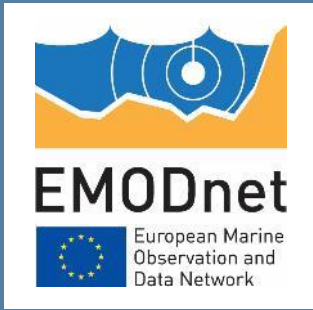# EMODNet Chemistry 5 Training 2024
30-31 January 2024 – Trieste, Italy

NEMO, OCTOPUS and MIKADO
Importance of using the SeaDataNet tools

Julie GATTI | julie.gatti@ifremer.fr
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Presentation overview

- Reminder of the tool roles

- SeaDataNet processing flow (data and metadata)

- Good reasons to use the tools

- Errors that could be avoided using the tools

- Homogenisation work before using the tools

    Attention to be paid when using the tools

    Additional very useful metadata that should be added

- Why using Octopus is important?

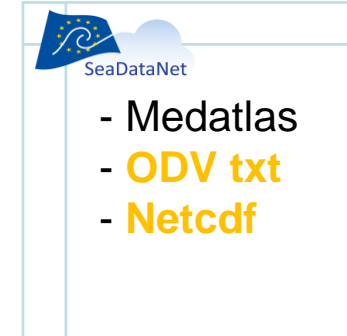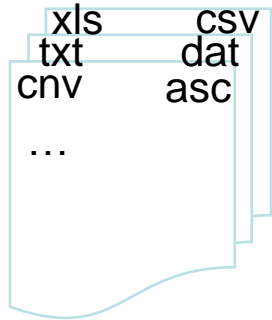- Hands-on session with Nemo, Octopus and Mikado
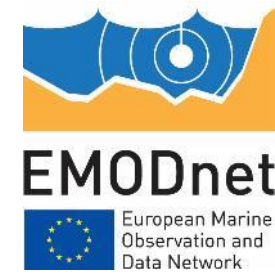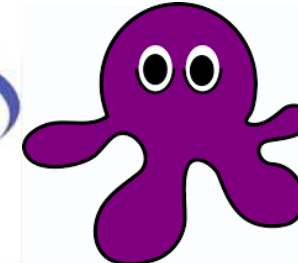
NEMO   **OCTOPUS**   **MIKADO**

What are the tools for?

NEMO, the reformatting software, for creation of data files at the **European standards**

xls   csv
txt   dat
cnv   asc
…

NEMO
ifremer

SeaDataNet
- Medatlas
- **ODV txt**
- **Netcdf**

Thematic :
- Physico-chemical
- Biology
- Microlitter
- Flow cytometry

File type:
- Vertical profiles
- Time series
- Trajectory

3 requirements as input:
- ASCII files only
- Data measurements in columns
- Files homogeneity: Information must be located at the same position and in the same format in the files

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What are the tools for?

OCTOPUS, for the checks of SeaDataNet file formats, and the conversion from one SeaDataNet format to another one.

OCTOPUS also allows multi-station files to be split into multiple formats (generation of 1 file per station)
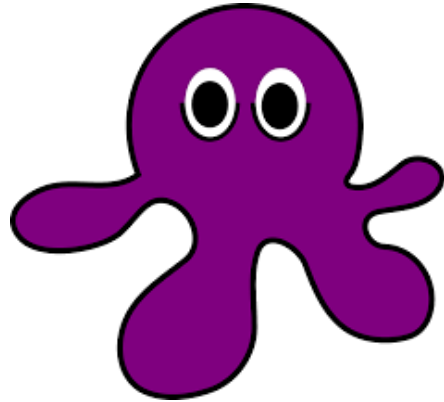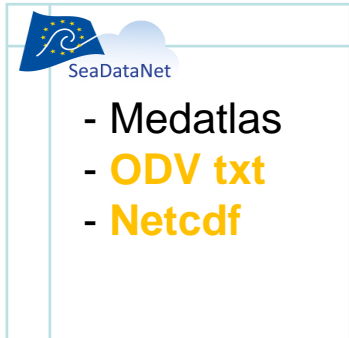
OCTOPUS possible conversions

SeaDataNet
- Medatlas
- **ODV txt**
- **Netcdf**

output→ input ↓	MedSDN	ODV	ODV variants	netCDF - CFPoint
Med non SDN	✓	✓	✗	✓
Med SDN	✓	✓	✗	✓
ODV SDN	✗	✓	✗	✓
ODV variants	✗	✗	✓	✗
netCDF-CFPoint	✗	✓	✗	✓
MGDv81	✗	✓	✗	✗
MGDv98	✗	✓	✗	✗

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What are the tools for?

MIKADO, for the generation of the metadata for SeaDataNet catalogues

CSR	Cruise Summary Report
EDMED	Environmental Data
EDMERP	Research Project
EDIOS	Ocean Observing Systems
CDI	Common Data Index

What are the tools for?

Link between NEMO and MIKADO

NEMO creating a CDI_SUMMARY file while converting

➔ this file can be used by MIKADO to create the CDI metadata files with all the **minimum mandatory information**
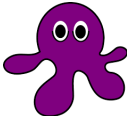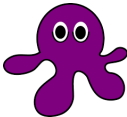
NEMO   **MIKADO**

SeaDataNet data processing flow

Different cases

Data	Metadata	Modus (Replication Manager flow)	Useful SeaDataNet Software		
			NEMO	OCTOPUS	MIKADO
Files	Files	Modus 1 (mono-station) Modus 3 (multi-stations)			
Files	Database				
Database	Database	Modus 2 (database only)			

Glider's data (netCDF)

Modus 1 for mono-station data file (3-4 times per year)

Physics/Chemistry data (CTD, bottles) from French Research Vessels
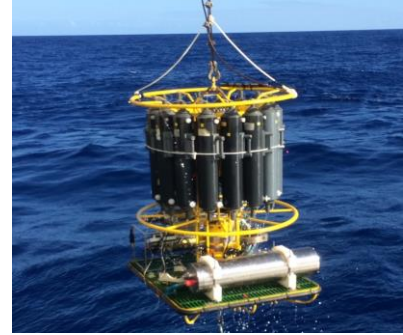
Modus 3 for multi-stations data file (3-4 times per year)

Data flow

① Format X files from data collection lab

② NeMo ifremer

SDN format files (MedAtlas) No QC

③ **QC Software** ifremer

QC

SDN format files (MedAtlas) QC

Split+convert

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Metadata flow

Metadata

Coupling table*
Data File (CSV)

RM * - IM

SeaDataNet

SISMER database ifremer

Mikado * ④

XML

CDI central

QC: Quality Check │ **RM: Replication Manager** │ **IM: Import Manager** │ **CDI: Common Data Index**

emodnet.ec.europa.eu

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Data from monitoring networks
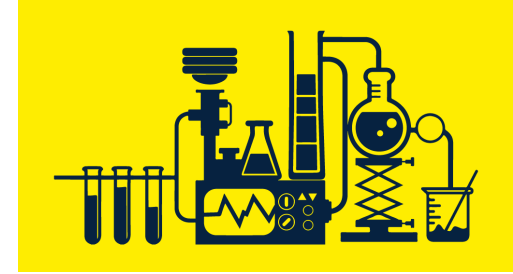
Modus 2 for database data (frequency according European projects)

Data and metadata

Quadrige **1**

Quantitative and
Qualitative data on marine and coastal waters
(portal / database)

QC

1) **Coupling table***
SQL Query
+
2) **Mapping file** to describe
columns with standards
(formating data)

Data File

convert

EUDAT DATA CLOUD

3

RM * - IM

SeaDataNet

Mikado*

2

Metadata

XML
</>

CDI central

QC: Quality Check │ RM: Replication Manager │ IM: Import Manager │ CDI: Common Data Index

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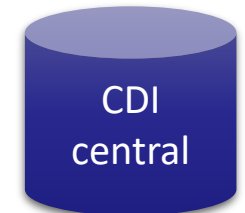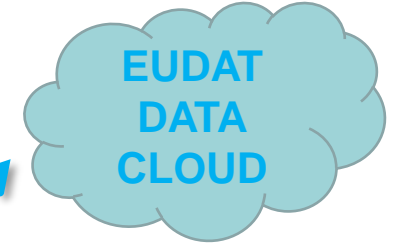
Why using the tools? 4 good reasons

1) They guarantee that the formats of the data and metadata files are **SeaDataNet compliant** and will not be rejected by the Replication Manager and/or Ocean Data View

2) They follow the **last specifications** of the metadata and data formats

3) They are **freely available** from SeaDataNet website and well documented with FAQ, user manuals
   https://www.seadatanet.org/Software/NEMO
   https://www.seadatanet.org/Software/OCTOPUS
   https://www.seadatanet.org/Software/MIKADO

4) They have **responsive helpdesks**
   sdn-userdesk@seadatanet.org
   https://www.emodnet-chemistry.eu/help/

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Example of frequent errors that cannot happen using the tools

- Incoherencies between missing value and corresponding QC flag
    Like in ODV, flag 9 and values like 9999, -99999, 0 ….

- Wrong values for bottom depth when bottom depth is unknown
    like 9, or -999 ….

- Wrong reference parameters
    Like Depth instead of Time for timeseries

- Missing mandatory columns
    Very useful particularly for the ODV variant formats

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Nevertheless the tools cannot do everything...

- Make sure that the metadata and the data are coherent

      Mapping between P02 (metadata) and P01 (data)

      If all flags for one parameter are set to 9 (missing value) in a data file then
the corresponding P02 must not appear in the metadata file

      L22 instruments of the metadata files
(var49 of MIKADO) = L22 instruments described in the data files

      Water depth of the metadata files (var35 of MIKADO)
= **Bottom depth** indicated in the data files

- The **EMDO-CODE in the data file is the one of the CDI-PARTNER (metadata)**
      = var01 of automatic MIKADO
      = the organisation connected to SDN infrastructure and distributing the data.
      Originator and custodian EDMO-CODEs are in the metadata not in the data files

- The **reference parameter for a vertical profile can be DEPTH or PRES**
      DEPTH can be ADEPZZ01 for the water column and COREDIST for the sediment

You have to provide as much information as possible

- Important for the **regional leaders** and the **general users**

- Important for **data discovery**

- Important for **links between catalogues** (CSR, EDMED, EDMERP…)

- Important for **interoperability** with other initiatives (COPERNICUS – CMEMS), EEA…

Information useful to keep in the metadata

The Cruise (**CSR)** during which the data was collected & **platform** codes

    in CDI with MIKADO
    in data files with **<snd_references>** to make links with
    other catalogues (CSR, C17,…)

The **instruments** used for the measurement (L05 and L22)

    in CDI with MIKADO
    in data files with **sdn_mapping** lines (L22)

The related **project** : MSFD (EDMERP code 12294) or code with "research" or "monitoring" keywords

    in CDI with MIKADO
    in data files with **<snd_references>** in comments field

The **QA/QC procedures** used in collecting data :

    in CDI with MIKADO
    ex: DOI for the QC questionnaire on contaminants

⚠   data ODV.txt and metadata CDI.xml files
have the same information

CDI - https://cdi.seadatanet.org/report/3442136/

HOW?

Instrument/gear category	CTD water temperature sensor salinity sensor
Device type	Sea-Bird SBE 911plus CTD
Platform type	research vessel
Cruise name	OVIDE 2018
Alternative cruise name	18000510
Cruise start date	20180611
Cruise Summary Report (CSR)	OVIDE 2018 - Thalassa(35HT)
Station name	FI3520180510000002
Alternative station name	2
Station start date	20180616

WHO?

Data originator	Laboratory for Ocean Physics and Satellite remote
Data custodian	Ifremer, Scientific Information Systems for the sea
Project name	Go-Ship - Global Ocean Ship-based Hydrographic Investigations Program LEFE (research project) OVIDE (research project) NAOS - NAOS Project (research project)

OTHER INFO

Quality info

Name	Date	Comment
COMMISSION REGULATION (EC) No 1205/2008 of 3 December 2008 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata	2008-12-04	See the referenced specification
COMMISSION REGULATION (EU) No 1089/2010 of 23 November 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services	2010-12-08	See the referenced specification
Manual of Quality Control Procedures for Validation of Oceanographic Data, IOC Manuals and guides No. 26	1993-01-01	See the referenced specification

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Why using Octopus is important?
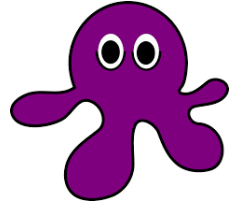
OCTOPUS checks the formats and gives warning and/or Errors

The **Replication Manager** uses OCTOPUS libraries
- To check the format
- To convert the data files to the other possible formats

Using OCTOPUS make you **save time**:
in case of errors you can directly **correct the files before sending** them to the Replication Manager

NEMO
SeaDataNet reformatting tool to standards

2.0.1

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General description

To convert input file(s), the NEMO user has to proceed with **5 steps** :
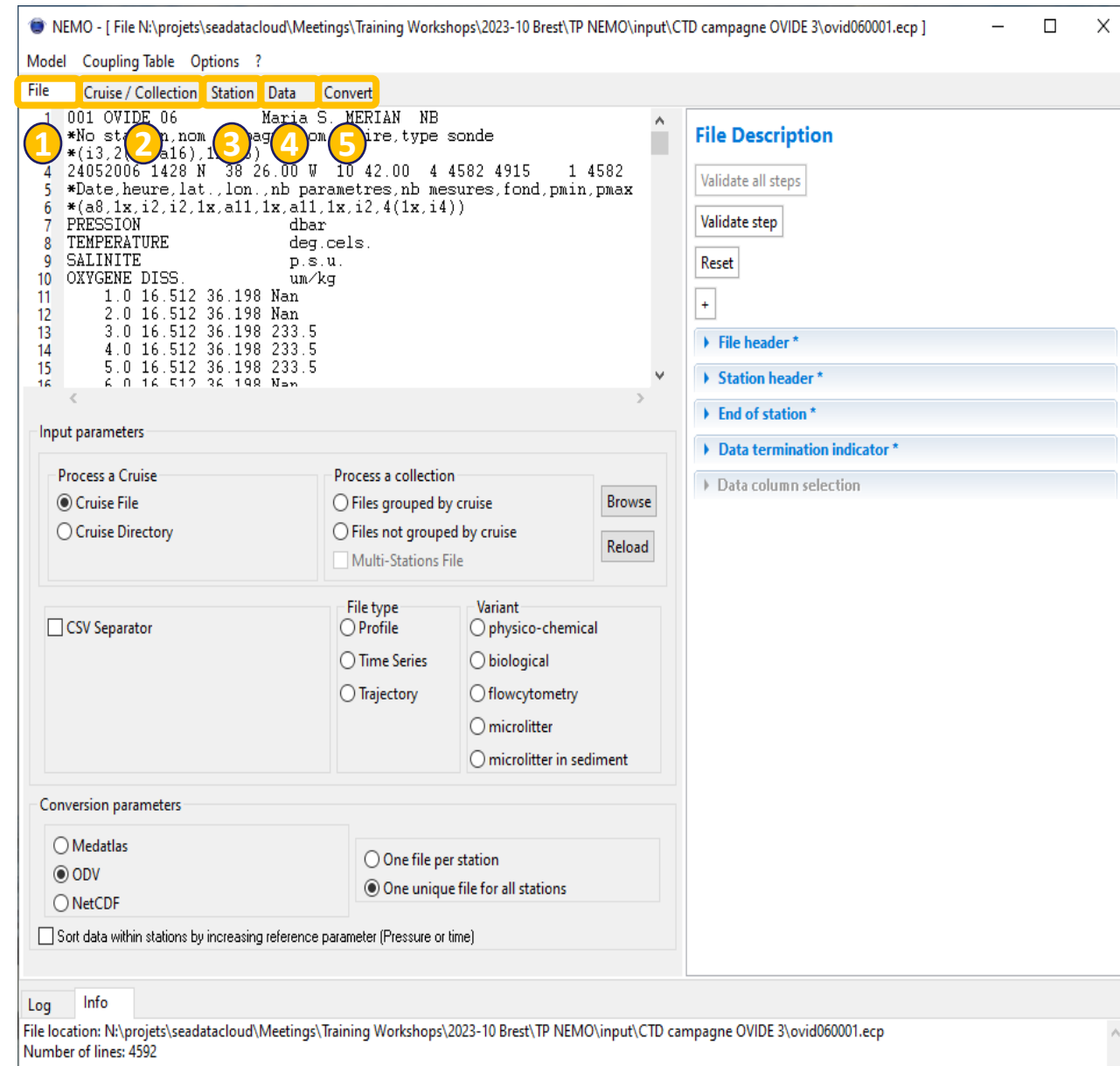
1- **File** tab : describe the type of file and the type of measurement

2- **Cruise** tab : describe the cruise or the data collection

3- **Station** tab : describe the station information

4- **Data** tab : describethe measured parameters

5- **Convert** tab : convert the input file(s)

General changes

- Menu **Right-click** search function removed
  - Replaced by a Search window for fields with a list of values

- Use of **mouse wheel** no longer results in changing values in already entered fields (like in Station tab for example)

- **Display of line numbers** in input file preview (except data tab if CSV file)

- **Help** tab at the bottom of the main screen removed
  - Replaced by access to the user manual in the '?'

Changes on File tab (1)

- Reload button added:
  - Allows to reload the file after modifications without changing the template and without resetting all

Changes on File tab (2)

- Changes in Data column selection for CSV files
  - Ability to enter multiple rows

Changes on File tab (3)

- Changes in Data column selection for CSV files
  - *allows for example to display the units if available in the input file*

Changes on File tab (4)

- New field in **Data column selection** for CSV files
  - Allows you to describe a row containing the parameter codes P01 or P09:

Changes on Cruise tab (1)

- Changes in Data source
  - Use of EDMERP codes of projects instead of free text label, several projects possible, loaded by XML initialisation or manual input - Possibility to add or remove projects

GOAL

Increase data FAIRness by adding metadata

Changes on Cruise tab (2)

- Added as sdn_references in the output file:
  - *<sdn_reference xlink:href="https://edmerp.seadatanet.org/report/**12297**" xlink:role="isObservedBy" xlink:type="**SDN:L23::EDMERP"/>***
  - *<sdn_reference xlink:href="https://edmerp.seadatanet.org/report/**11760**" xlink:role="isObservedBy" xlink:type="**SDN:L23::EDMERP"/>***

- In the MedAtlas format, list of project codes (4 maximum, even if more in the cruise)

```
*FI35201805100 OVIDE 2018                         35HT Thalassa
11/06/2018-15/07/2018 North Atlantic Ocean
35 Laboratory for Ocean Physics and Satellite remote (LOPS)
LHERMINIER Pascale                         Project=12297;11760;11824;12222
Regional Archiving= FI                     Availability=L
Data Type=D71 n=30    QC=N
Data Type=H09 n=2220 QC=N
Data Type=H10 n=104   QC=N
Data Type=H21 n=2220 QC=N
Data Type=H22 n=2215 QC=N
Data Type=H24 n=2215 QC=N
```

Changes in the data table menu

- New drag&drop function
- New Autofill functions
- New for multiple lines selections
- Set column number (CSV separator) or set start/end (without separator)

Set start/end
Update test
Parameter list
Select an instrument
Select a P06 unit
Select a format
Select a Standard Name
Move current parameter up to top
Move current parameter up
Move current parameter down
Move current parameter down to bottom
Delete current parameter

Set flag
Delete flag

Delete all parameters

Replaced by

Set column number
Auto-Fill next parameter column
Update test
Select an instrument
Delete instrument
Select a P06 unit
Select Format
Set Conversion Value
Set Input Default Value
Select Standard Name
Select Long Name

Add Parameter
Auto-Fill P09/P01 parameter
Delete Parameter

Set Flag
Auto-Fill next parameter flags
Delete Flag

Automatic fill in of the parameter table (1)

- Only possible for:
  - CSV files containing P09 or P01 parameter codes
  - If the line containing these codes has been filled in the File tab

➡ New "Auto-fill" menu is available in the data tab Menu

Automatic fill in of the parameter table (2)

- Right click ➜ table of parameters is filled
- Need to check or add the formats and add if necessary the default values, the flags in input and the instruments used

Auto-fill next parameter/flag positions (1)

Possible only for:

- CSV files

- If the list of parameters entered in the data table is in the same order as in the data file

- When the position of the 1st parameter has already been entered

Auto-fill next parameter positions (2)

1. Measured parameters one column out of 2

2. Parameters in the same order in the file and in the table of measurements

3. 1st parameter position already set

Auto-fill next parameter flags positions (2)

1. QC flags one column out of 2
2. Same order of pthe paramters
3. Position of the 1st flag already set

Set the input default value

For one or more parameters depending on the number of lines selected

New fields in the CDI Summary

GOAL
Increase data FAIRness by adding metadata

- Used by MIKADO to generate CDI metadata

- Additional information
  L05 (L22-L05 mapping) and L22 instrument codes, EDMERP codes,
  Cruise alternative name and CSR id, Cruise start date, Sampling rate and unit,
  Bounding box for trajectories, Station start and end date, Min and max
  measurement depth, Bottom depth

- Generation of a file allowing to draw the trajectory route in MIKADO
  ➜ MIKADO upgrading done to take into account this new file

New batch builder tool (1)

To help the user in writing batch procedures for NEMO, especially for a set of files using the same template but for different cruises/datasets

GOAL
Ease user life

- Makes it easier to create a batch with arguments that vary from one file to another

- Arguments are listed in a CSV file: one line per file

Interaction with MIKADO

Software user support

NEMO home page
https://www.seadatanet.org/Software/NEMO

2.0.1
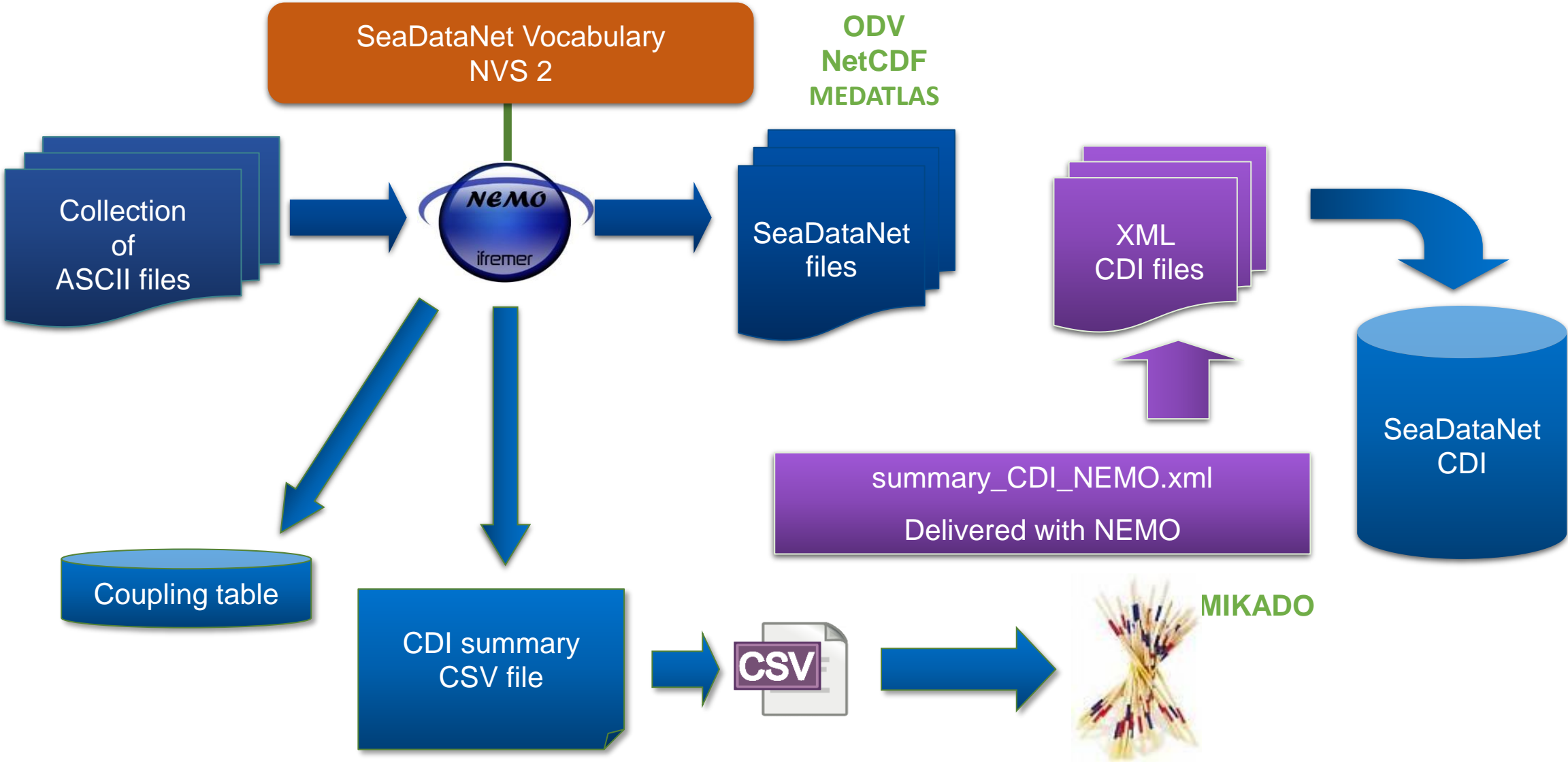
Installation files: Windows 32/64 bit, Linux 32/64 bit
https://www.seadatanet.org/Software/NEMO/Download-NEMO-2.0.1

User manual
https://www.seadatanet.org/content/download/7899/file/sdn_Nemo_UserManual.pdf

Helpdesk
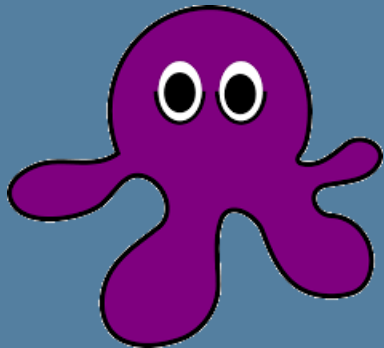sdn-userdesk@seadatanet.org

FAQ
https://www.seadatanet.org/Software/NEMO/FAQ

OCTOPUS
SeaDataNet format conversion tool

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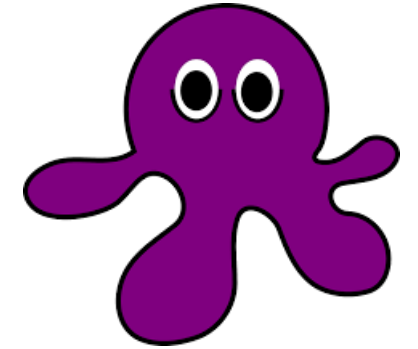steven.piel@ifremer.fr

Ifremer

General description
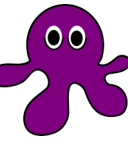
Main functions of Octopus:

1- Select **Input file or directory**

2 - **Check** of the input SDN formats

3 - **Split** Multistation file into Monostation files

4 – **Export/Convert** in one of SDN formats

5 – Log window

Software user support

NEMO home page
https://www.seadatanet.org/Software/OCTOPUS

Installation files: Windows 64 bit, Linux + Standalone version (Java 1.8 included)
https://www.seadatanet.org/Software/OCTOPUS/Download-Octopus-1.9.0

User manual
https://www.seadatanet.org/content/download/698/file/SDN_OCTOPUS_UserManual.pdf

Helpdesk
sdn-userdesk@seadatanet.org

FAQ
https://www.seadatanet.org/Software/OCTOPUS/FAQ

MIKADO
Generation of ISO-19115/19139
SeaDataNet metadata files

Julie GATTI julie.gatti@ifremer.fr
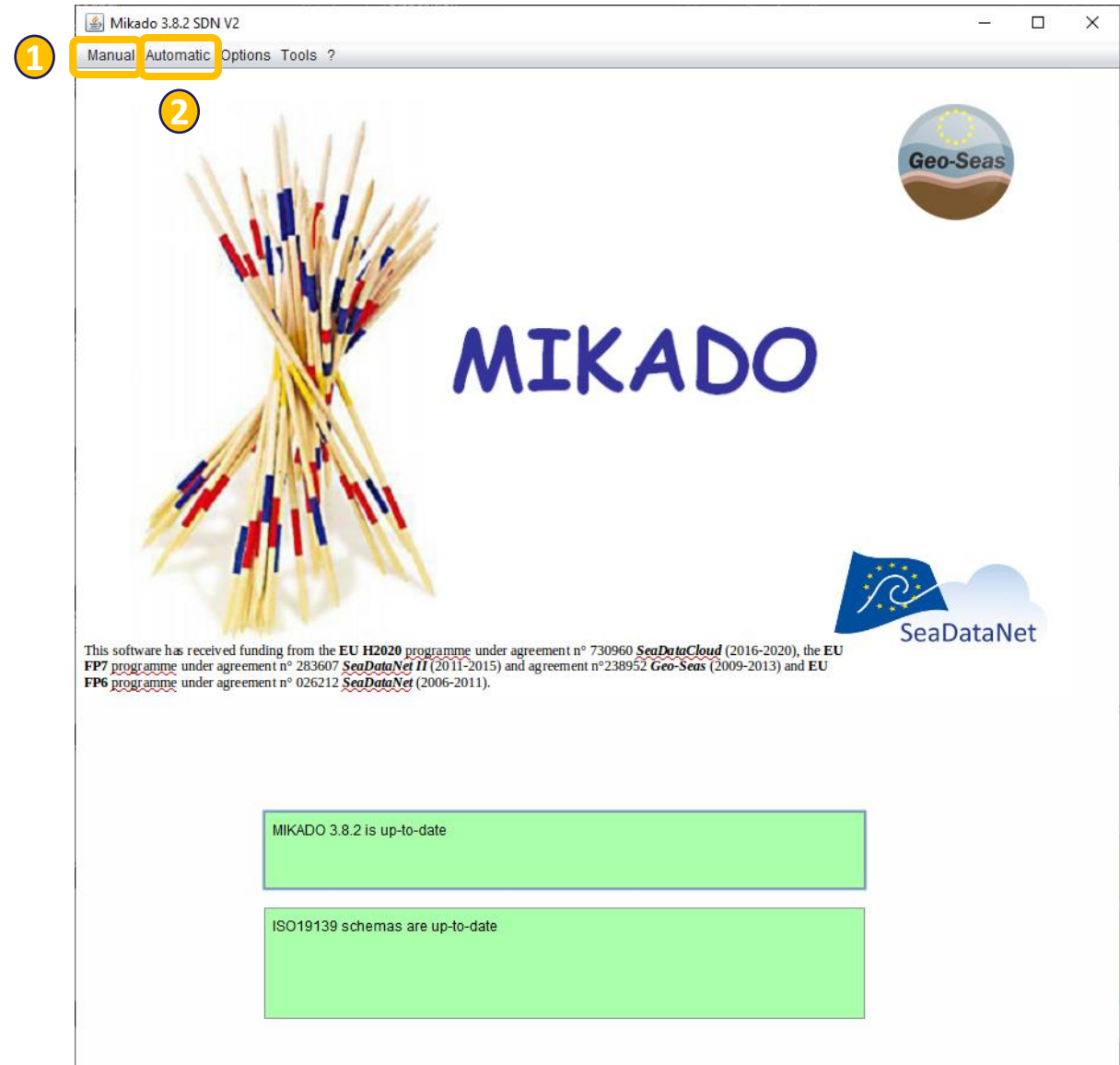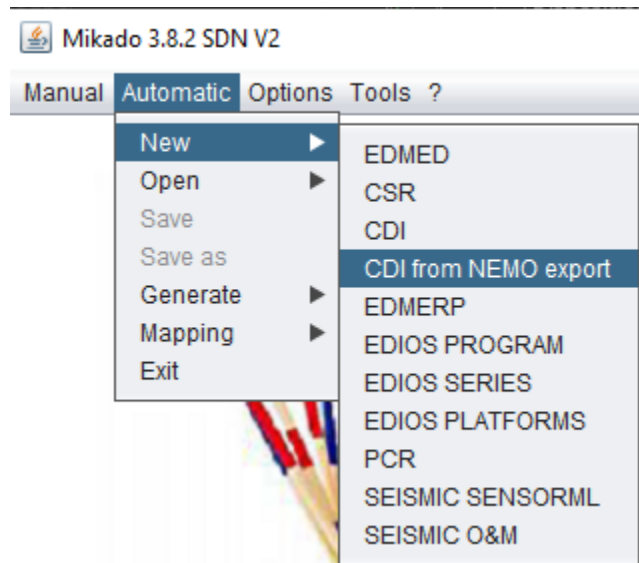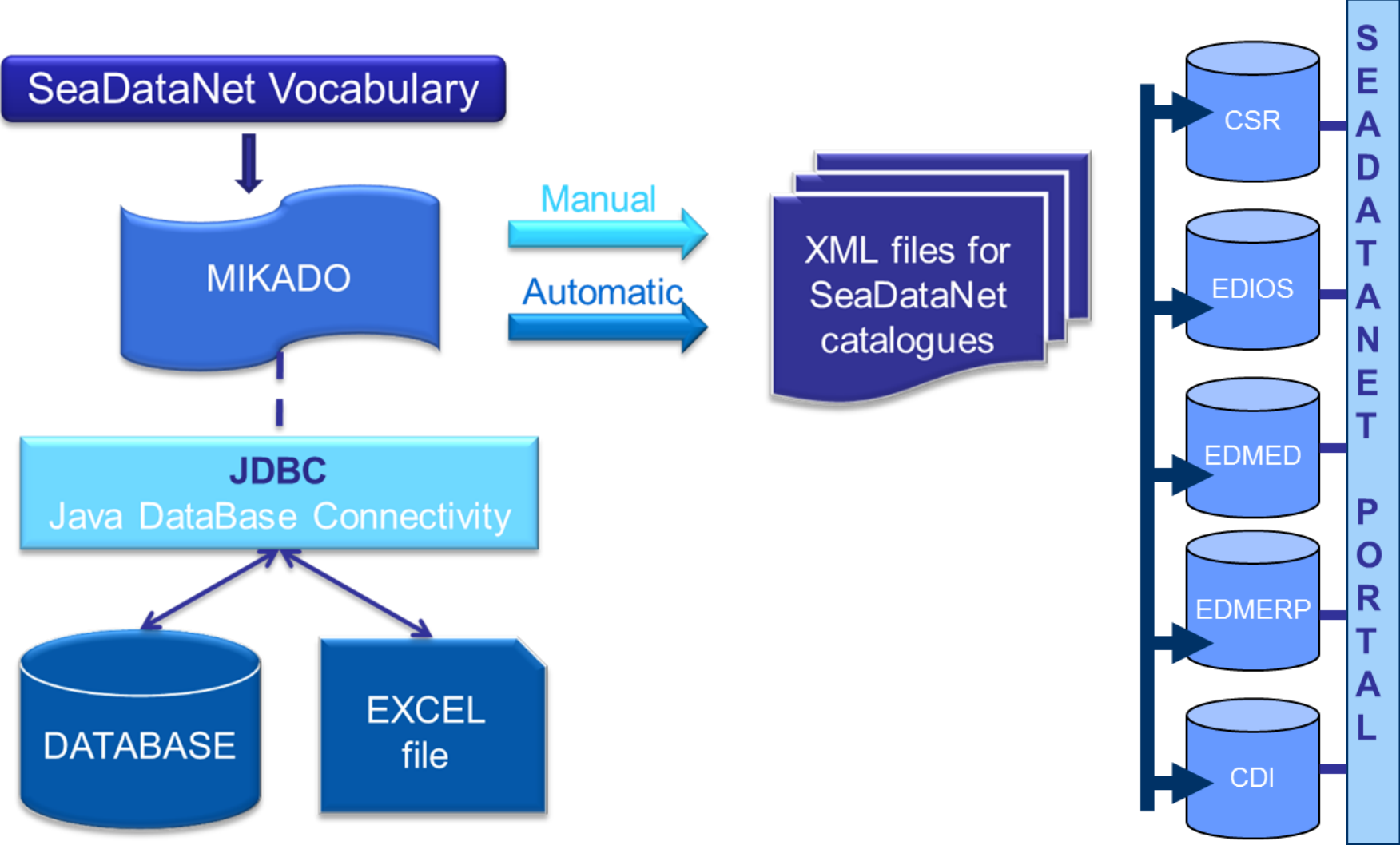Steven PIEL steven.piel@ifremer.fr

Ifremer

General description

Generate XML metadata catalogue descriptions using **SDN common vocabularies** (EDMERP, CSR, CDI…)

1 – **Manual** mode

2 – **Automatic** mode

MIKADO main features

MIKADO – Automatic XML generation

4 steps:

• **Connect** to a database or a csv file and test the connection

• Write the **queries** to retrieve information in the database or in CSV, test the queries

• Save the queries in a "Configuration file"

• Generate the XML files using the "Configuration file"

Software user support

MIKADO home page
https://www.seadatanet.org/Software/MIKADO

Installation files: Windows/Linux (version 3.8.2 and 3.5.3)
https://www.seadatanet.org/Software/MIKADO/Download-MIKADO

User manual
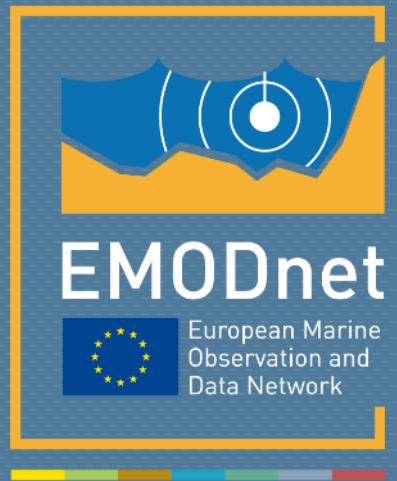https://www.seadatanet.org/content/download/651/file/sdn_Mikado_UserManual_V3.8.2.pdf

Helpdesk
sdn-userdesk@seadatanet.org

FAQ
https://www.seadatanet.org/Software/MIKADO/FAQ

Thank you for your attention!
Any questions?

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Your gateway to marine data in Europe

Slide X: top image from EMODnet Open Sea Lab II, source: Dirk Leemans

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