

TWEED SAND BYPASSING

OVERVIEW

In June 2018:

- 38,030 m³ of sand was pumped to Snapper Rocks East.
- 0 m³ of sand was dredged and placed at Snapper Rocks East.
- 0 m³ of sand was pumped to Duranbah Beach.
- 0 m³ of sand was dredged and placed at Duranbah Beach.
- Significant wave heights ranged mostly from calm to moderate (0.43 m to 2.98 m), with a maximum significant wave height of 2.98 m on 7th June. Wave directions were predominantly from the SE and ESE. Please note that the Tweed wave buoy suffered some intermittent and unrecoverable data losses from 17th June until the end of the month.
- 1661 vessel crossings were recorded for the month (This is 99% of the June average (2002 – 2018)).
- The modelled estimated amount of sand moving north towards the Tweed River entrance by natural processes was in the order of 73,000 m³ (this is 119% of the June average of 61,538 m³). Note that this estimate is a guide only due to intermittent wave buoy data losses.

1. SAND PUMPING & DREDGING

Sand Delivery June 2018

| | |
|----------|-----------------------|
| Pumped: | 38,030 m ³ |
| Dredged: | 0 m ³ |
| Total: | 38,030 m ³ |

The number of days sand was pumped this month = 23

Sand Delivery January 2018 to December 2018

| | |
|----------|------------------------|
| Pumped: | 201,900 m ³ |
| Dredged: | 0 m ³ |
| Total: | 201,900 m ³ |

Stage II Sand Delivery June 2000 to June 2018

| | |
|----------|-----------------------------|
| Pumped: | 9,130,053 m ³ |
| Dredged: | 2,320,514 m ³ * |
| Total: | 11,450,567 m ³ * |

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

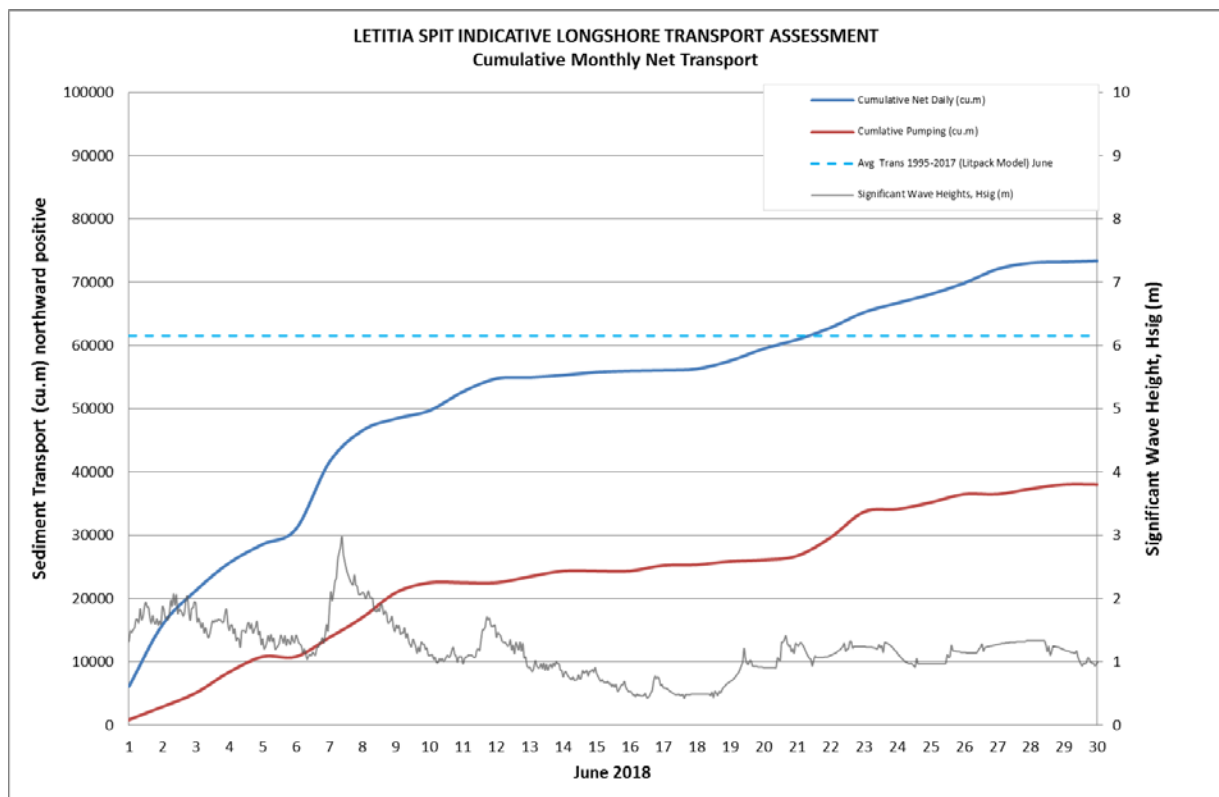
2. INDICATIVE LONGSHORE TRANSPORT

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

In June 2018 the estimated natural sand transport moving north towards the Tweed River entrance was calculated to be 73,373 m³.

This result is 119% of the average estimated sand transport quantity of approximately 61,538 m³ for the month of June.


Note that this estimate is a guide only due to wave buoy data errors including missing time steps.



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3. TWEED RIVER ENTRANCE USAGE

Marine Rescue NSW - Monitoring Results (Not including trawlers)

 Weekends and public holidays

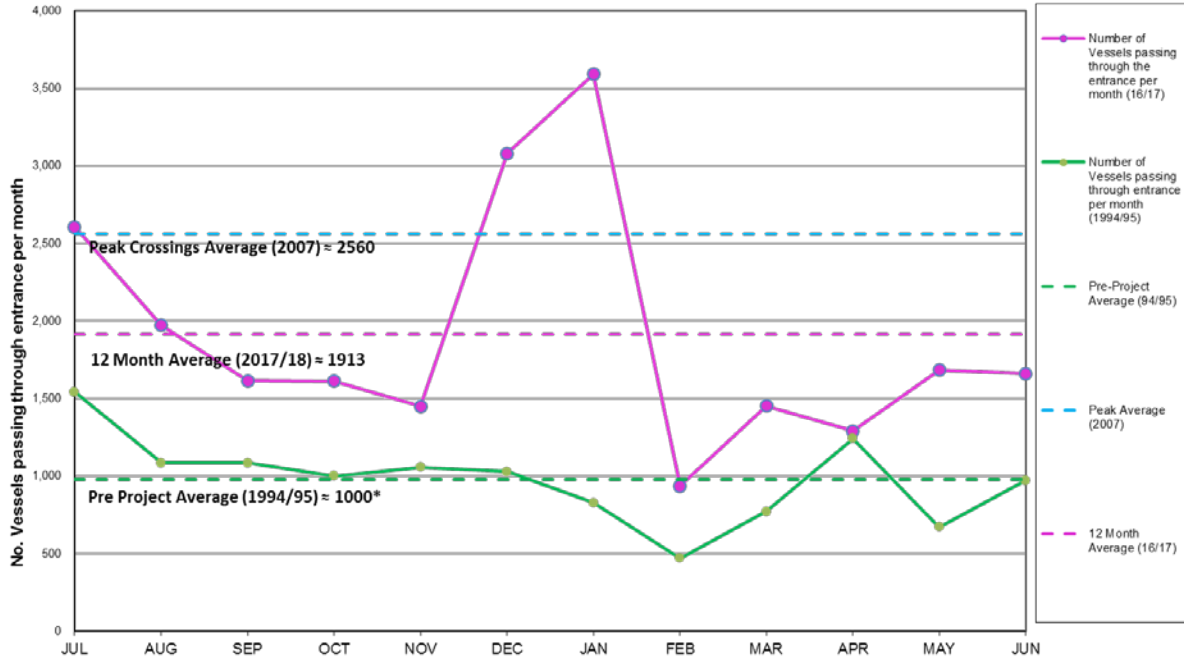
| Date | Navigation Rating | | | | | Number of Crossings |
|------------------|-------------------------|------------------------|-----------------------------|--------------------------|-----------------|---------------------|
| | Impassable <-----> Good | | | | | |
| | Impassable | Difficulty Encountered | Some Difficulty Encountered | Relatively Good Crossing | Good Conditions | |
| | 1 | 2 | 3 | 4 | 5 | |
| 1 st | | | | | | 0 |
| 2 nd | | | | | | 6 |
| 3 rd | | | | | | 0 |
| 4 th | | | | | | 1 |
| 5 th | | | | | | 11 |
| 6 th | | | | | | 4 |
| 7 th | | | | | | 5 |
| 8 th | | | | | | 84 |
| 9 th | | | | | | 25 |
| 10 th | | | | | | 10 |
| 11 th | | | | | | 26 |
| 12 th | | | | | | 26 |
| 13 th | | | | | | 86 |
| 14 th | | | | | | 120 |
| 15 th | | | | | | 161 |
| 16 th | | | | | | 261 |
| 17 th | | | | | | 198 |
| 18 th | | | | | | 43 |
| 19 th | | | | | | 17 |
| 20 th | | | | | | 8 |
| 21 st | | | | | | 4 |
| 22 nd | | | | | | 6 |
| 23 rd | | | | | | 75 |
| 24 th | | | | | | 165 |
| 25 th | | | | | | 12 |
| 26 th | | | | | | 6 |
| 27 th | | | | | | 10 |
| 28 th | | | | | | 39 |
| 29 th | | | | | | 105 |
| 30 th | | | | | | 147 |
| | | | | | Total: | 1661 |

Source: Marine Rescue NSW, Point Danger

* Total does not include trawlers

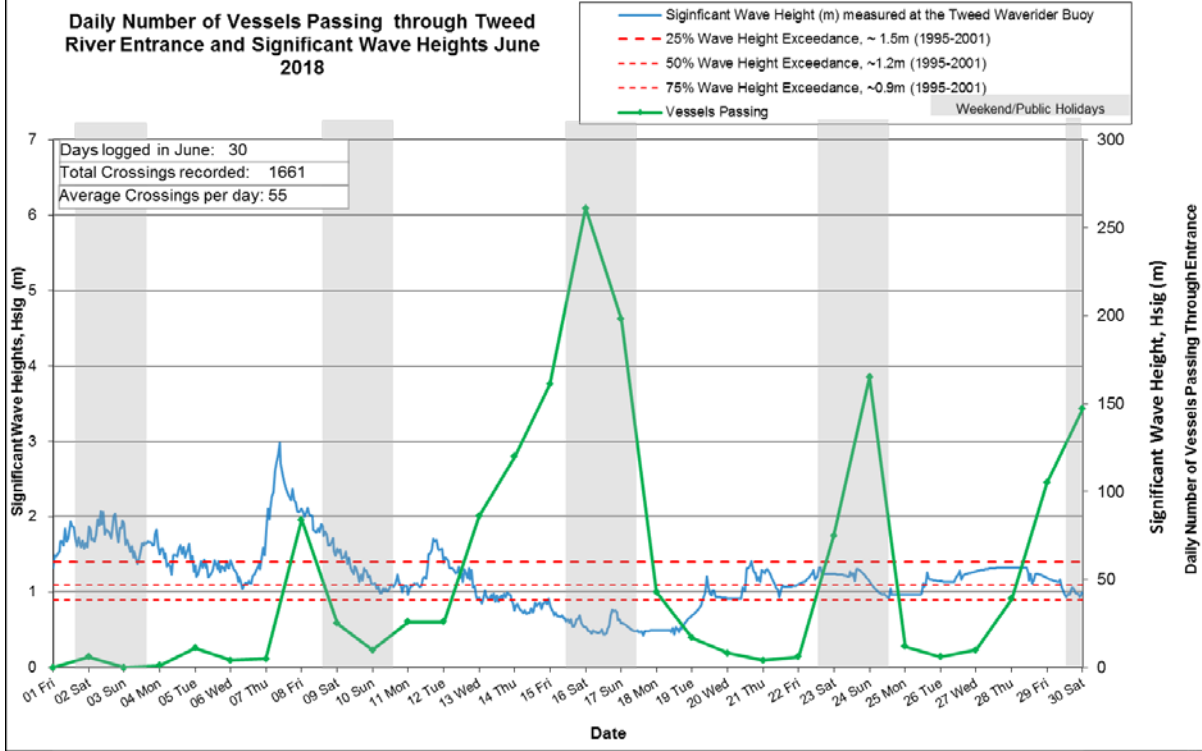
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Comparison of the number of vessels passing through the entrance per month 2017/18 compared to 2007 (peak crossings) and 1994/95 (prior to entrance improvements)



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

Daily Number of Vessels Passing through Tweed River Entrance and Significant Wave Heights June 2018



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4. WAVE CONDITIONS

Wave conditions over the month: Significant wave heights ranged mostly from calm to moderate (0.43 m to 2.98 m), with a maximum significant wave height of 2.98 m on 7th June. Wave directions were predominantly from the SE and ESE. Note that data was captured for 960 out of 1440 time steps (66.7%) the month.

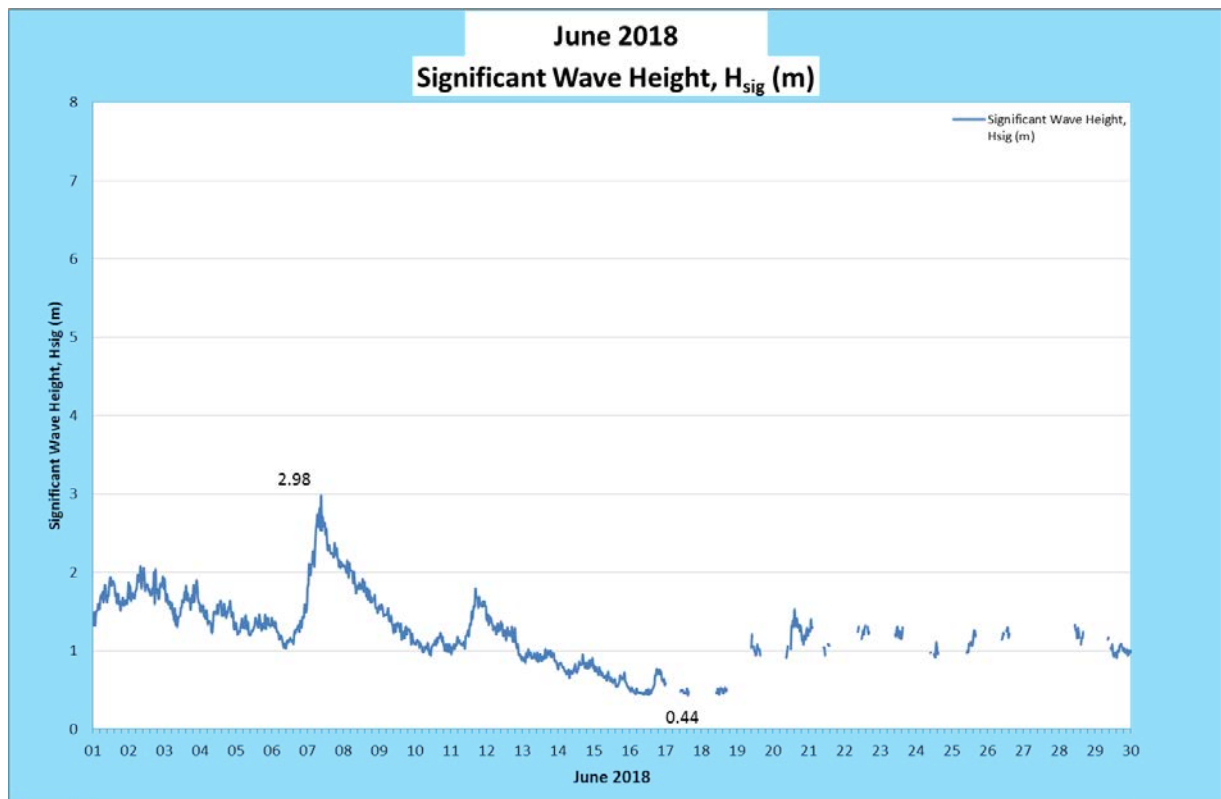
Monthly minimum significant wave height: 0.43 m on 17th June

Monthly maximum significant wave height: 2.98 m on 7th June

Number of days on which waves were below 1.0 m at some point in the day: 16 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

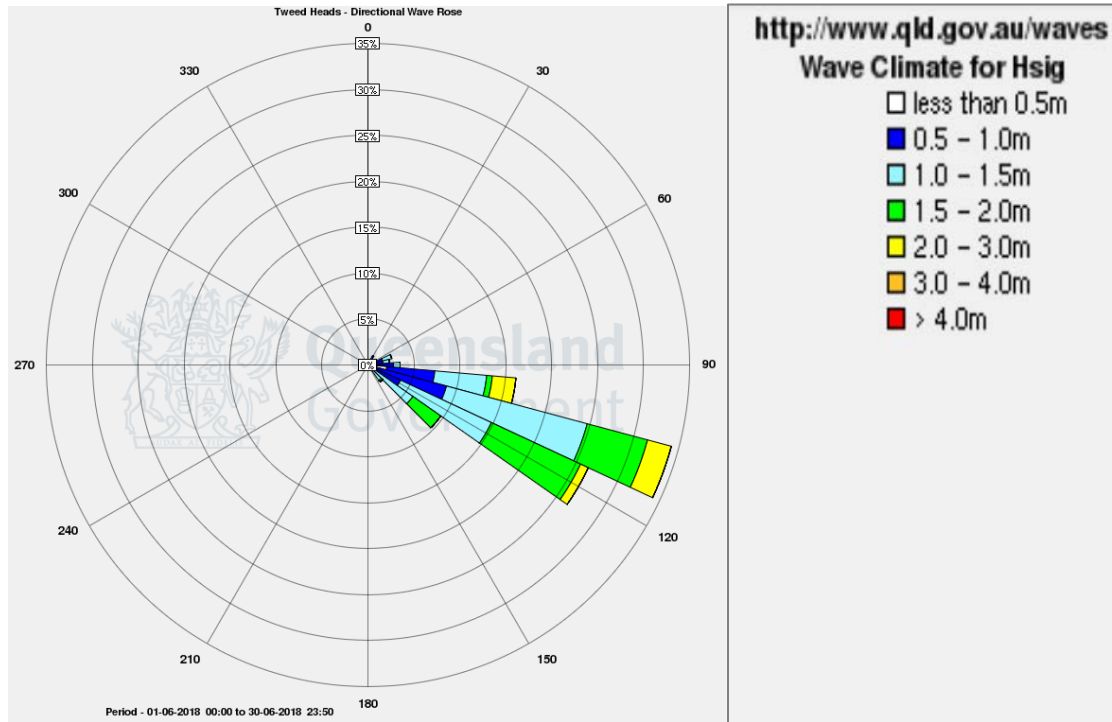


(Source: Tweed Heads Waverider Buoy; Queensland Government)

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

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WAVE DIRECTION



(Source: Tweed Heads Waverider Buoy; Queensland Government)