**Dashboard for interactively measures for Temperature and Dissolved Oxygen in Nova Scotia**

CMAR and CIOOS Atlantic contribute and support science research projects to better understand the ocean, marine issues, and interactions with other earth systems.

In order to support the sustainable development of coastal resources in Nova Scotia, CMAR promotes innovation and science-based decision making by collecting and analyzing biophysical and socio-economic data.

Essential Ocean Variables (EOVs) is the term used to describe those variables arising from ocean observing activities. Currently, CIOOS Atlantic fully supports six EOVs such as: Temperature; Salinity; Currents; Nutrients; Oxygen and Sea Surface Height.

To determine other seven derived or related sub-variables (Seawater Density; Speed of Sound; Potential Density; Potential Temperature; Nitrate and Nitrite; Phosphate and Silicic Acid), the metadata required by CIOOS Atlantic includes essential ancillary data of time, depth, latitude, and longitude. These variables cannot be searched or filtered via CKAN or the Asset Map. However, datasets containing partially supported variables are discoverable by searching “organization” or a fully-supported variable contained within the same dataset.

CMAR currently maintains and supports over 60 sensor strings and is continuously expanding into new areas throughout coastal Nova Scotia (10 counties). The CIOOS Asset Map and Metadata Catalogue are the main portals for discovering and accessing CIOOS data and all datasets within CIOOS are accessible and may be downloaded as reports (PDF). There is also a data server that allows you a simple, consistent way to download subsets of scientific datasets in common file formats and make graphs and maps, which is ERDDAP (the Environmental Research Division's Data Access Program) with oceanographic data (for example, data from satellites and buoys).

Seawater may be over-saturated or under-saturated with oxygen, depending on the physical, chemical, and biological processes that produce or consume oxygen. Dissolved oxygen is the amount of oxygen, usually measured in milligrams or millilitres, dissolved in one litre of water. The solubility of oxygen in water is inversely correlated with temperature and salinity. Under normal conditions (i.e., a sample of air-equilibrated seawater with a salinity of 35‰ at 10ºC), the concentration of DO in seawater would be 8.6 mg⋅L-1 (Davis 1975a) (adapted from Canadian Water Quality Guidelines for the Protection of Aquatic Life,1999).

Temperature limits the amount of oxygen that can dissolve in water: water can hold more oxygen during winter than during the hot summer months. However, even at the warmest temperatures seen in the Bay (around 91 degrees Fahrenheit), water is capable of having dissolved oxygen concentrations of 6 to 7 mg/L. So, although high temperatures can influence dissolved oxygen levels, temperature is not the only cause of low-oxygen areas found in the Bay each summer.

According to the Atlantic Salmon Federation, Canada's Cooke confirms that it has lost about 10,000 Atlantic salmon at its Kelly Cove Salmon site off the coast of Coffin Island, in Nova Scotia, due to a “super chill” event.

February and March are the coldest months of the year for seawater temperatures in Atlantic Canada and temperatures can be expected to warm up soon, but salmon farmers have been nervously keeping an eye on their stocks in the meantime.

Most winters, Nova Scotia's marine waters stay above freezing. Sustained cold air temperatures can drop the water below 0 Celsius, to the temperature that fish blood freezes, around -0.7 C.

A number of chemical reactions start immediately after the death of the fish. These include reactions that are responsible for how fish quality changes during chilled storage, such as: Rigor mortis, where death terminates the supply of oxygen to the muscle; Protein changes, once the post-mortem degradation of proteins is one of the most important processes influencing the textural quality of fish muscle (Delbarre-Ladrat et al., 2006); Lipid changes, that may produce a range of substances during post-mortem events (Undeland, 1997); and Microbial changes, where the influence on the chilled fish induces bacterial growth until the specific spoilage organisms have increased to a certain level (Gram and Huss, 1996).

Using the sensor strings available around Nova Scotia, it is possible to predict and anticipate how and when these events may occur. It may also be helpful to optimize and maintain healthy fish living in the farms during these infrequent events.