

TWEED SAND BYPASSING

ENVIRONMENTAL MONITORING SUMMARY – DECEMBER 2020

1. SAND PUMPING & DREDGING

- 31,038 m³ was pumped to Snapper Rocks East.
- 0 m³ of sand was dredged.

Sand Delivery December 2020

Pumped: 31,038 m³

Dredged: 0 m³

Total: 31,038 m³

The number of days sand was pumped this month = 19

Stage II Sand Delivery May 2000 to date

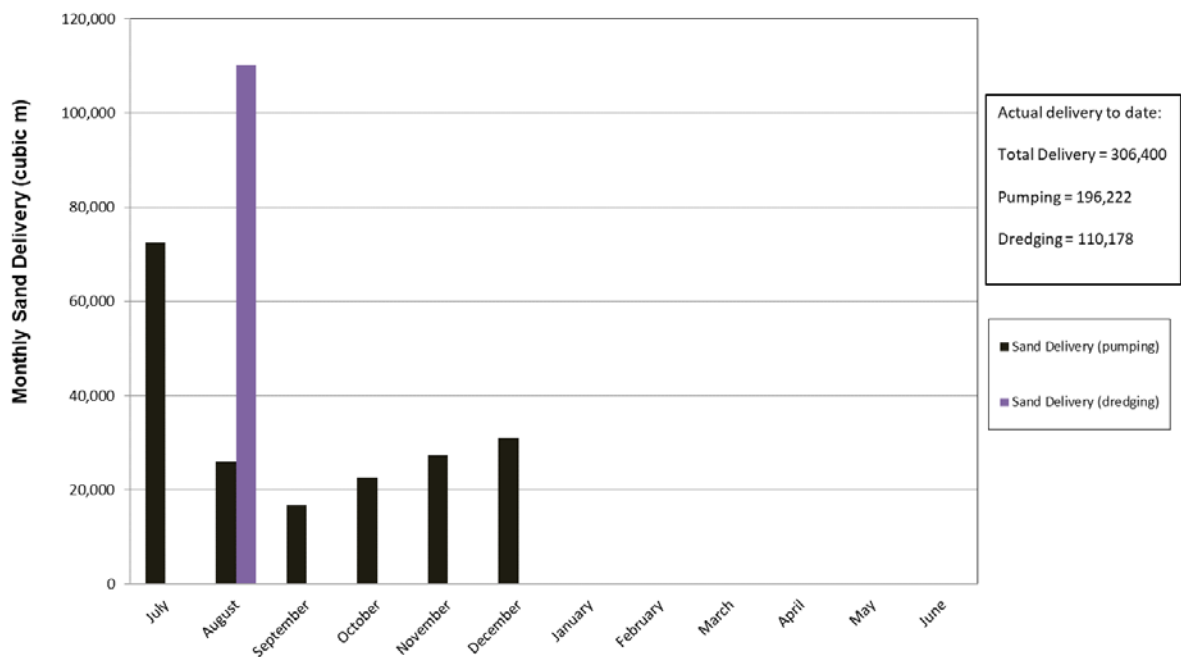
Pumped: 10,076,483 m³

Dredged: 2,582,052 m³ *

Total: 12,658,535 m³ *

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

2020/21 Monthly Sand Delivery



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2. WAVE CONDITIONS

Significant wave heights (H_{sig}) were relatively calm outside of an approximately 6 day major storm event resulting in large waves with the peak H_{sig} occurring on the 14th of December 2020. Wave directions throughout the month were generally from the ESE with the major storm event producing waves from the east and ENE.

- Minimum H_{sig} : 0.58 m on 8th December 2020
- Maximum H_{sig} : 6.41m on 8th December 2020
- Number of days where $H_{sig} < 1$ m at some point: 13
- Number of days where $H_{sig} > 2$ m at some point: 6

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



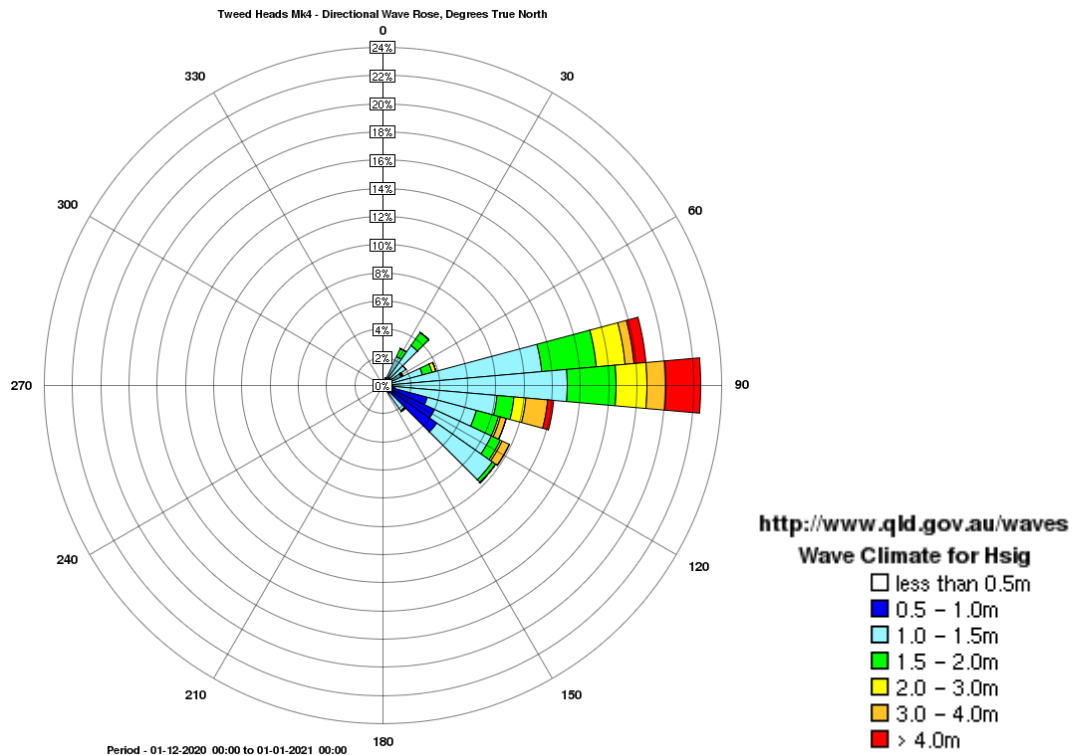
(Source: Tweed Heads Waverider buoy; Queensland Government)

In January 2020 TSB commissioned the deployment of another Waverider buoy in the Tweed region. 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.

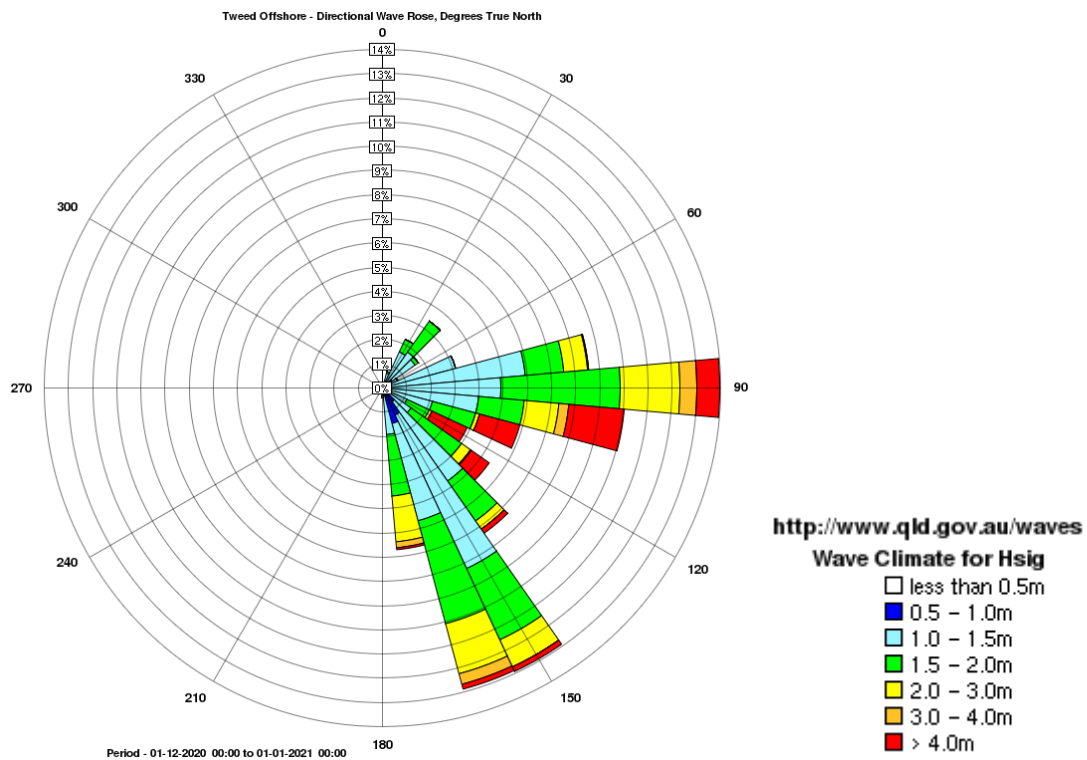
A link to data recorded by the Tweed Heads and Tweed Offshore Waverider buoys is available at:
<http://www.qld.gov.au/waves>

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NEARSHORE WAVE DIRECTION



OFFSHORE WAVE DIRECTION



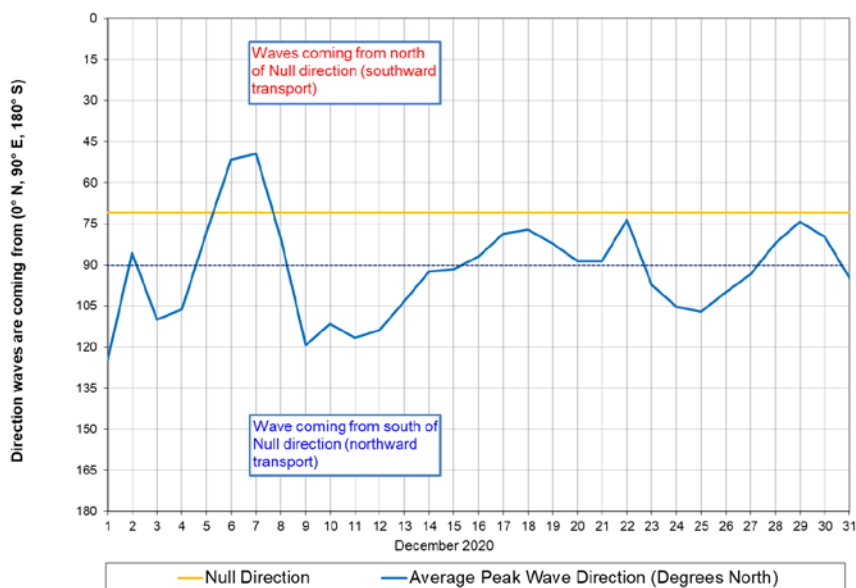
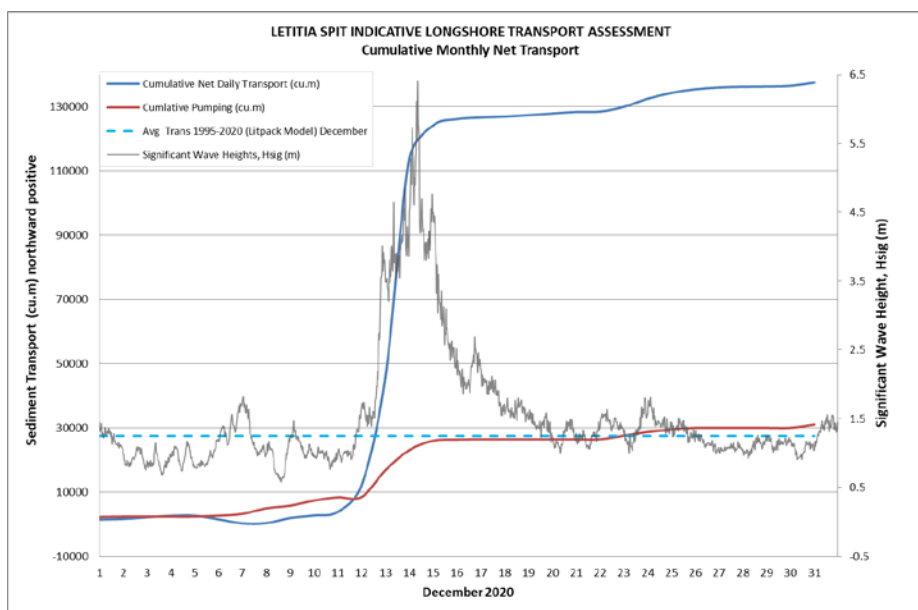
December 2020

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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.

In December 2020 the estimated natural sand transport moving north towards the Tweed River entrance was calculated to be in the order of 138,000 m³. This result is 502% of the average estimated sand transport quantity of approximately 27,000 m³ for the month of December. Large discrepancies between estimated transport and sand delivery volumes are expected during months where significant swell events occur. This is primarily due to some overestimation of transport when the wave heights are large, and also that the sand is highly mobile in these conditions which means that it does not readily settle in the vicinity of the jetty to be mechanically moved (and rather naturally moves past this location in the surf zone and further offshore).

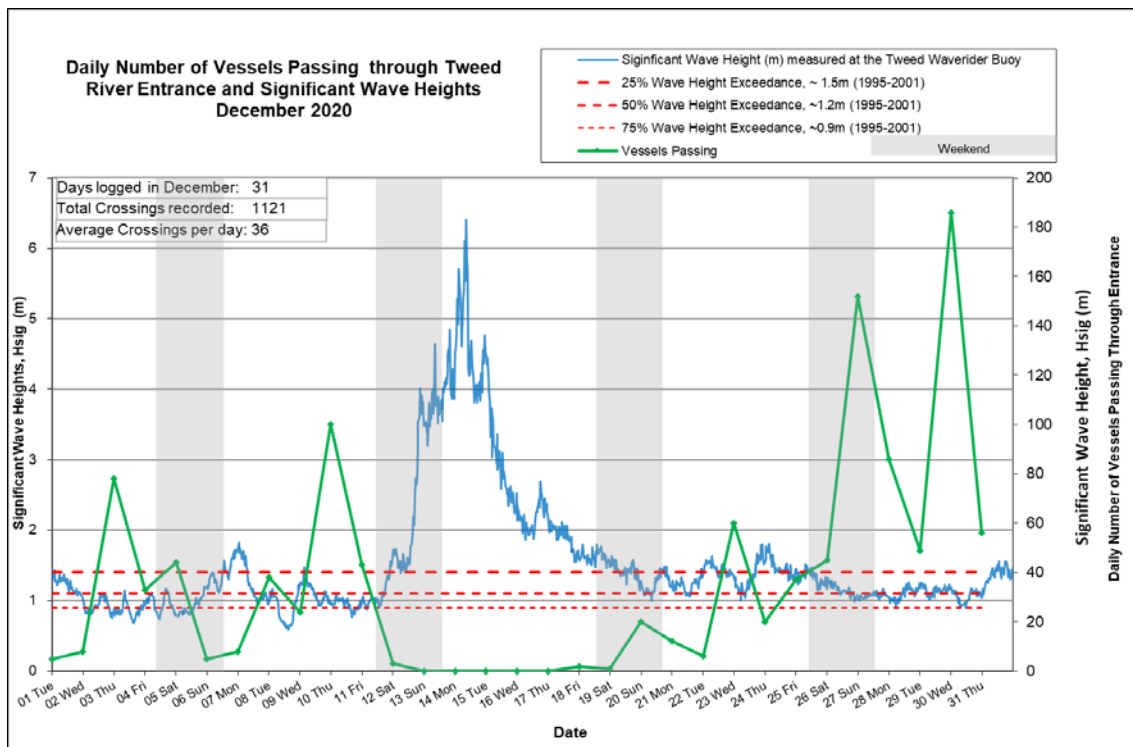
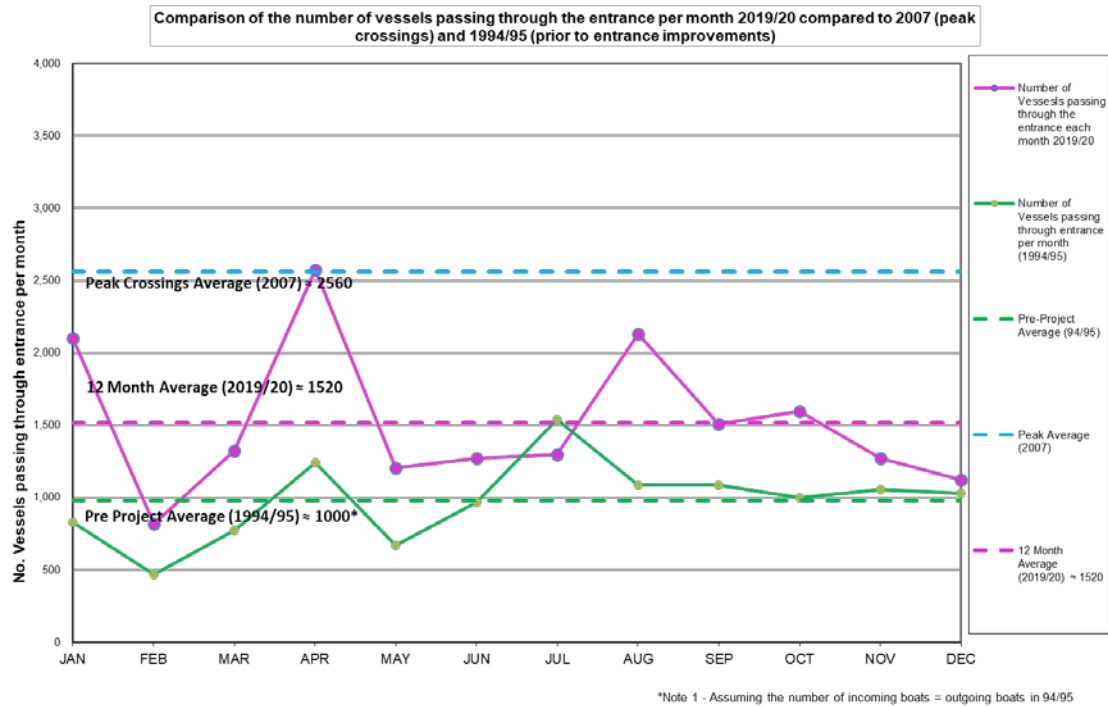


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4. TWEED RIVER ENTRANCE USAGE

A total of 1,121 Tweed River entrance vessel crossings were recorded for the month (55% of the November average (2002 – 2020)).



December 2020

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Date December 2020	Navigation Rating					Number of Crossings
	Impassable < - - - - > Good					
	Impassable	Difficulty Encountered	Some Difficulty Encountered	Relatively Good Crossing	Good Conditions	
	1	2	3	4	5	
1						5
2						8
3						78
4						33
5						44
6						5
7						8
8						38
9						24
10						100
11						43
12						3
13						0
14						0
15						0
16						0
17						0
18						2
19						1
20						20
21						12
22						6
23						60
24						20
25						37
26						45
27						152
28						86
29						49
30						186
31						56
					Total:	1,121

Marine Rescue NSW - Monitoring Results (Not including trawlers)

 Weekends

Source: Marine Rescue NSW, Point Danger

* Total does not include trawlers