



HAL
open science

Impact of dust enrichment on the metabolism of Mediterranean plankton communities under present and future conditions of pH and temperature

Frédéric Gazeau, Samir Alliouane, C Stolpe, Thierry Blasco, France van Wambeke, Emilio Maranon, M Pérez-Lorenzo, Cécile Guieu

► To cite this version:

Frédéric Gazeau, Samir Alliouane, C Stolpe, Thierry Blasco, France van Wambeke, et al.. Impact of dust enrichment on the metabolism of Mediterranean plankton communities under present and future conditions of pH and temperature. Future Oceans2 IMBeR Open Science Conference, Jun 2019, Brest, France. 2019. hal-03945042

HAL Id: hal-03945042

<https://hal.science/hal-03945042v1>

Submitted on 26 Jan 2023

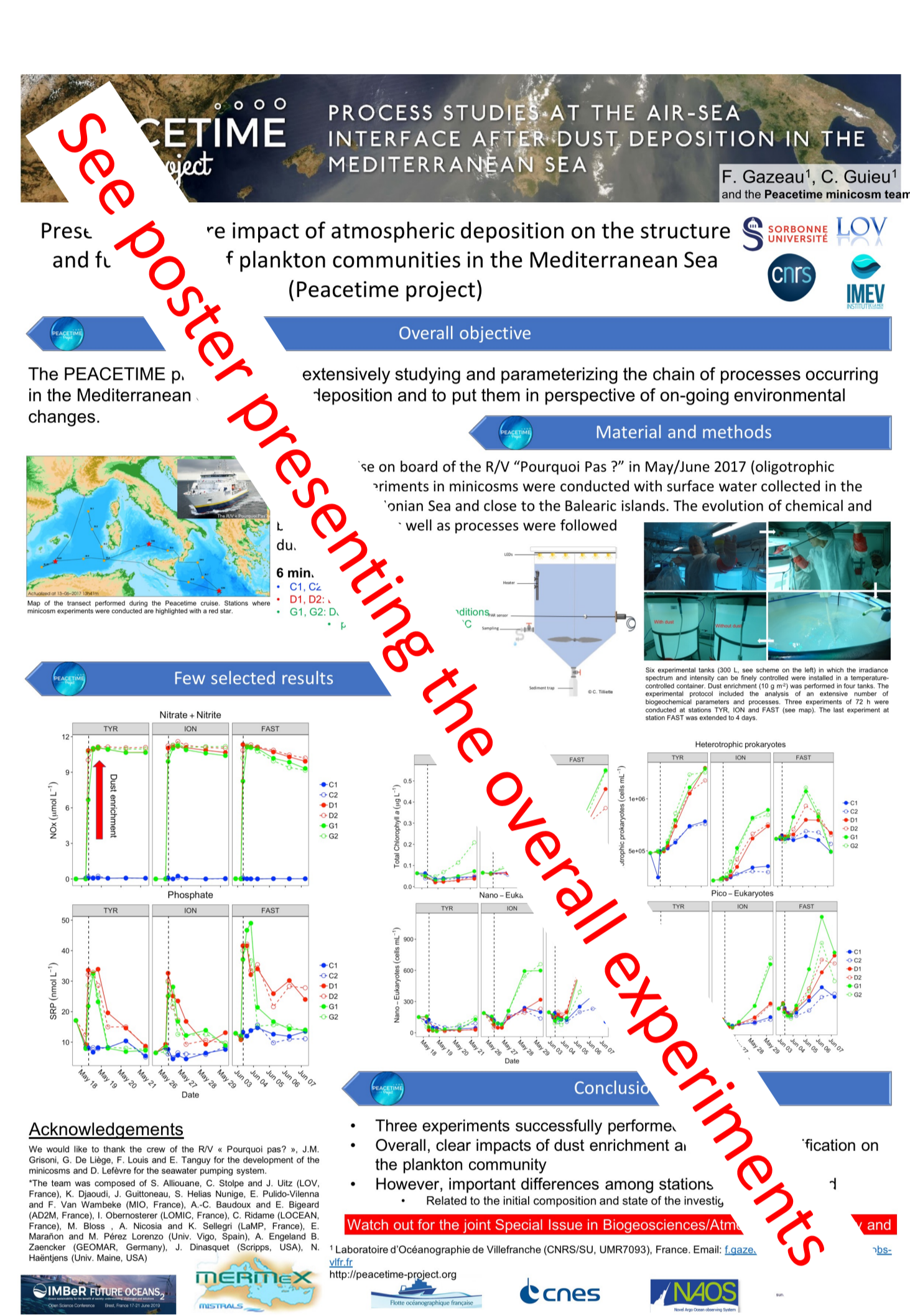
HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Impact of dust enrichment on the metabolism of Mediterranean plankton communities under present and future conditions of pH and temperature

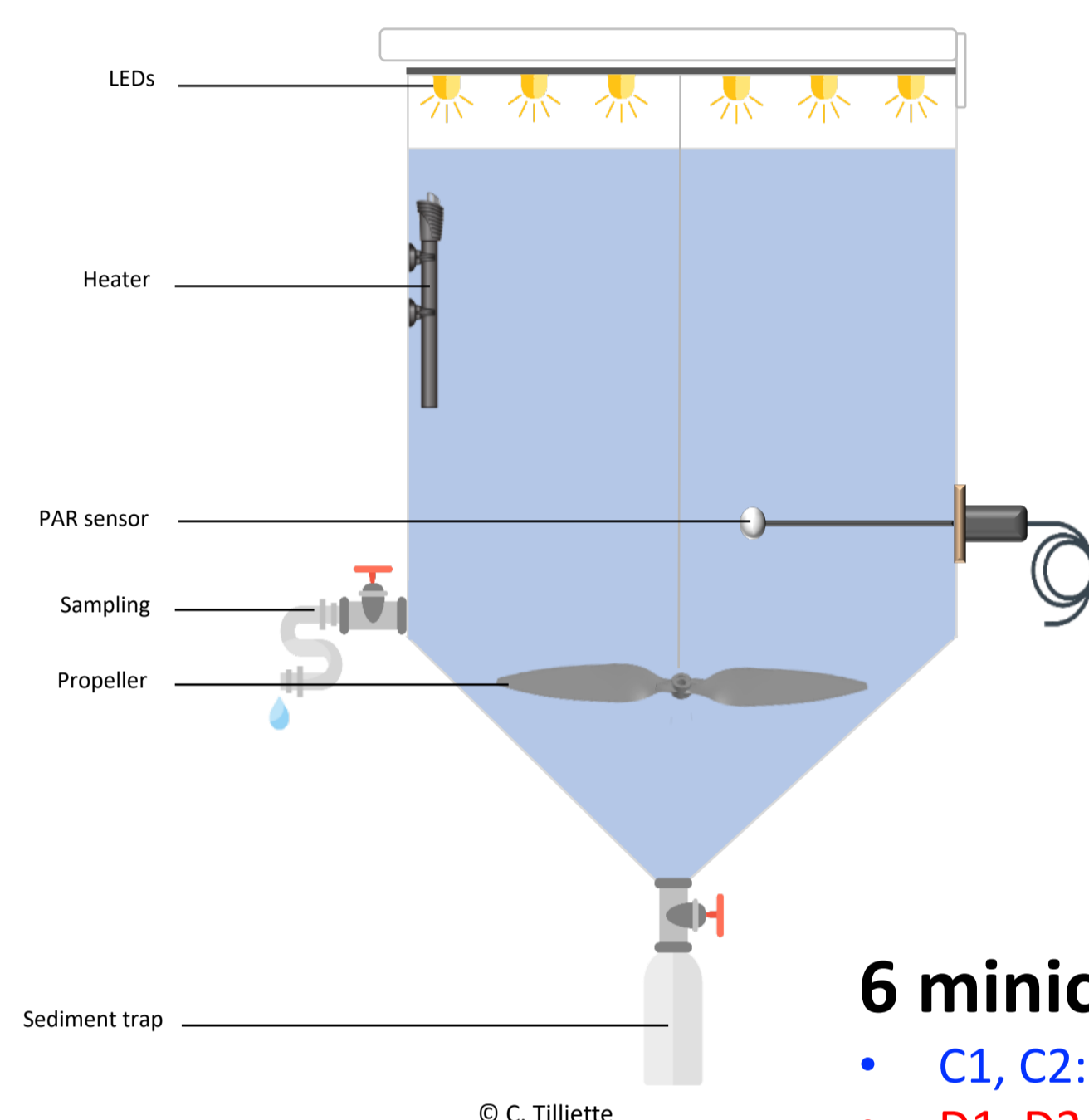
Overall objective

The PEACETIME project aimed at extensively studying and parameterizing the chain of processes occurring in the Mediterranean Sea after dust deposition and to put them in perspective of on-going environmental changes.



Material and methods

During a cruise on board of the R/V "Pourquoi Pas ?" in May/June 2017 (oligotrophic season), three experiments in climate reactors were conducted with surface water collected in the Tyrrhenian Sea (TYR), Ionian Sea (ION) and Alboran Sea (FAST).

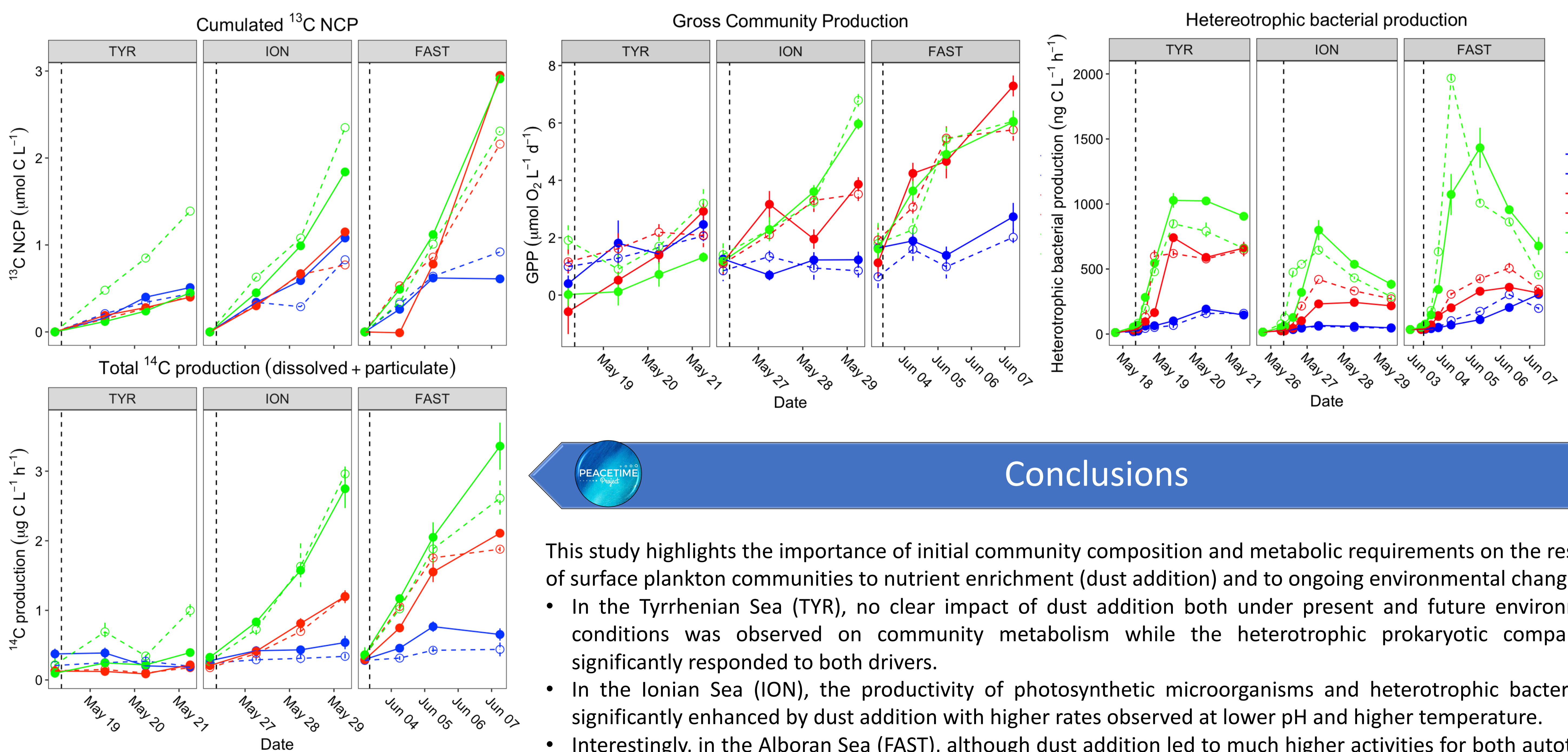


Six experimental units (300 L) were used to follow simultaneously and with a high temporal resolution, the evolution of biological activity (oxygen and carbon community metabolism, heterotrophic bacterial production, ¹³C net community production) among other parameters and processes, after dust addition (10 g m⁻²) both under present environmental conditions and following a realistic climate change scenario.

- 6 minicosms**
- C1, C2: Control
 - D1, D2: Dust enrichment
 - G1, G2: Dust enrichment under future conditions (pH - 0.3, temperature + 3 °C)

- ¹³C-HCO₃⁻ enrichment (+ 300 ‰) directly in each tank
- Separated incubations for ¹⁴C incorporation and O₂ metabolism (24 h, light-dark) at the corresponding irradiance and temperature levels
- Dark incubations at the corresponding temperature levels for heterotrophic bacterial production (³H-leucine, 2 h)

Results



Acknowledgements

We would like to thank the crew of the R/V « Pourquoi pas? », J.M. Grisoni, G. De Liège, F. Louis, D. Delhommeau and E. Tanguy for the development of the minicosms and D. Lefèvre for the seawater pumping system.

Watch out for the joint Special Issue in Biogeosciences/Atmospheric Chemistry and Physics

¹ Laboratoire d'Océanographie de Villefranche (CNRS/SU, UMR7093), France. Email: f.gazeau@obs-vlfr.fr
² Mediterranean Institute of Oceanography, France
³ University of Vigo, Spain

<http://peacetime-project.org>