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# Ocean modelling and Early-Warning System for the Gulf of Thailand

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Storm surges associated with severe tropical cyclones are among the most hazardous and damaging natural disasters to coastal areas. The Gulf of Thailand (GoT) has been periodically affected by typhoon induced storm surges in the past (e.g. storm Harriet in 1962, storm Gay in 1989 and storm Linda in 1997). Due to increased touristic / economic development and increased population density in the coastal zone, the combined effect and risk of high water level and increased rainfall / river discharge has dramatically increased and are expected to increase in future due to climate change effects.

This presentation describes the development and implementation of the first real-time operational storm surge, wave and wave setup forecasting system in the GoT, a joint applied research initiative by Deltares in The Netherlands and the Hydro and Agro Informatics Institute (HAII) in Thailand. The modelling part includes a new hydrodynamic model to simulate tides and storm surges and two wave models (regional and local). The hydrodynamic model is based on Delft3D Flexible Mesh, capable of simulating water levels and detailed flows. The regional and the recently-developed local wave model are based on the SWAN model, a third-generation wave model. The operational platform is based on Delft-FEWS software, which coordinates all the data inputs, the modelling tasks and the automatic forecast exports including overland inundation in the upper Gulf of Thailand.

The main objective of the Gulf of Thailand EWS is to provide daily accurate storm surge, wave and wave setup estimates automatically with various data exports possibilities to support this task. It adds a coastal component to HAII's existing practice of providing daily reports on fluvial flood forecasts, used for decision-support in issuing flood warnings for inland water systems in Thailand. Every day, three-day coastal forecasts are now produced based on the latest regional meteorological predictions. Examples are given to illustrate the system's development and main features, with a focus on decision-support products.