

# Eubenangee Swamp

## Northern Transect



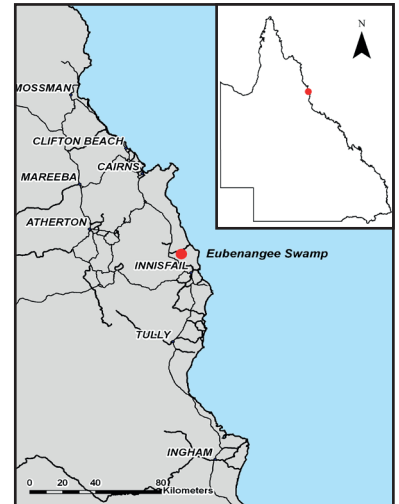
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### Study Area

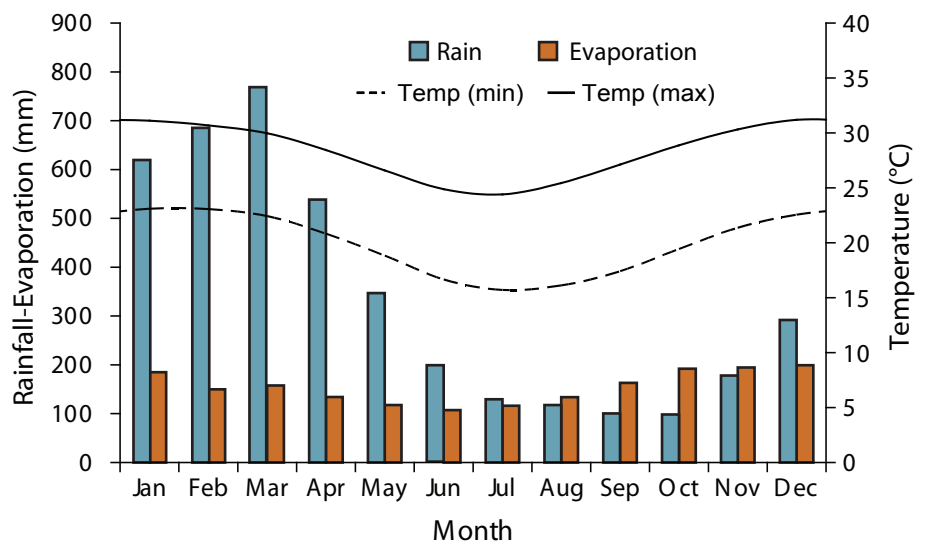
Eubenangee swamp is located 20 km north of Innisfail along the Bramston Beach Road, Northern Queensland.

The majority of the site falls within the Eubenangee Swamp National Park. There were two study areas undertaken at Eubenangee, located at the northern and southern sections of the swamp.

Eubenangee swamp is an example of a coastal and sub-coastal floodplain grass, sedge, herb swamp with organic soils in the Wet Tropics Bioregion.



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



The study area is situated within a tropical/equatorial climatic region with a distinct wet and dry season. Rainfall exceeds evaporation in the majority of months. The annual average rainfall is 4065 mm.

<b>Landform and Inundation</b>	Closed depression on alluvium Freshwater permanent and seasonally inundated areas from overland flow
<b>Soils<sup>2</sup></b>	Organosols and Hydrosols
<b>Vegetation<sup>3</sup></b>	<i>Hemarthria uncinata</i> and/or <i>Ischaemum australe</i> and/or <i>Cynodon dactylon</i> grassland, and/or ephemeral sedge lands, on seasonally inundated alluvial plains (RE 7.3.1)
<b>Geology<sup>4</sup></b>	Quaternary alluvial and minor colluvial deposits
<b>Disturbance</b>	Little to no disturbance



Australian Government



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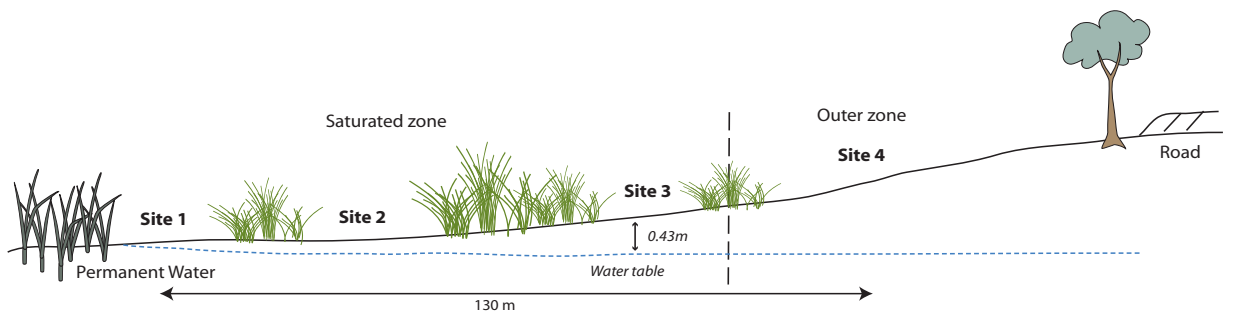
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## Location

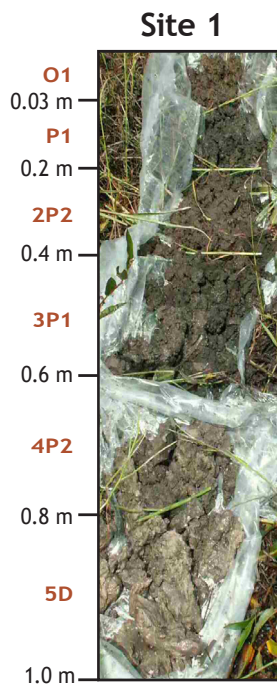
GDA94 • MGA Coordinates : 319468 E, 8074891 N, Zone 55 • Lat/Long : -17.40916 S, 145.97817 E



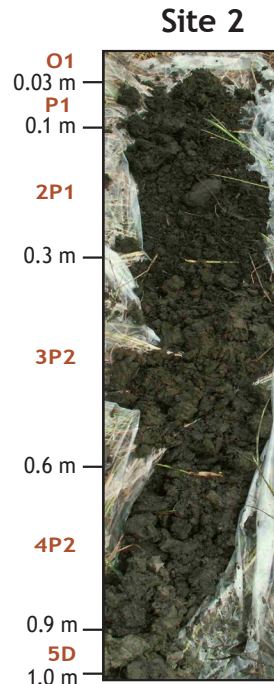
## Landscape Diagram



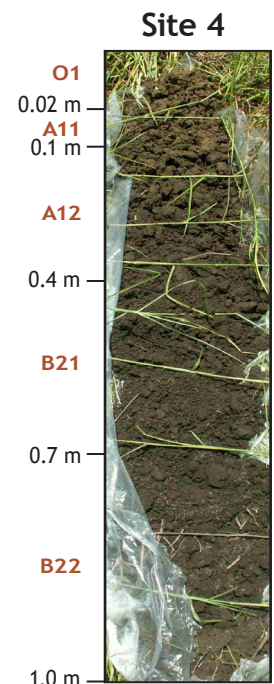
## Soil Profiles



Organic materials, high organic carbon content and grey colours at depth (0.8 m) are indicative of a reduced environment



Organic materials, high organic carbon content, dark surface colour and mottling all indicate a waterlogged environment



Wetland soil indicators disappear out of profile moving out of the wetland, site may only be inundated for a short time

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

Indicator <sup>5</sup>	Site 1	Site 2
Organic materials and organic carbon (OC)*	Organic materials to 0.3 m OC: 8.93%	Organic materials to 0.3 m OC: 8.45%
Matrix colour	Black to dark grey	Black
Chroma (thickness of layer)**	Present (0.3 m)	Present (0.3 m)
Mottles and Segregations	Few 5-15 mm faint brown mottles	Very few <5 mm faint brown mottles
Depth to groundwater	0.05 m	0.3 m
Ferruginous root channel and pore linings	Not present	Not present
pH <sup>6</sup>	Very strongly acid	Very strongly acid
Texture	Loam to light clay	Loam to clay loam
Acid sulfate material	Not present	Not present
Electrical Conductivity (EC) <sup>6</sup>	Non saline	Non saline
Indicator <sup>5</sup>	Site 3	Site 4
Organic materials and organic carbon (OC)*	Organic materials to 0.3 m OC: 8.43%	No organic materials OC: 7.47%
Matrix colour	Black to dark grey	Greyish brown to grey
Chroma (thickness of layer)**	Present (0.3 m)	Present (0.3 m)
Mottles and Segregations	Few 15-30 mm faint brown mottles	Not present
Depth to groundwater	0.43 m	Not present
Ferruginous root channel and pore linings	Not present	Not present
pH <sup>6</sup>	Very strongly acid	Very strongly acid
Texture	Loam to clay loam	Loam
Acid sulfate material	Not present	Not present
Electrical Conductivity (EC) <sup>6</sup>	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

- Presence of swamp hummock microrelief denotes a saturated environment
- Darker soil surface colours are a positive indicator of reducing conditions where there is organic accumulation
- High organic carbon levels and presence of organic materials indicate saturated conditions
- Poor external drainage with high water tables predispose area to saturated conditions
- Mottling observed within surface 0.3 m and at depth indicates water fluctuation throughout profiles in the saturated and transition zone



Soil Morphology

Site 1		Classification			Australian Soil Classification				Terric, Acidic, Fibric Organosol		
					Landform Element				Swamp		
					Morphological Type				Closed depression		
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
O1	0 to .03	-	-	-	none	none	massive	none	-		
P1	.03 to .2	clear to	fibric loam	black (2.5Y21)	none	none	massive	none	-		
2P2	.2 to .4	clear to	sapric light clay	very dark grey (2.5Y31)	few (2-10%) medium (5-15 mm) faint brown mottles	none	massive	none	-		
3P1	.4 to .6	diffuse to	fibric light clay	black (2.5Y21)	few (2-10%) medium (5-15 mm) faint grey mottles	none	massive	none	-		
4P2	.6 to .8	clear to	sapric light medium clay	very dark grey (2.5Y31)	very few (<2%) medium (5-15 mm) faint dark mottles	none	massive	none	-		
5D	.8 to 1	-	light medium clay	light olive grey (5Y62)	none	none	massive	none	-		

Site 2		Classification			Australian Soil Classification				Terric, Acidic, Sapric Organosol		
					Landform Element				Swamp		
					Morphological Type				Closed depression		
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
O1	0 to .03	clear to	-	-	none	none	massive	none	-		
P1	.03 to .1	clear to	fibric loam	black (10YR21)	very few (<2%) fine (<5 mm) faint brown mottles	none	massive	none	-		
2P1	.1 to .3	gradual to	fibric clay loam	black (2.5Y21)	none	none	massive	-	-		
3P2	.3 to .6	gradual to	sapric light clay	very dark grey (2.5Y31)	few (2-10%) medium (5-15 mm) distinct grey mottles	none	massive	-	-		
4P2	.6 to .9	abrupt to	sapric light medium clay	very dark grey (2.5Y31)	none	none	massive	none	-		
5D	.9 to 1	-	medium clay	grey (5Y61)	none	none	massive	none	-		

Site 3		Classification			Australian Soil Classification				Terric, Acidic, Sapric Organosol		
					Landform Element				Swamp		
					Morphological Type				Closed depression		
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
O1	0 to .02	-	-	-	none	none	massive	none	-		
P2	.02 to .1	gradual to	sapric loam	very dark grey (2.5Y31)	few (2-10%) coarse (15-30 mm) faint brown mottles	none	massive	none	-		
2P2	.1 to .4	diffuse to	sapric clay loam	black (2.5Y21)	none	none	massive	none	-		
3P2	.4 to .8	diffuse to	sapric light clay	black (5Y21)	none	none	massive	none	-		
4P2	.8 to .9	clear to	sapric light medium clay	very dark grey (2.5Y31)	none	none	massive	none	-		
D	.9 to 1	-	medium clay	greyish brown (2.5Y52)	none	none	massive	none	-		

Site 4		Classification			Australian Soil Classification				Humose-Acidic, Kurosollic, Oxyaquic Hydrosol		
					Landform Element				Plain		
					Morphological Type				Closed depression		
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
O1	0 to .02	-	-	-	none	none	massive	-	-		
A11	.02 to .1	clear to	loam	very dark greyish brown (10YR32)	none	none	weak 5-10 mm granular	none	-		
A12	.1 to .4	gradual to	loam	very dark grey (10YR31)	none	none	weak 2-5 mm granular	none	-		
B21	.4 to .7	clear to	light clay	dark grey (2.5Y41)	none	none	massive	none	-		
B22	.7 to 1	-	light medium clay	dark greyish brown (10YR42)	none	none	massive	none	-		

## Soil Chemistry

Site	Depth (m)	pH*	EC dS/m	Cl mg/kg	NO3-N mg/kg	P mg/kg	S mg/kg	TC** %	TN** %	Ca meq/100g	Mg meq/100g	Na meq/100g	K meq/100g	Na corr meq/100g	Cu mg/kg	Zn1 mg/kg	Mn mg/kg	Fe mg/kg
1	0.00-0.10	4.8	0.07	37	4	19	34	8.93	0.88	0.499	0.517	0.266	0.262	0.162	2.1	0.5	0.8	244
	0.20-0.30	4.9	0.03	22	<1	15	27	6.89	0.57	0.222	0.228	0.316	0.125	0.254	1.7	0.2	0.7	96.1
	0.40-0.50	5	0.02	23	<1	12	41	5.38	0.41	0.139	0.127	0.135	0.056	0.071	0.6	0.1	0.3	32.2
2	0.00-0.10	4.7	0.05	32	<1	11	30	8.45	0.76	0.317	0.287	0.225	0.222	0.134	1.9	0.5	0.6	195
	0.20-0.30	4.8	0.02	23	<1	11	40	6.45	0.53	0.191	0.147	0.14	0.098	0.075	0.8	0.2	0.7	83.6
	0.40-0.50	5	0.02	22	<1	9	45	5.52	0.37	0.127	0.095	0.109	0.08	0.047	0.6	0.1	0.3	34.7
3	0.00-0.10	4.8	0.05	33	<1	11	30	8.53	0.77	0.23	0.263	0.214	0.31	0.121	2	0.6	0.8	139
	0.20-0.30	4.7	0.03	30	1	12	24	7.46	0.56	0.11	0.11	0.123	0.084	0.038	0.7	0.2	0.5	57.3
	0.40-0.50	4.9	0.01	23	<1	11	37	5.63	0.38	0.072	0.072	0.101	0.054	0.036	0.4	<0.1	0.4	18.8
4	0.00-0.10	4.8	0.04	24	3	20	35	7.47	0.65	0.414	0.364	0.12	0.205	0.052	1.9	0.7	1.3	174
	0.20-0.30	4.6	0.02	25	<1	9	54	6.33	0.5	0.09	0.104	0.047	0.103	<0.012	0.8	0.5	0.5	76
	0.40-0.50	4.7	0.02	24	1	9	61	5.46	0.32	0.048	0.045	0.043	0.058	<0.012	0.4	0.2	1.1	45.5

\*Aqueous 1:5

\*\*Total carbon and total nitrogen

## References

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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].
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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

