

HPC Profiles in Leadership

ArcDEM Project: Responding to Climate Change

Earl Joseph, Steve Conway, Bob Sorensen, and Kevin Monroe
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HYPERION RESEARCH OPINION

The ArcDEM project is a response to the need for high quality elevation data in remote locations, the availability of technology to process big data, and the need for accurate measurement of topographic change. ArcDEM will encompass all land area north of 60°N. In addition, coverage will include all territory of Greenland, the State of Alaska in entirety, and the Kamchatka Peninsula of the Russian Federation.



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SITUATION OVERVIEW

The Obama Administration issued an executive order calling for improved geospatial mapping of the Arctic region, including high-quality elevation data in remote locations, the technology to process big data, and accurate measurement of topographic change. The National Geospatial-Intelligence Agency (NGA), the National Science Foundation (NSF), and the University of Minnesota's Polar Geospatial Center (PGC) collaborated on this project that used the Blue Waters supercomputer at the National Centers for Supercomputing Applications (NCSA). The scope of the project included Alaska and will expand to include the entire Arctic by the end of 2017. ArcticDEM has also started to map the Antarctic region.

WHY THIS HPC INNOVATION IS IMPORTANT

The primary innovation of the ArcticDEM Project was processing satellite data to develop high-resolution topographic maps of the Arctic that for the first time provide consistent coverage needed to help combat climate change. ArcDEM has reduced the price of this kind of research by three orders of magnitude, costing \$2.5 million versus an estimated \$4 billion it would have cost using traditional methods. "Doing this in the traditional airborne manner is impossible. If it was, it would have cost about \$4 billion. Similar savings are expected in the Antarctic project.

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Headquarters

365 Summit Avenue
St. Paul, MN 55102
USA
612.812.5798
www.hpcuserforum.com

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