

Coastal & Estuarine Sediment Transport

The movement of sediments within the coastal and estuarine environment is a continuous process driven by the forces of nature, such as tidal, fluvial and wave driven currents. There is constant interaction with manmade infrastructure and human intervention activities, such as dredging. Through the advancement of data, and computational technology we are better placed now than ever before to predict and assess sediment transport behaviour. This will support the sustainable management of this ever-changing environment today and into the future.

The TUFLOW software suite has been developed and evolved over decades to meet these needs, seamlessly combining our extensively benchmarked, 3D-capable hydrodynamic models with industry-leading water quality, sediment transport and particle tracking capabilities.

Enable your team to tackle the most complex environmental problems with TUFLOW.

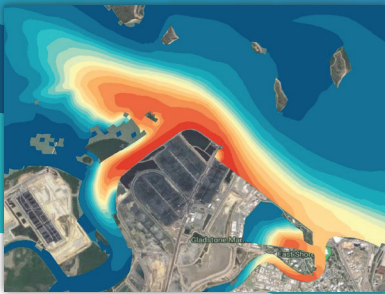
As researchers, scientists and engineers we work in a range of industries that solve complex environmental problems. Our assessments span scales from the molecular, to the global, from the instantaneous to the inter-decadal. Our projects require flexible, accurate, fast and powerful tools backed up by research, benchmarking and support.

Take your assessments further with TUFLOW sediment transport

TUFLOW Feature Focus

- Model multiple sediment fractions, including mixed cohesive and non-cohesive sediments such as sands silts, clays and muds all in the one model run.
- Optionally select from a range of common bed load, suspended load and total load models.
- Enable sediment transport due to currents and/or wave driven processes.
- Couple with 2D or 3D hydrodynamics with or without heat, salinity or sediment density coupling.
- Optionally enable dynamic bed morphology to reproduce scour or bed evolution.
- Rely on TUFLOW's high speed parallel processing and GPU compute capability.
- Multiple 3D and moving sediment boundary condition options.

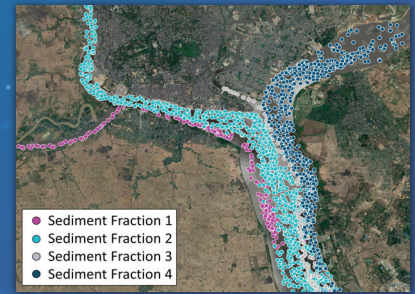
Suspended Sediment Plume



Dredge Plume Modelling



Sediment Source Analysis



TUFLOW's sediment transport module is a state-of-the-art multiple fraction, multi-bed-layer sediment transport and coupled hydrodynamic-morphological model. It has been used extensively for the simulation of sediment transport in creeks, rivers, estuaries, coastal and ocean environments allowing:

- Capital and operational dredging.
- Navigation.
- Port development.
- Morphological analysis, bed scour and deposition.
- Sand bar accretion and erosion.
- Contaminated sediments.
- Mine site rehabilitation.
- River/estuary morphodynamics.

The implementation of our sediment transport module provides a high level of control over sediment characteristics.

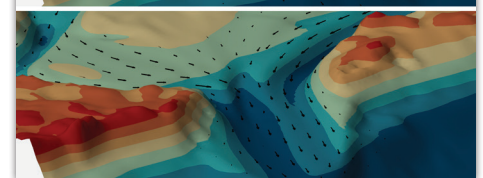
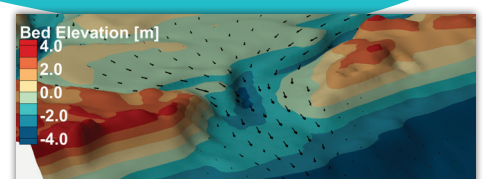
Sediment fraction groups can be assigned as cohesive or non-cohesive within a single simulation.

There is also the added flexibility of selecting a range of common sediment transport models/equations independently for each fraction.

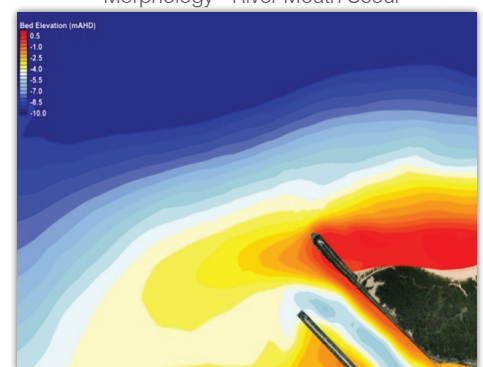
TUFLOW sediment transport capabilities have been extensively benchmarked and validated on projects worldwide, including successful application to dredging assessments within the highly regulated and environmentally sensitive Great Barrier Reef World Heritage Area.

Supported by the stability, speed and accuracy of TUFLOW's 3D capable flexible mesh hydrodynamic solver, TUFLOW provides the sediment transport model of choice for your project.

For more information:
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Morphology - River Mouth Scour



Morphology - Coastal Bar Accretion