MareHUB All Faces Workshop
AG Viewer / Portal – Mapping

October 16th 2020
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Mapping – Topics

1. Motivation

2. Mapping
    1. Units
    2. Method Groups
    3. Parameter Groups

3. Summary and Outlook

Motivation

Motivation

- Integration of data from different data sources for better data exploration
  - Pangaea
  - HZG-SOS
  - …

Motivation

- Integration of data from different data sources for better data exploration
  - Pangaea
  - HZG-SOS
  - …
- Those data (including ist metadata) comes with different names and naming conventions which need to be harmonised somehow

Unit Mapping

Units – Incoming Data

Units – Incoming Data

dataset_count bigint	unit character varying
2606	°C
252	degree_Celsius
183	?C
108	deg C
39	degrees C
24	degrees_C
9	degc
6	Degree C
3	Deg.C
3	degreesC
3	degC

Units – Incoming Data

dataset_count bigint	unit character varying
2606	°C
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39	degrees C
24	degrees_C
9	degc
6	Degree C
3	Deg.C
3	degreesC
3	degC

dataset_count bigint	unit character varying
428	m/s
194	meter/second
92	m s-1
9	m s^{-1}

Units – Consistent Representation

symbol character varying	name character varying
m	meter
m²	square meter
°	degree
°C	degree Celsius
m/s	meter per second

Units – Consistent Representation

symbol character varying 🔒	name character varying 🔒	reference unknown 🔒
m	meter	[null]
m²	square meter	[null]
°	degree	[null]
°C	degree Celsius	[null]
m/s	meter per second	[null]

Units – Mapping
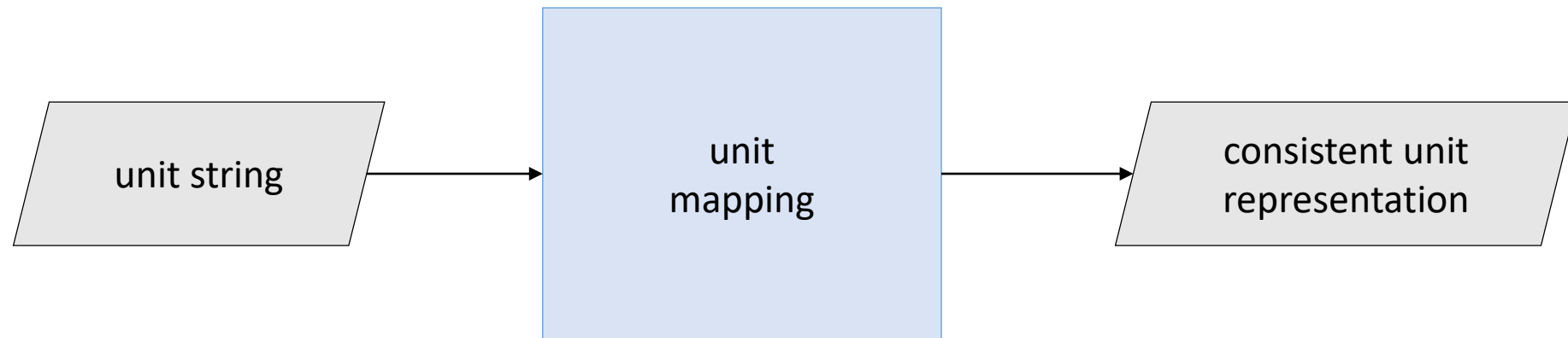
unit string → unit mapping → consistent unit representation

Units – Mapping Table

unit_string	symbol	name
m/s	m/s	meter per second
meter/second	m/s	meter per second
m s-1	m/s	meter per second
m s^{-1}	m/s	meter per second

Units – Mapping Table

unit_string	symbol	name
m/s	m/s	meter per second
meter/second	m/s	meter per second
m s-1	m/s	meter per second
m s^{-1}	m/s	meter per second

input data

Units – Mapping Table

unit_string	symbol	name
m/s	m/s	meter per second
meter/second	m/s	meter per second
m s-1	m/s	meter per second
m s^{-1}	m/s	meter per second

mapping results

Units – Mapping Table

unit_string	symbol	name
m/s	m/s	meter per second
meter/second	m/s	meter per second
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Units – Mapping Table

unit_string	symbol	name
m/s	m/s	meter per second
meter/second	m/s	meter per second
m s-1	m/s	meter per second
m s^{-1}	m/s	meter per second
°C	°C	degree Celsius
deg C	°C	degree Celsius
degree_Celsius	°C	degree Celsius
…	°C	degree Celsius

Method Mapping

MareHub - AG Viewer / Portal

Methods – Incoming Strings

dataset_count bigint	🔒	method character varying	🔒
125469		CTD/Rosette (CTD-RO)	
12904		Counting	
11601		CTD/Rosette with Underwater Vision Profiler (CTD-RO_UVP)	
7824		Isotope ratio mass spectrometry (URI: https://en.wikipedia.org/wiki/Isotope_ratio_mass_spec...	
3518		[null]	
3364		MultiCorer (MUC)	
3321		Underway cruise track measurements (CT)	
3313		High Performance Liquid Chromatography (HPLC) (URI: https://en.wikipedia.org/wiki/High-pe...	
3225		Counting, Binocular microscope	
3196		Calculated	
2856		Multiple opening/closing net (MSN)	
2478		Mass spectrometer Finnigan MAT 251	
2392		Calculated, using biomass conversion factor from Riisgaard et al. (submitted)	
2002		Giant box corer (GKG) (URI: http://en.wikipedia.org/wiki/Box_corer)	

Methods – Incoming Strings

dataset_count bigint	method character varying
2002	Giant box corer (GKG) (URI: http://en.wikipedia.org/wiki/Box_corer)
1493	Multicorer with television (TVMUC)
1450	Colorometric autoanalysis
1299	CTD, SEA-BIRD SBE 911plus, SN T5101-C3290
1240	CTD
1179	Element analyser CHN
1146	Ice station (ICE)
1116	Calculated from individual length measurements, converted to carbon (Koski 2015) (URI: http:…
1066	CTD Large (CTD-L)
988	Colorimetric autoanalysis
866	derived from SBE43 oxygen sensor
860	WP-2 towed closing plankton net (WP2)
858	X-ray fluorescence spectrometer (Philips PW1400)
822	Gas chromatography - Mass spectrometry (GC-MS)

Methods – Mapping/Grouping

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name character varying 🔒
CMC
RS
elektrisch
mechanisch
Fluorometry
Spectrophotometry
Colorimetry
Chromatography

Methods – Mapping/Grouping

Methods – Mapping/Grouping

method/device string → method mapping → method group

Methods – Mapping/Grouping

method/device string → method mapping → method group, sphere
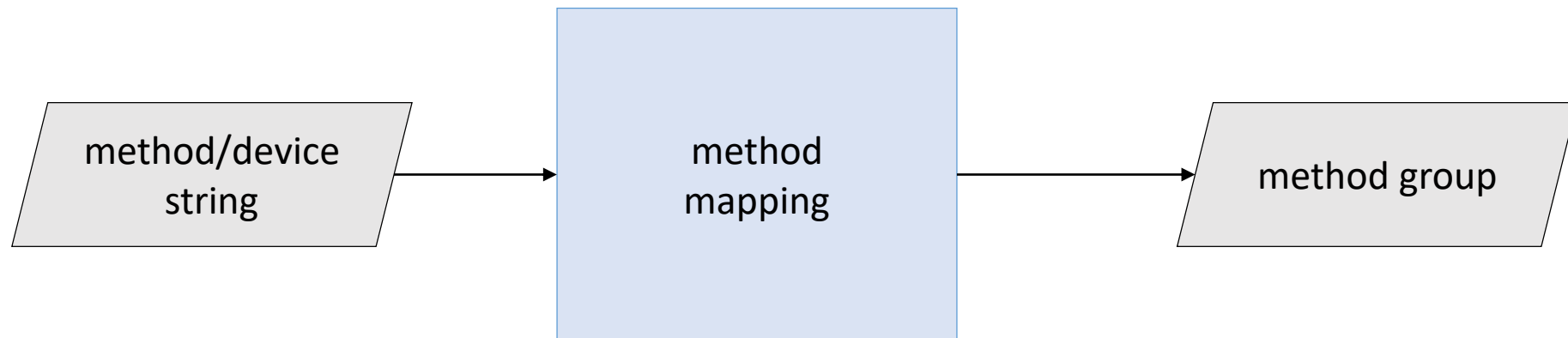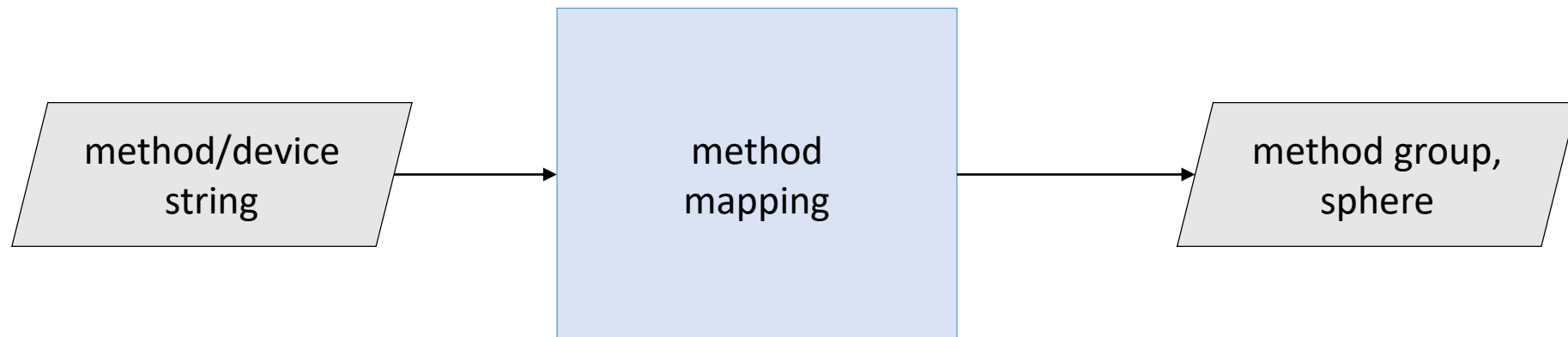
Methods – Mapping/Grouping

sphere 🔒
character varying

Athmosphere

Hydrosphere

Kryosphere

Lithosphere

Biosphere

technical

method/device string → method mapping → method group, sphere
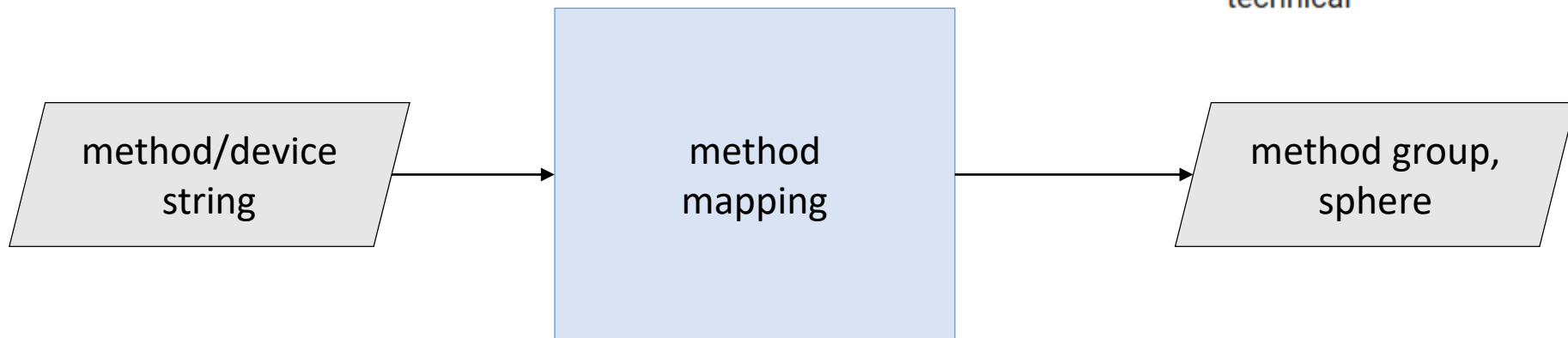
Methods – Mapping Table Example

method/device_string	method_group
Advanced Very High Resolution Radiometer (AVHRR)	RS (remote sensing)
Satellite derived	RS
Satellite SAR interferometry	RS
calculated using satellite products obtained from the Oregon University	RS
derived from GES-DISC (Goddard Earth Sciences Data&Information Services Center)	RS
derived from MERIS remote sensing data	RS
derived from MODIS remote sensing data	RS
Satelite distance measurement	RS
Sea-viewing Wide Field-of-view Sensor (SeaWiFS)	RS
SeaWiFS color scanner	RS

Parameter Mapping

Parameters – Incoming Data

Parameters – Incoming Data

Parameter(s):

#	Name	Short Name	Unit	Principal Investigator	Method/Device	Comment
1	DATE/TIME 🔍	Date/Time				Geocode
2	DEPTH, water 🔍	Depth water	m			Geocode
3	Pressure, water 🔍	Press	dbar	Rohardt, Gerd 🔍	Rotor current meter, Aanderaa 🔍	
4	Current velocity, horizontal 🔍	CV hor	cm/s	Rohardt, Gerd 🔍	Rotor current meter, Aanderaa 🔍	
5	Current direction 🔍	DIR	deg	Rohardt, Gerd 🔍	Rotor current meter, Aanderaa 🔍	
6	Current velocity, east-west 🔍	UC	cm/s	Rohardt, Gerd 🔍	Rotor current meter, Aanderaa 🔍	
7	Current velocity, north-south 🔍	VC	cm/s	Rohardt, Gerd 🔍	Rotor current meter, Aanderaa 🔍	
8	Temperature, water 🔍	Temp	°C	Rohardt, Gerd 🔍	Rotor current meter, Aanderaa 🔍	

Parameters – Incoming Data

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4	Current velocity, horizontal 🔍	CV hor	cm/s	Rohardt, Gerd 🔍
5	Current direction 🔍	DIR	deg	Rohardt, Gerd 🔍
6	Current velocity, east-west 🔍	UC	cm/s	Rohardt, Gerd 🔍
7	Current velocity, north-south 🔍	VC	cm/s	Rohardt, Gerd 🔍
8	Temperature, water 🔍	Temp	°C	Rohardt, Gerd 🔍

```
Parameter(s): DATE/TIME (Date/Time) * GEOCODE

    DEPTH, water [m] (Depth water) * GEOCODE

    Pressure, water [dbar] (Press) * PI: Rohardt, Gerd (gerd.ro-
hardt@awi.de, http://www.awi.de/en/about-us/organisation/staff/gerd-
rohardt.html) * METHOD/DEVICE: Rotor current meter, Aanderaa

    Current velocity, horizontal [cm/s] (CV hor) * PI: Rohardt, Gerd
(gerd.rohardt@awi.de, http://www.awi.de/en/about-us/organisa-
tion/staff/gerd-rohardt.html) * METHOD/DEVICE: Rotor current meter,
Aanderaa

    Current direction [deg] (DIR) * PI: Rohardt, Gerd (gerd.ro-
hardt@awi.de, http://www.awi.de/en/about-us/organisation/staff/gerd-
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    Current velocity, east-west [cm/s] (UC) * PI: Rohardt, Gerd
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(gerd.rohardt@awi.de, http://www.awi.de/en/about-us/organisa-
tion/staff/gerd-rohardt.html) * METHOD/DEVICE: Rotor current meter,
Aanderaa

    Temperature, water [°C] (Temp) * PI: Rohardt, Gerd (gerd.ro-
hardt@awi.de, http://www.awi.de/en/about-us/organisation/staff/gerd-
rohardt.html) * METHOD/DEVICE: Rotor current meter, Aanderaa
```

Par

Parameter(s):

```xml
<!-- Procedure -->
<om:procedure/>
<!-- the property measured -->
<om:observedProperty xlink:href="Temperature_8"/>
<!-- Feature Of Interest -->
<om:featureOfInterest xlink:href="urn:bodyofwater"/>

<!-- Result Structure and Encoding -->
<om:resultDefinition>
    <swe:DataBlockDefinition>
        <swe:components name="Temperature_8">
            <swe:DataRecord>
                <swe:field name="time">
                    <swe:Time definition="urn:ogc:def:phenomenon:time:iso8601"/>
                </swe:field>
                <swe:field name="latitude">
                    <swe:Quantity definition="urn:ogc:def:phenomenon:latitude:wgs84">
                        <swe:uom code="deg"/>
                    </swe:Quantity>
                </swe:field>
                <swe:field name="longitude">
                    <swe:Quantity definition="urn:ogc:def:phenomenon:longitude:wgs84">
                        <swe:uom code="deg"/>
                    </swe:Quantity>
                </swe:field>
                <swe:field name="depth">
                    <swe:Quantity definition="cf:depth">
                        <swe:uom code="urn:ogc:unit:meter"/>
                    </swe:Quantity>
                </swe:field>
                <swe:field name="Temperature_8">
                    <swe:Quantity definition="Temperature_8">
                        <swe:uom xlink:href="urn:mm.def:units#?C"/>
                    </swe:Quantity>
                </swe:field>
                <swe:field name="quality flag">
                    <swe:Quantity definition="SeaDataNet Quality Flag Definition">
                        <swe:uom xlink:href="http://vocab.ndg.nerc.ac.uk/list/L201/current"/>
                    </swe:Quantity>
                </swe:field>
            </swe:DataRecord>
        </swe:components>
    </swe:DataBlockDefinition>
</om:resultDefinition>
```

| 1 2 3 4 5 6 7 8

d (gerd.ro-
tion/staff/gerd-
Aanderaa

: Rohardt, Gerd
organisa-
current meter,

l (gerd.ro-
tion/staff/gerd-
Aanderaa

ardt, Gerd
organisa-
current meter,

ohardt, Gerd
organisa-
current meter,

d (gerd.ro-
tion/staff/gerd-
Aanderaa

Parameters – Incoming Data

dataset_count bigint 🔒	long_name character varying 🔒	short_name character varying 🔒
1539	Temperature, water	Temp
740	Temperature, water, po...	Tpot
159	Pyrolysis temperature ...	Tmax
110	Sea surface temperatu...	SST (1-12
67	ReferenceTemperature	
43	Temperature, air	TTT
24	TEMP_0.5	
18	AirTemperature	
18	WaterTemp_FSI	
18	WaterTemp_Turner	
17	WaterTemp_Aanderaa	
16	TEMP_6.0	
15	TEMP_3.0	
15	TEMP_25.0	

Parameters – Mapping/Grouping

parameter_id [PK] integer	name character varying
0	Temperature
1	Current
2	Salinity
3	Pressure
4	Chlorophyll
5	Sample ID
6	Turbidity
7	Total Organic Carbon

Parameters – Mapping/Grouping

long_name,
short_name → parameter mapping → parameter group

Parameters – Mapping/Grouping

long_name,
short_name → parameter
mapping → parameter
group, sphere
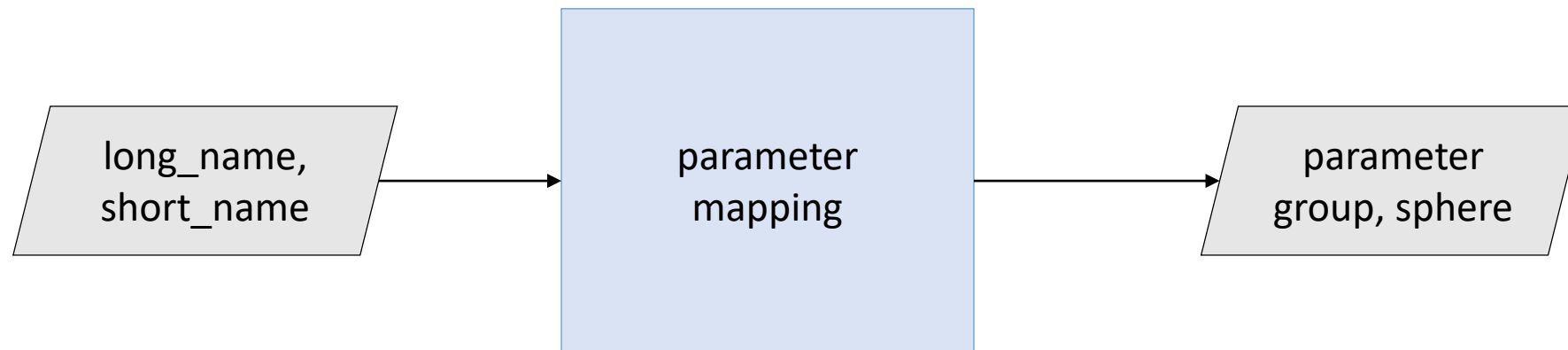
Parameters – Mapping Principle

long	short	parameter_group
Temperature, water	Temp	Temperature
Temperature, air, relative mean	Temp m	Temperature
Temperature, air	TTT	Temperature
Temperature	-	Temperature
-	Temp	Temperature

Parameters – Mapping Principle

long	short	group
Temperature, water	Temp	Temperature
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Temperature, air	TTT	Temperature
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Temperature, water	Temp	Temperature
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Temperature	-	Temperature
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1. Is there an entry with matching long and short name?

Parameters – Mapping Principle

long	short	group
Temperature, water	Temp	Temperature
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Temperature, air	TTT	Temperature
Temperature	-	Temperature
-	Temp	Temperature

1. Is there an entry with matching long and short name?
2. Is there an entry with matching long name (and without a short name)?

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Temperature, water	Temp	Temperature
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Temperature, air	TTT	Temperature
Temperature	-	Temperature
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1. Is there an entry with matching long and short name?
2. Is there an entry with matching long name (and without a short name)?
3. Is there an entry with matching short name (and without a long name)?
4. Parameter cannot be mapped to a parameter group!

Parameters – Mapping Principle Example

long	short	group
Temperature, water	Temp	Temperature
Temperature, air, relative mean	Temp m	Temperature
Temperature, air	TTT	Temperature
Temperature	-	Temperature
-	Temp	Temperature

Incoming Data: Long: `Temperature, Ocean`
Short: `Temp`

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3. Is there an entry with matching short name (and without a long name)?

→ Map incoming data to parameter group „Temperature"
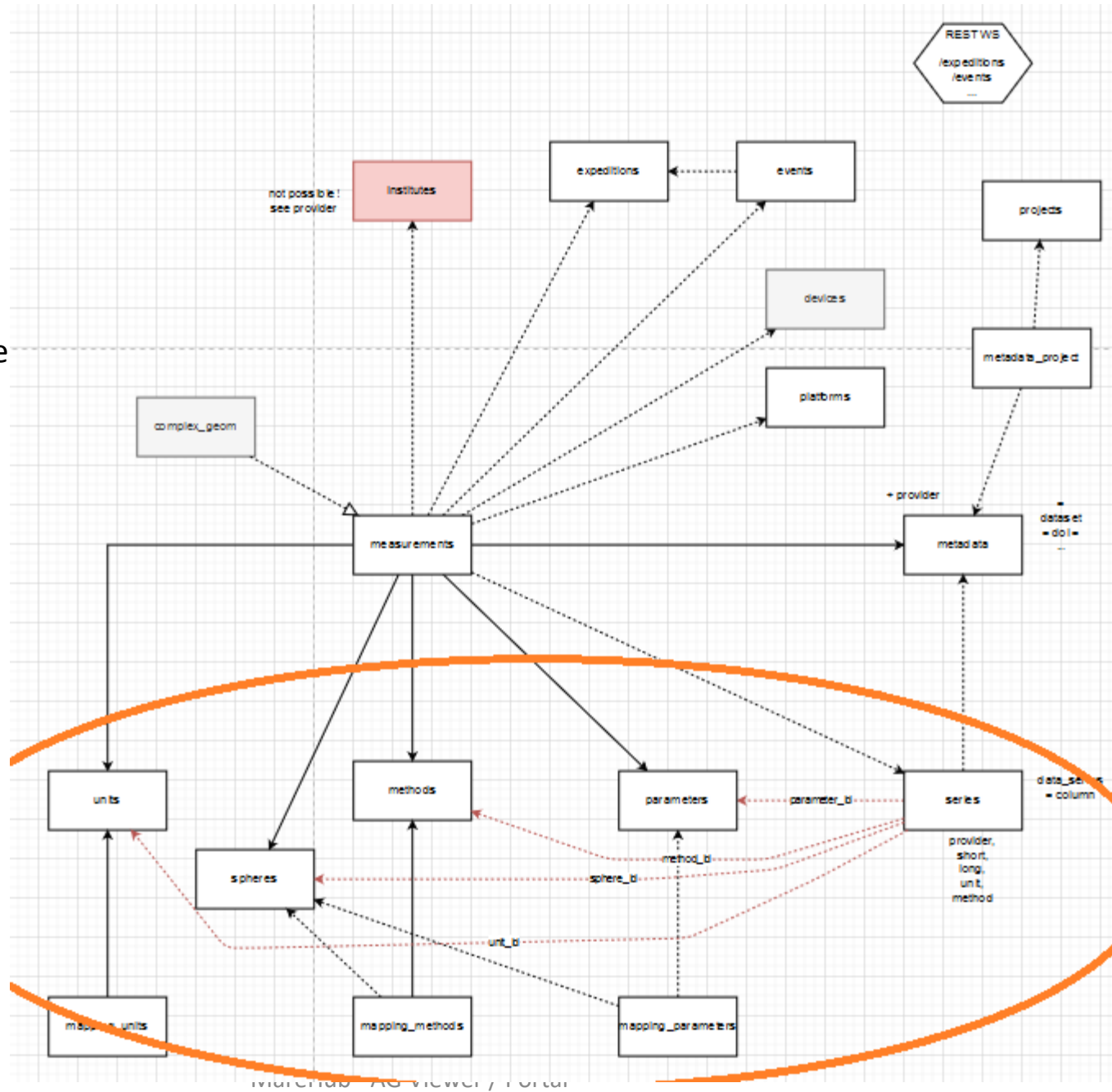
Summary and Outlook

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- Documentation on Spaces:
    - DAM Datenmanagement → MareHUB → AG Viewer Portal → Viewer Portal Deliverables → Mapping Infrastructure
    - https://spaces.awi.de/x/CyBGF
    - Will include this presentation

Outlook

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- Listen to Norbert's talk for more background information

Last Slide