



Queensland  
Wetlands Program

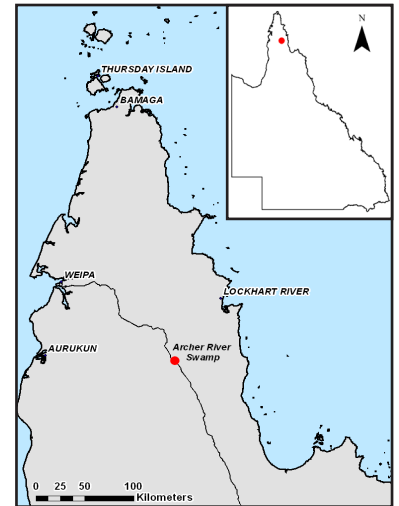
## Archer River Swamp

### Study Area

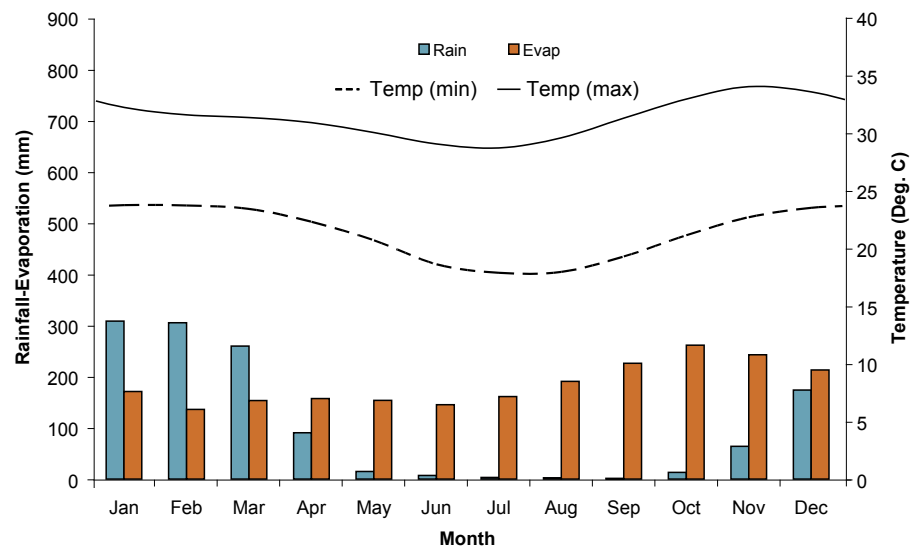
The Archer River swamp is located approximately 70 km north of Coen along the Peninsula Development Road, Northern Queensland.

The swamp is a closed depression dominated by *Melaleuca* formed in a granodiorite landscape.

This study area is an example of a coastal and sub-coastal non-floodplain tree swamp (*melaleuca* and *eucalyptus* spp.) in the Cape York Peninsula Bioregion.



### Climate<sup>1</sup>



The study area is situated within a tropical/equatorial climatic region with a distinct wet and dry season. Evaporation exceeds rainfall in the majority of months. The average annual rainfall for the area is 1243 mm.

<b>Landform and Inundation</b>	Closed depression swamp within a granodiorite landscape Freshwater seasonally inundated area from overland flow
<b>Soils<sup>2</sup></b>	Hydrosols and Dermosols
<b>Vegetation<sup>3</sup></b>	<i>Melaleuca viridiflora</i> with or without <i>Melaleuca saligna</i> woodland in sinkholes and drainage depressions (RE 3.3.32)
<b>Geology<sup>4</sup></b>	Cape York Peninsula Batholith: Porphyritic biotite adamellite
<b>Disturbance</b>	No effective disturbance except grazing by hoofed animals



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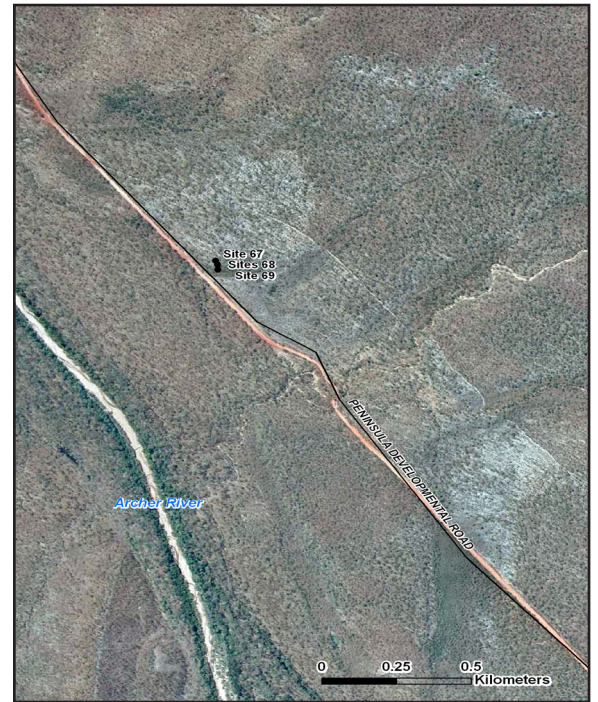


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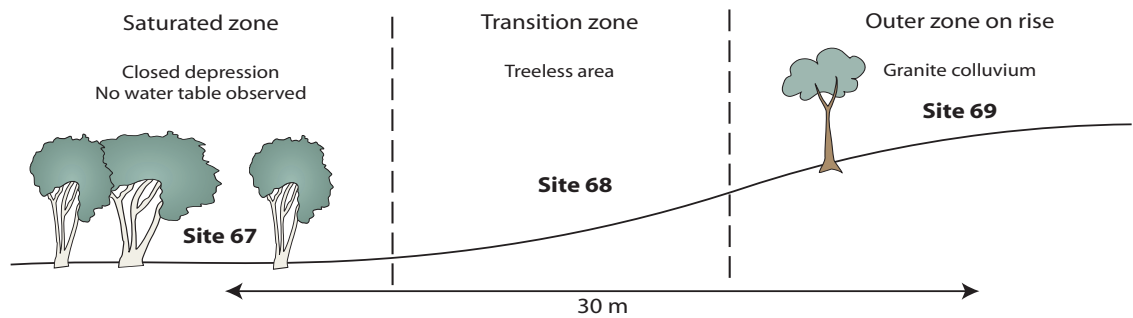
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## Location

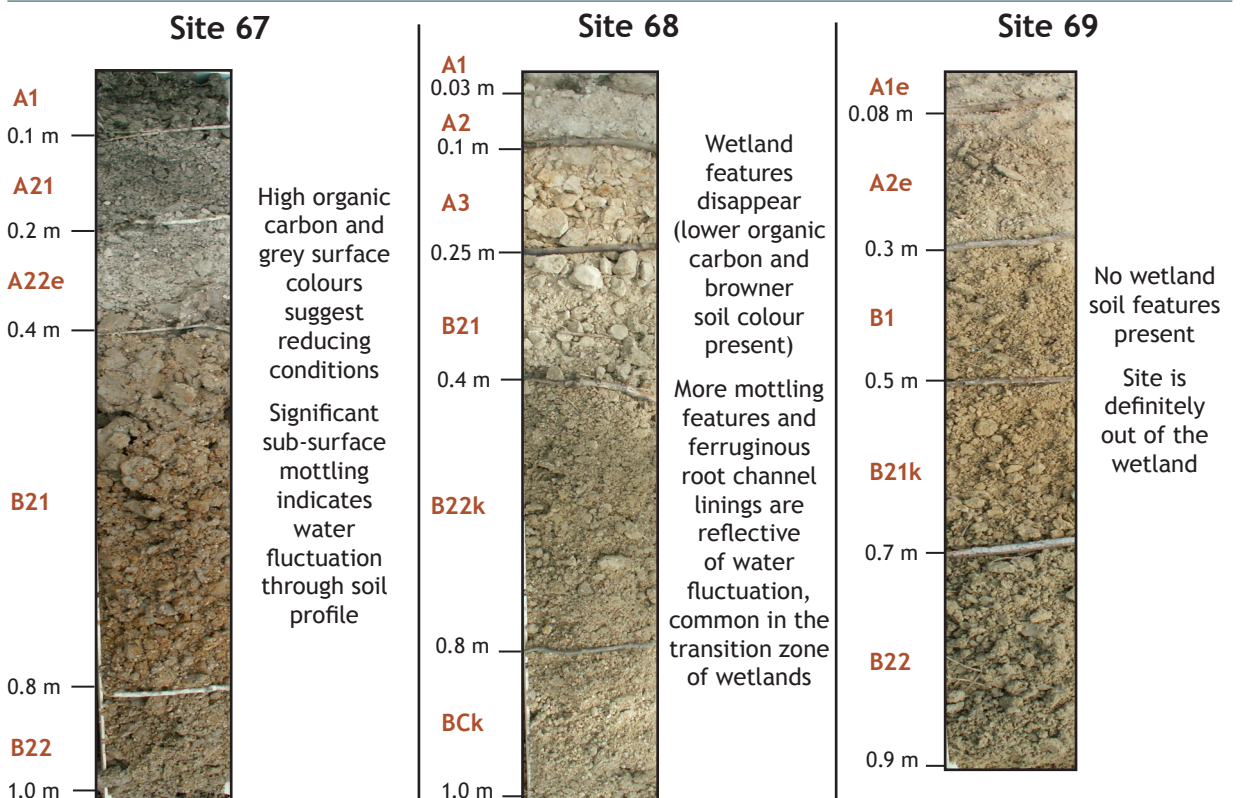
GDA94 • MGA Coordinates : 708205 E, 8517325 N, Zone 54 • Lat/Long : -13.40446 S, 142.92281 E



## Landscape Diagram



## Soil Profiles



## Soil Indicators Present (within 0.3 m of surface)

Indicator <sup>5</sup>	Site 67	Site 68	Site 69
Organic materials and organic carbon (OC)*	No organic materials OC: 2.59%	No organic materials OC: 1.01%	No organic materials OC: 0.37%
Matrix colour	Grey	Greyish brown to brownish grey	Brown
Chroma (thickness of layer)**	Present (0.3 m)	Present (0.3 m)	Present (0.08 m)
Mottles and Segregations	Few <5 mm faint orange mottles	Few <5 mm faint orange mottles Few <5 mm distinct orange mottles Few 5-15 mm faint orange mottles Few <2 mm manganiferous soft segregations	Not present
Depth to groundwater	Not present	Not present	Not present
Ferruginous root channel and pore linings	Not present	Present	Not present
pH* <sup>6</sup>	Very strongly acid	Strongly acid	Moderately acid
Texture	Silty clay loam	Loamy fine sand to silty clay loam	Loamy fine sand to fine sandy loam
Acid sulfate material	Not present	Not present	Not present
Electrical Conductivity (EC) <sup>6</sup>	Non saline	Non saline	Non saline

\*Organic carbon % (Dumas method) and pH taken from surface (0-0.1 m)

\*\*Chroma value is less than or equal to 2

## Summary of Field Observations

- Darker soil surface colours reflect reducing conditions in the saturated zone
- Significant sub-surface mottling present in wetter areas indicative of water fluctuation throughout profile
- Higher organic carbon in saturated zone (2.5%) suggests a waterlogged environment
- Organic acids contribute to a low pH in saturated zone (4.5 to 5.0 at depth), acidic to alkaline pH in outer zone on granite colluvium (5.7 to 9.1 at depth)
- Soil textures indicate wetter conditions with silty soil fraction (dilatant soils, Figure 1) present in saturated zone grading to a fine sandy colluvium in transition and outer zone
- *Melaleuca* species indicative of intermittent waterlogged condition
- Salts have been flushed through the soil profile in the saturated zone with salts accumulating at depth in the transition and outer zones



Figure 1. Dilatant soil a) When squeezed into a ball water is held in the soil particles and does not flow out of the soil b) Upon releasing the ball, water quickly appears on the soil surface c) a few seconds later soil particles lose cohesion and water flows out of the ball

Soil Morphology

Site 67		Classification			Australian Soil Classification				Bleached, Chromosolic, Redoxic Hydrosol		
		Landform Element			Swamp				Lower slope		
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
A1	0 to .1	clear to	silty clay loam	very dark grey (10YR31)	none	none	strong 2-5 mm subangular blocky	none	weak moist		
A21	.1 to .2	clear to	silty clay loam	grey (10YR51)	none	none	massive	none	firm moderately moist		
A22e	.2 to .4	clear to	silty clay loam	grey (10YR61)	few (2-10%) fine (<5 mm) faint orange mottles	none	weak 10-20 mm platy	none	firm moderately moist		
B21	.4 to .8	gradual to	silty medium clay	grey (10YR61)	many (20-50%) fine (<5 mm) prominent orange mottles	none	moderate 10-20 mm angular blocky	none	firm moderately moist		
B22	.8 to 1		silty medium clay	grey (10YR61)	common (10-20%) medium (5-15 mm) faint orange mottles	none	moderate 2-5 mm angular blocky	none	firm moist		

Site 68		Classification			Australian Soil Classification				Bleached-Sodic, Sodosolic, Redoxic Hydrosol		
		Landform Element			Swamp				Simple slope		
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
A1	0 to .03	-	silty loam	dark greyish brown (10YR42)	few (2-10%) fine (<5 mm) faint orange mottles	none	weak 10-20 mm platy	few (2-10%) fine (<2 mm) ferruginous root linings	weak dry		
A2	.03 to .1	-	loamy fine sand	dark greyish brown (2.5Y42)	few (2-10%) fine (<5 mm) distinct orange mottles	none	massive	none	firm dry		
A3	.1 to .25	-	silty clay loam	dark greyish brown (2.5Y42)	many (20-50%) fine (<5 mm) distinct orange mottles	none	weak 5-10 mm platy	few (2-10%) fine (<2 mm) manganiferous soft segregations	very firm dry		
B21	.25 to .4	-	silty clay loam	light brownish grey (2.5Y62)	few (2-10%) medium (5-15 mm) faint orange mottles	none	strong 50-100 mm columnar, weak 5-10 mm angular blocky	none	strong moderately moist		
B22k	.4 to .8	-	fine sandy light clay	light brownish grey (2.5Y62)	common (10-20%) medium (5-15 mm) distinct orange mottles	none	weak 5-10 mm angular blocky	few (2-10%) medium (2-6 mm) calcareous nodules	firm moist		
Bck	0.8 to 1.2	-	coarse sandy light medium clay	-	none	none	-	-	-		

Site 69		Classification			Australian Soil Classification				Bleached, Hypocalcic, Yellow Dermosol	
		Landform Element			Hillslope					
		Morphological Type			Lower slope					
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence	
A1e	0 to .08	abrupt to	loamy fine sand	greyish brown (10YR5/2)	none	none	massive	-	-	
A2e	.08 to .3	clear to	fine sandy loam	brown (10YR5/3) moist very pale brown (10YR7/3) dry	none	none	massive	none	-	
B1	.3 to .5	gradual to	fine sandy clay loam	yellowish brown (10YR5/4)	none	none	massive	very few (<2%) fine (<2 mm) manganiferous nodules	-	
B21k	.5 to .7	gradual to	fine sandy light clay	light yellowish brown (2.5Y6/4)	common (10-20%) fine (<5 mm) faint yellow mottles	none	weak 5-10 mm angular blocky	few (2-10%) coarse (6-20 mm) calcareous concretions	-	
B22	.7 to .9	-	fine sandy light medium clay	light brownish grey (2.5Y6/3)	very few (<2%) fine (<5 mm) faint yellow mottles	none	moderate 5-10 mm angular blocky	very few (<2%) medium (2-6 mm) manganiferous laminae	-	

## Soil Chemistry

Site	Depth (m)	pH*	EC (dS/m)	Cl (mg/kg)	NO3-N	TC%**	TN%**
67	0.00-0.10	4.6	0.04	29	2	2.59	0.11
	0.20-0.30	4.5	0.02	20	2	0.23	<0.03
	0.40-0.50	5	0.03	23	1	0.14	<0.03
68	0.00-0.10	5.2	0.04	30	<1	1.01	0.07
	0.20-0.30	6.6	0.11	94	<1	0.11	<0.03
	0.40-0.50	7.6	0.69	940	1	0.08	<0.03
69	0.00-0.10	5.7	0.09	84	<1	0.37	<0.03
	0.20-0.30	7.8	0.31	326	<1	0.12	<0.03
	0.40-0.50	9.1	0.79	937	1	0.07	<0.03

\*Aqueous 1:5

\*\*Total carbon and total nitrogen

## References

1. Queensland Department of Natural Resources and Water (2008). *SIL0* [online]. Available at <http://www.longpaddock.qld.gov.au/silo/> [accessed 5/11/2007].
2. Isbell RF (2002). *The Australian Soil Classification*. CSIRO Publishing, Collingwood, Victoria, revised edition.
3. EPA (2008) *Regional Ecosystems*. [online]. Available at [http://www.epa.qld.gov.au/nature\\_conservation/biodiversity/regional\\_ecosystems/](http://www.epa.qld.gov.au/nature_conservation/biodiversity/regional_ecosystems/) [accessed 28/06/08].
4. Bureau of Mineral Resources (1977). *Coen: Australia 1:250,000 Geological Series, Bureau of Mineral Resources, Canberra*.
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6. Hazelton P and Murphy B (2007). *Interpreting Soil Test Results: What do all the numbers mean? [2nd ed]. CSIRO publishing. Collingwood Victoria*

