

Automated Production of High Resolution Commercial Imagery Mosaics of Antarctica

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As the amount of high-resolution commercial satellite imagery of Antarctica increases, the need for user-friendly access to the data for the scientific community has become urgent. The Polar Geospatial Center (PGC) developed a method of automatically sorting and overlaying the imagery in its archive to create tiled image mosaics with 50 cm resolution. Input images are orthorectified to a DEM to correct for terrain displacement and converted to top-of-atmosphere reflectance to color match images as much as possible. They are sorted by measurements of image quality, including cloud cover, sun elevation angle, off-nadir angle, and camera exposure settings. Lower quality imagery is removed from the final product in the merging stage. By eliminating redundant data caused by overlaps and by reducing the number of files, the final product is smaller, faster, more portable, and much easier for non-image scientists to use than the original imagery. The tiled mosaic product can be published as a web service, facilitating access to high-resolution imagery of remote areas by scientists and operations support staff with no GIS or remote sensing training. So far, 30% of West Antarctica has been mosaicked with this process on our compute cluster, at a rate of 50,000 square kilometers per day.