



## **Requirements for wave modelling at global, regional and local scales**

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Surface waves on the ocean are an important process, not only in their own right, in transmitting energy large distances across ocean basins and producing significant impacts at the coast, but also because they modulate other processes, such as the transmission of momentum to the ocean by wind. Although they can often be treated with linear theory, they also have important nonlinear interactions: wave-wave interactions, interaction with the sea-bed and with large and small-scale currents in the deep ocean, continental shelf and coastal scales.

Here we review the requirements for wave modelling at various scales, particularly relevant to this session on operational oceanography in the coastal zone. Unlike in some other models, where the processes may be locally generated, it is important to provide boundary conditions from global and regional models, as waves are generated at many scales. Thus, we require downscaling or nesting of models using various techniques. Here we discuss the necessary forcing fields and interactions at various resolutions, with illustrations from applications on the NW European continental shelf, the South China Sea and the Caribbean.