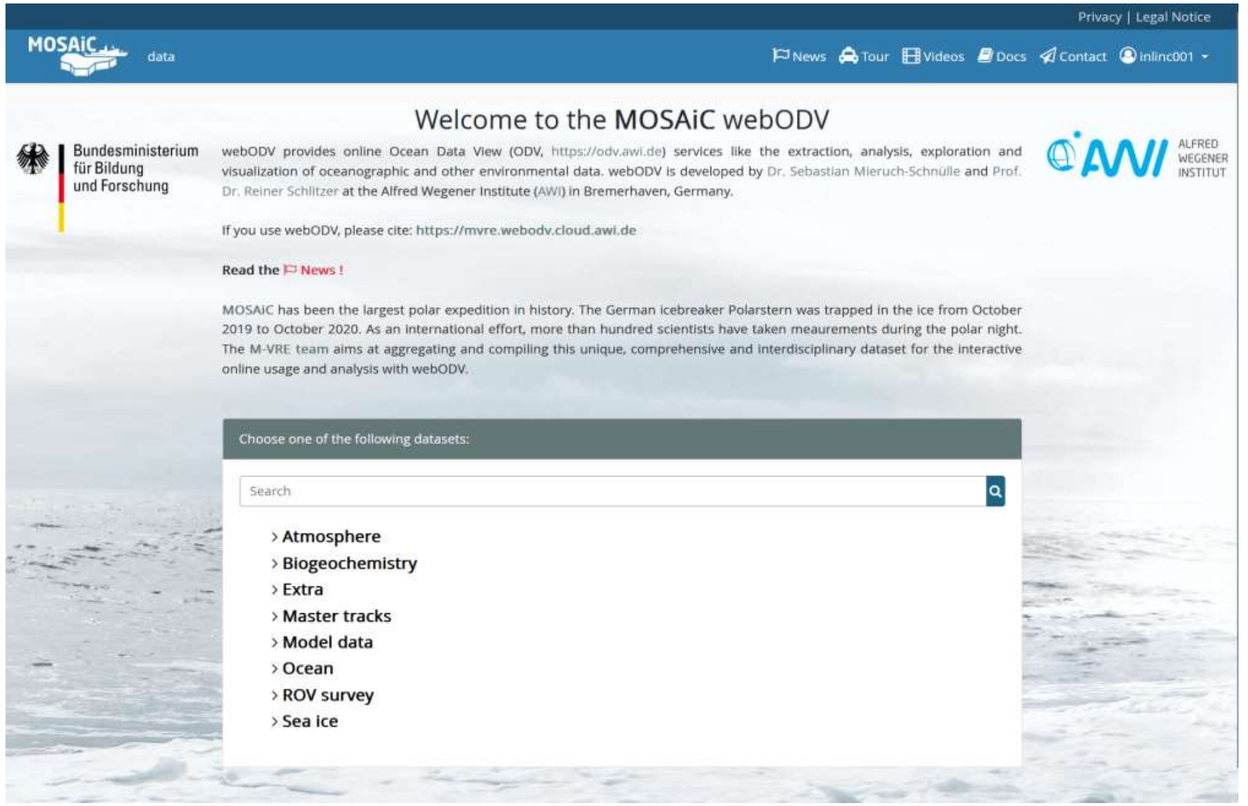
27-29 May 2024

International conference on Marine Data and Information Systems

SeaDataNet AISBL · Havforskningsinstituttet · Ifremer · MARIS · MEDIN · National Oceanography Centre · INGV · iMagine · ICDE · eosc Blue-Cloud2026

The data conversion process for the M-VRE webODV

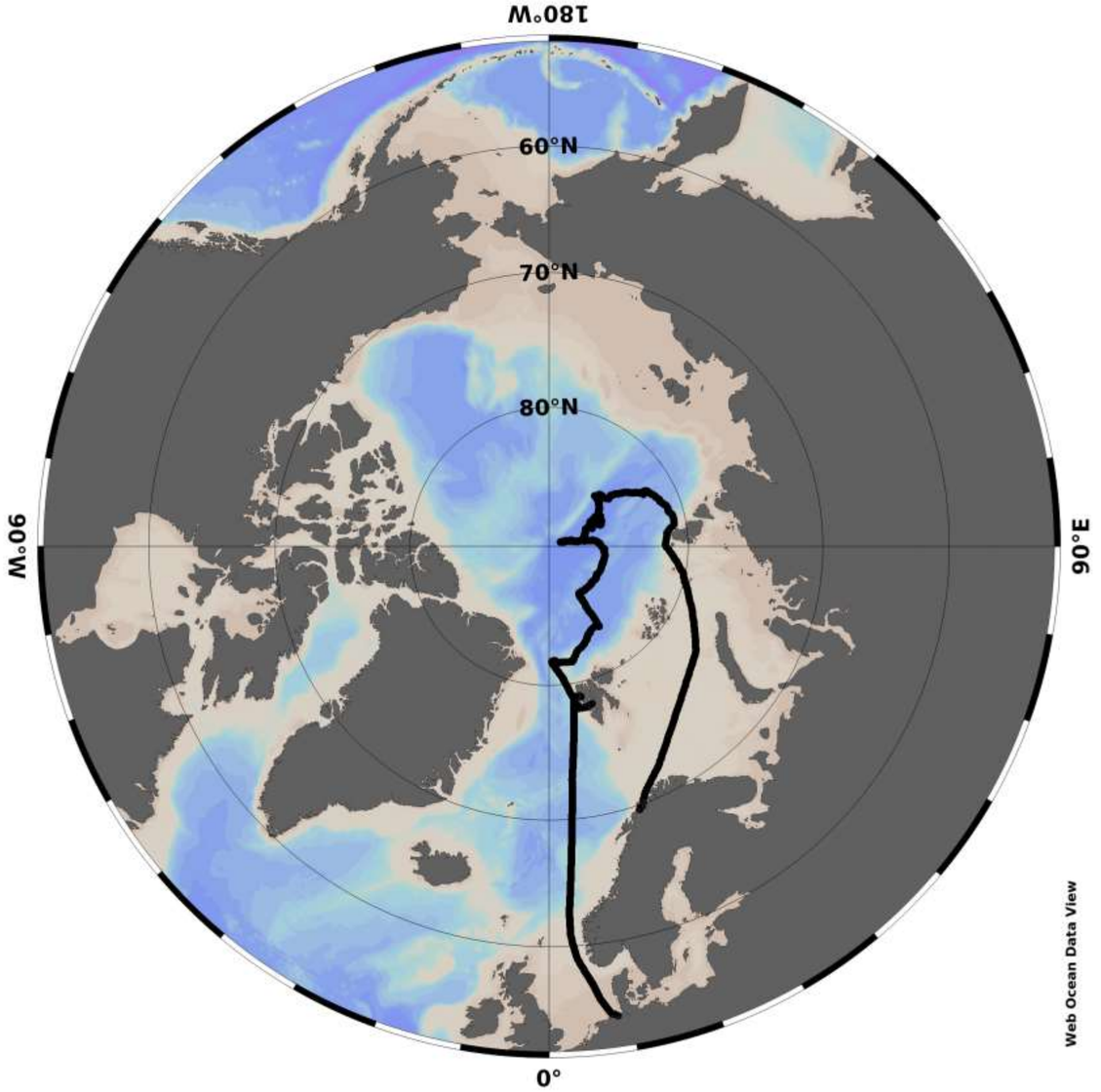


Ingrid Linck Rosenhaim
Sebastian Mieruch
Reiner Schlitzer

May 29th 2024, Bergen - Norway

MOSAiC Expedition

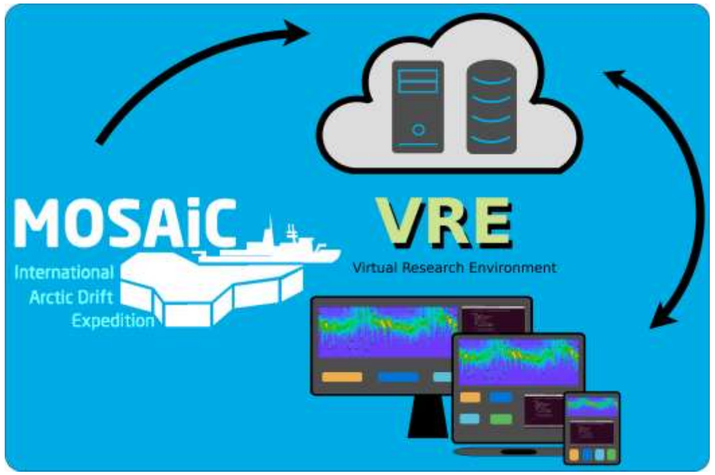
- The icebreaker Polarstern was frozen in the Arctic Sea ice for a year (2019-2020) following the Transpolar Drift
- An international expedition involving many countries and more than 100 scientists
- An incredible amount of measurements were collected above, within, and under the sea ice
- These data are available as open source since January 2023 in PANGAEA



https://mosaic-expedition.org

MOSAiC-Virtual Research Environment Project

- The M-VRE Project offers different tools for the exploration of MOSAiC data.
- One of these tools is webODV.
- webODV is the online version of Ocean Data View (ODV)
  - ODV is an established software for the analysis and visualization of oceanographic and georeferenced data
- webODV is an interactive and powerful tool accessible via the browser and in a user-friendly virtual environment
- In M-VRE webODV, the MOSAiC data is uploaded and kept up-to-date with PANGAEA, and the data can be analyzed and visualized directly.



https://mosaic-vre.org

webODV

https://webodv.awi.de

Ocean Data View
Interactive exploration, analysis and visualization of oceanographic and other geo-referenced data.

https://odv.awi.de

webODV and FAIR data

Findable

Accessible

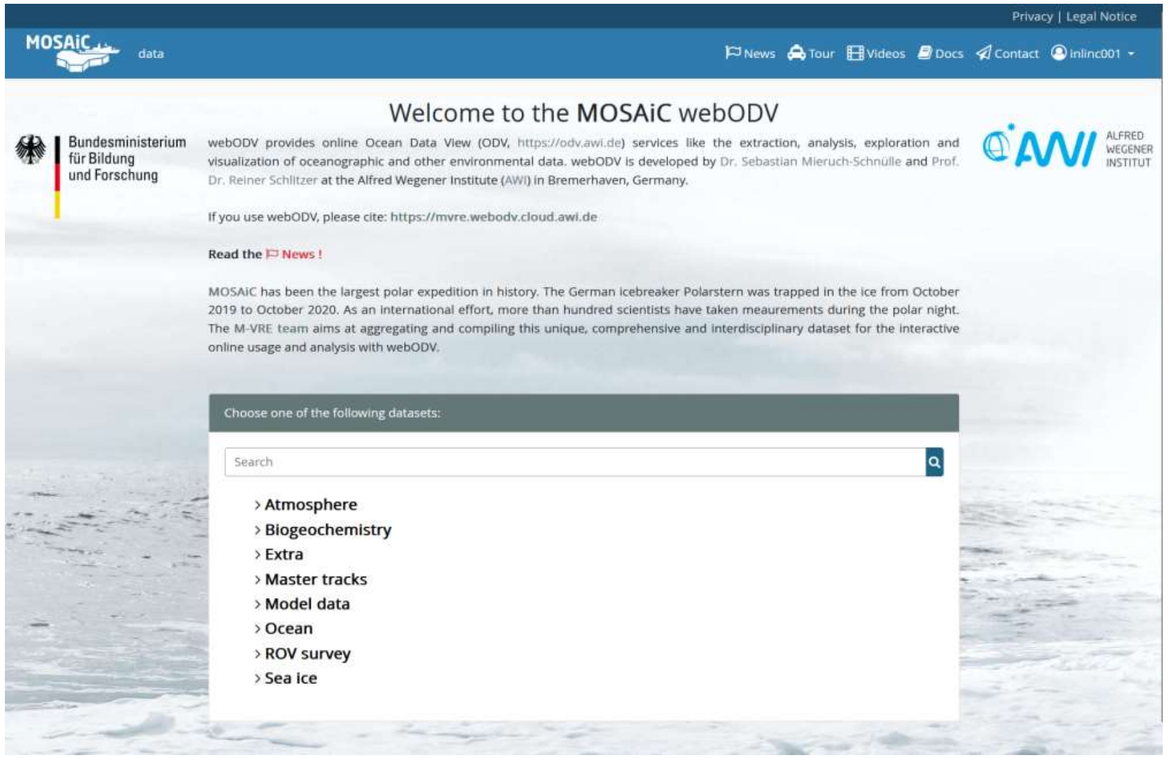
Interoperable

Reusable

- **Findable**: every data set in webODV has a direct link to the original file in PANGAEA
- **Accessible**: data aggregated into collections of similar measurements. These data can be analyzed and visualized individually by filtering the data. The collections are kept up-to-date with the data, metadata, and data references in PANGAEA.
- **Interoperable**: Data collections are provided in webODV for download in three consistent formats: text, ODV, and netCDF.
- **Reusable**: copies of analysis and visualizations of collections created in webODV can be shared with co-authors and colleagues via links. These are easily **Reproducible** without changing the analysis and visualizations of the sender.

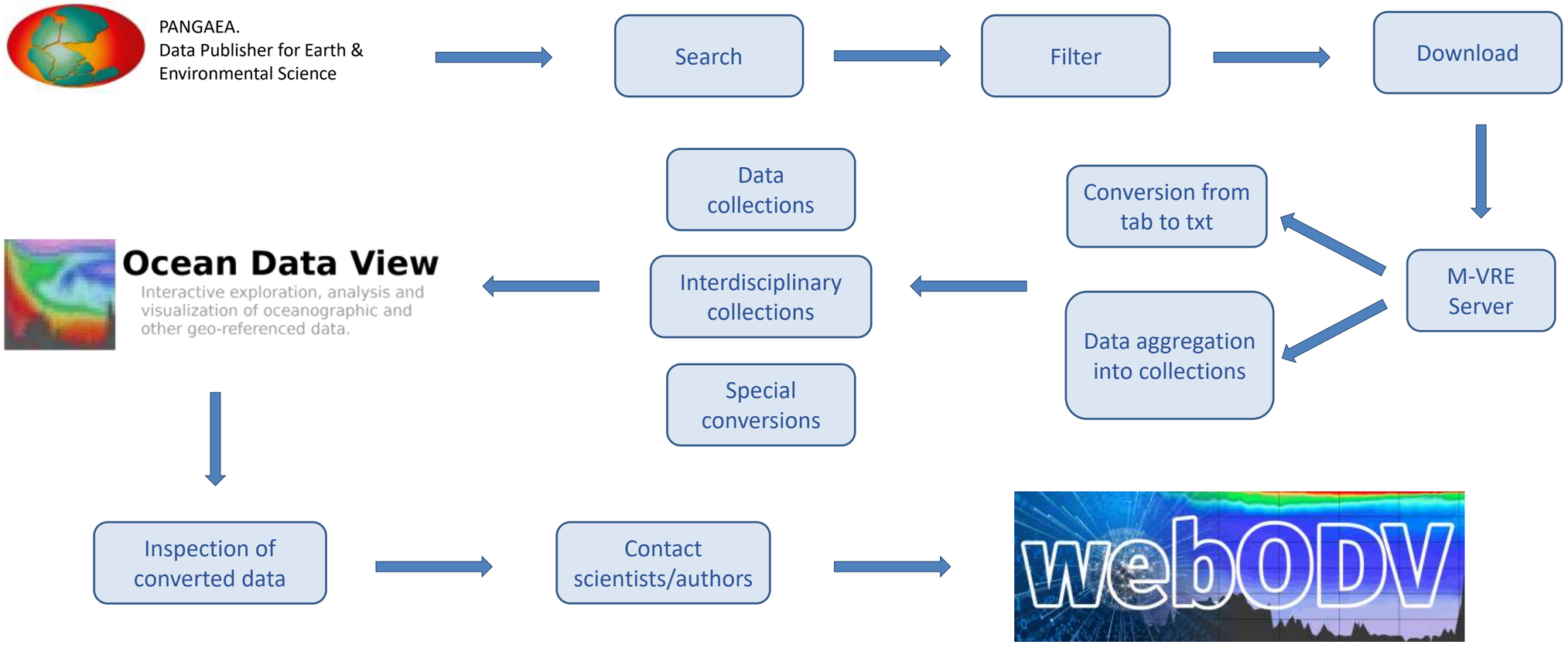
The MOSAiC data in webODV

- The MOSAiC measurements in webODV are presented as data collections
- These data collections are separated into categories:
  - Atmosphere
  - Biogeochemistry
  - Interdisciplinaty collections
  - Master tracks
  - Model data
  - Ocean
  - ROV survey
  - Sea ice
  - Extra



https://mvre.webodv.cloud.awi.de

Data conversion workflow: from PANGAEA to webODV



Metadata

- The following metadata variables are merged to the data:

  - Basis
  - Cruise
  - Event
  - Station
  - Project
  - URL
  - RIS and BibTeX citations
  - Version
  - Last modified
  - Scientists
  - Main Scientist
  - Contact
  - Method
  - Bottom Depth [m]
  - Original file url
  - Longitude and Latitude

- These metadata ensure:
  - Transparency
  - Traceability of data source and authors

Special conversions

- Data not in tab format:
  - netCDF
  - Text
  - TAR
  - zip
  - xlsx
  - Etc…

- Data structure:
  - Missing data variable / different data structure
  - Transformation of many columns into a few new ones

Data

Download dataset as tab-delimited text — *use the following character encoding:* UTF-8: Unicode (PANGAEA defa

All files referred to in data matrix can be downloaded in one go as ZIP or TAR. **Be careful: Thi**

1 Content	2 Binary	3 Binary (Size) [Bytes]
Coordinates of the nearest CCLM grid point (1h data)	C15_Lat_Lon_winter.txt	209.4 kBytes
CCLM near-surface data (1h): sea ice from AMSR data	C15_near-surface_winter.txt	556.1 kBytes
CCLM near-surface data (1h): sea ice from MODIS data	C15MOD0_near-surface_winter.txt	557.6 kBytes
CCLM Integrated humidity and temperature data (1h data)	C15MOD0_integrated_GS_winter.txt	170.1 kBytes

Regional climate model simulations of near-surface variables
https://doi.pangaea.de/10.1594/PANGAEA.944502

Sample: 1 / 1	
1: time_ISO8601 [years since 0000-01-01]	2020.1134
2: Quality flag, position ()	0.00
3: Temperature, difference (Thermistor 1) [°C]	-31.84
4: Temperature, difference (Thermistor 2) [°C]	-31.82
5: Temperature, difference (Thermistor 3) [°C]	-31.74
6: Temperature, difference (Thermistor 4) [°C]	-31.87
7: Temperature, difference (Thermistor 5) [°C]	-31.73
8: Temperature, difference (Thermistor 6) [°C]	-31.98
9: Temperature, difference (Thermistor 7) [°C]	-31.87
10: Temperature, difference (Thermistor 8) [°C]	-31.93
11: Temperature, difference (Thermistor 9) [°C]	-31.88
12: Temperature, difference (Thermistor 10) [°C]	-31.93
13: Temperature, difference (Thermistor 11) [°C]	
14: Temperature, difference (Thermistor 12) [°C]	
15: Temperature, difference (Thermistor 13) [°C]	
16: Temperature, difference (Thermistor 14) [°C]	
17: Temperature, difference (Thermistor 15) [°C]	
18: Temperature, difference (Thermistor 16) [°C]	

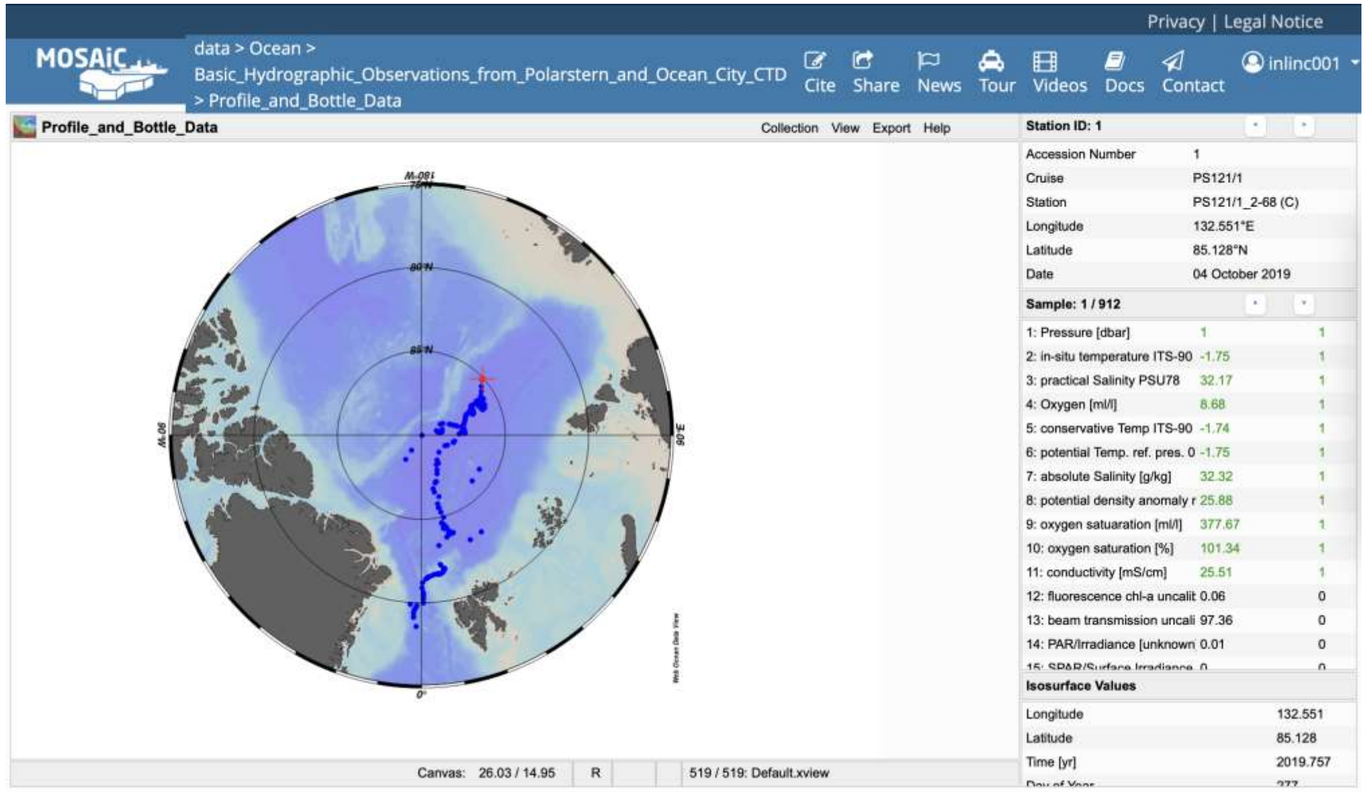
Sample: 1 / 208	
1: time_ISO8601 [years since 0000-01-01]	2019.7603
2: Quality flag, position ()	0
3: Seconds after the heating cycle [sec]	0
4: Thermistor number	2
5: Temperature, difference [°C]	-9.62

204: Temperature, difference (Thermistor 202) [°C]	-1.88
205: Temperature, difference (Thermistor 203) [°C]	-1.79
206: Temperature, difference (Thermistor 204) [°C]	-1.90
207: Temperature, difference (Thermistor 205) [°C]	-1.73
208: Temperature, difference (Thermistor 206) [°C]	-1.73
209: Temperature, difference (Thermistor 207) [°C]	-1.74
210: Temperature, difference (Thermistor 208) [°C]	-1.77

Heating-induced temperature difference measurements from radiation station
https://doi.org/10.1594/PANGAEA.948899

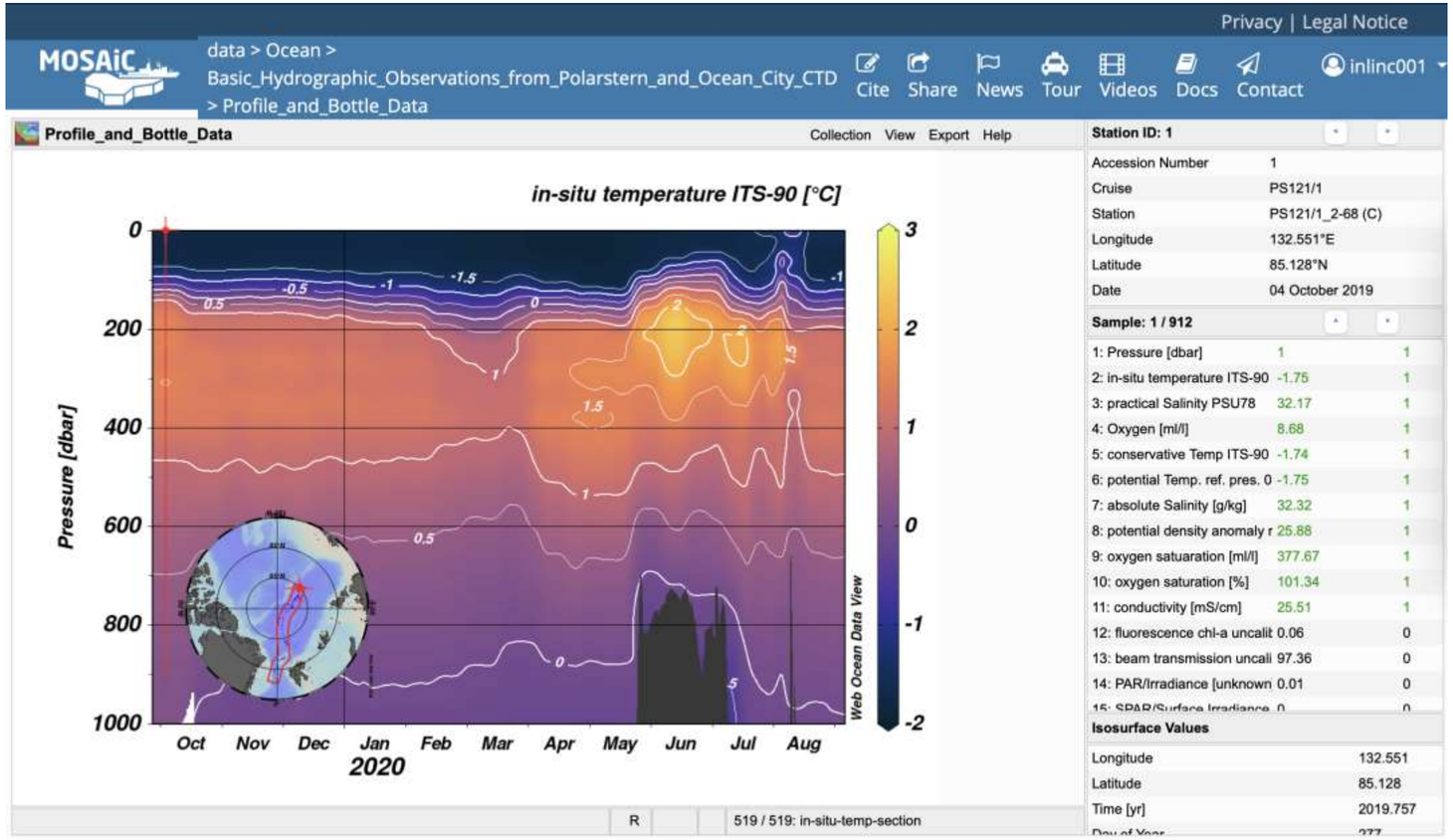
Data conversion to ODV format

- Bash scripted
  - .Data folder and default views
  - .odv file
  - .nc files used by other M-VRE tools like DIVAnd
- The collections are then uploaded onto our webODV test
  - Through inspection of the converted data
- The collections are uploaded onto webODV and are ready for use.



Physical oceanography based on ship CTD during POLARSTERN cruise PS122
https://doi.pangaea.de/10.1594/PANGAEA.959963

Section layout in webODV



Physical oceanography based on ship CTD during POLARSTERN cruise PS122
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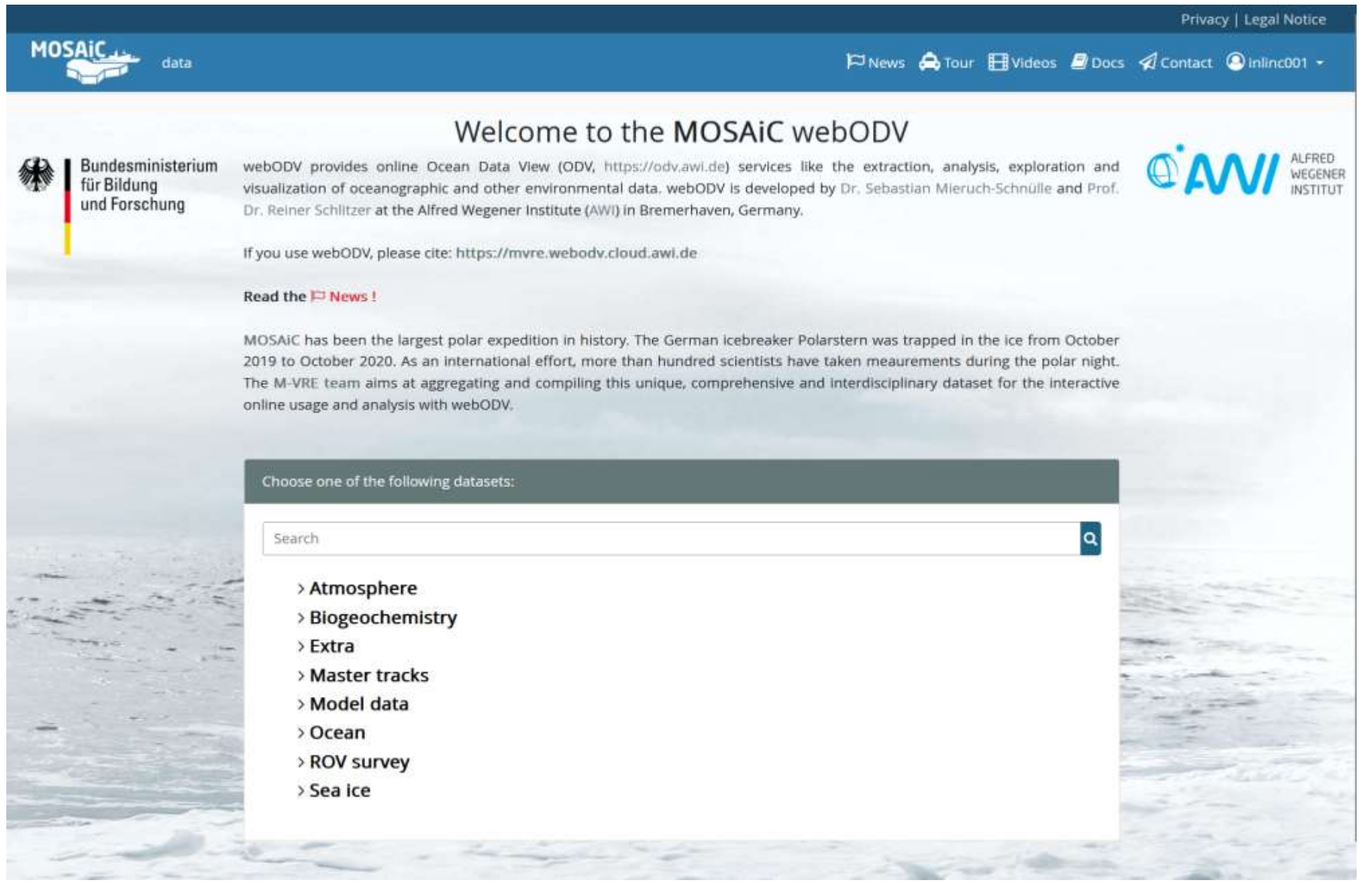
Thank you!



https://mvre.webodv.cloud.awi.de

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