3D Data Modelling at Esri

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ABSTRACT

We live in a three-dimensional world, and hence 3D data is becoming increasingly important to national mapping agencies (NMAs) and to their customers (particularly the younger generation raised on realistic 3D computer games). New 3D data sources such as LIDAR and CityGML complement the traditional 2D topographic and terrain data held by NMAs, and together provide the basis for 3D GIS.

This presentation provides an overview of the 3D capabilities of the Esri ArcGIS system. It covers 3D data types, and their storage and data management in the geodatabase; 3D analysis including intervisibility, skylines and shadows; 3D visualization, from local perspective views in ArcScene to landscapes and worlds in ArcGlobe; and sharing of 3D globes through ArcGIS Server.

The 3D equivalents of traditional 2D vector data include 3D points, lines and areas - symbolised as 3D markers, textured lines and polygons, optionally extruded into volumes. An important 3D data type in the geodatabase is the 'terrain' which holds XYZ point clouds from LIDAR as well as surfaces as TINs. The other vital 3D data type is the 'multipatch', which describes volumetric spaces such as 3D buildings, complete with their surface textures.

The presentation will be illustrated by examples of 3D analysis and visualisation, particularly using an example 'virtual city' template geodatabase, which is available as a free download to help with the design and implementation of 3D solutions.