

East Gippsland Estuary Opening Fact Sheet



Estuaries are dynamic systems that provide significant environmental, social and economic values to local communities, including important culturally significant places for Traditional Owners.

Background

Estuaries are dynamic ecosystems that support a large range of plants and animals. Many estuaries close from time to time as part of a natural process. The estuaries of the East Gippsland coast are susceptible to entrance closures caused by sand build-up at the mouth of the estuary, which can lead to flooding of neighbouring land and place community assets at risk. As the climate begins to change, the likelihood of

estuaries closing in East Gippsland is increasing. The EGMA may consider artificial opening of an estuary in consultation with other agencies when there is an identified risk to public assets, there is a high likelihood of success and minimal impact to the environment. However, it is becoming increasingly difficult to manage estuary openings due to changes and events that are driven by climate change.

How do estuaries open and close?

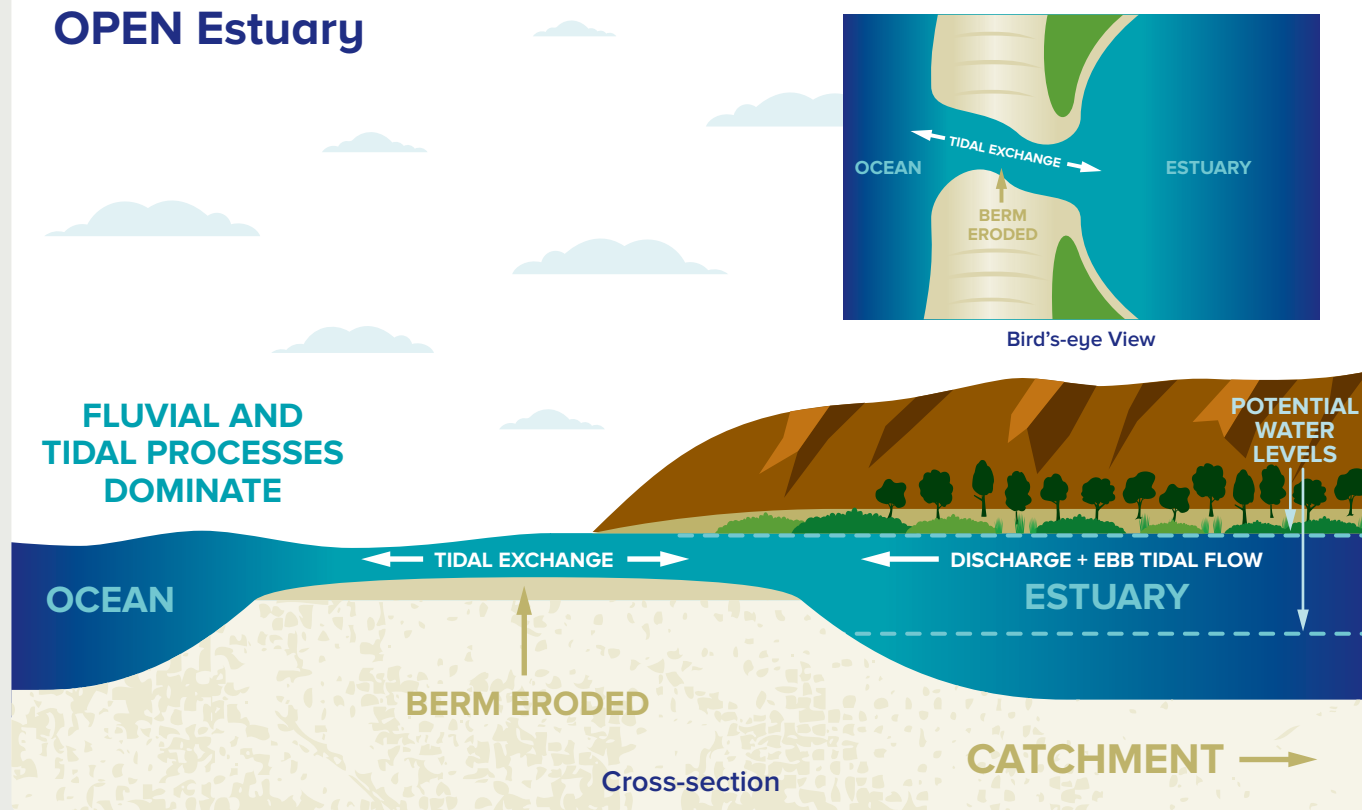
- An estuary closes when waves transport sand across the mouth of an estuary, forming a sandbar. Closures most often occur during summer months when flows into the estuary are at their lowest
- Natural estuary openings and closures are driven through a combination of rainfall, river flows, tides, wave energy and the shape of the estuary
- Catchment inflows and tides move in and out to help create and maintain estuary openings
- Low catchment inflows and large wave patterns that transport sand contribute to estuary closure.

See diagram on following page.

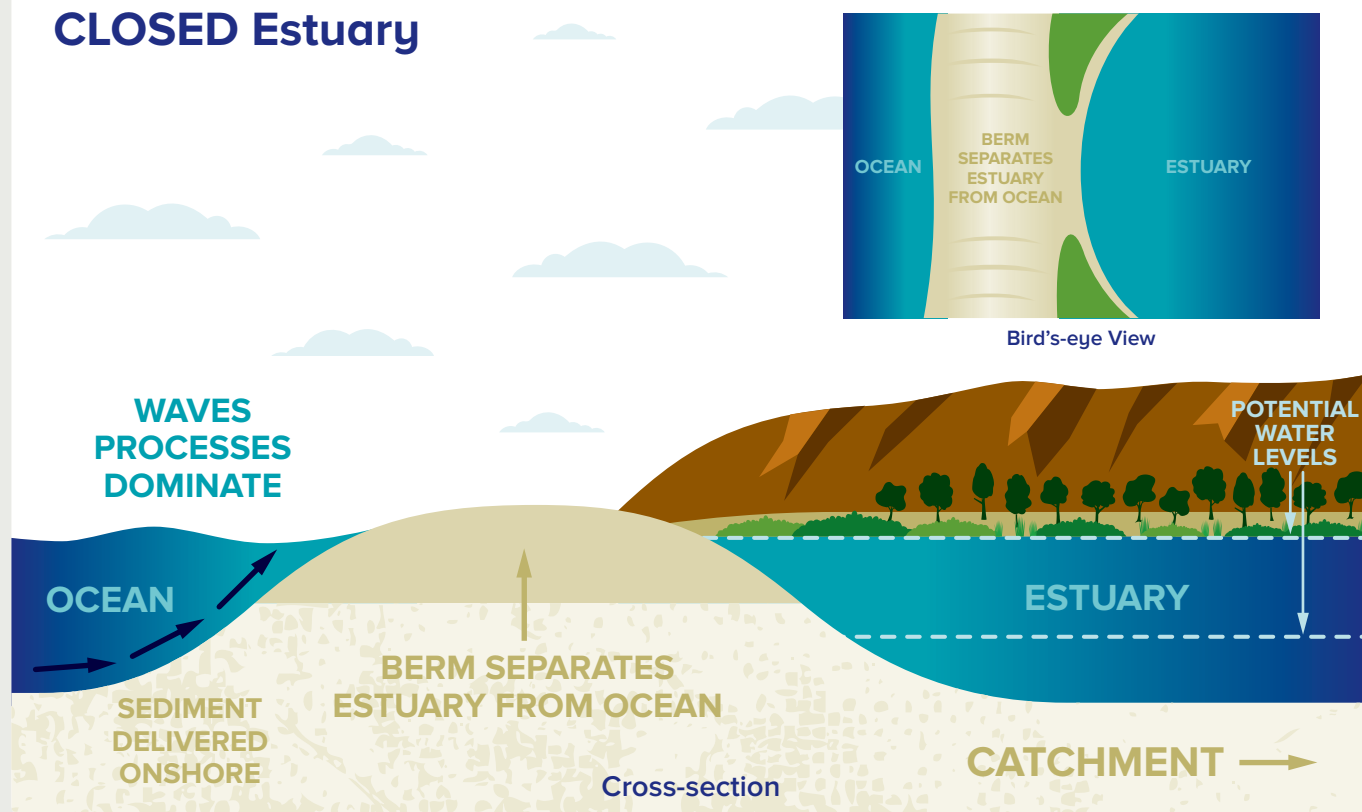
Are estuary closures normal?

- Estuaries are dynamic systems which naturally experience closed and open periods, and a range of catchment inflows and water levels.
- These conditions can influence food and habitat availability, water quality, and the estuary appearance (e.g. stagnant water) and odour (e.g. rotting plants).
- Plants and animals, and ecosystem processes respond differently to open and closed conditions: some thrive while others decline.
- There is no preferred state for an estuary, as both open and closed features are a part of the estuary cycle.
- Under climate change, estuary closures are becoming more frequent.

OPEN Estuary

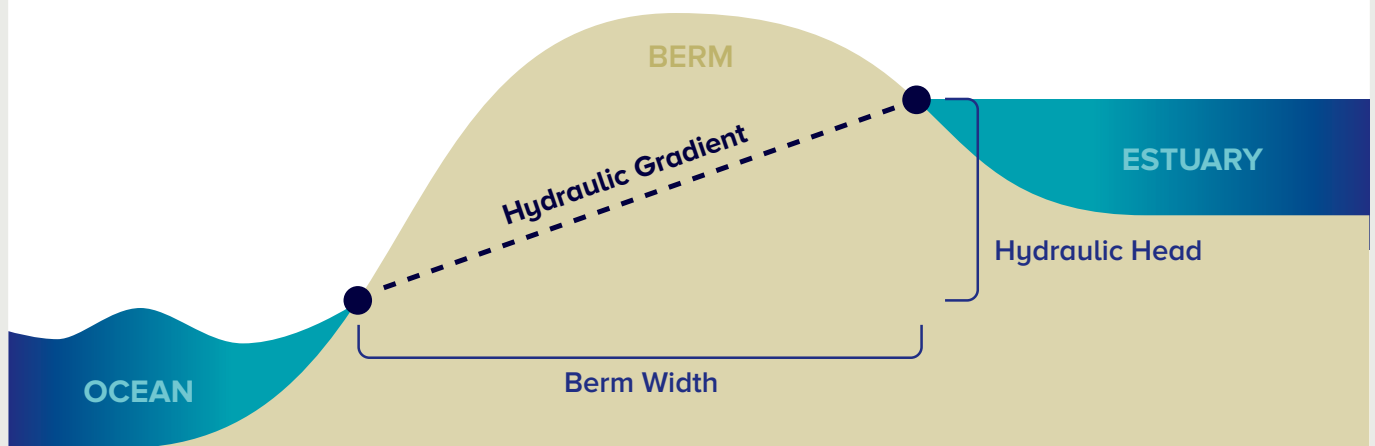


CLOSED Estuary



Hydraulic gradient across the berm of a closed estuary

Under the right conditions, an artificially opened estuary can remain open for several years. However, if undertaken during unsuitable conditions, an artificial opening can fail to open or re-close in a matter of days or weeks.



$$\text{Hydraulic Gradient} = \text{Hydraulic Head} / \text{Berm Width}$$

When should we open an estuary and how?

The estuaries of the Gippsland coast are susceptible to entrance closures caused by sand build-up at the mouth of the estuary, which can lead to flooding of neighbouring land and place community assets at risk.

The East Gippsland Catchment Management Authority (EGCMA) is the lead waterway manager responsible for decision making and approval conditions for estuary artificial openings in East Gippsland. The EGCMA prefers natural openings as they most often result in better entrance scour and a longer-lasting open entrance. However, an estuary artificial opening may be considered as a management option when high water levels have a significant impact on the environmental, social and economic values of the estuary and adjoining community assets.

The success of an estuary artificial opening is dependent on several physical factors, including a steep hydraulic head (see diagram), low offshore wave heights, high fluvial inflows, and low tides. The relationship between all these factors will determine how long an estuary remains open and the chance of the mouth closing.

Prior to implementing an artificial estuary opening, EGCMA considers social, cultural, economic and environmental factors to help ensure the opening is successful.

Unauthorised estuary openings

An unauthorised estuary opening is one in which an estuary is artificially opened without written consent from EGCMA. There are known examples of past unauthorised openings in East Gippsland estuaries conducted by members of the public when estuary water levels are high and the EGCMA has not responded to public pressure to open because it is not safe and/or practical to do so under the Protocols.

These openings are not permitted under the Water Act and can result in hefty fines and/or imprisonment for offenders. Unauthorised estuary openings are dangerous and a risk to human safety. They can produce adverse effects to property as well as local fish and bird populations when environmental impacts are failed to be considered. Unauthorised openings also have a high likelihood of being unsuccessful because they do not take into consideration the parameters and conditions needed for a successful estuary artificial opening.

Artificial Openings Can Negatively Impact Estuary Values

The risks of artificially opening an estuary under low inflow and low water level conditions has the potential to cause fish deaths, changes to vegetation communities, and decreased amenity.

Fish

- Fish deaths in estuaries occur occasionally as part of the natural estuary cycle.
- Opening an estuary during periods of low catchment inflows and low water level conditions can result in the loss of oxygenated surface water which is critical for fish survival.
- The remaining water with critically low dissolved oxygen levels can lead to fish deaths.

Vegetation

- Vegetation communities are complex and will adjust and adapt to the range of flow and water quality conditions experienced in an estuary.
- Any interference with natural processes may impact on the type and extent of vegetation communities.

Amenity

- Opening an estuary during periods of low catchment inflows and low water level conditions can result in poor water quality, fish deaths, strong odours and changes in vegetation.
- This can make the estuary a less pleasant recreational environment and can impact the way people use and experience an estuary.

