

[BIOSWOT-Med]: SPASSO Images Analysis

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May 3, 2023

Executive Summary

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1 Ongoing operations and upcoming stations

SWOT passing time (UTC) over:

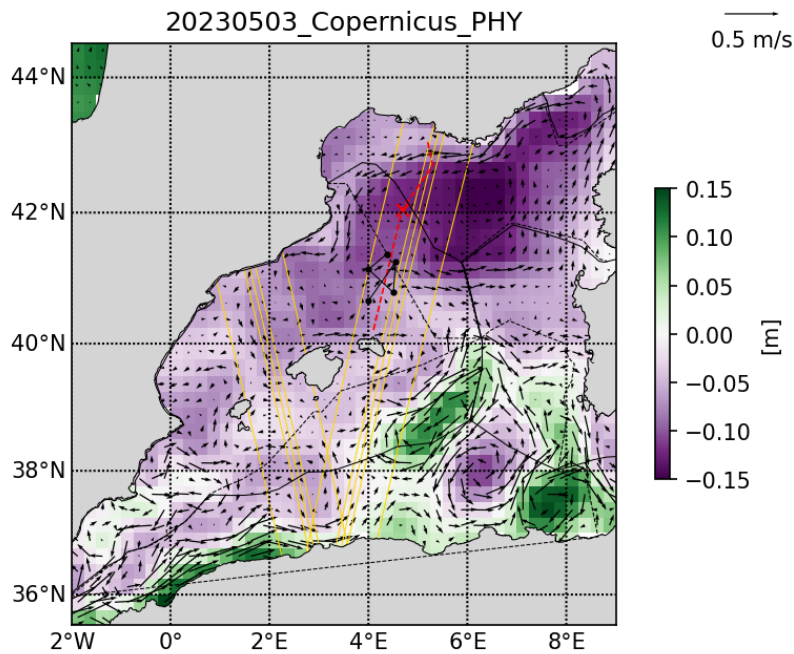
43°N - 5°E Asc	42.7°N - 4.8°E Asc
2023-05-03 18:44:39	2023-05-03 18:44:39
2023-05-04 18:35:16	2023-05-04 18:35:16
2023-05-05 18:25:54	2023-05-05 18:25:54
2023-05-06 18:16:31	2023-05-06 18:16:31
2023-05-07 18:07:09	2023-05-07 18:07:09

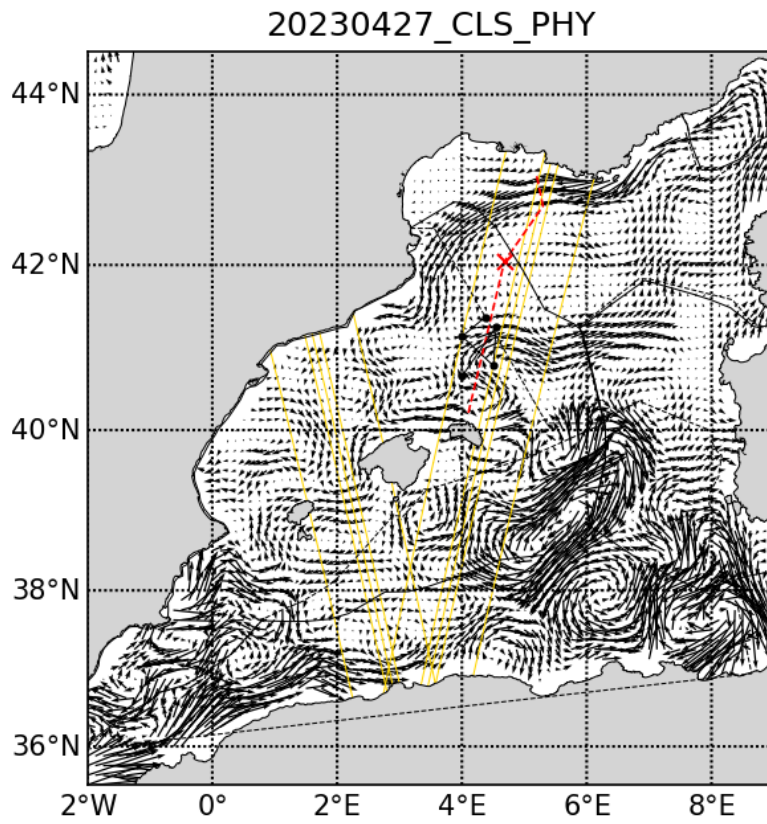
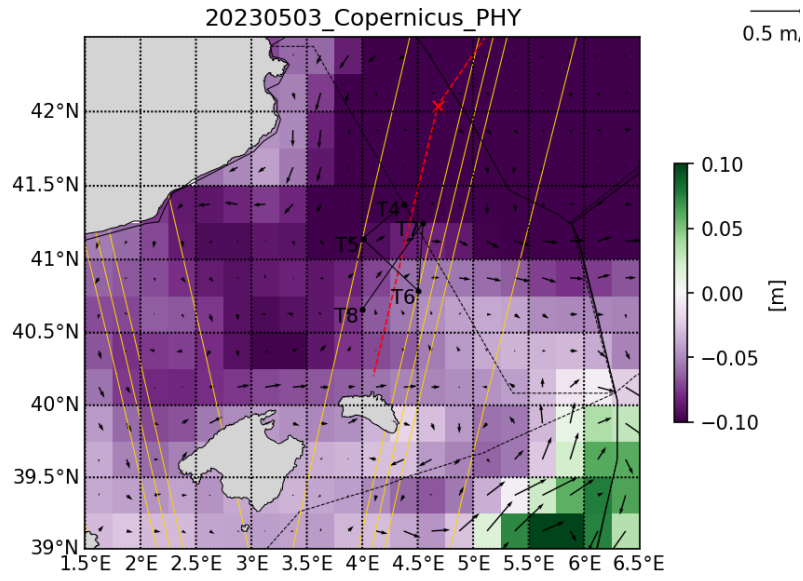
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2 Daily figures analysis

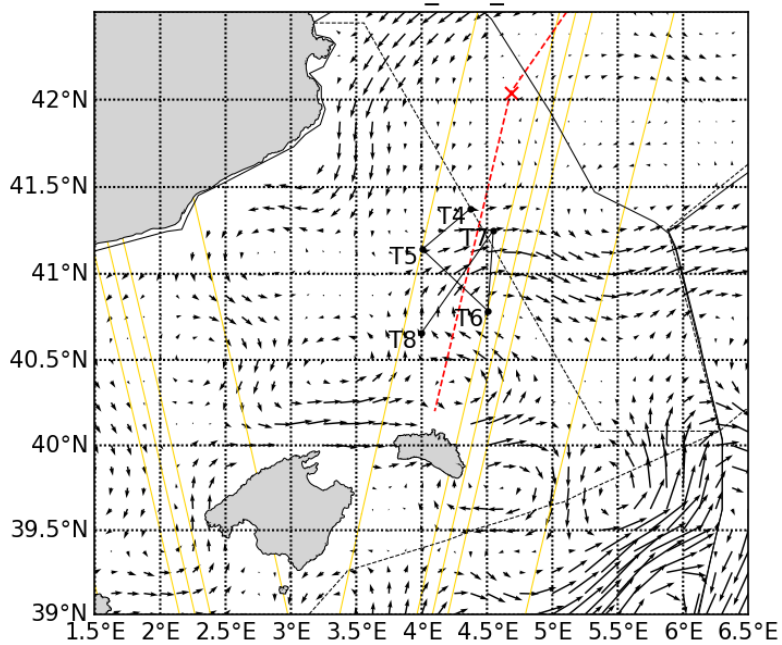
2.1 Altimetry, derived currents

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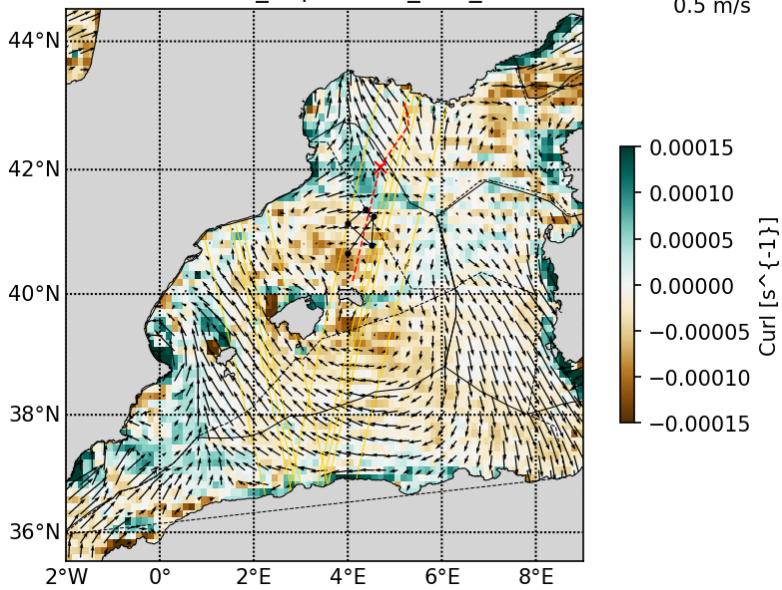


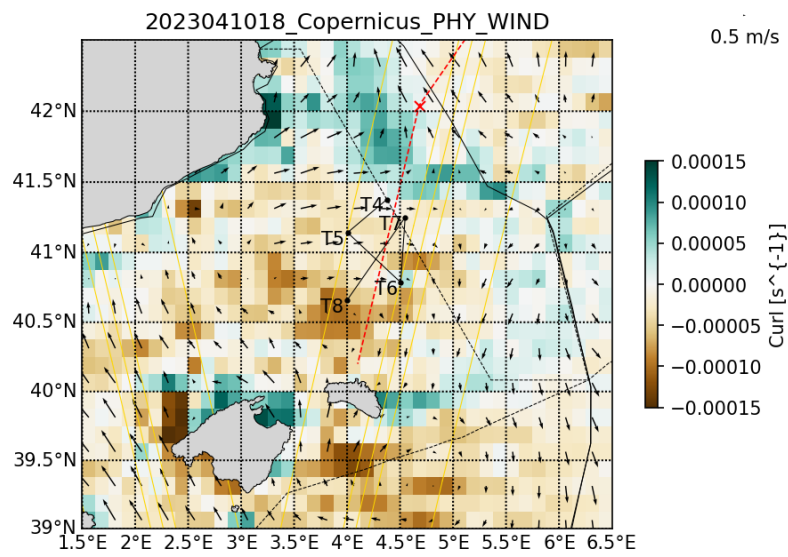


20230427_CLS_PHY



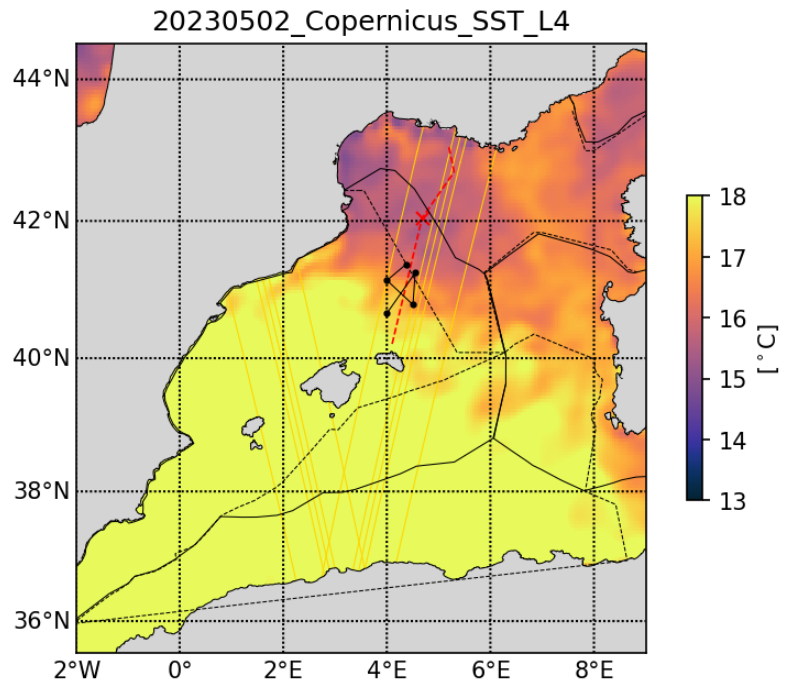
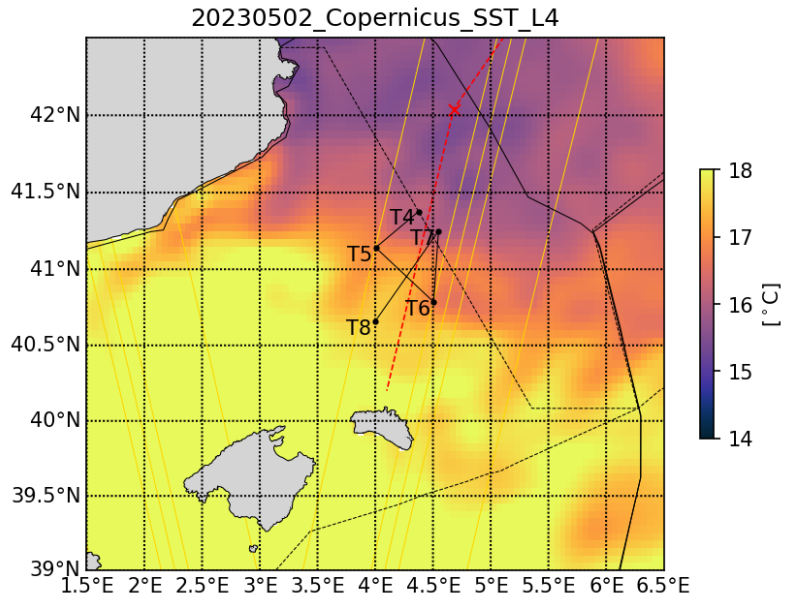
2023041018_Copernicus_PHY_WIND

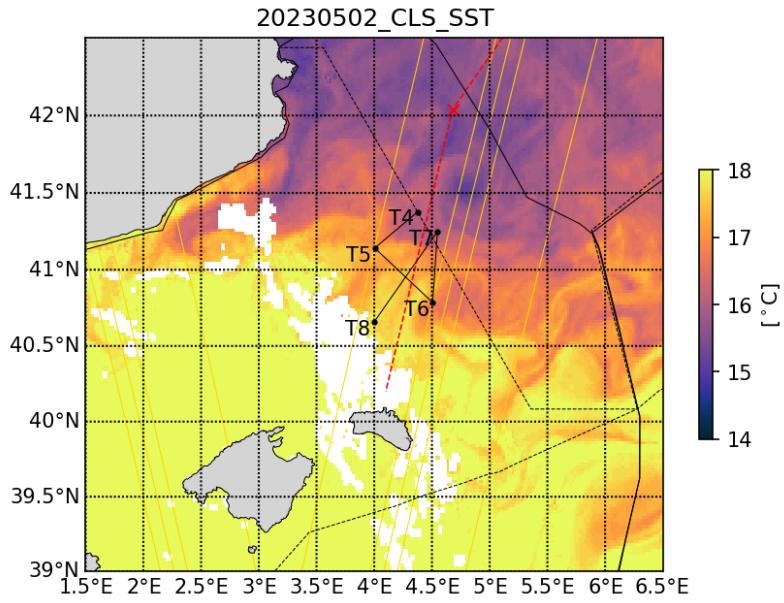
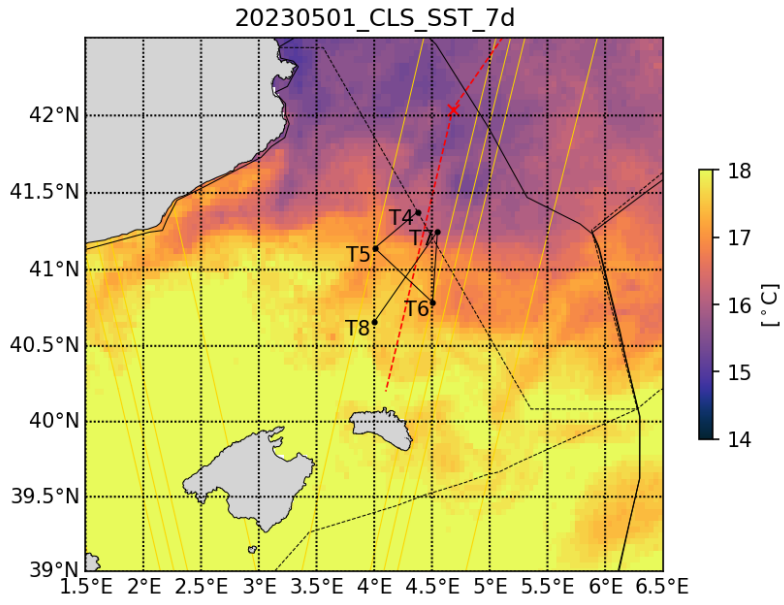




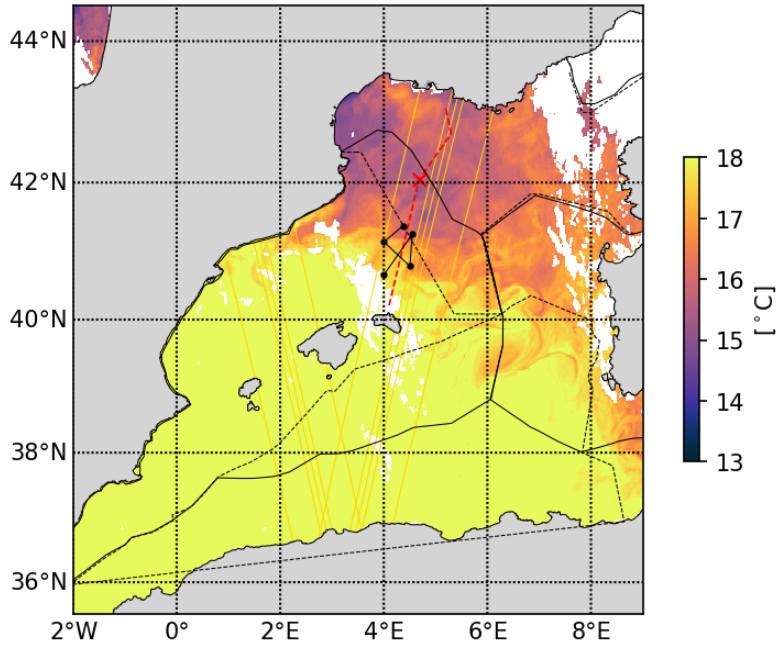
2.2 SST analysis

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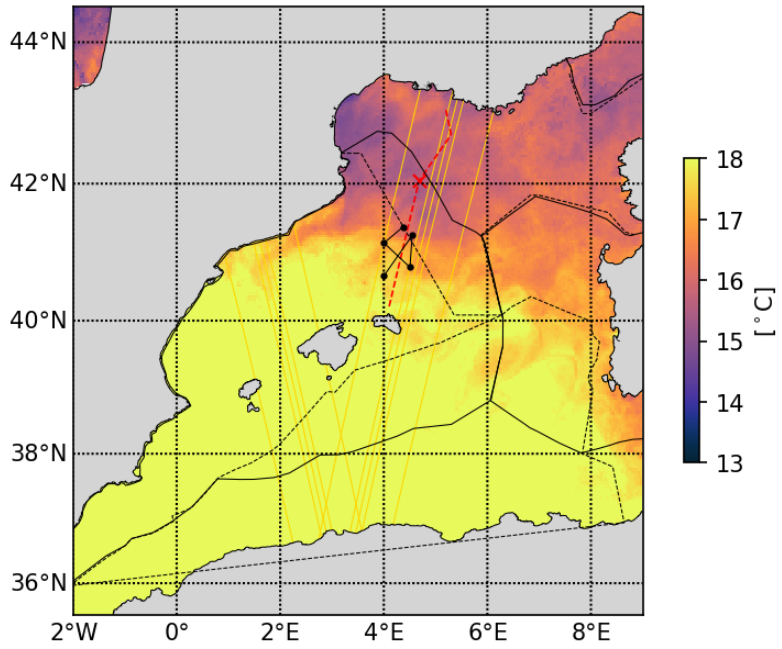




20230502_CLS_SST

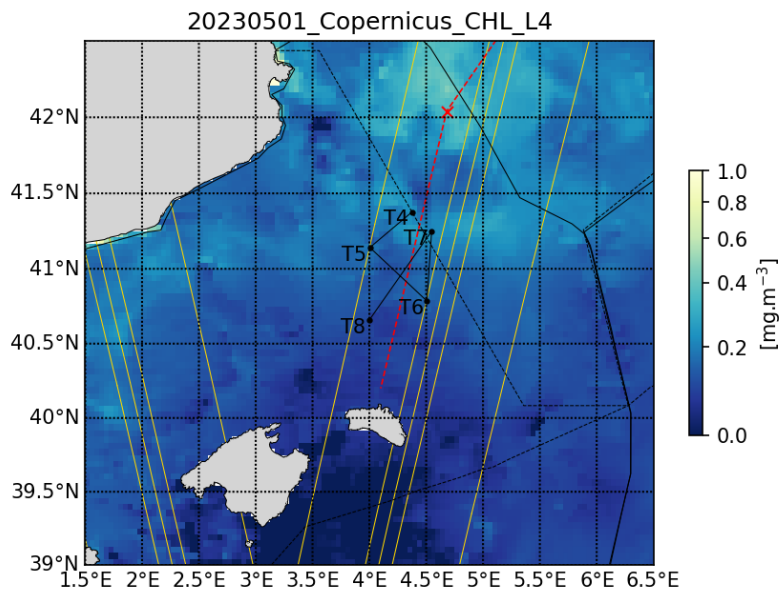
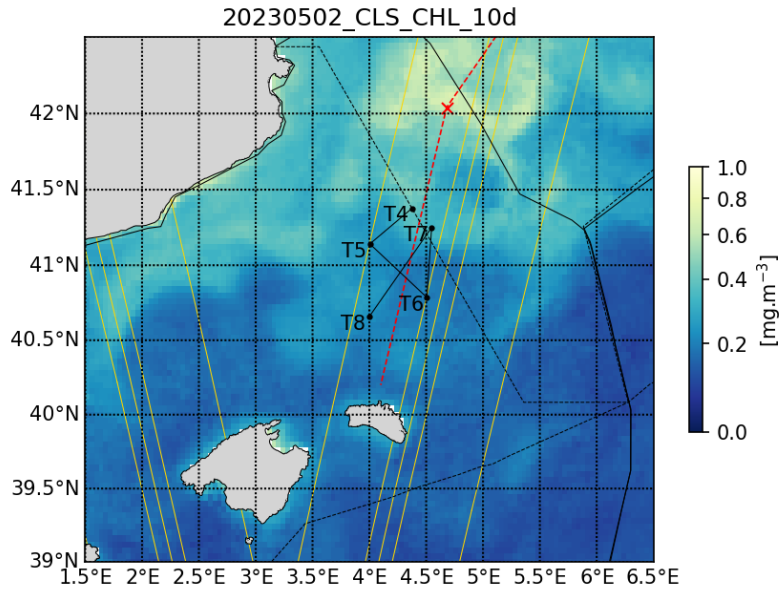


20230501_CLS_SST_7d

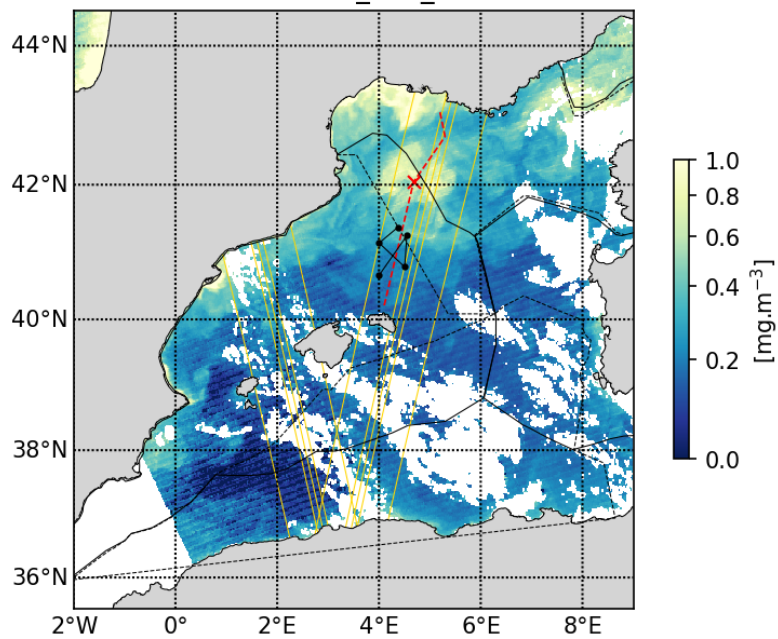


2.3 Chlorophyll analysis

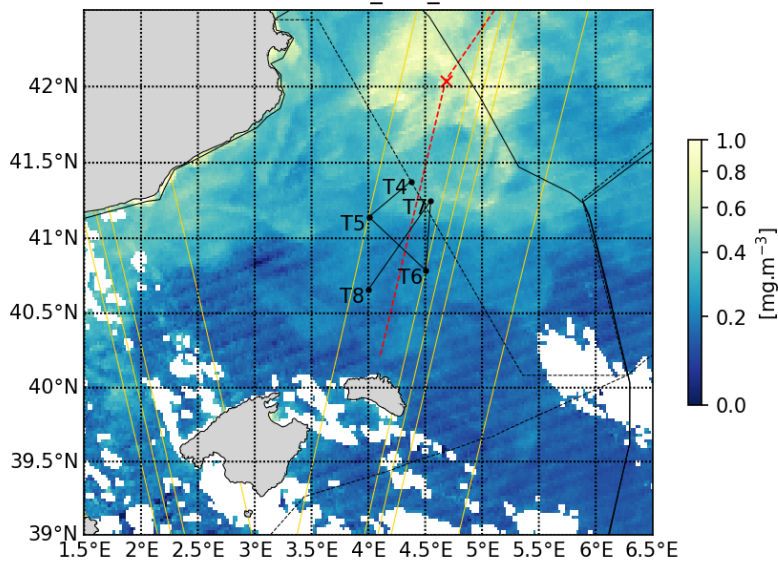
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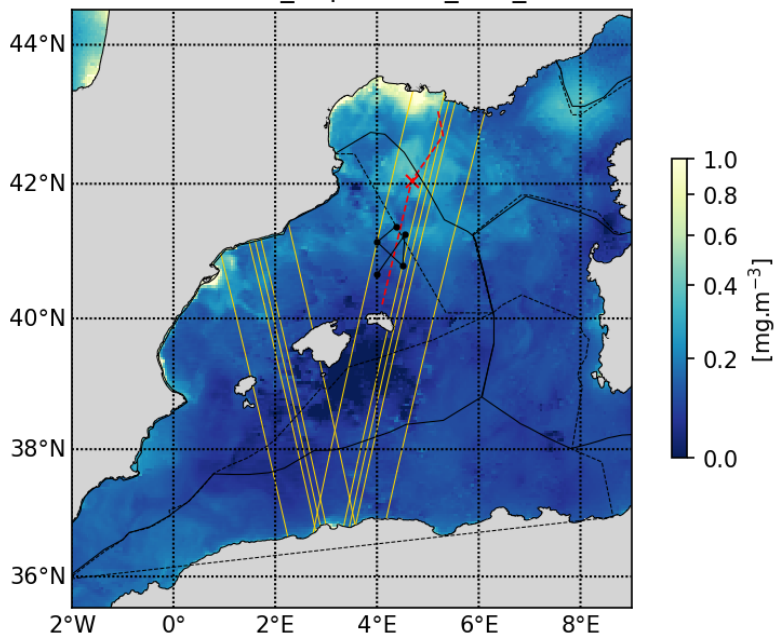
20230502_CLS_CHL



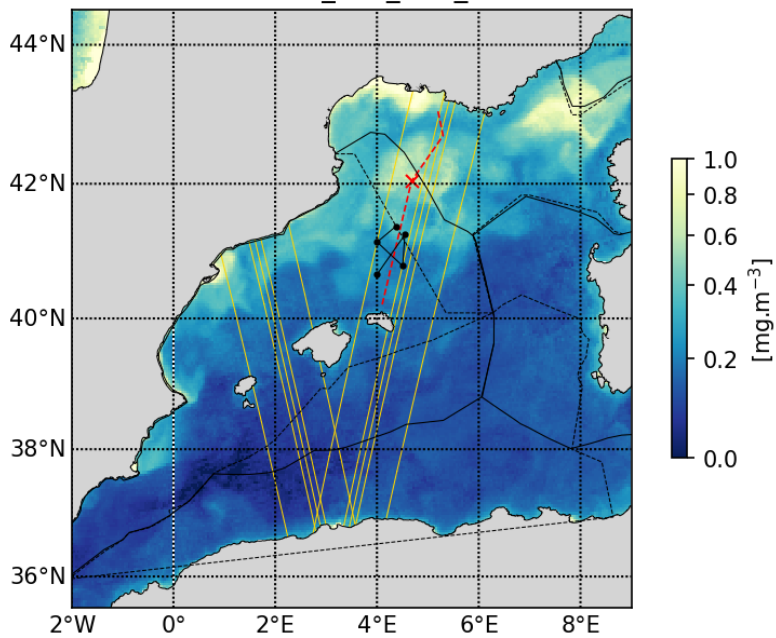
20230502_CLS_CHL



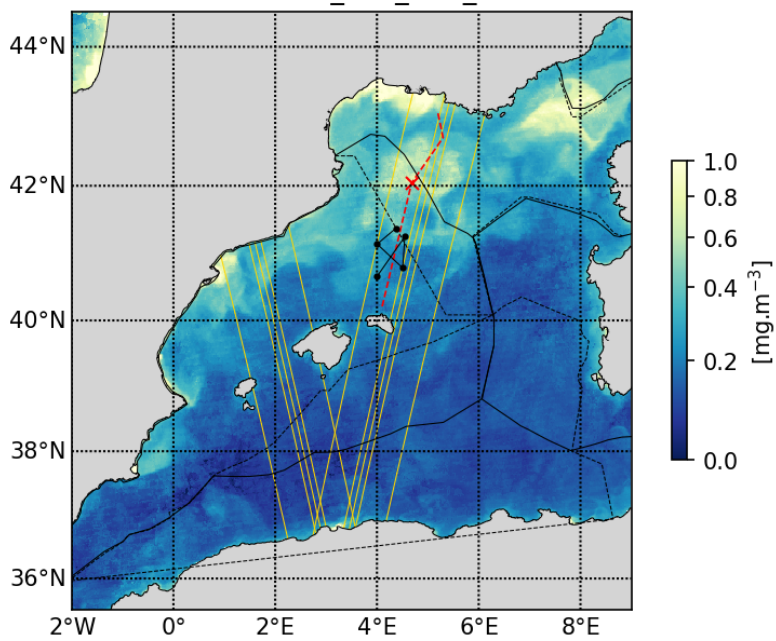
20230501_Copernicus_CHL_L4



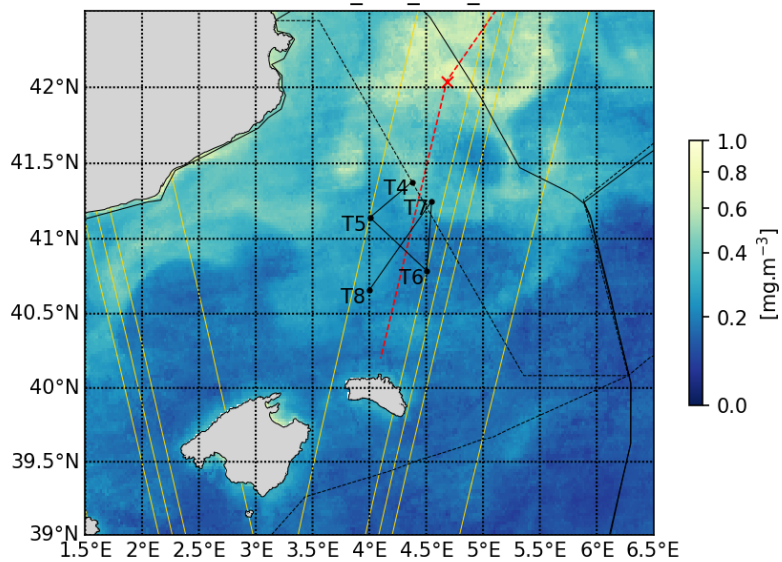
20230502_CLS_CHL_10d



20230430_CLS_CHL_5d



20230430_CLS_CHL_5d



2.4 Eulerian/Lagrangian analysis

Eulerian diagnostics computed with Copernicus_PHY velocities:

KE: kinetic energy

OW: Okubo-Weiss parameter

Lagrangian diagnostics computed by seeding Lagrangian particles every 0.02deg and advected for 30 days backward in time with Copernicus_PHY velocities:

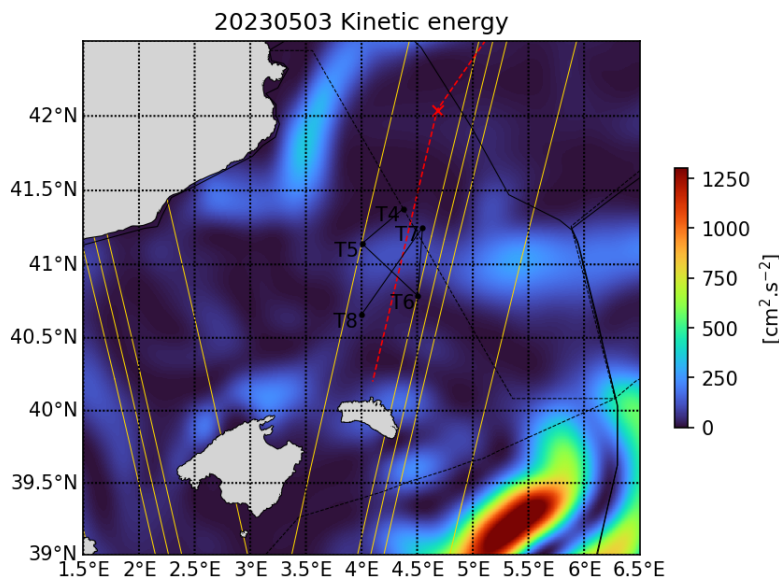
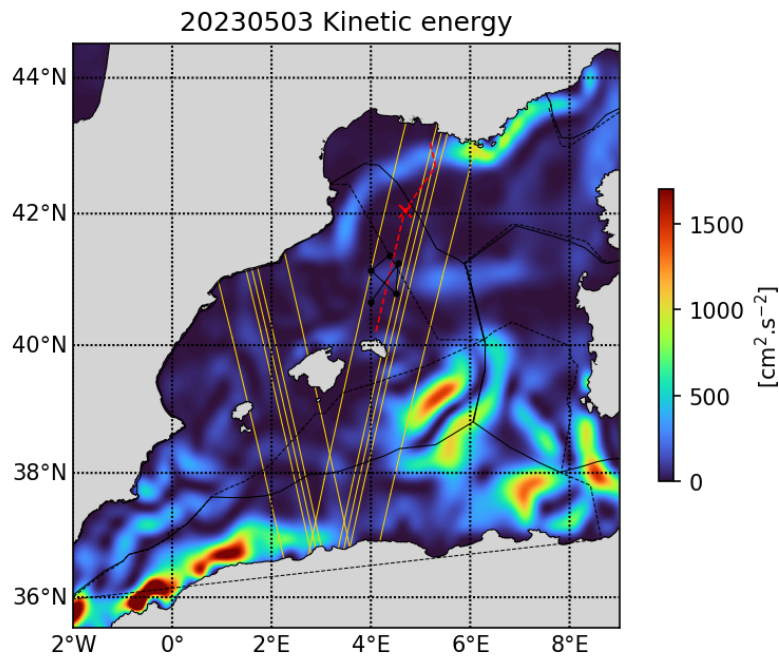
FTLE: finite time Lyapunov exponents (convergent fronts detection)

LLADV: longitude and latitude advection

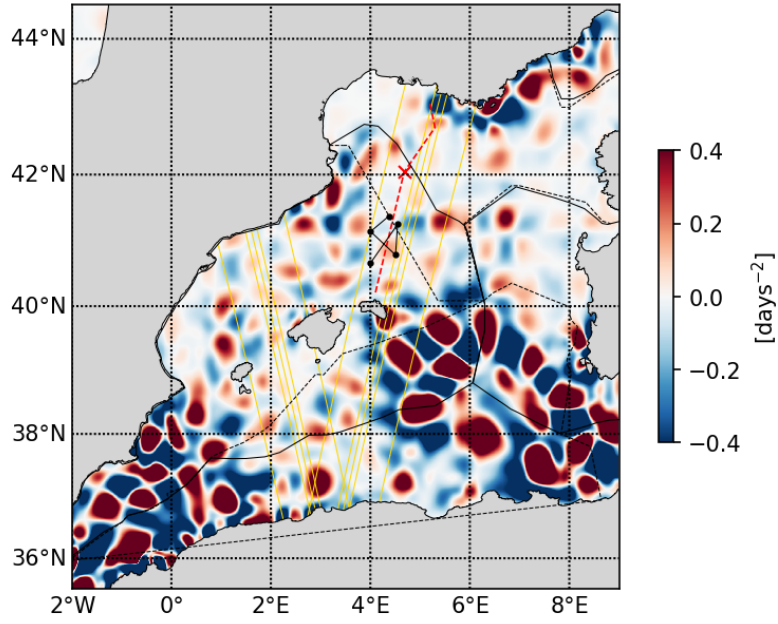
Retention parameter (based on computing the okubo Weiss parameter along a particle trajectory): Detect trapping structures (colorbar = days water parcels have a positive vorticity)

Timefrombathy: Water age since last contact with isobath XXm (precised in figure title)

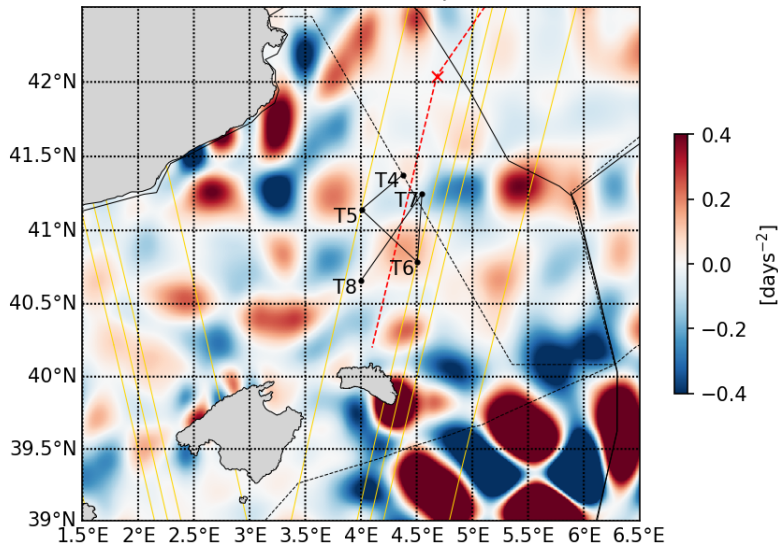
More details available at: <https://www.swot-adac.org/resources/swot-adac-products-access/>



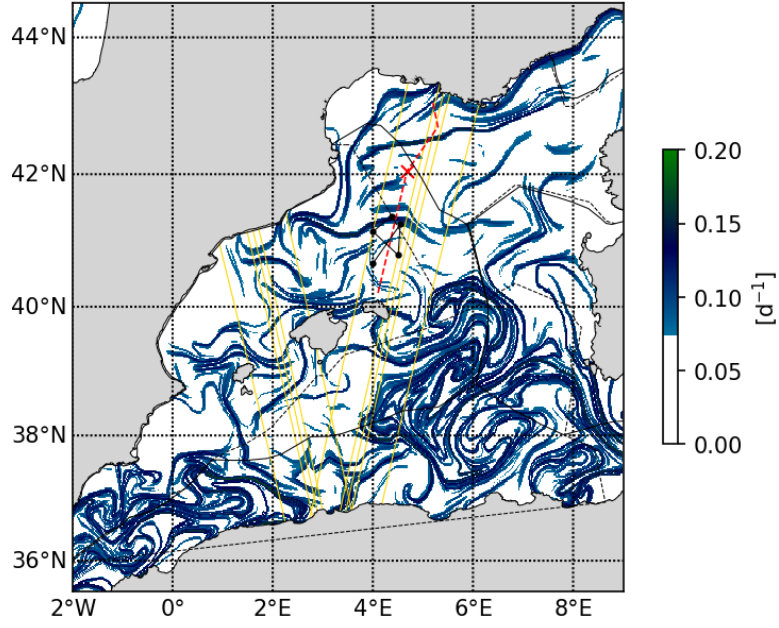
20230503 Okubo-Weiss parameter



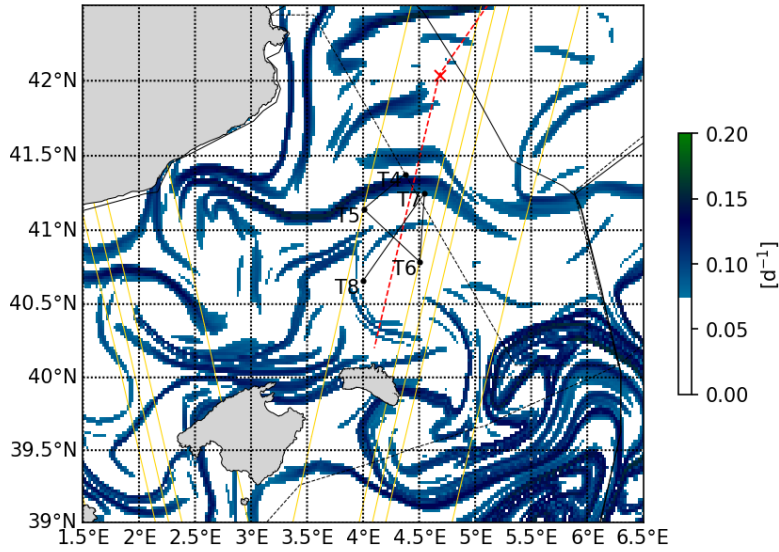
20230503 Okubo-Weiss parameter



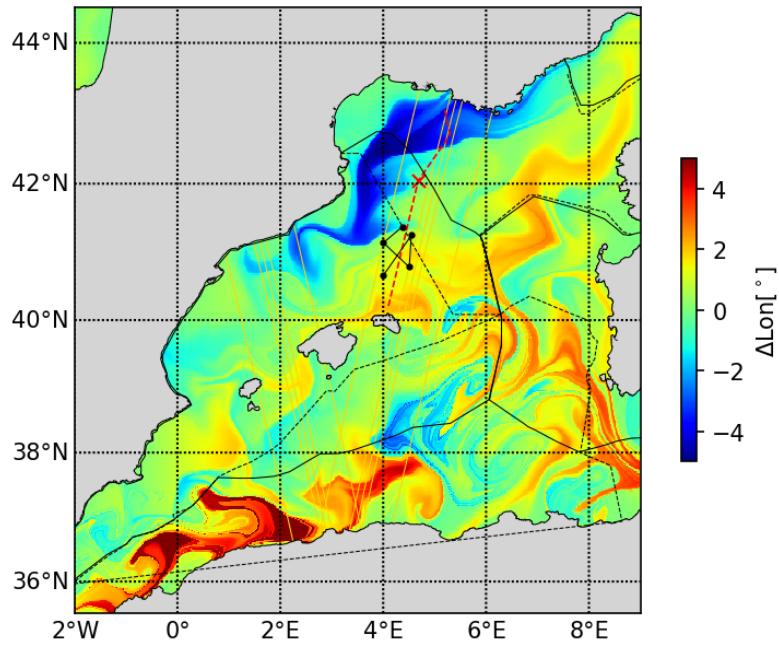
20230503 Finite Time Lyapunov Exponent



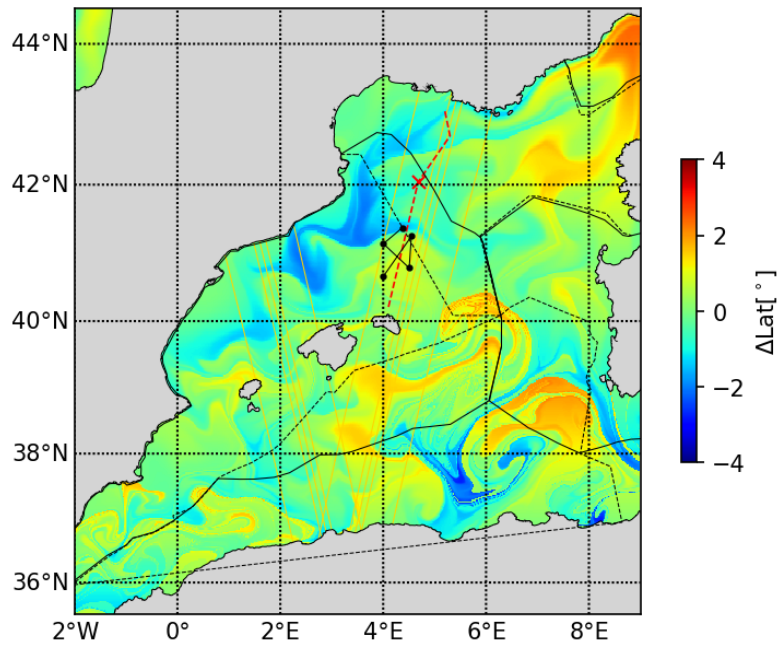
20230503 Finite Time Lyapunov Exponent

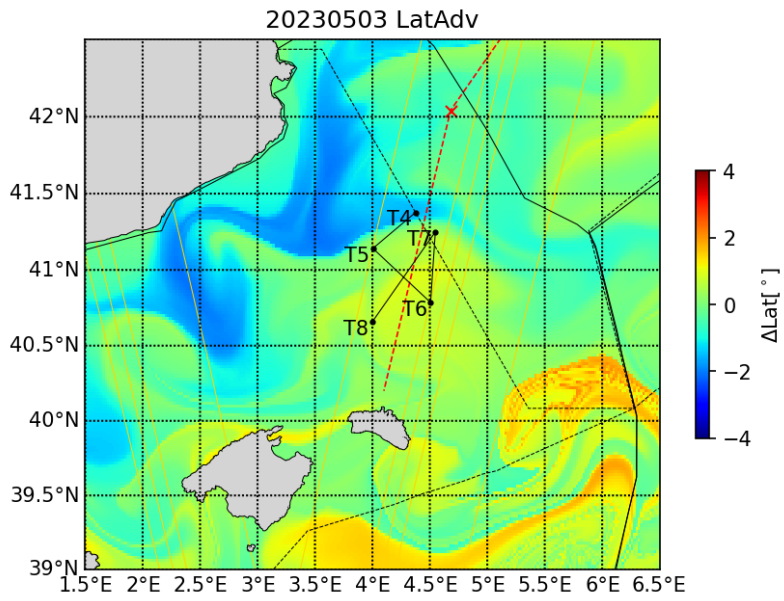
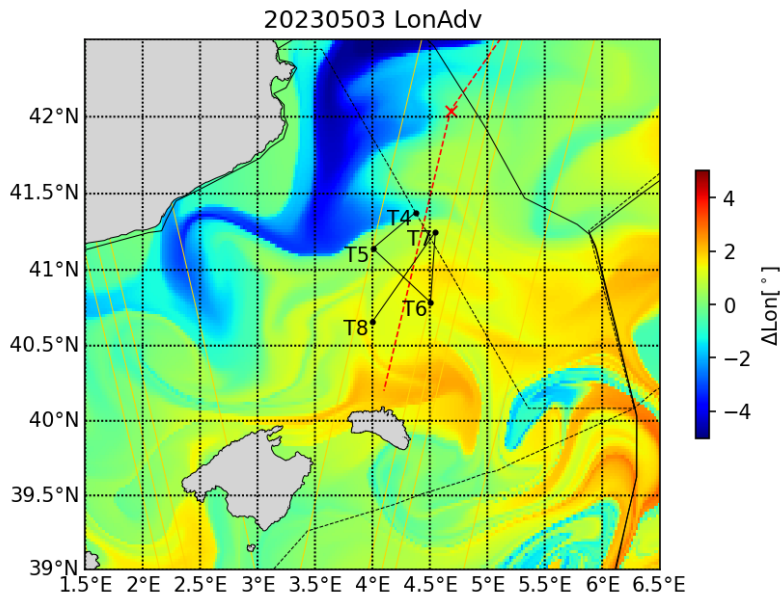


20230503 LonAdv

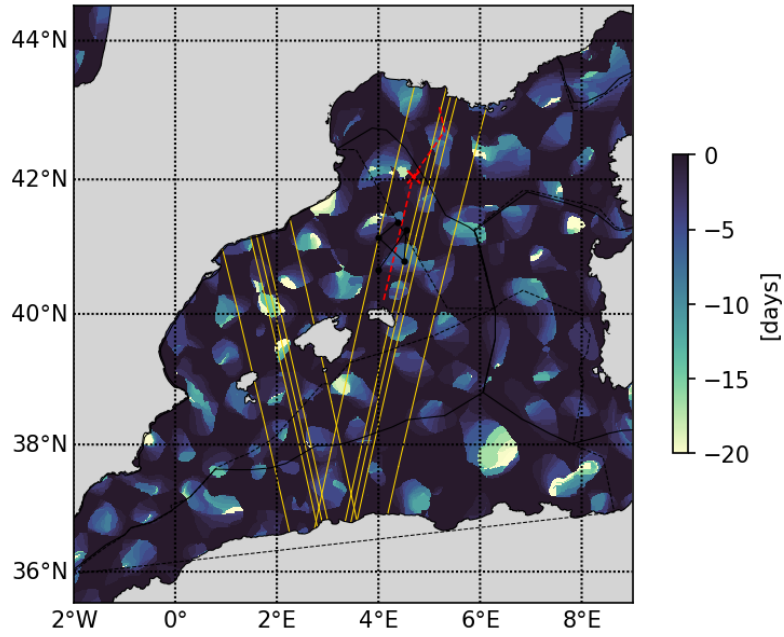


20230503 LatAdv

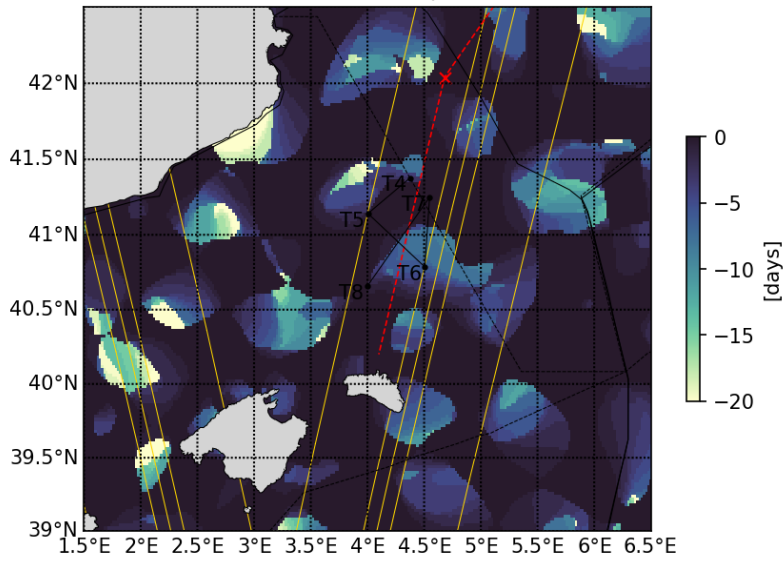




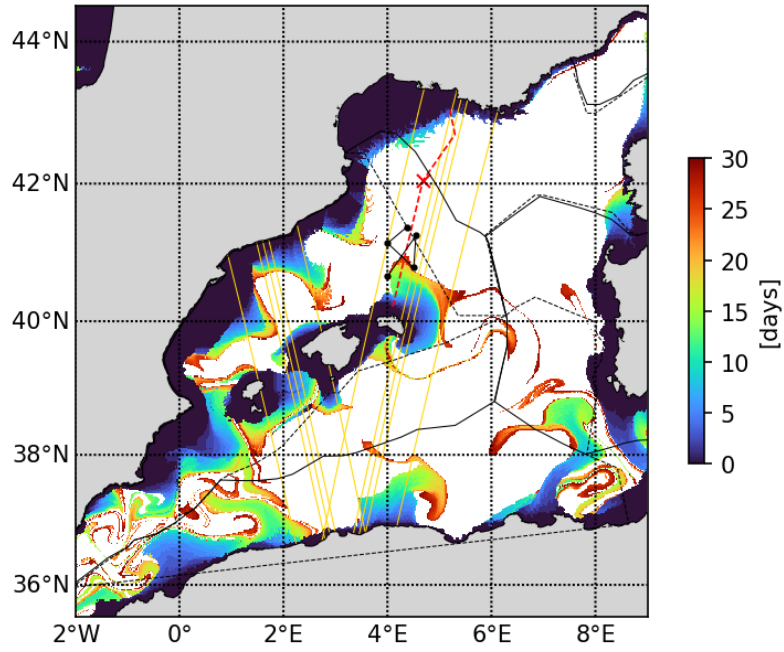
20230503 Retention parameter



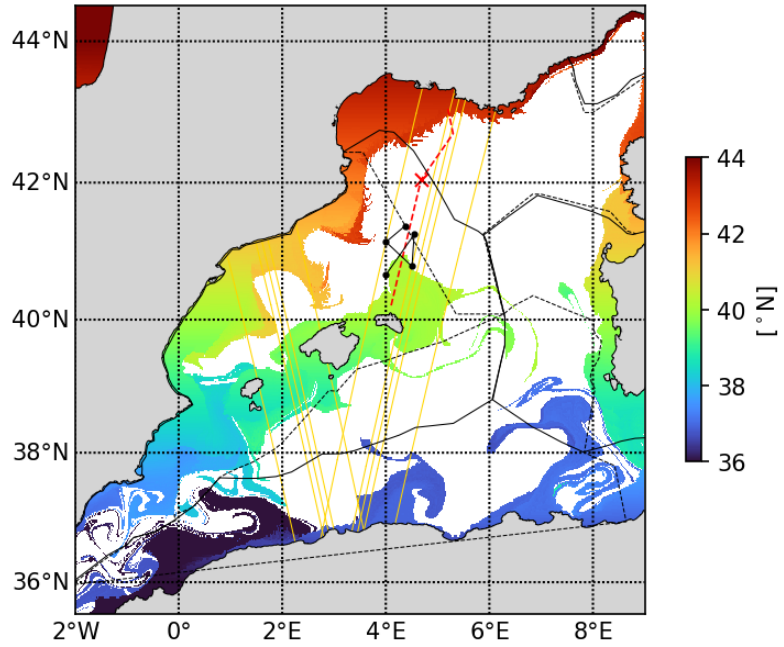
20230503 Retention parameter



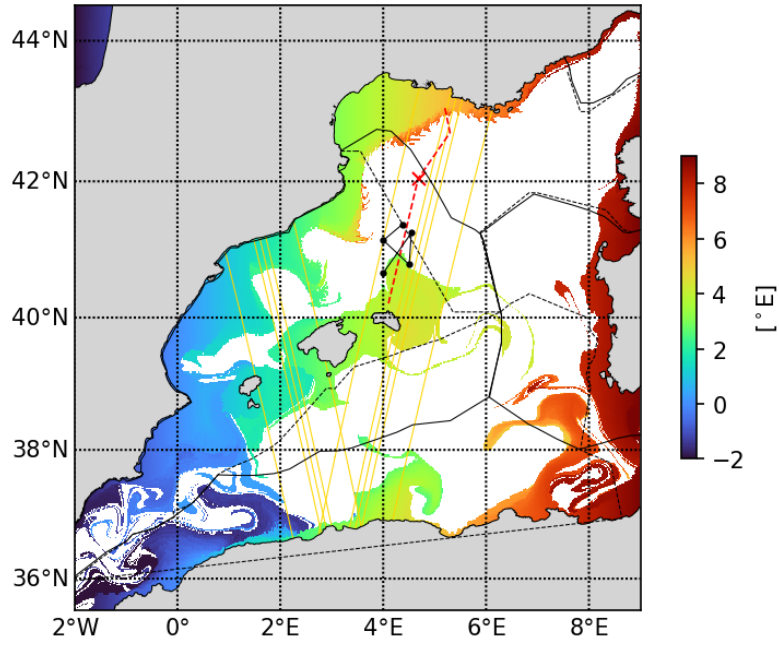
20230503 Timefrombathy_500m



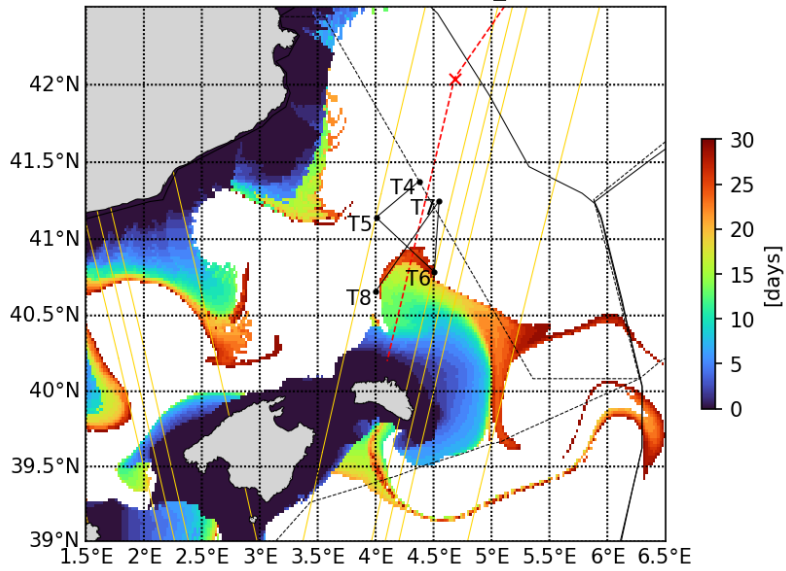
20230503 Latfrombathy_500m

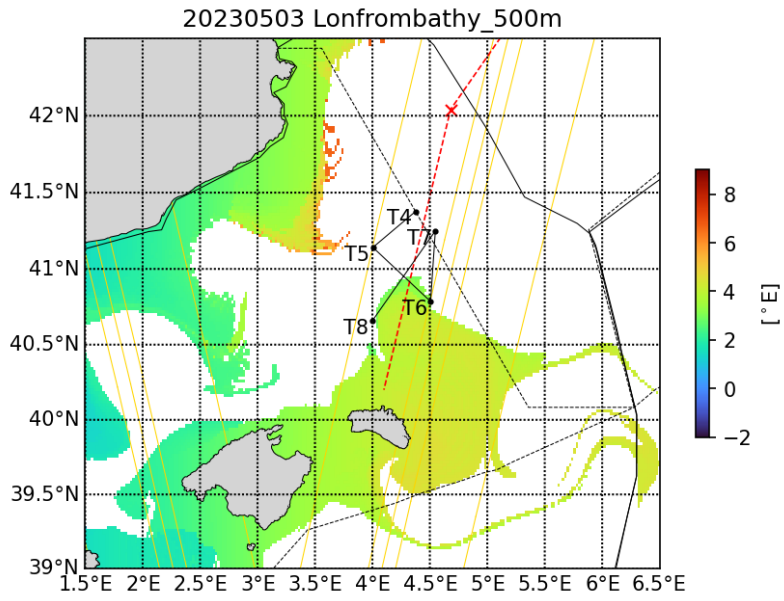
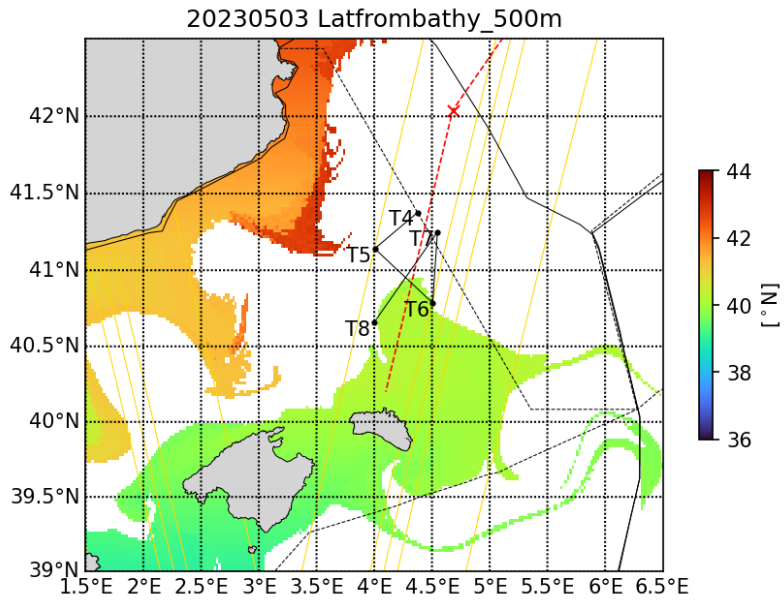


20230503 Lonfrombathy_500m

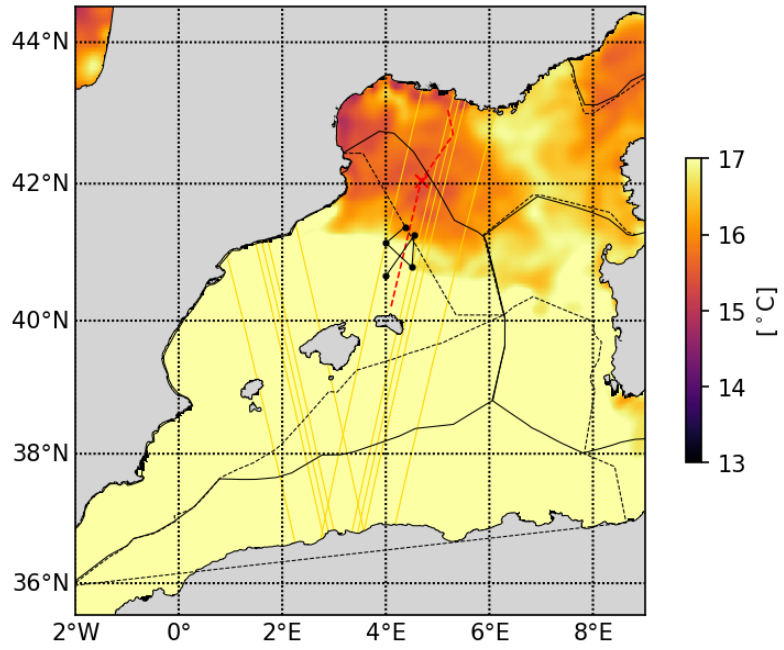


20230503 Timefrombathy_500m

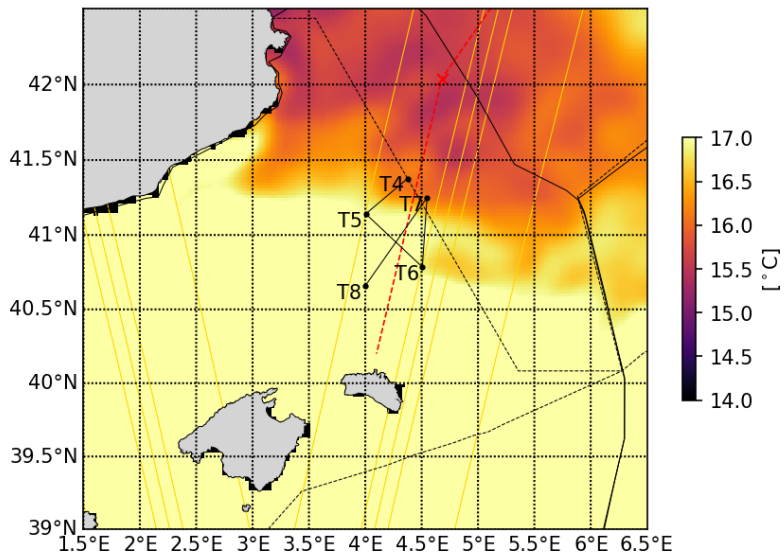




20230503 Tracer advection

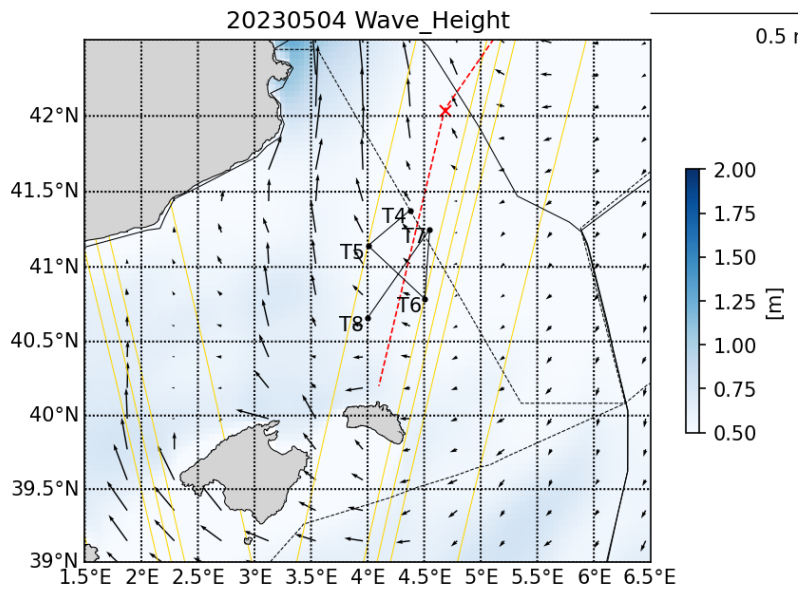
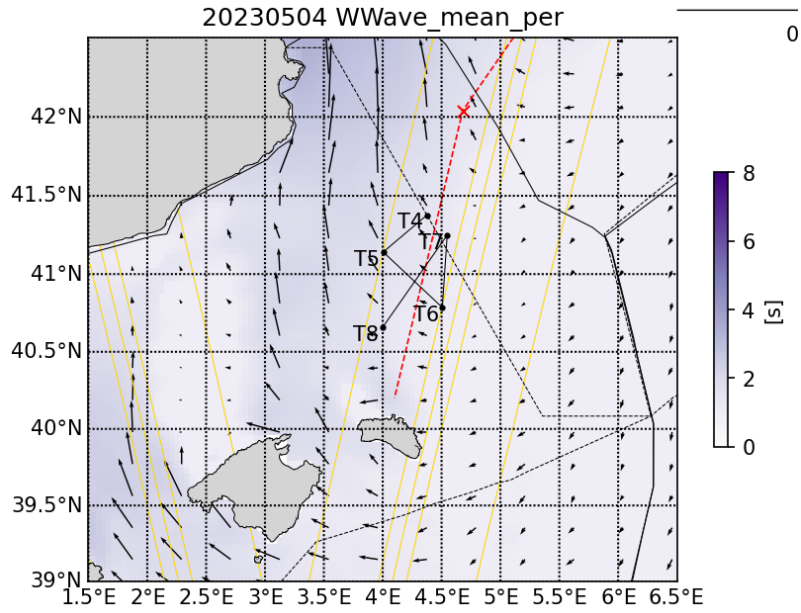


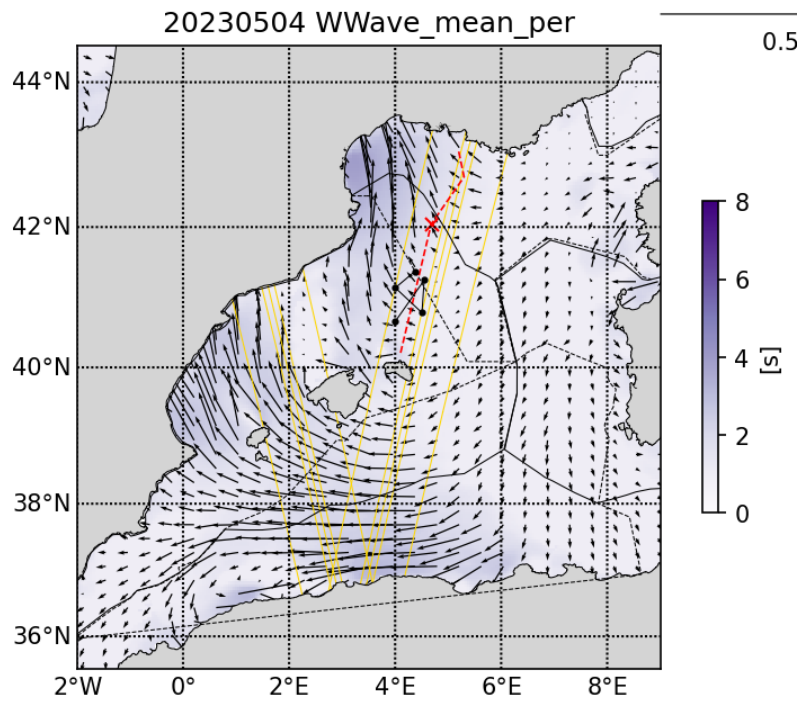
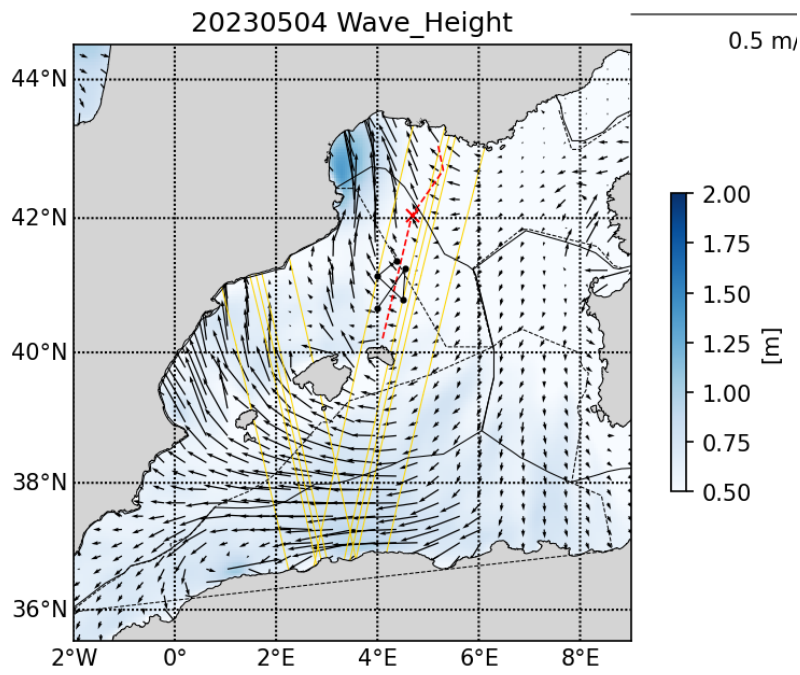
20230503 Tracer advection

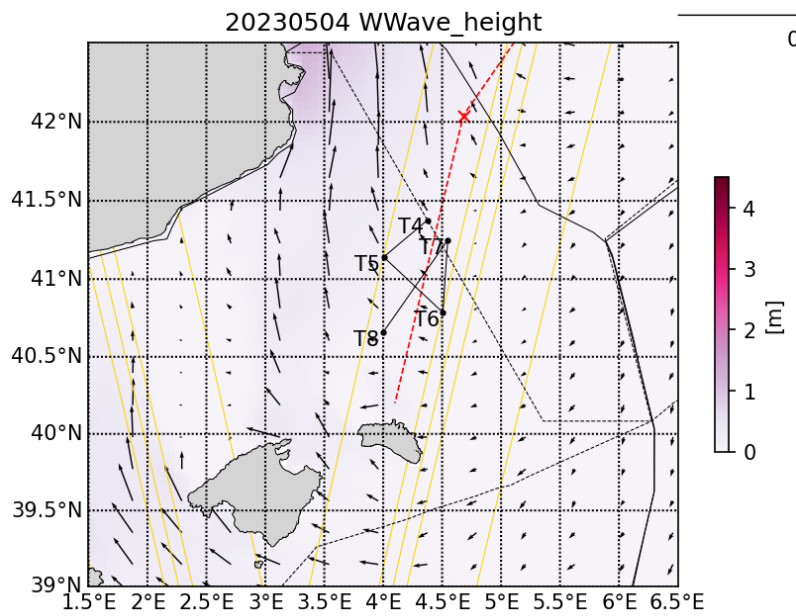
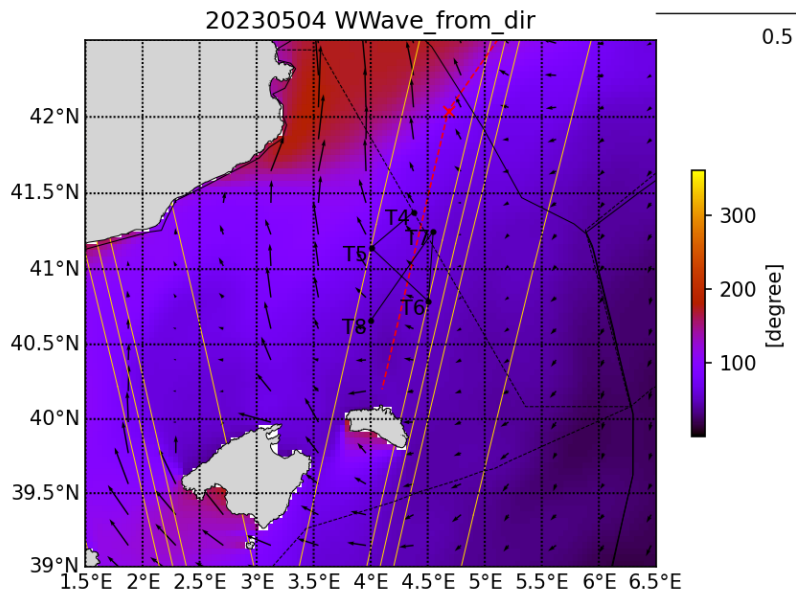


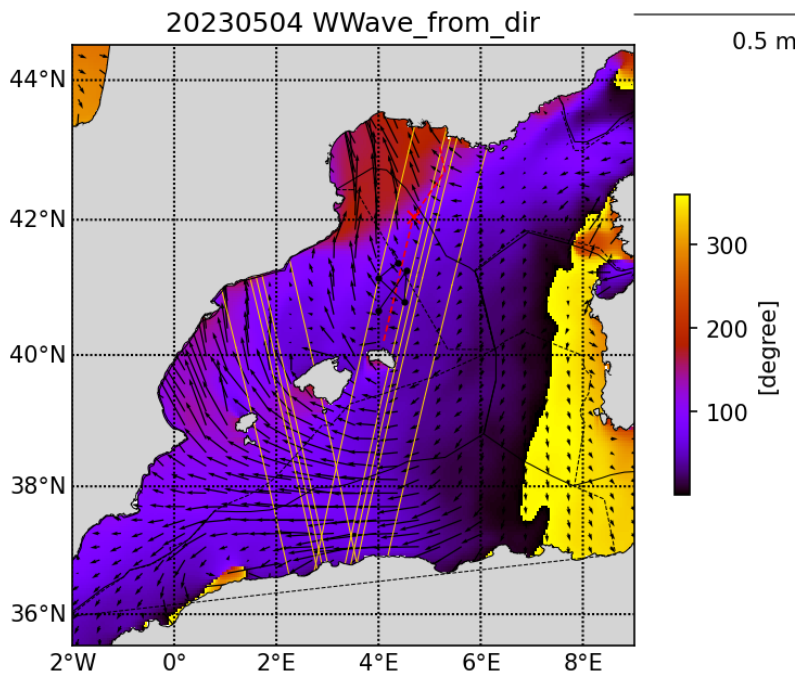
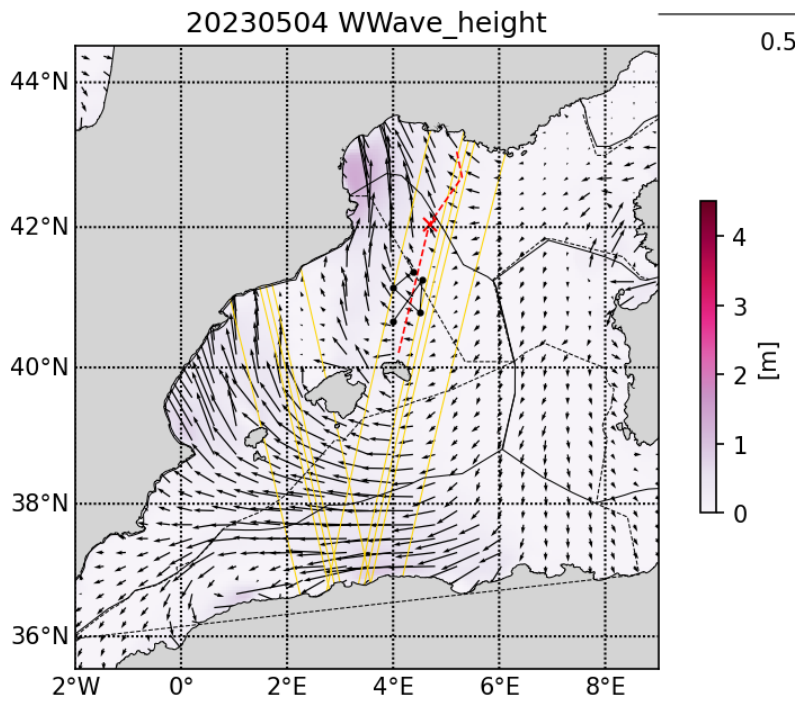
2.5 Wave forecast analysis

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Acknowledgments

Example:

The altimetry data are the AVISO Mediterranean regional product: <http://www.aviso.altimetry.fr/index.php?id=1275>. The derived currents are processed by SPASSO to derive Eulerian and Lagrangian diagnostics of ocean circulation: OkuboWeiss parameter, particle retention time and advection, Lagrangian Coherent Structures. CLS provided the SST and surface CHL concentration composite products. Sea surface temperature (level 3 and 4, 1 km resolution) and chlorophyll concentration (level 3, 1km resolution, MODISAqua and NPPVIIRS sensors combined (after May 27, 2017) into a new product called MULTI) have been provided by CMEMS Copernicus Marine Environment Monitoring Service (<http://marine.copernicus.eu>). Another SST product (level 4, composite, 1 km resolution) is provided by the Jet Propulsion Laboratory (JPL), Pasadena, CA. SPASSO is operated with the support of the SIP (Service Informatique de Pythéas) and in particular C. Yohia, J. Lecubin. D. Zevaco and C. Blanpain (Institut Pythéas, Marseille, France).