

Estuary Entrance Openings

Fact sheet

Shoalhaven's Estuaries

The Shoalhaven region has diverse estuaries that support a variety of coastal ecosystems. One type of estuary is called Intermittently Closed and Open Lakes and Lagoons (ICOLLs), which naturally open and close to the ocean at irregular intervals.

This natural process is based on water levels in the estuary, controlled by catchment rainfall and oceanic conditions. Individual ICOLLs have very different opening and closing regimes and have all adapted to cycle between being open and closed for different durations.



Open entrance at Lake Conjola, April 2022.

Entrance closures and openings

ICOLL entrances naturally close when sand builds up and forms a berm at the opening from waves and incoming tides pushing sand into the entrance. This constricts tidal flow and leads to a gradual closing of the estuary to the ocean.

When an ICOLL entrance is closed, water levels can increase within the estuary due to rainfall, runoff and waves overtopping the berm. Rising water levels can lead to inundation of low-lying foreshore areas, including urbanised areas.

Natural breakouts, or openings, occur when water levels in the estuary reach the height of the entrance berm. Eventually, the water in an ICOLL will spill over the entrance berm into the ocean and scour out a channel. When ICOLLs are open to the ocean, they become tidal and have seawater moving in and out of them.

In their natural cycles, some ICOLLs can remain open to the ocean for long periods of time, particularly in wetter seasons, and closed to the ocean for long periods of time, more common during droughts. Historical records show that about [70% of ICOLLs in NSW are closed for most of the time](#).



Closed entrance at Tabourie Lake, February 2022.

Flood Mitigation

Shoalhaven City Council, in conjunction with NSW State Government agencies, is responsible for the management of ICOLLs and estuaries. Council may artificially open some ICOLLs to alleviate low-level flooding in accordance with agreed entrance management policy triggers and in accordance with licenses sought from NSW Crown Lands and consultation with State Government agencies.

This generally involves using an excavator to dig a channel in the berm between the estuary and the ocean. This is usually done to reduce the flood impacts on low-lying properties around the ICOLL. However, the benefit of entrance opening must be balanced against the negative environmental impacts of artificial openings.



Artificial opening of Tabourie Lake entrance, February 2023.

Why is it important to maintain the natural system?

Closed ICOLLs are often falsely viewed as ‘unhealthy’ due to perceived poor water quality. However, closed ICOLLs typically maintain good water quality. Opening an ICOLL will not necessarily improve water quality, as there is limited tidal movement or ‘flushing’ in most ICOLLs. Poor water quality can be caused by pollutants or nutrients from nearby areas being washed into the estuary, particularly after rainfall. However, it is better to address this at the source by managing pollution. Additionally:

- Rapid lowering of water levels from artificial opening can result in fish kills due to the decanting (or removal) of oxygen rich water from the top layer, leaving deoxygenated water.
- ICOLLs sustain complex ecosystems that have evolved to rely on the natural opening and closure cycles and frequencies. The impact of artificially opening entrances on estuarine species can have unintended consequences.
- Flooding and drying are natural parts of estuarine hydrological and ecological cycles.
- Research shows that to maintain a ‘healthy’ ICOLL it ideally should be left to operate as close to natural as possible.

Further information on ICOLL management is provided by the [NSW Department of Planning and Environment](#) and the [Shoalhaven City Council Website](#).

Unauthorised opening of River and Lake Entrances is prohibited under the *Fisheries Management Act 1994 (NSW)* and can carry a maximum fine of up to and \$110,000 for individuals and \$220,000 for corporations.



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