MyOceandataSQL: an application to store and distribute ocean observations data

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Context and motivation

Oceanographic observation plays a key role in ocean forecasting. However, while oceanographic data collection is challenging and expensive, its dissemination is often not optimised due to a lack of efficient and practical data management tools and/or capacity.

Governments are warrant of national archives but often suffer from duplications amongst departments/institutes, lack of clear data archiving mandates and inconsistent budgets rendering public access often unsatisfying.

MyOceandataSQL came out of needs and frustration. The aquaculture section of Fisheries and Oceans Canada (DFO), Newfoundland and Labrador Region (NAFC), was in need of properly archiving and providing efficient access to oceanographic data collected in various bays around the coast of Newfoundland. Since no suitable system existed, the section developed its own tool. The tool was to achieve two main tasks:

1) centralise the data and,
2) provide intuitive, map-based, access to the data

Components

- ❑ A data upload application (Oceandata Upload Application – OUA – Fig. 1),
- ❑ A MySQL database to store data and metadata,
- ❑ A web-based and map-interactive interface (Oceandata Web Application – OWA – Fig. 2).

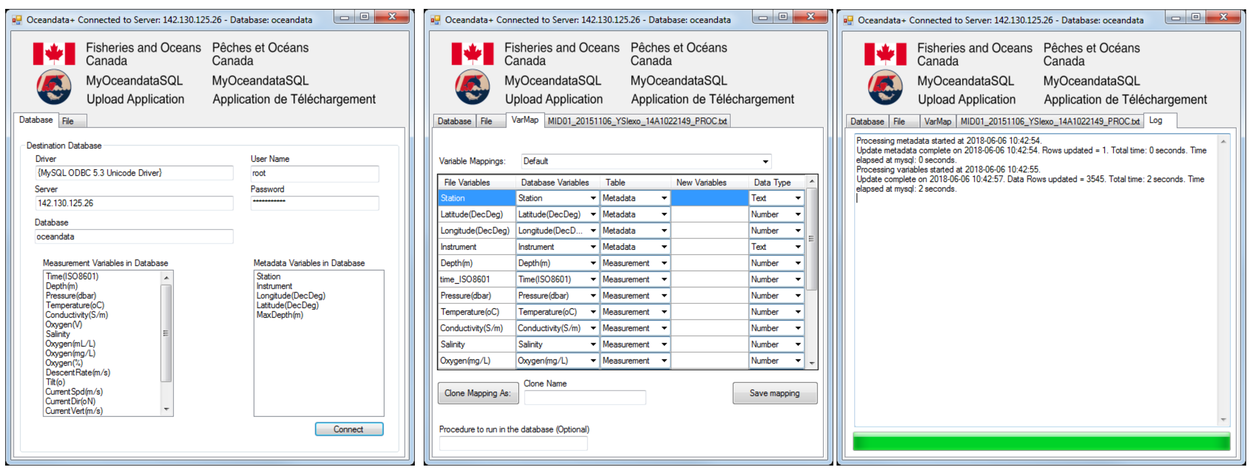

Figure 1: *Oceandata Upload Application (OUA) featuring visualisation of database variables prior upload (left) variable mapping (middle) and processing log (right)*

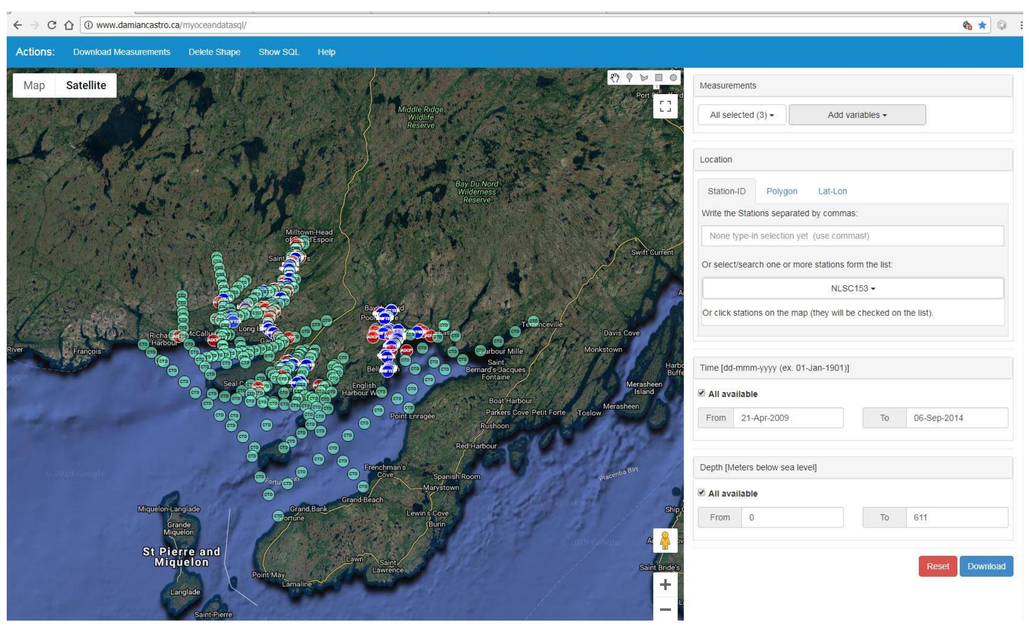

Figure 2: *Oceandata Web Application (OWA)*

Characteristics

- ❑ **Lightweight:** the suite can run on ordinary PCs and offers a map-based user interface for rapid visualisation (Fig. 2)
- ❑ **Versatile**: moving measurements, fixed-point profiles, as well as fixed-point timeseries data. At NAFC, we use the application to store drifters, CTD profiles, moored sondes (e.g. thermistors), ADCP profiles, tide gauges, and weather stations data
- ❑ **Expandable**: variables do not need to be defined before hand. New variables can be included during upload (Fig. 1 center panel for upload, Fig. 3 right panel for download)
- ❑ **Flexible:** data selection can be made through selection of station ID (Fig. 4 left panel), by clicking on station(s) or by specifying a region of interest using **Google Earth API** polygon (Fig. 4 center panel) or circle (Fig. 4 right panel)
- ❑ **Portable/Common export format**: data are exported as CSV (Comma Separated Values) files
- ❑ **Quick data query**: a search for 9 months of current data (20 min sampling rate, 1 million rows, 125MB) took about 13 s from a 115 million rows, 13.1 GB database using a desktop computer (12 cores, 1.2 GHz)

Figure 3: *User can select one or various types of data (depending on the instrument type) as well as one or various variables to download*

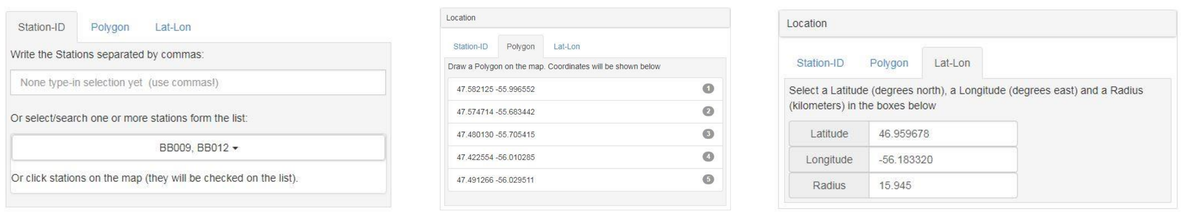

Figure 4: *User can select stations by specifying their ID (left panel), defining a region of interest (center panel) or specification of latitude, longitude, and radius range (right panel)*

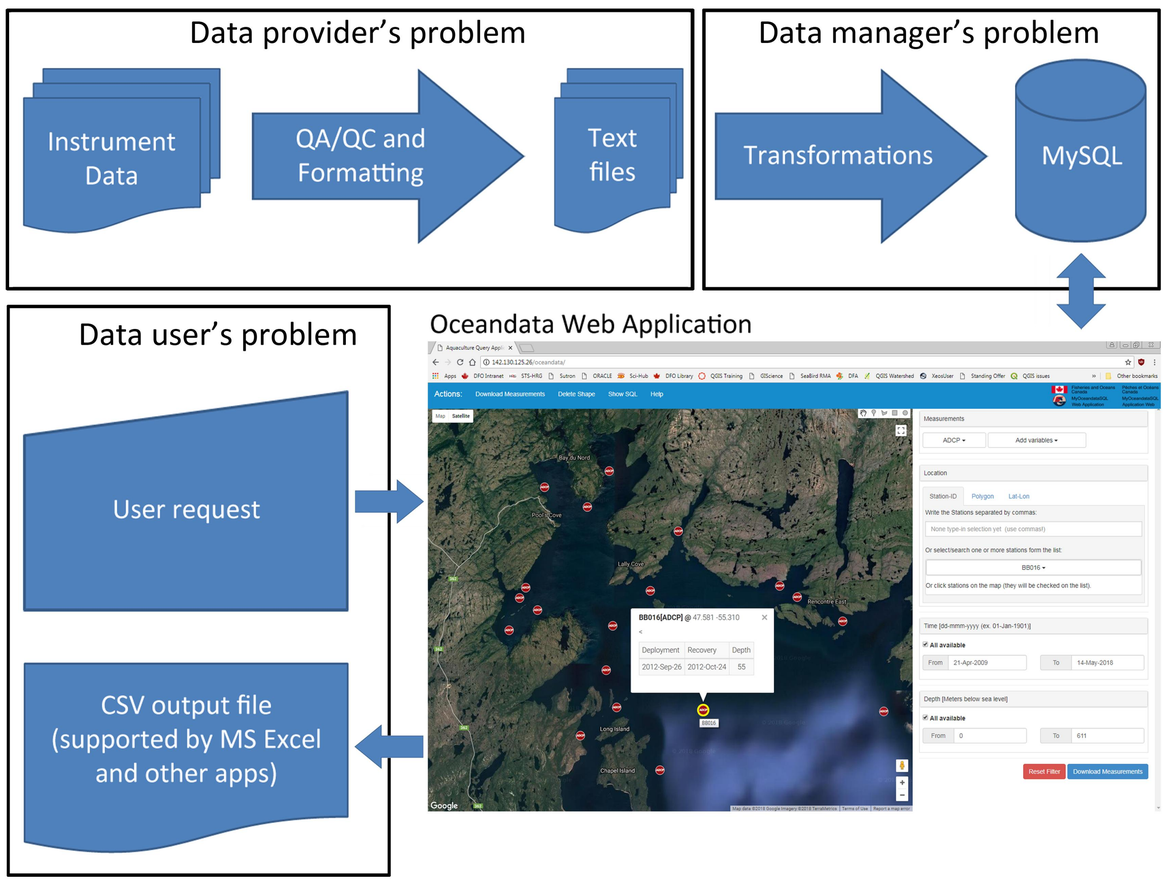

Figure 5: *processes and applications of MyOceandataSQL suite*

Access and perspectives

- ❑ Publicly available data can be accessed via QR code or at http://www.damiancastro.ca/myoceandatasql/
- ❑ Open source code available with the possibility to contribute to its continuous improvement. **To be released soon on** https://github.com/damianocastro**, stay tuned!**