

Integrating science into governance and management of coastal areas at urban scale

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BACKGROUND

With burgeoning demand for coastal space and resources, and increased commitment to biodiversity protection, conflicts emerged. This is most pertinent in urban coastal centres. These centres are the foci of coastal development and often borders sensitive ecological areas such as estuaries, bays and bights, as is the case in Saldanha (Saldanha Bay, Langebaan Lagoon), Cape Town (Table Bay, Hout Bay, False Bay), Port Elizabeth (Algoa Bay), East London (Buffalo Estuary) and eThekweni (Durban Bight). Here strategic, integrated coastal spatial and development planning (CSDP) is no longer an option but a necessity.

Current legislation devolves many fine scale planning and management functions within coastal urban centres to local authorities, including land-use and urban and economic development planning. However, it is widely recognised that there is a severe implementation deficit in this sphere of government that stems from limited capacity to implement legislation and manage the coast, but also from deficiencies in the production, dissemination and application of appropriate science.

How then can science be integrated into strategic CSDP? We argue that two key elements are required:

1. Institutional structures to facilitate engagement and knowledge negotiation among scientists, managers and local knowledge holders
2. Scientific tools that are appropriately designed to support the knowledge negotiation process.

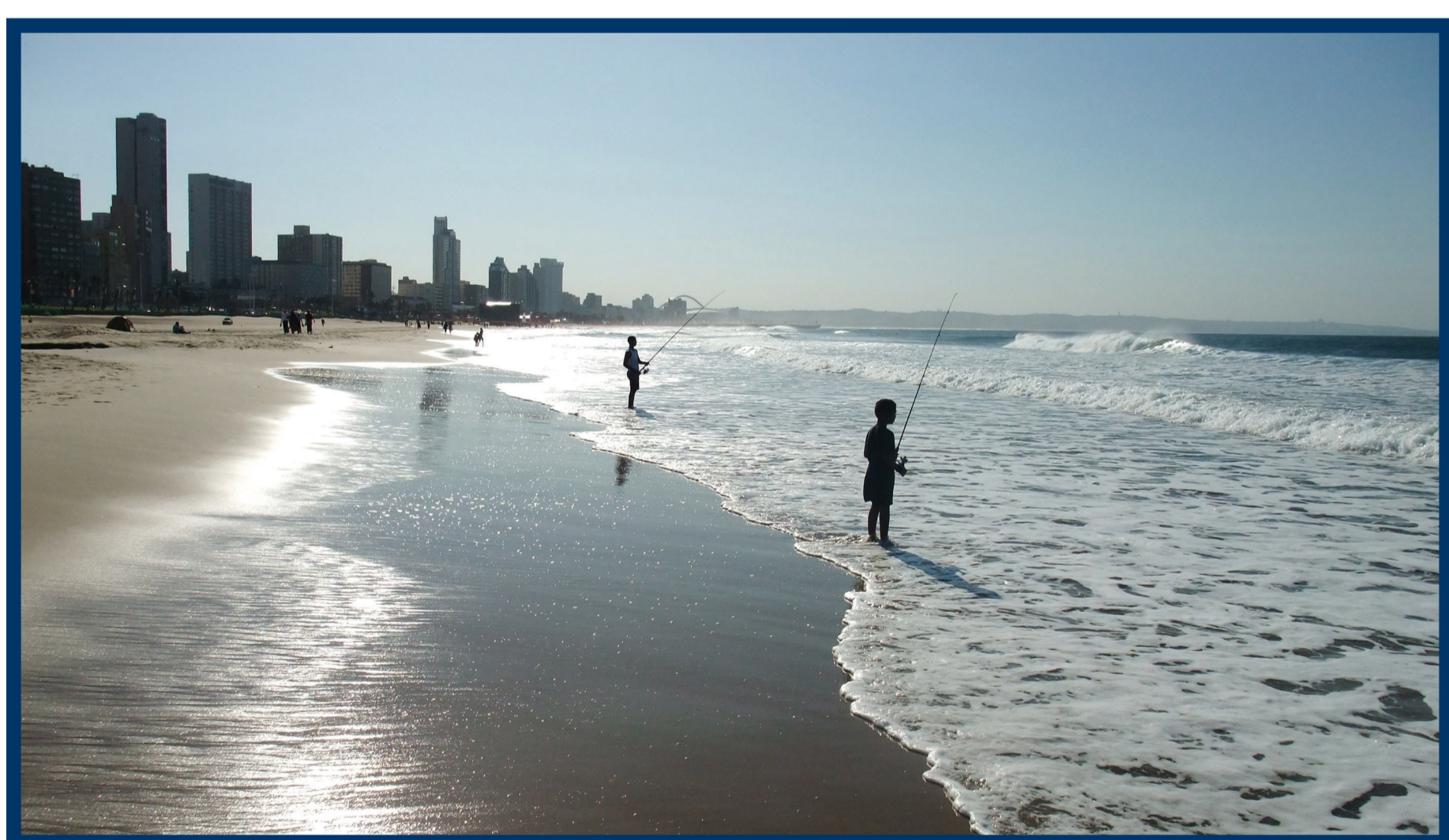


Figure 1: Coastal urban centres along South Africa's coastline

INSTITUTIONAL STRUCTURE TO FACILITATE A KNOWLEDGE NEGOTIATION PROCESS

In collaboration with social scientists from the University of KwaZulu-Natal, we are conducting research to explore the concept of knowledge negotiation within the eThekweni Municipality/Durban Port coastal space. The negotiation process will take place within an institutional mechanism that can be termed a 'competency group' – a team of multi-disciplinary actors, including researchers, civil society, the state, non-government organisations and the private sector, who will engage to produce 'science' for sustainable coastal management. The hypothesis is that this local knowledge production process will contribute to the goals of strategic CSDP by actively engaging with science to the point

where the knowledge is negotiated to address identified socio-ecological issues. This project aims to demonstrate an alternative institutional arrangement ('a new way of doing things') for negotiating and integrating science into coastal governance. If successful, this research could inform the reform of traditional local coastal governance institutions.



Figure 2: A recent workshop between scientists and municipal officials from eThekweni

INITIATING THE KNOWLEDGE NEGOTIATION PROCESS WITH MUNICIPAL OFFICIALS IN ETHEKWENI

One of the key research activities is the framing of the coastal issues that are at the heart of the project. The manner in which different groups of stakeholders – the project team (scientists) and key stakeholders (government official/managers) – observed their world and represented their perspective on a two-dimensional surface (the Golden Mile of Durban), was conspicuously different. This provides an inkling of the diversity of the expression of knowledge, and the need to explore ways in which to learn from each other in order to understand the problem and find mutually agreeable solutions for coastal issues.

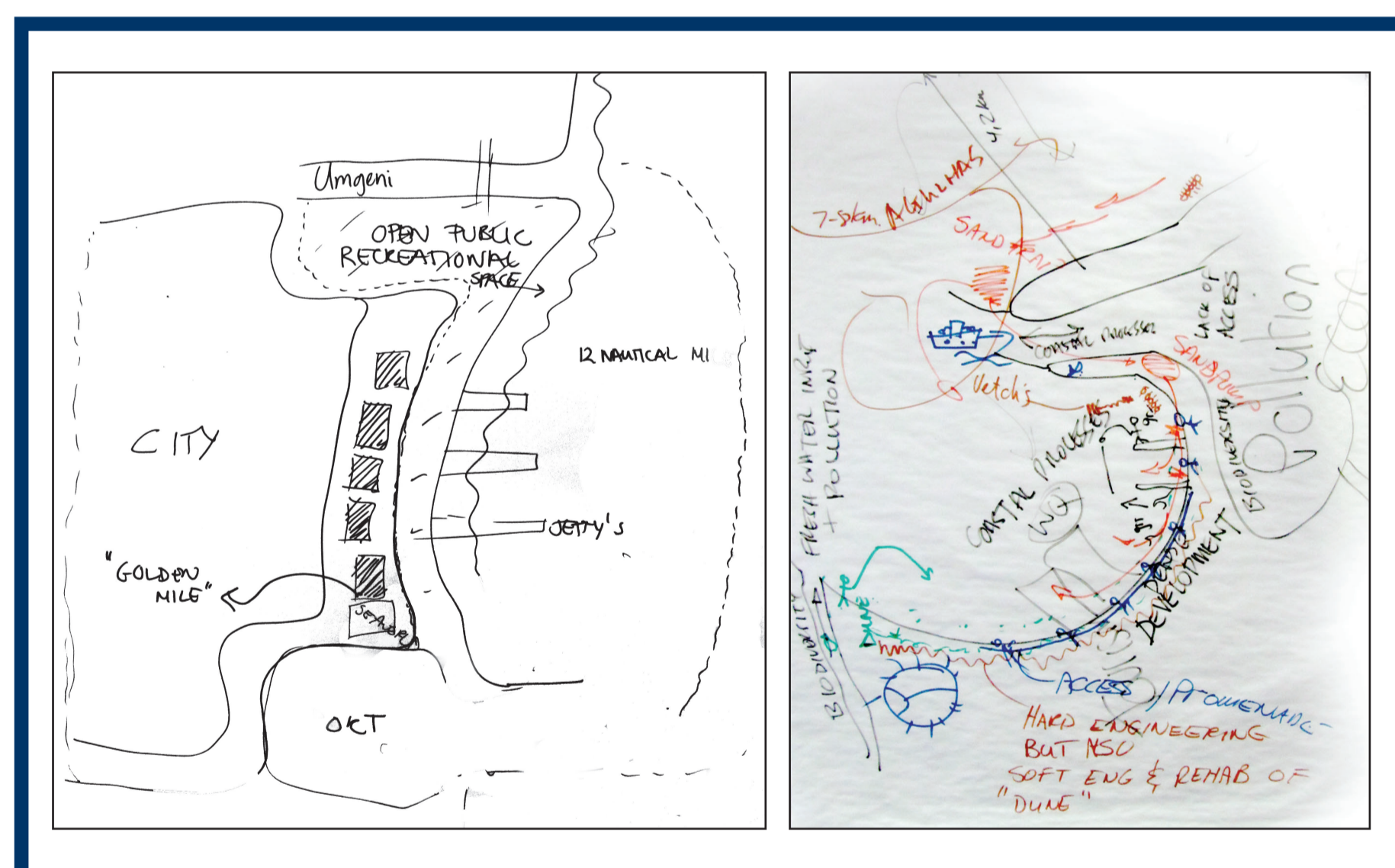


Figure 3: Different views of a similar space through the eyes of coastal scientists (left) and municipal managers (right)

SCIENTIFIC TOOLS TO SUPPORT THE KNOWLEDGE NEGOTIATION PROCESS

In the knowledge negotiation process, participants require means of capturing and consolidating their knowledge, which, for strategic CSDP, may include mapping tools, simulation models or statistical assessment methodologies. Here the CSIR is currently focusing their research on the application of numerical modelling technologies in combination with other spatial applications such as GIS (including open source programmes such as Google Earth). In the coastal space, 3D numerical modelling is regularly applied to investigate the potential impact of single activities or development at the environmental impact assessment (EIA) level. This research aims to explore the feasibility of applying these technologies at the strategic environmental assessment (SEA) level. Specific research questions to be addressed are:

- What constitutes 'appropriate reduction of complexity' in physical dynamic and biogeochemical numerical processes to resolve coastal biophysical process responses in strategic, multi-development coastal planning assessments?
- What are suitable methods of linking the physical/biogeochemical modelling output to ecological or socio-economic responses in order to evaluate feasibility of multi-development coastal planning scenarios suitable for strategic planning initiatives?

The interactions of multiple activities and development in the eThekweni/Durban port coastal space provide a real life case to develop and test the application of such tools. In this area, conflict among coastal uses is increasingly reaching the media – one being the loss of Blue Flag beaches as a result of coastal pollution introduced from various land-based activities. User-friendly scientific tools able to better quantify and predict the influence between complex coastal processes and multi-development scenarios can make a huge difference in decision-making processes. Such tools may even benefit certain operational management in urban coastal systems related to, for example, risk management and adaptation, and compliance management.

This project demonstrates 'a new way of doing things' for negotiating and integrating science into coastal governance. If successful, this research could inform the reform of traditional local coastal governance institutions.

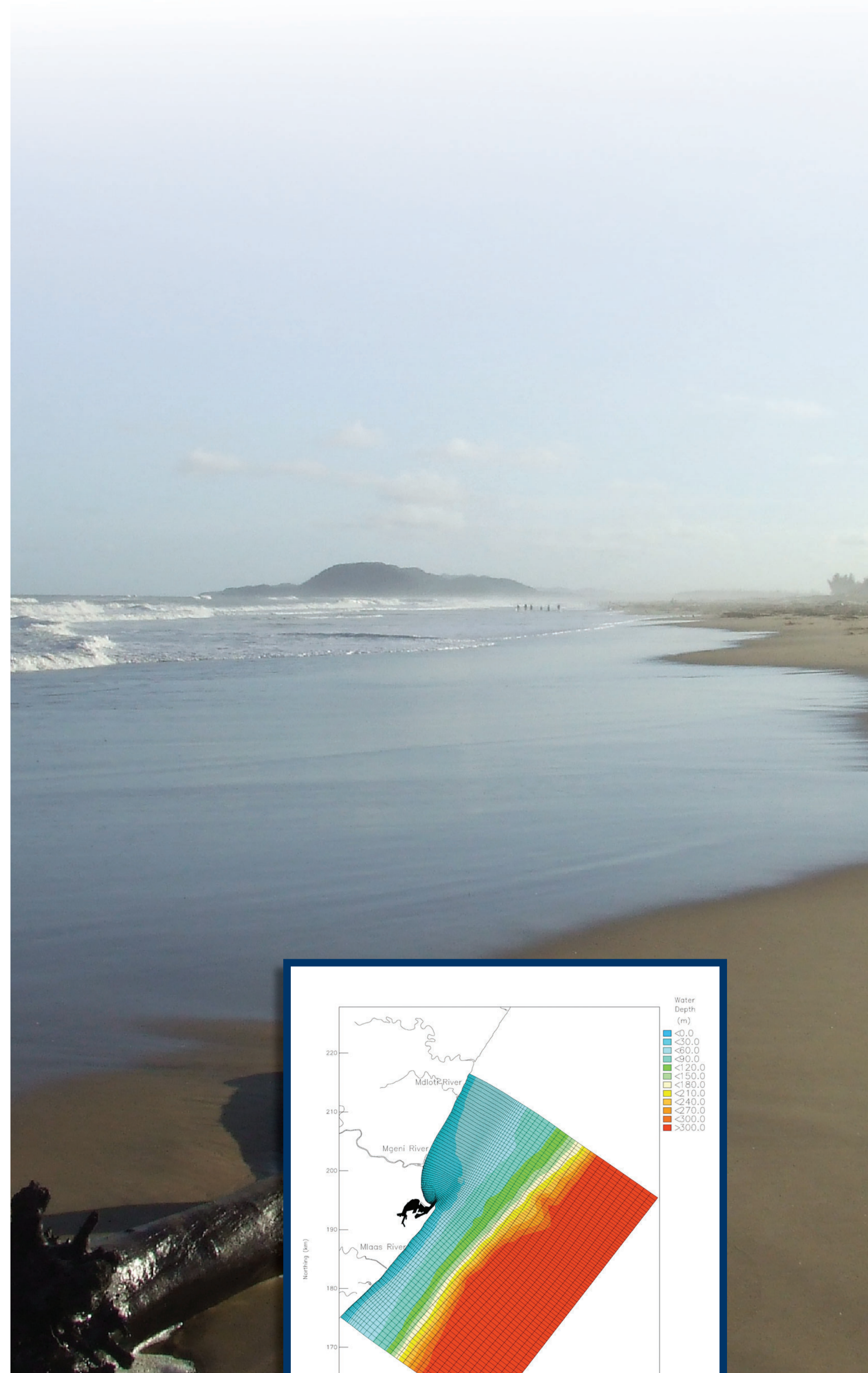


Figure 4: Model scale and set-up for eThekweni/Durban port case