The coastal area of Crete is an area of increasing interest due to the recent hydrocarbon exploration and exploitation activities in the Eastern Mediterranean Sea and the increase of the maritime transport after the enlargement of the Suez Canal. National and local authorities, like ports and the coast guard, who are involved in maritime safety, such as oil spill prevention, the tourism industry and policy makers involved in coastal zone management, are key end users’ groups who can benefit from high spatial and temporal resolution forecasting products and information to support their maritime activities in the coastal sea area of the island. To support local end users and response agencies to strengthen their capacities in maritime safety and marine conservation, a high-resolution, operational forecasting system, has been developed for the coastal area of Crete. The COASTAL CRETE forecasting system implements advanced numerical hydrodynamic and sea state models, nested in CMEMS Med MFC products and produces, on a daily basis, 5-day hourly and 6-hourly averaged high-resolution forecasts of important marine parameters, such as sea currents, temperature, salinity and waves. The COASTAL CRETE high-resolution (~1km) hydrodynamic model is based on a modified POM parallel code implemented by CYCOFOS in the Eastern Mediterranean and the Levantine Basin, while for wave forecasts, the latest ECMWF CY46R1 parallel version including a number of new features, a state-of-the-art wave analysis and prediction model, with high accuracy in both shallow and deep waters has been implemented with a resolution of ~1.8 km. The COASTAL CRETE hydrodynamic model has been evaluated against the CMEMS Med MFC model and with satellite Sea Surface Temperature data with good statistical estimates. The COASTAL CRETE wave model is calibrated with in-situ data provided from the HCMR buoy network operating in the area. Both the CMEMS Med MFC products and COASTAL CRETE forecasts are made available through a customized instance of ADAM (Advanced geospatial Data Management platform) developed by MEOO S.r.l. (https://explorer-coastal-crete.adamplatform.eu/). This application 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. Among the numerous functionalities of the platform, a depth slider allows to
explore the COASTAL CRETE products through the depth dimension, and a sea current magnitude feature enables the visualization of the currents vectors by overlaying them to any available product/parameter, thus allowing comparisons and correlations. The downscaled high-resolution COASTAL CRETE forecasts will be used to deliver on demand information and services in the broader objectives of the maritime safety, particularly for oil spill and floating objects/marine litters predictions. Such a use case is presented for the port area of Heraklion, implementing nested fine grid hydrodynamic and oil spill models (MEDSLIK-II).