Advisian
WorleyParsons Group

waterRIDE
What's Happening Newsletter
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A common discussion point amongst many of our users is the management of disparate flood modelling datasets available across their jurisdiction.

In this issue, we take a brief look at the mapping approach to help "standardise" modelling for use in generating planning layers, automating flood certificates, and broad development assessment.

Managing Disparate Flooding Datasets

The effort required to produce quality flood modelling, combined with finite limits on model size and budgets has led to a rather piecemeal approach to flood modelling.

Larger, main streams are often given higher priority and therefore studied earlier, followed by establishing models for tributaries and overland flow paths.

Combined with advancement in modelling capabaility, this often means that within any given "Council Area", there are varying:

- Types of model (1D, 2D, coupled – often spanning decades)
- Model resolution/detail
- Modelling approaches (classic vs "rain on grid")
- Mainstream/tributary/storm surge studies that overlap

The above presents a challenge when attempting to consistently manage information flow to the general community.

If the available modelling datasets are hydraulically sound, then a consistent set of "flood mapping" can be established without the need for time-consuming remodelling.

Mapping (or draping) the results onto a common Digital Elevation Model (DEM) standardises all results to the same resolution or detail.

For example, a 2m LiDAR based DEM could be used as the base onto which a range of detailed 2D, coarse 2D and 1D model results could be overlaid.

The result of this approach is that the detail in any depth-based hydraulic parameter will be enhanced (depth, velocity x depth, hazard, flood extent etc).

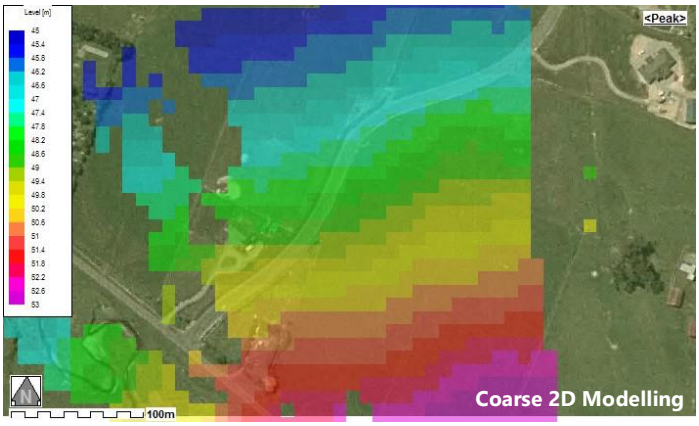
However, when mapping results, it is important to understand that although the results appear more detailed, the underlying hydraulics *have not changed*.

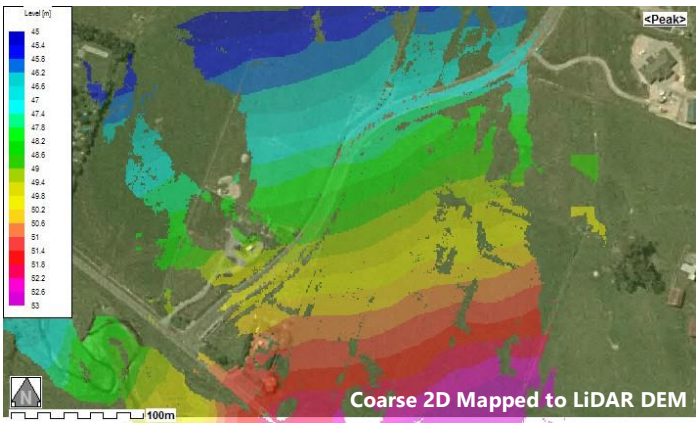
For example, although a 10m 2D grid model may appear to show flow "squeezing" between urban dwellings when draped onto a 2m DEM, the hydraulics of the original 10m model would not be sufficiently detailed to accurately simulate such flow.

Conversely, in backwater areas or on large floodplains, the detailed mapped output will accurately represent flood behaviour, perhaps even more accurately than at the native flood model resolution.

Where model results overlap, "envelope mapping" is an excellent approach to preparing consistent surfaces.

Discussed in a recent newsletter, this approach can be used to determine maximum envelopes of flood risk parameters which may relate to different models (eg storm surge may produce the maximum inundation but the maximum hazard (combination of depth, velocity and VxD) may come from riverine flooding).





When mapping results, there are a number of techniques to enhance the quality of the output surfaces, including:

- Dynamic TINning of gridded results
- 1D average velocity distribution
- Clipping/transitioning "waterfall" overlap areas
- Stretching the mapped surface(s) to the extents of the LiDAR DEM

All of the tools used and approaches mentioned above are available on the Utilities menu.