Coastal Water Quality Analysis

The importance of sustainably managing the quality of our coastal aquatic environments is recognised within the United Nations' Sustainable Development Goals 6.3, 6.6 and 14.

Aquatic coastal environments around the world are subjected to numerous environmental pressures including waste disposal, trade, and recreation. All of these have the potential to adversely impact receiving aquatic environments.

Numerical modelling allows us to improve our understanding of the complex biogeochemical interrelationships to help us preserve and protect our natural and manmade aquatic resources.

The TUFLOW software suite has been developed and evolved over three decades, with coastal water quality modelling a core focus area. Our extensively benchmarked software offers industry-leading accuracy, computational speed, and functionalities to simulate the most challenging coastal water quality situations. Simulate interactions between biogeochemical variables including dissolved oxygen, carbon, nutrients (organic and inorganic), sediment, light temperature, phytoplankton, zooplankton, and geochemistry.

Enable your team to tackle the most complex coastal 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.

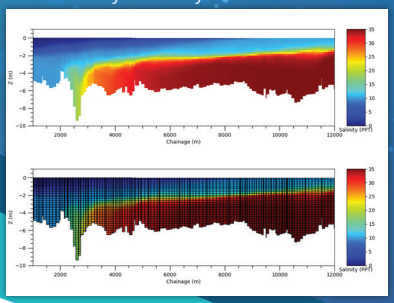
TUFLOW

Access world-leading water quality science via TUFLOW

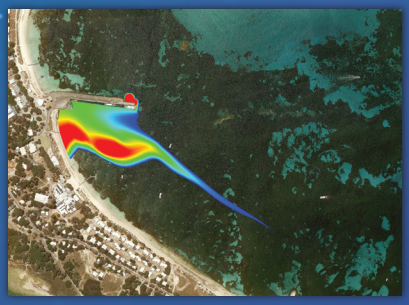
TUFLOW Feature Focus

- Advanced water quality algorithms and numerical models fully integrated with TUFLOW hydrodynamic solvers that draw on the compute power of GPUs and domain decomposition.
- Simulation of the impacts of ocean outfalls including dissolved oxygen sags from desalination plant discharges.
- Simulation of the potential impacts that aquaculture operations have on the marine environment.
- Selectable water quality modules to simulate interactions between biogeochemical variables including dissolved oxygen, carbon, nutrients (organic and inorganic), sediment, light temperature, phytoplankton, zooplankton, and geochemistry.
- Flexibility and freedom to customise for your own water quality modelling project. Add your own water quality modules using the equation sets of your choosing.
- Use free GIS plugins for immediate and interactive viewing of model results in 1D, 2D and 3D including curtain and other advanced plots.
- Access to research quality science through a tried and tested commercial interface.
- Supported by our expert TUFLOW support team who also develop the software and have many years' experience in real-world applications.

Salinity Density Stratification



Harbour Contaminant Plume



TUFLOW offers industry-leading coastal water quality modelling science that exploits the computational speed of GPU acceleration: never again wait days or weeks for your hydrodynamic simulations to finish before embarking on your water quality project. Applied with a 2D and/or 3D TUFLOW flexible mesh framework, TUFLOW WQ allows for simulation of interactions between biogeochemical variables in coastal situations, including:

- Coastal environments in their natural and perturbed states.
- The impacts of shipping and transport including capital and maintenance dredging, port construction and operation, and ship ballast release.
- Release of standard and boutique pollutants associated with ocean outfalls from desalination plants, wastewater treatment plants and other industrial discharges.
- Impacts on seagrasses and other higher trophic coastal environments.

TUFLOW is extensively benchmarked against theory, lab scale experiments and real-world data. Its superior accuracy has been established through numerous verification exercises for multiple nationally significant EIS studies within the world heritage Great Barrier Reef Marine Park World. TUFLOW has proved itself in this challenging regulatory environment, and as a result is the software of choice by many experienced modellers for coastal assessments.

TUFLOW is uniquely integrated with GIS and GUI software such as ArcGIS, QGIS and SMS. These complimentary GIS and GUI software are supported by program specific plugins and free Matlab and Python script toolboxes to optimise model build efficiency, result visualisation, analysis, and reporting efficiency.

For more information:
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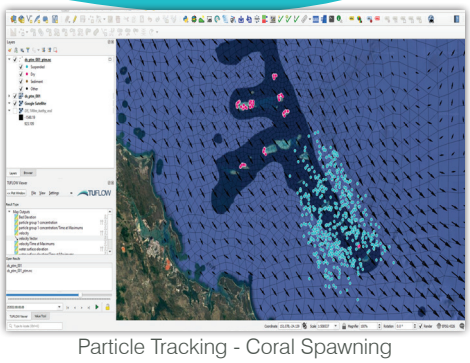
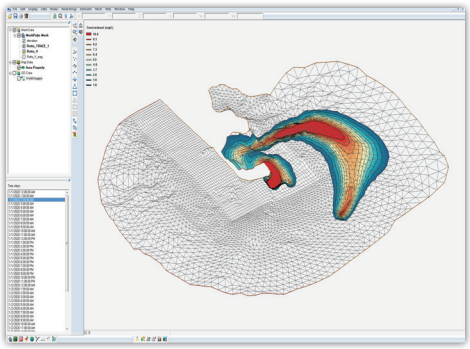
www.tuflow.com



Particle Tracking - Coral Spawning



Ballast Water Contaminant Plume

BMT TUFLOW