

Reaching for the Cloud: Architecting a Cloud-Native Service-Based Ecosystem for MetOcean Data Management

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As Nova Scotia's energy needs grow and evolve, decision makers and stakeholders need ocean data and information to support responsible offshore energy development. Ocean observation improves oil spill and emergency response, operational safety, and understanding of marine environments to aid site selection, surveys, construction, permitting, and monitoring. In the United States, data from NOAA Integrated Ocean Observing System (IOOS), supported by Regional Associations (RAs) helps industry players with effective co-use of the oceans, where fisheries, protected species, and infrastructure overlap.

The IOOS inclusive of the Canadian Integrated Ocean Observing System (CIOOS) provides public access to data and products generated through observation and modeling of the nations' oceans and coasts. However, the esoteric nature of the data formats, tools, and services required present a barrier for users. Rapid advancements in oceanographic and meteorological technologies offer new ways to lower this barrier and provide efficiencies and stability to ocean data users. The Reaching for the Cloud (RFC) initiative leveraged one such advancement, cloud computing, which provides an accessible and cost-effective option to build upon current data management procedures and metadata standards, with similar cloud-native frameworks. This work led to key recommendations and a roadmap outlining how IOOS can transition towards a service-based cloud ecosystem to increase the use of data and promote interdisciplinary collaboration and stakeholder engagement.

This work has informed Tetra Tech, clients, and the industry of clear path forward for working with scientific data in the cloud, and has resulted in the creation of several new open-source communities and tools to aid in the formatting and serving of multidimensional array-oriented gridded data. We will describe these new tools, the ecosystem, and how they can be used to serve data from the cloud and support Nova Scotia's offshore wind development and data management needs.