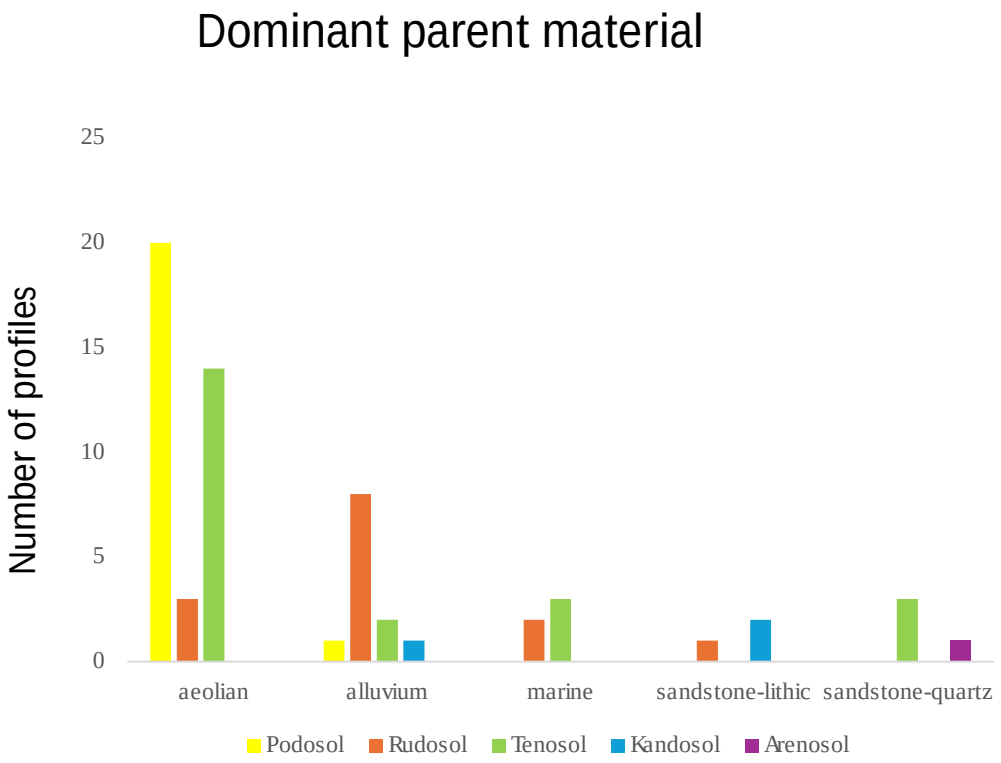
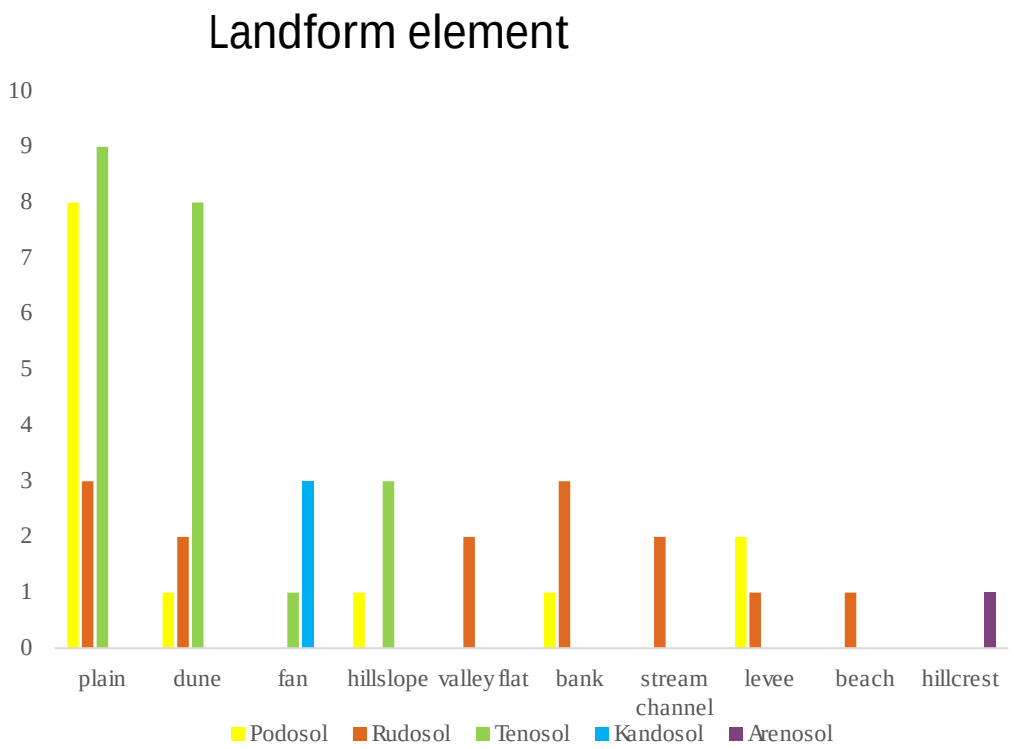
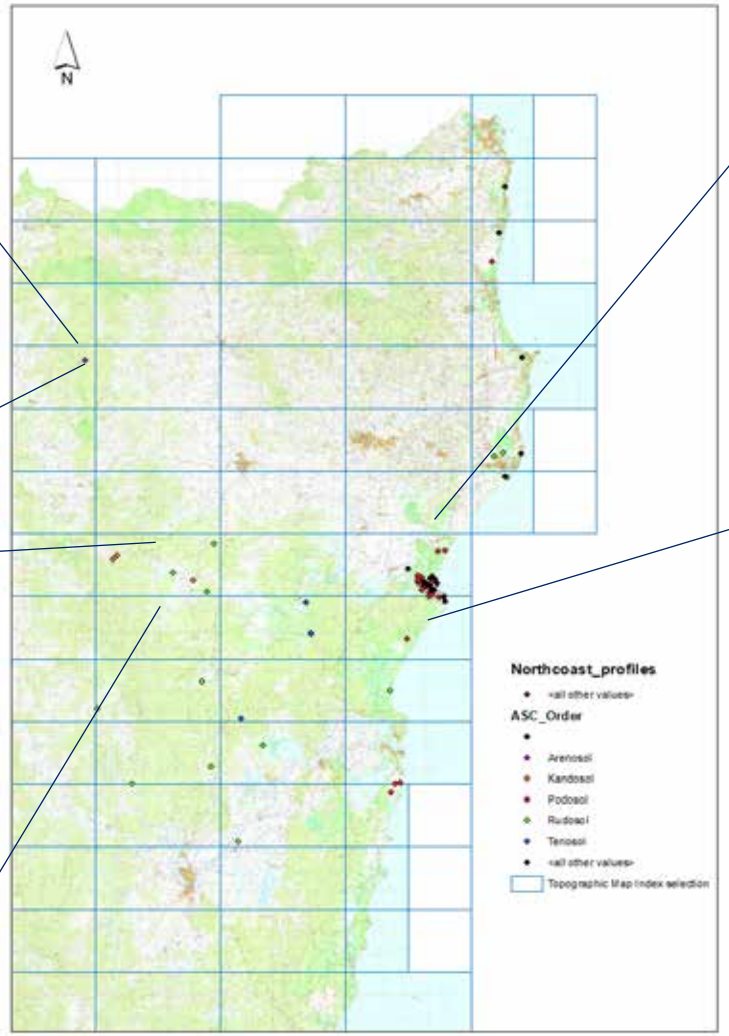
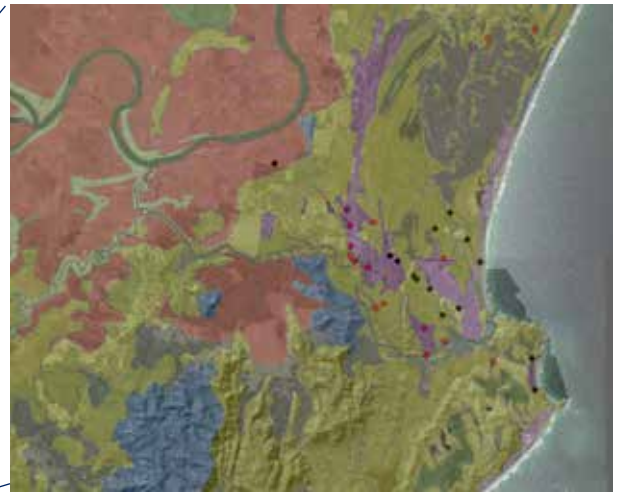
Results: North Coast Arenosols





Spatial distribution North Coast





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Discussion & Conclusions

- SALIS contains sufficient data to search for potential Arenosols based on layer characteristics.
- Arenosols in the Hunter and North Coast occur on alluvium, aeolian re-worked alluvium, alluvial terraces or colluvium derived from high-sand content parent materials.
- Arenosols also occur on coastal sand bodies, interspersed with Podosols.
- Field examination of these soils to confirm classifications.

Further work should include a NSW-wide search of the Soil and Land Information System to inform state Arenosol distribution.

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References

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Questions?