{rokbox title=| Overview of the cruises included in the CARIMED data synthesis products :: Image: Authors|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-carimed-carbon-tracers-ancillary-2026-garciaibañez-thumb-et-al.jpg|}images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-carimed-carbon-tracers-ancillary-2026-garciaibañez-et-al.jpg{/rokbox}

Marta Álvarez, **Maribel I. García-Ibáñez**, Nico Lange, Alex Kozyr, Antón Velo, Toste Tanhua, Giuseppe Civitarese, Carolina Cantoni, Malek Belgacem, Katrin Schroeder, Rubén Acerbi, Laurent Coppola, Thibaut Wagener, Noelia M. Fajar, Susana Flecha, Michele Giani, Louisa Giannoudi, Elisa F. Guallart, Abed El Rahman Hassoun, Emma I. Huertas, Valeria Ibello, Mehdia A. Keraghel, Férial Louanchi, Anna Luchetta, Fiz F. Pérez, Carsten Schirnick, Ekaterini Souvermezoglou, Lidia Urbini, Montserrat Vidal, and Patrizia Ziveri, 2026.
CARIMED (CARbon, tracers, and ancillary data In the MEDiterranean Sea): a ship-based data synthesis product – overview and quality control procedures.
Earth System Science Data. Volume 18. Issue 7. 2026.
https://doi.org/10.5194/essd-18-4915-2026

Abstract:The Mediterranean Sea (MedSea) is highly sensitive to climate-driven changes in temperature, oxygen, and pH, among other variables. To better assess these long-term trends, we developed CARIMED (CARbon, tracers, and ancillary data In the MEDiterranean Sea), the first comprehensive, harmonised data synthesis product for the MedSea. CARIMED integrates hydrographic, inorganic carbon, transient tracer, and ancillary measurements from 46 research cruises spanning the period from 1976 to 2018, containing observations for the entire water column across all MedSea sub-basins. A substantial component of the data was retrieved from fragmented or locally archived historical records, thus consolidating previously inaccessible measurements. Following global synthesis approaches, CARIMED applies a quality-controlled, and bias-adjusted framework. A key adaptation was the secondary quality control (2QC) procedure, specifically tailored to the MedSea's unique hydrography, utilising sub-basin divisions and supplementary checks (including statistical consistency assessments) to resolve complex, often contradictory, inter-cruise offsets. This rigorous process minimised systematic biases, yielding a dataset with improved consistency, and highlights the urgent need for adapted standard operating procedures and reference materials to address the MedSea biogeochemical particularities. CARIMED delivers two complementary, freely available products: the aggregated original cruise data product (https://doi.org/10.20350/digitalCSIC/17785 , García-Ibáñez et al., 2025) and the final bias-adjusted data synthesis product (https://doi.org/10.25921/cp5b-zq67 , Álvarez et al., 2025; hosted at

https://www.ncei.noaa.gov/access/ocean-carbon-acidification-data-system/oceans/CARIMED/ , last access: 26 June 2026). This essential resource establishes a new benchmark for assessing long-term biogeochemical trends, validating regional ocean models, and supporting climate-change mitigation and adaptation strategies in this rapidly changing semi-enclosed basin.

Keywords: