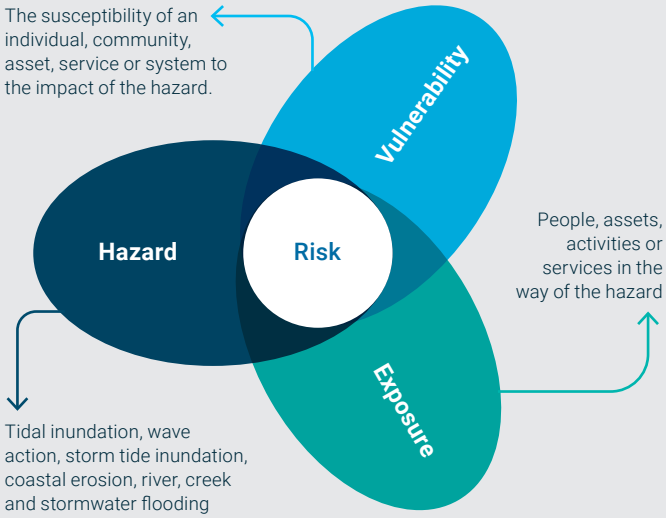
# Common Coastal Hazard Adaptation and Flooding Terminology

**Fact Sheet 01**

This fact sheet provides a description of some of the commonly used terms relevant to coastal management and coastal hazard adaptation.

Climate risk is a combination of hazard, vulnerability and exposure. We can reduce existing and future coastal hazard risks by reducing the level of exposure (e.g. locating infrastructure outside of erosion prone areas), reducing community vulnerability (e.g. improving the flood resilience of buildings), or reducing or removing the hazard (e.g. increasing the capacity of stormwater drainage networks). Planning for adaptation to coastal hazards means comparing and investigating different options to reduce risk.




## Commonly used terms

**Adaptation**
Adaptation is the process of adjusting to actual or expected climate and its effects. It can involve avoiding harm, changing behaviours or putting in place interventions that can reduce risk.

**Coastal hazards**
Natural coastal processes that may negatively impact on the natural environment and human use of the coastal zone. Hazards include coastal erosion, storm tide inundation, and inundation due to sea level rise.

**Coastal hazard adaptation**
Coastal hazard adaptation comprises strategies and solutions that address the current and potential future impacts of coastal hazards. This can be achieved through modification of infrastructure or landform, changes in land use practices, or changes to behaviour that prevent or reduce adverse impacts associated with coastal hazards.

**Resilient infrastructure**
Refers to the systems and structures that are designed, built, and managed to withstand and rapidly recover from both anticipated and unanticipated hazard events such as storm tide inundation, ensuring that they can continue to function and serve the community that rely on them.

**Risk assessment**
A systematic process of evaluating the potential risks that may be associated with an event or activity. Risk is assessed based on the likelihood of an asset or value being exposed to a coastal hazard or flood, combined with the consequence of that exposure.

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# What are Coastal hazards?

Storm tide inundation, tidal inundation and coastal erosion are natural processes that shape the unique landforms of our coasts. However, when these processes negatively impact our communities, infrastructure or natural assets, they are considered coastal hazards. Coastal hazard exposure is expected to increase with changes in wave action, storm activity and sea level rise associated with climate change.

Coastal hazards include inundation of low-lying coastal areas and erosion of the shoreline. In South-East Queensland, significant coastal hazard impacts are typically associated with East Coast Lows and tropical cyclones.

## Coastal erosion

Coastal erosion is a natural process in which coastlines gradually erode over time, driven by fluctuations in sediment or sand supply and changing climate patterns.

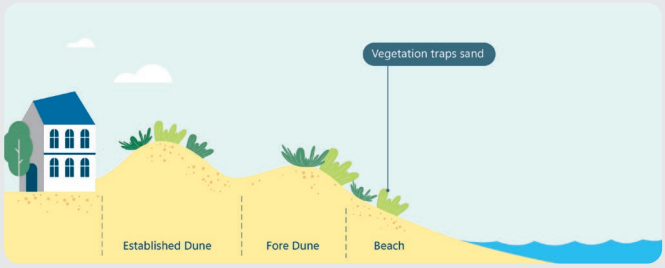
**Short-term erosion**
Coastal erosion occurs when winds, waves and coastal currents shift sediment or sand from the shoreline. This process can be temporary, often caused by storm activity (known as storm bite), after which the beach typically rebuilds over time. Sand that shifts offshore during a storm generally returns to the beach within months to years. In this case, periodic beach erosion does not result in a long-term landward movement of the shoreline.

**Long-term erosion**
In some instances, due to changes in sediment supply or climate conditions, the beach may lack the capacity to fully rebuild between storm events. Without intervention, this can lead to long-term erosion, known as shoreline recession, where the shoreline gradually moves landward over decades.

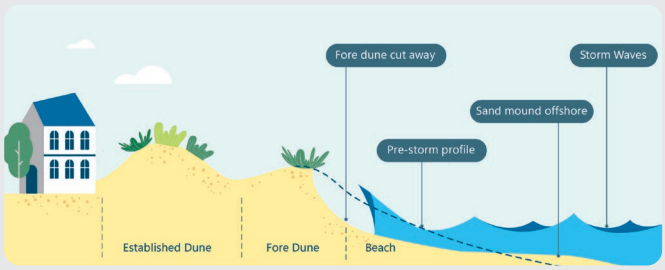
## Storm tide inundation

Storm tide inundation occurs when low-lying coastal areas are flooded by a temporarily elevated sea level, known as 'storm tide'. Storm tide results from the combination of the astronomical tide, storm surge and wave action. Storm surge itself is primarily caused by the combined effects of low atmospheric pressure and strong winds, often associated with events like tropical cyclones.

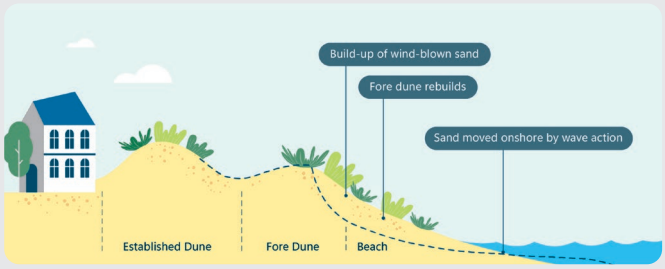
Storm tide levels vary depending on the location and setting. Open coast areas are directly exposed to waves, which can significantly increase storm tide levels. In estuary settings, wave action is generally reduced due to protection from land and shallower waters, leading to smaller increase in storm tide levels.



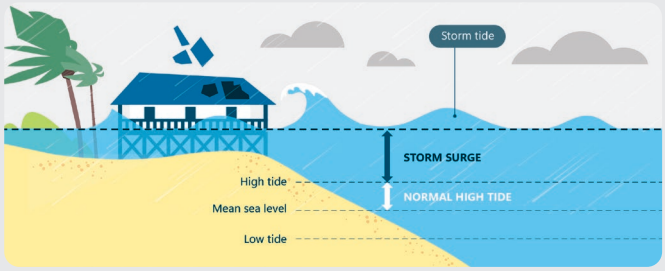

— Normal beach shape, calm conditions




— Beach erosion during storm




— Beach and dune repair after storm




— Storm tide inundation

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## Wave action

**Wave setup**
As waves break, they create a localised effect to increase the sea level, known as breaking wave setup. This local increase in water level can be added to storm tide estimates if they are exposed to wave conditions .

**Nearshore waves and wave run-up**
If broken waves reach the shoreline any residual energy may intermittently run up and down the beach face, known as wave run-up. This may cause localised erosion impacts as waves can reach elevations higher than the underlying storm tide level. The vertical elevation the waves may reach will be dependent on the slope[1].

## Permanent tidal inundation due to sea level rise

Tidal inundation refers to the permanent flooding of low-lying coastal areas with sea water due to the normal tidal cycle. This can occur either through direct inundation of low-lying areas adjacent to the coast or through backwater inundation of inland low-lying areas connected through the stormwater network. As sea level rises, these areas will become increasingly prone to more extensive tidal inundation. The Queensland State Government currently plans for a projected sea level rise of 0.8 meters by 2100.

# Flood risks

Although not technically a coastal hazard, flood risks need to be considered when looking at coastal hazard adaptation. Some adaptation options may result in incidental improvements to flood risk, while others may worsen flood risk if site constraints are not appropriately considered.

The purpose of coastal hazard adaptation is not to resolve existing flood issues, but to ensure that our coastal areas can continue to be functional into the future.

### Reference

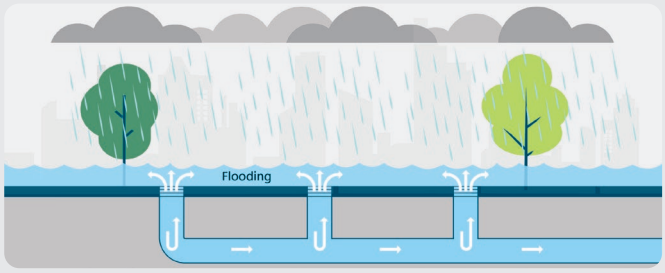
Terminology has been tailored for the Coastal Hazard Adaptation Precinct Plans and is consistent with **The National CoastAdapt information manuals**

[1]JBP (2024) Draft Sunshine Coast Storm Tide Study

## Stormwater flooding

Stormwater flooding is the result of intense rainfall over the local catchment area. Stormwater runoff flows across land before it drains to the stormwater network. If the capacity of the stormwater network is exceeded or if pipes or inlets are blocked, excess runoff will continue to flow across land. Stormwater flooding often occurs with little warning and can happen at the same time as storm tide inundation, river or creek flooding.

Increased sediment and sand at stormwater outlets and/or rising sea levels may reduce the capacity of the stormwater drainage network in coastal areas. The intensity of short duration storm events is also expected to significantly increase. Climate change is likely to result in an increase in the frequency, duration and magnitude of stormwater flooding.



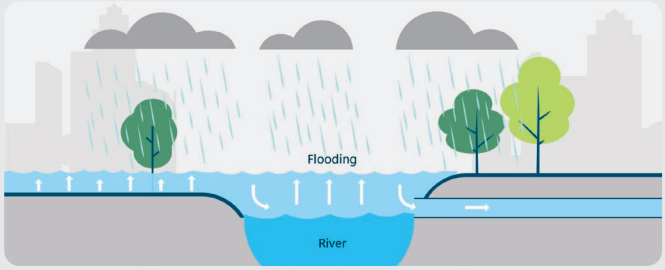

– Stormwater flooding

## River and creek flooding

Numerous rivers and creeks in our region drain directly to the ocean, and so river or creek flooding may be a hazard for adjacent coastal areas. River and creek flooding results from heavy or prolonged rainfall when the normal confines of the river or creek are exceeded. The rainfall may have fallen over the local catchment area and/or locations further upstream.

Coastal areas can be inundated directly as water rises or flows over land that is normally dry. Low-lying coastal areas can also be inundated through backwatering of the stormwater network.

Due to the relatively small catchment areas of rivers and creeks on the Sunshine Coast, peak flood levels can be reached quickly with short warning times.




– River and creek flooding

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## How to get involved

Keep an eye on the **CHAPP web page** and Council's social media pages for the latest news, invitations, and progress updates.

Register for regular updates. These updates will include invitations to a range of opportunities to have your say and provide feedback to Council.

Further details of what areas may be subject to future coastal hazards can be found on Council's MyMaps flood mapping.

Ask a question about coastal hazards and Council's coastal planning activities by emailing **ourresilientcoast@sunshinecoast.qld.gov.au**

Visit **haveyoursay.sunshinecoast.qld.gov.au** for more information and engagement.

**Find out more**

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