



Tweed River Entrance Sand Bypassing Project (TRESBP)

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RESPONSES

Case study part 3, of 5

Across the decades, communities and governments have responded to navigation difficulties at the Tweed River entrance and to drastic beach erosion on the southern Gold Coast.

Responses by government

Safety concerns or concerns about a loss within the community can prompt governments to respond to coastal issues.

Responding to navigation concerns

Navigation had a vital role in Australia’s transport and distribution of goods. But shallow and hazardous river entrances caused shipwrecks and deaths. The Tweed walls, built in the early 1960s, extend 380 metres out to sea. They extend beyond walls built earlier, in the 1890s. Public Works Departments in all states, historically, responded to public pressure and concerns for navigation safety by constructing training walls.



The *Tjalgum*, which ran aground at Tweed Heads in 1939.
Photo: Fred Lang Image courtesy of Tweed River Regional Museum

Responding to erosion

A coastline of eroded beaches was a massive issue for a local council. Southern Gold Coast beaches were particularly eroded in the 1960s and 1970s. There were major beach nourishment campaigns, or placing of sand, in the 1970s, 1980s and 1990s.

As well as beach nourishment, coastal structures were built including boulder walls at Coolangatta, Kirra and Bilinga beaches, and groynes at Kirra. These were built against a backdrop of debate over suitable coastal protection measures, and how much each level of government should pay for these measures. The adverse impact of coastal structures on sandy beach systems was not generally understood by communities and politicians until decades after these structures were built (Gourlay 1996). This coastline, however, has long been a managed one. For example, timber walls were constructed at the back of Coolangatta and Kirra beaches following a cyclone in 1936.



Waves over Kirra Surf Life Saving Club in the early 1970s (left), and Coolangatta’s boulder wall, built 1968, to protect the beach, surf club and Marine Parade.

Responding to coastal issues with research

Severe erosion on the Gold Coast led the Queensland Government to commission, in the 1960s, the Delft Hydraulic Laboratory study into coastal processes. The study, released by the government in 1971, recommended coastal protection measures. It also established the quantity of longshore sediment drift at, on average, 500,000 cubic metres per year. This was important—quantifying the amount of sand southern Gold Coast beaches should receive through longshore drift, but missed out on.

Another important research milestone was a joint study on the Tweed River entrance and options for improving coastal outcomes, with sand bypassing as one option. The New South Wales and Queensland governments initiated the study in 1990; the study led to high-level political meetings considering sand bypassing as a reality for the region.

Responding to coastal issues with Tweed sand bypassing

The Tweed River Entrance Sand Bypassing Project (TRESBP) commenced in 2001, after years of political meetings, research, environmental studies, community consultation, and then legislation (in the 1990s). The system is a complex, long-term, coastal management response tackling two major, related problems:

- the sand build-up at the Tweed River entrance
- the failure of drifting ocean sand, or longshore drift, to reach southern Gold Coast beaches.

Two key characteristics of the sand bypassing system as a response are: it reinstates longshore drift, which was absent for almost forty years; and the system works through a partnership between two states, New South Wales and Queensland.



Tweed River entrance and training walls, with popular beaches to the north.

Responses by community

Communities voiced concerns and lobbied for action on erosion. Media played an important part. In 1972, the editorial of the Queensland newspaper *The Courier-Mail* (21 January 1972) stated: "Whichever party wins the next election [Queensland state election of May 1972], long-term planning to overcome erosion should not be delayed. But some urgent action is needed now."

Responding to erosion (prior to sand bypassing)

During drastic storms on the Gold Coast in 1967 thousands of residents and community volunteers worked to save coastal properties by filling sandbags for protective walls. Communities also responded by lobbying for coastal protection structures such as groynes. These structures were an attempt to halt the massive beach erosion of the 1960s and 1970s, and the social and economic upheaval.

Responding to navigation hazards (prior to sand bypassing)

In the 1990s, navigators and fishers responded to the decades of built-up sand at the Tweed River entrance by lobbying media and politicians for a sand bypassing system. The Tweed Heads newspaper, *Daily News*, ran an article on 27 June 1992 about a planned rally: "Professional fisherman and the Kirra Coastwatchers will hold a rally early next month to focus public attention on the extreme urgency of the decision to proceed with a Tweed River bypass system."

Responding to loss of surfing quality at Kirra (since sand bypassing)

Surfers expressed concerns over wave quality at Kirra Beach by lobbying, including the Australia Day 'paddle-out' off Kirra. In

January 2009, more than 1000 surfers made the shape of mainland Australia with their boards. This was a strong media-oriented response by part of the surfing community. Their concerns were a loss of wave quality at Kirra and wide beaches. A decade of very few storms (which disperse sand) kept southern Gold Coast beaches wide. Storm activity from 2009 onwards began to shift this excess sand, with beaches fluctuating naturally.

Responding to channel depth concerns (since sand bypassing)

Even since sand bypassing, navigators occasionally express concerns about sand build-up at the river entrance. Some sand will always make its way past the sand traps at the jetty, and end up in the river mouth. Concerned navigators 'call' for dredging. They seek a deeper entrance channel and improved conditions for entering and leaving the river. Today most navigation is recreational with some commercial boating such as tourism and fishing; fifty years ago the fishing fleet had a dominant presence.

Reference:

Gourlay, M 1996, 'History of Coastal Engineering in Australia', in NC Kraus (ed), *History and Heritage of Coastal Engineering*, American Society of Civil Engineers, New York.



Hazardous navigation conditions at Tweed entrance in 1995, prior to sand bypassing (left), and Tweed River entrance today still requires caution.

Little of Australia's massive coastline needs coastal management—but when it does, problems are often major. This extract looks at why these problems occur, and three main responses on the Gold Coast.

Impact of coastal erosion in Australia

by Professor Andrew Short

For the 50 per cent of the Australian coast that is composed of sand and in some places mud, the shoreline is prone to change, building seaward and in some places eroding landward. In most locations this is a natural process with usually no impact on human settlement. Coastal protection of the shoreline is rarely required in Australia, however in a few locations the dynamic shoreline has become a problem, in some cases a major and expensive problem, and in almost all of these cases the problem is related to human interference or encroachment on the shoreline.

Coastal protection works, such as breakwaters, groynes, or seawalls, are usually built to guard against erosion. In doing so they harden the coast and reduce its ability to adjust naturally. As a consequence, these defences can exacerbate further erosional problems, with seawalls reflecting and concentrating wave energy and erosion, and groynes starving downdrift the coast of sediment thereby leading to further erosion. There are areas where humans have encroached into the dynamic beach environment only to suffer the consequences, and others where they have interfered with coastal processes leading to accelerated coastal erosion.

...Australia's best known strip of defended coastline, and a major holiday destination for local, national and international tourists, is the 35 kilometres between the New South Wales–Queensland border at Point Danger and the Nerang Inlet, better known as the Gold Coast. Here is a system that is part of a northerly conveyor

belt of sand moving north from New South Wales across the border at a rate estimated at 500 000 cubic metres each year. In 1962–64 the Tweed River training walls were extended for navigation, 400 metres out to sea. The southern wall blocked the movement of sand, which built out the adjacent Letitia Spit by 250 metres, in the process trapping millions of cubic metres of sand and preventing it from moving across the border and along the Gold Coast beaches. As the sand supply was depleted, combined with a series of severe cyclones (Dinah, Barbara, Dulcie, Elaine and Glenda) in 1967, 8 million cubic metres of sand was eroded from the beaches and threatened the backing Gold Coast roads, houses and hotels. The solution has been threefold. First, a continuous terminal seawall was built the length of the coast and covered with sand and dunes. Second between 1995 and 2000, 3.5 million cubic metres of sand was dredged from the Tweed Bar and placed offshore of the southern Gold Coast beaches. Third, a permanent pumping system was built just south of the training wall, which since 2000 has pumped more than 500 000 cubic metres of sand each year from New South Wales across the border onto the Gold Coast beaches. In 2007 these beaches were as wide as they have ever been. However, it has all come at a cost in the tens of millions of dollars.

Extract reprinted courtesy of *Coastalwatch* and Professor Short

Source: www.coastalwatch.com/news/article.aspx?articleid=4524&catelid=3&title=Impact%20of%20coastal%20erosion%20in%20Australia