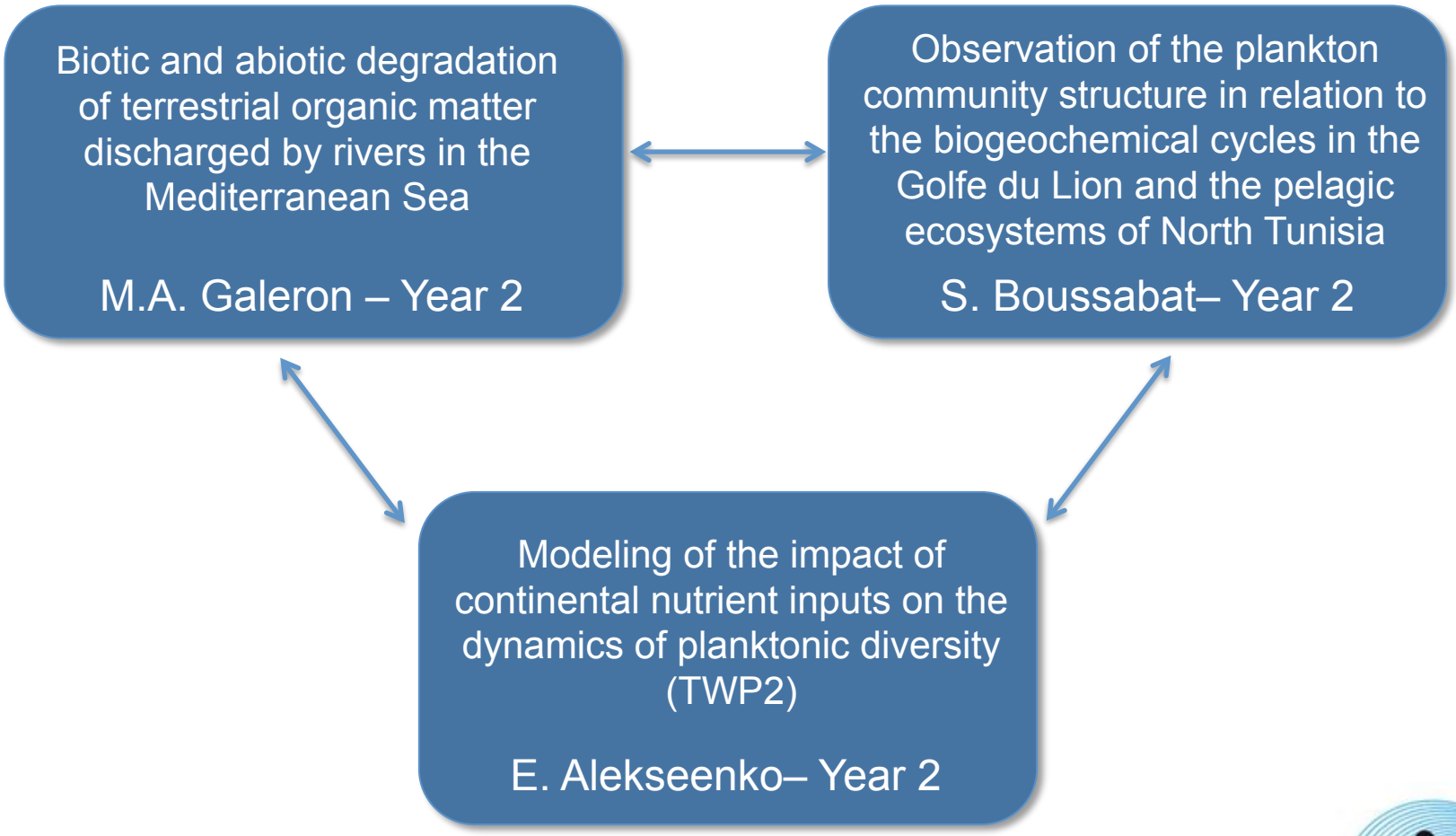
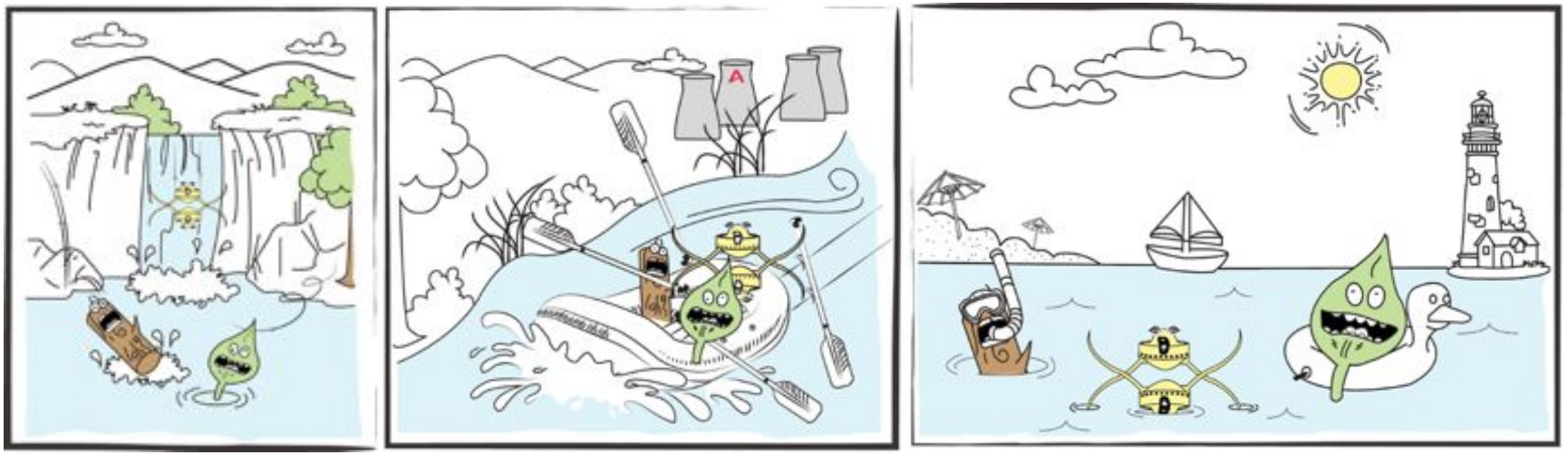
WP2 – Marine Science Projects



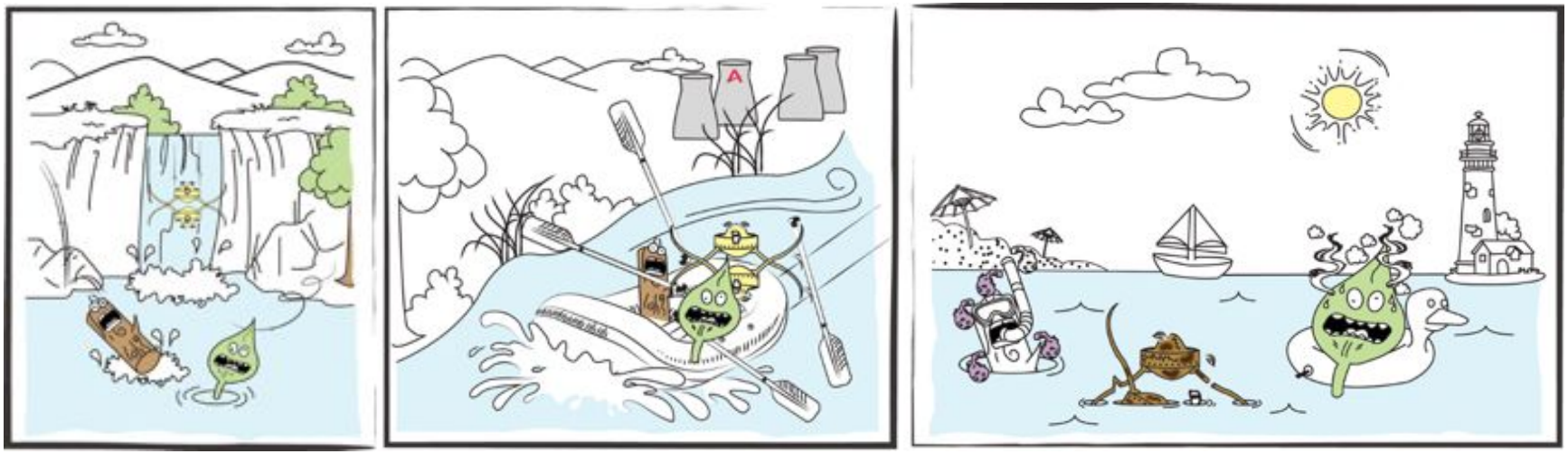
Biotic and abiotic degradation of particulate organic matter discharged by rivers in the Mediterranean Sea



M.A. Galeron

Supervisors: J.F. Rontani (MIO) and O. Radakovitch (CEREGE)

Biotic and abiotic degradation of particulate organic matter discharged by rivers in the Mediterranean Sea



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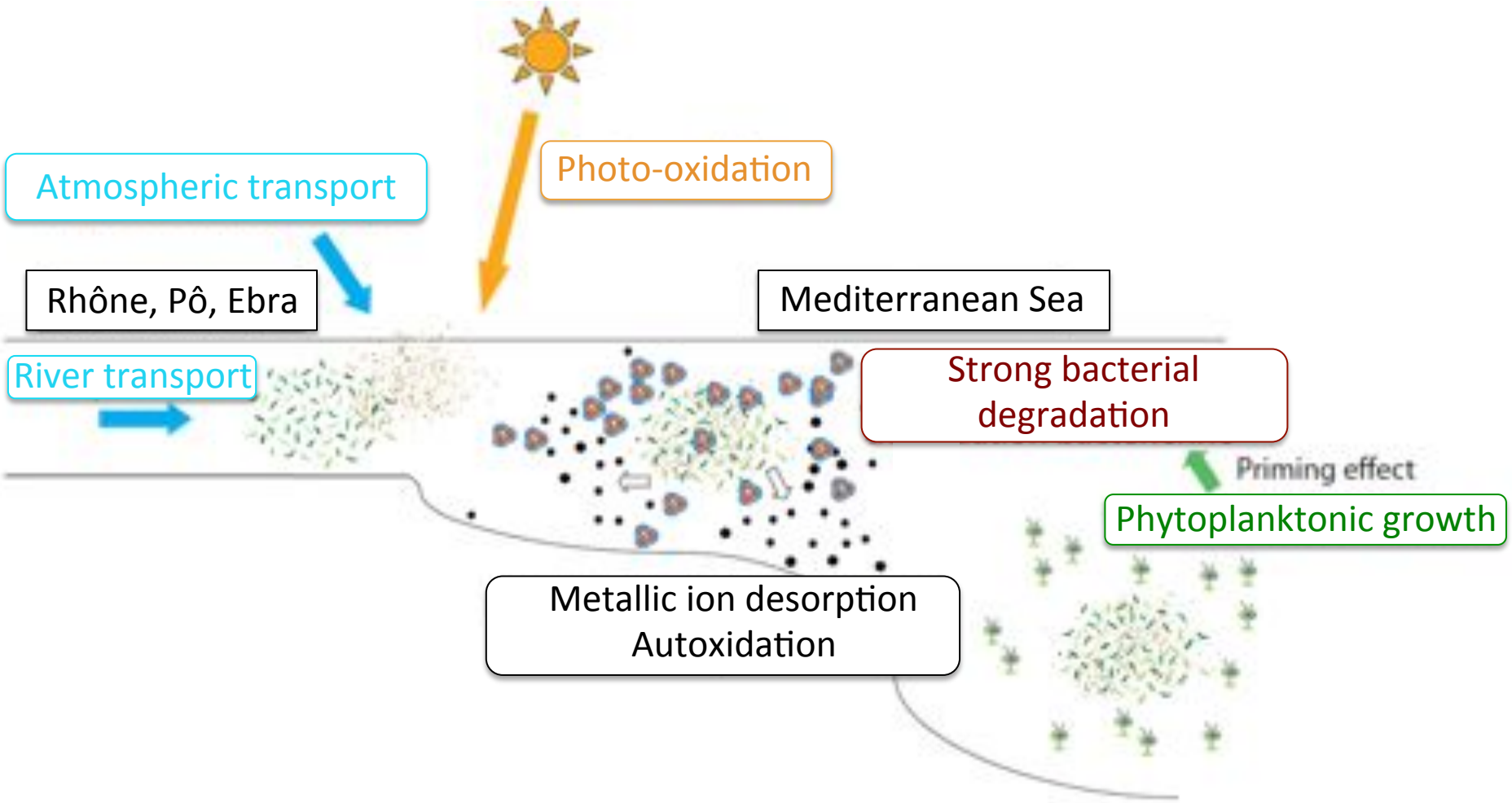
Project Overview

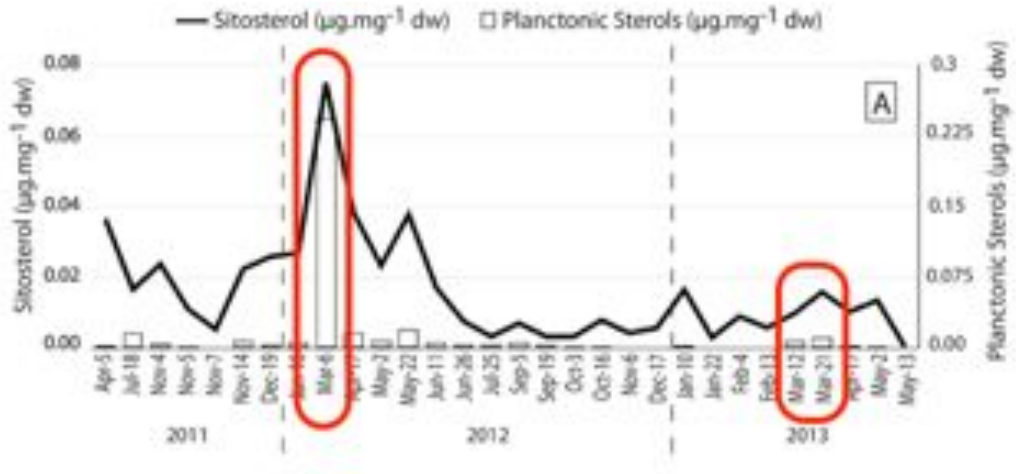


Objectives

- Composition and fate of organic matter
- Rhône ecosystems
- Estuary ecosystems
- Global C budgets
- Natural Hazards (floods)

Results

- Composition and fate of organic matter flowing in the Rhône
- Phytoplanktonic blooms
- Degradation state of POM in the Rhône



Results submitted to Biogeosciences (under review)
Communicated at the JILO (Marseille 2014) and AGU (San Francisco 2014)

Observation of the plankton community structure in relation to the biogeochemical cycles in the Golfe du Lion and the pelagic ecosystems of North Tunisia (Bay of Bizerte)

Thesis directors :

Bernard QUEGUINER (MIO)
Mohamed Néjib DALY-YAHIA (BFSA)

Soumaya BOUSSABAT

Framework

SPEciMed

–

Structures of Planktonic Ecosystems in the North-western Mediterranean

MERMEX
Marine Ecosystems Response in the Mediterranean Experiment
MISTRALS

In the framework of the MISTRALS program, MerMex-SPECiMed project aims to document about plankton communities incl. bacteria, phyto-, microzoo- and mesozooplankton and associated biogeochemical cycles of major elements (C, N, P, and Si) and physical environment.

SPECiMed objectives

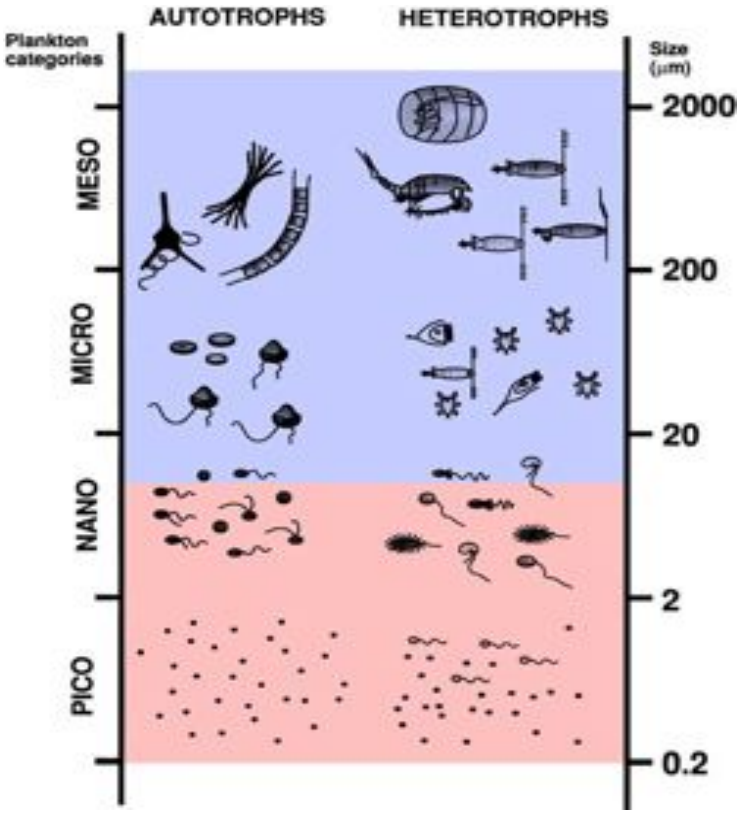
SPECiMed is focused on the seasonal and annual evolution of biological community structures of the continuum bacteria–phytoplankton–zooplankton, to give new insights into:

1) the characterization of community dynamics for
2) the definition of functional types to implement the biogeochemical– ecological–physical coupled model that will be used to identify
3) the temporal trends of ecosystem structure changes.

Strategy

SOLEMIO - JULIO: May 2010 - June 2014 at entrance of the general circulation: (SOLEMIO) a coastal station in the Bay of Marseille, (JULIO) an offshore station close to the continental slope, impacted by the incursions of the North-Mediterranean current.

SOLA - MOLA: October 2012 - July 2014 at the exit of the general circulation: (SOLA) a coastal station in the Bay of Banyuls/mer, (MOLA) an offshore station along the continental slope, impacted by the cross–shore transfer waters of the Gulf of Lion.



Representative classification of planktonic organisms by size showing the diversity of various autotrophic and heterotrophic groups (modified from Karl, 1999).

Thesis objectives and questions

Establish a typology of the phytoplankton community structures in relation to the biogeochemical properties: basis for a long-term observation of the evolution of the pelagic ecosystem in the *Golfe du Lion*.

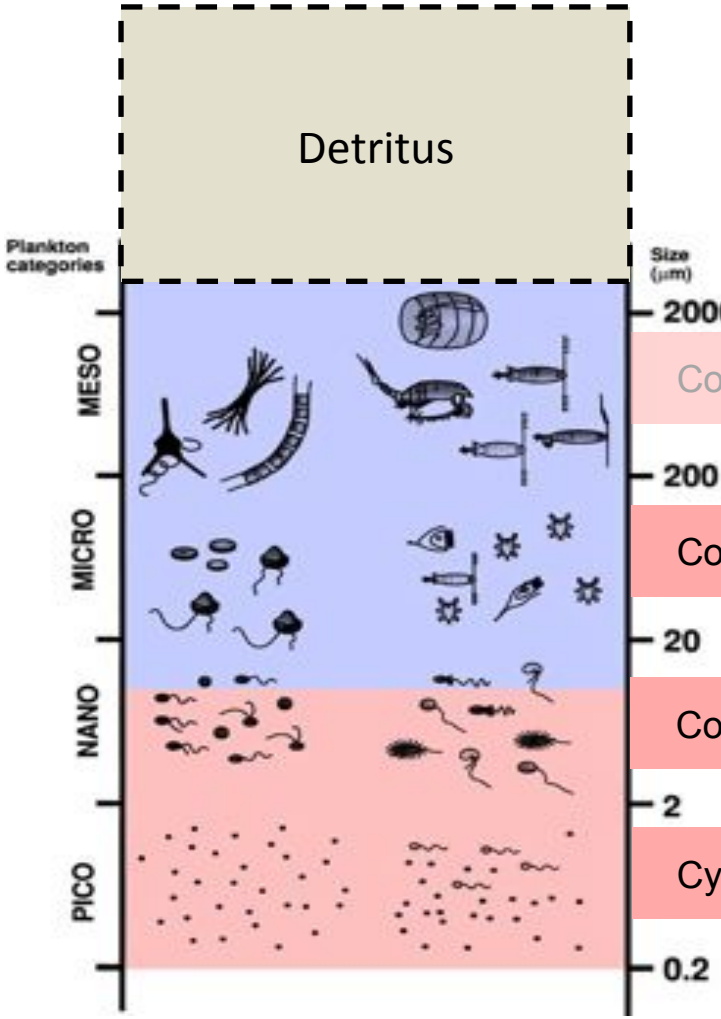
1. What is the temporal variability of phytoplankton community structures at different scales: seasonal and annual?

2. What is the spatial variability of phytoplankton community structure at different scales on the vertical and across the *Golfe du Lion*?

3. What is the relationship between the structure of phytoplankton communities and the biogeochemical and physical environments?

Relationship between microbial compartment and biogeochemistry

BIOGEOCHEMISTRY
Elemental composition of the bulk particulate matter



BIOLOGY
biological compartments

Counts/Biovolume/Biomass

Counts/Biovolume/Biomass

Counts/Cytometry

Cytometry

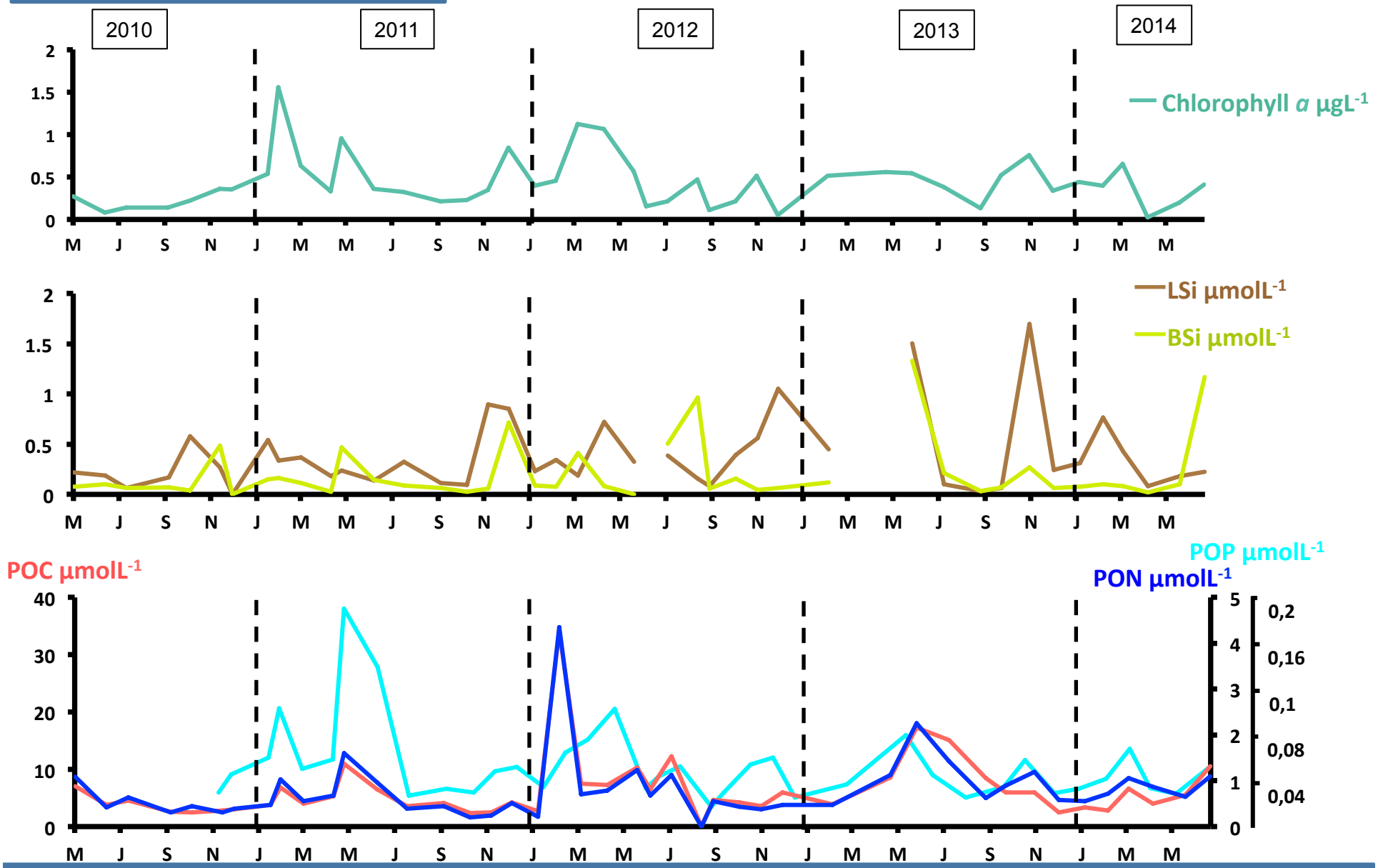
Typology of community structures

Species–specific contribution on total biomass

Silicifiers/ Non silicifiers
Diatoms- Silicoflagellates/ Dinoflagellates

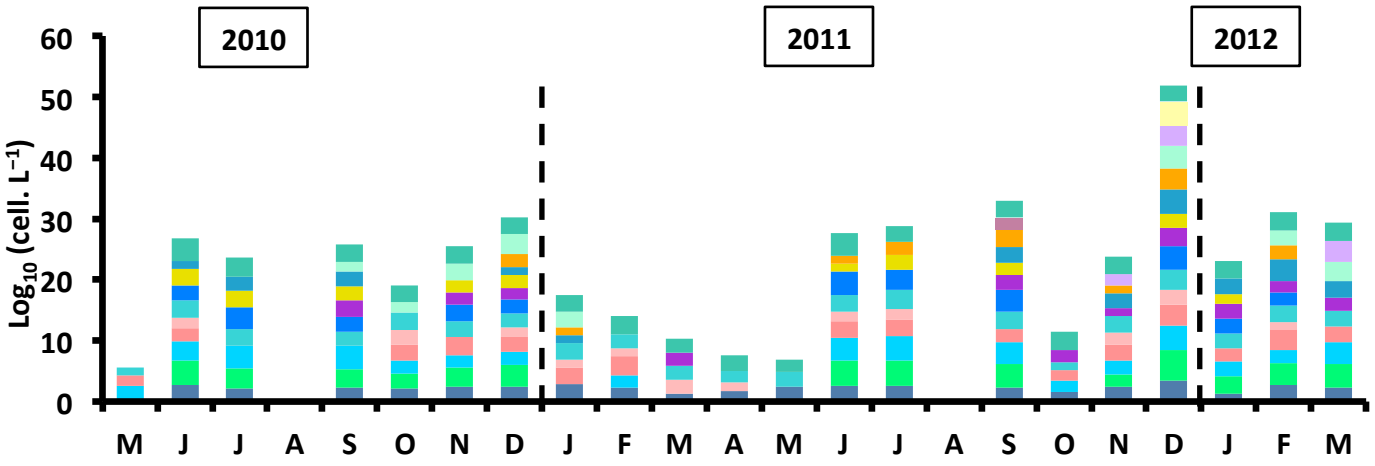
Temporal evolution of the chlorophyll biomass, biogenic and lithogenic Silica, and POM (C/N/P)

SOLEMIO- Surface

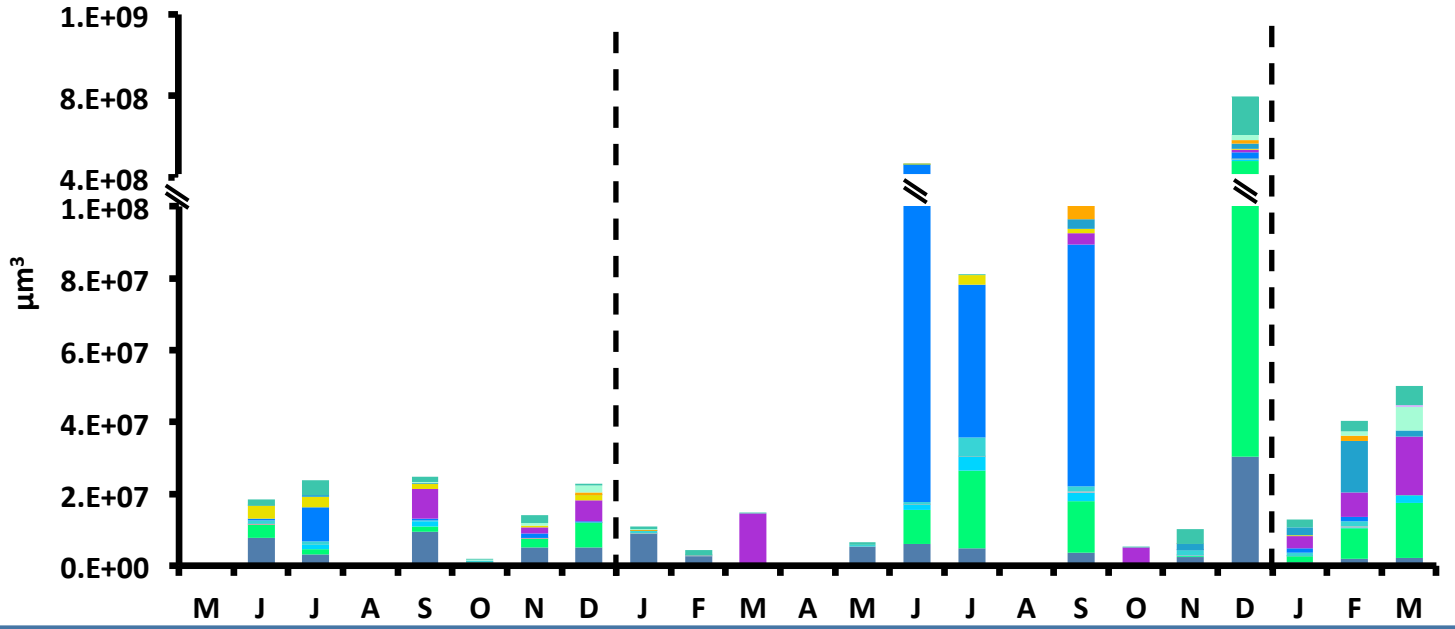


Exemple of Results

SOLEMIO- Surface: Diatoms succession

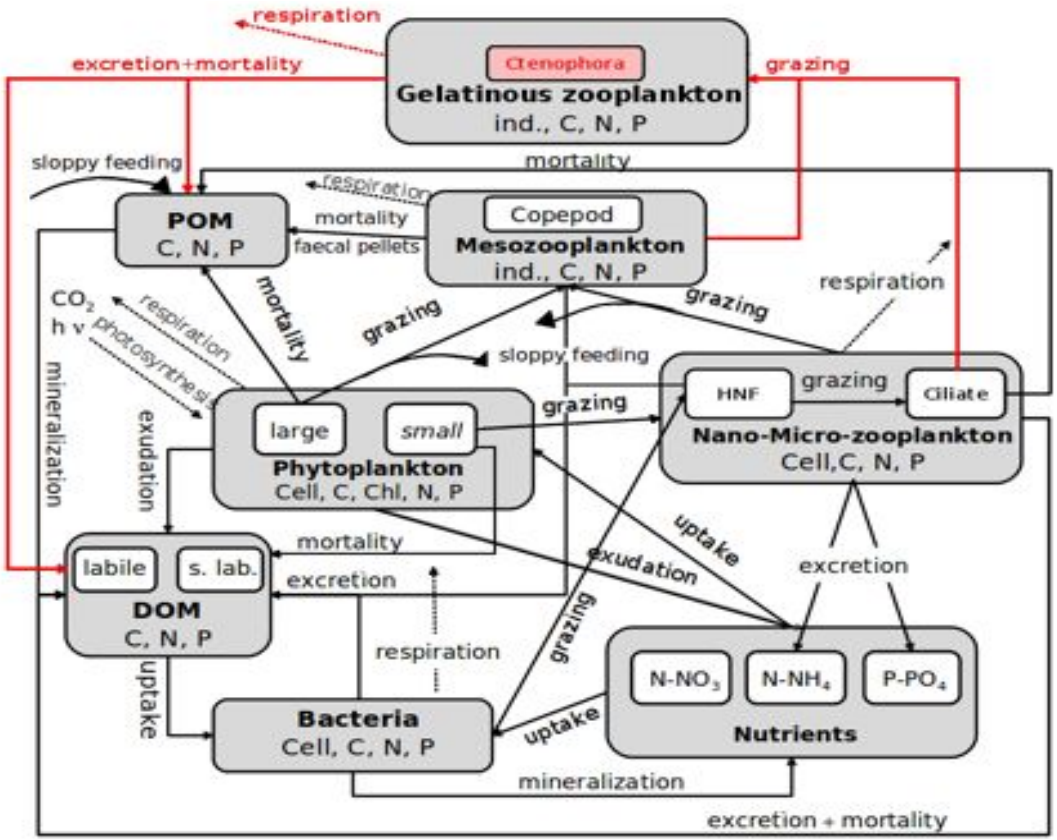


SOLEMIO- Surface: Specific Biovolume



Future directions & Interactions

TWP2: Modeling of the impact of continental nutrient inputs on the dynamics of planktonic diversity



Alekseenko Elena, PhD

Scientific advisor: Melika Baklouti

Other collaborators: François Carlotti , Pierre Garreau, Arnaud Guyennon