

TWEED SAND BYPASSING

ENVIRONMENTAL MONITORING SUMMARY – OCTOBER 2021

1. SAND PUMPING & DREDGING

- 14,201 m³ was pumped to Snapper Rocks East.
- 0 m³ of sand was dredged

Sand Delivery October 2021

Pumped: 14,201 m³

Dredged: 0 m³

Total: 14,201 m³

The number of days sand was pumped this month = 18

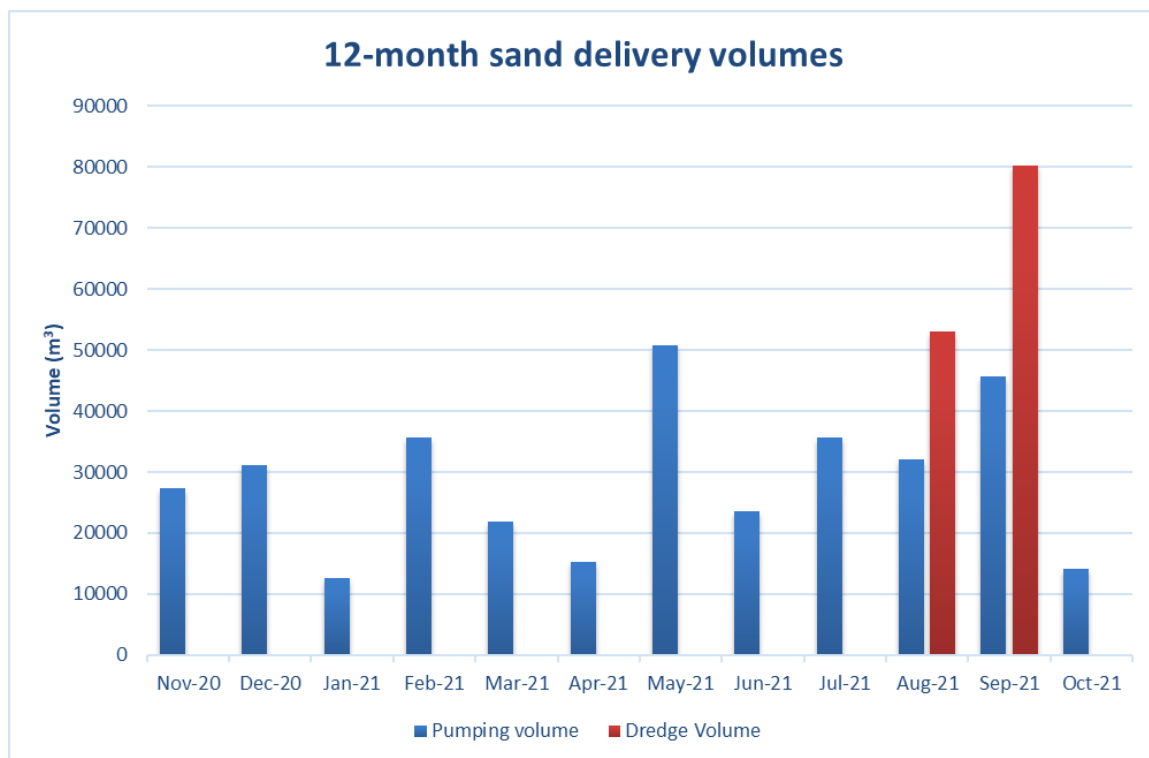
Stage II Sand Delivery May 2000 to date

Pumped: 10,363,955 m³

Dredged*: 2,715,369 m³

Total*: 13,079,324 m³

* This Includes 22,870 m³ of sand delivered by dredge to Palm Beach between June 2005 and September 2005



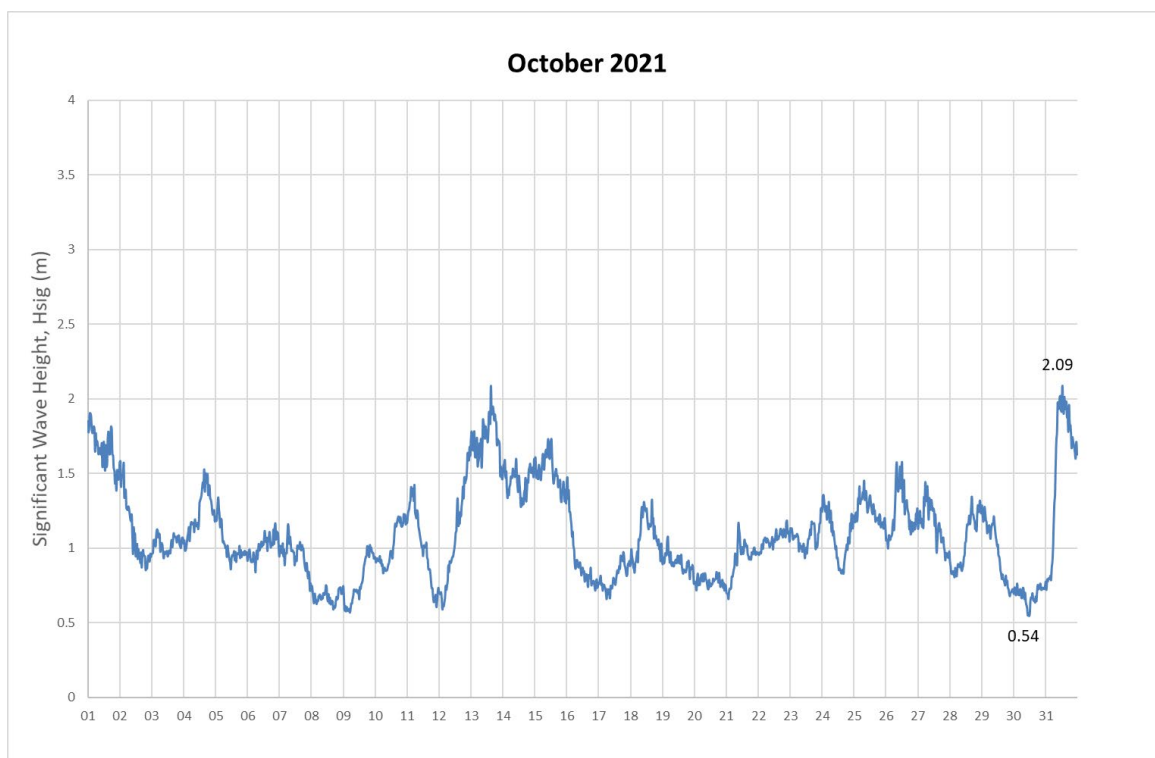
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2. WAVE CONDITIONS

Significant wave heights (H_{sig}) were low for the month of October. Wave directions were predominantly from the south east and ESE.

- Minimum H_{sig} : 0.54 m on 30 October 2021
- Maximum H_{sig} : 2.09 m on 31 October 2021
- Number of days where $H_{sig} < 1$ m at some point: 26
- Number of days where $H_{sig} > 2$ m at some point: 2

Note: H_{sig} is defined as the average of the highest one-third of waves recorded over a period of approximately 30 minutes



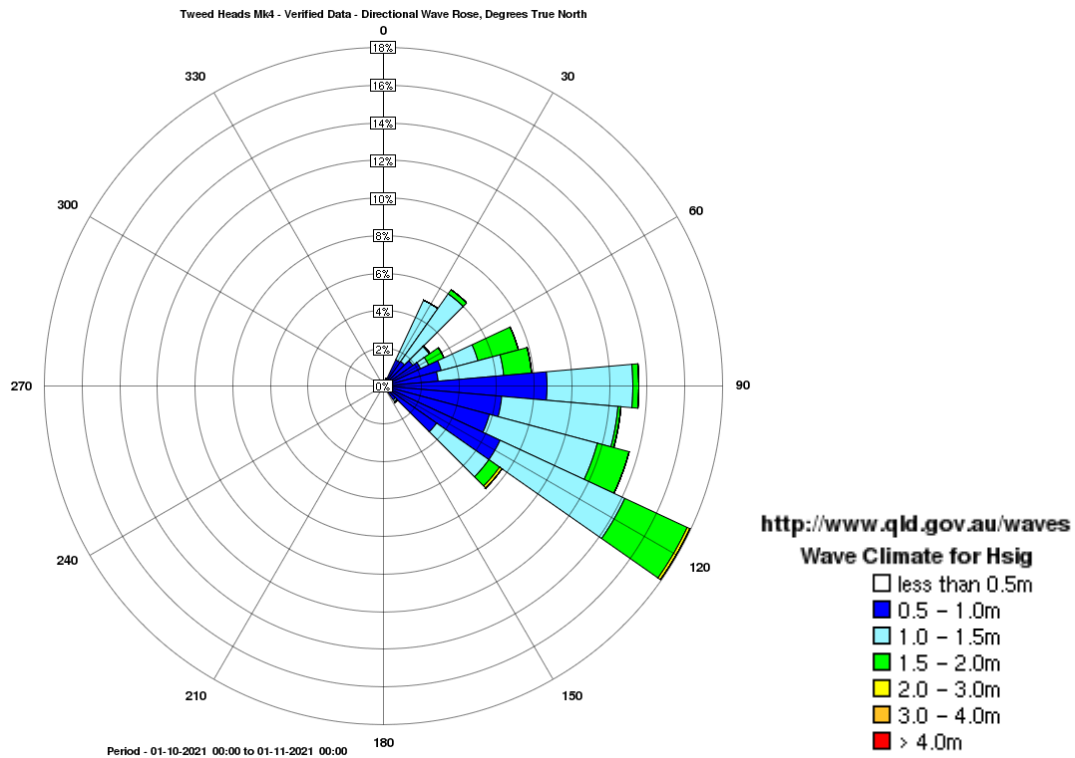
(Source: Tweed Heads Waverider buoy; Queensland Government)

In January 2020 TSB commissioned the deployment of another Waverider buoy in the Tweed region. The Tweed Offshore Waverider buoy was deployed in approximately 60 m water depth to the east and adjacent to Kingscliff and Dreamtime Beaches. The purpose of the Tweed Offshore buoy is to observe and assess changes in wave climate at the Tweed Heads buoy due to the presence of the Danger Reefs and Cook Island.

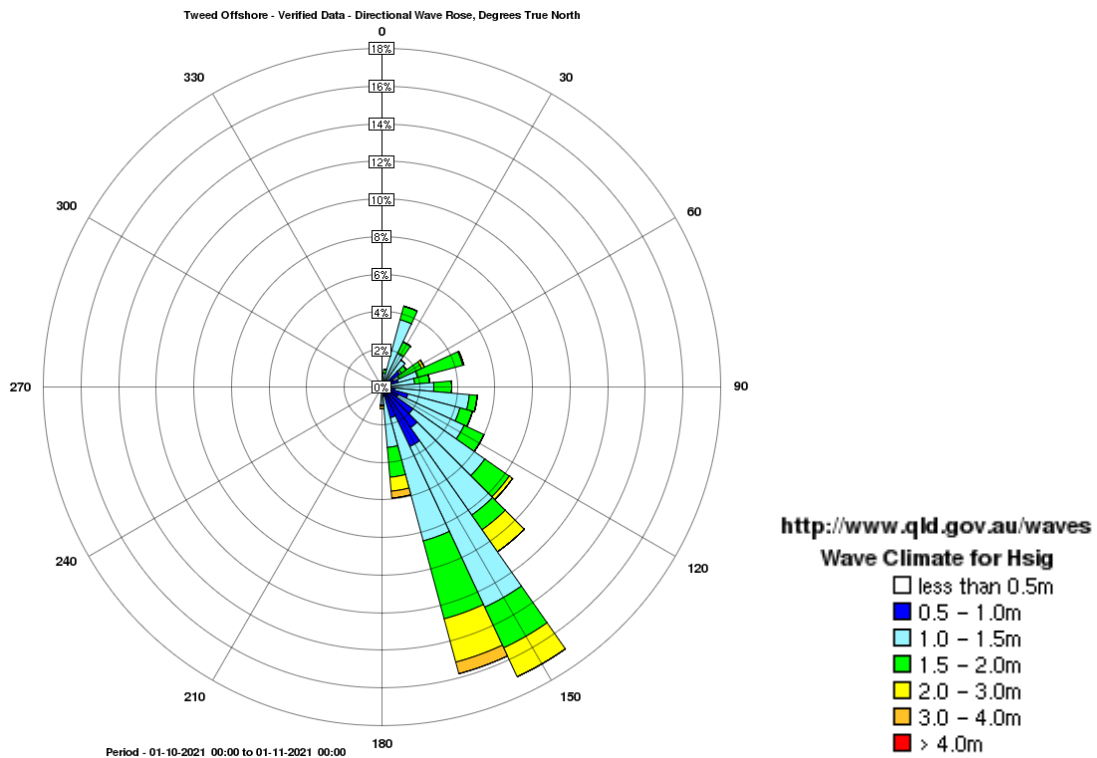
A link to data recorded by the Tweed Heads and Tweed Offshore Waverider buoys is available at: <http://www.qld.gov.au/waves>

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NEARSHORE WAVE DIRECTION



OFFSHORE WAVE DIRECTION



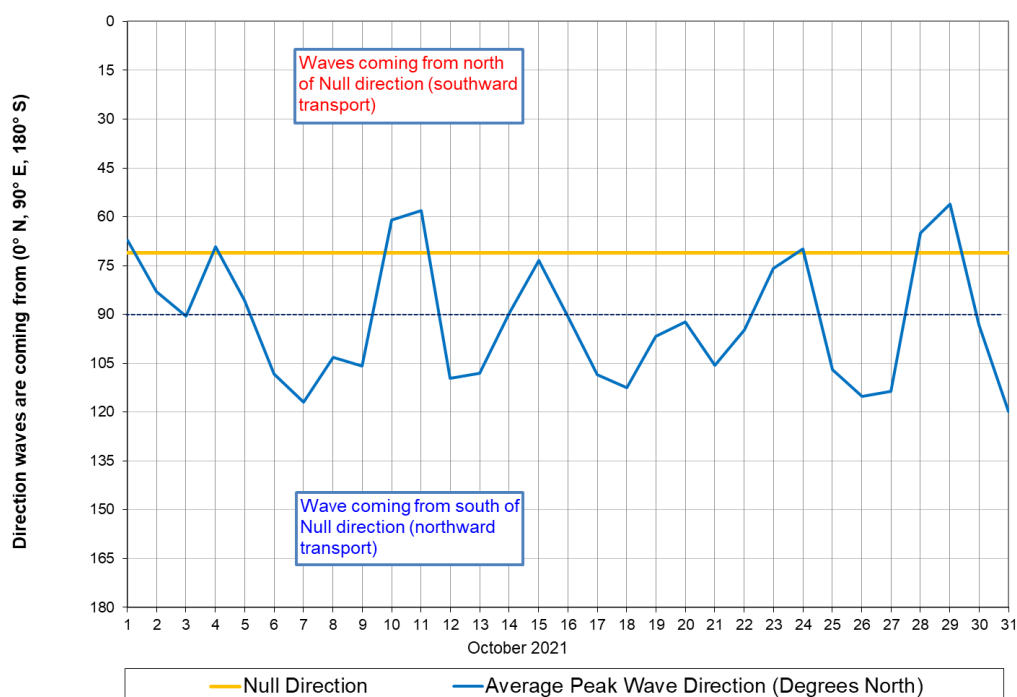
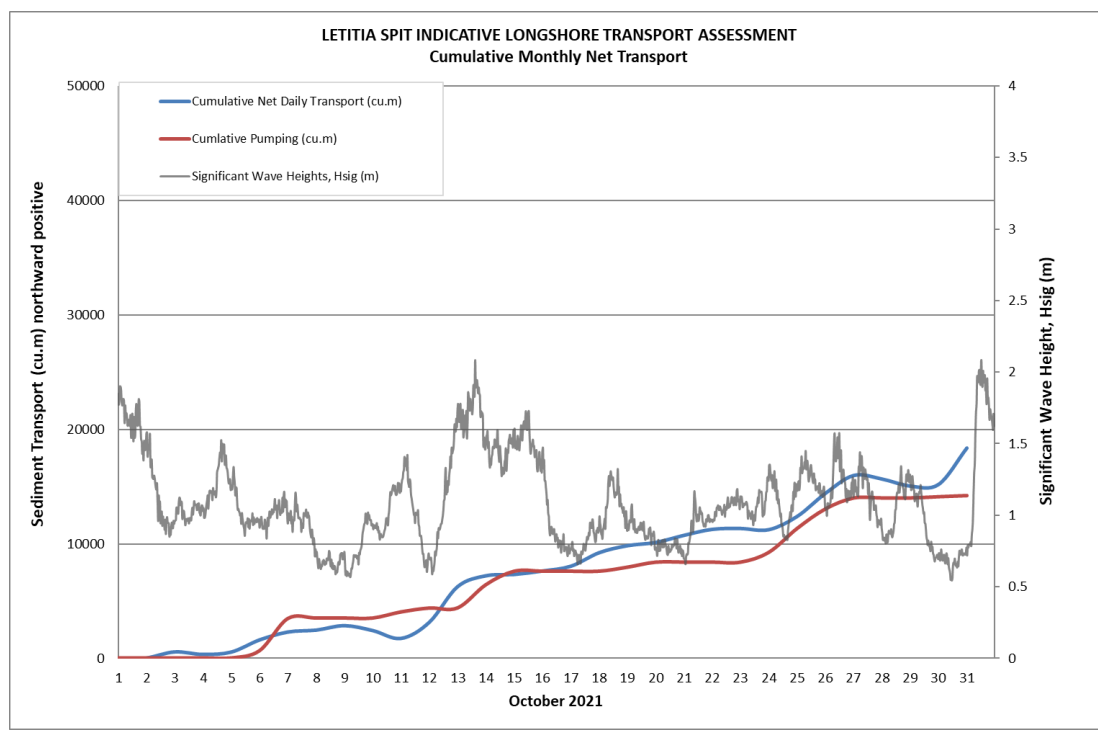
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3. INDICATIVE LONGSHORE TRANSPORT

The first graph below is based on simplified sediment transport modelling and is indicative only. The second graph indicates the wave direction in relation to the shoreline null direction (a wave direction coming from south of this line generally results in northward transport of sand).

In October 2021 the estimated natural sand transport moving north towards the Tweed River entrance was calculated to be in the order of 18,000 cubic metres. This result is 61 per cent of the average estimated sand transport quantity of approx. 30,000 m³ for the month of October.

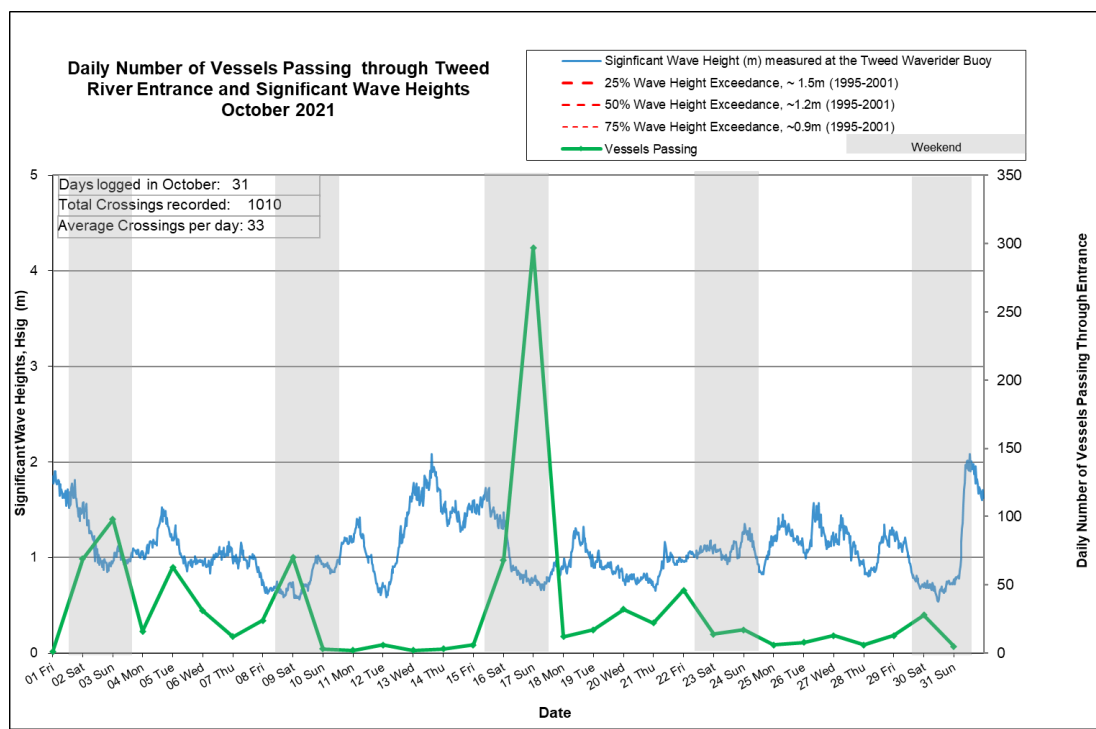
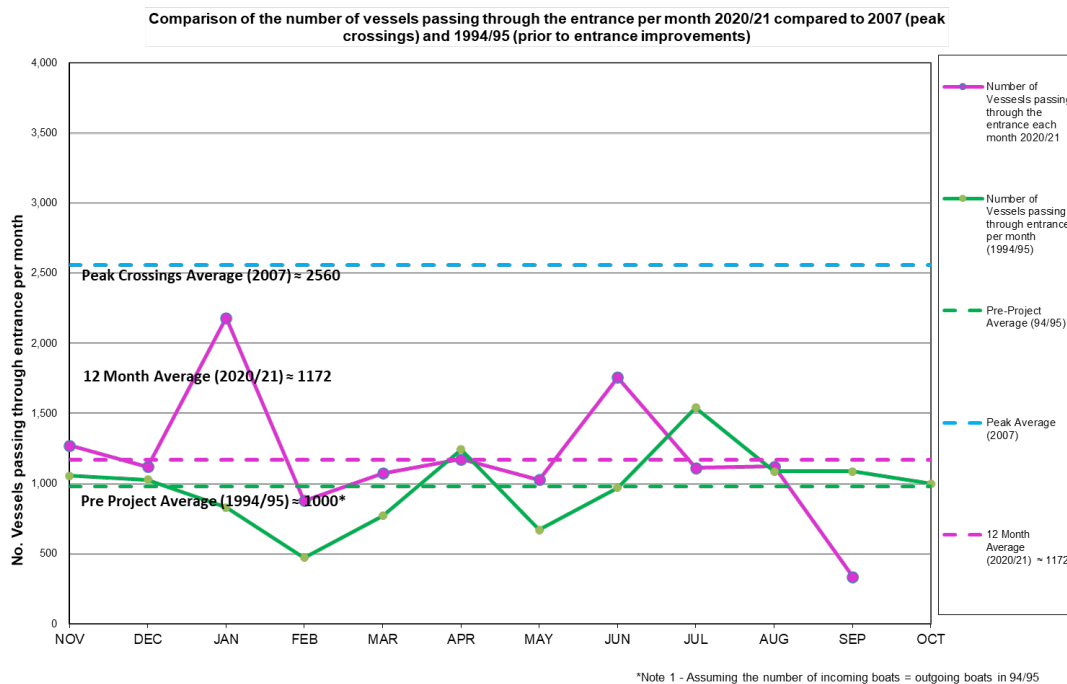


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4. TWEED RIVER ENTRANCE USAGE

A total of 1,010 Tweed River entrance vessel crossings were recorded for the month (62 per cent of the October average (2002–2021)).



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Date October 2021	Navigation Rating					Number of Crossings
	Impassable < - - - - > Good					
	Impassable	Difficulty Encountered	Some Difficulty Encountered	Relatively Good Crossing	Good Conditions	
	1	2	3	4	5	
1						1
2						69
3						98
4						16
5						63
6						31
7						12
8						24
9						70
10						3
11						2
12						6
13						2
14						3
15						6
16						68
17						297
18						12
19						17
20						32
21						22
22						46
23						14
24						17
25						6
26						8
27						13
28						6
29						13
30						28
31						5
					Total:	1,010

Marine Rescue NSW - Monitoring Results (Not including trawlers)

 Weekends

Source: Marine Rescue NSW, Point Danger