SeaDataCloud

Progress made on standardization of flow Cytometry data

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Plenary Meeting, Athens, 18th October 2017
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BODC
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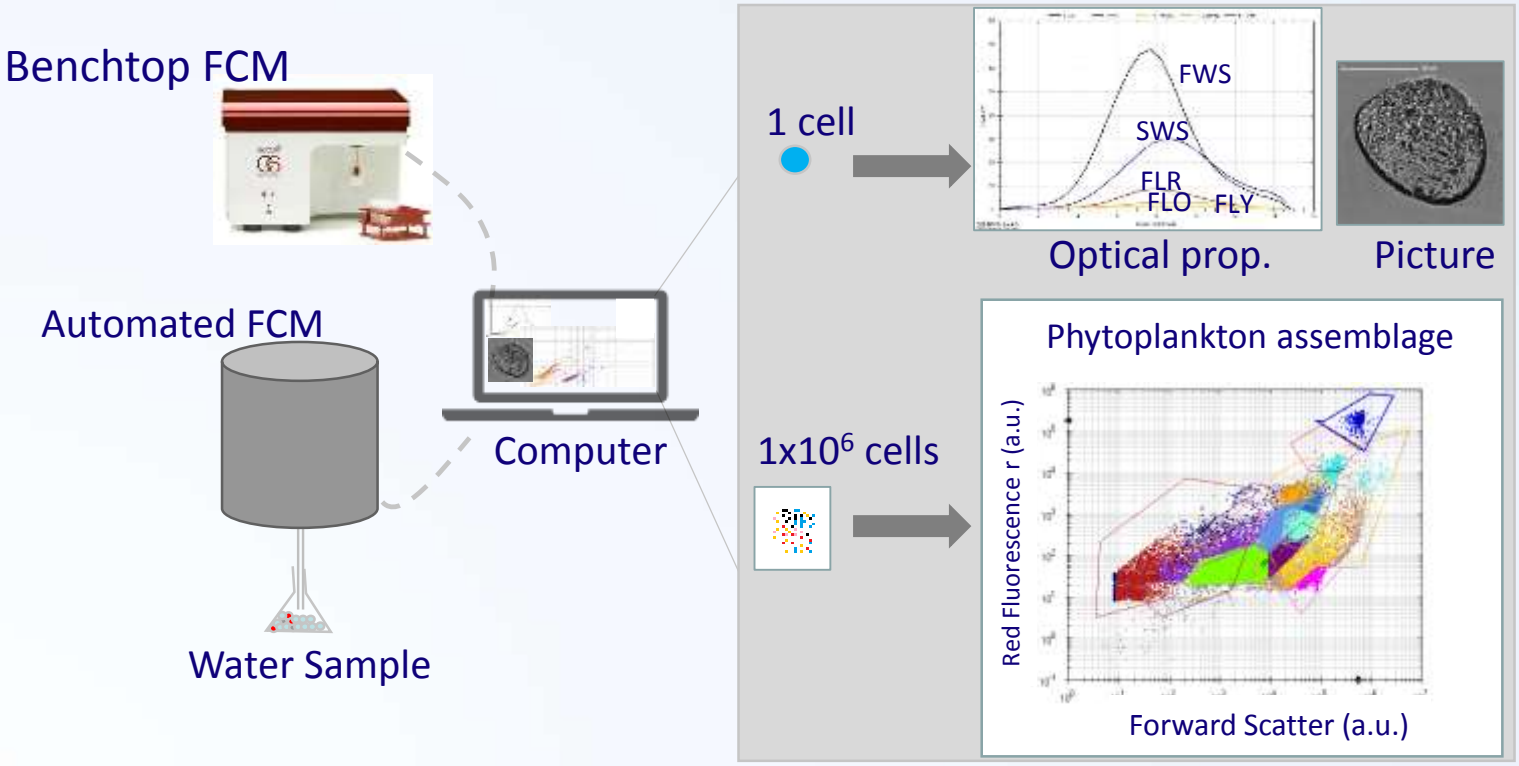
1. What is Flow Cytometry (FCM) Data ?



- **Functional groups, abundance per group**
- **Fluorescences per cell, scatter per cell, Size estimation (after calibration of scatter) and Images (taxonomical identification >20 µm)**

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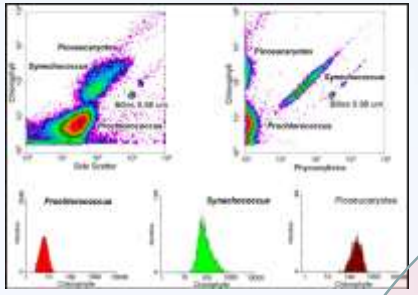
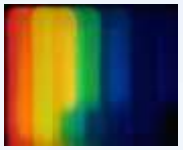
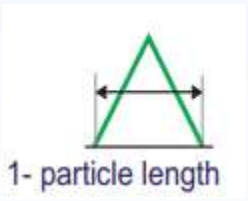
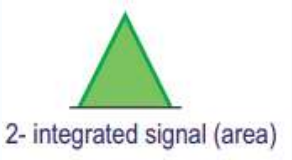
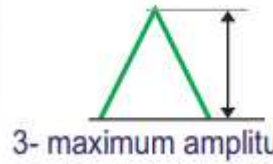


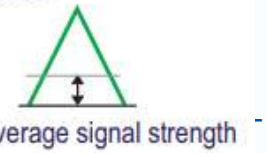


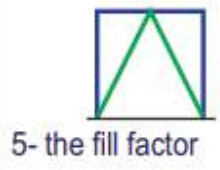
Abundance

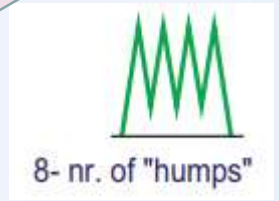












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2. FCM Common vocabulary progress

a) Analysis of the existing codes (P01 list)

b) FCM captured parameters (JericoNext)

c) Literature review and bibliography (1983-2017)

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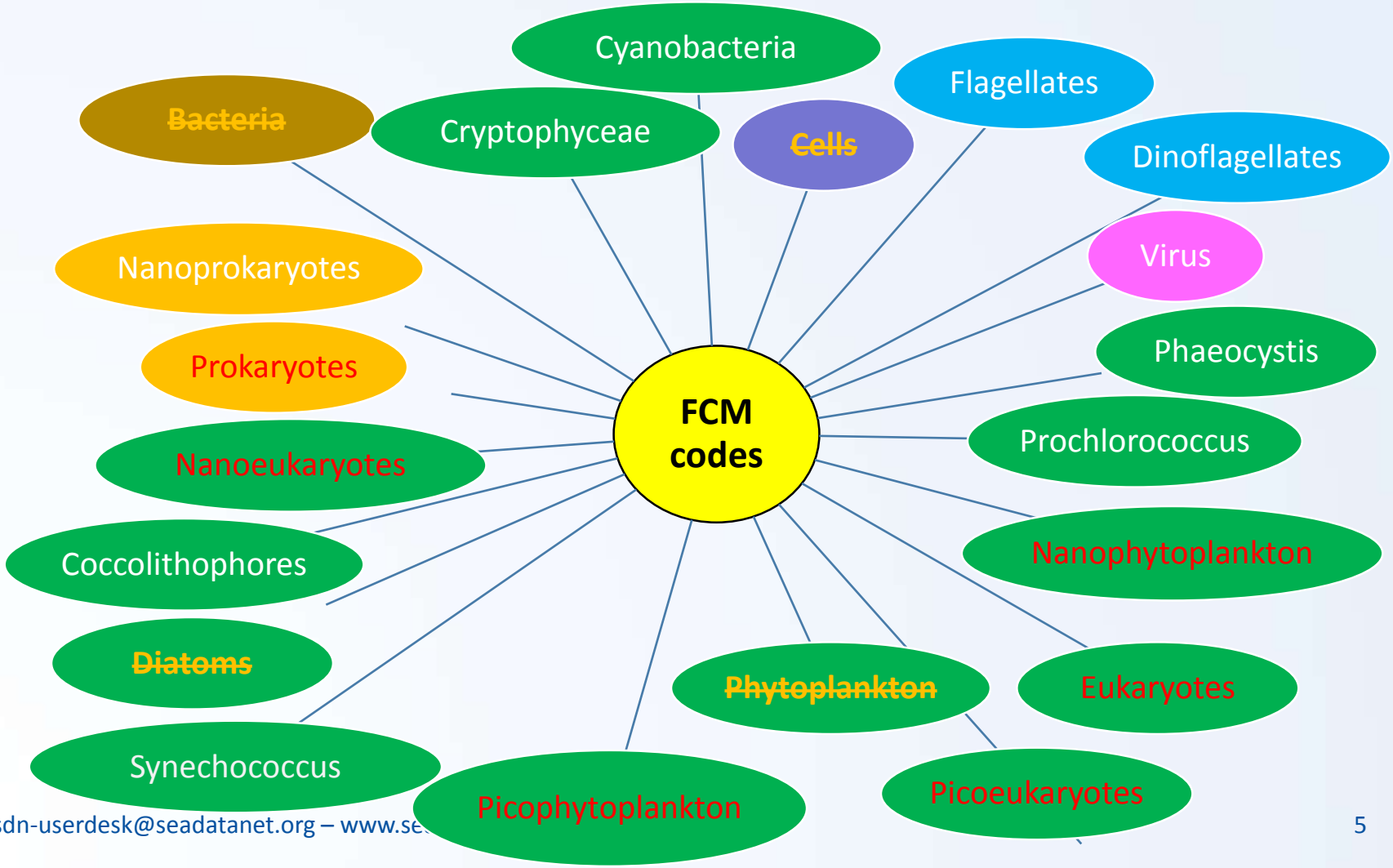
a) Analysis of the 34 existing codes (P01 list)



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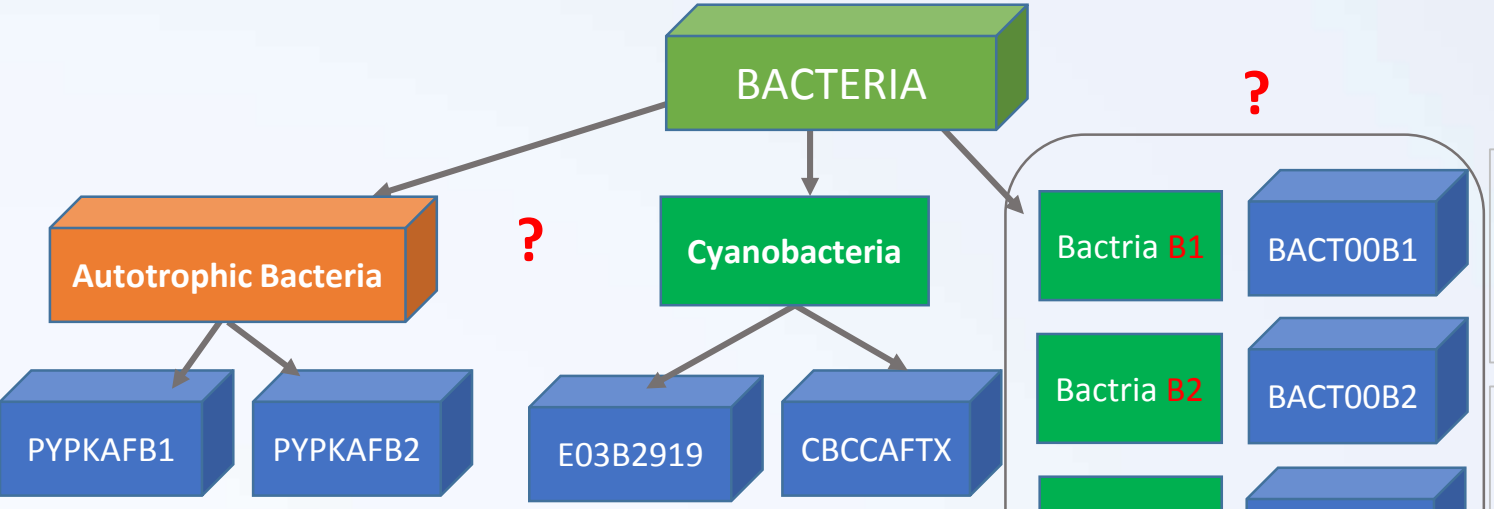

Abundance of Bacteria (ITIS: 202421: WoRMS 6) [Subgroup: group PSB1 autotrophic] per unit volume of water body by flow cytometry

Abundance of Bacteria (ITIS: 202421: WoRMS 6) [Subgroup: group PSB2 autotrophic] per unit volume of the water body by flow cytometry

Abundance of Cyanobacteria (ITIS: 601: WoRMS 146537) [Size: 5-8um] per unit volume of the water body by flow cytometry

Abundance of Cyanobacteria (ITIS: 601: WoRMS 146537) per unit volume of the water body by flow cytometry

Abundance of Bacteria (ITIS: 202421: WoRMS 6) [Subgroup: group B1] per unit volume of the water body by flow cytometry

Abundance of Bacteria (ITIS: 202421: WoRMS 6) [Subgroup: group B2] per unit volume of the water body by flow cytometry

Abundance of Bacteria (ITIS: 202421: WoRMS 6) [Subgroup: Zubkov population 1] per unit volume of the water body by flow cytometry

Abundance of Bacteria (ITIS: 202421: WoRMS 6) per unit volume of the water body by flow cytometry

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Picoeukaryotes

Group	Code BODC	Description
Picoeukaryotes	PU00A02A	Abundance of eukaryote picophytoplankton per unit volume of the water body by flow cytometry
Picoeukaryotes P1	PHYT00P1	Abundance of picoeukaryotic cells [Subgroup: group P1] per unit volume of the water body by flow cytometry
Picoeukaryotes P2	PHYT0P10	Abundance of picoeukaryotic cells [Subgroup: group P10] per unit volume of the water body by flow cytometry
Picoeukaryotes P3	PHYT00P2	Abundance of picoeukaryotic cells [Subgroup: group P2] per unit volume of the water body by flow cytometry
Picoeukaryotes P4	PHYT00P3	Abundance of picoeukaryotic cells [Subgroup: group P3] per unit volume of the water body by flow cytometry
Picoeukaryotes P5	PHYT00P4	Abundance of picoeukaryotic cells [Subgroup: group P4] per unit volume of the water body by flow cytometry
Picoeukaryotes P6	PHYT00P5	Abundance of picoeukaryotic cells [Subgroup: group P5] per unit volume of the water body by flow cytometry
Picoeukaryotes P7	PHYT00P6	Abundance of picoeukaryotic cells [Subgroup: group P6] per unit volume of the water body by flow cytometry
Picoeukaryotes P8	PHYT00P7	Abundance of picoeukaryotic cells [Subgroup: group P7] per unit volume of the water body by flow cytometry
Picoeukaryotes P9	PHYT00P8	Abundance of picoeukaryotic cells [Subgroup: group P8] per unit volume of the water body by flow cytometry
Picoeukaryotes P10	PHYT00P9	Abundance of picoeukaryotic cells [Subgroup: group P9] per unit volume of the water body by flow cytometry
Picoeukaryotes	PYEUA00A	Abundance of picoeukaryotic cells per unit volume of the water body by flow cytometry

One Code	One description
PYEUA00A	Abundance of picoeukaryotic cells per unit volume of the water body by flow cytometry

Cytobuoy Meeting, March 2017➔ Parallel session – Harmonisation of flow cytometry use and data (protocol, standardisation, definition of functional types, quality control)

- Some are good
- Redundancy
- Definitions are not clear for FCM users and difficult to understand

b) FCM captured parameters

Task 3.1: Automated platform for the observation of Phytoplankton diversity in relation to ecosystem services

Leader: Felipe ARTIGAS (CNRS-ULCO)

Exercice of FCM captured parameters

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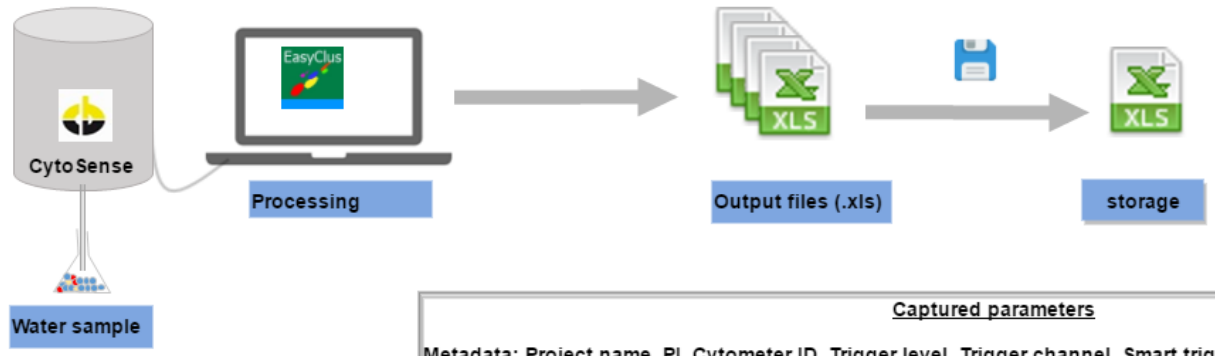
Rijkswaterstaat

VLIZ

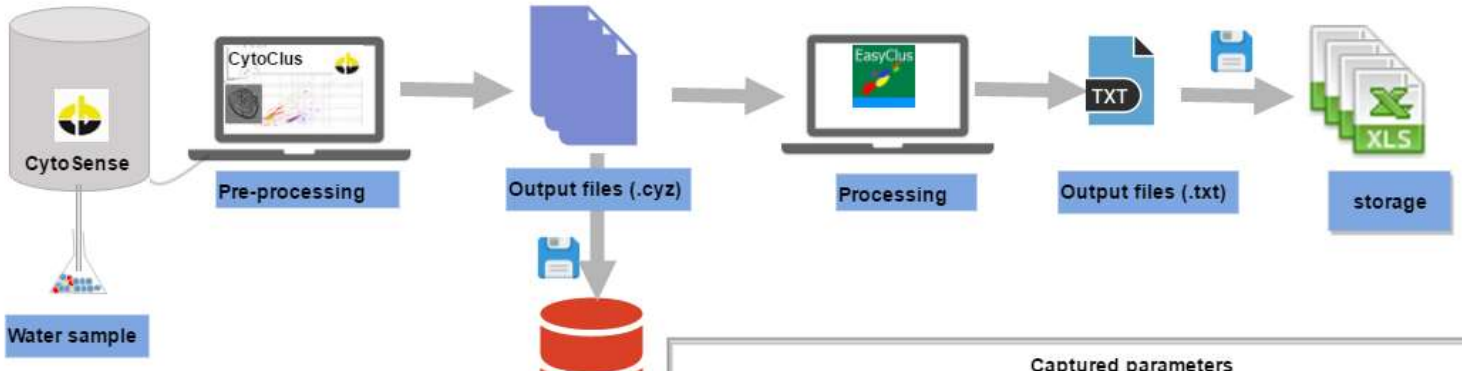
RWS Data Management Workflow



Captured parameters

Metadata: Project name, PI, Cytometer ID, Trigger level ,Trigger channel, Smart trigger, Smart trigger level, Sample operator, Observation type, Plateform type, Plateform ID, Plateform Nationality, sampling date, sampling time, Study area, Latitude, Longitude, file name, Station, Depth, Standard beads_size_type, Quality Check_instrument, Temperature QC, noise signal_QC

Data: Volume, Cluster name, size classe, Concentration (cell/ml), TOF, Length FWS, Length SWS -hs, Tot FWS, Tot SWS-hs, Tot SWS-ls, Tot FLY-hs, Tot FLO -hs, TotFLred-hs, Max FWS, Max SWS-hs, Max SWS-ls, Max FLY-hs, MaxFLO-hs, Max FLR-hs



Captured parameters

Metadata: PI,sample_name,Latitude,Longitude,Sampling date and time,Proccess date and time,Station,Depth,Study area,Standards Reference,Cluster software,Reference database,Clustering Method,Observation Type,Platform Type,Platform ID,Platform nationality,Trigger Channel,Trigger level,Smart trigger,Smart trigger level

Data: Cluster name, Concentration (cell/ml), Total FL Red HS/ml, Volume, Abundance, link_pic

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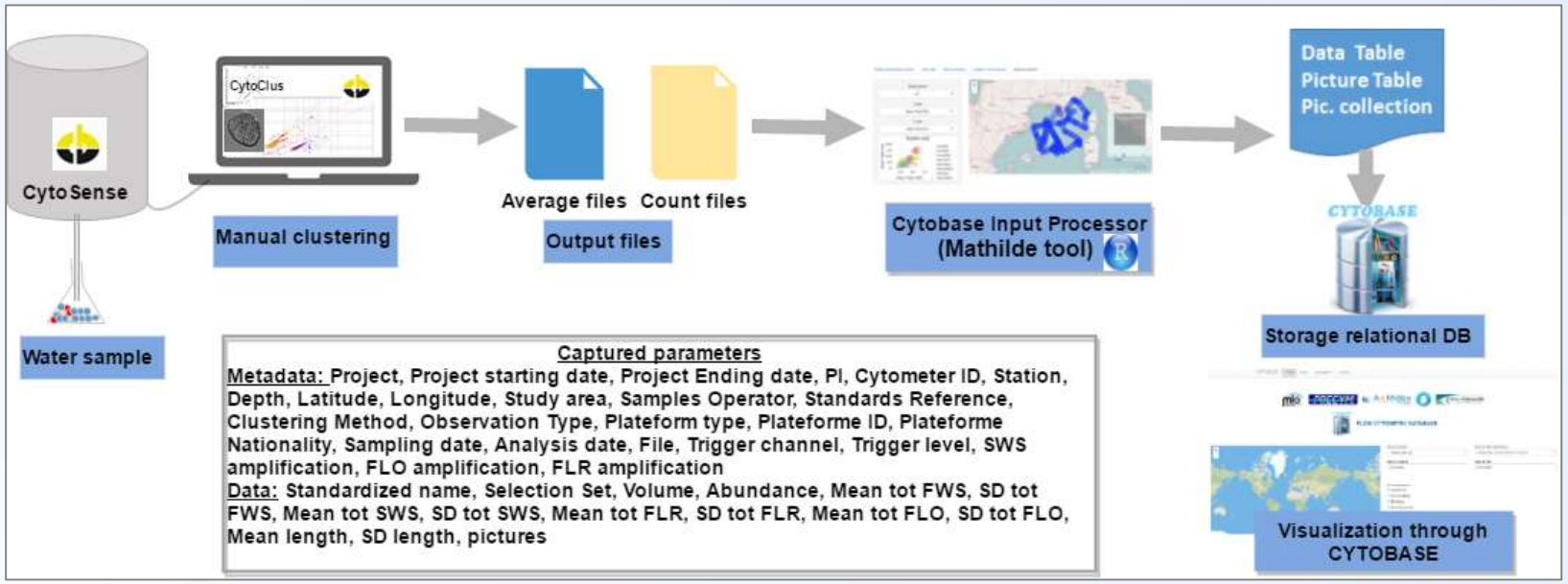
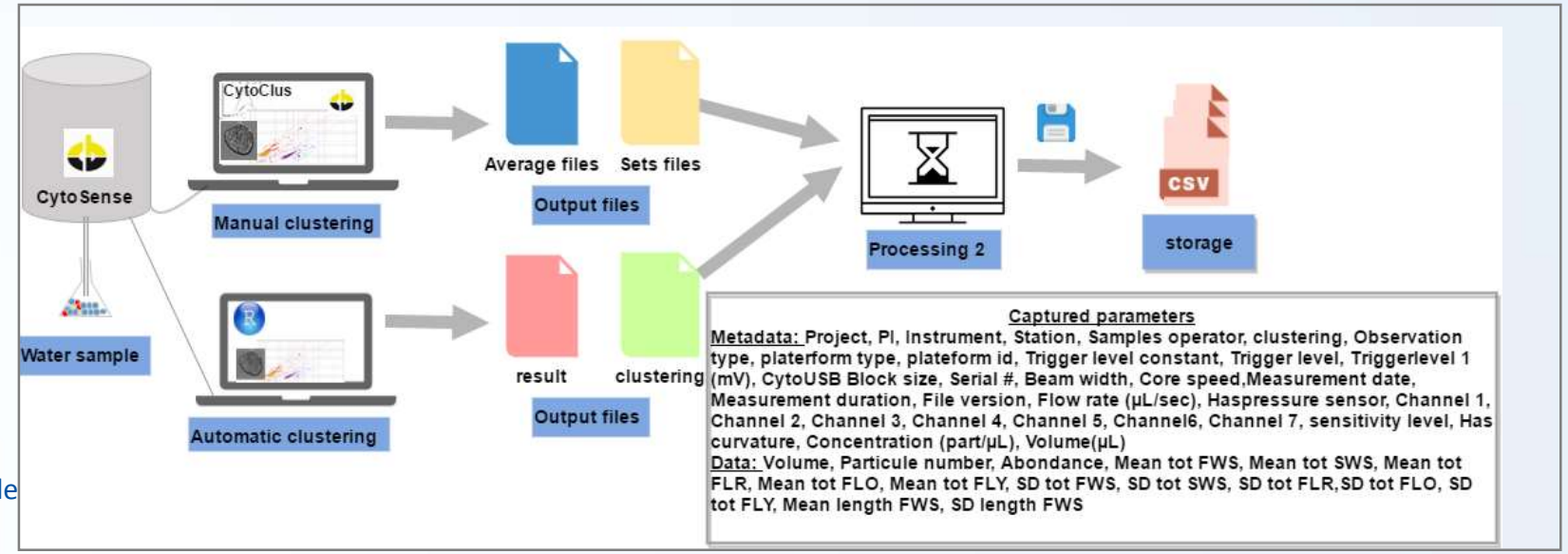
Institut Méditerranéen d'Océanologie





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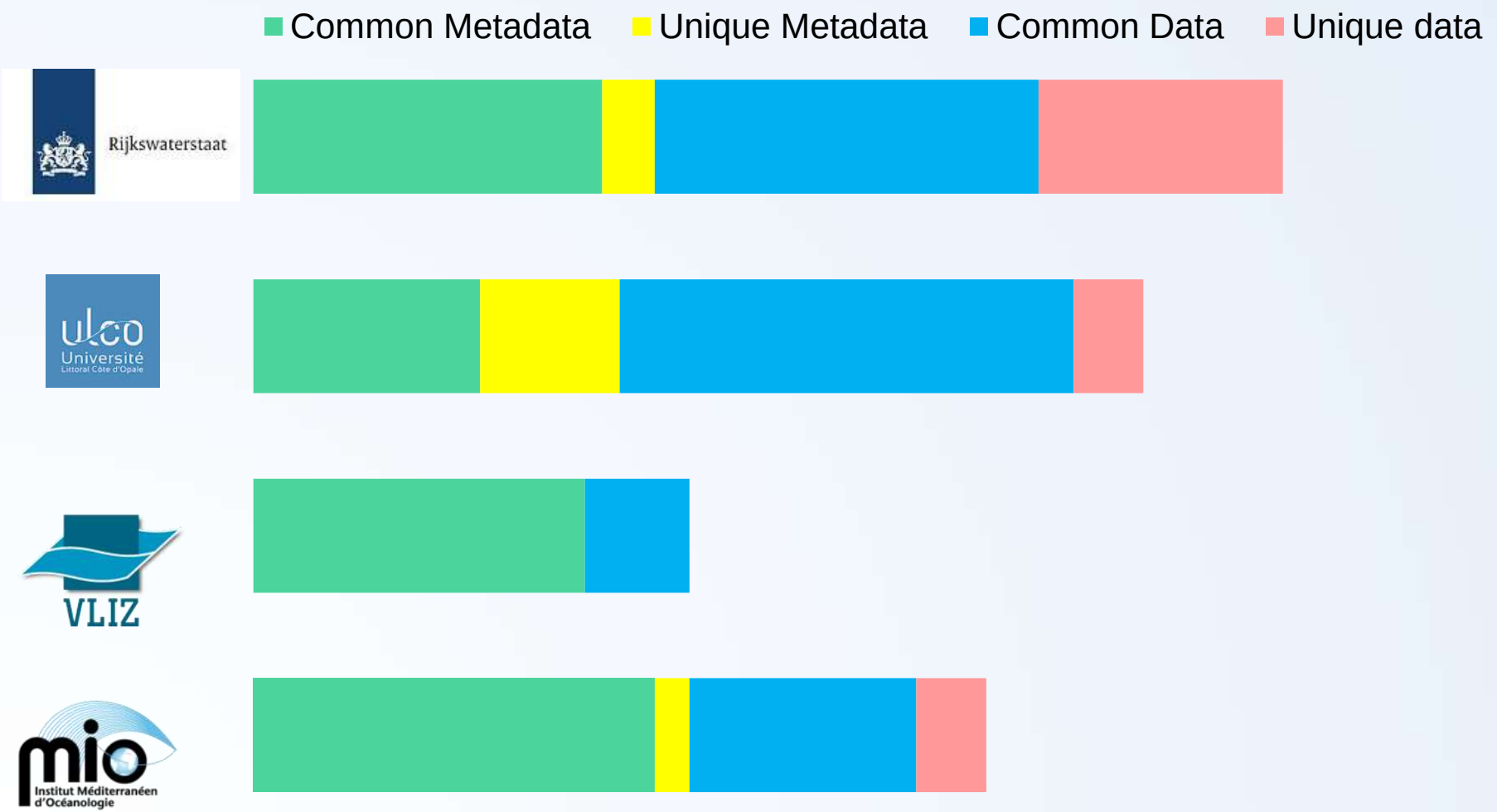
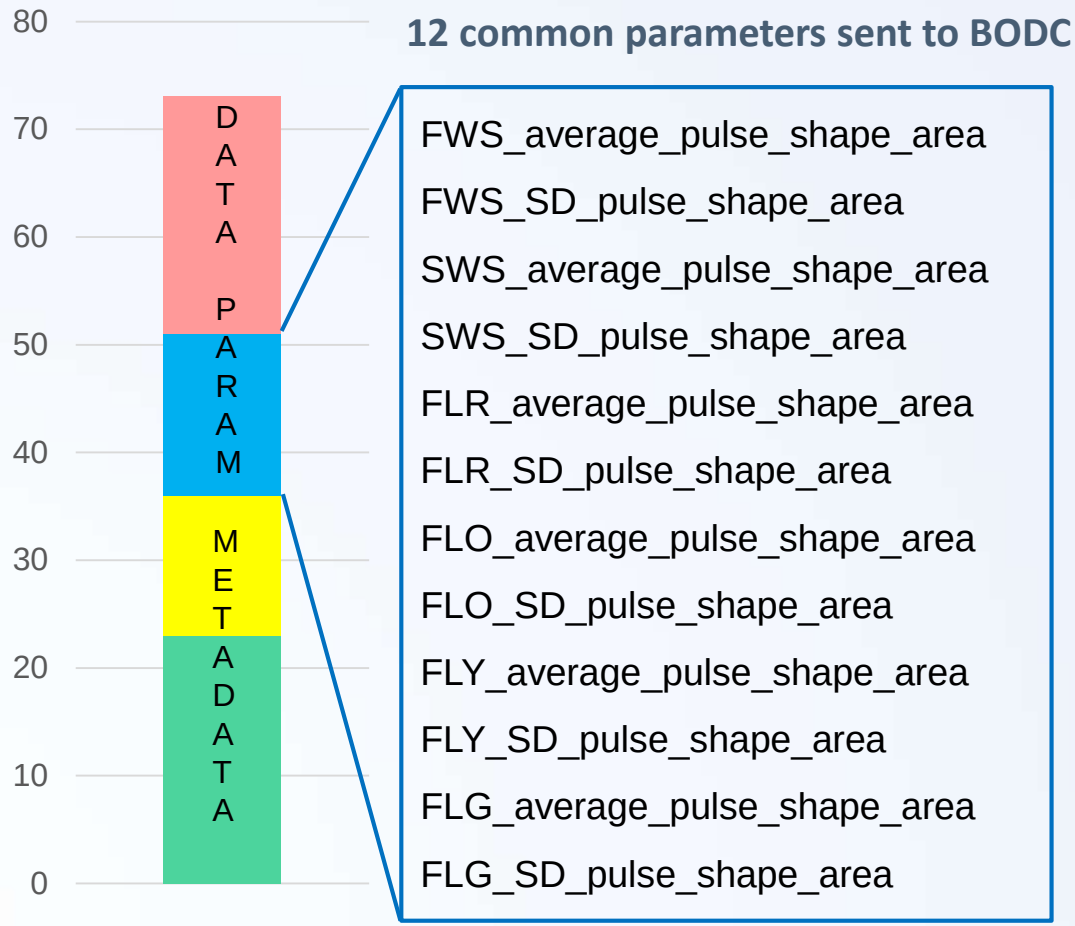

Common Metadata
Unique Metadata
Common Data
Unique data
Rijkswaterstaat
ulco Université Littoral Côte d'Opale
VLIZ
mio Institut Méditerranéen d'Océanologie
0
10
20
30
40
50
60
70


80
70
60
50
40
30
20
10
0
DATA
PARAM
METADATA
12 common parameters sent to BODC
FWS_average_pulse_shape_area
FWS_SD_pulse_shape_area
SWS_average_pulse_shape_area
SWS_SD_pulse_shape_area
FLR_average_pulse_shape_area
FLR_SD_pulse_shape_area
FLO_average_pulse_shape_area
FLO_SD_pulse_shape_area
FLY_average_pulse_shape_area
FLY_SD_pulse_shape_area
FLG_average_pulse_shape_area
FLG_SD_pulse_shape_area
Common Metadata
Unique Metadata
Common Data
Unique data

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Semantic model (BODC)

Chemical model	Biological model	Physical model
Measurement Substance Measurement Matrix Relationship Matrix Matrix Subcomponent	Measurement Organism Name Organism Specifics Measurement Matrix Relationship Matrix Matrix Subcomponent Method	Measurement Statistical Measurement Matrix Relationship Matrix Method
Concentration of carbon (total inorganic) {TCO2} per unit mass of the water body [dissolved plus reactive particulate phase]	**Abundance of Bacteria (ITIS: 202421: WoRMS 6) [Subgroup: heterotrophic] per unit volume of the water body by automated flow cytometry**	**Forward light scatter pulse shape area average per cluster in the water body by automated flow cytometry**

Forward scatter pulse shape area

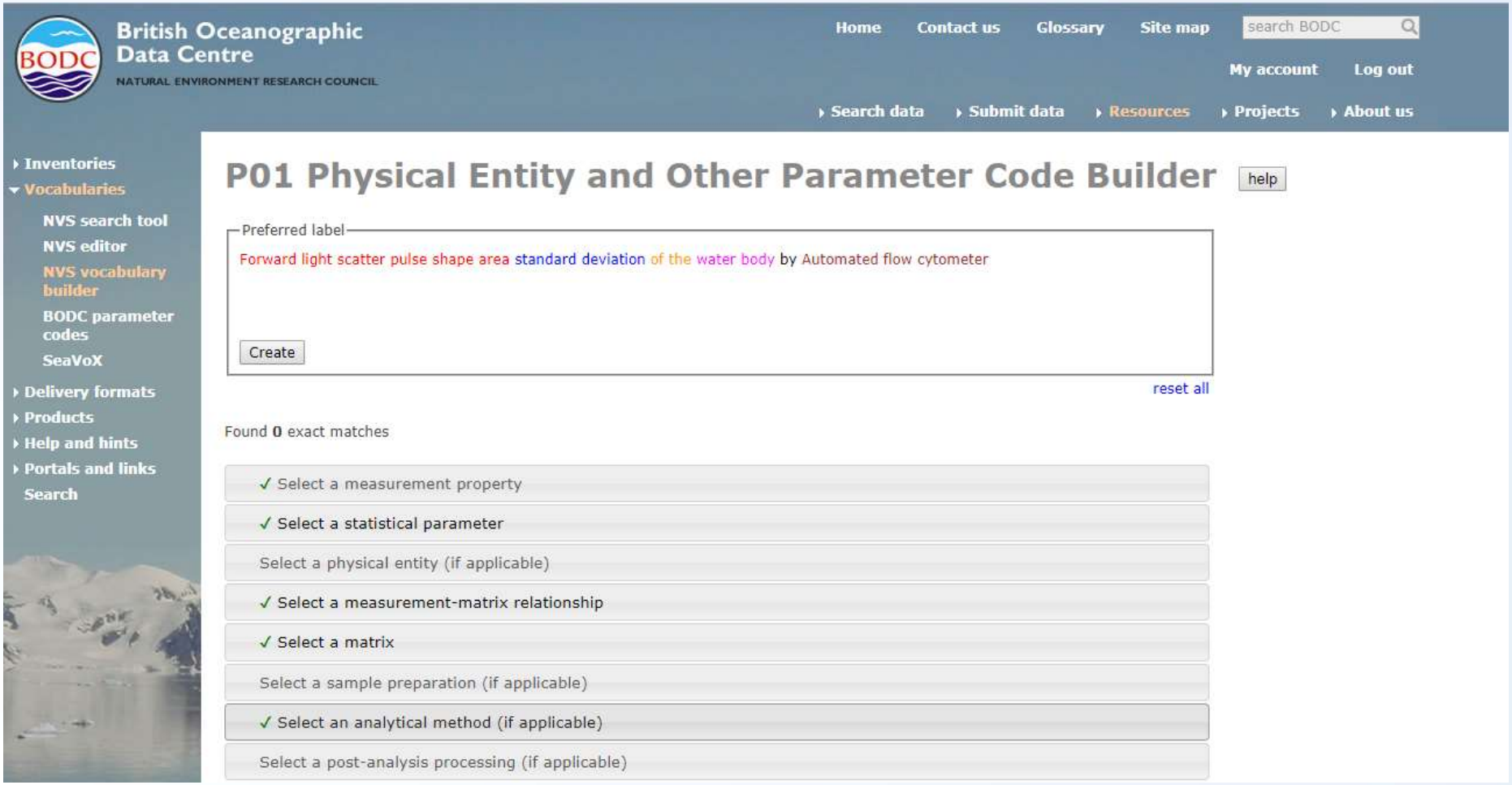
Average

per cluster in the

Water body

automated flow cytometry

The cluster name is managed in a separate vocabulary (and separate column in ODV).


British Oceanographic Data Centre
NATURAL ENVIRONMENT RESEARCH COUNCIL
Home
Contact us
Glossary
Site map
search BODC
My account
Log out
Search data
Submit data
Resources
Projects
About us
Inventories
Vocabularies
NVS search tool
NVS editor
NVS vocabulary builder
BODC parameter codes
SeaVoX
Delivery formats
Products
Help and hints
Portals and links
Search
P01 Physical Entity and Other Parameter Code Builder
help
Preferred label
Forward light scatter pulse shape area standard deviation of the water body by Automated flow cytometer
Create
reset all
Found 0 exact matches
✓ Select a measurement property
✓ Select a statistical parameter
Select a physical entity (if applicable)
✓ Select a measurement-matrix relationship
✓ Select a matrix
Select a sample preparation (if applicable)
✓ Select an analytical method (if applicable)
Select a post-analysis processing (if applicable)

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Flow Cytometry Standardized cluster names

New Vocab. list

- Standard beads
- Prochlorococcus
- Synechococcus
- Eukaryote Picophytoplankton
- Eukaryote Nanophytoplankton
- Cryptophytes
- Coccolithophores
- Microphytoplankton
- Heterotrophic Bacteria

WoRMS World Register of Marine Species

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c) Literature review and bibliography (1983-now)

COMMENT

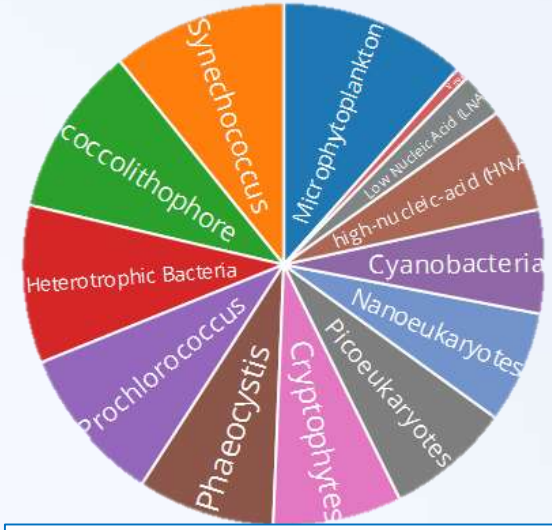
Flow cytometry and cell sorting: A technique for analysis and sorting of aquatic particles!

HETEROGENEITY IN FRAGILITY AND OTHER BIOCHEMICAL AND BIOPHYSICAL PROPERTIES

A Simple Method to Preserve Oceanic Phytoplankton for Flow Cytometric Analyses

D. Vaulot, C. Courties, and F. Partensky

Common functional groups



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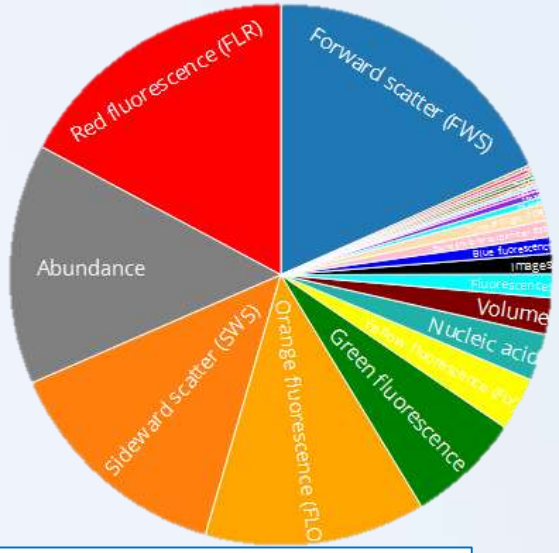

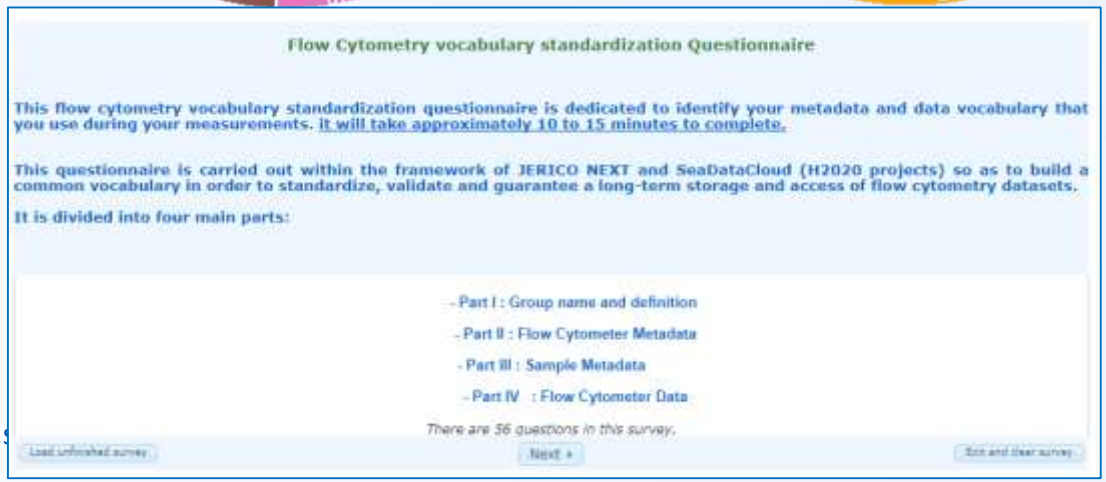

Flow Cytometry vocabulary standardization Questionnaire

This flow cytometry vocabulary standardization questionnaire is dedicated to identify your metadata and data vocabulary that you use during your measurements. it will take approximately 10 to 15 minutes to complete.

This questionnaire is carried out within the framework of JERICO NEXT and SeaDataCloud (H2020 projects) so as to build a common vocabulary in order to standardize, validate and guarantee a long-term storage and access of flow cytometry datasets.

It is divided into four main parts:

- Part I : Group name and definition
- Part II : Flow Cytometer Metadata
- Part III : Sample Metadata
- Part IV : Flow Cytometer Data

There are 56 questions in this survey.

Load unfinished survey | Next » | Exit and clear survey

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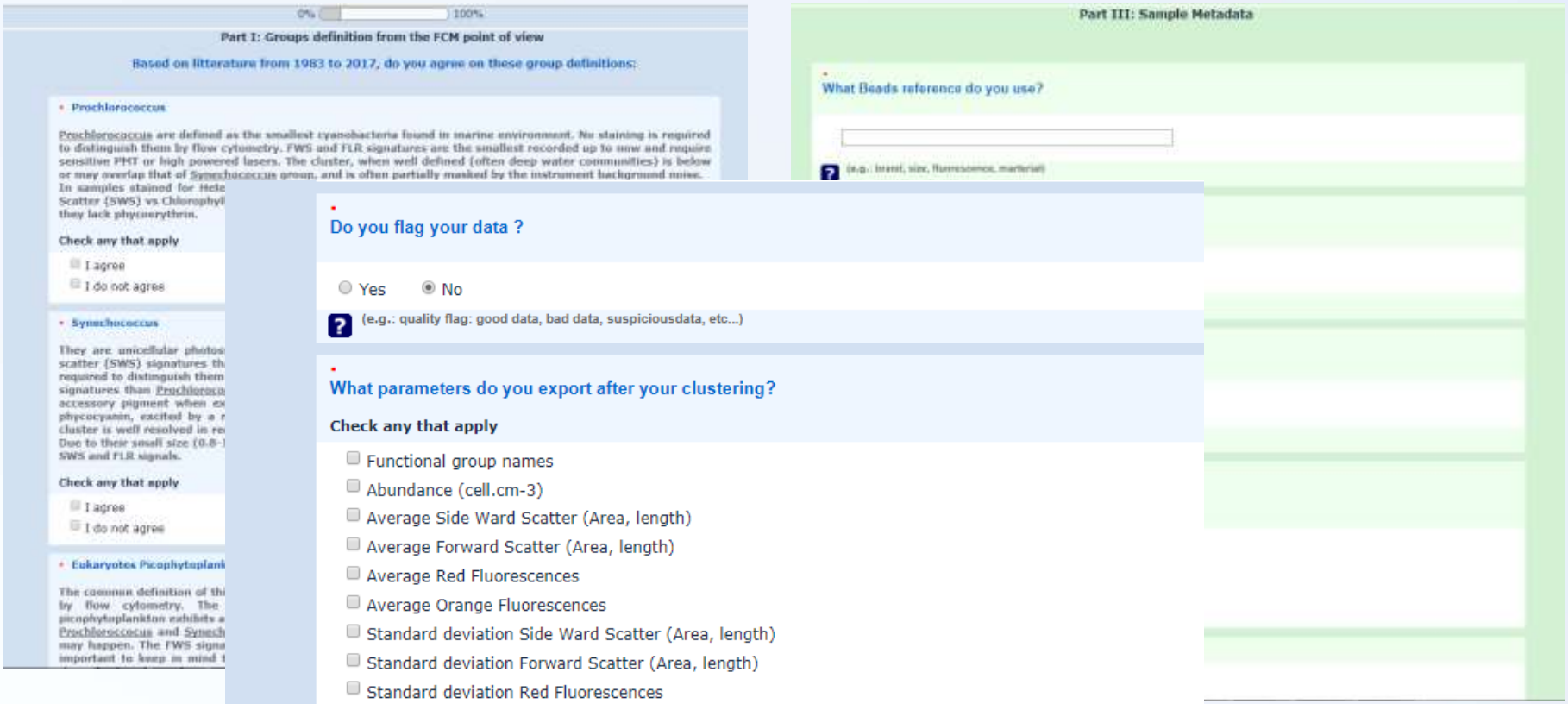

3. Conclusion/Workplan

- Standardization of 12 FCM vocabulary parameters **December 2017**
- Injection of FCM CDI to SDN infrastructure **Jan-Feb 2017**

  ➔ Download Manager is already installed in 3 CNRS centers (Bordeaux, Roscoff and Marseille)

- Identifying/Updating FCM vocabulary (Questionnaire) **Feb-March 2018**

  ➔ 38 answers (since 9 october 2017))

- Deliverable D9.5.2 : *Ingesting, validating, long-term storage and access of flow cytometry data* **May 2018**

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Thank you for your support

Any questions?