SeaDataCloud

WP10 – Virtual Research Environment –

Progress of VRE development

WP10 team

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SeaDataCloud

Outline

1. SDC VRE – progress summary
2. Demo of individual components
   - Marine-ID and B2Access (Themis, 5 mins)
   - WebODV (Sebastian, 10 mins)
   - DIVAnd and Notebooks (Charles, 10 mins)
   - Biological QC (Simon, 5 mins)
   - Visualisation (Giorgio, 5 mins)
3. VRE deadlines and deliverables

1. VRE – Progress summary

SeaDataCloud

SeaDataClouds VRE needs to:

- Facilitate collaborative and individual research:
- Combine data with subsets from other data resources, such as the ingested collections
- Have a high capacity and performance for big data processing and state-of-the-art web visualisation services

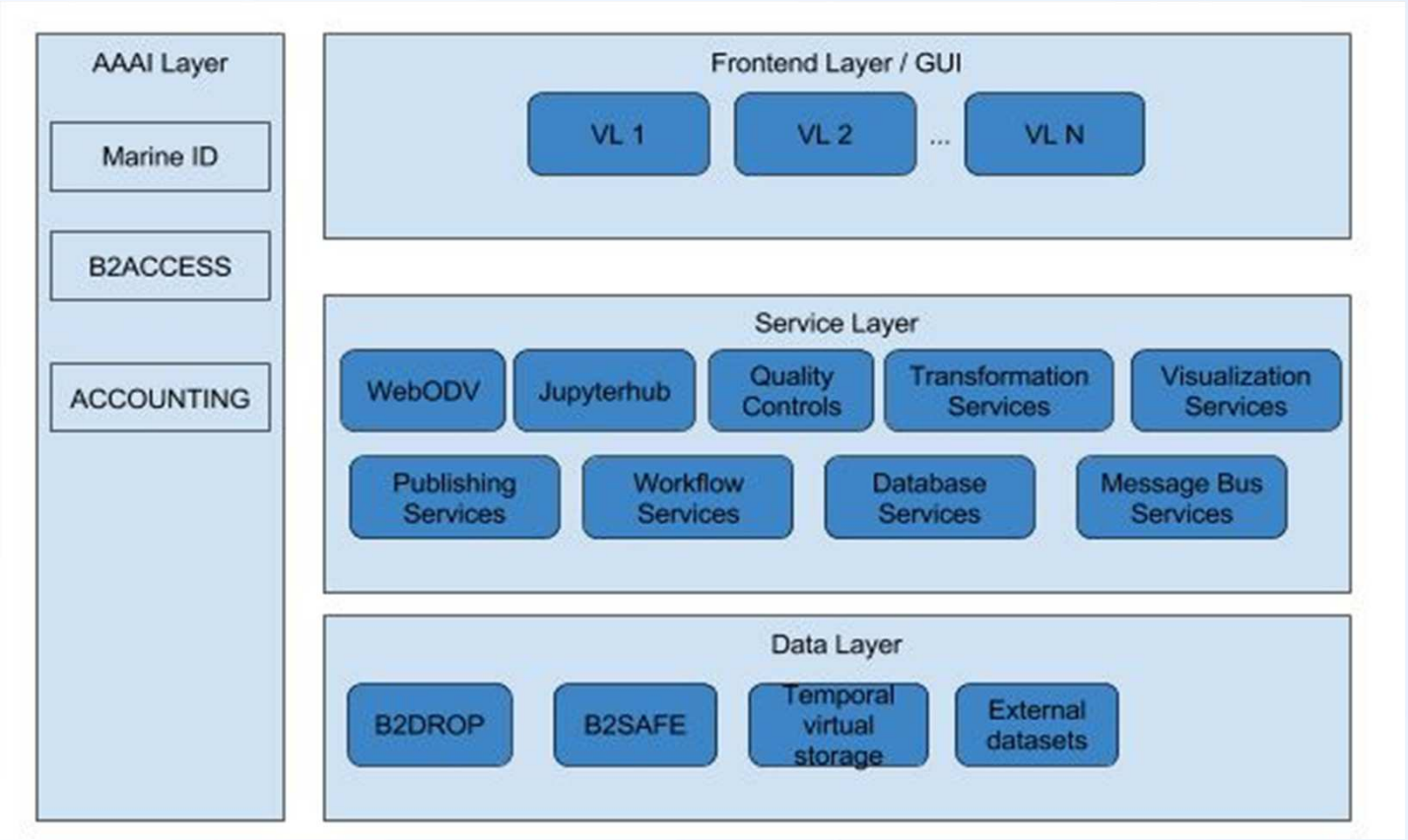
SeaDataCloud

- Respect privacy of users and differences in data policies. Differentiated users, different access to data and data products.
- Be possible to configure virtual work spaces for individuals or groups to work on specific projects, including setting up of dedicated pools of data
- Allow producers to decide whether their outcomes will be shared in the public domain or stay private
- Be based and hosted on EUDAT's infrastructure based on it B2-… service platforms

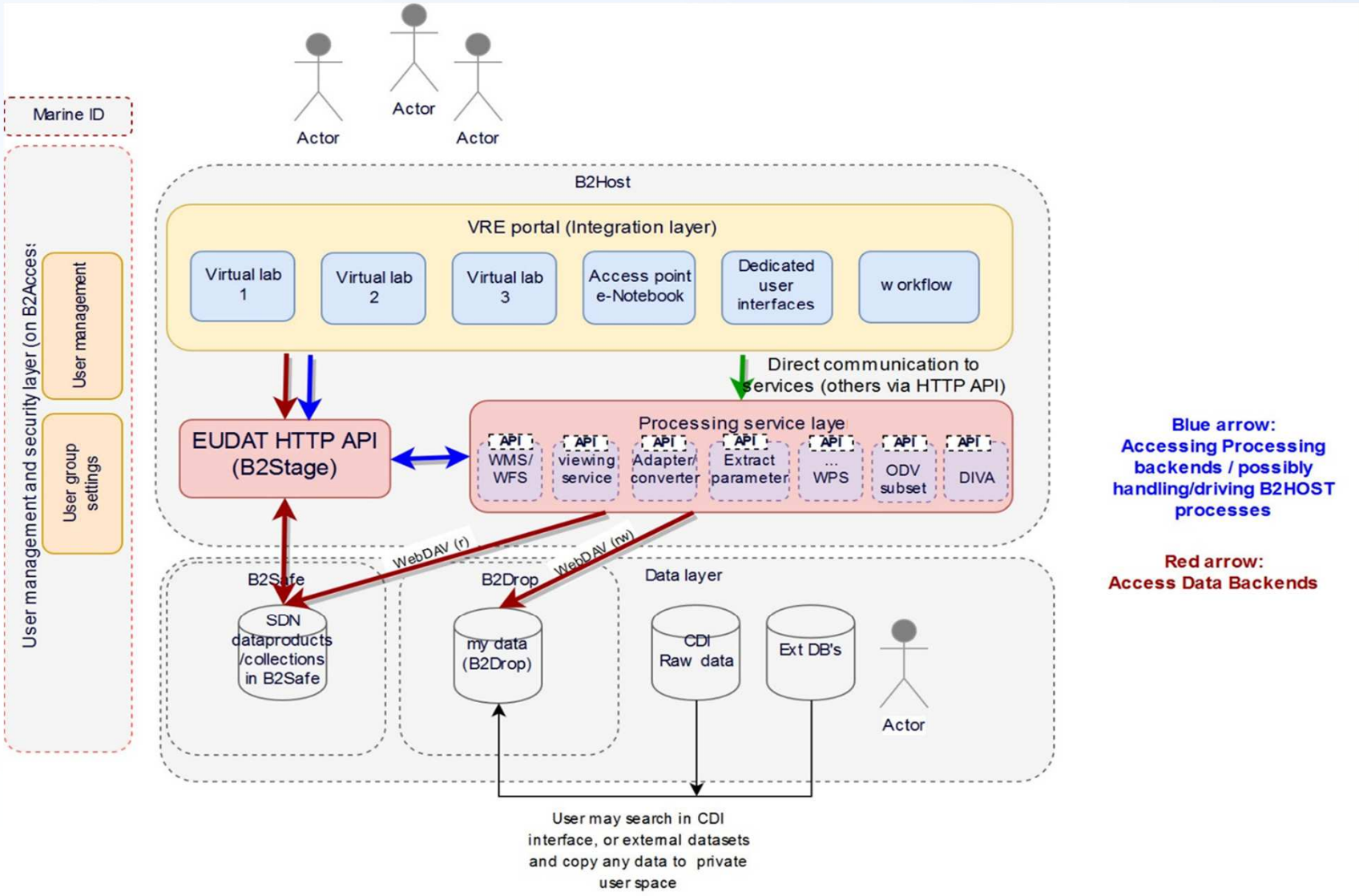
Focus on 5 versatile use cases:

1. **SeaDataNet Temperature and Salinity** water column analysis
2. **EMODNET - Chemistry**, same for bio-geo-chemistry
3. **SeaDataNet Biology Quality Assessment**
4. **EMODNET - HRSM**, DTM processing
5. **Processing and visualising data sets**

SDC VRE Architecture – level 1



SDC VRE Architecture – level 2



Prototype functions targeted of T/S (narrow abstract of total use case!)

log in with single sign on	B2ACCESS + Marine-ID
integration GUI development	Javascript library
apply water column obs quality control with friendly data editor and save result,	webODV
advise data centre of the regional quality control	
be advised of quality control result (email of log of changes/anomalies sorted per DC)	email
configure DIVA interpolation	Jupyter + DIVA library
apply DIVA interpolation, send notification (email) when processing is completed	
visualize interpolation result together with original observations of other observations	
extract and view profiles, time series, hovmuller out of the interpolation result	
publish dataset results (metadata and data), get a DOI	oceanBrowser+sextant-dataCite

2. Progress per component

Some highlights

Connecting Marine-ID to B2Access - Themis

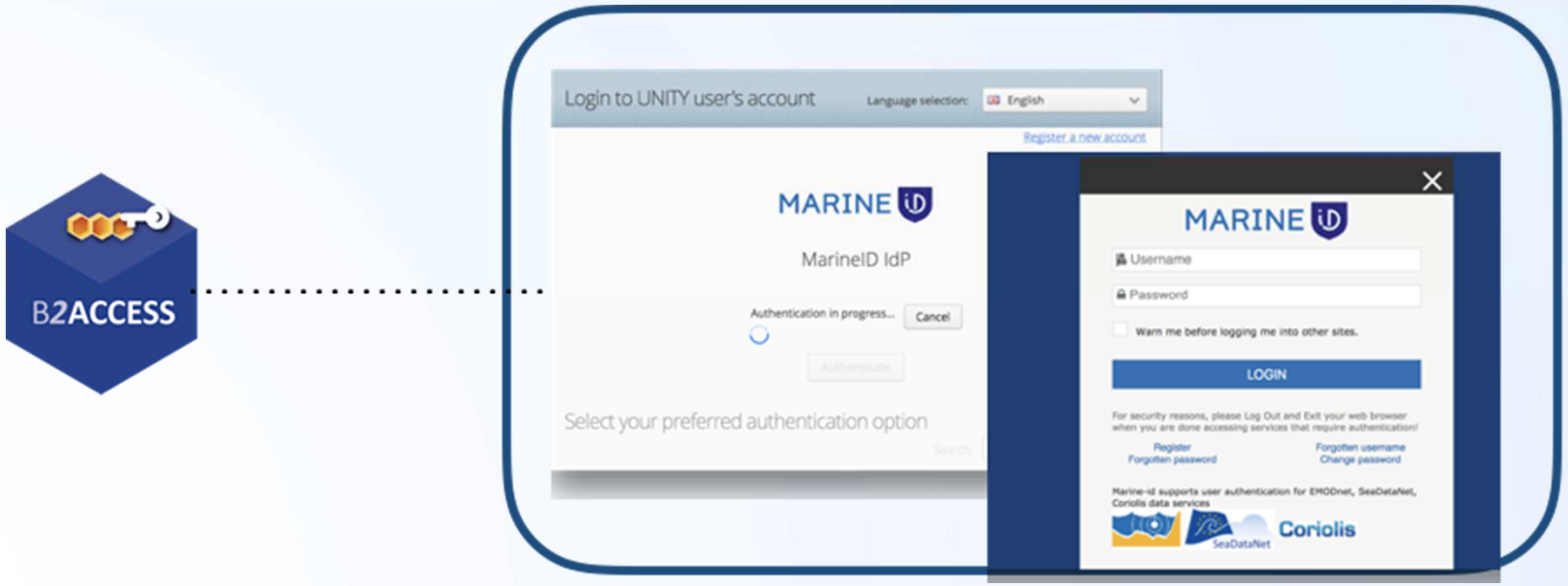
Connecting B2ACCESS - Marine-ID

- B2ACCESS is an easy-to-use and secure Authentication and Authorization platform developed by EUDAT. B2ACCESS is versatile and can be integrated with any service.

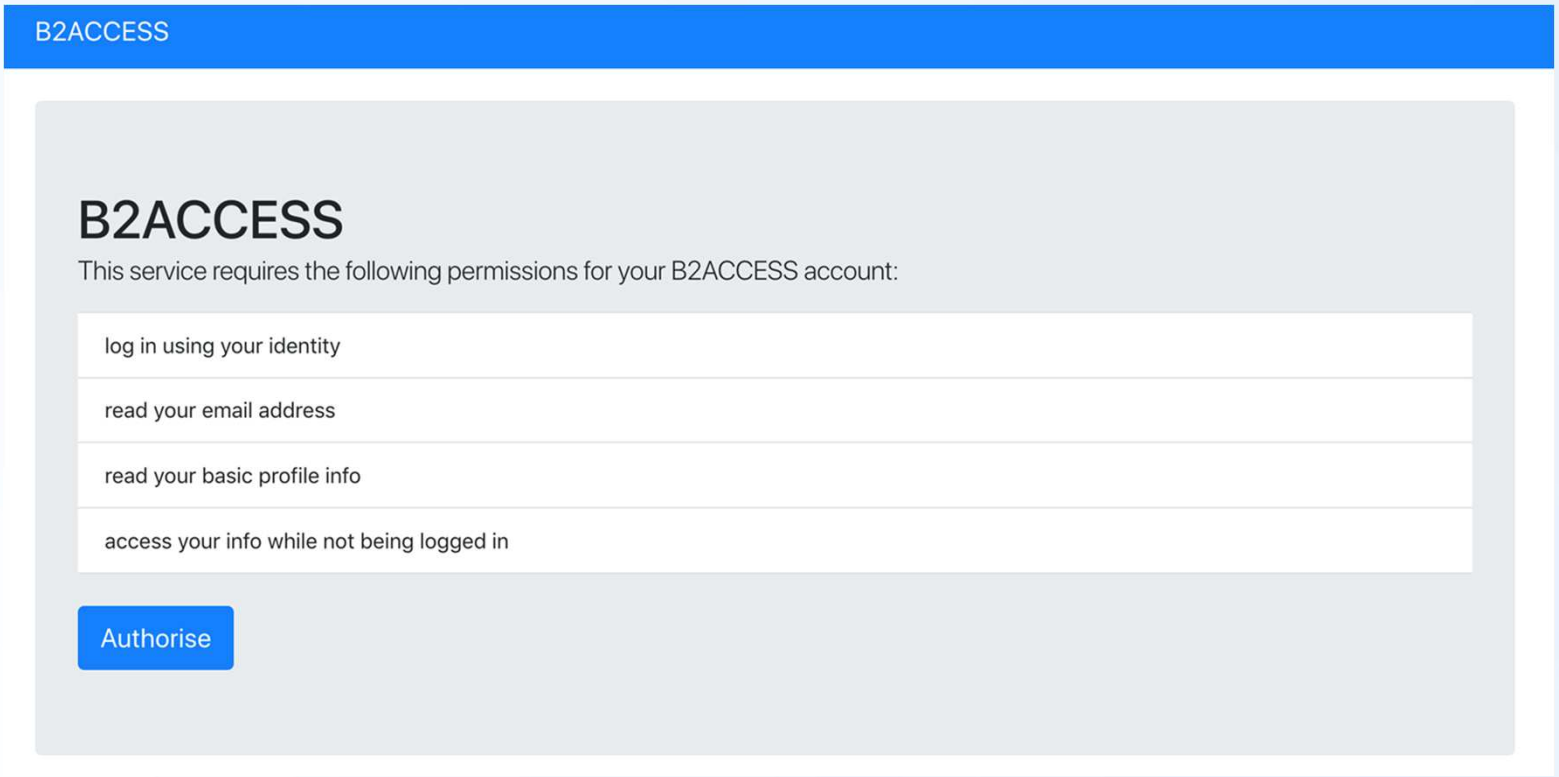
- Marine-ID is an integrated Registration, Authentication and Accounting infrastructure for marine data users (SeaDataNet, EMODNET, …).

Connecting B2ACCESS - Marine-ID

Marine-ID has been registered as an Identity Provider in B2ACCESS allowing users to access Services connected to B2ACCESS using their Marine-ID accounts.

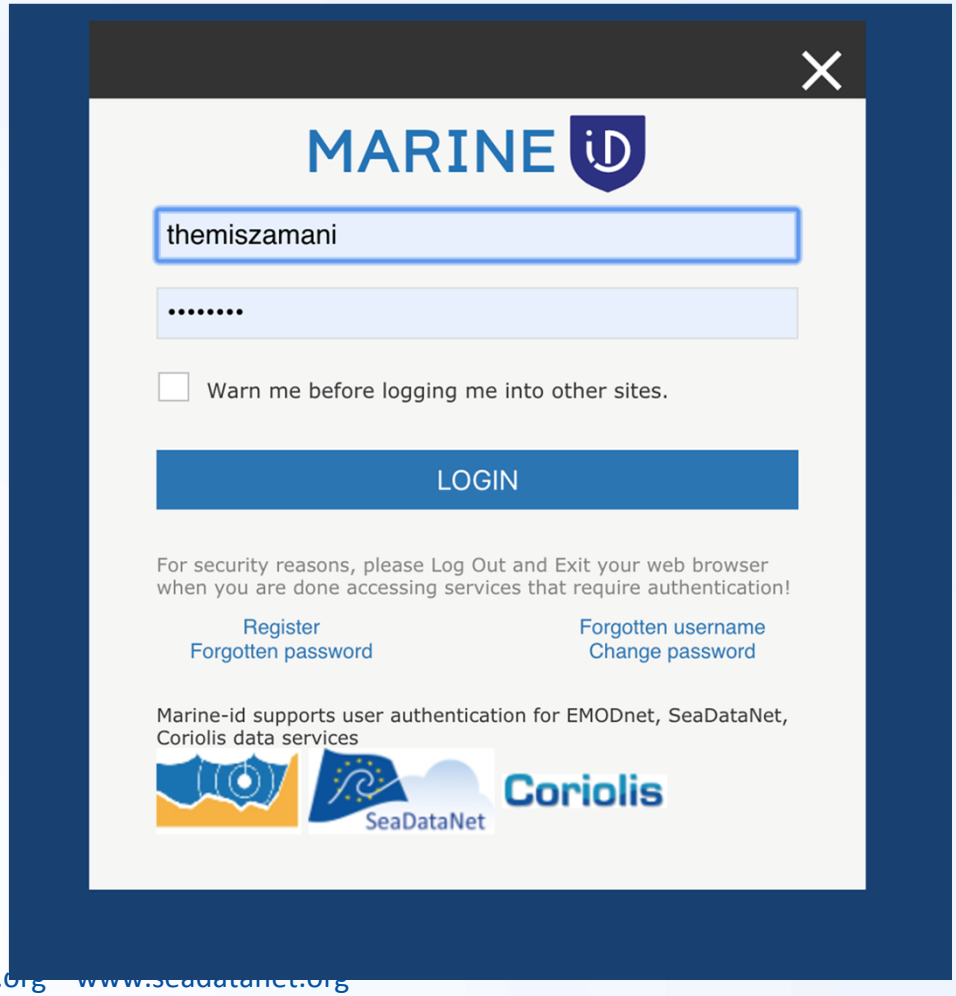


Step 1: Demo page

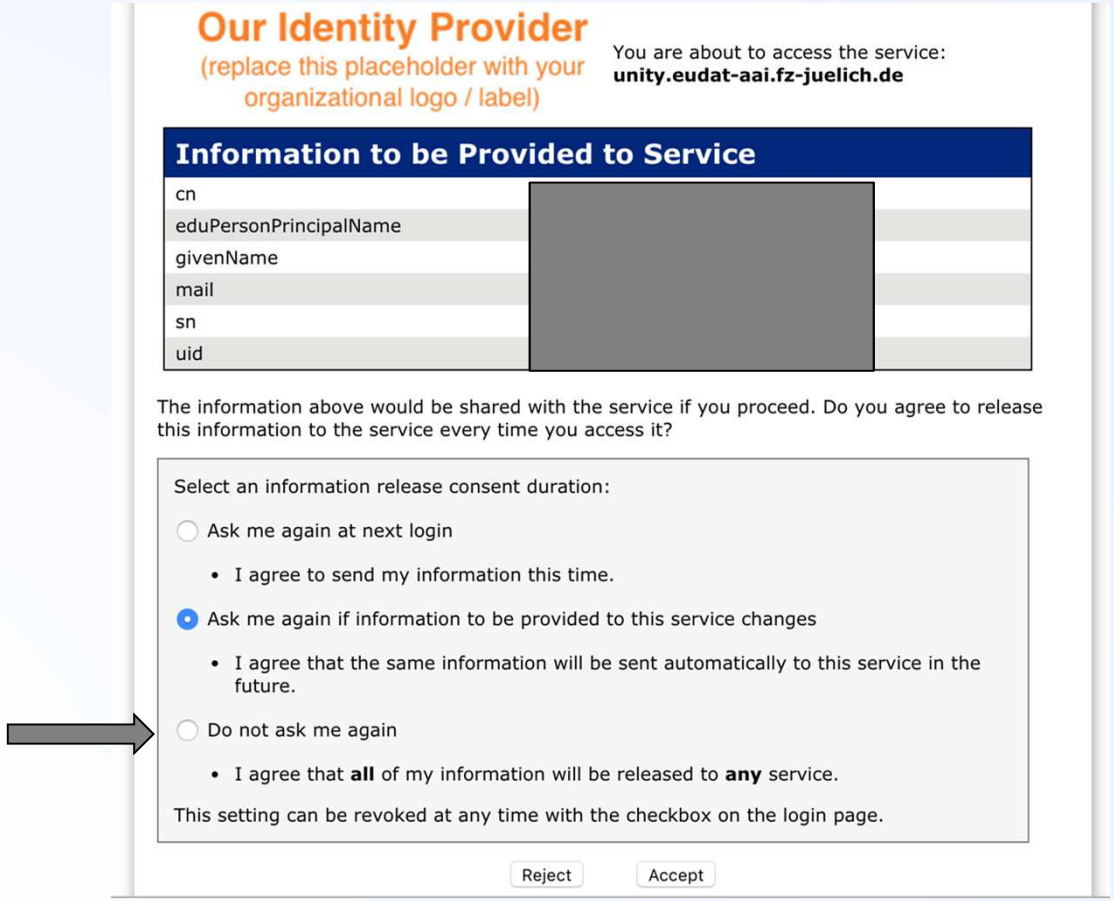


Demo: https://snf-761524.vm.okeanos.grnet.gr/b2access

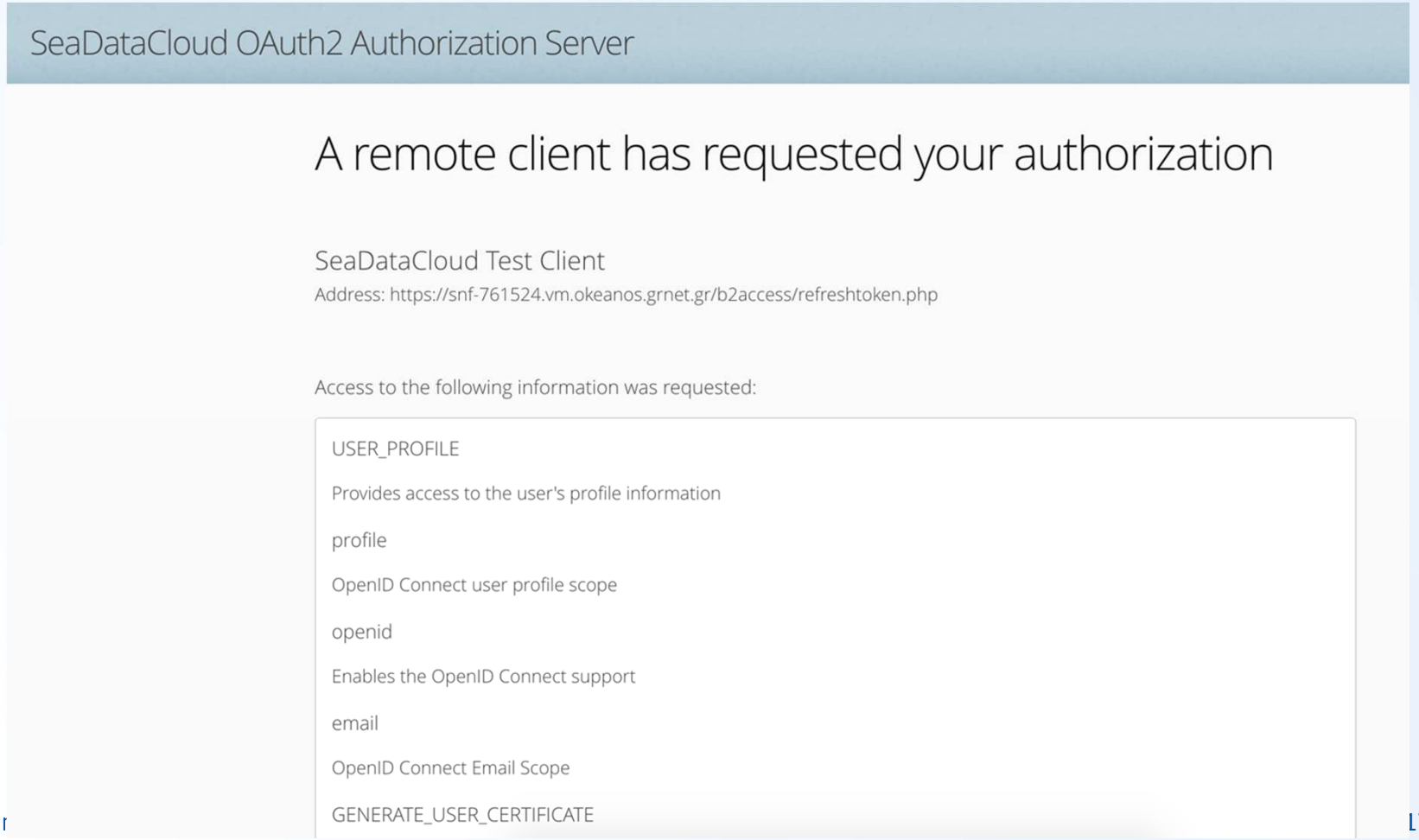
Step 2: Insert Credentials



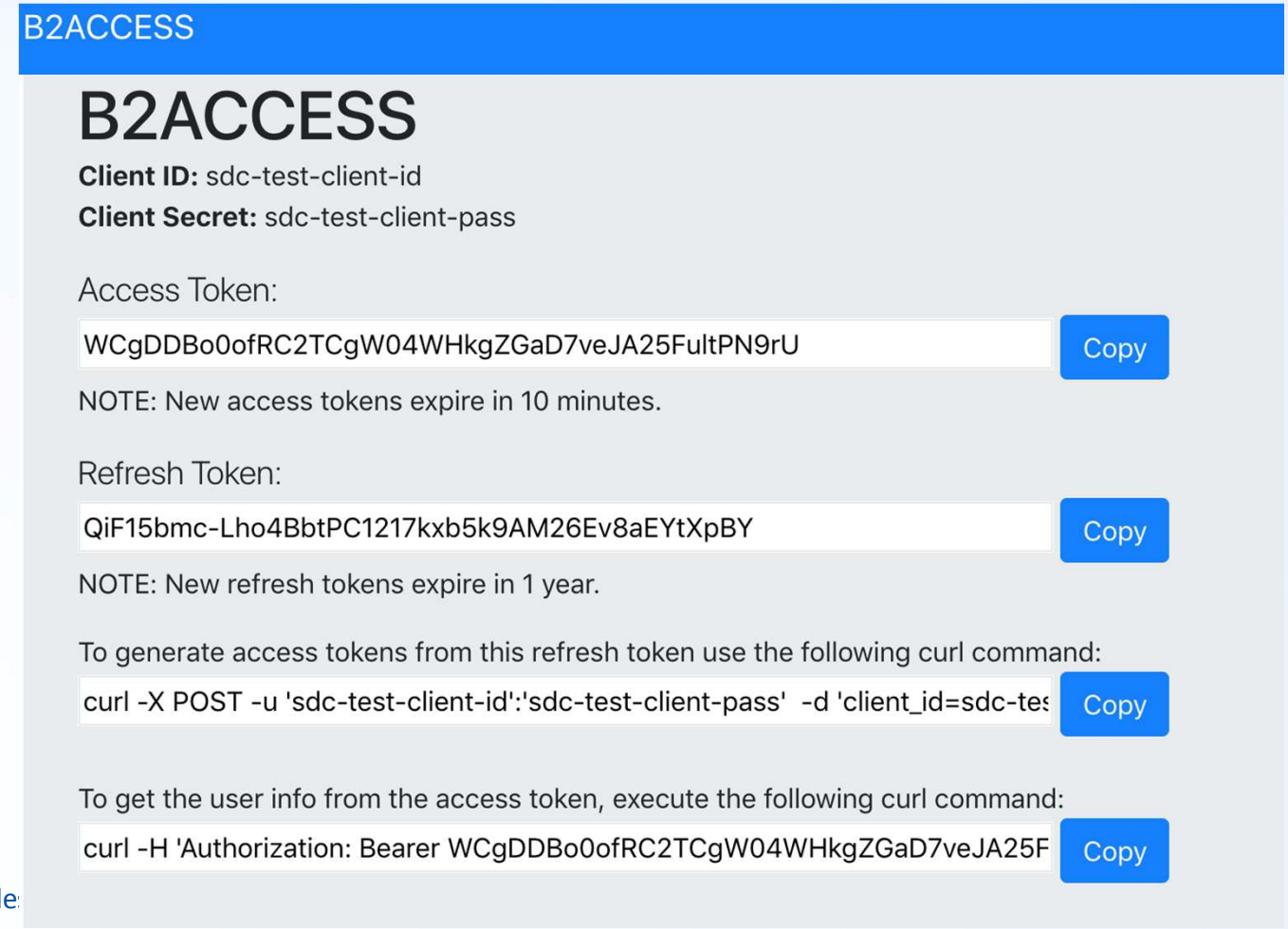
Step 3: Marine-ID Consent Form



Step 4: B2ACCESS Consent form



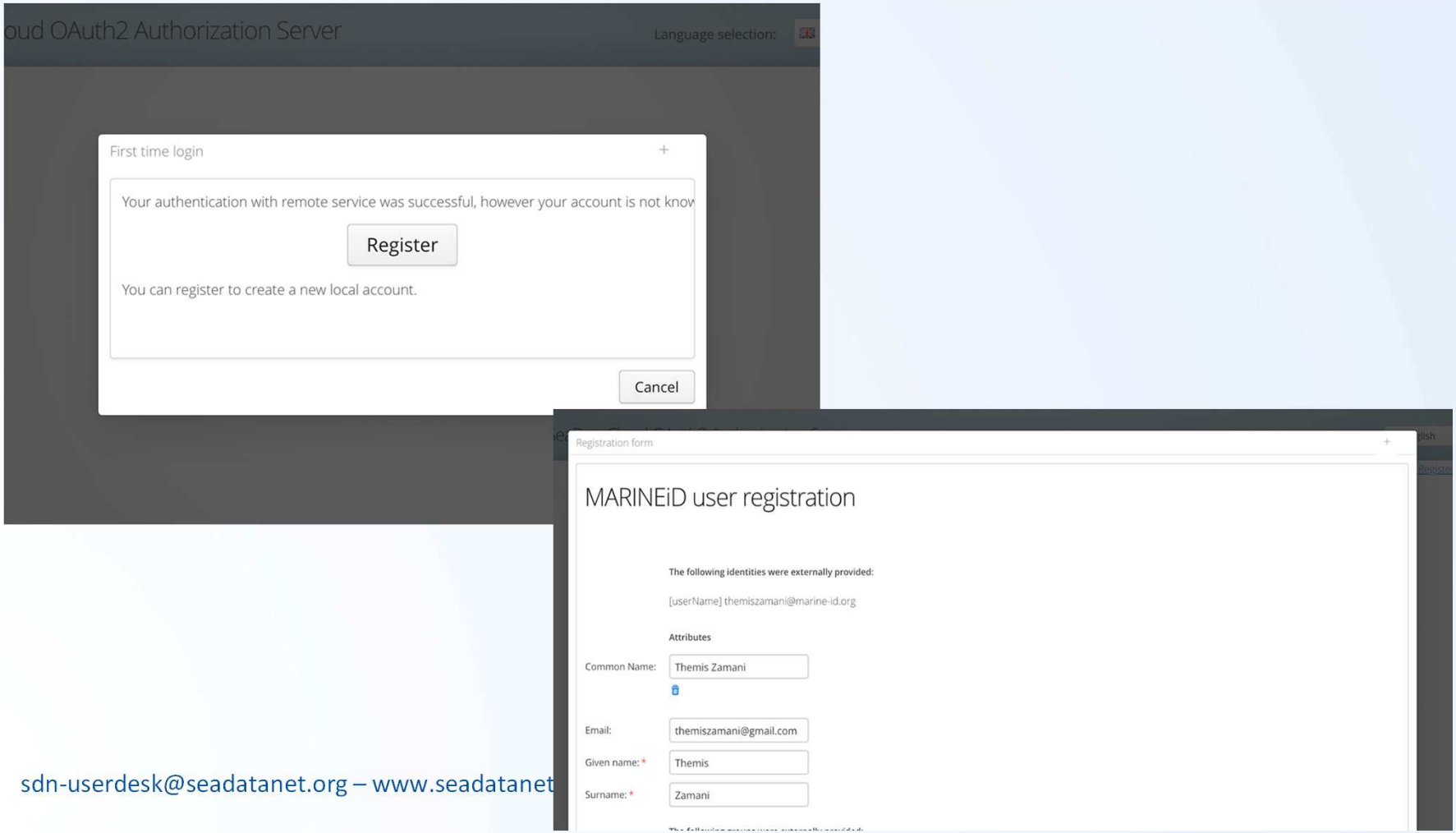
Step 5: Yes you have logged in



Access to SDC web-based services

1. User clicks on the “login” button in the portal of a SeaDataCloud service and he/she is redirected to B2ACCESS.
   - Then B2ACCESS redirects the user automatically to Marine-ID.
2. The user enters his/her credentials.
3. The user is asked to consent the information that Marine-ID is going to release to B2ACCESS.
   - The user is redirected back to B2ACCESS.
4. If the user logins through B2ACCESS for the first time, he/she needs to register to the platform. Otherwise, the user will be asked to consent the information that B2ACCESS is going to release to the SeaDataCloud service.
5. The user is redirected back to the SeaDataCloud service.

Register only the first time



More on WebODV integration - Sebastian

Quality control

video

sdc-vre - Chromium

sdc-vre

seadatacloud/vre

SeaDataNet

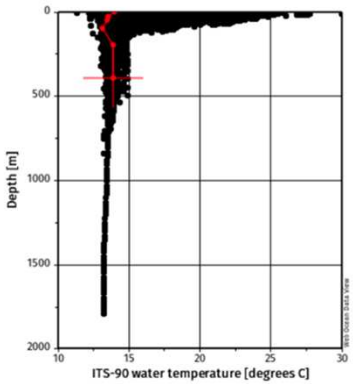
PAN-EUROPEAN INFRASTRUCTURE FOR OCEAN & MARINE DATA MANAGEMENT

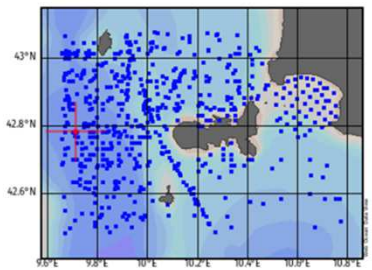
Welcome Test
Change settings

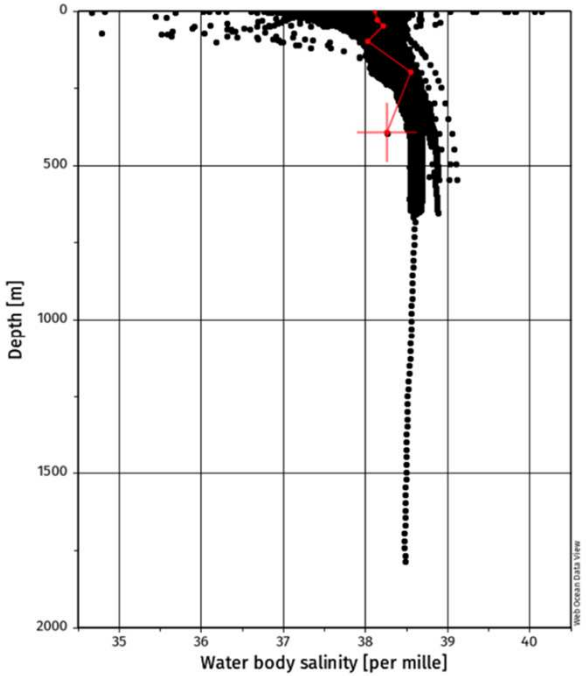
Quality Control Services

← previous | 1. Select data set | 2. QC Editor | 3. Save/Export/Exit | next →

Right click on the data windows or map window to open context menus and choose an options. Apply zoom by double left mouse click or *enter* key if *zoom mode* is active. Cancel *zoom mode* by *ESC* key. To assign a quality flag, right click on the value or flag of the respective variable in the "Sample" table at the bottom right of the page. Use the *arrow buttons* below to navigate from sample to sample within one station. Use double-clicking for larger steps.







Status:

Data set:	VRE/SDN_test_El...
Mouse:	

Station ID: 369

Accession Num...	369
Cruise	EAA2
Station	36950 (B)
Position	9.717° E / 42.783...
Date	25 March 1976
Time	10:05:59
Depth Range [m]	[0.00 - 396.45]
LOCAL_CDI_ID	158829
EDMO_CODE	120

Sample: 6/6

variable	value	flag
1: Depth [...	396.45	1
2: ITS-90 ...	13.88	4
3: Water ...	38.26	4

sdc-vre - Chromium

sdc-vre

seadatacloud/vre

SeaDataNet

PAN-EUROPEAN INFRASTRUCTURE FOR OCEAN & MARINE DATA MANAGEMENT

Welcome Test
Change settings

Data Extractor

← previous | 1. Select stations | 2. Select variables | 3. Download | 4. Exit | next →

Select cruises from the *Cruises menu*. Click *Zoom in* to define a sub-region, *Apply* to select the sub-region, or *Zoom out* to return to global domain. Use the *Required variables* as a station filter.

Selection status

Stations:
Output variables:

Cruises

cruises

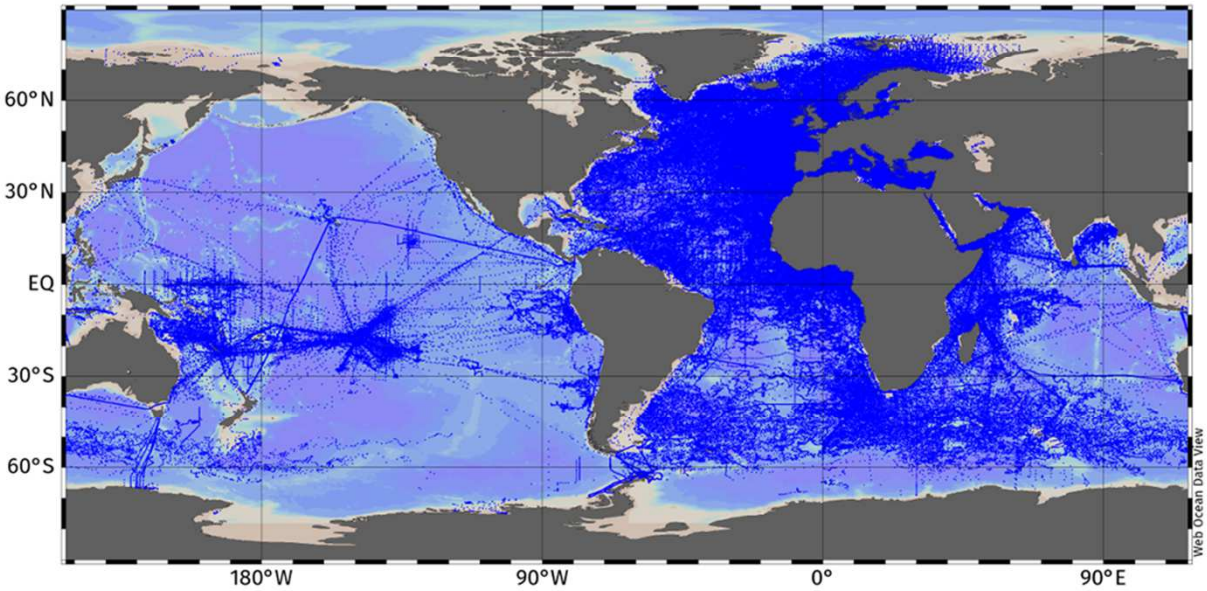
Map domain

Zoom in

Required variables

Nothing selected

Reset



sdc-vre - Chromium

sdc-vre

seadatacloud/vre

SeaDataNet

PAN-EUROPEAN INFRASTRUCTURE FOR OCEAN & MARINE DATA MANAGEMENT

Welcome Test
Change settings

Data Extractor

← previous | 1. Select stations | 2. Select variables | 3. Download | 4. Exit | next →

Select output variables from the *Output variables* treeview.

Selection status

Stations:
Output variables:

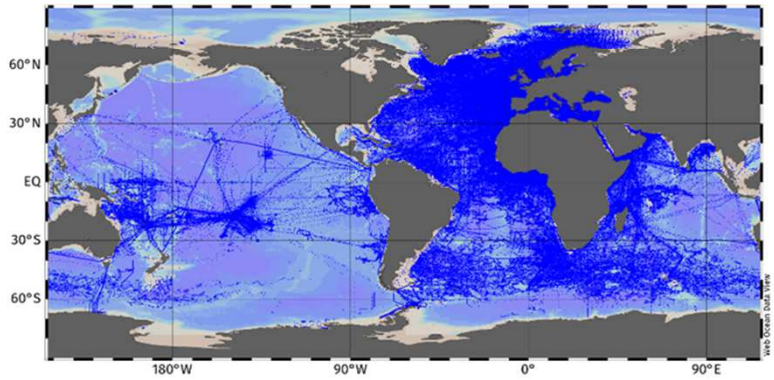
Search

Output variables

- All
  - Depth
  - Temperature
  - Salinity

Collapse

Reset



sdc-vre - Chromium

sdc-vre

seadatacloud/vre

SeaDataNet

PAN-EUROPEAN INFRASTRUCTURE FOR OCEAN & MARINE DATA MANAGEMENT

Welcome Test
Change settings

Data Extractor

← previous | 1. Select stations | 2. Select variables | 3. Download | 4. Exit | next →

Download data in different formats. You will receive a .zip file containing the data in the format of your choice.

Selection status

Stations:
Output variables:

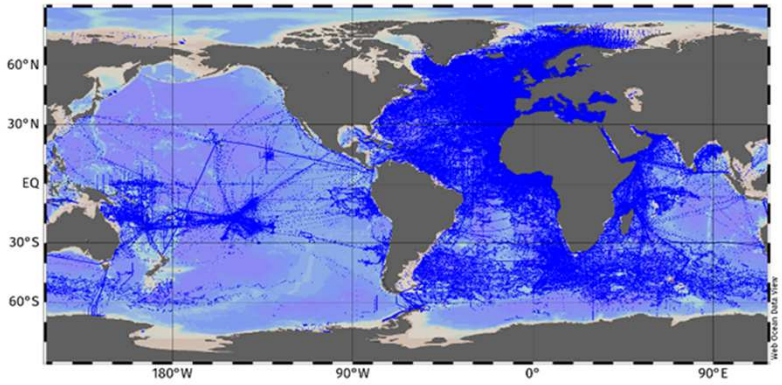
Download

Spreadsheet

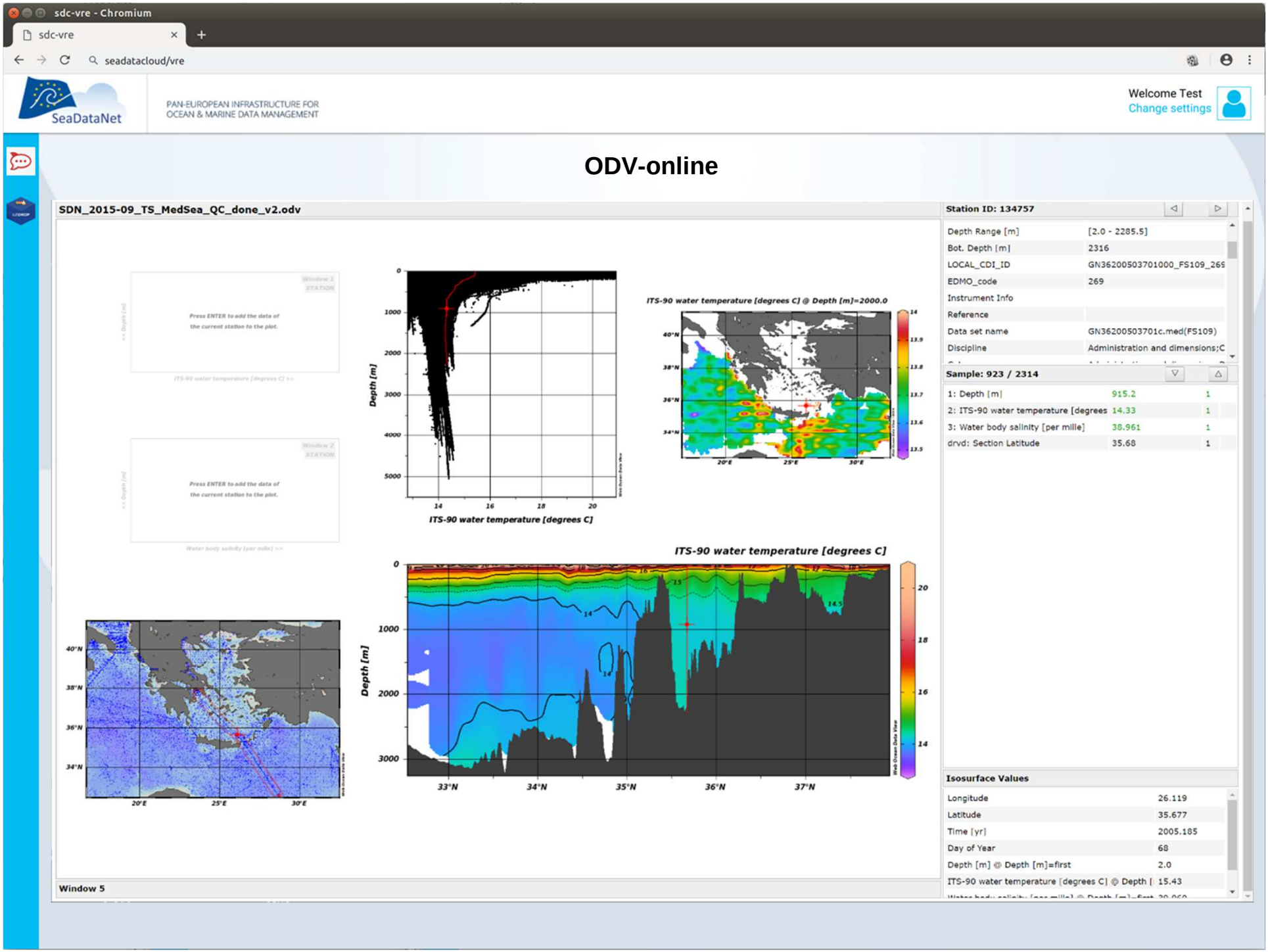
ODV Collection

netCDF

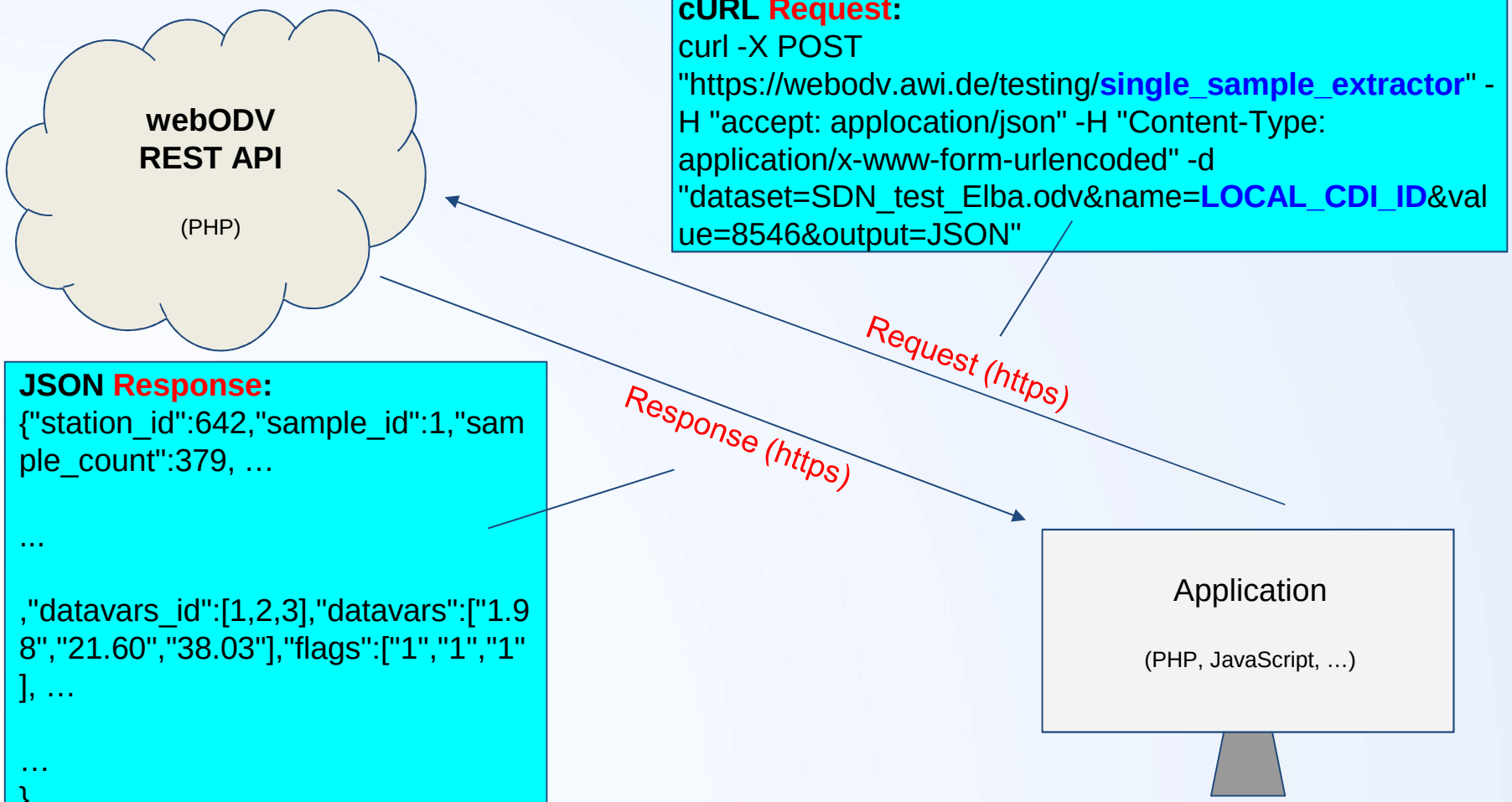
WHP Exchange



ODV-online


sdc-vre - Chromium
sdc-vre
seadatacloud/vre
SeaDataNet
PAN-EUROPEAN INFRASTRUCTURE FOR
OCEAN & MARINE DATA MANAGEMENT
Welcome Test
Change settings
SDN_2015-09_TS_MedSea_QC_done_v2.odv
Press ENTER to add the data of
the current station to the plot.
Depth [m]
ITS-90 water temperature [degrees C]
ITS-90 water temperature [degrees C] @ Depth [m]=2000.0
ITS-90 water temperature [degrees C]
Station ID: 134757
Depth Range [m] [2.0 - 2285.5]
Bot. Depth [m] 2316
LOCAL_CDI_ID GN36200503701000_FS109_269
EDMO_code 269
Instrument Info
Reference
Data set name GN36200503701c.med(FS109)
Discipline Administration and dimensions;C
Sample: 923 / 2314
1: Depth [m] 915.2 1
2: ITS-90 water temperature [degrees 14.33 1
3: Water body salinity [per mille] 38.961 1
drvd: Section Latitude 35.68 1
Isosurface Values
Longitude 26.119
Latitude 35.677
Time [yr] 2005.185
Day of Year 68
Depth [m] @ Depth [m]=first 2.0
ITS-90 water temperature [degrees C] @ Depth [15.43
Window 5

REST API -- for developers (us) and advanced users



SeaDataCloud

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

Client

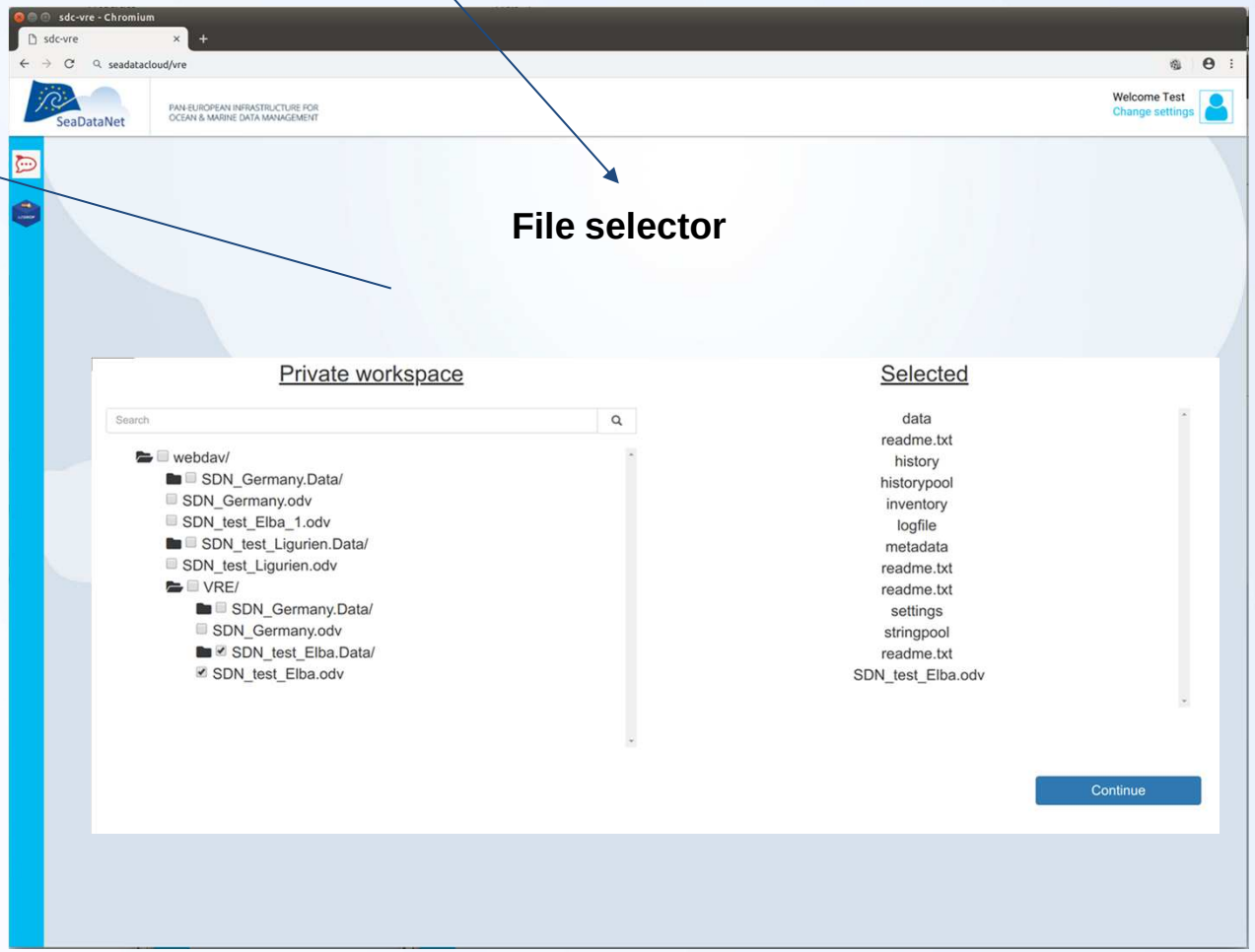
File selector Service (API)

docker

WebDAV

B2DROP

File selector



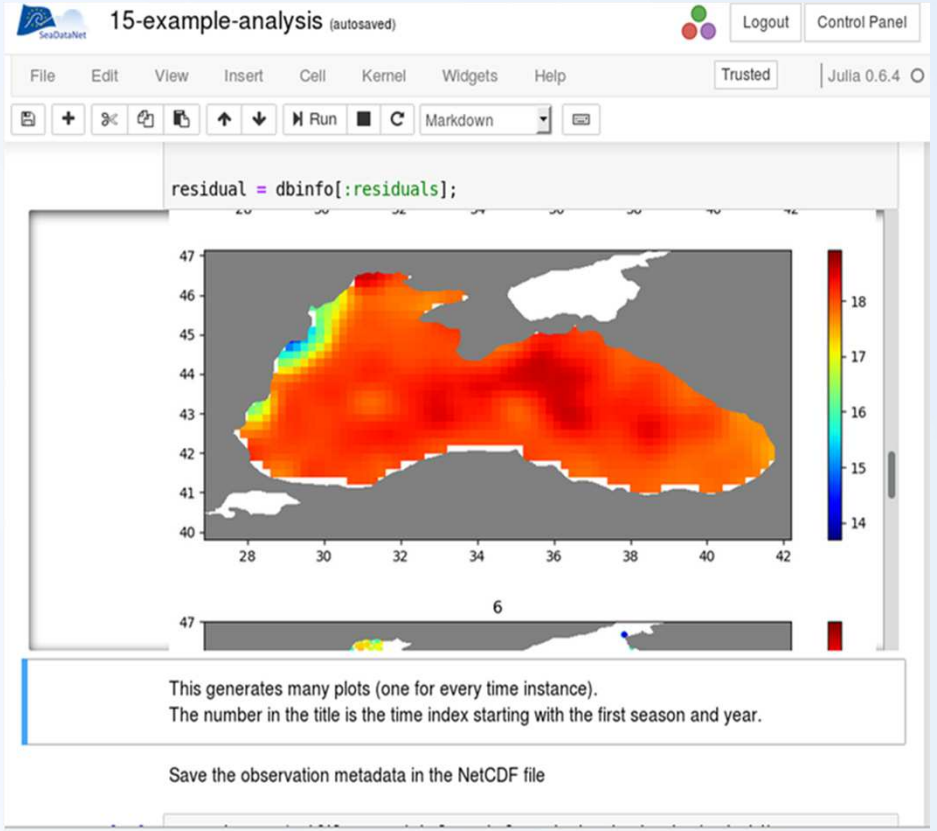
More on DIVA integration - Alexander, Charles

DIVAnd in Jupyter notebooks

- Jupyter notebooks are integrated web environment
  - Computing
  - Visualization
  - Documentation of code
- DIVAnd extension of DIVA in more than 2 dimensions
- DIVAnd distributed as a Julia package installed into Docker containers

DIVAnd in Jupyter notebooks

- Loading bathymetry (GEBCO, EMODnet)
- Data formats (ODV spreadsheets, netCDF, mat files etc.)
- Support for databases like:
  World Ocean Database
  CMEMS INSTAC
- Check for duplicates
- Automated quality checks
- Parameter optimisation
- Error field computation
- Plot results and data
- Generate XML for catalog



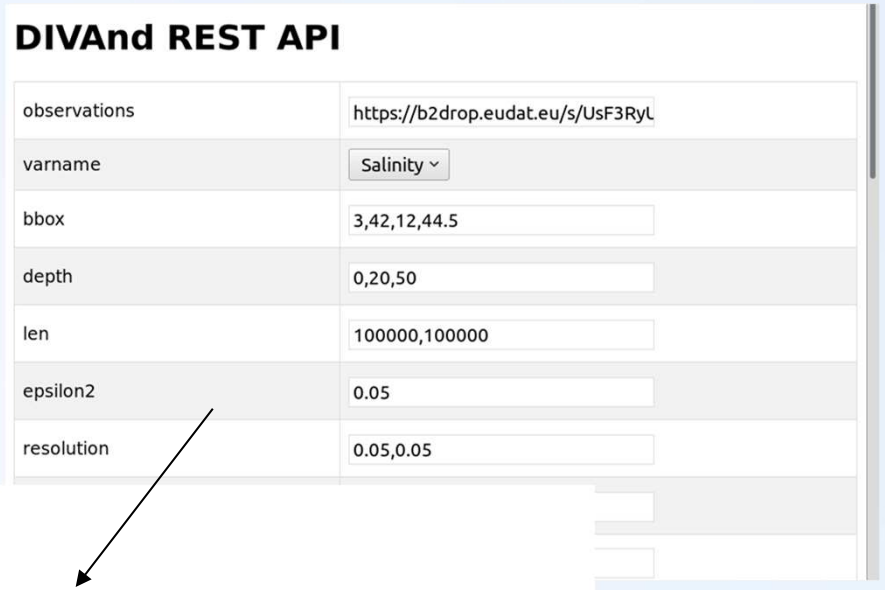
[Full example notebook]

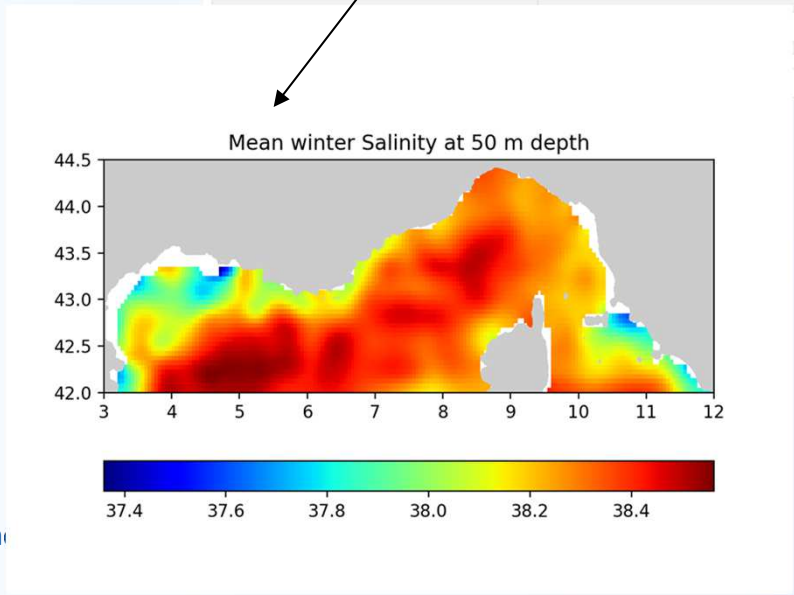
Integrations with SeaDataCloud services

- Querying the vocabulary service
- Querying the EDMO database
- XML files for Sextant
- Extracting data from the ODV REST API
- Embbed additional metadata for a given observation based on EDMO code and local CDI id from jupyter notebook

REST API of DIVAnd

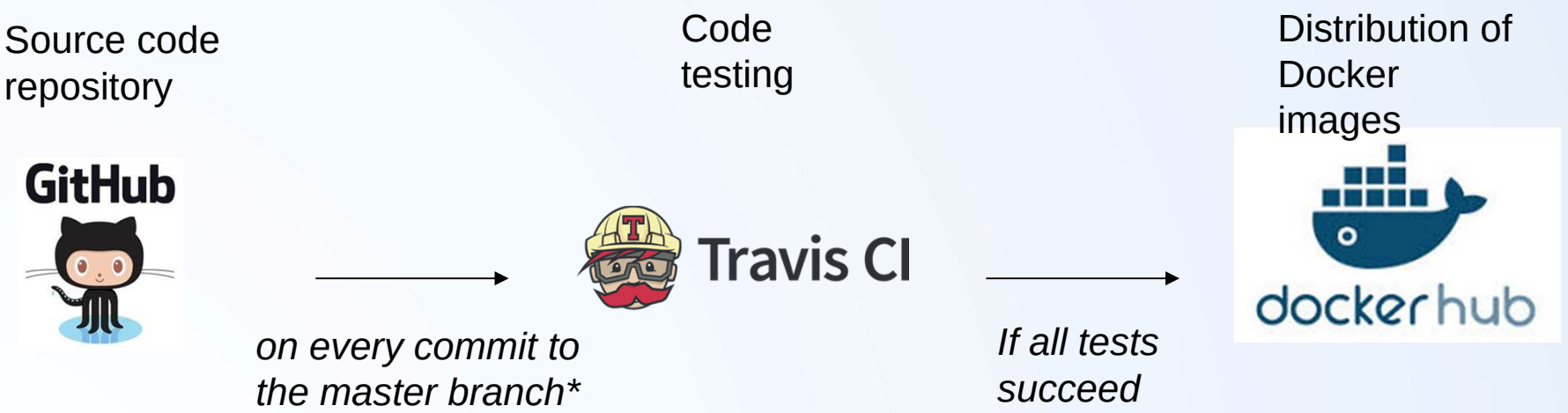
- User provides the URL of the data set (netCDF format)
- Provide analysis parameters and metadata
- Download the final analysis





Deployment-Pipeline

- Pipeline of the Docker images for the
  - Jupyter notebook
  - REST API

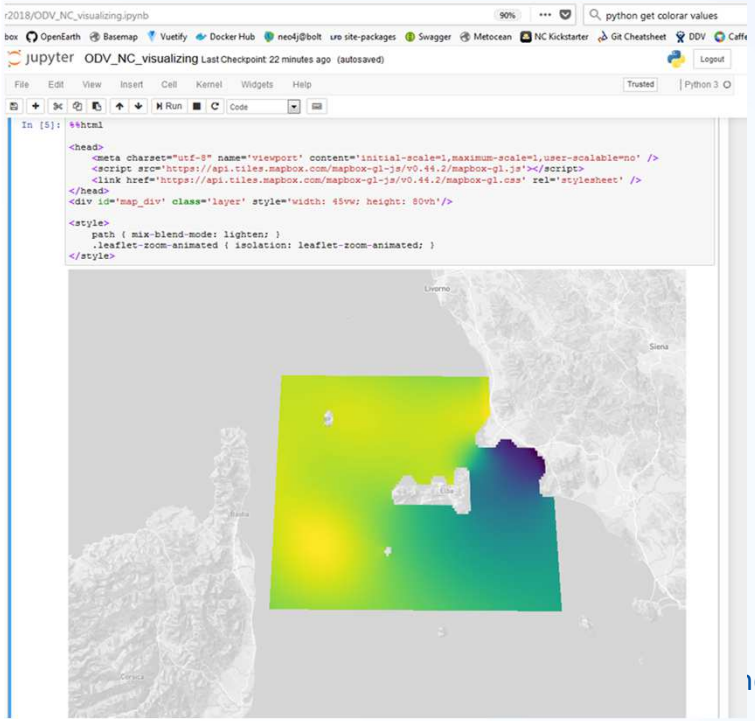


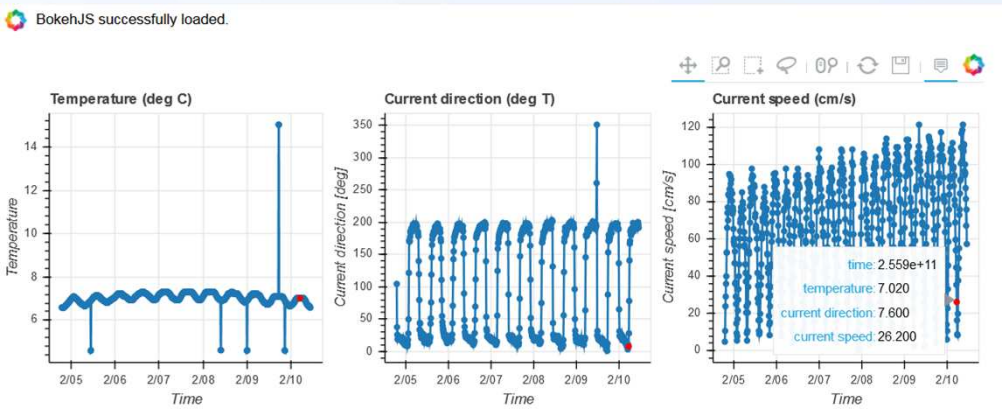
*Only fully implemented features are merged into the master branch

Biological QC – Simon

Additional visualisation – Giorgio

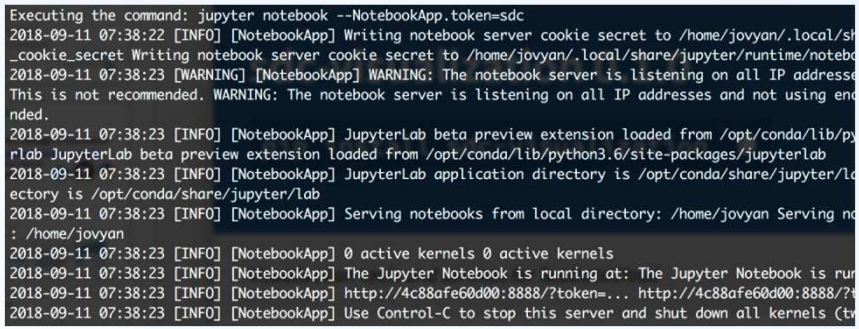
- Containers, Notebooks, Package, Visualization
- **Docker**file https://github.com/openearth/sdc-visualization
- Data type. NetCDF / tarfile from **B2DROP**
- Logging, **import sdc_visualization**

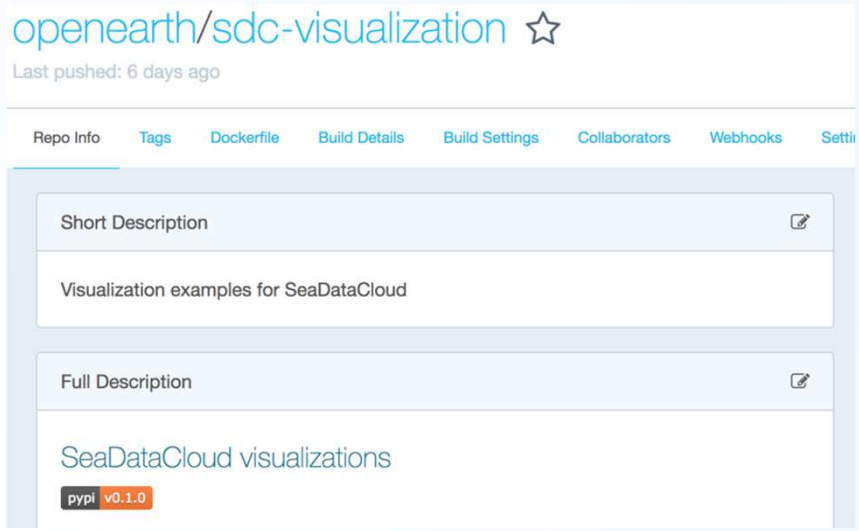




ıet.org

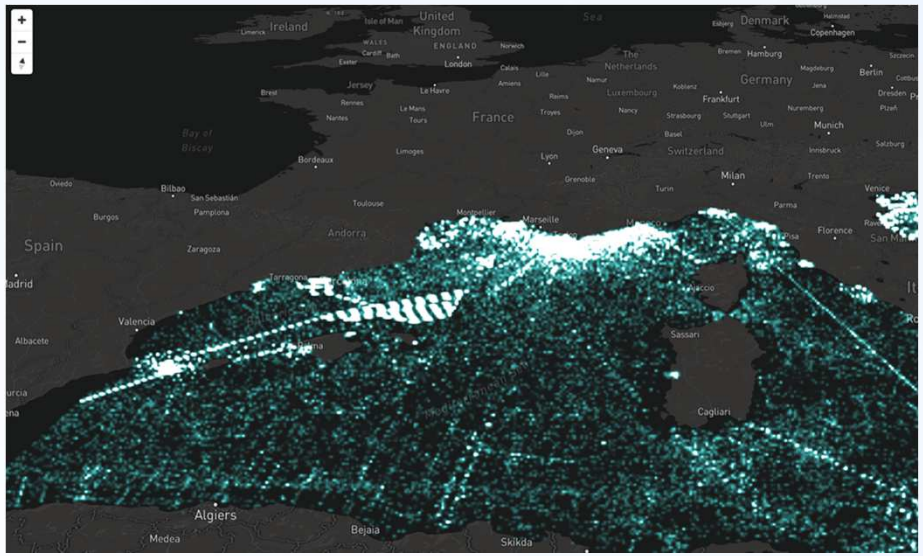
Docker image updates

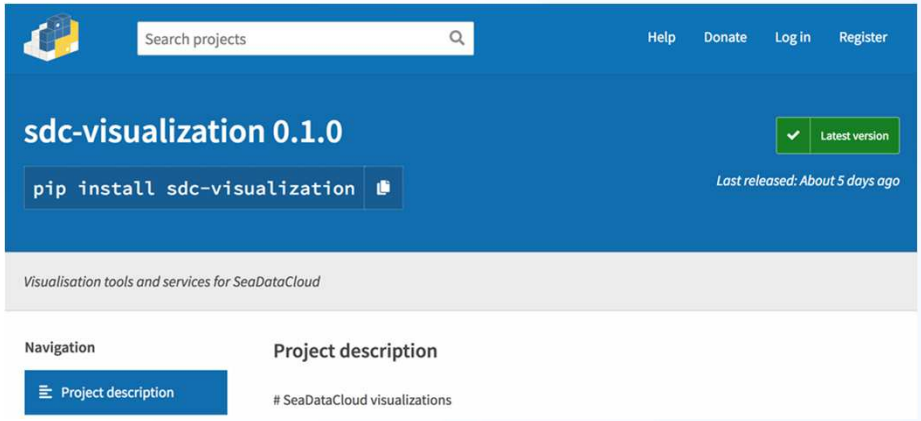




- Custom logging format (both for notebooks and python code)
- Updates published to hub.docker.com/openearth/sdc-visualization
- Closer follows docker guidelines
- Some help needed with limiting restrictions needed (--privileged --cap-add SYS_ADMIN –device)

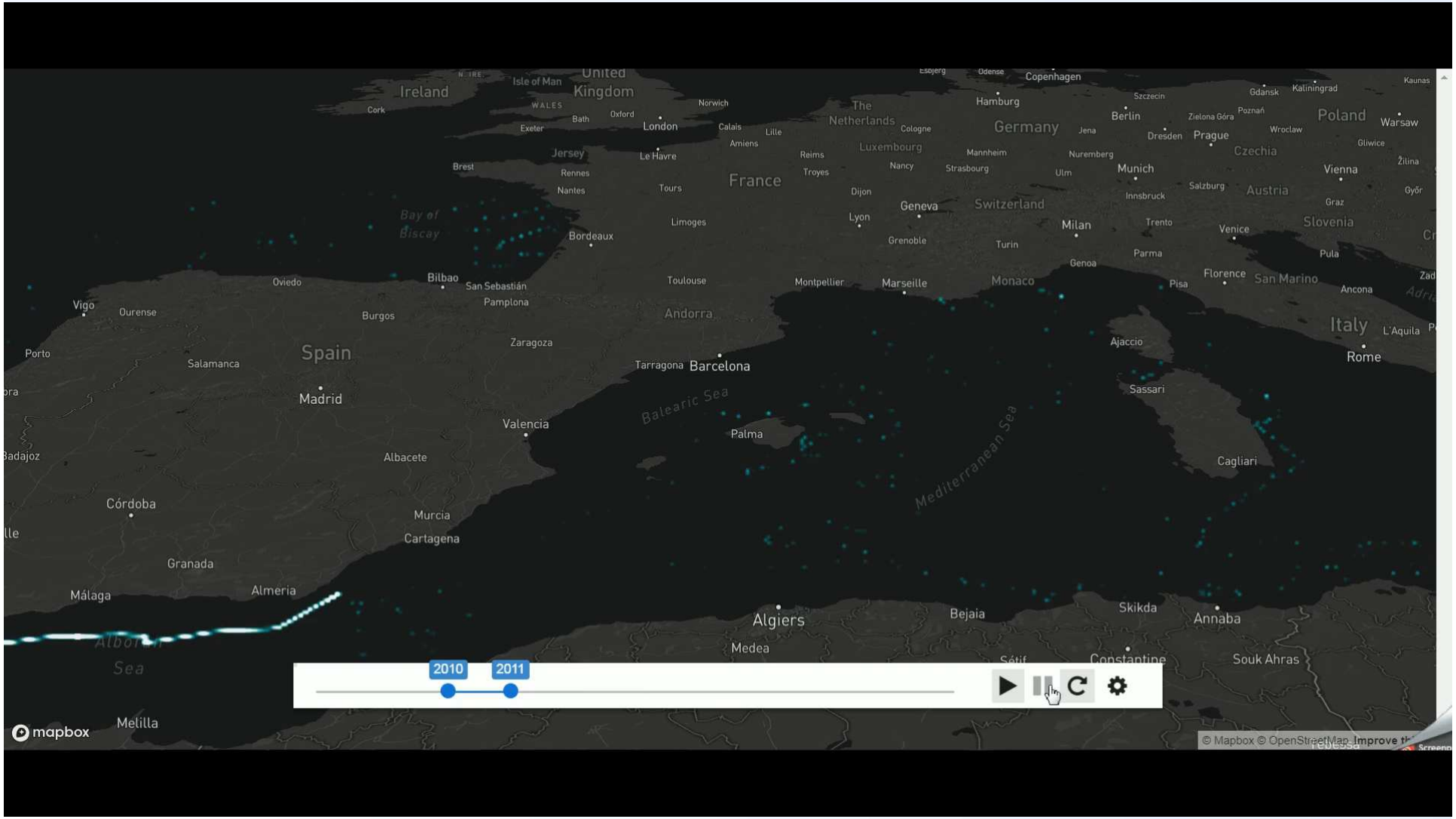
Mapbox application



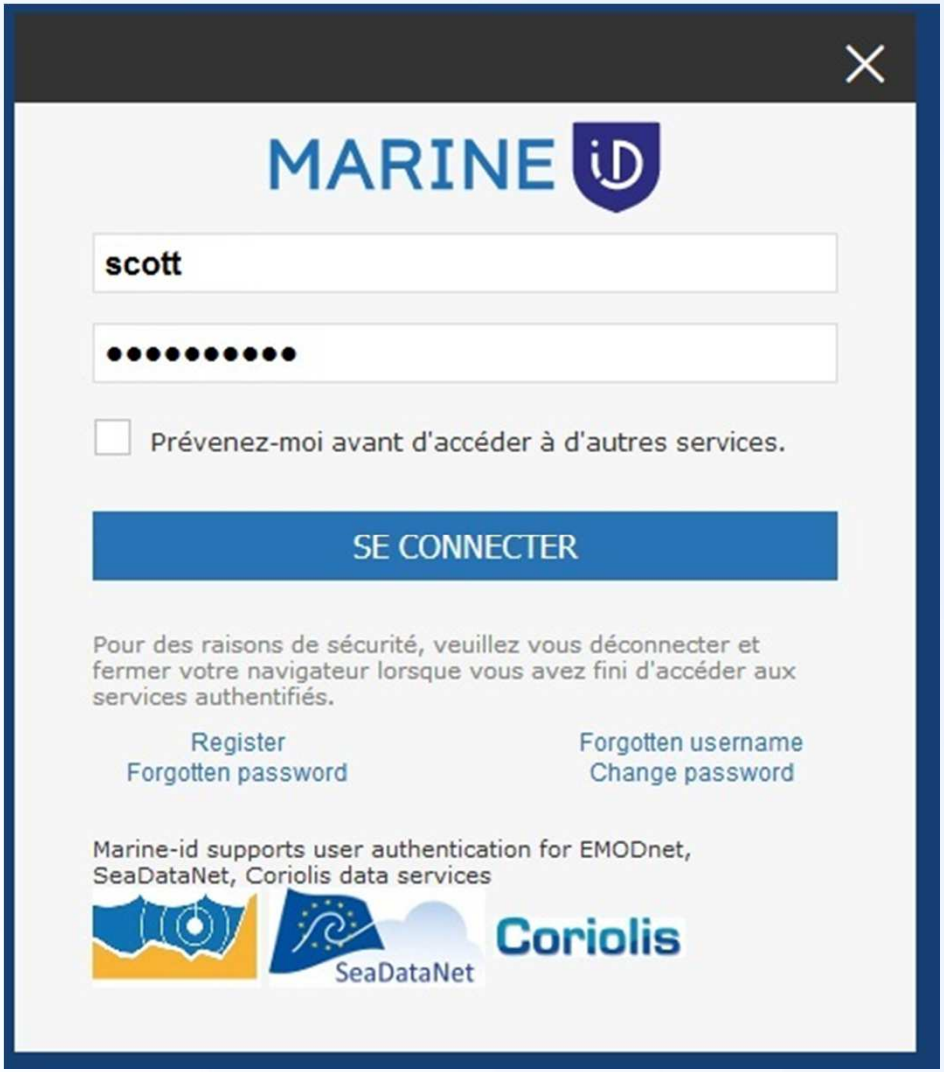


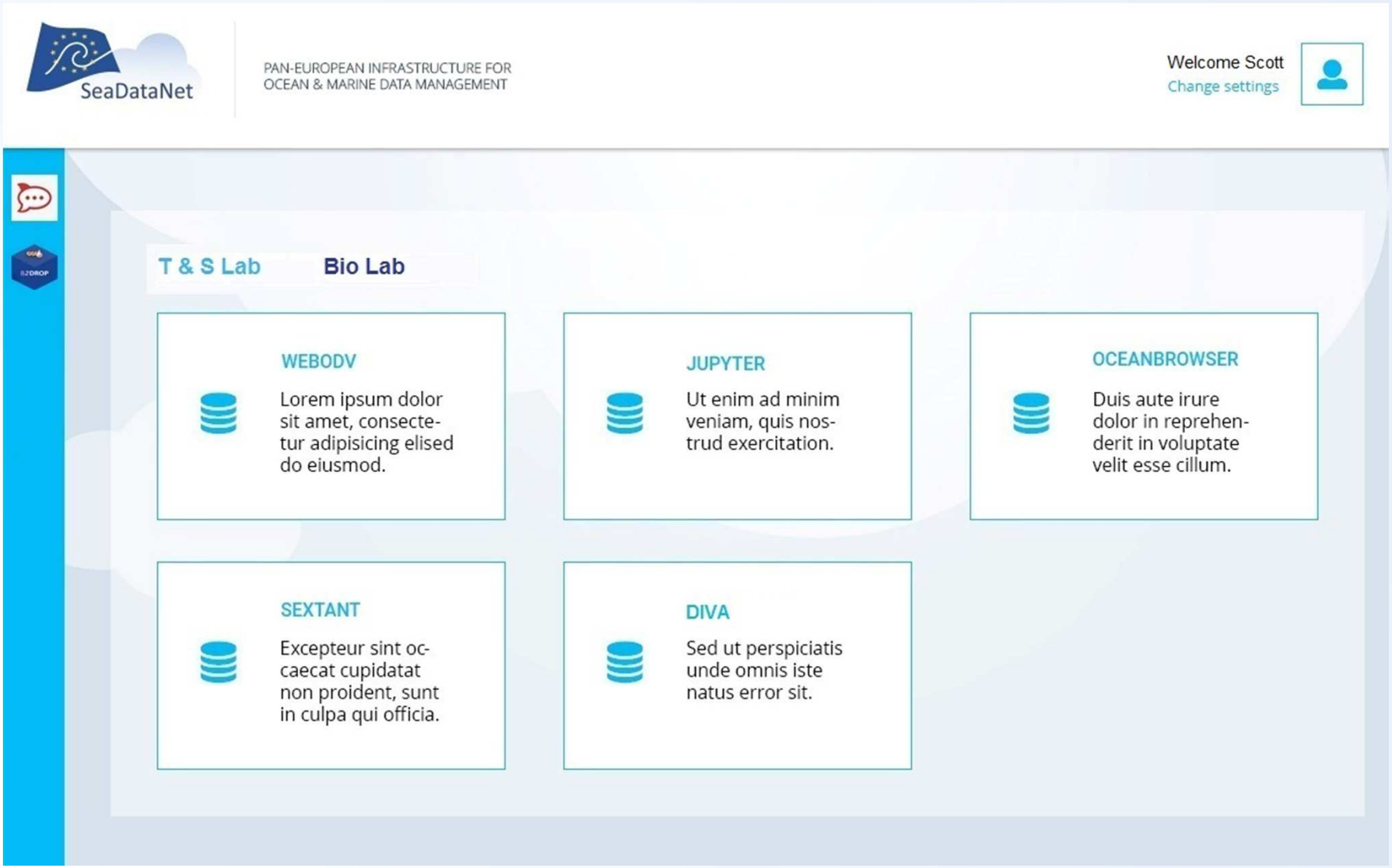
- Interactive API
- Code is available @ hub.docker.com/openearth/sdc-visualization
- Reads NetCDF and subset based on time
- Some help needed with limiting restrictions (--privileged --cap-add SYS_ADMIN –device)

Movie example

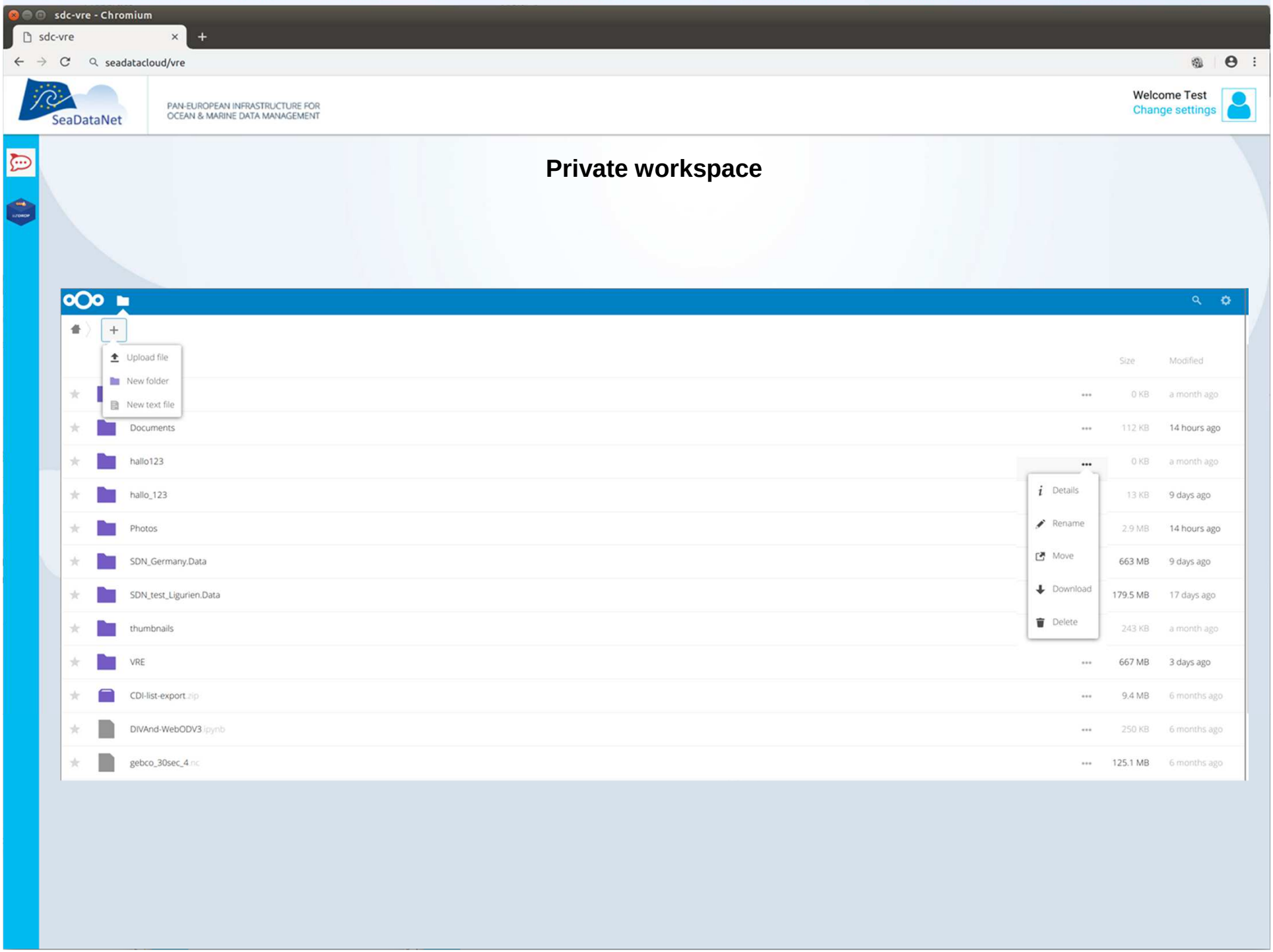


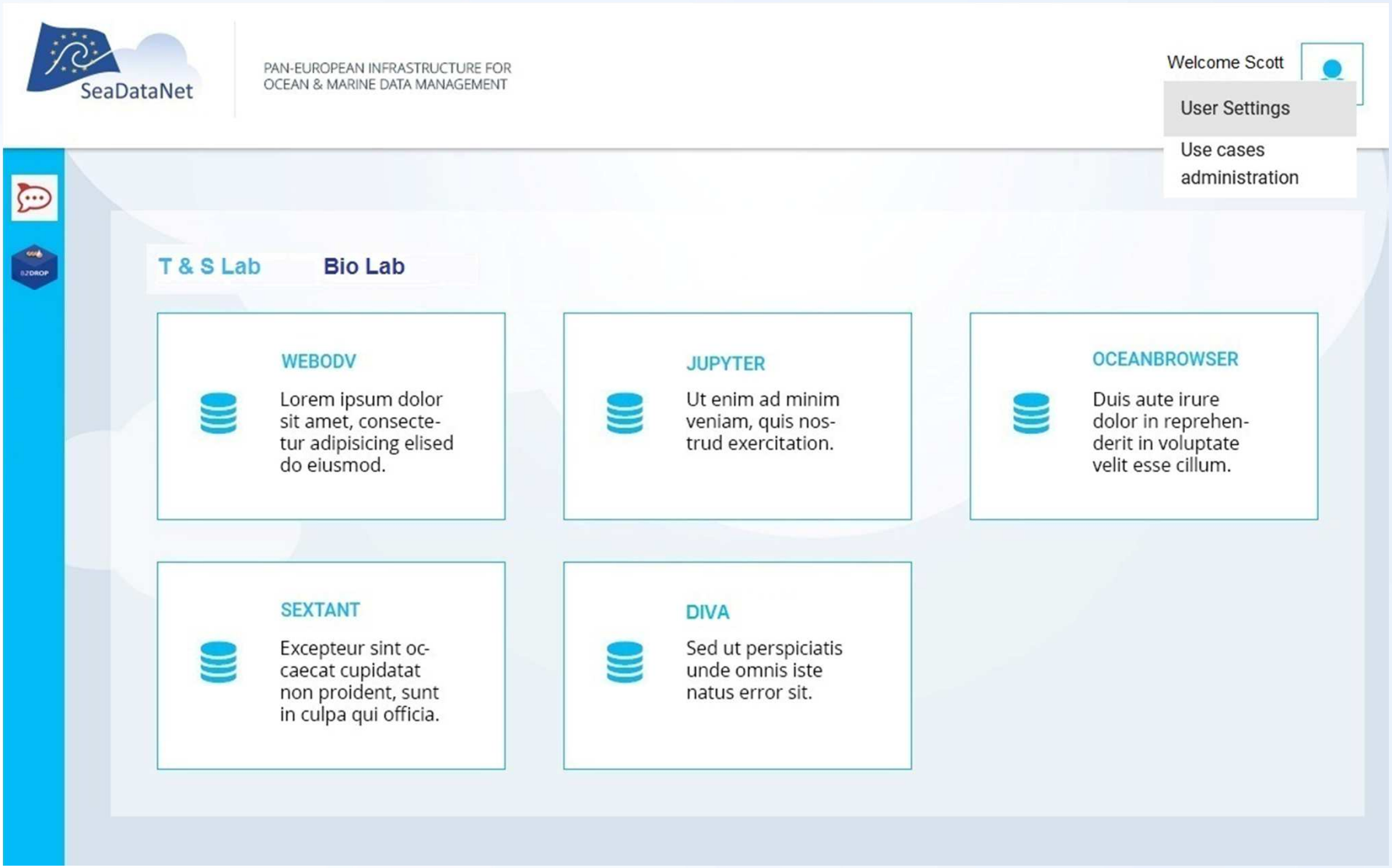
Integration layer mockups (UI) - Peter


MARINE
scott
Prévenez-moi avant d'accéder à d'autres services.
SE CONNECTER
Pour des raisons de sécurité, veuillez vous déconnecter et fermer votre navigateur lorsque vous avez fini d'accéder aux services authentifiés.
Register
Forgotten password
Forgotten username
Change password
Marine-id supports user authentication for EMODnet, SeaDataNet, Coriolis data services
SeaDataNet
Coriolis


SeaDataNet
PAN-EUROPEAN INFRASTRUCTURE FOR
OCEAN & MARINE DATA MANAGEMENT
Welcome Scott
Change settings
T & S Lab
Bio Lab
WEBODV
Lorem ipsum dolor sit amet, consecte-tur adipisicing elised do eiusmod.
JUPYTER
Ut enim ad minim veniam, quis nos-trud exercitation.
OCEANBROWSER
Duis aute irure dolor in reprehen-derit in voluptate velit esse cillum.
SEXTANT
Excepteur sint oc-caecat cupidatat non proident, sunt in culpa qui officia.
DIVA
Sed ut perspiciatis unde omnis iste natus error sit.


SeaDataNet
PAN-EUROPEAN INFRASTRUCTURE FOR
OCEAN & MARINE DATA MANAGEMENT
Welcome Scott
Change settings
MESSAGING
FILE SYSTEM
Bio Lab
WEBODV
Lorem ipsum dolor sit amet, consecte-tur adipisicing elised do eiusmod.
JUPYTER
Ut enim ad minim veniam, quis nos-trud exercitation.
OCEANBROWSER
Duis aute irure dolor in reprehen-derit in voluptate velit esse cillum.
SEXTANT
Excepteur sint oc-caecat cupidatat non proident, sunt in culpa qui officia.
DIVA
Sed ut perspiciatis unde omnis iste natus error sit.


sdc-vre - Chromium
sdc-vre
seadatacloud/vre
SeaDataNet
PAN-EUROPEAN INFRASTRUCTURE FOR
OCEAN & MARINE DATA MANAGEMENT
Welcome Test
Change settings
Private workspace
Upload file
New folder
New text file
Size
Modified
Documents
112 KB
14 hours ago
hallo123
0 KB
a month ago
hallo_123
13 KB
9 days ago
Photos
2.9 MB
14 hours ago
SDN_Germany.Data
663 MB
9 days ago
SDN_test_Ligurien.Data
179.5 MB
17 days ago
thumbnails
243 KB
a month ago
VRE
667 MB
3 days ago
CDI-list-export.zip
9.4 MB
6 months ago
DIVAnd-WebODV3.ipynb
250 KB
6 months ago
gebco_30sec_4.nc
125.1 MB
6 months ago
Details
Rename
Move
Download
Delete


SeaDataNet
PAN-EUROPEAN INFRASTRUCTURE FOR
OCEAN & MARINE DATA MANAGEMENT
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3. VRE deadlines and deliverables

SeaDataCloud

Where are we now?

- Development kick-off At Deltares
- Virtual code sprint in June 2018
- Physical workshops in Sopot and Helsinki
- Currently in third development cycle of 4 months (Nov 2018 - Feb 2019)
- Two weekly telco's / trello boards with actions
- Currently in integration phase:
  - Many concepts already tested
  - Basic functions working in the cloud
  - Now development of dashboard for first user group

Project month	Component	remark
PM12	VRE specification document	This document
PM15	Start actual developments VRE	Kickoff to be decided
PM18	**D10.3: Specification of sub-setting application and development plan**	**Led by IFREMER**
PM18	**D10.5: Specification of Ocean Data View online and development plan**	**Led by AWI**
PM18	**D10.7: Specification of DIVA online and development plan**	**Led by ULiege**
PM18	**D10.9: Specification of Biology Data QC online and development plan**	**Led by VLIZ**
PM18	**D10.13: Specification of visualisation services and development plan**	**Led by Deltares**
PM18	**D10.19: Specification of MySeaDataCloud and development plan**	**Led by EUDAT**
PM24	D10.10: Phase 1 of Biology Data QC online operational	Led by VLIZ
PM24	D10.17: Specification of SOS viewing services and development plan	Led by 52N
PM26	D10.15: Specification of Oceanotron services and development plan	Led by IFREMER
PM30	*D10.2 First version Virtual Research Environment (VRE) in the cloud operational*	*For internal users, related to selected use cases*
PM30	*D10.4: Sub-setting application operational in VRE*	*Led by IFREMER*
PM30	*D10.6: Ocean Data View online operational in VRE*	*Led by AWI*
PM30	*D10.8: DIVA online operational in VRE*	*Led by ULiege*
PM30	*D10.14: Visualisation services operational in VRE*	*Led by Deltares*
PM30	D10.20: MySeaDataCloud operational	Led by EUDAT
PM31	D10.18: SOS viewing services for data streams operational	Led by 52N
PM36	D10.11: Phase 2 of Biology Data QC online operational	Led by VLIZ
PM40	D10.16: Upgraded Oceanotron services operational for SeaDataNet WP11 data products	Led by IFREMER
PM42	D10.12: Phase 3 of Biology Data QC online operational	Led by VLIZ
PM42	VRE operational for internal (and some public?) users	New: No official deliverable

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Questions, or suggestions?