

## Marine Plain Normanton

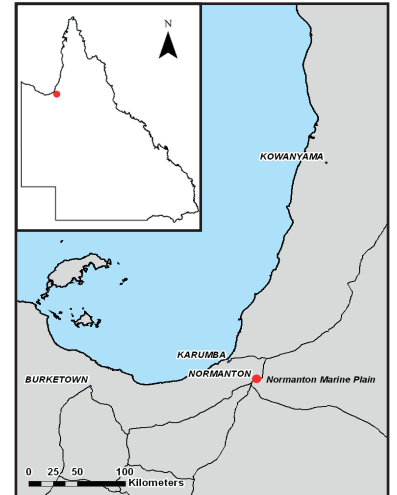


### Study Area

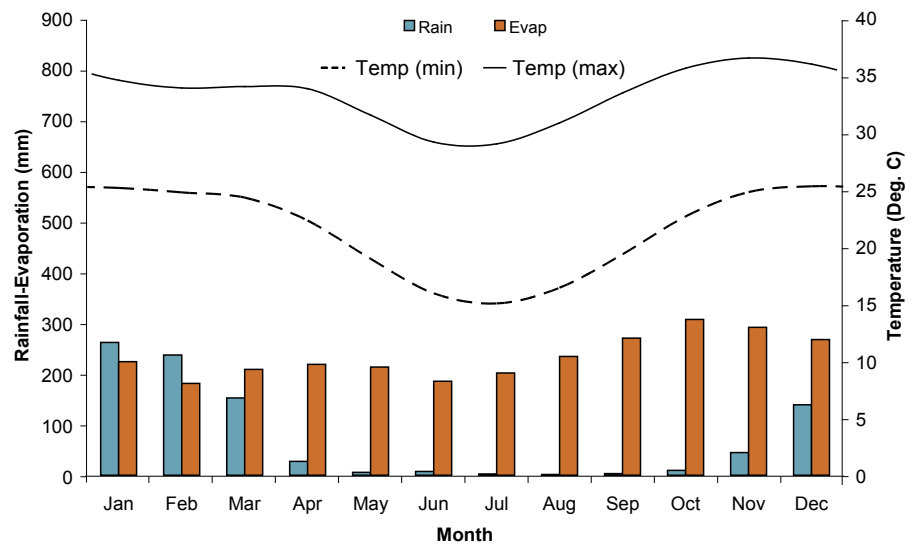
The Normanton marine plain transect is located on an extratidal flat 1 km north of the township of Normanton, Northern Queensland.

The area appears to be influenced by seasonal freshwater inundation and infrequent tidal inundation.

This study area is an example of a supratidal flat in the Gulf Plains 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 889 mm.

<b>Landform and Inundation</b>	Salt pan and tidal flat Infrequent tidal inundation and seasonal freshwater inundation from overland flow
<b>Soils<sup>2</sup></b>	Hydrosols
<b>Vegetation<sup>3</sup></b>	Infrequently inundated clay plains and low samphire rises (RE 2.1.4)
<b>Geology<sup>4</sup></b>	Floodplain alluvium and floodout deposits
<b>Disturbance</b>	No effective disturbance



Australian Government



Queensland Government

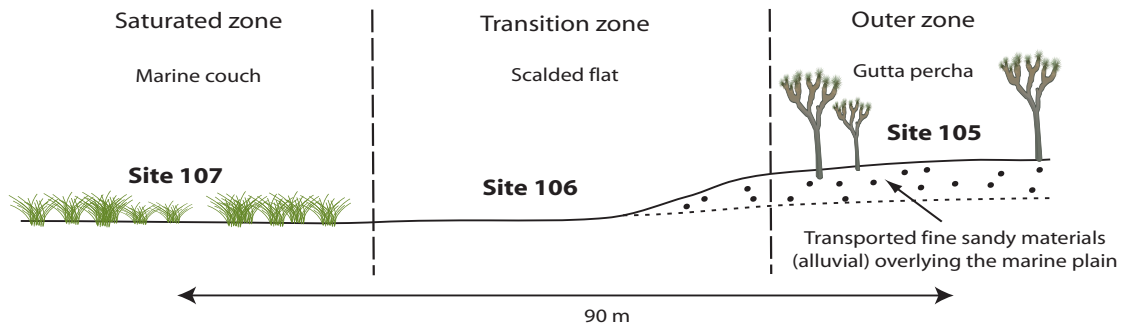
Queensland  
Wetlands Program

## Location

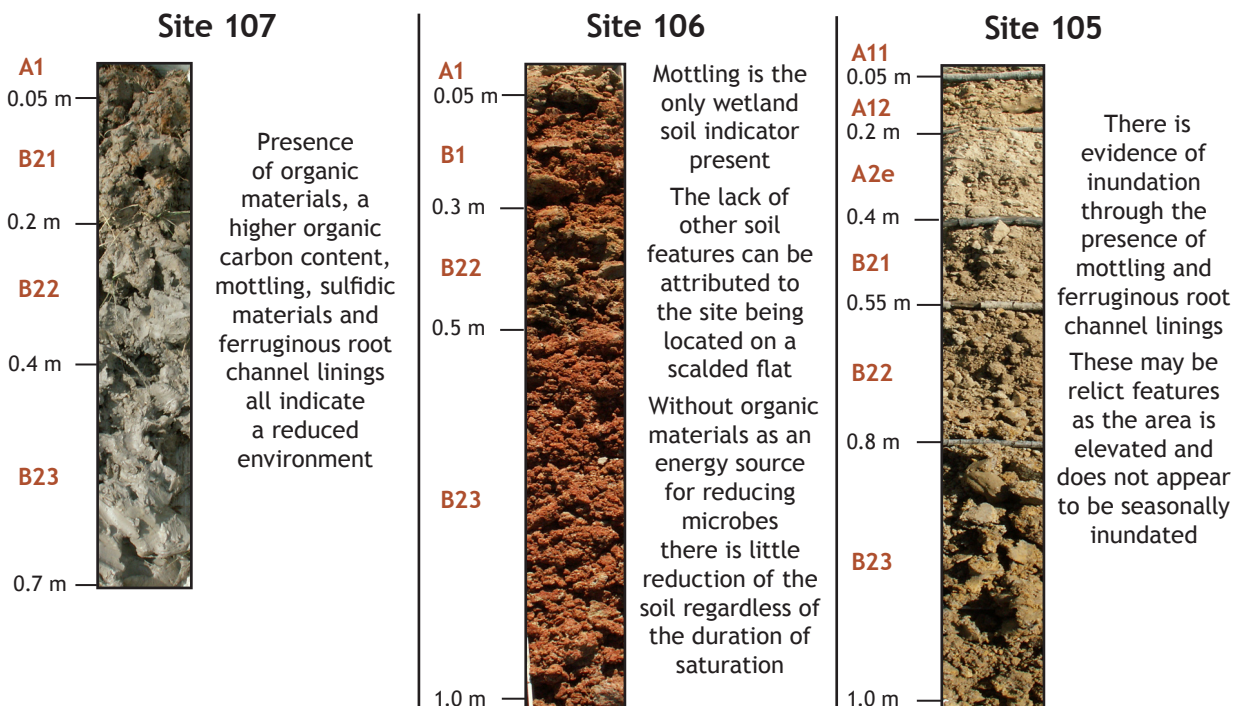
GDA94 • MGA Coordinates : 510340 E, 8047343 N, Zone 54 • Lat/Long : -17.66076 S, 141.09748 E



## Landscape Diagram



## Soil Profiles





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

Indicator <sup>5</sup>	Site 105	Site 106	Site 107
Organic materials and organic carbon (OC)*	No organic materials OC: 0.91%	No organic materials OC: 0.07%	Organic materials layer 0.05 m thick starting within 0.3 m OC: 1.42%
Matrix colour	Brown	Yellowish brown	Grey
Chroma (thickness of layer)**	Present (0.1 m)	Not present	Present (0.3 m)
Mottles and Segregations	Few <5 mm prominent orange mottles Common <5 mm distinct orange mottles	Few <5 mm distinct yellow mottles Few <5 mm distinct gley mottles Few 2-6 mm manganiferous laminae	Few 2-6 mm sulfurous soft segregations Common <5 mm distinct orange mottles Common 5-15 mm prominent orange mottles Common 5-15 mm distinct orange mottles
Depth to groundwater	Not present	Not present	Not present
Ferruginous root channel and pore linings	Present	Not present	Present
pH <sup>6</sup>	Very strongly acid	Slightly acid	Very strongly acid
Texture	Silty clay loam to fine sandy clay loam	Sand to sandy light medium clay	Silty light clay to silty light medium clay
Acid sulfate material	Not present	Not present	Present
Electrical Conductivity (EC) <sup>6</sup>	Non saline	Moderately saline	Moderately 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

- Grey surface colours and low chroma values indicative of reduced environment in the saturated zone
- Mottling observed within the soil surface and at depth indicates water fluctuation throughout all profiles, this is reflective of an environment which is seasonally saturated
- Organic materials in saturated zone imply the area is commonly inundated
- Sulfurous segregations in saturated zone and iron staining of nearby environment indicative of acid sulfate materials (Figure 1 and 2)
- Ferruginous root channel linings suggest a periodically waterlogged environment (Figure 3)



Figure 1. Sulfurous segregations or yellow jarosite present within the saturated zone



Figure 2. Iron staining is a by-product of the oxidation of acid sulfate soils. This leads to the formation of rust coloured iron stains which coat the surrounding environment and the formation of oily looking bacterial surface water <sup>7</sup>



Figure 3. Ferruginous root channel linings provide reliable evidence of plant growth in a saturated environment, where the root has pushed oxygen into the saturated soil forming a coating of ferric iron around the root channel

Soil Morphology

Site 105	Classification			Australian Soil Classification				Bleached-Sodic, Dermosolic, Redoxic Hydrosol		
	Classification			Landform Element				Plain		
	Morphological Type			Morphological Type				Flat		
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence	
A11	0 to .05	clear to	silty clay loam	brown (10YR43)	few (2-10%) fine (<5 mm) prominent orange mottles	none	weak 10-20 mm platy, moderate 5-10 mm subangular blocky	common (10-20%) fine (<2 mm) ferruginous root linings	firm dry	
A12	.05 to .2	clear to	clay loam, fine sandy	pale brown (10YR63)	common (10-20%) fine (<5 mm) distinct orange mottles	none	weak 5-10 mm subangular blocky	common (10-20%) medium (2-6 mm) ferruginous root linings	weak moderately moist	
A2e	.2 to .4	clear to	fine sandy clay loam	pale brown (10YR63)	common (10-20%) fine (<5 mm) distinct orange mottles	none	weak 5-10 mm subangular blocky	few (2-10%) fine (<2 mm) ferruginous root linings	weak moderately moist	
B21	.4 to .55	-	fine sandy light clay	greyish brown (10YR52)	few (2-10%) fine (<5 mm) distinct red mottles, common (10-20%) medium (5-15 mm) faint yellow mottles	none	weak 10-20 mm angular blocky	none	firm moderately moist	
B22	.55 to .8	-	fine sandy light clay	greyish brown (10YR52)	common (10-20%) fine (<5 mm) distinct red mottles, few (2-10%) medium (5-15 mm) distinct yellow mottles	none	weak 10-20 mm angular blocky	none	firm moderately moist	
B23	.8 to 1	-	fine sandy light medium clay	yellowish brown (10YR56)	many (20-50%) medium (5-15 mm) distinct grey mottles, common (10-20%) fine (<5 mm) faint orange mottles	none	weak 10-20 mm angular blocky	few (2-10%) fine (<2 mm) manganiferous laminae, few (2-10%) fine (<2 mm) manganiferous soft segregations	firm moist	

Site 106		Classification			Australian Soil Classification				Mottled, Hypersalic Hydrosol		
		Landform Element			Extratidal Flat				Extratidal Flat		
		Morphological Type			Midslope				Midslope		
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
A1	0 to .05	abrupt to	sand	very pale brown (10YR73)	none	none	weak 10-20 mm platy	none	firm dry		
B1	.05 to .3	gradual to	sandy light medium clay	dark yellowish brown (10YR46)	few (2-10%) fine (<5 mm) distinct yellow mottles, few (2-10%) fine (<5 mm) distinct grey mottles	none	weak 2-5 mm lenticular	few (2-10%) medium (2-6 mm) manganese laminae	very firm dry		
B22	.3 to .5	clear to	sandy medium clay	light brownish grey (10YR62)	many (20-50%) fine (<5 mm) distinct red mottles, few (2-10%) fine (<5 mm) faint yellow mottles	none	weak 2-5 mm lenticular	none	firm moist		
B23	.5 to 1	clear to	medium clay	light brownish grey (10YR62)	common (10-20%) medium (5-15 mm) prominent pale mottles, few (2-10%) fine (<5 mm) distinct yellow mottles	none	weak 2-5 mm lenticular	none	very firm moderately moist		
B2?	1 to 1.1	-	-	light brownish grey (10YR62)	common (10-20%) medium (5-15 mm) prominent red mottles, few (2-10%) fine (<5 mm) faint yellow mottles	none	strong 20-50 mm prismatic, strong 10-20 mm angular blocky	none	strong dry		

Site 107		Classification			Australian Soil Classification				Sulfuric, Extratidal Hydrosol		
		Landform Element			Extratidal Flat				Extratidal Flat		
		Morphological Type			Open depression				Open depression		
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
A1	0 to .05	clear to	fibric silty light clay	grey (10YR51)	common (10-20%) fine (<5 mm) distinct orange mottles	none	moderate <2 mm subangular blocky	many (20-50%) medium (2-6 mm) ferruginous root linings	weak moist		
B21	.05 to .2	clear to	silty light medium clay	grey (2.5Y51)	common (10-20%) medium (5-15 mm) prominent orange mottles	none	massive	common (10-20%) medium (2-6 mm) ferruginous root linings	weak moist		
B22	.2 to .4	gradual to	silty light medium clay	grey (2.5Y51)	common (10-20%) medium (5-15 mm) distinct orange mottles	none	massive	few (2-10%) medium (2-6 mm) sulphurous soft segregations	weak wet		
B23	.4 to .7		silty light clay	light brownish grey (2.5Y62)	none	none	massive	common (10-20%) medium (2-6 mm) sulphurous soft segregations	very weak wet		

## Soil Chemistry

Site	Depth (m)	pH*	EC (dS/m)	Cl (mg/kg)	NO <sub>3</sub> -N (mg/kg)	TC%**	TN%**
105	0.00-0.10	4.3	0.08	130	4	0.91	0.08
	0.20-0.30	4.7	0.1	112	1	0.24	<0.03
	0.40-0.50	4.8	0.73	932	<1	0.26	<0.03
106	0.00-0.10	6.1	5.29	7850	2	0.07	<0.03
	0.20-0.30	5.5	6.28	9390	2	<0.05	<0.03
	0.40-0.50	5.6	6.93	11000	1	<0.05	<0.03
107	0.00-0.10	4.4	2.96	3590	<1	1.42	0.12
	0.20-0.30	4.7	6.08	8710	1	0.38	<0.03
	0.40-0.50	4.2	9.55	14800	<1	0.3	0.03

\*Aqueous 1:5

\*\*Total carbon and total nitrogen

## References

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