What's Happening...

waterRIDE™

Some recent project work has highlighted subtle differences between hydraulic modelling engines in the realm of "2D modelling".

In this issue, we take a look at some of the different ways of managing "coupled 1D/2D" models, which is the most common approach to 2D modelling we encounter.

Working With Coupled 1D/2D Model Results – Composite Files vs Merged Files

Commonly, 2D models are not "fully 2D" in that they combine a 1D channel network with a 2D floodplain network.

Referred to as "coupled 1D/2D models", the 1D and 2D portions are linked dynamically during solving.

Model outputs are usually either separate files for the 1D and 2D components, or may be processed datasets amalgamating the two on a common spatial framework.

When interrogating results, both the 1D and 2D portions should be combined in some way.
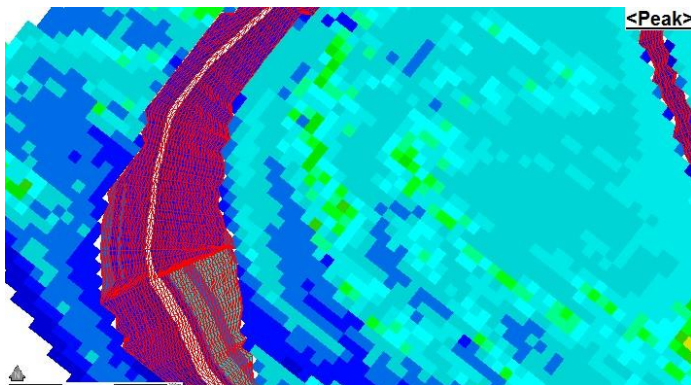
1D Channel (triangulated) with 2D floodplain - Terrain

In some circumstances, for visualisation and interrogation, it is often preferred to leave the 1D and 2D portions as separate result sets, but combine them virtually using a *composite* file (*.wrc).
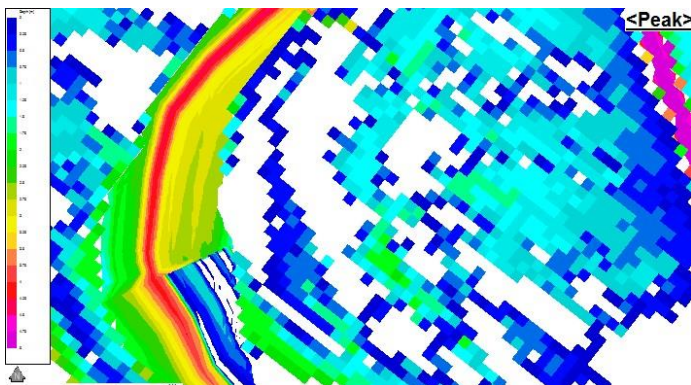
Visualisation of 1D-2D Model Results – Composite File

Composite files support mixed framework result types (eg TINned 1D with gridded 2D).

The end user will "see" the composite files as if they were a single results set, despite them actually being two (or more).

This approach allows the results to be interrogated "as modelled", including highlighting to the end user the way the model was established and may help explain any inconsistencies such as at the interface between the 1D and 2D networks.

It also ensures consistency when calculating "depth-derived" information such as flow hydrographs.

However, not all processing is available to composite files (such as stretching, creating flood planning surfaces and cleaning).

In these cases, the separate model outputs should be merged/mapped onto a common framework.

Usually, this framework is the 2D model network itself or, if the modelling is coarse, a fine scale Digital Elevation Model which will also enhance surface resolution.
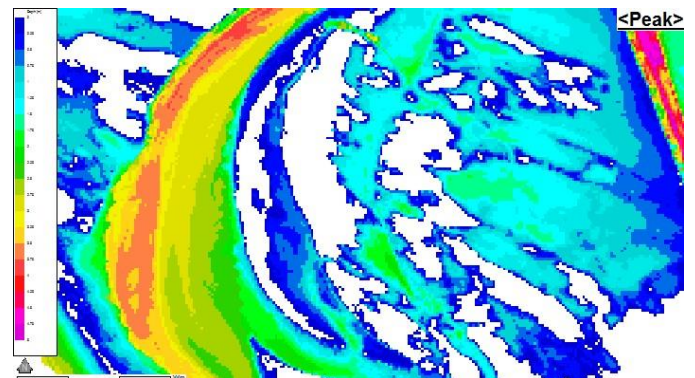
Visualisation of 1D-2D Model Results – Mapped/Combined

Whilst subtle, it is important to understand that different models are developed in different ways and accessing results "as modelled" may be preferable to a merged dataset.

However, in other circumstances, the end user may not be interested in the "detail" of the model, and it may avoid confusion to provide a merged dataset.

Quick Tip: F4

Have you ever wondered where the layer you are looking at resides on your network/disk?

Pressing F4 will provide a list of layers used in the current project, including the full path to each layer.