

# LEVEES

This fact sheet provides information on one of a set of adaptation options that were considered in detail as part of the Coastal Hazards Adaptation Plan (CHAP) for responding to coastal hazard risks.

## What are they?

Levees are an option for controlling or preventing the inundation of low-lying areas from king tides, storm tides, and flooding caused by rainfall across the catchment. They are an artificially constructed embankment or wall, usually made from earth and covered with vegetation and situated roughly parallel to the shoreline.

Many examples of levees can be found both internationally and in Australia (Figure 1), in places associated with tidal riverine type environments or those subject to high riverine flood risks.

## Why have they been considered?

Levees can be a reliable means of responding to inundation and flooding events. Depending on their design and scale, they can provide protection from low to moderate scale but high frequency inundation events, without significant impact on adjacent recreational values and visual amenity.

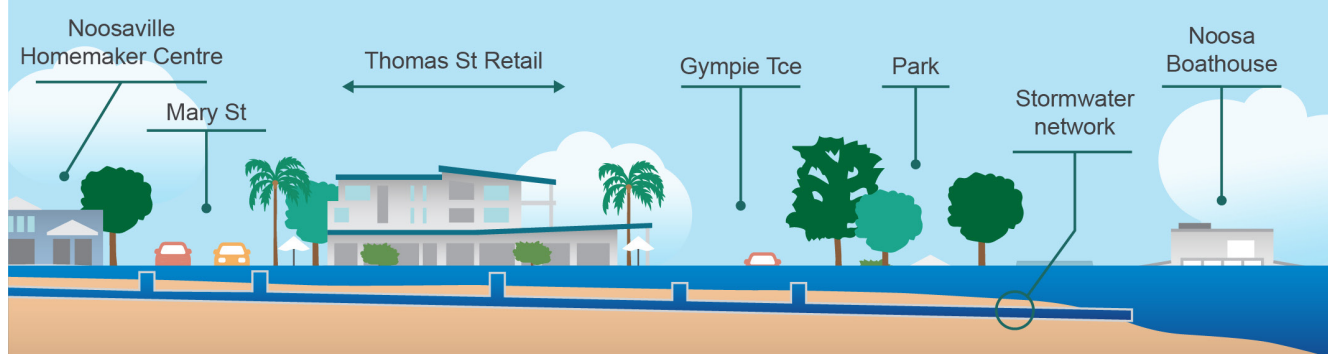
## Things to consider:

- › Capital costs and then maintenance and re-design costs to accommodate continued rises in sea level.
- › Once a levee is overtopped, the water can become trapped behind it and can create a 'dam' like effect and have flood impacts on neighbouring properties.
- › Water can sometimes come in from behind a levee from an unprotected area or the stormwater network.
- › The design and scale to minimise impacts on the surrounding area and landscape.



Figure 1: Earth mound levee. Source: <https://www.abc.net.au/>

## Scenario 1: No response to inundation risks by 2100



## Scenario 2: With adaptation measures in place



Figure 2: Effect of foreshore levee on frequent inundation

## What did our analysis conclude?

The analysis performed by specialist economics consultants considered the construction of levees or barriers, commencing from the year 2070, around areas at high risk from frequent inundation along the Noosa River, Weyba Creek, and lake frontages of Noosaville and Noosa Heads.

Different structural forms of differing heights (earth bunds, revetment extensions or clear glass vertical panels) were specifically selected and costed for each location based on what was most feasible given the constraints of each location (e.g. how much land available to use, whether adjacent lots are privately or publicly-owned and how close buildings are to the foreshore).

The effectiveness of this option is materially dependent on it being applied in conjunction with backflow prevention devices (Fact Sheet 04).

The combination of levees and stormwater protection devices as a response to inundation risks was found to have the greatest net benefit to the Noosa community of potential adaptation measures analysed. Figure 2 shows the anticipated effect of implementing this measure on an example area adjacent to Gympie Terrace.

This is driven by greater protection from inundation leading to:

- › Avoided loss of tourism revenue.
- › Avoided loss of benefits from access to recreational areas along the foreshore.
- › Reduced road damage.
- › Reduced damage to the stormwater network.

The independent analysis found the combination of these two measures delivers a net benefit to the community of \$21.5M (NPV<sup>1</sup>). Some inputs used are considered conservative and therefore it is highly likely that this approach could deliver a greater net benefit to the community than found through this analysis.

1 – Put simply, Net Present Value is a method of calculating the total return on investment for a project or expenditure by comparing the total costs with the total benefits you expect to result from the investment and translating those returns into today's dollars, so that you can decide whether the project is worthwhile.