Platforms, Digital Infrastructure & Interoperability

Thu. Nov 12, 2026 2:00 PM - 3:30 PM JST | Thu. Nov 12, 2026 5:00 AM - 6:30 AM UTC | Room B (Kujaku) (2F)

Oral B2 Digital Twin Infrastructure and Operational Services

Chair: Avichal Mehra, Shintaro Momose

2:45 PM - 3:00 PM JST | 5:45 AM - 6:00 AM UTC

[Z-NE6gfo-04] From SST Observations to Reusable Services for the European Digital Twin Ocean

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Reliable, traceable, and fit-for-purpose sea surface temperature (SST) information is essential for transforming Digital Twins of the Ocean from integrated data environments into effective tools for climate monitoring, extreme-event assessment, and product evaluation. This contribution outlines a planned Copernicus Marine initiative, developed within a project proposal currently under evaluation, to deploy four mature SST workflows on the European Digital Twin Ocean (EDITO), translating established scientific methods into accessible, reproducible, and scalable digital services.

The proposed applications cover the full pathway from observations to user-oriented information. They include global monitoring of marine heatwaves and cold spells using near-real-time and multi-year SST analyses; detection and object-based tracking of Mediterranean marine heatwaves, including their evolution, propagation, merging, and splitting; production of monthly SST anomaly maps relative to the 1991–2020 climatology, initially for the Baltic Sea but applicable to other regional and global products; and fair intercomparison and quality monitoring of SST products against a common set of in situ observations and harmonised diagnostics.

Rather than forming a single monolothic system, the four applications will operate as independent, reusable EDITO processes. Each workflow will be containerised and reproducible, following common standards for data access, provenance, configuration, documentation, testing, and interoperability. The services will exploit Copernicus Marine datasets and deliver interactive notebooks, analysis-ready datasets, and web-ready outputs, as appropriate, through scheduled or user-triggered execution. Externalised configuration and product-agnostic interfaces will facilitate their transfer across regions and SST products.

Beyond their individual scientific applications, these workflows will demonstrate how mature Earth observation methods can be integrated into Digital Twin Ocean infrastructures as reusable analytical services. Collectively, they would improve access to climate diagnostics, strengthen the monitoring and characterisation of marine extreme events, and support consistent and transparent product evaluation. Their deployment would also provide feedback on platform integration, data access, scalability, and long-term reuse, supporting the evolution of interoperable digital-ocean platforms.

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