Sustainability of reclaimed foreshore – case study: Southport Broadwater Parklands

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ABSTRACT

The sustainability of an upcoming reclamation project at Southport Parklands on the Gold Coast, Australia, was assessed. Southport Parklands has been under development for a long time, which led to irreversible damages to the coastal environment. Therefore, it is important to have a proactive design strategy for a sustainable development. In the present study, a numerical model has been established to simulate hydrodynamic processes. A better understanding of the physical processes advocated developers to adopt a proactive strategy for all new foreshore protection designing.

KEY WORDS: Estuarine environment; Foreshore management; Gold Coast; Hydrodynamic model; Reclamation; Sediment transport; Sustainability.

INTRODUCTION

Land reclamation has always been widely used for the development of coastal areas. Its impacts on the environment need to be considered. The purpose of this study was to assess the sustainability of the land reclamation to reshape coastal zones for human convenience. The new development to extend the foreshore at Southport Parklands, Gold Coast, within the Broadwater is shown in Figure 1. The Broadwater is a semi-enclosed estuarine which plays a significant role in the Gold Coast community life (Mirfenderesk, 2007). It has been continuously modified during the last 60 years to respond to the community aspirations. The earlier modifications have not always been conducted by a sustainable approach, and led the Southern part of the Broadwater to a dangerous situation (Burton, 2003; Mirfenderesk, 2007). The geomorphology of the Southern part of the Broadwater is directly influenced by its entrance on the Coral Sea by the Spit on its southern part and by South Stradbroke Island on the remaining part. The Southern part of the waterway, which encompasses the proposed reclamation site, is linked to the ocean through the Gold Coast Seaway and alimented in freshwater by the Nerang River and a few creeks (Mirfenderesk, 2007). The studied area is quite shallow (generally <6m), with a mean tidal range of 1.5m with a maximum of 2m. Water circulation is mainly driven by tidal inputs as their amplitude is significantly larger than the freshwater flows from the rivers, except during flood events (Burton, 2003; Mirfenderesk, 2007; McInnes, et al., 2000).

STUDY SITE

The Broadwater is a semi-enclosed water body separated from the Coral Sea by the Spit on its southern part and by South Stradbroke Island on the remaining part. The Southern part of the waterway, which encompasses the proposed reclamation site, is linked to the ocean through the Gold Coast Seaway and alimented in freshwater by the Nerang River and a few creeks (Mirfenderesk, 2007). The studied area is quite shallow (generally <6m), with a mean tidal range of 1.5m with a maximum of 2m. Water circulation is mainly driven by tidal inputs as their amplitude is significantly larger than the freshwater flows from the rivers, except during flood events (Burton, 2003; Mirfenderesk, 2007; McInnes, et al., 2000).