TWEEDSAND BYPASSING

Contract Year 22 Report

October 2022 – September 2023

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INTRODUCTION

Tweed Sand Bypassing (TSB) was established by the New South Wales and Queensland governments to overcome severe southern Gold Coast beach erosion and navigation problems at the Tweed River entrance.

TSB is a sand transport system that collects sand from the southern side of the Tweed River entrance and pumps it under the river to outlets on the northern side. The Project also periodically dredges sand accumulated in the Tweed River entrance.

Acts of Parliament in New South Wales (1995) and Queensland (1998) set the TSB objectives as:

- establishing and maintaining a safe, navigable entrance to the Tweed River; and
- providing a continuing supply of sand to southern Gold Coast beaches, consistent with natural drift rates, together with additional sand as needed to restore and maintain recreational amenity of the beaches.

Commissioning of the system began in September 2001, following river entrance dredging campaigns from 1995. TSB is designed to transport natural quantities of sand northward interrupted by the Tweed River breakwaters' construction.

Tweed Sand Bypassing has been a part of the Tweed and southern Gold Coast community since 2001 and maintains sandy beaches, a safe and navigable river entrance and world-famous surf breaks

BACKGROUND

Natural, northerly sand drifts along the Tweed coast and into southern Gold Coast beaches averages around 500,000 m3 per year. The extension of the Tweed River entrance breakwaters in the 1960s to improve navigation inadvertently intercepted the natural northerly sand drift and created a sand trap against the southern breakwater.

Without sand naturally nourishing and rebuilding the beaches of the southern Gold Coast, they became severely eroded from the 1960s onwards. In addition, navigation became dangerous at the Tweed River entrance as sand accumulated. By the mid-1990s, about 7.5 million m3 of sand was trapped in the river entrance, and on the southern side of the Tweed River entrance training wall.

Pipeline and pump discharge outlets

Following river entrance dredging which began in 1995, sand bypassing operations commenced in 2001. With consent from the Tweed Byron Local Aboriginal Land Council, a pump house and fixed pumping jetty were constructed at Letitia Spit.

Sand is collected by pumps on the jetty and transferred back to the ocean through an underground pipeline network to southern Gold Coast beaches, bypassing the Tweed River entrance. This is with an ocean-going dredge periodically used to clear the navigation channel. The quantities of sand delivered are consistent with estimated natural sediment transport quantities.

PARTNERS

New South Wales

The New South Wales Government is the coordinating state for TSB; Transport for NSW is responsible for project implementation through a specialist project team.

Queensland

The Queensland Government is the reviewing state for TSB; the Department of Environment and Science takes a complementary role including environmental and technical monitoring.

Local Government

City of Gold Coast actively supports TSB with guidance on local and community aspects, and also contributes financially.

Tweed Shire Council actively supports TSB with guidance on local and community aspects.

Contractor

Tweed River Entrance Sand Bypassing Company Pty Ltd, a subsidiary of McConnell Dowell Corporation Ltd, operates and maintains the sand bypassing system.

TSB GOVERNANCE

The sand bypassing system was designed and built by McConnell Dowell (Australia) with system operation and maintenance conducted by McConnell Dowell's subsidiary, the Tweed River Entrance Sand Bypassing Company (TRESBCo), under a twenty-five-year contract ('Concession Agreement') with the governments to September 2024.

TRESBCo staff oversee pumping and dredging operations and conduct systems maintenance from the sand bypassing jetty facility at Letitia Spit.

TSB is a joint initiative of the New South Wales and Queensland State governments. The two agencies that implement the TSB are:

- Transport for NSW
- Queensland Department of Environment and Science

Strategic decisions are made jointly by the governments through a defined management structure.

A Working Group has been constituted under the states' legislation to provide strategic direction and oversight for TSB. The Working Group met four times during Contract Year 22.

Working Group Member	Position
Anthony Johansson	NSW Project Director
Celine Roux	Qld Project Director
Darren Wood	NSW State Representative
Dr Mark Jacobs	Qld State Representative
Jane Lofthouse	NSW Local Government Representative
Liam De Lucia	Qld Local Government Representative

Both state Ministers are joint principals to the operating contract. A partnering approach has been adopted between the Project teams from the two states so there is a transparent management and joint decision-making process.

A community engagement and communications process are in place recognising the importance of community input and reciprocal communications.

FINANCIAL SUMMARY

The costs of TSB are shared between the New South Wales Government, the Queensland Government, and the City of Gold Coast.

The interstate cost sharing arrangements are set down within the Project's legislation: the *Tweed River Entrance Sand Bypassing Act 1995* (NSW) and the *Tweed River Entrance Sand Bypassing Agreement Act 1998* (Qld). The cost sharing arrangement between the Queensland Government and the City of Gold Coast for TSB costs is 50 per cent each. A breakdown of the total annual operating expenditure for Contract Year 22 is shown below:

Period	Expenditure ($)
Oct-22	464,801
Nov-22	354,721
Dec-22	447,311
Jan-23	355,707
Feb-23	253,522
Mar-23	427,521
Apr-23	374,851
May-23	999,229
Jun-23	1,576,523
Jul-23	164,973
Aug-23	883,925
Sep-23	807,174
Total	**$7,110,258**

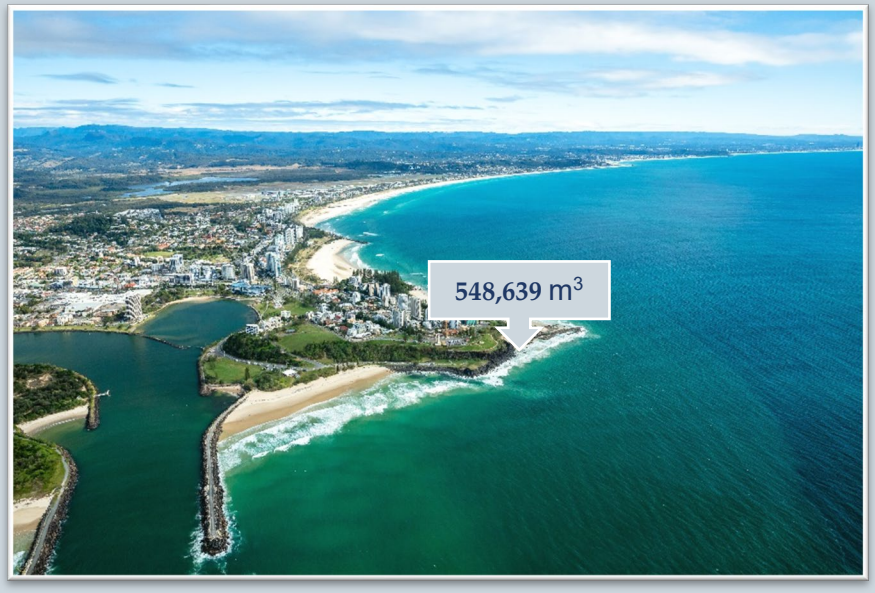
OPERATIONS

Total sand delivery through sand pumping and entrance dredging for Contract Year 22 was 818,772 cubic metres (m^3) (548,639 m^3 pumping and 270,133 m^3 dredging).
April 2023 saw the largest April month of pumping since TSB commencement due to a highly active wave climate. In contrast to these conditions, the modelled longshore sediment transport rate for August 2023 was the lowest August on record.

Pumping

PUMPED SAND DELIVERED VIA JETTY MOUNTED SYSTEM IN CY22 (m^3)					
Year	**Month**	**Volume SRE**	**Volume D'bah**	**Volume Total**	**Volume Average (2018–2022)**
2022	OCT	77,432	0	77,432	34,389
2022	NOV	12,241	0	12,241	19,699
2022	DEC	88,971	0	88,971	41,258
2023	JAN	48,339	0	48,339	32,712
2023	FEB	41,601	0	41,601	45,401
2023	MAR	22,898	0	22,898	38,229
2023	APR	98,757	0	98,757	34,569
2023	MAY	35,478	0	35,478	49,844
2023	JUN	23,324	0	23,324	38,920
2023	JUL	32,493	0	32,493	42,051
2023	AUG	22,418	0	22,418	27,248
2023	SEP	44,687	0	44,687	31,027
TOTAL		548,639	0	548,639	435,347

SRE = Snapper Rocks East *D'bah = Duranbah Beach*

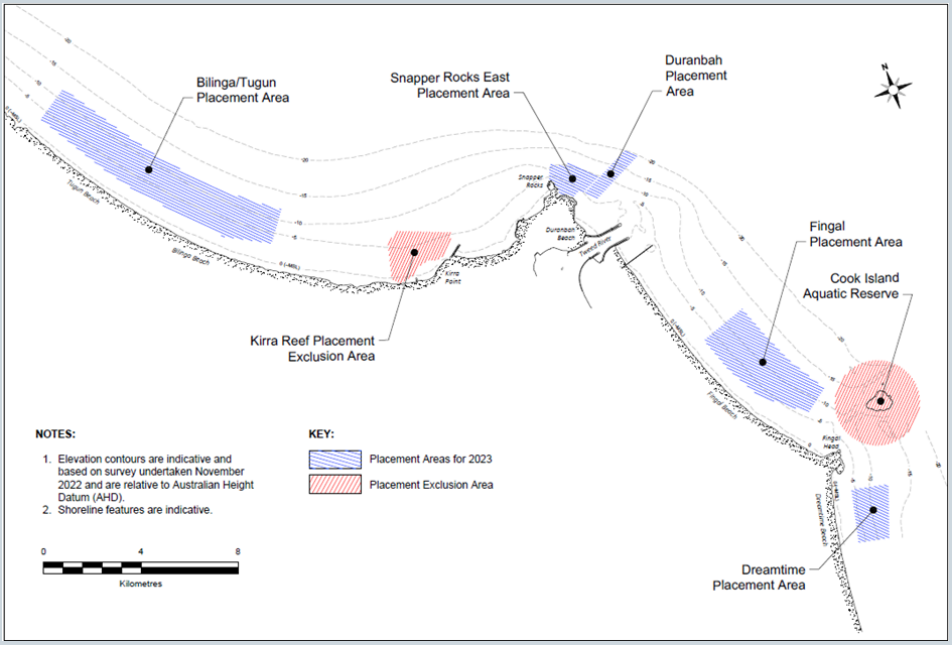


Dredging

The volume of sand dredged and delivered in Contract Year 22 was 270,133 m^3. Dredging occurred on three separate occasions in CY22.

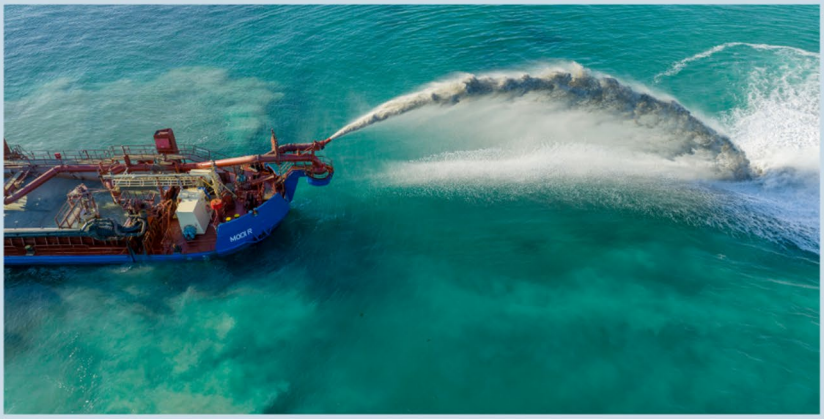
Dredging in October / November 2022 was a continuation from CY21 with 19,865 m^3 dredged by the *Viking R*. In May and June 2023, 199,764 m^3 was dredged using the *Modi R* and then in September the *Trud R* dredged an additional 50,504 m^3. Removal and placement volumes for each month of the contract year are shown below.

SAND DELIVERY BY DREDGE CY22						
MONTH	**Duranbah**	**Snapper Rocks East**	**Fingal**	**Dreamtime**	**Bilinga**	**Total Vol (m^3)**
OCT	10,256	2,777				13,033
NOV	6,832					6,832
DEC						0
JAN						0
FEB						0
MAR						0
APR						0
MAY	55,936					55,936
JUN	12,124	59,722	31,084		40,898	143,828
JUL						0
AUG						0
SEP		8,958		10,739	30,807	50,504
TOTAL	**85,148**	**71,457**	**31,084**	**10,739**	**71,705**	**270,133**



CY22 dredge placement locations

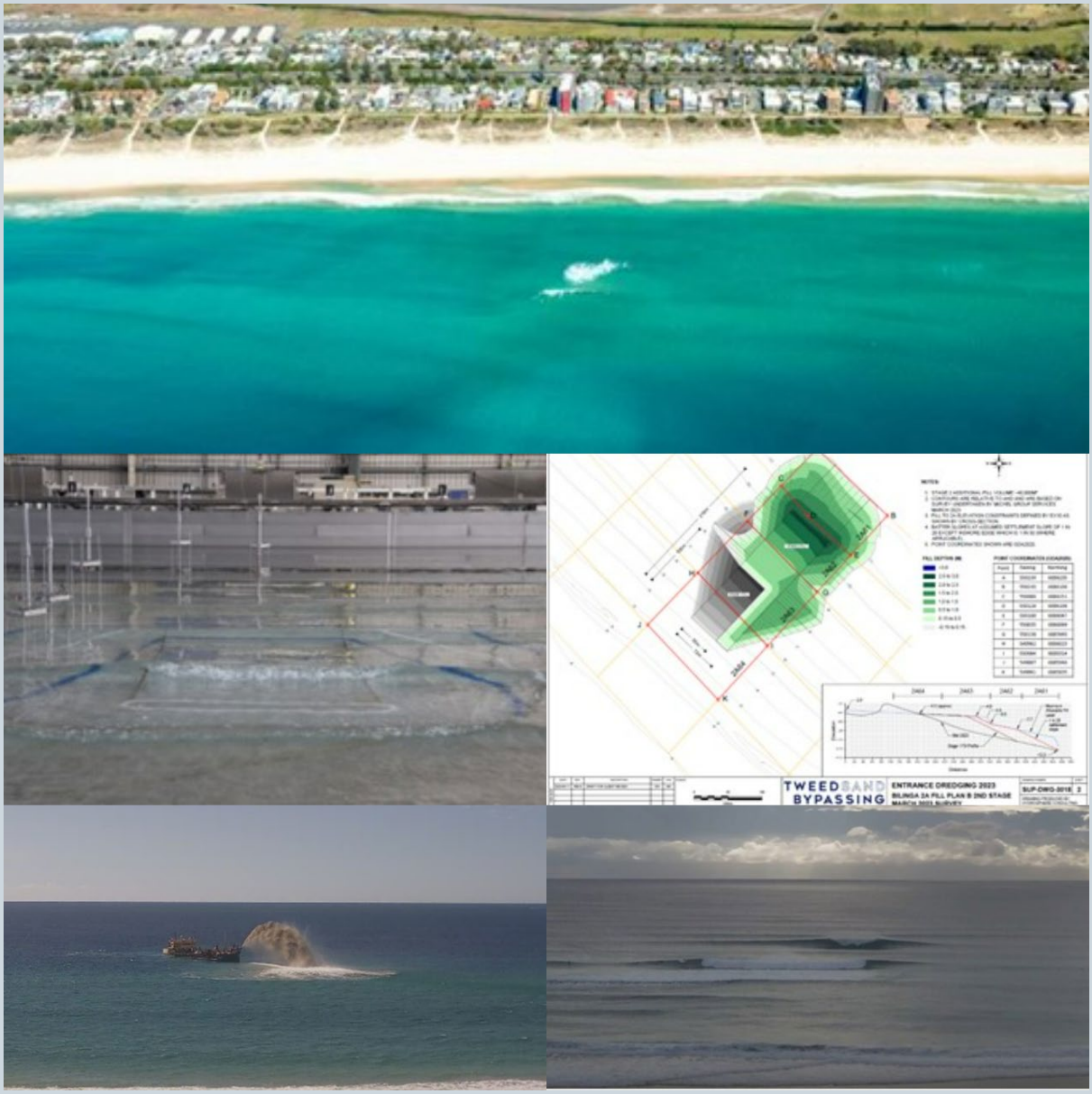
operations (cont.)...



CY22 dredge vessels

operations (cont.)...

Bilinga was used for targeted dredge placement in CY22 following previous investigations and physical modelling by the Queensland Government Hydraulics Laboratory. Surf amenity benefits were realised via the placement and images of the physical modelling, design and placement outcomes are shown below.



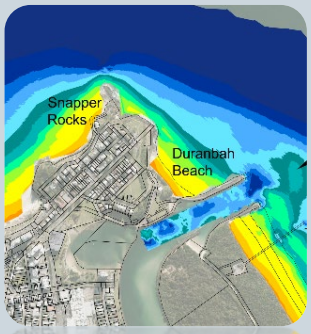
ENVIRONMENTAL

Environmental Monitoring

In CY22 the TSB undertook the following environmental monitoring activities:

Wave and tidal data

Collected data from 3 wave buoys and 2 tide gauges. Annual wave and tidal reports produced.

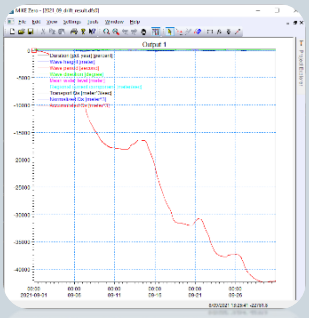


Hydrographic surveys

2 full coastal surveys, 3 Letitia Beach & Duranbah Beach surveys, 10 entrance surveys & navigation aid maps produced.

Aerial imagery

4 oblique photo runs to monitor beach amenity, 2 aerial imagery runs for use with GIS mapping.



Sediment transport modelling

Monthly numerical model calculations to compare against conditions and pumping volumes.

Reef biota monitoring

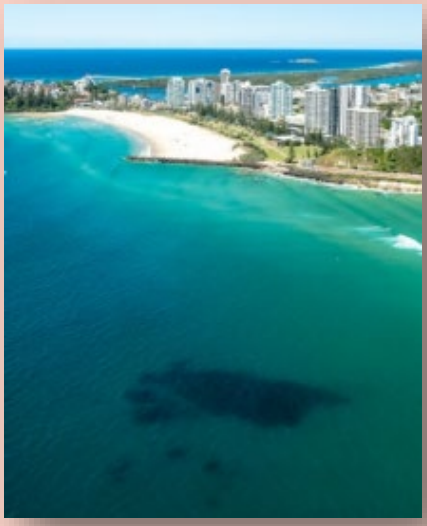
Kirra Reef, Cook Island, Palm Beach Reef field surveys and reporting.

Shoreline and surf monitoring

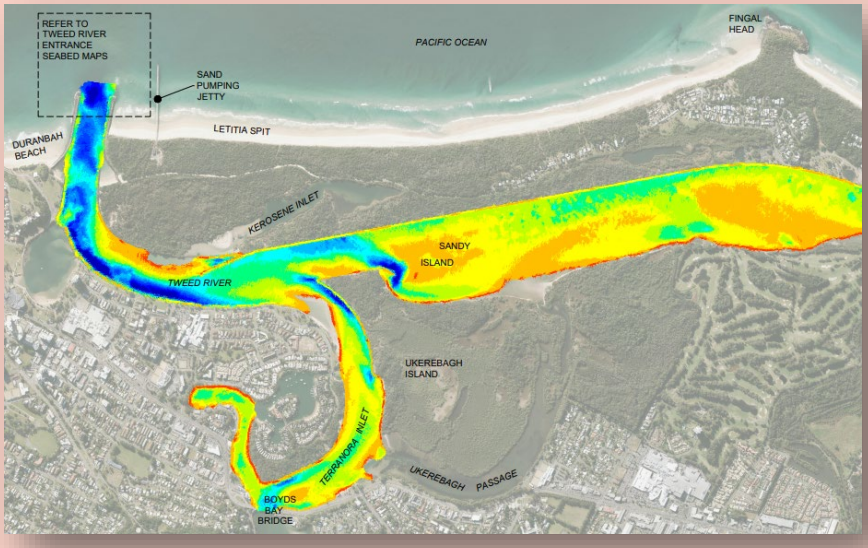
Beach width tracking at Duranbah, Rainbow Bay, Coolangatta and Kirra beaches.

Environmental Subject Matters

The following are examples of environmental subject matters that were tracked throughout CY22:



Kirra Reef areal extent increased between 2022 and 2023 and remains within the variability seen since 2012.



Lower Estuary Shoals determined to be in a reasonable condition through the analysis of Tweed River survey completed in July 2022 in response to the March 2022 floods.

COMMUNITY & COMMUNICATIONS

TSB Advisory Committee

During Contract Year 22, meetings for TSB Advisory Committee, established under New South Wales and Queensland legislation, were held in November 2022, and February, May, August 2023. This ten-member committee is TSB's main community engagement forum.

Position	Appointee
Qld State Officer	Celine Roux
Qld State Officer	Linda Rijkenberg
City of Gold Coast Representative	Gail O'Neill Cr
Qld Community Representative	Wayne Bartholomew AM
Qld Community Representative	Peter Turner
NSW State Officer	Anthony Johansson
NSW State Officer	Adrian Barwick
Tweed Shire Council Representative	Jane Lofthouse
NSW Community Representative	John Ede
NSW Community Representative	Robert Alexander

Ordinary items discussed at each meeting:

- Community beach and river entrance reports
- Advisory Committee member reports
- Sand bypassing system operations + delivery program
- Environmental monitoring
- Entrance conditions, usage and survey
- Projects and enhancements
- Communications
- Community Comments/Questions

Key topics raised by community members in CY22 included:

- Tweed River entrance navigability
- Consistently good surf and swimming conditions
- Dredging campaign
- Fingal beach erosion
- Swimming amenity Rainbow Bay

Summaries of the key issues and discussion points from each Advisory Committee meeting can be found here on the TSB website.

Community Relations

2023 World Surf League Snapper Rocks Challenger Series

May 2023

Geoff Provest MP tour of operations June 2023

Flotsam Festival 2023

Digital sculpture responsive to environmental elements affecting the southern Gold Coast's surf conditions with data provided by the Tweed Sand Bypass

37th International Conference on Coastal Engineering

2022 IPWEA Maritime and Coastal Infrastructure Forum

Australasian Coasts and Ports Conference 2023

community + communications (cont.)...

Engaging with and responding to local communities during CY22 included:

Meetings

Focus group sessions held with the SLSC community and Friends of Rainbow Bay

Visits

3 school group visits

1 university group visit

2 overseas delegation tours

Noticeboards

Local area educational noticeboards upgraded, and 1 new location added

Emails

Project updates to Advisory Committee members and community stakeholders

Online

TSB website, TSB App, TSB Instagram posts

Other

Presentations at 3 conferences

Information booths

TSB Website

www.tweedsandbypass.nsw.gov.au

The website continues to be reviewed and updated with TSB information. CY22 saw the environmental content improved to include:

- environmental approvals
- monthly monitoring summaries – more relevant information and data visualisations presented
- coastal conditions – links to wave buoy and tidal data updated, reports easily accessible
- surveys – new bathymetric plans
- current reef monitoring report
- estimated sand transport – all historical reports reproduced and now up to date.

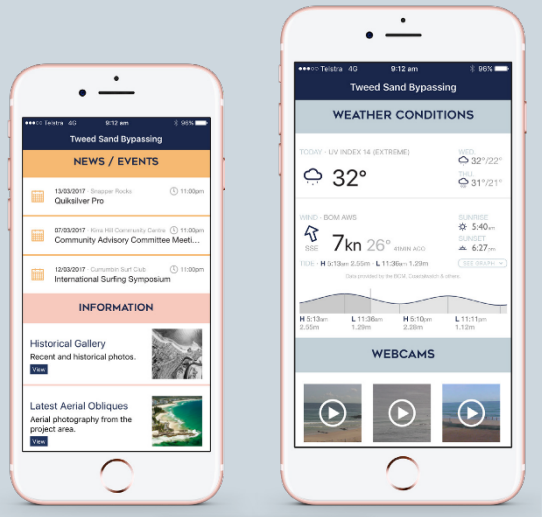
Instagram

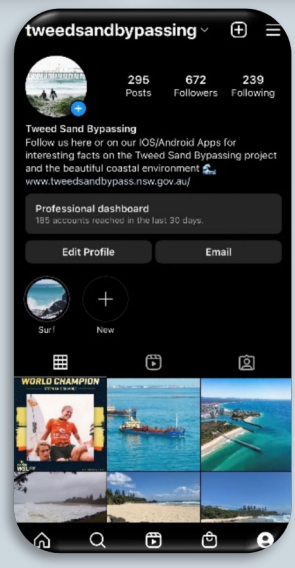
@tweedsandbypassing

The Project's social media presence is maintained through Instagram. The official page for Tweed Sand Bypassing currently has just over 670 followers.

TSB App

The Tweed Sand Bypassing Smart Phone application (app) provides key information and resources on TSB. The app informs users of the latest sand pumping and dredging activities, including where and how much sand has been delivered in the previous 24 hours. Other features include access to Duranbah, Snapper, Rainbow and Kirra webcams, live wave buoy data, the latest entrance survey map, weather conditions, news and events and other Project information.





CY22 KEY EVENTS

TSB Transition Project

Transition activities progressed through CY22 with preparations for NSW to take on direct operation, maintenance, management, and repair of TSB from 1 October 2024. Some key tasks completed or commenced in CY22 included:

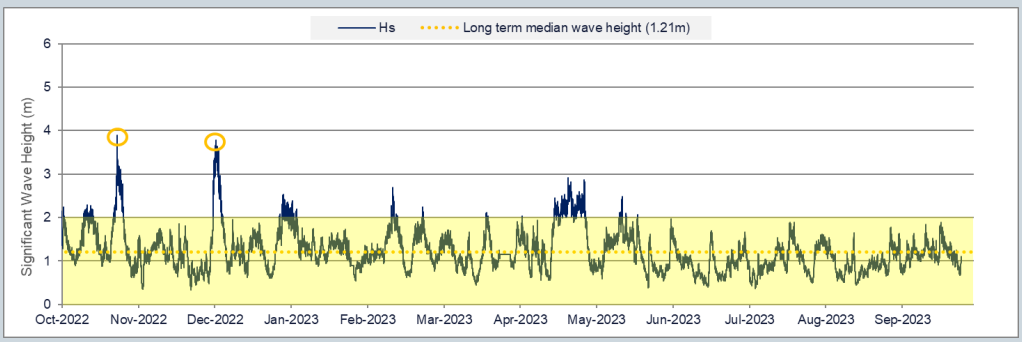
- Preparation and adoption of a new TSB strategy for implementation 1 October 2024.
- TSB Management System drafting.
- Drafting of future Intergovernmental Agreement for Operations, Maintenance, Management and Repair.
- Preparations for recruitment of operations staff.
- Preparations for IT solutions, heavy plant, and goods and service contracts.

Surf Conditions

Favourable surfing conditions were common during the first half of CY22 with persistent above average wave heights. The sand banks from Snapper Rocks to Greenmount remained high quality resulting in excellent waves during larger swells. Duranbah Beach also maintained quality sand banks through the majority of CY22 with smaller swell conditions being more suitable.

Weather events

Through CY22 there were only a few significant weather events which was a clear contrast to the year before which included record flooding of the Tweed River. CY23 started off with a sub-tropical low in October that moved from the central Qld coast and tracked south. Wave heights peaked just under 4 metres. Again, similar peak wave heights were observed in December from a large easterly swell. From mid-April 2023 until the end of the month there were persistent overlapping sources of wave energy resulting in sustained energetic wave conditions from the east. This resulted in the largest estimated longshore sediment transport rate for April of any year since commencement of TSB. In the figure below the swell events noted can be observed in October, December, and April.



Projects and Enhancements

Letitia Coastal Processes Study

A technical analysis of the long-term shoreline response at Letitia was completed allowing the relaxation of a long standing Concession Agreement monitoring requirement.

Kirra Amenity Assessment

An assessment of beach and surf amenity unique to Kirra Beach commenced which aims to address historical community perceptions and consider emerging trend in overall amenity.

Cathodic Protection

An assessment of the cathodic protection systems operating at TSB including investigations into opportunities for improvements to ensure TSB's infrastructure is adequately protected from corrosion.

Hydrographic Survey Contract

A new 3+1+1 year contract for ongoing hydrographic survey services was procured.

TSB Management System

Along with preparation of numerous plans, specifications and procedures, a new drawing set was created for the TSB Management system.

CONTACTS

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Instagram @tweedsandbypassing

Tweed Sand Bypassing acknowledges Aboriginal peoples as the Traditional Owners and custodians of the land. We recognise their connection to land, sea and community, and pay our respects to Elders past, present and emerging.

Prepared by: Tweed Sand Bypassing

October 2023