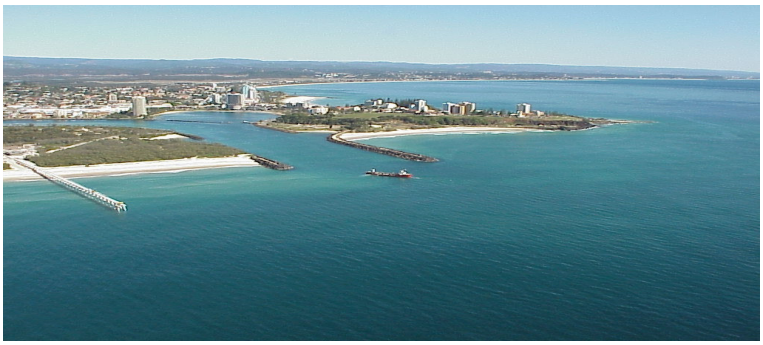
Tweed River
Entrance Sand Bypassing Project

Letitia Spit to Kirra



Monthly Environmental Monitoring Summary

NOVEMBER 2008

Department of Lands NSW

TRESBC
TWEED RIVER ENTRANCE SAND BYPASSING COMPANY

Queensland Government
Environmental Protection Agency

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1. EXECUTIVE SUMMARY

This report provides a summary of environmental monitoring undertaken by the TRESBP in November 2008.

In November 2008:

- The number of vessels that passed through the entrance was slightly more than the 2002-2007 average number of crossings for the month of November.
- Surf quality in November was average to good, with mainly small waves interspersed with short-lived moderate sea events through the month.
- Tide data for the month of November 2008 is currently being analysed. Results will be presented in the project's December 2008 Monthly Environmental Monitoring Summary.
- The amount of sand moving north towards the Tweed River Entrance by natural processes was slightly more than the November average.

2. INTRODUCTION

This document provides a summary of sand quantities delivered by the project, as well as surf, beach, river, entrance and weather conditions for the southern Gold Coast Beaches, Duranbah and the Tweed River Entrance for ongoing monitoring purposes.

Information has been sourced from TRESBP monitoring programs, GCCC, QEPA, the Bureau of Meteorology, Surfing Australia, media coverage, Coastalwatch.com.au and Swellnet.com.au.

3. SAND PUMPING & DREDGING ACTIVITIES

Sand Delivery for November 2008

	PUMPED		NOV 2008 TOTAL DELIVERY
Location	**Snapper Rocks East**	**Duranbah**	
Amount (m^3)	23,086 m^3	9,140 m^3	32,226 m^3

Total Sand Delivery This Year (January to November 2008)

	PUMPED	DREDGED	2008 TOTAL DELIVERY
Amount (m^3)	580,106 m^3	198,979 m^3	779,085 m^3

Total Sand Delivery Last Year (January to December 2007)

	PUMPED	DREDGED	2007 TOTAL DELIVERY
Amount (m^3)	562,247 m^3	0 m^3	562,247 m^3

Total Stage 2 Delivery to Date (May 2000 to November 2008)

	PUMPED	DREDGED	TOTAL DELIVERY STAGE 2
Amount (m^3)	5,000,194 m^3	*2,038,901 m^3	*7,039,095 m^3

* Nb. Does not include 22,870 m^3 of dredged sand delivered to Palm Beach from June to September 2005.

4. TWEED RIVER ENTRANCE CONDITIONS

VOLUNTEER VIDEO MONITORING LOG

The following Entrance Condition observations for November 2008 were recorded by volunteer Mr Brian Mason:

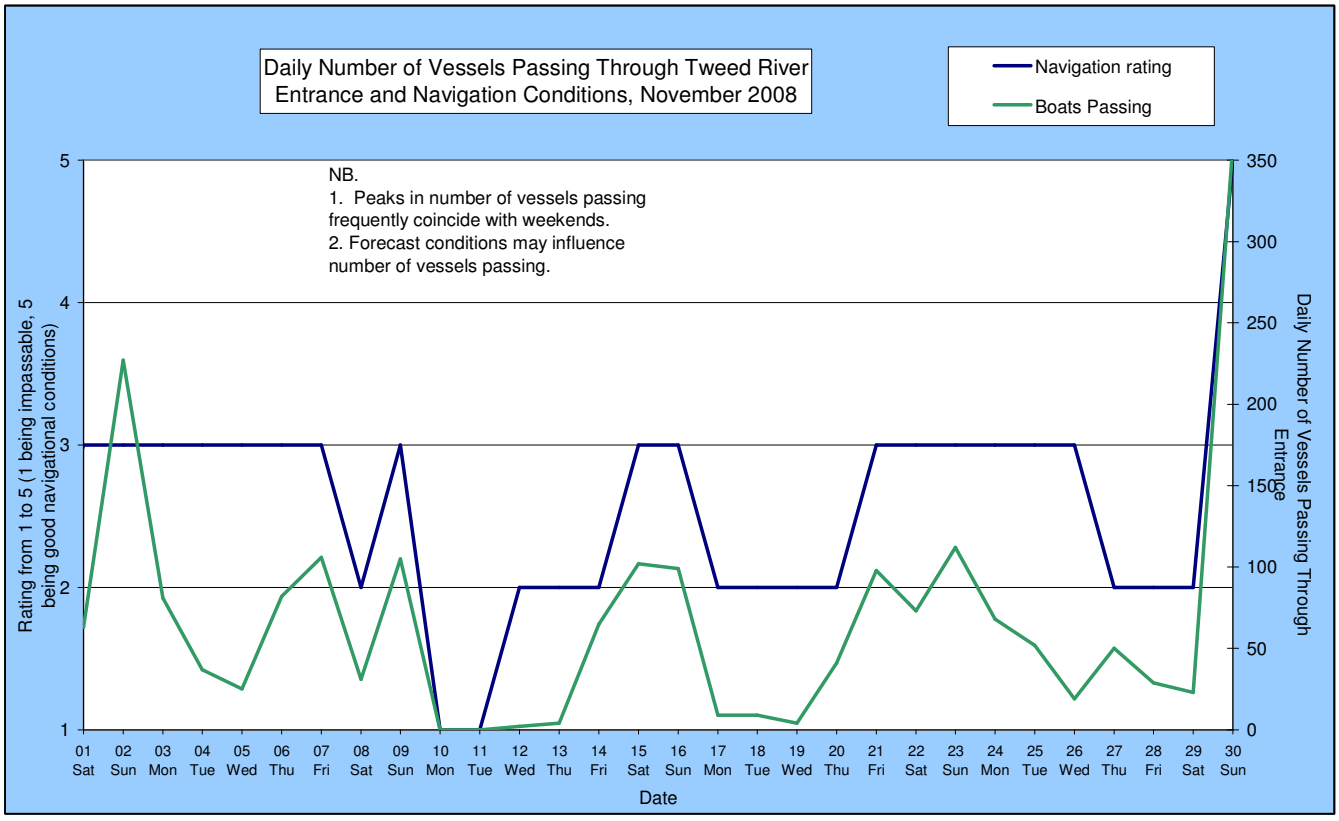
Date	Observations
01/11/08	Passable with caution. Strong SE winds. Several vessels (small) entered the river without drama.
14/11/08	Entrance appeared rough, a small vessel entered safely but the ride would have been rough.

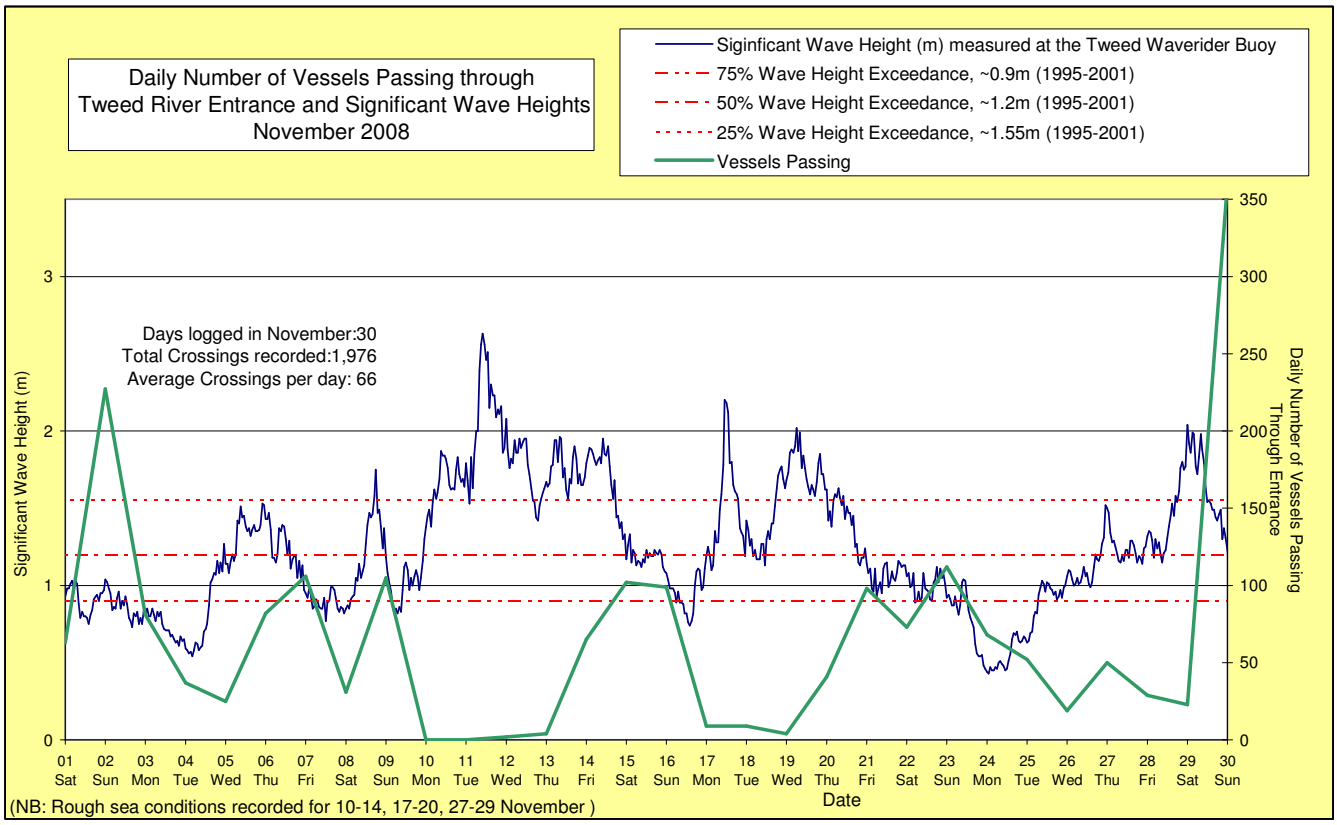
VOLUNTEER MARINE RESCUE REPORTS

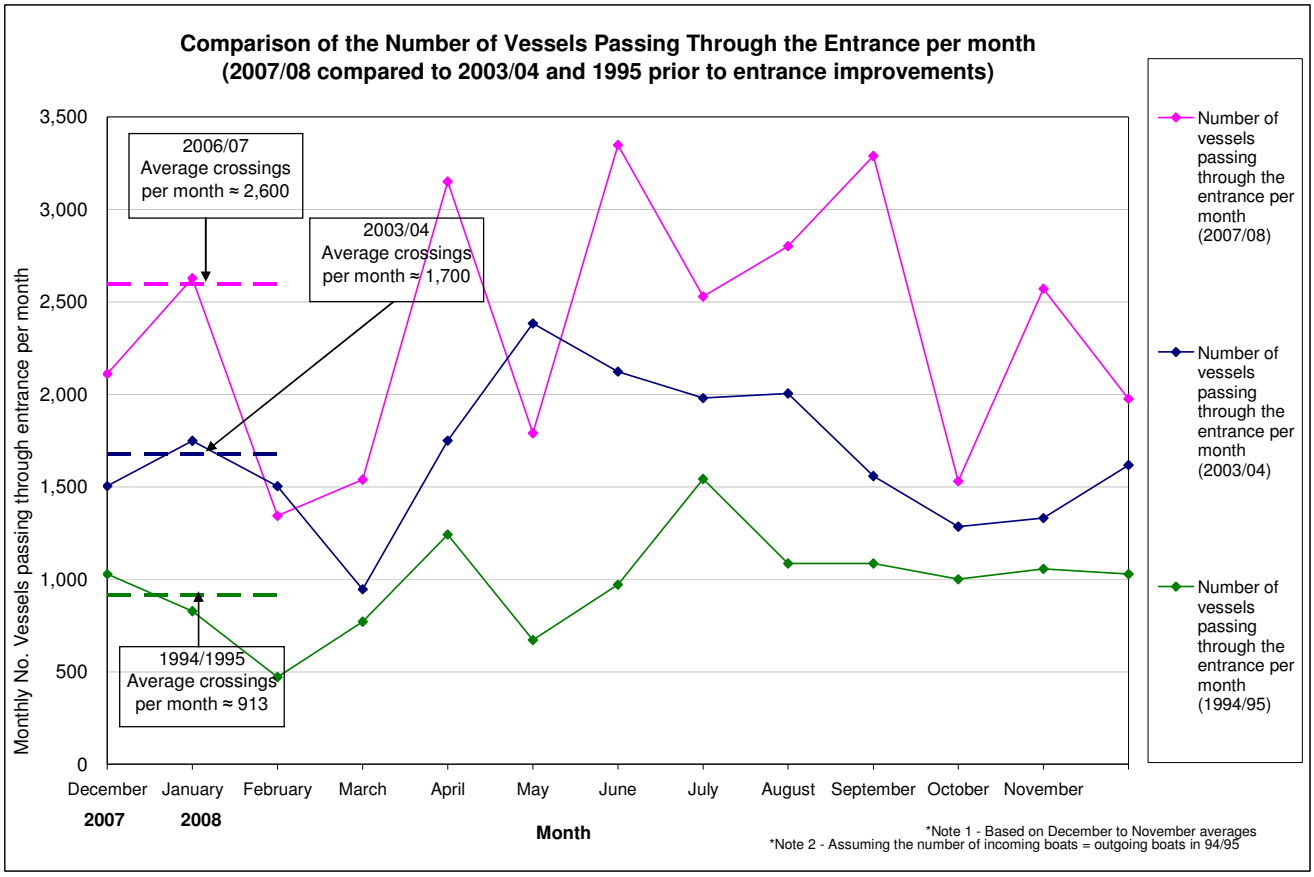
Volunteer Marine Rescue Pt Danger has been monitoring entrance conditions on behalf of TRESBP since 20 January 2002. Monitoring results for November 2008 are presented below.

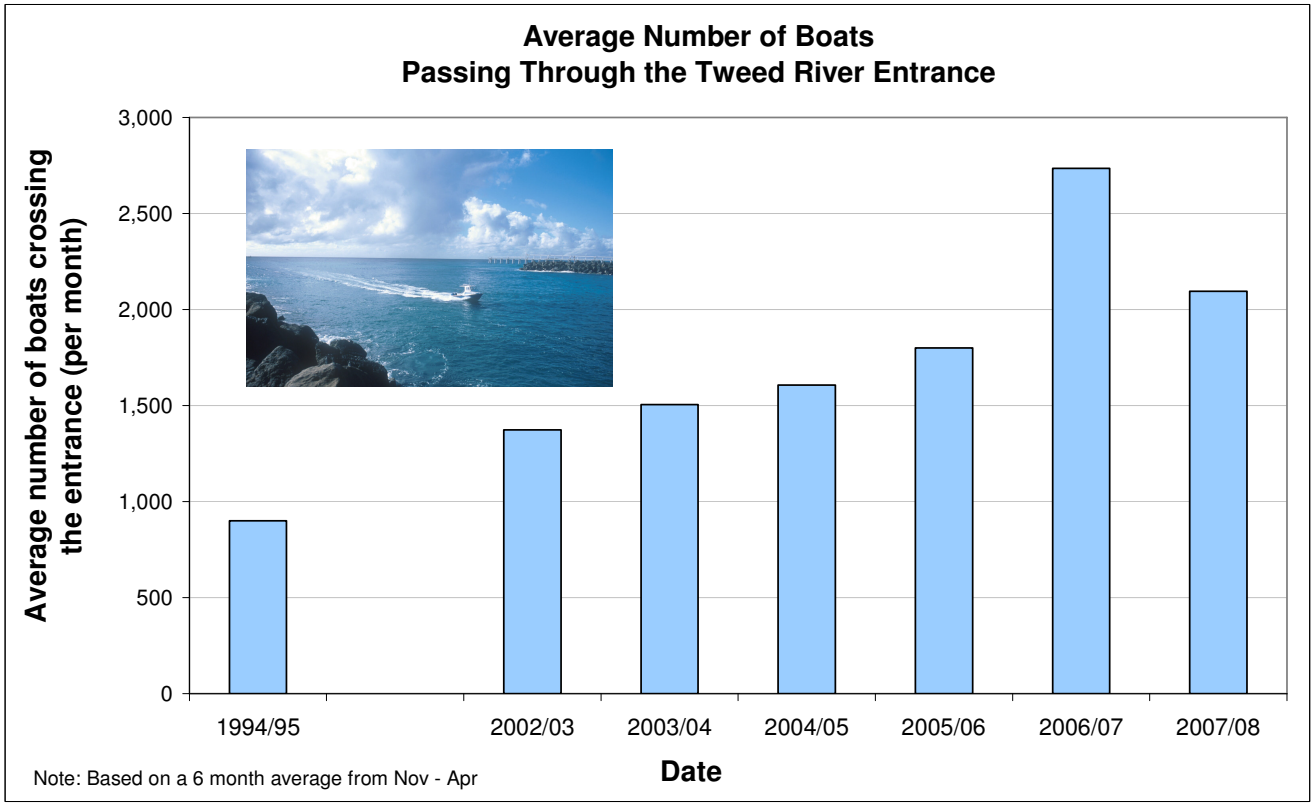
Weekends and public holidays

Date	Entrance Conditions		Navigation Rating Impassable----------Good					Number of Boats
			Impassable	Difficulty Encountered	Some Difficulty Encountered	Relatively Good Crossing	Good Conditions	
1	Moderate	30 Kt						63
2	Moderate	15 Kt						227
3	Moderate	9 Kt						81
4	Moderate	19 Kt						37
5	Moderate	11 Kt						25
6	Moderate	15 Kt						82
7	Moderate	14 Kt						106
8	Moderate	25 Kt						31
9	Moderate	32 Kt						105
10	Rough	29 Kt						0
11	Rough	28 Kt						0
12	Rough	21 Kt						2
13	Rough	25 Kt						4
14	Rough	22 Kt						65
15	Moderate	20 Kt						102
16	Moderate	15 Kt						99
17	Rough	26 Kt						9
18	Rough	21 Kt						9
19	Rough	19 Kt						4
20	Rough	30 Kt						41
21	Moderate	15 Kt						98
22	Moderate	30 Kt						73
23	Moderate	23 Kt						112
24	Moderate	17 Kt						68
25	Moderate	16 Kt						52
26	Moderate	12 Kt						19
27	Rough	18 Kt						50
28	Rough	23 Kt						29
29	Rough	26 Kt						23
30	Moderate	12 Kt						360
							TOTAL	**1,976**


Daily Number of Vessels Passing Through Tweed River Entrance and Navigation Conditions, November 2008
Navigation rating
Boats Passing
NB.
1. Peaks in number of vessels passing frequently coincide with weekends.
2. Forecast conditions may influence number of vessels passing.
Rating from 1 to 5 (1 being impassable, 5 being good navigational conditions)
Daily Number of Vessels Passing Through Entrance
Date


Daily Number of Vessels Passing through Tweed River Entrance and Significant Wave Heights November 2008
Siginficant Wave Height (m) measured at the Tweed Waverider Buoy
75% Wave Height Exceedance, ~0.9m (1995-2001)
50% Wave Height Exceedance, ~1.2m (1995-2001)
25% Wave Height Exceedance, ~1.55m (1995-2001)
Vessels Passing
Days logged in November:30
Total Crossings recorded:1,976
Average Crossings per day: 66
Significant Wave Height (m)
Daily Number of Vessels Passing Through Entrance
Date
(NB: Rough sea conditions recorded for 10-14, 17-20, 27-29 November)


Comparison of the Number of Vessels Passing Through the Entrance per month
(2007/08 compared to 2003/04 and 1995 prior to entrance improvements)
Monthly No. Vessels passing through entrance per month
3,500
3,000
2,500
2,000
1,500
1,000
500
0
2006/07
Average crossings
per month ≈ 2,600
2003/04
Average crossings
per month ≈ 1,700
1994/1995
Average crossings
per month ≈ 913
December
2007
January
2008
February
March
April
May
June
July
August
September
October
November
Month
Number of vessels passing through the entrance per month (2007/08)
Number of vessels passing through the entrance per month (2003/04)
Number of vessels passing through the entrance per month (1994/95)
*Note 1 - Based on December to November averages
*Note 2 - Assuming the number of incoming boats = outgoing boats in 94/95


Average Number of Boats
Passing Through the Tweed River Entrance
Average number of boats crossing the entrance (per month)
3,000
2,500
2,000
1,500
1,000
500
0
1994/95
2002/03
2003/04
2004/05
2005/06
2006/07
2007/08
Date
Note: Based on a 6 month average from Nov - Apr

5. SURFING CONDITIONS

Dominant swell condition: 1.0-1.5 m from SE

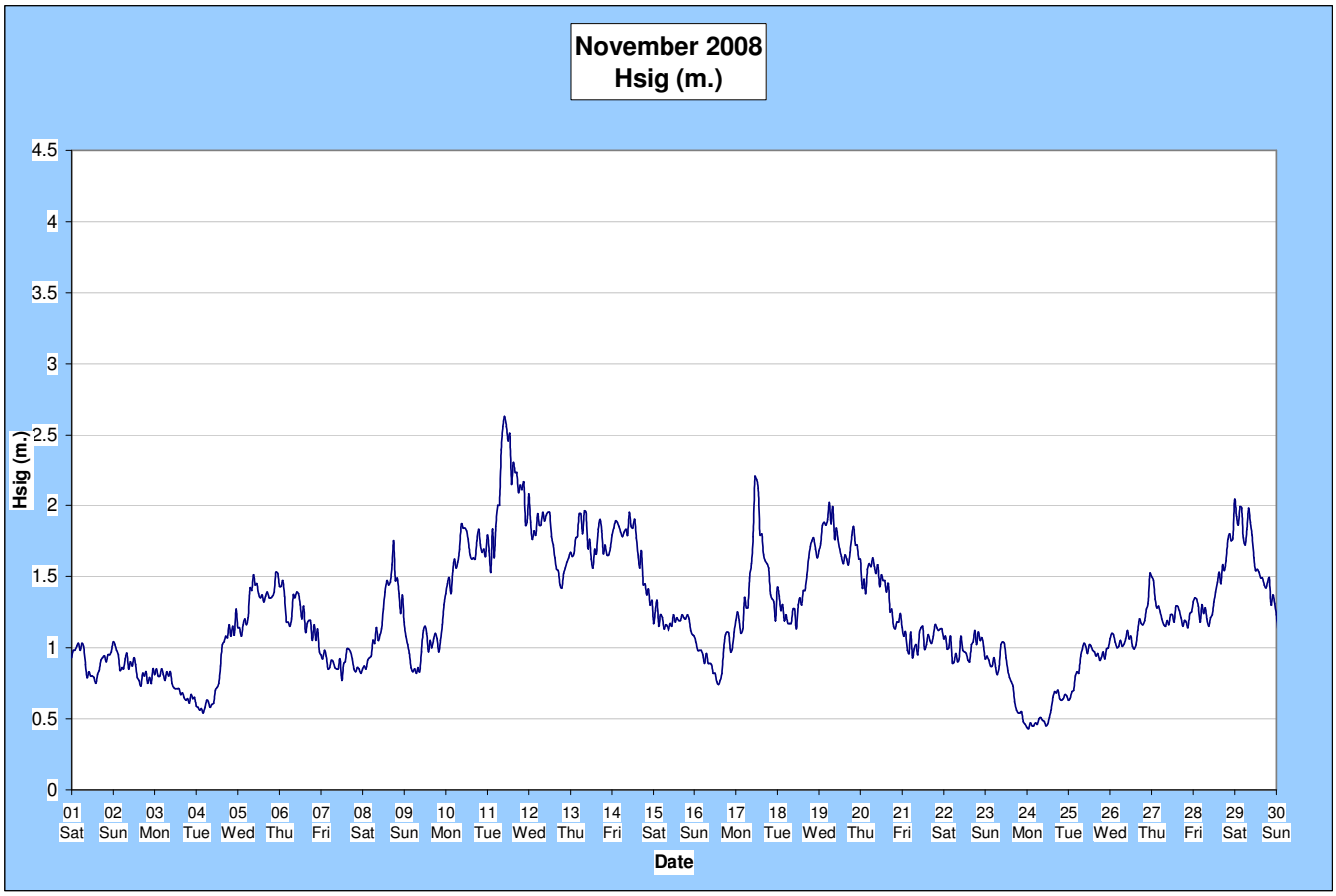
Moderate sea events: 11-12 November (waves reaching 2.63 m), 17 November (waves reaching 2.18 m), 19 November (waves reaching 2.02 m), 29 November (waves reaching 2.04 m)

Monthly minimum significant wave height: 0.6 m on 8 November

Monthly maximum significant wave height: 2.63 m on 11 November

Number of days with waves below 1.0 m: 16 days

Number of days with waves above 2.0 m: 5 days (Source: Tweed & Brisbane Waverider Buoy; BoM)



A link to data recorded by the Tweed Waverider Buoy is available at www.epa.qld.gov.au/sandbypass/

SURF & SURF LIFE SAVING AND OTHER EVENTS

Events in November 2008

Roxy Pro Trial for Trials Contest, 1-2 November, Gold Coast

RipCurl Into Summer Junior Challenge, 1-2 November, Tweed-Byron Coast

SLSQ Surf Carnival, 2 November, Kirra Beach

Surfing Australia Boys Surf Camp, 3-5 November, Tweed-Byron Coast

Surfing Australia Girls Surf Camp, 10-12 November, Tweed-Byron Coast

Lizzy Girls Surf Series Event 3, 15-16 November, Gold Coast

RipCurl Girls Go Surfing Day, 15-16 November, Australia-wide

Honolua Stand Up Paddle Challenge, 22-23 November, Gold Coast

SLSQ Ocean Assault, 24 November, Coolangatta

Surfing Australia Adult Surf Camp, 24-26 November, Tweed-Byron Coast

Upcoming events in December 2008

Billabong Queensland Open, 6-7 December, Gold Coast

Team Australia High Performance Camp, 10-14 December, Tweed/Byron

Wahu Surfer Grom Comp, 13-14 December, Gold Coast

Ripcurl Grom Search, 15-19 December, Gold Coast

Quiksilver Pro Trials for Trials, 20-21 December, Gold Coast

Source: Surfing Australia & Surf Life Saving Queensland

VOLUNTEER SURF QUALITY OBSERVATIONS

The following observations for November 2008 were made by volunteer Mr Brian Mason on behalf of the TRESBP.

Date	Duranbah	Frog's Beach / Snapper Rocks	Kirra Point
1/11/08	ENE plunging and spilling waves, 1.0-1.5 m. 34 surfers present. Strong S wind causing waves to break up.	No longshore transport visible. No offshore bar visible. 42 surfers present.	Plunging and spilling waves, less than 1.0 m. 28 surfers present. Strong southerly winds have moved some of the surfers to the protected beach at Kirra North.
14/11/08	Plunging waves greater than 2.5m. Strong winds 20-25 kt. 10 surfers present. Much of the recently pumped sand onto the beach would have been lost over the last few days.	Large amount of northward longshore transport visible. No offshore bar visible. 36 surfers present.	Plunging and spilling waves, 1.0 to 1.5m. 10 surfers present. Offshore bar well established and extends north as far as can be seen. Very few beach users, wind conditions make beach use unpleasant.

6. MEDIA COVERAGE

Gold Coast Bulletin, 5 November 2008, "Shifting sands expose bedrock"

"Combined with recent strong northerly winds, the rock between Snapper and Rainbow Bay has been exposed, creating large pools of water in the middle of the beach."

Gold Coast Bulletin, 8 November 2008, "Signs aim to curb surf rage"

"Signs detailing the international Surfers' Code have been erected at the Gold Coast's most popular breaks [Burleigh, Currumbin Alley and Snapper Rocks] in a bid to combat surf rage."

Coastalwatch website, 11 November 2008, "Impact of coastal erosion in Australia"

"…since 2000 has pumped more than 500,000 m3 of sand each year from NSW across the border onto the Gold Coast beaches. In 2007 these beaches were as wide as they had ever been. However, it has all come at a cost in the tens of millions of dollars."

Tweed Daily News, 22 November 2008, "Dune plan key to saving Kirra"

"Mr Deane said a solution that could satisfy all stakeholders was for built-up sand at Kirra to be pushed up to create a dunal system 3-4m high and about 20m wide, allowing tidal action speed up the natural drift of sand."

Tracks Magazine, January 2009 issue, "A Kirra Call to Arms"

"A massive public rally is planned on Sunday December 7th at Kirra on Ocean Care Day. The simple theme is 'Bring Back Kirra Point' and for the public and surfing fraternity to demonstrate against the loss of Kirra Point"

Tweed Border Mail, 27 November 2008, "More Snapper pumping, no change for Kirra"

""Any proposal to 'turn off'the project would have significant impacts and lead to a complex series of effects along the whole coastline," Mr Taylor said."

Tweed Daily News, 28 November 2008, "Rescue operation needed after bypass kills Kirra"

"It doesn't take rocket science to realise that there is far too much sand at the point and the 25-year contract for sand pumping, agreed to by the authorities, is at the root of the problem."

7. TWEED LOWER ESTUARY TIDE CONDITIONS

Tweed River tide data for October and November 2008 will not be available until the end of January 2009. Results will be presented in the January 2009 monthly monitoring summary.

Tweed River September Mean Low Water Spring (MLWS) tide level: -0.481 m AHD

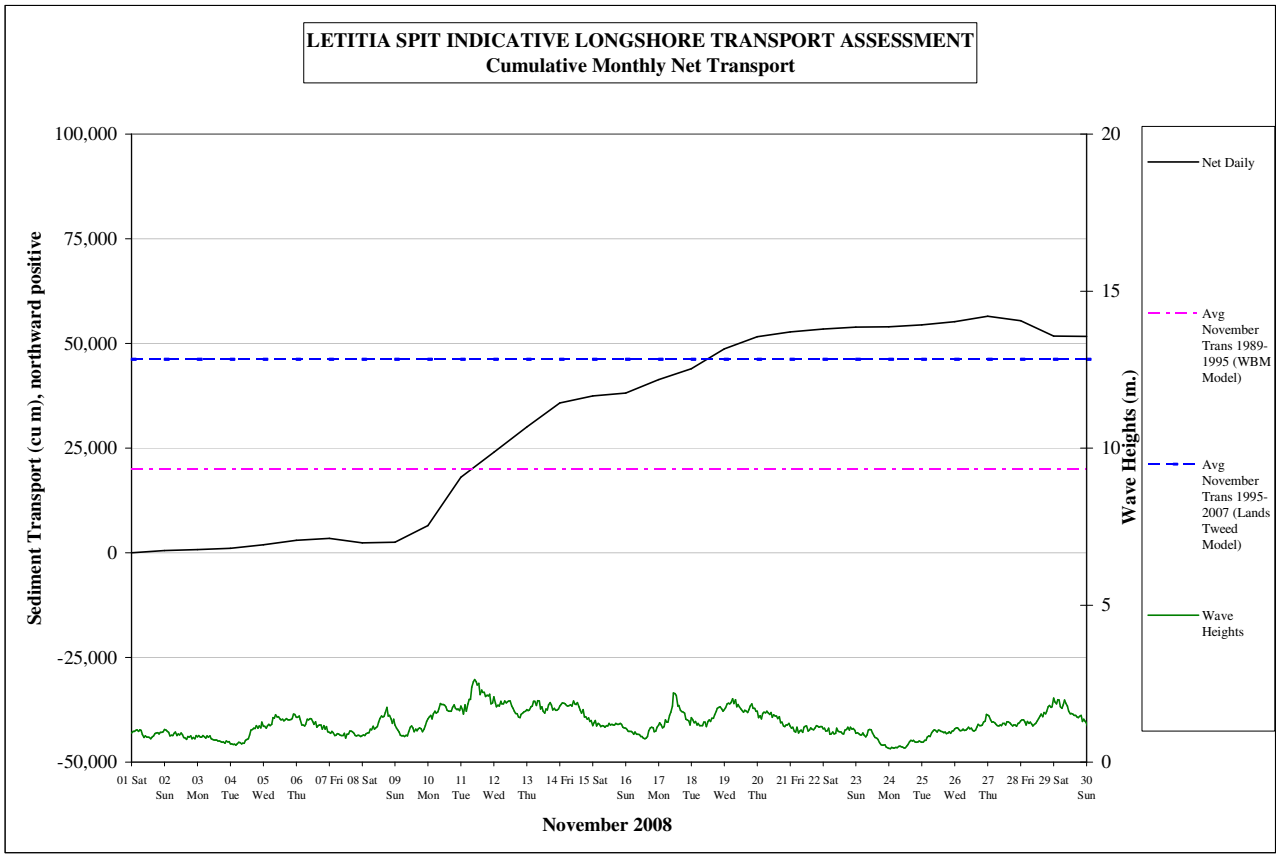
Letitia 2A tide data for September 2008 mirrored the Mooloolaba ocean tidal trends indicating that the TRESBP had not had a significant impact on the Lower Tweed River tidal range.

8. INDICATIVE LONGSHORE TRANSPORT

The longshore sand transport information presented in the graph overleaf is based on a simplified sediment transport model and should only be used as an indicator of the actual sand transport quantities for the month.

November 2008 estimated natural sand transport (moving N towards Tweed entrance): 52,000 m^3.

This result is slightly higher than average sand transport for the month of November.



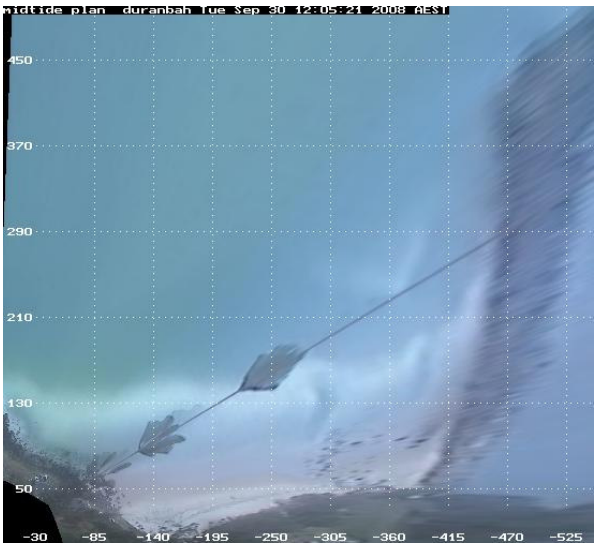
9. ARGUS COASTAL IMAGING

UNSW monitors Duranbah Beach to North Kirra Beach for the project using an ARGUS coastal imaging system. Hourly and archived images are available on the internet at the following address:

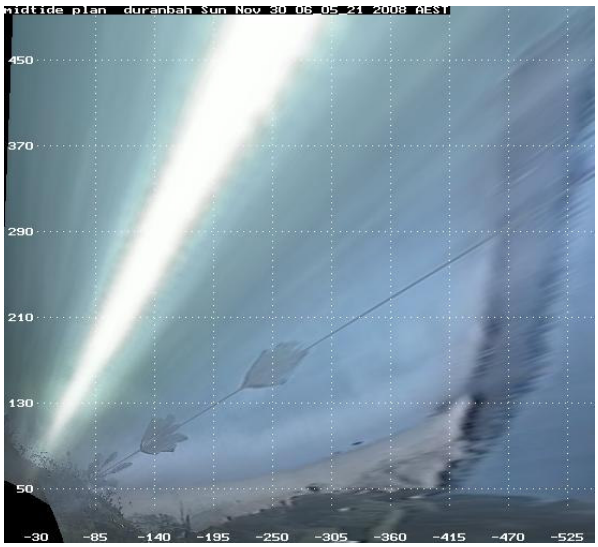
http://www.wrl.unsw.edu.au/coastalimaging/public/tweed/index.html

Merged and rectified images taken at mid tide for each of the locations are shown below.

DURANBAH BEACH

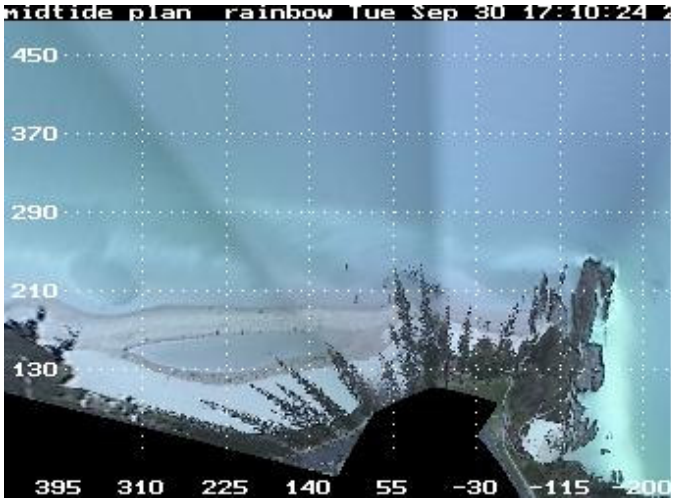


30 September 2008



30 November 2008

RAINBOW BAY



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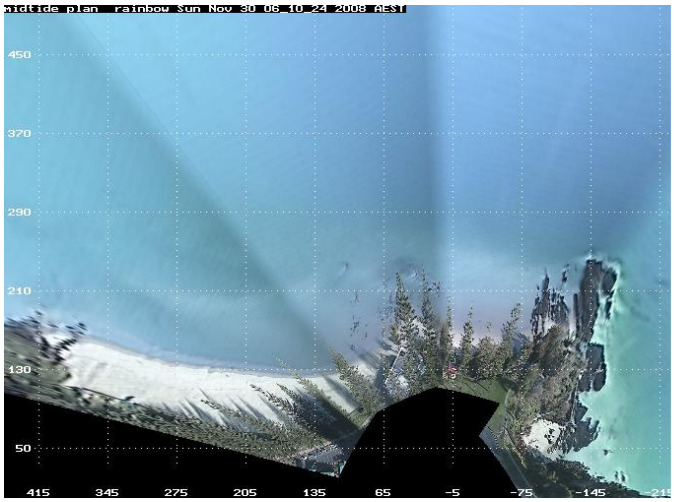
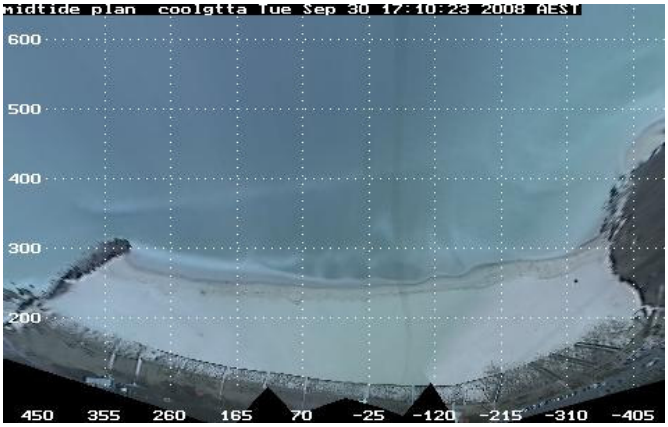
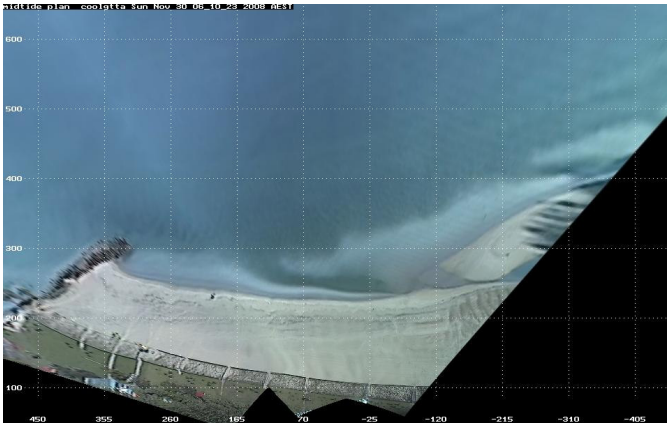


30 November 2008

COOLANGATTA - GREENMOUNT

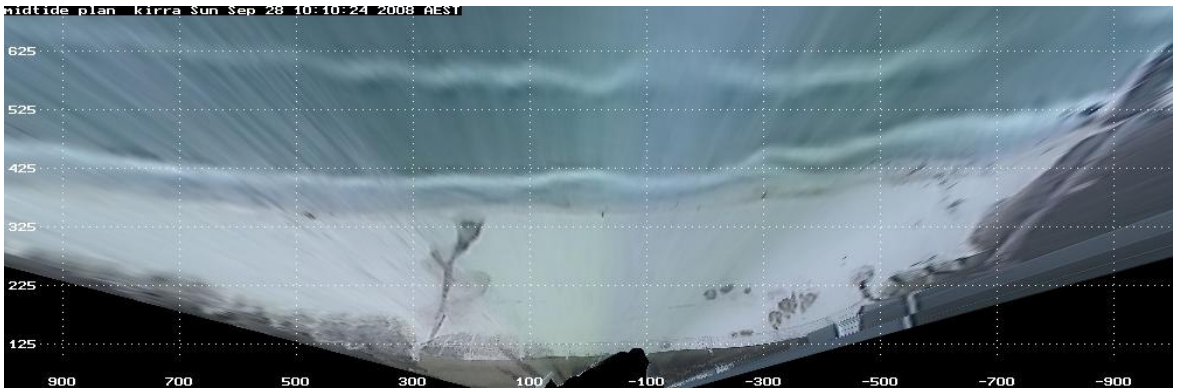


30 September 2008

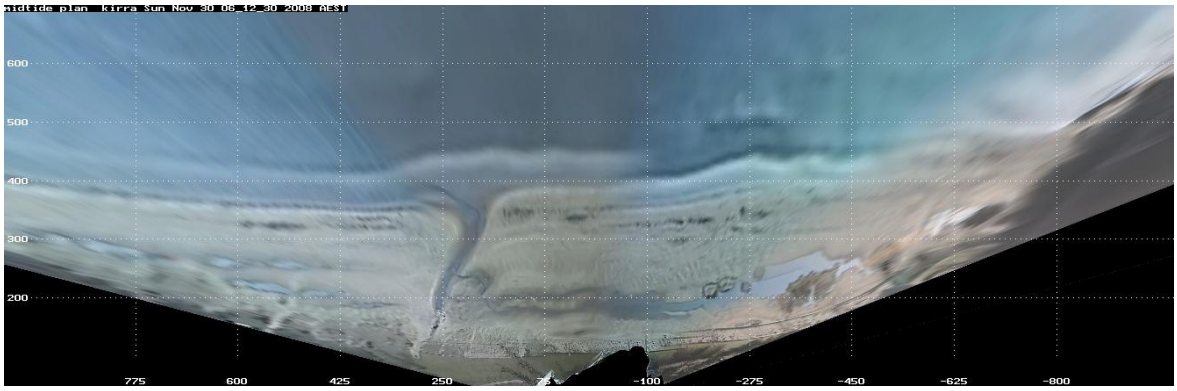


30 November 2008

NORTH KIRRA – KIRRA



28 Sep 2008



30 Nov 2008

9. FEATURE ITEM – COOLANGATTA BAY VOLUMES REDUCING

If there were no entrance training walls at the Tweed River entrance and no pumping or dredging was undertaken there, an average quantity of about 500,000 cubic metres of sand would be pushed northwards past the entrance each year by waves and currents coming mainly from the southeast. The sand would move around Pt Danger, through Coolangatta Bay and continue to flow northward along the Gold Coast, almost like a river of sand.

The actual amount of sand pushed northward each year would range from about 250,000 cubic metres to over 1 million cubic metres, depending on waves and currents, which are always changing in direction and intensity, particularly between the seasons. This is why the beaches from Frogs Beach to Kirra Point were known to change from narrow to wide or vice-versa over a matter of months prior to the construction of the Tweed training walls in the 1960s.

Coolangatta early 1958

(Photograph by Ray Sharpe, sourced from GCCC Local Studies Library)

Coolangatta late 1958

(Photograph by Arthur Leebold, sourced from GCCC Local Studies Library)

After the training walls were built, a lot of the sand that would have been naturally pushed to the north became trapped behind them. Sand began to build up at the Tweed entrance and the natural sand supply to Coolangatta Bay dwindled. The southern Gold Coast beaches became severely eroded at times and this is part of the reason that the Tweed River Entrance Sand Bypassing Project (TRESBP) was put in place.

By 2000, the sand bar at the Tweed River entrance (the Tweed Bar) had built up to the point where it was a navigation hazard and the Southern Gold Coast beaches were suffering ongoing depletion of sand.

During the early years of TRESBP pumping and dredging, more than the average natural amount of 500,000 cubic metres of sand was bypassed around the training walls each year. This was required to clear the severe sand congestion at the Tweed River entrance and to make up for the long-term depletion of sand that the Southern Gold Coast beaches had experienced since the training walls were built.

TRESBP bypasses sand around the training walls by pumping and dredging. The pumping system has been operating since 2001.

With this extra sand being delivered, the beaches from Frogs Beach to Kirra Beach grew in width and the nearshore area (the area from the surfing zone out to a water depth of about 10 metres) became shallower.

Coolangatta 2000

(Photograph © NSW Department of Lands)

Coolangatta 2003

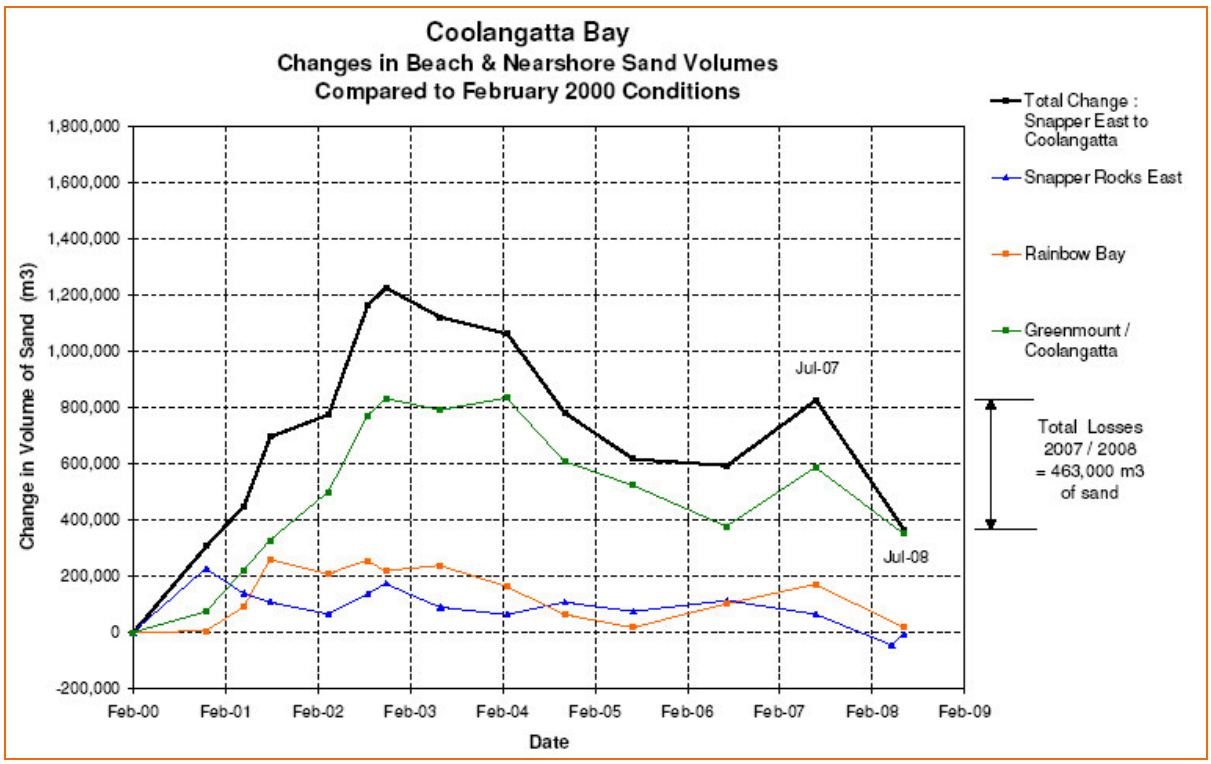
(Photograph © NSW Department of Lands)

Since 2006, TRESBP has been aiming to bypass the same amount of sand that nature would have pushed past the entrance if the training walls did not exist. The yearly sand volumes still vary greatly because of ever-changing wave and current conditions.

With less sand coming in to Coolangatta Bay, the build-up of sand that had previously been sitting there is now being pushed naturally and more rapidly to the north. It could take a few years for all of the extra sand to spread away, but the process is happening.

Almost 500,000 cubic metres (or about one average year's worth) of built-up sand has already been lost from the bay over the last year (2007/08) and hydrographic survey (seabed mapping) results show that this trend is continuing. About 15 % of the sand came from the Snapper Rocks/Point Danger area and about 85 % came from the Rainbow Bay/Coolangatta area.

However, the sand that has been lost so far has almost all come from the nearshore zone, mainly from water depths of about 2 to 5 metres in the Snapper Rocks to Coolangatta area and 4 to10 metres off Frog's Beach. So the chances are, unless you have been visiting the bay regularly in a boat with a depth sounder, you won't have noticed the change.



The sand loss is only just beginning to show itself in the inshore (wading) zone and upper-beach (tidal and dry beach) zone and beach users won't have noticed any significant difference in beach widths or swimming conditions as yet. (Any recent changes in conditions are more likely to be due to seasonal weather than long term effects).

Beaches are expected to become narrower to match the deeper nearshore zone over time. Natural variations in waves and currents will still cause short-term changes in beach size and shape, but the beaches from Frog's Beach to Kirra Point will be much closer to their natural states than they have been since the 1960s. (See predicted changes to beach conditions under a restored sand supply system in the project's Environmental Impact Study extract). [linked]

It is difficult to say exactly when the beaches will become narrower again because beach conditions are very dependent on seasonal weather, particularly the occurrence and duration of significant storms. One major cyclone may be all it takes.

Coolangatta 2008

(Photograph © NSW Department of Lands)

Now that sand is being pushed out of Coolangatta Bay, the beaches to the north which have been low on sand for many years, will gain sand to protect them against storm erosion. Most of the sand from Coolangatta Bay has already moved past Kirra Beach and Coolangatta Creek over the past year and the majority of it has now reached the area to the north of the North Kirra Surf Life Saving Club.

Sand volumes in the Snapper Rocks and Rainbow Bay area are now getting close to what they were before sand pumping began. The rate at which sand moves out of the Greenmount/Coolangatta area is now beginning to slow down and more movement of sand out of the Kirra area should be soon be seen as the sand continues to be naturally pushed further north to the North Kirra/Tugun area.

There are no obstructive features such as headlands or groynes along the North Kirra to Tugun stretch of coast so it is expected the sand will 'spread out' along these beaches. It is not expected that the sand will travel as a large mass of the kind that filled in the beaches from Rainbow Bay to Kirra in the early years of pumping. As a result of the spreading out of the sand, the beaches to the north of Kirra shouldn't become as wide as the beaches from Rainbow Bay to Kirra have been in recent years.

10. CONTACT

For more information regarding the Tweed River Entrance Sand Bypassing Project please refer to the following web addresses:

www.tweedsandbypass.nsw.gov.au

www.epa.qld.gov.au/sandbypass/

www.wrl.unsw.edu.au/coastalimaging/public/tweed/index.html

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