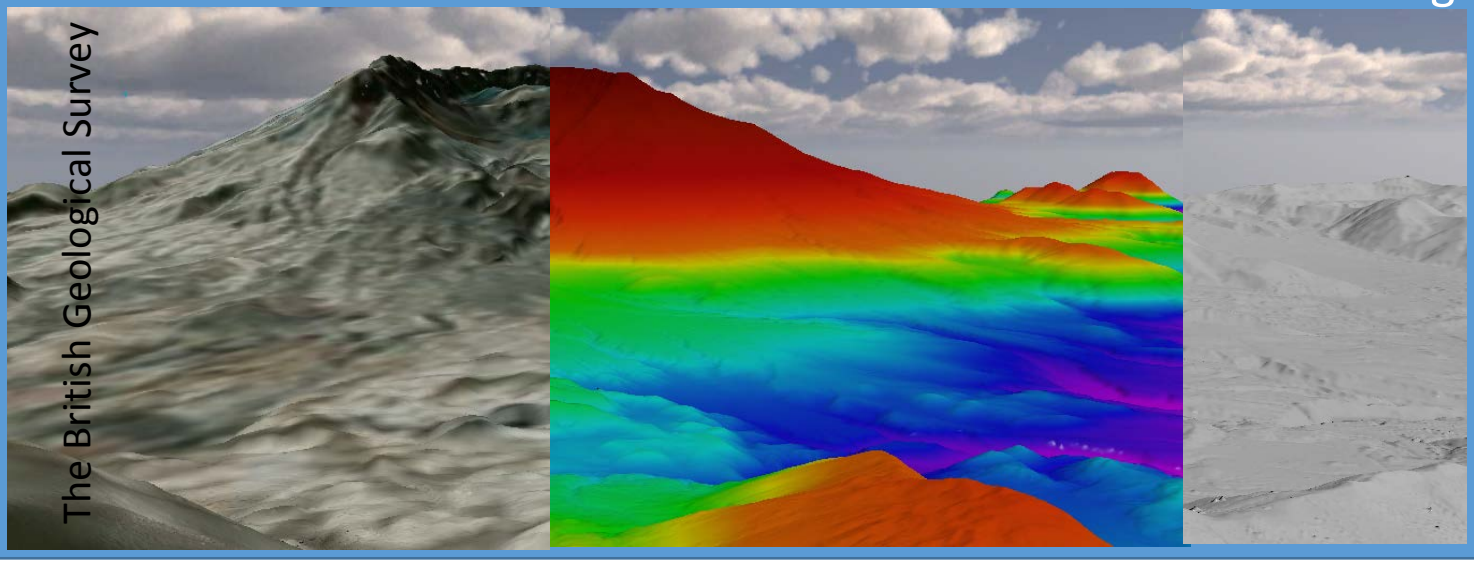
3D Visualisation Systems

Geo-environmental monitoring



River system management schemes can be monitored over long periods of time using 3D visualisation data integration as shown in GeoVisionary. Large amounts and wide varieties of data are rendered seamlessly from various sources in unison, allowing the user to get a true picture of how the river system develops and how soft and hard engineering affects flow, sedimentation and vegetation growth.

The lateral eruption of Mt St Helens in 1980 caused a large influx of sediment into surrounding areas; it was the watersheds to the north of the volcano which underwent the biggest changes.

The North Fork Toutle River is a tributary of the main Toutle River, just to the north of Mt St Helens, as a result it was buried in large levels of sediment due to the crater blast, with the majority of vegetation being wiped out.

Constant monitoring of the braided river system has been undertaken by the USGS, the U.S Army Corps of Engineering and Portland University in the case of vegetation growth, bankside stability and river base level.

These highly affected river systems result in the rapid movement of sediment downstream and without serious intervention and management, communities downstream of the North Fork Toutle River would be under threat of flooding. GeoVisionary offers a resourceful alternative or useful aid to current monitoring schemes helping the challenge of monitoring such a vast, fast changing environment.

VIRTALIS GEOVISIONARY

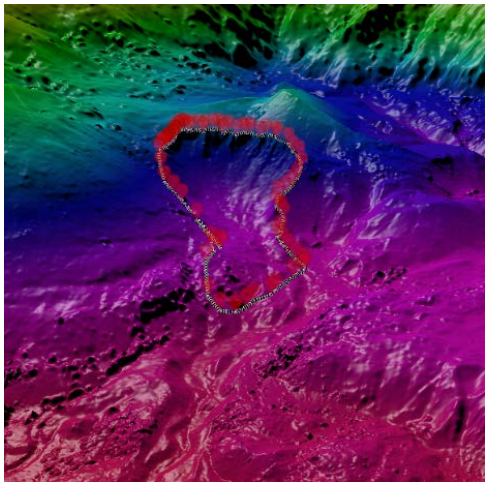


Figure 1 Area pre-landslip

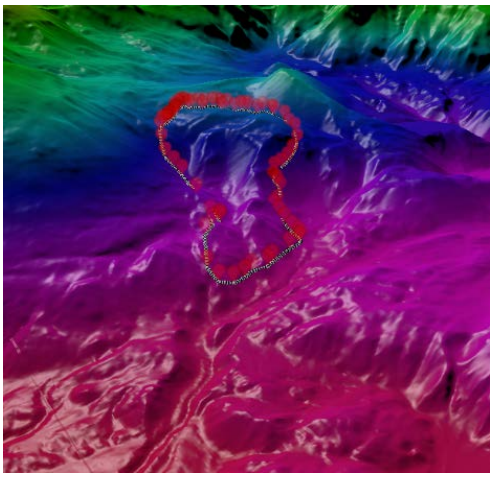


Figure 2 Area of landslip

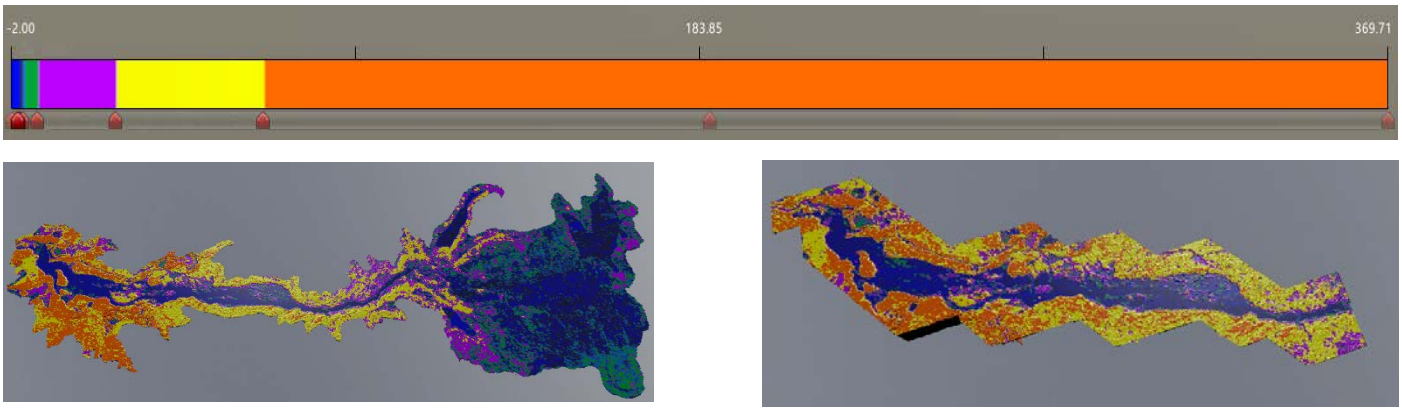


Figure 3 Vegetation Height in ft

The Challenge:

- Informing stakeholders on the vast range of opportunities available to them if they undertook 3D visualisation in their management of affected rivers, such as the communicating the results of current management strategies.
- Using GeoVisionary to monitor the variation in vegetation height along the river through time, coupled with terrain height and gradient data to understand areas of likely sediment movement. This allows scenario development with regards to future intervention using soft (vegetation) or hard (dams) infrastructure.
- To develop consistent data management and dissemination, incorporating surface and subsurface geology to identify which areas are likely to slip and result in an influx of sediment inflow to the river i.e. identifying high risk areas in need of management.

Further Information:

GeoVisionary was developed by Virtalis in collaboration with the British Geological Survey as Specialist software for high resolution visualisation of spatial data.

http://www.bgs.ac.uk/research/environmentalModelling/3dvisualisation.html

http://www.geovisionary.com/

http://lidarportal.dnr.wa.gov/

https://www.arcgis.com/features/index.html

Skills and Data Used:

● ArcGIS, Modelling, Spatial Analysis, Geology, 3D Visualisation, Biogeography.

● 1m DEM (LiDAR), 1m DSM (LiDAR) for North Fork Toutle River catchment area (Washington State Lidar Portal). Aerial Imagery.

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