BMT

"Where will our knowledge take you?"

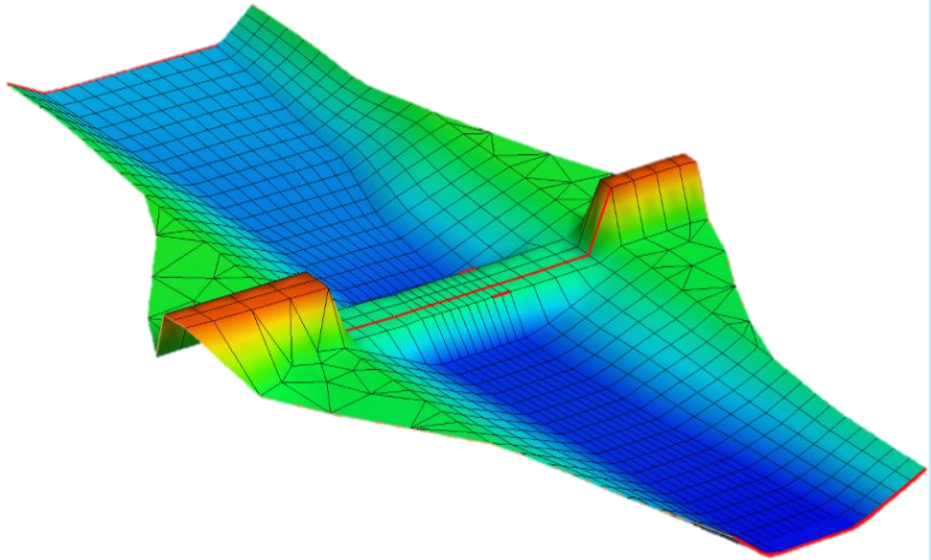
TUFLOW

TUFLOW FV – 2018 Release

A BIG year for TUFLOW FV…

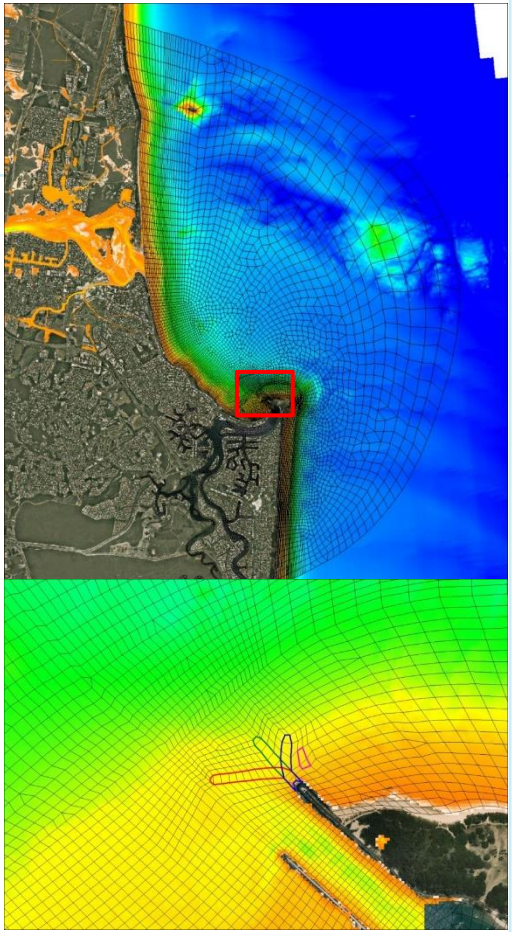
TUFLOW FV

- Overview
- 2018 Release – new features
- Supporting software update
- Future TUFLOW FV development



TUFLOW FV

- TUFLOW's flexible mesh 2D & 3D solver
- Finite Volume scheme
- Triangular and quadrilateral elements
- Adaptive time stepping
- CPU Parallelised (GPU in the future)
- 1st and 2nd order schemes available
- Text file setup – similar to TUFLOW Classic

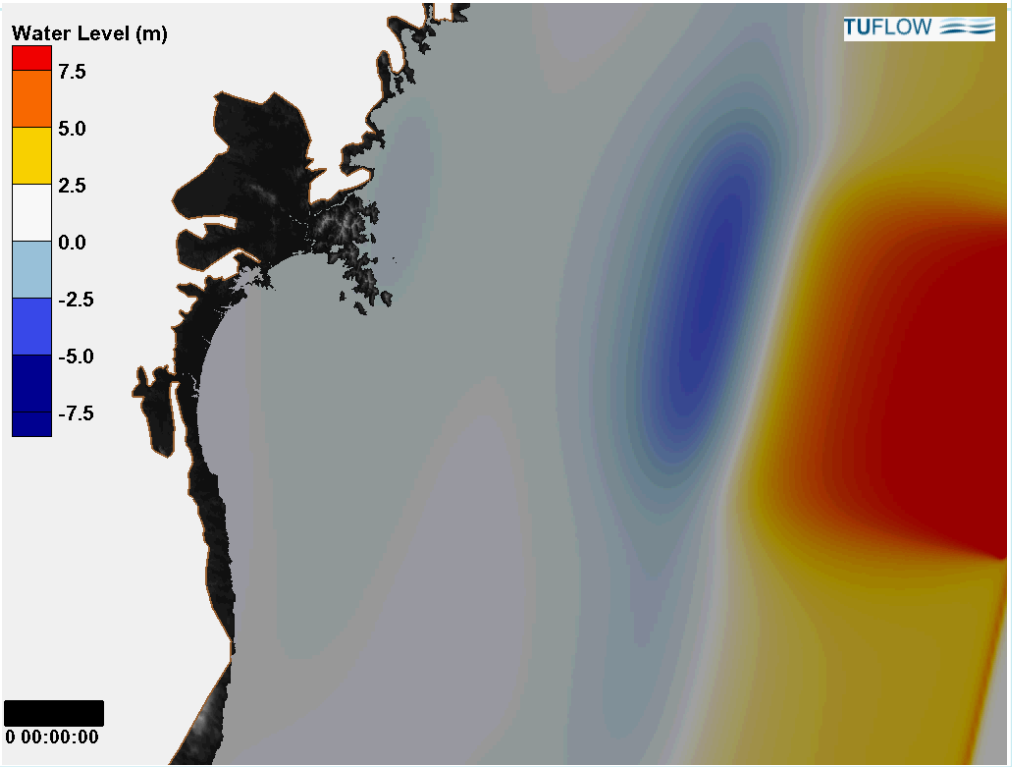


TUFLOW FV Modules

- Advection-Diffusion module
- 3D baroclinic module
- Integrated atmospheric heat module
- Water quality - AED2 NEW
- Sediment and morphology module* NEW
- Particle tracking* NEW

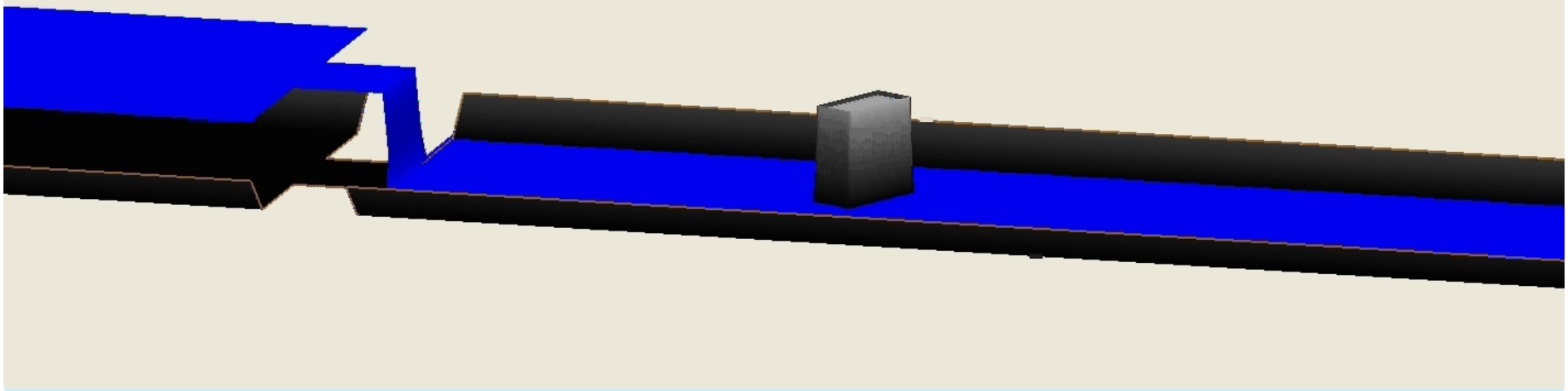
TUFLOW FV Applications

- Catchment flooding / dam break
- Storm tide assessment and tsunami
- Coastal sediment transport and dredging
- Ocean outfalls
- Receiving water quality – ocean, estuary, rivers

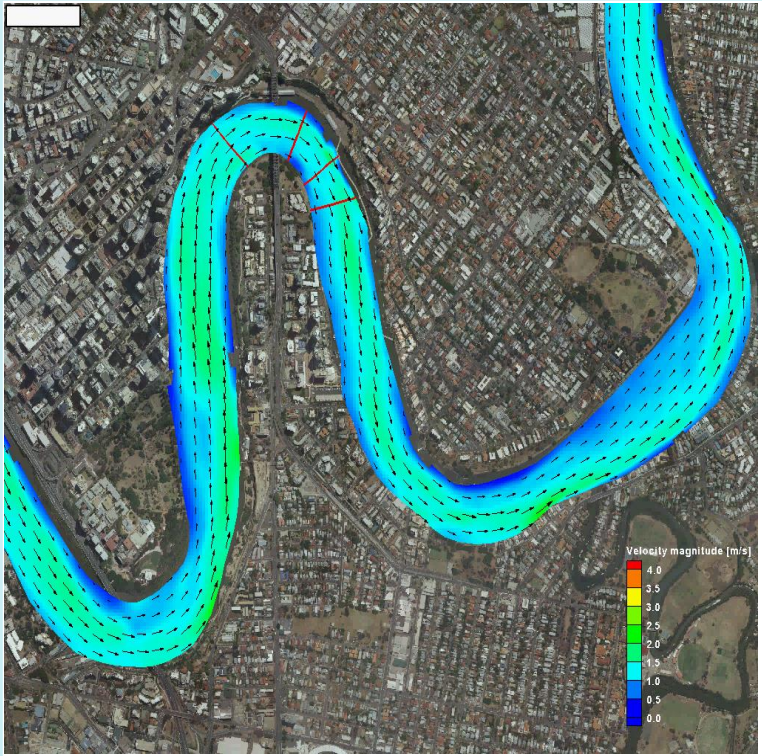


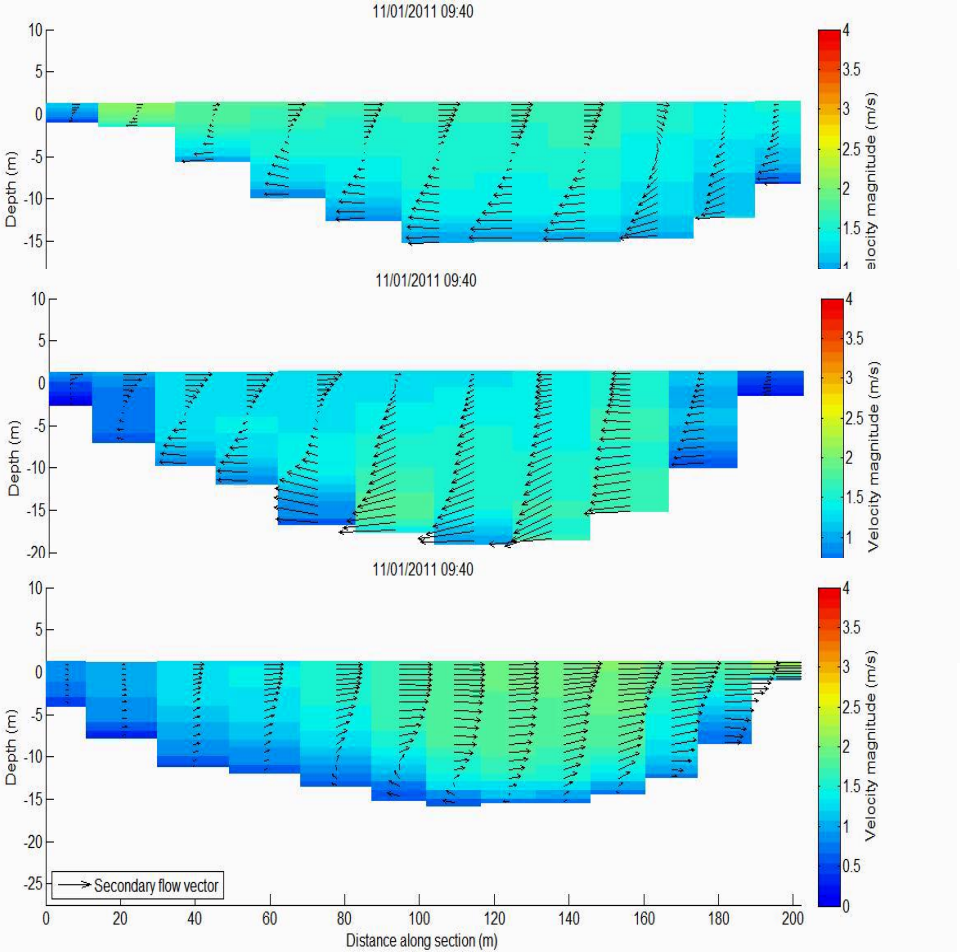
TUFLOW FV - Hydrodynamic Engine

- Shock capturing
- Wetting/drying
- Supercritical flows
- UK EA Benchmark Tested ✓ ✓



3D River Modelling Secondary Flows





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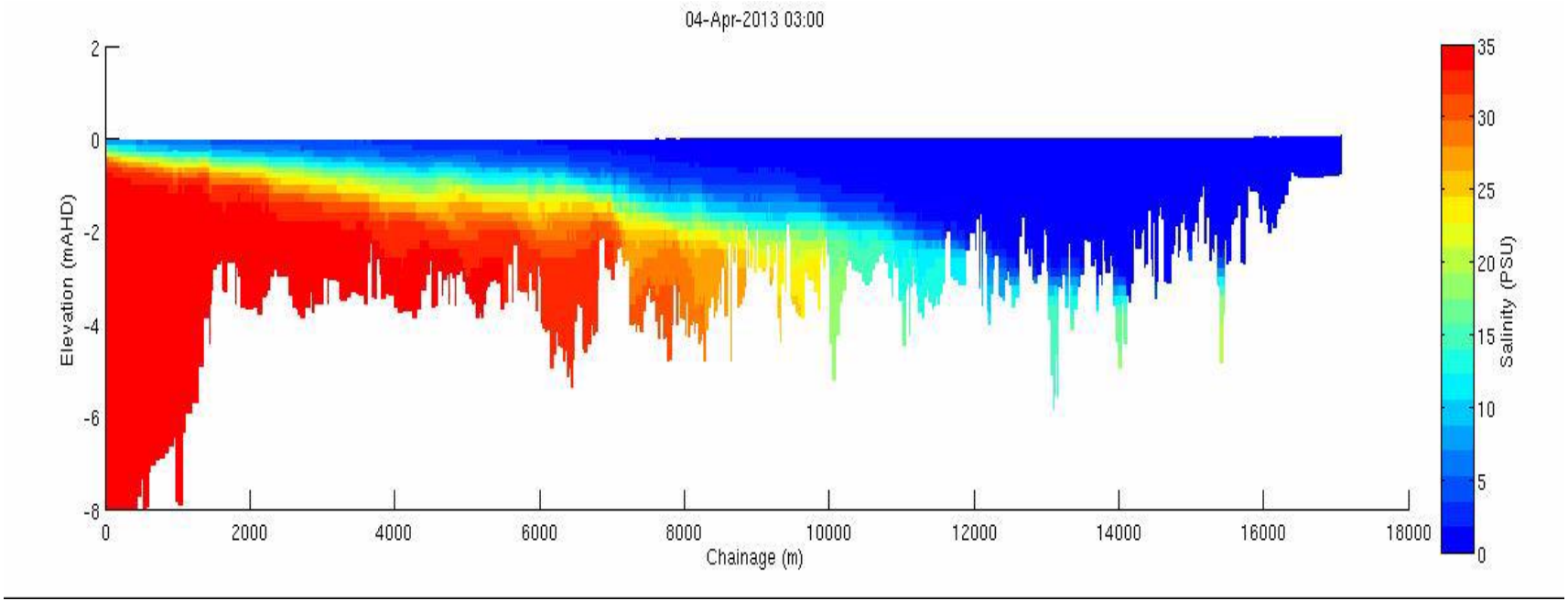
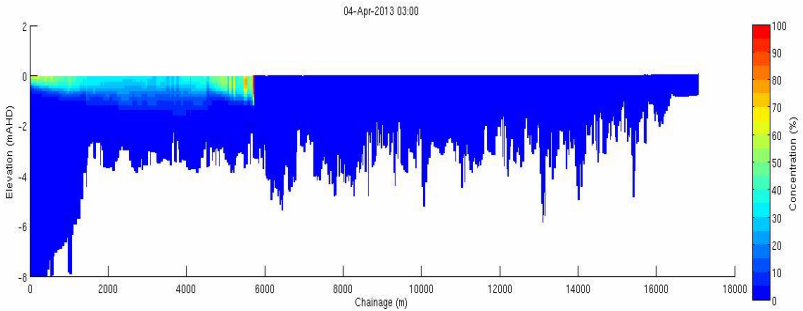
‘Salt Wedge’ Estuary - Salinity

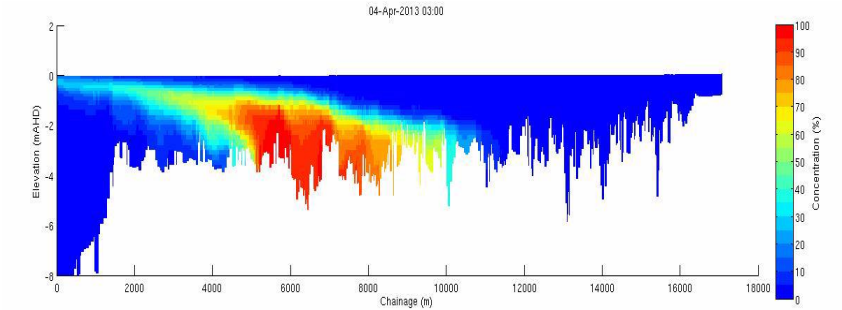


How a contaminant might behave in this system

Salt-wedge estuary:
Buoyant surface plume

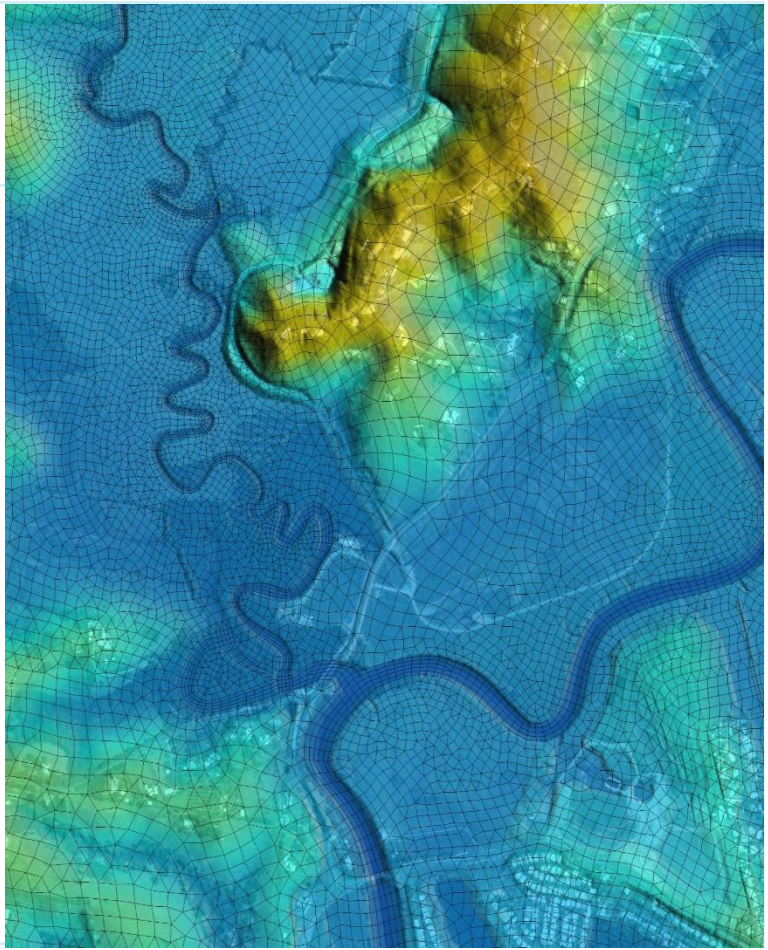


- Salt-wedge estuary:
Dense near-bed plume



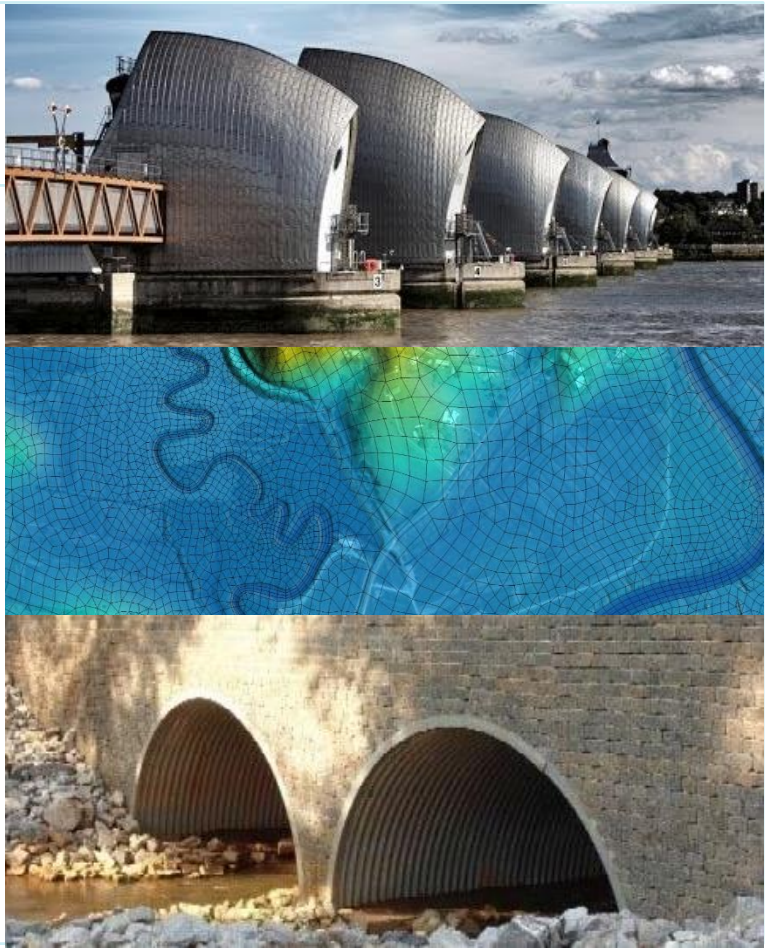
TUFLOW FV - 2018

- Release anticipated 2nd half 2018
- Linked with ESTRY
- GIS integration
- Integration with TUFLOW Classic (Solution Scheme == FV)
- ‘Classic-ifying’ TUFLOW FV



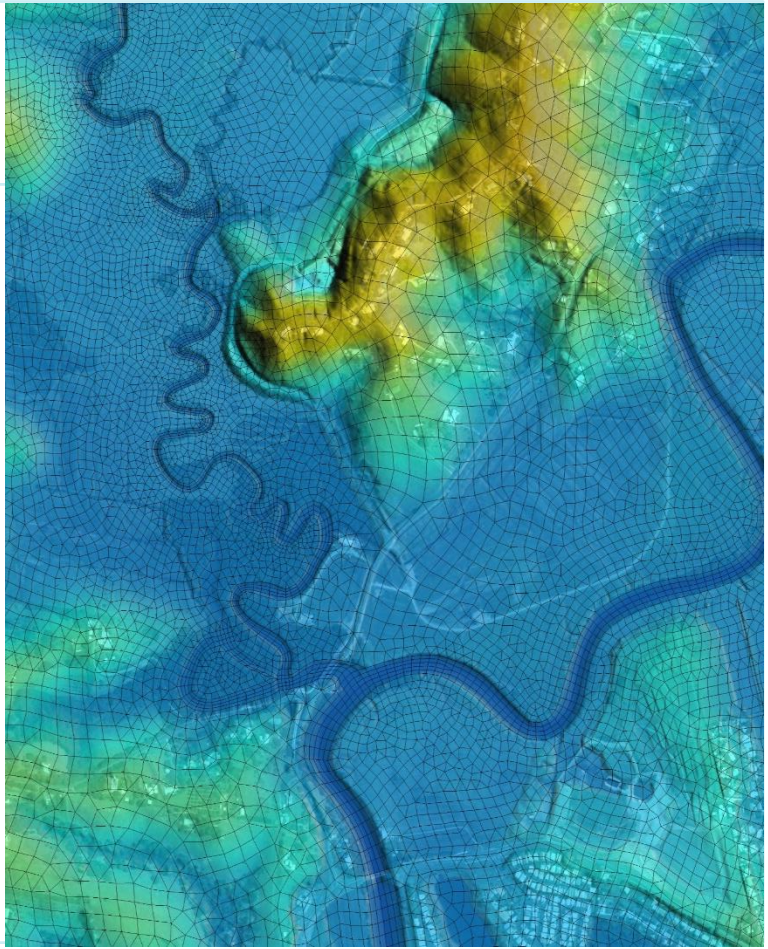
TUFLOW FV - Structures

- ESTRY (SX) Linking
- ESTRY pipe networks, culverts, gates, pumps, operational structures, bridges, spillways…
- Improved 2D routines, energy loss and control structures
- Culvert linking improvements



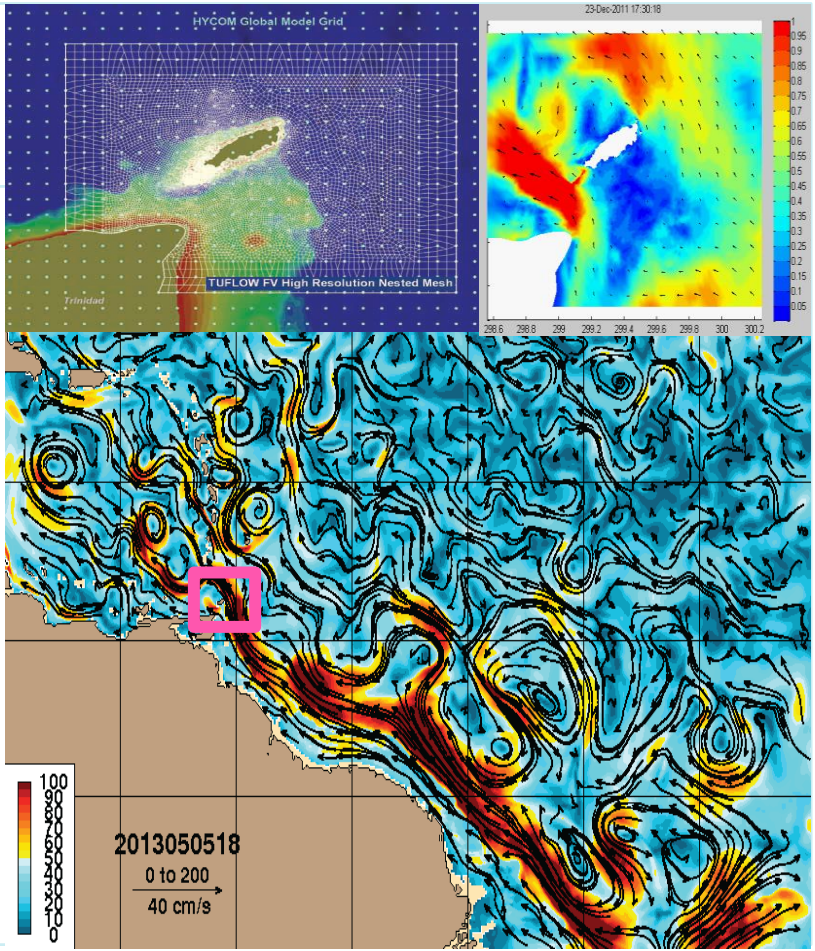
TUFLOW FV & GIS

- GIS integration – similar to that available within TUFLOW Classic
- A more independent mesh brings flexibility
- Traditionally materials and topography pre-assigned to mesh – NO LONGER ☺
- Layer ordering for building of complex topography, materials



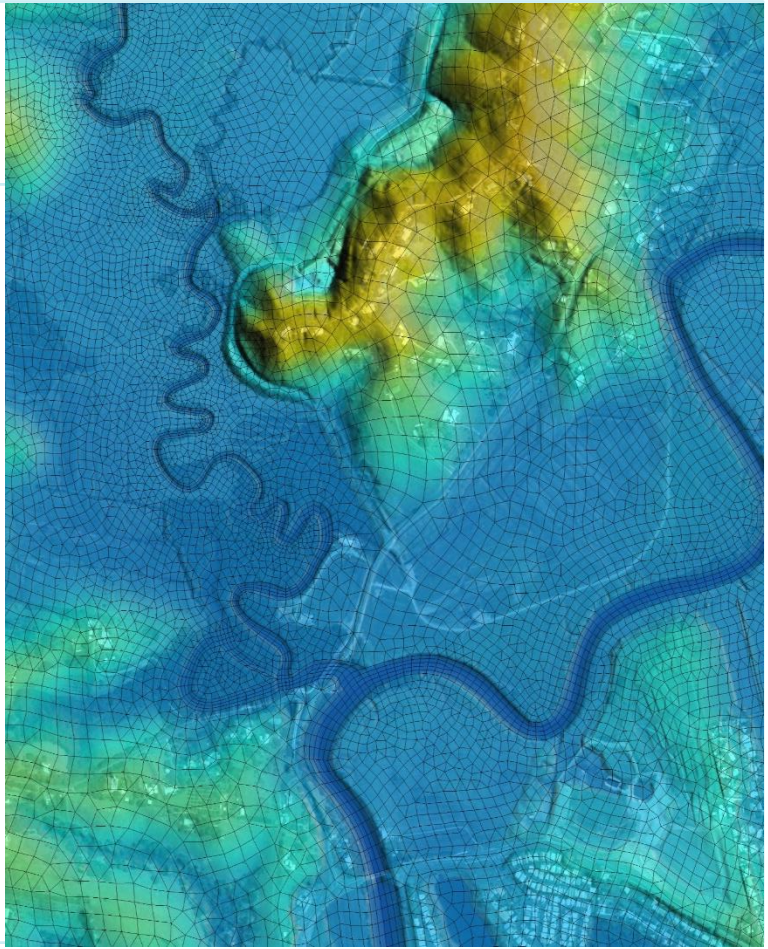
TUFLOW FV - 2018

- Improved open boundary and wave boundary conditions
- Nested ocean circulation modelling
- Temperature, salinity, currents and sea level anomalies as boundaries



TUFLOW FV - 2018

- New manuals
- Example models and extended tutorials
- Free Demo Version for small models
- Demo Version will include modules
- Provide a testing and learning environment for our user base

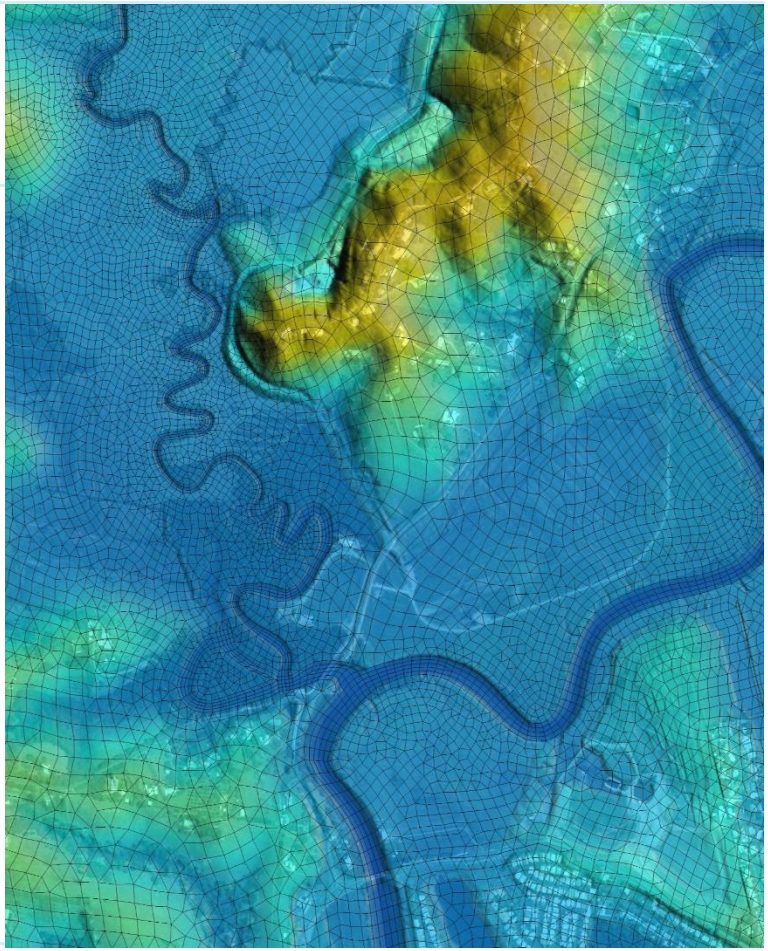


TUFLOW FV
3rd Party Software

- Aquaveo SMS

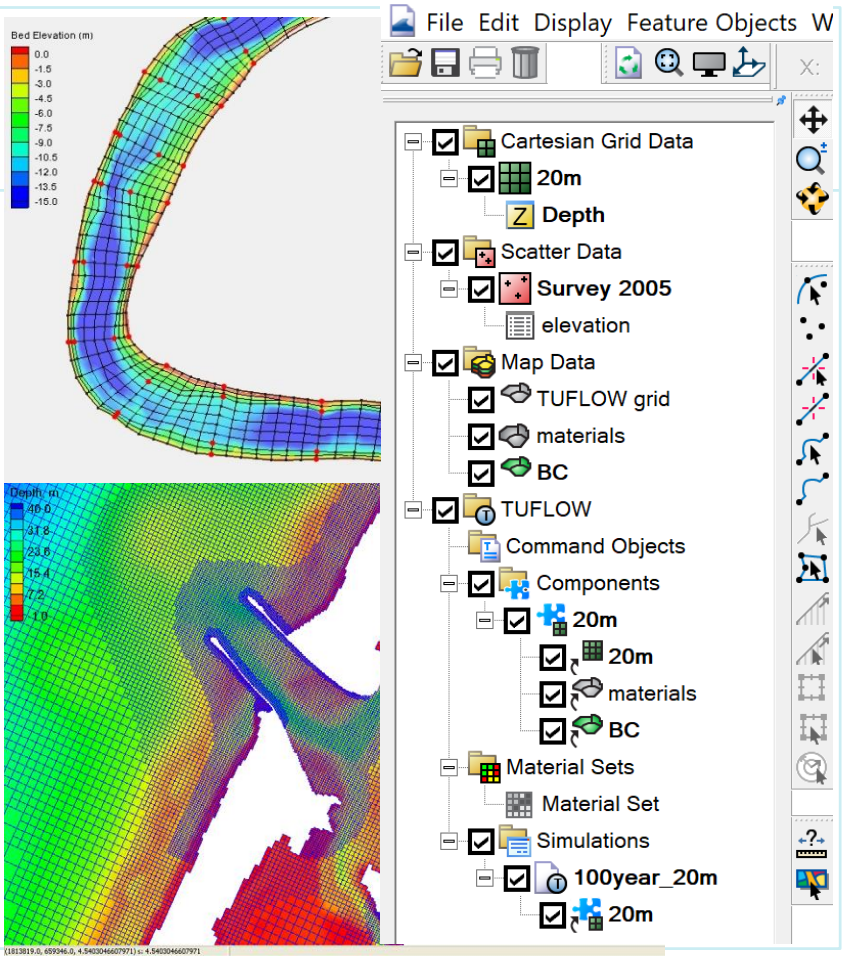
- Rising Water Software
  GIS-based mesh generator

- QGIS/Crayfish



Aquaveo SMS

- TUFLOW FV interface
- Mesh generator
- Data pre-processing
- Result viewing
- Post processing
- A powerful accompanying software to TUFLOW FV



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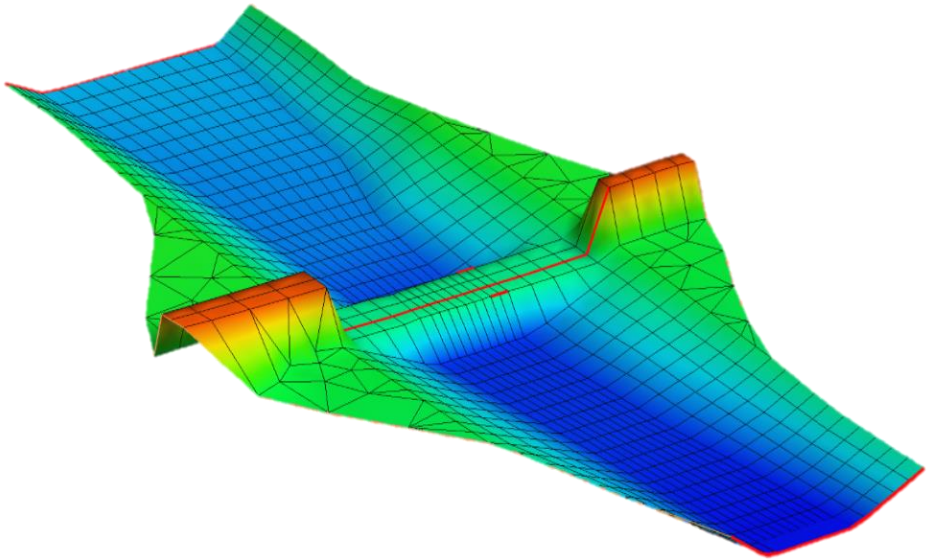
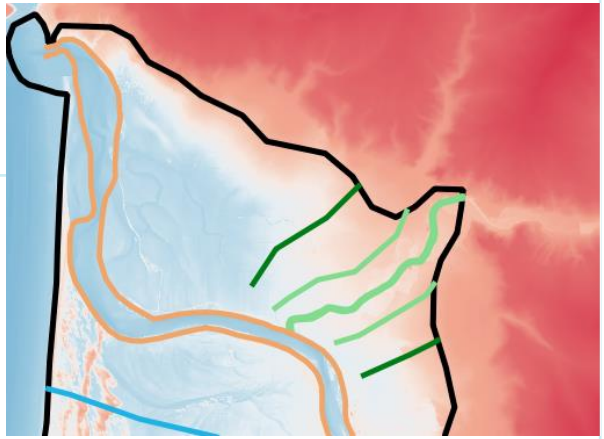
Aquaveo SMS – New Features

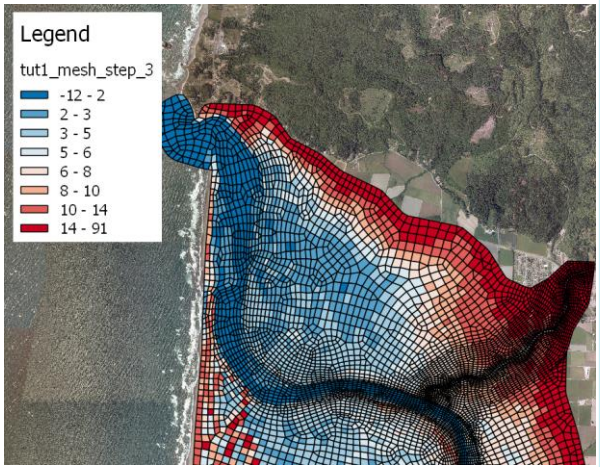
- TUFLOW HPC support
- New dataset tools
- Quadtree grid support
- Display improvements
- TUFLOW FV interface updates
  - Mesh building and Dynamic Model Interface



Rising Water Software
GIS Mesh Generator

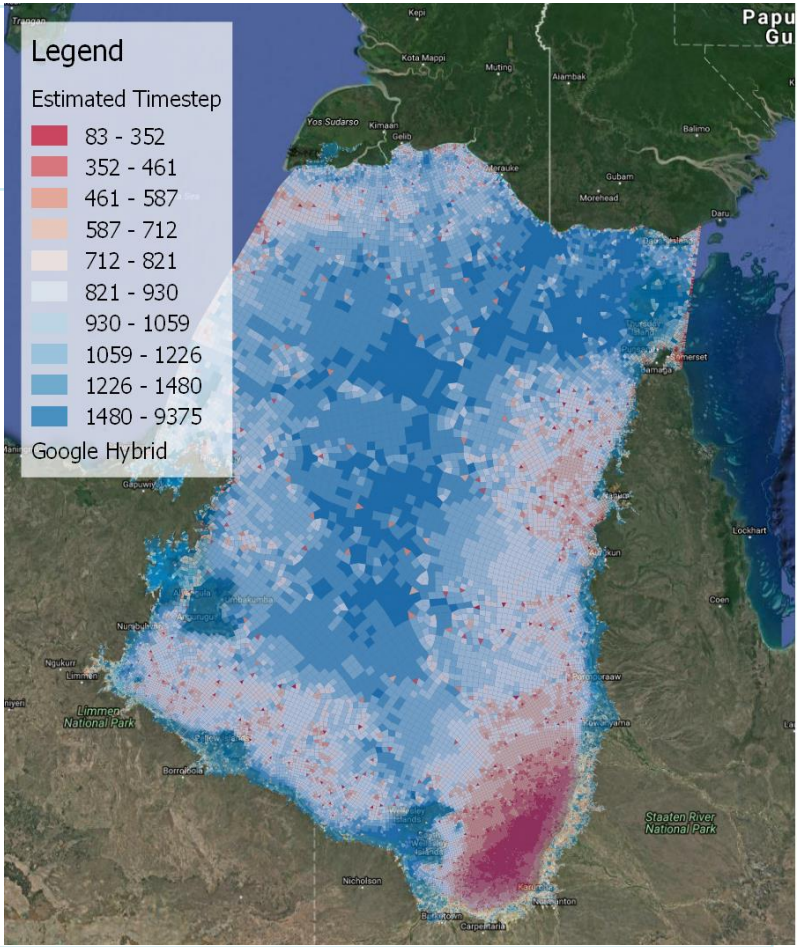
- Now do all your work in GIS!
- GIS package independent
- GIS files read into Mesh Control File
- Assign target mesh sizes
- Break lines to control mesh shape
- Combination of quad/triangle
- Example models and manual





Rising Water Software
GIS Mesh Generator

- Materials specified via GIS polygons
- Direct assignment of elevation from rasters to nodes and elements
- Nodestrings from polylines
- Export meshes to 2dm and/or GIS
- Out Mid-2018
- Currently looking for beta testers



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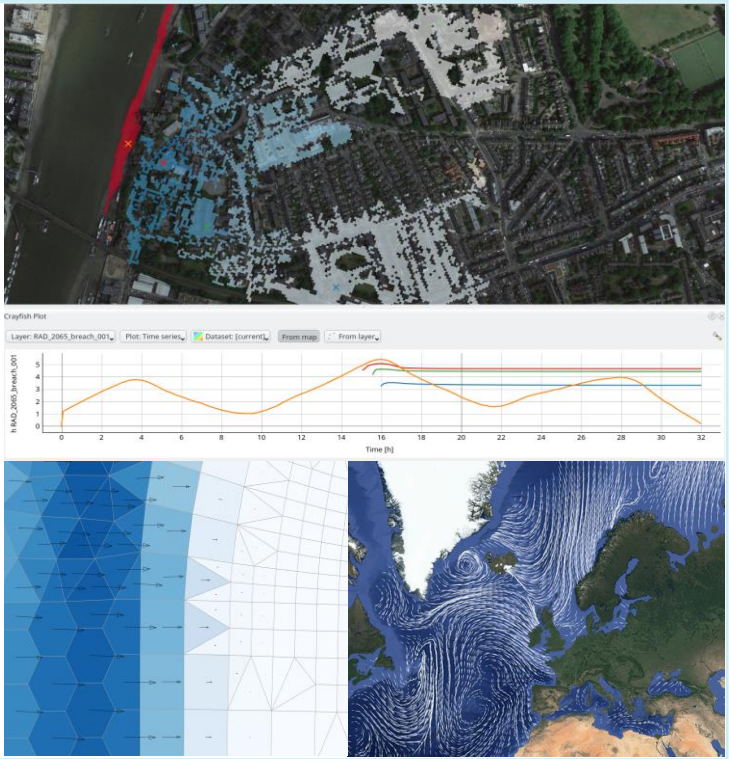
QGIS Crayfish Plugin by Lutra Consulting

- Can be used to view TUFLOW FV results in same manner as Classic
- More on Crayfish this afternoon



Future TUFLOW FV Development

- **Continuously improve the workflow between user and model**
- **New research and Modules**
- Ice Cover (Heat Module), Oil Spill, Drill Cut, Ship Navigation, Particle Tracking
- **Improved riverine and overland sediment transport**
- **GPU and domain decomposition**