

# Webinar: MOSAiC research data publishing

November 10<sup>th</sup> 2020, 16:30 CET

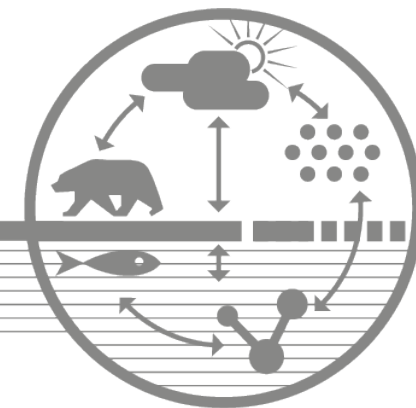
with Dana Ransby (AWI Bremerhaven)  
&  
PANGAEA and RZ Team





# MOSAiC

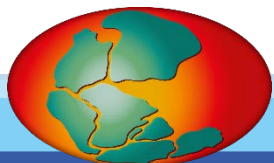
International  
Arctic Drift  
Expedition



## MOSAiC research data publishing

November 10<sup>th</sup> 2020, Bremerhaven

Dana Ransby (AWI)  
&  
PANGAEA and RZ Team



ALFRED-WEGENER-INSTITUT  
HELMHOLTZ-ZENTRUM FÜR POLAR-  
UND MEERESFORSCHUNG



# Overview



- Why do I have to publish “my” MOSAiC data?
  - In context of MOSAiC Data Policy, FAIR principles and good scientific practice
- What is data publication?
  - Publishing datasets, not scientific papers
- When do I publish “my” MOSAiC data?
  - Timing of data publication, (also) in connection to paper publication
- Where do I publish “my” MOSAiC data?
  - PANGAEA and other data repositories
- Data publication process in PANGAEA in detail





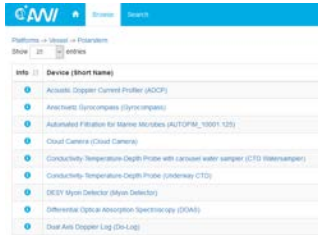
# Observation to Analysis (O2A)



Documentation for MOSAiC: <https://spaces.awi.de/x/UjyVEg>  
Support: [support@mosaic-data.org](mailto:support@mosaic-data.org)



# Data Flow in MOSAiC

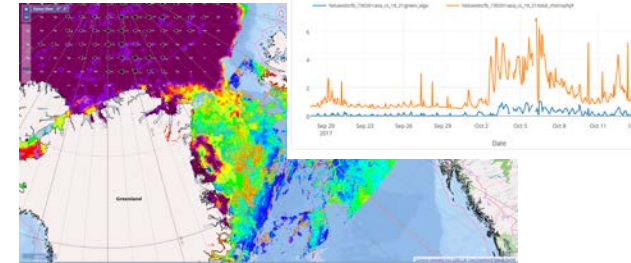


**SENSOR** for management of device metadata

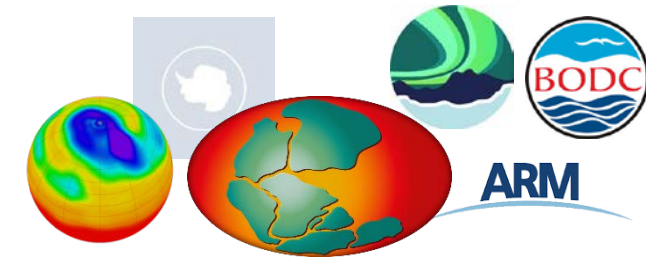
≡ ActionLog Events

Activity - Device Operation	Start	Device	Action	Latitude	Longitude
PS4_4-1 ADCP	12.10.2016 11:49:24	Acoustic Doppl...	station start	51° 03.088' N	001° 23'
	12.10.2016 11:49:01	Acoustic Doppl...	station start	51° 03.157' N	001° 23'
PS4_1-3 BLN	11.10.2016 14:17:22	BALLON	in the water	46° 07.339' N	010° 15'
PS4_1-1 BOAT	11.10.2016 14:13:31	Boat	MyAction	46° 07.251' N	010° 15'

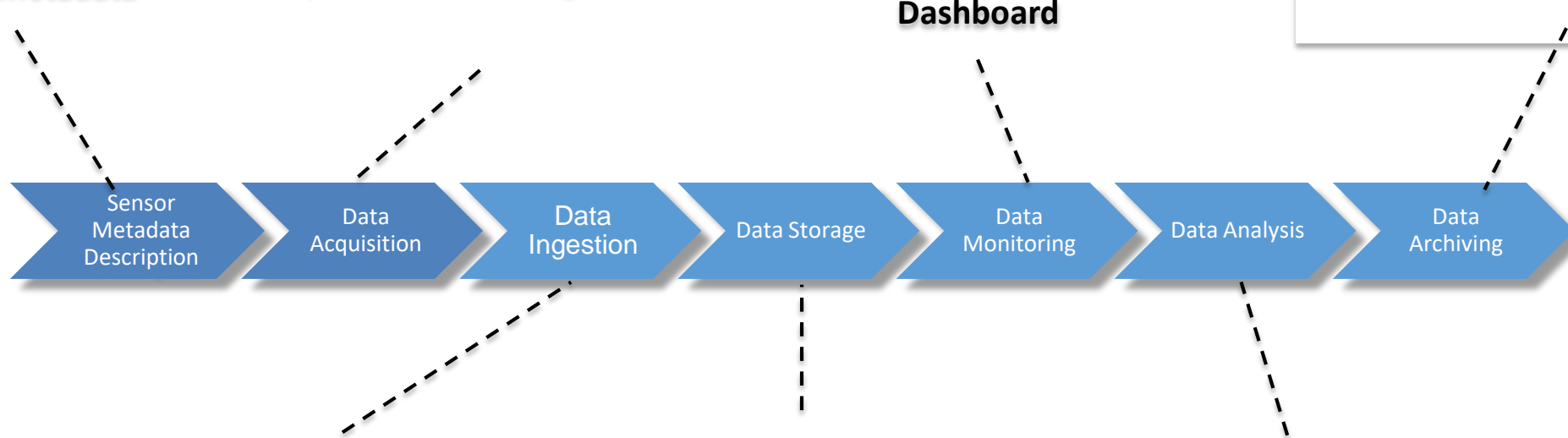
**DSHIP-ActionLog** for Device-Operation ID management



**DSHIP-Mapviewer and Dashboard**



Raw and primary data at PANGAEA and other repositories



Data transfer via satellite, local LAN, radio LAN as stream and/or in delayed mode

MOSAic Central Storage MCS Platforms and Workspace

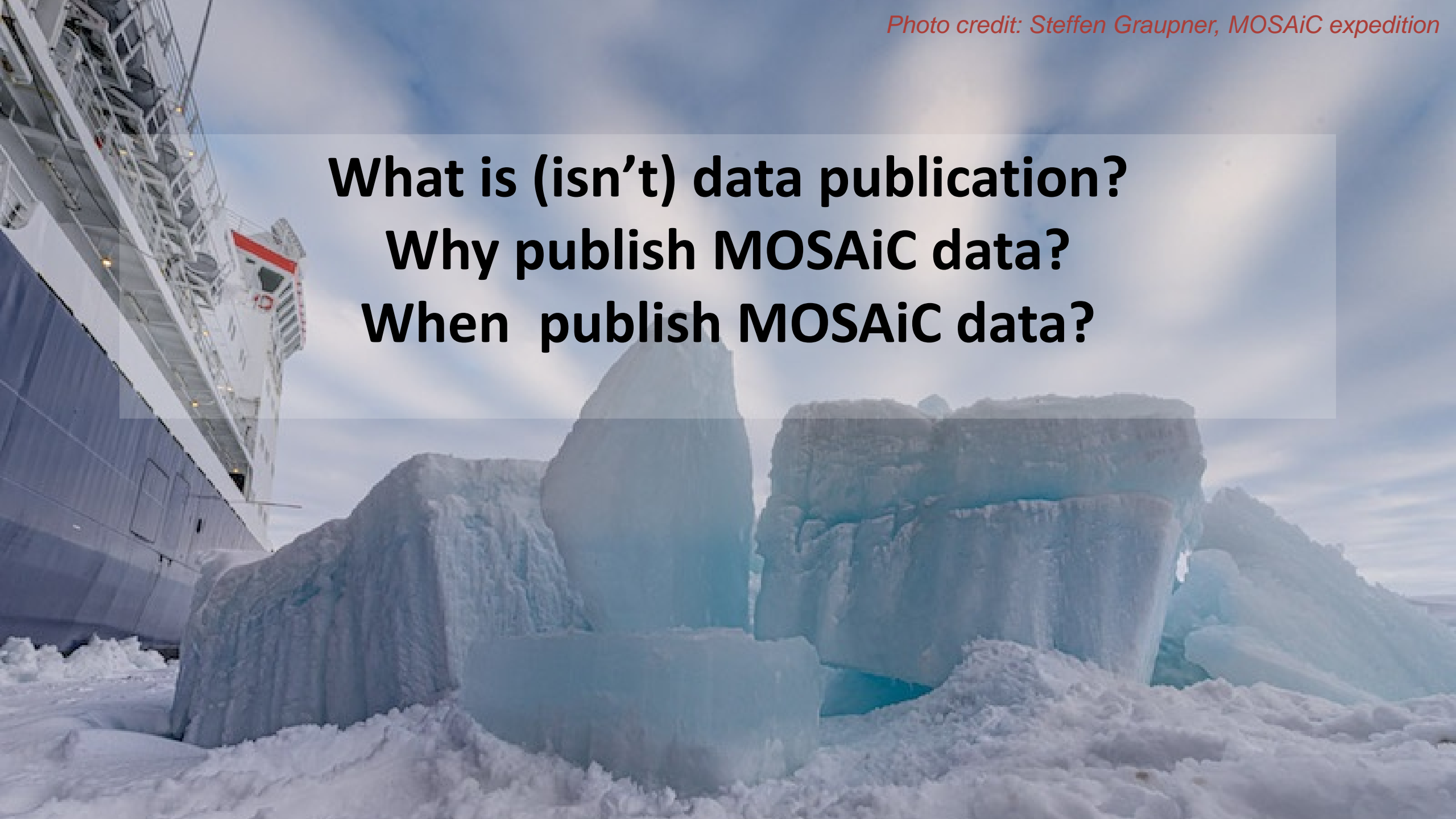


Using workspace and **Marketplace (VMs)** e.g. with **Jupyter Notebook** (R or Python) or Bash-Script or or ...?

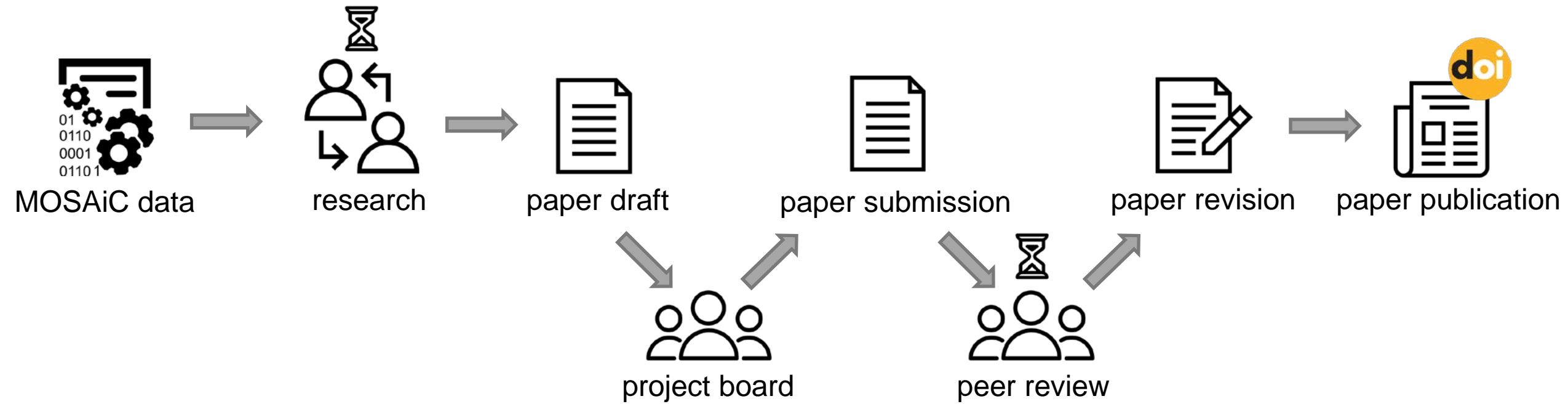




**What is (isn't) data publication?**  
**Why publish MOSAiC data?**  
**When publish MOSAiC data?**

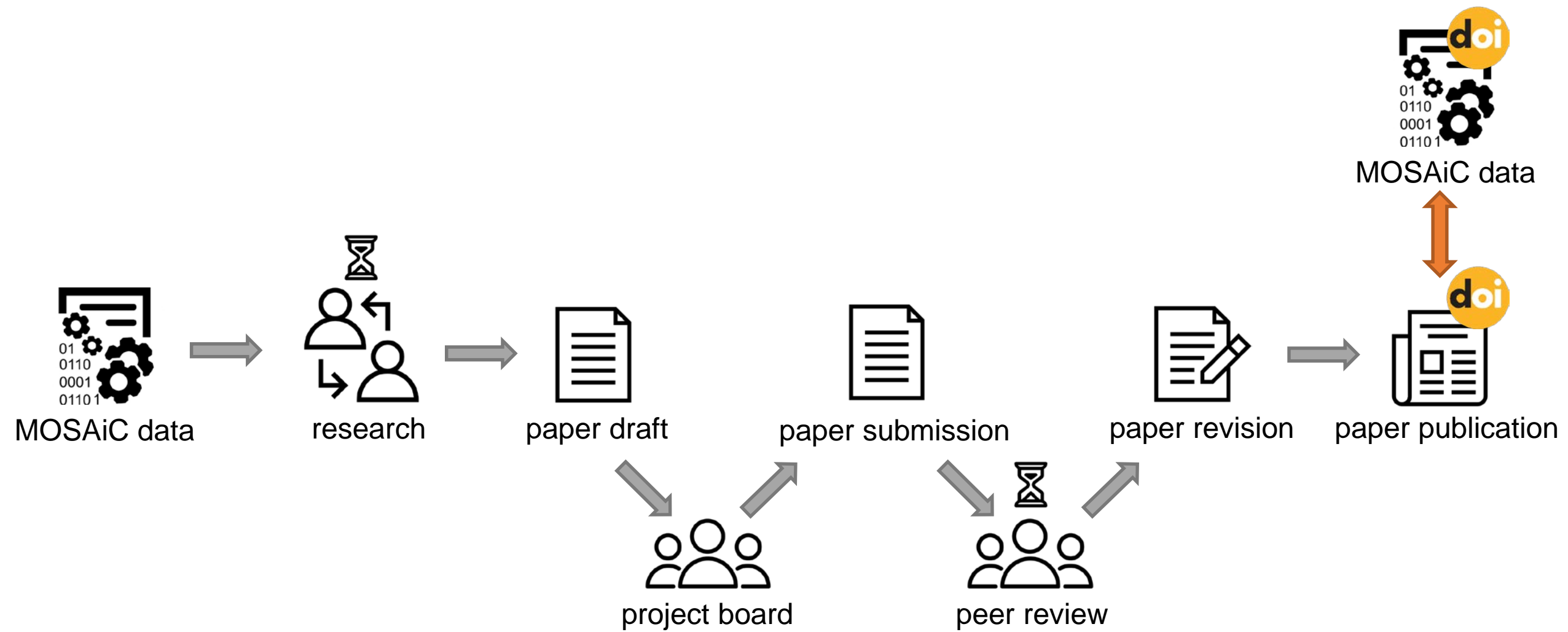




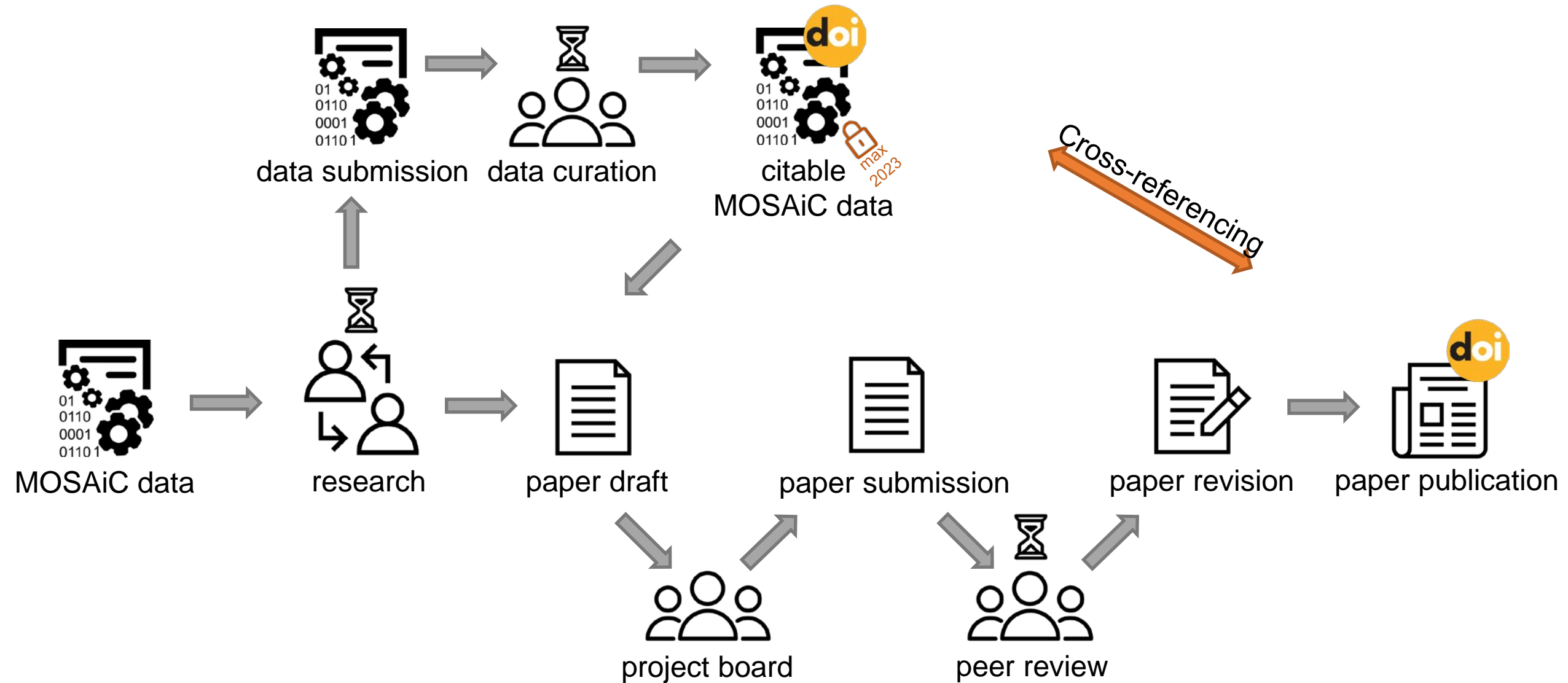


A digital object identifier (DOI) is a persistent identifier used to identify objects uniquely











# Metadata: Data about Data

**What?**



*Parameter, unit*

**Who?**



*Authors, PI,  
publication*

**Where?**



*Latitude, Longitude*

*Depth in ice / water / sediment  
Altitude*

**When?**

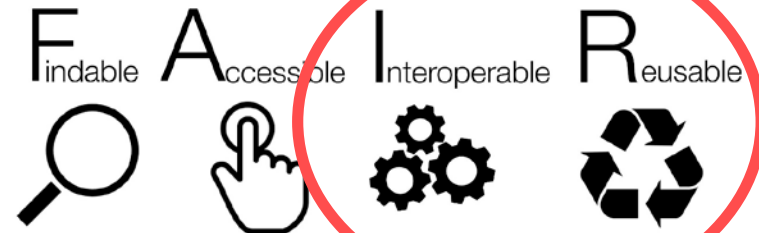


*Date/time, age*

**How?**



*Method, device*





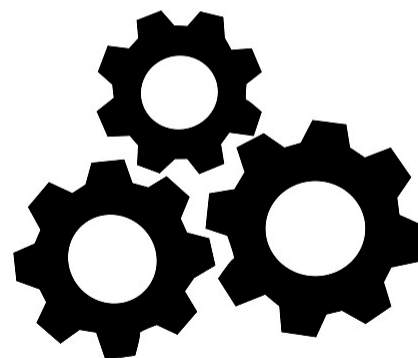
F indable



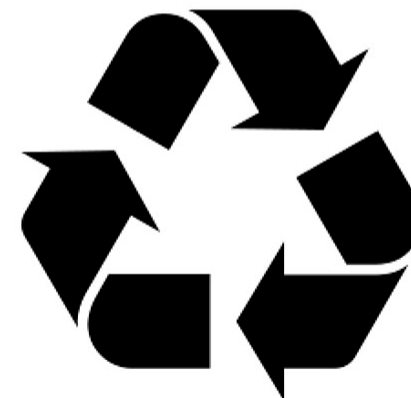
A ccessible



I nteroperable



R eusable





# What ISN'T / IS published data?



	<b>F</b> Findable	<b>A</b> Accessible	<b>I</b> Interoperable	<b>R</b> Reusable
MOSAiC Central Storage (MCS) or another (semi)public server				
Supplement to a published paper				
Accredited data repository (e.g., PANGAEA, BODC, ...)				

~~Statement in the paper "Data used for this manuscript were uploaded to PANGAEA and will be available soon."~~

~~USB stick / Hard drive~~



# What IS published data?



- A published data set equipped with a complete set of metadata.
- It is fully citable by having:
  - a title,
  - authors,
  - abstract and
  - a persistent identifier (usually DOI).
- It can have (but doesn't need to have) a reference to a scientific paper publication.

Correct citation: Authors (YYYY) Title. PANGAEA, DOI. (not only DOI)

Example: *Bonne, Jean-Louis; Werner, Martin; Meyer, Hanno; Kipfstuhl, Sepp; Rabe, Benjamin; Behrens, Melanie K; Schönicke, Lutz; Steen-Larsen, Hans-Christian; Tippenhauer, Sandra (2019): Water vapour isotopes analyser calibrated data from POLARSTERN cruise PS93.2 (ARK-XXIX/2.2). PANGAEA, <https://doi.org/10.1594/PANGAEA.897406>*



# Benefits for the authors



- Visibility
- Credibility
- Exchange
  
- Data authors vs. paper authors
- Acknowledging contributions of scientists, technicians, students, who generated the data, but did not contribute to the interpretation or manuscript writing
  
- Authors of datasets: those who contributed to collection and processing of data
- Follow general rules of good scientific practice





# MOSAiC Data Policy



- Signing [Data Policy](#) pre-requisite for participation in MOSAiC field operations and being a member of the MOSAiC consortium
  
- Regulates
  - data management
  - data access
  - data release
  - authorship
  - acknowledgments (project, colleagues, ...)



# Data Provision, Access and Sharing



- Early access by MOSAiC consortium to data crucial for successful collaboration within the consortium
  - all data must be made available to the consortium by the MCS as fast as possible
- Internal release:
  - 31 Jan 2021: quality-assured automated sensor & fast analysis sample data
  - ...
  - 31 Jan 2022: full collection of laboratory sample analysis data
- **Public release: 1 Jan 2023**
  - all MOSAiC data publicly available








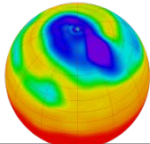
# Where to publish MOSAiC data?





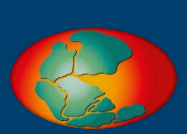
# MOSAiC data repositories



Repository		Comment
<a href="#"><b>PANGAEA</b></a>		MOSAiC repository for primary and raw data
<a href="#">Arctic Data Center (ADC)</a>		Data of NSF funded scientists; contact: support@arcticdata.io
<a href="#">Atmospheric Radiation Measurement (ARM) data center</a>		Data of Department of Energy funded scientists
<a href="#">British Oceanographic Data Centre (BODC)</a>		Data of NERC funded scientists
<a href="#">UK Polar Data Centre</a>		Data of NERC funded scientists
<a href="#">Centre for Environmental Data Analysis (CEDA)</a>		Data of NERC funded scientists







# PANGAEA

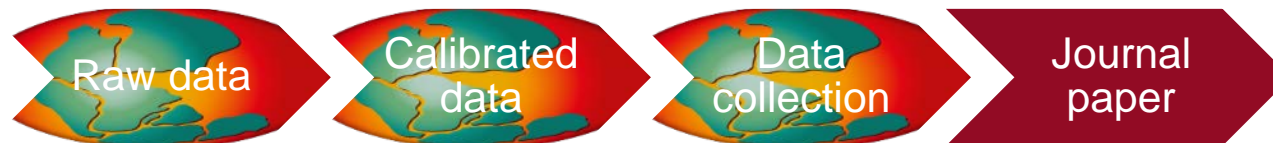
- Open access data repository for geoscientific & environmental data co-hosted by AWI & MARUM
- Data georeferenced in space & time, relational database
- Data citation incl. persistent identifier (DOI)
- Long-term accessibility of data guarantee
- Data FAIR (Findable, Accessible, Interoperable, Re-usable both for machines and for people)



# How to use PANGAEA as data author



- Submission of data and metadata using ticket system
- Curators guide the users through the process
- Final step: before publishing approval needed
- Possibility of moratorium on access, max 2023-01-01 for MOSAiC
- PANGAEA can provide access for reviewers of papers





## Citation and sharing tools



Citation:

**Nicolaus, Marcel; Fang, Yin-Chih; Hoppmann, Mario (2020):** Snow height on sea ice, meteorological conditions and drift of sea ice from autonomous measurements from buoy 2019S79, deployed during MOSAiC 2019/20. PANGAEA, <https://doi.pangaea.de/10.1594/PANGAEA.923187> (DOI registration in progress)

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

RIS Citation

BIBTeX Citation

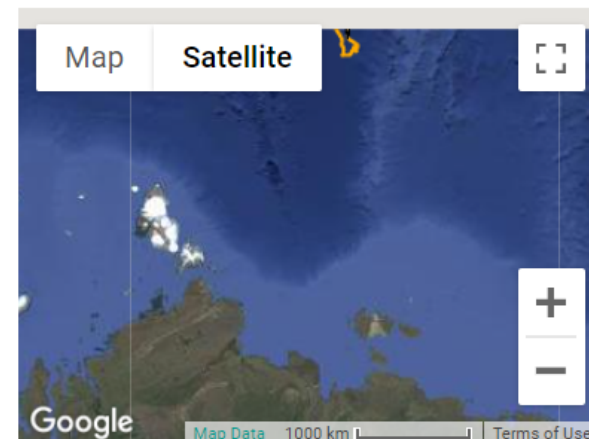
Copy Citation

Facebook

Twitter

Show Map

Google Earth



## Documentation



Abstract:

Snow height was measured by the Snow Buoy 2019S79, an autonomous platform, installed on drifting sea ice in the Arctic Ocean during MOSAiC (Leg 1) 2019/20. The resulting time series describes the evolution of snow height as a function of place and time between 07 Oct 2019 and 28 Nov 2020 in sample intervals of 1 hour. The Snow Buoy consists of four independent sonar measurements representing the area (approx. 10 m\*\*2) around the buoy. The buoy was installed on pack ice. In addition to snow height, geographic position (GPS), barometric pressure, air temperature, and ice surface temperature were measured. Negative values of snow height occur if surface ablation continues into the sea ice. Thus, these measurements describe the position of the sea ice surface relative to the original snow-ice interface. Differences between single sensors indicate small-scale variability of the snow pack around the buoy. The data set has been processed, including the removal of obvious inconsistencies (missing values). Records without any snow height may still be used for sea ice drift and meteorological analyses.

Keyword(s):

autonomous platform ; buoy ; drift ; snow depth

Further details:

[Buoy Deployment Report 2019S79 \(pdf\)](#)

Project(s):

[Sea Ice Physics @ AWI \(AWI\\_Sealce\)](#)

[Current sea ice maps for Arctic and Antartic](#) (meereisportal.de)

[Multidisciplinary Ice-based Distributed Observatory \(MIDO\)](#)

[Multidisciplinary drifting Observatory for the Study of Arctic Climate](#) (MOSAIC)

## Project acknowledgement



[Multidisciplinary drifting Observatory for the Study of Arctic Climate](#)

Label: MOSAiC

Funded by: Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, grant/award no. AWI\_PS122\_00

0 \* West-bound Longitude: 117.911400 \* North-bound



Sampling metadata



Project(s):

Sea Ice Physics @ AWI (AWI\_Sealce) [Q](#)  
Current sea ice maps for Arctic and Antartic (meereisportal.de) [Q](#)  
Multidisciplinary Ice-based Distributed Observatory (MIDO) [Q](#)  
Multidisciplinary drifting Observatory for the Study of Arctic Climate (MOSaIC) [Q](#)

Coverage:

Median Latitude: 85.366409 \* Median Longitude: 126.990882 \* South-bound Latitude: 84.548200 \* West-bound Longitude: 117.911400 \* North-bound Latitude: 86.006000 \* East-bound Longitude: 137.639000  
Date/Time Start: 2019-10-07T02:00:00 \* Date/Time End: 2019-11-28T08:02:00

Event(s):

AF-MOSaIC-1\_108 (PS122/1\_1-146) [Q](#) \* Latitude Start: 84.871300 \* Longitude Start: 135.758250 \* Latitude End: 85.624500 \* Longitude End: 126.857200 \* Date/Time Start: 2019-10-07T02:00:00 \* Date/Time End: 2019-10-28T12:30:32 \* Sensor URI: [Link](#) \* Location: Arctic Ocean [Q](#) \* Campaign: AF-MOSaIC-1 (MOSaIC20192020) [Q](#) \* Basis: Akademik Fedorov [Q](#) \* Method/Device: Snow buoy (BUOY\_SNOW) [Q](#) \* Comment: Station M2\_Measurement:Snow thickness\_\_Comment: \_\_Old Labels:M2\_SB05\_AWI\_20191007\_PS122/1\_1-146

Parameter(s):

#	Name	Short Name	Unit	Principal Invest	
1	DATE/TIME <a href="#">Q</a>	Date/Time		Nicolaus, Marcel	
2	LATITUDE <a href="#">Q</a>	Latitude		Nicolaus, Marcel	
3	LONGITUDE <a href="#">Q</a>	Longitude		Nicolaus, Marcel	
4	Snow height <a href="#">Q</a>	Snow h	m	Nicolaus, Marcel	
5	Snow height <a href="#">Q</a>	Snow h	m	Nicolaus, Marcel	
6	Snow height <a href="#">Q</a>	Snow h	m	Nicolaus, Marcel	<a href="#">Q</a> Snow buoy (BUOY_SNOW) <a href="#">Q</a> Sensor 3
7	Snow height <a href="#">Q</a>	Snow h	m	Nicolaus, Marcel	<a href="#">Q</a> Snow buoy (BUOY_SNOW) <a href="#">Q</a> Sensor 4
8	Snow height <a href="#">Q</a>	Snow h	m	Nicolaus, Marcel	<a href="#">Q</a> Snow buoy (BUOY_SNOW) <a href="#">Q</a> mean
9	Pressure, atmospheric <a href="#">Q</a>	PPPP	hPa	Nicolaus, Marcel	<a href="#">Q</a> Snow buoy (BUOY_SNOW) <a href="#">Q</a>
10	Temperature, air <a href="#">Q</a>	TTT	°C	Nicolaus, Marcel	<a href="#">Q</a> Snow buoy (BUOY_SNOW) <a href="#">Q</a>
11	Temperature, technical <a href="#">Q</a>	T tech	°C	Nicolaus, Marcel	<a href="#">Q</a> Snow buoy (BUOY_SNOW) <a href="#">Q</a> Equipment body

Campaign: AF-MOSaIC-1 [Q](#)

Optional name: MOSaIC20192020  
Start: 2019-09-21  
End: 2019-10-18  
Start location: Tromsø  
End location: Arctic Ocean  
Mastertrack: [📍](#) doi:10.1594/PANGAEA.909433

License:

Creative Commons Attribution 4.0 International

Size:

8453 data points

Download Data

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

View dataset as HTML (shows only first 2000 rows)



## 3

Ingest

Current Version

Sensor (2020). Metadata for Buoy Snow Buoy 2019S79 at Current Version. <https://hdl.handle.net/10013/sensor.44a117dc-8d9a-4b23-8680-4dbc3a2ea769>

**State:**

## Construction

Public

ID: 2532

**Parent:**

Device URN: buoy:2019s79

Short Name: 2019S79

**Long Name:** Snow Buoy 2019S79

**Collections:** MOSAiC-ICE

**Description:**

The Snow Buoy determines the distance between four acoustic sounders, mounted on a frame at a height of 1.5 m, and the underlying surface (usually ice and snow). Conversion of the distance data to actual snow height is achieved by calibration to initial in-situ snow depth measurements below the acoustic sounders during deployment. Hourly measurements result in a time series of snow height evolution at the location of the buoy. Negative values of snow height occur if surface ablation continues into the sea ice. Thus, all snow height measurements describe the surface elevation relative to the original snow-ice interface. Differences between single sensors indicate small-scale variability of the snow pack around the buoy. In addition to snow height, geographic position (GPS), barometric pressure, air temperature and an internal hull temperature are recorded.

**Serial:** 300234066344810

**Manufacturer:** MetOcean ICEB-I-TBAS-SH-A (FID4052)

**Model:** Snow Buoy

Type: Buoy

Asset Number:

Download sensor metadata as: [Sensor ML](#) | [JSON](#)

sensor.awi.de



Parameters, units



Data



Event(s):

**AF-MOSaIC-1\_108** (PS122/1\_1-146) \* *Latitude Start:* 84.871300 \* *Longitude Start:* 135.758250 \* *Latitude End:* 85.624500 \* *Longitude End:* 126.857200 \* *Date/Time Start:* 2019-10-07T02:00:00 \* *Date/Time End:* 2019-10-28T12:30:32 \* *Sensor URI:* [Link](#) \* *Location:* Arctic Ocean \* *Campaign:* AF-MOSaIC-1 (MOSaIC20192020) \* *Basis:* Akademik Fedorov \* *Method/Device:* Snow buoy (BUOY\_SNOW) \* *Comment:* Station M2\_Measurement:Snow thickness\_Comment:\_Old Labels:M2\_SB05\_AWI\_20191007,PS122/1\_1-146

Parameter(s):

#	Name	Short Name	Unit	Principal Investigator	Method/Device	Comment
1	<a href="#">DATE/TIME</a>	Date/Time		Nicolaus, Marcel		<a href="#">Geocode</a>
2	<a href="#">LATITUDE</a>	Latitude		Nicolaus, Marcel		<a href="#">Geocode</a>
3	<a href="#">LONGITUDE</a>	Longitude		Nicolaus, Marcel		<a href="#">Geocode</a>
4	<a href="#">Snow height</a>	Snow h	m	Nicolaus, Marcel	Snow buoy (BUOY_SNOW)	Sensor 1
5	<a href="#">Snow height</a>	Snow h	m	Nicolaus, Marcel	Snow buoy (BUOY_SNOW)	Sensor 2
6	<a href="#">Snow height</a>	Snow h	m	Nicolaus, Marcel	Snow buoy (BUOY_SNOW)	Sensor 3
7	<a href="#">Snow height</a>	Snow h	m	Nicolaus, Marcel	Snow buoy (BUOY_SNOW)	Sensor 4
8	<a href="#">Snow height</a>	Snow h	m	Nicolaus, Marcel	Snow buoy (BUOY_SNOW)	mean
9	<a href="#">Pressure, atmospheric</a>	PPPP	hPa	Nicolaus, Marcel	Snow buoy (BUOY_SNOW)	
10	<a href="#">Temperature, air</a>	TTT	°C	Nicolaus, Marcel	Snow buoy (BUOY_SNOW)	
11	<a href="#">Temperature, technical</a>	T tech	°C	Nicolaus, Marcel	Snow buoy (BUOY_SNOW)	Equipment body

License:

[Creative Commons Attribution 4.0 International](#)

Size:

8453 data points

## Data

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

1	2	3	4	5	6	7	8	9	10	11
Date/Time	Latitude	Longitude	Snow h [m]	Snow h [m]	Snow h [m]	Snow h [m]	Snow h [m]	PPPP [hPa]	TTT [°C]	T tech [°C]
			(Sensor 1)	(Sensor 2)	(Sensor 3)	(Sensor 4)	(mean)			(Equipment body)
2019-10-07T02:00:00	84.8720	135.7358						1023.5	-5.9	-2.0
2019-10-07T03:00:00	84.8708	135.7702						1023.2	-6.0	-1.7
2019-10-07T04:00:00	84.8694	135.8062						1023.0	-6.0	-1.6
2019-10-07T05:00:00	84.8676	135.8422	0.114	0.14		0.12	0.125	1022.7	-6.0	-1.5
2019-10-07T06:00:00	84.8654	135.8788	0.114	0.14		0.12	0.125	1022.4	-5.9	-1.4
2019-10-07T07:00:00	84.8630	135.9138	0.124	0.14		0.12	0.128	1022.0	-6.1	-1.3
2019-10-07T08:00:00	84.8606	135.9468	0.124	0.14	0.13	0.12	0.129	1021.6	-6.0	-1.2
2019-10-07T09:00:00	84.8584	135.9796	0.124	0.14	0.13	0.12	0.129	1021.3	-5.6	-1.2
2019-10-07T10:00:00	84.8560	136.0152	0.124	0.14	0.13	0.12	0.129	1021.2	-5.3	-1.1
2019-10-07T11:00:00	84.8536	136.0572	0.124	0.14	0.13	0.12	0.129	1020.5	-5.8	-1.0
2019-10-07T12:00:00	84.8512	136.1066	0.114	0.14	0.13	0.12	0.126	1019.8	-6.0	-1.0

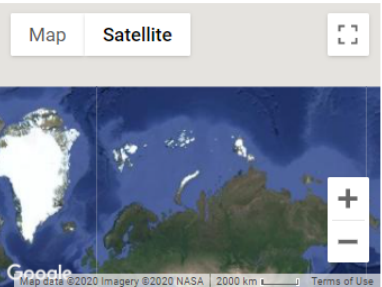


Status (in review) →

Citation:

Granskog, Mats A; Høyland, Knut V; De La Torre, Pedro R; Divine, Dmitry; Katlein, Christian; Itkin, Polona; Raphael, Ian; Olsen, Lasse M (2020): Temperature and heating induced temperature difference measurements from the sea ice mass balance SIMBA 2020T60. <https://doi.pangaea.de/10.1594/PANGAEA.924269> (dataset in review)

[Facebook](#) [Twitter](#) [Show Map](#) [Google Earth](#)



Abstract:

Temperature and heating-induced temperature differences were measured along a chain of thermistors. SIMBA 2020T60 (a.k.a. HAVOC 0101) is an autonomous instrument that was installed on drifting sea ice in the Arctic Ocean during the 2nd leg of MOSAiC in February 2020. The thermistor chain was 10m long and included 250 sensors with a regular spacing of 4cm.

The resulting time series describes the evolution of temperature and temperature differences after two heating cycles of 30 and 120 s as a function of place, depth and time between 08 Jan 2020 and 22 Apr 2020 in sample intervals of 6 hours for temperature and 24 hours for temperature differences. The buoy was installed on the ridge crest known as SIRO.

In addition to temperature, geographic position, barometric pressure, air temperature measured 1m over the ice level, tilt and compass were measured. The data set has been processed as follows: obvious inconsistencies (missing values) and unrealistic values in position have been removed.

This instrument was deployed as part of the project Ridges - Safe HAVens for ice-associated Flora and Fauna in a Seasonally ice-covered Arctic Ocean (HAVOC).

Keyword(s):

Autonomous buoy [Q](#); Ice mass balance [Q](#); Temperature [Q](#); Thermistor [Q](#)

Further details:

[SIMBA HAVOC0101 \(SRSL UI 02943\) deployment description \(pdf\)](#) [Q](#)  
[SIMBA HAVOC0101 \(SRSL UI 02943\) deployment record \(pdf\)](#) [Q](#)

Project(s):

[Ridges - Safe HAVens for ice-associated Flora and Fauna in a Seasonally ice-covered Arctic Ocean \(HAVOC\)](#) [Q](#)  
[Current sea ice maps for Arctic and Antarctic \(meereisportal.de\)](#) [Q](#)  
[Multidisciplinary drifting Observatory for the Study of Arctic Climate \(MOSAiC\)](#) [Q](#)

Coverage:

Median Latitude: 86.585397 \* Median Longitude: 51.011861 \* South-bound Latitude: 84.101210 \* West-bound Longitude: 7.594640 \* North-bound Latitude: 88.653070 \* East-bound Longitude: 115.615480  
Date/Time Start: 2020-01-08T09:00:17 \* Date/Time End: 2020-04-22T03:00:16

Size:

4 datasets

Password protection →

[Download Data \(login required\)](#)

Download ZIP file containing all datasets as tab-delimited text (use the following character encoding: [UTF-8: Unicode \(PANGAEA default\)](#))

Dataset collection →

#### Datasets listed in this bundled publication

1. Granskog, MA; Høyland, KV; De La Torre, PR et al. (2020): Auxiliary data from the sea ice mass balance SIMBA 2020T60. <https://doi.pangaea.de/10.1594/PANGAEA.924251>
2. Granskog, MA; Høyland, KV; De La Torre, PR et al. (2020): Heating induced temperature difference measurements from the sea ice mass balance SIMBA 2020T60: 120 s after the heating cycle. <https://doi.pangaea.de/10.1594/PANGAEA.924268>
3. Granskog, MA; Høyland, KV; De La Torre, PR et al. (2020): Heating induced temperature difference measurements from the sea ice mass balance SIMBA 2020T60: 30 s after the heating cycle. <https://doi.pangaea.de/10.1594/PANGAEA.924267>
4. Granskog, MA; Høyland, KV; De La Torre, PR et al. (2020): Temperature measurements from the sea ice mass balance SIMBA 2020T60. <https://doi.pangaea.de/10.1594/PANGAEA.924265>



# MOSAiC data @PANGAEA



PANGAEA.

ALL TOPICS

MOSAiC20192020



SEARCH

SUBMIT

ABOUT

CONTACT

<https://www.pangaea.de/?q=MOSAiC20192020>

Filter by...

66 datasets found on search for »MOSAiC20192020«

SHOW MAP

GOOGLE EARTH

DATA WAREHOUSE

< 1 2 3 4 5 6 7 >

## Dataset Author

[Ehrlich, André](#) (23)  
[Herber, Andreas](#) (23)  
[Lüpkes, Christof](#) (23)  
[Krumpen, Thomas](#) (16)  
[Katlein, Christian](#) (8)  
[Rex, Markus](#) (7)  
[Divine, Dmitry](#) (5)  
[Itkin, Polona](#) (5)  
[more...](#)

## Dataset Publication Year

☐ 2020 (64)  
☐ 2019 (2)

## Topic

[Geosciences, Multidisciplinary](#) (4)  
[Lithosphere](#) (4)  
[Atmosphere](#) (1)  
[Chemistry](#) (1)  
[Cryosphere](#) (1)  
[Inorganic Chemistry](#) (1)

## Project

☐ MOSAiC (56)  
☐ meereisportal.de (6)  
☐ HAVOC (4)  
☐ AWI\_Sealce (2)  
☐ MIDO (2)

### 1. **Herber, A; Ehrlich, A; Lüpkes, C (2020):** Master tracks in different resolutions during POLAR 5 campaign P5\_223\_MOSAiC\_ACA\_2020

*Related to:* Trackline maps and master track processing reports for POLAR 5 campaign P5\_223\_MOSAiC\_ACA\_2020.

*Size:* 11 datasets

<https://doi.pangaea.de/10.1594/PANGAEA.924603> - Score: 24.77

### 2. **Krumpen, T (2020):** Master track from POLAR 6 flight P6\_222\_IceBird\_MOSAiC\_2020\_2009080501 in 1 sec resolution (zipped, 212 kBytes)

*Size:* 212.2 kBytes

<https://doi.pangaea.de/10.1594/PANGAEA.924750> - Score: 22.12

### 3. **Krumpen, T (2020):** Master track from POLAR 6 flight P6\_222\_IceBird\_MOSAiC\_2020\_2008310201 in 1 sec resolution (zipped, 117 kBytes)

*Size:* 117.1 kBytes

<https://doi.pangaea.de/10.1594/PANGAEA.924747> - Score: 22.12

### 4. **Krumpen, T (2020):** Master track from POLAR 6 flight P6\_222\_IceBird\_MOSAiC\_2020\_2009130801 in 1 sec resolution (zipped, 103 kBytes)

*Size:* 103.1 kBytes

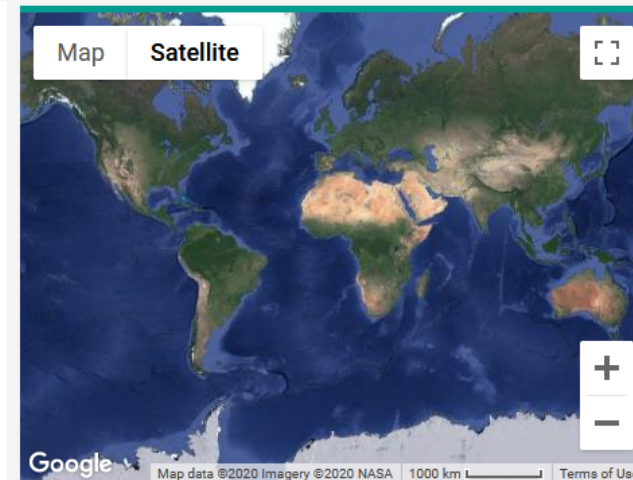
<https://doi.pangaea.de/10.1594/PANGAEA.924753> - Score: 22.12

### 5. **Krumpen, T (2020):** Master track from POLAR 6 flight P6\_222\_IceBird\_MOSAiC\_2020\_2008050101 in 1 sec resolution (zipped, 134 kBytes)

*Size:* 134.5 kBytes

<https://doi.pangaea.de/10.1594/PANGAEA.924746> - Score: 20.85

### 6. **Herber, A; Ehrlich, A; Lüpkes, C (2020):** Master track from POLAR 5 flight P5\_223\_MOSAiC\_ACA\_2020\_2009070701 in 1 sec resolution (zipped, 195 kBytes)

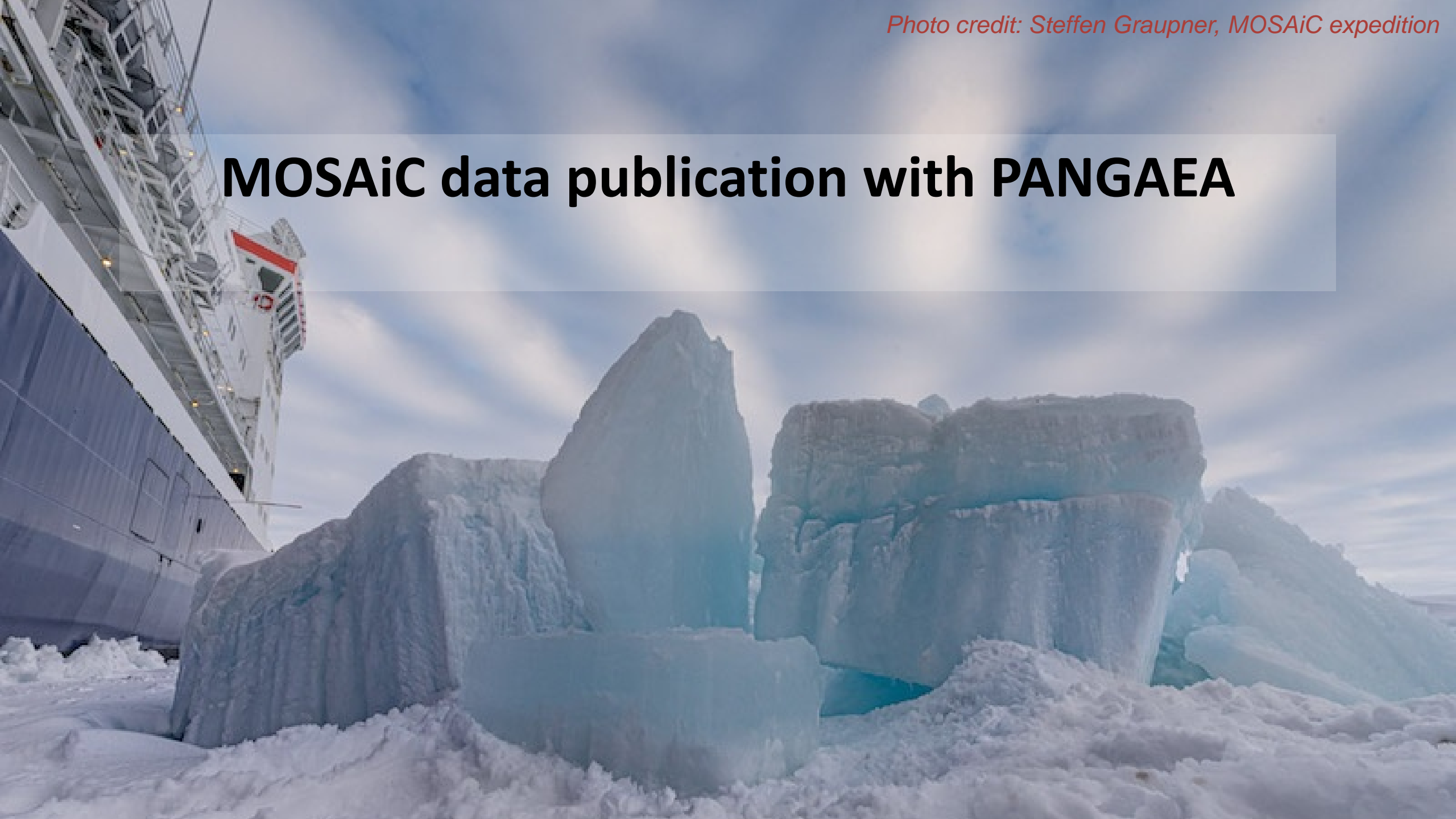


To create a new geographic search coverage, use the buttons and input fields to enter coordinates below. The GPS button (top-left of wind rose) selects the area around your current location. For using the map, select the viewport button (top-right of wind rose) and drag or zoom the bounding rectangle on its borders. You can also select a date range by entering a start/end date. Press "Apply" to restrict current search results!



*Photo credit: Steffen Graupner, MOSAiC expedition*

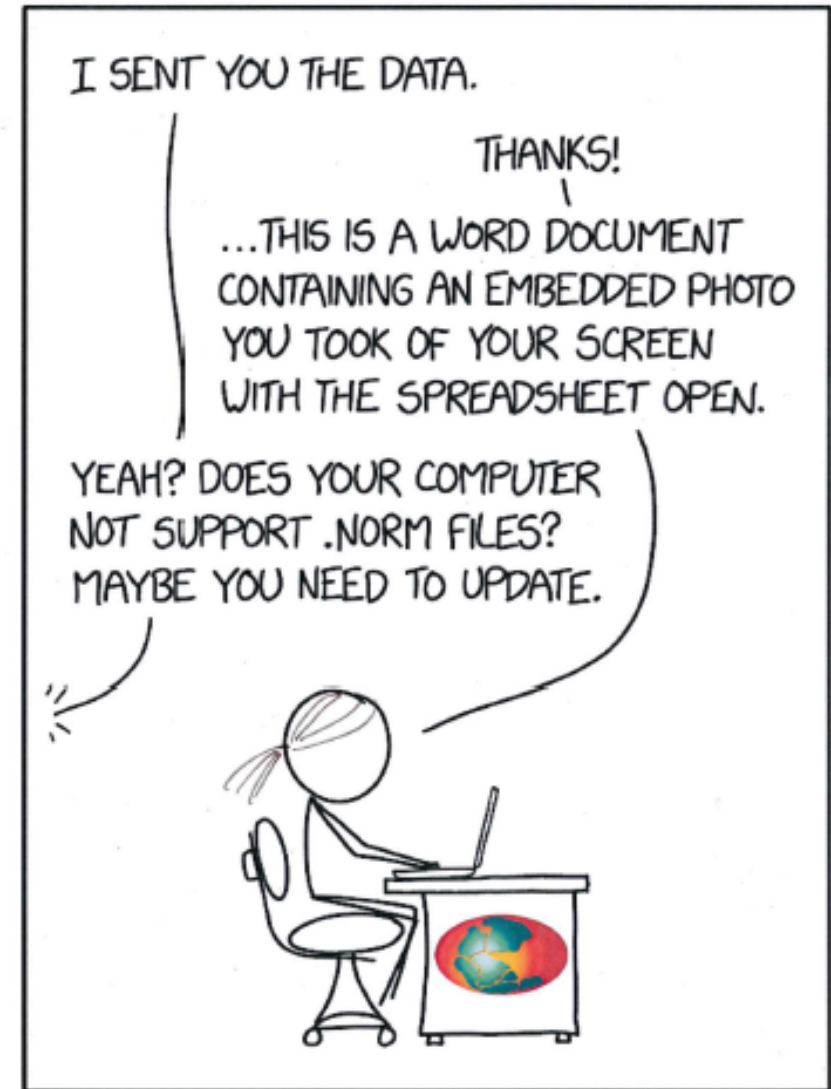
# **MOSAiC data publication with PANGAEA**





# Data submission preparation

...to minimize the preparatory work prior to upload



SINCE EVERYONE SENDS STUFF THIS WAY ANYWAY, WE SHOULD JUST FORMALIZE IT AS A STANDARD.



# Data submission preparation (tabular data)

- Data might be submitted as TAB-delimited text files or spreadsheets
- For all samples, observations and measurements made somewhere on earth, **georeference is mandatory** (latitude/longitude in decimal degree).
- Additionally, third dimension: water depth, altitude, depth in ice, ...
- Date/Time must be provided in ISO-format (e.g. 2020-04-07T13:34:11)
- For each observation provide **Event (Device operation ID)** in the first column
- **Parameters** are always accompanied by a **unit**
- Abbreviations should be explained
- A separate metadata table can be added, with short name / long name / PI / method / comment for each parameter



[illegible]



# Data submission preparation (binary files)

- Binary files with specific formats (e.g. shape, netCDF, segy, images, films ...) archived as links to files.
- A file list including:
  - Event / Device operation ID
  - Latitude, Longitude
  - Date/Time
- Data description (readme file)
- File names should not contain spaces and special symbols



	A	B	C	D	E	F	G
1	Event	Latitude	Longitude	Depth	Date/Time	Content	File name
2	PS122/2_25-44	88.0912	77.6853	33	2020-02-18T00:00	Under-ice fauna in between ice platelets	amphipodvlsnap-2020-02-19-11h15m18s072.png
3	PS122/2_18-89	87.0071	115.3934	91	2020-01-04T00:00	Brinicles covered in platelets	vlcsnap-2020-01-05-17h51m34s474.png
4	PS122/2_19-115	87.2136	111.325	41	2020-01-11T00:00	Platelet covered level ice next to "Fort ridge"	vlcsnap-2020-01-12-11h02m09s615.png
5	PS122/2_19-115	87.2136	111.325	11	2020-01-11T00:00	Platelet covered eastern side of "Fort ridge" site	vlcsnap-2020-01-12-11h03m00s535.png
6	PS122/2_19-115	87.2136	111.325	17	2020-01-11T00:00	Platelet ice on rope	vlcsnap-2020-01-12-11h18m23s083.png
7	PS122/2_19-115	87.2136	111.325	42	2020-01-11T00:00	Platelet ice on ridge blocks	vlcsnap-2020-01-12-11h19m57s927.png
8	PS122/2_19-115	87.2136	111.325	47	2020-01-11T00:00	Platelet ice on level ice and ridge blocks	vlcsnap-2020-01-12-11h20m29s474.png
9	PS122/2_20-23	87.4001	105.3323	20	2020-01-14T00:00	Platelet ice on ridge blocks next to sediment trap deployment hook	vlcsnap-2020-01-15-06h38m08s331.png
10	PS122/2_20-23	87.4001	105.3323	26	2020-01-14T00:00	Platelet ice on ridge blocks and on sediment trap deployment hook	vlcsnap-2020-01-15-06h38m20s328.png
11	PS122/2_20-101	87.4132	98.2978	60	2020-01-18T00:00	Brinicle covered in platelets	vlcsnap-2020-01-19-13h03m54s055.png
12	PS122/2_20-101	87.4132	98.2978	27	2020-01-18T00:00	Platelet ice on ridge blocks and on sediment trap deployment hook	vlcsnap-2020-01-19-13h10m50s462.png
13	PS122/2_20-101	87.4132	98.2978	31	2020-01-18T00:00	Platelet ice on hot wire crossbar and ablation stake	vlcsnap-2020-01-19-13h14m54s168.png
14	PS122/2_21-125	87.4053	92.83	81	2020-01-25T00:00	Platelet ice growing upwards on rafted floe	vlcsnap-2020-01-26-12h36m55s039.png
15	PS122/2_21-125	87.4053	92.83	45	2020-01-25T00:00	Platelet ice growing upwards on rafted floe	vlcsnap-2020-01-26-12h37m17s483.png
16	PS122/2_21-125	87.4053	92.83	3	2020-01-25T00:00	Under-ice fauna in between ice platelets	vlcsnap-2020-01-26-12h55m49s566.png
17	PS122/2_21-125	87.4053	92.83	3	2020-01-25T00:00	Under-ice fauna in between ice platelets close to ROV hole	vlcsnap-2020-01-26-12h56m03s753.png
18	PS122/2_21-125	87.4053	92.83	35	2020-01-25T00:00	Under-ice fauna and sediment (?) deposit in between ice platelets atop a rafted floe	vlcsnap-2020-01-26-12h57m03s914.png
19	PS122/2_21-125	87.4053	92.83	74	2020-01-25T00:00	Brinicles covered in platelets	vlcsnap-2020-01-26-13h25m36s839.png
20	PS122/2_21-125	87.4053	92.83	94	2020-01-25T00:00	Brinicles covered in platelets	vlcsnap-2020-01-26-13h25m42s652.png
21	PS122/2_22-107	87.345	95.2801	33	2020-02-02T00:00	Platelet ice growth on MYI structures	vlcsnap-2020-02-03-07h00m21s589.png
22	PS122/2_22-107	87.345	95.2801	89	2020-02-02T00:00	Platelet ice on ridge blocks and on sediment trap deployment hook	vlcsnap-2020-02-03-07h12m31s555.png
23	PS122/2_22-107	87.345	95.2801	77	2020-02-02T00:00	Platelet ice on ridge blocks and on sediment trap deployment hook	vlcsnap-2020-02-03-07h12m31s555.png
24	PS122/2_22-107	87.345	95.2801	30	2020-02-02T00:00	Platelet ice on protruding spine catching the ROV tether cable	vlcsnap-2020-02-03-07h12m31s555.png
25	PS122/2_23-29	87.4704	95.1437	40	2020-02-04T00:00	Platelet ice on under-ice ablation stake	vlcsnap-2020-02-05-09h18m49m02s251.png
26	PS122/2_23-29	87.4704	95.1437	41	2020-02-04T00:00	Platelet ice on under-ice ablation stake	vlcsnap-2020-02-05-09h18m49m02s251.png
27	PS122/2_23-116	87.6688	93.8622	8	2020-02-08T00:00	Platelet ice along MYI structures	vlcsnap-2020-02-09-18h49m25s189.png
28	PS122/2_23-116	87.6688	93.8622	52	2020-02-08T00:00	Platelet ice growing on rafted floes	vlcsnap-2020-02-09-18h52m12s840.png
29	PS122/2_23-116	87.6688	93.8622	11	2020-02-08T00:00	Platelet ice growing on rafted floes	vlcsnap-2020-02-09-18h59m49s773.png
30	PS122/2_23-116	87.6688	93.8622	68	2020-02-08T00:00	Platelet ice on ridge blocks and on sediment trap deployment hook	vlcsnap-2020-02-09-19h01m23s342.png
31	PS122/2_23-116	87.6688	93.8622	23	2020-02-08T00:00	Platelet ice on ridge blocks and on sediment trap deployment hook	vlcsnap-2020-02-17-07h26m12s452.png
32	PS122/2_23-116	87.6688	93.8622	49	2020-02-08T00:00	Platelet ice on ridge blocks and on sediment trap deployment hook	vlcsnap-2020-02-17-07h28m49s856.png
33	PS122/2_23-116	87.6688	93.8622	76	2020-02-08T00:00	Brinicle with only few platelets	vlcsnap-2020-02-17-07h31m40s224.png
34	PS122/2_23-116	87.6688	93.8622	9	2020-02-08T00:00	Platelet ice on ridge blocks and on sediment trap deployment hook	vlcsnap-2020-02-17-07h32m07s381.png
35	PS122/2_24-97	88.0688	79.8141	25	2020-02-15T00:00	Platelet ice growing on rafted floes	
36	PS122/2_24-97	88.0688	79.8141	75	2020-02-15T00:00	Platelet ice along MYI structures	
37	PS122/2_24-97	88.0688	79.8141	63	2020-02-15T00:00	Platelet ice on under-ice ablation stake	
38	PS122/2_24-97	88.0688	79.8141	0	2020-02-15T00:00	Platelet ice on hot wire crossbar and ablation stake	

<https://doi.pangaea.de/10.1594/PANGAEA.919398>



# Data submission preparation

- **Titles** for all your submitted datasets (tables) – different from the paper, should reflect what was measured, where and when
- MOSAiC as project
- (Preliminary) paper citation – if data related to a publication
- **Abstract** – data specific
- Extended documentation (SOPs) – as plain text or pdf-file, or hdl (link to Epic)
- Check more details at **PANGAEA wiki**



# Data submission

## Create Issue

Project **PANGAEA Data Archiving & Publication**

Issue Type **+ Data Submission**

Summary\* **py, Alfred-Wegener-Institut, Helmholtz-Zentrum für Polar und Meeresforschung**

The summary (subject) is used as identifier in the further communication.

Author(s)\* **Ransby, Daniela**

Please, enter the author(s) (the principal investigators) for the data set(s) you want to submit. One author per line;  
example: Smith, Joe Peter

Title

ABSTRACT and/or further details describing the data.


...

ABSTRACT and/or further details describing the data.

Keywords

Separate keywords by comma or semicolon.

Attachment

 Drop files to attach, or browse.

<p>DATA FILE(S) ARE REQUIRED! Max. size for attachments is 100MB. If you have larger files OR if you have more than 20 files please request an upload link writing a comment into your issue. For data submissions, read our <a href="https://wiki.pangaea.de/wiki/Format" class="external-link" target="\_blank" rel="nofollow noopener">format guide</a>.</p>

License\*

CC-BY: Creative Commons Attribution 4.0 International

General information on used licences can be found on the Creative Commons license pages. If you need help to choose the correct license for your dataset, you can look here: <https://wiki.pangaea.de/wiki/License>

and create labels or press down to select a suggested label.

mission, e.g. PROJECT, institute, etc. Labels have to be one word!

ences to articles or submitted manuscripts related to this data submission.

Copy/paste the full citation, preferably with a Digital Object Identifier (DOI name).

Create Cancel



ORCID: Open Researcher and Contributor ID is a nonproprietary alphanumeric code to uniquely identify scientific and other academic authors and contributors.



# New submission interface:



- Coming soon!



## Basic Informations

### Title\*

Title max length: 180 chars

What was measured, where and when

The title should ideally reflect what has been measured, observed, or calculated, when, where, and how.

### Authors\*



Ransby

Daniela

daniela.ransby@awi.de

Alfred-Wegener-Institut, Helm



Please, enter the author(s) (the principal investigators) for the data set(s) you want to submit.

Add an author

### Keywords

diatom; ice core; Antarctica; south westerly wind;

Press 'Enter' to create badge.

### Abstract/Describe your Data\*

- WHAT
- WHERE
- WHEN
- HOW
- WHY

Avoid interpretation of the results, this should not be a part of data publication.

**ABSTRACT** give further details about your data set(s) link: <https://wiki.pangaea.de/wiki/Abstract>.

Next



1

Basics

2

Licenses

3

References

4

Further-Details

5

Upload

## Licenses and References

Licenses\*

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General information on used licenses can be found on the [Creative Commons](#) license pages. If you need help to choose the correct license for your dataset, you can use the [following page](#).

Moratorium ☐

Back

Next



1

Basics

2

Licenses

3

References

4

Further-Details

5

Upload

## References

### References\*



e.g.: Aliprantis and Kim C. Border (1994), Infinite Dimensional Analysis. Springer, Berlin.



Please, specify any references to articles or submitted manuscripts related to this data submission. Copy/paste the full citation, preferably with a [Digital Object Identifier \(DOI name\)](#)

Add a new reference

Back

Next



1

Basics

2

Licenses

3

References

4

Further-Details

5

Upload

## Erweiterung

### Project

project MOSAiC

Press 'Enter' to add a project. Context of the data submission, e.g. PROJECT, institute, etc. Labels have to be one word!

### Labels

de.NBI\_survey

If you already got a projecttag, enter it here.

Place for comments.

### ID/Awards

award

Press 'Enter' to add an award.

Back

Next



1

Basics

2

Licenses

3

References

4

Further-Details

5

Upload

## File Upload

Upload\*

Choose a file

DATA FILE(S) ARE REQUIRED! Max. size for attachments is 100MB. If you have larger files OR if you have more than 20 files please request an upload link writing a comment into your issue. For data submissions, read our format guide (<http://wiki.pangaea.de/wiki/Format>).

Terms of Use\* ☐

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Where do I find Event /  
Device operation ID?



# D-ship log → PANGAEA



- **Science Activities** are a collection of device operations
- **Device Operations** are your measurements or sampling actions
- Device Operations can be composed of several **actions**

The screenshot shows a web browser window with the URL `dship1.fs-polarstern.de:8080/dship-web/`. The browser's address bar and tabs are visible. Below the browser window, the DSHIP web interface is shown. It features a header with the text "DSHIP MOSAiC20192020/1" and coordinates "75° 08,241' N 039° 07,762' E" along with the date "2019-09-22". The main content area is titled "DShip\_ActionLog" and contains a table with the following data:

Activity - Device Operation	Timestamp	Device	Action	Latitude	Longitude	Depth (m)	Speed (kn)	Co
PS122/1_4-1 CTD_SBE9plus_485	22.09.2019 09:...	Conductivity-Te...	information	75° 07,932' N	039° 05,969' E	184.0	13.1	^
PS122/1_3-1 topAWI	22.09.2019 09:...	Towed Ocean ...	information	75° 05,362' N	038° 51,058' E	186.0	13.3	
PS122/1_2-1 AIRGUN_PS	22.09.2019 08:...	Air Gun	profile start	74° 59,125' N	038° 15,496' E	177.0	13.3	
PS122/1_1-1 topAWI	21.09.2019 18:...	Towed Ocean ...	information	73° 08,358' N	029° 49,934' E	267.0	12.7	
PS122/1_0_Underway-60 Weather	20.09.2019 17:...	Weather Station	station start	69° 40,773' N	018° 59,799' E	0.0	0.0	v

Device Operation ID (D-ship):

Campaign/Expedition-Leg\_Science Activity-No. of Device Operation within Science Activity



# Device operation ID = Event



- Device Operation ID (logged during MOSAiC expedition) --> **Event** (in PANGAEA)  
Campaign/Expedition-Leg\_Science Activity-No. of Device Operation within Science Activity
- Events in PANGAEA are not sub-divided to Actions! (a simplified list)

View and download Event lists by MOSAiC leg: <https://www.pangaea.de/expeditions/byproject/MOSAiC>



**PANGAEA.**

Data Publisher for Earth & Environmental Science

SEARCH SUBMIT ABOUT CONTACT

## Event List of AF-MOSAiC-1

[Download as tab-delimited text](#)

Event label	Optional label	Method/Device	Sensor URI	Date/Time	Latitude	Longitude	Elevation	Date/Time end	Latitude end	Longitude end	Elevation end	Comment
AF-MOSAiC-1_track		Underway cruise track measurements		2019-09-21T08:00:11	69.67879	18.99250		2019-10-18T00:19:10	84.76533	132.13295		
AF-MOSAiC-1_139	PS122/1_1-157	Surface velocity profiler	<a href="#">Link</a>	2019-09-29T00:36:00	85.53700	139.03100						Station P40_Measurement:GPS Position_Comment:EUMETNET YOPP buoy. Deployed by heli crew during survey flight__Old Labels:MO_SVP-I-BXGS-AP,PS122/1_1-157
AF-MOSAiC-1_3	PS122/1_3-3	Helicopter	<a href="#">Link</a>	2019-09-30T00:01:00	85.12439	137.98501						__Measurement:Sea ice thickness__Comment:EM-Bird survey over floe 4a and in the vicinity. Instrument showed strong drift in signal which may be the result of a broken SBC computer. After flight, computer was replaced and problem solved. Data requires additional processing to compensate for strong instrument drift__Old Labels:HELI_AEM_AWI_20190930,PS122/1_3-3
AF-MOSAiC-1_1	PS122/1_3-1	Broadband electromagnetic sensor	<a href="#">Link</a>	2019-09-30T03:15:00	85.12085	137.85481						20190930_Station_001_Measurement:__Comment:__Old Labels:PS122/1_3-1
AF-MOSAiC-1_43	PS122/1_3-43	Ice thickness gauge	<a href="#">Link</a>	2019-09-30T03:21:00	85.78149	123.69648						Ice Thickness measurement__Measurement:__Comment:__Old Labels:PS122/1_3-43
AF-MOSAiC-1_36	PS122/1_3-36	Broadband electromagnetic sensor	<a href="#">Link</a>	2019-09-30T06:54:00	85.10939	137.70180						20190930_Station_002_Measurement:__Comment:__Old Labels:PS122/1_3-36
AF-MOSAiC-1_165	PS122/1_1-180	Buoy, universal tracker	<a href="#">Link</a>	2019-09-30T12:00:00	86.18000	125.37000						Station P45_Measurement:GPS Position_Comment:Placed during survey flight north of distributed network area. Loc,date estimated from buoy reports.__Old Labels:OSU-UT-0003,PS122/1_1-180
AF-MOSAiC-1_164	PS122/1_1-179	Buoy, universal tracker	<a href="#">Link</a>	2019-09-30T12:00:00	85.83000	118.19000						Station P44_Measurement:GPS Position_Comment:Placed during survey flight north of distributed network area. Loc,date estimated from buoy reports.__Old Labels:OSU-UT-0001,PS122/1_1-179
AF-MOSAiC-1_44	PS122/1_3-44	Ice thickness gauge	<a href="#">Link</a>	2019-10-01T01:15:00	85.71339	123.24103						Ice Thickness measurement__Measurement:__Comment:__Old Labels:PS122/1_3-44
AF-MOSAiC-1_45	PS122/1_3-45	Ice thickness gauge	<a href="#">Link</a>	2019-10-03T01:24:00	85.19975	135.47300						Ice Thickness measurement__Measurement:__Comment:__Old Labels:PS122/1_3-45
AF-MOSAiC-1_154	PS122/1_1-191	Buoy, ice tracker	<a href="#">Link</a>	2019-10-04T11:08:00	85.11570	133.13030						Station P04_Measurement:GPS Position_Comment:Deployed on small flow along side ship by Daniel Watkins__Old Labels:OSU-IT-0013,PS122/1_1-191





# Found a mistake in an Event?



- Errors cannot be corrected in D-ship log, but can be corrected in PANGAEA & Sensor web
- Go to instructions: <https://spaces.awi.de/x/IIFrF>, download correction sheet and contact PANGAEA (submit correction sheet)



# Raw data publishing



- Raw data publication: semi-automatic process, using metadata from sensor.awi.de
- The responsible PIs will be informed about raw data publication, asked for a proofread
- **All sensor PIs:** please create a **PANGAEA account** ASAP
- If the raw data wasn't published with PANGAEA at the time of primary data publication yet, and is needed, contact the PANGAEA team
- During data publication instruct the editors in your data repository to create links to other versions of data (e.g., raw data, data in another repository)



# Raw data description



- Each relevant file type must be described prior to submission via the sensor related ingest tab on sensor.awi.de <https://spaces.awi.de/x/IACZBQ>
- A link to a detailed description (in epic.awi.de) shall be given for non standard raw files.
- **Directory and files structure description:**
  - Under which path on the MCS are the files stored?
  - Where are the relevant files on the data storage?
  - Naming schema of relevant files. (Prefix, postfix, timestamp, datatype)?
  - Are there files in the data storage which shall not be published. (E.g. redundant data, ...)



# Data available to MOSAiC team

Onboard MCS Data



Raw and primary data

1

Land MCS



Metadata

4

Primary data

Upon Data-Ticket issued by researcher via Ticketing System of PANGAEA

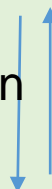


## Published data

PANGAEA = Publication with DOI (=> citable)



Link between datasets



Password protection until 2023-01-01 possible (only metadata are visible)



MOSAiC Data not stored on onboard MCS (e.g. buoy data or DOE-ARM)

5 Raw and primary data

2 Raw data

3

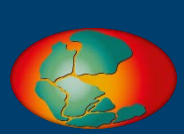
Raw data

Semi-automated

Long term archive







# PANGAEA's data management team for MOSAiC



daniela.ransby@awi.de  
info@pangaea.de

Information on data publication:  
<https://spaces.awi.de/x/AKnFEw>





# Welcome to MOSAiC data services

Welcome to the services for MOSAiC provided by the Alfred Wegener Institute.

## General information

### Mosaic Web Site

Visit the official MOSAiC web site.

[Goto MOSAiC](#)

### Password

Change the password for your MOSAiC account

[Change password](#)

### MOSAiC Logbook

Logbook from Polarstern

[Open Logbook](#)

### Panomax

Check out 360 degrees pictures from Polarstern

[Open Panomax-Viewer](#)

### Contact

Contact MOSAiC Data Support Team

[Contact us](#)

## Access the Data

### MOSAiC Data Management

Documentation of the MOSAiC Data Management and how to access and work with MOSAiC Data

[Open MOSAiC Data Documentation](#)

### Access MOSAiC Data

Access Mosaic Data via SFTP Protokoll.

[Open SFTP documentation](#)

### Upload new MOSAiC Data

Use the Ingest Submission Service at ingest.awi.de to upload new MOSAiC data to MCS

[Open Ingest-Service Documentation](#)

### JupyterHub

Work with your MOSAiC data in Jupyter notebooks.

[Open JupyterHub](#)

### VPN Access

Connect to the AWI network via VPN (for external project members)

[Open VPN documentation](#)

### AWI marketplace

Request virtual machines / services from AWI marketplace (VPN required)

[Open marketplace documentation](#)

support@mosaic-data.org

## Observation to Archive (O2A)

### SENSOR

Manage your platforms and devices.

[Goto SENSOR](#)

### Data Publication

Publish MOSAiC datasets

[Goto MOSAiC data publication guideline](#)

### PANGAEA

Find, archive and publish data.

[Goto PANGAEA](#)

### O2A-Wiki

Understand the O2A framework.

[Goto documentation](#)

### O2A Examples

Explore and try data science examples.

[Goto GitHub](#)

### O2A Videos

Learn about O2A components.

[Goto YouTube](#)

### DASHBOARD

Manage your data dashboards.

[Goto DASHBOARD](#)

### DATA PORTAL and MAPS

Explore data, metadata and maps.

[Goto DATA](#)