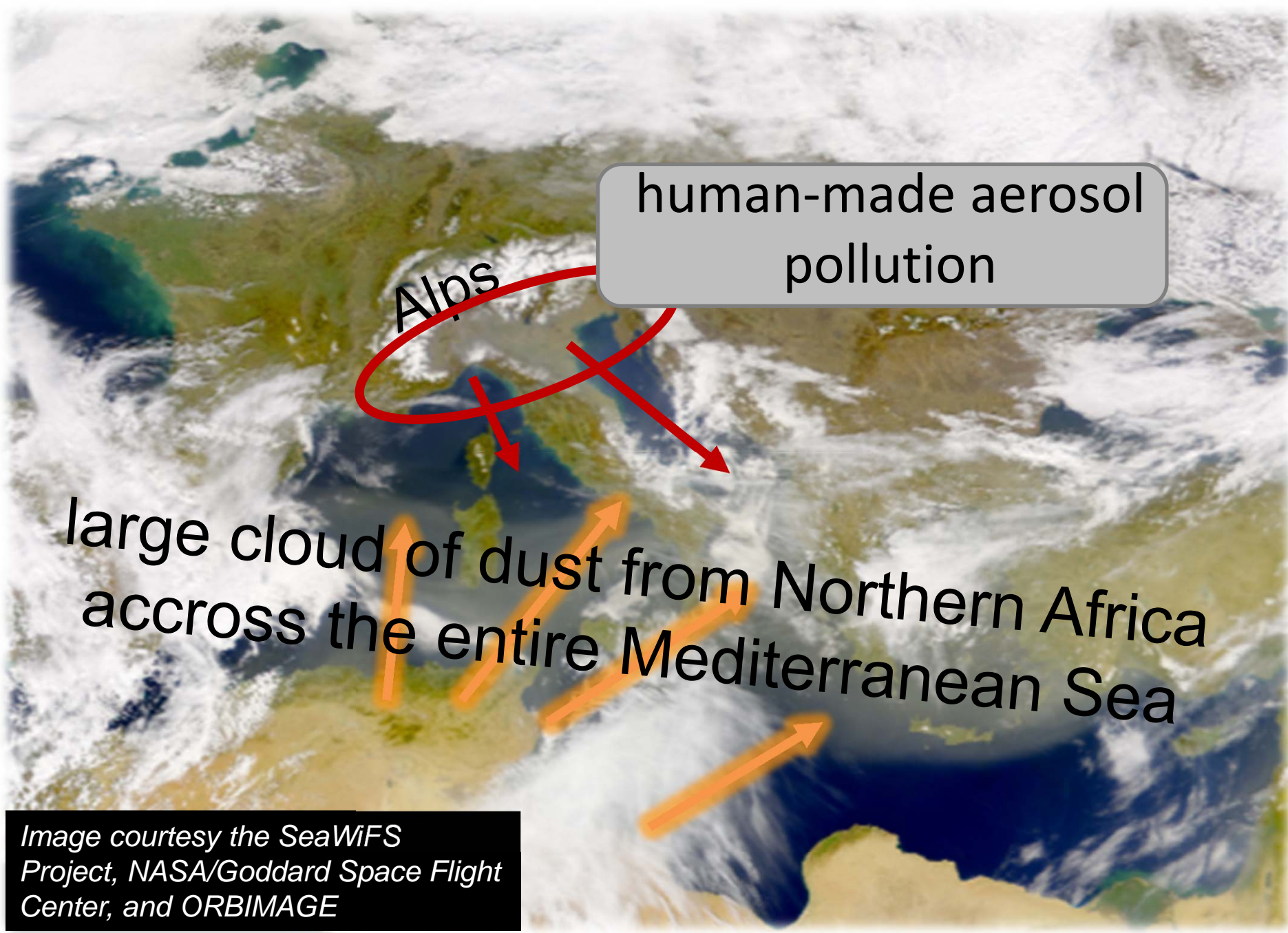


# A plan for a SOLAS campaign across the Mediterranean Sea in 2015

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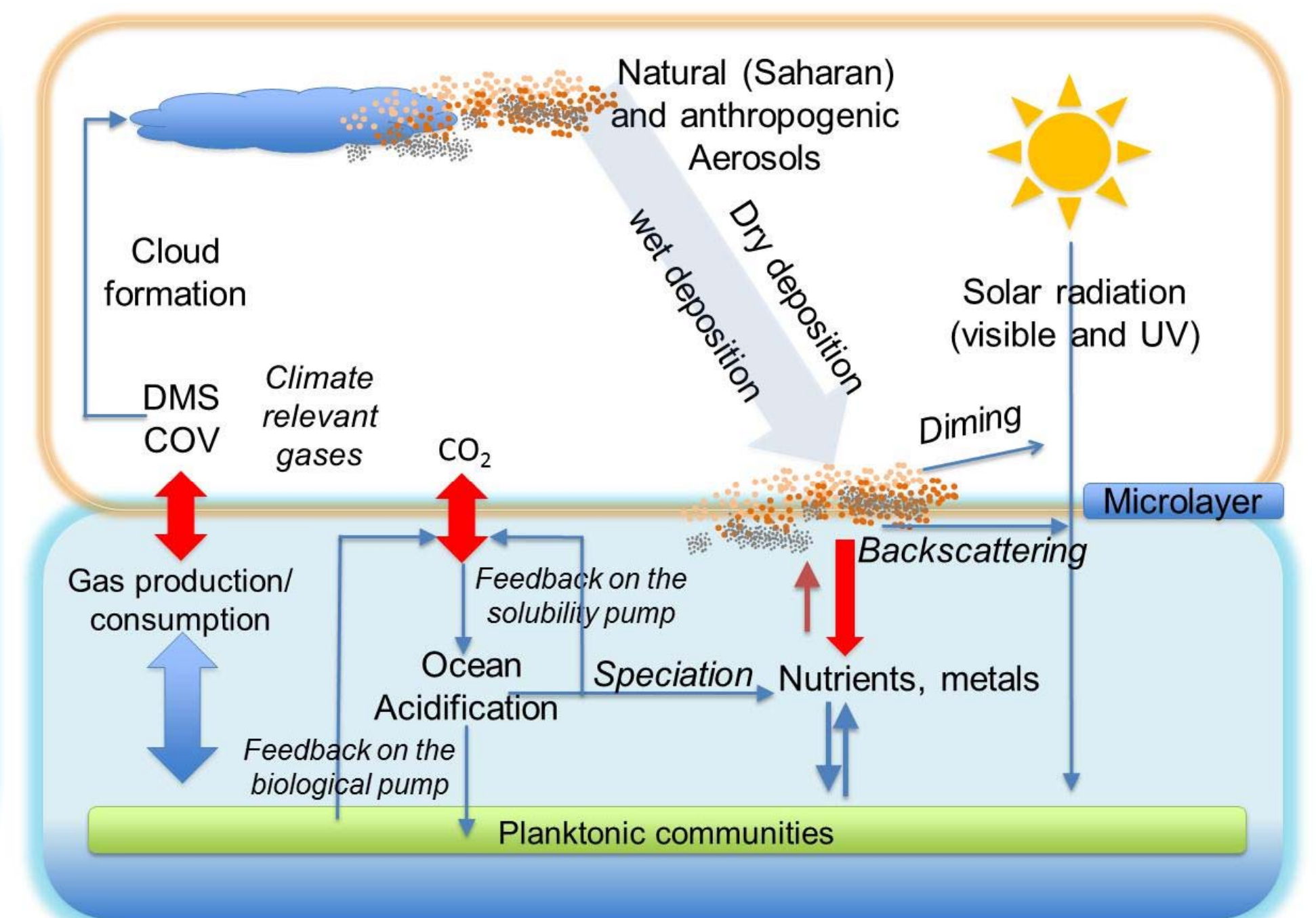
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Mermex Group, 2011

“PEAcEtIME - ProcEss studies at the Air-sea Interface: a Mediterranean Experiment”:

- a project to study a series of key processes at the air-sea interface and their links with marine biogeochemistry in the Mediterranean Sea
- a joint effort from the atmospheric and marine scientific communities
- A 1-month oceanographic campaign in May 2015
- The first 'SOLAS' cruise in the Mediterranean and an important contribution to the French MISTRALS program (Mediterranean Integrated Studies at Regional And Local Scales). Current applications for R/V and research funding



## IDEAL PERIOD FOR a 'SOLAS' CRUISE?

- a high probability to encounter a Saharan dust event
- Potential for a maximum impact on the biogeochemical cycles and ecosystems → during the stratification period when the surface mixed layer is nutrient depleted (oligotrophic conditions) and the atmospheric inputs represent the main source of new nutrient to the surface ocean

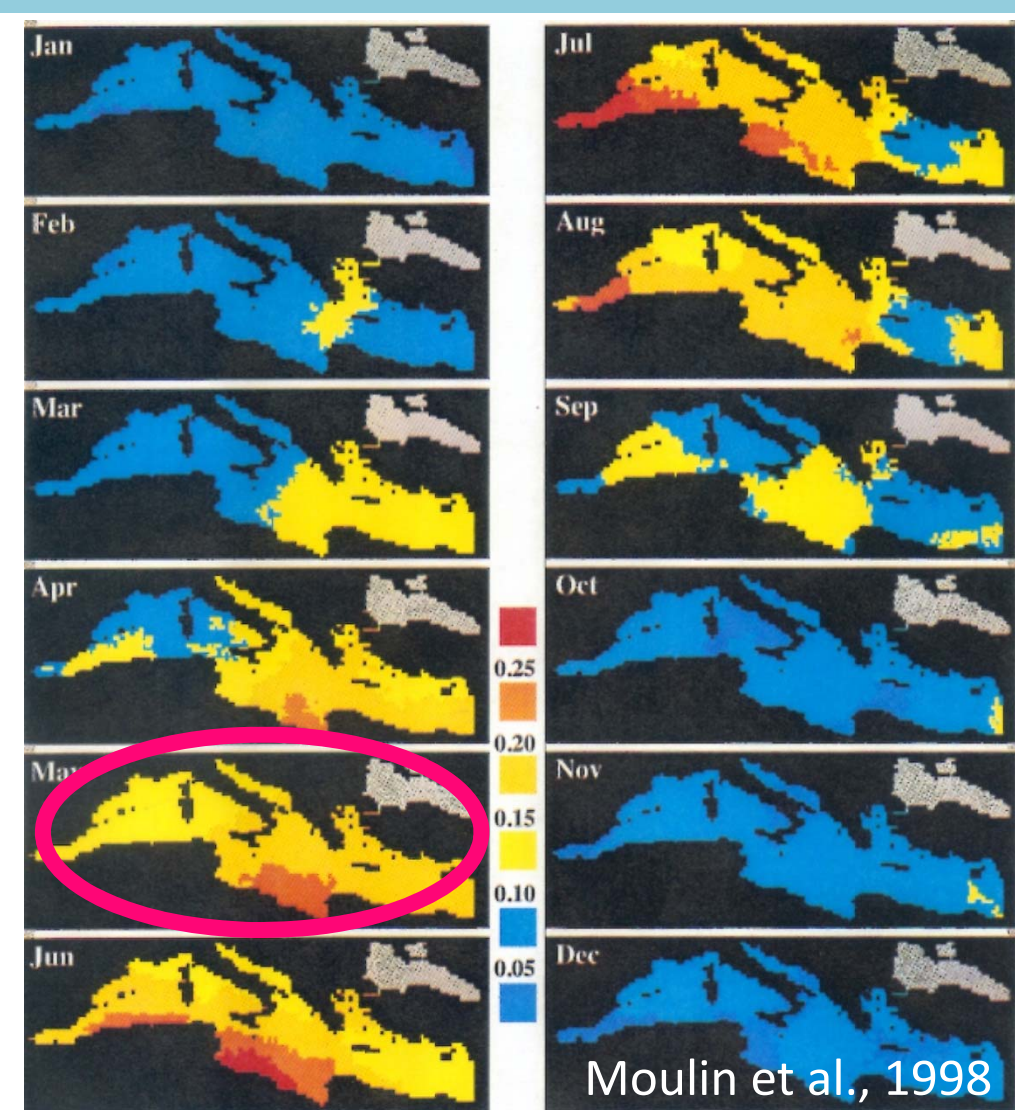
The proposed experiment will address 3 of the 5 most up-to-date scientific themes as raised by the Mid-term Strategy of the international program SOLAS:

- Atmospheric control of nutrient cycling and production in the surface ocean
- Ocean-derived aerosols: production, evolution and impacts
- Ship plumes: impacts on atmospheric chemistry, climate and nutrient supply to the oceans

## Main Objectives:

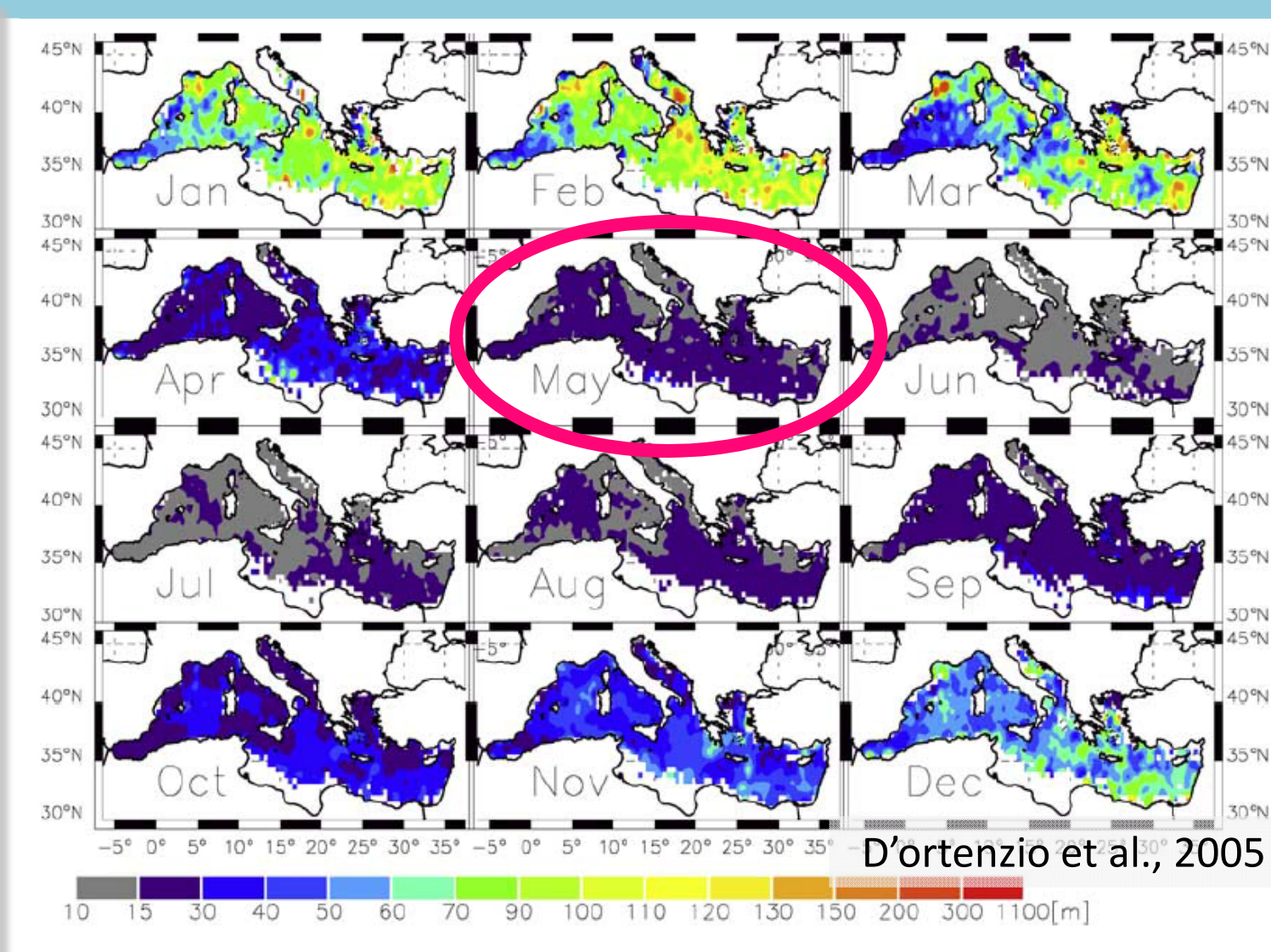
- Study the effect of atmospheric deposition on nutrient cycling and ecosystem functioning
- Quantify the biogenic and sea-salt natural emissions from the surface water
- Quantify the optical properties both above and below the air-sea interface in an area submitted to a variety of natural and anthropogenic aerosols.

## Monthly mean of the dust optical depth at 550 nm (1984-1994)



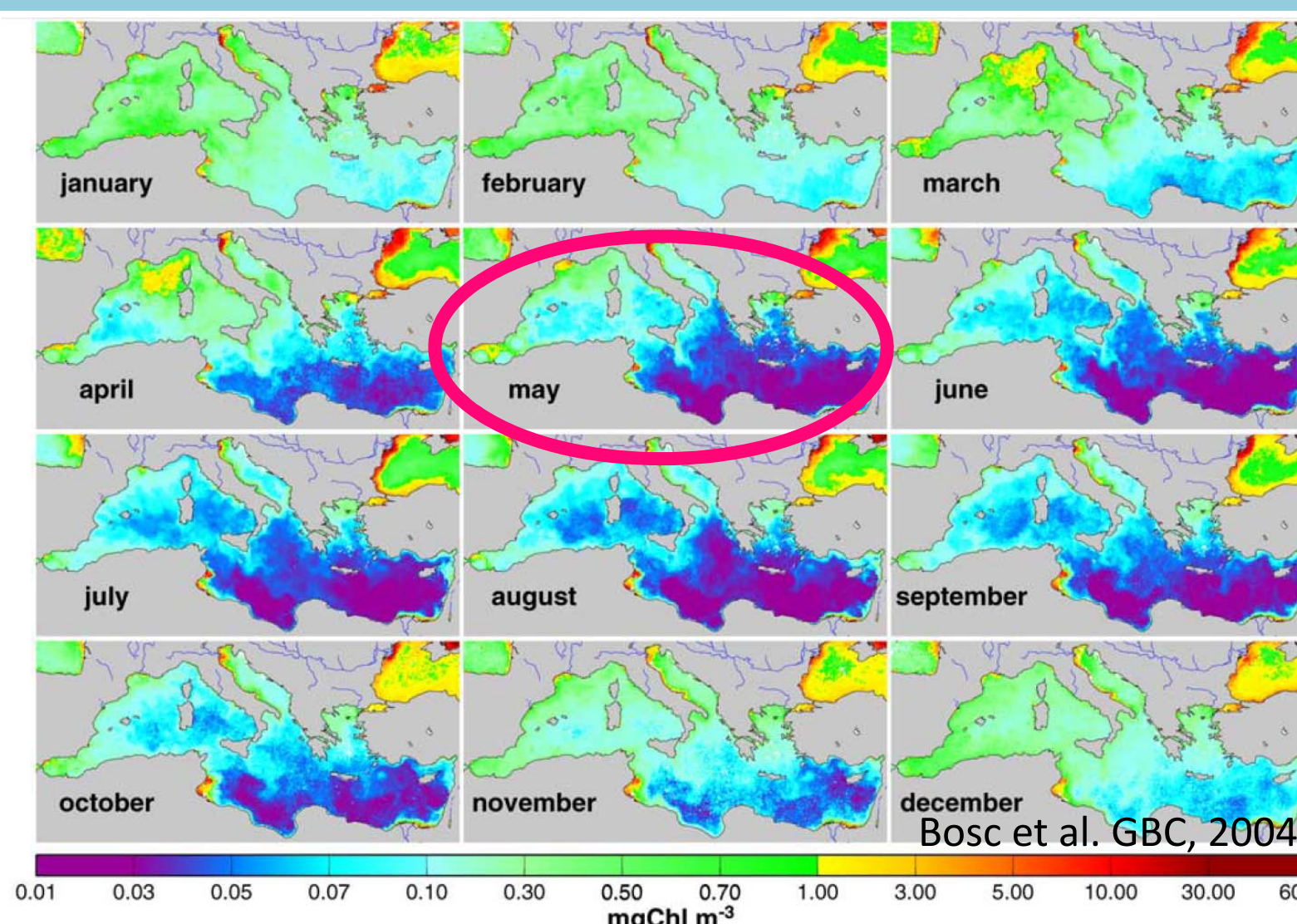
Moulin et al., 1998

## Mediterranean mixed layer depth climatology



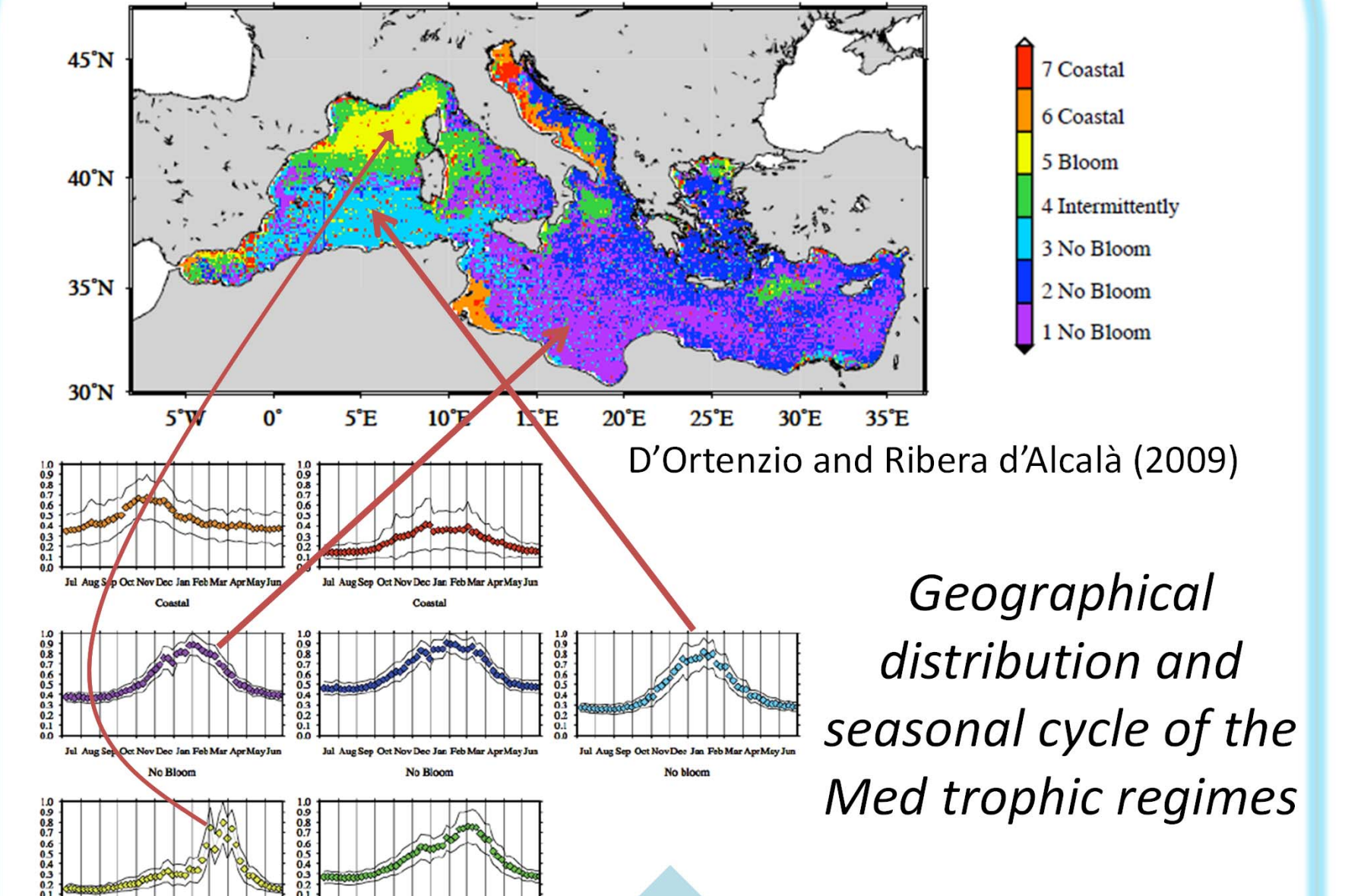
D'ortenzio et al., 2005

## Monthly chlorophyll maps derived from SeaWiFS data for the year 1999



Bosc et al. GBC, 2004

## WHERE should be performed the PROCESSES STUDIES?



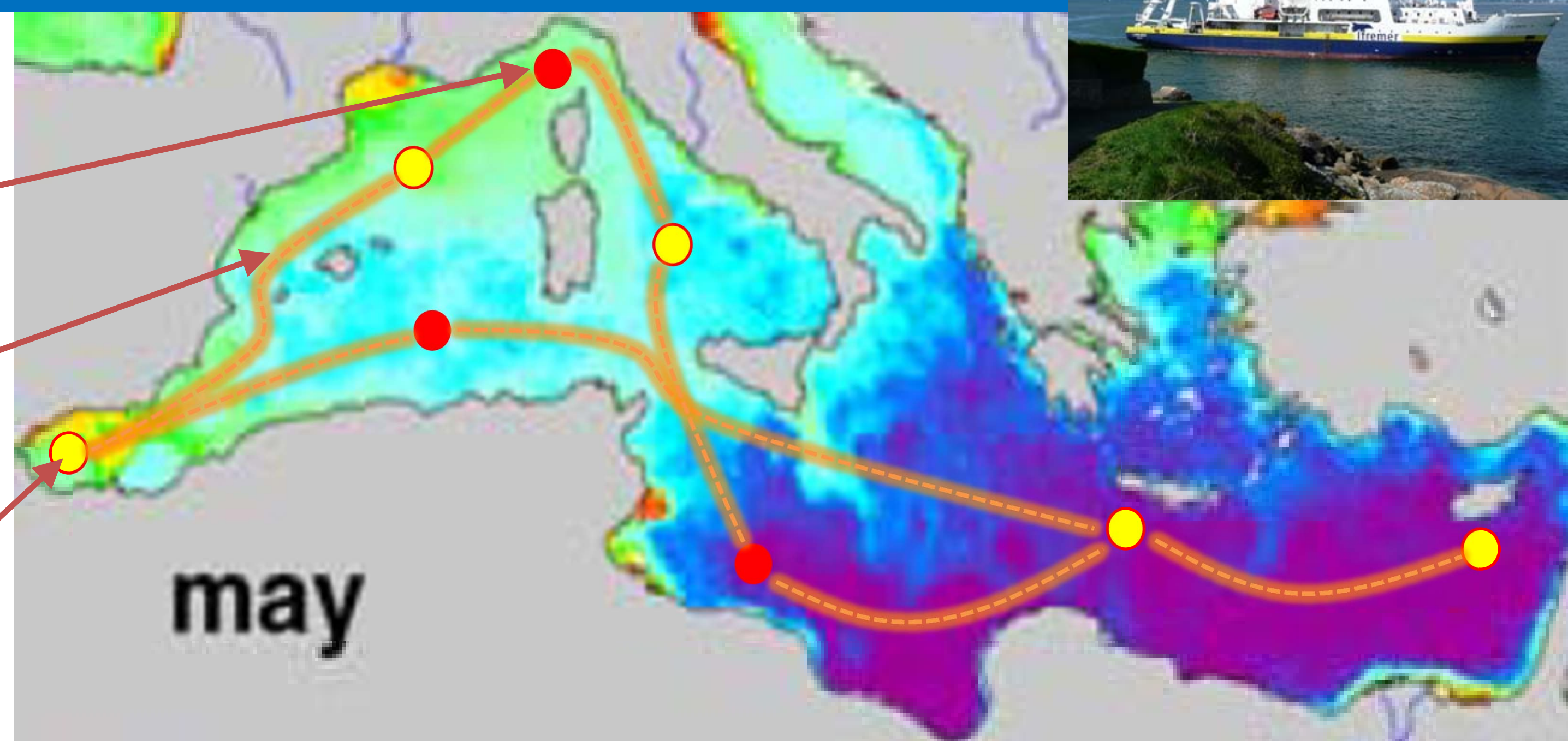
D'Ortenzio and Ribera d'Alcalá (2009)  
Geographical distribution and seasonal cycle of the Med trophic regimes

- dust transport starts in late winter in the eastern Med. and then shifts towards west in spring
- (not shown) in May, those events have a high probability to occur as wet event (Loÿe-Pilot and Martin, 1996; Kubilay et al., 2000), a form that has more impact on biogeochemistry.
- May represents thus a good window to encounter a wet Saharan event

- MLD seasonal variability is characterized by a basin scale deepening from Nov. to Feb. - March and an abrupt re-stratification in April, which is maintained throughout the summer and early autumn
- In May the waters are thus well stratified all over the basin

- In May, various trophic conditions can be found in the basin, with still relatively high Chla concentrations in the Ligurian and Alboran Sea and ultra-oligotrophic condition in the central and eastern basin

## Tentative track for the PEACETIME cruise



Red dots

→ Long stations (5-8 days) with processes studies, deep profiles and drifting sediment traps.

Transect

→ a series of parameters from the continuous seawater supply of the ship and from a towed 'clean' fish + aerosols sampling

Yellow dots

→ short stations

## Organization in working groups (on going):

**Optical properties WG:** a strategy to perform optical measurements of optical properties both above and below the air-sea interface

**Emission WG:** a strategy to address both biogenic and sea-salt natural emissions from the surface waters and possibly consider a dedicated study of anthropogenic ship emissions.

**Tracers and trace element WG:** a specific strategy will be implemented to acquire high quality numbers concerning a series of tracers (e.g. of Saharan deposition) and trace elements (such as N and P that are considered as trace elements in the SML at this period of the year).

**Atmospheric Impact on biogeochemistry WG:** processes studies

**Fast Action WG:** in case of a Saharan event is forecasted, a specific sampling strategy will have to take place. This WG will work on defining the timing and the sampling strategy to adopt.

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