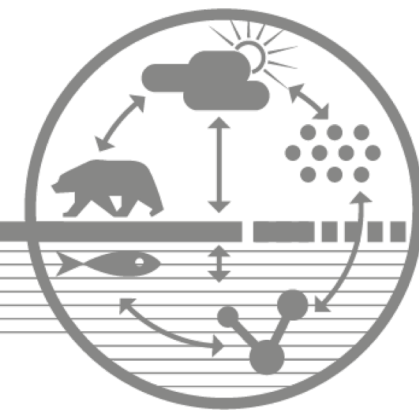


# MOSAiC

International  
Arctic Drift  
Expedition



## SENSOR(Web) and Overview of Metadata Flow in MOSAiC

### MOSAiC Data Webinar for Chief Editors and Data Contact Persons

Janik Eilers, Antonia Immerz, AWI Data Centre

16.07.2019



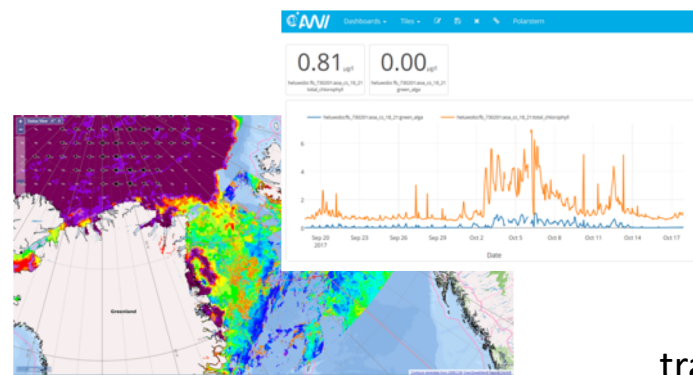
ALFRED-WEGENER-INSTITUT  
HELMHOLTZ-ZENTRUM FÜR POLAR-  
UND MEERESFORSCHUNG

# Data Flow in MOSAiC



ActionLog Events

Activity - Device Operator	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'
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'

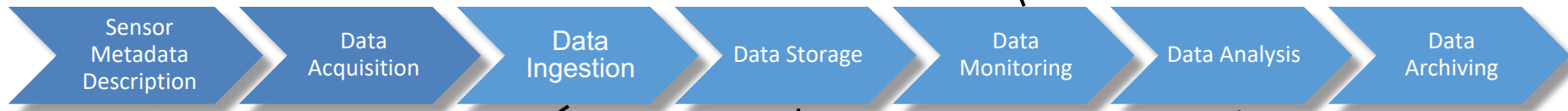
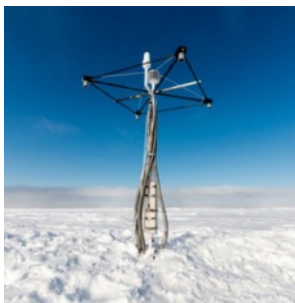


SensorWeb at AWI and onboard of Polarstern

Acquisition organized by MOSAiC groups.  
**DShip-ActionLog** for Device-Operation ID management

DShip-Mapviewer and Dashboard at AWI and onboard of Polarstern

Raw and primary data archiving at AWI. Data transfers after legs or parts during legs



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

MOSAiC Central Storage and workspace

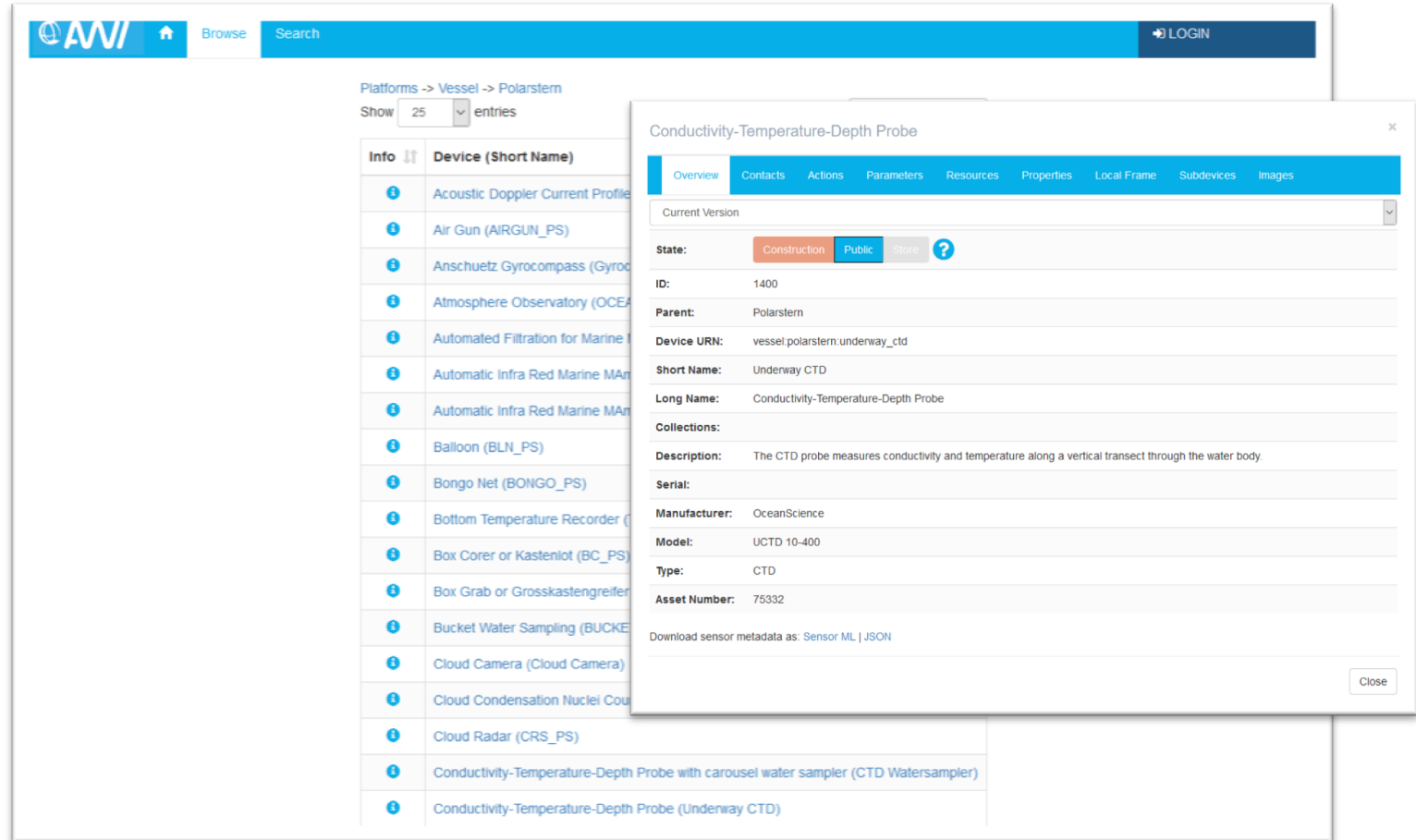
Using workspace and Marketplace (VM) e.g. with Jupyter Notebook (R or Python) or Bash-Script or or ...?



**Sensor metadata description (SensorWeb) is the basis for all parts!!!**

- ✓ Describe your sensor only once with SENSORWeb
- ✓ Then sensor data can be ingested, stored, monitored, analysed and archived

# SENSOR

The screenshot shows the SENSORWeb interface. At the top, there is a navigation bar with 'AWI', 'Browse', 'Search', and 'LOGIN'. Below this, the breadcrumb path is 'Platforms -> Vessel -> Polarstern'. A 'Show 25 entries' dropdown is visible. A table lists various sensors, including 'Acoustic Doppler Current Profile', 'Air Gun (AIRGUN\_PS)', 'Anschutz Gyrocompass (Gyro)', 'Atmosphere Observatory (OCEA)', 'Automated Filtration for Marine', 'Automatic Infra Red Marine MA', 'Automatic Infra Red Marine MA', 'Balloon (BLN\_PS)', 'Bongo Net (BONGO\_PS)', 'Bottom Temperature Recorder', 'Box Corer or Kastenlot (BC\_PS)', 'Box Grab or Grosskastengreifer', 'Bucket Water Sampling (BUCKE)', 'Cloud Camera (Cloud Camera)', 'Cloud Condensation Nuclei Cou', 'Cloud Radar (CRS\_PS)', 'Conductivity-Temperature-Depth Probe with carousel water sampler (CTD Watersampler)', and 'Conductivity-Temperature-Depth Probe (Underway CTD)'. A modal window is open for the 'Conductivity-Temperature-Depth Probe', showing details such as 'Current Version', 'State: Construction', 'ID: 1400', 'Parent: Polarstern', 'Device URN: vessel.polarstern.underway\_ctd', 'Short Name: Underway CTD', 'Long Name: Conductivity-Temperature-Depth Probe', 'Description: The CTD probe measures conductivity and temperature along a vertical transect through the water body.', 'Manufacturer: OceanScience', 'Model: UCTD 10-400', 'Type: CTD', and 'Asset Number: 75332'. There is also a 'Download sensor metadata as: Sensor ML | JSON' option and a 'Close' button.

Sensor Metadata Description

Data Acquisition

Data Ingestion

Data Storage

Data Monitoring

Data Analytics

Data Archiving

# What is SensorWeb

- Sensor Web manages metadata of
  - Research platforms
  - sensors
- Sensor Web does not manage measurement data

SENSOR

Sensor  
Metadata  
Description

Data  
Acquisition

Data  
Ingestion

Data  
Storage

Data  
Monitoring

Data  
Analytics

Data  
Archiving

**HELMHOLTZ**

# SensorWeb

- Sensor Information System - Create and manage meta data of devices and sensors

[https://sensor.awi.de/?urn=vessel:polarstern:ctd\\_watersampler](https://sensor.awi.de/?urn=vessel:polarstern:ctd_watersampler)

Parent Item-Type: Vessel  
 Parent Item: RV Polarstern  
 Sub Item: CTD Watersampler

**Subdevices**  
 Altimeter  
 Lowered Acoustic Doppler Current Profiler  
 SBE32 water sampler  
 SBE3plus temperature sensor  
 SBE4 conductivity sensor  
 SBE43 oxygen sensor  
 Transmissiometer

**Parameters**  
 conductivity  
 temperature  
 altimeter  
 transmission  
 oxygen  
 pressure  
 fluorescence



**Overview**  
 Long and short names  
 Manufacturer  
 Model-Nr.

**Properties**  
 - used for quality checks: e.g. Water temperature min/max values

**Contact**  
 Owner: AWI  
 Editor: Peter Gerchow  
 Engineer in Charge: Marius Hirsekorn  
 Principal Investigator: ...  
 Data Scientist: ...  
 Data Provider: ...

**Resources**  
 - factsheets  
 - calibration certificates  
 - manuals

**Actions**  
 Deployment  
 Recovery

# SENSOR

Overview

Contacts

Actions

Parameters

Resources

Properties

Local Frame

Subdevices

Images

Ingest

2018-06-04 02:00:00 Mount Mounted to heluw1

SENSOR (2014). Sensor metadata for SST\_CTD\_183 of Station AWIPEV Underwater Observatory Svalbard Alfred Wegener Institute for Polar and Marine Research. <https://hdl.handle.net/10013/sensor.82f77b6c-a35d-40ff-ba8d-65442cfb49e7#subItemID=1285&subItemEventID=3389>

PIDs + Citation for all actions of type: calibration, commissioned, deployment, mount

<https://hdl.handle.net/10013/sensor.82f77b6c-a35d-40ff-ba8d-65442cfb49e7#subItemID=1285&subItemEventID=3389>

State: public

ID: 1285

Parent: Svalbard Underwater Node 2

Device URN: station:svluwobs:svluw2:ctd\_183

Short Name: CTD\_183

Long Name: SST\_CTD\_183

Collections: undefined

Description: High quality, high accuracy multi parameter probe for oceanographic and limnological parameters.

Serial: 183

Manufacturer: Sea and Sun Technology

Model: CTD 90

Type: CTD

Overview Contacts Actions Parameters Resources Properties Local Frame Subdevices Images Ingest

Current Version

Show 25 entries

Search:

ID	Name	E-Mail	Role	Organization
70	Cornelia Roder	cornelia.roder@awi.de	Editor	Alfred-Wegener-Institute

Showing 1 to 1 of 1 entries

Previous 1 Next

Inherited Contacts

Show 25 entries

Search:

ID	Name	Role	Organization	Inherited from
73	Alexandra Kraberg	Editor	Alfred-Wegener-Institute	Helgoland Underwater Observatory

Overview Contacts Actions Parameters Resources Properties Local Frame Subdevices Images

Current Version

Show 25 entries

Search:

ID	Short Name	Name	Sensor Output Type	Units
861		Conductivity	conductivity	mS/cm
862		Salinity	salinity	PSU

# Item State

pCO2 Monitoring System General Oceanics

Overview Contacts Actions Parameters Resources

Current Version

Reassign

State: Construction Public Store ?

ID: 1398

Parent: Polarstern

Device URN: vessel:polarstern:pco2\_go\_ps

shortName\* pCO2\_GO\_PS

longName\* pCO2 Monitoring System General Oceanics

## Construction:

- Seen only by “editor” of this device under “My Devices”
- not Ready for publication

## Public:

- Seen by everybody (no Login)
- Ready for publication
- Public devices should not be deleted. (Measured data would loose metadata)

## Store:

- Device they are not in use
- Device at the store

# Further Features

## Facetted Search

SENSOR

AMI [Browse](#) [Search](#) [Device Store](#) [My Devices](#) [Create Item](#)

Item type: [MicroCAT](#) (171)

Parameters: conductivity (12), depth (9), oxygen (9), temperature (9), water temperature (3). See more...

Action type: Deployment (150), Recovery (62), Calibration (1), Mount (1), Unmount (1)

Action: NABOS/2309-1 (7), NABOS/2409-1 (7), NABOS/2409-2 (7), NABOS/3008-1 (7), HE451-2/2-1 (6). See more...

Contact: Vernaleken, Jutta (150), von Appen, Wilken-Jon (150), Lochthofen, Normen (21), Hattermann, Tore (12), Scholz, Daniel (11)

Collections: FRAM (2)

Search... Selected facets: [MicroCAT](#) ✕

Sort by relevance | Sort alphabetically

Info	Long Name	Short Name	URN	Item State	Tools	
	MC1	MC1_37-12917	mooring:fsw1_300234061031800:mc1_37-12917	public		
	MC3	MC3_37-12715	mooring:fsw1_300234061031800:mc3_37-12715	public		
	MC5	MC5_37-12717	mooring:fsw1_300234061031800:mc5_37-12717	public		
	SBE-37 SM	SBE-37-SM_1606	mooring:f4-16:sbe-37-sm_1606	public		
	SBE37-SMP-ODO_13			public		
	SBE37-SMP-ODO_13			public		
	SBE-37 SM	0:mc1_37-12917	public		<b>Clone</b>	
	SBE-37 SM	0:mc3_37-12715	public		<b>Reassign</b>	
	SBE-37 SMP	0:mc5_37-12717	public		<b>Add Subitem</b>	
	SBE-37 SM		public			
	SBE-37 SMP		public			
	SBE-37 SMP	SBE-37-SMP_10935	mooring:f5-16:sbe-37-smp_10935	public		
	SBE-37 SMP	SBE-37-SMP_12502	mooring:ak5-1:sbe-37-smp_12502	public		
	SBE-37 SMP	SBE-37-SMP_12492	mooring:ak5-1:sbe-37-smp_12492	public		

Showing 1 to 15 of 171 entries

« 1 2 3 4 5 6 7 8 9 »



# Linking PANGAEA to SENSOR



- Configuration of device at measurement time linked directly to SENSORWeb

**PANGAEA.**  
Data Publisher for Earth & Environmental Sciences

**Wulff, Thorben; Bauerfeind, Eduard; von Appen, Sascha (2018):** Vertical profiles of physical and chemical parameters in the vicinity of an ice tongue in the Fram Strait. <https://doi.org/10.1594/PANGAEA.887579>

**Abstract:** AWI's autonomous underwater vehicle "PAUL" covered two 10 km transects across the meltwater front. The meltwater front was associated to a large ice tongue. The resolution profile of the following parameters: Temperature, Conductivity, Salinity, Depth, and Pressure. The dataset contains the data of the vertical ascends only. Due to the nature of the parameter has an individual depth stamp.

**Related to:** **Wulff, Thorben; Bauerfeind, Eduard; von Appen, Wilken-Jon (2016):** Vertical profiles of physical and chemical parameters in the vicinity of an ice tongue in the Fram Strait. <https://doi.org/10.1016/j.dsr.2016.07.001>

**Project(s):** **Physical Oceanography @ AWI (AWI\_PhyOce)**

**Coverage:** Median Latitude: 78.753080 \* Median Longitude: 5.144880 \* South-bound Latitude: 78.714727 \* West-bound Longitude: 5.100582 \* North-bound Latitude: 78.794343 \* East-bound Longitude: 5.185734  
Date/Time Start: 2013-07-02T20:45:38 \* Date/Time End: 2013-07-03T01:35:26  
Minimum DEPTH, water: 1.22 m \* Maximum DEPTH, water: 52.62 m

**Event(s):** **MSM29\_440-5** \* Latitude Start: 78.714170 \* Longitude Start: 5.160830 \* Latitude End: 78.715330 \* Longitude End: 5.158000 \* Date/Time Start: 2013-07-02T19:58:00 \* Date/Time End: 2013-07-03T02:58:00 \* Elevation Start: -2332.3 m \* Elevation End: -2332.0 m \* SENSOR AWI: <https://hdl.handle.net/10013/sensor.664525cf-45b9-4969-bb88-91a1c5e97a5b> \* Location: North Greenland Sea \* Campaign: MSM29 (HAUSGARTEN 2013) \* Basis: Maria S. Merian

**SENSOR.awi.de**

**AWI AUV Polar Autonomous Underwater Laboratory**

Overview | Contacts | Actions | Parameters | Resources | Properties | Local Frame | Subdevices | Images

2013-07-02 19:58:00 Deployment MSM29\_440-5

SENSOR (2013). Platform metadata for Vehicle AWI AUV Polar Autonomous Underwater Laboratory. Configuration from 2013-07-02 21:58:00. Alfred Wegener Institute for Polar and Marine Research. <https://hdl.handle.net/10013/sensor.664525cf-45b9-4969-bb88-91a1c5e97a5b>

State: public

ID: 458

Parent:

Device URN: vehicle:awi\_paul

Short Name: AWI-PAUL

Long Name: AWI AUV Polar Autonomous Underwater Laboratory

Collections:

Description: The Bluefin-21 is a highly modular autonomous underwater vehicle able to carry multiple sensors and payloads at once. It boasts a high energy capacity that enables extended operations even at the greatest depths. The Bluefin-21 has immense capability but is also flexible enough to operate from various ships of opportunity worldwide.

Serial: Paul

Manufacturer: Bluefin Robotics

Model: Bluefin-21

Type: Vehicle

Asset Number: 44055

# (Former) PlatformTypes in SENSOR



- Aircraft
- Buoy
- Laboratory
- Mooring
- Pack Ice
- Satellite
- Small Boat
- Station
- TowedSystem
- Vehicle
- Vessel
- Model



# Structure of an Item: Action Types in SENSOR



- Calibration (create version)
- Comissioned (create version)
- Configuration
- Decomissioned
- Deployment (create version)
- Information
- Maintenance
- Mission
- Mount (create version)
- Partial failure
- Recovery
- Total failure

# Structure of an Item: Contact Roles



- Special function of roles:
  - Editor: can edit items, has write access to raw data directory on MCS
  - Owner (special contact of the institute)
  - dship connector -> import sensors into DSHIP
  - Data Provider -> write access to raw data directory on MCS
  - Device Contact -> Contact person for device!
  
- Other roles
  - Data Scientist
  - Engineer in Charge
  - Principal Investigator



# Collections



- MOSAiC-Aircraft
- MOSAiC-ATMOS
- MOSAiC-BGC
- MOSAiC-ECO
- MOSAiC-ICE
- MOSAiC-Modelling
- MOSAiC-OCEAN
- MOSAiC-RemoteSensing

# Device URNs

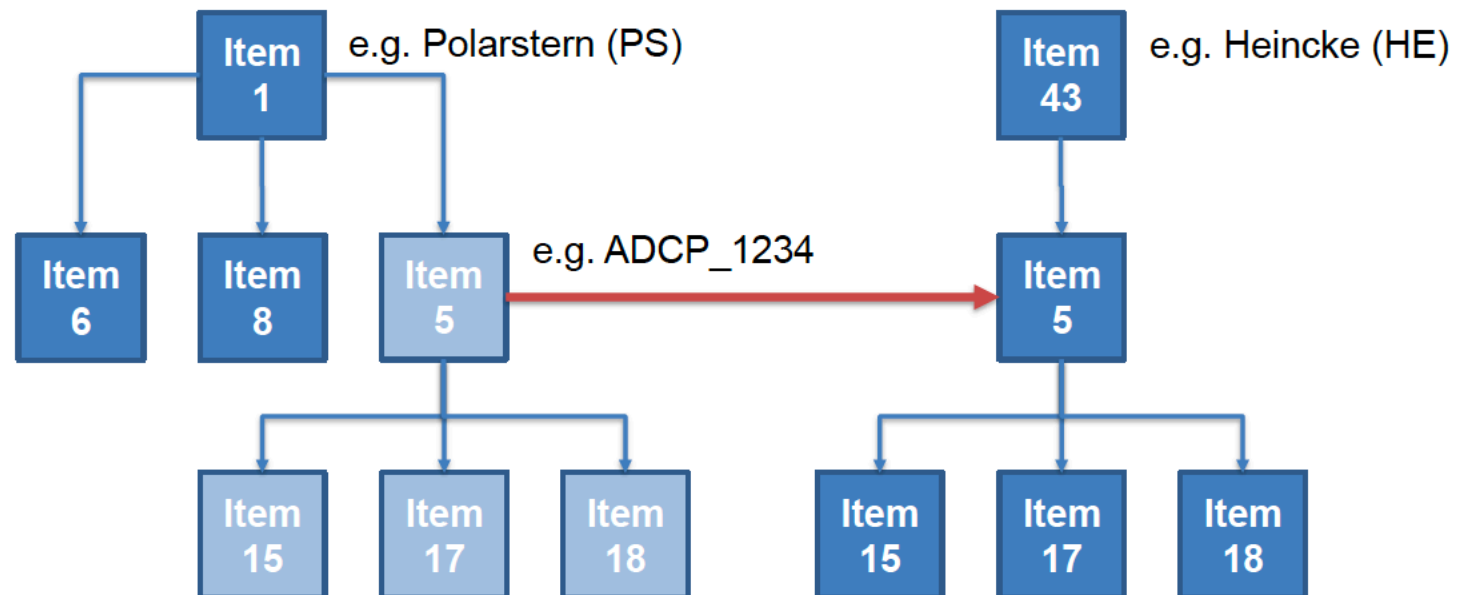


- URN (Uniform ResourceName)
  - Unique name of an item
    - Example: vessel:ps:adcp
  - Composed of short names
  - The path to your data is based on the URN
    - Example: .../vessel/ps/adcp
  - It is human readable in contrast to a numeric ID
- Short name
  - catchy abbreviations of your item name
    - Polarstern-> PS
    - AcousticDoppler CurrentProfiler-> ADCP
  - can't be edited by a user, only admins can change the short name



# Reassignment

- Items can be assigned to a different parent
  - Changes URN of device
  - May create a new version of device



Device URN change from vessel:**ps**:adcp\_1234 to vessel:**he**:adcp\_1234

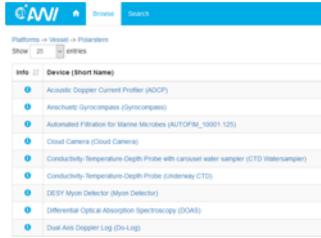
# Versioning



- Every time you add an action of type deployment, mount, calibration or commissioned, a version of your current sensor configuration is permanently stored
  - All versions get a citation with a persistent identifier (like DOI) and therefore can be referenced in publications
  - Deletion of versions is always critical
  - Versions can only be deleted by a system administrator
- Enter changes in the order they were done on the device / platform
  - This is a best practice, because once created versions cannot be modified afterwards
- Best Practice: Every device should be versioned before first device operation with action type ‚comissioned‘ and label ‚MOSAiC 122/Leg-No.‘



# Data Flow in MOSAiC

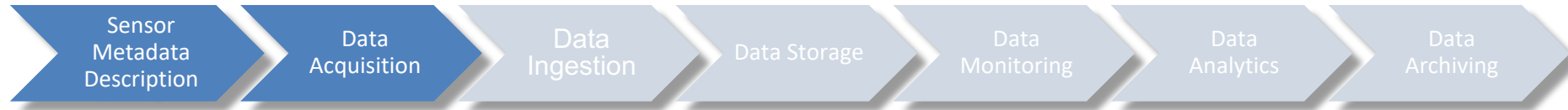


≡ ActionLog Events

Activity - Device Operator	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'

SensorWeb at AWI and onboard of Polarstern

Acquisition organized by MOSAiC groups.  
**DShip-ActionLog** for Device-Operation ID management

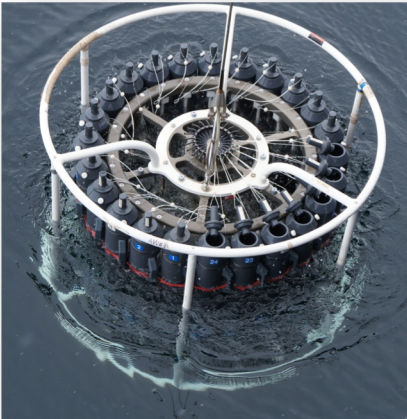
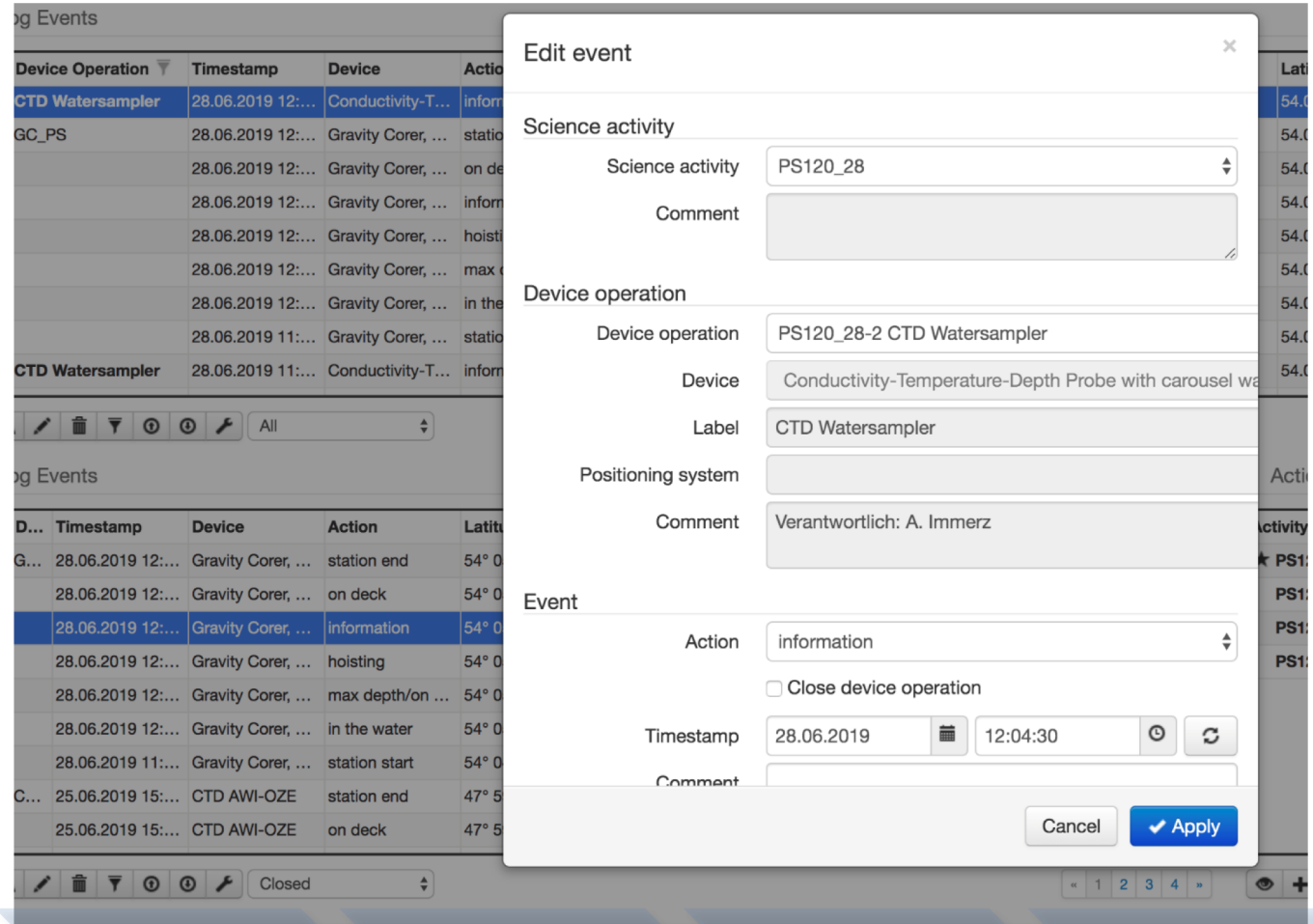


**Sensor metadata description (SensorWeb) is the basis for all parts!!!**



- ✓ Logs science activities and device operations during cruise
- ✓ Logging can be easily done in Webbrowser (real time) or using the IceFloeNavi-APP (delayed)

# DSHIP-ActionLog

The screenshot displays the 'Log Events' interface. The main table lists events with columns for Device Operation, Timestamp, Device, and Action. An 'Edit event' dialog box is open, showing fields for Science activity (PS120\_28), Comment, Device operation (PS120\_28-2 CTD Watersampler), Device (Conductivity-Temperature-Depth Probe with carousel wa...), Label (CTD Watersampler), Positioning system, Comment (Verantwortlich: A. Immerz), Event (information), and Timestamp (28.06.2019 12:04:30). Buttons for 'Cancel' and 'Apply' are visible at the bottom of the dialog.

Device Operation	Timestamp	Device	Action
CTD Watersampler	28.06.2019 12:...	Conductivity-T...	inform
GC_PS	28.06.2019 12:...	Gravity Corer, ...	station
	28.06.2019 12:...	Gravity Corer, ...	on de
	28.06.2019 12:...	Gravity Corer, ...	inform
	28.06.2019 12:...	Gravity Corer, ...	hoist
	28.06.2019 12:...	Gravity Corer, ...	max
	28.06.2019 12:...	Gravity Corer, ...	in the
	28.06.2019 11:...	Gravity Corer, ...	station
CTD Watersampler	28.06.2019 11:...	Conductivity-T...	inform

Sensor  
Metadata  
Description

Data  
Acquisition

Data  
Ingestion

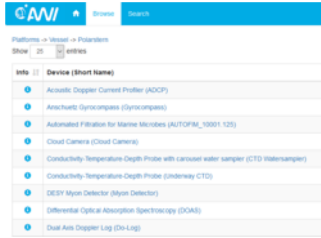
Data  
Storage

Data  
Monitoring

Data  
Analytics

Data  
Archiving

# Data Flow in MOSAiC

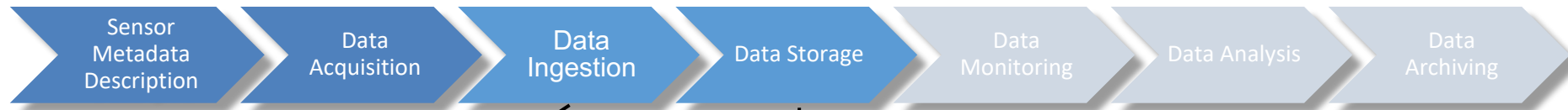


ActionLog Events

Activity - Device Operator	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'

SensorWeb at AWI and onboard of Polarstern

Acquisition organized by MOSAiC groups.  
**DShip-ActionLog** for Device-Operation ID management



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

MOSAic Central Storage and workspace



**Sensor metadata description (SensorWeb) is the basis for all parts!!!**



# MOSAiC Central Storage (MCS)



- Central Storage for raw data and data products on board Polarstern
- Naming convention of device area is derived from SensorWeb
- Data transferred to in Bremerhaven for common access by MOSAic consortium members



## platforms

vessel

polarstern

ctd\_watersampler

SBE3plus temperature sensor

exdata

DSHIP-DEVICEOPERATION-ID

SensorFile.xxx

FerryBox

exdata

DSHIP-DEVICEOPERATION-ID

SensorFile.xxx

vehicle

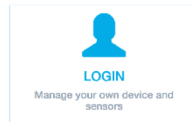
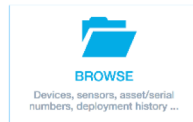
BEAST

ECO-Triplet Fluorometer

...

## SENSOR INFORMATION SYSTEM

Create and manage platform, device and sensor related information



## Tasks

Coring

Site 1

Quicklooks

Processed Data

Combined Datasets

Site 2

DN

...

SnowPits

Site 1

Site 2

DN

ROV

## Team-Folders

OCEAN

ICE

ATMOS

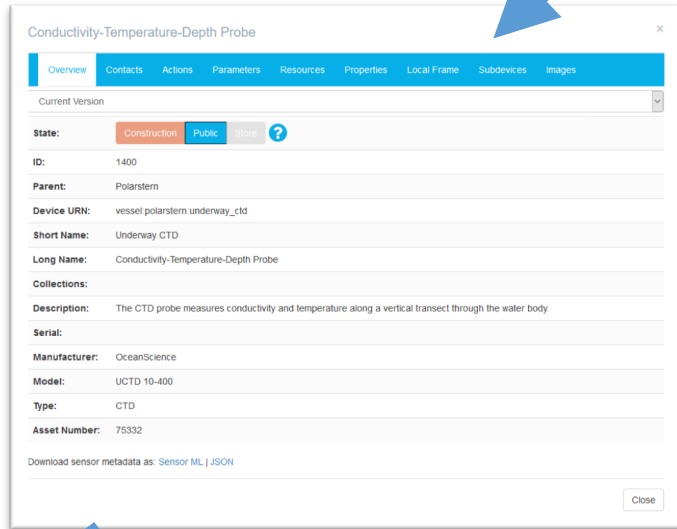
...



Devices has to be created in SENSOR (only once)

Log every device operation

**SENSOR.fs-polarstern.de**



Conductivity-Temperature-Depth Probe

Overview | Contacts | Actions | Parameters | Resources | Properties | Local Frame | Subdevices | Images

Current Version

State: Construction Public

ID: 1400

Parent: Polarstern

Device URN: vessel.polarstern.underway\_ctd

Short Name: Underway CTD

Long Name: Conductivity-Temperature-Depth Probe

Collections:

Description: The CTD probe measures conductivity and temperature along a vertical transect through the water body.

Serial:

Manufacturer: OceanScience

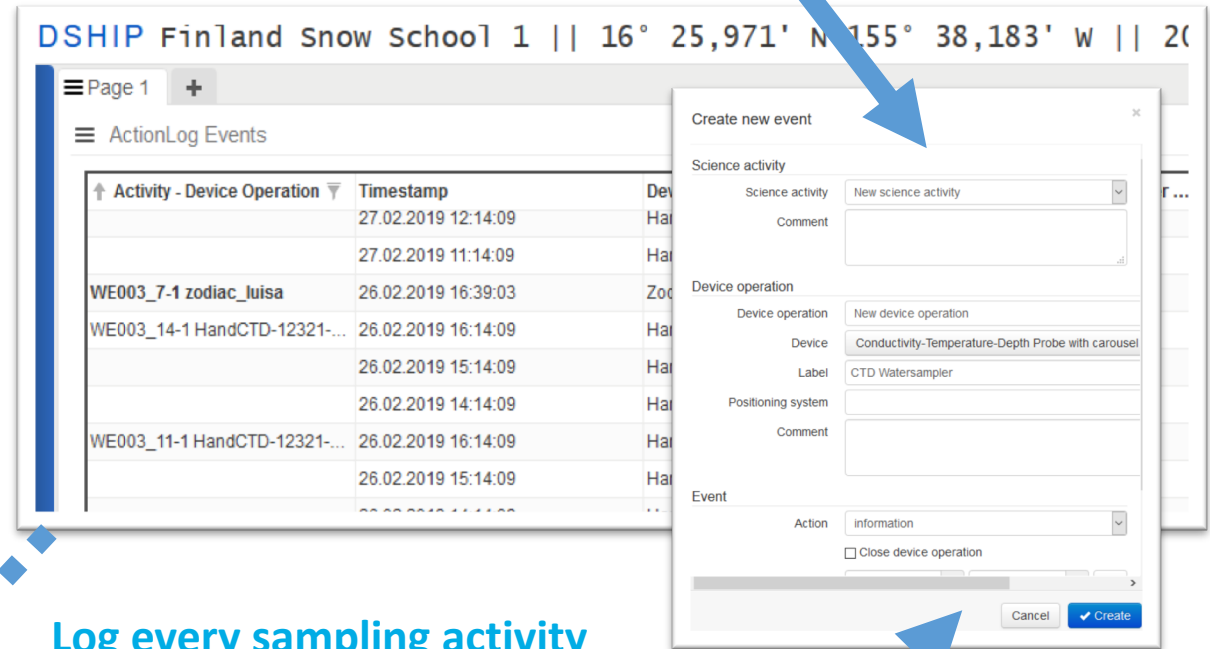
Model: UCTD 10-400

Type: CTD

Asset Number: 75332

Download sensor metadata as: Sensor ML | JSON

**DSHIP-ActionLog**



DSHIP Finland Snow School 1 || 16° 25,971' N 155° 38,183' W || 20

Page 1

ActionLog Events

Activity - Device Operation	Timestamp	Dev
	27.02.2019 12:14:09	Ha
	27.02.2019 11:14:09	Ha
WE003_7-1 zodiac_luisa	26.02.2019 16:39:03	Zod
WE003_14-1 HandCTD-12321-...	26.02.2019 16:14:09	Ha
	26.02.2019 15:14:09	Ha
	26.02.2019 14:14:09	Ha
WE003_11-1 HandCTD-12321-...	26.02.2019 16:14:09	Ha
	26.02.2019 15:14:09	Ha

Create new event

Science activity

Science activity: New science activity

Comment:

Device operation

Device operation: New device operation

Device: Conductivity-Temperature-Depth Probe with carousel

Label: CTD Watersampler

Positioning system:

Comment:

Event

Action: information

Close device operation

Cancel Create

background  
Synching  
(device & device operation)

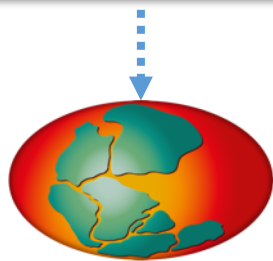
Background creating directories  
(device & device operation)

Log every sampling activity

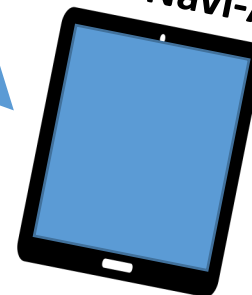
manually  
Synching  
(device & device operation)

**Storage MCS**

vessel/polarstern/ctd\_watersampler/SBE3plus\_temperature\_sensor/exdata/DEVICEOPERATION\_ID/



**IceFloeNavi-App**



Data Flow in more detail

- > vehicle
- ▼ vessel
  - ▼ polarstern
    - > adcp
    - > aimmms\_0001
    - > aimmms\_0002
    - > airgun\_ps
    - > autofim\_10001\_125
    - > bc\_ps
    - > bln\_ps
    - > bongo\_ps
    - > bow\_sonic\_3d
    - > bucket\_ps
    - > canberra-awi-det\_2
    - > ccnc\_ps
    - > cloud\_camera
    - > crds\_ghg\_ship\_bow
    - > crs\_ps
    - ▼ ctd\_watersampler
      - ▼ altimeter
        - ▼ exdata
          - PS120\_28-1
          - PS120\_28-2
      - ▼ exdata
        - PS120\_28-1
        - PS120\_28-2
    - > ladcp
    - > sbe3plus

Overview Contacts **Actions** Parameters Resources Properties Local Frame Subdevices Images Ingest

Current Version

Show  entries Search:

ID ↑↓	Type ↑↓	Label ↑↓	Date ↓↑	Lat/Long/elevation ↑↓	Tools ↑↓
4630	Information	PS120_28-2	2019-06-28T12:51:52+02:00	54.408908° / -7.934236 / 21.3	<a href="#">i</a>
4603	Recovery	PS120_25-15	2019-06-24T17:51:52+02:00	44.482408° / -10.965533° / 4941 m	<a href="#">i</a>

≡ ActionLog Events

↑ Activity - Device Operation ▼	Timestamp	Device	Action	Latitude	Longitude	Depth (m)	Speed (kn)	Course
<b>PS120_28-2 CTD Watersampler</b>	28.06.2019 12:...	Conductivity-T...	information	54° 04,977' N	007° 58,006' E	21.3	1.0	285.0
PS120_27-1 GC_PS	28.06.2019 12:...	Gravity Corer, ...	station end	54° 05,044' N	007° 57,271' E	22.4	9.3	257.9
	28.06.2019 12:...	Gravity Corer, ...	on deck	54° 05,015' N	007° 58,072' E	21.2	0.0	36.8
	28.06.2019 12:...	Gravity Corer, ...	information	54° 05,009' N	007° 58,069' E	20.9	0.2	233.5
	28.06.2019 12:...	Gravity Corer, ...	hoisting	54° 05,011' N	007° 58,078' E	21.2	0.1	305.1
	28.06.2019 12:...	Gravity Corer, ...	max depth/on ...	54° 05,011' N	007° 58,076' E	20.8	0.3	110.0
	28.06.2019 12:...	Gravity Corer, ...	in the water	54° 05,010' N	007° 58,073' E	21.0	0.4	94.5
	28.06.2019 11:...	Gravity Corer, ...	station start	54° 04,345' N	007° 58,260' E	20.7	7.3	45.8
<b>PS120_28-1 CTD Watersampler</b>	28.06.2019 11:...	Conductivity-T...	information	54° 03,956' N	007° 57,546' E	22.2	13.7	48.6
<b>PS120_27-2 topAWI</b>	28.06.2019 11:...	Towed Ocean...	information	54° 03,575' N	007° 57,025' E	23.2	13.9	30.2

# Structure

- Expedition (per Leg)
  - Science Activity (weekly)
    - Device Operation

Device Operation ID:

<Campaign/Expedition-Leg>\_

<Science Activity>-

<No. of Device Operation within Science Activity>

Display in ActionLog:

<Campaign/Expedition-Leg>\_<Science Activity>-<Number of Device Operation within Science Activity> <Shortname>  
 (e.g. PS120\_28-2 CTD Watersampler“)

≡ ActionLog Events

Activity - Device Operation	Timestamp	Device	Action	Latitude	Longitude	Depth (m)	Speed (kn)	Course	Latitude (deg)	Longitude (deg)	Wind Dir	Wind Velocity	Transp
PS120_28-2 CTD Watersampler	28.06.2019 12:...	Conductivity-T...	information	54° 04,977' N	007° 58,006' E	21.3	1.0	285.0	54.082946	7.966764	295.0	4.8	
PS120_27-1 GC_PS	28.06.2019 12:...	Gravity Corer, ...	station end	54° 05,044' N	007° 57,271' E	22.4	9.3	257.9	54.084065	7.954517	330.0	5.2	
	28.06.2019 12:...	Gravity Corer, ...	on deck	54° 05,015' N	007° 58,072' E	21.2	0.0	36.8	54.083582	7.967863	314.0	4.1	
	28.06.2019 12:...	Gravity Corer, ...	information	54° 05,009' N	007° 58,069' E	20.9	0.2	233.5	54.083486	7.967815	310.0	5.2	
	28.06.2019 12:...	Gravity Corer, ...	hoisting	54° 05,011' N	007° 58,078' E	21.2	0.1	305.1	54.083523	7.967969	321.0	3.2	
	28.06.2019 12:...	Gravity Corer, ...	max depth/on ...	54° 05,011' N	007° 58,076' E	20.8	0.3	110.0	54.083511	7.967926	309.0	4.4	
	28.06.2019 12:...	Gravity Corer, ...	in the water	54° 05,010' N	007° 58,073' E	21.0	0.4	94.5	54.083504	7.967879	309.0	4.4	
	28.06.2019 11:...	Gravity Corer, ...	station start	54° 04,345' N	007° 58,260' E	20.7	7.3	45.8	54.072423	7.971005	318.0	6.7	
PS120_28-1 CTD Watersampler	28.06.2019 11:...	Conductivity-T...	information	54° 03,956' N	007° 57,546' E	22.2	13.7	48.6	54.065936	7.959104	317.0	7.6	
PS120_27-2 topAWI	28.06.2019 11:...	Towed Ocean ...	information	54° 03,575' N	007° 57,025' E	23.2	13.9	30.2	54.059586	7.950411	316.0	7.9	

# Extract from DHIP Archive (dms.awi.de)



	A	B	C	D	E	F	G	H	I	J
1	<b>Campaign</b>	<b>Station - Device Operation</b>	<b>Device Types</b>	<b>Device Types Code</b>	<b>Device</b>	<b>Device Code</b>	<b>Date/Time (Start)</b>	<b>Action (Start)</b>	<b>Latitude (deg) (Start)</b>	<b>Longitude (deg) (Start)</b>
2	PS118	PS118_0_Underway-10	Thermosalinograph	TSG	Thermosalinograph Keel	TSG_KEEL	20.02.19 08:54	profile start	-57.897.329	-61.533.381 0
3	PS118	PS118_0_Underway-13	Magnetometer	MAG	Magnetometer	MAG	20.02.19 09:03	profile start	-57.908.644	-61.514.114 3
4	PS118	PS118_5-3	Video,Multi Corer	VIDEO,MUC	Video Multi Corer	TVMUC	04.03.19 18:32	station start	-64.983.699	-57.751.797 4
5	PS118	PS118_5-4	Multi Corer,Video	MUC,VIDEO	Video Multi Corer	TVMUC	04.03.19 20:26	station start	-64.981.029	-57.746.836 0
6	PS118	PS118_6-5	Plankton Net	PLA	Epibenthossledge	EBS	05.03.19 16:58	station start	-64.973.826	-57.786.732 0
7	PS118	PS118_6-6	Plankton Net	PLA	Epibenthossledge	EBS	05.03.19 19:07	station start	-64.970.863	-57.798.089 0
8	PS118	PS118_6-7	Bottom Net	BN	Agassiz Trawl	AGT	05.03.19 21:31	station start	-64.964.397	-57.836.353 0
9	PS118	PS118_6-8	Remotely Operated Vehicle	ROV	Remotely Operated Vehicle	ROV	06.03.19 00:54	station start	-64.953.392	-57.795.686 0
10	PS118	PS118_9-4	Plankton Net	PLA	Epibenthossledge	EBS	12.03.19 14:24	station start	-64.017.813	-55.918.205 4
11	PS118	PS118_9-5	Plankton Net	PLA	Epibenthossledge	EBS	12.03.19 15:50	station start	-64.019.655	-55.901.400 4
12	PS118	PS118_9-6	Bottom Net	BN	Agassiz Trawl	AGT	12.03.19 17:43	station start	-64.023.801	-55.918.680 4

## Extract of Device Operation in ActionLog:

<Campaign/Expedition-Leg>\_<Science Activity>-<Number of Device Operation within Science Activity>  
 (e.g. PS120\_28-2“)





# Your Role as a Chief Editor

- Collect list of devices to be entered in SENSOR for your team
- Act as a multiplier for SENSOR in team.
  - spread knowledge on updates of SENSOR in team.
  - Filter questions which can already be answered by you for your team
    - Best practices
    - Best configuration of instruments
    - Where to get documentation
  - Spread knowledge
    - on best practices in SENSOR specific for team
    - How SENSOR, DSHIP and MCS relate
  - Act as first contact for questions on SENSOR for team.
- Monitor devices in SENSOR for your team to ensure best practices are followed
  - All roles mentioned
  - Correct configuration

# Your Role as a Data Contact Person on Board

- Act as a multiplicator for knowledge
  - on best practices in SENSOR specific for team
  - on SENSOR, DSHIP, MCS on Board
  - how SENSOR, DSHIP and MCS relate
- First contact for questions regarding SENSOR
  - Know Best practices
  - Help reassigning, editing (and entering new) devices
  - Where to get documentation
- Keep an eye on data for your team.
  - Is raw data being stored in MCS appropriately and in time?

1. RAW data files will be transferred after expedition by myself (USB-Disk)
2. RAW data files should be transferred after expedition by central transmission (Tape)
3. RAW data should be transferred continuously in near realtime (NRT)

Polarstern

Overview Contacts Actions Parameters Resources Properties Local Frame Subdevices Images **Ingest**

## CONTACT FORM FOR DATA INGEST

**Transmission Type** Choose...

**Data Access**

- RAW data files will be transferred after expedition by myself
- RAW data files should be transferred after expedition by central transmission
- RAW data should be transferred continuously in near realtime

by dashboard.awi.de

published to Pangaea

Select how the data should be accessible.

**Transmission Start** tt.mm.jjjj

Select, when RAW data transmission should be started

**ePIC-Link**

Enter the ePIC Link, if available, for non standard RAW files.

**comment**

Describe the content of the data.

Send Request

Close

# Near Real Time (NRT)

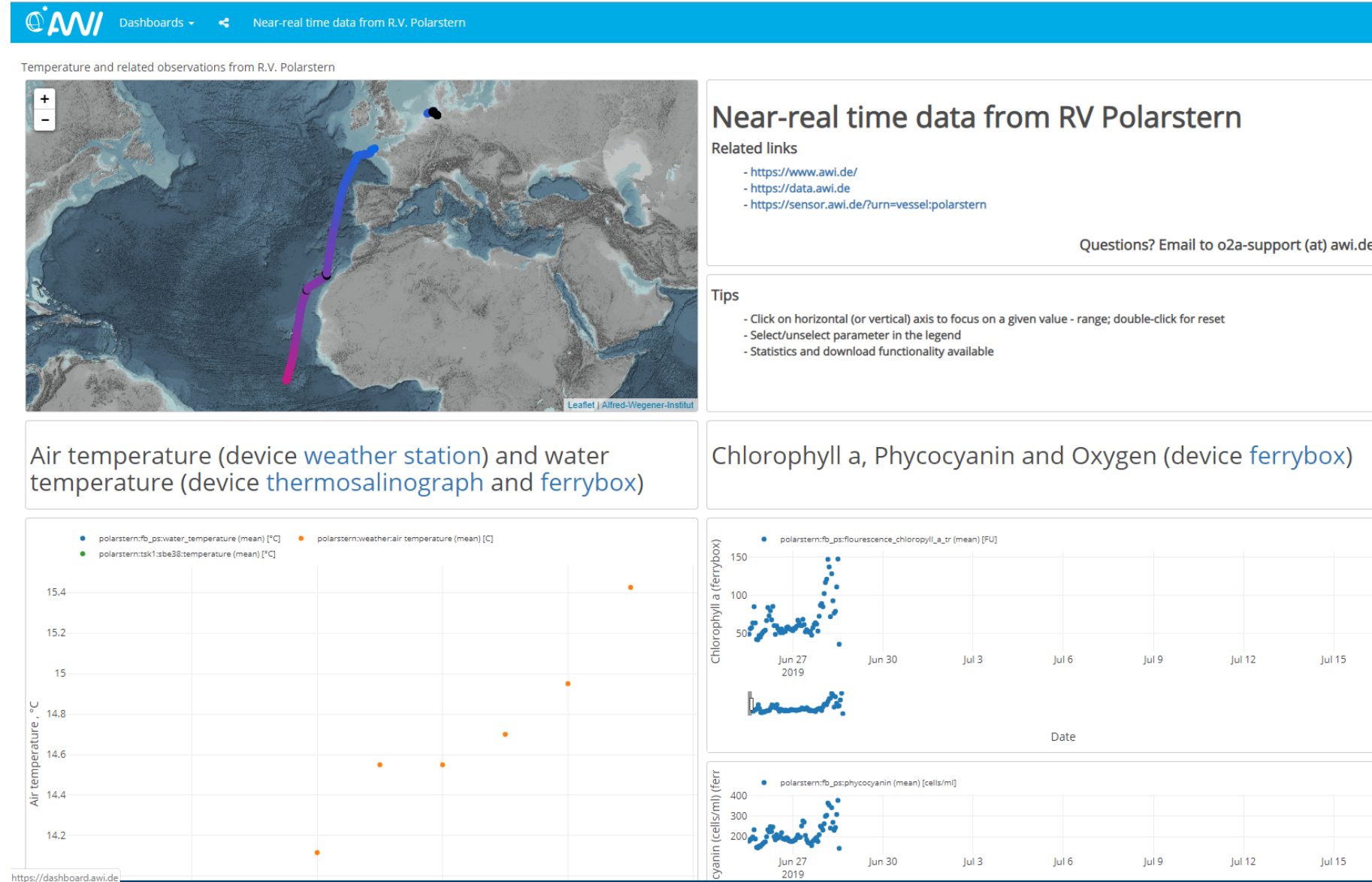
datetime	vessel:polarstern:tsk1:salinity [psu]	vessel:polarstern:tsk1:sbe38:temperature [°C]
2019-02-28 15:50:00.000	34.1234	2.443
2019-02-28 15:50:01.000	34.1345	2.564
2019-02-28 15:50:02.000	34.1456	2.544

- **Transmission Methods**

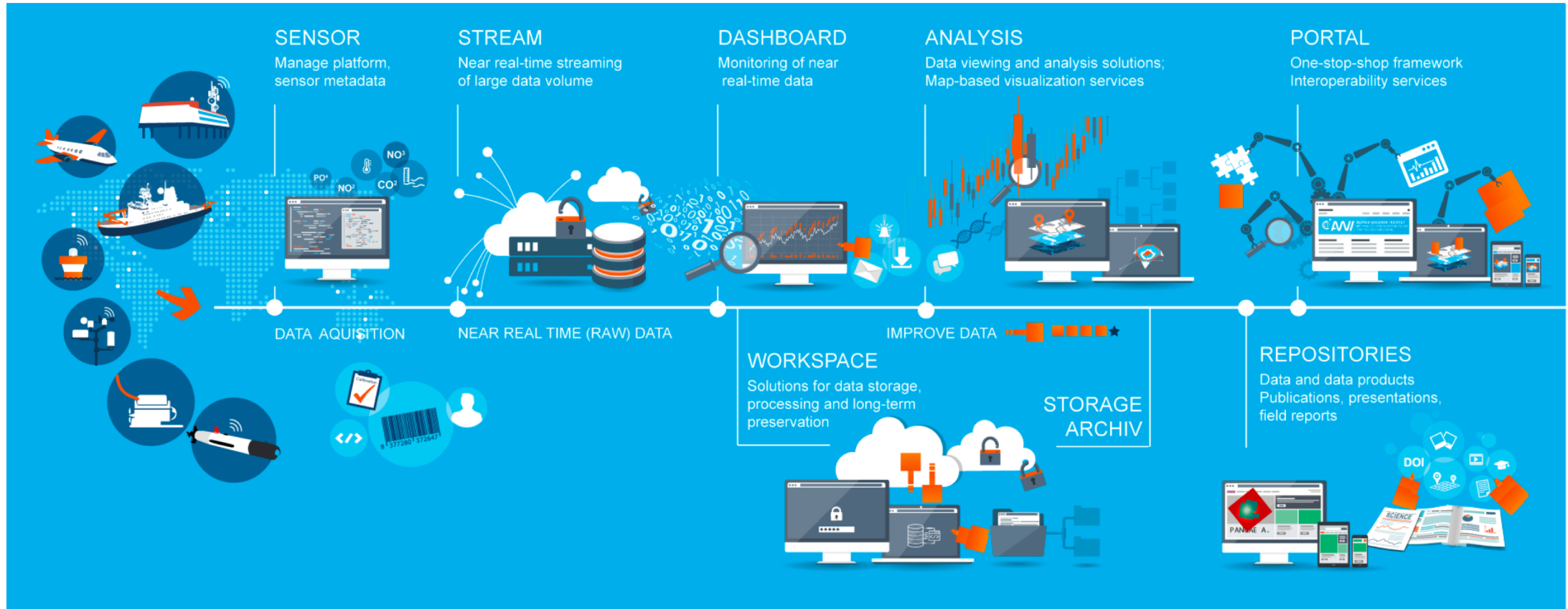
- E-Mail
- sftp
- ftp
- smb (Windows-Share)
- rsync (only Download)

- 2D graph
- Heatmap
- Map widgets color-coded parameters
- and more tools...

- Share your Dashboards
  - With a group
  - Open to all (Public)



# O2A Framework

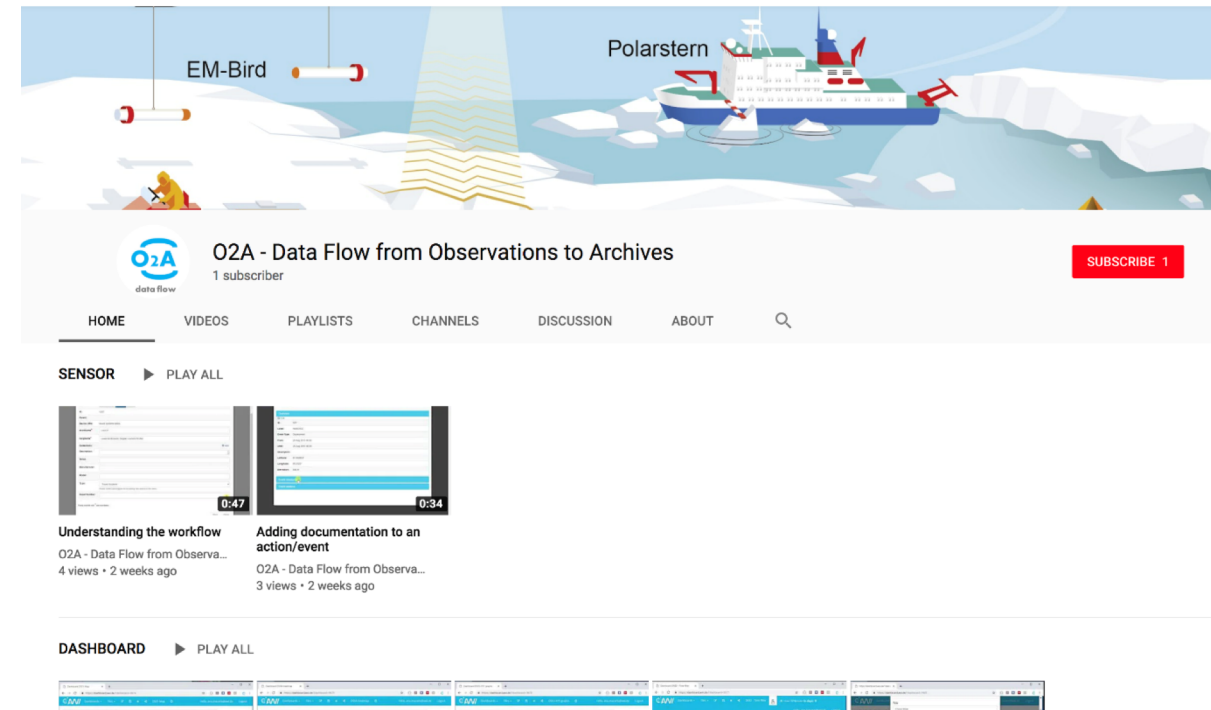


# References and Further Documentation

- <https://spaces.awi.de/display/DM>

- [sensor.awi.de](https://sensor.awi.de)

- [pangaea.de](https://pangaea.de)



- <https://www.youtube.com/channel/UCljKBoLBJqy8XASA3QKrRxA/>