ILIAD Discussion (PDII)

Fri. Nov 13, 2026 2:00 PM - 3:30 PM JST | Fri. Nov 13, 2026 5:00 AM - 6:30 AM UTC | Room C (201) (2F)

**Oral C5 A Federated Ocean-Earth Digital Twin Ecosystem: Connecting EDITO, Destination Earth and Open Standards**

Chair: Bente Lilja Bye, Marco Oliveira

2:25 PM - 2:35 PM JST | 5:25 AM - 5:35 AM UTC

## [cMFDCOEL-04] Building Blocks for AI-Ready Ocean Data: An Interoperability Architecture for Digital Twins of the Ocean

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A digital twin of the ocean is only as trustworthy as the data flowing through it. Ocean information arrives from many communities, from physics and biology to fisheries and socio-economics, in different structures, described with different metadata, and named with different vocabularies. Forcing all of it into one common schema fails, because it either loses what each community depends on or grows into a superset no one can validate. And as digital twins increasingly rely on automated and AI-driven analysis, a further problem appears: a machine arriving at a dataset cannot reliably tell what it means, how good it is, or how it was produced, so it guesses, and confident, plausible, unaccountable answers are exactly what a decision-support twin cannot afford.

This talk presents a practical answer developed openly within OGC and its community. Interoperability requires handling four things together: APIs, schemas, semantic models, and vocabularies, and above all a way to declare how they join up. Rather than another standard, the approach is an architecture of composable, independently testable building blocks that bind structure, discovery, meaning, and provenance into machine-actionable artifacts. Meaning is declared and resolvable, provenance is assembled step by step, and correctness is checked automatically. The result is data that is interoperable, auditable, and AI-ready, whose lineage a person or an agent can trace back to the observation behind it.

Illustrated with marine worked examples, the talk introduces the Oceans Information Model, used as the basis for interoperability in the ILIAD Digital Twin of the Ocean. It shows how the same building blocks can make ocean data reusable across borders and platforms by reusing common standard models, and how declared meaning reduces the risk of AI hallucination. It is offered as a shared basis for discussion, consolidating recent pilots and testbeds rather than proposing a single mandate.

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