



FRM4SOC-2 Hands—on workshop

Work package 2:
Ocean colour database OCDB

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Ocean colour in situ measurement database (OCDB) - Practical demonstrations

OCDB, besides FidRadDB and CP, is the third component of FRMOCnet.

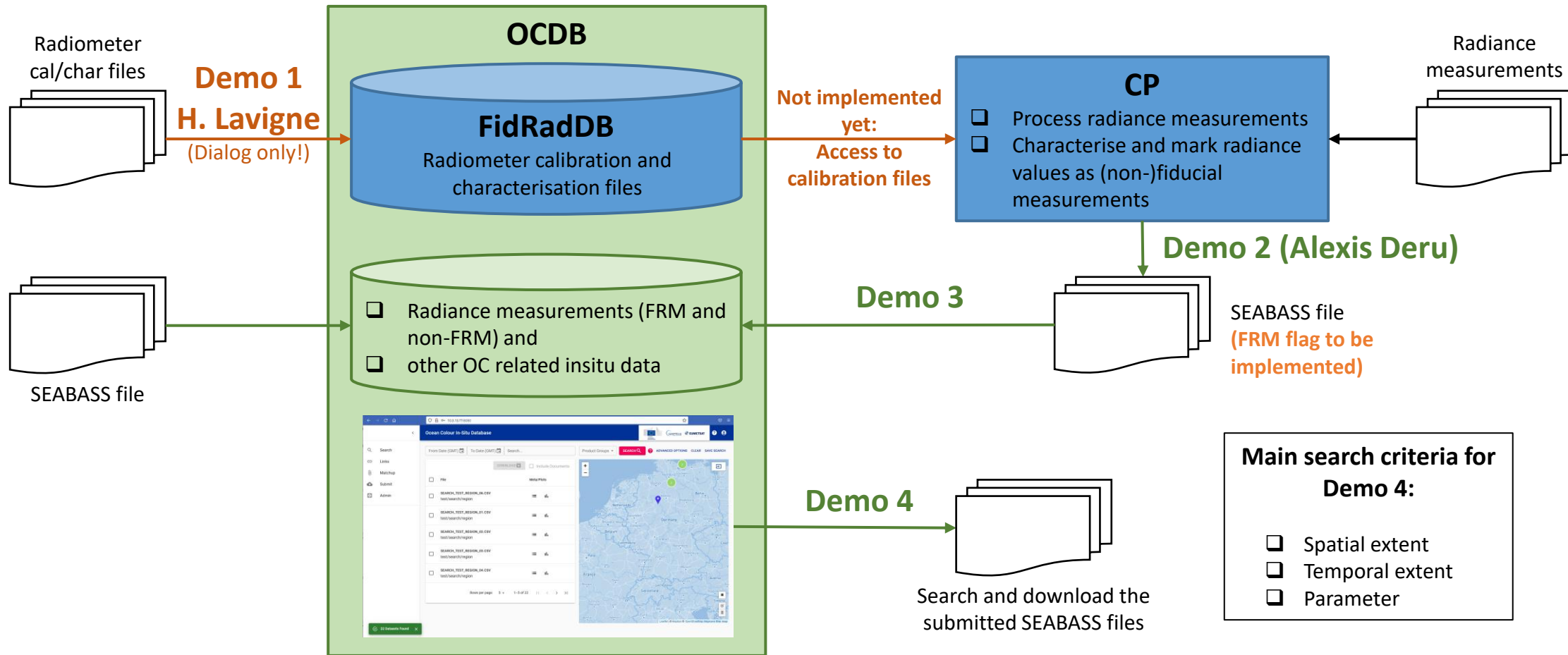
It stores in situ measurement data, which are directly or indirectly related to ocean colour. The OCDB web application (ocdb.eumetsat.int) provides a user interface to download the data (left) as well as a user interface to submit (upload) in situ data (right):

The screenshot shows the 'Ocean Colour In-Situ Database' interface. It features a search bar with 'From Date (GMT)' and 'To Date (GMT)' filters, and a 'SEARCH' button. Below the search bar is a map of Europe with a location pin over Germany. To the left of the map is a list of files for download, including 'SEARCH_TEST_REGION_06.CSV' and 'SEARCH_TEST_REGION_01.CSV'.

The screenshot shows the 'Ocean Colour In-Situ Database' interface for submitting data. It features a table of submissions with columns for Submission ID, Submitter, Submission Date, Publication Date, Publication Allowed, Status, and Actions. The table contains several rows of test data with various statuses like PUBLISHED, SUBMITTED, CANCELED, and PAUSED.

Submission ID	Submitter	Submission Date	Publication Date	Publication Allowed	Status	Actions
test_search_wdepth	uwe_admin	2022-10-18T12:17:17...		✓	PUBLISHED	[Edit] [List] [Pause] [Delete]
test_validation_fields-units	uwe_admin	2022-10-20T11:18:01...		✓	SUBMITTED	[Edit] [List] [Pause] [Delete]
test_search_region	uwe_admin	2022-10-20T12:06:54...		✓	PUBLISHED	[Edit] [List] [Pause] [Delete]
test_search_non-public	uwe_submit	2022-10-20T12:53:51...		✓	CANCELED	[Edit] [List] [Play] [Delete]
test_parameter_DS3_IOPstudy	uwe_admin	2022-10-20T19:48:44...		✓	PAUSED	[Edit] [List] [Play] [Delete]
test_parameter_AERONET-OCDS3_I...	uwe_admin	2022-10-20T19:54:28...		✓	PUBLISHED	[Edit] [List] [Pause] [Delete]
test_search_public	uwe_submit	2022-10-20T21:12:23...		✓	PUBLISHED	[Edit] [List] [Pause] [Delete]
test_search_admin-non-public	uwe_admin	2022-10-20T21:21:45...		✓	PROCESSED	[Edit] [List] [Pause] [Delete]
Submissions Loaded	uwe_admin	2022-10-20T21:22:55...		✓	PUBLISHED	[Edit] [List] [Pause] [Delete]

FRMOCnet: **Fiducial radiometer database**, **Community Processor** and **Ocean Colour database**



SEABASS file format (<https://seabass.gsfc.nasa.gov/>)

Description of the SEABASS file format:

- ❑ Metadata header elements: <https://seabass.gsfc.nasa.gov/wiki/metadataheaders>
- ❑ Standard fields and units: <https://seabass.gsfc.nasa.gov/wiki/stdfields>
- ❑ Example file: <https://seabass.gsfc.nasa.gov/wiki/metadataheaders#Example%20Header>

Example Header	
<pre> /begin_header /investigators=John_Smith,Mary_Johns /affiliations=State_University /contact=jsmith@state.edu /experiment=CalCOFFEE /cruise=cal0101 /station=93.26 /data_file_name=CalCOFFEE_cal0101_pi /original_file_name=pigments_cal0101 /documents=cal0101_readme.txt /calibration_files=turner_cals_0012. /calibration_date=20001212 /instrument_model=10AU_Field_Fluorom /instrument_manufacturer=Turner_Desi /data_type=pigment /data_status=final </pre>	<pre> /start_date=20010314 /end_date=20010314 /start_time=16:01:30[GMT] /end_time=16:30:45[GMT] /north_latitude=42.135[DEG] /south_latitude=42.055[DEG] /east_longitude=-72.375[DEG] /west_longitude=-72.420[DEG] /water_depth=250 /measurement_depth=NA /secchi_depth=4.5 /cloud_percent=50 /wind_speed=5.0 /wave_height=1.0 </pre>
<pre> ! COMMENTS ! ! Slightly overcast, with large cumulous on horizon. Wind from NE. ! ! Turner fluorometer last calibrated: 12 December 2000 ! ! lower limit of detection = 0.001 mg/m^3 ! </pre>	
<pre> /missing=-9999 /below_detection_limit=-8888 /above_detection_limit=-7777 /delimiter=comma /fields=date,time,lat,lon,depth,CHL,CHL_sd,PHAEO,PHAEO_sd,Tpg,bincount /units=yyyymmdd, hh:mm:ss, degrees, degrees, m, mg/m^3, mg/m^3, mg/m^3 /end_header 20010314,16:01:30,42.135,-72.375,0,2.355,0.000,0.785,0.100,3.140,3 20010314,16:03:45,42.055,-72.420,5.5,2.180,0.005,1.005,0.009,3.185,3 20010314,16:07:53,42.100,-72.378,10,1.510,0.124,-9999,-9999,-9999,3 20010314,16:15:11,42.130,-72.380,50,0.027,0.001,-8888,-9999,0.057,3 ... </pre>	

Demo 1: Upload calibration file to OCDB => See presentation by Héloïse Lavigne

Create new Calibration Submission

Radiometer system
TriOS-RAMSES

Laboratory*
Tartu

Calibration path (read only)
TriOS/Tartu

Unique calibration ID *
TriOS_Tartu

Calibration date*
11/01/2022

Drag and drop calibration and characterisation files as well as additional documentation files to the corresponding drop box. Alternatively, you can click the drop boxes to select files via a file browser dialog.

Drop box for cal/char files [*.txt, *.dat].
accepted:Rejected:

Drop box for DOCUMENT files [any file type].
accepted:Rejected:

SUBMIT CLEAR CLOSE ?

Upload and validation is not implemented yet!

A strict syntax will be used for calibration file names:

- Radiometer,
- serial number,
- laboratory,
- calibration date and
- file type

Resulting in a file pattern such as:

Cal_[file type]_[Radiometer]_[SN]_[Lab]_[cal. Date]

Example:

Cal_RADCAL_SAM_81_CA_TartuObs_20220627

Demo 2: Create SEABASS files using Community processor

See presentation given by Alexis Deru

SEABASS file created by Community Processor

```
/begin_header
!
! -----
! Mandatory SEABASS metadata headers, for details see: https://seabass.gsfc.nasa.gov/wiki/metadataheaders
! -----
!
/investigators=The_Sampler
/affiliations=Sample_University
/contact=sample@sampleu.edu
/experiment=sample_pySAS
/cruise=sample_cruise
/station=station_45.0
/data_file_name=FRM4SOC2_FICE22_NASA_20220719_100000_L2_STATION_45_0.hdf
/documents=sample_document.pdf
/data_type=above_water
/calibration_files=UMTWR_v0.tdf,HSL0385.cal,SATTHS0045A.tdf,HSL0386.cal,GPRMC_NMEA0183v3.01.tdf,HSE0488.c
/start_date=20220719
/end_date=20220719
/start_time=10:31:27[GMT]
/end_time=10:31:27[GMT]
/north_latitude=45.3142[DEG]
/south_latitude=45.3142[DEG]
/east_longitude=12.5083[DEG]
/west_longitude=12.5083[DEG]
/water_depth=NA
/missing=-999
/delimiter=comma
! For metadata headers fields and units, please see below !
```

SEABASS file created by Community Processor (See demo in presentation by Alexis Deru)

```
! -----
! Conditional SEABASS metadata headers
! -----
!
! This header is obsolete and will raise a warning, which can be neglected!
/measurement_depth=0
!
! -----
! Optional but recommended SEABASS metadata headers
! -----
!
!
/calibration_date=NA
/cloud_percent=NA
/instrument_manufacturer=Satlantic
/instrument_model=HyperSAS
/secchi_depth=NA
/wave_height=NA
/wind_speed=2.9
!
! -----
! Optional SEABASS metadata headers
! -----
!
! This header is obsolete and will raise a warning, which can be neglected!
/original_file_name=Data/FICE2/NASA/L0/FRM4SOC2_FICE22_NASA_20220719_100000.raw
/data_status=NA
```

```
! -----
! Comments from CP
! -----
!
! platform=AAOT
! HyperInSPACE vers = 1.1.1
! HyperInSPACE Config = FICE2_NASA.cfg
! SZA Filter = Off
! SZA Max = 70.0
! Rotator Home Angle = 0.0
! Rotator Delay = 1.0
! Pitch/Roll Filter = On
! Max Pitch/Roll = 5.0
! Rotator Min/Max Filter = On
! Rotator Min = -126.0
! Rotator Max = 52.0
! Rel Azimuth Filter = On
! Rel Azimuth Min = 89.0
! Rel Azimuth Max = 136.0
:
! Remove negatives = On
! DateTime Processed = Fri Nov 25 10:18:03 2022
! Example of HyperSAS with pySAS robot.
! Quality definitions for all columns named *_quality:
0=non-FR measurement, 1=FR measurement
```


SEABASS file created by Community Processor (See demo in presentation by Alexis Deru)

Sample file data block:

```

Metadata
{
! Quality definitions for all columns named *_quality: 0=non-FR measurement, 1=FR measurement
/fields=date,time,lat,lon,RelAz,SZA,AOI,cloud,wind,Rrs353.2,Rrs356.5,Rrs359.8,
Rrs353.2_unc,Rrs356.5_unc,Rrs359.8_unc,Rrs353.2_quality,Rrs356.5_quality,Rrs359.8_quality
/units=yyyymmdd,hh:mm:ss,degrees,degrees,degrees,degrees,unitless,%,m/s,l/sr,l/sr,l/sr,unitless
,unitless,unitless,unitless,unitless,unitless
/end_header
Data
{
20220719,10:31:27,45.3142,12.5083,89.1,26.2,0.1129,0,2.9,0.004811,0.004965,0.004929,0.303953,0.
300520,0.297044,0,-999,1
    
```

For validation purpose: Is -999 (Missing data) a reasonable value for quality columns?

Demo 3: Upload Community Processor output file to OCDB

1. Open OCDB web application: ocdb.eumetsat.int
2. Login
3. Choose Submit

The screenshot shows the OCDB web application interface. The browser address bar shows <https://ocdb.eumetsat.int>, which is circled in red and labeled with a red '1.'. The page title is 'Ocean Colour In-Situ Database'. In the top right corner, there is a user profile icon circled in red and labeled with a red '2.'. On the left sidebar, the 'Submit' button is circled in red and labeled with a red '3.'. The main content area displays a search interface with filters for 'From Date', 'To Date', and 'Product Group', along with a 'SEARCH' button. Below the search filters, there is a 'DOWNLOAD' button and a checkbox for 'Include Documents'. A table lists four datasets:

<input type="checkbox"/>	File	Meta/Plots
<input type="checkbox"/>	ODERMATT2007.TXT Eawag/Odermatt2007/Zurich_Geneva	☰ 📊
<input type="checkbox"/>	BRACHER_2019_HE462_DB.TXT AWI/North_Sea_transect/HE462	☰ 📊
<input type="checkbox"/>	ANT-XXVII_2_PHYTOPLANK_PIGM_DB.TXT AWI/ANT/ANT-XXVII-2	☰ 📊
<input type="checkbox"/>	BRACHER_2019_PS106_DB.TXT AWI/FRAM/PS106	☰ 📊

At the bottom left, a green notification bar indicates '7 Datasets Found'. On the right side, there is a map of Europe with a location pin over the North Sea region.

Demo 3: Upload Community Processor output file to OCDB

The screenshot shows the 'Ocean Colour In-Situ Database' web interface. At the top, there are navigation buttons and logos for the European Commission, Copernicus, and EUMETSAT. Below the header, there are two prominent red buttons: 'NEW SUBMISSION' and 'NEW CALIBRATION SUBMISSION'. A table below displays a list of submissions with columns for Submission ID, Submitter, Submission Date, Publication Date, Publication Allowed, Status, and Actions. The status column contains colored buttons: green for 'PUBLISHED', red for 'SUBMITTED', orange for 'CANCELED', and orange for 'PAUSED'. A green notification bar at the bottom left indicates 'Submissions Loaded'.

Submission ID	Submitter	Submission Date	Publication Date	Publication Allowed	Status	Actions
test_search_wdepth	uwe_admin	2022-10-18T12:17:17...		✓	PUBLISHED	[Edit] [Menu] [Pause] [Delete] [Power] [Refresh] [Up]
test_validation_fields-units	uwe_admin	2022-10-20T11:18:01...		✓	SUBMITTED	[Edit] [Menu] [Pause] [Delete] [Power] [Refresh] [Up]
test_search_region	uwe_admin	2022-10-20T12:06:54...		✓	PUBLISHED	[Edit] [Menu] [Pause] [Delete] [Power] [Refresh] [Up]
test_search_non-public	uwe_submit	2022-10-20T12:53:51...		✓	CANCELED	[Edit] [Menu] [Play] [Delete] [Power] [Refresh] [Up]
test_parameter_DS3_IOPstudy	uwe_admin	2022-10-20T19:48:44...		✓	PAUSED	[Edit] [Menu] [Play] [Delete] [Power] [Refresh] [Up]
test_parameter_AERONET-OCDS3_I...	uwe_admin	2022-10-20T19:54:28...		✓	PUBLISHED	[Edit] [Menu] [Pause] [Delete] [Power] [Refresh] [Up]
test_search_public	uwe_submit	2022-10-20T21:12:23...		✓	PUBLISHED	[Edit] [Menu] [Pause] [Delete] [Power] [Refresh] [Up]

Demo 3: Upload Community Processor output file to OCDB

Create new Submission

Affiliation *
ACRI

Experiment *
CP

Cruise *
Sample_file

Unique submission ID *
ACRI_CP_Sample_file

Publication date *

Publication (yes/no)

Drag and drop SEABASS data files and additional documentation files to the corresponding drop box. Alternatively, you can click the drop boxes to select files via a file browser dialog.

Drop box for SEABASS data files [*.txt , *.sb , *.csv].
Accepted: CP_sample_SEABASS_output_file_modified.txt

Drop box for DOCUMENT files [any file type].

SUBMIT **CLEAR** **CLOSE**

NEW SUBMISSION **NEW CALIBRATION SUBMISSION**

Submission ID	Submitter	Submission Date	Publication Date	Publication Allowed	Status	Actions
ACRI_CP_Sample_file	uwe_admin	2022-12-01T16:39:36...		×	VALIDATED	[Edit] [List] [Pause] [Delete] [Power] [Share] [Download]
ACRI_CP_TEST_01	uwe_admin	2022-11-25T17:35:19...		✓	SUBMITTED	[Edit] [List] [Pause] [Delete] [Power] [Share] [Download]
MyAffiliation_MyExperiment_MyCru...	uwe_admin	2022-11-24T15:44:59...		×	VALIDATED	[Edit] [List] [Pause] [Delete] [Power] [Share] [Download]
a_e_c	uwe_admin	2022-11-29T13:56:30...		×	VALIDATED	[Edit] [List] [Pause] [Delete] [Power] [Share] [Download]

LEGEND:

- SUBMITTED** : **Not valid** due to crucial errors, e. g. Number of fields, units and data per row are not equal.
- VALIDATED** : Either **valid** with warnings (unknown field) or without warnings. **Not yet imported to database!**
- PROCESSED** : Admin - Data will be imported to **OCDB** database. **Not yet publicly available.**
- PUBLISHED** : Admin - Data will be made publicly available.

Demo 3: Upload Community Processor output file to OCDB

1. Submit a valid SEABASS file

=> Status

VALIDATED

2. Submit invalid SEABASS files

=> Status

SUBMITTED

Demo 4: Download previously uploaded files - Search criteria spatial extent

1. Spatial extent:

Searching by spatial extent, please drag a rectangle (relation overlap) on the map or, e. g. when searching for fixed stations, specify a range for any longitude (W/E) and/or any latitude (N/S), e. g. search all totally contained datasets by:

north_latitude: [45.25 TO 45.75] AND east_longitude: [12.4 TO 12.6]

Search by rectangle will result in a larger result list!

The screenshot displays the 'Ocean Colour In-Situ Database' search interface. The search criteria are: `north_latitude: [45.25 TO 45.75] AND east_longitude: [12.4 TO 12.6]`. The search results table shows two entries:

File	Meta/Plots
<input checked="" type="checkbox"/> CP_SAMPLE_SEABASS_OUTPUT_FILE_MODIFIED.TXT	<input type="checkbox"/>
<input checked="" type="checkbox"/> ACRI/CP/Sample_file	<input type="checkbox"/>

The interface also includes a 'DOWNLOAD' button, 'Include Documents' checkbox, and pagination controls showing 'Rows per page: 25' and '1-1 of 1'. A map on the right shows the Adriatic Sea region with a red location pin.

Demo 4: Search criteria temporal extent and parameter

2. Search by temporal extent (18. Jul. 2022 to 20. Jul. 2022):

The screenshot displays the 'Ocean Colour In-Situ Database' search interface. The search criteria are set to 'From Date (GMT) 07/18/2022' and 'To Date (GMT) 07/20/2022'. The search results show one dataset: 'CP_SAMPLE_SEABASS_OUTPUT_FILE_MODIFIED.TXT' with the parameter 'ACRI/CP/Sample_file'. The interface includes a sidebar with navigation options (Search, Links, Matchup, Submit, Admin), a search bar, and a map of the Adriatic Sea region. A green notification bar at the bottom left indicates '1 Datasets Found'.

Demo 4: Search by parameter using advanced search

For parameters not depending on wavelength, users can search by product (parameter) using the advanced search:

The screenshot displays the 'Ocean Colour In-Situ Database' search interface. On the left, a sidebar contains navigation options: Search, Links, Matchup, Submit, and Admin. The main search area includes fields for 'From Date', 'To Date', 'Product Groups', and a 'Search...' input. A 'SEARCH' button and an 'ADVANCED OPTIONS' link are visible. Below the search fields, a filter bar shows 'products: Chl_a'. A 'DOWNLOAD' button and an 'Include Documents' checkbox are also present. The search results table lists several datasets, including 'BRACHER_2019_HE462_DB.TXT' and 'IMOS_SRS-OC-BODBAW_X_20101114T225000Z_LUCINDA_2010_NOV-PIGMENT_FV02_END-20101118T032600Z.TXT'. A map of Europe is shown on the right side of the interface. A red box highlights the 'ADVANCED OPTIONS' link, and a red arrow points from it to a 'Select Products' dropdown menu. The dropdown menu is open, showing a list of product names: 'Chl_a', 'Chl_a_allom', 'Chl_a_prime', 'Chl_b', 'Chl_c', and 'Chl_c1'. A green notification box at the bottom left indicates '190 Datasets Found'.

Enable search for wavelength-dependent products!

Demo 4: Search by parameter

3. Parameter:

To search for data files containing the Parameter Rrs, the search has to cover all field names containing Rrs independent of the wavelengths, e. g. Rrs353.2,Rrs356.5,Rrs359.8, Therefore, the wild card * is required i. e.:

*fields: Rrs**

Currently, this search is case sensitive! This will be changed in version 2.4 (due Jan. 2023).

The screenshot shows the 'Ocean Colour In-Situ Database' search interface. The search bar is highlighted with a green box and contains the text 'fields: Rrs353*'. Below the search bar, there is a 'DOWNLOAD' button and a checkbox for 'Include Documents'. The search results are displayed in a table with one row: 'CP_SAMPLE_SEABASS_OUTPUT_FILE_MODIFIED.TXT' with a file icon. The table also shows 'ACRI/CP/Sample_file' and 'Meta/Plots' columns. A map on the right shows the location of the dataset in the Adriatic Sea. A green notification bar at the bottom says '1 Datasets Found'.

Next steps:

The following issues should be considered as having a high priority to be implemented next:

Calibration files

1. Implement validation and upload of calibration files into Fiducial radiometer database.
2. Add converter to convert TRIOS radcal file format to TO radcal file format.
3. Provide access to calibration files for FRM-certifying person or entity and the Community processor.

Seamless data download

- Enable download of seamless data rather than data files.

Web user interface for data search and download

1. Add a filter for FRM flagged data
2. Enable advanced search for wavelength-specific products/parameter.
3. Avoid case-sensitivity when searching for fields.
4. General enhancement of user interface for data search with emphasis to the result list and map.

How shall cal/char files be selectable or provided for users?

- **Define distinct selection criteria and a web user interface?**
- **Define a distinct directory and file name structure?**

Thank you

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