WAQUA - TRIWAQ

Water movement and water quality modelling

The system "WAQUA in SIMONA" is used for two- and three-dimensional hydrodynamic and water quality simulation of well-mixed estuaries, coastal seas and rivers. WAQUA in SIMONA contains the shallow water flow models WAQUA and TRIWAQ, which are intended to solve the shallow water equations in two (WAQUA) and three dimensions (TRIWAQ) in an accurate and fast way.

The hydrodynamical models WAQUA and TRIWAQ compute water levels, currents and particle transport in open water. Several modules are available for temperature modelling, transport of salinity and conservative constituents.

TRIWAQ is mostly used in modelling water systems with high vertical density gradients (3D circulations where fresh water meets the sea). TRIWAQ will generally approach the physical behaviour of a water system more accurately than WAQUA, but the model computations require more time.

WAQUA and TRIWAQ considers a study area that can be characterised by curviform shaped, quadrangular grid of computation points. Grid sizes vary from small (1 m) to large (16 km), making it possible to model a creek in detail, as well as the whole North Sea. The corresponding grid cells are attributed with linked information such as bathymetry and bed roughness.

Commissioned by Rijkswaterstaat, Svašek Hydraulics has developed several WAQUA and TRIWAQ models for the Dutch coast, estuaries and rivers. For the port of Rotterdam a fully operational system is built, predicting currents and water level for the coming 24 hours. Besides developing, Svašek Hydraulics has a large expertise on using WAQUA and TRIWAQ models in a decision-making process. With the use of specific in-house developed presentation techniques the WAQUA and TRIWAQ results can be presented in a visually clear manner.
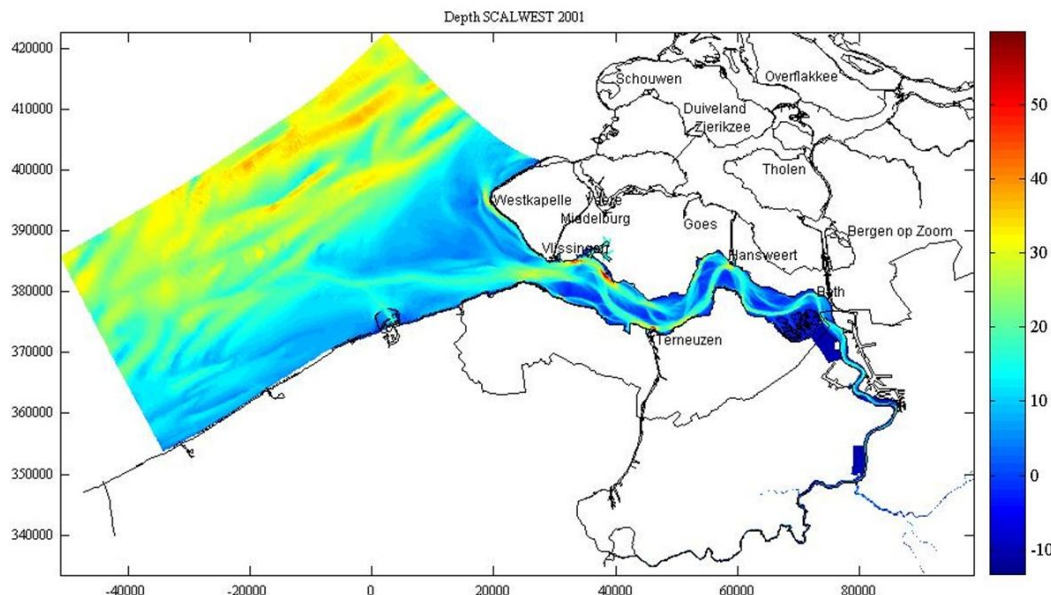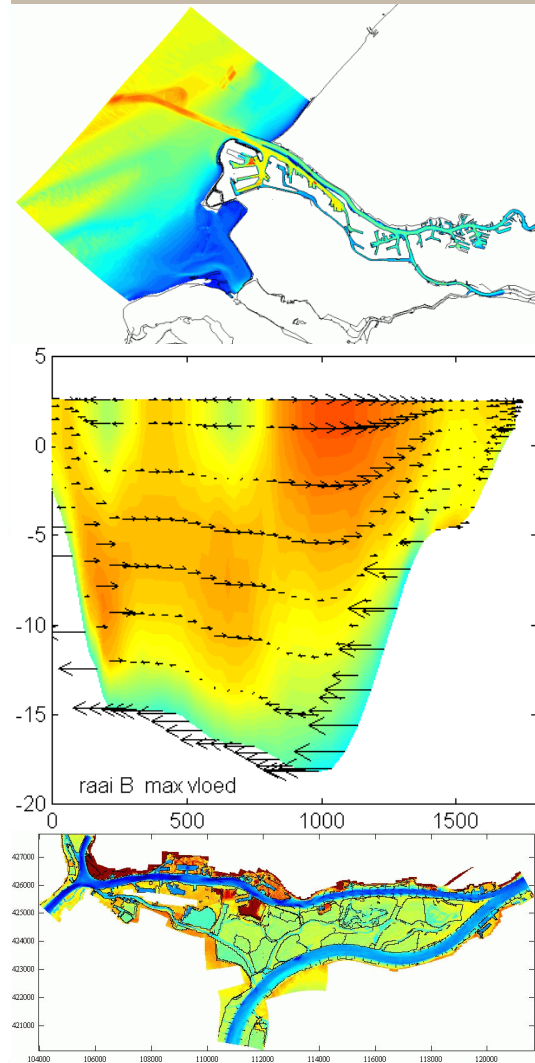
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