Validating ANUGA for Riverine Flood Modelling

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ANUGA was released to the public in December 2006, as a model capable of predicting the behaviour of a tsunami striking the coastline and interacting with terrain and buildings. Rudy's specific interest was in attempting to use ANUGA to model riverine flooding.

As indicated in the first presentation the ANUGA model now has the primary building blocks that provide it with a flood modeling capability. As discussed previously this still needs to be further enhanced to provide higher levels of capability, however it is currently being applied and successfully being validated against other models and methods.

The next logical progression is to attempt to validate the ANUGA model against a real flood scenario.

As it is the case that it is very difficult to validate flood models due to the complexity of variables involved and the spatial and temporal variation, validation of the ANUGA model as a flood model may be difficult. {To validate a flood model requires saturating a catchment with rain gauges, knowing the soil moisture condition, and being able to measure the resulting flood levels over a wide range.} This level of data is usual simply not available.

The author has conjured up a novel way that may provide a very realistic method of validating ANUGA's capabilities. The Penrith White Water Stadium is a 350m long concrete channel that drops around 6m in elevation, and has the ability to have any number of obstacles placed along the channel. In addition it has 6 powerful pumps that can generate 14.0m3/s of flow that can flow over the obstacles and create a very realistic simulation of a stream with complex rapids and the like.

This presentation describes efforts made to date to create a model of the site and also discusses the proposed way forward to provide what is likely to be the most comprehensive approach in validating a flood model ever devised. This also of course will allow other models (FLO-2D, Hydro-AS-2D, FST-2DH, River2D, TUFLOW, etc.) to be compared to the performance of ANUGA.

By modeling the same terrain with the same flow, other models can also be setup and run and compared to not only ANUGA, but also to the surveyed resulting flood surface, to provide a comparison of the capability of models including ANUGA to reproduce the resulting complex wave forms in the stadium.