



4. Bongaree Jetty to Bribie Gardens Estate

4.1 Site description

The Bongaree Jetty to Bribie Gardens Estate Canal study area is located on the south-western coastline of Bribie Island and is approximately 1.3 km long (refer to [Figure 23](#)). The shoreline along this section is reinforced by a stepped sea wall, although sand build-up is present and partly covering this sea wall. The land tenure along the foreshore between Bongaree Jetty and the canal is esplanade and road reserve under the trusteeship of Moreton Bay Regional Council.

The Bongaree Jetty foreshore features park landscaping with large fig trees and some eucalypts attracting urban-adapted bird species. Areas of marine couch are present on the upper beach zone, particularly south of the jetty walkway. Bongaree Jetty features a build-up of sand on both sides of the walkway behind the pontoons (refer to [Photo Plate 4-1](#)). Two 650 mm diameter stormwater pipes extend to the tidal area north of the jetty.

Shirley Creek is approximately half-way along this study area and features an exposed stepped sea wall either side of the mouth of the channel. Sand spits are featured either side of this channel entrance (refer to [Photo Plate 4-4](#)). A bridge along Welsby Parade is located just inside the mouth of the creek with seawall structure along the banks (refer to [Photo Plate 4-3](#)), with mangroves present immediately upstream of the bridge. A boat ramp, car and trailer parking and picnic facilities are located south of Shirley Creek (refer to [Photo Plate 4-2](#)).

Parts of the sea wall are de-stabilised along this study area (refer to [Photo Plate 4-5](#)).

The canal at the Bribie Gardens Estate features a rock groyne that protects the entrance to the canal on both sides (refer to [Photo Plate 4-7](#)). On the southern side of the canal entrance, the sand has built up along this rock groyne and allowed for the establishment of some mangroves (refer to [Photo Plate 4-6](#)). There is also a large build up of sand south of the groyne; however further south of this the sea wall is exposed and there is little beach at low tide.

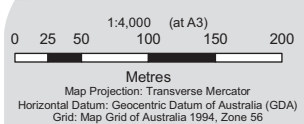
A footpath extends along the foreshore in this section with scattered picnic shelters and park areas or playgrounds.

A Coastal Management District over Land is mapped along the shoreline in this section (refer to [Appendix B](#)).



LEGEND

- | | | | | |
|-----------------|--------------------|------------------------|---------------------------------|-------------------|
| Stormwater Pipe | Cadastral Boundary | Section 86 Permits | Culvert/Bridge/Weir/Groyne/Wall | Dredging Area |
| Footpath | Community Facility | Jetty/Pier/Pontoon | Marina/Building | Beach Nourishment |
| Main Road | Foreshore Reserve | Boat Ramp/Works/Access | Channel/Canal | Seawall |



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Shoreline Erosion Management Plan

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Bongaree Jetty to Bribie Gardens Estate Canal - Locality Plan

Figure 23



Photo Plate 4-1 Bongaree Jetty



Source: GHD 21/12/2009 8:47

Photo Plate 4-2 Boat ramp north of Bongaree Jetty



Source: GHD 21/12/2009 16:37

Photo Plate 4-3 Shirley Creek bridge and seawall structures



Source: GHD 21/12/2009 8:52

Photo Plate 4-4 Sand formation at Shirley Creek entrance



Source: GHD 21/12/2009 8:50

Photo Plate 4-5 Seawall movement north of Shirley Creek



Source: GHD 21/12/2009 11:08

Photo Plate 4-6 Bribie Gardens Estate southern entrance of the canal



Source: GHD 21/12/2009 8:57

Photo Plate 4-7 Bribie Gardens Estate groyne structure in the canal



Source: GHD 21/12/2009 8:57

4.2 Historical shoreline changes

Reference to Figures 27 and 28 indicates that immediately north of Bongaree Jetty, the shoreline has undergone significant realignment. This is likely to be due to the sheltering effect of the jetty itself, causing sand to fall out of suspension as it reaches the protected waters east of the jetty. The accretion evident north and south of the jetty demonstrates that longshore transport to the north and the south is occurring, although the net transport direction is to the north. This is supported by corresponding erosion immediately north of the accretion area (between the Bongaree Jetty tombolo and Shirley Creek, and was already evident in the 1942 aerial photography. When sediment is being transported from south to north, it is trapped by the tombolo forming around the jetty and no sediment reaches the shoreline further north. Conversely, when sediment is being transported from north to south, the sediment transported into the eroded area is immediately transported further south onto the northern side of the tombolo.

This section of coastline has a stepped revetment along most of its length. From the photography, the meandering alignment indicates that the revetment appears to have been aligned along the erosion scarp present at the time of construction. The photography also indicates that the revetment was constructed in stages, with a short section of early wall construction occurring by 1975 approximately halfway between Kangaroo Avenue and the mouth of the canal at Bribie Gardens Estate (Welsby Bridge). By 1982 the revetment had been upgraded and extended southwards past Hall Avenue.

There are numerous places where the revetment protrudes noticeably seawards compared to the adjacent shoreline, such as the small area of parkland close to the intersection of Hall Avenue and Welsby Parade. In these locations, there is little or no recreational beach at any



stage of the tide. This beach lowering occurs because the sediment from the upper beach has been isolated from the active beach system by the revetment wall. The only sediment available to be transported must therefore be sourced from the lower beach. Any sediment being transported into the area is less likely to be deposited in front of the revetment due to increased turbulence caused by the presence of the revetment.

Localised erosion has also occurred around the mouth of Shirley Creek. The erosion is likely to have occurred in a similar fashion to that described for the small creek south of Bongaree Jetty. By 1999, the revetment wall had been extended southwards to limit further shoreline changes in the vicinity of Shirley Creek and southwards to Bongaree Jetty.

Between Shirley Creek and Bongaree Jetty, there are two small boat ramps and several stormwater pipes crossing the beach. These structures have had a limited localised effect on the shoreline due to the lack of sediment supply to this area.

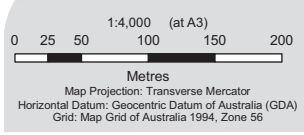
The northern end of this beach compartment is marked by the mouth of the canal at Bribie Gardens Estate. The mouth was located along the drainage line of an existing creek, but is also coincidentally located at the point of a significant change in shoreline alignment. This point marks reorientation of the shoreline from a north-south to a northwest-southeast alignment. The shoreline in this area has been influenced by the works around the mouth to the canal in the mid to late 1980's. Prior to this time, the beach in this area was subjected to local erosion from the meandering mouth of the creek. Connection of the canal estate to Pumicestone Passage involved deepening and widening of the creek mouth, and stabilisation with rock breakwaters.

The southern breakwater has acted as a groyne, resulting in stabilisation of the beach from the creek south to the area where the initial revetment was constructed. However, this accretion has been at the expense of beaches further north, which have been deprived of this sediment (discussed in the next chapter). Recent aerial photography indicates that the groyne effect of the breakwater is at capacity and some sediment bypassing has started.



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	1982		2003
	1958		2007
	1975		2009



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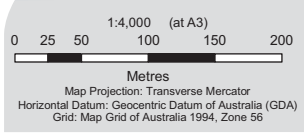
**Bongaree Jetty to Bribie Gardens
Estate Canal - Shorelines**

Figure 24



LEGEND

	Vegetation Lines		1982		2003
			1990		2007
			1999		2009
			1975		



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**Bongaree Jetty to Bribie Gardens
Estate Canal - Vegetation Lines**

Figure 25

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 Data source: MBRC Quickbird Image 2009 and Council Infrastructure, 2009. Created by: S Potts



4.3 Longshore transport

This section presents details of the potential longshore transport for this particular section of the coastline with both the annual southerly, northerly, and net transport movements shown as well as the seasonal variations. Just as the annual calculations are based on the average wind climate over the period of record for the full 12 months, the seasonal calculations are based on the average wind climate over the period of record for that particular season.

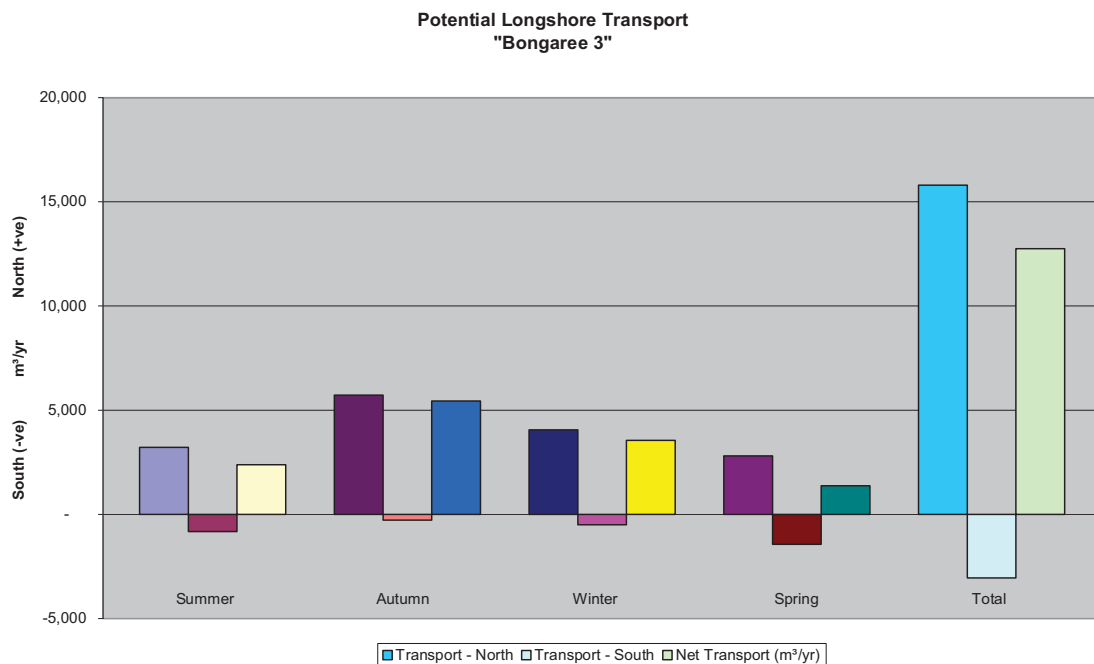
The seasons are defined as follows:

- ▶ Summer – December, January, February;
- ▶ Autumn – March, April, May;
- ▶ Winter – June, July, August; and
- ▶ Spring – September, October, November.

For this section of the coast the following observations can be made (refer [Figure 26](#)):

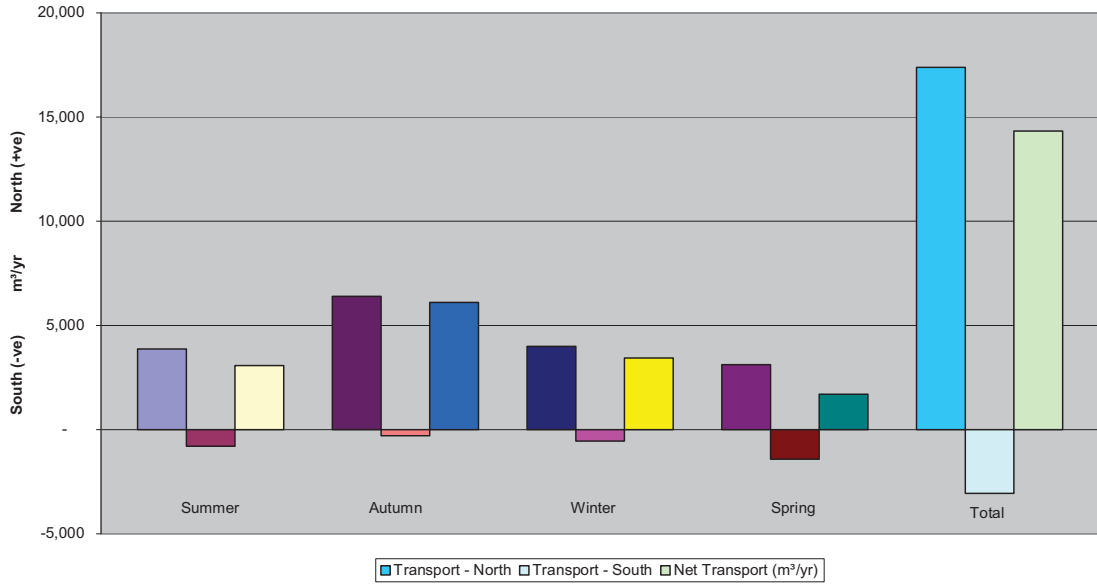
- ▶ The predominant transport direction is strongly to the north;
- ▶ The potential longshore transport is much less than the transport south of the Bongaree Jetty due to a degree of sheltering from the south-easterly waves;
- ▶ There is only minimal differences in the transport magnitude along this section of the study area; and
- ▶ The seasonal variation is similar to the annual results with higher potential transport rates occurring during Autumn.

Figure 26 Bongaree Jetty to Bribe Gardens Estate – Longshore Transport

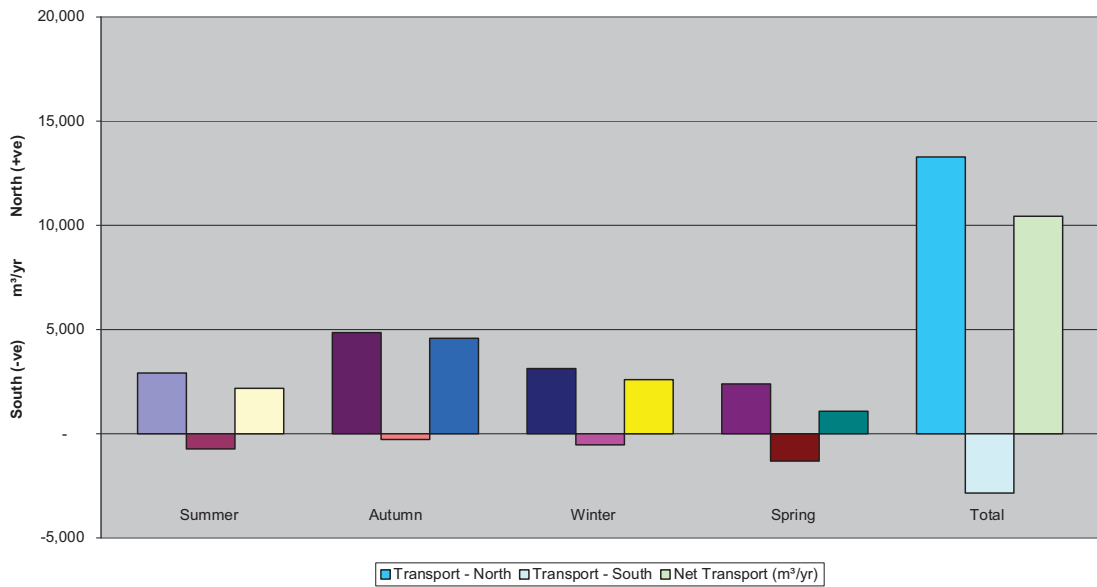




Potential Longshore Transport
"Bongaree 2"

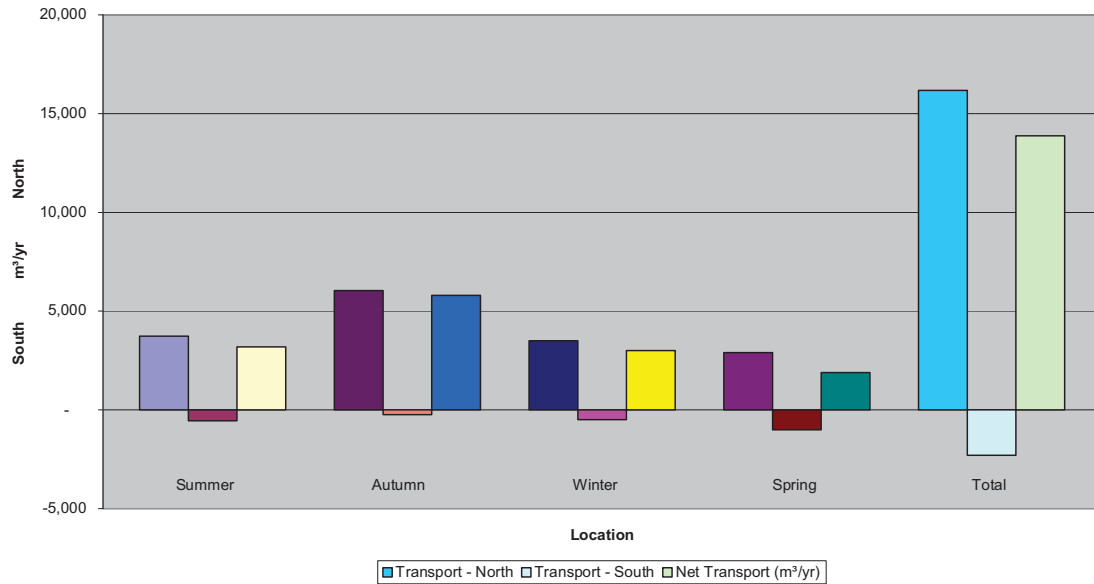


Potential Longshore Transport
"Bongaree 1"





Potential Longshore Transport
"Bribie Gardens Estate Canal"



4.4 Expected shoreline trends

As mentioned in the previous chapter, if accretion at the jetty is allowed to continue unchecked, eventually the tombolo will behave like a groyne and interrupt sediment supply further north. This will further exacerbate erosion of the beach to the north of the Jetty. Sediment supply to the beach north of Bongaree Jetty will only resume once the southern beach compartment is full. Sand accumulated in the tombolo may adversely impact on the functionality of the jetty for recreational use. Dredging to maintain navigational depths may be required to allow all tide access. Any sediment removed from the tombolo should be placed on the currently eroded foreshore north of the jetty.

Without a significant increase in sediment supply to the beach compartment, continued beach lowering in front of revetments would be expected. Beach lowering will reach a natural limit based on the ambient wave and tide conditions, i.e. once a water depth is reached whereby sediment is no longer able to be entrained by wave and current action.

4.5 Other considerations

As the shoreline south of the southern breakwater at the mouth of the canal at Bribie Gardens Estate has filled, sediment is starting to bypass the breakwater. Initially, this sediment will deposit into the creek mouth, where it is likely to eventually become a concern for navigation. Ultimately, a regular program of dredging may need to be initiated in this area. Any clean sand removed through dredging should be used for beach nourishment purposes on beaches north of the canal mouth.



Undermining of the existing revetment may also be an issue should beach lowering continue. This would be influenced by the design and construction standard of individual sections of revetment.