Keynote

Thu. Nov 12, 2026 9:00 AM - 10:30 AM JST | Thu. Nov 12, 2026 12:00 AM - 1:30 AM UTC | Room A (Oshidori) (2F)
Keynotes A2
Chair: Fumio Inagaki, Swadhin Behera

9:00 AM - 9:20 AM JST | 12:00 AM - 12:20 AM UTC

[MW49V9HW-01] From EDITO, the European Digital Twin of the Ocean, to ONE-DTO, the Collaborative, AI-Enabled Global Digital Twin of the Ocean

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EDITO is the core public infrastructure of the **European Digital Twin of the Ocean**: an open environment where data, models, computing resources, and applications converge to transform ocean observations into actionable knowledge. Building on **Copernicus Marine**, **EMODnet**, and Europe's research and innovation ecosystem, EDITO is progressively federating national and regional contributions into a shared European capability—while enabling countries and communities to retain their expertise, assets, and identity. It also connects with cutting-edge digital assets and programs, such as **Destination Earth** (with its Earth-system digital twins and data ecosystem) and **EuroHPC's** pre-exascale and exascale computing resources. Together, these infrastructures can link ocean, climate, weather, and human activities, support higher-resolution simulations, and make trusted European data and computing capacities accessible to a broader community.

Now, the **Digital Twin of the Ocean (DTO)** capability is central to **OceanEye**, Europe's flagship initiative to strengthen ocean observation and unlock ocean knowledge. At the**OceanEye International Alliance** launch during the **UN General Assembly** in New York on 23 September 2026, European Commission President **Ursula von der Leyen**stated:
"OceanEye can show us what is happening in the ocean right now. The Digital Twin of the Ocean can help us predict what may happen next."
The DTO is the means to combine these observations, test scenarios, and convert a global flow of data into decisions for resilience, safety, restoration, and a sustainable blue economy.

Similarly, the **OceanEye International Alliance** represents the next step toward a fully federated and interoperable **One Digital Twin of the Ocean (ONE-DTO)**. This system should rely not only on sustained global observing systems but also on distributed, heterogeneous infrastructures. With the active contribution of the **International community**, it will connect data and services through open standards and provide interfaces tailored to national and regional needs. Rather than a single centralized system, it will be a **system of systems**, combining shared foundations with specialized portfolios of applications—for example, an **Arctic DTO** addressing polar observation, forecasting, ecosystems, communities, and navigation.

To conclude, we must remember that **artificial intelligence (AI)** is already *completely* reshaping this ecosystem. New AI agents will not only help users find and interpret information; they will orchestrate models, trigger simulations, generate fit-for-purpose data products, and combine evidence across infrastructures. Interoperability may shift from traditional data sharing or federated infrastructure to **agents exchanging information dynamically**. This evolution can make digital twins more accessible and powerful—**provided that scientific validation, traceability, and human oversight remain embedded by design**.

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