XBeach X was named to commemorate the tenth anniversary of the first presentation of the code at the 10th International Workshop on Wave Hindcasting and Forecasting and Coastal Hazard Symposium in Hawaii on 11 November 2007

XBEACHX - NEW ANNIVERSARY RELEASE OF THE DELTARES COASTAL IMPACT SOFTWARE

In 2017, Deltares, IHE Delft and TU Delft issued a new release of XBeach – XBeachX – which incorporates the latest physics and expands the software's application area. XBeach is an open-source, process-based, morphodynamic numerical model. This means that it is based on physical principles which govern the dynamics of water levels, waves, sediment transport and the erosion and accretion of beaches and dunes.

The XBeachX release was named to celebrate the 10th anniversary of the first presentation of the code at the 10th International Workshop on Wave Hindcasting and Forecasting and Coastal Hazard Symposium in Hawaii on 11 November 2007. After a successful three-day anniversary conference during the Delft Software Days, the XBeachX BETA release was shared with the community. The new release contains many new features based on ongoing research results funded via JIP, EU and market projects.

XBeach-surfbeat simulates the hydrodynamic processes of short wave transformation (refraction, shoaling and breaking), long wave (infragravity wave) transformation (generation, propagation and dissipation), wave-induced setup and unsteady currents, as well as overwash and inundation. The morphodynamic processes include bed load and suspended sediment transport, dune face avalanching, bed update and breaching. A more complete model is the non-hydrostatic model, which solves all processes including short wave motions, but with more computational demand.

In addition to sandy coasts, the model has been applied to coral fringing and atoll reefs in cooperation with, and with funding from, the University of Western Australia, the USGS and the Asian Development Bank. The model includes vegetative damping effects calculated with support from the U.S. Office of Naval Research.

'Beach-surfbeat simulates the hydrodynamic processes of short wave transformation'

The non-hydrostatic model was developed initially by TU Delft (as a prototype version of the SWASH model). For the purpose of simulating the morphodynamic processes on gravel beaches, the model was extended and validated with support from the
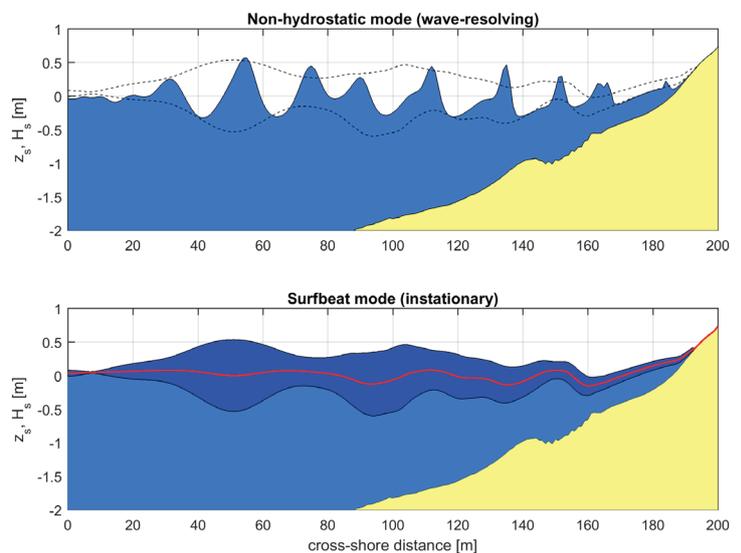
Comparison of wave-resolving (top panel) and surf-beat modes (bottom panel). Blue line: total wave motion; black dotted lines: envelope of the short waves; red lines: infragravity component.

University of Plymouth (XBeach-G). In this mode, ship-induced waves can be simulated as well, demonstrating the flight that the model has taken since its first inception.

To download XBeach, visit the XBeach website (www.xbeach.org). The XBeachX release, skillbed and release notes can be found at *http://oss.deltares.nl/web/xbeach/source-code-and-exe*. The documentation for XBeach is hosted on *http://xbeach.readthedocs.io.*

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Further reading:
Roelvink et al, (2017). *Improving predictions of swash dynamics in XBeach: The role of groupiness and incident-band runup. Coastal Engineering*