

Investigating Coombabah Lake and Creek, Gold Coast

The Coombabah Lake and Creek wetland system is popular with locals and visitors providing opportunities for recreation activities such as bush walking, trail running, bike riding and bird watching.

The wetland system is located within a highly urbanised catchment, which combined with the shallow nature of the lake, makes it susceptible to impacts associated with urban catchments, such as sediments and pollutants.

A project by the Department of Environment and Science with input from the City of the Gold Coast and other key partners is documenting the state of the wetland system. Information gained from tidal, sediment, vegetation and other studies will provide insight into how the system may change in response to increasing urbanisation and a changing climate.

The information from this study will contribute to management solutions and climate adaptation measures to conserve the wetland system.

Background

The Coombabah wetland is an estuarine system comprising Coombabah Lake and Coombabah Creek.

The site is of international significance under the Ramsar Convention (part of the Moreton Bay Ramsar site). It is also a declared Fish Habitat Area and a marine national park zone under the Marine Parks (Moreton Bay) Zoning Plan 2019.

The catchment area for the lake is quite small. The lake is fed by Coombabah Creek from the southwest, meandering 15 km from its headwaters in Nerang State Forest.

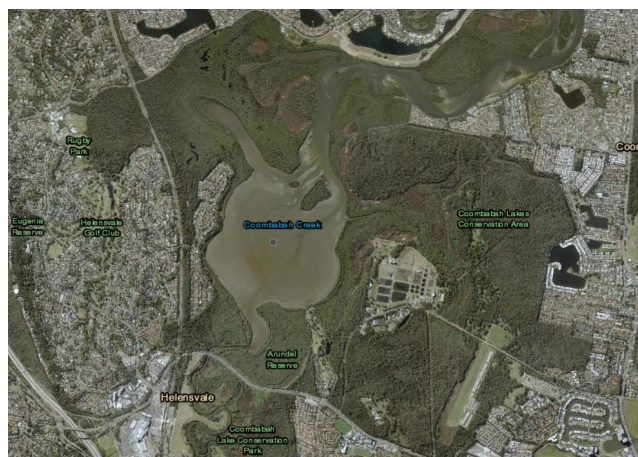


Figure 1. Urbanisation around Coombabah Lake Conservation Area.

The lake is approximately 460 Ha in size. The wetland system is under tidal influence, being connected to the Gold Coast Seaway and Moreton Bay via Coombabah and Coomera Creeks. Upstream the lake is connected to the suburbs of Gaven and Ernest via Coombabah Creek.

Significant modification of the lake's catchment has occurred in the past, replacing natural bushland with urban and industrial development.

Concerns have been raised that the conservation values of the lake and creek are declining due to the possible accumulation of sediments and a narrowing and shallowing of the creek channel downstream. Previous studies of the lake however, suggest that the rate of sediment accumulation has been relatively slow over the last 5500-6000 years, with an estimated accumulation rate of 0.10-0.45 cm/year.

Since the Gold Coast Seaway was built in 1983, it is understood that a greater volume of tidal water has been able to penetrate the local waterways including Coombabah Lake and Creek.

In addition, historical tidal gauge records for Queensland confirm that Queensland's sea levels are rising—consistent with what is projected to continue globally, under a changing climate. Rising sea levels can affect estuaries in many ways including saltwater intrusion further upstream.



Figure 2. Casuarina showing stress as mangrove seedlings expand landwards, indicating increased tidal inundation (Photo: Adame 2019).

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This may lead to progressive impacts on intertidal environments, vegetation changes and displacement of estuarine shorelines.

Get involved

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Study objectives

Identify *historical* changes in water level and water currents within the system including the lake/creek and adjacent tidal waterways.

Investigate *historical* changes in lake bathymetry (underwater topography) including through sedimentation processes and bed form evolution.

Document the *current* state of the lake including tidal regimes across the waterway and environs.

Investigate changes in vegetation patterns in the lake, creek and adjacent tidal waterway and environs and the relationship to changes in tidal levels.

Consider how the Coombabah Lake and surrounding habitats might respond to continued and projected changes in the climate (e.g. rising sea levels, tides and temperatures, changing rainfall and runoff in the catchment area).

Consult with stakeholders to develop a climate adaptation management plan for the site.

Anticipated study outcomes

The project will provide:

- An understanding of the historical evolution of the Coombabah wetland system with respect to local sea level rise, changes to bathymetry and vegetation response to these changes.
- Projections of future changes to the lake and environs under plausible climate change scenarios to inform long-term management.
- Information to guide management of the Moreton Bay Marine Park and the fish habitat area.
- Information to assist with developing a climate adaptation management plan for the wetland system.

Project participants and links

A project by the Department of Environment and Science, with input from the City of the Gold Coast and other key partners.

The project supports advancing climate science action under the Queensland [Climate Adaptation Strategy](#) (Q-CAS) and is aligned with the [Biodiversity and Ecosystems Climate Adaptation Plan for Queensland](#).

An Informal Coordination Group has been established to coordinate projects associated with the wetland. Technical subgroups have also been established for vegetation, sediment and hydraulic studies and sediment studies.