COCKBURN SOUND
COASTAL ALLIANCE

Cockburn Sound Coastal Vulnerability & Flexible Adaptation Pathways Project – Vulnerability Study

FREQUENTLY ASKED QUESTIONS

What are the key findings?

Stage 1 of the Cockburn Sound Coastal Vulnerability & Flexible Adaptation Pathways was a Coastal Vulnerability Study. This involved a detailed analysis of coastal processes within the Owen Anchorage Cockburn Sound (OACS) and assessed potential future changes to beaches, dunes and the seabed in response to those processes, including future climate change. The role that man-made and natural coastal structures play in the redistribution of sand was also identified. Erosion and inundation (flooding) hazard maps were developed for different timeframes, storm severity and sea level rise scenarios.

To access the report and hazard maps visit
www.cockburnsoundcoastalalliance.info

Key Findings - Inundation

The inundation assessment identified areas inland of the coastal dunes that may be affected by coastal flooding during severe storm events and future sea level rise. Findings of the study indicated that a number of isolated areas are currently susceptible to coastal flooding. The majority of these areas are located where coastal dunes are naturally low or have been removed. Sea level rise is likely to increase the severity of flooding in these areas, and may also expose additional sites to inundation hazard.

Key Findings - Erosion

The erosion assessment identified potential changes to the shoreline arising from:

- storm events and sea level rise (acute events); and
- sea level rise, changes in sediment supplies (natural processes and influence of coastal structures), historic erosion trends and change in equilibrium profiles of the beach due to storm events (chronic events).

What do the Hazards Maps show?

Erosion and inundation hazard maps were developed to show the extent of coastal inundation and erosion at different timeframes and scenarios. The timeframes selected were 2013 (present day), 2070 and 2110. The selected sea level rise scenarios for these timeframes were 0m, +0.5m, +0.9m and 1.5m.

The **erosion maps** show where the shoreline is likely to be at present day, 2070 and 2110. Erosion hazard lines comprise of short-term (acute) and long term (chronic) components. The acute component is a result of short-term changes in shoreline position caused by coastal processes and storm events. The chronic component is a result of long-term changes in shoreline position arising from both sea level rise and storm occurrences.

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The **inundation maps** show areas likely to be affected by inundation for 1 year, 10 year, 100 year and 500 year Average Recurrence Interval (ARI) storm event scenarios and for each sea level rise scenario (present, +0.5m, +0.9m, +1.5m). Four inundation events with different probabilities of occurrence in any one year were selected as the basis for the inundation mapping. These inundation levels were applied to the Department of Water LiDAR high-resolution topography from 2008, captured at a 1m spatial resolution with a ±0.1m vertical accuracy.

What are the key implications for management of the OACS coast?

The Cockburn Sound coast currently has a net surplus sediment supply. Sediments are naturally transported on shore from offshore banks and benthic habitats. This has historically lead to the effective use of coastal protection structures (typically groynes). However, coastal structures have interfered with sediment transport and supply causing erosion downdrift of these structures. The CSCA Vulnerability study discloses that this sediment supply will progressively decline, providing increasing difficulty to obtain and redistribute sediment. When the sediment supply is insufficient to keep pace with coastal change due to sea level rise, which is estimated to occur prior to or around 2070, a shift will be required for coastal management. Unretained sections of coast are predicted to experience progressive erosion, with the relative rate of erosion amplified as the proportion of protected coast is increased.

What are the key implications for planning?

The hazard mapping prepared as a part of the Project shows areas that may be at risk of coastal erosion and flooding. It is intended only to inform the other stages of the project. The mapping has not been developed to assist in the determination of development approvals or the definition of coastal setbacks and should not be used in the design of coastal structures, or setting of finished floor levels.

What are the limitations of the maps?

Whilst the data available for the Cockburn Sound is very rich and accurate, several gaps and limitations still exist and they have been acknowledged and partly addressed in Stage 1. Apart from potential inaccuracies in the data there is still uncertainty inherent in predicting any future climate variables. As a result of these limitations, the indicative coastal vulnerability mapping described by and accompanying this report does not provide a definitive high-confidence assessment of coastal vulnerability at any particular coastal site along the Cockburn Sound. Achieving a more confident assessment of the degree of vulnerability at any particular coastal site will require detailed mapping, on-going assessment and monitoring of that particular site, taking into consideration a range of regionally and locally variable climatic, oceanographic, geological, geomorphic, topographic and other factors specific to a site (or sediment cell).

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Glossary

ARI: Average Recurrence Interval. When talking about floods, this is an indication of how frequently a storm event of a particular size is likely to occur on average. Therefore, a 100 year ARI storm is likely to occur once in 100 years on average, but it has a one per cent chance of occurring in any one year.

Benthic: refers to anything associated with or occurring on the bottom of a body of water.

Coastal Erosion: refers to shoreline movement where the shoreline shifts landward, reducing the width of a coastal foreshore reserve.

Coastal Inundation: means the flow of water onto previously dry land. It may be either permanent (for example, due to sea level rise) or a temporary occurrence during a storm event.

Coastal Hazards: means the consequence of coastal processes that affect the environment and safety of people. Potential coastal hazards include erosion, accretion and inundation.

Vulnerability: predisposition to be adversely affected or unable to cope with events.

Contacts

Further information and details can be obtained from the Cockburn Sound Coastal Alliance website at www.cockburnsoundcoastalalliance.info or by contacting the Cockburn Sound Coastal Alliance Coastal Project Coordinator on Ph (08) 9411 3426.

You can also contact the CSCA local governments.

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