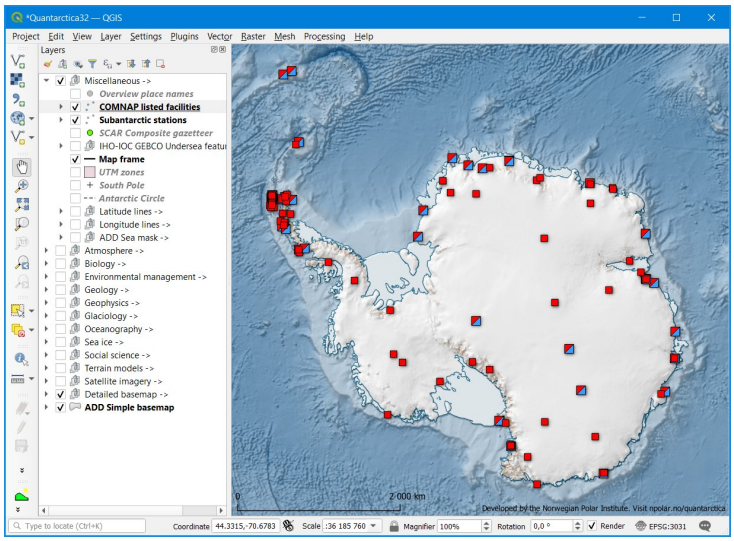
Get started with

Quantarctica 4.0

Norwegian Polar Institute, October 2026, v1.0
Project website: https://sites.npolar.no/quantarctica/

Quantarctica is the result of an initiative by the Norwegian Polar Institute (NPI) to develop and host a collection of freely available geographical datasets, with offline capabilities to explore the Antarctic region, aimed at research, education, management and operational use. The current version is the fourth release of the package, with data gathered from data centres around the world, based on recommendations by an international editorial board for the various diciplines. ***This is a tool for and by the user community. Data sharing is encouraged!***



In the practical sense, Quantarctica (*Quantum GIS* [Since 2.0 just QGIS] + *Antarctica* = "*Quantarctica*") is a *QGIS* project presenting *basemaps, satellite data, and a range of scientific data* of the world south of 40°S, on top of which the end users can load their own data; to create, visualise, analyse and present Antarctic geographical data.

In published works produced using Quantarctica, you are required to cite each dataset that was used in the work. Quantarctica provides all dataset citation information in each layer's Metadata tab in QGIS, in a text file in the data folder, and in the online Quantarctica Data Catalog. You are also required to acknowledge or cite Quantarctica and the Norwegian Polar Institute in your work. See https://doi.org/10.21334/npolar.2026.1da42c46.

The Quantarctica package

QGIS. This is the software on which Quantarctica works. QGIS (qgis.org) is a powerful, user friendly and open source geographic information system (GIS) that runs on Windows, Mac and Linux. It was first released in 2002, and is licensed under the GNU General Public License. It supports a range of vector, raster and database data formats, and connects to several types of online map services. The core functionality can be extended with plugins and scripting.

The basemap data. Quantarctica comes with basemap data for Antarctica and the Southern Ocean, featuring coastlines and outcrops, elevation contours, facility locations, place names etc., provided as vector data in the ESRI Shapefile format. Also included are e.g. elevation models and satellite imagery, provided as raster data in GeoTIFF, JPEG and JPEG2000 formats.

The scientific data. The package includes scientific data, with the following main themes: atmospheric sciences, biology, environmental management, geology, geophysics, glaciology, oceanography, sea ice, and social sciences.

The Quantarctica package is available for download at or via the project website in two ways:

- The whole package as a single .ZIP file (10 GB), available both on the main Quantarctica site and on mirror sites.
- The whole Quantarctica project uncompressed, where any file or folder can be downloaded individually. This option is only available on the main Quantarctica site, not on the mirror sites.

The project website also includes a data catalogue where the various themes and datasets can be browsed.

Quantarctica Setup

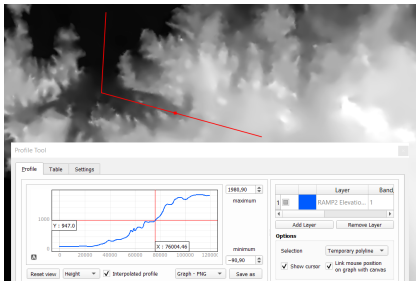
Download Quantarctica. The package components mentioned above, can be downloaded from the project website.

The rest of this guide is based on QGIS 3.44.15 for Windows.

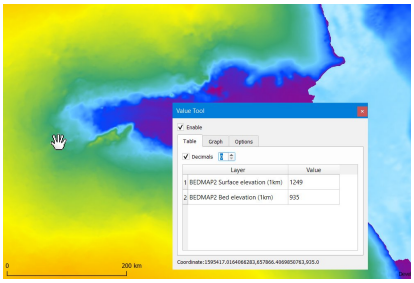
- *QGIS version 3.44.15 is the latest long term release. As Quantarctica is saved in this release, earlier releases may not be fully compatible or show all Quantarctica formatting as intended.*
- *For Mac and Linux installers, please visit https://qgis.org/download.*

Install QGIS. Launch the QGIS standalone installer (.exe file) included in the *Software* folder of the package, and follow the instructions. When completed, double-click the QGIS project file *Quantarctica40.qgz* in the Quantarctica folder to launch the project.

Install Plugins. Beyond the core functionality, numerous plugins are available to extend it. Plugins can be easily installed to QGIS through the core embedded Plugin installer, and run from the *Plugins* toolbar and menu (some install to other menus). As part of the installation of QGIS, some plugins might be assumed handy to install. While online, click the *Plugins* menu in QGIS, and select *Manage and Install Plugins*, select *All* from the left menu, and search for and install plugins, such as:



Profile Tool
See the cell values along a profile of raster layers, e.g. elevation



Value Tool
See the value of the raster cells below the mouse cursor

Other plugins to consider:

• *GarminCustomMap**	Export map to KMZ (for Google Earth or custom Garmin GPS map).
• *Point Sampling Tool*	Transfer multiple raster values to point dataset at point position.
• *Spreadsheet Layers*	Load layers from spreadsheet files (ods, xls, xlsx).
• *TimeManager*	Create animations visualising spatio-temporal data.

** Visit Garmin website to see which handheld GPS units support custom KMZ maps.

First time launch: QGIS tuning

The next step is some optional and one-time QGIS tuning and customisations.

From the *Plugins* menu, click *Manage and Install Plugins*. In the *Settings* tab in the appearing box, enable QGIS to *Check for updates on startup*.

From *Settings*/*Options* menu, consider the following adjustments:
• In the *General* tab, change *Icon size* if the toolbar buttons are too big or small.
• In the *General* tab, check *Override System Locale*, and set to *American English*. Also check the *Show group (thousand) separator* two steps below. These will introduce a period as the decimal sign, and comma as the thousand separator, which Quantarctica content is tailored for.
• In the *Rendering* tab: In *Rasters / Contrast Enhancement* dropdowns, set *No Stretch.*
Click *OK* to finish.

Consider hiding rarely used toolbars from the interface. Right-click e.g. to the right of the *Help* menu, and uncheck all but these: *Attributes Toolbar, Digitizing Toolbar, Manage Layers Toolbar, Map Navigation Toolbar, Plugins Toolbar, Project Toolbar* and *Selection Toolbar.*

To hide rarely used panels, perhaps the *Value Tool Panel* or *Browser Panel*, uncheck them in the *View/Panels* menu. (The panel you might want to keep, is *Layers Panel*.)

If you at any time want clean up and remove individual toolbar buttons you don't use, go to *Settings/Interface Customization*, and uncheck them in the expanded *Toolbars* section.

Toolbars can be docked at any side of the interface, e.g. vertically on the left, by click, hold and drag the "rubber-band" section at the left or top of a toolbar .

Close and restart QGIS to save and apply any of these changes requiring restart to take effect.

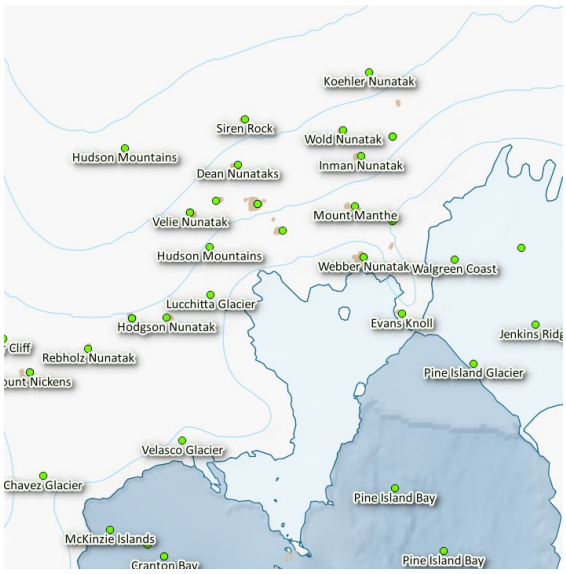
Some general Quantarctica recommendations
• Rename the MyDataFolder folder in Quantarctica, to your own user name.
• Save the default Quantarctica project as a new and personal project file in this folder.
• Save your own data in this folder too.
• Add your own data in your personal project file.
• Save regularly when editing data, and do data backups.

Explore Quantarctica – Basic operation

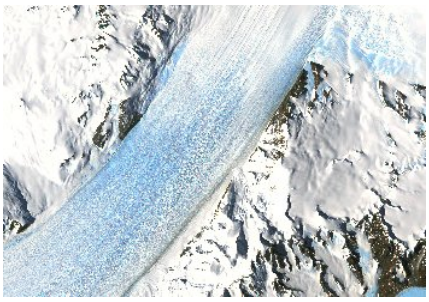
Opening the Quantarctica QGIS project might take a minute or more, due to the large amout of datasets. When it is fully loaded, a basemap is the only visible data in the map canvas. However, a range of preloaded datasets are available for display in the tree structure in the *Layers Panel*. Let's go through some basic operation of Quantarctica.

Navigate in the map. Click the *Zoom In* button in the navigation toolbar, and draw a rectangle around e.g. the Antarctic Peninsula, and repeat to zoom closer in to a specific area. As you will see, the level of detail increases as you zoom in. Click the *Pan Map* button in the navigation toolbar to pan around in the map. Try using the mouse wheel for even more convenient zooming.

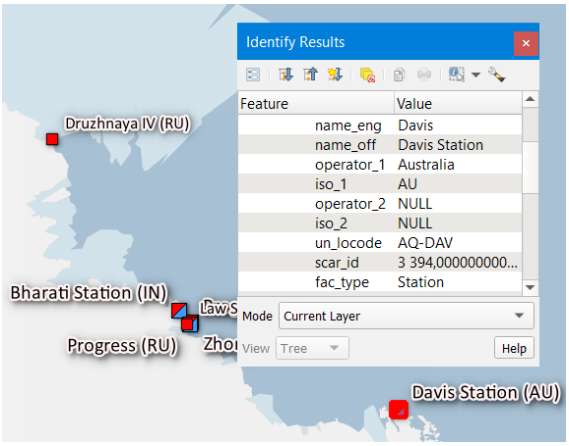
Toggle comprehensive place names data. The project includes three place names datasets. One for overview purposes (which is already visible), one with all place names in Antarctica (as reported to SCAR), and one with undersea feature names. Now, zoom out to see the whole of the continent, do this by clicking the *Zoom Full* button. Then, expand the *Miscellaneous* group by clicking the node ▸ to the left of it, and uncheck the *Overview place names* layer. Zoom in a step or two, and check the *Composite Gazetteer of Antarctica, SCAR* layer. A lot of points populate the map canvas. To see the actual place name labels, zoom further in. (This kind of scale dependent rendering is used for many layers to keep large-area views simple and small-area views information rich.)



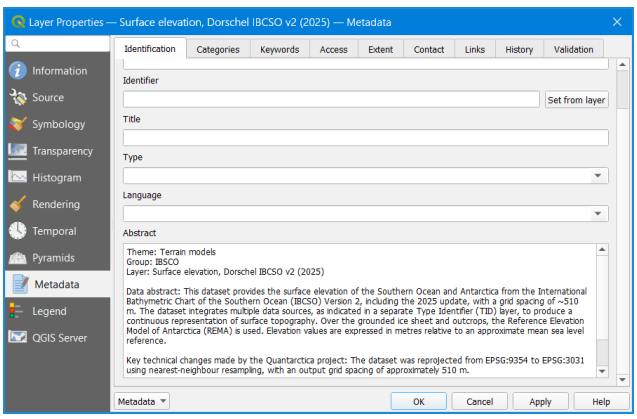
Switch to satellite view. Uncheck *Detailed basemap* (for performance reasons), and expand the *Satellite imagery* group. From the expanded list, check the *LIMA Landsat low-resolution mosaic (240m)* layer, and the image appears on top of the simple basemap. To view the image in its native resolution, click the layer in the *Layers Panel* so that it is marked in e.g. grey or blue (meaning, it has the focus), and click the concurrently enabled *Zoom to Native Resolution* button.



Get map feature info. Turn off all layers except the *Simple basemap*, expand the *Miscellaneous* group, and check the *Antarctic facilities, COMNAP* layer. Zoom to the extent of the dataset by clicking the *Zoom to Layer* button. To read the specific info on any particular facility in the map, zoom in on one of the facilities, make sure that the COMNAP layer is selected (shown in e.g. gray or blue) in the *Layers Panel*, click the *Identify Features* button in the toolbar and then on a facility point in the map. A box titled *Identity Results* appears, and here are all the data about this specific facility for you to study. Close and click e.g. on the *Pan Map* button to leave identify mode.



View dataset metadata. To read the general info about a dataset, e.g. the *Surface elevation, Dorschel IBCSO v2 (2025)* dataset in the *Terrain models* group, double-click the layer in the *Layers Panel*. The *Layer Properties* box appears. Several tabs appear in the left section, click the *Metadata* tab. The metadata accompanies any single dataset in the file folders also as a .TXT file. The meta-data includes a short abstract, technical details, and references to be cited when the data are used.



See layer legend. You can see any layer's legend (symbols and explanations) by expanding the tree node ▸ to the left of the layer name.

> *Concerning the appearance of raster layers: The default colour scale is optimised to show overall spatial variations across the map domain. Therefore, the upper and lower bounds of the colour bar as shown in the Layers Panel, may not represent the actual maximum and minimum values in the dataset.*

Export map. Besides regular printscreens, the most straight-forward way to take your current map view out of QGIS, is to export it into a graphical image file, like TIFF or JPEG. From the *Project* menu, select *Import/Export* and *Export map to Image*. However, if you want more advanced exports with higher resolution and perhaps a scale bar, a north arrow, a legend and maybe some other customisations, the *New Print Layout* in the *Project* menu is more versatile and can produce both vector and raster exports for your papers.

Explore Quantarctica – More useful essentials

View country specific place names. To just view e.g. the place names approved by New Zealand, activate the *Composite Gazetteer Of Antarctica, SCAR* layer, right-click it in the layer list, and from the appearing context menu, click *Filter.* In the appearing *Query Builder*, double-click *CntryName* in the *Fields* list, then the equals sign in the *Operators* box, and then click the *All* button in the *Values* box. From the appearing list, double-click *New Zealand*. As you can see in the box *Provider Specific Filter Expression*, you now choose to show only the place names where *"CntryName" = 'New Zealand'*. Press *OK*, and you'll see only the names approved by New Zealand. To reset and show all countries submissions, clear the content of the *Provider Specific Filter Expression* box.

View attribute table. A vector dataset has an associated data table that hosts all the non-geometric information on the features, like the information you've seen with the *Identify Features* tool in the *Basic operation* tutorial. To view more than one feature's associated data at a time, you can open the attribute table by right-clicking the layer, e.g. the *Composite Gazetteer Of Antarctica, SCAR*, and selecting *Open Attribute Table*. The box that appears, resembles spreadsheet software, and you can expand columns, sort and select records similarly as in regular spreadsheets. Browse and select a few of the records (click on a record number to the left, hold down the *Ctrl* key, and click another). Now click the *Zoom map to the selected rows* button above the table, and minimise the table to see the selected features highlighted in the map. (Note: When selecting several records geographically far apart in a dataset table with large record numbers, the selected features might not be clearly visible among the others.) Deselect with the *Deselect Features from all layers* button.

Adjust image contrast. If you zoom in on any specific part of a satellite image, you can stretch the contrast to see the details better, e.g. fine glacier structures in Radarsat imagery. A convenient way to do this is with a right-click on the image in the *Layers Panel*, and *Stretch Using Current Extent*.

See layer without preset styling. Layers in Quantarctica comes with preset styling, including labeling, transparency and scale-dependent rendering settings. If this doesn't suit your needs, you can change the styling manually in the layer's properties, under the *Symbology* and *Labels* tabs. Saving the project means that the style is also saved, so if you at any point want to go back to the previous default styling, open the layer properties, then from the bottom *Style* dropdown button, select *Restore Default* to get back the default Quantarctica styling.

Increase readability. If symbols and labels appear to small on your computer, you can either change the symbol size and labels manually in the layer properties, or apply a magnification factor on the map canvas itself. This is done by entering the desired magnify percentage in the *Magnifer*

box located in the QGIS status bar in the lower right corner.

Rotate map canvas. If you like to rotate the map canvas, you can do so with the *Rotation* option in the status bar. Note that hillshades in the *Detailed basemap* group will appear different, as if the light direction is from somewhere else than top-left. To deal with this, you can turn off the two *Hillshade* sub-groups within the *Detailed basemap* group, turn on the *Virtual hillshades* subgroups, and then for each of the layers within this group, adjust the *Azimuth* value to equal 315 minus the map rotation angle. For example, if you rotate the map with value 45 degrees, the azimuth should be 270 degrees to give the impression that the light still comes from the upper left corner. Upper left corner is the typical light source in the world of cartography.

Terrain models: Render as virtual contours or hillshades. Rather than creating actual contour line data e.g. from an elevation model, QGIS can calculate from the elevation model and render contours on the fly in the map itself. This adds flexibility to the package, as you can decide for yourself which contour interval you need for any specific map task. As a test, expand the *Terrain models* group, and e.g. the *REMA v2* subgroup. Then first, duplicate the *Surface elevation, Howat REMA v2* layer by right-clicking it in the *Layers Panel*, and in the appearing context menu, there should be a *Duplicate Layer* entry. For the appearing copy, double-click it to get to the layer properties, and in the *Symbology* tab and the *Band Rendering* section, choose *Contours* in the *Render type* dropdown menu. Then you can set the *Contour Interval* to what you like. This feature is more demanding on the computer than working with an actual contour dataset, but it can be a quick way to visualise something. Terrain models can also be rendered as hillshades, and similar to contour rendering, you can set the *Rendering Type* to *Hillshade*, and further adjust *Altitude*, *Azimuth* and *Z Factor* (vertical exaggeration) to what suits the purpose.

Read the geographical position at the mouse cursor. Zoom in to get to a level where the position of the cursor is more exact where you want it, and to the right of "Coordinate" in the QGIS status bar, you will see the values of the cursor position in terms of longitude and latitude.

Working with GPS data. QGIS can read and write GPX files, which can be transfered to and from e.g. a Garmin GPS unit using Garmin Basecamp software. Also, there are some capabilities to have live tracking on your QGIS map, by connecting an external GPS antenna eg. through the USB port. (Toggle *GPS Information Panel* through the *View/Panels* menu entry.)

Some more Quantarctica recommendations

• If the project launches very slowly or if you use Quantarctica on a not too powerful computer, you can consider removing layers loaded in the default project but not crucial for a specific purpose. This will make the project launch faster. Right-click the group or layer in the layer list and select *Remove Layer*. (Removes from the project only, not from disk.)

• Generally, have only visible layers checked. A layer totally covering another layer (lies above it in the *Layers Panel*, and without preset/custom transparency), makes the covered layer unnecessary to render, and decreases performance.

• Although QGIS can render and work with data of different projections at the same time, it is generally recommended that when creating data, it should be projected to the default projection. This shortens rendering time.

Further reading

• You can find a GIS introduction, a QGIS user guide and QGIS training manual in the Quantarctica *Software* folder.

Please read the Quantarctica_ReadMe text file in the main Quantarctica folder for general terms and disclaimer.