



Contribution ID: 180

Type: **Presentation**

Methodological Approaches and Best Practices for Integrating Arctic Data and Research Infrastructure

Wednesday 15 October 2025 15:17 (11 minutes)

Arctic research faces persistent challenges, including limited accessibility, geopolitical complexities, and a general scarcity of high-quality data. In response, several international consortia—such as INTAROS and Arctic PASSION—have initiated collaborative efforts to address these issues through the development of integrated Earth observing systems (e.g., SIOS and GIOS). The Svalbard Integrated Arctic Earth Observing System (SIOS) builds upon an established and diverse portfolio of world-class observational and research infrastructure concentrated in Svalbard. This foundation supports SIOS's aim to advance systematic methodologies for observational design and data integration, thereby enhancing the capacity for coordinated Arctic monitoring.

This session will explore methodological frameworks and operational practices that support collaboration among data providers, researchers, and infrastructure operators in the Arctic and Northern Polar regions. Emphasis will be placed on strategies for harmonizing distributed data sources and enhancing interoperability through coordinated data management systems. A keynote presentation will provide illustrative examples of the added value generated by the SIOS data management system, particularly in terms of its capacity to integrate heterogeneous observational data and infrastructure across institutional boundaries.

Through presentations and discussions, the session will highlight emerging tools, protocols, and governance models that enable more efficient sharing, discovery, and reuse of Arctic data. Special attention will be given to the role of FAIR (Findable, Accessible, Interoperable, Reusable) data principles in facilitating transnational collaboration and long-term data stewardship. Case studies from current and past projects will be presented to demonstrate how integrated observing systems can improve the scientific understanding of Arctic environmental processes and support decision-making in response to rapid climate and socio-ecological changes.

The session aims to bring together stakeholders from across the Arctic research community—including data scientists, infrastructure managers, environmental researchers, and policy advisors—to exchange knowledge, align efforts, and foster the development of interoperable, sustainable data ecosystems. By promoting best practices in data integration and infrastructure co-design, the session seeks to contribute to the resilience and responsiveness of Arctic research systems in the face of ongoing and future challenges.

Primary author: WICHOROWSKI, Marcin (Institute of Oceanology, PAS)

Presenter: WICHOROWSKI, Marcin (Institute of Oceanology, PAS)

Session Classification: Presentations Session 7: Open research through Interconnected, Interoperable, and Interdisciplinary Data

Track Classification: SciDataCon2025 Specific Themes: Open research through Interconnected, Interoperable, and Interdisciplinary Data