Ocean of Data Challenge: Coast to Coast to Coast

Dates

November 1 to 20, 2023

Tagline

Put your skills to the test and dive into the world of ocean data!

Overarching Challenge Question

How can ocean data help us understand Canada's ocean health, ocean economy, and ocean people?

Challenge Description

Join the Ocean of Data Challenge by CIOOS, Fisheries and Oceans Canada, Ocean Start Up Project,, COVE, ShiftKey Labs and DeepSense for some creative collaboration and idea generation! This **free** event will kick off on **Wednesday, November 1st at 6pm ADT** with an introduction to the Challenge, presentations from experts, the chance to ask questions to help idea exploration, and a chance to network and build teams with other participants. Participants submit their video presentation on **Monday, November 20th** and the winners are announced on **Monday, November 27th.**

This Data Challenge will invite participants to imagine **how can ocean data help us understand Canada's ocean health, ocean economy, and ocean people**. We are inviting students at post-secondary institutions across Canada to harness CIOOS data for the creation of innovative solutions (including but not limited to user interfaces, tools, visualizations, infographics, dashboards, and more) that convey valuable insights tailored to a specific ocean audience.

The Canadian Integrated Ocean Observing System (CIOOS) is a national collaboration to share high-quality bi-lingual data on the state of Canada's coasts and oceans, from the Pacific, St. Lawrence, and Atlantic regions. CIOOS' online platform is structured so that data integrated into the system is visible regionally, nationally, and internationally. The more data that is shared, the more robust the information platform becomes for ocean users. CIOOS uses the network of shared data to create models and visualization tools which enable the discoverability, accessibility and interoperability of essential data and information for ocean users. With major datasets and decades of observations in key basins from coast to coast to coast, CIOOS should be a primary resource when proposing research projects in a new location or searching for data records. Our efforts contribute to global initiatives and are part of Canada's commitment to the United Nations Decade of Ocean Science for Sustainable Development (2021 – 2030). These endeavours strive to make ocean science more accessible, predictable, and engaging for all.

Choose one stream and provide interdisciplinary ideas for exploring how data can be utilized to better inform scientists, the fishing industry, or the general public. You may need to use other open-data sources to complete your application, however CIOOS data must be included.

The challenge is broken down into **three Challenge Streams: In the Water, On the Water, and Around the Water.** Individuals and teams will be asked to choose one stream and provide interdisciplinary ideas for exploring how data can be utilized to better inform scientists, the fishing industry, or the general public. Each stream can be used to explore different types of data, for example: "In the Water" can explore how oceanographic conditions impact the future state of the ocean. "On the Water" can use CIOOS data to dive into fisheries management, and "Around the water" finds how "everyday" recreational ocean are impacted by our changing ocean. You may need to use other open-data sources to complete your application, however CIOOS data must be included. More details on the streams below.

This Challenge allows you to work at your own pace to explore ways to learn about ocean data, meet others with the same interests and bring together unique skills to create a team (or work solo). This is a fantastic way to show off your design, programming or other talents. Not to mention more than $2,000 in prizes!

Challenge Stream #1: In the Water

Oceanographic conditions are rapidly changing across Canada. With the creation of national repositories for ocean observations such as CIOOS, access to data and information is becoming easier. However, CIOOS does not provide a mechanism to evaluate how these point-source observations relate to one another spatially and temporally, and whether newly collected ocean observations are outside of historical trends (think anomalies).

<u>Guiding questions</u>.

1. Evaluate patterns in oceanographic conditions (eg. temperature, salinity) between regions and/or time periods.
2. Compare new observations to historical averages. Are there significant anomalies in a given area relative to historic conditions?
3. Can historical data help us predict how warm surface and sub-surface waters will be in a given area in the future?
4. Examine how changes in oceanographic conditions may be affecting biodiversity inside Marine Protected Areas.

Challenge Stream #2: On the Water

Oceanographic data can be directly correlated to commercial catches, enabling greater insight into when and where certain fish species are found. This allows for precision fishing, increasing targeted catch

species while avoiding bycatch and choke species. This means quotas can be improved and by-catch avoided more effectively, leading to an overall improvement of ocean health. In the long run, this data can be used to understand the true causes of abundance and distribution shifts, enabling you to better plan for the future.

For example, bottom temperatures are used in the lobster stock assessment to correct for temperature-dependent changes in catchability between different survey methods.

Guiding questions

1. Create a user-friendly interface to summarize oceanographic conditions needed for effective fisheries management.
2. Use historical data to show trends and predict bottom water temperatures and salinity in the fishing areas during the fishing season.
3. Track oceanographic conditions and develop indices to mitigate impacts to fisheries with a changing climate.

Challenge Stream #3: Around the Water

We all strive for healthy ocean-human interactions. A goal of CIOOS is for recreational ocean users from swimmers to kayakers to use the online platform to plan their day on the water. Develop a resource, tool, or visualization that explores Canada's coasts and oceans, allowing "everyday" users to understand data in a context that supports sustainable use of the ocean. Consider parameters/data that the general public would find valuable to check on a daily basis when planning their marine activities.

Guiding Questions

1. Track and visualize historic water temperatures in recreational swimming areas. Predict when the warmest swimming conditions will be in the future.
2. Create a visualization of currents and/or wind speeds for recreational boating.
3. Gather all historic data from a single variable and create an interface or application to summarize the data in a user-friendly way.
4. Use historical data from the same dates in years past to give trend lines and expected oceanographic conditions for expected water and air temperatures, and build an interface to showcase these predictions.

Who should participate?

The best ideas come from interdisciplinary teams, so we invite those studying **Computer Science, Engineering, Biology, Sustainability, Business, or any other programs!** As long as participants are students who are registered full or part-time at an University, College, or Cegep in Canada. You can go **solo,** or work with a team of up to **five people**. **The Challenge kick-off will take place on Wednesday, November 1 at 6pm ADT/ 5pm EDT/ 2pm PDT and streamed online, with a recording uploaded the next day.** Please ensure you read the Official Rules below.

The Rules

- Competitors must own rights or have written permission from the owner for all software demonstrated in the competition.
- Your submission could be as simple as just a single really insightful bar chart. Or maybe you will use machine learning to build a prediction. Surprise us! Judging will be based on the potential for impact, originality, and creativity.
- Competitors can work solo or on teams of up to 5 members.
- Competitors are not allowed to submit projects containing confidential information
- Required to use data from CIOOS and can supplement with other open source data, noting the source of the data in the presentation or within infographic, visual or slides
- Submissions must either be in English or French
- Video submissions must be a maximum of 3 minutes and must be uploaded to either YouTube or Vimeo and set to private. We will not accept videos that need to be downloaded.
- Must currently be living in Canada with an active Canadian bank account
- Must be a current part-time or full-time student of an University, College, or Cegep in Canada
    - If you have any questions on eligibility, please reach out to info@deepsense.ca

Expected Outcome and Submissions

- On **Monday, November 20th, 2023 at 11:59pmPDT** submit the following**:**
    - Each team submits their information, video link, and concept through this registration form to be eligible for judging: https://forms.gle/Gjnx1erKfoYEmat48
- The video presentation can be a **3 minute long video** of a diagram, a technology solution, an analysis of data, or something else, as long as it is a solution to one of the Challenge Stream questions outlined above.
- Your tangible outcome or solution will vary based on your skill, background, area of expertise and team.

Schedule

Wednesday, November 1st
6 - 8:30 pm ADT / 5 - 7:30 pm EDT / 2 - 4:30 pm PDT
Challenge Kick Off Event and Networking

The challenge kicks off! Learn about CIOOS and how its data helps support Canadian research and innovation. The session will include a live virtual panel with presenters and a Q&A with presenters and about the Challenge. The whole session will be recorded and shared within 24 hours with all those who were not able to attend. The event will end with a networking session where you can meet other participants and create teams, if interested.

November 2 to November 20th
During Challenge

Join our slack channel! This is a great way to meet potential team members, discuss with other participants, or ask any question related to the challenge to us hosts.

Monday, November 20th
Due 11:59pm PST
Final Submissions

Teams must submit their final registration info, details about their concept, links to the used data, and a link to their video by the end of November 20th. You can submit to the challenge using this form: https://forms.gle/Gjnx1erKfoYEmat48

Monday, November 27th
Results Announced
Participants will be contacted with the results!

Judging and Prizes

Judging will be done offline. Judges will have one week to review the submissions and will then come together to decide on winners. Projects will be judged on presentation, sustainability, creativity and, of course, **the prototype (ranges from a technology solution, a visualization, or an overall plan).**

- 1st place: $750
- 2nd place: $600
- Most Sustainable Solution: $500
- Most Creative Solution: $500