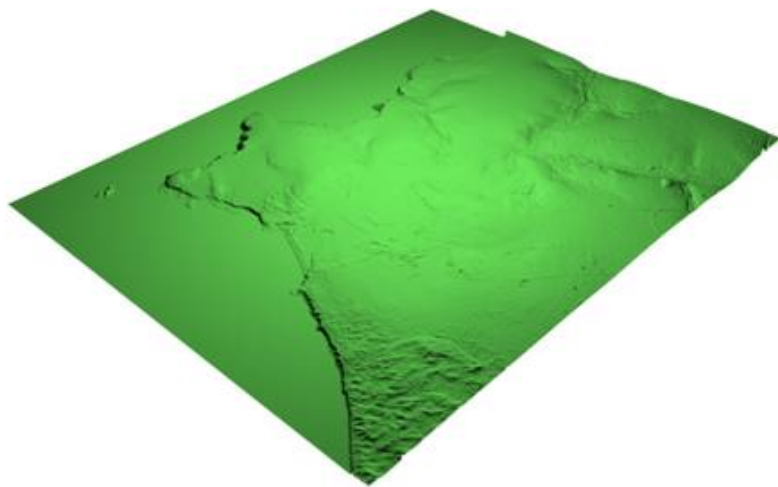


3D River Catchment Models – migrating from digital to analogue

Engaging stakeholders and informing the public are important aspects of the Water Framework Directive. Through the Cycleau Project, the Natural Environment Service of Cornwall County Council and the 3D Digital Research Cluster of University College Falmouth have produced physical scale models of the topography of some river catchments in Cornwall for display at roadshow-style events. At these the public have been encouraged to touch the model and to feel the river valleys and floodplains to appreciate the drainage routes within the catchment.

The topographic data used was the NextMap Britain Digital Terrain Model (DTM), available as spot heights on a 5m horizontal grid spacing. This data derives from airborne remote sensing using radar technology (Interferometric Synthetic Aperture Radar). The data is held in digital form suitable for displaying as a virtual 3D surface computer image.



Digital image of the Lower Red River

The scan data was made into a virtual solid object using 3D Computer Aided Design software and then imported into Computer Aided Machining software in order to generate cutting paths for a Computer Numeric Controlled milling machine. A number of tests were conducted in order to establish the optimum scale and finish for the 3D models.

Due to the size of the data files, it was necessary to reduce the resolution of the DTM to 25m horizontal resolution. At a 1:50,000 scale, this resulted in a model resolution of 0.5 mm. For some sub-catchment areas a 1:10,000 scale was used and this allowed the full 5m data resolution to be applied to achieve a 0.5 mm model resolution. In order to accentuate the surface topography, a vertical exaggeration of 4 times was used.

The final models were cut in a hard resin tooling board which machines to a high tolerance and surface quality.

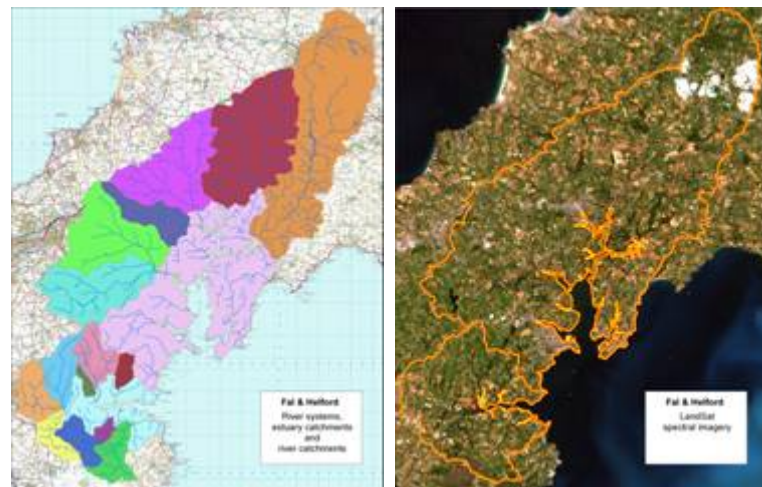


VMC100 CNC Milling machine was used to cut the models



Lower Red River model after first Cut

To bring the models to life a computer data projector was used to overlay various themes onto the surface by way of a rolling PowerPoint presentation. The themes used included Ordnance Survey maps, aerial photography and LandSat imagery, river systems and sub-catchments, critical drainage areas and floodplains, geological and soils maps.



Overlays showing sub-catchment and LandSat imagery for the Fal and Helford catchments



LandSat projected onto the 3D model



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