

Endorsement
by IGBP
programs



Global change and
natural hazards in the
Mediterranean basin

Combination of
observations and modelling

Understand and predict
responses of the Med. Sea
marine ecosystems to
global change

Combination of
observations and modelling



Research Programs

HyMeX	• Hydrological cycle in the Med. eXperiment
ChArMEX	• Chemistry-Aerosol Mediterranean eXperiment
MerMeX	• Marine Mediterranean eXperiment
SICMed	• Surfaces and Interfaces Continentales in the Med.
BioDivMex	• BioDiversity of the Mediterranean eXperiment
PaleoMeX	• Paleo Mediterranean eXperiment

Transverse Actions

Impacts of Climate Change in the Mediterranean

air pollution,
drought,
acidification,
biodiversity

- Med CORDEX simulations
- Downscaling methods
- Impact models



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Transfer of contaminants in the Mediterranean

particles, contaminants, biogeochemistry, ecosystems

- Regional model simulations
- Air-Land-Sea transfer of contaminants
- Impact models

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MedECC

Science-Society, international visibility, link with decision makers



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Structure and study areas of MERMEX phase 2 (2017-2020)



AT « Pollution et Contaminants »

3 trans-disciplinary flagship operations:

Impact of contaminants - The MERITE action (Marine ecosystem response to the input of contaminants in the coastal zone)

Impact of atmospheric deposition - The PEACETIME action (Process studies at the air-sea interface after dust deposition in the Mediterranean)

Impact of dense water formation - The PERLE action (Pelagic ecosystem response to dense water formation in the Levant experiment)



Air-sea interactions

(1) foster skills in analytical chemistry, biogeochemistry, physics, optics to examine the changes within air-sea interactions

(2) investigate the effects of changes in UV radiation and aerosol deposition on biogeochemical processes

PARTICULE: a sampler of atmospheric aerosols

AIOLOS inputs of OM from atmosphere

NANO-P MED : to improve trace analysis of phosphate

PhD: Kahina Djaoudi

See posters K Djaoudi & E Pulido

TRACFIRE : tracers of forest fires in seawater

See poster C Panagiotopoulos

MERMEX phase 1 - WP4 and WP1

MERMEX phase 2

PEACETIME (dust deposition),

PERLE (formation and spreading of levantine intermediate waters)

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Biogeochemical fluxes linked to various forcing

(1) changes in dense water formation, impact of rivers , ...in the NW Mediterranean Sea ecosystem

(2) impact on biogeochemical cycles and first planktonic trophic levels

ROBIN activity at depth, biological pump, ballast minerals
Postdoc : Virginie Riou

BALTOMS lability of terrestrial OM
PhD Marie Aimé Galeron
See 2 posters JF Rontani

MERMEX phase1 - WP1 and WP3

DEWEX (deep convection in NWM)

MOOSE (NW oceanic observatory)

OT-Med WP1 : CLIMATE CHANGE IN THE MEDITERRANEAN AND NATURAL HAZARDS

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Impact of contaminants on the Mediterranean Sea

(1) develop long-term observation systems to measure microbial and chemical parameters

(2) focus on the role of industrial activity, maritime traffic, oil refineries in the maritime area around Marseille

MEDPOP : *persistant organic pollutants*

Postdoct Javier Castro Jiménez

See poster J Castro Jimenez

CONTALT : impact Alteo effluent

See poster S Jacquet

MERMEX phase 1 WP3

MERMEX phase 2 MERITE

OT-Med WP2 : IMPACT OF CLIMATE AND SOCIO-ECONOMIC CHANGE

Marine ecosystem functioning until exploited resources

- 1) study the responses of trophic webs in terms of community structure, functioning and adaptation with regard to climatic forcing and direct human impacts,
- 2) setup a long-term observation of diversity structure of the main planktonic communities in Gulf of Lion,
- 3) understand and forecast jellyfish blooms in coastal regions

MNEMIOPSIS: Modelling Jellyfish outburst in the NW Med sea ecosystem
Post-doc E. Alekseenko

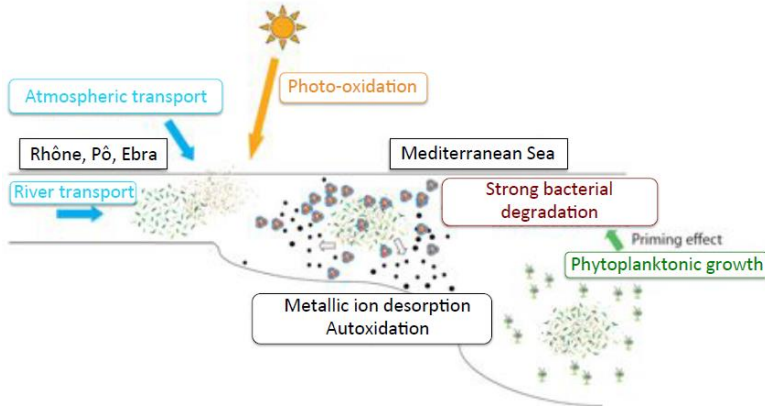
SPECIMED: Long term monitoring phytoplankton diversity
PhD student: Soumaya Boussabat

MORESCA Benthic recovery dynamics after 50-yrs offshore red mud disposal: monitoring benthic foraminifera response to physical disturbance in Cassidaigne canyon

MERMEX phase 1 WP2

Action IPP, action Specimed : test to implement biology in observatory systems
(phyto & zoo plankton taxonomy)

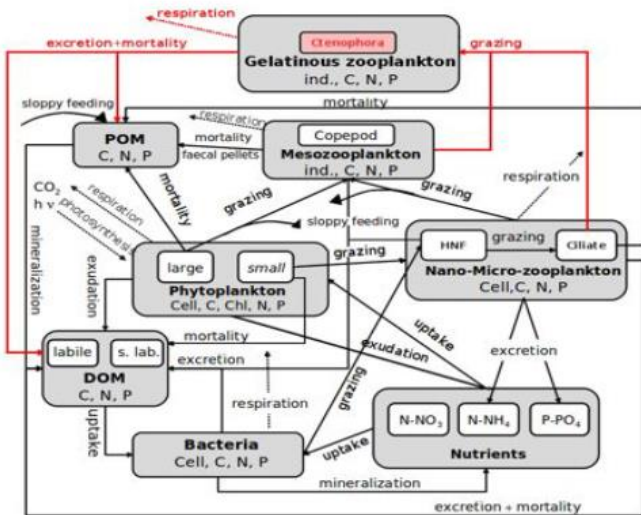
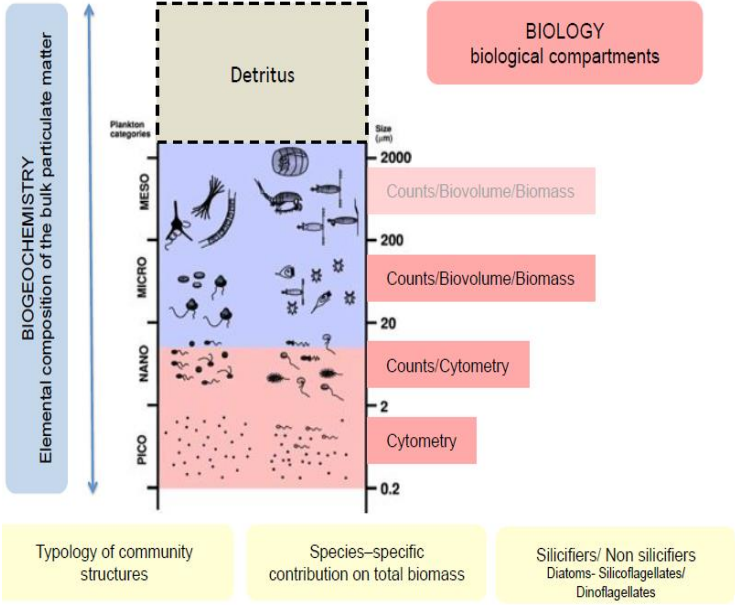
OT-Med WP2 : IMPACT OF CLIMATE AND SOCIO-ECONOMIC CHANGE



Biotic and abiotic degradation of terrestrial organic matter discharged by rivers in the Mediterranean Sea
 M.A. Galeron – Year 2

Observation of the plankton community structure in relation to the biogeochemical cycles in the Golfe du Lion and the pelagic ecosystems of North Tunisia
 S. Boussabat – Year 2

Modeling of the impact of continental nutrient inputs on the dynamics of planktonic diversity (TWP2)
 E. Alekseenko – Year 2



OT-Med TW1 The observation systems and databases

TW1.1 Marine Observation Services

Long-term survey of physico-chemical and planktonic parameters in the open MOOSE programme in collaboration with MERMEX.

Observation of meso- and bathy-pelagic environments : deep-sea observatories (ANTARES, MEUST).
SE French coast national SOMLIT network

DHEMISA : Dynamics of heterotrophic microorganisms determined by in situ automated flow cytometry
Postdoc : Tina Silovic

AMC: Aix-Marseille Carbon Pilot Study

Postdoc Brian Nathan (physical forcings CO₂ sources),

Post doc Katixa Lajaunie (modelling med sea with variable stoichiometry including O₂ and carbonate systems)

Ph D (Ministry) Cathy Wimar Rousseau : CO₂ budgets acidification in Bay of Marseille (AMC) and in Mermex phase 2 projects (PERLE)

See poster C Wimar-Rousseau

MERMEX phase 1 WP2 and WP3

MERMEX phase 2 PERLE

MOOSE / SOMLIT Med

OT-Med TWP2. Toward an integrated modelling of the Mediterranean systems

The goal of TWP2 was to develop **integrated model** for the Mediterranean based on several major coupled components.

Among them : Marine model, OT-Med partners are developing their own codes for 3D physical-biogeochemical coupled models, coupled to hydrodynamical models developed in by other collaborating institutes (e.g. Eco3M).

Modeling the impact of the quantity and quality of nutrient inputs on the structural and functional dynamics of planktonic diversity at seasonal time-scales. A case study on the NW Mediterranean Sea under the influence of the Rhône River

Postdoc Elena Alekseenko

LASER MED

Impact of climate change and land-use on the carbon sequestration and the productivity of marine ecosystems of the Mediterranean Sea

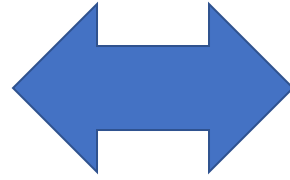
PhD student: Rémi Pagès

See 5 posters *LASERMED*

MERMEX phase 1 WP1, WP3 and WP5

MERMEX Phase 2 TW2 et MEDECC

Balance report OT-MED / MERMEX



- Funded projects: 16
- Post-docs: 7
- PhDs: 5
- Invited scientists: 2
- Supported workshops : 5
- Common publications including special issue MERMEX: ~ 50 publications

MERMEX KEY-WORDS

