

## Editorial

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Much has been made in recent times of the problems arising from global warming. However, not everyone agrees with the predicted future changes or even the primary causes of such changes. This is unfortunate for those trying to make up their own minds on the subject. However, we should not be surprised by such disagreement, even amongst those who have access to the large volume of information on the subject. Complex interactive systems with a wide range of spatial and temporal scales are not easy to understand and are even more difficult to model. Everyone is now familiar with the problems of weather forecasting and readily accepts that forecasts are less good as the timescale increases beyond a few days. Equally, modellers dealing with the prediction of complex unsteady flows understand that improved technical descriptions of turbulence and surface drag have been made but usually involve the introduction of more model 'constants' than simpler approaches. Such constants are rarely universal in value and can be difficult to refine since the refining data themselves are rarely extensive enough.

The problems of understanding and interaction also extend to engineering solutions. The UK Environment Agency suggests that five million people in England and Wales are likely to be at risk from flooding in the future. Yet when schemes to raise flood defences are suggested, there are often objections on the grounds of loss of visual amenity by people living in the affected areas. Use of coastal setback helps with the generation of salt-marsh and the creation of natural defences but removes material from other areas. Coastal wind farms and wave power generation devices help with global warming issues. However, wind turbines sited in coastal areas with large tides and influenced by strong inflows and outflows from nearby estuaries pose design problems over the lifetime of the project from lateral-moving flow channels, which current morphological computer models find difficult to resolve. Wave power devices extract 'free energy' but then reduce wave conditions at the coast with consequent effects on littoral movements of sediment and on people using both the beach and enjoying the thrills of surfing. Hardly surprising, then, that coastal communities who depend upon the income from surfers and tourists object to such schemes while promoters of such schemes find it difficult to satisfy objectors when predictions from environmental models are difficult to make over the long term. The recent hot spell and the follow-on effects from a number of dry years in the south-east of England has led to suggestions for new water pipelines to divert water from one part

of the country to another. However, suggestions to use natural estuaries as convenient 'pipelines' need careful study since changes in river flows can have serious consequences on estuarine and coastal navigation channels located many kilometres downstream.

Improved understanding of complex interactive systems and more comprehensive observation of the environment are the keys to better long-term designs and planning. The 'holistic' view of planning that has gradually emerged in more recent times needs to be understood and appreciated by all those with an interest in maritime matters. The papers produced in *Maritime Engineering* and journals like it should help with the improvement of understanding. Our companion journal, *Water Management*, has already produced a special issue on flood modelling (March 2006) and *Maritime Engineering* has plans for special issues on flood defence planning for the next 50 years in the Humber estuary, and on coastal management planning, both of which, it is hoped, will appear in 2007. The Institution of Civil Engineers' (ICE) Maritime Board is also helping with dissemination of new ideas. A highly successful one-day meeting on emerging technologies for monitoring the coastal zone was held in March 2006 as part of the Oceanology International Exhibition. The Engineering and Physical Sciences Research Council (EPSRC), in association with the ICE, is also helping: a well-attended meeting was held at the ICE in March 2006, which disseminated the latest research findings on wave impact pressures and the storm modelling of beach changes in the presence of near-shore breakwaters on the Norfolk coastline. Hopefully both the ICE and EPSRC will continue such initiatives for the future: *New Civil Engineer's* conference on coastal defence and shoreline management plans is scheduled for late September 2006 as is the ICE/ IAHR (the International Association of Hydraulic Engineering and Research) conference on renewable energy from the sea, while a call for papers has already been made for the ICE's international conference on coastal management, which will focus on the European Union's recommendations on integrated coastal management and the UK Government's Marine Bill, and will be held in Cardiff in October 2007. Information on future events is also contained in the briefing article about the Maritime Board in the present issue.

Finally, if readers have areas on which they wish to have more information, please let me and/or the editorial team know.