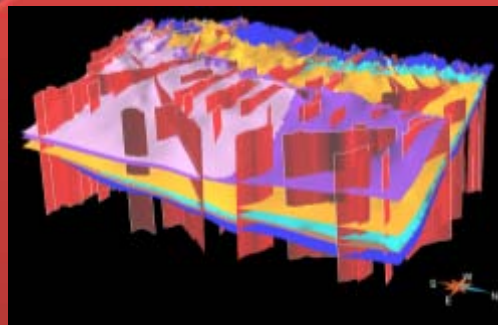
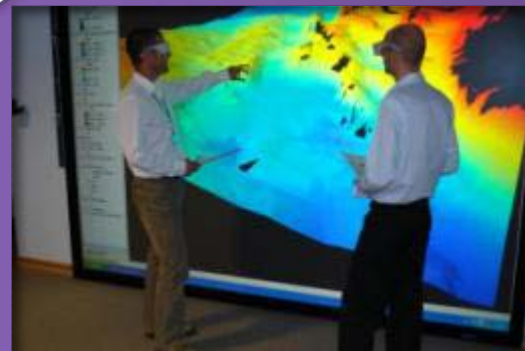
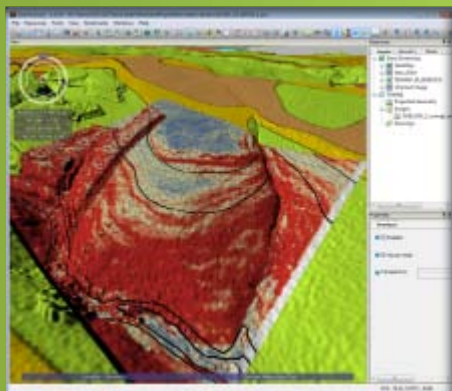


3-D VISUALISATION AT THE BRITISH GEOLOGICAL SURVEY

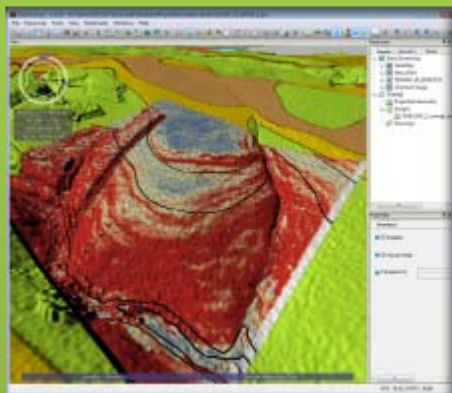


Mapping

Communication

Modelling

3-D VISUALISATION AT THE BRITISH GEOLOGICAL SURVEY



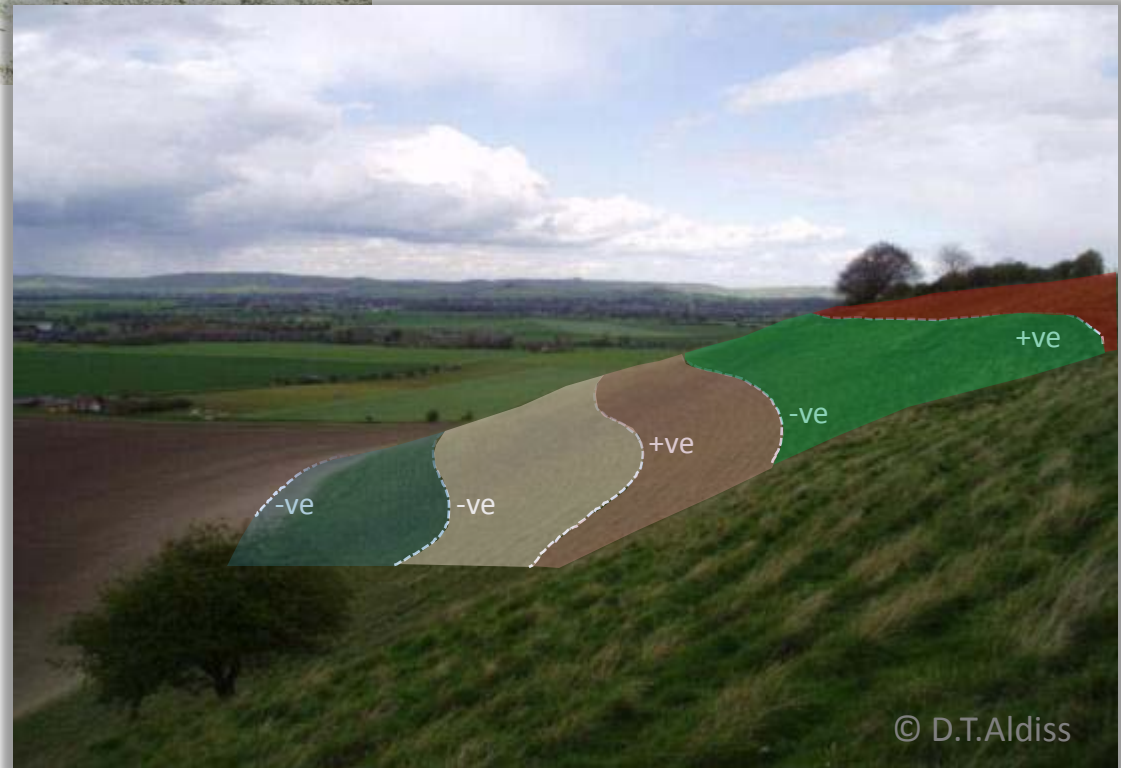
- Landscape literacy
- Conventional approaches
- The GeoVisionary solution
- Virtual Field Reconnaissance
- What are the benefits?

Mapping



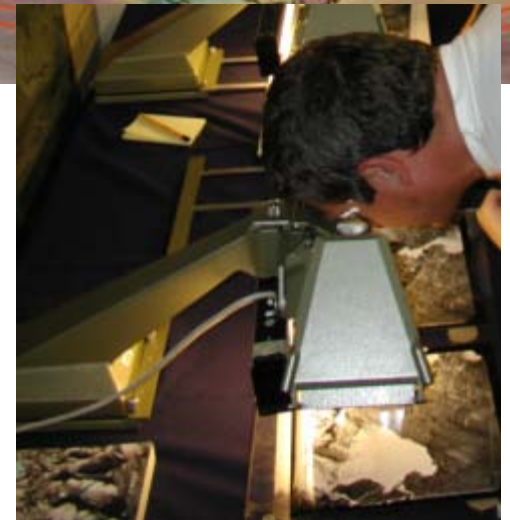
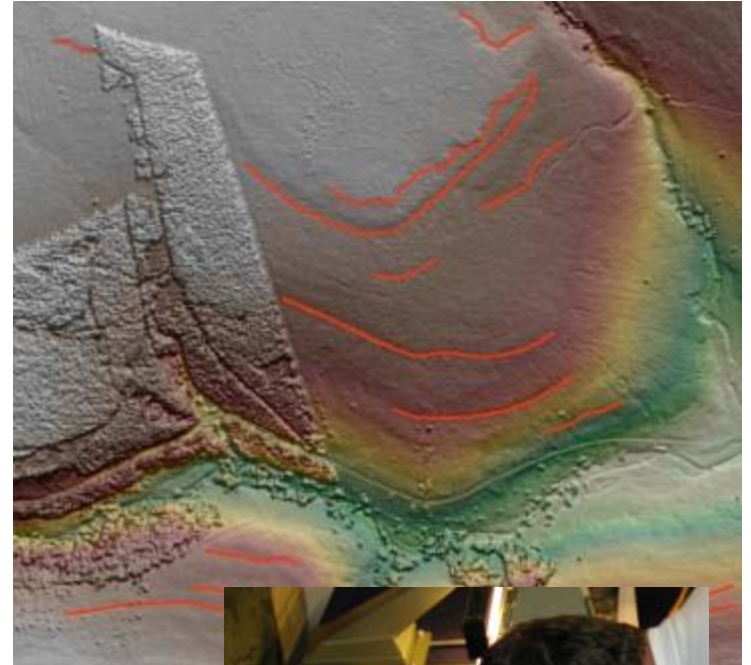
Landscape Literacy

- Relating characteristic breaks of slope to underlying strata *or* landscape processes
- Inferring geological contacts and structures



Conventional approaches

- **Complement field observation with remote sensing:**
 - photogrammetry
 - satellite image interpretation
 - GIS analysis of DEMs
- **Conventional techniques effective, but ‘restrictive’:**
 - fixed perspective (i.e. mostly vertical)
 - often complex tools / software
 - difficult to integrate subsurface data



The GeoVisionary solution

A single application combining key functionality from common virtual globe, GIS and 3D modelling applications

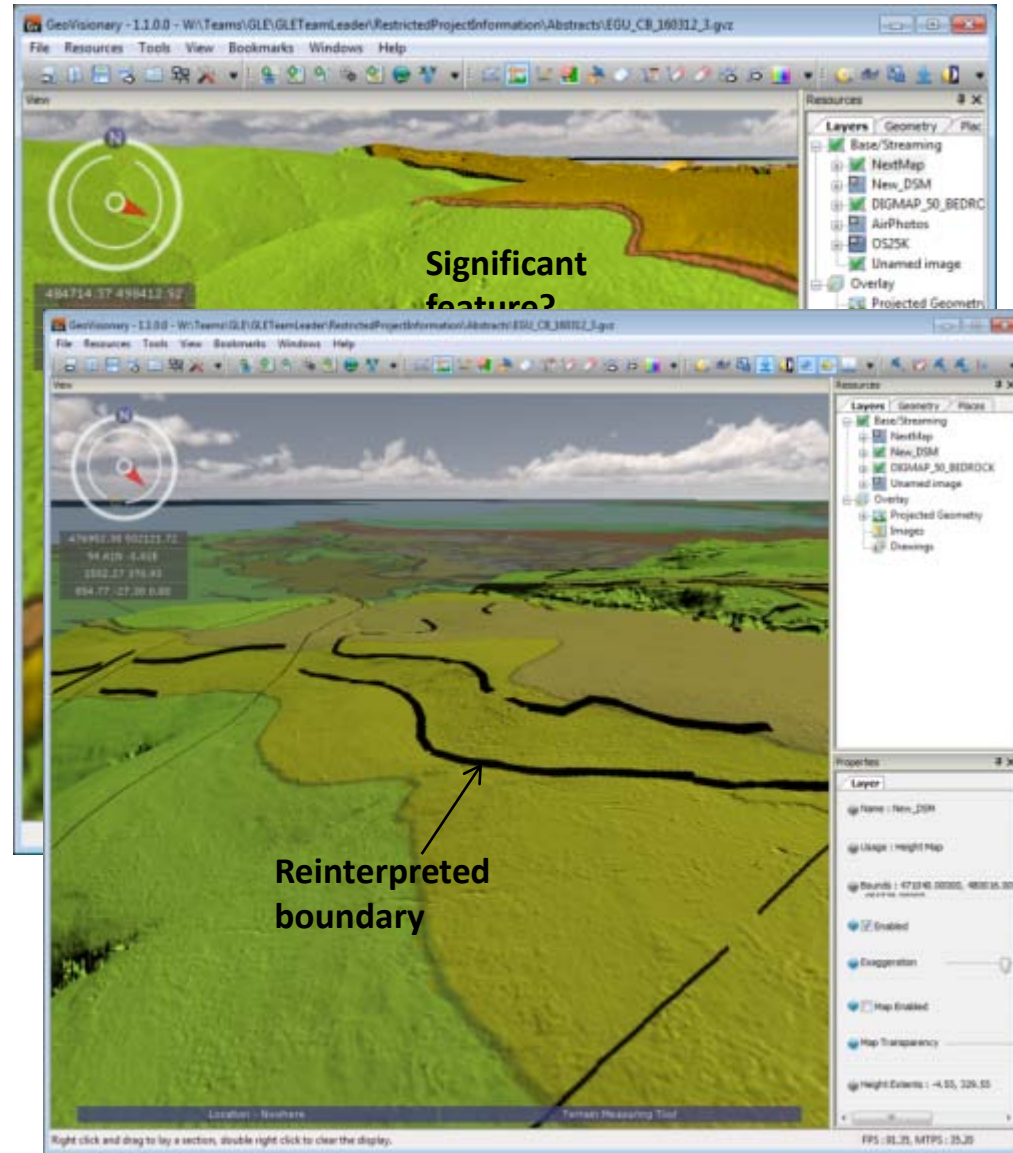


- **Intuitive GUI**
- Free-flight
- Rapid data streaming
- Powerful visualisation
- **Digitising**
- True-perspective
- Attribution-rich
- GIS compatible
- **Integrated subsurface data**
- Boreholes
- Cross-sections
- 3D models

<http://www.virtalis.com/geovisionary/>

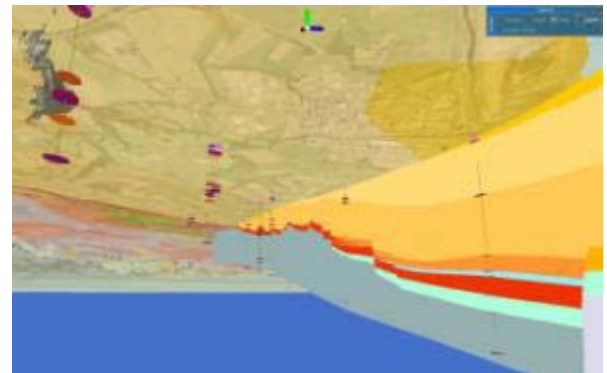
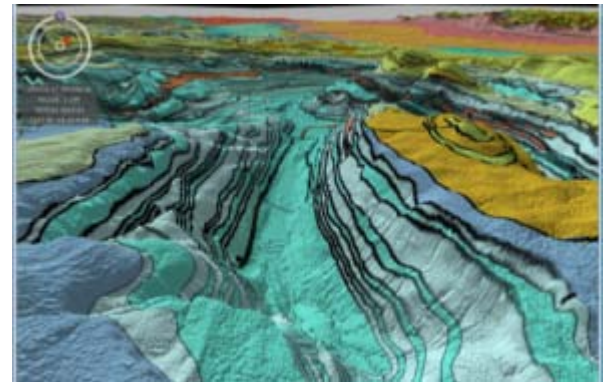
Virtual Field Reconnaissance

- landscape familiarisation
- baseline data compilation
- assess existing mapping:
 - *accept?*
 - *reject and re-interpret virtually?*
 - *prioritise field targets?*
- promote consistency
- identify and resolve potential 'disagreements'



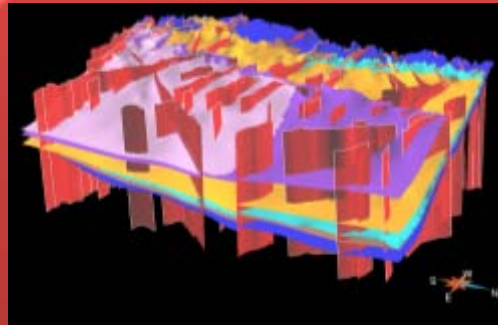
What are the benefits?

- Logistical:
 - cost reduction (prioritising field observation)
 - risk reduction – staff and environment
- Contextual:
 - rich environment for interpretation
 - increased precision / accuracy
 - greater confidence
- Cultural:
 - ‘meeting of minds’
 - ‘killer app’ in the digital workflow
 - communication



3-D VISUALISATION AT THE BRITISH GEOLOGICAL SURVEY

- Baseline data validation
- Interactive surface creation
- Model interrogation and approval
- Scientific discovery



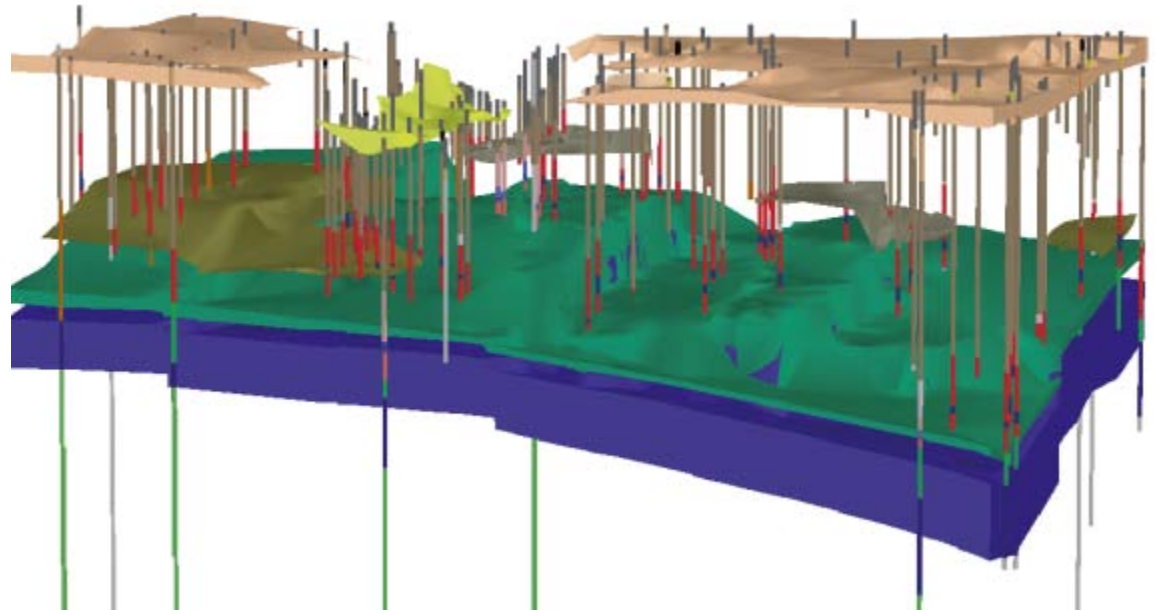
Modelling

Baseline data validation

- Contextual assessment of diverse data
- Supports improved data trend and anomaly detection

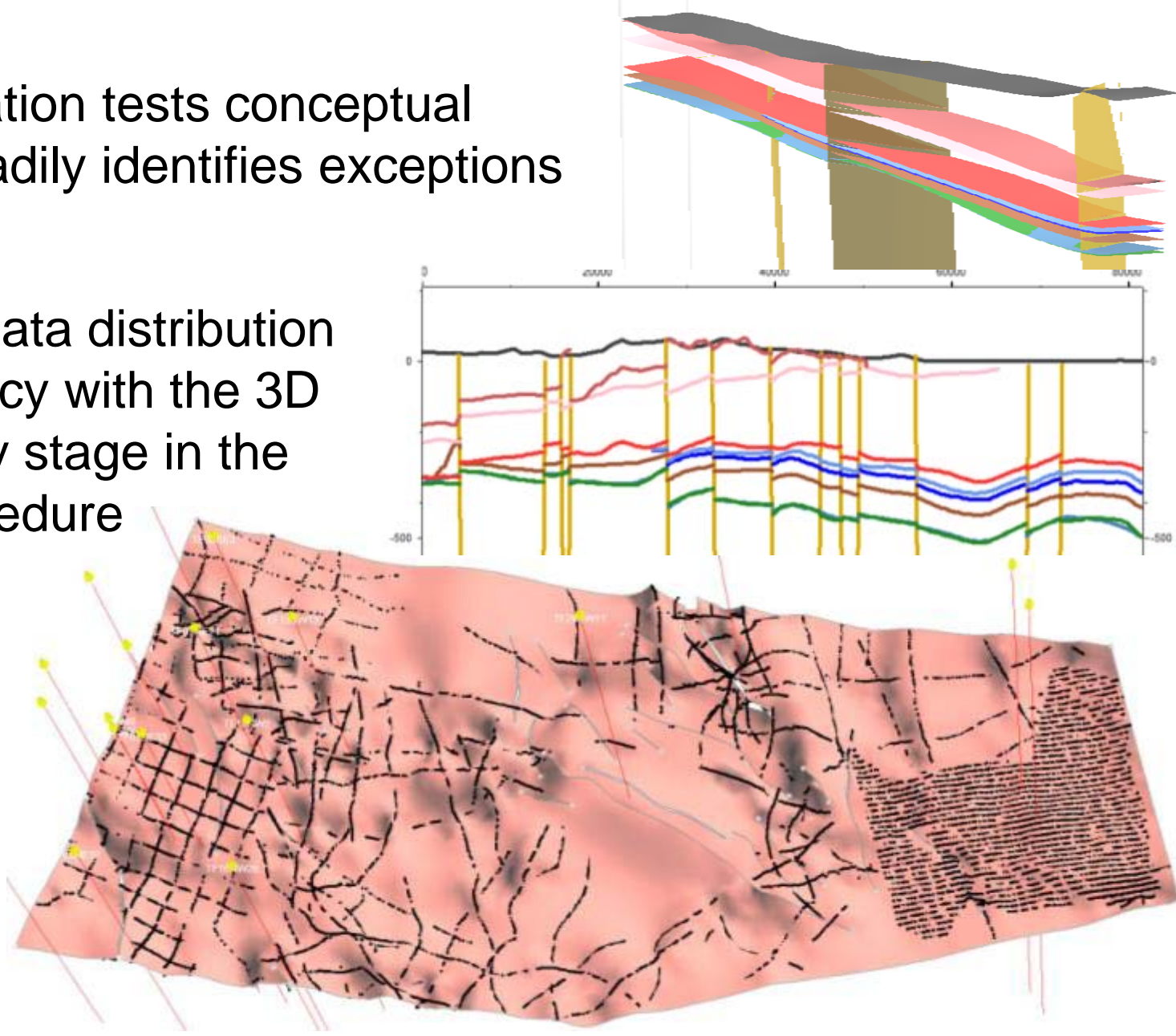
Interactive surface creation

- Rapid 'prototyping' of conceptual model
- Real-time verification of evolving model

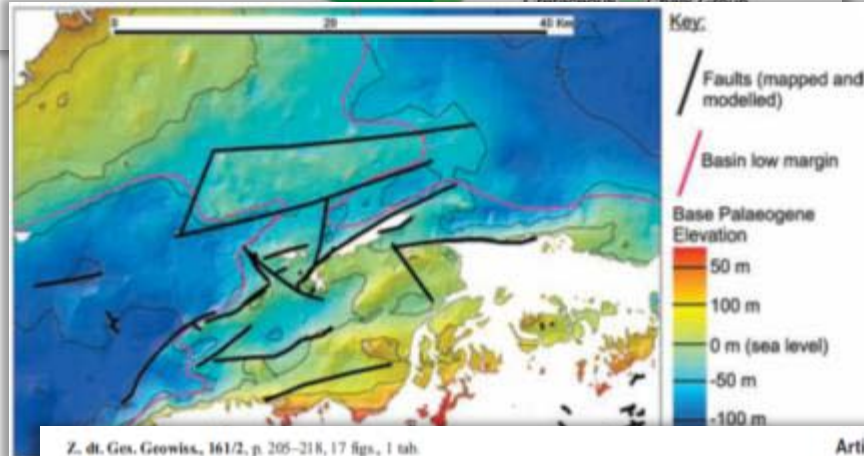
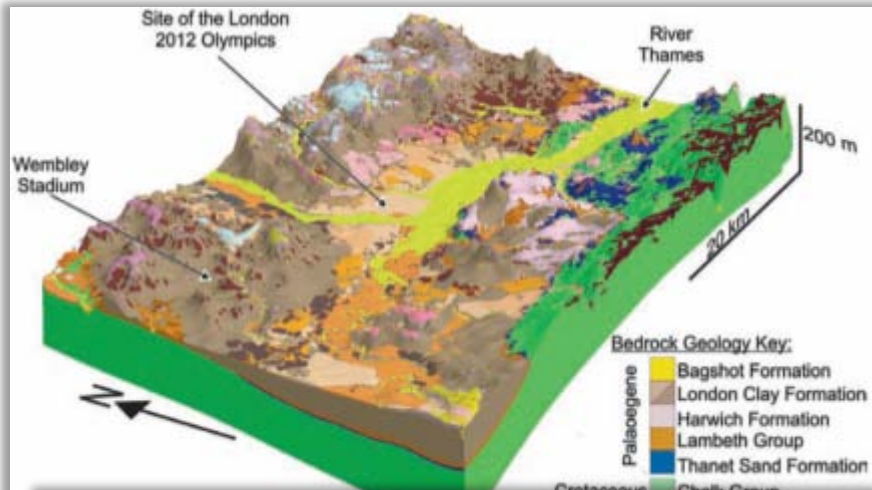


Model interrogation and approval

- 3D visualisation tests conceptual model and readily identifies exceptions
- Assessing data distribution and consistency with the 3D model is a key stage in the approval procedure



Visualisation for science

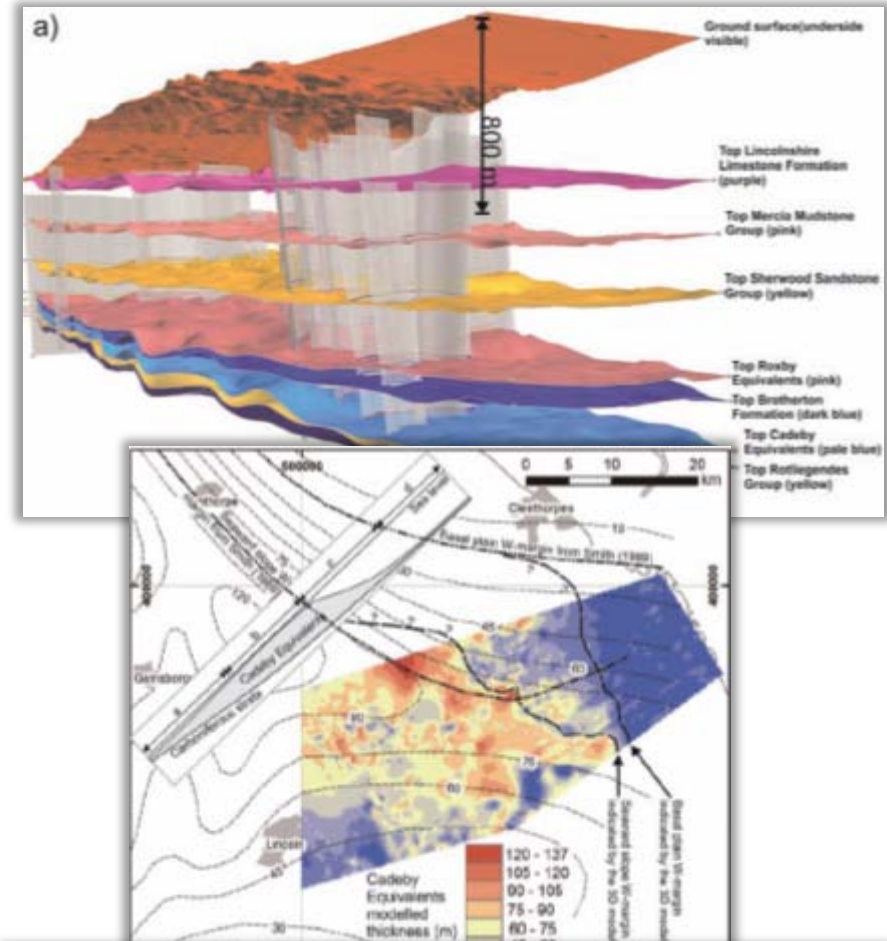


Z. dt. Ges. Geowiss., 161/2, p. 205–218, 17 figs., 1 tab.
Stuttgart, June 2010

Article

Geological 3D modelling: scientific discovery and enhanced understanding of the subsurface, with examples from the UK

Jonathan R. Ford, Stephen J. Mathers, Katherine R. Royse, Donald T. Aldiss & David J.R. Morgan*



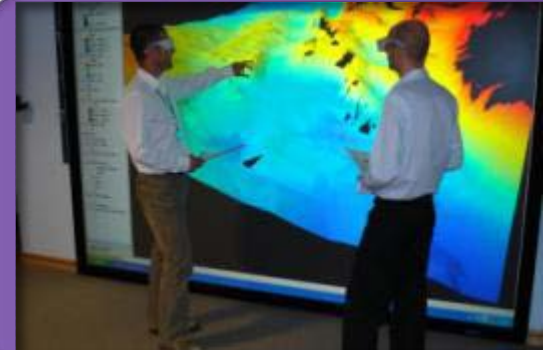
PROCEEDINGS OF THE YORKSHIRE GEOLOGICAL SOCIETY, VOL. XX, PART 3, PP. 1-23, 2012

New insights from 3D geological models at analogue CO₂ storage sites in Lincolnshire and eastern Scotland, UK

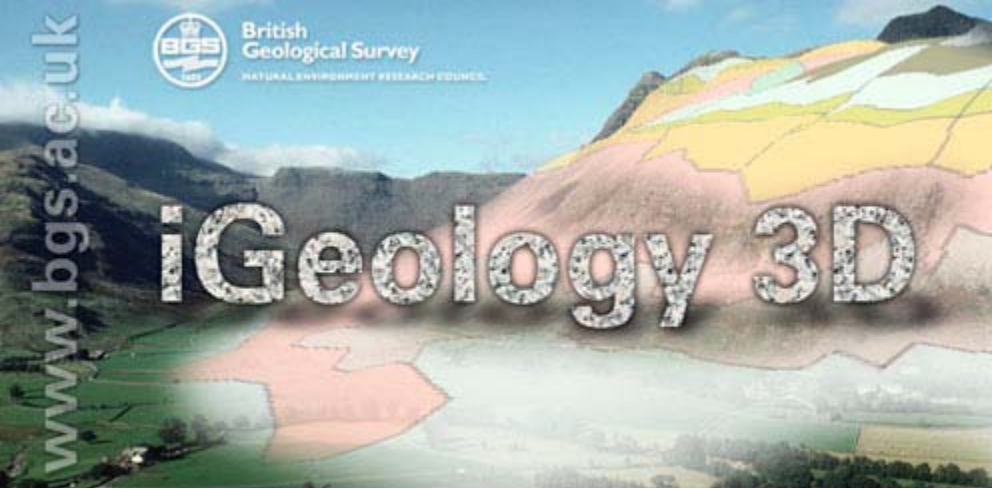
ALISON MONAGHAN^{1*}, JONATHAN FORD², ANTONI MIŁODOWIEŃ², DAVID MCNEILY¹, TIMOTHY PHARACH²,
JEREMY RUSHTON², MIKE BROWNE², ANTHONY COOPER², ANDREW HULLBERT² & BRUCE NAPIER²

3-D VISUALISATION AT THE BRITISH GEOLOGICAL SURVEY

- Geology and landscape
- Augmented Reality
- 3D collections
- Geology and infrastructure
- 3D model interrogation
- 3D model dissemination



Communication



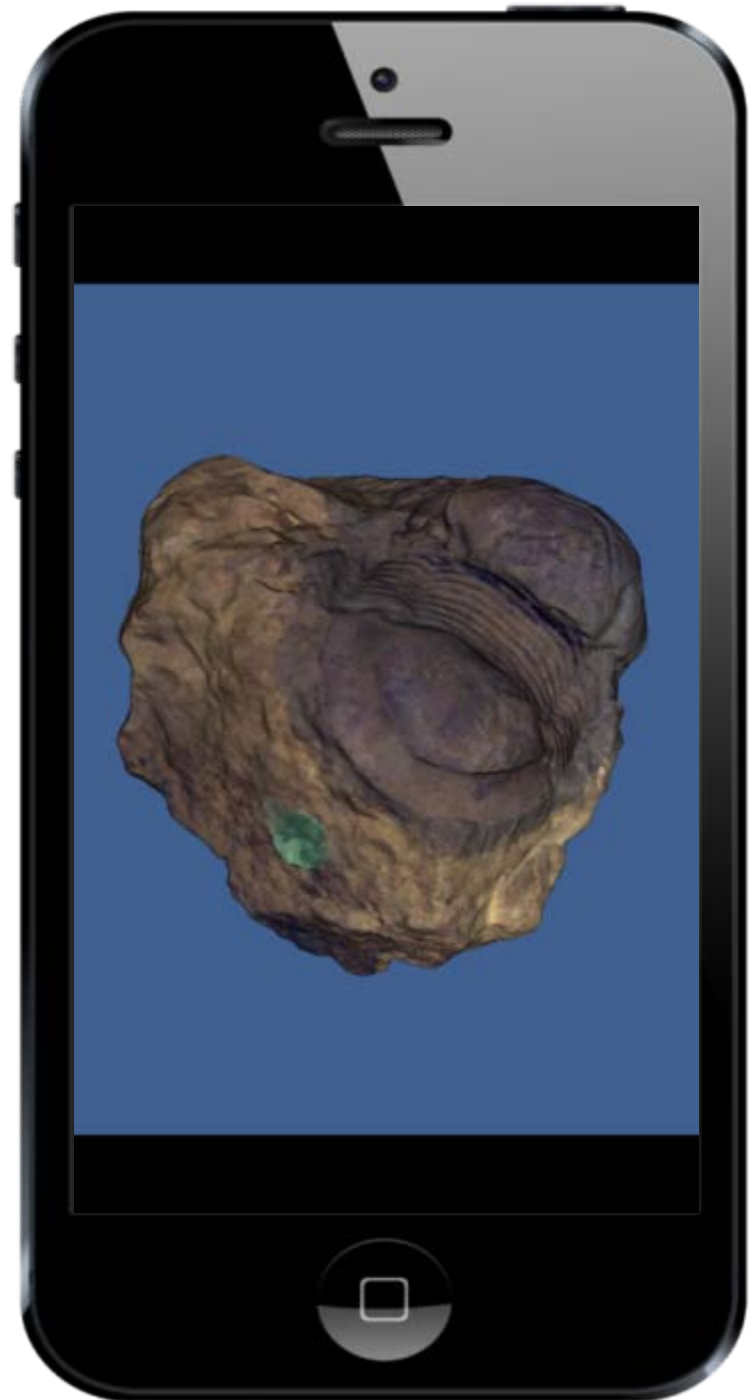
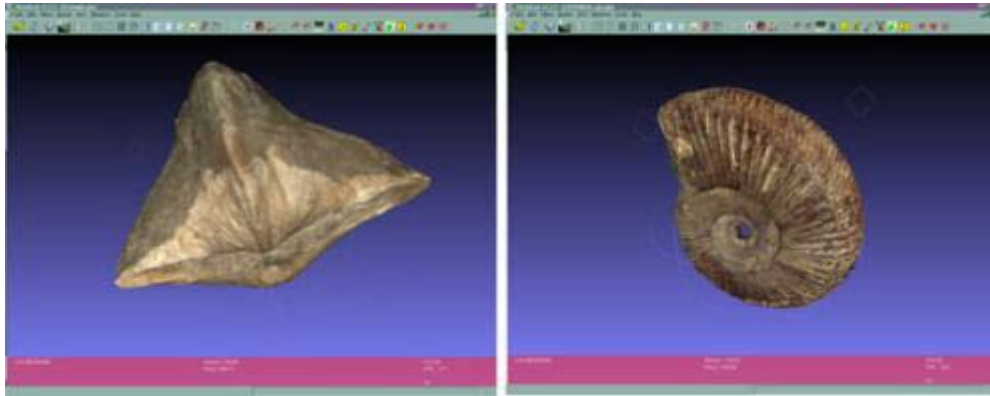
- Free Smartphone app for Android download from [Google Play](https://play.google.com/store/apps/details?id=uk.bgs.iGeology3D)
- Combining DEM data, digital geology and landscape to 'paint' the geological map on the ground



GB/3D type fossils online

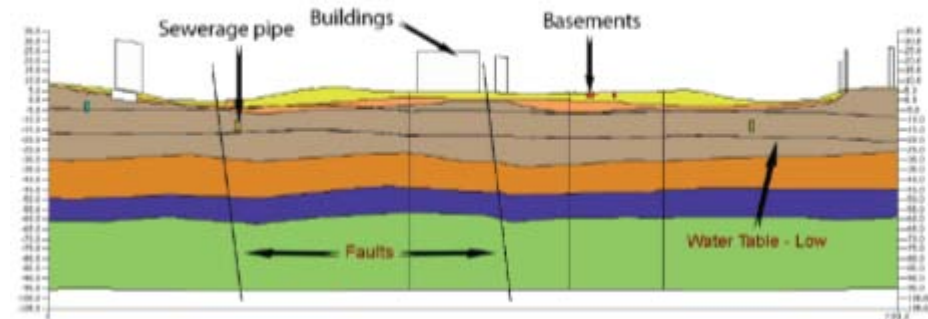
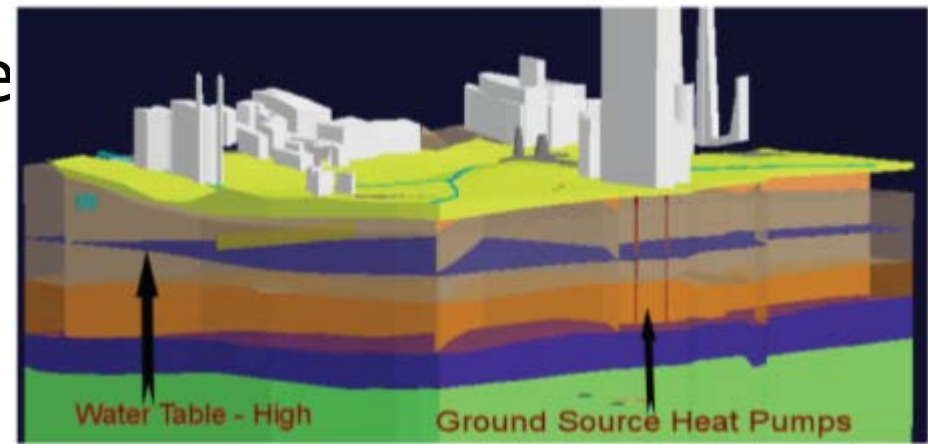
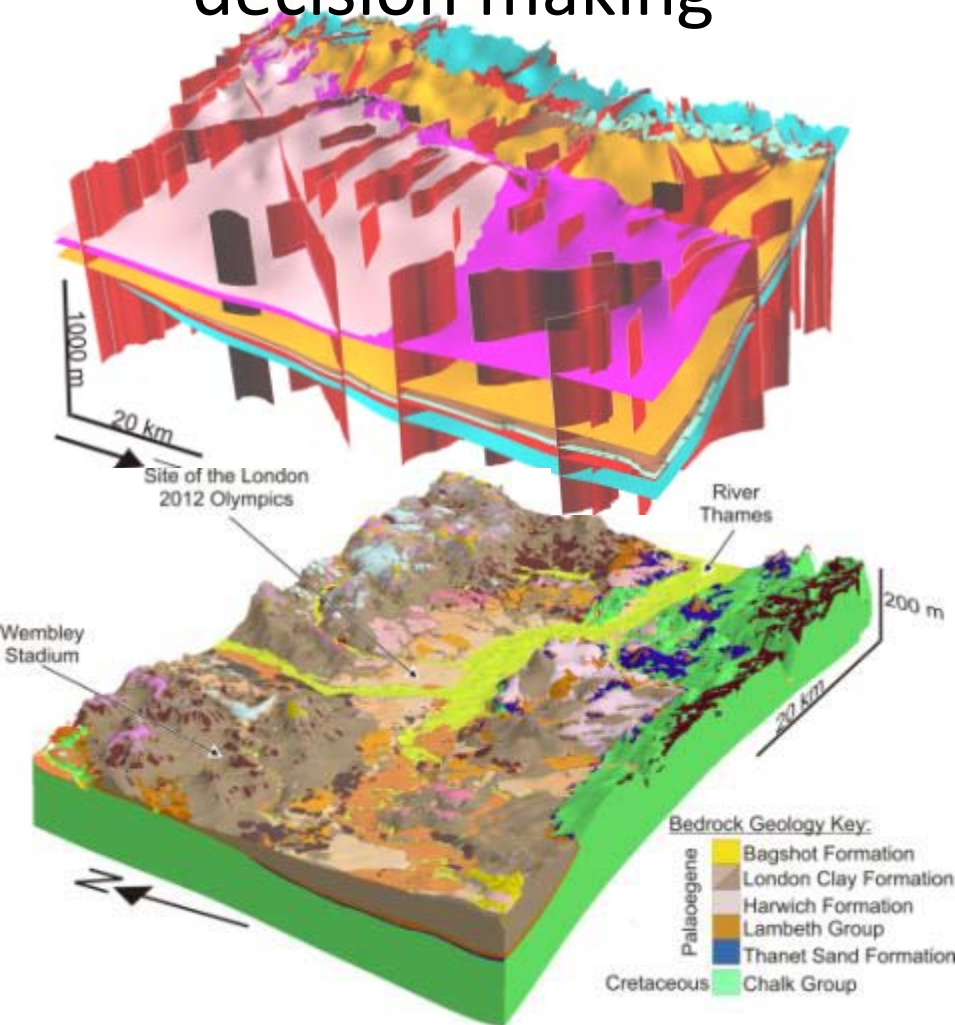
- A collaborative database of British type specimens
- Web-enabled images and digital models

www.3d-fossils.ac.uk



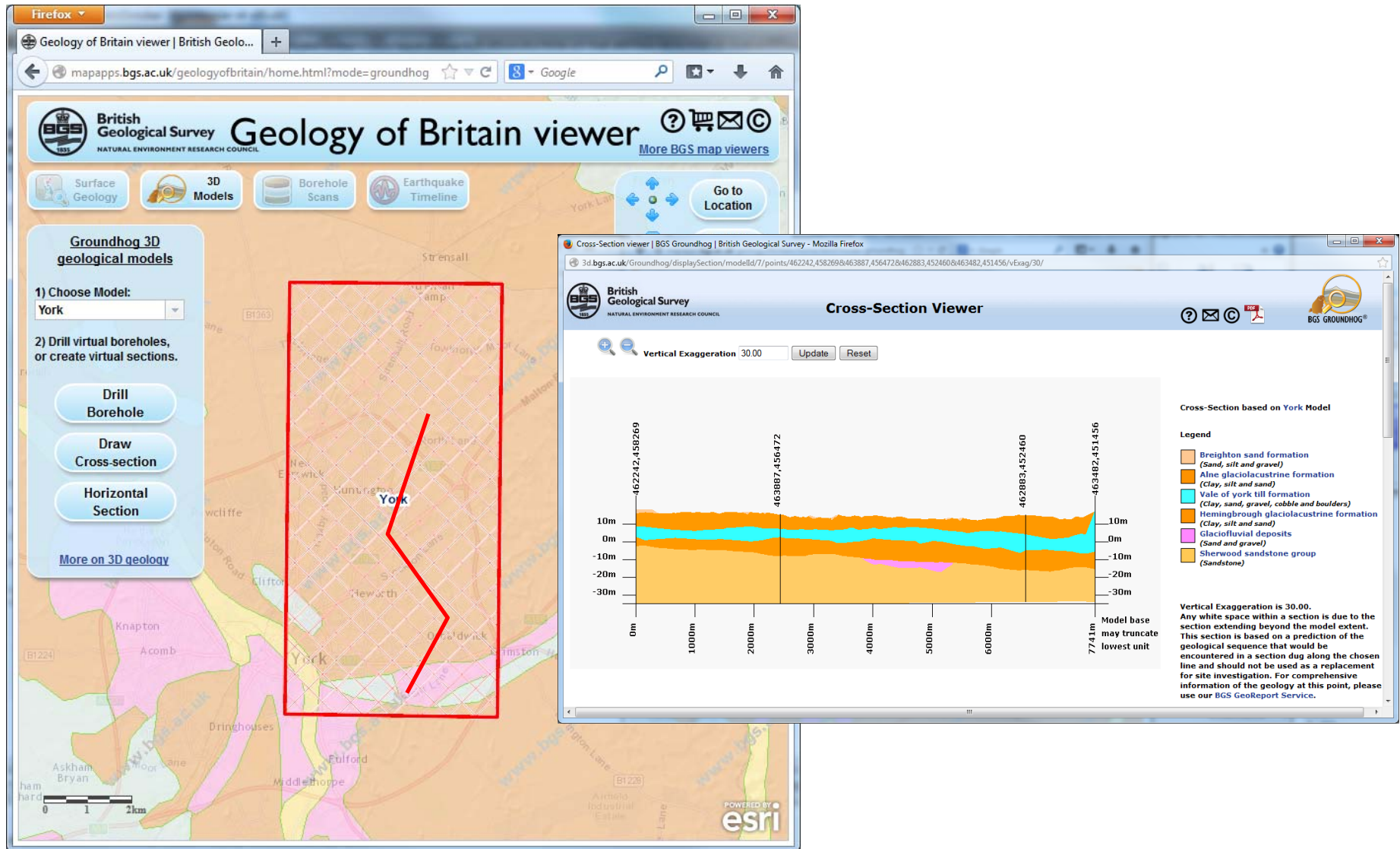
Geology and infrastructure

- 3D geology to support decision making



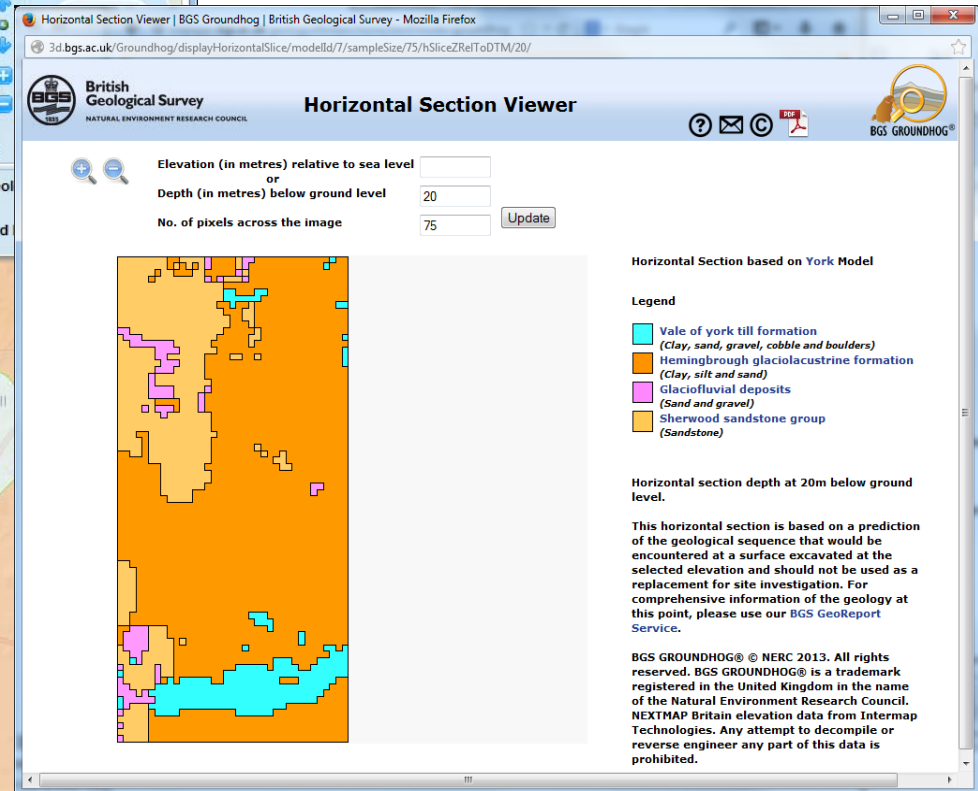
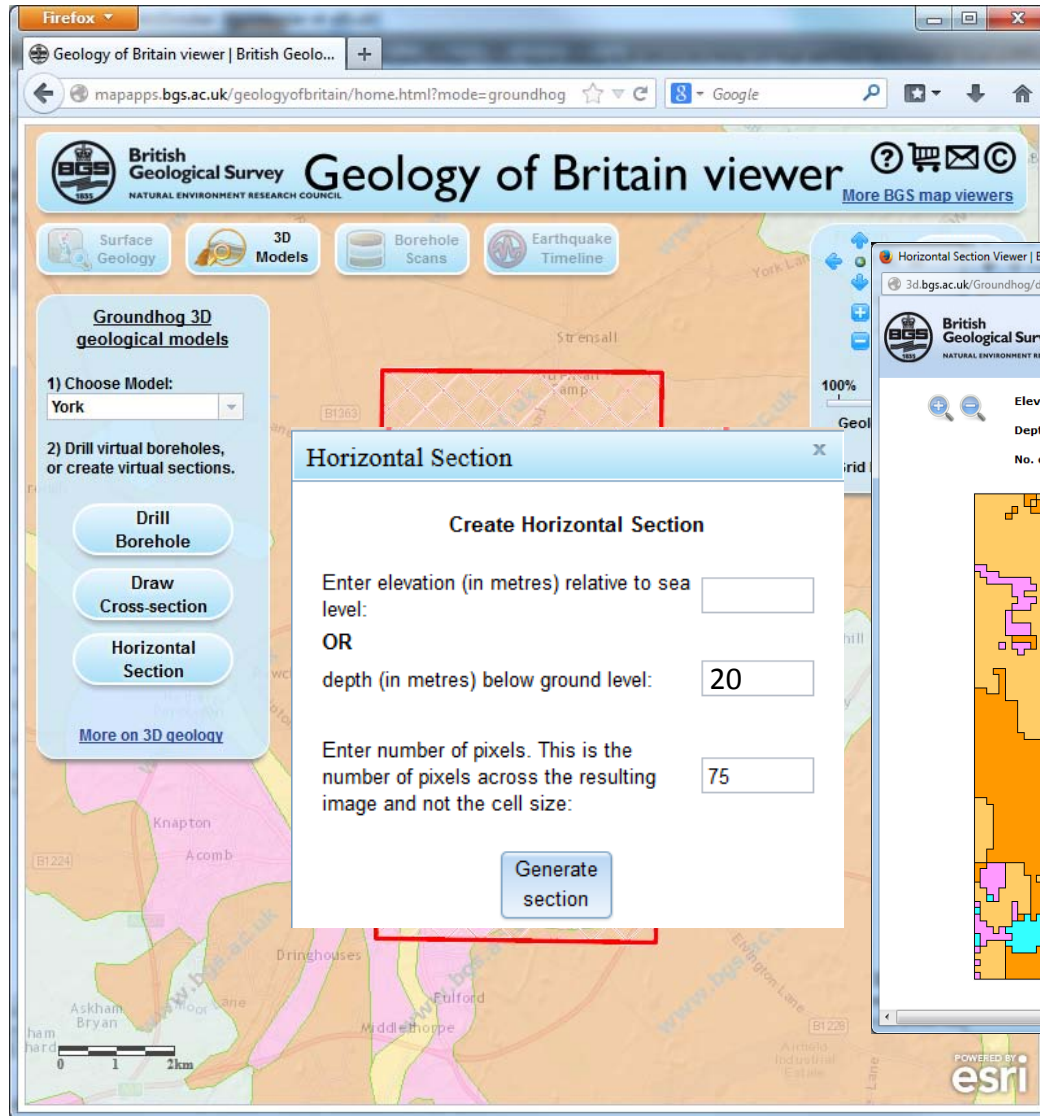
- Export to CAD or GIS for integration with infrastructure models
- Extensible and dynamic – updated as new data becomes available

3D model interrogation - via the web

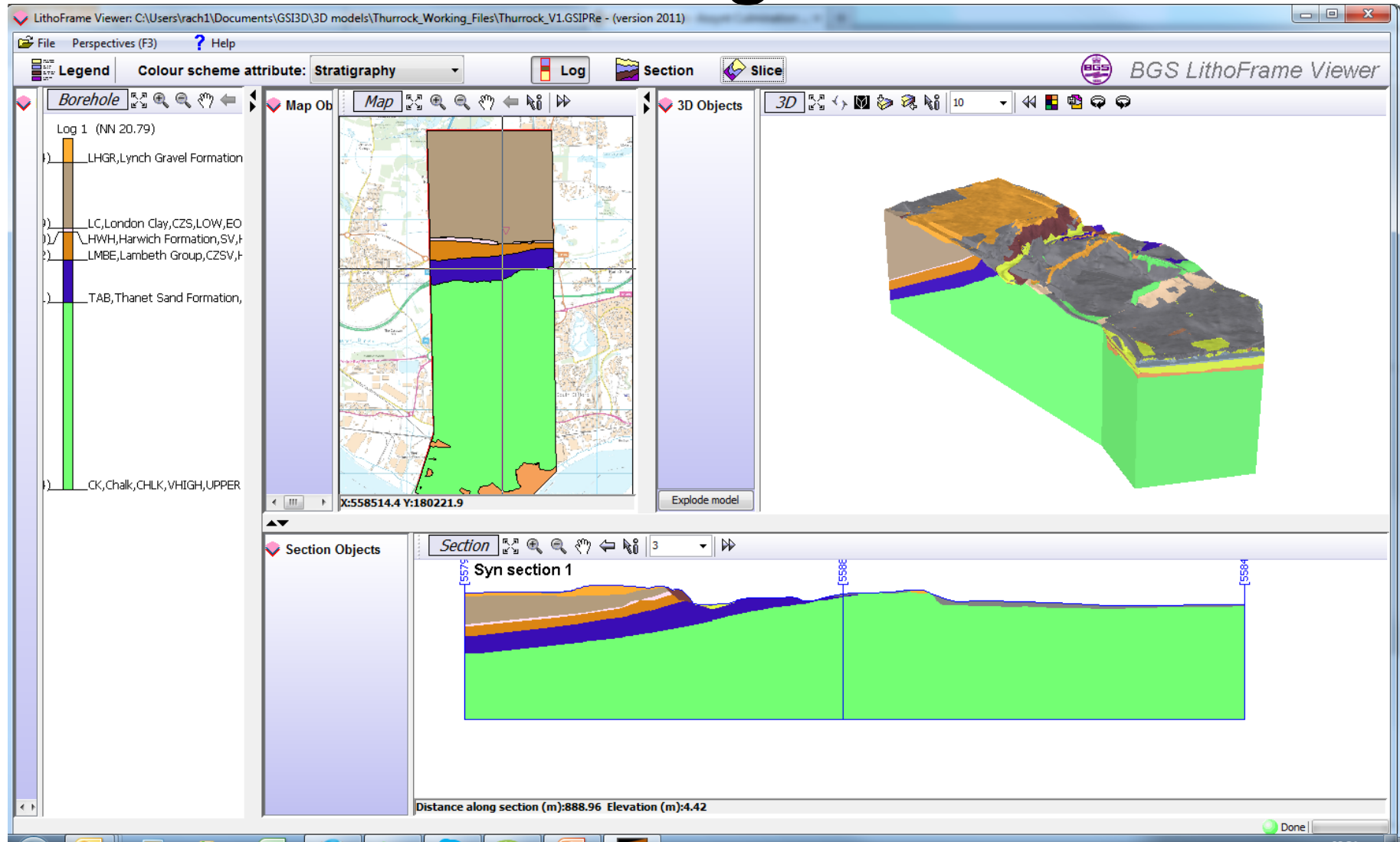


<http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html>

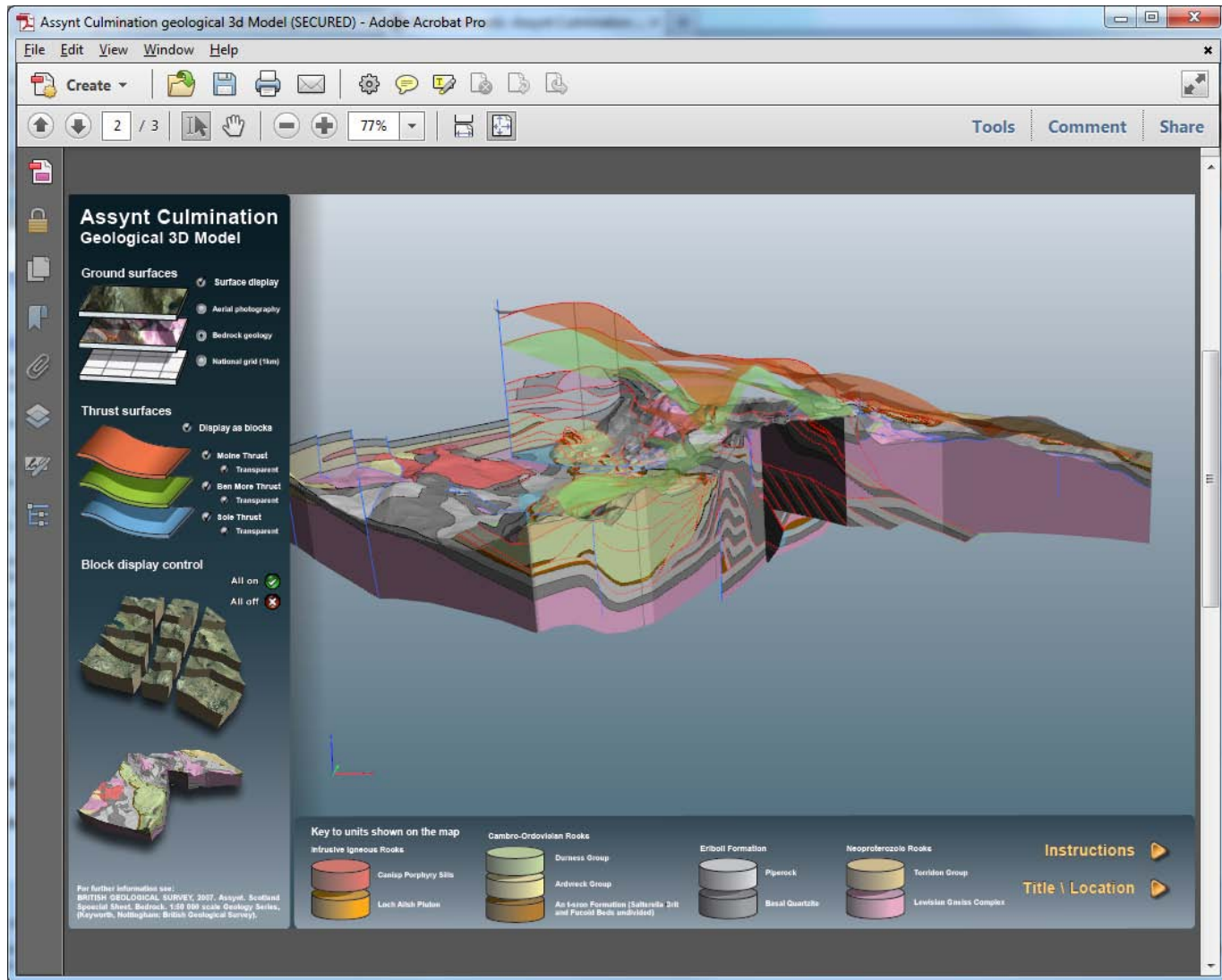
3D model interrogation - via the web



3D model interrogation - viewer

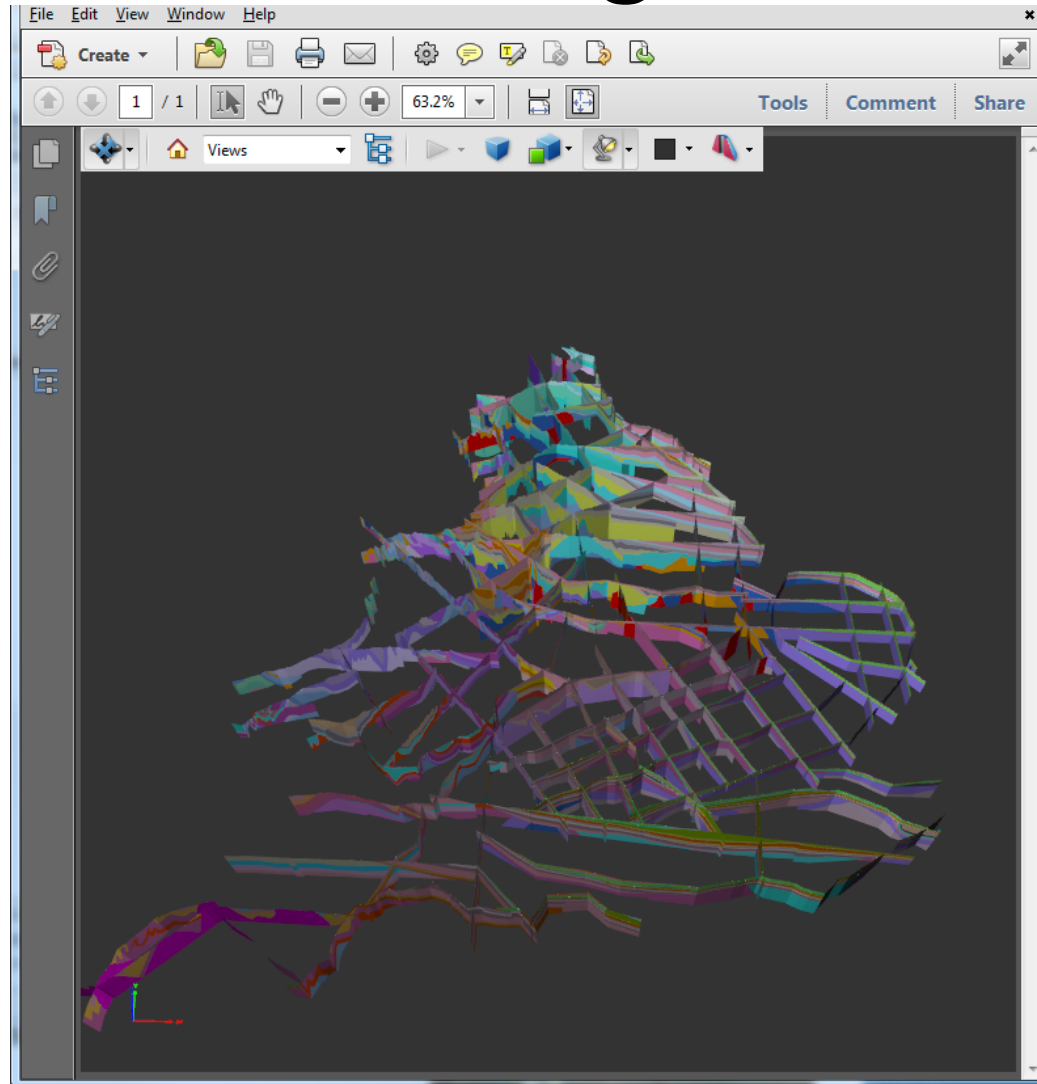


3D model interrogation - 3D PDF



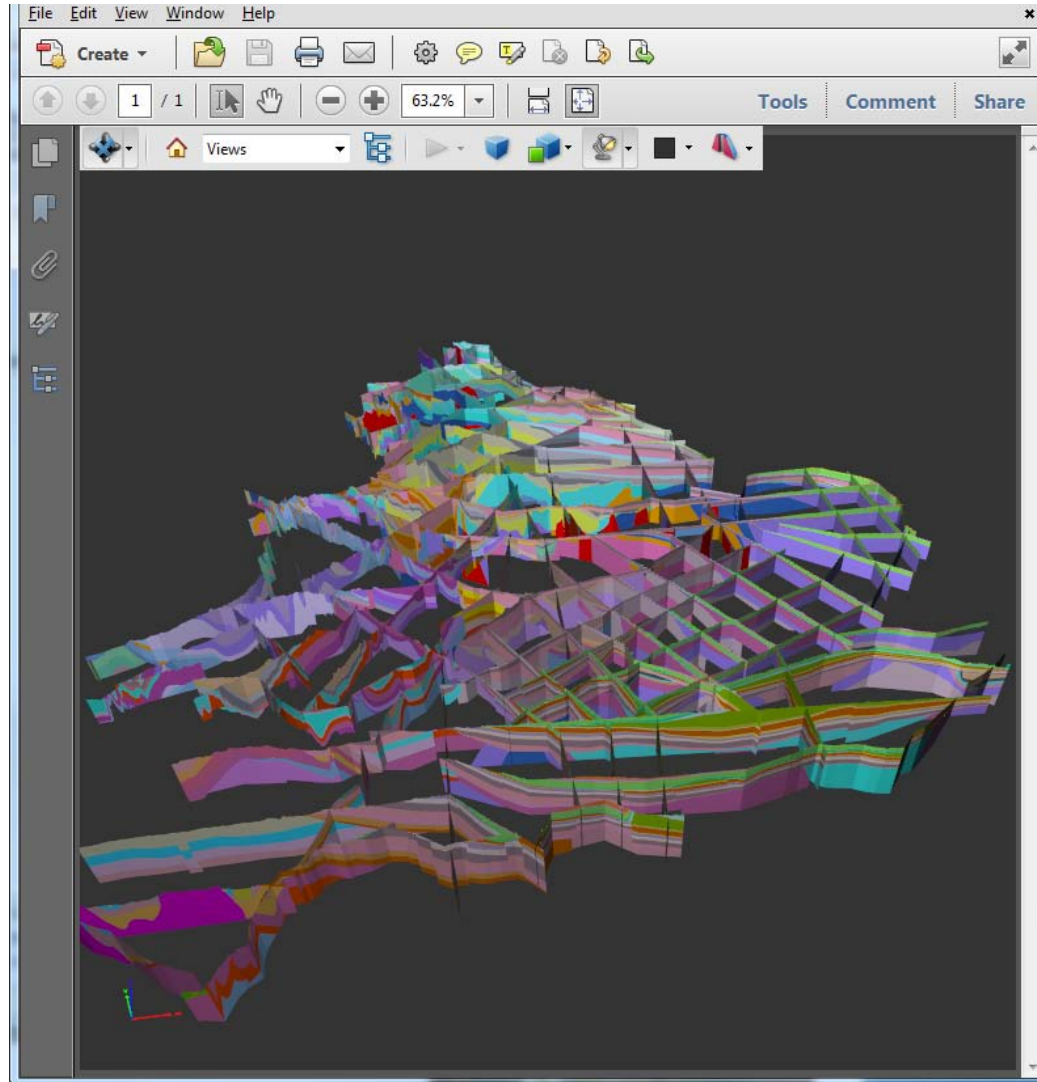
<http://www.bgs.ac.uk/research/ukgeology/assyntCulmination.html>

3D model interrogation - 3D PDF

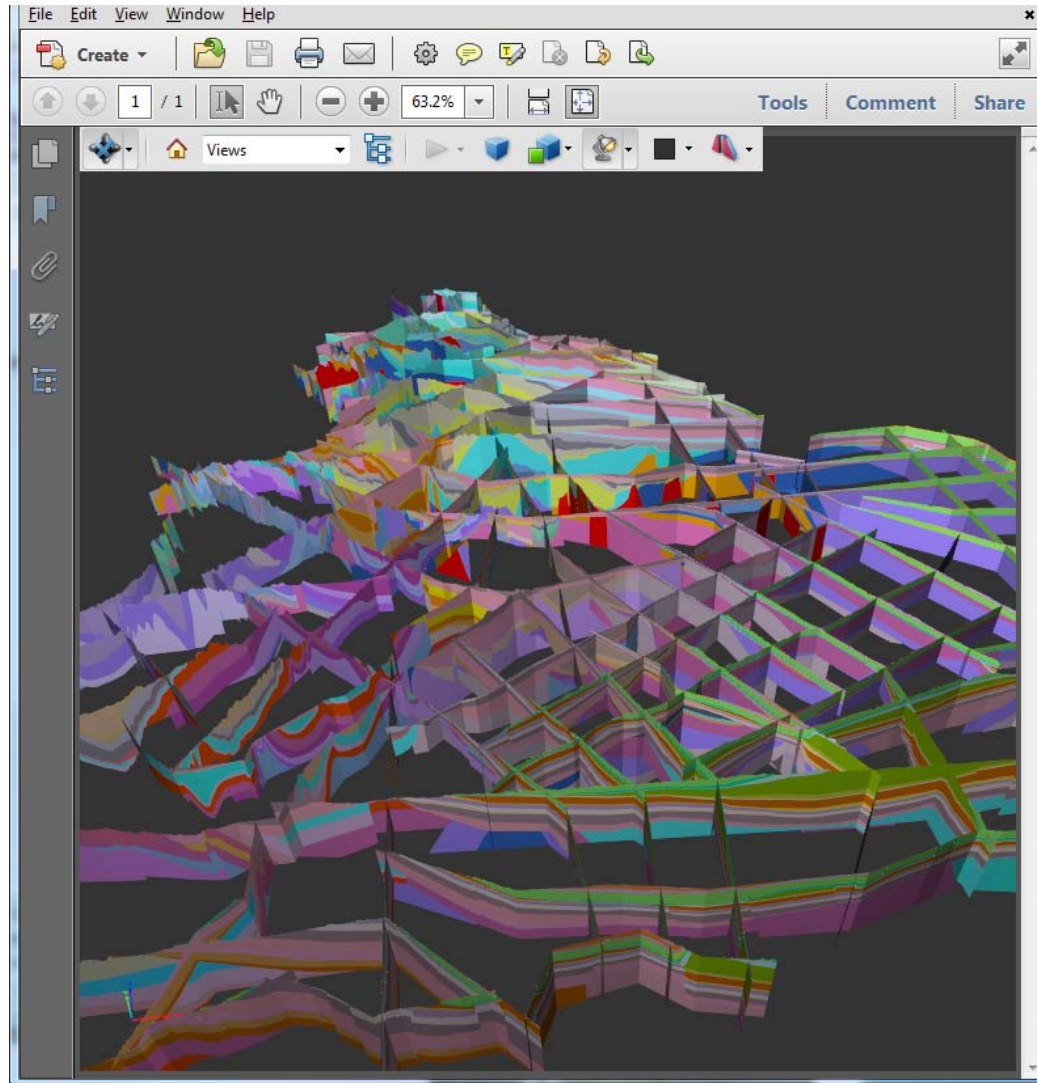


<http://www.bgs.ac.uk/research/ukgeology/nationalGeologicalModel/GB3D.html>

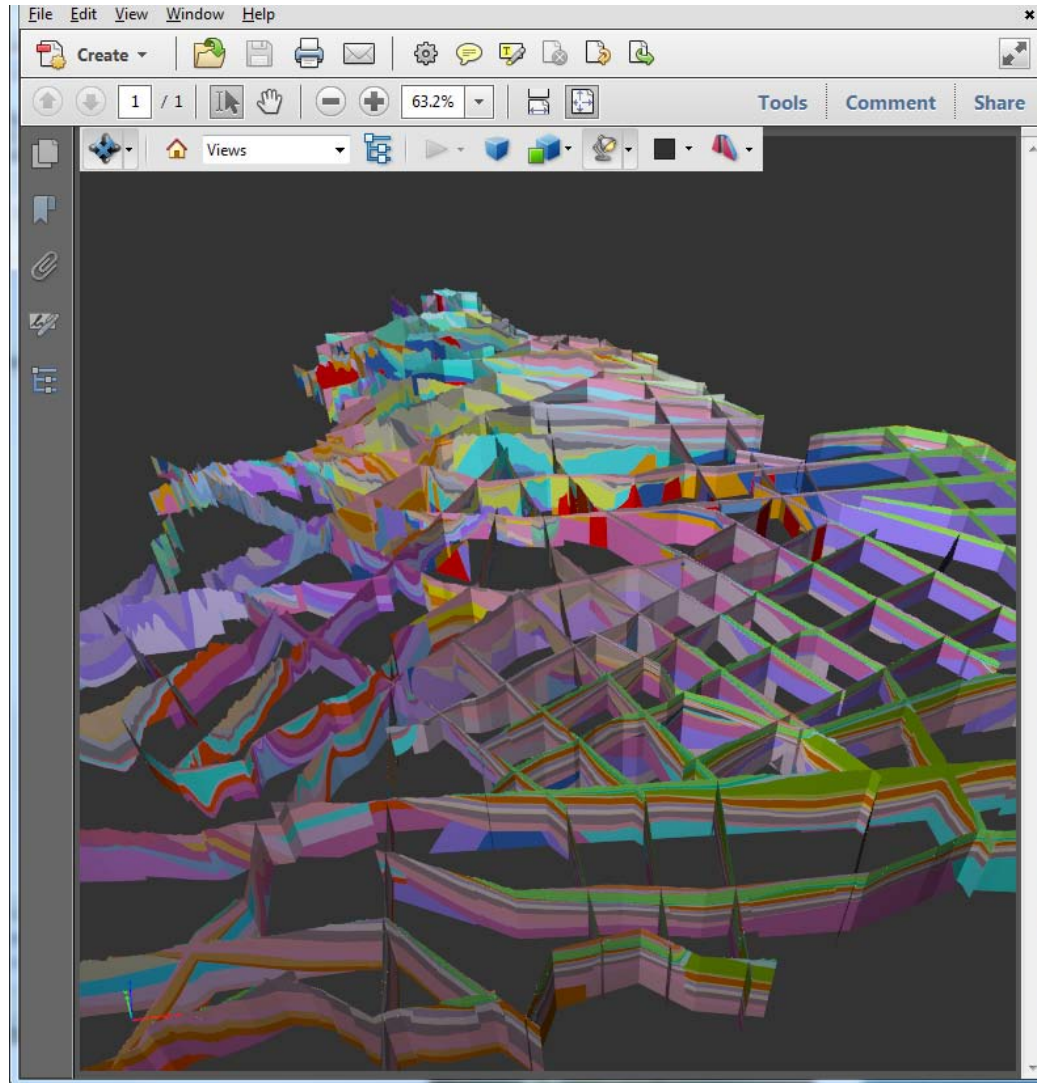
3D model interrogation - 3D PDF



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3D model interrogation - 3D PDF

