FOR IMMEDIATE RELEASE   No.2018-24
Sept. 5, 2018

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NGA imagery, expertise critical to first hi-res Antarctica map

SPRINGFIELD, Virginia – The National Geospatial-Intelligence Agency provided imagery and expertise for the recent release of the first Reference Elevation Model of Antarctica, providing an 8-meter terrain map of about 98 percent of the contiguous continental landmass.

Similar to the Arctic DEM project completed in September 2017, the REMA is a mosaic constructed from hundreds of thousands of individual stereoscopic digital elevation models extracted from pairs of submeter-resolution DigitalGlobe satellite images, most of which were collected in 2015 and 2016 and licensed by NGA.

The Antarctic REMA team used an algorithm extensively tested by NGA experts and matured during the Arctic DEM project to process the images into DEMs, said Brian Bates, NGA data scientist and project team lead.

The REMA mosaic extends from just short of the South Pole at about 88 degrees south latitude to around 61 degrees south latitude. It is compiled from multiple strip DEMs that were co-registered, blended and feathered to reduce edge-matching artifacts. The DEM strips are time stamped to allow users to perform change detection analysis and compare observations of topography data acquired in different seasons or years.

The model was generated using the Blue Waters supercomputer at the University of Illinois at Urbana-Champaign and by applying specialized techniques using open-source software developed at the Byrd Polar and Climate Research Center at Ohio State University. The National Science Foundation awarded the project, and the Polar Geospatial Center at the University of Minnesota provided support. Esri produced the REMA viewer.

For more information, download instructions, maps and viewers visit the REMA website.

Approved for public release: 18-789

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