ArcticDEM

Background

The ArcticDEM (Arctic Digital Elevation Model) was developed through a National Science Foundation (NSF) – National Geospatial-Intelligence Agency (NGA) public-private initiative. It is a deliverable of the United States Chairmanship of the Arctic Council (April 2015 to April 2017). The effort joined multiple partners in innovation to produce the highest resolution (2-meter), highest quality pan-Arctic digital elevation map currently in existence and to make it widely available.

ArcticDEM was constructed from hundreds of thousands of high-resolution, stereo-optical images acquired between 2009 and 2017 by the DigitalGlobe constellation of satellites and licensed through NGA. The effort was carried out by the NSF-sponsored Polar Geospatial Center at the University of Minnesota. Largely automated data processing was performed on the Blue Waters supercomputer using optimized open source photogrammetry software SETSM. Each individual digital elevation model was vertically registered to satellite altimetry measurements from ICESat, resulting in absolute uncertainties of less than 1-meter over most of its area and relative uncertainties of decimeters.

This printed version displays an exaggerated hillshade of the ArcticDEM that has been downsampled by a factor of 40,000. Data gaps have been filled with the GTOPO30 digital elevation model for visual continuity. ArcticDEM's elevation data includes vegetation, tree canopy, buildings, and other man-made surface features.

The ArcticDEM can be downloaded at *arcticdem.org*.

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Authorship

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Map and visualization by Brad Herried[1], Paul Morin[1], Michael Cloutier[1]. Basemap data *Made with Natural Earth*, Esri, National Geospatial–Intelligence Agency.

Map for reference use only, not for navigation.

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Legend

- Mountain / Peak
- National Capital
- City / Settlement
- U.S. Research Station
- U.S. Logistics Hub

0 100 200 300 400 500 KILOMETERS

0 100 200 300 400 500 MILES

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