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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

11:40 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

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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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