

RESILIENT COAST

DOUGLAS SHIRE COUNCIL

BUILDING A RESILIENT COAST

At the interface of the catchment and ocean, the coastal zone will continue to be prone to periodic impacts from coastal hazards such as storm tide inundation and short and long-term erosion processes. As changes to our climate occur, these impacts are expected to become more severe. Councils and communities can work together to build the resilience of the coastline and adapt to change.

A resilient coast has social, economic and environmental systems in place to avoid, manage and mitigate the impact of hazardous events or disturbances. Resilience also means the ability to respond or reorganise in ways that maintain the essential function, identity and values of a region.

HOW CAN WE ADAPT?

There are a range of ways we can adapt to change in the coastal zone. Across each region, broad adaptation responses include:

- Avoid the hazards (or retreat)
- Accommodate change (moderate intervention)
- Hold the line / defend (major intervention)

For each of these broad responses there are a range of adaptation actions that can be used to avoid, manage and mitigate the risk of coastal hazards. There are:

1. Updates to landuse planning
2. Changes and upgrades to infrastructure
3. Coastal engineering options.



EXAMPLE ADAPTATION OPTIONS

1. Updates to landuse planning

Updates to landuse planning may include:

- Identifying appropriate areas for new development (residential, commercial), and new critical infrastructure (e.g. roads, hospitals)
- Tailoring specific uses for flood and erosion prone areas (e.g. sporting fields, open space and parklands, conservation zones)
- Planning for agriculture, industry, and ecosystem changes
- Updating emergency response planning.

2. Changes and upgrades to infrastructure

Changes to infrastructure may include:

- Increasing floor levels (freeboard) of buildings in flood prone areas
- Relocating critical infrastructure (e.g. access roads, hospitals, schools)
- Upgrading critical infrastructure that cannot readily be relocated
- Updating drainage networks and systems.

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EXAMPLE ADAPTATION OPTIONS (CONTINUED)

3. Coastal engineering

The range of coastal engineering adaptation options include:

Dune protection and maintenance

Dune protection and maintenance involves limiting disturbance to dunes and protecting/enhancing dune vegetation to increase the stability of the dunes.

The dune system is the beach's natural defence to coastal hazards. The foredunes dissipate wave energy and protect the land behind from impacts of erosion and storm tide. Vegetation across the dunes traps windblown sand and enhances the ability of dunes to rebuild after storm activity. Vegetation plans can be tailored to each site, and with consideration of other needs (e.g. views, access).



Beach nourishment

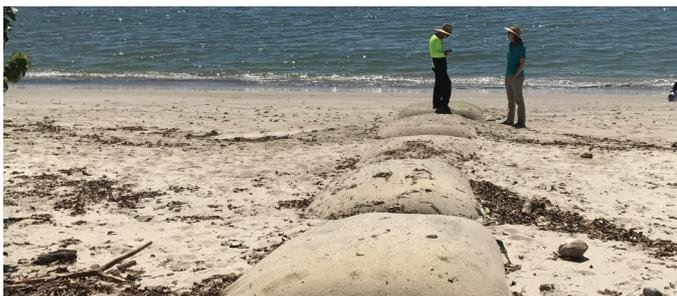
Beach nourishment involves importing additional sand to increase the volume of sand on the beach. Sand can be sourced from off-shore, quarries or other sources. Beach nourishment is typically combined with dune maintenance, to enhance the level of protection against erosion and storm tide levels.

Beach nourishment has the benefit of providing increased protection from coastal hazards while maintaining the natural values of the beach and coastline.

Structures to assist with sand retention

Structures can be installed to assist with retaining sand in a specific area of the shoreline. Usually combined with beach nourishment and dune maintenance, these structures typically take the form of one or many groynes that extend perpendicular to the long-shore sand transport.

Groynes will accumulate sand to the side where sand moves towards the groyne. Groynes are typically made of rock, wood, or geo-fabric bags.



Structures to assist with off-shore energy dissipation

Structures can be installed off-shore to create a zone where wave energy will break and dissipate prior to reaching the beach. These structures include breakwaters and artificial reefs. Natural off-shore reefs such as those present along the Douglas Shire Coastline already provide this benefit for many beaches.

Last line of defence structures

Structures such as seawalls can be used to protect critical assets where other coastal engineering options are not considered to be feasible. Seawalls provide an artificial barrier between the ocean and adjacent coastal land, and protect the coastal assets behind the wall from erosion. Seawalls are typically made of rock, concrete or geo-fabric bags, and can be designed as buried revetments or exposed walls.

A seawall is a hard barrier to wave energy. Unlike a dune system, a seawall has limited capacity to dissipate (spread out and absorb) energy when it hits the wall. As a result, waves refract off the seawall and scour sand away from the base (or toe). The presence of a seawall can often result in a complete loss of the high tide sandy beach. The appropriateness of seawalls is considered on a site by site basis.



Structures to minimise coastal flooding

Structures such as dykes and levees can be used to keep floodwaters from entering specific areas. Dykes and levees are artificially elevated mounds or walls that can be made of earth, rock, concrete, geo-fabric bags or other materials. The presence of dykes and levees can be either part of an emergency planning approach, or more permanent features as part of a drainage network.

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Adaptation approaches:

- Will vary from site to site within each region
- Are tailored to the needs of local communities
- Consider the relative impacts of coastal hazards
- Seek to safeguard the values (social, environmental and economic) and character of the landscape.

WORKING TOGETHER

Across Queensland, Councils and communities are working together to develop a Coastal Hazard Adaptation Strategy (CHAS), to avoid, manage and mitigate the impact of coastal hazards (from now to 2100). A shared understanding of values, assets, and the character of each landscape, provides the platform on which to build a tailored approach to adaptation.

Community members and interested stakeholder groups are encouraged to share knowledge on the history of their region, key values, past coastal hazard impacts, landscape changes, and a vision for a resilient coast.



MORE INFORMATION ON COASTAL ADAPTATION CAN BE FOUND AT:

- ✓ Coast Adapt: <https://coastadapt.com.au>
- ✓ QCoast2100: <http://www.qcoast2100.com.au>



FACT SHEETS IN THIS SERIES:

- Terminology
- Coastal landscapes
- Coastal hazards
- Coastal adaptation.