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COASTAL CRETE: A high-resolution operational forecasting system for the coastal area of Crete, Eastern Mediterranean

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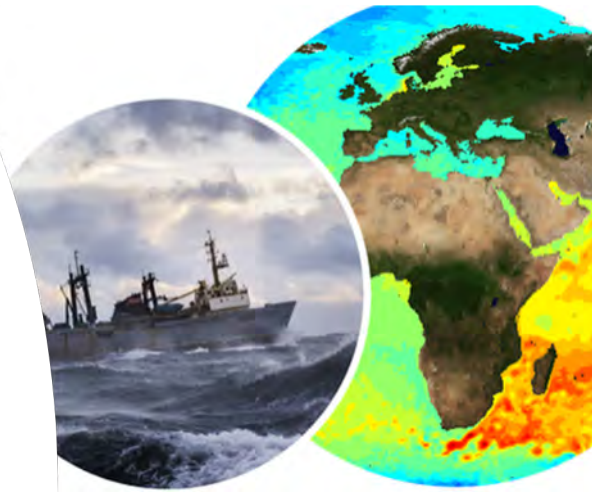


COASTAL CRETE

at a glance



- An area of increasing interest in view of the oil/gas exploration activities in the broader sea area of the island
- Ever increasing need of high-resolution, reliable data, information and services for local end-users, e.g. port authorities, coast guard, tourism industry
- Dissemination of Copernicus Marine Products and Service to local end users



COASTAL CRETE

at a glance



- A high-resolution operational forecasting system for the coastal area of Crete
- Implements advanced numerical hydrodynamic and sea state models nested in CMEMS Med MFC
- Provides, 5-days hourly and 6-hourly averaged forecasts of currents, sea temperature, salinity and waves
- Downscaled high-resolution COASTAL CRETE forecasts are used in maritime safety and coastal management & monitoring



On demand simulation of different response actions in case of a pollution accident.



Early warnings and alerts (e.g. warn me when the waves are higher than 5 meters from north).

COASTAL CRETE

context and description



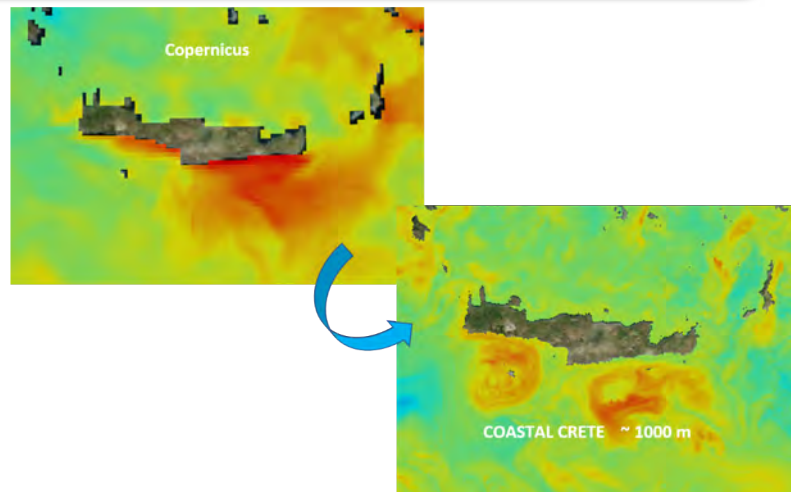
EMODNET Bathymetry & local measurements

Copernicus Med MFC initial & boundary conditions

SKIRON weather forecasting system for surface forcing

EO SST, Sea level anomaly Mooring time series

COASTAL CRETE high-resolution (~1000) hydrodynamic model: forecasts of currents, SSH, T, S



Ocean variables

Maps, information services, warning & alerts

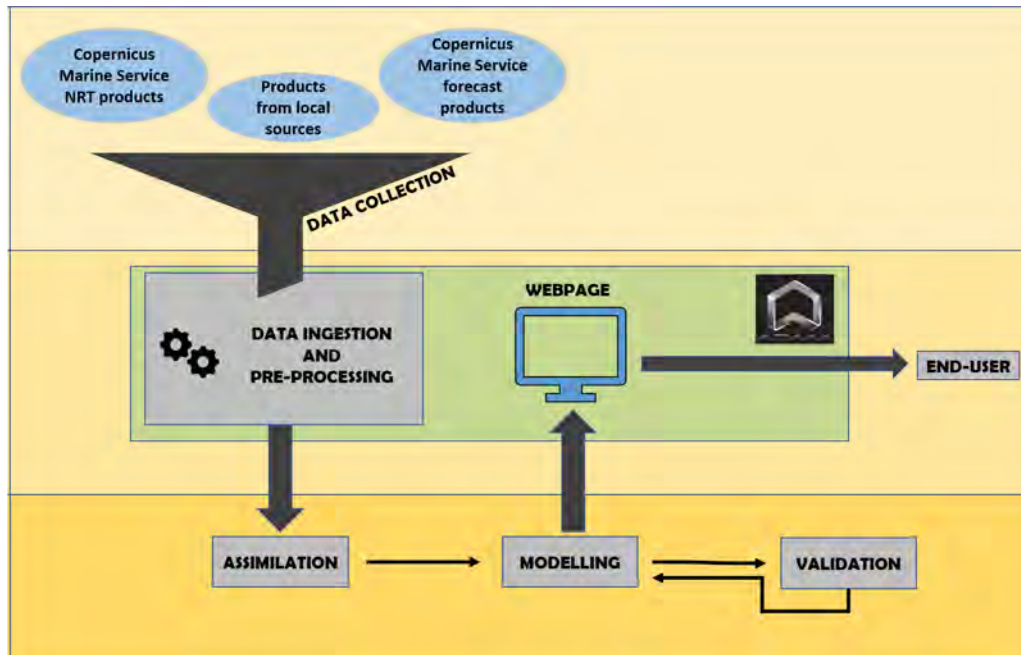
COASTAL CRETE wave model (the latest ECMWF WAM CY46R1 parallel version) series of nested models of increasing resolution - (~1000 m to ~250 m) -

COASTAL CRETE

context and description



- Copernicus Marine Service products play a key role in the operational forecasting chain providing the required initial and open boundary conditions to run the series of nested hydrodynamic and wave models



Analysis and Forecast

Mediterranean Sea Physics Analysis and Forecast
[MEDSEA ANALYSIS FORECAST PHY 006 013](#)

Mediterranean Sea Waves Analysis and Forecast
[MEDSEA ANALYSIS FORECAST WAV 006 017](#)

Observations

✓ Mediterranean Sea High Resolution and Ultra High Resolution Sea Surface Temperature Analysis

[SST_MED_SST_L4_NRT_OBSERVATIONS_010_004](#)

✓ Mediterranean Sea- In-Situ Near Real Time Observations

[NSITU_MED_NRT_OBSERVATIONS_013_035](#)

✓ MEDITERRANEAN SEA GRIDDED L4 SEA SURFACE HEIGHTS AND DERIVED VARIABLES NRT

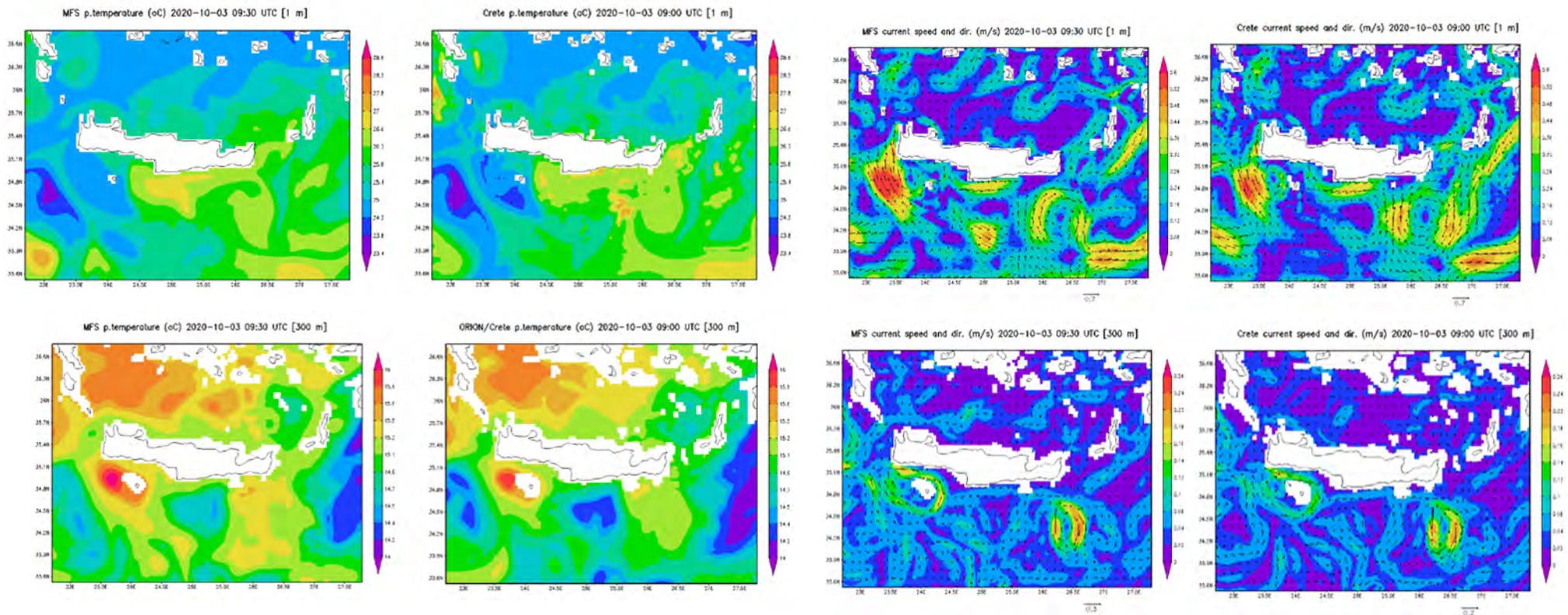
[SEALEVEL_MED_PHY_L4_NRT_OBSERVATIONS_008_050](#)

COASTAL CRETE

context and description



Calibration and validation of COASTAL CRETE hydrodynamic model



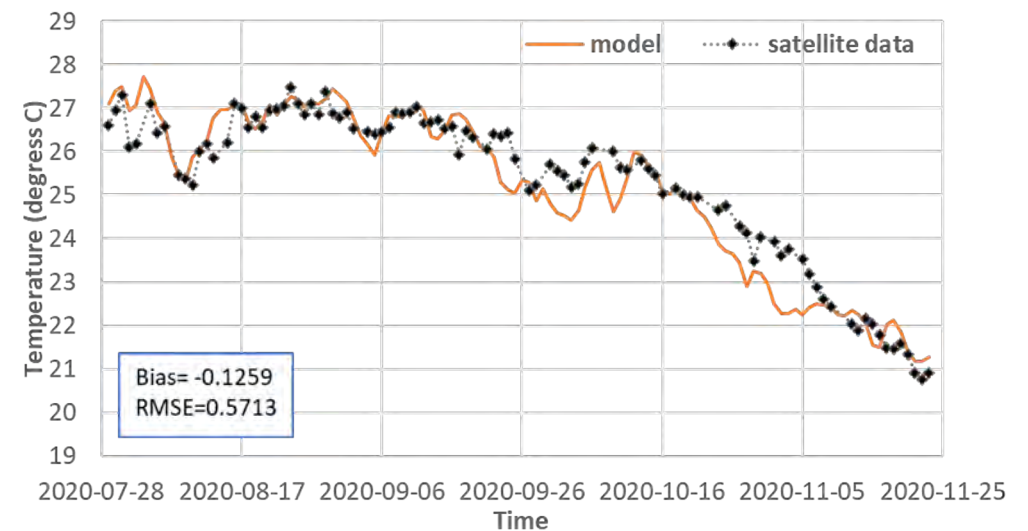
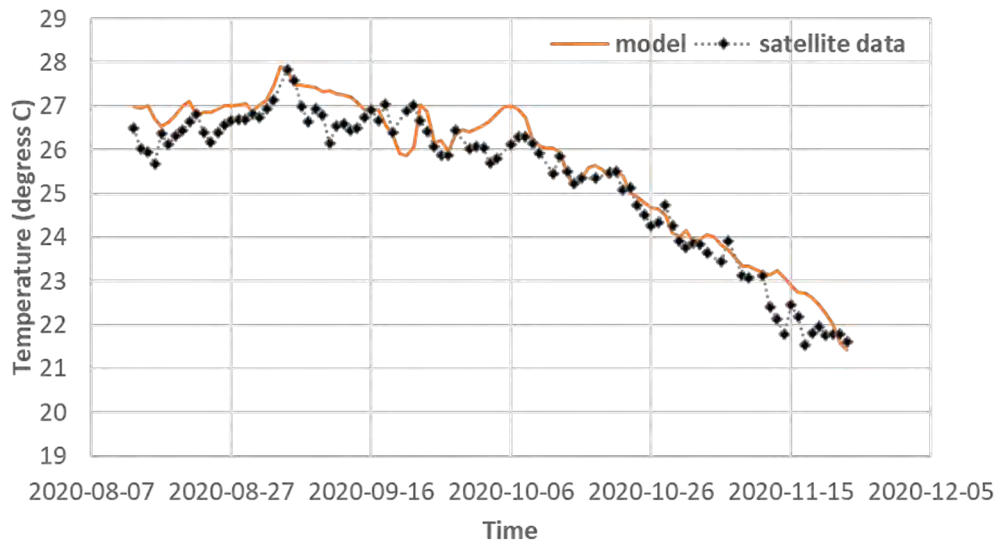
evaluation of the Crete coastal hydrodynamical model based on the comparison of the produced temperature, salinity and sea current values against the hourly produced CMEMS Med MFC data

COASTAL CRETE

context and description



Calibration and validation of COASTAL CRETE hydrodynamic model



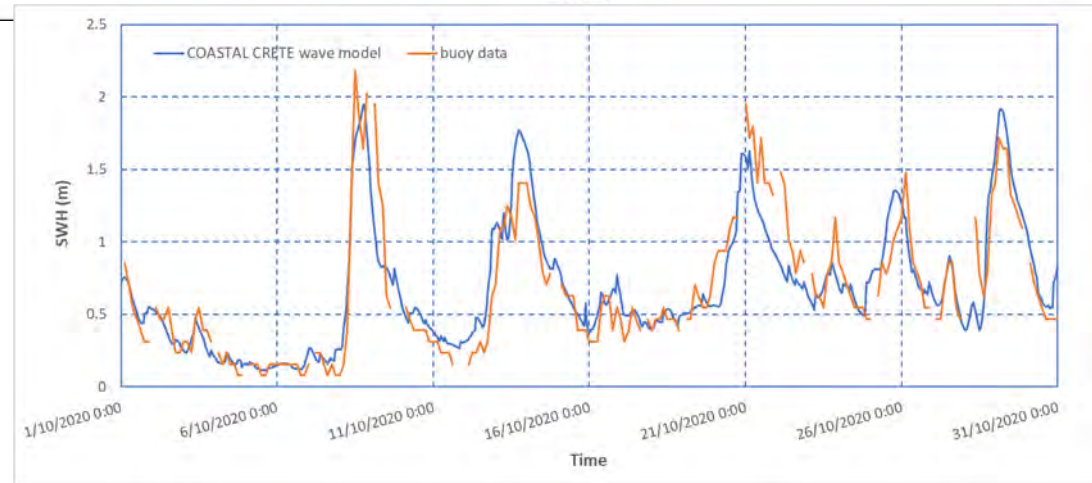
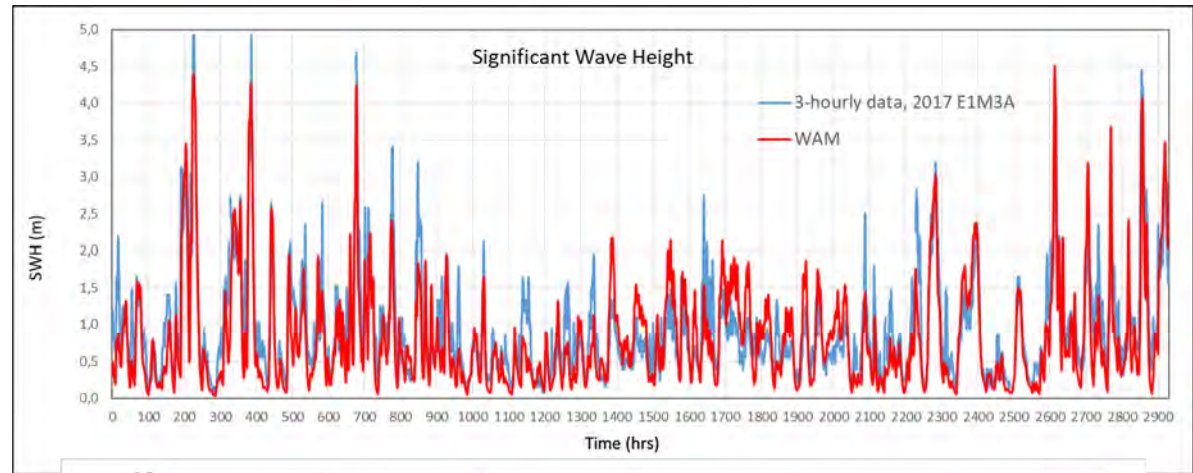
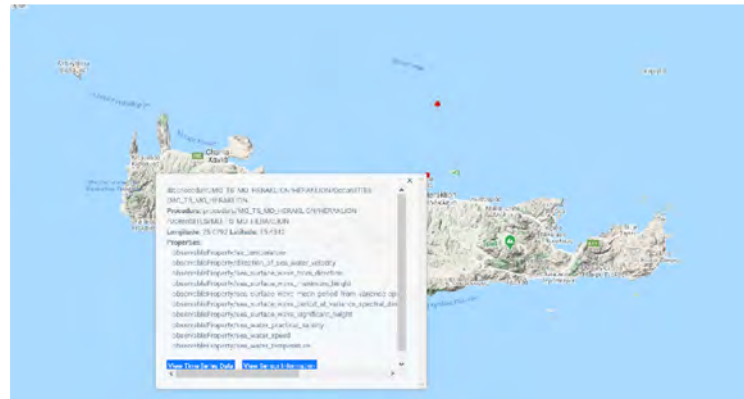
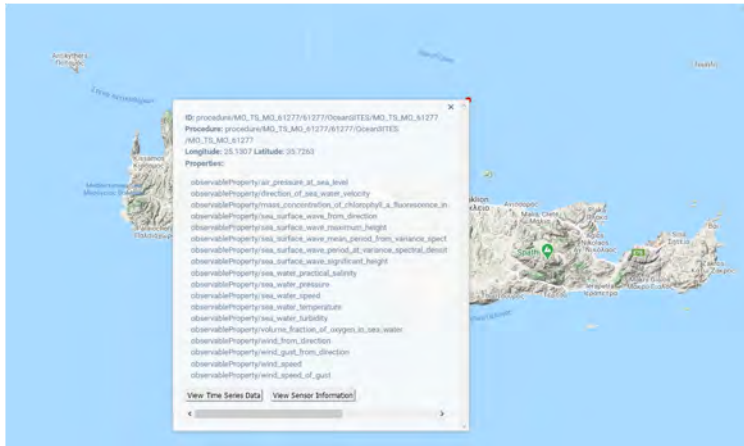
Inter-comparison of COASTAL CRETE model (red line) with satellite SST observations (black dots), for 2 selected points (1st point long. 25.95°, lat 34.68°, 2nd point 23.73°, lat. 35.11°) at the south of COASTAL CRETE domain for a period of 3 months from 13/8/2020 to 23/11/2020.

COASTAL CRETE

context and description



Calibration and validation of COASTAL CRETE wave mode



COASTAL CRETE SERVICES



COASTAL CRETE
A high-resolution COASTAL Forecasting system for CRETE Island

Region
Mediterranean sea
- Coastal Area of Crete -

Markets
Safety & disaster
Marine Navigation

Service

What we offer

- ✓ COASTAL CRETE is an operational high-resolution coastal forecasting service for Crete Island, implementing advanced numerical hydrodynamic and sea state models nested in Copernicus Marine Service products
- ✓ The service provides hourly and 6-hourly averaged high-resolution short-term (5-day) forecasts of sea temperature, salinity, velocity fields, wave characteristics, on a daily basis
- ✓ Delivers (on demand) customized and ready to use information and derived products for maritime safety, using the downscaled high-resolution COASTAL CRETE forecasts, e.g. for oil spill and floating objects trajectories predictions and transport and safety of ships
- ✓ Products and information are accessible and visualized through ADAM platform

Accessibility of the service

The information is distributed both in a free public basis (high-resolution short-term for marine parameters) and by paid premium services. Premium services may include information derived from very high-resolution (~ 200m) forecasts, non-public local data, user tailor information and specific alerts

Examples of such services are:

- ✓ Very high-resolution wave and currents forecasts
- ✓ Support to the response to environmental hazards such as oil spills (there was a pollution accident: where shall I put my response effort?)
- ✓ Personalized early warnings and alerts (e.g. warn me when the waves become high)

ADAM provides automatic data exchange management capabilities between the CMEMS Med MFC and the COASTAL CRETE models, enabling data visualization, combination, processing and download through the implementation of the Digital Earth concept.

CMEMS Med MFC products and the abovementioned COASTAL CRETE forecasts are made available through a customized instance of ADAM (Advanced geospatial Data Management platform) developed by MEEO S.r.l.
<https://explorer-coastal-crete.adamplatform.eu/>

COASTAL CRETE SERVICES





Thank you !

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COASTAL-MED SEA. COASTAL-CRETE, Contract: 110-DEM5-L3.*