

Goorganga Plain

Swamp



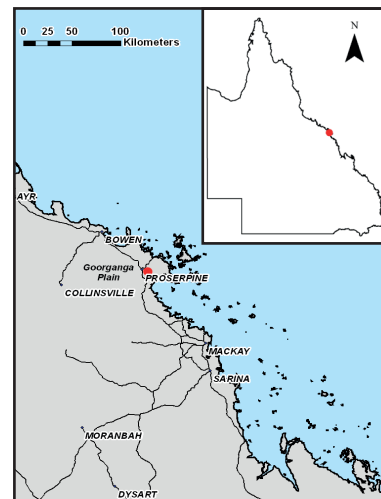
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Study Area

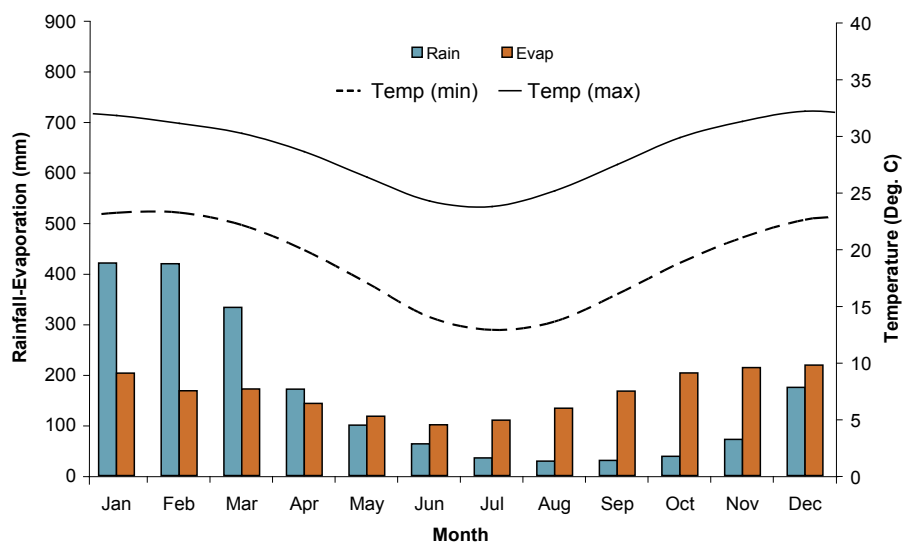
Goorganga plain is situated approximately 6 km south-east of Proserpine, Central Queensland.

Goorganga plain is the largest floodplain in the Central Queensland Bioregion and has extensive areas of seasonally inundated grasslands¹.

This study site is an example of a coastal and sub-coastal floodplain tree swamp (melaleuca and eucalyptus spp.) within the Central Queensland Bioregion.



Climate²



The study area is situated within a subtropical climatic region with a wet and dry season. Evaporation exceeds rainfall in the majority of months. The average annual rainfall for the area is 1886 mm.

Landform and Inundation	Freshwater melaleuca swamp on an alluvial plain Freshwater periodically inundated areas from overland flow
Soils³	Hydrosols and Chromosols
Vegetation⁴	<i>Melaleuca viridiflora</i> closed forest to woodland in broad drainage areas (wetlands) (RE 8.3.11)
Geology⁵	Coastal mud, silt and minor evaporites
Disturbance	No effective disturbance except grazing by hoofed animals



Australian Government



Queensland Government

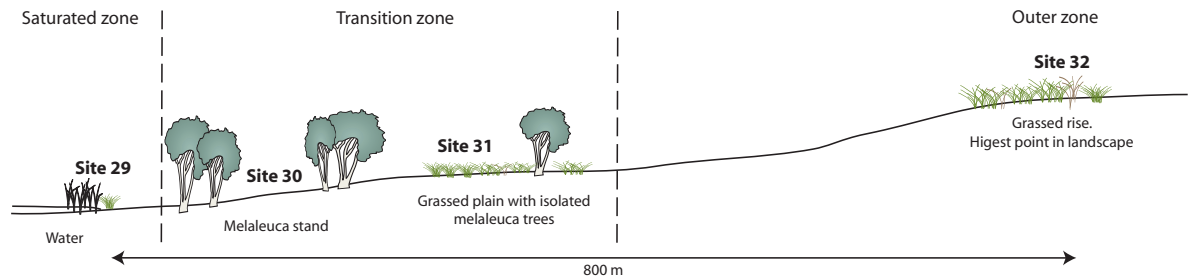
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Location

GDA94 • MGA Coordinates : 671010 E, 7740993 N, Zone 55 • Lat/Long : -20.42176 S, 148.63905 E

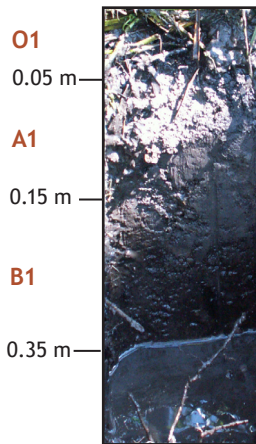


Landscape Diagram



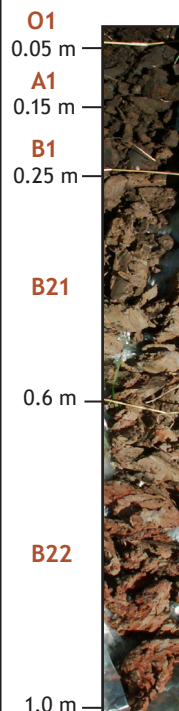
Soil Profiles

Site 29



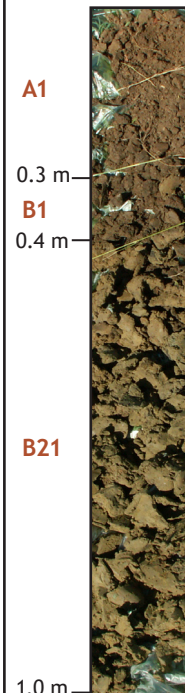
High organic carbon content, organic materials, mottling and ferruginous root channel linings indicate that the area remains saturated for extended periods of time

Site 30



High organic carbon content, mottling and ferruginous root channel linings all positive indicators of periodic inundation

Site 32



Mottling is the only indicator of a wetland soil

This suggests the area may be infrequently saturated/ inundated

Soil Indicators Present (within 0.3 m of surface)

Indicator ⁶	Site 29	Site 30
Organic materials and organic carbon (OC)*	Organic materials layer 0.15 m thick starting within 0.3 m OC: 4.03%	No organic materials OC: 4.85%
Matrix colour	Black to dark grey	Dark grey
Chroma (thickness of layer)**	Present (0.3 m)	Present (0.3 m)
Mottles and Segregations	Very few <5 mm distinct red mottles	Very few <5 mm distinct red mottles Few <5 mm faint brown mottles Few 5-15 mm prominent orange mottles
Depth to groundwater	0.05 m	Not present
Ferruginous root channel and pore linings	Present	Present
pH ^{*7}	Very strongly acid	Very strongly acid
Texture	Heavy light clay to light medium clay	Light medium clay to medium clay
Acid sulfate material	Not present	Undetermined
Electrical Conductivity (EC) ⁷	Non saline	Non saline
Indicator ⁶	Site 31	Site 32
Organic materials and organic carbon (OC)*	No organic materials OC: 4.02%	No organic materials OC: 3%
Matrix colour	Greyish brown to black	Dark grey
Chroma (thickness of layer)**	Present (0.3 m)	Present (0.3 m)
Mottles and Segregations	Few 5-15 mm distinct red mottles	Very few <5 mm faint red mottles
Depth to groundwater	Not present	Not present
Ferruginous root channel and pore linings	Present	Not present
pH ^{*7}	Very strongly acid	Strongly acid
Texture	Heavy light clay to light medium clay	Light medium clay
Acid sulfate material	Not present	Not present
Electrical Conductivity (EC) ⁷	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

- Considerable faint, distinct and prominent mottling at all sites is indicative of water fluctuation throughout the profiles
- High organic carbon levels signify a saturated environment
- Presence of sapric materials suggest the saturated zone is inundated for a long period of time
- Ferruginous root channel linings are indicative of periodically inundated environment (Figure 1)

Figure 1. 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 29			Classification			Australian Soil Classification			Acidic, Kandosolic, Redoxic Hydrosol		
			Landform Element			Landform Element			Swamp		
			Morphological Type			Morphological Type			Flat		
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
O1	0 to .05	-	-	-	none	none	-	none	-		
A1	.05 to .15	-	sapric light medium clay	black (10YR2.1)	none	none	massive	none	-		
B1	.15 to .35	-	heavy light clay	very dark grey (10YR3.1)	very few (<2%) fine (<5 mm) distinct red mottles	none	weak 2-5 mm angular blocky	none	-		
B21	.35 to .45	-	heavy light medium clay	very dark grey (2.5Y3.1)	few (2-10%) fine (<5 mm) distinct yellow mottles, few (2-10%) medium (5-15 mm) faint grey mottles	very few (<2%) angular quartz small pebbles (2-6 mm)	weak 2-5 mm angular blocky	none	-		
B22	.45 to 1	-	heavy light medium clay	dark grey (2.5Y4.1)	common (10-20%) medium (5-15 mm) distinct red mottles, few (2-10%) medium (5-15 mm) distinct yellow mottles	very few (<2%) angular quartz small pebbles (2-6 mm)	weak 2-5 mm angular blocky	none	-		

Site 30			Classification			Australian Soil Classification			Acidic, Kandosolic, Redoxic Hydrosol		
			Landform Element			Landform Element			Plain		
			Morphological Type			Morphological Type			Flat		
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
O1	0 to .05	-	-	very dark grey (2.5Y3.1)	very few (<2%) fine (<5 mm) distinct red mottles	none	massive	none	-		
A1	.05 to .15	-	light medium clay	very dark grey (2.5Y3.1)	very few (<2%) fine (<5 mm) distinct red mottles	none	massive	none	-		
B1	.15 to .25	-	medium clay	very dark grey (2.5Y3.1)	few (2-10%) fine (<5 mm) faint brown mottles	none	massive	none	-		
B21	.25 to .6	-	heavy medium clay	greyish brown (2.5Y5.2)	few (2-10%) medium (5-15 mm) prominent orange mottles, very few (<2%) medium (5-15 mm) prominent red mottles	none	weak 2-5 mm angular blocky	none	-		
B22	.6 to 1	-	medium clay	grey (10YR6.1)	few (2-10%) medium (5-15 mm) prominent red mottles, very few (<2%) medium (5-15 mm) prominent orange mottles	none	weak 2-5 mm angular blocky	none	-		

Site 31		Classification			Australian Soil Classification				Acidic, Kandosolic, Redoxic Hydrosol		
					Landform Element				Plain		
					Morphological Type				Simple slope		
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
O1	0 to .05		heavy light clay	very dark greyish brown (10YR32)	very few (<2%) medium (5-15 mm) distinct red mottles	none	massive	none	-		
A1	.05 to .15		heavy light clay	very dark greyish brown (10YR32)	very few (<2%) medium (5-15 mm) distinct red mottles	none	massive	none	-		
B1	.15 to .3		light medium clay	black (10YR21)	few (2-10%) medium (5-15 mm) distinct red mottles	none	massive	none	-		
B21	.3 to .4		heavy medium clay	grey (2.5Y51)	few (2-10%) medium (5-15 mm) distinct orange mottles	none	weak 2-5 mm angular blocky	none	-		
B22	.4 to 1		heavy medium clay	grey (10YR61)	few (2-10%) medium (5-15 mm) prominent red mottles, very few (<2%) medium (5-15 mm) prominent orange mottles	none	weak 2-5 mm angular blocky	none	-		

Site 32		Classification			Australian Soil Classification				Mottled, Mesotrophic, Brown Chromosol		
					Landform Element				Plain		
					Morphological Type				Rise		
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
A1	0 to .3	-	light medium clay	very dark grey (7.5YR31)	very few (<2%) fine (<5 mm) faint red mottles	none	massive	none	-		
B1	.3 to .4	-	medium heavy clay	dark greyish brown (10YR42)	very few (<2%) fine (<5 mm) faint grey mottles	none	massive	very few (<2%) fine (<2 mm) ferruginous nodules	-		
B21	.4 to 1	-	heavy medium clay	greyish brown (2.5Y53)	few (2-10%) fine (<5 mm) faint yellow mottles, very few (<2%) fine (<5 mm) distinct grey mottles	none	weak 2-5 mm angular blocky	very few (<2%) fine (<2 mm) calcareous soft segregations	-		

Soil Chemistry

Site	Depth (m)	pH*	EC dS/m	Cl mg/kg	NO ₃ -N mg/kg	P mg/kg	S mg/kg	Ca meq/ 100g	Mg meq/ 100g	Na meq/ 100g	K meq/ 100g	Na corr meq/ 100g	Cu mg/kg	Zn mg/kg	Mn mg/kg	Fe mg/kg	TC** %	TN** %
29	0.00-0.10	4.6	0.24	64	1	9	301	7.28	11.3	1.66	0.336	1.48	1.1	2	16.4	290	4.03	0.26
	0.20-0.30	4.5	0.28	81	2	4	390	4.78	7.86	1.53	0.603	1.3	0.7	1.4	10.8	187	3.18	0.2
	0.40-0.50	4.4	0.28	93	2	5	483	3.58	7.46	2.35	0.618	2.09	0.6	1.1	13.2	130	1.62	0.09
30	0.00-0.10	4.3	0.5	239	<1	31	786	4.87	5.67	2.01	0.262	1.34	0.3	0.6	18.6	252	4.85	0.31
	0.20-0.30	3.9	0.73	217	1	4	1180	2.3	4.04	2.06	0.296	1.45	0.1	0.1	16.4	41.2	1.53	0.05
	0.40-0.50	3.9	0.85	211	<1	2	1220	2.2	4.64	2.22	0.421	1.63	<0.1	0.2	23	18.5	0.6	0.04
31	0.00-0.10	4.9	0.09	39	7	20	82	-	-	-	-	-	-	-	-	-	4.02	0.3
	0.20-0.30	4.5	0.1	24	2	10	228	4.61	4.5	0.455	0.645	0.387	0.4	0.7	13.3	172	2.73	0.17
	0.40-0.50	4.1	0.22	41	<1	3	571	2.56	3.36	0.526	0.507	0.41	<0.1	0.2	12.5	17.3	0.85	0.05
32	0.00-0.10	5.1	0.06	21	4	14	53	5.27	5.2	0.557	0.331	0.498	2.7	2.4	123	274	3	0.24
	0.20-0.30	5.5	0.04	<20	3	3	32	5.5	6.44	0.946	0.262	0.946	1.6	0.7	116	117	1.74	0.11
	0.40-0.50	5.9	0.09	36	3	2	60	6.26	9.84	1.88	0.401	1.77	0.9	0.2	31.5	51	0.9	0.07

*Aqueous 1:5

**Total carbon and total nitrogen

References

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