Coastal hazards

What are coastal hazards?

Erosion and inundation are natural processes that shape the coastline. However, they can become hazards when they impact on coastal values and how we use and enjoy the coast.

Coastal hazards include:

- Erosion of beaches and the shoreline
- Short- and longer-term tidal inundation of low-lying coastal land.

Coastal hazards can have adverse impacts on a range of coastal assets including social, cultural, economic and environmental values. In south east Queensland, coastal hazard impacts are typically associated with ex-tropical cyclones and East Coast Lows.

Storm tide inundation

Storm tide inundation is temporary inundation of low-lying coastal land from locally elevated sea levels, also known as a ‘storm tide’.

The storm tide is a combination of the predicted (normal) tide, storm surge, and wave action (Figure 1). Storm surge is driven by the combined influence of low atmospheric pressure and high winds associated with storm events.

Figure 1. Storm tide inundation
Coastal erosion

Coastlines naturally erode and accrete over time, driven by variations in sediment supply and climate patterns.

Coastal erosion occurs when winds, waves and coastal currents shift sediment away from the shoreline. This can be a short-term shift, or a longer term erosion trend.

When a beach is stable, all of the sand moved offshore during a storm eventually moves back onto the beach (over timeframes of months to years). In this case the beach erosion (storm bite) is only temporary.

In other cases, due to changing sediment supply or climate conditions, the beach may not have sufficient capacity to rebuild between storm events. In the absence of intervention, long-term erosion (termed recession) may continue.

Both short term and long-term erosion processes may impact on coastal assets, depending on how close to the fore dune assets are located.

Coastal hazard impacts

Coastal hazards periodically impact the Sunshine Coast and are predicated to have an increased impact in the future (Figure 3, Figure 4).

Future climate predictions for South East Queensland include:

- **Temperature continue to increase year-round**
- **More frequent sea-level extremes**
- **Hotter & more frequent hot days**
- **Reduced rainfall**
- **More intense downpours**
- **Harsher fire conditions**
- **Rising sea level**
- **Warmer & more acidic seas**
- **Fewer frosts**

Figure 2. Coastal erosion

Planning to adapt

Adverse impacts of coastal hazards can be minimised through strategic planning and adaptation actions. This involves:

- Understanding the physical processes
- Assessing the likely extent of storm tide inundation and erosion, now and in the future, and assets that may be impacted
- Assessing the consequence of impacts for communities and assets
- Considering the range of planning and adaption options and developing an adaptation strategy.

Projected sea level rise and an increase in storm intensity for the south Queensland coastline is anticipated to increase the extent and impact of coastal hazards.

Coastal erosion:
- Increased water levels will accelerate coastal erosion
- Sediment transport patterns may be altered by shifts in wave direction, triggering changes to the form and location of shorelines
- Low-lying land may be permanently inundated
- Increased storm activity will escalate the severity of coastal erosion events

Storm tide inundation:
- Sea level rise will increase the apparent severity and frequency of storm tide inundation and will cause inundation to occur further inland
- Increased storm intensity will add to the magnitude of storm tide events and the extent of inundation

Figure 4. Source: Coastal Hazard Technical Guideline (DEHP 2013)