

Lake Wombah



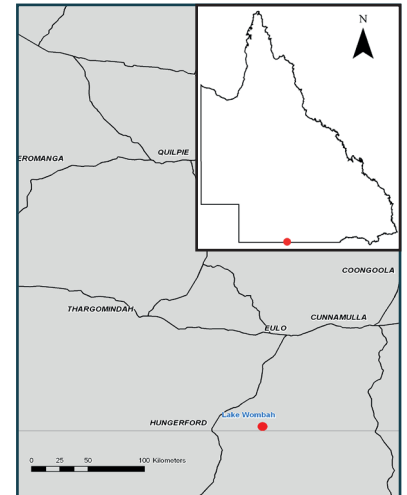
Queensland
Wetlands Program

Study Area

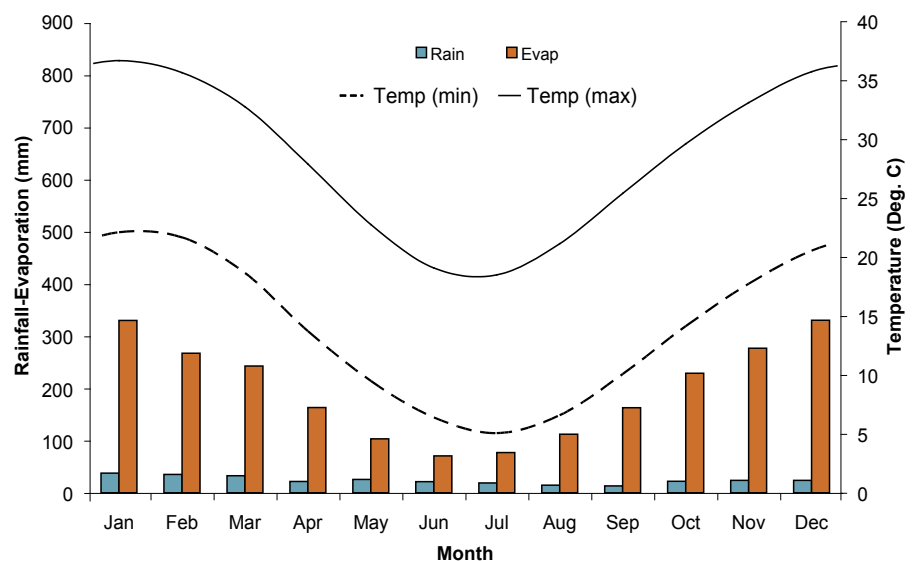
Lake Wombah is located approximately 50 km east of Hungerford, South-West Queensland, on the NSW/Queensland border.

The lake forms part of the Lake Wombah - Kungie Lake group which is an aggregation of ephemeral to permanent lakes and claypans.

Lake Wombah is an example of a semi-arid floodplain lake in the Mulga Lands Bioregion.



Climate¹



The study area is situated within a semi-arid climatic region with no distinct wet or dry season. Evaporation exceeds rainfall in every month. The average annual rainfall for the area is 288 mm.

Landform and Inundation	Shallow lake on gently undulating sand plains Permanently inundated lake from overland flow however may become dry in times of prolonged drought
Soils²	Hydrosols and Rudosols
Vegetation³	<i>Halosarcia</i> spp. open succulent shrubland on alluvium (RE 6.3.10)
Geology⁴	Quaternary alluvium
Disturbance	No effective disturbance except grazing by hoofed animals



Australian Government

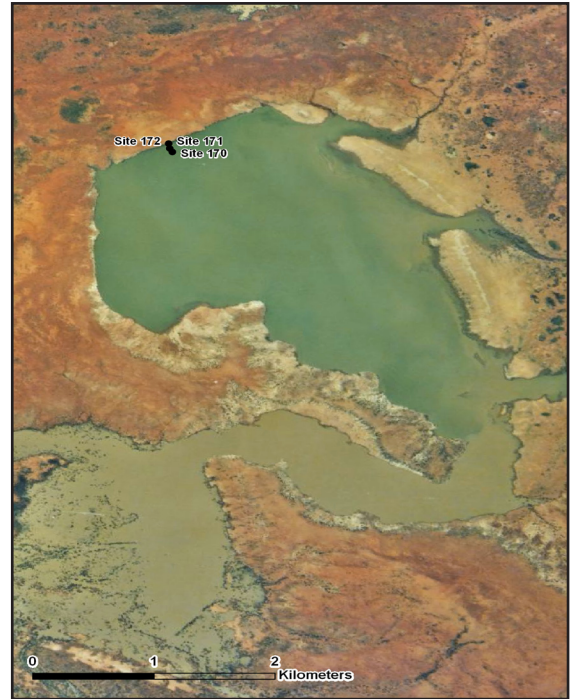


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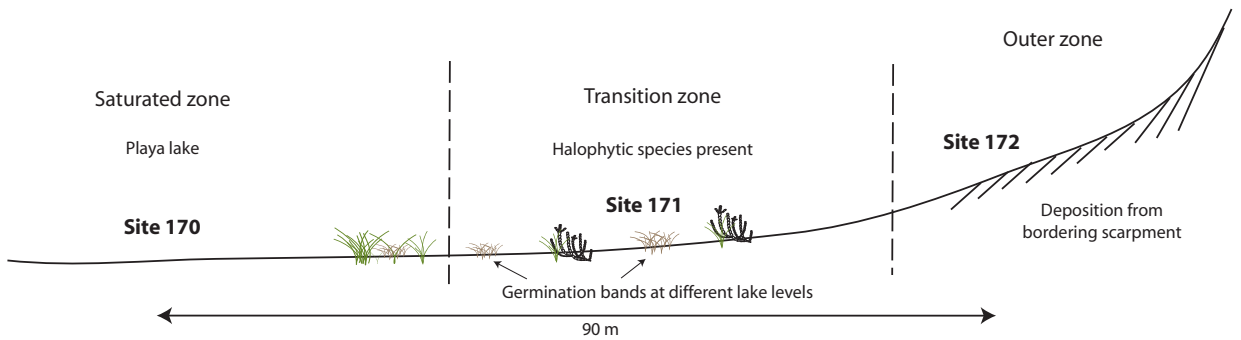
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Location

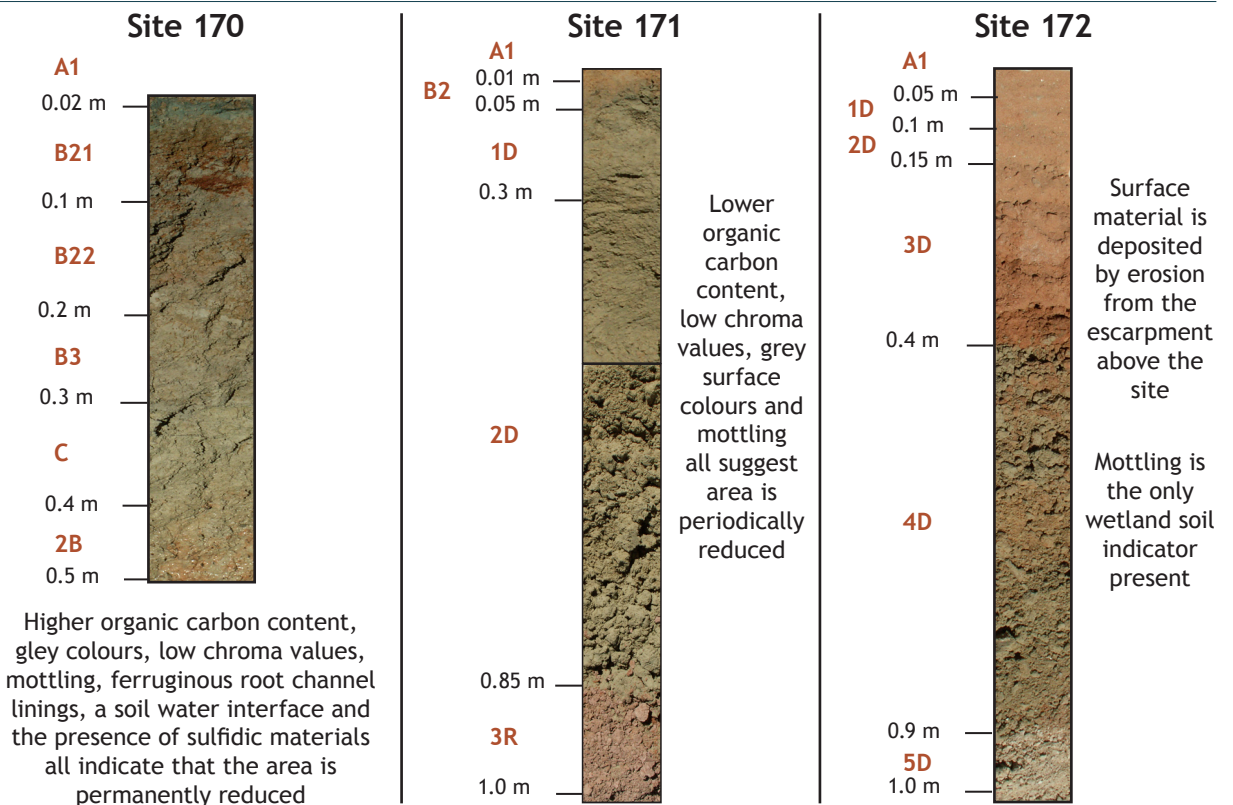
GDA94 • MGA Coordinates : 287027 E, 6794351 N, Zone 55 • Lat/Long : -28.96115 S, 144.81451 E



Landscape Diagram



Soil Profiles



Soil Indicators Present (within 0.3 m of surface)

Indicator ⁵	Site 170	Site 171	Site 172
Organic materials and organic carbon (OC)*	No organic materials OC: 1.29%	No organic materials OC: 0.21%	No organic materials OC: 0.1%
Matrix colour	Greyish brown to greenish black	Olive brown to brownish grey	Olive to brown
Chroma (thickness of layer)**	Present (0.3 m)	Present (0.26 m)	Not present
Mottles and Segregations	Few <5 mm prominent brown mottles Many 5-15 mm prominent brown mottles Many <5 mm distinct brown mottles Common 5-15 mm faint brown mottles Very few <2 mm calcareous soft segregations Very few <2 mm saline crystals	Many <5 mm distinct orange mottles Many 5-15 mm faint brown mottles Few <2 mm saline crystals Very few <2 mm calcareous soft segregations	Few 5-15 mm faint yellow mottles Few <5 mm faint brown mottles Very few <2 mm calcareous soft segregations
Depth to groundwater	0.5 m	Not present	Not present
Ferruginous root channel and pore linings	Present	Not present	Not present
pH* ⁶	Mildly alkaline	Mildly alkaline	Strongly alkaline
Texture	Silty light clay to light clay	Fine sandy clay loam to fine sandy light medium clay	Clayey sand to sandy clay
Acid sulfate material	Present	Not present	Not present
Electrical Conductivity (EC) ⁶	Moderately saline	Highly saline	Slightly saline

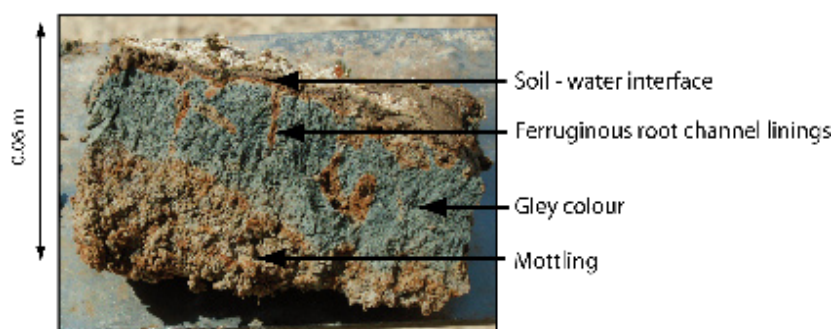
*Organic carbon % (Dumas method) and pH taken from surface (0-0.1 m)

**Chroma value is less than or equal to 2

Summary of Field Observations

- Organic carbon content increases moving into the saturated zone, whilst there is no visible accumulation of plant materials this can be attributed to the presence of microscopic algae
- Faint, distinct and prominent mottling (Figure 1) all indicative of water fluctuation at all soil profiles
- Ferruginous root channel linings in the saturated zone (Figure 1) are evidence of plants growing in saturated conditions
- Gley colours (Figure 1) and low chroma values suggest a permanently reduced environment in the saturated zone
- Sulfidic materials confirmed by laboratory testing in saturated zone indicate a reduced environment
- Evaporative profile in transition zone from capillary fringe effect indicated by high EC and presence of halophytic species
- Uniform salt profile in saturated zone
- A thin layer of red or orange soil colours exist as evidence of the oxidation reactions occurring at the soil water interface in the saturated zone (Figure 1)

Figure 1.
Mottling, ferruginous root channel linings, gleyed soil colour and a soil water interface in the surface of the saturated zone



Soil Morphology

Site 170		Classification			Australian Soil Classification			Mottled, Hypersalic Hydrosol		
		Landform Element			Playa					
		Morphological Type			Flat					
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations		
A1	0 to .02	sharp to	silty light clay	dark greenish black (10G31)	few (2-10%) fine (<5 mm) prominent brown mottles	none	massive	very few (<2%) fine (<2 mm) calcareous soft segregations, few (2-10%) fine (<2 mm) ferruginous root linings		
B21	.02 to .1	clear to	light clay	grey (10YR51)	many (20-50%) medium (5-15 mm) prominent brown mottles	none	weak 2-5 mm subangular blocky	very few (<2%) fine (<2 mm) saline crystals		
B22	.1 to .2	clear to	light clay	greyish brown (10YR52)	many (20-50%) fine (<5 mm) distinct brown mottles	none	moderate 2-5 mm subangular blocky	very few (<2%) fine (<2 mm) saline crystals		
B3	.2 to .3	clear to	light clay	greyish brown (2.5Y52)	common (10-20%) medium (5-15 mm) faint brown mottles	none	moderate 2-5 mm subangular blocky	very few (<2%) fine (<2 mm) saline crystals		
C	.3 to .4	clear to	light clay	light olive grey (5Y62)	few (2-10%) fine (<5 mm) faint brown mottles	none	massive	none		
2B	.4 to .5		light medium clay	light grey (5Y72)	many (20-50%) medium (5-15 mm) distinct orange mottles	none	massive	very few (<2%) fine (<2 mm) manganiferous soft segregations		

Site 171		Classification			Australian Soil Classification			Epicalcareous, Hypersalic Hydrosol		
		Landform Element			Playa					
		Morphological Type			Midslope					
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations		
A1	0 to .01	sharp to	fine sandy clay loam	very dark grey (10YR31)	none	none	-	few (2-10%) fine (<2 mm) saline crystals		
B2	.01 to .05	diffuse to	fine sandy clay loam	light olive brown (2.5Y56)	many (20-50%) fine (<5 mm) distinct orange mottles	none	massive	very few (<2%) fine (<2 mm) calcareous soft segregations		
1D	.05 to .3	sharp to	fine sandy light medium clay	light brownish grey (2.5Y62)	many (20-50%) medium (5-15 mm) faint brown mottles	none	massive	none		
2D	.3 to .85	sharp to	fine sandy medium clay	light brownish grey (2.5Y62)	none	none	massive	none		
3R	.85 to 1	-	-	light reddish brown (2.5YR63)	few (2-10%) fine (<5 mm) distinct red mottles	very abundant (>90%) mudstone medium pebbles (6-20 mm)	-	none		

Site 172			Classification			Australian Soil Classification			Stratic Rudosol		
			Landform Element			Playa			Upper slope		
			Morphological Type								
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Structure	Segregations	
A1	0 to .05	sharp to	light sandy clay loam	olive (5Y54)	none	very few (<2%) angular shell small pebbles (2-6 mm)	-	none	-	none	
1D	.05 to .1	sharp to	clayey sand	olive (5Y53)	few (2-10%) medium (5-15 mm) faint yellow mottles	very few (<2%) angular shell small pebbles (2-6 mm)	-	very few (<2%) calcareous soft segregations	-	very few (<2%) calcareous soft segregations	
2D	.1 to .15	sharp to	sandy clay	pale brown (10YR63)	few (2-10%) fine (<5 mm) faint brown mottles	very few (<2%) angular shell small pebbles (2-6 mm)	-	very few (<2%) calcareous soft segregations	-	very few (<2%) calcareous soft segregations	
3D	.15 to .4	sharp to	clayey sand	olive brown (2.5Y44)	none	very few (<2%) angular shell small pebbles (2-6 mm)	-	very few (<2%) calcareous soft segregations	-	very few (<2%) calcareous soft segregations	
4D	.4 to .9	sharp to	medium clay	light brownish grey (2.5Y63)	none	none	-	none	-	none	
5D	.9 to 1	-	light medium clay	light brownish grey (2.5Y62)	none	none	-	common (10-20%) fine (<2 mm) gypseous crystals	-		

Soil Chemistry

Site	Depth (m)	pH*	EC dS/m	Cl mg/kg	NO3-N mg/kg	TC** %	TN** %	Ca meq/100g	Mg meq/100g	Na meq/100g	K meq/100g	ESP %	CEC meq/100g
170	0.00-0.10	7.8	7.08	6230	7	1.29	0.16	11	9.56	10.1	2.71	31.6	32
	0.20-0.30	7.7	9.19	11000	<1	0.5	0.05	2.96	11.1	14.6	2.46	43.1	34
	0.40-0.50	7.8	9.6	12000	23	0.09	0.04	3.36	13.4	16.7	3.31	46.4	36
171	0.00-0.10	7.8	13	16400	22	0.21	0.04	2.68	10.2	6.44	1.82	26.8	24
	0.20-0.30	8.2	8.39	10100	15	0.12	0.04	1.94	12.6	12.3	2.64	43.9	28
	0.40-0.50	8.3	5.6	5740	10	0.1	0.03	2.2	11.7	13.5	2.55	41.3	33
172	0.00-0.10	8.5	1.45	916	5	0.1	<0.03	4.04	1.24	0.45	0.35	6.4	7
	0.20-0.30	9.2	1.32	1520	<1	0.07	<0.03	1.48	1.05	1.26	0.28	29.3	4
	0.40-0.50	8	10.2	13200	1	0.11	<0.03	3.22	9.05	13.1	2.35	52.7	25

*Aqueous 1:5 **Total carbon and total nitrogen

References

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