OSID & IESS

Thu. Nov 12, 2026 4:00 PM - 5:30 PM JST | Thu. Nov 12, 2026 7:00 AM - 8:30 AM UTC | Room D (Icho) (3F)

Oral D3 OSID & IESS

Chair: Bruno Buongiorno Nardelli, Akira Nagano

4:30 PM - 4:45 PM JST | 7:30 AM - 7:45 AM UTC

[OECfne_2-03] Building Ireland’s Digital Twin of the Ocean: From Trusted Marine Data to Operational Decision Support

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Ireland is advancing a Digital Twin of the Ocean (DTO) to support sustainable ocean management, marine spatial planning and climate resilience. Building on decades of marine observations, data stewardship and national monitoring programmes, the Marine Institute (MI) is developing an operational and interoperable DTO ecosystem that connects trusted observations, models, data services, analytics and decision-support tools. Rather than a single visualisation platform, Ireland's approach focuses on creating reusable digital capabilities that enable data, models and users to interact across multiple marine management applications.

The MI manages marine data through trusted pipelines, standardised metadata, and open publication services backed by internationally recognised quality and governance frameworks, including IODE accreditation and CoreTrustSeal certification. Adopting a cloud-first approach the MI is modernising spatial infrastructure, marine portals and digital services while enabling integration with emerging European data spaces and advanced analytics environments. These foundations support capabilities including real-time data integration, scenario modelling, immersive 3D visualisation, and AI-driven analysis.

As Ireland's National Oceanographic Data Centre and an active contributor to European marine data initiatives, the MI provides trusted and reusable data supporting applications across government, research, industry and society. These foundations are reinforced by a strong organisational data culture where stewardship, quality, interoperability and reuse are shared responsibilities.

Practical applications are already emerging through the recently launched cloud-native Marine Atlas, Ireland's maritime spatial planning initiatives, sea sensitivity assessments and marine policy development, demonstrating how trusted data and predictive capabilities can be translated into actionable decision support.

The presentation demonstrates how trusted marine data infrastructure, supported by strong organisational governance and data culture, can evolve into operational Digital Twin capabilities. Ireland's experience provides transferable lessons for the international DITTO community on the technical, organisational and governance foundations required to move from authoritative marine data services to interoperable, user-driven Digital Twins of the Ocean.

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