

Preface

Models are formalized representations of reality. A clay model represents a car or a person without pretending to be it. A hydraulic scale model can simulate the flow around a harbor but it is not a harbor. Computer models of coastal morphology contain ideas about hydraulics, waves, sediment transport and sediment conservation that are captured in formulations. They produce interesting pictures and flashy animations of coastal behaviour but they cannot claim to represent reality in all its complexity. Rather, they quantify concepts we have in our heads and combine processes that are too difficult for us to combine just by reasoning. So far so good. The problem arises when the people who put the concepts into the model are different from the people who use the model. Then model concepts may be used out of context and results produced that are clearly wrong.

This guide to coastal morphodynamic modeling is meant to give coastal engineers and scientists an insight into some important processes in a relatively narrow strip of some kilometres from the coastline where most of the human activity takes place, where most of the sand transport and morphological changes occur and a large part of the transport of nutrients, pollutants and fine sediments are located.

This kind of understanding will help us to make quick assessments of important processes. It will make it easier to select a numerical model for a particular situation, and to assess whether the assumptions in it are acceptable. Finally, it will help us set up such models and to interpret and check the outcomes. Rather than being innocent victims of computer models we can master them and use them intelligently.

Dano Roelvink and Ad Reniers