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Research objectives

- Analyse uncertainty in modelling water flow in catchments using different digital elevation models.
- Explore the challenges of linking terrain models (water flow modelling) and 3D geographical visualization for the decision support.

Key messages

- Some nationally available DEMs are not 'fit for purpose' for local catchment modelling
- In comparison with mapped topographic contours, the best performing DEM was NEXTMap 5m
- ASTER and Landmap values are underestimated in open areas and overestimated in woodlands areas

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Description of research/methods

Digital elevation models (DEMs) are widely used to identify patterns of water flow in catchment modelling. However, all DEMs are approximations to some degree and it is widely recognised that their characteristics can vary according to attributes such as the resolution and data source (e.g. contours, optical or radar imagery). As a consequence, it is important to assess the 'fitness for purpose' of different DEMs and evaluate how uncertainty in the terrain representation may propagate into products such as delineated drainage networks and catchment boundaries. In areas where the under-drainage of land is common, it is also important to evaluate how the presence of such drains may alter the flow patterns estimated from surface topography.

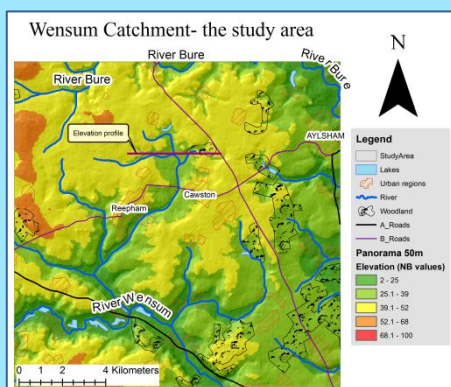


Fig 1: Study area showing topography in the Blackwater sub-catchment

To demonstrate the type of inherent uncertainty, Figure 2 shows a comparison of elevation profiles for the line of section shown in Figure 1.

As part of the Wensum Demonstration Test Catchment (DTC) project seven different DEMs (ASTER 30m, SRTM 90m, Landform Panorama 50m, Landform Profile 10m, Landmap 25m, NextMap 5m and Bluesky 5m) have been compared in terms of their general quality and uncertainty values in derived catchment parameters.

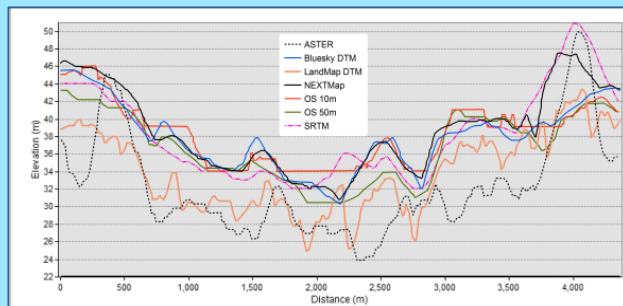


Fig 2: Elevation profile form all DEMs

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knowledge

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