

Data management workflows for experiment and model data

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Agenda

- Data management: who, when and how
- Components of data management workflow
- Examples:
 - Ocean modeling
 - Mesocosm experiments
 - Samples

Data management: who, when and how

Who: scientists, data stewards, data manager

When: proposal, preparation of work, during expeditions/experiments/coding, exchange of results, publishing of results

How: agreement of group, set up of systems, using tools, monitoring and visibility

Central data management workflow @ GEOMAR

1. Agreement on one **data policy or DMP**
(expected data, responsible persons, timeframes)
2. Information system with metadata and linked data for exchange and monitoring deliverables (**OSIS**)
3. Accessibility and reuseability of research data based on **persistent identifiers** (DOI + handle)

1. Data management plan (DMP)

- The **DMP** describes the expected data and how and when they will be handled, stored and made available
- The information system **keeps track** on the **deliverables** and sends reminder
- The result is an **overview on the outcome** of the project => data management record

2. OSIS: Ocean Science Information System

- tool for search and share data for ongoing projects
 - metadata are open access
 - data can be login protected for project groups
 - links to longterm repositories
- Helps transparency (Open Science)

2. OSIS

[Overview](#)
[Expeditions](#)
[Numerical Models](#)
[Experiments](#)
[More...](#)
Mehrtens, Hela (hmehrtens@geomar.de) / Version 4.2r1061 - Logout

Context:

OSIS Ocean Science Information System for Expeditions, Numeric Models, Experiments...

[View Terms of Use](#)

My Deliverables

Expedition	Name	Flag	Due
AL418	OFOS Data	OPEN	2016-07-02
M131	MSS	OSIS	2019-11-08
MSM72	LADCP	PUBLISHED	2020-09-30
MSM72	VMADCP	PUBLISHED	2020-09-30
MSM72	underway CTD	PUBLISHED	2020-09-30
M119	Mooring data	PUBLISHED	2019-12-12

Latest links

Type	Description	Linked to
DSHIP	DSHIP Sensor data available at GEOMAR	Leg: AL562
URL	Map with cruise track	Leg: AL563
URL	Map with cruise track	Leg: AL562
Print Publication	Weekly reports	Leg: M176
URL	AL561 Weekly report	Cruise: AL561
DSHIP	DSHIP Sensor data available at GEOMAR	Leg: AL561
URL	Map with cruise track	Leg: M176
URL	Map with cruise track	Leg: AL561
DSHIP	DSHIP Sensor data available at GEOMAR	Leg: AL560
DSHIP	DSHIP Sensor data available at GEOMAR	Leg: AL559b

Files

File Title	Uploaded	Creator
pangaea.txt for SO2 35	2021/09/20	Mehrtens, Hela
MSM80_FlowCytometry_062021.xlsx for MSM80	2021/09/15	Fernandez-Mendez, Mar
MSM80_PhotosyntheticPigments_062021.xlsx for MSM80	2021/09/15	Fernandez-Mendez, Mar

Expeditions

Label	Departure - Return	Chief-Scientist
IODP Exp.396	2021/08/06 - 2021/10/06	Berndt, Christian
SO293	2022/07/17 - 2022/09/06	Brandt, Peter
MSM103	2021/09/12 - 2021/11/07	Hözl, Sebastian

Models

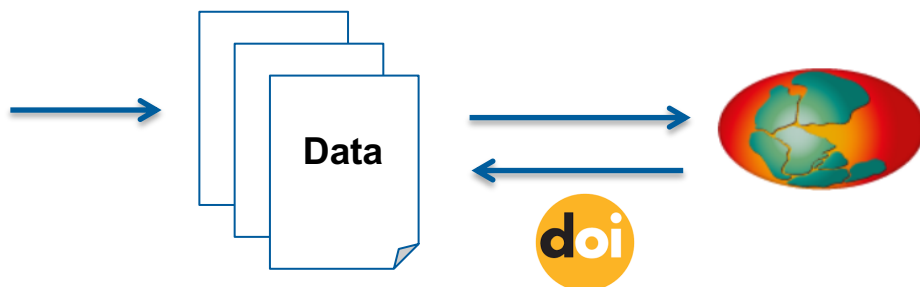
Label	Updated	Responsible Person
VIKING20X.L46-K KG36107B	2021/06/17	Getzlaff, Klaus
NorESM-T4.4-3	2021/03/08	Schwinger, Jörg
NorESM-T4.4-2	2021/03/08	Schwinger, Jörg

Experiments

Experiment	Updated	Responsible Person
KOSMOS 2021 Gran Canaria	2021/05/27	Haunost, Mathias
KOSMOS 2022 Bergen	2021/01/14	Haunost, Mathias
Dissolution Experiments	2021/01/12	Suitner, Niels

3. Persistent identifier

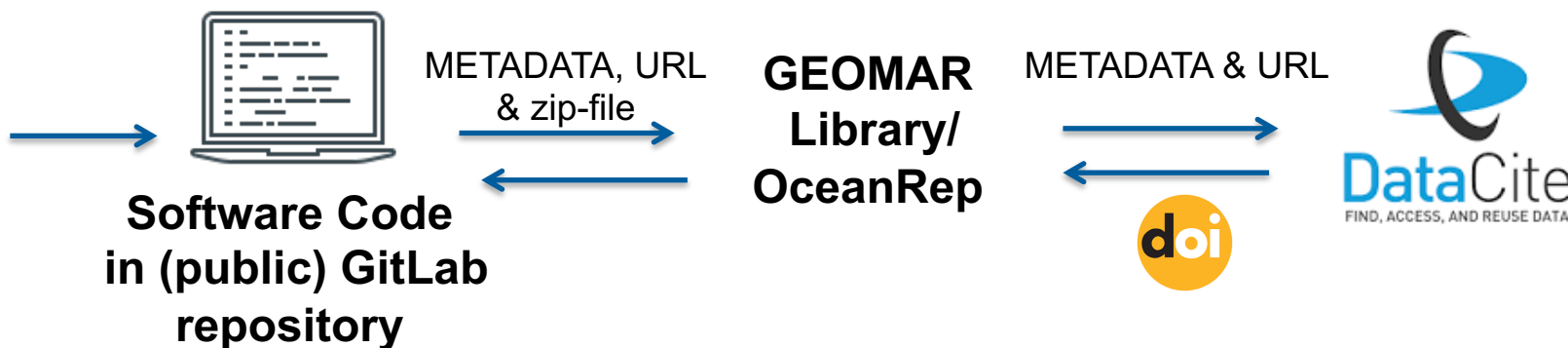
DOI-Registry at GEOMAR: Workflows



PANGAEA.

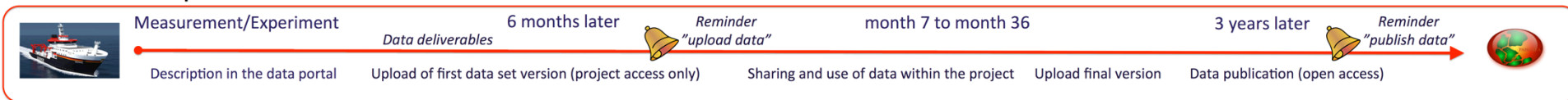
Data Publisher for Earth & Environmental Science

Scientists



Example: Experiment workflow

Data curation process



- Cruise planning involves DMP components
- Data reminder in OSIS used for several projects
- Deliverable done: data are openly available as data publications with DOI at PANGAEA


Mesocosm experiments















- Information System used for 15 experiments (2009-2022)
- More than 130 data publications at PANGAEA

Overview Expeditions Numerical Models **Experiments** More... Mehrtens, Hela (hmehtens@geomar.de) / Version 4.2r1061 - Logout

Context: Any...

15 Experiment(s) match term *kosmos*

 New Experiment

Label	Subject	Species	Description	Duration of Experiment	PI	Files	Links	Action...
KOSMOS 2009 Boknis Eck	Mesocosm Experiment		Boknis Eck in Kiel Bight at about 54.538N, 10.038E	20.05.2009 - 05.07.2009	Riebesell, Ulf	0	1	 Action...
KOSMOS 2010 Svalbard	Mesocosm Experiment		Kongsfjorden, Ny-Alesund, on the north-west coast of Spitsbergen, Svalbard archipelago, Norway	31.05.2010 - 08.07.2010	Riebesell, Ulf	1	24	 Action...
KOSMOS 2011 Bergen	Mesocosm Experiment		Espregrend Marine Biological Station of University of Bergen, Raunefjord, Norway	01.06.2011 - 31.07.2011	Riebesell, Ulf	1	10	 Action...
KOSMOS 2012 Tvärminne	Mesocosm Experiment		Zoologische Station Tvärminne, Finland	13.06.2012 - 08.08.2012	Riebesell, Ulf	8	17	 Action...
KOSMOS 2013 Kristineberg	Mesocosm Experiment		Kristineberg, Gullmarfjord, Sweden	29.01.2013 - 30.06.2013	Riebesell, Ulf	8	9	 Action...
KOSMOS 2014 GC2	Mesocosm Experiment		Gran Canaria	23.09.2014 - 05.12.2014	Riebesell, Ulf	2	7	 Action...
KOSMOS 2015 Bergen	Mesocosm Experiment		Espregrend Marine Biological Station of University of Bergen, Raunefjord, Norway	03.05.2015 - 30.06.2015	Riebesell, Ulf	1	6	 Action...
KOSMOS 2016 Gran Canaria	Mesocosm Experiment		The study (KOSMOS Gran Canaria 2016) was carried out at the pier of Tallarte, Gran Canaria (Canary Islands), from 2nd March to 5th April 2016.	02.03.2016 - 05.04.2016	Riebesell, Ulf	0	3	 Action...
KOSMOS 2017 Gran Canaria				01.09.2017 - 01.10.2017	Riebesell, Ulf	0	0	 Action...
KOSMOS 2017 Peru	Mesocosm Experiment		off Peru	31.01.2017 - 10.04.2017	Riebesell, Ulf	36	4	 Action...
KOSMOS 2018 Gran Canaria	Mesocosm Experiment		Gran Canaria	01.09.2018 - 30.11.2018	Riebesell, Ulf	20	1	 Action...
KOSMOS 2019 Gran Canaria	Mesocosm Experiment		Gran Canaria	07.09.2019 - 09.10.2019	Riebesell, Ulf	0	0	 Action...
KOSMOS 2020 Peru	Mesocosm Experiment		off Peru	01.02.2020 - 15.04.2020	Riebesell, Ulf	1	0	 Action...
KOSMOS 2021 Gran Canaria	Mesocosm Experiments		D5.4: Comprehensive data set on ecological and biogeochemical responses of a low latitude oligotrophic ocean system to a gradient of alkalization intensities	06.09.2021 - 07.10.2021	Riebesell, Ulf	0	0	 Action...

EXAMPLE I: Experiments

in OSIS

Overview Expeditions Numerical Models **Experiments** More...

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Context: Any... Filter experiments... Go

Experiment Info Files (36) Related Links (5)

Edit

Experiment: KOSMOS 2017 Peru
Subject: Mesocosm Experiment
Organisation: Helmholtz Centre for Ocean Research Kiel
Experiment PI: Riebesell, Ulf
Start Date: 2017/01/31
End Date: 2017/04/10
Species:
Life stage:
Sample Origin:
Responsible Person: Bach, Lennart T.
Date of final data: 2017/06
Description: off Peru
Description/Res/Hypothesis:
Comment:
Community Context: [SFB754, SFB754-KOSMOS]
Created: Mehtrens, Hela / 2016-06-22 11:38
Last Updated: Springer, Pina / 2018-04-24 10:14

Overview Expeditions Numerical Models **Experiments** More...

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Context: Any... Filter experiments... Go

Experiment Info Files (36) Related Links (5)

...for this Experiment (5)

Create new related link for Experiment KOSMOS 2017 Peru...

Type of Link	Link Address (Path) / Description	Date created	Action...
Open Data Repository	https://www.pangaea.de/?q=event%3Alabel%3AKOSMOS_2017_Peru Data archived in PANGAEA	2021-09-27 15:39	Action...
Print Publication	https://oceanrep.geomar.de/47668 Overview of activities during the KOSMOS mesocosm study 2017 in the coastal upwelling system off Peru	2019-09-10 13:07	Action...
Print Publication	https://oceanrep.geomar.de/52596 Temporal dynamics of surface ocean carbonate chemistry in response to natural and simulated upwelling events during the 2017 coastal El Niño near Callao, Peru	2021-05-12 11:04	Action...
Print Publication	https://oceanrep.geomar.de/43539 Nutrient cycling in the Peru upwelling zone under coastal El Niño-no conditions, a mesocosm study	2018-07-03 12:42	Action...
Print Publication	https://oceanrep.geomar.de/41912 Influence of ocean acidification on elemental mass balances and particulate organic matter stoichiometry in natural plankton communities	2018-02-16 11:34	Action...

EXAMPLE I: Experiments

in PANGAEA



The screenshot shows the PANGAEA website interface. At the top right, the user 'Hela Mehrrens' is logged in. The navigation menu includes 'SEARCH', 'SUBMIT', 'HELP', 'ABOUT', and 'CONTACT'. The PANGAEA logo and tagline 'Data Publisher for Earth & Environmental Science' are visible. The main content area displays a dataset entry with the following details:

- Citation:** Baumann, Moritz; Sswat, Michael; Ortiz Cortes, Joaquin; Hernández-Hernández, Nauzet; Baños Cerón, Isabel; Vanharanta, Mari; Heinemann, Malte (2021): KOSMOS 2018 Gran Canaria mesocosm study: water column biogeochemistry. PANGAEA, <https://doi.pangaea.de/10.1594/PANGAEA.933090> (dataset in review)
- Abstract:** The data set compiles biogeochemical water column collected during a KOSMOS mesocosm experiment carried out in the frame work of the Ocean Artificial Upwelling project. The experiment was performed in the North-East Atlantic Ocean off the coast of Gran Canaria in autumn 2018 and lasted for 39 days. In this study we investigated the effect of different intensities of artificial upwelling combined with two upwelling modes (recurring additions versus one singular addition) on POC export and its potential transfer efficiency to depth. The data set includes the amounts of surface water that were exchanged with nutrient-rich deep water (from ~300 m depth), primary production and chlorophyll a, elemental composition of suspended particulate matter (POC, PON, C:N) and prokaryotic heterotrophic production.
- Keyword(s):** artificial upwelling; carbon sequestration; export flux; mesocosm study; particle properties; remineralization depth; remineralization rate; sinking velocity
- Supplement to:** Baumann, Moritz; Taucher, Jan; Paul, Allanah; Heinemann, Malte; Vanharanta, Mari; Bach, Lennart Thomas; Spilling, Kristian; Ortiz Cortes, Joaquin; Arístegui, Javier; Hernández-Hernández, Nauzet; Riebesell, Ulf (in prep.): Effect of different rates and modes of artificial upwelling on particle flux and potential POC deep export.
- Project(s):** Ocean Artificial Upwelling (Ocean-artUp)

A map of the study area is shown on the right, highlighting the location off the coast of Gran Canaria, with labels for 'Morocco' and 'Western Sahara'. The map includes a scale bar for 500 km and a 'Terms of Use' link.

EXAMPLE I: Experiments

Event(s):

KOSMOS_2018_Mesocosm-M1 [Q](#) * *Latitude:* 27.927880 * *Longitude:* -15.364330 * *Date/Time Start:* 2018-11-06T00:00:00 * *Date/Time End:* 2018-12-14T00:00:00 * *Location:* Canarias Sea [Q](#) * *Campaign:* KOSMOS_2018 (KOSMOS Gran Canaria) [Q](#) * *Method/Device:* Mesocosm experiment (MESO) [Q](#)

KOSMOS_2018_Mesocosm-M2 [Q](#) * *Latitude:* 27.927880 * *Longitude:* -15.364330 * *Date/Time Start:* 2018-11-06T00:00:00 * *Date/Time End:* 2018-12-14T00:00:00 * *Location:* Canarias Sea [Q](#) * *Campaign:* KOSMOS_2018 (KOSMOS Gran Canaria) [Q](#) * *Method/Device:* Mesocosm experiment (MESO) [Q](#)

KOSMOS_2018_Mesocosm-M3 [Q](#) * *Latitude:* 27.927880 * *Longitude:* -15.364330 * *Date/Time Start:* 2018-11-06T00:00:00 * *Date/Time End:* 2018-12-14T00:00:00 * *Location:* Canarias Sea [Q](#) * *Campaign:* KOSMOS_2018 (KOSMOS Gran Canaria) [Q](#) * *Method/Device:* Mesocosm experiment (MESO) [Q](#)

Show more...

Parameter(s):

#	Name	Short Name	Unit	Principal Investigator	Method/Device	Comment
1	Event label Q	Event		Baumann, Moritz Q		
2	DATE/TIME Q	Date/Time		Baumann, Moritz Q		Geocode
3	Experiment day Q	Exp day	day	Baumann, Moritz Q		
4	Mesocosm label Q	Meso label		Baumann, Moritz Q		
5	Treatment Q	Treat		Baumann, Moritz Q		
6	Treatment Q	Treat		Baumann, Moritz Q		
7	Deep water exchange, total Q	Deep water exch	m ³	Sswat, Michael Q		
8	DEPTH, water, experiment Q	Depth water exp	m	Baumann, Moritz Q		Geocode - top
9	DEPTH, water, experiment Q	Depth water exp	m	Baumann, Moritz Q		Geocode - bottom
10	Primary production Q	PP	µmol/l/day	Ortiz Cortes, Joaquin Q		
11	Primary production, cumulative Q	PP cum	µmol/l	Ortiz Cortes, Joaquin Q		
12	Chlorophyll a Q	Chl a	µg/l	Ortiz Cortes, Joaquin Q		
13	Carbon, organic, particulate Q	POC	µmol/l	Baumann, Moritz Q		Chl a [µg/l]
14	Nitrogen, organic, particulate Q	PON	µmol/l	Baumann, Moritz Q		
15	Carbon/Nitrogen ratio Q	C/N	mol/mol	Baumann, Moritz Q		
16	Prokaryotic heterotrophic production Q	P het prod	µmol/l/day	Baños Cerón, Isabel Q		

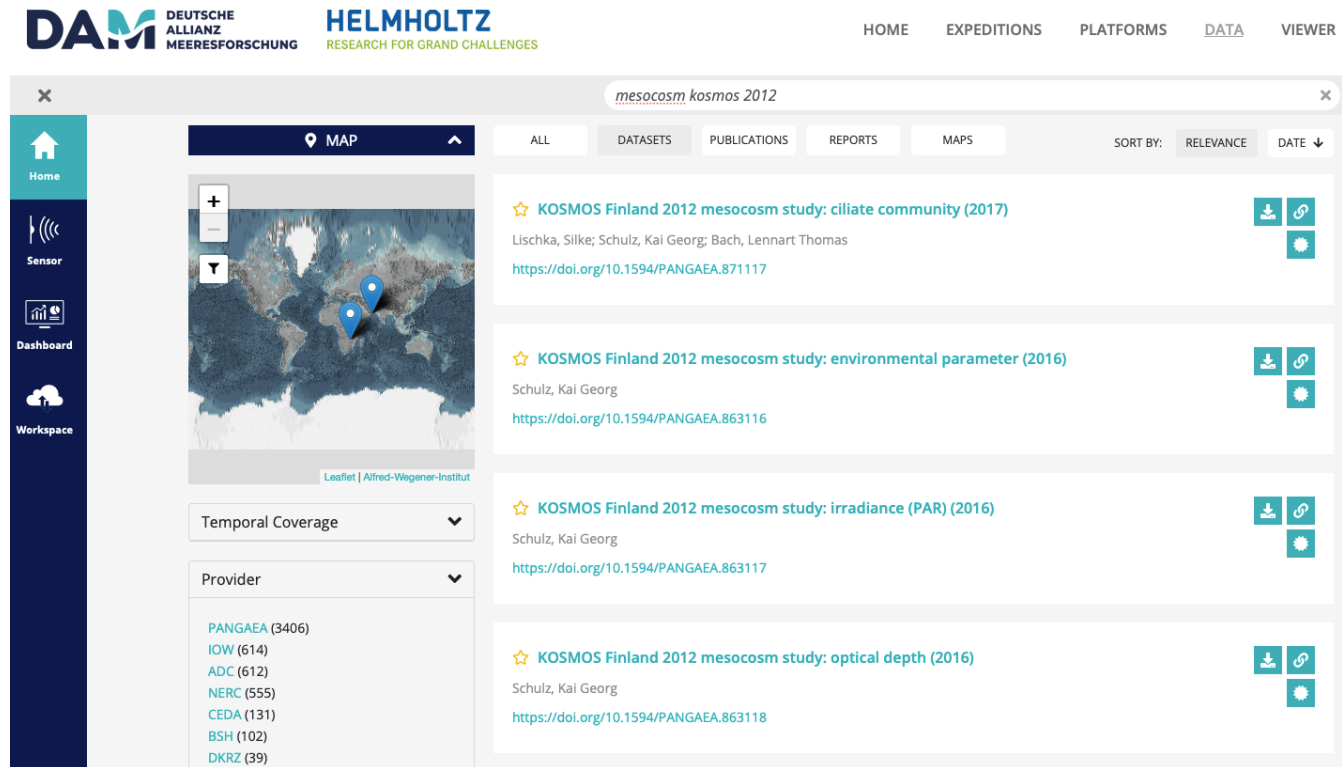
Status:

Curation Level: Enhanced curation (CurationLevelC) [Q](#)

Size:

2094 data points

Further Access: DAM Portal

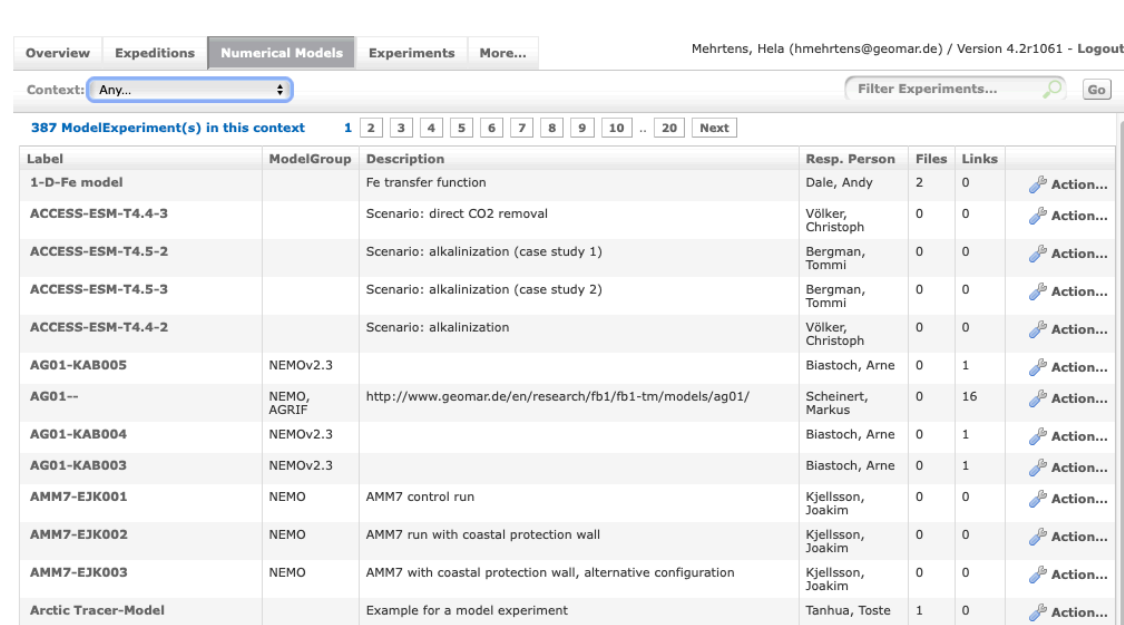


The screenshot displays the DAM Portal interface. At the top, the DAM logo (DEUTSCHE ALLIANZ MEERESFORSCHUNG) and HELMHOLTZ logo (RESEARCH FOR GRAND CHALLENGES) are visible. The navigation menu includes HOME, EXPEDITIONS, PLATFORMS, DATA, and VIEWER. The search bar contains the query 'mesocosm kosmos 2012'. The left sidebar shows navigation options: Home, Sensor, Dashboard, and Workspace. The main content area features a map of the North Atlantic region with two blue location pins. Below the map are filters for 'Temporal Coverage' and 'Provider'. The provider list includes PANGAEA (3406), IOW (614), ADC (612), NERC (555), CEDA (131), BSH (102), and DKRZ (39). The search results list four entries, each with a star icon, title, authors, and a DOI link. Each entry also has icons for download, share, and refresh.

Star	Title	Authors	DOI	Download	Share	Refresh
☆	KOSMOS Finland 2012 mesocosm study: ciliate community (2017)	Lischka, Silke; Schulz, Kai Georg; Bach, Lennart Thomas	https://doi.org/10.1594/PANGAEA.871117	Download	Share	Refresh
☆	KOSMOS Finland 2012 mesocosm study: environmental parameter (2016)	Schulz, Kai Georg	https://doi.org/10.1594/PANGAEA.863116	Download	Share	Refresh
☆	KOSMOS Finland 2012 mesocosm study: irradiance (PAR) (2016)	Schulz, Kai Georg	https://doi.org/10.1594/PANGAEA.863117	Download	Share	Refresh
☆	KOSMOS Finland 2012 mesocosm study: optical depth (2016)	Schulz, Kai Georg	https://doi.org/10.1594/PANGAEA.863118	Download	Share	Refresh

Example: Model results

- Information System contains >300 descriptions
- Links to articles and storage



Overview Expeditions Numerical Models Experiments More...

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Context: Any... Filter Experiments... Go

387 ModelExperiment(s) in this context 1 2 3 4 5 6 7 8 9 10 .. 20 Next

Label	ModelGroup	Description	Resp. Person	Files	Links	Action...
1-D-Fe model		Fe transfer function	Dale, Andy	2	0	Action...
ACCESS-ESM-T4.4-3		Scenario: direct CO2 removal	Völker, Christoph	0	0	Action...
ACCESS-ESM-T4.5-2		Scenario: alkalization (case study 1)	Bergman, Tommi	0	0	Action...
ACCESS-ESM-T4.5-3		Scenario: alkalization (case study 2)	Bergman, Tommi	0	0	Action...
ACCESS-ESM-T4.4-2		Scenario: alkalization	Völker, Christoph	0	0	Action...
AG01-KAB005	NEMOv2.3		Biaστοch, Arne	0	1	Action...
AG01--	NEMO, AGRIF	http://www.geomar.de/en/research/fb1/fb1-tm/models/ag01/	Scheinert, Markus	0	16	Action...
AG01-KAB004	NEMOv2.3		Biaστοch, Arne	0	1	Action...
AG01-KAB003	NEMOv2.3		Biaστοch, Arne	0	1	Action...
AMM7-EJK001	NEMO	AMM7 control run	Kjellsson, Joakim	0	0	Action...
AMM7-EJK002	NEMO	AMM7 run with coastal protection wall	Kjellsson, Joakim	0	0	Action...
AMM7-EJK003	NEMO	AMM7 with coastal protection wall, alternative configuration	Kjellsson, Joakim	0	0	Action...
Arctic Tracer-Model		Example for a model experiment	Tanhua, Toste	1	0	Action...

Example II: Model results

In OSIS

Model Experiment Info | Files (91) | Related Links (2)

Edit

Parent Model: **BSIOM**
ModelExperiment: BSIOM-ERAinterim-WAVE-O2
Description: coupled Baltic Sea Ice-Ocean-waves simulation for the period 1979-2019 forced by ERA-Interim reanalysis; including simplified wave and oxygen consumption model
ModelGroup: Regional model Baltic Sea
Resp. Person: Lehmann, Andreas
Start of run:
End of run:
Status: completed
Comment: Hind-cast 1979-2018 forced by ERA-Interim reanalysis; including simplified wave and oxygen consumption model
Organisation: Helmholtz-Zentrum für Ozeanforschung Kiel (GEOMAR), Germany
Published:
Community Context: [UFO-TRINET]
(Add a community as context in which this ModelExperiment should be listed by default)
Created: Springer, Pina / 2018-10-09 13:46
Last Updated: Getzlaff, Klaus / 2021-01-15 14:16

Storage: **NEC SX-ACE**
Code:
Forcing: **ERA-Interim 1979-2019: yes
runoff HELCOM**
Restoring (SSS,SST):
Specification:

Edit

Example II: Model results

In OSIS

Overview Expeditions Numerical Models Experiments More...

Mehrtens, Hela (hmehrtens@geomar.de) / Version 4.2r1061 - Logout

Context: SFB754 Filter Experiments... Go

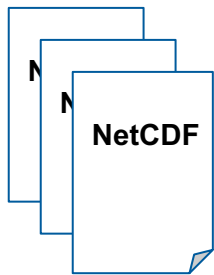
Model Experiment Info Files (91) Related Links (2)

...for this Model Experiment (2)

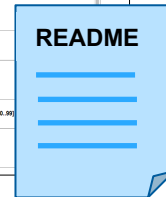
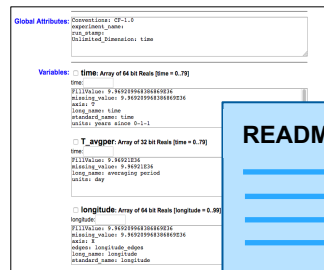
Create new related link for ModelExperiment BSIOM-ERAinterim-WAVE-O2...

Type of Link	Link Address (Path) / Description	Date created	Action...
Internal Data Repository	https://hdl.handle.net/20.500.12085/a3b523be-dc00-479a-8706-0b6b74c759d5 hindcast simulation (1979-2019) using HRBSIOM configuration based on configuration described in https://doi.org/10.1016/j.jmarsys.2014.02.012 with ERAS atmospheric forcing applied	2020-10-09 16:33	Action...
Print Publication	https://doi.org/10.1016/j.jmarsys.2014.02.012 Method paper	2020-10-09 16:33	Action...

1. Preparation of model data for publication by data owner

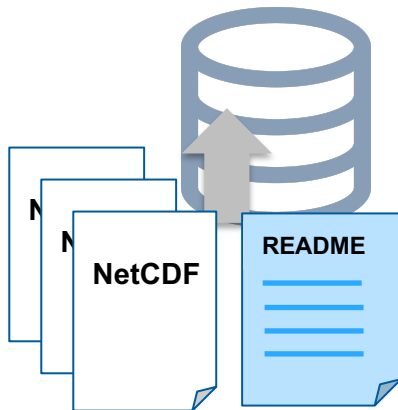


dataset organisation,
file formatting,
checksums



Metadata &
Documentation

2. Dataset submission to the data management team

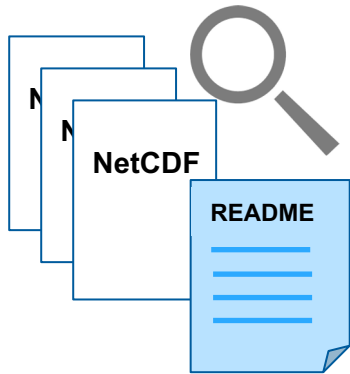


data transfer via
GEOMAR cloud or
(S)FTP server
&
data submission
information to DM
via web form



Example II: Workflow

3. Data publication on data.geomar.de (OPeNDAP Service)



data integrity check
&
data dissemination
via THREDDS-Server
by data manager

Numerical Modeling Data - OPeNDAP Service

Numerical Modeling Data Related to Peer Reviewed Journal Articles

2018	2017	2016	2015	2014	2013	2012	before 2012
Blastoch et al. (2018), DOI 10.1016/j.ocemod.2017.12.002 :: Details in OceanRep							
Groatbitch et al. (2018), JGR : OI 10.1029/2017JC013055 :: Details in OceanRep							
Keller et al. (2018), GMD : JGR 10.5194/gmd-11-1133-2018 :: Details in OceanRep							
Kloewer et al. (2018), GMD : DOI 10.1016/j.ocemod.2018.09.006 :: Details in OceanRep							
Rieck et al. (2018), JPO : DOI 10.1175/JPO-D-17-0173.1 :: Details in OceanRep							

Data Sets by Research Projects

Data Sets by Research Units

Software / Code

Bathymetric Data Sets

ScienceDirect Journals & Books Register Sign in >

Download PDF Export

Recommended articles

Will high-resolution global ocean models Ocean Modelling, Volume 120, 2017, pp. 12

Vertical resolution of baroclinic modes in Ocean Modelling, Vertical resolution of baroclinic modes in Ocean Modelling, Volume 120, 2017, pp. 12

Assessing the accuracy of satellite derived Remote Sensing of Environment, Volume 2

Simulating the Agulhas system in global ocean models - nesting vs. multi-resolution unstructured meshes

Arne Blastoch^{a,*,} Ar. B. Dmitry Sein^{b,} Jonathan V. Durgadoo^{c,} Qiang Wang^{b,} Sergey Danilov^a

https://doi.org/10.1016/j.ocemod.2017.12.002

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1 2 Next >

Citing articles (1)

Article Metrics

Captures

Readers:

Social Media

Shares, Likes & Comments:

Tweets:

Citations

Highlights

- Comparison of global NEMO and FESOM configurations with emphasis on the Agulhas system.
- Both models simulate a reasonable and comparable large-scale circulation.
- Both models have individual strengths and weaknesses to match the observations of the WBC system.
- The numerical cost of FESOM is twice the one of NEMO.

GEOMAR Helmholtz-Zentrum für Ozeanforschung Kiel

ZENTRUM FORSCHEN STUDIEREN ENTDECKEN SERVICE

OceanRep

> OceanRep Startseite

> Kontakt

SCHNELLSUCHE

> Einfache Suche

> Erweiterte Suche

BLÄTTERN

> Autor

> Forschungsbereich

> Publikationsart

> Jahr

> Studiengang

NEUZUGÄNGE

> Anskel - begutachtet

Supplementary Data:

Example II: Access

Numerical Modeling Data - OPeNDAP Service



OPeNDAP based server provides access to **datasets of model experiments** published by GEOMAR researchers either via web browser for full downloads or for OPeNDAP queries on data (sub)sets.

Observations

THREDDS - OPeNDAP / WMS / DSHIP

Supplementary Data of Numerical Simulations (published)

Experiments

Images - Videos

Software - Code

hdl:20.500.12085/4e104bf-eaa9e-4d1e-99fa-5a7d1b9f9313

Supplementary Dataset

[Handle ID](#) [Related Publication](#) [Oceans](#) [THREDDS](#) [ISO XML](#)

Handle for this dataset:

<https://hdl.handle.net/20.500.12085/4e104bf-eaa9e-4d1e-99fa-5a7d1b9f9313>

Please cite this dataset as:

Wang, Yuan, Greatbatch, Richard John, Claus, Martin, and Sheng, Jinyu (2020). Supplementary Data to "Decomposing barotropic transport variability in a high-resolution model of the North Atlantic Ocean" [Supplementary Dataset]. hdl:20.500.12085/4e104bf-eaa9e-4d1e-99fa-5a7d1b9f9313

[Copy Data Citation](#)

Supplement to [Open Access]:

Wang, Yuan, Greatbatch, Richard John, Claus, Martin, and Sheng, Jinyu (2020). Decomposing barotropic transport variability in a high-resolution model of the North Atlantic Ocean. *Journal of Geophysical Research: Oceans*, 125, Art.Nr. e2019JC015516. doi:10.1029/2019JC015516

The above information originates from <https://www.geomar.de/highlights/2020/09/2020-09-14-geomar-opens-4074.txt>

Data

- SWM_input
- 4e104bf-eaa9...
- 4e104bf-eaa9...
- bathymetry.nc
- Checksums.txt
- checksums.txt
- psi_1960_200...
- psi_viking_19...
- Readme.txt

Filter/Search files and folders:
Click filter icon at window top to filter displayed files/folder only on current page. Click search icon at window top to search all files and (sub)folders by pattern. Use prefix "re:" for JavaScript regular expressions, e.g. "re:.nc" to search for all netCDF files with ".nc" extension. Space separated sequences get OR-ed.
Machine-actionable services:

THREDDS:
<https://hdl.handle.net/20.500.12085/4e104bf-eaa9e-4d1e-99fa-5a7d1b9f9313@thredds>
ISO XML Metadata:
<https://hdl.handle.net/20.500.12085/4e104bf-eaa9e-4d1e-99fa-5a7d1b9f9313@metadata>

Example II: Access



GEOMAR THREDDS Server

THREDDS Data Server

Catalog <https://data.geomar.de/thredds/20.500.12085/4e104bfe-aa9e-4d1e-99fa-5a7d1b9f9313/catalog.html>

Dataset: Supplementary Data to "Decomposing barotropic transport variability in a model of the North Atlantic Ocean" (hdl:20.500.12085/4e104bfe-aa9e-4d1e-99fa-5a7d1b9f9313)/psi_viking_1960_2009.nc

- Data format: netCDF
- Data size: 252.5 Mbytes
- Data type: GRID
- Naming Authority: de.geomar
- ID: 20.500.12085/4e104bfe-aa9e-4d1e-99fa-5a7d1b9f9313/psi_viking_1960_2009.nc

Documentation:

- [Decomposing barotropic transport variability in a high-resolution model of the North Atlantic Ocean \(doi:10.1029/2019JC015516\)](#)
- [Decomposing barotropic transport variability in a high-resolution model of the North Atlantic Ocean \(http://oceanrep.geomar.de/49274\)](#)
- rights: cc_by_4.0
- summary: A method using a linear shallow water model is presented for decomposing the temporal variability of the barotropic streamfunction in a high-resolution model of the North Atlantic Ocean. The method is illustrated by examining how the transport of water in the North Atlantic Ocean responds to the winter North Atlantic Oscillation (NAO). While no statistically significant response is found in the year overlapping with the NAO, a significant response is found in the year following the NAO. This tendency for the Gulf Stream transport to increase as the NAO becomes more positive. This becomes significant in lead years 1 and 2 when the mean momentum flux (EMF) contributions, associated with nonlinear momentum advection, dominate. Only after 2 years, does the potential energy (PE) term play a role and it is only after 5 years that the transport dependence on the NAO ceases to be significant. It is also shown that the PE contribution to the memory of up to 5 years in the Labrador and Irminger Seas. However, it is only around the northern rim of these seas that VIKING20 and the transport of water is due to masking by the MFA and EMF contributions.

Access:

1. OPENDAP: [/thredds/dodsC/20.500.12085/4e104bfe-aa9e-4d1e-99fa-5a7d1b9f9313/psi_viking_1960_2009.nc](http://thredds/dodsC/20.500.12085/4e104bfe-aa9e-4d1e-99fa-5a7d1b9f9313/psi_viking_1960_2009.nc)
2. HTTPServer: [/thredds/fileServer/20.500.12085/4e104bfe-aa9e-4d1e-99fa-5a7d1b9f9313/psi_viking_1960_2009.nc](http://thredds/fileServer/20.500.12085/4e104bfe-aa9e-4d1e-99fa-5a7d1b9f9313/psi_viking_1960_2009.nc)
3. WCS: [/thredds/wcs/20.500.12085/4e104bfe-aa9e-4d1e-99fa-5a7d1b9f9313/psi_viking_1960_2009.nc](http://thredds/wcs/20.500.12085/4e104bfe-aa9e-4d1e-99fa-5a7d1b9f9313/psi_viking_1960_2009.nc)
4. WMS: [/thredds/wms/20.500.12085/4e104bfe-aa9e-4d1e-99fa-5a7d1b9f9313/psi_viking_1960_2009.nc](http://thredds/wms/20.500.12085/4e104bfe-aa9e-4d1e-99fa-5a7d1b9f9313/psi_viking_1960_2009.nc)
5. NetcdfSubset: [/thredds/netcdf/20.500.12085/4e104bfe-aa9e-4d1e-99fa-5a7d1b9f9313/psi_viking_1960_2009.nc](http://thredds/netcdf/20.500.12085/4e104bfe-aa9e-4d1e-99fa-5a7d1b9f9313/psi_viking_1960_2009.nc)
6. NCML: [/thredds/ncml/20.500.12085/4e104bfe-aa9e-4d1e-99fa-5a7d1b9f9313/psi_viking_1960_2009.nc](http://thredds/ncml/20.500.12085/4e104bfe-aa9e-4d1e-99fa-5a7d1b9f9313/psi_viking_1960_2009.nc)
7. UDDC: [/thredds/uddc/20.500.12085/4e104bfe-aa9e-4d1e-99fa-5a7d1b9f9313/psi_viking_1960_2009.nc](http://thredds/uddc/20.500.12085/4e104bfe-aa9e-4d1e-99fa-5a7d1b9f9313/psi_viking_1960_2009.nc)
8. ISO: [/thredds/iso/20.500.12085/4e104bfe-aa9e-4d1e-99fa-5a7d1b9f9313/psi_viking_1960_2009.nc](http://thredds/iso/20.500.12085/4e104bfe-aa9e-4d1e-99fa-5a7d1b9f9313/psi_viking_1960_2009.nc)

Keywords:

- north atlantic
- transport variability
- high resolution model

NetCDF Attribute Convention for Dataset Discovery Report

The Unidata Attribute Convention for Data Discovery provides recommendations for netCDF attributes that can be added to netCDF files to facilitate discovery of those files using standard metadata searches. This tool tests conformance with those recommendations using this [stylesheet](#). More [Information on Convention and Tool](#).

Title: Supplementary Data to "Decomposing barotropic transport variability in a high-resolution model of the North Atlantic Ocean"

Total Score: 31/46

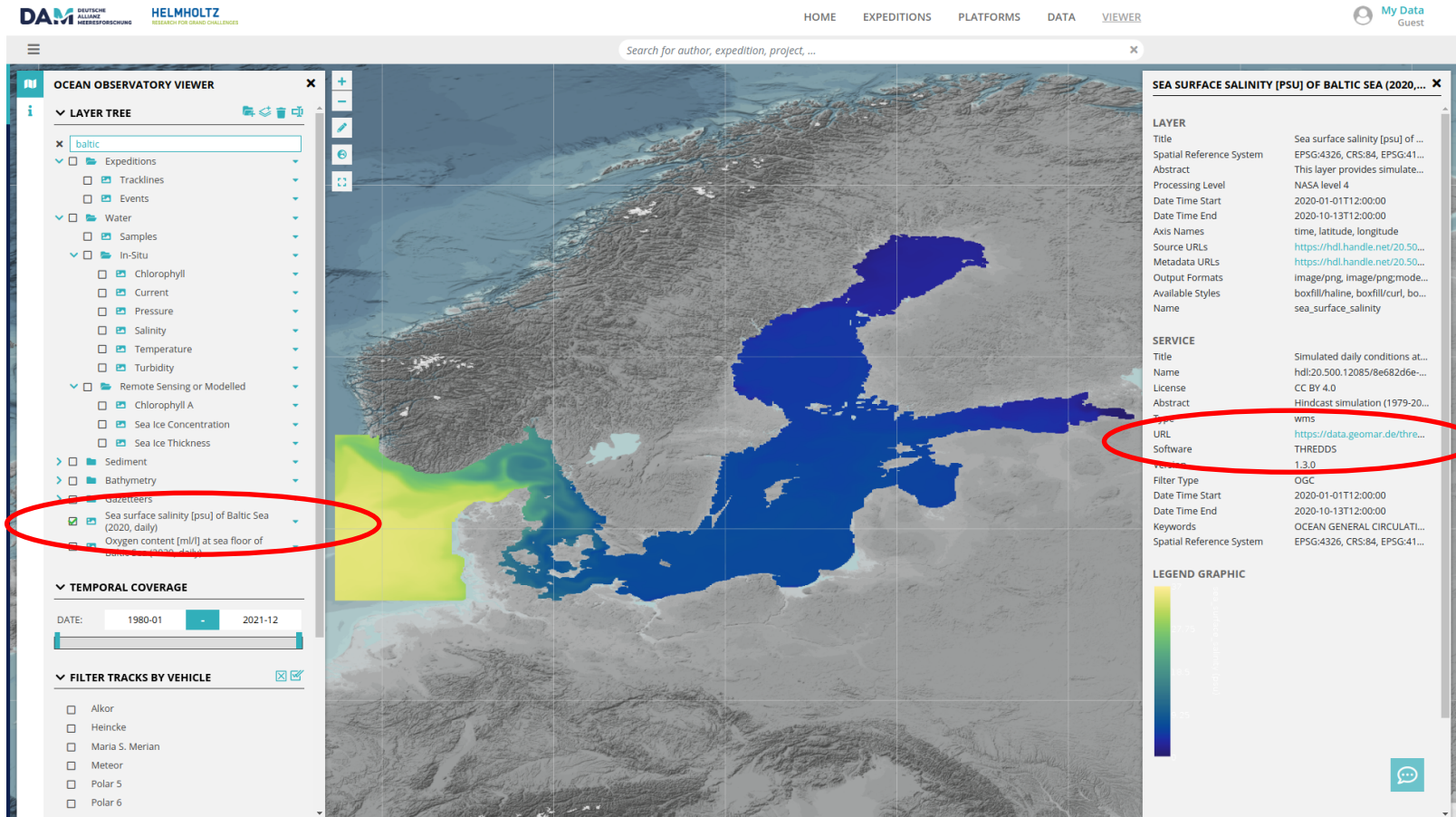
General File Characteristics

Number of Global Attributes 19
Number of Variables 5
Number of Variable Attributes 12
Number of Standard Names 0
Number of Services 4

	Spiral	None	1-33%	34-66%	67-99%	All
Total					X	
Identification						X
Text Search					X	
Extent Search				X		
Other Extent Information				X		
Creator Search					X	
Contributor Search						X
Publisher Search						X
Other Attributes					X	

[Identification](#) | [Text Search](#) | [Extent Search](#) | [Other Extent Information](#) | [Creator Search](#) | [Contributor Search](#) | [Publisher Search](#) | [Other Attributes](#)

Example II: Further Access



OCEAN OBSERVATORY VIEWER

LAYER TREE

- ▼ baltic
 - Expeditions
 - Tracklines
 - Events
 - Water
 - Samples
 - In-Situ
 - Chlorophyll
 - Current
 - Pressure
 - Salinity
 - Temperature
 - Turbidity
 - Remote Sensing or Modelled
 - Chlorophyll A
 - Sea Ice Concentration
 - Sea Ice Thickness
 - Sediment
 - Bathymetry
 - ↳ **conductors**
 - Sea surface salinity [psu] of Baltic Sea (2020, daily)
 - Oxygen content [ml/l] at sea floor of Baltic Sea (2020, daily)

TEMPORAL COVERAGE

DATE: 1980-01 - 2021-12

FILTER TRACKS BY VEHICLE

- Alkor
- Heincke
- Maria S. Merian
- Meteor
- Polar 5
- Polar 6

SEA SURFACE SALINITY [PSU] OF BALTIC SEA (2020, ...

LAYER

Title: Sea surface salinity [psu] of ...
Spatial Reference System: EPSG:4326, CRS:84, EPSG:41...
Abstract: This layer provides simulate...
Processing Level: NASA level 4
Date Time Start: 2020-01-01T12:00:00
Date Time End: 2020-10-13T12:00:00
Axis Names: time, latitude, longitude
Source URLs: <https://hdl.handle.net/20.50...>
Metadata URLs: <https://hdl.handle.net/20.50...>
Output Formats: image/png, image/png/mode...
Available Styles: boxfill/haline, boxfill/cur, bo...
Name: sea_surface_salinity

SERVICE

Title: Simulated daily conditions at...
Name: hdl:20.500.12085/8e682d6e-...
License: CC BY 4.0
Abstract: Hindcast simulation (1979-20...
Type: wms
URL: <https://data.geomar.de/thre...>
Software: THREDDS
Version: 1.3.0
Filter Type: OGC
Date Time Start: 2020-01-01T12:00:00
Date Time End: 2020-10-13T12:00:00
Keywords: OCEAN GENERAL CIRCULATI...
Spatial Reference System: EPSG:4326, CRS:84, EPSG:41...

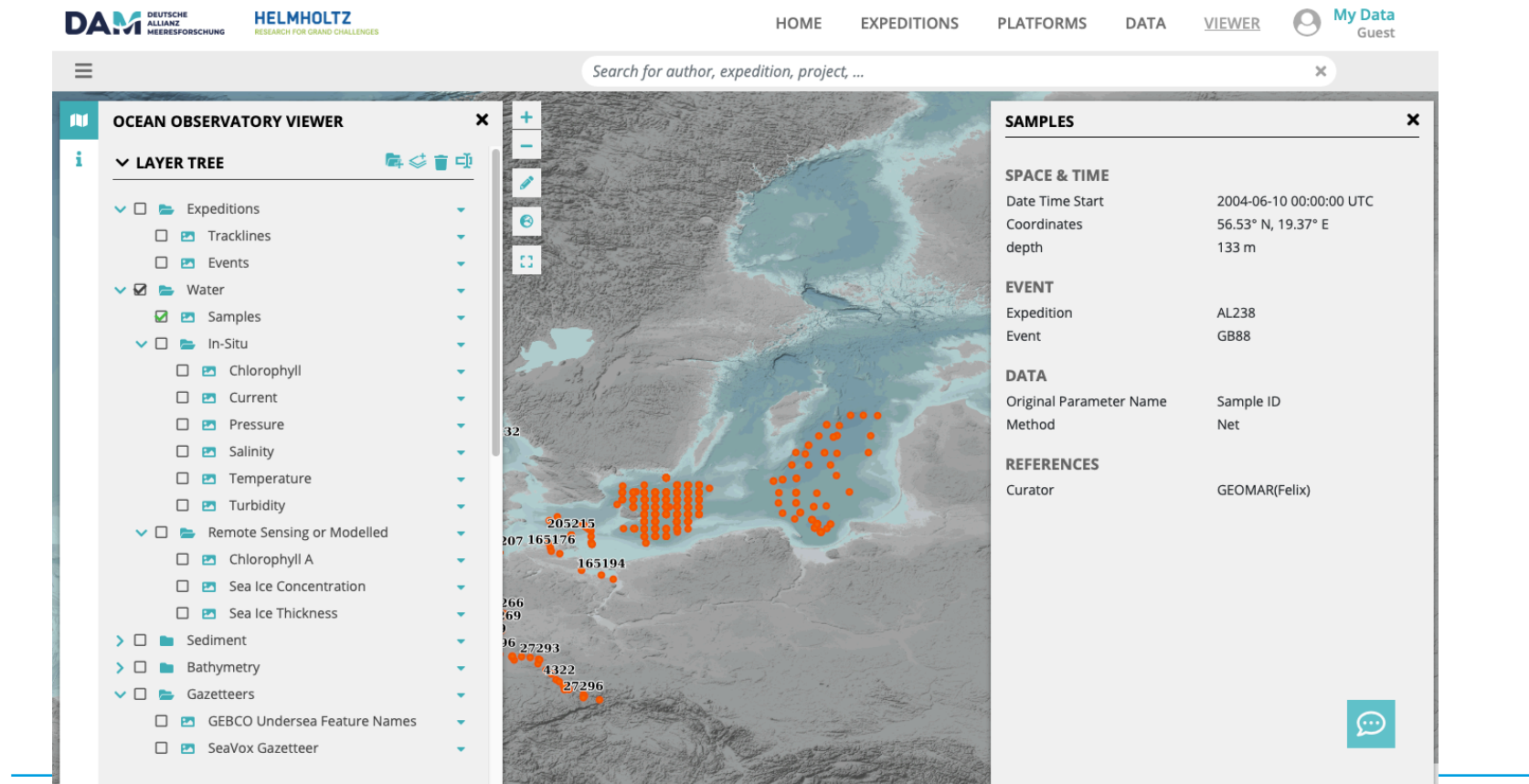
LEGEND GRAPHIC

Sea surface salinity [psu] of Baltic Sea (2020, daily)

Samples (in progress)

- Sample management systems for geosamples and biosamples
- Connection to OSIS for field samples as sediment cores and biological measurements and experiments
- Connection to Nagoya Protocol information necessary
- Metadata export for DAM Viewer

Access: DAM Portal



The screenshot displays the DAM Portal interface. At the top, there are logos for DAM (DEUTSCHE ALLIANZ MEERESFORSCHUNG) and HELMHOLTZ (RESEARCH FOR GRAND CHALLENGES). Navigation links include HOME, EXPEDITIONS, PLATFORMS, DATA, and VIEWER. A user profile for 'My Data Guest' is visible in the top right.

The main interface is divided into three main sections:

- OCEAN OBSERVATORY VIEWER:** Contains a 'LAYER TREE' on the left with various data layers such as Expeditions, Water, In-Situ, Remote Sensing or Modelled, Sediment, Bathymetry, and Gazetteers. The 'Samples' layer is checked.
- Map:** A central map showing a geographic area with numerous orange dots representing sample locations. Some dots are labeled with numbers like 205215, 165176, 165194, 266, 169, 27293, 4322, and 27296.
- SAMPLES:** A panel on the right displaying details for a selected sample. It includes sections for 'SPACE & TIME', 'EVENT', 'DATA', and 'REFERENCES'.

SPACE & TIME	
Date Time Start	2004-06-10 00:00:00 UTC
Coordinates	56.53° N, 19.37° E
depth	133 m

EVENT	
Expedition	AL238
Event	GB88

DATA	
Original Parameter Name	Sample ID
Method	Net

REFERENCES	
Curator	GEOMAR(Felix)

Questions and comments?

Data Management Team @GEOMAR

datamanagement@geomar.de