Nova Scotia Department of Natural Resources
Mineral Resources Branch

Open File Map ME 2004-1

# Shaded Relief Map of Nova Scotia

Azimuth 315°, Altitude 45°, Vertical Exaggeration 10

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SCALE 1:500 000

10 0 10 20 30 40 50 kilometres

RECOMMENDED CITATION

Fisher, B.E., Poole, J.C., McKinnon, J.S. and Beaumont, J.A. 2004: Shaded relief map of Nova Scotia; Nova Scotia Department of Natural Resources, Mineral Resources Branch, Open File Map ME 2004-1, scale 1:500 000.

MAP NOTES

Universal Transverse Mercator (UTM) Projection, Zone 20, Central Meridian 63°00' West.

North American Datum (NAD) 1927.

Base and digital elevation data derived from the Nova Scotia Topographic Database (NSTDB). Copyright Her Majesty the Queen in Right of the Province of Nova Scotia. The NSTDB is available from Service Nova Scotia and Municipal Relations (SNSMR), Land Information Services Division (LIS), Nova Scotia Geomatics Centre (NSGC), Amherst, Nova Scotia.

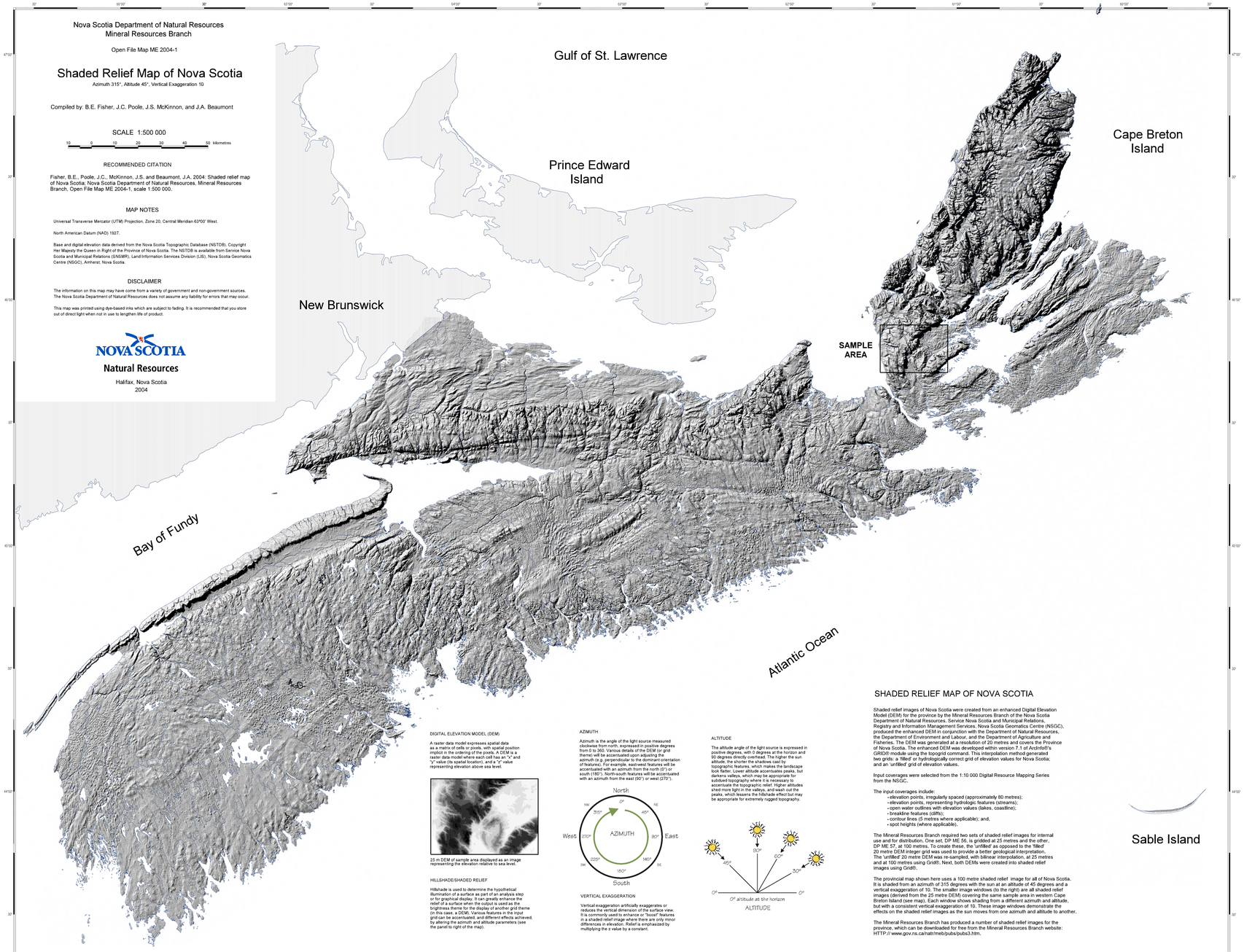
DISCLAIMER

The information on this map may have come from a variety of government and non-government sources. The Nova Scotia Department of Natural Resources does not assume any liability for errors that may occur.

This map was printed using dye-based inks which are subject to fading. It is recommended that you store out of direct light when not in use to lengthen life of product.

NOVA SCOTIA
Natural Resources

Halifax, Nova Scotia
2004




DIGITAL ELEVATION MODEL (DEM)

A raster data model expresses spatial data as a matrix of cells or pixels, with spatial position implicit in the ordering of the pixels. A DEM is a raster data model where each cell has an "x" and "y" value (its spatial location), and a "z" value representing elevation above sea level.



25 m DEM of sample area displayed as an image representing the elevation relative to sea level.

HILLSHADE/SHADED RELIEF

Hillshade is used to determine the hypothetical illumination of a surface as part of an analysis step or for graphical display. It can greatly enhance the relief of a surface when the output is used as the brightness theme for the display of another grid theme (in this case, a DEM). Various features in the input grid can be accentuated, and different effects achieved, by altering the azimuth and altitude parameters (see the panel to right of the map).

AZIMUTH

Azimuth is the angle of the light source measured clockwise from north, expressed in positive degrees from 0 to 360. Various details of the DEM (or grid theme) will be accentuated upon adjusting the azimuth (e.g. perpendicular to the dominant orientation of features). For example, east-west features will be accentuated with an azimuth from the north (0°) or south (180°). North-south features will be accentuated with an azimuth from the east (90°) or west (270°).




VERTICAL EXAGGERATION

Vertical exaggeration artificially exaggerates or reduces the vertical dimension of the surface view. It is commonly used to enhance or "boost" features in a shaded relief image where there are only minor differences in elevation. Relief is emphasized by multiplying the z value by a constant.

ALTITUDE

The altitude angle of the light source is expressed in positive degrees, with 0 degrees at the horizon and 90 degrees directly overhead. The higher the sun altitude, the shorter the shadows cast by topographic features, which makes the landscape look flatter. Lower altitude accentuates peaks, but darkens valleys, which may be appropriate for subdued topography where it is necessary to accentuate the topographic relief. Higher altitudes shed more light in the valleys, and wash out the peaks, which lessens the hillshade effect but may be appropriate for extremely rugged topography.



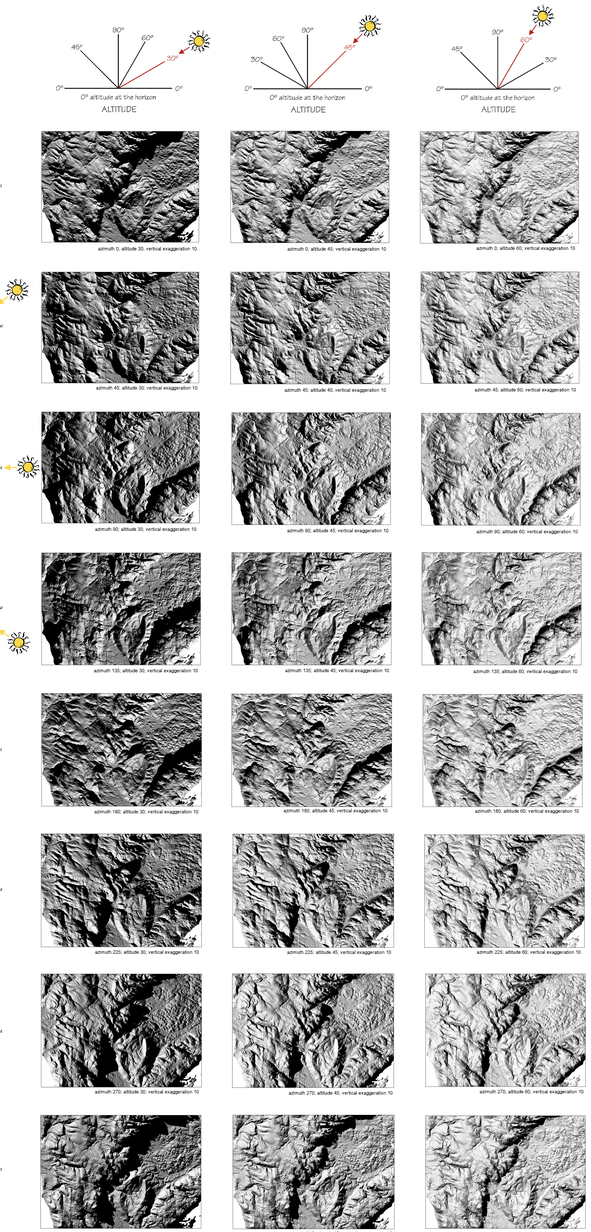

## SHADED RELIEF MAP OF NOVA SCOTIA

Shaded relief images of Nova Scotia were created from an enhanced Digital Elevation Model (DEM) for the province by the Mineral Resources Branch of the Nova Scotia Department of Natural Resources, Service Nova Scotia and Municipal Relations, Registry and Information Management Services, Nova Scotia Geomatics Centre (NSGC), produced the enhanced DEM in conjunction with the Department of Natural Resources, the Department of Environment and Labour, and the Department of Agriculture and Fisheries. The DEM was generated at a resolution of 20 metres and covers the Province of Nova Scotia. The enhanced DEM was developed within version 7.1 of Ardrishaf's GRIDdf module using the topogrid command. This interpolation method generated two grids: a 'filled' or hydrologically correct grid of elevation values for Nova Scotia; and an 'unfilled' grid of elevation values.

Input coverages were selected from the 1:10 000 Digital Resource Mapping Series from the NSGC.

The input coverages include:
- elevation points, irregularly spaced (approximately 80 metres);
- elevation points, representing hydrologic features (streams);
- open water outlines with elevation values (lakes, coastline);
- breakline features (cliffs);
- contour lines (5 metres where applicable); and,
- spot heights (where applicable).

The Mineral Resources Branch required two sets of shaded relief images for internal use and for distribution. One set, DP ME 56, is gridded at 25 metres and the other, DP ME 57, at 100 metres. To create these, the 'unfilled' as opposed to the 'filled' 20 metre DEM integer grid was used to provide a better geological interpretation. The 'unfilled' 20 metre DEM was re-sampled, with bilinear interpolation, at 25 metres and at 100 metres using GridIt!. Next, both DEMs were created into shaded relief images using GridIt!.

The provincial map shown here uses a 100 metre shaded relief image for all of Nova Scotia. It is shaded from an azimuth of 315 degrees with the sun at an altitude of 45 degrees and a vertical exaggeration of 10. The smaller image windows (to the right) are all shaded relief images (derived from the 25 metre DEM) covering the same sample area in western Cape Breton Island (see map). Each window shows shading from a different azimuth and altitude, but with a consistent vertical exaggeration of 10. These image windows demonstrate the effects on the shaded relief images as the sun moves from one azimuth and altitude to another.

The Mineral Resources Branch has produced a number of shaded relief images for the province, which can be downloaded for free from the Mineral Resources Branch website: HTTP://www.gov.ns.ca/natr/meb/pubs/pubs3.htm.