

Norwegian Polar Institute, 2013
A N T A R C T I C A
MAP DATA SOURCES AND NOTES

All sources are digital and have been accessed on the Internet in 2012 and early 2013, unless written otherwise. Courtesy of all data providers.

THE ANTARCTIC CONTINENT AND ISLANDS

Coastlines, ice shelves and bare land are from the **Scientific Committee on Antarctic Research (SCAR)** provided database *SCAR Antarctic Digital Database (ADD)*, version 6.0 (<http://add.scar.org/>). Exceptions: Six islands/ice rises within Fimbulisen and the Amery, West and Shackleton ice shelves are digitized from the **U.S. Geological Survey (USGS)** provided *Landsat Image Mosaic of Antarctica (LIMA)* (<http://lima.usgs.gov/>).

Place names are selected from the **SCAR** provided *SCAR Composite Gazetteer Antarctica* database (<https://data.aad.gov.au/aadc/gaz/scar/>). For the Norwegian, Australian, French and New Zealand claims, names approved by the respective authorities have been selected. According to an agreement with the United Kingdom, British names have been selected within the British claim and Sub-Antarctic islands, also where the claim overlaps with Argentine and Chilean claims. Within the sole Chilean part of the Chilean claim, Chilean names are selected, with some supplements. For the sector not claimed by any nation, the American names have been favoured. Vostok Subglacial Lake, East and West Antarctica, East and West Antarctic Ice Sheets are plotted although they are not listed by the claimants. For the Norwegian claim, the **Norwegian Polar Institute (NPI)** place names database has been an additional source (<http://placenames.npolar.no/>).

Antarctic facilities are plotted from the **Council of Managers of National Antarctic Program (COMNAP)** provided *Main Antarctic Facilities operated by National Antarctic Programs in the Antarctic Treaty Area (South of 60° latitude South)*, version 1. April 2012 spreadsheet (<https://www.comnap.aq/Information/SitePages/Home.aspx>). Additional information has been obtained through e-mail correspondence with M. Rogan-Finnemore, COMNAP Executive Secretary, COMNAP Secretariat. Where facilities by default cluster in the map, they have been cartographically adjusted to be distinguishable in the map. Additionally, some facility points originally covering essential topographical information have been slightly shifted in the map. Note that this is not a complete dataset of facilities, only those reported to COMNAP by the national Antarctic programs as the main facilities they operate are included.

Elevation above sea level values for selected facilities on the East Antarctic Ice Sheet are gathered from the following web pages; Kohnen: **Alfred Wegener Institute for Polar and Marine Research (AWI)**, http://www.awi.de/en/infrastructure/stations/kohnen_station, Mizuho: Japan's **National Institute of Polar Research (NiPR)**, <http://www.nipr.ac.jp/english/antarctic-expedition.html>, Dome Fuji: **NiPR**, <http://www.nipr.ac.jp/english/antarctic-expedition.html>, Kunlun: **SciencePoles, International Polar Foundation (IPF)**, http://www.sciencepoles.org/articles/article_detail/china_spreads_its_polar_wings_research_programmes_at_kunlun_station, Amundsen-Scott South Pole Station: The U.S. **Office of Polar Programs (OPP), National Science Foundation (NSF)**, <http://www.nsf.gov/od/opp/support/southp.jsp>, Vostok: The **Russian Antarctic Expedition (RAE), Arctic and Antarctic Research Institute (AARI)**, http://www.aari.aq/stations/vostok/vostok_en.html, Concordia: the Italian **Polar Network, National Research Council (CNR)**, <http://www.polarnet.cnr.it/content/view/165/58/lang.en>, and Mid Point: The Italian **Programma Nazionale di Ricerche in Antartide (PNRA)**, http://www.pnra.it/biblioteca/docs/rapporti_campagna/CA99-00.pdf.

Selected mountains have been plotted with elevations from narratives in SCAR Gazetteer and from the elevation point dataset in ADD. Exceptions: Height of Jøkulkyrkja, measured by **NPI** (value provided e.g. at http://carl.npolar.no/geografi/dronning_maud_land). Mount Menzies, **Australian Antarctic Division (AAD)** (<http://www.antarctica.gov.au/about-antarctica/fact-files/geography/areas-lengths-heights-and-distances>). Mount Jackson, **British Antarctic Survey (BAS)** factsheet (http://www.antarctica.ac.uk/about_antarctica/teacher_resources/resources/factsheets/factsheet_geostats_print.pdf). Vinson Massif, **Gildea, D., and J. Spletstoesser (2007)**, Craddock Massif and Vinson Massif remeasured, in *Antarctica: A Keystone in a Changing World* – Online Proceedings of the 10th ISAES, edited by A.K. Cooper and C.R. Raymond et al., USGS Open-File Report 2007-1047, Short Research Paper 069, 3 p.; doi:10.3133/of2007-1047.srp069 (<http://pubs.usgs.gov/of/2007/1047/srp/srp069/of2007-1047srp069.pdf>).

When values vary between sources, the selection has been done with support of the **USGS** provided *Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) Global Digital Elevation Model (GDEM) Version 2* (<http://gdex.cr.usgs.gov/gdex/>).

Elevation contours and hill shades are generated from **Bamber, Jonathan L., Jose Luis Gomez-Dans, and Jennifer A. Griggs. 2009. Antarctic 1 km Digital Elevation Model (DEM) from Combined ERS-1 Radar and ICESat Laser Satellite Altimetry.** Boulder, Colorado USA: National Snow and Ice Data Center (<http://nsidc.org/data/nsidc-0422.html>). The generated elevation contours have been generalized. The generated hill shade effect exaggerates the elevation by 25 times. For the area south of ~86°, the *RADARSAT-1 Antarctic Mapping Project (RAMP) 100m balanced mosaic* provided by **Byrd Polar Research Center (BPRC)** (<http://bprc.osu.edu/rsl/radarsat/data>) has supplemented the hill shade. Likewise, the hillshade on the northernmost part of the Antarctic Peninsula is generated from the *Radarsat Antarctic Mapping Project Digital Elevation Model Version 2*, provided by **NSIDC** (<http://nsidc.org/data/nsidc-0082.html>). The terrain models are filtered prior to hillshade generation, and the hillshades have been manually edited at some locations.

The outline of Vostok Subglacial Lake is digitized by **NPI** from the RADARSAT-1 mosaic. The ice thickness value above the lake is from **Studinger, M., R.E. Bell, G.D. Karner, A.A. Tikku, J.W. Holt, D.L. Morse, T.G. Richter, S.D. Kempf, M.E. Peters, D.D. Blankenship, R.E. Sweeney and V.L. Rystrom 2003.** Ice cover, landscape setting, and geological framework of Lake Vostok, East Antarctica. *Earth and Planetary Science Letters*, **205**(3-4): 195-210.

The greatest known ice thickness and lowest bed elevation (m.b.s.l.) in Antarctica, as well as the Gamburtsev Subglacial Mountains rounded elevation value (m.a.s.l.) have been plotted based on information in **Fretwell, P., and 55 others. 2012.** Bedmap2: improved ice bed, surface and thickness datasets for Antarctica, *The Cryosphere Discuss.*, 6, 4305-4361, doi:10.5194/tcd-6-4305-2012.

The South Magnetic and Geomagnetic Poles are calculated at **NPI** utilizing the **Maus, S., S. Macmillan, S. McLean, B. Hamilton, A. Thomson, M. Nair, and C. Rollins, 2010,** The US/UK World Magnetic Model for 2010-2015, *NOAA Technical Report NESDIS/NGDC*; provided by the **U.S. National Oceanic and Atmospheric Administration (NOAA)** (<http://www.ngdc.noaa.gov/geomag/WMM/DoDWMM.shtml>).

ANTARCTIC AND SUB-ANTARCTIC OCEANS AND OCEAN FLOOR

South of 60 degrees, depth tints and hill shade are derived from **Arndt, J.E., H. W. Schenke, M. Jakobsson, F. Nitsche, G. Buys, B. Goleby, M. Rebesco, F. Bohoyo, J.K. Hong, J. Black, R. Greku, G. Udintsev, F. Barrios, W. Reynoso-Peralta, T. Morishita, R. Wigley,** "The International Bathymetric Chart of the Southern Ocean (IBCSO) Version 1.0 - A new bathymetric compilation covering circum-Antarctic waters", *Geophysical Research Letters*, doi: [10.1002/grl.50413](https://doi.org/10.1002/grl.50413), provided by the **IBCSO program** (<http://ibcso.org/>). Depth tints and hill shade north of 60 degrees, are derived from *Earth Topography Digital Dataset (ETOPO)* dataset - **Amante, C. and B. W. Eakins,** ETOPO1 1 Arc-Minute Global Relief Model: Procedures, Data Sources and Analysis. *NOAA Technical Memorandum NESDIS NGDC-24*, 19 pp, March 2009; provided by **NOAA** (<http://www.ngdc.noaa.gov/mgg/global/global.html>). The hill shade is exaggerated 10 times and made significantly transparent. It is modified to coincide with the more recent ice shelf edge data along Ronne Ice Shelf. The appearing ripple pattern e.g. outside the continental shelf in the southern region of the Weddell Sea is an effect of lower terrain model quality in this region.

Undersea feature names are selected from the **International Hydrographic Organization (IHO) / Intergovernmental Oceanographic Commission (IOC) IHO-IOC GEBCO Gazetteer of Undersea Feature Names, October 2012 version** spreadsheet provided by the General Bathymetric Chart of the Oceans (GEBCO) group (http://www.gebco.net/data_and_products/undersea_feature_names/), as well as the GEBCO world map (http://www.gebco.net/data_and_products/gebco_world_map/). Ocean names are selected from the **International Hydrographic Organization (IHO) Limits of Oceans and Seas (1953)** (http://www.iho.int/iho_pubs/standard/S-23/S23_1953.pdf), a **SCAR** article *The Southern Ocean defined* (<http://www.scar.org/articles/southernocean.html>), from the **SCAR** gazetteer (marginal seas), and **Encyclopædia Britannica** (<http://www.britannica.com/>) (Scotia Sea). Additional information has been obtained through e-mail correspondence with H. Werner, Chair of GEBCO Sub-Committee on Undersea Feature Names (SCUFN). The depth point in the South Sandwich Trench has been plotted with data from the Lamont-Doherty Earth Observatory, provided at **NOAA** (http://maps.ngdc.noaa.gov/viewers/geophysics/index_antarctic.html?layers=, search key ELT08). The names Bellingshausen Abyssal Plain, Marie Byrd Seamounts and South Orkney Plateau are placed based on the IBCSO Printable Chart (<http://ibcso.org/>). The label placements of Pitman, Shackleton, Hero Fracture Zones, South Shetland Trough and South Scotia Ridge are slightly adjusted based on various scientific

papers.)

LAND MASSES BETWEEN 55 AND 60° SOUTH

Coastlines are from the **Natural Earth** database (<http://www.naturalearthdata.com/>).

The hill shade is derived from *ETOPO1*. The generated hill shade effect exaggerates the elevation by 10 times.

OVERVIEW MAP

Coastlines are from **Natural Earth** and **SCAR** as well as from **NOAA** National Geophysical Data Center: *Global Self-consistent, Hierarchical, High-resolution Shoreline Database (GSHHS)* (<http://www.ngdc.noaa.gov/mgg/shorelines/shorelines.html>).

The polar front is visualized using **Orsi, A.H., T. Whitworth III, and W.D. Nowlin Jr., 1995**: On the meridional extent and fronts of the Antarctic Circumpolar Current. *Deep-Sea Research*, 42, 641-673.

The sea ice data show the typical extent of sea ice during Antarctic summer and winter. The summer and winter sea ice extents are calculated as the 30% contour of the 10 year (2003-2012) median sea ice concentration during February and September, respectively. The median extent datasets are based on **Cavalieri, D., C. Parkinson, P. Gloersen, and H. J. Zwally. 1996**, updated yearly. *Sea Ice Concentrations from Nimbus-7 SMMR and DMSP SSM/I-SSMIS Passive Microwave Data*. [2003-2010]. Boulder, Colorado USA: National Snow and Ice Data Center. Digital media. As well as from **Maslanik, J., and J. Stroeve. 1999**, updated daily. *Near-Real-Time DMSP SSM/I-SSMIS Daily Polar Gridded Sea Ice Concentrations*, [2011-2012]. Boulder, Colorado USA: National Snow and Ice Data Center. Digital media.

POSTER BACKGROUND

LIMA tiles are mosaiced and colour balanced.