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Thu. Nov 12, 2026 11:00 AM - 12:30 PM JST | Thu. Nov 12, 2026 2:00 AM - 3:30 AM UTC | Room A (Oshidori) (2F)

Demos A1

Chair: Akihiro Inomata, Laura Rogers

11:00 AM - 11:20 AM JST | 2:00 AM - 2:20 AM UTC

[6sWwrMMb-01] European Digital Twin Ocean – Immersive Control Center

*Camille Cherques[1] (1. Mercator Ocean International (France))

11:20 AM - 11:40 AM JST | 2:20 AM - 2:40 AM UTC

[6sWwrMMb-02] Smart Watershed Digital Twin for the Ocean-Based Blue Economy

*Tetsu Hattori[1] (1. PwC Consulting (Japan))

11:40 AM - 12:00 PM JST | 2:40 AM - 3:00 AM UTC

[6sWwrMMb-03] Big Blue Cloud: Enabling User-Driven Ocean Digital Twins for Marine Protected Areas and Participatory Science

*Jack Pan (1. Ocean Motion Technologies, Inc. (USA))

12:00 PM - 12:20 PM JST | 3:00 AM - 3:20 AM UTC

[6sWwrMMb-04] iSeaPower: An Interactive Decision-Support Digital Twin Platform for Offshore Management

*Naseem Ali[1] (1. Helmholtz-Zentrum Hereon (Germany))

12:20 PM - 12:30 PM JST | 3:20 AM - 3:30 AM UTC

[Discussion] Discussion

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[6sWwrMMb-01] European Digital Twin Ocean – Immersive Control Center

*Camille Cherques[1] (1. Mercator Ocean International (France))

The European Digital Twin Ocean is a virtual replica of the ocean that will make ocean knowledge readily available to everyone via a free, public platform (EDITO). Its aim is to democratise access to ocean knowledge and aid decision-makers, researchers, innovators, and citizens with tools to shape a sustainable future. EDITO is a free, public pilot platform intended to evolve into a long-term European operational service by 2030, acting as a global benchmark for digital ocean solutions.

EDITO integrates and upgrades existing European assets, combining data from EMODnet and the Copernicus Marine Service into a single digital framework. EDITO enables the distribution of high-resolution ocean observation data, forecasts, and analysis, the ingestion of external data and tools, and links to advanced computing resources, such as cloud and high-performance computing (HPC), to support complex simulations and scenario modelling.

The proposed live demonstration will show concrete marine applications that support decision-making across environmental, economic, and operational contexts, showcasing what-if scenarios and operationally relevant use cases. As part of the demonstration, an interactive control centre is designed to provide the community with a hands-on experience.

The live demonstration will display marine environmental monitoring and coastal risk management scenarios accessing real-time operational ocean information. They will illustrate how the European DTO is helping transform ocean knowledge into actionable tools for policymakers, researchers and stakeholders. Visitors will interact in this immersive exhibition space with AI-driven marine forecasts, ocean governance dashboards, predictive modelling tools highlighting ocean data in climate resilience strategies and simulation-based scenarios such as coastal restoration strategies, ship routing optimization, oil spill responses, and more.

Through a unique experience using cutting-edge visualization tools, the demonstration will provide an overview of the vast possibilities offered by the European Digital Twin Ocean to empower decision-making with practical insights and actionable strategy based on scientifically qualified solutions.

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[6sWwrMMb-02] Smart Watershed Digital Twin for the Ocean-Based Blue Economy

*Tetsu Hattori[1] (1. PwC Consulting (Japan))

This demonstration presents a Smart Watershed Digital Twin designed to support the development of “Umi-gyo,” a Japanese concept that expands local economic activity by connecting fisheries with tourism, food, learning, recreation, and community engagement.

The digital twin visualizes and integrates the diverse demands of fishers, tourism operators, residents, visitors, municipalities, researchers, and businesses. It enables stakeholders to explore future scenarios for how coastal areas, fishing ports, and marine resources can be used in complementary ways.

Coastal communities contain multiple opportunities, including seagrass and seaweed bed restoration, sustainable fisheries, stock enhancement, recreational fishing, fishing experiences, marine tourism, coastal walks, environmental education, local cuisine, accommodation, and cultural activities. By treating these activities as an integrated Umi-gyo system, the approach strengthens fisheries while creating new sources of income, employment, and exchange.

The platform combines user needs—such as preferred locations, timing, expected value, required facilities, and acceptable conditions—with information on marine ecosystems, fishing grounds, seasonal changes, catch data, port infrastructure, visitor movements, walking routes, local events, restaurants, and accommodation.

This makes it possible to identify areas for seaweed bed restoration, sustainable fishing, tourism, learning, recreation, and community use, while coordinating activities by season and time of day. For example, restored seaweed beds can improve fish habitats and support fisheries, while also creating opportunities for underwater observation, fishing experiences, environmental education, local seafood dining, and coastal tourism.

The Smart Watershed Digital Twin therefore functions as a shared decision-making platform for designing the future use of the sea. By coordinating nature restoration, fisheries, tourism, food, education, and community activities, it helps maximize environmental, economic, and social value. Ultimately, the concept aims to create a sustainable Umi-gyo model in which healthier marine ecosystems generate stronger local economies, and regional economic activity, in turn, supports continued restoration and stewardship through inclusive planning, adaptive management, and locally grounded collaboration.

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[6sWwrMMb-03] Big Blue Cloud: Enabling User-Driven Ocean Digital Twins for Marine Protected Areas and Participatory Science

*Jack Pan (1. Ocean Motion Technologies, Inc. (USA))

Operational digital twins of the ocean require more than high-volume data - - they need accessible and traceable workflows that connect Earth observations, in situ measurements, model outputs, analytics, and the communities that use the resulting information. This live demonstration presents the Big Blue Cloud, a cloud-based open data science platform developed by Ocean Motion Technologies Inc. to support application-specific data-to-decision workflows for ocean research and management.

Two use cases will illustrate how a shared platform can support both formal conservation governance and participatory science. For the Ross Sea Region Marine Protected Area (RSRMPA), we will combine NASA Earth observations, in situ data, model products, and official management boundaries, explore conditions across space and time, and generate interactive visualizations and analytical products relevant to research, monitoring, and the 2027 decadal review. For IceEco, a NASA-supported coastal Greenland project with Scripps Institution of Oceanography collaborators, we will show how satellite products and observations contributed by expedition participants can be curated, compared, and visualized to investigate relationships among icebergs, glacial meltwater, phytoplankton, and seabirds. Participants will follow a reproducible workflow from data discovery and ingestion through provenance tracking, multi-dataset analysis, visualization, and sharing. The demonstration will include configurable dashboards and machine-learning tools designed to lower technical barriers while maintaining transparency. Audience members will be invited to test queries and provide feedback on interoperability, governance, and co-design priorities.

Rather than presenting a single “monolithic” digital twin, this demonstration positions the Big Blue Cloud as reusable digital infrastructure for building user-driven ocean digital twins around specific management and research questions. It shows how researchers, managers, community partners, and the public can transform diverse observations into collaborative, actionable intelligence for environmental stewardship and resilience.

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[6sWwrMMb-04] iSeaPower: An Interactive Decision-Support Digital Twin Platform for Offshore Management

*Naseem Ali[1] (1. Helmholtz-Zentrum Hereon (Germany))

As Europe works toward climate neutrality by 2050, offshore wind is expanding rapidly increasing the need for integrated management and sustainable co-use of increasingly crowded marine space. The cost-efficient, and safe deployment, operation, and maintenance of offshore wind farms depend on reliable meteorological and oceanographic forecasts. In particular, the accurate identification of suitable weather windows is essential for safe and efficient offshore activities as forecast uncertainties lead to costly delays and increased operational risk. Simultaneously, offshore management increasingly requires decision-support tools that can integrate multiple activities, environmental conditions, and user requirements within a common digital framework. Consequently, decision-support systems can formalize key concepts such as accessibility, and approachability, and combine them with user-defined operational constraints, to improve the planning of activities ranging from routine inspections to major maintenance campaigns and coordinated operations. We introduce iSeaPower, a web-based Digital Twin of the Ocean (DTO) interactive decision-support platform for offshore renewable energy operations and multi-use applications. iSeaPower integrates model and observation data covering a wide range of temporal scales and translates them into actionable information for specific decision problems. Its modular architecture provides a basis for extension beyond individual offshore environment, and the co-use of offshore space, including combined activities such as offshore wind energy and aquaculture. For example, iSeaPower supports uncertainty-aware planning, and provides an interactive workflow that links geospatial selection, constraint definition, and decision outputs. The modular framework enables the integration of AI-based methods, and the intelligent exploration of complex operational scenarios. By integrating data, models, AI, and user interaction, iSeaPower supports adaptive DTO-based decision-making and enables users to explore heterogeneous data and operational scenarios across multiple spatial and temporal scales. Consequently, iSeaPower contributes to the DITTO vision of interoperable and user-driven Digital Twins of the Ocean that connect data, models, advanced digital technologies, and users to support ocean management.

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