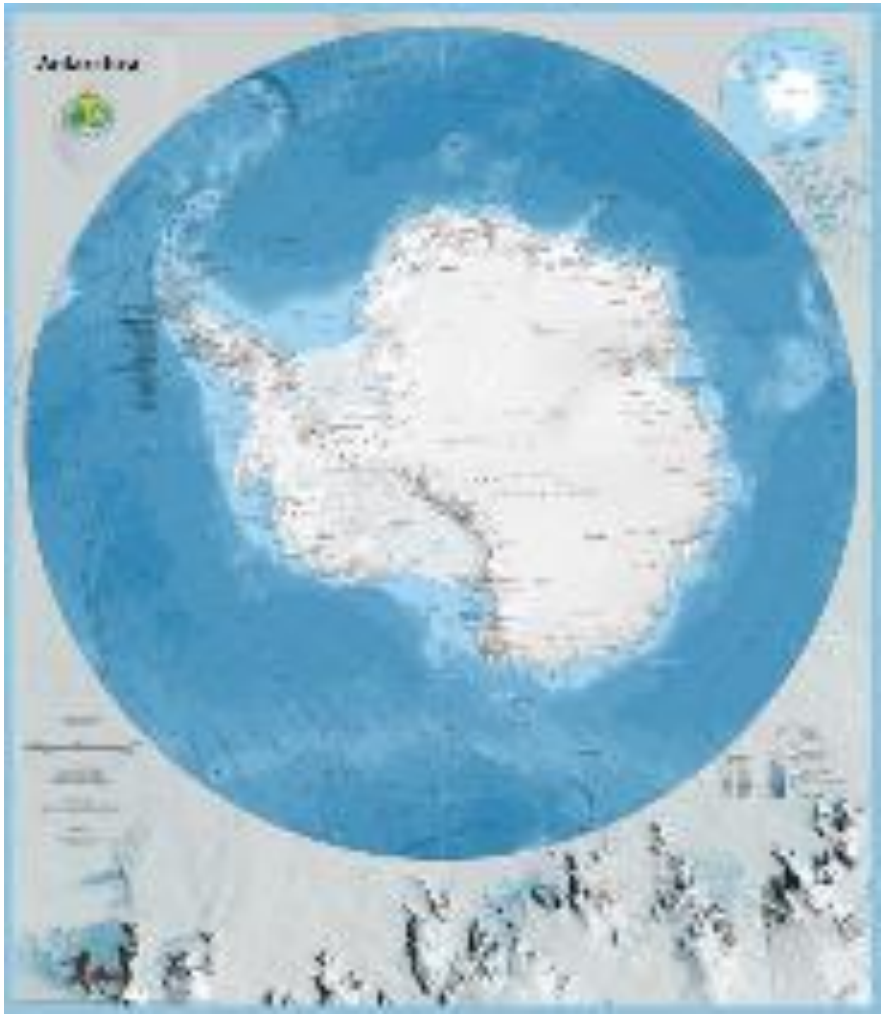
Current Norwegian mapping activities in Antarctica

- New map of the Antarctica
- New map of Dronning Maud land
- Air Operation map series
- Quantarctica

New map: Antarctica

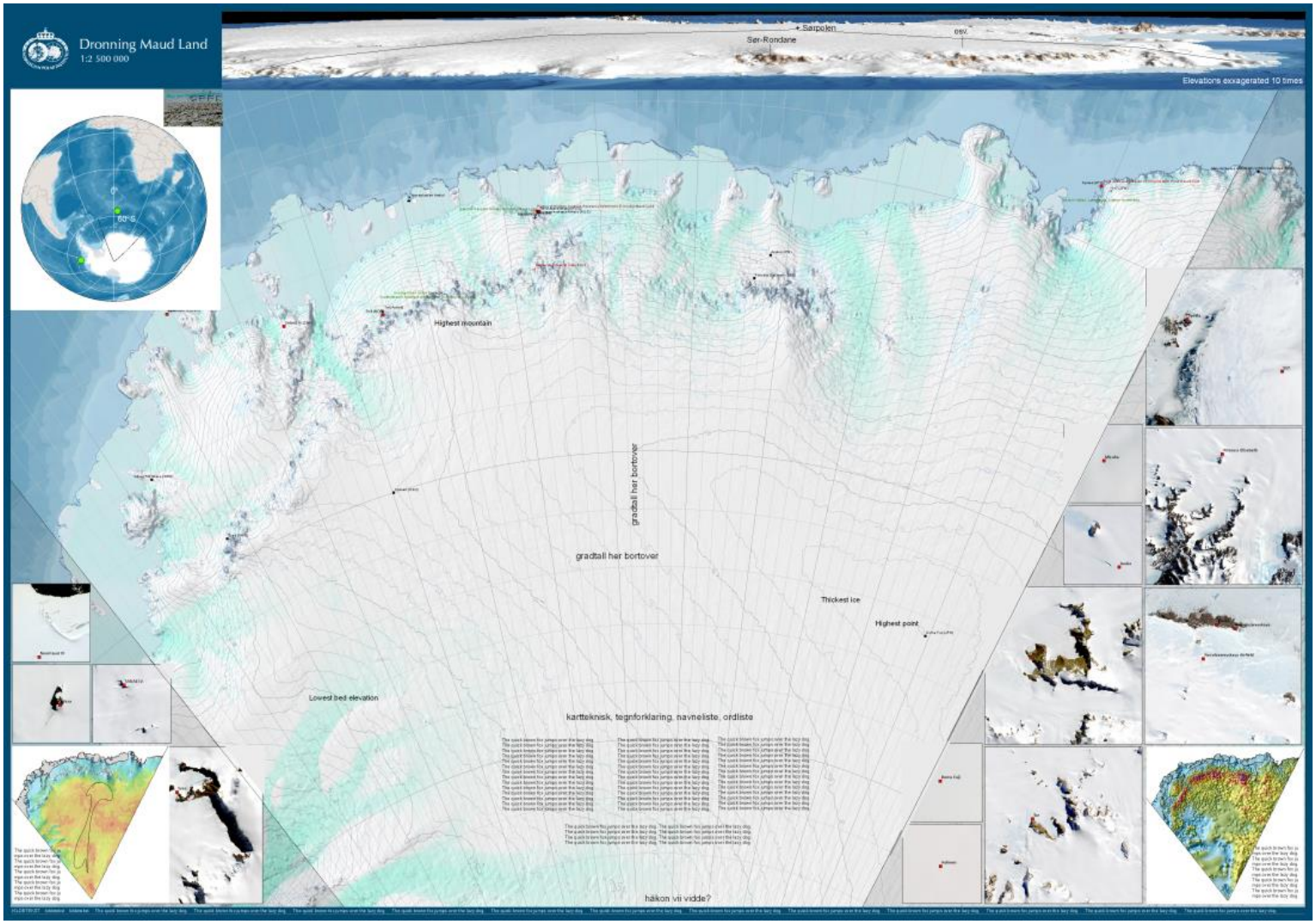
- - Wall map at scale 1:10 000 000
- - Many data sources
- - SCAR ADD (coastlines, ice shelves, bare land)
- - ERS-1/ICESat (DEM for land hillshade, hillshade somewhat edited)
- - RAMP (RADARSAT mosaic for lacking hillshade south of ~86 dgr)
- - IBCSO and ETOPO1 (DEMs for ocean floor hillshade and depth)
- - COMNAP (facilities)
- - SCAR gazetteer
- - GEBCO gazetteer (ocean floor features)
- - LIMA (poster backdrop)
- ... etc-
- - Place names: Used names approved by claimant countries within claimant sectors. Used BAS approved names within BAT. Used US names where missing claimant names.
- - 2 months' work (perhaps 50/50 on compilation and design, and quality assurance)



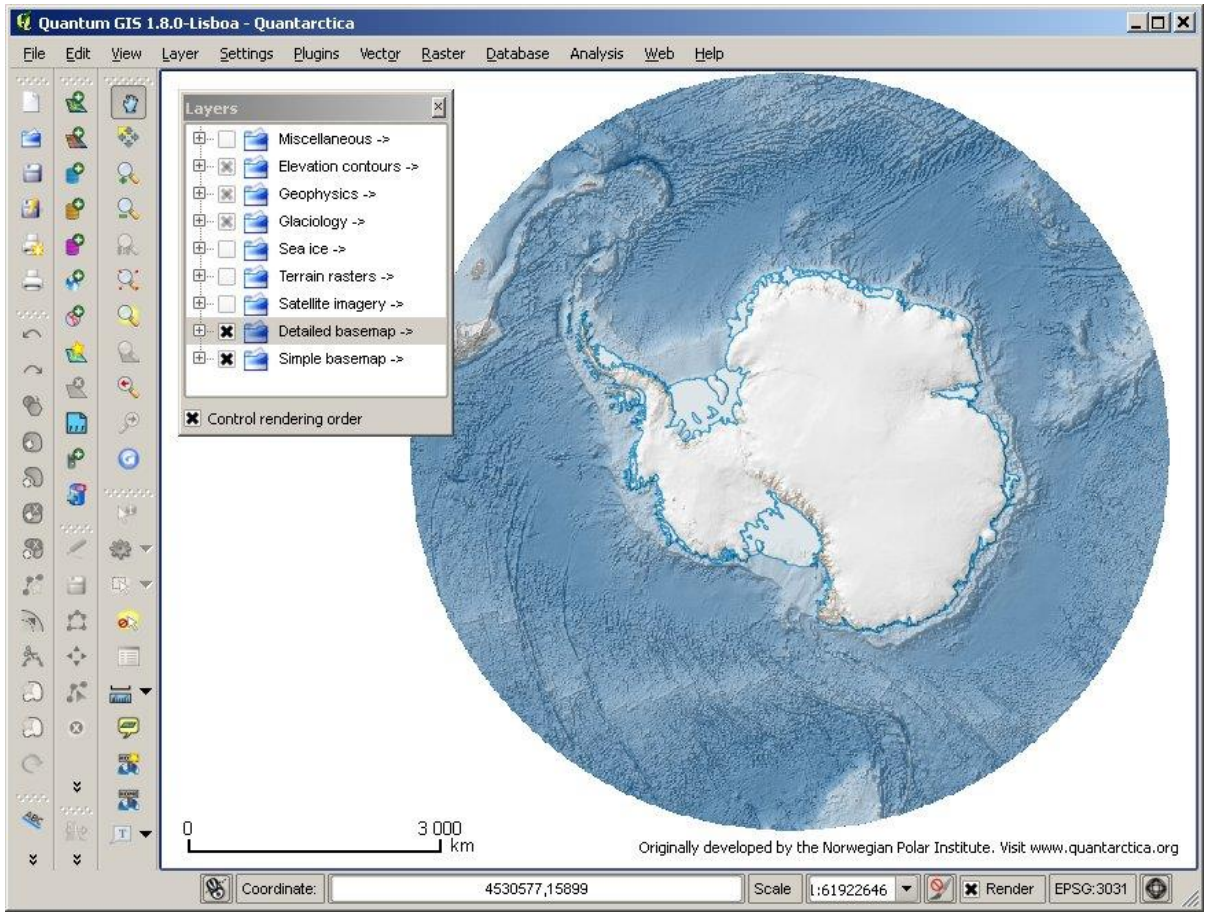
Upcoming map of Dronning Maud Land

- - Wall map at 1:2 500 000
- - Including Landsat8 views from station areas at 1:250 000
- - Including blue ice and ice flow effects, bed elevation and ice thickness
- - Including 3D overview map
- - Effort to merge DEMs (ASTER GDEM and ERS-1/ICESat, respectively good at outcrops and ice plains)
- - Digitizing of rock outcrops from Landsat8 imagery, cooperation with the DML geological map compilation project.
- - Likely output of new data to ADD: elevation contours and rock outcrops (and perhaps lakes and moraines)

Dronning Maud Land



Quantarctica: A free GIS package for research, education, and operation in Antarctica



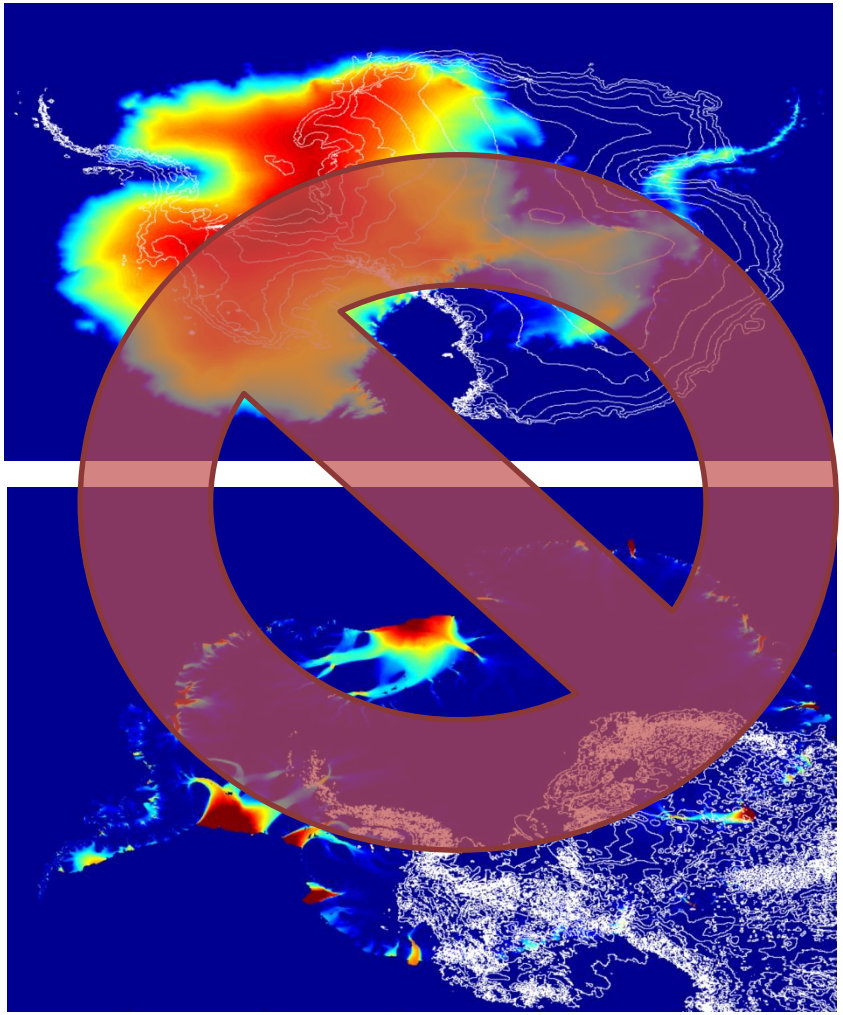
Quantarctica

- Works with free software QGIS (former Quantumn GIS).
- Includes a range of geographical data.
- Requires no internet access for the daily use, i.e. suitable for operation in Antarctica.
- Is able to plot GPS-provided current positions together with GIS layers.

Nice for research/operation in Antarctica as well as education.

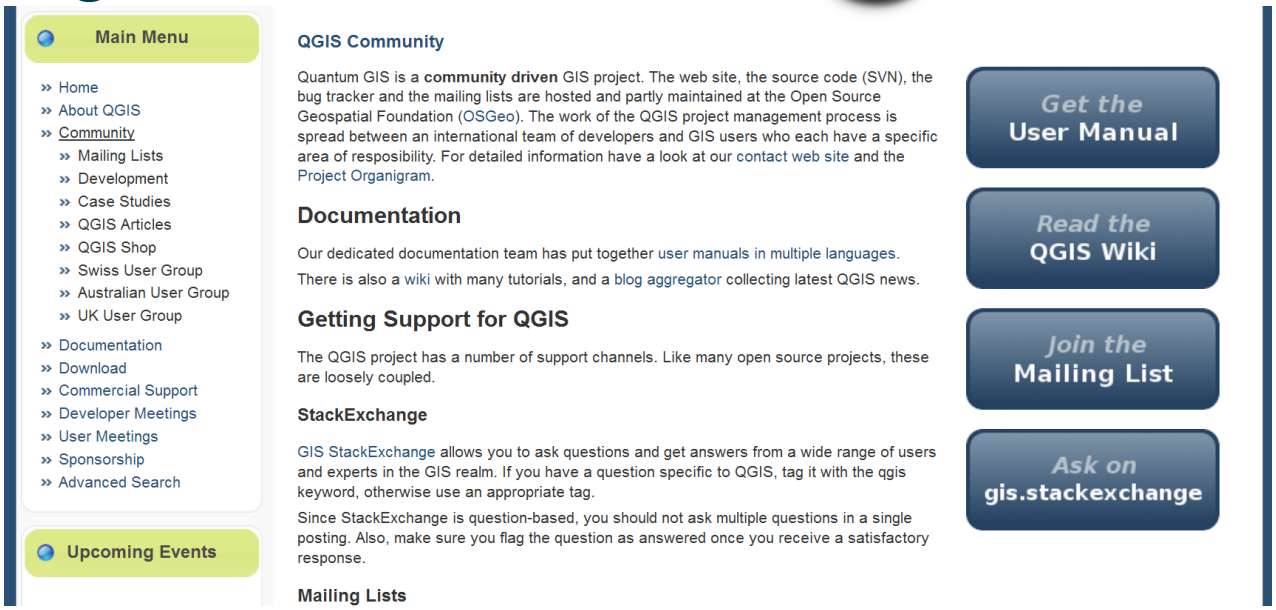
What’s really unique?

- Uniform map projection for all datasets
- Optimized file size for satellite images
- Sophisticated cartography
- Capabilities to add your own data layers on Quantarctica and make your own GIS package.



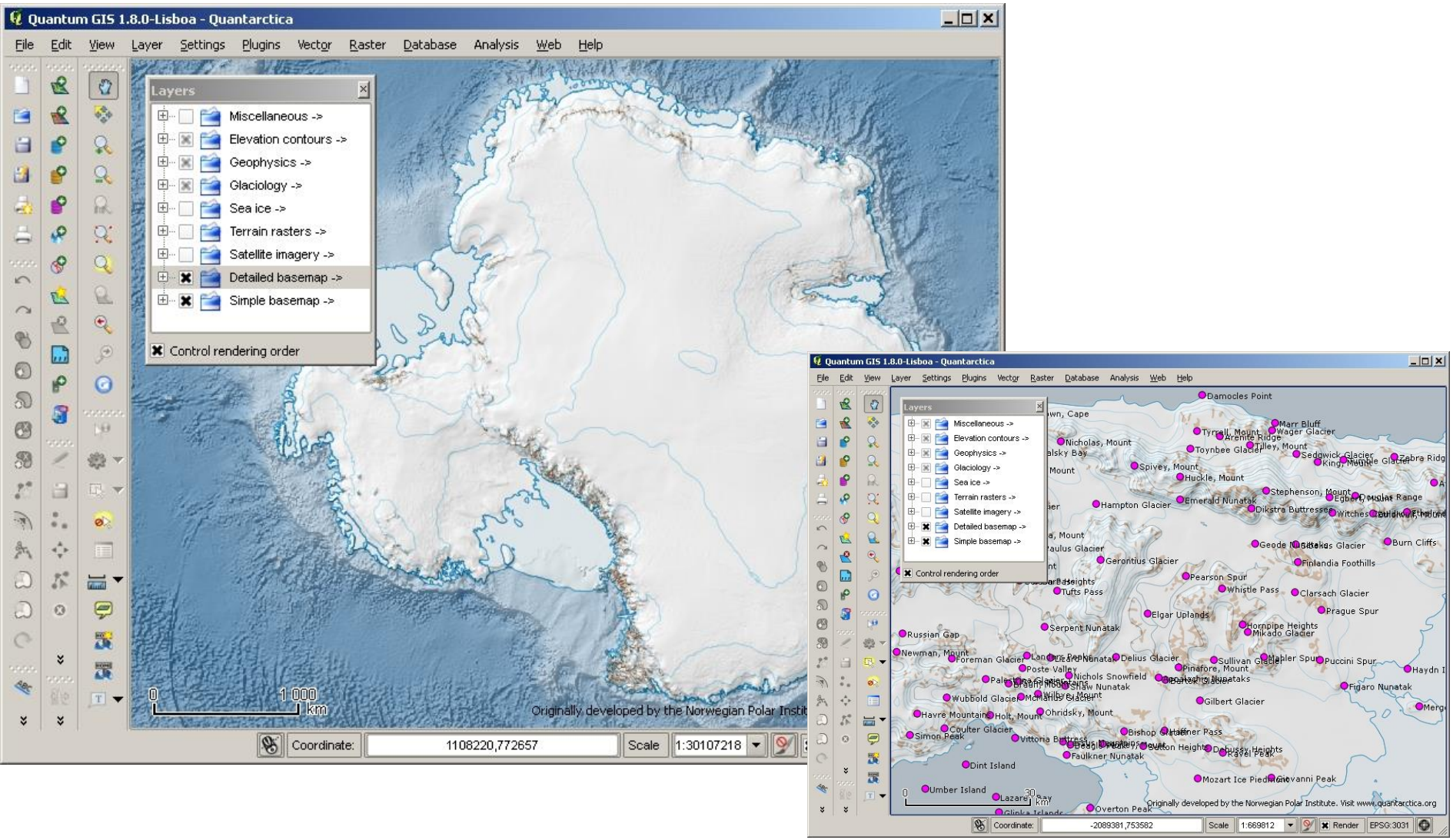
QGIS (former Quantum GIS)

- Open source (GNU)
- First release in 2002.
- Regular updates.
- Numerous plugins.
- Active community support.



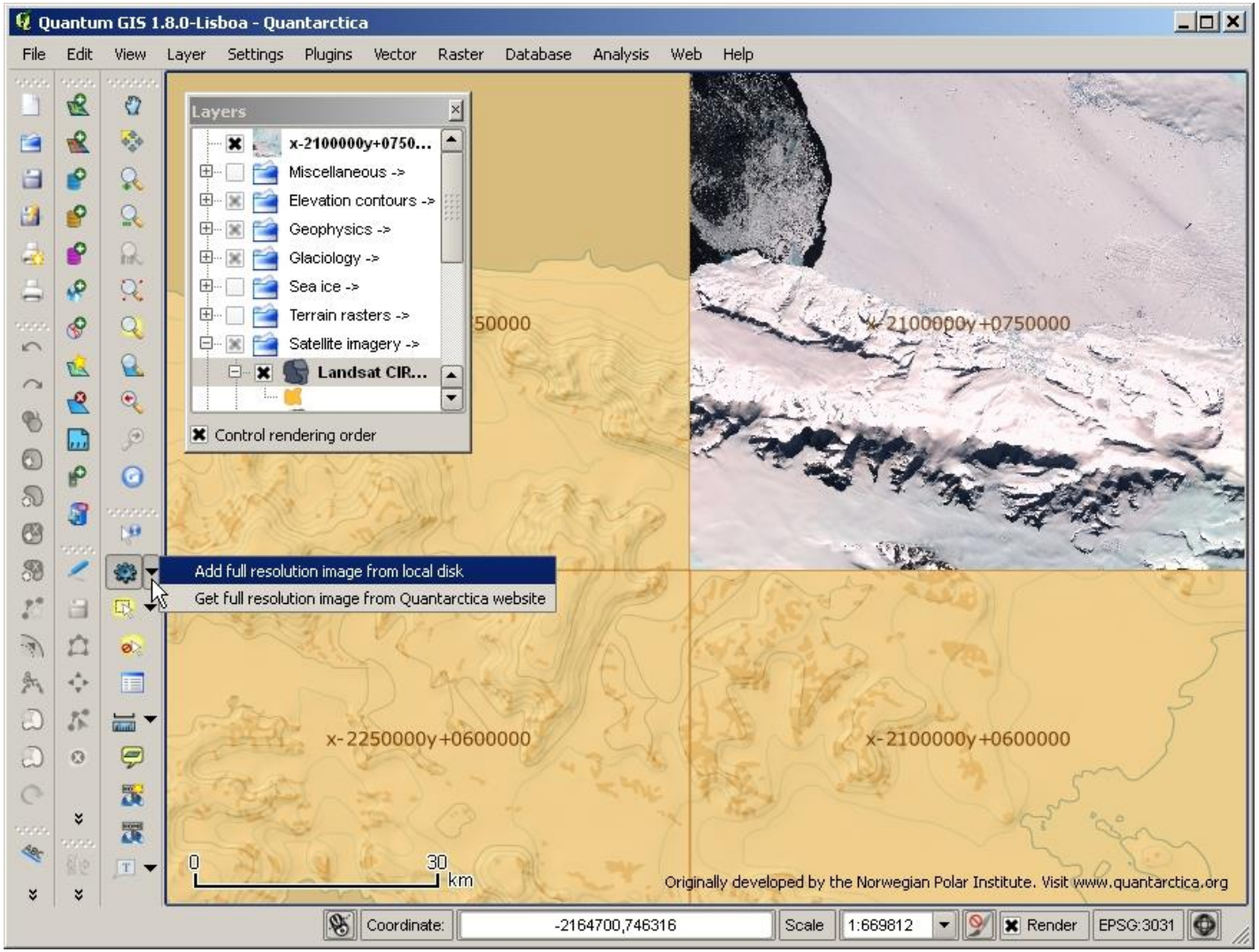
http://www.qgis.org/

Screenshot: detailed basemap



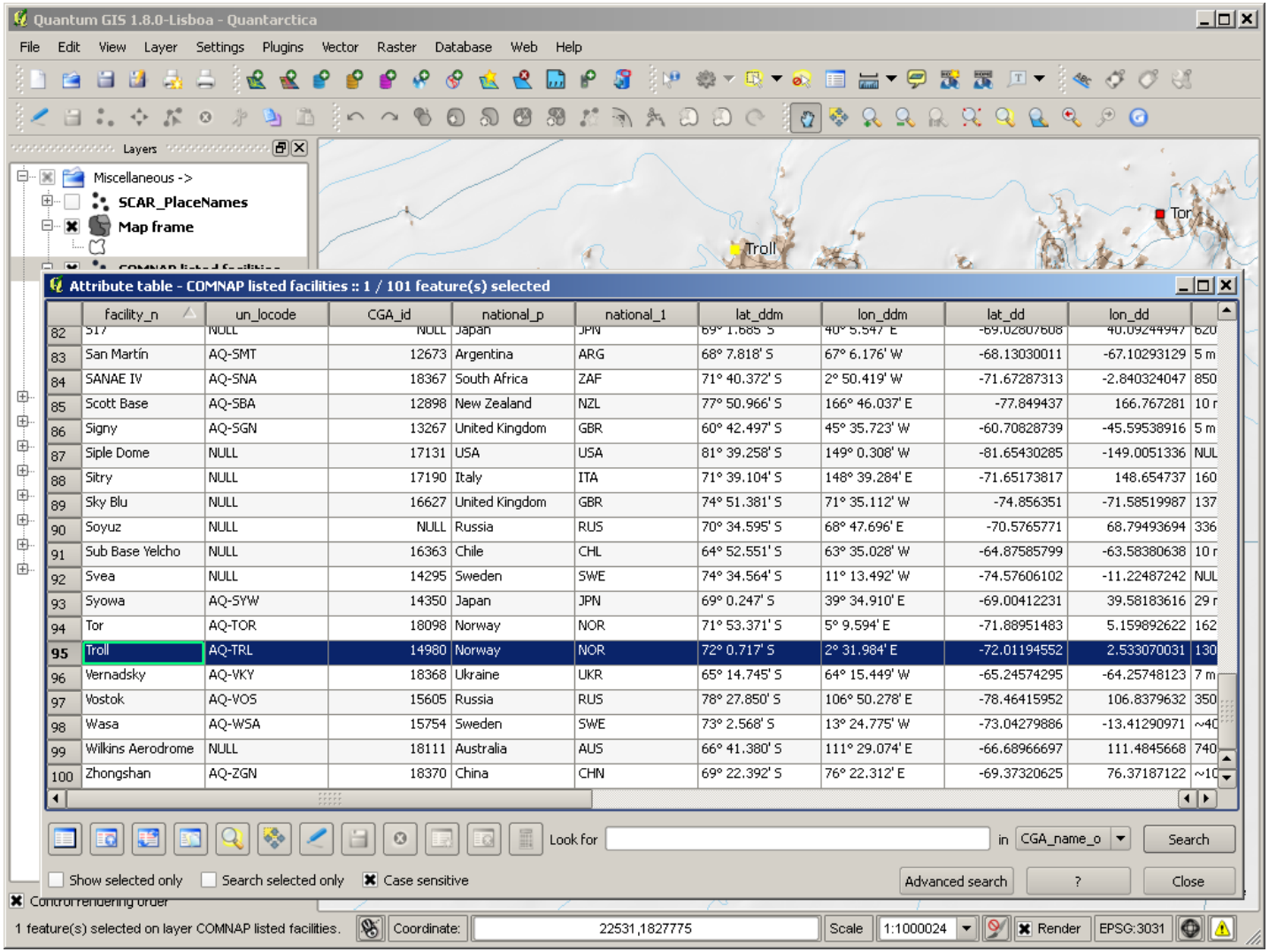
You have simple continet-wide and informaiton-rich close-up views.

Import of high-res satellite images



High-resolution satellite imagenary can be imported with few clicks.

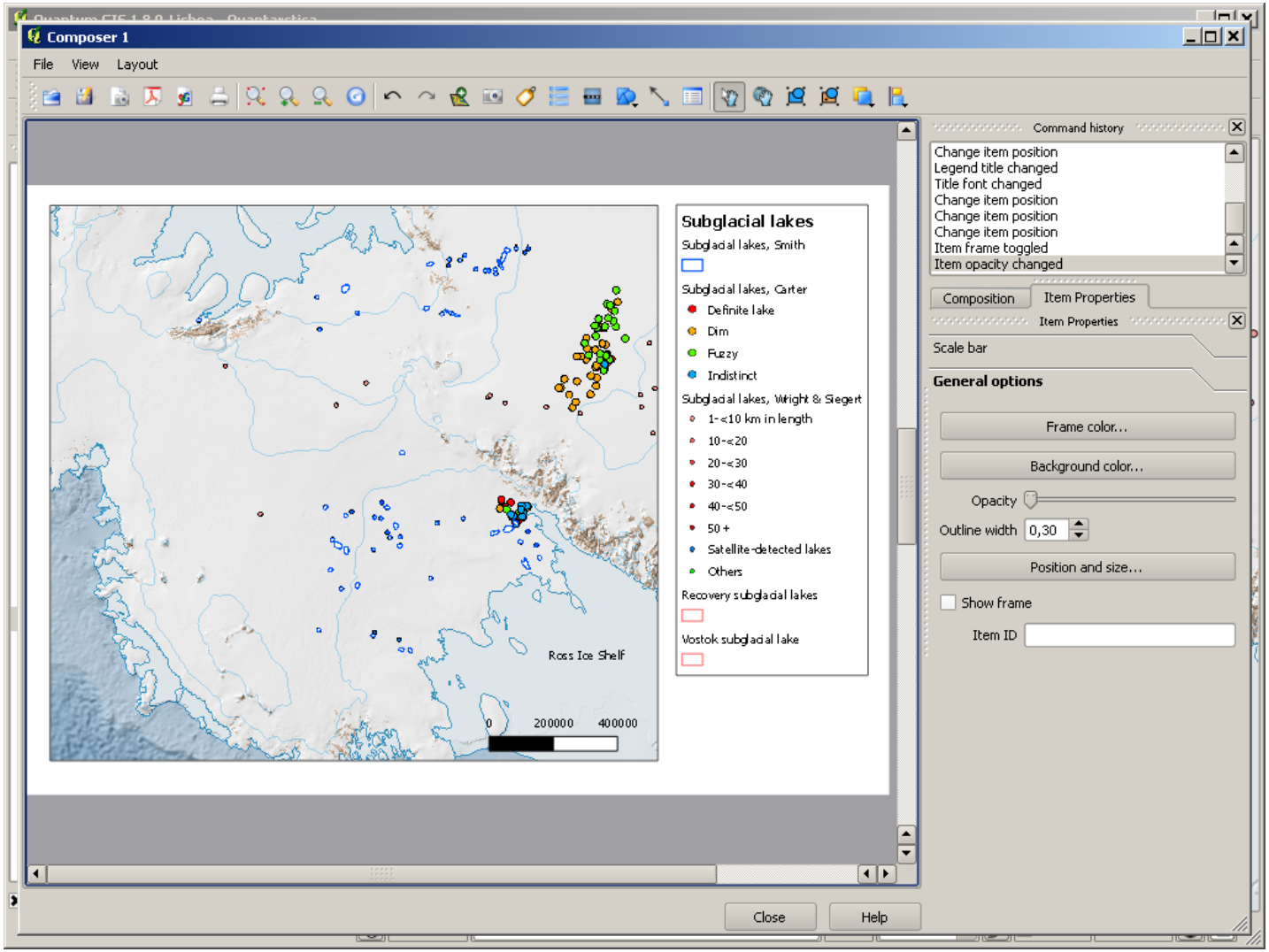
Attribute table



	facility_n	un_locode	CGA_id	national_p	national_1	lat_ddm	lon_ddm	lat_dd	lon_dd	
82	517	NULL	NULL	Japan	JPN	69° 1.685' S	40° 5.547' E	-69.02807608	40.09244947	620
83	San Martín	AQ-SMT	12673	Argentina	ARG	68° 7.818' S	67° 6.176' W	-68.13030011	-67.10293129	5 m
84	SANAE IV	AQ-SNA	18367	South Africa	ZAF	71° 40.372' S	2° 50.419' W	-71.67287313	-2.840324047	850
85	Scott Base	AQ-SBA	12898	New Zealand	NZL	77° 50.966' S	166° 46.037' E	-77.849437	166.767281	10 r
86	Signy	AQ-SGN	13267	United Kingdom	GBR	60° 42.497' S	45° 35.723' W	-60.70828739	-45.59538916	5 m
87	Siple Dome	NULL	17131	USA	USA	81° 39.258' S	149° 0.308' W	-81.65430285	-149.0051336	NUL
88	Sitry	NULL	17190	Italy	ITA	71° 39.104' S	148° 39.284' E	-71.65173817	148.654737	160
89	Sky Blu	NULL	16627	United Kingdom	GBR	74° 51.381' S	71° 35.112' W	-74.856351	-71.58519987	137
90	Soyuz	NULL	NULL	Russia	RUS	70° 34.595' S	68° 47.696' E	-70.5765771	68.79493694	336
91	Sub Base Yelcho	NULL	16363	Chile	CHL	64° 52.551' S	63° 35.028' W	-64.87585799	-63.58380638	10 r
92	Svea	NULL	14295	Sweden	SWE	74° 34.564' S	11° 13.492' W	-74.57606102	-11.22487242	NUL
93	Syowa	AQ-SYW	14350	Japan	JPN	69° 0.247' S	39° 34.910' E	-69.00412231	39.58183616	29 r
94	Tor	AQ-TOR	18098	Norway	NOR	71° 53.371' S	5° 9.594' E	-71.88951483	5.159892622	162
95	Troll	AQ-TRL	14980	Norway	NOR	72° 0.717' S	2° 31.984' E	-72.01194552	2.533070031	130
96	Vernadsky	AQ-VKY	18368	Ukraine	UKR	65° 14.745' S	64° 15.449' W	-65.24574295	-64.25748123	7 m
97	Vostok	AQ-VOS	15605	Russia	RUS	78° 27.850' S	106° 50.278' E	-78.46415952	106.8379632	350
98	Wasa	AQ-WSA	15754	Sweden	SWE	73° 2.568' S	13° 24.775' W	-73.04279886	-13.41290971	~40
99	Wilkins Aerodrome	NULL	18111	Australia	AUS	66° 41.380' S	111° 29.074' E	-66.68966697	111.4845668	740
100	Zhongshan	AQ-ZGN	18370	China	CHN	69° 22.392' S	76° 22.312' E	-69.37320625	76.37187122	~10

A right click gives an easy access to attributes of each facility (layer)

Print composer



High-quality figures for publications can be easily made

Supporting community effort

- It's a community effort.
- Layer contributions are expected.
  - Data layers particularly for oceanography, geology, meteology, biology, ….
  - Model-output layers for any disciplines.
- ML annoucning updates (please register yourself at the web site below).

Download and contribute!

www.quantarctica.org

Data currently available on QA (1)

Glaciology

Ice flow velocity

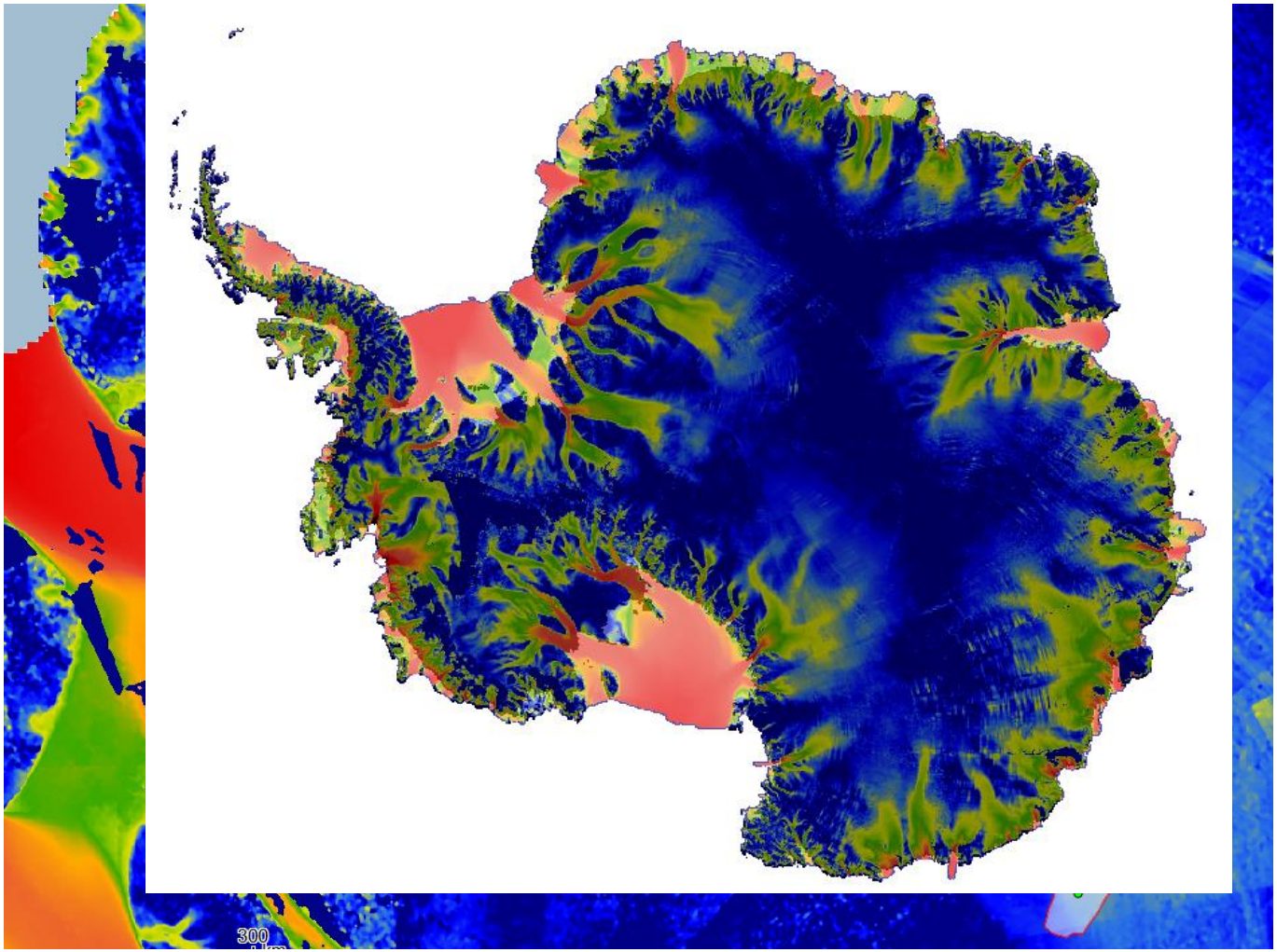
Bed elevation

Ice thickness

Grounding line

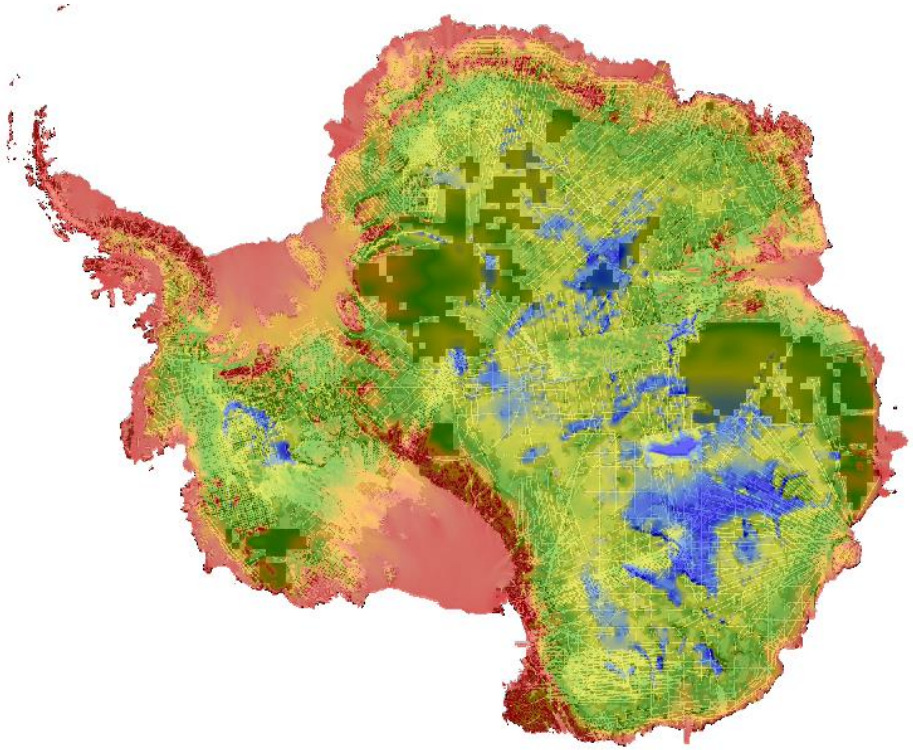
Subglacial lakes

various more

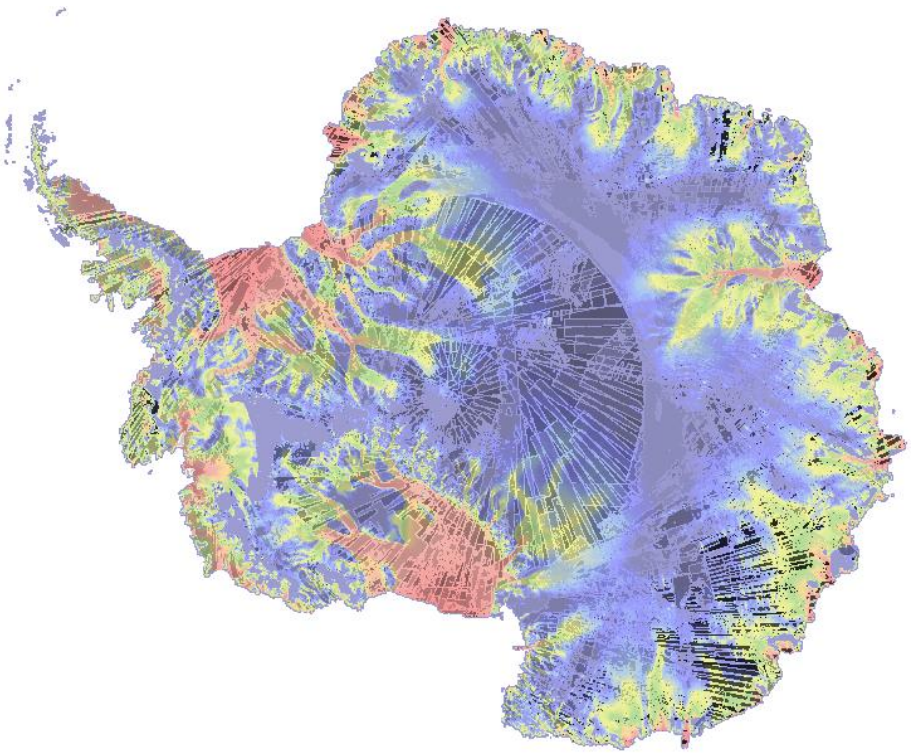


Error layers

Ice thickness



Ice-flow speed



More transparent cells have more confident estimates

Data currently available on QA (2)

Glaciology

Ice flow velocity

Bed elevation

Ice thickness

Grounding line

Subglacial lakes

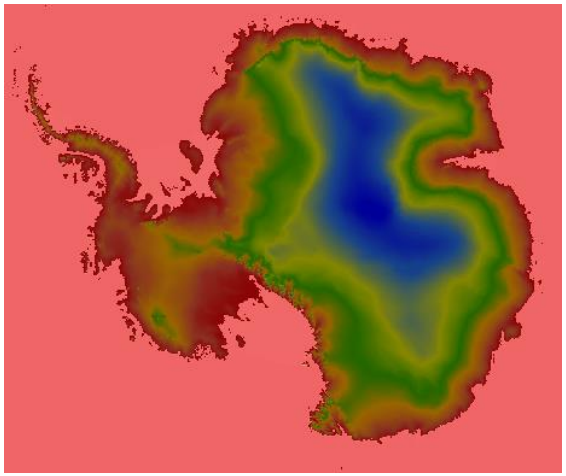
Surface elevation

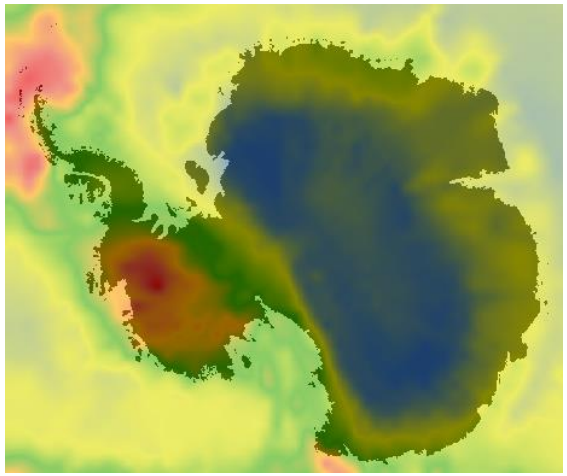
Geothermal flux

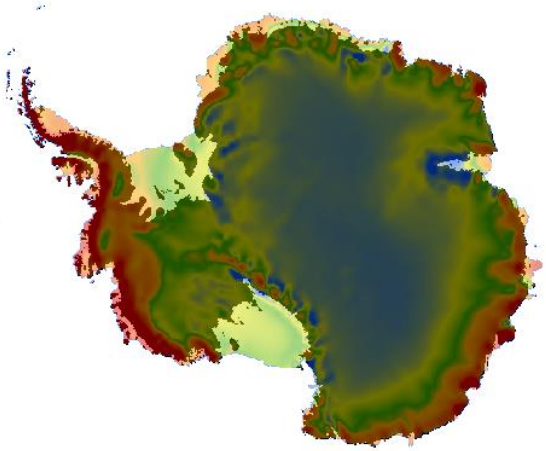
Surface mass balance

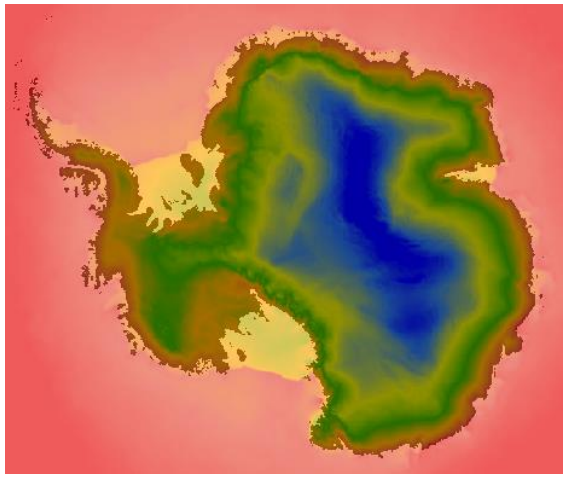
Surface temperature

various more









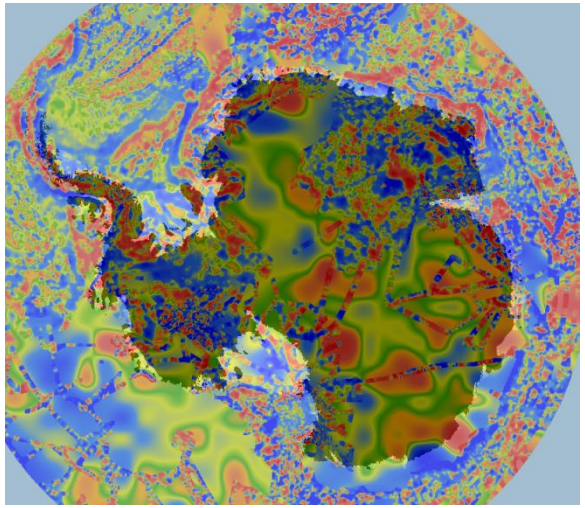
Data currently available on QA (3)

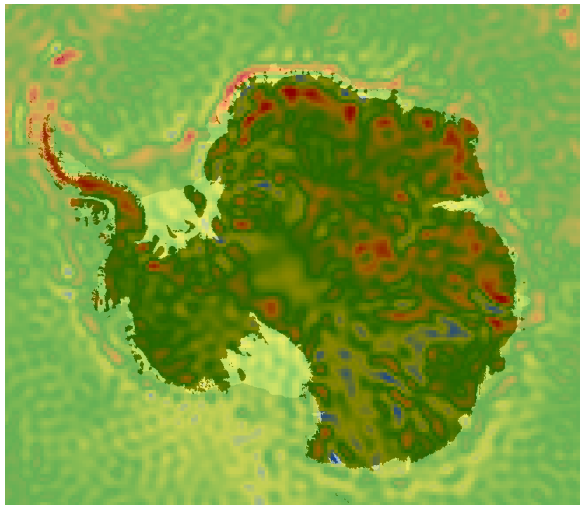
Geophysics

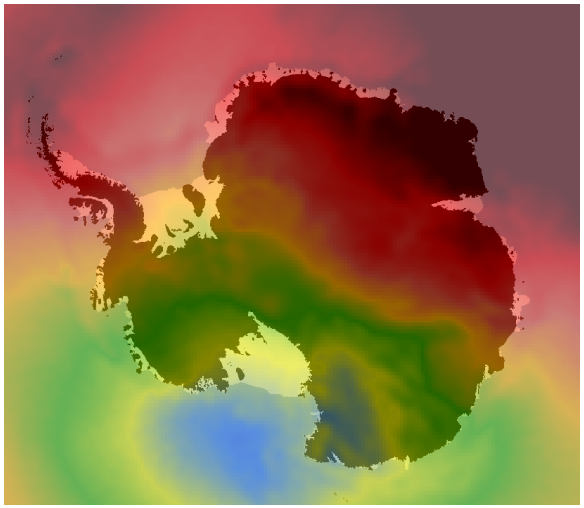
Magnetic anomalies

Gravity anomalies

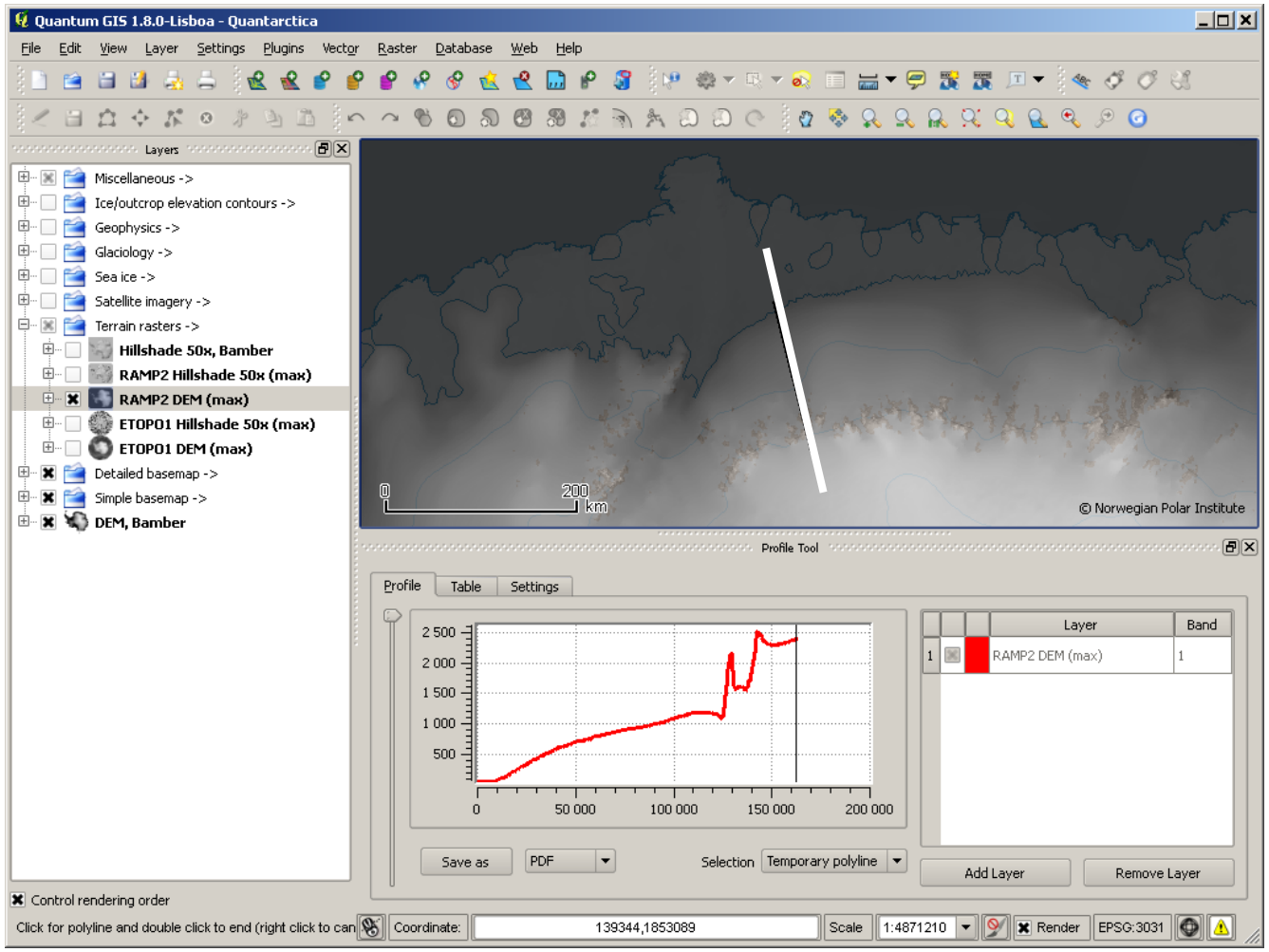
Geoid heights







Plugins: an example

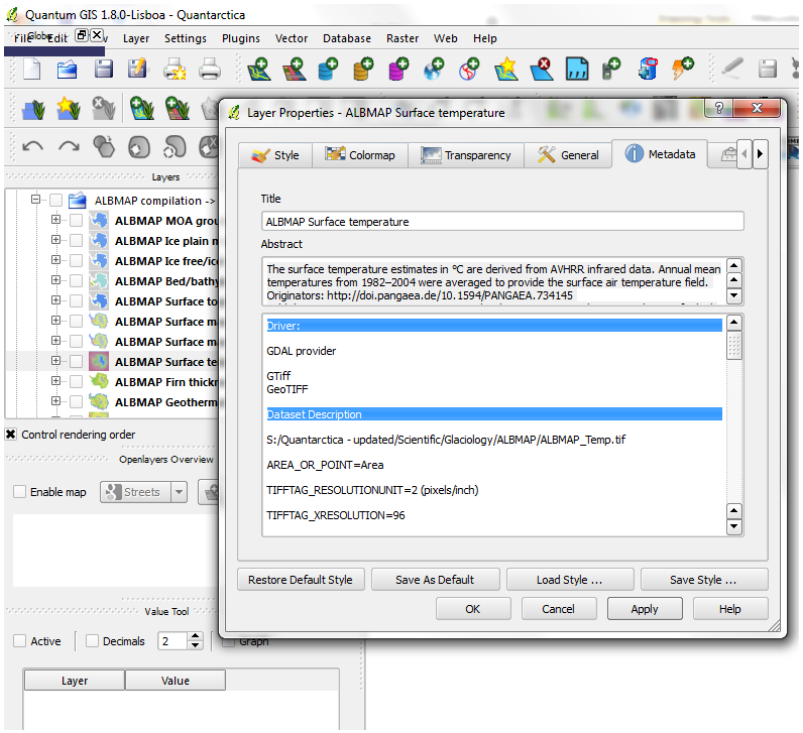


Profile plugin extracts digital values (e.g. elevation) from raster data

Metadata and references

Each layer has a description including references

Abstract: The surface temperature estimates in °C are derived from AVHRR infrared data. Annual mean temperatures from 1982–2004 were averaged to provide the surface air temperature field.
Originators: http://doi.pangaea.de/10.1594/PANGAEA.734145
Publisher: Le Brocq, A. M., Payne, A. J., and Vieli, A.: An improved Antarctic dataset for high resolution numerical ice sheet models (ALBMAP v1), Earth Syst. Sci. Data, 2, 247-260, doi:10.5194/essd-2-247-2010, 2010.
Publication date: 2010
Data location: \Quantarctica\Scientific\Glaciology\ALBMAP\ALBMAP_Temp.tif
References: Comiso, J. C.: Variability and trends in Antarctic surface temperatures from in situ and satellite infrared measurements, J. Climate, 13(10), 1674–1696, 2000.



Version 2 released this summer

- Adapted the package to the latest QGIS version (version 2.4).
- Include more data:
  - Blue ice distribution (Fengming et al.)
  - Drainage basin (Zwally et al.)
  - IBSCO bathymetry (Arndt et al.)
- Fixed some minor bugs.

The new version is available on our web site,

quantarctica.org

and on a USB stick (please ask)

Poster C171, Wednesday 27 Aug

Quantarctica: new GIS package for research, education and operation in Antarctica

CENTRE FOR ICE, CLIMATE AND ECOSYSTEMS

Quantarctica (= Quantum GIS + Antarctica)

- works with free software Quantum GIS.
- includes a range of geographical data.
- requires no internet access for the daily use.
- is able to plot GPS-provided current positions together with GIS layers.
- can be expanded for your own purpose.
- is color blind frindly.

Quantum GIS

- is GNU licensed (open source).
- is first released in 2002.
- has been updated regularly.
- has numerous plugins.
- has active community support.

Datasets currently included in the package

We include peer-reviewed data with meta data.

- **Basemap**: ADD Antarctic digital database, SCAR place names, COMNAP-listed facilities. UTM zones, Graticules, etc.
- **Satellite imagery**: LIMA, MODIS, Radarsat. Both continent-wide mosaics and high-resolution images with tile indeces.
- **Glaciology**: subglacial lakes, ALBMAP, ASAID grounding line, ALBMAP, BEDMAP2, Rignot's flow speeds.
- **Geophysics**: ADMAP magnetic anomaly, GOCE gravity anomaly, GOCE geoid height.

Distribution package

- 8 GB base package (with Landsat CIRREF high-res images)
- Other high-res satellite images (30 GB) are downloadable individually using Quantarctica or as a whole.

Future of Quantarctica

- It's a community effort.
- Norwegian Polar Institute takes responsibility to host the project.
- Layer contributions are expected.
- We particularly welcome data contributions in oceanography, geology, meteology and biology.
- Model-output layers in any disciplines are also very welcome.
- Use Quantarctica as a platform to release your data.
- Be updated; please register yourself at the project web site.

Download and contribute!
www.quantarctica.org

Key developers at NPI

Anders Skoglund Kenny Matsuoka

Thanks!

Quantarctica

Contribute? Contact us at:
quantarcitca@npolar.no