

Ballina land-based floodgate trial

COUNCIL NAME

Ballina Shire
Council

WEB ADDRESS

ballina.nsw.gov.au

SIZE

485 square
kilometres

POPULATION

41,000

FUNDING PROGRAM

Increasing
Resilience to
Climate Change

Overview

Ballina, a coastal town located on the northern bank of the Richmond River in northern New South Wales, is vulnerable to impacts from storm surges, flooding and high tides.

Ballina experienced 'once-in-a-1000-year' flooding events in 2022, but residents have been accustomed to frequent inundation of their low-lying CBD with each king tide. However, by 2050 the predicted sea level rise will mean king tide inundation is no longer just 'nuisance' flooding. Instead, it will cause significant damage to properties and critical infrastructure.

To adapt to a changing climate, Ballina Shire Council embarked on a pilot project to map its infrastructure and trial a prototype floodgate that presents immediate and positive resilience benefits.

Background

Lying adjacent to the Richmond River mouth, Ballina experiences inundation of its stormwater system during high ocean tides. These high tides pose a significant inundation threat, particularly when combined with storm surge and flood events.

Ballina's CBD is currently inundated by high tide events 6 to 10 times a year. This will increase in magnitude and frequency with sea level rise. Inundation generally affects roads, rather than properties. However, residents are frequently forced to drive through salt water up to 30 centimetres deep to access their homes.

Traditional floodgates were installed by Council at some locations, but these offered limited value because they were designed for agriculture and were prone to pipe leakage and frequent gate seizures. Information about the location and condition of stormwater drainage infrastructure was also poor, making attempts to address king tides a challenge.

Implementation

Ballina Shire Council is working hard to help its communities prepare for flood emergencies and to understand their own risks, hazards and tolerability to flooding. A series of flood studies and strategies has been undertaken over more than a decade, including the [Ballina Flood Study Update \(2008\)](#) and the [Ballina Floodplain Risk Management Study \(2012\)](#).

This project went a step further, mapping each stormwater and drainage infrastructure asset in Ballina's CBD, assessing its condition and functionality plus developing implementation plans for several sites.

A site for the trial floodgate was then selected alongside the Richmond River, at the south end of Moon Street where a large stormwater outlet is located.

The design and installation of the two main elements, a land-based pit enclosure and the floodgate itself, were achieved with the help of local resources, a Brisbane-based design team and a manufacturer in Sydney.



Traditionally, floodgates have been located at or over a water body. This project involved the construction of a land-based pit enclosure, which allows safe floodgate maintenance. The pit features a precast concrete lower section, which was easy to install.

The floodgate was made from HDPE, or high-density polyethylene. This material is strong, lightweight and malleable. The custom-made HDPE floodgate, with long-lasting stainless steel hinges, had advantages over unsuitable agricultural floodgates and costly imported options.



From left to right: installing pre-cast pit; installing the floodgate; the HDPE floodgate at the factory.

Outcomes

The floodgate is now being closely monitored in line with king tide cycles, and water levels manually checked at pit and kerb locations.

Key Learnings

The project was not without its challenges. The full-time role of stormwater and floodplain engineer remained unfilled during the rollout of this project, causing some delays. However, the pit is now operational and monitoring underway.

The NSW Government has identified Ballina as the state's first coastal town to be impacted by projected sea level rise. As such, the lessons learned from this project will be of keen interest to other coastal towns.

Contact

Name: Paul Busmanis
Position: Manager Engineering Works
Phone: 02 6686 1241
Email: Paul.Busmanis@ballina.nsw.gov.au



Funded by the
NSW Government
in association with
LGNSW