

Data Story: AWI Radar Data Viewer

Legacy and open access of 30 years of airborne radar surveys of the Antarctic and Greenland Ice Sheet by the Alfred Wegener Institute

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Antonie Haas, Roland Koppe (AWI, Marine Data Portal support)



Why fair data sharing matters in German polar science



Radar Data Viewer

MARINE
DATA

HOME ABOUT DATA EXPEDITIONS VIEWERS

LOGIN

RADAR DATA OVERVIEW

LAYER TREE

☒ Radar Tracks Overview

TEMPORAL COVERAGE

DATE: 1980-01-01 2025-03-26

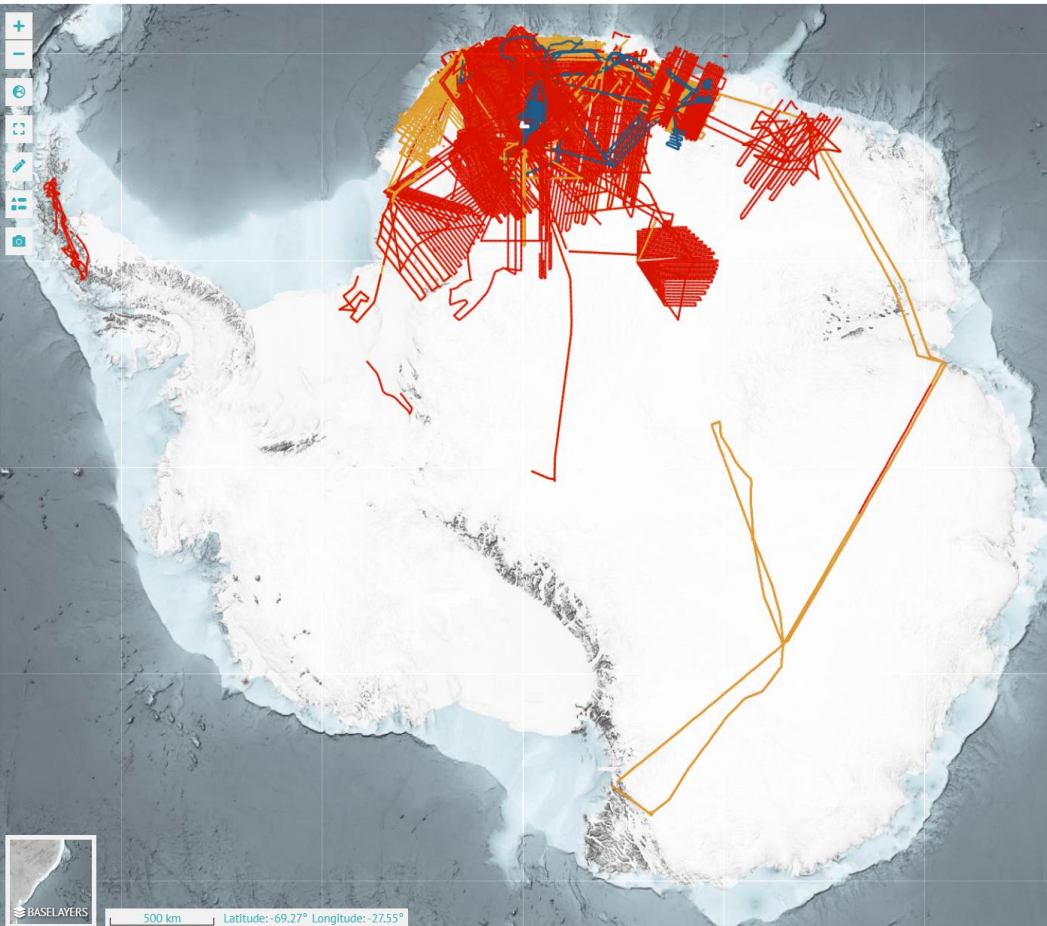
CHECKBOX FILTER

- | | |
|---------------------------------------|--|
| <input type="checkbox"/> ASIRAS | <input checked="" type="checkbox"/> EMR60 |
| <input type="checkbox"/> BAS | <input checked="" type="checkbox"/> EMR600 |
| <input type="checkbox"/> CReSIS_accum | <input checked="" type="checkbox"/> UWB |
| <input type="checkbox"/> CReSIS_rds | <input checked="" type="checkbox"/> UWBM |

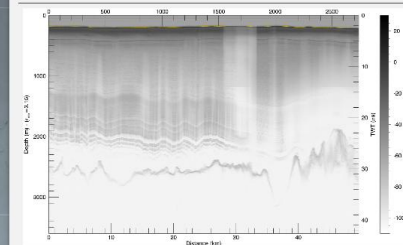
FILTER BY ATTRIBUTE

key value

+ Add Filter



OVERVIEW | 2024_ANTARCTICA_POLAR6_RDS_QLOOK



[View Gallery for "2024_Antarctica_Polar6_rds_qlook"](#)

SPACE & TIME

Date Time Start 2023-11-29,12:52:50+00:00
Date Time End 2023-11-29,13:02:52+00:00

EVENT

Campaign P6-244 ANT_23_24
PANGAEA Event P6-244_ANT_23_24_2311290701

DATA

Quick Look <https://media.o2a-data.de/proje...>
Radar UWB

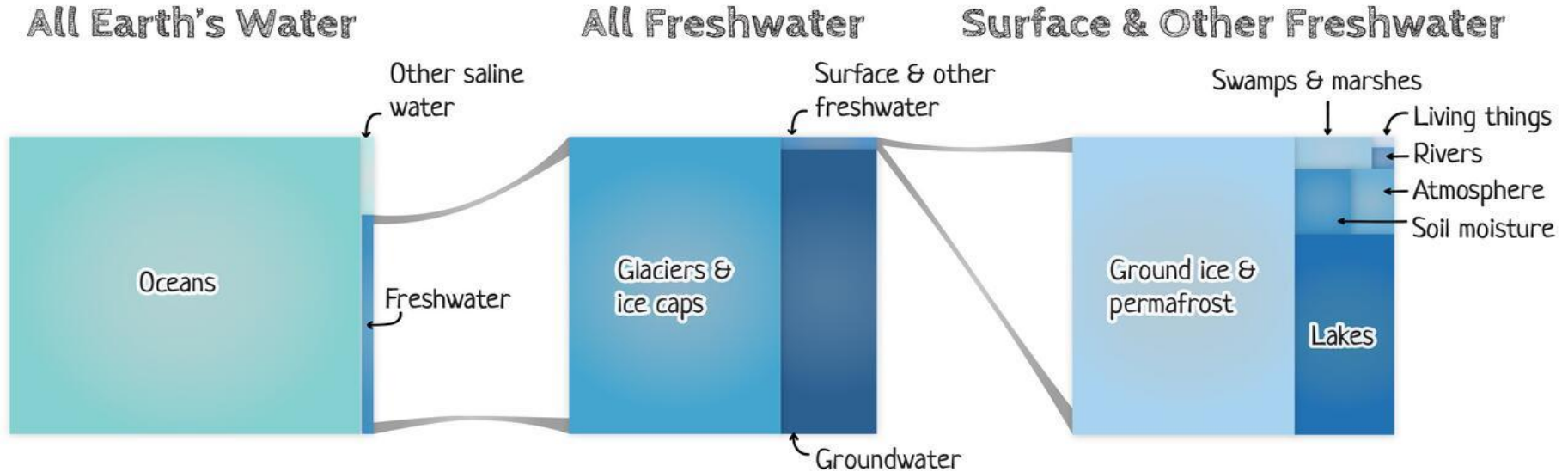
REFERENCES

Principal Investigator —
DOI <https://doi.pangaea.de/10.1594...>
Procname 2024_Antarctica_Polar6_rds_qlo...
Project CHARISO



Why study Ice Sheets?

Where's Earth's water?



Why study Ice Sheets?



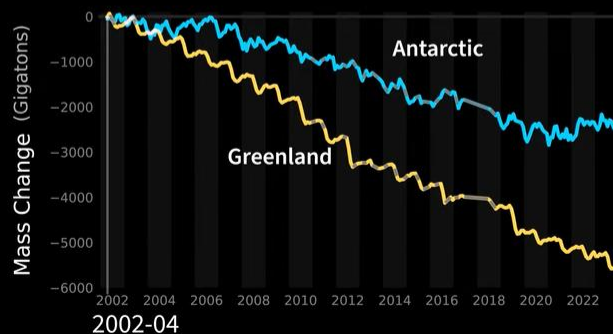
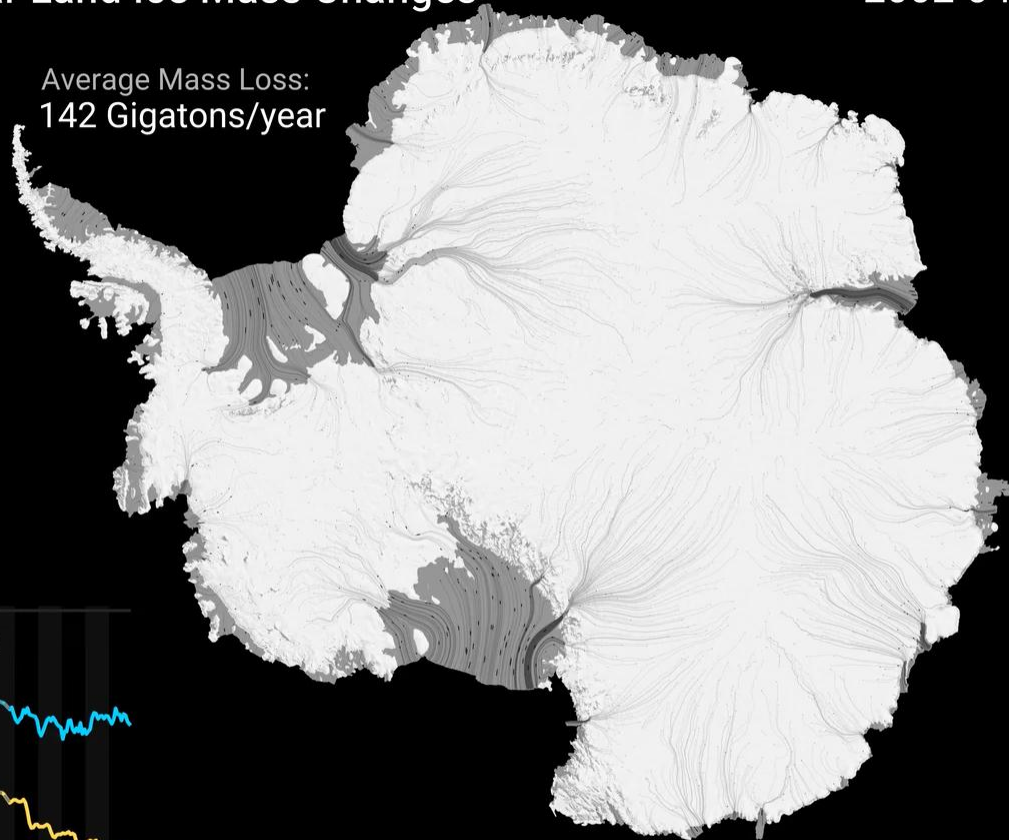
GRACE AND GRACE-FO Observations of Polar Land Ice Mass Changes

2002-04

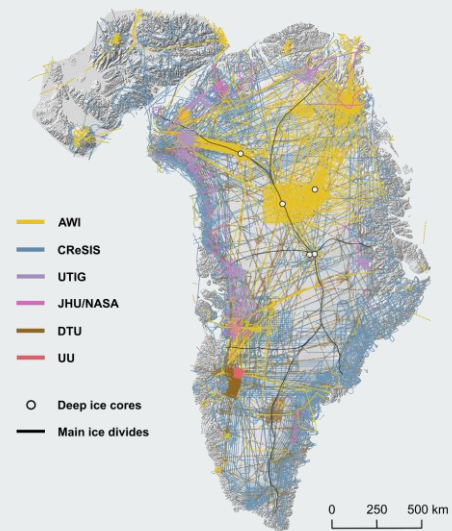
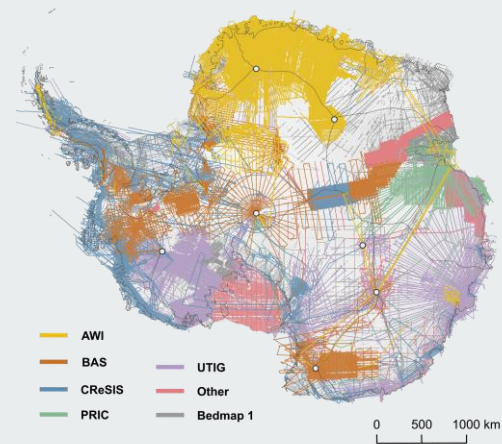
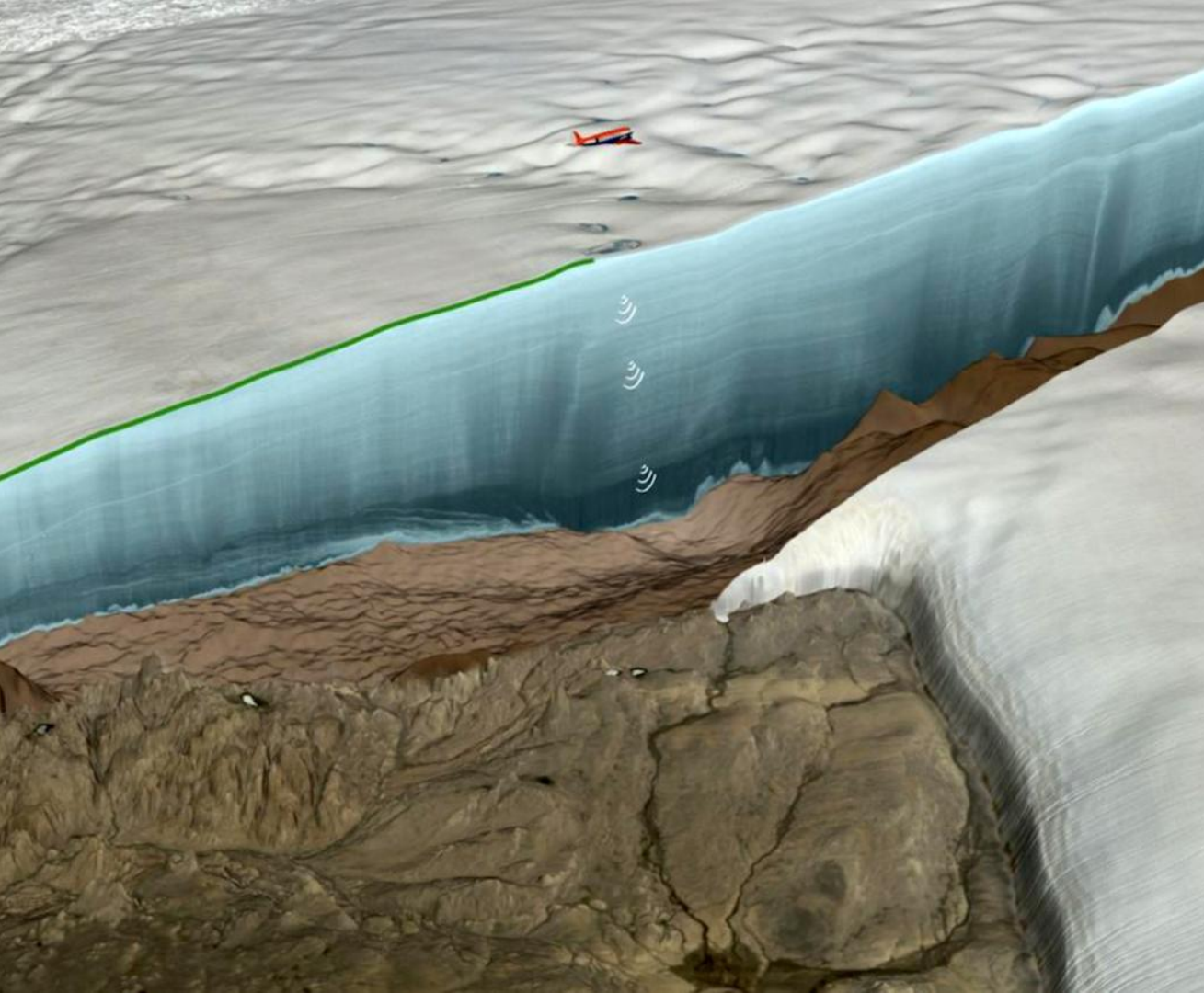
Average Mass Loss:
269 Gigatons/year

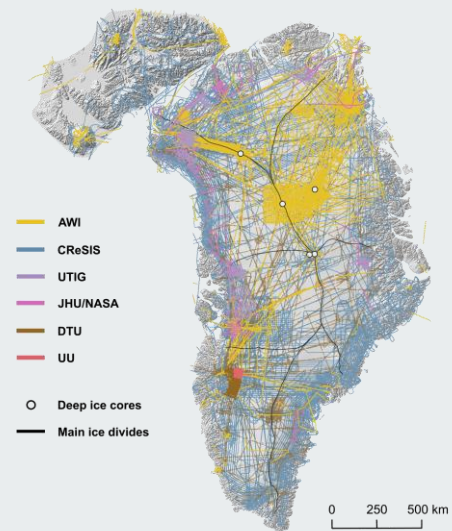
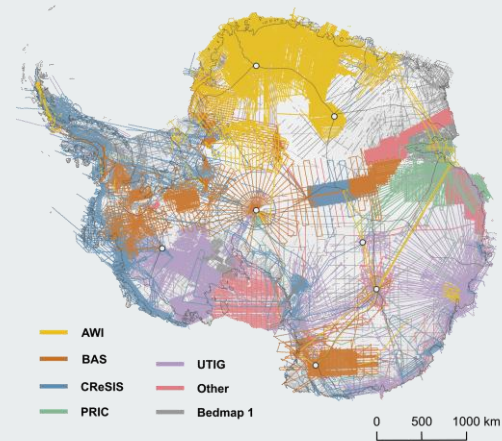


Average Mass Loss:
142 Gigatons/year











- First radar campaigns started 1994
- Six different radar systems
- Two polar aircrafts (Polar 5 & 6)
- Radar campaigns last 1-2 month
- In total 1.377.395 km of radar profiles were collected (~ 35 times around Earth)

Main findings using airborne radar data

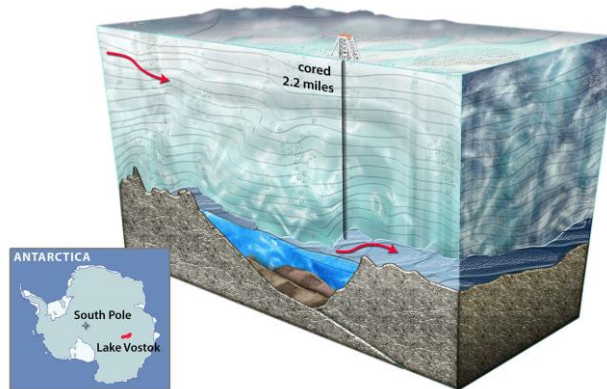
Ice thickness & bed topography

- Ice thickness up to 4 km
- 60 m sea level rise if the Antarctic ice sheet melts
- ~ 7.5 m for the Greenland ice sheet



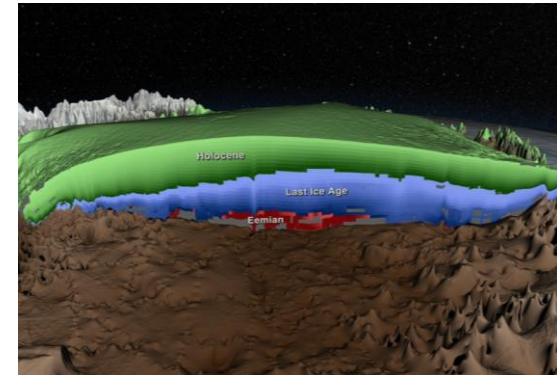
Subglacial lakes & water systems

- ~ 750 subglacial lakes
- Are isolated ecological systems for millions of years
- Seasonal water transport influences ice flow velocity

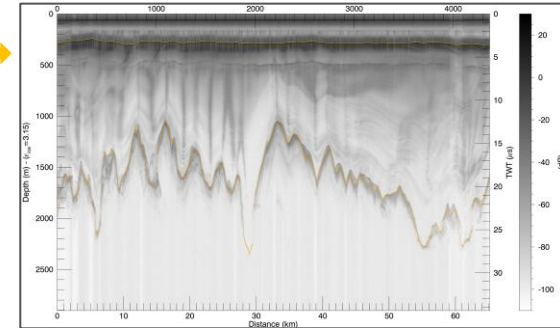
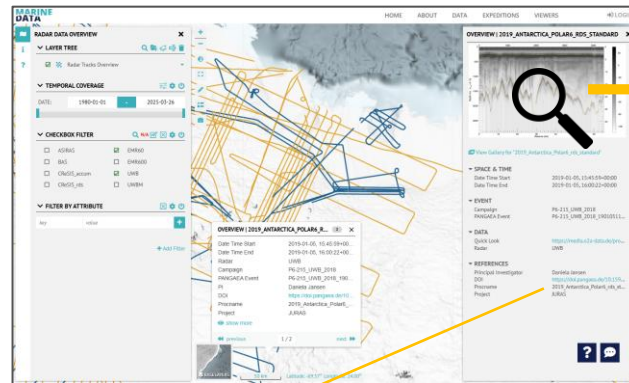
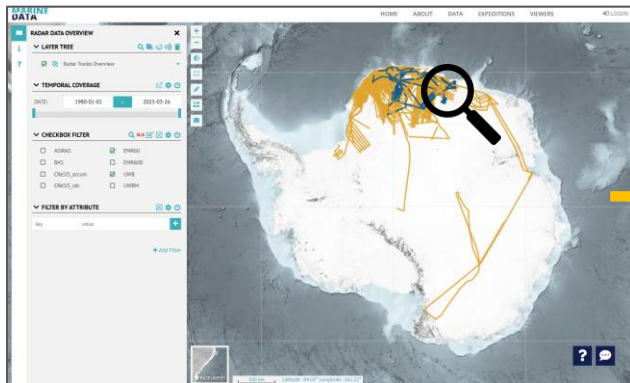


Ice-internal structure

- Reconstruct climate history
- Where to drill for a new ice core?
- Knowledge about ice-internal deformation



Radar Data Viewer - Usage



PANGAEA.
Data Publisher for Earth & Environmental Science

SEARCH SUBMIT HELP ABOUT CONTACT

Citation: Franke, Steven; Helm, Veit; Steinhage, Daniel; Jansen, Daniela (2025): ANT 2018/19: AWI airborne ultra-wideband radar data over the Jutulstraumen Drainage Basin and South of Ser Rondane Mountains in Dronning Maud Land, East Antarctica (JuRA Project) [dataset]. PANGAEA, <https://doi.org/10.1594/PANGAEA.976759> [DOI registration in progress]

Always quote citation above when using data! You can download the citation in several formats below.

Published: 2025-05-27

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Data

Download dataset as tab-delimited text — use the following character encoding: [UTF-8 Unicode (PANGAEA default)]

All files referred to in data matrix can be downloaded in one go as ZIP or TAR. Be careful: This download can be very large!

Season	Profile ID	Instrument	Radar prod.	netCDF	netCDF (Size)	GIS	IMAGE
ARX 1999	19992504	EMR	600 ns pulse	19992504_stp10.nc	95.3 Mbytes	19992504_stp10.kml	19992504_stp10.jpg
ARX 1999	19992513	EMR	600 ns pulse	19992513_stp10.nc	203.8 Mbytes	19992513_stp10.kml	19992513_stp10.jpg

File format

Content

netCDF

Radar data + metadata

KML

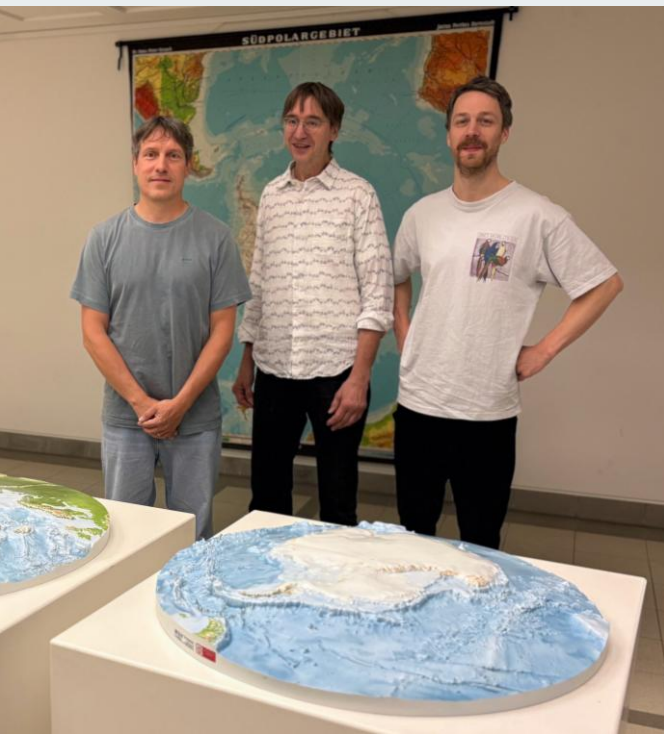
Profile location (GIS file)

JPG

Quicklook of the radargram

Radar Data Viewer – Contributions & Challenges

AWI Glaciology (Field Glaciology)
AWI Logistics
Uni Tübingen (Dep. Geosciences)



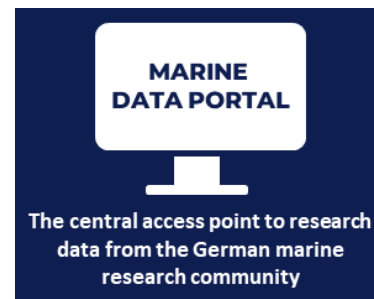
- Revisiting the 30-year data archive
- Reprocessing large amounts of data
- Retrieving metadata
- Data conversion
- Workflow for the Marine Data Portal
- Data submission to Pangaea
- Quality checks and fixing bugs

Amelie Driemel



PANGAEA
Data Publisher for Earth &
Environmental Science

**Andreas Walter, Peter
Konopatzky, Robin Hess,
Antonie Haas, Roland Koppe**



Data Story Summary

- Radar data is important to study polar ice sheets
- AWI has a lot of it
- Radar data acquired over the last 30 years are now available and updated
- AWI's Radar Data Viewer allows to explore the data archive and download the data (PANGAEA)

