



# SeaDataCloud

Improving the workflow using the  
SeaDataNet tools  
NEMO, OCTOPUS, MIKADO

Michèle Fichaut - Ifremer

SeaDataCloud 1st training session, Ostende, Belgium, 20-27 June 2018

[sdn-userdesk@seadatanet.org](mailto:sdn-userdesk@seadatanet.org) – [www.seadatanet.org](http://www.seadatanet.org)

## Challenge for a data infrastructure

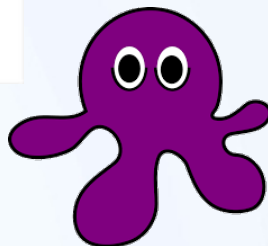
- Distribute homogeneous data and metadata files to data users in standardized formats that can be used in standard tools

- Available tools

- NEMO



- OCTOPUS



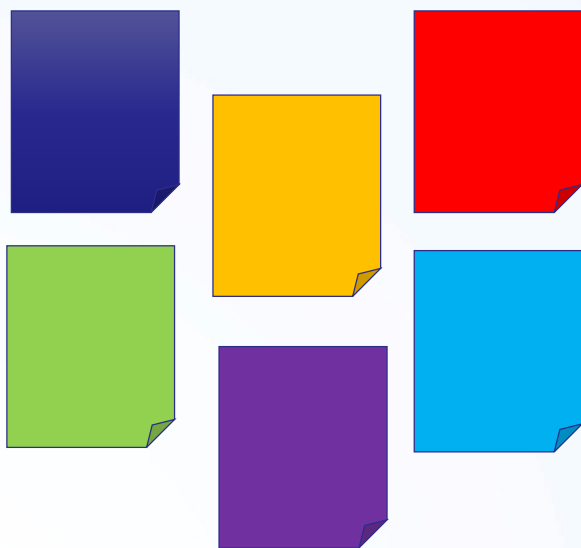
- MIKADO



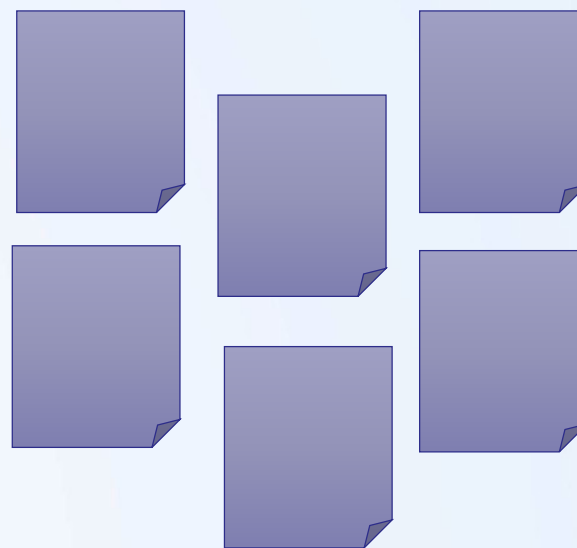
# NEMO

- Tool for data file conversions

Data files at any ASCII format



Data files at SeaDataNet format



# NEMO

- This the aim of NEMO software
  - Generate files at SeaDataNet formats
    - Ocean Data View (ODV, text csv format)
    - NetCDF (Binary format)
    - MedAtlas (Text format, enriched in metadata)
  - SeaDataNet formats because
    - Data files contain specific SeaDataNet information like LOCAL\_CDI\_ID, EDMO\_CODE
    - Mapping to P01 (parameters), P06 (units), L22 (instruments), CSR id....

## Exemple of specific SDN information

- **SEMANTIC header**

- `<subject>SDN:LOCAL:PRES</subject><object>SDN:P01::PRESPR01</object><units>SDN:P06::UPDB</units><instrument>SDN:L22::TOOL0035</instrument>`
- `<subject>SDN:LOCAL:TEMP</subject><object>SDN:P01::TEMPPR01</object><units>SDN:P06::UPAA</units><instrument>SDN:L22::TOOL0035</instrument>`
- `<subject>SDN:LOCAL:DOX2</subject><object>SDN:P01::DOXMZZXX</object><units>SDN:P06::KGUM</units>`

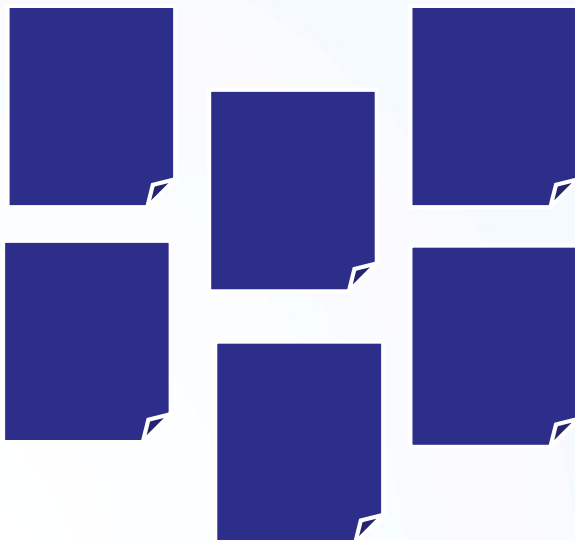
- **LOCAL\_CDI\_ID=FI35201500250\_00012\_H10**

- `<sdn_reference xlink:href="http://seadata.bsh.de/cgi-csr/XML/xmlDownload_V2.pl?edmo=486&identifier=15002500" xlink:role="isObservedBy" link:type="SDN:L23::CSR"/>`

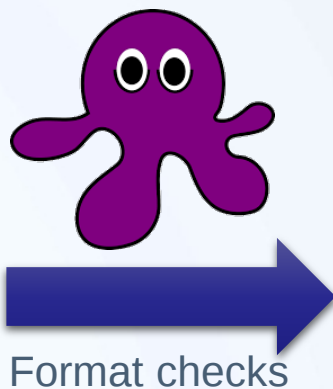
## OCTOPUS (1)

- New SeaDataCloud Tool for SeaDataNet data file **checks** and **conversions**

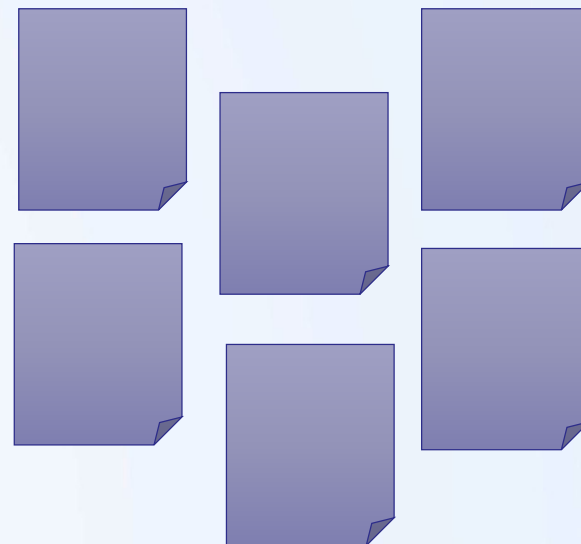
Data files at one  
SeaDataNet format



Format checks



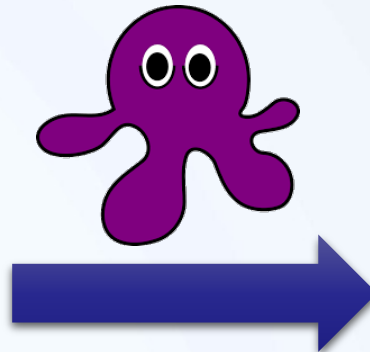
Data files at another  
SeaDataNet format



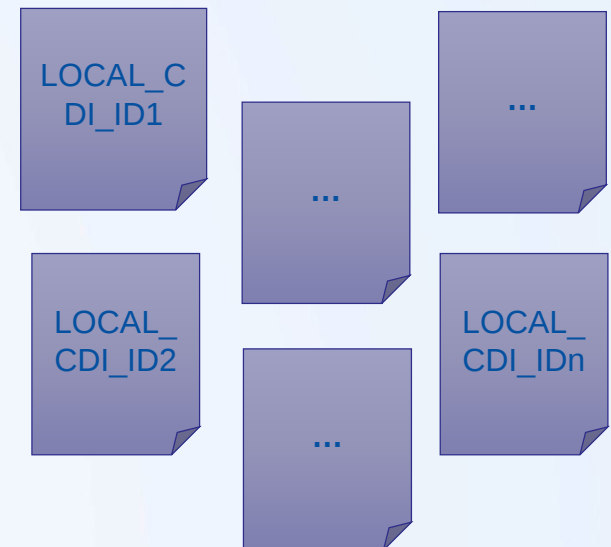
## OCTOPUS (2)

- Tool for SeaDataNet data file splitting

Multi-station file at one  
SeaDataNet format

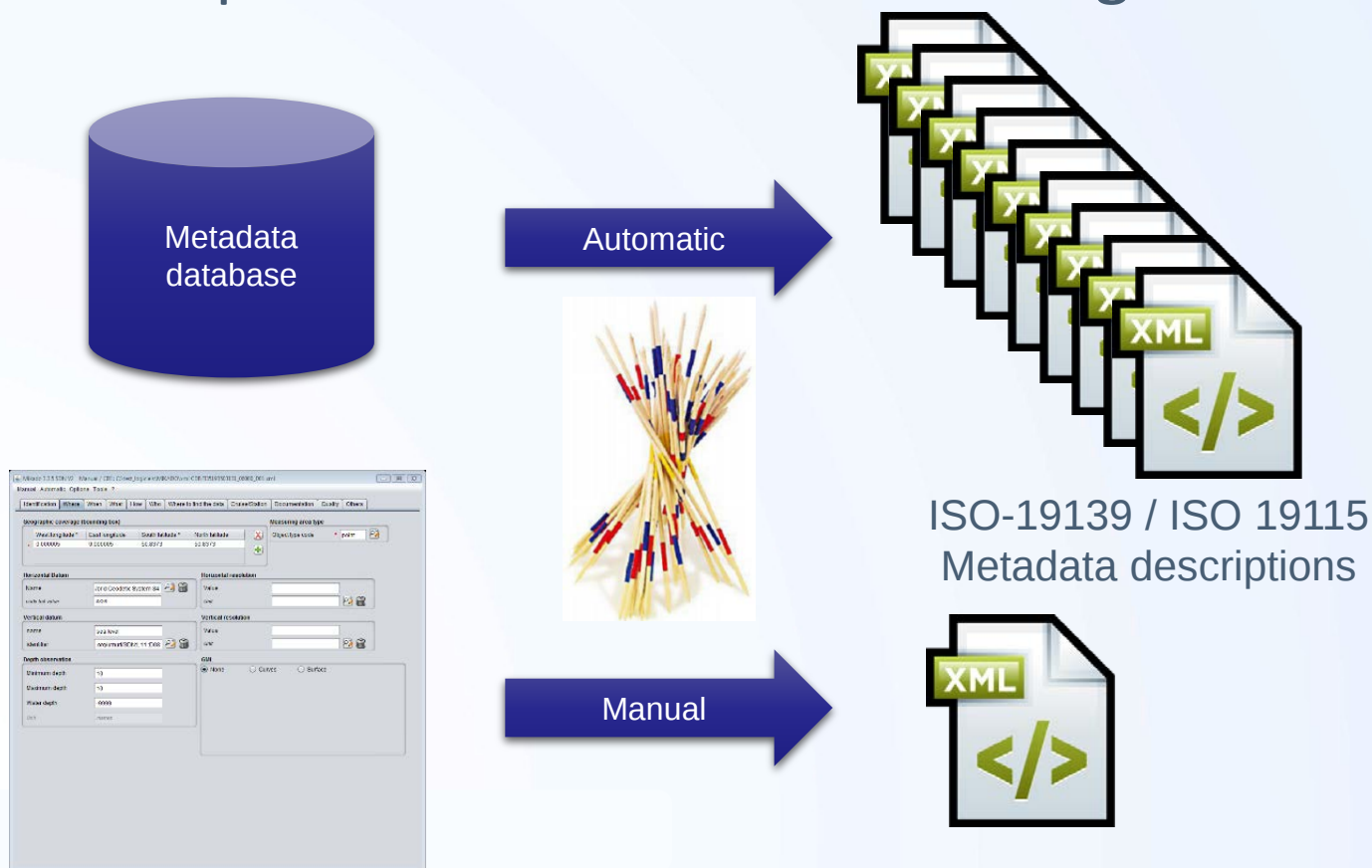


Mono-station file at the same  
or another SeaDataNet format



# MIKADO

- Generation of standardised metadata XML descriptions for SeaDataNet catalogues



## MIKADO

- EDMED : description of Marine data sets
- EDMERP : Description of Marine projects
- CSR : Cruise summary reports
- EDIOS : Description of observatories
- CDI : description of data
  - Vertical profile (point)
  - Time series (point)
  - Trajectories, tracks (curves or surface)

## Why again a workshop on MIKADO and NEMO?

- These tools are in used since the beginning of SeaDataNet → more than 10 years ago
- Still number of data and metadata files contain errors
  - Some of them are BLOCKING ERRORS
  - Others are just TIME CONSUMING MISTAKES when performing the generation of the products
- Aim of this presentation



## Example of a SeaDataNet ODV file

```
//optional comment lines
//
//<sdn_reference xlink:href="http://seadata.bsh.de/cgi-csr/XML/xmlDownload_V2.pl?edmo=486&identifier=6530010" xlink:role="isObservedBy"
//<sdn_reference xlink:href="http://vocab.nerc.ac.uk/collection/C17/current/06M2" xlink:role="isObservedBy" xlink:type="SDN:L23::NVS2CON"
//<sdn_reference xlink:href="http://seadatanet.maris2.nl/v_cdi_v3/print_xml.asp?edmo=486&identifier=FI35200653001_00001_H10" xlink:role="
//SDN_parameter_mapping
//<subject>SDN:LOCAL:Depth</subject><object>SDN:P01::ADEPZZ01</object><units>SDN:P06::ULAA</units>
//<subject>SDN:LOCAL:Temperature</subject><object>SDN:P01::TEMPPR01</object><units>SDN:P06::UPAA</units><instrument>SDN:L22::TOOL
//<subject>SDN:LOCAL:Salinity</subject><object>SDN:P01::PSLTZZ01</object><units>SDN:P06::UUUU</units><instrument>SDN:L22::TOOL0409</
//<subject>SDN:LOCAL:Oxygen</subject><object>SDN:P01::DOXMZZXX</object><units>SDN:P06::KGUM</units><instrument>SDN:L22::TOOL0036
//
```

| Cruise  | Station | Type | yyyy-mm-ddThh:mm:ss | Longitude [deg] | Latitude [deg] | LOCAL_CDI_ID   | EDMO_code | Bot. Depth [m] | Depth [m] | QV:St | Temperature [degC] | QV:St |
|---------|---------|------|---------------------|-----------------|----------------|----------------|-----------|----------------|-----------|-------|--------------------|-------|
| OVIDE 3 | 1       | C    | 2006-05-24T14:28:00 | -10.7           | 38.433333      | FI35200653001_ | 486       | 4915           | 1         | 1     | 16.512             | 1     |
|         |         |      |                     |                 |                |                |           |                | 2         | 1     | 16.512             | 1     |
|         |         |      |                     |                 |                |                |           |                | 3         | 1     | 16.512             | 1     |
|         |         |      |                     |                 |                |                |           |                | 4         | 1     | 16.512             | 1     |
|         |         |      |                     |                 |                |                |           |                | 5         | 1     | 16.512             | 1     |
|         |         |      |                     |                 |                |                |           |                | 6         | 1     | 16.512             | 1     |
|         |         |      |                     |                 |                |                |           |                | 7         | 1     | 16.512             | 1     |
|         |         |      |                     |                 |                |                |           |                | 8         | 1     | 16.512             | 1     |
|         |         |      |                     |                 |                |                |           |                | 9         | 1     | 16.512             | 1     |
|         |         |      |                     |                 |                |                |           |                | 10        | 1     | 16.512             | 1     |

## Example of a SeaDataNet ODV file

//

## Comment lines - Optional

```
//SDN parameter mapping
```

//<subject>SDN:LOCAL:Oxygen</subject><object>SDN:P01::DOXMZZXX</object><units>SDN:P06::KGUM</units><instrument>SDN:L22::TOOL0036

//

|    |   |        |   |
|----|---|--------|---|
| 2  | 1 | 16.512 | 1 |
| 3  | 1 | 16.512 | 1 |
| 4  | 1 | 16.512 | 1 |
| 5  | 1 | 16.512 | 1 |
| 6  | 1 | 16.512 | 1 |
| 7  | 1 | 16.512 | 1 |
| 8  | 1 | 16.512 | 1 |
| 9  | 1 | 16.512 | 1 |
| 10 | 1 | 16.512 | 1 |

# Example of a SeaDataNet ODV file

```
//optional comment lines
//
//<sdn_reference xlink:href="http://seadata.bsh.de/cgi-csr/XML/xmlDownload_V2.pl?edmo=486&identifier=6530010" xlink:role="isObservedBy"
//<sdn_reference xlink:href="http://vocab.nerc.ac.uk/collection/C17/current/
//<sdn_reference xlink:href="http://seadatanet.maris2.nl/v_cdi_v3/print_x
```

SeaDataNet external links - Optional

```
//SDN_parameter_mapping
//<subject>SDN:LOCAL:Depth</subject><object>SDN:P01::ADEPZZ01</object><units>SDN:P06::ULAA</units>
//<subject>SDN:LOCAL:Temperature</subject><object>SDN:P01::TEMPPR01</object><units>SDN:P06::UPAA</units><instrument>SDN:L22::TOOL0409</
//<subject>SDN:LOCAL:Salinity</subject><object>SDN:P01::PSLTZZ01</object><units>SDN:P06::UUUU</units><instrument>SDN:L22::TOOL0409</
//<subject>SDN:LOCAL:Oxygen</subject><object>SDN:P01::DOXMZZXX</object><units>SDN:P06::KGUM</units><instrument>SDN:L22::TOOL0036</
//
```

| Cruise  | Station | Type | yyyy-mm-ddThh:mm:ss | Longitude [deg] | Latitude [deg] | LOCAL_CDI_ID   | EDMO_code | Bot. Depth [m] | Depth [m] | QV:SI | Temperature [C] | QV:SI |
|---------|---------|------|---------------------|-----------------|----------------|----------------|-----------|----------------|-----------|-------|-----------------|-------|
| OVIDE 3 | 1       | C    | 2006-05-24T14:28:00 | -10.7           | 38.433333      | FI35200653001_ | 486       | 4915           | 1         | 1     | 16.512          | 1     |
|         |         |      |                     |                 |                |                |           |                | 2         | 1     | 16.512          | 1     |
|         |         |      |                     |                 |                |                |           |                | 3         | 1     | 16.512          | 1     |
|         |         |      |                     |                 |                |                |           |                | 4         | 1     | 16.512          | 1     |
|         |         |      |                     |                 |                |                |           |                | 5         | 1     | 16.512          | 1     |
|         |         |      |                     |                 |                |                |           |                | 6         | 1     | 16.512          | 1     |
|         |         |      |                     |                 |                |                |           |                | 7         | 1     | 16.512          | 1     |
|         |         |      |                     |                 |                |                |           |                | 8         | 1     | 16.512          | 1     |
|         |         |      |                     |                 |                |                |           |                | 9         | 1     | 16.512          | 1     |
|         |         |      |                     |                 |                |                |           |                | 10        | 1     | 16.512          | 1     |

## Example of a SeaDataNet ODV file

```
//optional comment lines
//
//<sdn_reference xlink:href="http://seadata.bsh.de/cgi-csr/XML/xmlDownload_V2.pl?edmo=486&identifier=6530010" xlink:role="isObservedBy"
//<sdn_reference xlink:href="http://vocab.nerc.ac.uk/collection/C17/current/06M2" xlink:role="isObservedBy" xlink:type="SDN:L23::NVS2CON"
//<sdn_reference xlink:href="http://seadatanet.maris2.nl/v_cdi_v3/print_xml.asp?edmo=486&identifier=FI35200653001_00001_H10" xlink:role="
//SDN_parameter_mapping
//<subject>SDN:LOCAL:Depth</subject><object>SDN:P01::ADEPZZ01</object><units>SDN:P06::ULAA</units>
//<subject>SDN:LOCAL:Temperature</subject><object>SDN:P01::TEM
//<subject>SDN:LOCAL:Salinity</subject><object>SDN:P01::PSLTZZ01
//<subject>SDN:LOCAL:Oxygen</subject><object>SDN:P01::DOXMZZ
//
```

SeaDataNet Semantic header - Mandatory  
Parameter mapping between local parameter name and NVSV2  
vocabulary

| Cruise  | Station | Type | yyyy-mm-ddThh:mm:ss | Longitude [deg] | Latitude [deg] | LOCAL_CDI_ID   | EDMO_code | Bot. Depth [m] | Depth [m] | QV:St | Temperature [degC] | QV |
|---------|---------|------|---------------------|-----------------|----------------|----------------|-----------|----------------|-----------|-------|--------------------|----|
| OVIDE 3 | 1       | C    | 2006-05-24T14:28:00 | -10.7           | 38.433333      | FI35200653001_ | 486       | 4915           | 1         | 1     | 16.512             | 1  |
|         |         |      |                     |                 |                |                |           |                | 2         | 1     | 16.512             | 1  |
|         |         |      |                     |                 |                |                |           |                | 3         | 1     | 16.512             | 1  |
|         |         |      |                     |                 |                |                |           |                | 4         | 1     | 16.512             | 1  |
|         |         |      |                     |                 |                |                |           |                | 5         | 1     | 16.512             | 1  |
|         |         |      |                     |                 |                |                |           |                | 6         | 1     | 16.512             | 1  |
|         |         |      |                     |                 |                |                |           |                | 7         | 1     | 16.512             | 1  |
|         |         |      |                     |                 |                |                |           |                | 8         | 1     | 16.512             | 1  |
|         |         |      |                     |                 |                |                |           |                | 9         | 1     | 16.512             | 1  |
|         |         |      |                     |                 |                |                |           |                | 10        | 1     | 16.512             | 1  |

## Example of a SeaDataNet ODV file

```
//optional comment lines
//
//<sdn_reference xlink:href="http://seadata.bsh.de/cgi-csr/XML/xmlDownload_V2.pl?edmo=486&identifier=6530010" xlink:role="isObservedBy"
//<sdn_reference xlink:href="http://vocab.nerc.ac.uk/collection/C17/current/06M2" xlink:role="isObservedBy" xlink:type="SDN:L23::NVS2CON"
//<sdn_reference xlink:href="http://seadatanet.maris2.nl/v_cdi_v3/print_xml.asp?edmo=486&identifier=FI35200653001_00001_H10" xlink:role="
//SDN_parameter_mapping
//<subject>SDN:LOCAL:Depth</subject><object>SDN:P01::ADEPZZ01</object><units>SDN:P06::ULAA</units>
//<subject>SDN:LOCAL:Temperature</subject><object>SDN:P01::TEMPPR01</object><units>SDN:P06::UPAA</units><instrument>SDN:L22::TOOL
//<subject>SDN:LOCAL:Salinity</subject><object>SDN:P01::PSLTZZ01</object><units>SDN:P06::UUUU</units><instrument>SDN:L22::TOOL0409</
//<subject>SDN:LOCAL:Oxygen</subject><object>SDN:P01::DOXMZZXX</object><units>SDN:P06::KGUM</units><instrument>SDN:L22::TOOL0036
//
Cruise Station Type yyyy-mm-ddThh:n Longitude [deg Latitude [deg LOCAL_CDI_ID EDMO_code Bot. Depth [r Depth [r QV:SI Temperature QV
```

ODV Column headers

Fixed labelling for the first columns from "Cruise" ... to "Bot. Depth"

Column for quality flags mandatory after each parameter column: labelled QV:SEADATANET

|    |   |        |   |
|----|---|--------|---|
| 6  | 1 | 16.512 | 1 |
| 7  | 1 | 16.512 | 1 |
| 8  | 1 | 16.512 | 1 |
| 9  | 1 | 16.512 | 1 |
| 10 | 1 | 16.512 | 1 |

# Example of a SeaDataNet ODV file

```
//optional comment lines
//
//<sdn_reference xlink:href="http://seadata.bsh.de/cgi-csr/XML/xmlDownload_V2.pl?edmo=486&identifier=6530010" xlink:role="isObservedBy"
//<sdn_reference xlink:href="http://vocab.nerc.ac.uk/collection/C17/current/06M2" xlink:role="isObservedBy" xlink:type="SDN:L23::NVS2CON"
//<sdn_reference xlink:href="http://seadatanet.maris2.nl/v_cdi_v3/print_xml.asp?edmo=486&identifier=FI35200653001_00001_H10" xlink:role="isObservedBy"
//SDN_parameter_mapping
//<subject>SDN:LOCAL:Depth</subject><object>SDN:P01::ADEPZZ01</object><units>SDN:P06::ULAA</units>
//<subject>SDN:LOCAL:Temperature</subject><object>SDN:P01::TEMPPR01</object><units>SDN:P06::UPAA</units><instrument>SDN:L22::TOOL0409</instrument>
//<subject>SDN:LOCAL:Salinity</subject><object>SDN:P01::PSLTZZ01</object><units>SDN:P06::UUUU</units><instrument>SDN:L22::TOOL0409</instrument>
//<subject>SDN:LOCAL:Oxygen</subject><object>SDN:P01::DOXMZZXX</object><units>SDN:P06::KGUM</units><instrument>SDN:L22::TOOL0036</instrument>
//
```

| Cruise  | Station | Type | yyyy-mm-ddThh:n     | Longitude [deg] | Latitude [deg] | LOCAL_CDI_ID   | EDMO_code | Bot. Depth [m] | Depth [m] | QV:SI | Temperature [degC] | QV:SI |
|---------|---------|------|---------------------|-----------------|----------------|----------------|-----------|----------------|-----------|-------|--------------------|-------|
| OVIDE 3 | 1       | C    | 2006-05-24T14:28:00 | -10.7           | 38.433333      | FI35200653001_ | 486       | 4915           | 1         | 1     | 16.512             | 1     |
|         |         |      |                     |                 |                |                |           |                | 2         | 1     | 16.512             | 1     |
|         |         |      |                     |                 |                |                |           |                | 3         | 1     | 16.512             | 1     |
|         |         |      |                     |                 |                |                |           |                | 4         | 1     | 16.512             | 1     |
|         |         |      |                     |                 |                |                |           |                | 5         | 1     | 16.512             | 1     |
|         |         |      |                     |                 |                |                |           |                | 6         | 1     | 16.512             | 1     |
|         |         |      |                     |                 |                |                |           |                | 7         | 1     | 16.512             | 1     |
|         |         |      |                     |                 |                |                |           |                | 8         | 1     | 16.512             | 1     |
|         |         |      |                     |                 |                |                |           |                | 9         | 1     | 16.512             | 1     |
|         |         |      |                     |                 |                |                |           |                | 10        | 1     | 16.512             | 1     |

Station header

ODV Data Lines

Measured parameters  
and QC flags

# Example of a SeaDataNet ODV file

```
//optional comment lines
//
//<sdn_reference xlink:href="http://seadata.bsh.de/cgi-csr/XML/xmlDownload_V2.pl?edmo=486&identifier=6530010" xlink:role="isObservedBy"
//<sdn_reference xlink:href="http://vocab.nerc.ac.uk/collection/C17/current/06M2" xlink:role="isObservedBy" xlink:type="SDN:L23::NVS2CON"
//<sdn_reference xlink:href="http://seadatanet.maris2.nl/v_cdi_v3/print_xml.asp?edmo=486&identifier=FI35200653001_00001_H10" xlink:role="
//SDN_parameter mapping
//<subject>SDN:LOCAL:Depth</subject><object>SDN:P01::ADEPZZ01</object><units>SDN:P06::ULAA</units>
//<subject>SDN:LOCAL:Temperature</subject><object>SDN:P01::TEMPPR01</object><units>SDN:P06::UPAA</units><instrument>SDN:L22::TOOL
//<subject>SDN:LOCAL:Salinity</subject><object>SDN:P01::PSLTZZ01</object><units>SDN:P06::UUUU</units><instrument>SDN:L22::TOOL0409</
//<subject>SDN:LOCAL:Oxygen</subject><object>SDN:P01::DOXMZZYX</object><units>SDN:P06::KGUM</units><instrument>SDN:L22::TOOL0036
//
Cruise Station Type yyyy-mm-ddThh:n Longitude [deg Latitude [deg LOCAL_CDI_ID EDMO_code Bot_Depth [m Depth [m QV:SI Temperature QV
```

## ODV Column headers (CH) and Semantic headers (SH) have to be coherent

- Number of SDN parameter mapping lines = Number of measured parameters
- Label in the CH= label in SDN:LOCAL in SH
- P01 Parameter code of SH match local label of CH
- P06 Unit code in SH match the unit of the CH

Wrong  
Right

## Different error types (1)

| Error in SeaDataNet <b>semantic header</b>        | Example                                                                              | Which tool to avoid or correct |
|---------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------|
| Wrong P01 parameter code                          | PH ZZXX<br>PHXXZZXX                                                                  | NEMO → to avoid                |
| Use of deprecated parameter code                  | MMUSHGXX<br>D2930561                                                                 | OCTOPUS → to correct           |
| File with the V1 NERC vocab terms                 | P011 → P01<br>P061 → P06                                                             | OCTOPUS → to correct           |
| Semantic header missing → Non SDN format          |                                                                                      | NEMO, to avoid                 |
| Errors in the mapping lines like missing brackets | <ul style="list-style-type: none"> <li>/units&gt;</li> <li>&lt;/units&gt;</li> </ul> | NEMO, to avoid                 |

Wrong  
Right

## Different error types (2)

| Error in ODV <b>metadata column headers</b>                     | Example                                                                                                                                                              | Which tool to avoid or correct |
|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| Wrong labelling of the metadata column headers (which is fixed) | <p>Bot.depth [m]</p> <p>Bot. Depth [m]</p> <p>yyyy-mm-ddThh-mm-ss.sss</p> <p>YYYY-MM-DDThh:mm:ss.sss</p> <p>Latitude [deg.North]</p> <p>Latitude [degrees_north]</p> | NEMO → to avoid                |

## Different error types (3)

| Error in ODV <b>data column headers</b>                                   | Example                                                                                                                                                                                                                                                                    | Which tool to avoid or correct |
|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| Missing space between parameter label and parameter unit in column header | DOXY[ml/l]<br>DOXY [ml/l]                                                                                                                                                                                                                                                  | NEMO → to avoid                |
| Incorrect primary variable (first measured variable after Bot. Depth)     | For sediment core:<br>Depth below sea surface: ADEPZZ01<br>→ Depth below surface of the bed: COREDIST<br>For vertical profile:<br>Sequence number: ACYCAA01 → Depth below sea surface: ADEPZZ01<br>→ Pressure: PRESPR01<br>For Time series:<br>Data and time ISO: DTUT8601 | NEMO → to avoid                |
| Extra last empty column                                                   |                                                                                                                                                                                                                                                                            | NEMO → to avoid                |
| QV:SeaDataNet column missing                                              |                                                                                                                                                                                                                                                                            | NEMO → to avoid                |

Wrong  
Right

## Different error types (4)

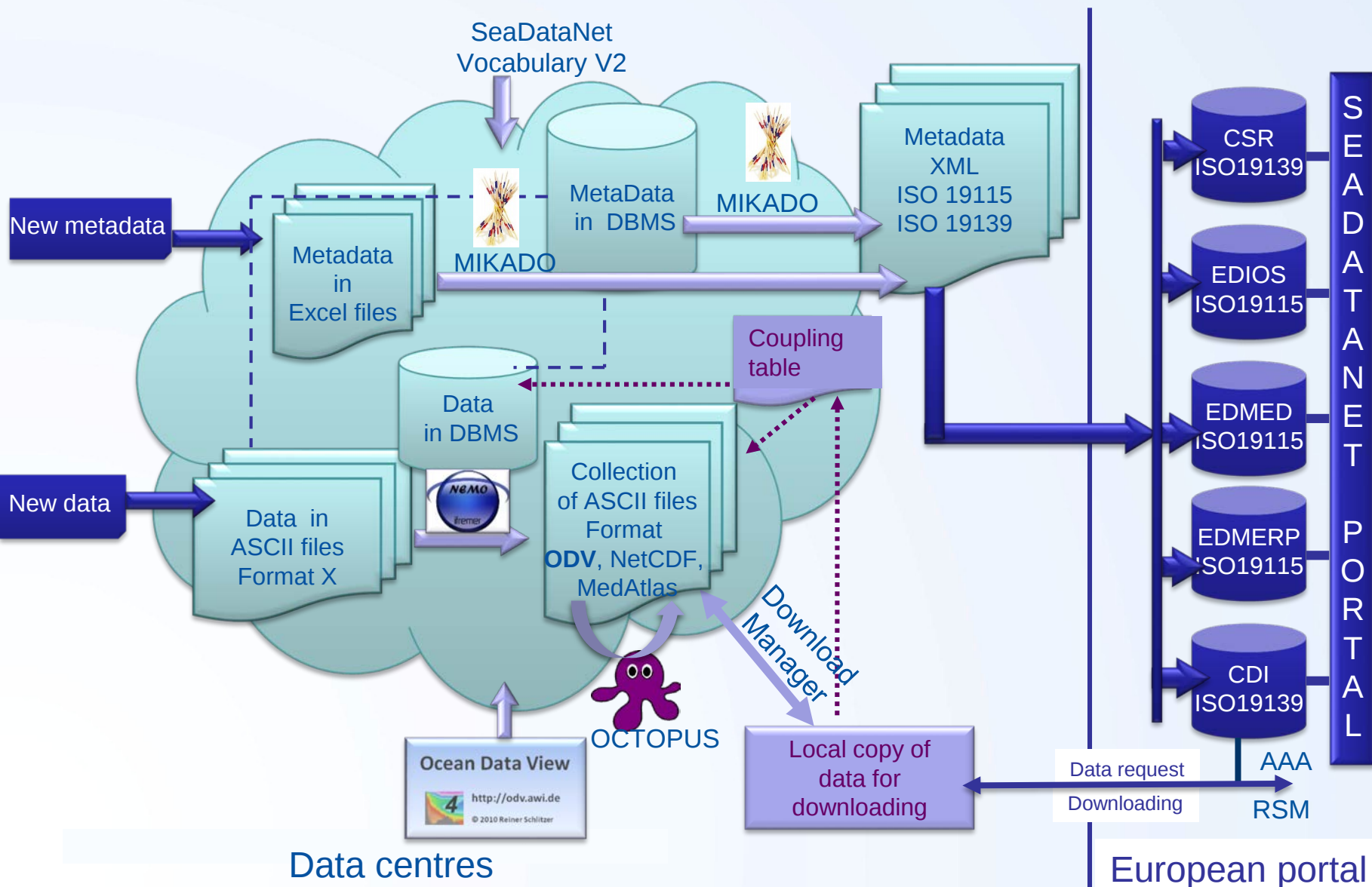
| Error in ODV <b>metadata and data lines</b>            | Example                                                | Which tool to avoid or correct      |
|--------------------------------------------------------|--------------------------------------------------------|-------------------------------------|
| Wrong EDMO_code                                        | EDMO of the originator<br>EDMO of the CDI_Partner      | NEMO → to avoid                     |
| Missing value set to a default value in stead of empty | -999.99                                                | NEMO → to avoid<br>ODV → to change? |
| Missing QC flag set to 9 for missing value             |                                                        | NEMO → to avoid                     |
| NO QC flag or Wrong scale of QC Flags                  | SeaDataNet QC flag scale has to be used (NVS list L20) | NEMO → to avoid                     |

Wrong  
Right

## Different error types (5)

| Incoherencies between data files (ODV, NetCDF, MedAtlas) and metadata files (CDI XML)                                                                                                     | Example                                                                                                                                                             | Which tool to avoid or correct |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| List of P02 parameters in the CDI XML files does not match with the P01 described in the data files → linked to variable measured parameters from one station to another in a cruise file | <p>In CDI XML: P02 = TEMP, PSAL, NTRA, NTRI</p> <p>In data files only: nutrients P01 codes, no temperature, salinity</p> <p>In CDI XML: P02= only NTRA and NTRI</p> | Checker in the cloud           |
| No match between LOCAL_CDI_ID in CDI XML and data file                                                                                                                                    | <p>123456789_ABCD in data file</p> <p>123456789-ABCD in CDI XML</p> <p>Should be the same</p>                                                                       | Checker in the cloud           |
| CDI partner EDMO_code different in CDI xml and in data file                                                                                                                               | <p>Originator EDMO code in data file in stead of CDI_partner EDMO code</p>                                                                                          | Checker in the cloud           |

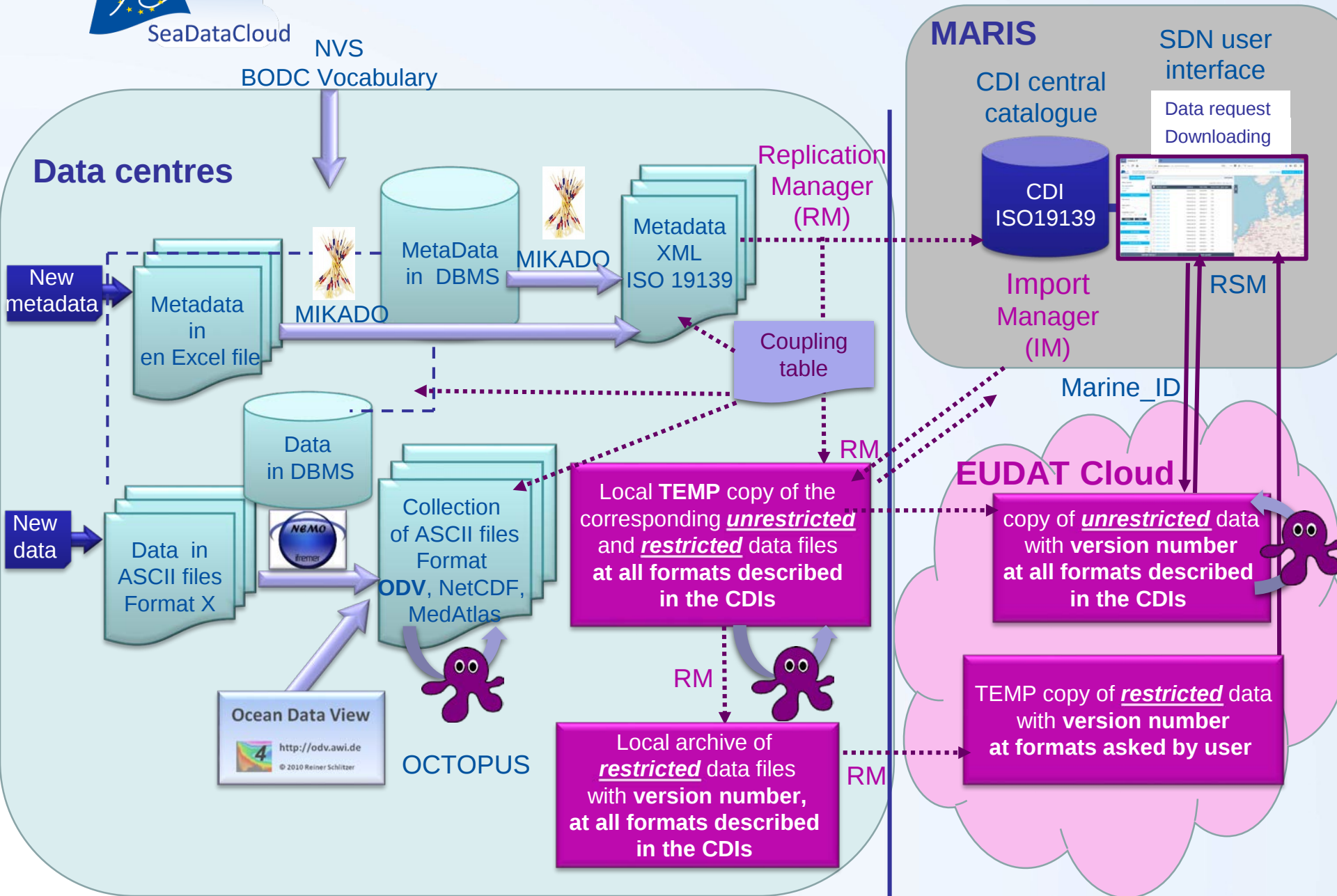
# Tools in SeaDataNet context





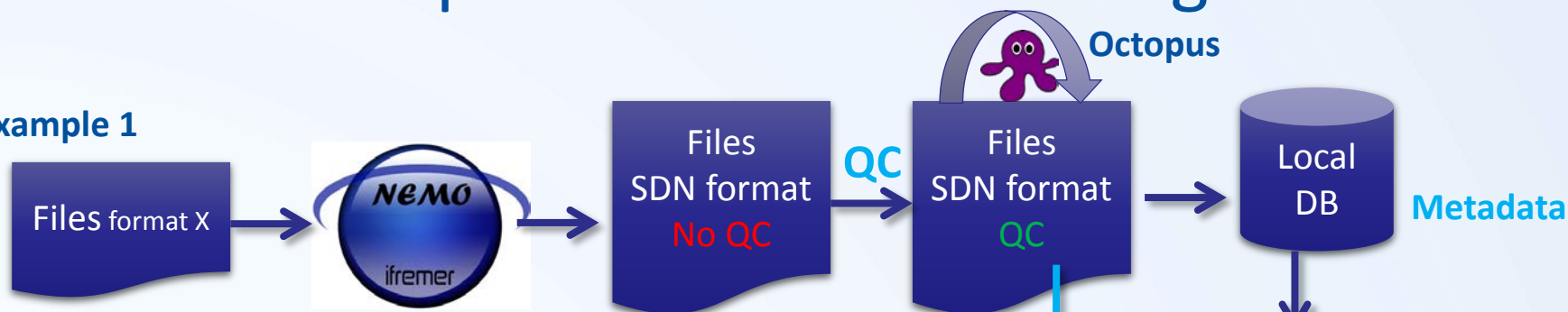
SeaDataCloud

# Tools in SeaDataCloud context

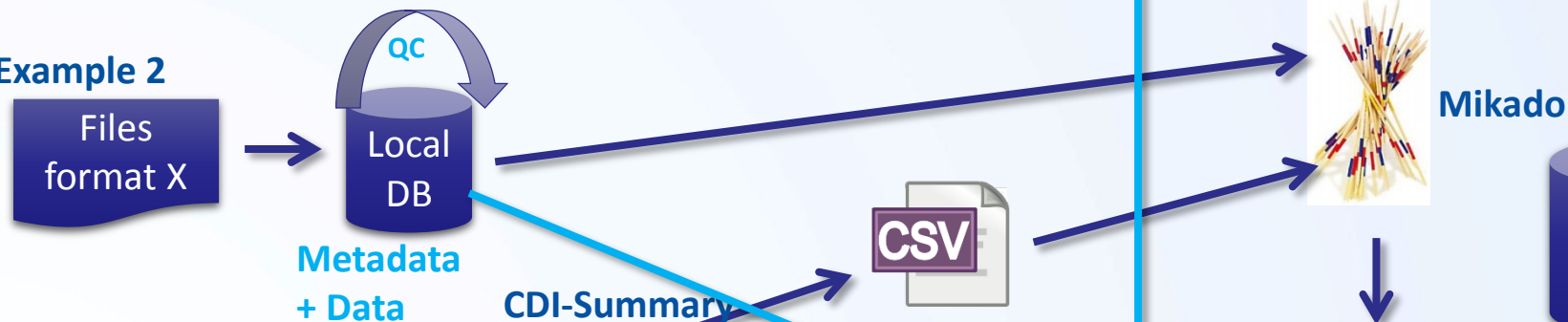


# Some examples of data flows using the tools

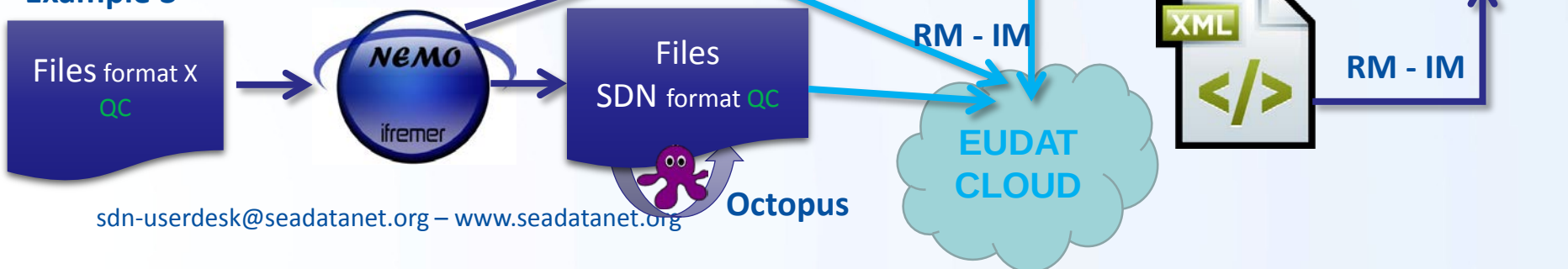
**Example 1**



**Example 2**



**Example 3**



## Advantages of using the tools

- Sure to be standard
- Lots of errors avoided
- Further standard and format evolutions are taken into account in the tools without any changes on your side

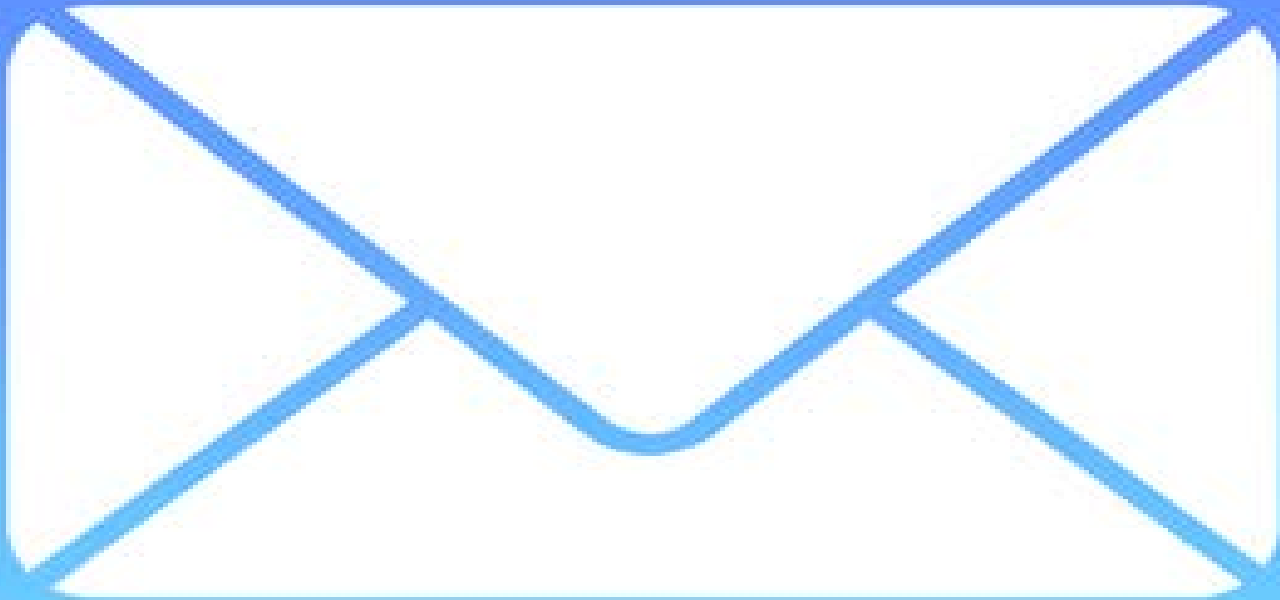


- No incoherencies between allowed
  - Data file (ODV, NetCDF, MedAtlas)
  - XML CDI description
  - Coupling table

## Call for beta testers

- Most of the tools are first tested internally by the developers and then by the responsible of the specifications
  - Vanessa for MIKADO
  - Michèle for NEMO and OCTOPUS
- Risk of missing important bugs
  - Need volunteers for beta testing

sdn-userdesk@seadatanet.org



I agree to be a beta  
tester of *Software\_name*

## Help needed for the training session

- Some of the exercises may be trivial for some of you who are very trained on the tools



Help welcome to  
assist the less  
experienced users!

# Any questions?

