Session 2 Event Summary

Innovative Approaches to Data Tools and Applications Using Data Exchange

Monday, December 7th

The Ocean Data Connector Series is a collaborative partnership between the Canadian Integrated Ocean Observing System (CIOOS) and Canada's Ocean Supercluster (OSC) to explore how data sharing drives coastal and marine collaboration and innovation.

Session Overview

Session 2 focused on exploring ways organizations can discover, access, share, manage and visualize data from multiple sources to support operational decision making in marine environments. Susan Hunt, Chief Technology Officer with Canada's Ocean Supercluster, facilitated a panel discussion that provided insights on innovative ways organizations are integrating and interpreting data into their day to day operations as well as some of the limitations and challenges currently being faced. These insights were further explored in breakout groups focused on operational planning decisions that require data, and the general use or knowledge of visualization tools and applications.

Event Highlights

Panel Discussion: ***Transforming data into information: exploring approaches for using data applications, tools and visualizations to support operational decisions***

Laura Dwyer, R&D Manager, Grieg NL, outlined their work towards achieving "egg to plate" traceability in their aquaculture operations through increased information sharing across their operation and the Placentia Bay region. Grieg NL is currently working with several partners from aquaculture and other sectors to improve communications and monitoring infrastructure to connect systems and measurable parameters into a single data hub that will allow Grieg's operators to use real-time analytics and visualize and connect all aspects of their operation to improve decision-making. Beyond Grieg NL's operations, all data collected will be made openly available, supporting enhanced regional communications, safety and research efforts.

Julie Angus, Co-founder and CEO of Open Ocean Robotics, stressed the importance of properly managing data into consistent interoperable formats to be able to compare and contrast different data types easily. The work of her team is very end user focused; providing the most effective data allows clients to make more informed decisions around sustainability and cost effectiveness. The potential to access and share greater amounts of data will allow users to draw further insights and advance greater data applications in the future. Further development of data analytics across the country will allow Canada to compete on a global scale.

Terry Bullock, Principal Meteorologist with Wood, and his team are focused on weather and oceanographic forecasting, primarily for the oil and gas sector. The science of forecasting is complex due to the large volume and diversity of data sources integrated by Wood's daily models that produce easy to interpret decision support tools for their clients, i.e. risk dashboards. Significant investments have been made in visualization tools and cloud based data management systems to support this work. Satellite and remote sensing systems will play a more significant role but will need to be validated with in-situ ocean observing infrastructure.

James Munroe, Associate Professor, Physics and Physical Oceanography, Memorial University of Newfoundland highlighted the ability of platforms like Ocean Navigator and CIOOS to provide users with

access to large volumes of data without requiring the infrastructure to download and store the information they need. Users can leverage the cloud technology, common frameworks and consistent formats offered by these platforms to build project specific tools, such as multi-ensemble forecasting, saving time and resources.

Joel Culina, Physical Oceanographer with FORCE focused on site characterization and environmental monitoring for tidal stream technology in a geographically limited space. Greater access to standardized 2D GIS tools to overlay shapefiles and visualization layers through platforms like CIOOS would greatly support their work. Moving into 3D and eventually 4D visualizations that account for a time variable is a priority.

Breakout Discussions – Major Themes and Key Takeaways

Human Aspects

- Opportunities for creating relationships through data exchange, through social licensing and data collaborations that expand outside of specific projects.
- Many visualizations such as dashboards still require human judgment calls for decision-making.
- Distributed workforce from pandemic. Virtual collaborations are increasing (Jira, Slack, Google calendars, GitHub, etc.).

Value Proposition

- Value for companies integrating other data sources to create richer, more robust end products, creating added value for clients through gained insights.
- Beyond using data for own applications, access to additional data extends the functionality of a company's applications/ tools.

Functionalities

- Visualizations with interactive layers are helpful for community members
- Visualizations that address risk and threshold analysis are of interest
- A reporting tool activated by drawing a bounding box around a geographic area is of interest

Needs

- Organizations are interested in more data for their tools. Some companies have their own modelling software and are looking for data from CIOOS, not visualizations. Site specific data is especially important for validating new technology.
- A need to create in-situ visualizations to reduce the need to send large amounts of data via satellite.
- For industry-led initiatives, ocean data can be very expensive, and the sharing of data can be difficult.
- Industry needs data for decision-making, in particular, analyzing impacts. Raw data is less important than how an operation is impacted.
- Data visualizations can help scientists understand operational decisions, and in turn, their support for those decisions.

Challenges

- Managing and sharing data becomes a significant challenge when companies are growing, and the depth and breadth of their data is expanding quickly.
- Very little financial incentive for companies to share the data, there must be a policy incentive.
- Once details around ownership are sorted, oil and gas industry have environment data used for planning, marine operations, emergency response, etc., that would be widely valuable.
- Limited relevance of visualization tools that are designed in response to highly specific questions or clients needs. Ocean data is only one component of the decisions that SMEsmake. Therefore, one benefit of these visualizations is CIOOS' data standards that enable greater use of the data from these visualizations.
- Wide range of capacities for visualizing data; from building, buying, adapting, to 'don't know'.

- Focusing on interactivity in visualizations may oversimplify the complexity of the dataset, creating liability issues.

Technological Considerations

- Need apps to be able to access the different data types. ERDDAP allows for multiple data formats to be downloaded, along with multiple ways to display. Useful / multi-functional; used by Wood, CIOOS, NOAA.
- Create visualizations built through open-source software like CIOOS that do not rely on clients to own licenses (such as MatLab) to view the results. Improves relations and usability of visualizations.
- Running applications in the cloud can be faster, as the data does not need to be downloaded first
- Important to have comprehensive metadata; data is collected for one use, but could be re-used for many other applications. Metadata key for interoperability.
- Automation must be used to our advantage, used as a tool to assist humans. Ever changing landscape of automation. Smartphones and mobile apps are trending past web apps.
- Microsoft Excel is very flexible, and much can be done with a limited budget for visualizing complex sources of information.

Join us for the following sessions as we continue to explore opportunities for data exchange.

Visit Eventbrite for the Agenda and more info on the final Session and its speakers!

https://www.eventbrite.ca/e/ocean-data-connector-3-part-series-tickets-128154390231

Reach out to info@cioosatlantic.ca for questions, or to sign-up to receive the VITALITY survey.