

# Ice sample and data management with LinkAhead in the Glaciology section @AWI

## Experience report 2019-2024



Core drilling supported by aircraft



Sample boxes

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für Polar- und Meeresforschung

ASDM workshop 8-10th April 2024, Göttingen

**HELMHOLTZ**

## **BACKGROUND:**

**WORKFLOWS in Ice core research**

**IceDB - LinkAhead:**

**SPECIFICATIONS**

**IMPLEMENTATION**

**USER CASES - EXPERIENCE**

**OUTLOOK**



## Article

### Modern temperatures in central-north Greenland warmest in past millennium



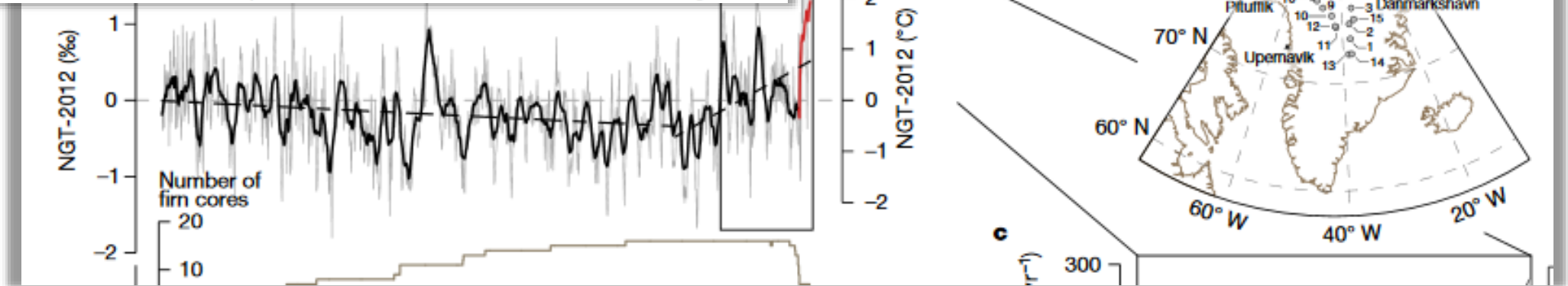
M. Hörhold<sup>1</sup>, T. Münch<sup>2</sup>, S. Weißbach<sup>1</sup>, S. Kipfstuhl<sup>1</sup>, J. Freitag<sup>1</sup>, I. Sasgen<sup>1</sup>, G. Lohmann<sup>1</sup>, B. Vinther<sup>3</sup> & T. Laepple<sup>2,4</sup>

The Greenland Ice Sheet has a central role in the global climate system owing to its size, radiative effects and freshwater storage, and as a potential tipping point<sup>1</sup>. Weather stations show that the coastal regions are warming<sup>2</sup>, but the imprint of global warming in the central part of the ice sheet is unclear, owing to missing long-term observations. Current ice-core-based temperature reconstructions<sup>3-5</sup> are ambiguous with respect to isolating global warming signatures from natural variability, because they are too noisy and do not include the most recent decades. By systematically redrilling ice cores, we created a high-quality reconstruction of central and north Greenland temperatures from AD 1000 until 2011. Here we show that the warming in

### Compilation of ice-core data from different sites/years

- Numerous core drillings and processings (logging, cutting) and data analysis steps (dating,...)
- Various measurements on core segments

Nature, 2023



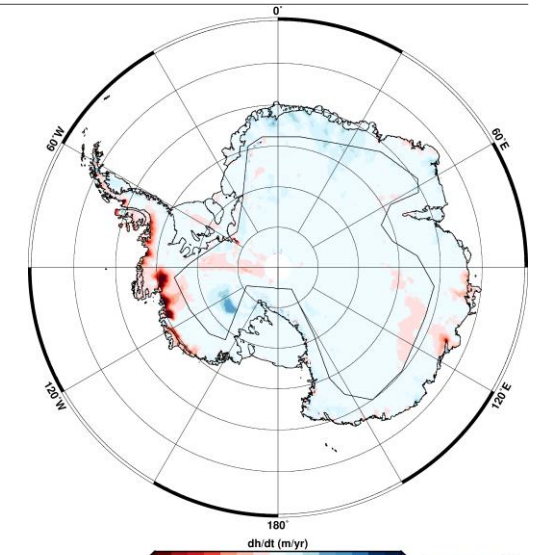
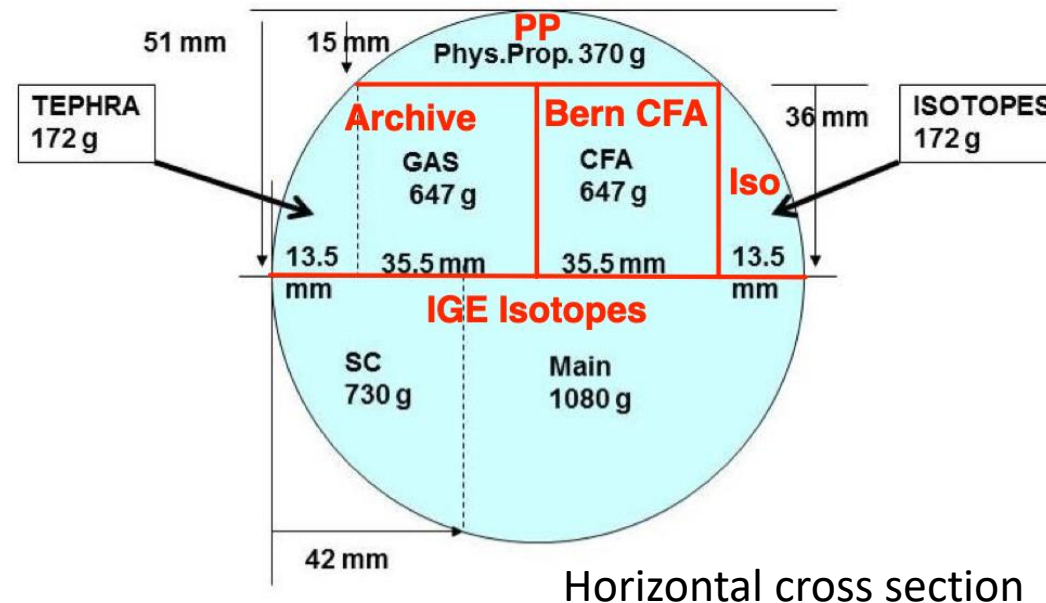
# Ice sample repository



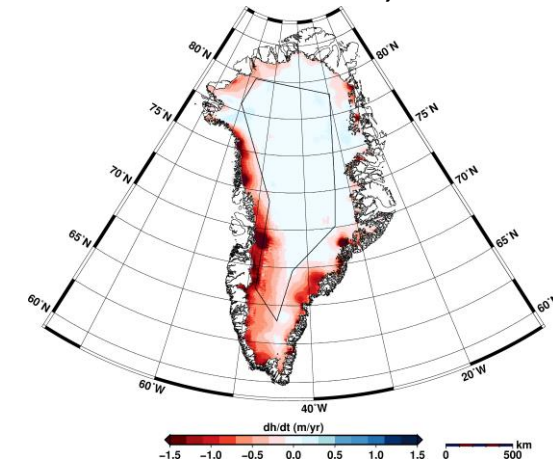
## Sample types:

- Icecores:** Deep Ice cores (<4000m) few years operation + Firn cores (< 200m) weekly operation
- Snow cores** (<8m) daily operation
- Snowpit samples** (<3m) daily operation
- Discrete samples** (< 0.1m) daily operation

## Core cutting scheme (EGRIP S1)

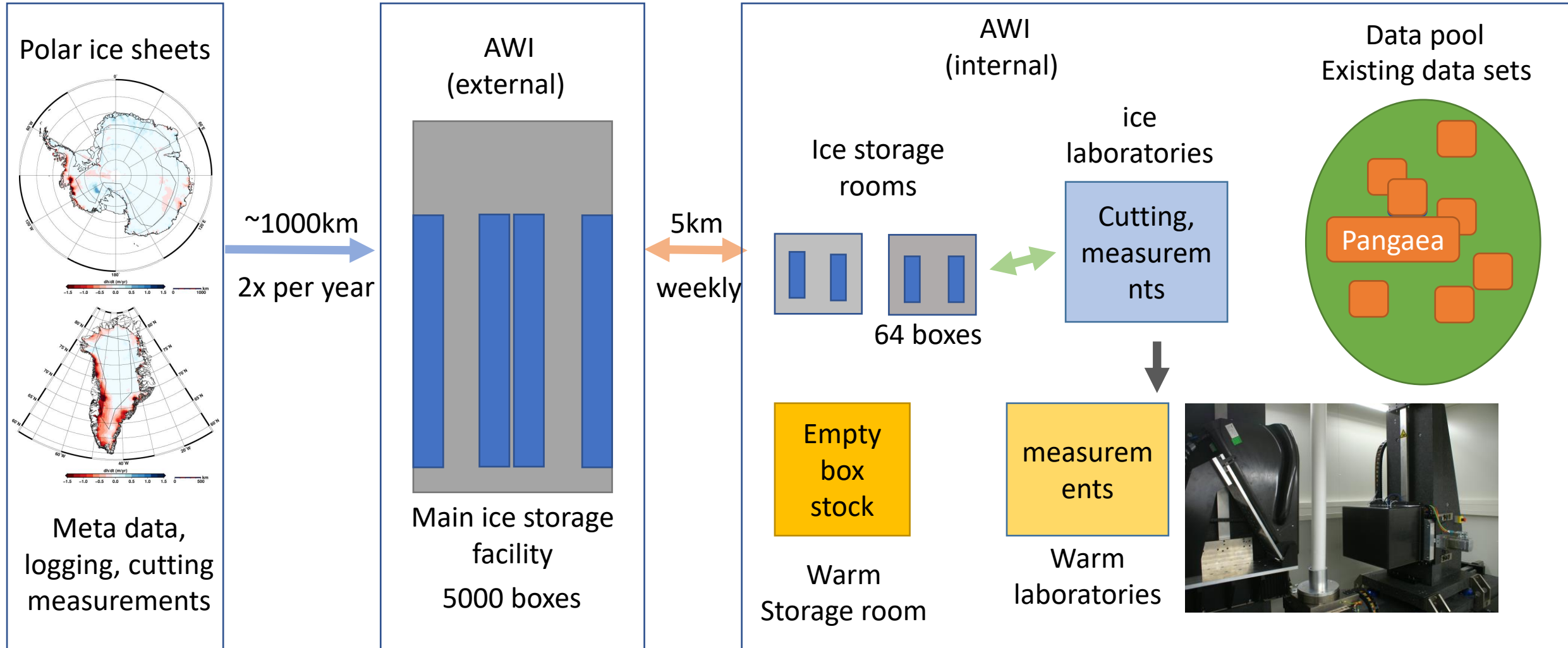


Helm et al., 2014



40 years of ice sampling @AWI

# Ice core research: typical workflow

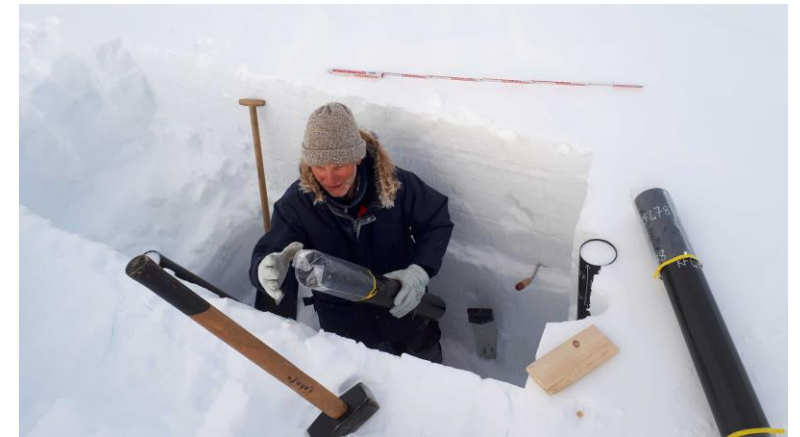


- What kind of samples do we have collected/ are still available?
  - Where are these samples?
  - How do we get access?
- Overloaded AWI-ice-storage/lab room!
- Do we have data related to these ice samples?
  - Where are the data („personal disk space..., personal contact“)?
  - How do we get access?
- Who is responsible for which box, ice, data?

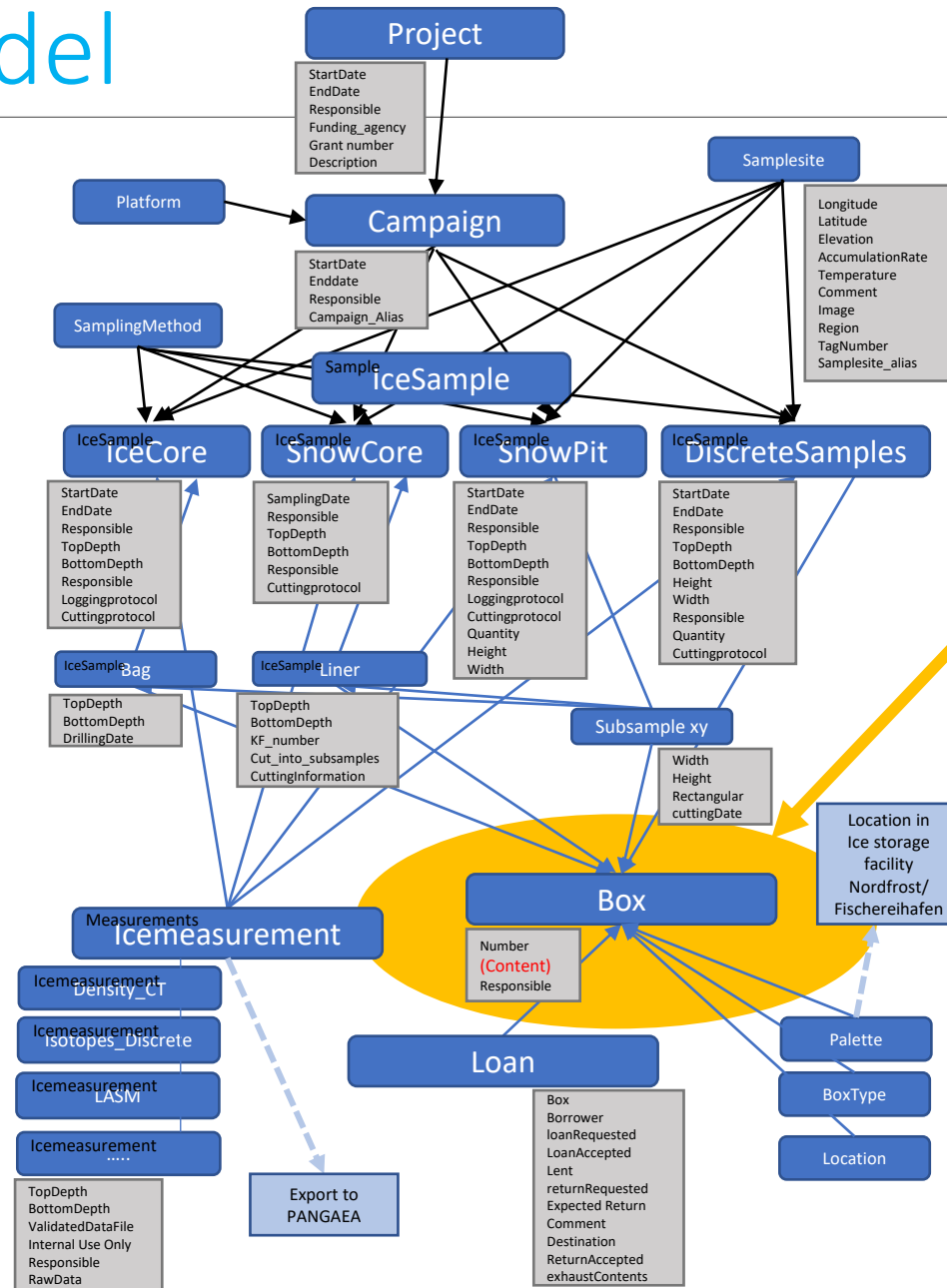


## Tasks/ specifications:

- **Box management** with personalized requests
- **Migration** of (old/recent)
  - box data sets
  - meta data information (Long,Lat,date,project, campaign, responsible,...)
  - cutting and logging information
  - measurement data sets
  - *data analysis/software*
- **User-friendly search queries**
  - map selection, core viewer,
  - downloads of results
- **Expandable for new functionalities**

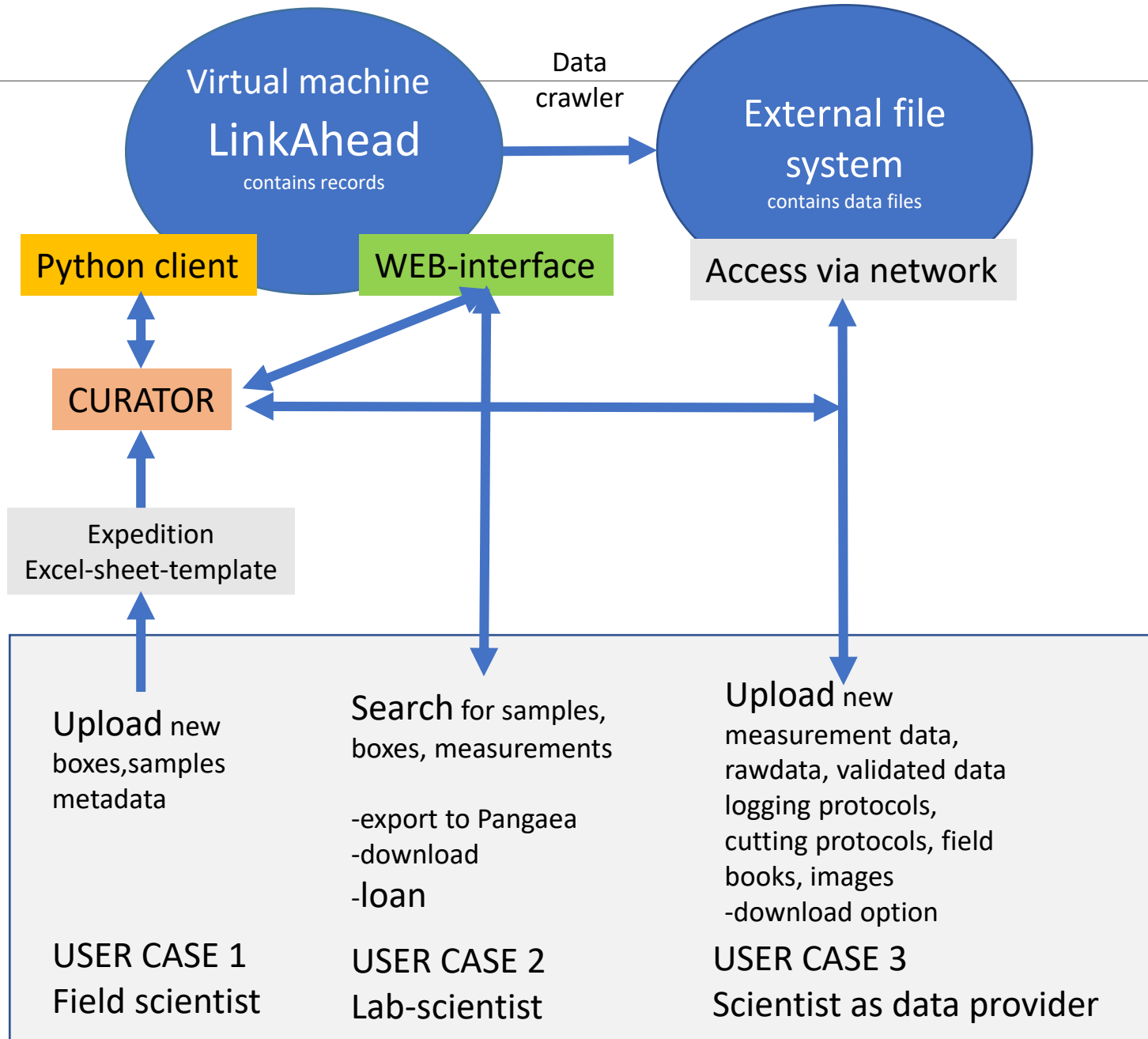


# Simplified data model



Former data base for ice core boxes: „Content-text field“





# External filesystem for data files

Name	Änderungsdatum	Typ	Größe
ANT-LAND-2003_EPICA-EDML	06.08.2020 19:30	Dateiordner	
ANT-LAND-2003_NEUMAYER	06.08.2020 19:34	Dateiordner	
ANT-LAND-2003_VISA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2004_NEUMAYER	06.08.2020 19:34	Dateiordner	
ANT-LAND-2004_VISA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2005_EPICA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2005_EPICA-DML-FIRNAIR	06.08.2020 19:29	Dateiordner	
ANT-LAND-2005_VISA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2006_EPICA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2006_VISA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2007_EPICA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2007_VISA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2008_EPICA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2008_VISA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2009_EPICA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2009_VISA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2010_EPICA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2010_VISA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2011_EPICA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2011_VISA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2012_EPICA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2012_VISA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2013_EPICA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2013_VISA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2014_EPICA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2014_VISA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2015_EPICA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2015_VISA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2016_EPICA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2016_VISA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2017_EPICA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2017_VISA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2018_EPICA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2018_VISA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2019_EPICA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2019_VISA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2020_EPICA	06.08.2020 19:29	Dateiordner	
ANT-LAND-2020_VISA	06.08.2020 19:29	Dateiordner	

**Campaigns (Expeditions)**

Name	Änderungsdatum	Typ	Größe
ANT-LAND-2019_ExNGT	06.08.2020 19:29	Dateiordner	
ANT-LAND-2019_ExNGT-CampaignInformation	06.08.2020 19:29	Dateiordner	
ANT-LAND-2019_ExNGT-IC_ExNGT_B16	10.08.2020 21:00	Dateiordner	
ANT-LAND-2019_ExNGT-IC_ExNGT_B19	06.08.2020 19:29	Dateiordner	
ANT-LAND-2019_ExNGT-IC_ExNGT_B22	06.08.2020 19:29	Dateiordner	
ANT-LAND-2019_ExNGT-IC_ExNGT_B2728	06.08.2020 19:29	Dateiordner	
ANT-LAND-2019_ExNGT-SC_ExNGT_B16	06.08.2020 19:29	Dateiordner	
ANT-LAND-2019_ExNGT-SC_ExNGT_B19	06.08.2020 19:29	Dateiordner	
ANT-LAND-2019_ExNGT-SC_ExNGT_B20	06.08.2020 19:29	Dateiordner	
ANT-LAND-2019_ExNGT-SC_ExNGT_B22	06.08.2020 19:29	Dateiordner	
ANT-LAND-2019_ExNGT-SC_ExNGT_B2728	06.08.2020 19:29	Dateiordner	
ANT-LAND-2019_ExNGT-SC_ExNGT_Veit-site	06.08.2020 19:29	Dateiordner	

**Samples**  
(Icecores, snowcores, snowpits, discrete samples)  
Additional campaign information

Name	Änderungsdatum	Typ	Größe
Cutting	26.06.2020 11:37	Dateiordner	
Density_CT	05.08.2020 11:42	Dateiordner	
Isotopes_Discrete	05.08.2020 11:42	Dateiordner	
Logging	26.06.2020 11:37	Dateiordner	
SamplingInformation	26.06.2020 11:37	Dateiordner	
Stratigraphy_2dCT	05.08.2020 11:42	Dateiordner	
TEMPLATE_MEASUREMENT_DEVICE	05.08.2020 11:42	Dateiordner	
SC_LTW_10_Pos50m_information.xlsx	18.08.2020 17:28	Microsoft Excel-Arbeitsmappe	6 KB
SC_LTW_10_Pos50m_measurement.xlsx	18.08.2020 11:23	Microsoft Excel-Arbeitsmappe	13 KB

**Measurement data**  
Logging protocols  
Cutting protocols



# iceDB-LinkAhead

## User Case 2 Lab Scientist

Query / shortcuts (slice)

Mapviewer (slice)

Select Box (slice)

Borrow Boxes (slice)

Return Boxes/ loan (slice)

## User Case 1 Field scientist

Expedition Template (slice)

*PythonScript Curator*

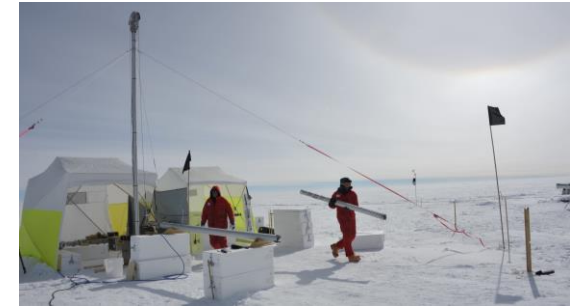
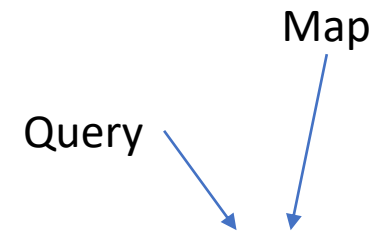
Select all collected samples of campaign xy (slice)

## User Case 3 Scientist as data provider

External Filesystem (slice)

Measurement entry (slice)

*DataCrawler Curator*



LinkAhead Entities Query Map Bookmarks Login

Welcome

# AWI iceDB

From a piece of ice to publication

This is the ice sample and data management platform of the Glaciology section. You can search for ice samples, boxes, metadata and processed measurement files, you can download data or request for ice. Just click 'Query', pose a query, choose shortcuts, select maps...

If you have questions, please contact Johannes Freitag (Johannes.Freitag@awi.de)

LinkAhead by IndiScale Data Services

LinkAhead – Thinking data management ahead. IndiScale – We make individual data management scalable.

Contact · Imprint/Impressum · Data Policy · License (AGPL-v3) · Sources · Documentation

Front page of iceDB

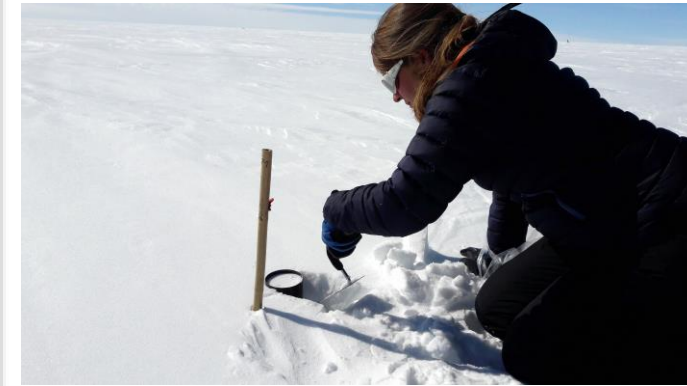
# (Lab) Scientist: shortcuts

LinkAhead Entities Query Map 2 Bookmarks Login

find b40

▼ Shortcuts

- Find box with number
- Find box with number like
- Find all boxes with content like
- Find all boxes with content/samples from icecore
- Generate table with boxes that have a content with
- Find all boxes with content/samples from snowcore
- Find boxes from person  (lastname)
- Find location and palette number for box with number
- Show list of samples from campaign
- Find IceSample/Project/SampleSite/measurement/analysis by name like
- Find metadata/measurements from icecore/icesample
- Find measurements from icesample
- Find datanalysis from icesample
- Show overview over measurement types actually storable in iceDB
- Show overview over campaigns archived so far in iceDB
- Show overview over dataanalysis in iceDB
- Show overview over software in iceDB
- Show overview table of loans
- Show table of lent boxes from person  (lastname)
- Find loan of box no.
- Show table of requested boxes from person  (lastname)



# (Lab) Scientist: meta data / core viewer

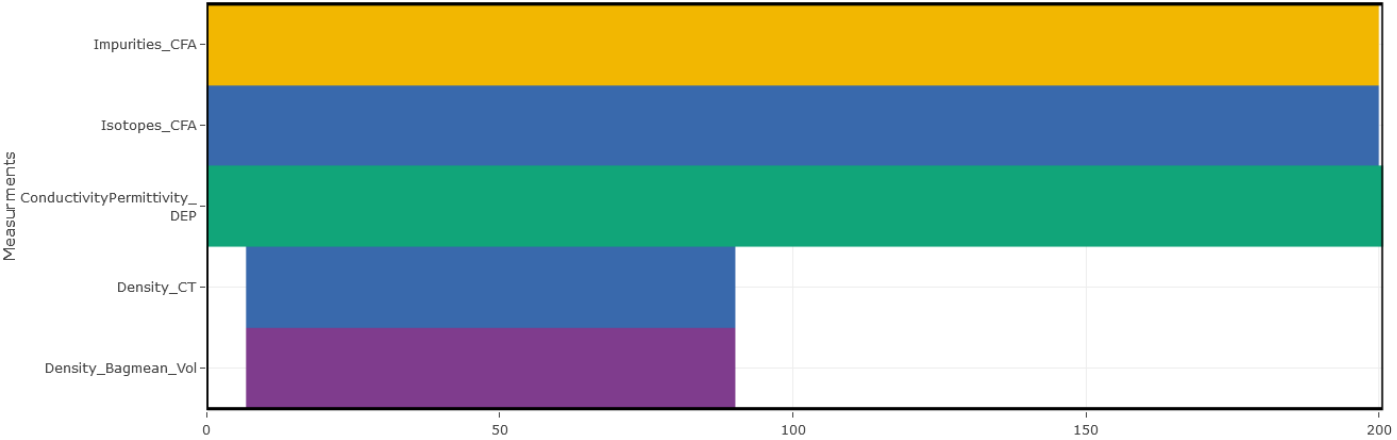
LinkAhead Entities Query Map 2 Bookmarks Login

Query: find b40 Results: 1  
[Bookmark all query results](#)

**IceCore B40**  
*description: enter more info* References

[Export to Pangaea](#)

SampleSite	Kohnen station B40
Campaign	ANT-Land_2012_COFI
startDate	2012-12-04
endDate	2012-12-10
TopDepth	0.0 m
BottomDepth	200.71 m
DrillingMethod	EDRILL
Responsible	6296
LoggingProtocol	13276
Density_Bagmean_Vol	15748
Density_CT	15749
longitude	0.067946
latitude	-75.000731
elevation	
EventLabel	
ConductivityPermittivity_DEP	16396
Isotopes_CFA	16406
Impurities_CFA	16408



Core Viewer (visual overview samples/measurements)



# (Lab) Scientist: meta data – sample link

LinkAhead Entities Query Map 2 Bookmarks Login

Query: find icecore with name=ExNGT\_B19 Results: 1  
[Bookmark all query results](#)

**R IceCore ExNGT\_B19**  
description: enter more info References

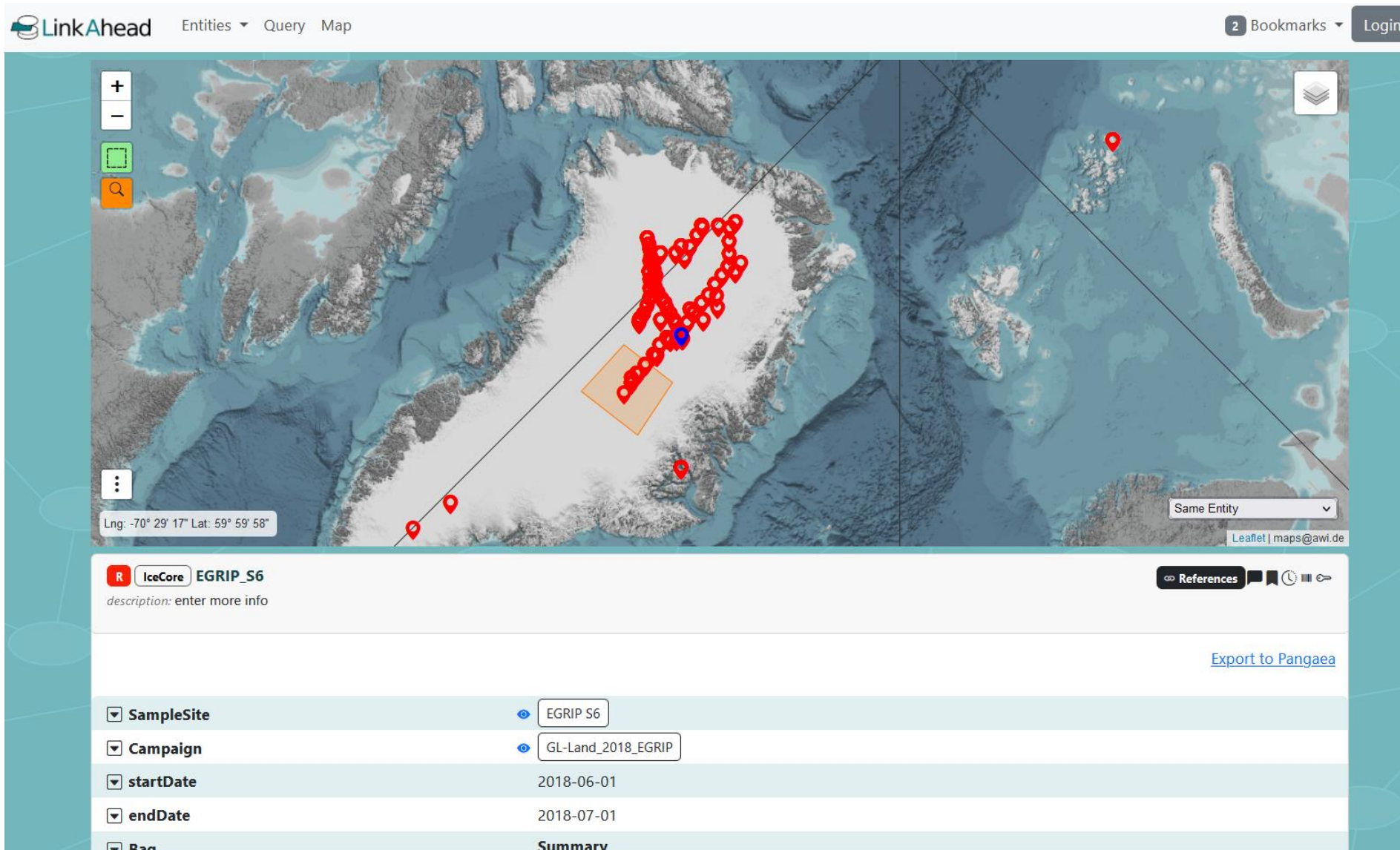
[Export to Pangaea](#)

SampleSite	ExNGT_B19				
Campaign	GL-Land_2019_ExNGT				
startDate	2019-05-19				
endDate	2019-05-19				
Bag	<b>Summary</b> IceCore: ExNGT_B19 (Bag: 2-38) <table border="1"><tr><td>7982 (IceCore ExNGT_B19, Bag 2)</td><td>7983 (IceCore ExNGT_B19, Bag 3)</td><td>7984 (IceCore ExNGT_B19, Bag 4)</td><td>7985 (IceCore ExNGT_B19, Bag 5)</td></tr></table>	7982 (IceCore ExNGT_B19, Bag 2)	7983 (IceCore ExNGT_B19, Bag 3)	7984 (IceCore ExNGT_B19, Bag 4)	7985 (IceCore ExNGT_B19, Bag 5)
7982 (IceCore ExNGT_B19, Bag 2)	7983 (IceCore ExNGT_B19, Bag 3)	7984 (IceCore ExNGT_B19, Bag 4)	7985 (IceCore ExNGT_B19, Bag 5)		
TopDepth	1.2 m				
DrillingMethod	EDRILL				
Responsible	6296				
LoggingProtocol	13214				
Density_Bagmean_Vol	15346				
LoggingProtocol	15345				
Stratigraphy_2dCT	15672				
Density_CT	15673				
longitude	-36.39222222				
latitude	77.99261111				



# (Lab) Scientist: Mapviewer - icecores

LinkAhead Entities Query Map 2 Bookmarks Login



Lng: -70° 29' 17" Lat: 59° 59' 58"

IceCore EGRIP\_S6  
description: enter more info

References

[Export to Pangaea](#)

SampleSite	EGRIP S6
Campaign	GL-Land_2018_EGRIP
startDate	2018-06-01
endDate	2018-07-01
Bag	Summary



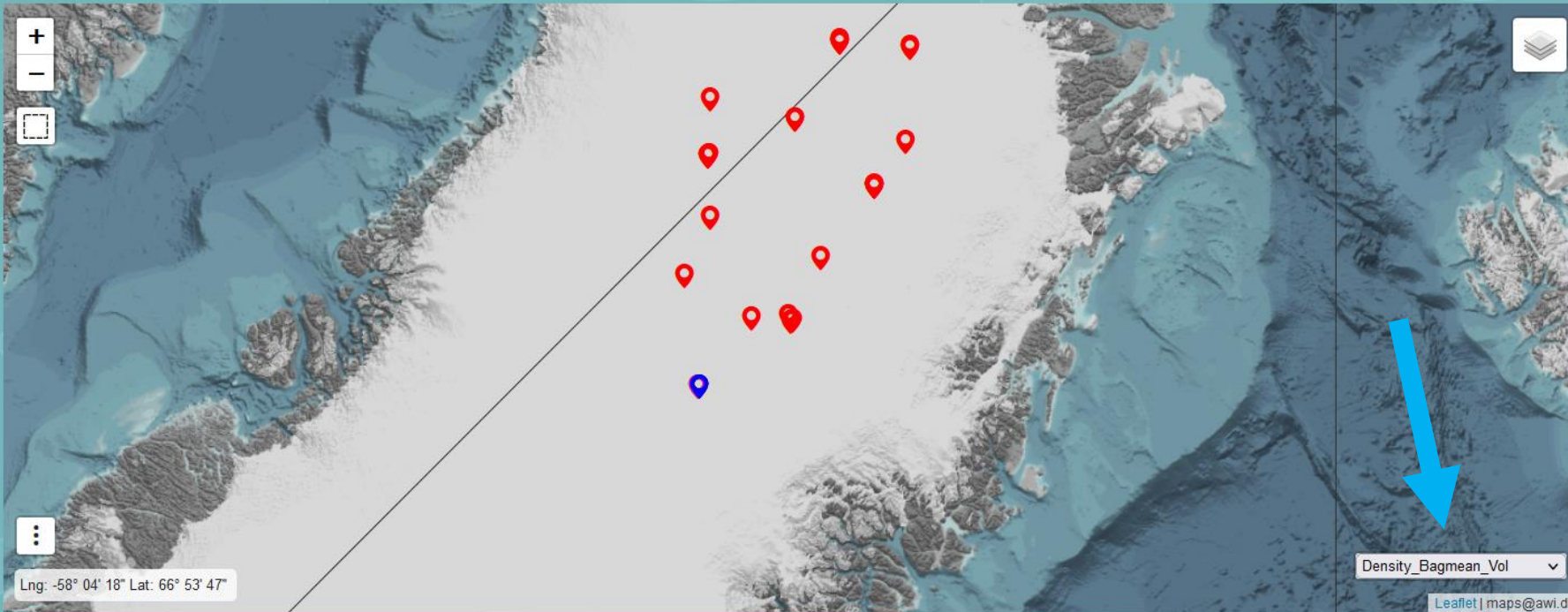
# (Lab) Scientist: Mapviewer-measurements

LinkAhead

Entities ▾ Query Map

2 Bookmarks ▾

Login



**R** Density\_Bagmean\_Vol

description: BagMeanDensity weighting in Lab, without outliers

References

[Export to Pangaea](#)

<input checked="" type="checkbox"/> Icecore	ExNGT_B16
<input checked="" type="checkbox"/> Number	1
<input checked="" type="checkbox"/> ValidatedDataFile	BulkDensity_ExNGTB16.xlsx
<input checked="" type="checkbox"/> ValidationMethod	GL2019_ExNGT_B16.pxp
<input checked="" type="checkbox"/> TopDepth	1.2 m









# (Lab) Scientist: Box search

LinkAhead Entities Query Map 2 Bookmarks Login

Query: select number, content, palette.number, palette.storagearea, location from box with content like "\*\*ExNGT\*B19\*" Results: 6  
[Bookmark all query results](#)

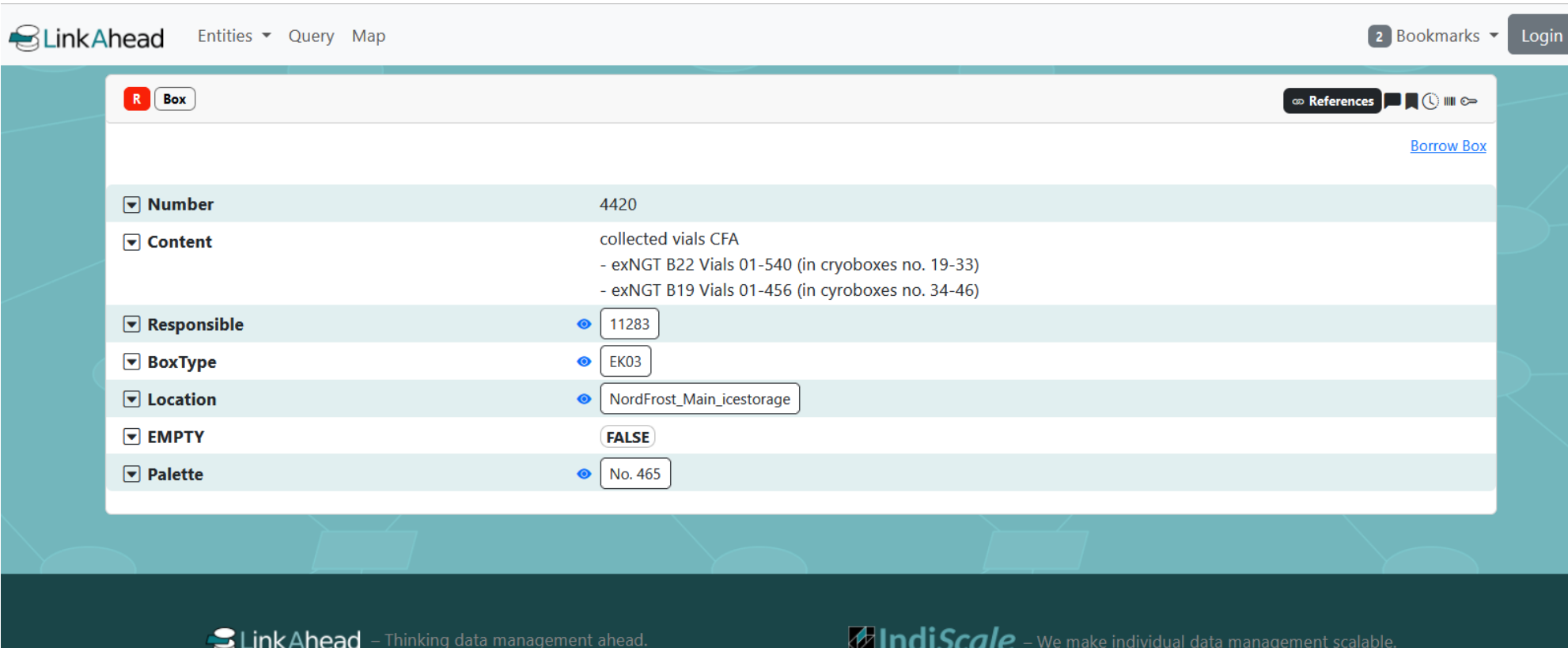
Table of selected fields Export

number	content	palette.number	palette.storagearea	location
 4420	collected vials CFA - exNGT B22 Vials 01-540 (in cryoboxes no. 19-33) - exNGT B19 Vials 01-456 (in cyroboxes no. 34-46)	465	HR	NordFrost_Main_icestorage
 6063	Inhalt laut Maria: ExNGT B19, diskrete Isotopenstreifen // 20.09.2023 DD	510	HR	NordFrost_Main_icestorage
 6362	ExNGT B19 Archive a	427	R0	NordFrost_Main_icestorage
 6385	ExNGT B19 Archive Main Bags 11-24 Bag 11 Bag 12 Bag 13 Bag 14	458	R11	AWI_D_icestorage_146
 6387	ExNGT B19 Archive Main Bags 2-10 Bag 2 Bag 3 Bag 4 Bag 5	426	R5	AWI_D_icestorage_146
 6435	ExNGT B19 Archive Main Bags 25-38 Bag 25 Bag 26 Bag 27 Bag 28	426	R5	AWI_D_icestorage_146

Notizen Kommentare



# (Lab) Scientist: Box search



The screenshot shows the LinkAhead web interface. At the top left, there is a navigation bar with 'LinkAhead', 'Entities', 'Query', and 'Map'. On the top right, there are '2 Bookmarks' and a 'Login' button. The main content area displays a search result for a 'Box' entity. The entity details are as follows:

Property	Value
Number	4420
Content	collected vials CFA - exNGT B22 Vials 01-540 (in cryoboxes no. 19-33) - exNGT B19 Vials 01-456 (in cryoboxes no. 34-46)
Responsible	11283
BoxType	EK03
Location	NordFrost_Main_cestorage
EMPTY	FALSE
Palette	No. 465

Additional UI elements include a 'References' button, a 'Borrow Box' link, and a footer with the LinkAhead logo and the tagline 'Thinking data management ahead.' along with the IndiScale logo and tagline 'We make individual data management scalable.'



# (Lab) Scientist: Borrow boxes

R Box

References

## Borrow Box

Please enter your full name and your email address. If you are doing this for the first time, a new user record will be created.

\* First Name:

johannes

\* Last Name:

Freitag

\* Email:

johannes.freitag@awi.de

\* Expected Return Date:

08.04.2024

\* Destination:

AWI\_D\_icestorage\_146

Purpose:

Test of iceDB

Are you going to completely exhaust the contents of this box?

\*required field

Submit

Number

4420

Content

collected vials CFA

- exNGT B22 Vials 01-540 (in cryoboxes no. 19-33)

- exNGT B19 Vials 01-456 (in cryoboxes no. 34-46)

Responsible

11283

BoxType

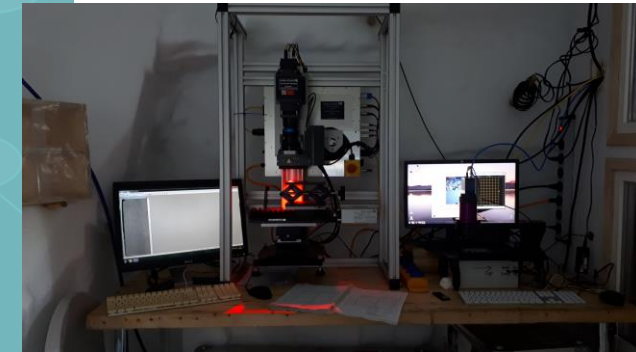
EK03

Location

NordFrost\_Main\_icestorage

EMPTY

FALSE



# (Lab) Scientist: Loans

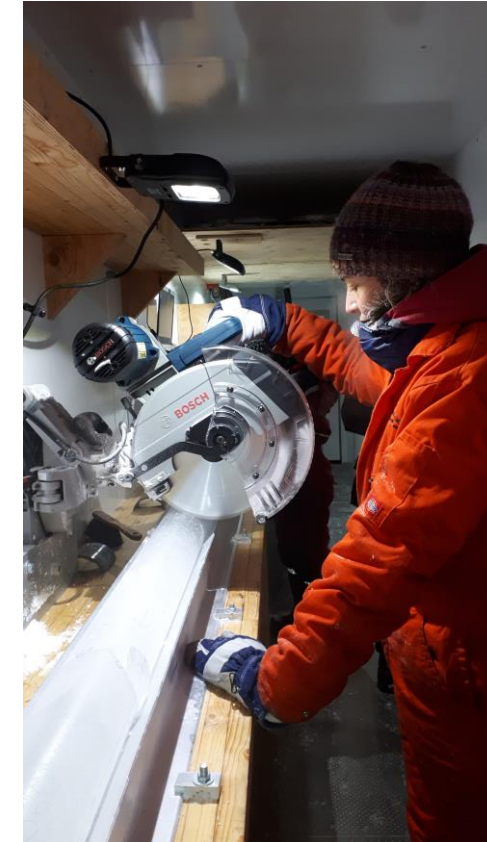
LinkAhead Entities Query Map 2 Bookmarks Login

Query: find loan Results: 478

[Bookmark all query results](#)

**R** Loan References

Box (borrowed)	6431
Borrower	6296
expectedReturn	2021-04-28
exhaustContents	FALSE
comment	CT-2d scan
destination	awi d
loanRequested	2020-09-14T13:32:13+0200
loanAccepted	2020-11-18T13:22:16+0100
lent	2020-11-18T15:30:21+0100
returnRequested	2021-04-27T07:25:57+0200
Content	unchanged content, 2dCT measured
ReturnLocation	NordFrost_Main_icestorage
returnAccepted	2021-04-27T07:26:11+0200
returned	2021-04-29T07:10:05+0200
Box (returned)	6431



# (Field) scientist: expedition sheet

A	B	C	D	E	F	G	H	I	J	K	L
Box no.	BoxType_REF	Content	EventLabel (unique!)	IcecoreName	Bag no. Start	Bag no. End	Aprox. Bag Length [m]	StartDateSampling	EndDateSampling	TotalTopDepth [m]	TotalBottom Depth [m]
1838	EKK01	EGRIP2022 - ExS5-1 core bag 1-6		ExS5-1	1	6	1	28.06.2022	01.07.2022	0	102
6438	EKK01	EGRIP2022 - ExS5-1 core bag 7-12		ExS5-1	7	12	1	28.06.2022	01.07.2022	0	102
6250	EKK01	EGRIP2022 - ExS5-1 core bag 13-18		ExS5-1	13	18	1	28.06.2022	01.07.2022	0	102
2974	EKK01	EGRIP2022 - ExS5-1 core		ExS5-1	19	24	1	28.06.2022	01.07.2022	0	102
1398	EKK01	EGRIP2022 - ExS5-1 core		ExS5-1	25	30	1	28.06.2022	01.07.2022	0	102
1337	EKK01	EGRIP2022 - ExS5-1 core		ExS5-1	31	36	1	28.06.2022	01.07.2022	0	102
6254	EKK01	EGRIP2022 - ExS5-1 core		ExS5-1	37	42	1	28.06.2022	01.07.2022	0	102
2933	EKK01	EGRIP2022 - ExS5-1 core		ExS5-1	43	48	1	28.06.2022	01.07.2022	0	102
521	EKK01	EGRIP2022 - ExS5-1 core		ExS5-1	49	54	1	28.06.2022	01.07.2022	0	102
6440	EKK01	EGRIP2022 - ExS5-1 core		ExS5-1	55	60	1	28.06.2022	01.07.2022	0	102
6391	EKK01	EGRIP2022 - ExS5-1 core		ExS5-1	61	66	1	28.06.2022	01.07.2022	0	102
6226	EKK01	EGRIP2022 - ExS5-1 core		ExS5-1	67	72	1	28.06.2022	01.07.2022	0	102
2631	EKK01	EGRIP2022 - ExS5-1 core		ExS5-1	73	78	1	28.06.2022	01.07.2022	0	102
857	EKK01	EGRIP2022 - ExS5-1 core		ExS5-1	79	84	1	28.06.2022	01.07.2022	0	102
2941	EKK01	EGRIP2022 - ExS5-1 core		ExS5-1	85	90	1	28.06.2022	01.07.2022	0	102
2561	EKK01	EGRIP2022 - ExS5-1 core		ExS5-1	91	96	1	28.06.2022	01.07.2022	0	102
6043	EKK01	EGRIP2022 - ExS5-1 core		ExS5-1	97	102	1	28.06.2022	01.07.2022	0	102

Campaign | Samplesites | **Icecore** | Snowcore | Snowpit | DiscreteSamples | 1stLOGGINGPROTOCOL | 2ndLOGGINGPROTOCOL



# (Field) scientist: sample overview









Query: select name, longitude, latitude, BottomDepth from icesample which references campaign with name= "GL-Land\_2019\_ExNGT"

Results: 16

[Bookmark all query results](#)

## Table of selected fields

Export

	name	longitude	latitude	BottomDepth
	ExNGT_B2728	-46.4764	76.6486	32.17 m
	ExNGT_B16	-37.61616667	73.93552778	36.62 m
	ExNGT_B16	-37.61616667	73.93552778	2.0 m
	ExNGT_B19	-36.39222222	77.99261111	2.0 m
	ExNGT_B19	-36.39222222	77.99261111	37.16 m
	ExNGT_B22	-45.67397222	79.30988889	38.67 m
	ExNGT_B20	-36.49822222	78.83286111	3.0 m
	ExNGT_Veit site	24.04625	70.22500000	2.0 m



# (Data provider) Scientist: ext. filesystem

i.de\projects-dmz) (U) > Data > ANT-Land\_2012\_COFI > IC\_B40

Name	Änderungsdatum	Typ	Größe
ConductivityPermittivity_DEP	16.01.2024 09:42	Dateiordner	
Cutting	06.08.2020 19:34	Dateiordner	
Density_Bagmean_Vol	08.02.2024 11:26	Dateiordner	
Density_CT	30.01.2024 15:42	Dateiordner	
Impurities_CFA	16.01.2024 09:50	Dateiordner	
Isotopes_CFA	16.01.2024 09:42	Dateiordner	
Logging	31.01.2024 10:11	Dateiordner	
SamplingInformation	06.08.2020 19:34	Dateiordner	
Temperature_Borehole	16.01.2024 09:42	Dateiordner	
TEMPLATE_MEASUREMENT_DEVICE	16.01.2024 09:42	Dateiordner	
TEMPLATE_MEASUREMENT_DEVICE - Ko...	08.02.2024 11:22	Dateiordner	
.DS_Store	16.01.2024 10:09	DS_STORE-Datei	11 KB
IC_B40_information.xlsx	18.08.2020 17:18	Microsoft Excel-A...	6 KB
IC_B40_measurement.xlsx	16.01.2024 09:53	Microsoft Excel-A...	14 KB

.de\projects-dmz) (U) > Data > ANT-Land\_2012\_COFI > IC\_B40 > Density\_CT

Name	Änderungsdatum	Typ	Größe
RawData	17.02.2022 11:41	Dateiordner	
ValidationMethod01	17.02.2022 11:47	Dateiordner	
.DS_Store	16.01.2024 09:42	DS_STORE-Datei	7 KB
2dctdensity_B40_iceDB.xlsx	27.01.2022 21:20	Microsoft Excel-A...	15.628 KB



A	B	C	D	E	F	G	H	I
Nr	MeasurementType_device	TopDepth(m)	BottomDepth(m)	Responsible(Last,FirstName)	Description	RawDataFolde	ValidationFolder	ValidatedDataFile
1	Density_Bagmean_Vol	7.01	89.99	Freitag,Johannes	BagMeanDensity weighting in Lab, without outliers		ValidationMethod0	Density_Bagmean_Vol_B40_iceD
2	Density_CT	7.01	89.99	Freitag,Johannes	0.1mm-HighResCT-density-bagmeanadjusted		ValidationMethod0	2dctdensity_B40_iceDB.xlsx
3	ConductivityPermittivity_DEP	0	200.5	Freitag,Johannes	DEP-measurement, not temperature corrected		ValidationMethod0	b40.raw.txt
4	Isotopes_CFA	0	200	Hoerhold,Maria	CFA, Joe McConnell		ValidationMethod0	B40_1_cm_ave_water_isotopes_062016
5	Impurities_CFA	0	200	Hoerhold,Maria	CFA, Joe McConnell		ValidationMethod0	B40_1cm_data_112013.xlsx
							yes	16.01.202
							yes	16.01.202

# Curater: Data crawler

Query: find b40

- Trigger Crawler
- Insert Ice Sample
- Upload Storage File
- New Box
- New Palette

Results: 1

[Bookmark all query results](#)

 **IceCore B40**

*description:* enter more info

 References    

[Export to Pangea](#)





# Data provider (scientist): measurements

LinkAhead Entities Query Map 2 Bookmarks Login

**R IceCore B40**  
*description: enter more info*

[Export to Pangaea](#)

▼ SampleSite	👁 Kohnen station B40
▼ Campaign	👁 ANT-Land_2012_COFI
▼ startDate	2012-12-04
▼ endDate	2012-12-10
▼ TopDepth	0.0 m
▼ BottomDepth	200.71 m
▼ DrillingMethod	👁 EDRILL
▼ Responsible	👁 6296
▼ LoggingProtocol	👁 13276
▼ Density_Bagmean_Vol	👁 15748
▼ Density_CT	<b>R Density_CT</b> <span>🔗</span> <i>description: 0.1mm-HighResCT-density-bagmeanadjusted</i>

▼ Icecore B40

▼ Number 2

▼ ValidatedDataFile 2dctdensity\_B40\_iceDB.xlsx

▼ ValidationMethod readme\_B40\_density\_CT.md

▼ RawData 2dCTdensityprofile\_hr\_bulk\_cor\_B40\_iceDB.xlsx

▼ TopDepth 7.01

▼ BottomDepth 89.99



## **USER (current status)**

40 user @AWI-Glaciology

- 20 active
  - 10 with full rights

20 user extern @AWI sea ice/geology/biology

10+x international cooperation partner

## **REPOSITORY (current status)**

~ 100 ice cores

~ 5000 sample boxes

~ 20000 records

## **ACTIVITIES per year**

150 box loans

1 (large) Core processing

2 field campaigns (new ice)

X measurement data generation (limited overview)

Y old data sets (no overview)



# Pros and cons of iceDB

## 7 PROS:

- Meta-data requests! (easy to find: „find xy“)
- Measurement data requests (easy to find: „find xy“)
- Geo-referenced/ measurement-referenced data screening (map and coreviewer!)
- Ice storage facility management (loan and box history, responsibilities)
- Sample box search (based on content-text)
- High potential of query language (helpful in finding sample boxes, in organizing big processing events)
- Easily to expand and adjust to new demands (tags, storageareas, images, measurementtypes,...)

## 6 CONS:

- Setting up sample-subsample references is much too complex in relation to box content entries if lots of changes have to be documented (core processing situation)
- Necessary changes can be easily forgotten (no overview, no clear workflow)
- Data crawler proves to be error-prone, multiple runs are necessary
- Pangaea entries are not visible in search requests (some measurements are not documented)
- Migration of measurement data is way too complex
- Request performance works too slowly!

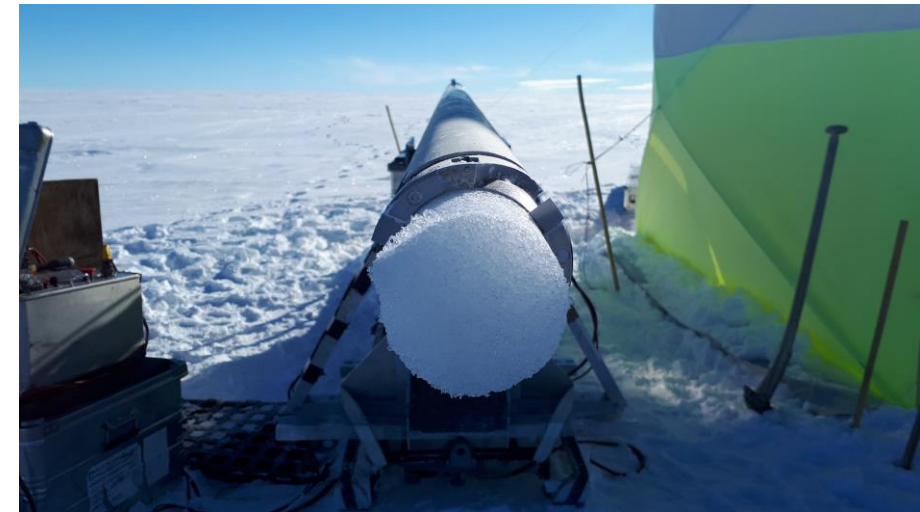


## Problems with iceDB to tackle in future:

- Need to increase the acceptance for working with iceDB in Glaciology-section
- Low-thresholds for data migration
  - AI support for data migration?
- Low-thresholds for some simple appearing requests (references <-> content text)
  - How can we speed up the switch from content-text to relational references?

## How shall we organize ice core research in future?

- Always with iceDB - Traceable, documentable?
- How can iceDB be connected with other repositories/platforms? (AWI O2A, Pangaea,...)



Thank you for listening!

