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# DELIVERABLE

# D4.1 – Specification of Demonstrators for Testing and Validation

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# Executive Summary

SEADOTs (Social-Ecological Ocean Management Applications using Digital Ocean Twins) aims to advance holistic, just and sustainable ocean management by integrating predictive socio-ecological components into comprehensive Digital Ocean Twins (DOTs). These DOTs will integrate human activities into digital twins of the ocean (DTOs) by combining social-ecological and socio-economic data with physical ocean and ecosystem data, and a variety of models. By developing and demonstrating applications in the Norwegian North Sea, the Southern North Sea and the Baltic Sea, SEADOTs aims to facilitate and inform political decision making, marine spatial planning and adaptive management to help safeguard ocean ecosystems, promote sustainable resource use, and enhance social and economic well-being.

The project builds on synergies with EU Mission and Green Deal projects including Iliad, EDITO, OLAMUR and CLIMAREST, and demonstrates Ocean Management Applications with Digital Ocean Twins on the EU Digital Twin Ocean infrastructure and other platforms for socio-ecological, socio-economic and political endpoints. A key ambition is to provide spatially explicit social-ecological data beyond the project's lifetime and to strengthen long-term data interoperability.

Work on deliverable D4.1, 'Specification of demonstrators for testing and validation'covers the design and definition of the key components of the demonstrators as implemented in the three case studies. Therefore, the deliverable essentially contains the results from the corresponding task, T4.1, 'Specify demonstrators for testing and validation'. Furthermore, D4.1 establishes the framework for subsequent tasks, such as T4.2, 'Set up pilot application(s) within the European DTO framework'. D4.1 is similar to D3.1 'Requirements and Use Cases Document', which is why it is important to distinguish between the two. While Work Package (WP) 3 is responsible for developing the Digital Twin infrastructure, interfaces and enabling framework tools, WP4 is responsible for operationalising this infrastructure through targeted demonstrator case studies (Norwegian Sea/Utsira, Baltic Sea/Gotland and the Southern North Sea/German Bight). WP4 is responsible for the specification, implementation and validation of scientific and deterministic model configurations within the WP3 framework, and for translating the developed tools into applied use cases. In this capacity, WP4 functions as the testing and evaluation layer of the project, assessing performance against defined KPIs and refining the framework through real-world blue economy scenarios. D4.1 also relates to WP1, which collects the specific data products defined in WP4. Furthermore, D4.1 relates to WP2 insofar as the demonstrator specifications are relevant to SES in the respective case studies.

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