SeaDataCloud

CNRS data flow to SeaDataNet

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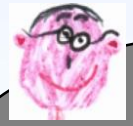
3 (out of 27) Observatories of the Science of the Universe (OSU)



EDMO 521

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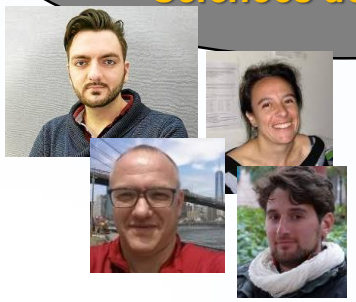

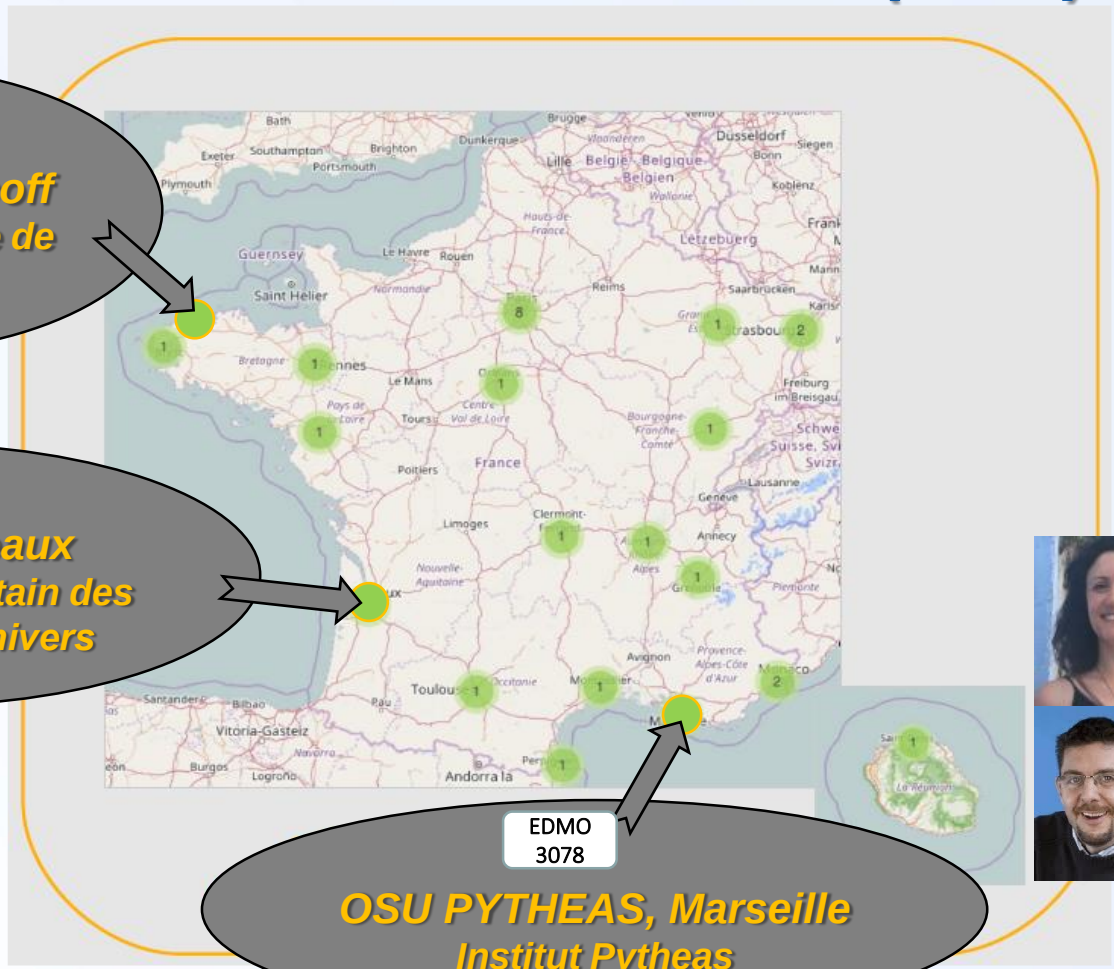

EDMO 3078

OSU PYTHEAS, Marseille
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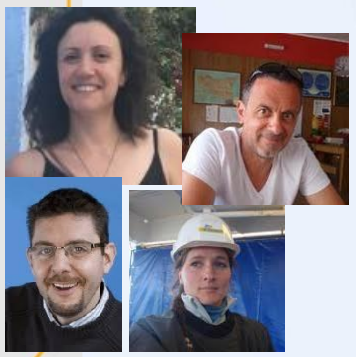

The National Observation Services (NOS)

French observation networks structuration within the Research Infrastructure for Coastal Ocean and Seashore ILICO

The datasets & the databases

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resomar

PELAGOS

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CYTOBASE

SEADATANET PORTAL

Flow Cytometry (FCM) data - CYTOBASE

Context & Initial aims

- Flow cytometry expert team at MIO (Melilotus Thyssen and Gerald Gregori)
- Many scientific campaigns and projects *(67 CDIs)*
- Abundant and complex data treatment

- Needs (objectives)
  - efficient software tools & workflow to manage data
  - interoperability for sharing data

SeaDataCloud WP9.2.5

"Ingesting, validating, long-term storage and access of Flow Cytometry data"

1. FCM Common Vocabulary
2. Data Transport Format for FCM data
3. Ingestion into SDN Infrastructure

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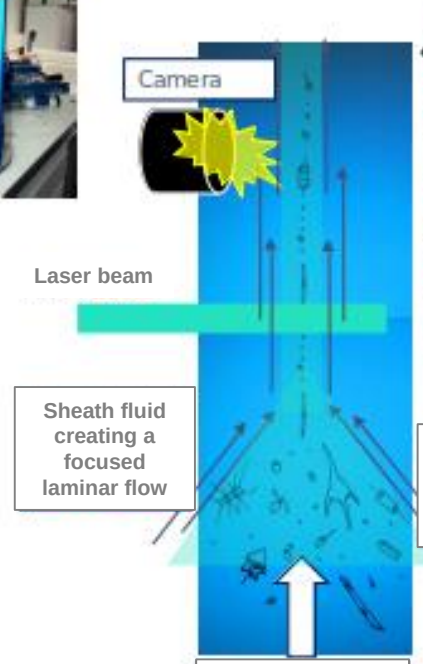
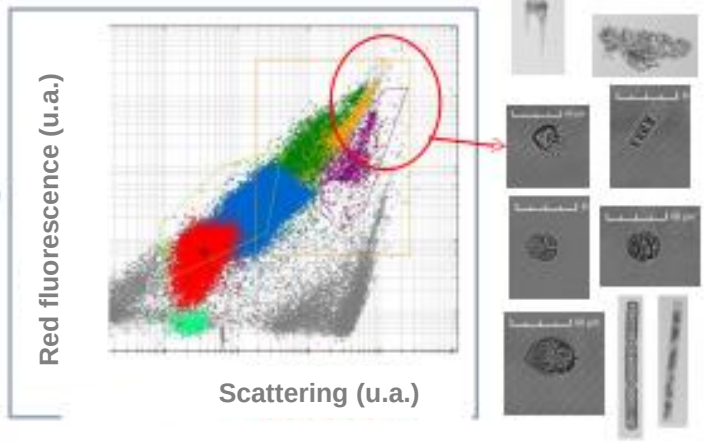
Flow cytometry (FCM) for marine research





Cytogram or picture describing the phytoplankton community
Up to 7 "functional" groups :
Prochlorococcus
Synechococcus
Picoeukaryotes
Nanoeukaryotes
Microphytoplankton
Cryptophytes like
Coccolitophorideae like

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Flow cytometry (FCM) for marine research

- nom_cruise :
- num_stat :
- sampling_date, analysis_date
- longitude / latitude
- sdn_local_cdi_id : FA35102016_CHROME_OCT_2016_FCMW
- sdn_edmo_code : 3078
- COL_instrument : tool1209
- bot_depth + depth :
- vol_ech :
- sdn_ClusterName : *Coccolithophores*
- sdn_ClusterNameID : *SDN:F02::F0200007*
- abundance : 19.4796
- Optical properties : *Red Fluorescence, Orange Fluorescence, Forward Scatter, Side Scatter*
  - *moy_tot_FLR QV_moy_tot_FLR sd_tot_FLR QV_sd_tot_FLR*
  - *moy_tot_FLO QV_moy_tot_FLO sd_tot_FLO QV_sd_tot_FLO*
  - *moy_tot_FWS QV_moy_tot_FWS sd_tot_FWS QV_sd_tot_FWS*
  - *moy_tot_SWS QV_moy_tot_SWS sd_tot_SWS QV_sd_tot_SWS*

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Flow Cytometry (FCM) data - CYTOBASE

For SDC tasks…

- Need to manage *in situ* real time flow cytometry data
- Converting FCM data files into CSV readable format
  (++ Python quality controls)
- Adding metadata

- Producing a common standard FCM voc.

- Inserting FCM data into a DB in order to perform queries
  (++ Python quality controls)

➔ Sharing FCM data with scientific community
(with metadata, with QC, in interoperable formats)

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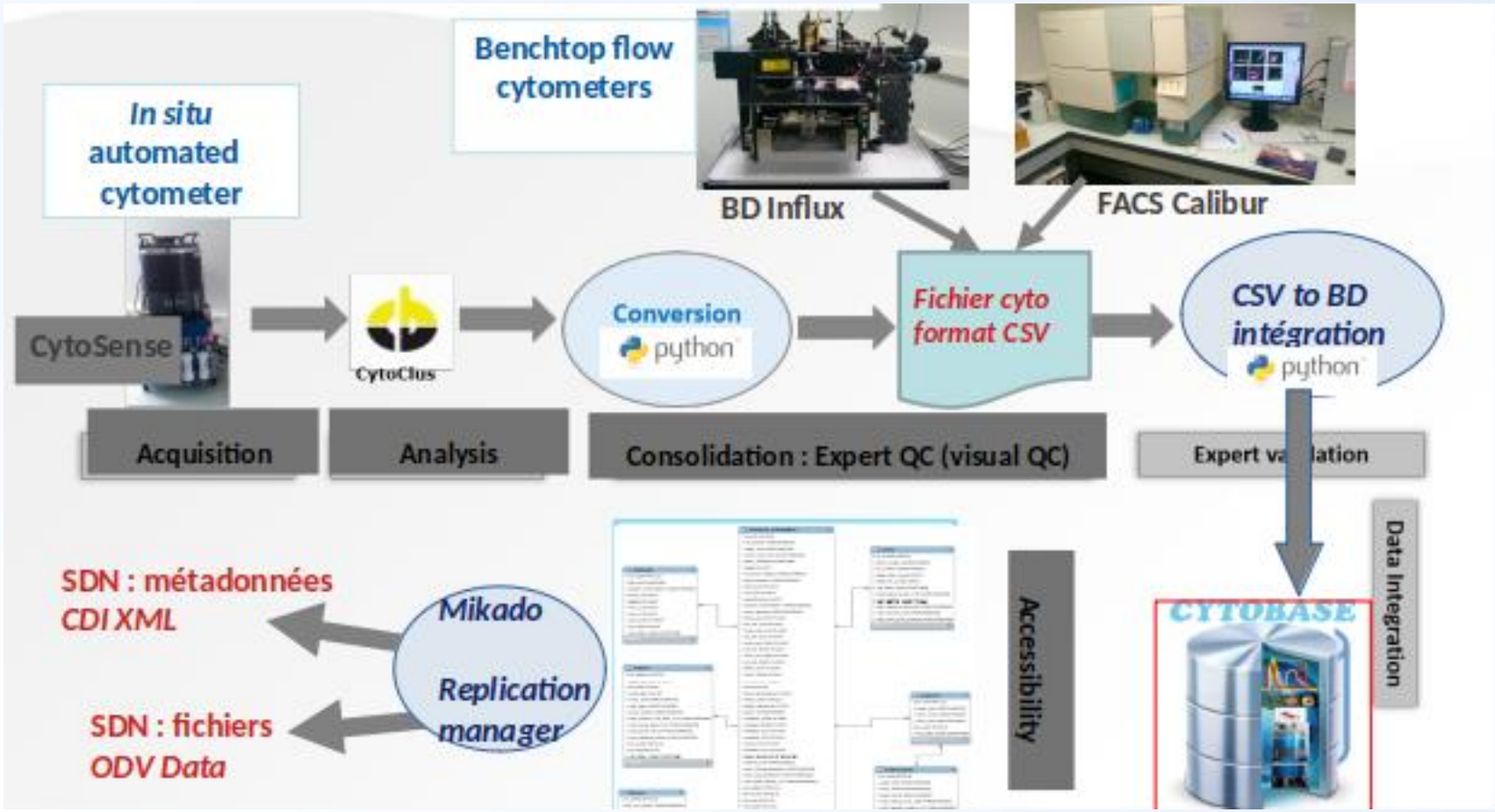
Flow Cytometry data workflow



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Microphytoplankton biodiversity data - PELAGOS DB

- specie's names
- abundances

Context & Initial aims

- Publishing biodiversity datasets *(2 CDIs)*
- Long-term coastal phytoplankton biodiversity data from NOS
- 24 measurements / year, since April 2000
- Time-consuming analysis through optical microscopy by experts
- Storage in the national PELAGOS DB hosted at Roscoff Marine Station

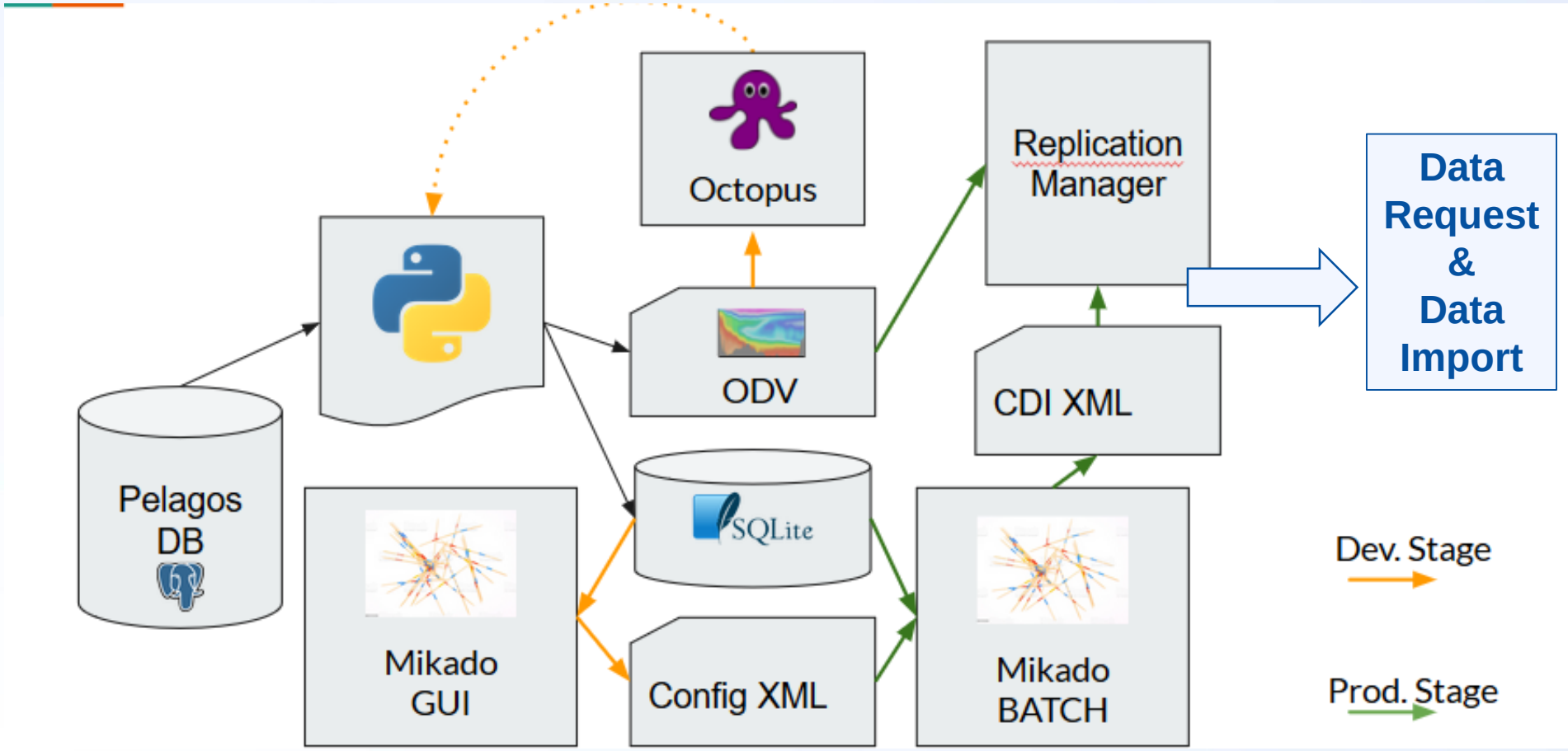
Expected Main Challenges

- Mapping PELAGOS data models with SeaDataNet
- Automating the workflow, from data extraction to data publishing

Expected Minor Challenges

- Setting up SDN technical components
- Mastering SDN tools

Microphytoplankton biodiversity data workflow



Physical, chemical, biological data – SOMLIT NOS DB

Context & Initial aims

- Bimonthly sampling from 1996
- 16 Essential Ocean Variables & pico-nano-plankton
- 12 ecosystems
- 3 main data types
  - ❖ hydro-biol. time-series *(50 CDIs)*
  - ❖ CTD *(3913 CDIs)*
  - ❖ pico-nano-plankton – FCM *(20 CDIs)*
- QC checks

But

- Metadata missing in DB
- Human approbation needed for data distribution
- File format not official standards

Challenges

- Integrating all metadata (contacting every expert in the 12 stations)
- Discovering & Learning SDN ecosystem
- Mapping data models

Main Goal

- International DB publishing
- International standards

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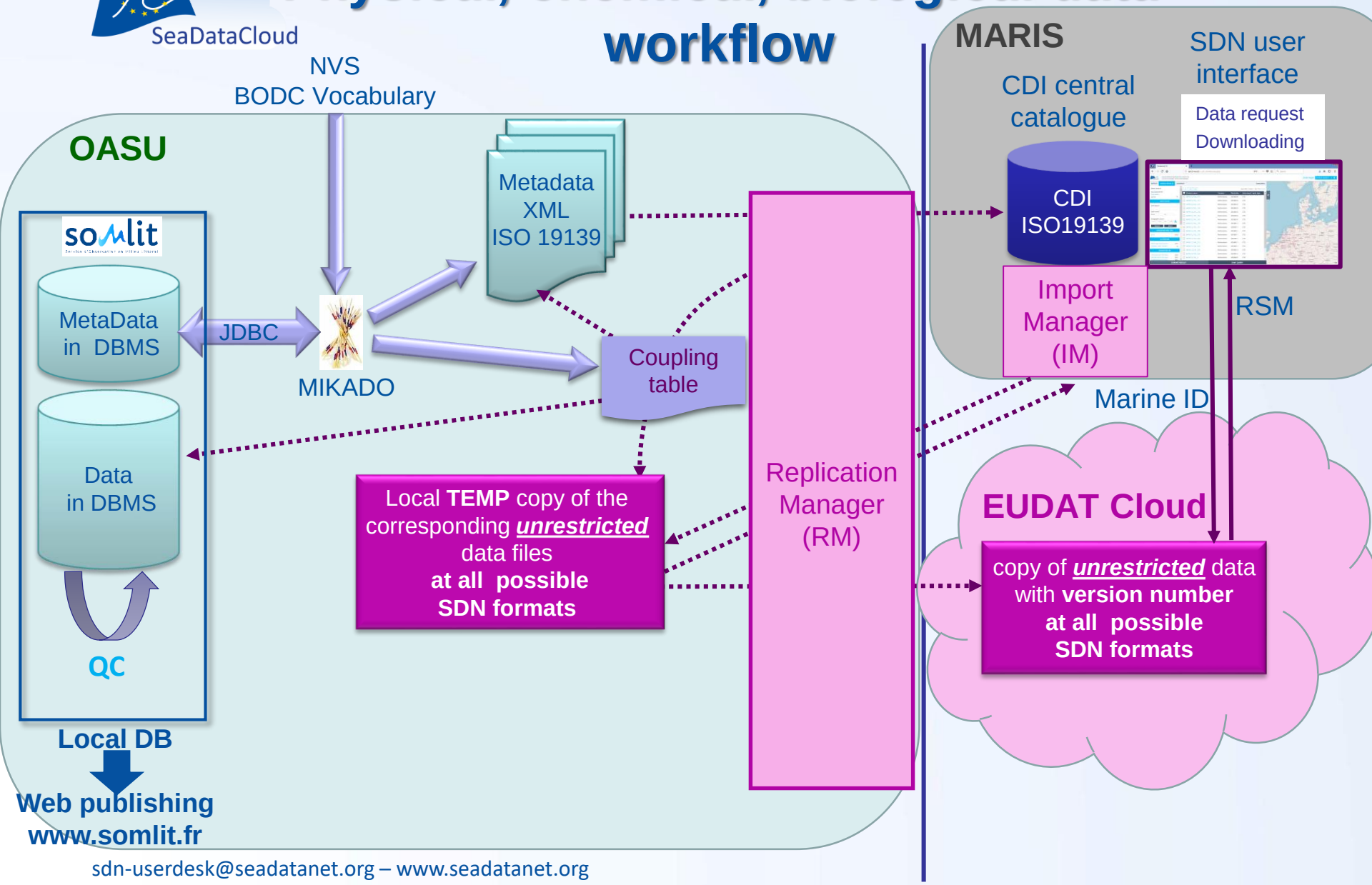
Physical, chemical, biological data workflow



Feedback statement – PROs & CONs

PROs

- ✓ SDN allows the ***distribution*** of data in standard formats through a nice and ***intuitive*** interface : datasets available in SDN (no more sending mails with attachments)
- ✓ ***European visibility*** of flow cytometry and SOMLIT data, laboratories, projects and originators (marine stations and labs)
- ✓ ***Interoperability*** with ***standardization*** of data file formats, and parameter names
- ✓ Gives a ***framework*** for data management in a standardized way
- ✓ Work in harmony and in ***accordance*** with the ***requirements of national datapoles (e.g. Odatis)***
- ✓ Definition of a ***standardized BODC controlled vocabulary*** among cytometrists
- ✓ ***Excellent help (& THANKS !!!)***
  - From collating centre (IFREMER), SDN userdesk, CDI-help desk
  - Training sessions (general and personal)
  - Documentation
  - "Informal" mail exchange with knowledgeable insiders

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DIFFICULTIES/ CONs

- ✓ Taming the ***complexity*** of SDN workflow, P0n thesaurus and tools (e.g. Mikado, Nemo, RM…)
- ✓ ***Understanding*** coupling tables and mapping files format
- ✓ Finding a ***compromise*** solution for the ***detail level*** of metadata from long-term series (past analytical/sampling methods) and its feasibility (especially in order not to "cut" series)
- ✓ ***Length*** of chain for processing ***changes*** (*e.g.* updating EDIOS or C17 vocabulary list)
- ✓ Metadata control and mapping by research experts was a big task
- ✓ Re-definition of ***dataset notion*** to match SDNet's : ***re-structuration local DB***
- ✓ ***Underestimation*** of the developer tasks for matching SDN needs

Feedback statement

NEW METHODS of management ?

- ✓ Look out and ***track updates*** of BODC Vocs, of European recommendations for standards
- ✓ Use of ***thesaurus*** and ***standard file formats*** (*e.g.* odv, NetCDF…)
- ✓ Addition of ***QC_Flags*** to some data types (*e.g*. CTD)
- ✓ Better ***traceability*** of data modifications (*e.g*. corrections, adds…)
- ✓ Local and new reflection on ***« dataset » definition***

Issues to keep in mind

- ✓ Data producers need to be (made) aware of the importance of ***describing*** their datasets using ***metadata*** as early as possible, and can still be reluctant to participate in this task.
- ✓ There was a significant ***effort*** to achieve mapping between the in-house data models and the SDN data format… But it should ***pay off*** over time as the surveys are standardized.
- ✓ (bio)ODV as we understand it may not be the best suited data format for storing “rich” biodiversity datasets
- ✓ Small improvement : the ***reason/objectives*** for what users download the data is not displayed in the Import Manager

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Thank you,

hoping to keep ingesting new data…

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