TWEEDSAND BYPASSING

OVERVIEW

In July 2018:

- 11,410 m^3 of sand was pumped to Snapper Rocks East.
- 0 m^3 of sand was dredged and placed at Snapper Rocks East.
- 0 m^3 of sand was pumped to Duranbah Beach.
- 0 m^3 of sand was dredged and placed at Duranbah Beach.
- Significant wave heights ranged mostly from calm to moderate (0.38 m to 2.28 m), with a maximum significant wave height of 2.28 m on 3rd July. Wave directions were predominantly from the SE.
- 2,352 vessel crossings were recorded for the month (This is 115% of the July average (2002 – 2017)).
- The modelled estimated amount of sand moving north towards the Tweed River entrance by natural processes was in the order of 33,000 m^3 (this is 54% of the July average of 61,789 m^3).

1. SAND PUMPING & DREDGING

Sand Delivery July 2018

Pumped:	11,410 m^3
Dredged:	0 m^3
Total:	11,410 m^3

The number of days sand was pumped this month = 12

Sand Delivery January 2018 to December 2018

Pumped:	213,310 m^3
Dredged:	0 m^3
Total:	213,310 m^3

Stage II Sand Delivery April 2000 to July 2018

Pumped:	9,141,463 m^3
Dredged:	2,320,514 m^3 *
Total:	11,461,977 m^3 *

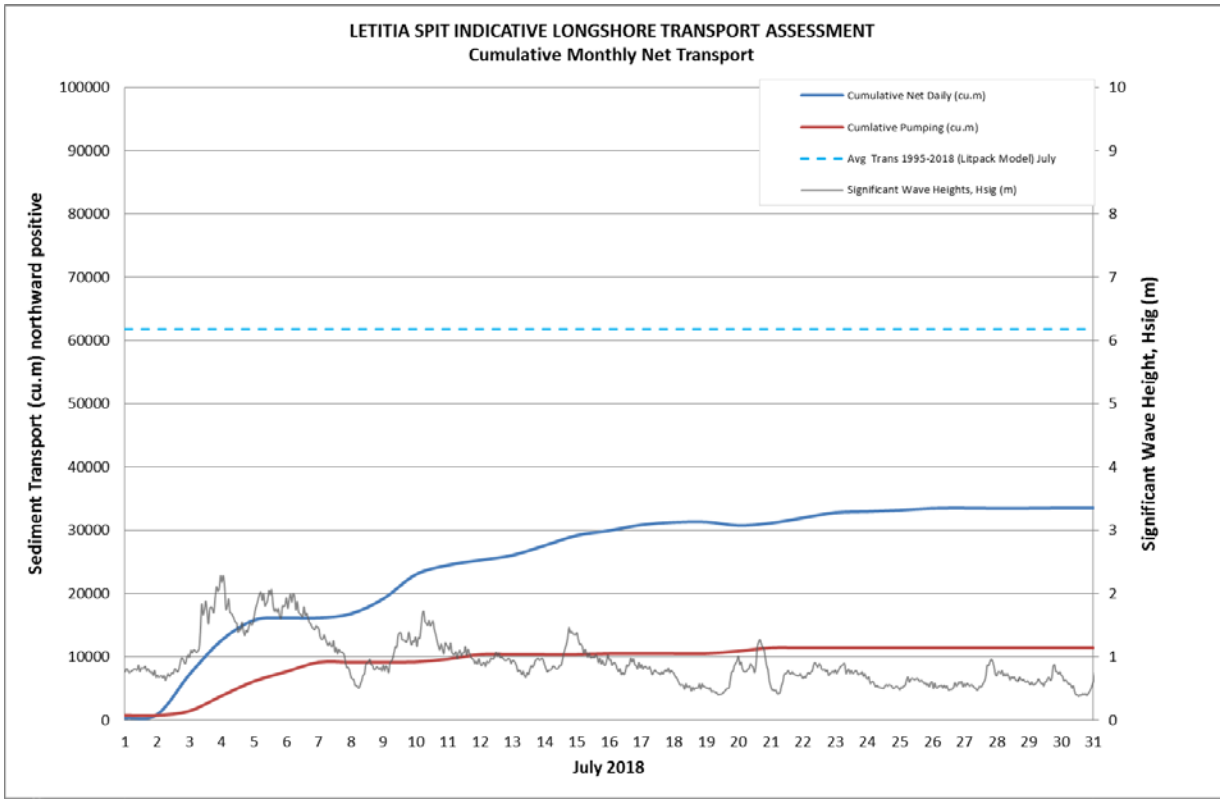
* This Includes 22,870 m^3 of sand delivered by dredge to Palm Beach between June and September 2005

2. INDICATIVE LONGSHORE TRANSPORT

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

In July 2018 the estimated natural sand transport moving north towards the Tweed River entrance was calculated to be 33,521 m^3.

This result is 54% of the average estimated sand transport quantity of approximately 61,789 m^3 for the month of July.



3. TWEED RIVER ENTRANCE USAGE

Marine Rescue NSW - Monitoring Results (Not including trawlers)

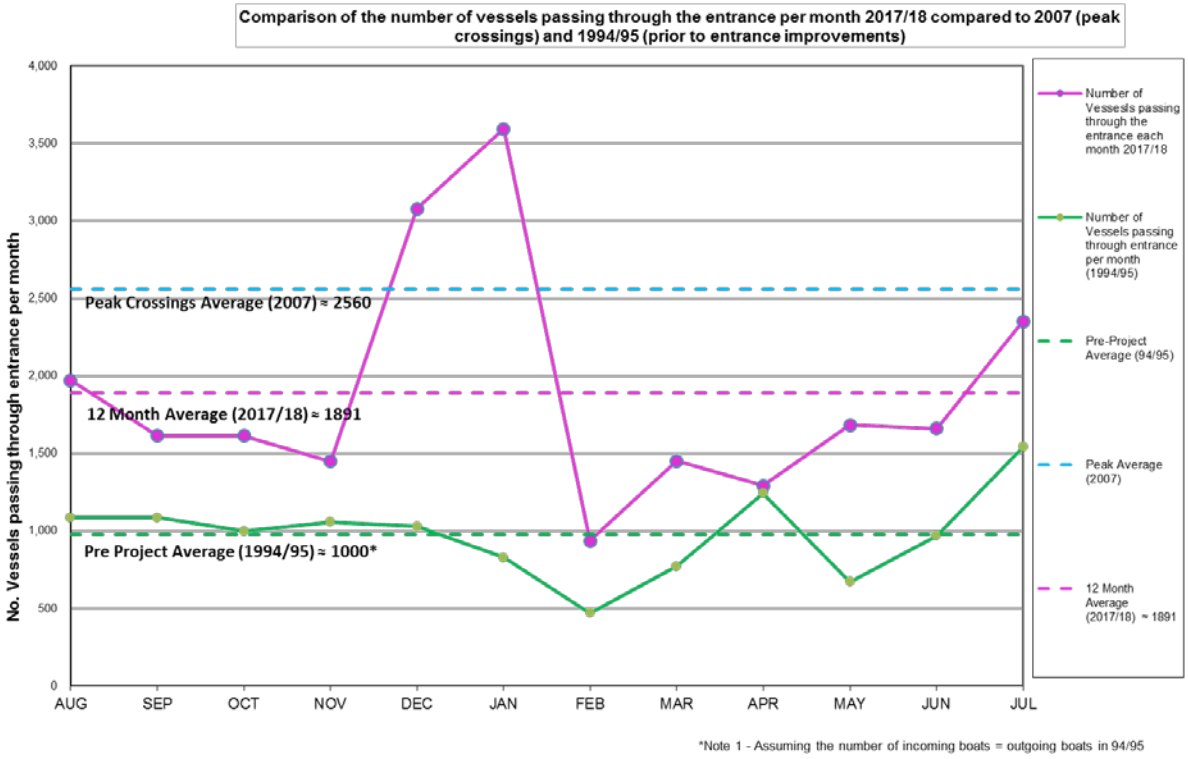
Weekends and public holidays

Date July 2018	Navigation Rating Impassable < - - - - - > Good					Number of Crossings
	Impassable	Difficulty Encountered	Some Difficulty Encountered	Relatively Good Crossing	Good Conditions	
	1	2	3	4	5	
1						157
2						17
3						0
4						1
5						1
6						0
7						25
8						116
9						24
10						1
11						28
12						83
13						85
14						131
15						270
16						63
17						110
18						147
19						117
20						4
21						83
22						112
23						104
24						22
25						61
26						131
27						46
28						86
29						119
30						70
31						138
					Total:	2352

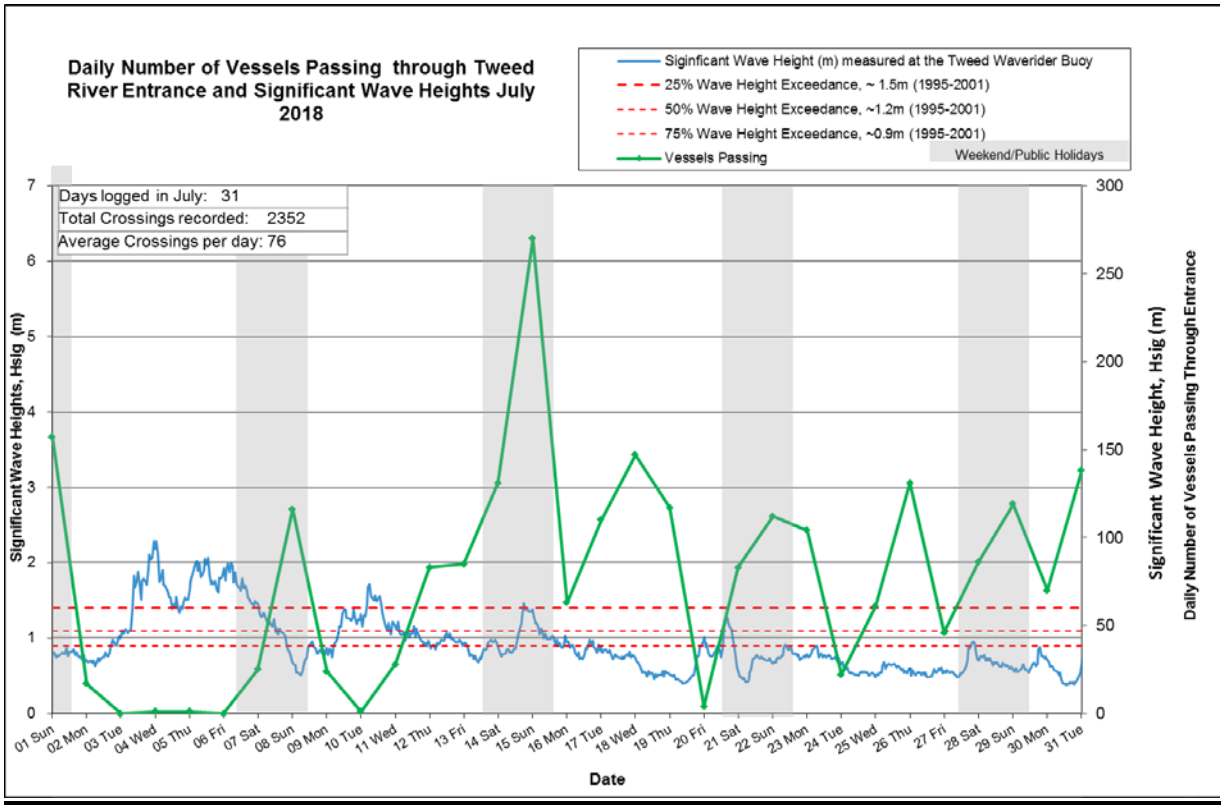
Source: *Marine Rescue NSW, Point Danger*

* Total does not include trawlers

TWEEDSAND BYPASSING



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



4. WAVE CONDITIONS

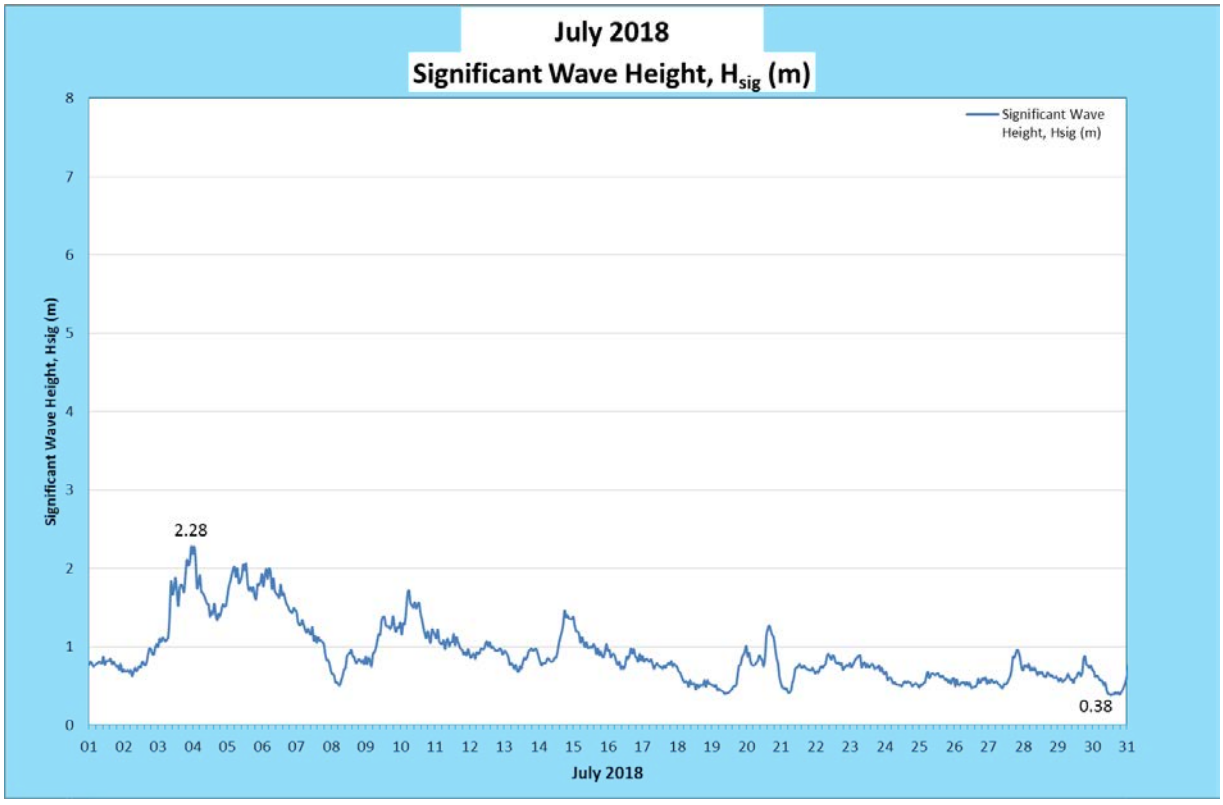
Wave conditions over the month: Significant wave heights ranged mostly from calm to moderate (0.38 m to 2.28 m), with a peak significant wave height of 2.28 m on 3rd July. Wave directions were predominantly from the SE.

Monthly minimum significant wave height: 0.38 m on 30th July
Monthly maximum significant wave height: 2.28 m on 3rd July

Number of days on which waves were below 1.0 m at some point in the day: 26 days

Number of days on which waves were above 2.0 m at some point in the day: 3 days

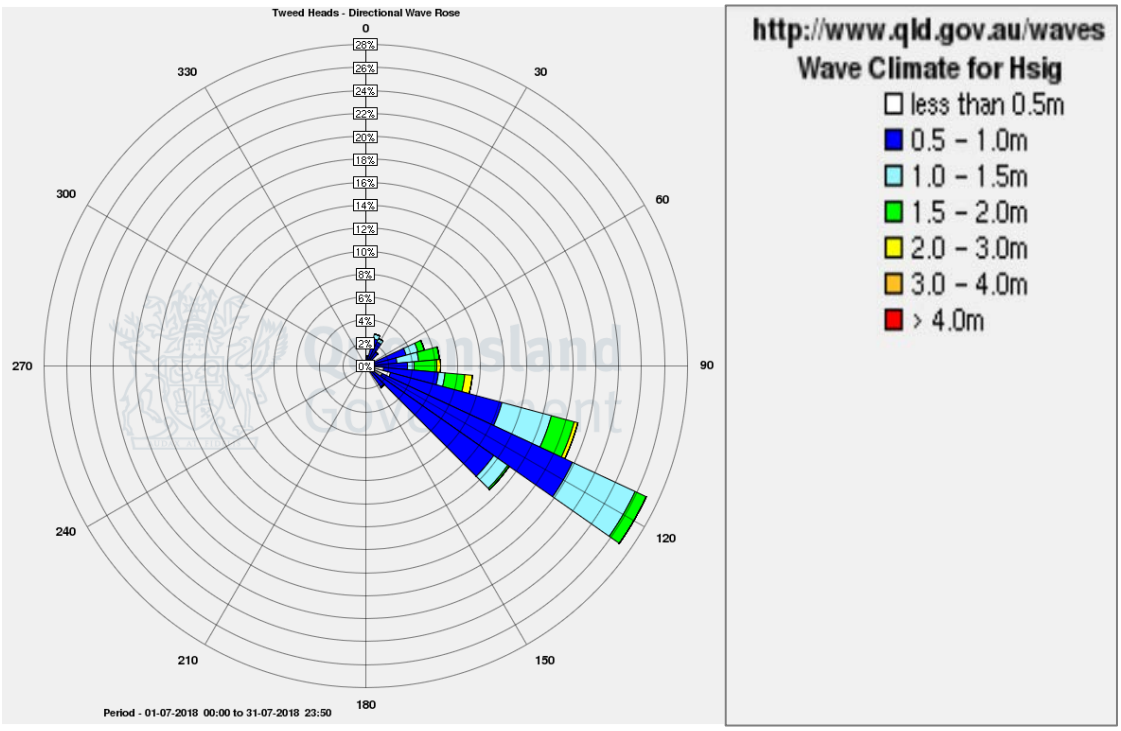
Note: Significant wave height (H_{sig}) is defined as the average of the highest one-third of waves recorded over a period of approximately 30 minutes



*(**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 Heads Waverider Buoy; Queensland Government)*