



# Storm Tide Inundation Modelling



Tropical cyclones, typhoons and hurricanes regularly impact our tropical and sub-tropical coasts. The hazard they present are threefold due to extreme winds coupled with life threatening inundation due to storm tide and coincident catchment flooding.

Storm tide driven elevated ocean levels and storm waves can inundate and impact property for hours and propagate inland over lowland areas and coastal estuaries for many kilometers, often decimating local communities. Through careful risk assessment, statistical analyses, forecast and warnings these risks can be reduced.

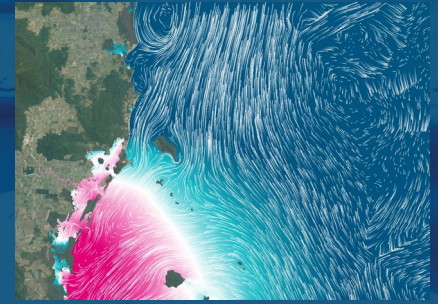
The TUFLOW software suite has been developed and evolved over three decades to excel in all aspects of storm tide risk assessment. Our engines are extensively benchmarked to analytical, theory, laboratory datasets and real-world historic events. They have been developed with three primary goals in mind: accuracy, simulation speed and workflow efficiency.

Enable your team to effectively tackle the most complex storm tide inundation problems with TUFLOW.

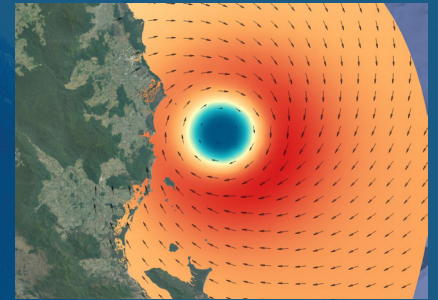
As researchers, scientists and engineers we work in a range of industries that solve complex environmental problems. Our assessments span scales from the molecular to global, from the instantaneous to the inter-decadal. Our projects require flexible, accurate, fast and powerful tools backed up by research,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



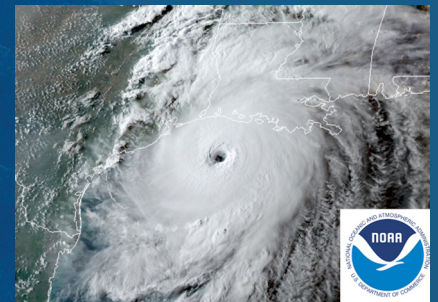
# Script TUFLOW for Monte Carlo Design Storm Tide Analysis



Water Level and Velocity

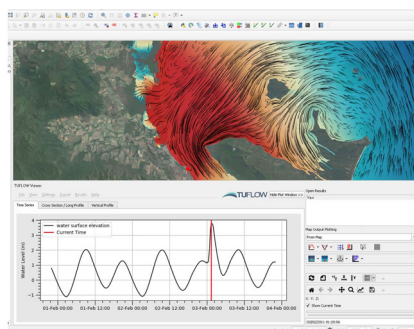


Tropical Cyclone Wind Field

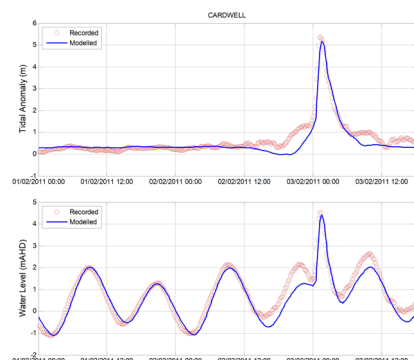


## TUFLOW Feature Focus

- Easily input spatially and temporally varying wind/pressure fields and parametric tropical cyclone tracks.
- Flexible mesh options enable you to efficiently represent coastal areas and overland without compromising on runtime.
- Compute at high speed with TUFLOW's heavily parallelised and GPU compute capabilities – perfect for Monte Carlo simulation.
- Rapid model setup and result visualization through GIS integration.
- Assess wave / surge interaction and wave setup with TUFLOW's one or two-way coupled wave model integration.
- Model confidently with robust wetting and drying and stability for overland flooding.
- Include ocean circulation model sea surface anomalies and currents through TUFLOW's advanced but easy to use boundary conditions.



Storm Tide Result Visualisation



Storm Tide Calibration

TUFLOW's hydraulic modelling engines offer industry-leading computational speed and numerical stability. Built within a flexible mesh framework, TUFLOW is especially well suited to storm tide inundation modelling in coastal regions and estuaries. TUFLOW is a world leader in this field:

- Accurate storm tide propagation modelling in the offshore and nearshore is achieved via the implementation of a 2nd order spatial schemes.
- The flexible mesh framework enables accurate high-resolution definition of complex geometries associated with the coastline and man-made infrastructure and structures.
- TUFLOW's speed facilitates high resolution street level resolution assessment and hazard mapping. It also enables efficient multiple event scenario analysis.

TUFLOW is uniquely integrated with GIS and GUI software such as ArcGIS, QGIS and SMS. Develop models and view results in your environment of choice. These complimentary GIS and GUI software are further supported by program specific plugins and free Matlab and Python script toolboxes to enhance model build efficiency, result visualisation, statistical analysis, and report production. Further to this TUFLOW's scriptable design allows the user compete execution flexibility. Model single events or multiple scenarios within a Monte Carlo framework with ease.

Develop accurate and meaningful hazard mapping outputs of inundation level, depth, velocity, velocity depth product, evacuation route inundation arrival time, inundation duration and hazard category using TUFLOW.

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