

# Littoral Drift – evolution of institutions for managing the long shore transport of sand across the NSW/Queensland border

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## Abstract

Littoral drift is the movement of sand in a direction parallel with the coastline driven by the wind and wave climate. Littoral drift moves sand from south to north, at the NSW/Queensland (Qld) border (the border). The natural rate of transport is estimated to be 500,000m<sup>3</sup> per year with substantial variability. Since the year 2000 the Gold Coast City Council and the NSW and Qld State Governments have jointly spent between \$4.7m and \$11.3m each year to artificially replicate this process over a distance of less than 1.5km from Letitia Spit in NSW to Snapper Rocks in Qld. The project this expenditure relates to is referred to as the Tweed River Entrance Sand Bypass Project (TRESBP).

This paper argues that political, institutional dimensions comprise critical contingencies in reaching an interstate agreement on the TRESBP, and, that these factors have been neglected in favor of narrative that over emphasises technology and scientific discovery. By focusing attention on the political and institutional contingencies for the TRESBP, coastal process interventions become part of an incremental rather than transformative process of coastal development situated within a series of 'lock-ins' and path dependencies.

Climate change and population growth are driving a global trend towards larger and more expensive coastal management initiatives that must negotiate jurisdictional uncertainty and complex stakeholder dynamics. The TRESBP provides an opportunity to examine the evolution of such a project and by emphasizing the as yet unexplored political and institutional dimensions, improve the processes by which we plan and develop coastal environments and prepare for global change.

## Introduction

The literature on coastal processes and their management at the border is almost exclusively from engineering or oceanography disciplines (Coomber & Nott, 1989; Dyson, Murray, & Connor, 1994; Dyson, Victory, & Connor, 2001; Foster et al., 2001; Murray et al., 1985). The majority of papers devote little more than one paragraph to 25 years of negotiations between Qld. and NSW State Government, which led to the intergovernmental agreement to develop and operate the TRESBP<sup>1</sup>.

The scant attention to the political or social context for this project reflects two prevailing ideas throughout the coastal management literature. The first is that of politics as a negative process and the second is a view of coastal management as a process best left to experts or technical specialists operating at arms length from the community.

Politics and the politics of community are difficult, complex and somewhat slippery compared to the precise models characteristic of coastal engineering. However,

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<sup>1</sup> "As the Tweed River is in NSW and the affected beaches are in Qld., the problems were jointly addressed. A solution was agreed that involved artificially bypassing sand from south of the entrance area to the Qld. beaches." (Dyson, Victory, & Connor, 2001 p 310)

examining the social and political aspects upon which the TRESBP was contingent reveals the political nature of such decisions. This examination can provide opportunities to invent or create new models of coastal management, which are capable of building the capacity of coastal managers to progress towards sustainable development of the coastal zone. Indeed, in this paper I argue that the consideration of the social and political context in a dynamic manner is an increasing critical challenge for coastal managers to maintain the relevance of their discipline.

## **Methods**

This paper is a historical case study of the TRESBP. The primary time period of concern is the second half of the 20th century and is focused primarily on the use and management of the coast at the border.

There are three main stages to the data collection;

- A review of literature on coastal management for Qld.'s Gold Coast and NSW Tweed Local Government Areas.
- Semi-structured interviews with individuals involved in coastal management at the border during the period concerned. Participants included retired, current and previous state and local government officers, academics, executive members of industry/community/environmental organisations.
- Document analysis based on documents provided or identified through the interviews and literature review, included government reports, legislation, consultants reports, personal journals and media reports.

The analysis adopted the approach of Kendall & Wickham (1999) and searched for contingencies rather than causes in an attempt to position the TRESBP within an ongoing series of events, rather than as an end in itself. These contingencies were identified by asking participants to recall the events that induced change (described as focal events) from Fidelman (2006) and Margerum & Born (2000).

## **Findings**

The existing literature on coastal management at the border presents three focal events that lead to the 1994 agreement between NSW and Qld to collaborate in the management of littoral drift across the border. The three events are; 1962-1965 Extension of the Tweed River Training Walls, 1967 Gold Coast Erosion Events and 1970 Delft Report.

The stakeholder interviews conducted for this research indicated a much wider range of focal events across dimensions of time, space and content than those identified by the literature above. The events identified through the interviews have been categorised within three themes of Institutions, Political Economy and Knowledge with each theme described below. Each of the three themes includes sub headings, which cluster together the focal events identified through the stakeholder interviews

### **Institutions**

Institutions are the rules and norms that are used to structure decision-making. At times they may but do not have to be embodied in organisations. The institutions relevant to coastal management at the border are inter-governmental and primarily those of the Commonwealth of Australia including the constitution and ocean and coastal legislation.

### **Australian Federation**

Australia is a federation with relationships between Governments guided by the *Commonwealth of Australia Constitution Act 1900* (Commonwealth of Australia, 1900). As an intergovernmental issue, ideally the parties concerned with the littoral transport of sand across the border would make use of the institutional arrangements described by the constitution to negotiate an agreement. Reports that the Qld. Government was considering a High Court challenge against NSW demonstrate a desire to draw on the institutional arrangements provided by the Constitution to reach agreement with NSW. An explanation for the failure of such action to eventuate is the absence of recognition of the potential for natural resources to be mobile and span borders within the constitution (Timothy & Kellow, 1995 p. 6) which would have precluded the High Court from arbitrating the action.

### **Ocean and Coastal legislation**

Since 1967 a number of legislative instruments of the Commonwealth have altered the jurisdictional control over the territorial sea (from the low tide mark to three nautical miles offshore) and consequently the sand resource moved by littoral drift (see Table 1). Similarly to the constitution these instruments have not recognized the mobility of resources and subsequently did not provide the institutional arrangements to arbitrate an agreement between NSW and Qld.

Table 1 Ocean and Coastal Legislation

<b>Instrument</b>	<b>Control of Territorial Sea</b>
1967 Petroleum (submerged lands) Act	State
1973 Seas and Submerged Lands Act	Commonwealth
1979 Offshore constitutional settlement	State

The 1979 Offshore constitutional settlement entrenches the rights of NSW to the sand trapped at the Tweed and provides no recognition of mobility of resources and consequent mechanism for negotiating an interstate agreement. Given the prominence of issues at the border at this time the failure of Qld, to take advantage of the reform opportunities, raises questions that warrant further consideration.

### **Political Economy**

Political economy considers the role of government, its response to constituents and the power relations by which resources are allocated. There is very little evidence of the TRESBP being a political issue for commonwealth politicians. As a result the issue was largely a bilateral negotiation between governments, without opportunities for Qld. to use the democratic process to exert their preferences. The negotiations between states were advanced opportunistically, rather than in a structured manner with a number of focal events favouring one state over the other. From the focal events three key issues emerge; the politics of marginal seats, Murray Darling Basin and Climate variability

### **NSW Elections and Marginal Seats**

After several terms in power the NSW Liberal party formed a minority government in coalition with the Nationals and independent MPs following the 1992 election. The 1992 election also reduced the margin by which the seat of Murwillumbah, which includes the Tweed River entrance, was held by the Nationals Member shifting it to a marginal seat.

Following a series of challenges early in the term following the 1992 election the marginal seat of Murwillumbah was attracting political interest as a seat that needed to be secured for the coalition to maintain Government at the 1995 election.

Simultaneously reports were emerging that due to the dangers of navigation at the Tweed the local fishing fleet was attracted to the relative safety of operating out of Qld's newly constructed Seaway, just 35km to the North.

This provided an attractive political environment for action by the incumbent NSW government. By reaching an agreement with Qld, the NSW Coalition Government would be seen to be improving conditions for commercial and recreational fishers, a key constituency for the incumbent Nationals party and for the wider economy of the state by avoiding loss of fishing related economic activity to Qld.

### ***Murray-Darling Basin Ministerial Council***

Similarly to the littoral transport of sand at the border, water within the Murray Darling Basin (MDB) is mobile and traverses a series of borders. It varies in that it has received significantly more attention nationally, involves 5 Governments including the Commonwealth and the flow between NSW and Qld, is the reverse of littoral drift.

The failure to reach an agreement over the littoral drift of sand across the border, could be seen as a precedent for other cross border natural resource management issues. Qld was increasing water extraction and storages from the MDB dramatically through the 80s. For NSW failure to compromise on the TRESBP risked setting a precedent for Qld to not compromise on the MDB.

### ***Climate Variability***

Public and political attention to coastal management increases significantly following severe storms and erosion events. As the climate for the east coast of Australia is highly variable, so to is the level of political and public attention devoted to coastal management. During periods of low storm activity, political attention is unlikely to be focused on coastal management. In a review of 200 years of coastal storms for Australia's east coast Helman, (2007 p. 132) identified a period of major erosion between 1946 and 1974 followed by a low storm period from 1980 to 2004.

### ***Technology and Capacity***

Given the complexity of the intergovernmental relations required for the TRESBP, the track record of large-scale engineering interventions in the region was an important balancing point to provide public confidence given the investment required.

### ***Qld. Coastal Policy Environment***

The Beach Protection Act 1968, formalised institutional arrangements for coastal management in Qld. Through the 70s and 80s the Gold Coast was the site for a series of major coastal engineering works from the Kirra and Currumbin Groynes to the Seaway and the Southern Beaches Nourishment projects. The scale of these projects was much greater than any previous works in the region and the orientation towards such major projects could be attributable to;

- The BPA management of beach erosion without jurisdiction over the Tweed River training walls which were one of the underlying causes of the issue
- The regional Gold Coast economy and political orientation towards tourism and coastal development.

### ***Technology***

The technology used for the permanent sand bypassing system at the Tweed River shares a number of similarities with the technology used for the Gold Coast Seaway project completed in 1987, just 36km north of the Tweed River. The Seaway project provides an important proof of concept within close proximity to the border and

reduces the potential technology risk of the TRESBP project. The aim of the Seaway project is said to be the stabilization of the Nerang River, however, stabilization is not an end in itself so the motivation for the Seaway is another contingency in reaching an agreement for the TRESBP.

The Gold Coast Seaway project was originally proposed by the Delft Hydraulics report in 1970, this project was the first permanent sand bypassing system of its kind on an open coast in the world.

The final decision for the investment in the seaway project was influenced by;

- The need to avoid breakthrough of the Nerang river at narrowneck
- The need to discharge sewage into the broadwater
- opportunities to improve the value of residential and resort developments on the broadwater by offering safe access to the open ocean
- The potential to develop South Stradbroke Island

## **Discussion**

The different objectives between the states, provides an explanation for the difference in motivation between them and its variation over time. For Qld, in addition to the interstate negotiation, there were also intrastate negotiations between the State Government and the Gold Coast City Council, which added further complexity and will be the subject of subsequent research.

The Qld objective of maintaining sand on Gold Coast beaches can be impacted by storm erosion, beach nourishment, coastal development and the volume of sand bypassing the Tweed training walls. The need to negotiate an agreement with NSW was most acute through to the mid 70s. With the more benign storm conditions from the mid 70s the level of public attention paid to managing severe erosion events on the southern Gold Coast fell. The major beach nourishment project of the mid 80s established a perception, at least among many politicians that the problem had been solved (Coomber & Nott, 1989). By the early 1990s these factors combined to decrease the motivation for Qld, to reach an agreement with NSW, to the lowest point since the extension of the training walls.

For NSW motivation to reach an agreement followed an inverse path to that of Qld. This can be explained by the alternate objective for NSW of maintaining the safety of navigation at the Tweed. Following the extension of the training walls public attention to the issues decreased as safety improved and as a result, motivation of NSW to reach an agreement was at its lowest during the period when Qld's motivation was highest.

By the mid 70's a bar had developed at the Tweed river entrance and navigation safety started to receive public attention again. A dredging campaign in the mid 70's was the result and public attention to the issue subsequently fell for some time. By the late 80s the issue was receiving more attention. In a committed move to find a unilateral solution NSW commissioned a two year study by the Public Works Department to find a second entrance to the Tweed. This study found a sand bypass of the current entrance to be the most viable option, so under increasing pressure and with a marginal seat in the balance the motivation of the NSW government to reach an interstate solution was at its highest point in the early 90s just when Qld's was at its lowest.

Motivation to reach an agreement differed between state governments and over time. The evidence for this is in the time taken to reach a solution and the allocation of

costs when an agreement was reached. The disproportionate allocation of costs to establish the TRESBP was said to be indicative of the motivations of each party in reaching an agreement by the mid 1990s with NSW paying 75% to Qld's 25%.

Clearly political, institutional dimensions comprise critical contingencies in reaching an interstate agreement on the TRESBP and these factors have been neglected in favor of narrative that over emphasises the scientific and technology aspects. If ignored social, cultural, political and institutional change processes will compromise the capacity of coastal management to address implications of global change.

### Take Home Messages

The dynamic nature of the social and political context is under emphasized within the literature on coastal management

Social, political and institutional change processes in addition to technology and knowledge acquisition are critical influences in the development of the coast.

The consideration of the social and political context in a dynamic manner is an increasingly critical challenge for coastal managers to maintain the relevance of their discipline.

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