TWEEDSAND BYPASSING

OVERVIEW

In December 2019:

- 12,321m^3 was pumped to Snapper Rocks East.
- 0 m^3 of sand was dredged.
- Significant wave heights ranged from calm to moderate (0.41 m to 1.35 m), with a maximum significant wave height of 1.35 m on 31st December. Wave directions were predominantly from the ESE and ENE.
- 2,225 vessel crossings were recorded for the month (This is 106% of the December average (2002 – 2019)).
- The modelled estimated amount of sand moving north towards the Tweed River entrance by natural processes was in the order of 18,776m^3 (this is 68% of the December average of 27,760m^3).

1. SAND PUMPING & DREDGING

Sand Delivery December 2019

Pumped:	12,321 m^3
Dredged:	0 m^3
Total:	12,321 m^3

The number of days sand was pumped this month = 10

Sand Delivery January 2019 to December 2019

Pumped:	360,052 m^3
Dredged:	151,360 m^3
Total:	511,412 m^3

Stage II Sand Delivery May 2000 to December 2019

Pumped:	9,649,452 m^3
Dredged:	2,471,874 m^3 *
Total:	12,121,326 m^3 *

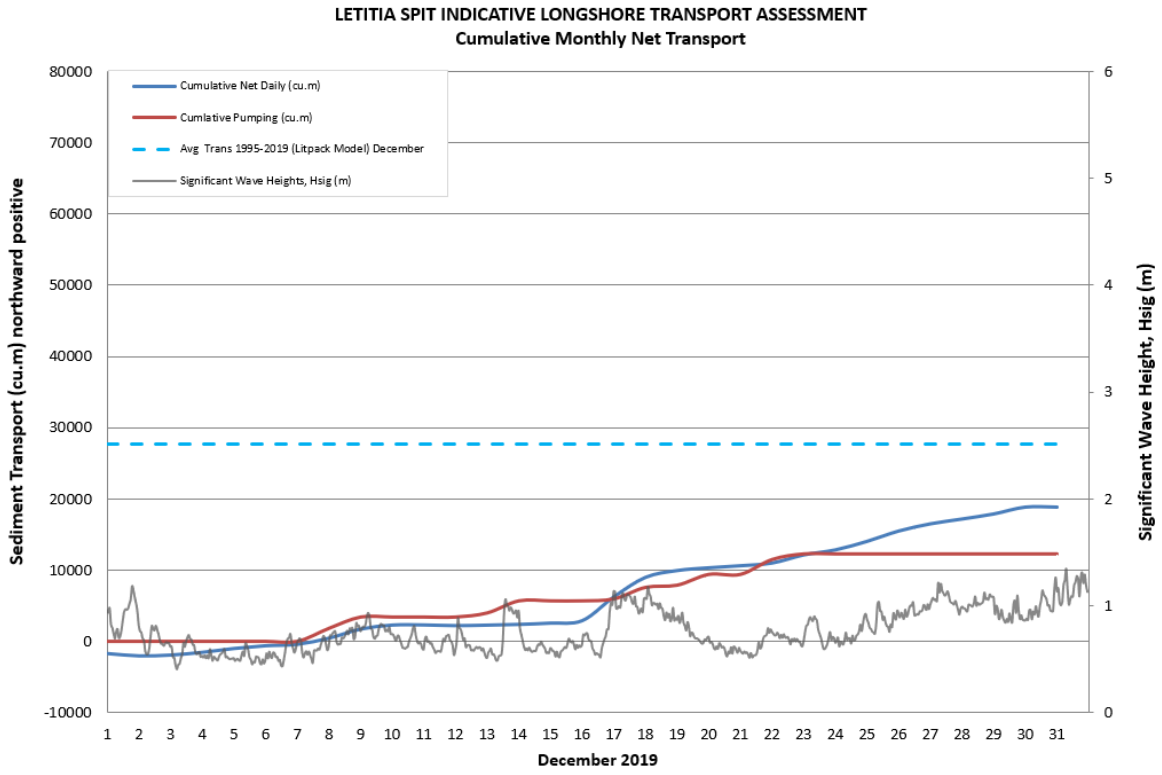
* This Includes 22,870 m^3 of sand delivered by dredge to Palm Beach between November and November 2005

2. INDICATIVE LONGSHORE TRANSPORT

The graph below is based on simplified sediment transport modelling and is indicative only.

In December 2019 the estimated natural sand transport moving north towards the Tweed River entrance was calculated to be 18,776 m^3.

This result is 68% of the average estimated sand transport quantity of approximately 27,760m^3 for the month of December.



3. TWEED RIVER ENTRANCE USAGE

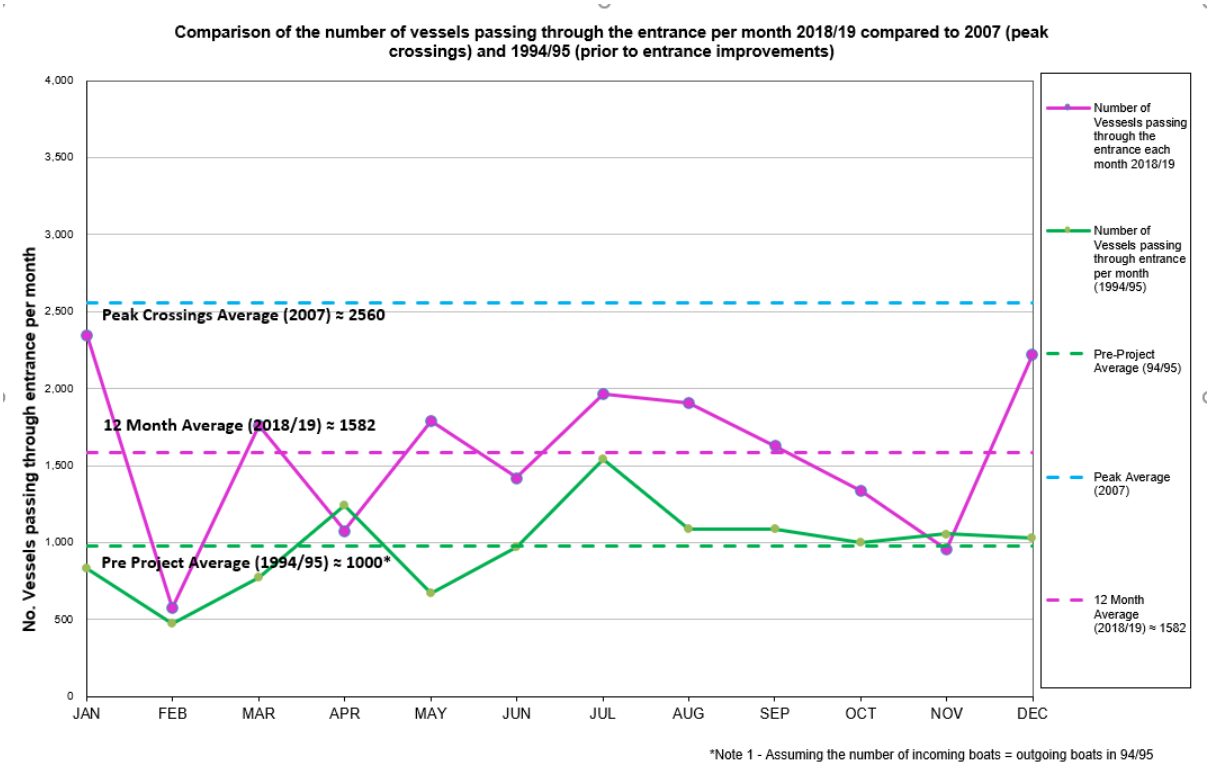
Marine Rescue NSW - Monitoring Results (Not including trawlers)

Weekends

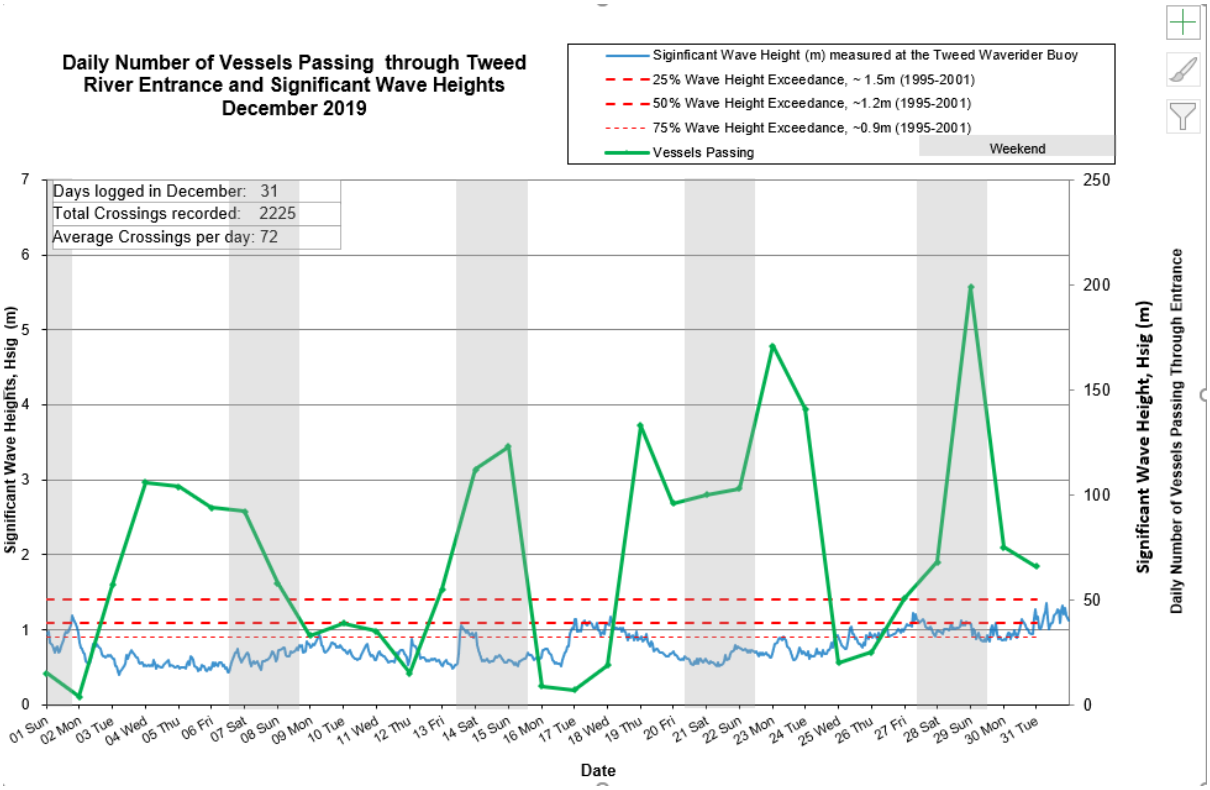
Date December 2019	Navigation Rating Impassable < - - - - - > Good					Number of Crossings
	Impassable	Difficulty Encountered	Some Difficulty Encountered	Relatively Good Crossing	Good Conditions	
	1	2	3	4	5	
1						15
2						4
3						57
4						106
5						104
6						94
7						92
8						58
9						33
10						39
11						35
12						15
13						55
14						112
15						123
16						9
17						7
18						19
19						133
20						96
21						100
22						103
23						171
24						141
25						20
26						25
27						51
28						68
						199
29						75
30						66
					Total:	2,225

Source: *Marine Rescue NSW, Point Danger*

* Total does not include trawlers



*Note 1 - Assuming the number of incoming boats = outgoing boats in 94/95



4. WAVE CONDITIONS

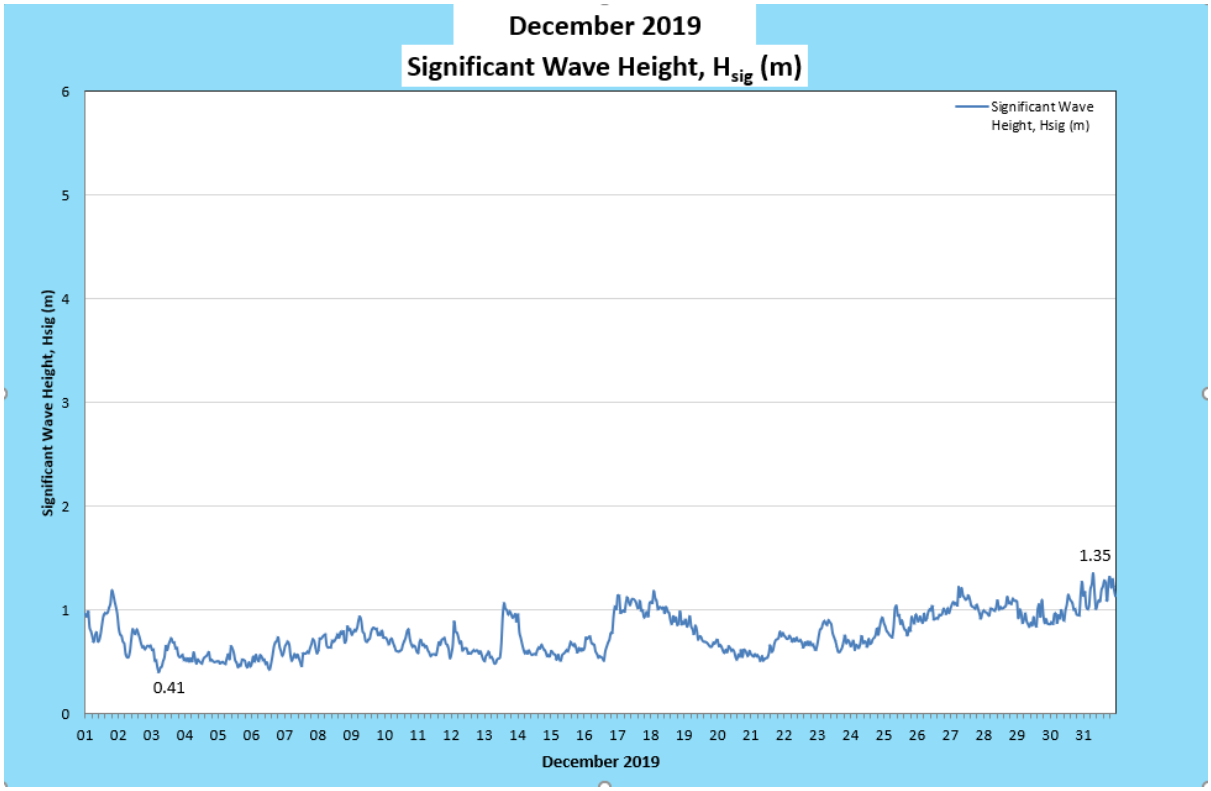
Wave conditions over the month: Significant wave heights ranged mostly from calm to moderate (0.41 m to 1.35 m), with a peak significant wave height of 1.35 m on 31st December. Wave directions were predominantly from the ESE and ENE.

Monthly minimum significant wave height: 0.41 m on 03rd December
Monthly maximum significant wave height: 1.35 m on 31st December

Number of days on which waves were below 1.0 m at some point in the day: 30 days

Number of days on which waves were above 2.0 m at some point in the day: 0 days

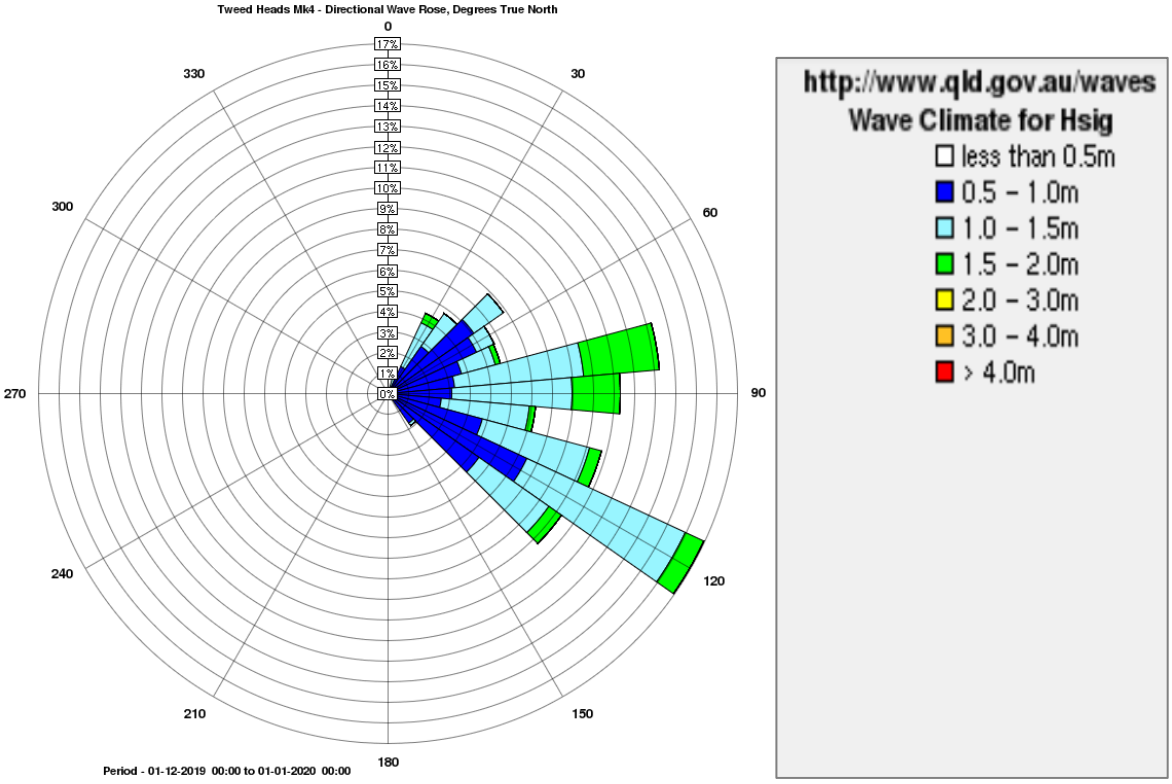
Note: Significant wave height (H_{sig}) is defined as the average of the highest one-third of waves recorded over a period of approximately 30 minutes



(***Source:*** *Tweed Heads Waverider Buoy; Queensland Government)*

A link to data recorded by the Tweed Waverider Buoy is available at: http://www.qld.gov.au/waves

WAVE DIRECTION



(***Source:*** *Tweed HeadsF Waverider Buoy; Queensland Government)*