United States Antarctic Program

Report to SCAGI of 2016-17 activities.

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SCAR-SCAGI 2017
Alfred Wegener Institute
Bremerhaven, Germany
June 12, 2017
USAP Science & Logistics Support

Maps & satellite imagery to support research groups, led by PGC User Services
40+ groups supported, research locations across the continent

PGC staff deployed to McMurdo Station from October through February

Highlights

- Shackleton Glacier Camp (SHG) first science season
- Pirrit Hills (J. Stone) traverse & drilling support
- RAID (J. Goodge) traverse & drilling support
- Helicopter and fixed-wing operations planning maps
- South Pole Traverse and USAP Vessel tracking maps
- U.S. Air National Guard LC-130 landing site planning maps & imagery
- SCAGI 1:1,000,000 Air Operations map contribution (Maps 11-16)
Air Operations Map Series

http://maps.apps.pgc.umn.edu/antarctica/20/17
COMMUNITY PROJECTS
Antarctic Flight Information Manual (AFIM)

Initial release: September 2016

- **COMNAP Data Dashboard**
  - Online database entry for Managers of National Antarctic Programs (MNAPs)
  - Operator information, facilities, airfields, communications

- **Release**
  - Digital, version-controlled document
  - Ask your national program for access

- **Future Plans**
  - Subsequent releases annually (or as needed)
  - Database expansion for more COMNAP/ATS datasets
COMNAP Antarctic Facilities

Initial Release: April 2017 (v1.0.0)

- Data Curation
  - Managed by COMNAP (Data Dashboard)
  - PGC provides GIS data formats (shapefile, GeoJSON, KMZ, GDB, WMS, WFS)

- Release
  - Data on PGC GitHub
    - [https://github.com/PolarGeospatialCenter/comnap-antarctic-facilities](https://github.com/PolarGeospatialCenter/comnap-antarctic-facilities)
  - Integrated into Quantarctica (v3)

- Future Plans
  - Releases and updates as needed
PGC Map Catalog

June 2017: 1,700+ Antarctic maps

- New Collections
  - Byrd Polar Research Center archive
  - U.S. NGA / Defense Mapping
  - Many more...

- New Map Browse Site
  - New design & functionality: [http://maps.apps.pgc.umn.edu](http://maps.apps.pgc.umn.edu)
  - Maps available as TIF, PDF, JPG, GeoTIFF

- Future Plans
  - Metadata integration with SCAR Map Catalogue (U.S.-produced maps)
  - Continued scanning, georeferencing, cataloging
  - Map-based (geographic) search for PGC Map Catalog
TIME Magazine
“Conquest of Antarctica”
1956

PGC Map Catalog

http://maps.apps.pgc.umn.edu/id/1209
French Antarctic Expedition
1908-1910
PGC Map Catalog

Argentina
“Isla Decepción”
1968

http://maps.apps.pgc.umn.edu/id/1073
Antarctic Placenames

U.S. Advisory Committee on Antarctic Names (US-ACAN)

- **Named features (2016-2017)**
  - 12 new features
- **Placename Coordinate Improvement**
  - PGC continues to improve geographic coordinates
  - As of June 2017: Improved 10,262 of 14,126 features (72.6%)
  - ACAN review PGC work via web application
- **Future Plans**
  - Liaise with SCAGI members
  - Active participation in Antarctic placename working group
  - Provide elevation data for placename improvement
ANTARCTIC ELEVATION
McMurdo Dry Valleys LiDAR

Progress
June 2017

Released:
2-meter mosaics

Upcoming:
LAS point cloud release
Aerial photography

https://www.pgc.umn.edu/data/elevation
**tangent: ArcticDEM**

**June 2017: Release 5**

- **Statistics**
  - 50,000+ 2-meter strip DEMs
  - 50,000,000+ km²
  - 1,700+ 8-meter tile mosaics

- **Future Releases**
  - September 2017: Release 6
  - 2018: Final Release v3.0

https://www.pgc.umn.edu/data/arcticdem

Sorry Yngve, we’re getting there...
Reference Elevation Map of Antarctica (REMA)

Project commenced June 2016

- **Background**
  - Principal Investigator: Ian Howat, Ohio State University
  - Data processing with PGC and NSF Blue Waters supercomputer using the SETSM stereo extraction algorithm
  - Source data: 60,000+ stereoscopic, high-resolution commercial satellite imagery pairs

- **Data Description**
  - Freely-available 8 meter resolution elevation model for Antarctica
  - With ground control: relative accuracy of 1 meter
  - Mosaicked product: best pixel available; time-dependent strips also

- **Release**
  - 2018?
Reference Elevation Map of Antarctica (REMA)

Progress
June 2017

Complete:
75% data processed

Current Work:
QA/QC
Remaining 25%

Final Steps:
Co-registration
IceSAT ground control
Mosaicking
Tiling

REMA hillshade representation (4x exaggeration)
McMurdo Dry Valleys Composite DEM

Tiled Composite Mosaic
June 2017

Source Data:
2-meter LiDAR (2014-15)
257 VHR stereo-derived DEMs

Metadata:
2 meter horizontal resolution
WGS84 ellipsoidal heights
Coregistered to LiDAR with <1m accuracy
~100 GB in 24 tiles

Availability:
Not license restricted! Contact PGC.
Web service?
McMurdo Dry Valleys Composite DEM

McMurdo Station

Scott Base
McMurdo Dry Valleys Composite DEM

Labyrinth

McMurdo Dry Valleys
McMurdo Dry Valleys Composite DEM

Garwood Valley

McMurdo Dry Valleys
Closing Remarks & Discussion Questions

High Resolution Elevation
PGC can release elevation without license restrictions. Useful for improving placename coordinates. How does the community want to obtain & use REMA?

Map Catalog
PGC will integrate metadata of non-duplicate maps into SCAR Map Catalogue. Great resource!

SCAR CGA
Defer all new naming efforts and policies to US-ACAN. Broaden discussion of online, map-based tools for increased collaboration. Must determine level of effort from all interested parties.

New PGC Website!
https://www.pgc.umn.edu
Thank you!

Questions?

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