

18 Mile Swamp

North Stradbroke Island



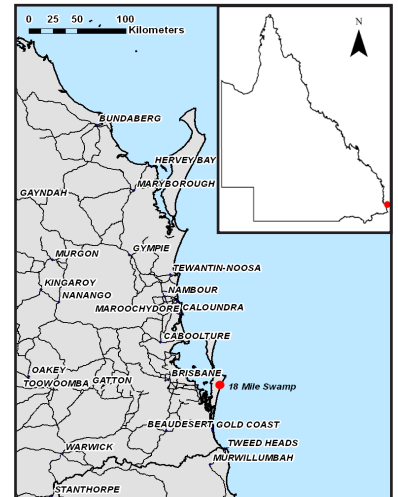
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Study Area

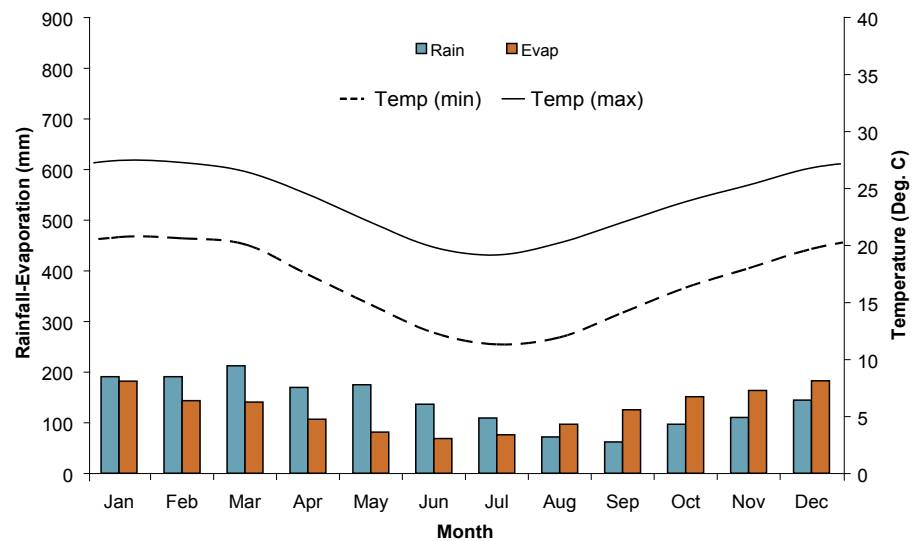
The 18 Mile Swamp is located on North Stradbroke Island, South-East Queensland.

The swamp is approximately 3000 ha in size which runs along the eastern side of the island¹.

This site is an example of a coastal and sub-coastal non-floodplain grass, sedge, herb swamp with organic soils in the South-East Queensland Bioregion.



Climate²



The study area is situated within a subtropical climatic region with a wet and dry season. Rainfall exceeds evaporation in the majority of months. The average annual rainfall within the area is 1668 mm.

| | |
|--------------------------------|--|
| Landform and Inundation | Open depression swamp within a coastal dune system Permanent freshwater inundation from groundwater and overland flow |
| Soils³ | Podosols and Organosols |
| ⁴ | Swamps with <i>Baumea</i> spp., <i>Juncus</i> spp. and <i>Lepironia articulata</i> (RE 12.2.15) |
| Geology⁵ | Estuarine, floodplain and tidal delta deposits |
| Disturbance | Little to no disturbance |



Australian Government



Queensland Government

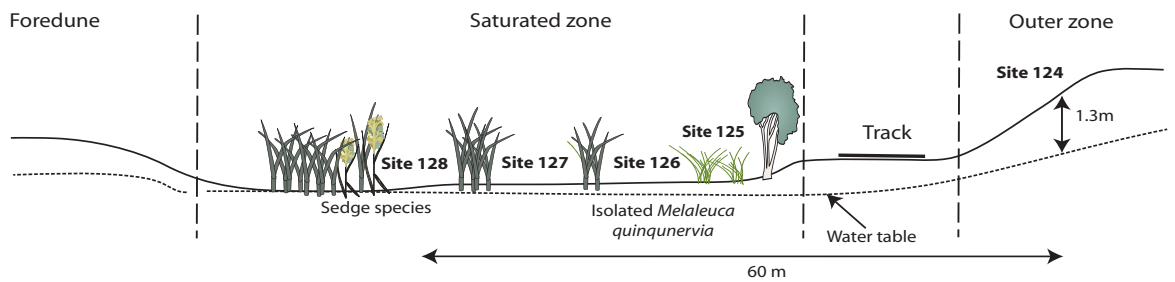
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Location

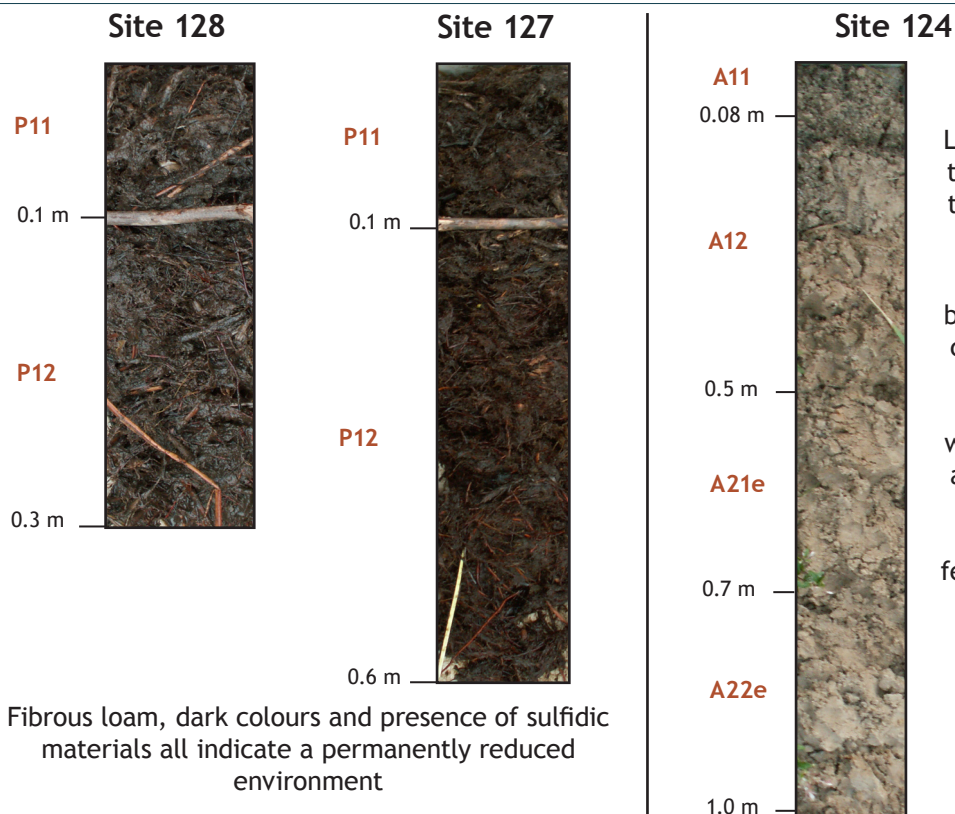
GDA94 • MGA Coordinates : 549158 E, 6955931 N, Zone 56 • Lat/Long : -27.51944 S, 153.49777 E



Landscape Diagram



Soil Profiles



Low chroma values in the surface 0.08 m is the only wetland soil indicator observed

For soils dominated by sand textures, low chroma values alone are not considered good indicators of wetland soils without additional indicators such as organic materials, redox features (like mottles) or ferruginous root channels and pore linings⁶

Fibrous loam, dark colours and presence of sulfidic materials all indicate a permanently reduced environment

Soil Indicators Present (within 0.3 m of surface)

| Indicator ⁷ | Site 124 | Site 125 | Site 126 |
|--|--|--|--|
| Organic materials and organic carbon (OC)* | No organic materials OC: 1.82% | Organic materials to 0.3 m OC: 26.3% | Organic materials to 0.3 m OC: 34.4% |
| Matrix colour | Greyish brown to brown | Reddish brown to Olive | Black to greyish brown |
| Chroma (thickness of layer)** | Present (0.08 m) | Present (0.1 m) | Present (0.3 m) |
| Mottles and Segregations | Not present | Not present | Not present |
| Depth to groundwater | Not present | 0.05 m | 0.01 m |
| Ferruginous root channel and pore linings | Not present | Not present | Not present |
| pH* ⁸ | Very strongly acid | Strongly acid | Very strongly acid |
| Texture | Sand | Loam | Loam |
| Acid sulfate material | Not present | Present | Present |
| Electrical Conductivity (EC) ⁸ | Non saline | Slightly saline | Slightly saline |
| Indicator ⁷ | Site 127 | Site 128 | |
| Organic materials and organic carbon (OC)* | Organic materials to 0.3 m OC: 38.6% | Organic materials to 0.3 m OC: 27.9% | |
| Matrix colour | Black | Black | |
| Chroma (thickness of layer)** | Present (0.3 m) | Present (0.3 m) | |
| Mottles and Segregations | Not present | Not present | |
| Depth to groundwater | 0.02 m | 0.03 m | |
| Ferruginous root channel and pore linings | Not present | Not present | |
| pH* ⁸ | Very strongly acid | Very strongly acid | |
| Texture | Loam | Loam | |
| Acid sulfate material | Present | Present | |
| Electrical Conductivity (EC) ⁸ | Non 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

- Presence of swamp hummock microrelief is typical of a saturated environment
- Organic materials are indicative of a reduced and permanently inundated environment
- High water tables and poor external drainage indicate the swamp is permanently inundated
- Hydrogen sulfide gas detected in swamp indicates the presence of acid sulfate materials

References

1. DEWHA (2008). *Australian Wetlands Database*. [online]. Available at <http://www.environment.gov.au/water/publications/environmental/wetlands/database/> [accessed 21/08/08].
2. Queensland Department of Natural Resources and Water (2008). *SIL0* [online]. Available at <http://www.longpaddock.qld.gov.au/silo/> [accessed 5/11/2007].
3. Isbell RF (2002). *The Australian Soil Classification*. CSIRO Publishing, Collingwood, Victoria, revised edition.
4. EPA (2008) *Regional Ecosystems*. [online]. Available at http://www.epa.qld.gov.au/nature_conservation/biodiversity/regional_ecosystems/ [accessed 28/06/08].
5. Bureau of Mineral Resources (1978). *Moreton: Australia 1:250,000 Geological Series*, Bureau of Mineral Resources, Canberra.
6. Richardson JL and Vepraskas MJ (2001). *Wetland Soils: Genesis, Hydrology, Landscapes and Classification*. CRC Press, Florida.
7. Bryant KB, Wilson PR, Biggs AJW, Brough DM and Burgess JW (2008). *Soil Indicators of Queensland Wetlands: State-wide assessment and methodology*. Queensland Department of Natural Resources and Water. Brisbane.
8. Hazelton P and Murphy B (2007). *Interpreting Soil Test Results: What do all the numbers mean?*. [2nd ed]. CSIRO publishing. Collingwood Victoria.

Soil Morphology

| Site 124 | | Classification | | Australian Soil Classification | | | Aeric Podsol | | |
|----------|-----------|----------------|-------------|----------------------------------|--|------------------|------------------------------------|--------------|----------------------------|
| | | | | Landform Element | | | Duneslope | | |
| | | | | Morphological Type | | | Lower slope | | |
| Horizon | Depth (m) | Boundary | Texture | Colour | Mottles | Coarse Fragments | Structure | Segregations | Consistence |
| A11 | 0 to .08 | - | fibric sand | dark greyish brown (10YR42) | none | none | single grain | none | very weak moderately moist |
| A12 | .08 to .5 | - | sand | brown (10YR53) | none | none | single grain | none | very weak moderately moist |
| A21e | .5 to .7 | - | sand | greyish brown (10YR52) | none | none | single grain | none | very weak moist |
| A22e | .7 to 1 | - | sand | brown (10YR53) | none | none | single grain | none | very weak moist |
| A23e | 1 to 1.25 | - | sand | pale brown (10YR63) | very few (<2%) fine (<5 mm) faint orange mottles | none | single grain | none | very weak wet |
| Site 125 | | Classification | | Australian Soil Classification | | | Terric, Sulfidic, Fibric Organosol | | |
| | | | | Landform Element | | | Swamp | | |
| | | | | Morphological Type | | | Closed Depression | | |
| Horizon | Depth (m) | Boundary | Texture | Colour | Mottles | Coarse Fragments | Structure | Segregations | Consistence |
| P11 | 0 to .1 | - | fibric loam | black (10YR21) | none | none | - | none | very weak wet |
| P12 | .1 to .3 | - | fibric loam | very dark greyish brown (10YR32) | none | none | - | none | very weak wet |
| Site 126 | | Classification | | Australian Soil Classification | | | Terric, Sulfuric, Fibric Organosol | | |
| | | | | Landform Element | | | Swamp | | |
| | | | | Morphological Type | | | Closed Depression | | |
| Horizon | Depth (m) | Boundary | Texture | Colour | Mottles | Coarse Fragments | Structure | Segregations | Consistence |
| P11 | 0 to .1 | - | fibric loam | black (10YR21) | none | none | - | none | very weak wet |
| P12 | .1 to .3 | - | fibric loam | very dark greyish brown (10YR32) | none | none | - | none | very weak wet |

| Site 127 | | Classification | | Australian Soil Classification | | | | Regolith, Sulfuric, Fibric Organosol | |
|----------|-----------|----------------|-------------|--------------------------------|---------|------------------|-----------|--------------------------------------|---------------|
| | | | | Landform Element | | | | Swamp | |
| | | | | Morphological Type | | | | Closed Depression | |
| Horizon | Depth (m) | Boundary | Texture | Colour | Mottles | Coarse Fragments | Structure | Segregations | Consistence |
| P11 | 0 to .15 | - | fibric loam | black (10YR21) | none | none | - | none | very weak wet |
| P12 | .15 to .6 | - | fibric loam | black (10YR21) | none | none | - | none | very weak wet |
| Site 128 | | Classification | | Australian Soil Classification | | | | Terric, Sulfuric, Fibric Organosol | |
| | | | | Landform Element | | | | Swamp | |
| | | | | Morphological Type | | | | Closed Depression | |
| Horizon | Depth (m) | Boundary | Texture | Colour | Mottles | Coarse Fragments | Structure | Segregations | Consistence |
| P11 | 0 to .1 | - | fibric loam | black (10YR21) | none | none | - | none | very weak wet |
| P12 | .1 to .3 | - | fibric loam | black (10YR21) | none | none | - | none | very weak wet |

Soil Chemistry

| Site | Depth (m) | pH* | EC (dS/m) | Cl (mg/kg) | NO3-N (mg/kg) | TC%** | TN%** |
|------|-----------|-----|-----------|------------|---------------|-------|-------|
| 124 | 0.00-0.10 | 5 | 0.05 | 34 | <1 | 1.82 | 0.05 |
| | 0.20-0.30 | 6.3 | 0.03 | 21 | <1 | 0.16 | <0.03 |
| | 0.40-0.50 | 6.5 | 0.01 | <20 | <1 | 0.09 | <0.03 |
| 125 | 0.00-0.10 | 5.5 | 1.05 | 921 | <1 | 26.3 | 1.03 |
| | 0.20-0.30 | 4.2 | 0.77 | 200 | <1 | 10.3 | 0.42 |
| 126 | 0.00-0.10 | 4.8 | 0.95 | 728 | 1 | 34.4 | 1.19 |
| | 0.20-0.30 | 4.6 | 1.02 | 565 | <1 | 28.1 | 1.07 |
| 127 | 0.00-0.10 | 4.1 | 0.81 | 623 | <1 | 38.6 | 0.81 |
| | 0.20-0.30 | 4.2 | 0.58 | 472 | <1 | 33.5 | 0.77 |
| | 0.40-0.50 | 4.2 | 0.65 | 498 | <1 | 36.8 | 0.95 |
| 128 | 0.00-0.10 | 4.8 | 0.76 | 511 | 2 | 27.9 | 1.06 |
| | 0.20-0.30 | 4.1 | 1.42 | 359 | <1 | 32.5 | 0.9 |

*Aqueous 1:5

**Total carbon and total nitrogen

