Guide: Case Study: Commercial Satellite Imagery
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Real-world example scenario of commercial imagery use from PGC.

In This Scenario

This case study will document an Antarctic research group and a request for commercial imagery in preparation for their upcoming field season.

This example elicits a typical support scenario that PGC provides. Commercial imagery is an integral data source for core PGC users, providing a solution for high-resolution mapping and logistics planning.

Background

The Polar Earth Observing Network (POLENET) is a National Science Foundation-funded research group with researchers from several universities across the United States.

POLENET deploys an array of GPS and seismic sensors across the polar regions, many of which are in very remote locations.

POLENET sensors deployed in a remote location of Antarctica *Source: © POLENET*

Each year, the POLENET team must visit the instrument sites by fixed-wing aircraft to perform routine maintenance, fix (or dig out) equipment, and download scientific data. Deploying from a central location within the array, many sites are visited by snowmobile.

Imagery Request

In preparation for their field season, POLENET requested commercial satellite imagery from the PGC.

Initial Request

The POLENET Principal Investigator reached out to her PGC Primary Contact Mike Cloutier in July via email. The initial request included the details of POLENET's upcoming field season (they were going to be deploying to Antarctica the next December and January) and an Excel spreadsheet with names and geographic coordinates (latitude and longitude) of the 33 sites they planned to visit in the season.

The request was fairly straightforward: POLENET requested panchromatic (black and white), cloud-free imagery collected within the last 12 months for their planned sites. There was no specific sensor (e.g. Worldview-2) requested, so any imagery in the PGC archive would suffice.

PGC Response

First, PGC User Services confirmed the NSF award for POLENET was still active and the gropu was eligible to receive support and imagery from PGC (it was). In order to determine the imagery processing options, such as orthorectification and projection, PGC discussed with the PI and her graduate students the purpose of the imagery.

The imagery was going to be used for visual analysis in GIS software. Particularly to determine:

- Site assessment: Is any of the science equipment visible in the imagery? Is it buried?
- Site reconnaissance: What are the ground (ice) conditions near the sites?
- Site safety: Are there any potential hazards near the sites that would prevent snowmobile travel?

PGC confirmed with the group that it would provide a standard imagery product for this type of purpose including orthorectification, projection to an Antarctic coordinate system, and conversion to GeoTIFFs for use in GIS software.

Imagery Search

Based on the imagery criteria, PGC searched its archive of imagery for the 33 sites. The result was promising: imagery had been collected (and was in the PGC archive) for all but 5 of the sites.

Delivery

In about a week, PGC processed and delivered the initial batch of imagery.

A total of 71 GeoTIFFs were delivered to the PI's FTP location on PGC servers for download. Included with every delivery is documentation, an index shapefile, and the imagery itself, all organized in a consistent folder and naming structure.

The PI then downloaded the delivery contents to her local machine and copied it to an external hard drive that the team (grad students, safety mountaineers, etc.) could share and use for this project.

Continued Support

POLENET requested imagery several months before their field season started, which allowed ample time for field season planning and additional imagery collection.

Because there was no imagery collected for 5 of the sites, the locations were then tasked for collection by the satellites at the start of the Antarctic field season (when it is sunny).

A month prior to deployment, POLENET followed up with PGC to see if the missing sites had been collected. Each of the sites was collected, but one of them only had imagery that was completely cloudy. The new imagery was processed and delivered before the team deployed.

Outcome

The POLENET team had a successful season (even with battling the unpredictable Antarctic weather) and the satellite imagery was critical for field planning.

POLENET not only used the satellite imagery prior to deployment, but also made their own maps for reference and navigation using the imagery as a basemap for use in the field. The imagery was also used in the field to verify the plan and have for visual reference if any of the plans changed.

Without the support of PGC, POLENET would have operated with less awareness of their sites and relied on outdated or less detailed satellite imagery. More time consuming, expensive, or potentially dangerous reconnaissance would have been necessary.