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Hydrodynamics of Singapore Strait

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The development of a hydrodynamic forecast system of Singapore Strait is presented. The system combines 3-D hydrodynamics and a set of pre- and post-processing tools to simulate tidal currents in coastal zones. Observations and characteristics of Singapore coastal hydrodynamics are discussed, with emphasis on tidal and monsoon phenomena as the major hydrodynamic driving forces of the Singapore Strait. The POM-based hydrodynamic model employs tidal-phase aligned boundaries to simulate local tidal phenomena. Harmonic prediction is used to forecast coastal dynamics accurately. Validation and statistic analyses of the model are presented for discussion on reliability and shortcomings of the approach.

The customized general purpose circulation model is integrated and controlled by Model INTEgrator (MINT) user environment. The Java-written interface is responsible for post- and pre- processing of model data and parameters. Data exchange and storage utilizes universal platform independent standards, like XML and netCDF. An internet-based hydrodynamic forecast system for Singapore Strait is freely available in a testing mode from PORL's web-site <http://www.porl.nus.edu.sg/> (Figure 1).

Keywords: Singapore Strait; hydrodynamic forecast; tidal boundary; harmonic prediction; Model INTEgrator; MINT; POM.

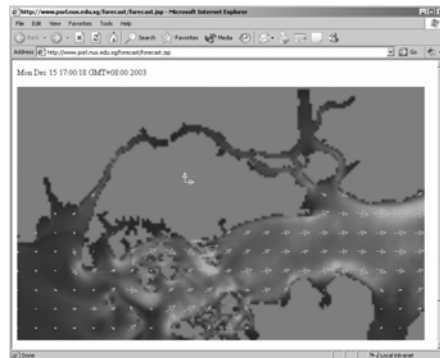


Figure 1. A sample of web-forecast, viewed via an internet browser.