BLUE MARBLE GEOGRAPHICS
MIND THE GAP BETWEEN WORLD AND MAP®

# Thurber Engineering Ltd.
## Engineering with Global Mapper

### BACKGROUND:

Thurber Engineering Ltd. is a Canadian consulting firm wholly-owned by senior practicing professionals. The company was founded in 1957 and has grown to employ over 300 engineers, geoscientists, and technologists in nine offices across Canada. The company provides a variety of geotechnical, geo-environmental, and construction materials engineering and testing services taking a multidisciplinary approach to work on problems related to earth, environmental, and materials science in a variety of industries across Canada.

Thurber staff includes a core group of senior principals, specialists, and practicing professionals who have many years of practical experience in a variety of technical specialties, as well as project staff including engineers, scientists, and technologists.

### CHALLENGES:

The engineers at Thurber use AutoCAD for drafting but also need a Geographic Information System for viewing data, pre-processing, and preparing data for use in AutoCAD and for analysis. They are strong believers in putting the computing power into the hands of the engineers; however this is not possible with expensive and complicated commercial GIS software.

One of the major components of the analysis work that Thurber undertakes is identifying geological landforms and assessing their suitability for a specific purpose. A GIS application is extremely useful for the following aspects of this terrain analysis:

- Aerial photo interpretation and landform mapping
- Site investigation
- Terrain visualization using digital elevation models and LiDAR
- Route selection for pipelines, roads, and power transmission lines
- Slope stability and setback lines
- Geo-hazard mapping and risk analysis
- Aggregate mapping and testing
- Field investigation (drilling, test pitting, geophysics)

CASE STUDY
## overview

### INDUSTRY:
Civil Engineering

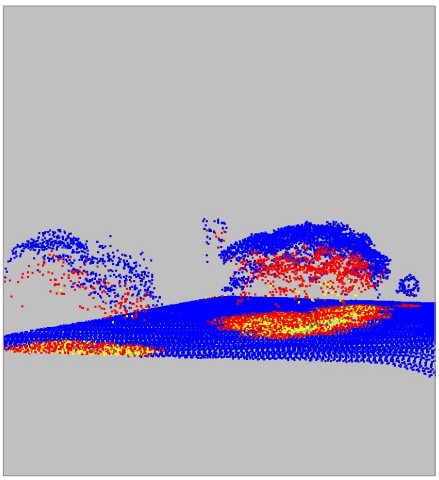
### CUSTOMER PROFILE:
Thurber Engineering provides geotechnical, environmental and construction materials engineering and testing services for a variety of industries. They are a Canadian company with nine offices across Canada offices in British Columbia, Alberta, Saskatchewan and Ontario.

### PRODUCT:
Global Mapper

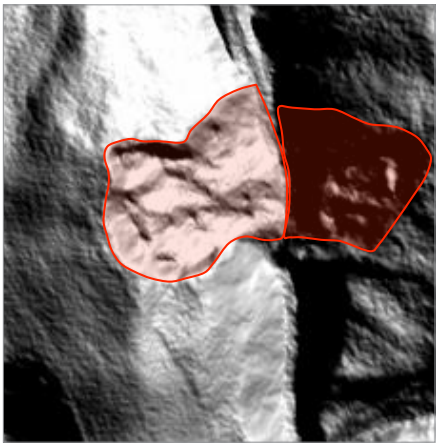
### CHALLENGES:
Finding a GIS solution that was affordable and easy to use

### SOLUTION:
Use Global Mapper to analyze and view data, as well as pre-processing and preparing data for use in AutoCAD

### BENEFITS:
Cost
Ease of Use
Speed
Functionality



Thurber Engineering uses Global Mapper to analyze LiDAR data to identify and assess the risk of hazards such as earthquakes, landslides, snow and rock avalanches, and debris flows.



Thurber engineers can qualitatively assess the data as an oblique view with the 3D Viewer and by applying hill shading.

Thurber needs an affordable GIS solution that can assist with all of these tasks.

## SOLUTIONS:

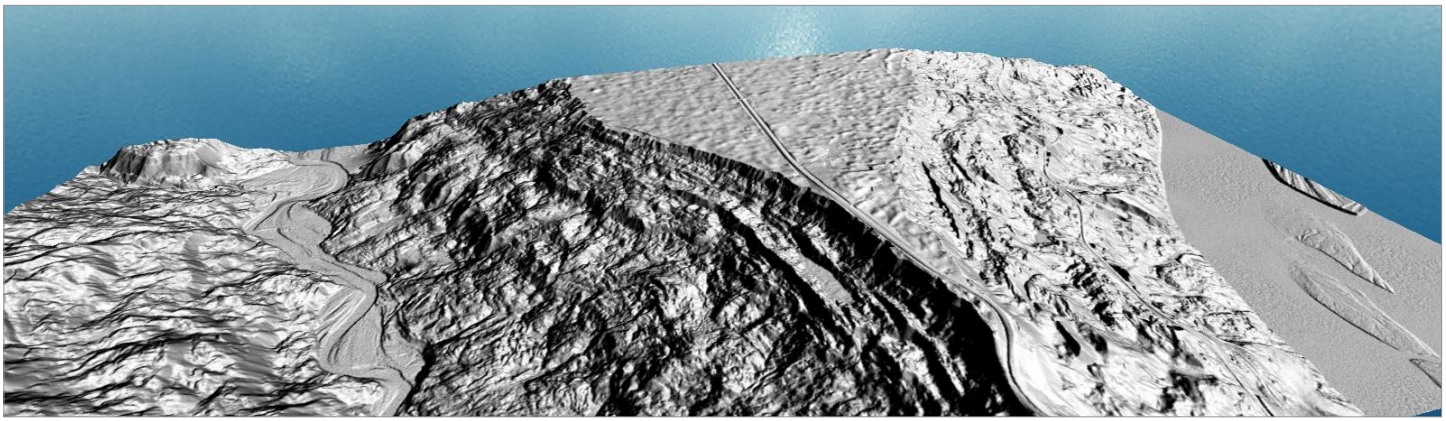
For over a decade, Global Mapper has developed a loyal following within the GIS community because of its ability to import and export over 250 data formats, including the AutoCAD formats that Thurber uses. Thurber has been a loyal customer since the earliest versions of the software and the number of users within the company has grown steadily over the years.

In addition to converting data for use in AutoCAD, Thurber uses the Global Mapper tools for site assessments, project planning, and for the terrain analysis tools, which are described in more detail in the example below. They have found that Global Mapper provides a better return on investment compared to other commercial GIS applications and with its flexible network licensing options, all of Thurber's engineers have access to the application when they need it.

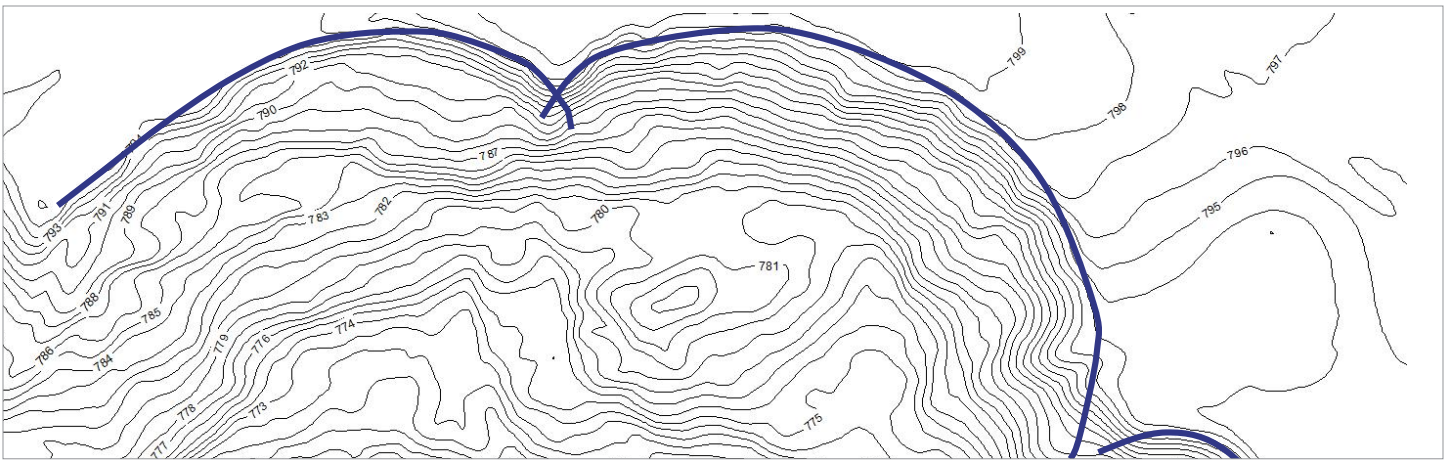
## EXAMPLE:

Thurber Engineering uses Global Mapper to analyze LiDAR data to identify and assess the risk of hazards such as earthquakes, landslides, snow and rock avalanches, and debris flows. LiDAR (LIght Detection and Ranging) is a remote-sensing technique that uses laser pulses to sample the earth's surface. The result is a dense set of points consisting of x, y, and z measurements that correspond to the objects encountered by the laser in the survey. A USGS study of the Seattle coastline (http://landslides.usgs.gov/docs/schulz/lidar_enggeo.pdf ) determined that the total number of landslides mapped using LiDAR is about four times that of previously published maps produced using aerial photographs, and the LiDAR-mapped landslides include all landslides depicted on those maps.

To map and characterize landslides Thurber looks for the distinct terrain characteristics, such as  an arcuate, bow-like or curved shape near crest



To map and characterize landslides Thurber looks for the distinct terrain characteristics, such as  an arcuate, bow-like or curved shape near crest of the slope along with a steep sloping section below.




Identification of the distinct landslide characteristics can be accomplished using Global Mapper's analysis tools, such as generating contours and finding ridgelines.

of the slope along with a steep sloping section below. They are also looking for irregular topography and overridden features.

Starting with LiDAR data, Thurber can generate digital elevations models in Global Mapper. These models are continuous surfaces of elevation data derived from the LiDAR elevations. If non-ground points are filtered from the dataset, the result is a terrain model that allows analysts to 'see through' the trees and view the landforms below.

Identification of the distinct landslide characteristics can be accomplished using Global Mapper's analysis tools, such as generating contours and finding ridgelines. Thurber engineers can qualitatively assess the data as an oblique view with the 3D Viewer and by applying hill shading and varying the azimuth of illumination, they can generate a different perspective of the terrain to view in the 2D and 3D maps.

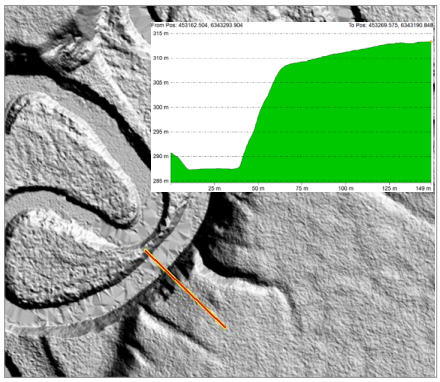
The elevation models are quantitatively analyzed using the Path Profile tool to generate cross-sectional views and by generating slope maps with the configurable shader options, including the Slope and the Slope Direction Shaders.

## BENEFITS:

Thurber has found the three most important things about Global Mapper to be:

- Cost
- Ease of use
- Speed

Thurber chooses to use Global Mapper above other products because of these reasons along with the powerful functionality that it offers. This single application meets all of the GIS needs of the organization. Bob Saunders from Thurber has found Global Mapper to have a "Huge return on investment compared to other commercial GIS applications.

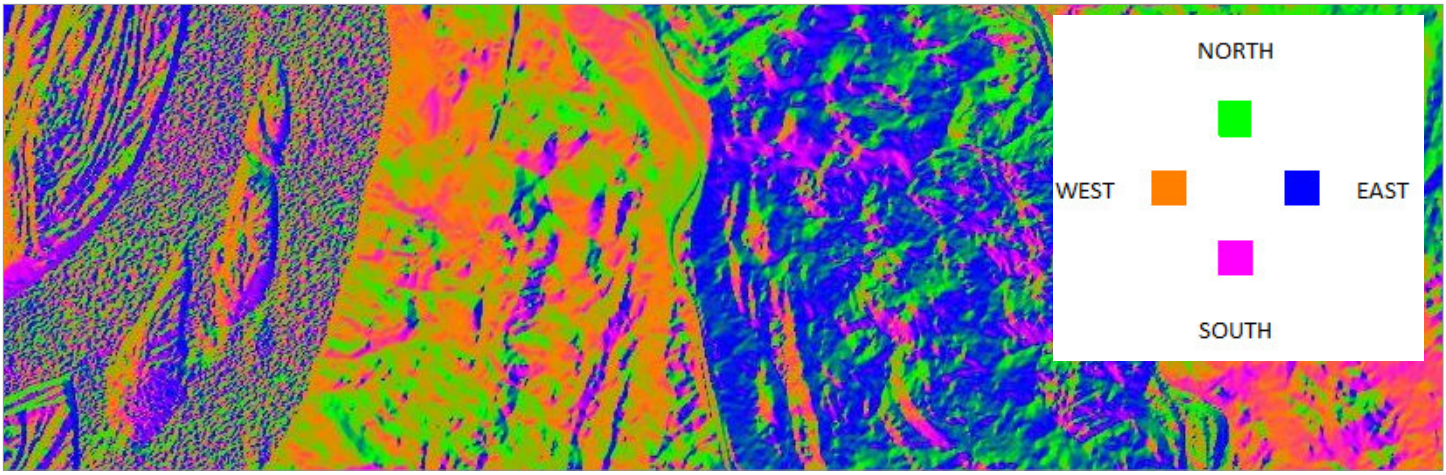


Thurber Engineering used the Path Profile tool to analyze cross-sections of the landscape.

## FROM THE BEGINNING

*Over half our jobs (in Calgary) use GM at some point even if it's as simple as processing GPS data and preparing a site plan for field work. We do terrain modeling with various DEM to design tailings ponds. I personally use it for geohazard identification (e.g. landslides).*

Bob Saunders
Senior Geotechnical Engineer
Thurber Engineering Ltd.




Thurber Engineering's elevation models are quantitatively analyzed by generating slope maps with the configurable shader options, including the Slope and the Slope Direction Shaders.

## THE BOTTOM LINE

*"We are strong believers in putting the computing power into the hands of the engineers. With expensive/ complicated GIS suites, this is not possible."*

Bob Saunders
Senior Geotechnical Engineer
Thurber Engineering Ltd.

We can put Global Mapper on a desktop for around $500 compared to $10,000. Site licensing means all engineers have access." Combined with ease of use, the speed of analysis and the functionality available, Global Mapper provides the most benefit for the cost.

## ABOUT THE PRODUCT:

Global Mapper is an affordable and easy-to-use GIS application that offers access to an unparalleled variety of spatial datasets and provides just the right level of functionality to satisfy both experienced GIS professionals and beginning users. Equally well suited as a standalone spatial data management tool and as an integral component of an enterprise-wide GIS, Global Mapper is a must-have for anyone who deals with maps or spatial data.

Key features in this case include: data conversion, 3D processing/analyzing tools (generating elevation models, contours, and ridgelines), configurable shaders, and the 3D Viewer.

## ABOUT BLUE MARBLE GEOGRAPHICS:

Trusted by thousands of GIS professionals around the world, Blue Marble Geographics is a leading developer of software products and services for geospatial data conversion and GIS. Pioneering work in geomatics and spatial data conversion quickly established this Maine-based company as a key player in the GIS software field. Today's professionals turn to Blue Marble for Global Mapper, a low-cost, easy-to-use yet powerful GIS software tool. Blue Marble is known for coordinate conversion and file format expertise and is the developer of The Geographic Calculator, GeoCalc SDK, Global Mapper, LiDAR Module for Global Mapper and the Global Mapper SDK.

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