# FOCCUS: advancing ocean prediction with improvements to European coastal monitoring and forecasting

J. Staneva[1], K. Johnson[1], E. Reyes[2], A. Bonaduce[3], G. Verri[4], I. Federico[4], A. Bartosova[5], P. Terskii[5], K.H. Christensen[6], Q. Jamet[7], A. Melet[8], I. Garcia Hermosa[8], L. Meszaros[9], G. El Serafy[9]

[1]Helmholtz-Zentrum Hereon, Germany
[2]Balearic Islands Coastal Observing and Forecasting System, Spain
[3]Stiftelsen Nansen Senter for Miljø Og Fjernmaling, Norway
[4]Fondazione Centro Euro-Mediterraneosui Cambiamenti Climatici, Italy
[5]Swedish Meteorological and Hydrological Institute, Sweden
[6]Meteorologisk Institutt, Norway
[7]Service Hydrographique et Oceanographique de la Marine, France
[8]Mercator Ocean International, France
[9]Stichting Deltares, Netherlands

## Abstract

The Horizon Europe FOCCUS project (Forecasting and Observing the Open-to-Coastal Ocean for Copernicus Users, foccus-project.eu) consists of 19 partners from 11 countries which provide expertise in oceanography, observational science, advanced modeling, and technology development in order to enhance the Copernicus Marine Environment Monitoring Service (CMEMS) for coastal zones. In collaboration with European Member State Coastal Systems (MSCS) and users, FOCCUS advances the coastal dimension of CMEMS by enhancing existing capability, developing innovative coastal products focusing on three key pillars: i) improving new coastal observations by fusing high-resolution remote sensing and in-situ data and implementing new technologies and approaches, including the use of Artificial Intelligence (AI) methods to improve accuracy; ii) developing advanced hydrology and coastal models including a pan-European hydrological ensemble for improved river discharge predictions, and establishing a unified coastal system by testing new methodologies in MSCS production chains while taking advantage of stochastic simulation, ensemble approaches, and AI technology; and iii) demonstrating innovative products and improved co-produced services that address both Environmental and Societal Challenges, enhancing the performance and societal relevance of coastal ocean prediction systems in and downstream of CMEMS. As an endorsed action under the UN Ocean Decade's CoastPredict program, FOCCUS aligns its efforts with international initiatives, fostering collaboration to address the complex challenges of coastal regions worldwide. FOCCUS collaborates with relevant international initiatives, such as the COSS-TT (Coastal Ocean and Shelf Seas Task Team under OceanPredict) and UN Decade programmes (such as CoastPredict, DITTO, and the Decadal Collaborative Center on Coastal Resilience (DCC-CR)). The project emphasizes co-production and collaboration with end-users, policy-makers, and local communities. Through stakeholder engagement, FOCCUS enhances the societal relevance of coastal forecasting systems, supporting decision-making processes for sustainable coastal management and climate adaptation strategies. Ultimately, FOCCUS provides high-quality, trusted marine knowledge needed for evidence-based management, supporting a sustainable blue economy, and building climate resilience for European and global communities.