



Ocean Data Management at Fisheries and Oceans Canada: Overview

Presented at the
MEOPAR Data Management Workshop
Marriott Château Champlain, Montréal
March 24-25, 2014



Data Management Report

- New data management policy adopted in September 2013
- “Preserve, enhance and facilitate the use of the valuable and irreplaceable Scientific Data resources of DFO”
- Science programmes must have a comprehensive plan to address the management of scientific Data collected or generated



Data Management Report (cont'd)

- **Data Management** : all disciplines related to the development, execution and supervision of plans, policies, programs and practices that validate, control, protect, deliver and enhance the value of Data.
 - data collection, generation, assembly, transformation (content management responsibility) and stewardship
 - storage, applications, access and preservation
- All scientific Data collected by DFO must be submitted to a Managed Data Repository



Data Management Report (cont'd)

National Science Data Management Committee :

- One representative from each region
- Develops and implements goals for data management



Oceanography and Scientific Data branch (2013):

- Formerly CODC (1962), MEDS (1971), ISDM(2006)
- Chairs NSDMC
- National Oceanographic Data Centre



Data Collected

Instruments:

- CTD, XBT, current meter, thermistor, ADCP, satellite tag (pop-up or glued), tide gauge, bioness, net, multi-net, thermosalinograph, moving vessel profiler, Seahorse...

Platforms:

- CCG ships, moorings, Argo profilers, towed platforms, marine animals, observatory (Barrow St)

Mode: underway, profile, time series, point, tow, etc.



Data Collected (cont'd)

Variables:

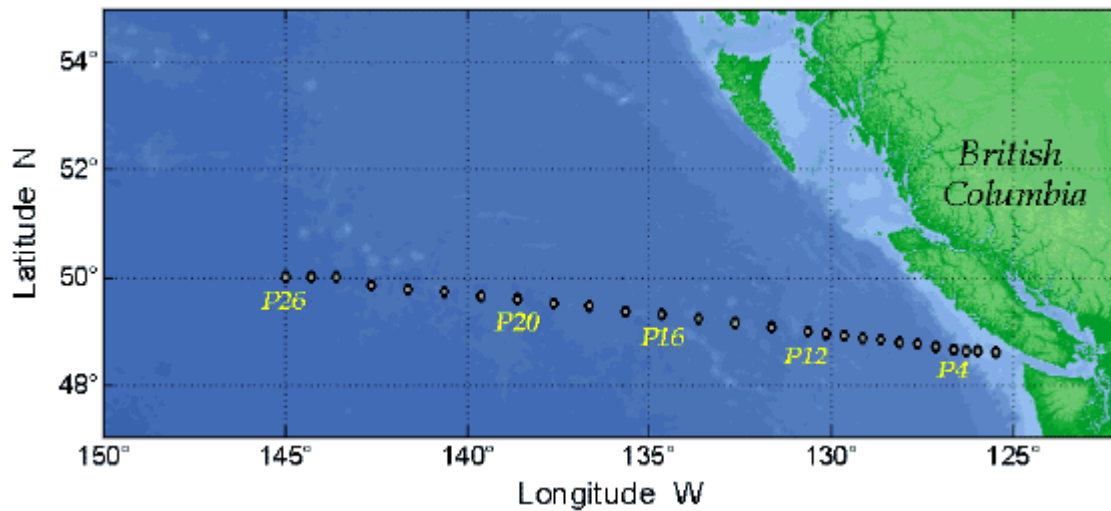
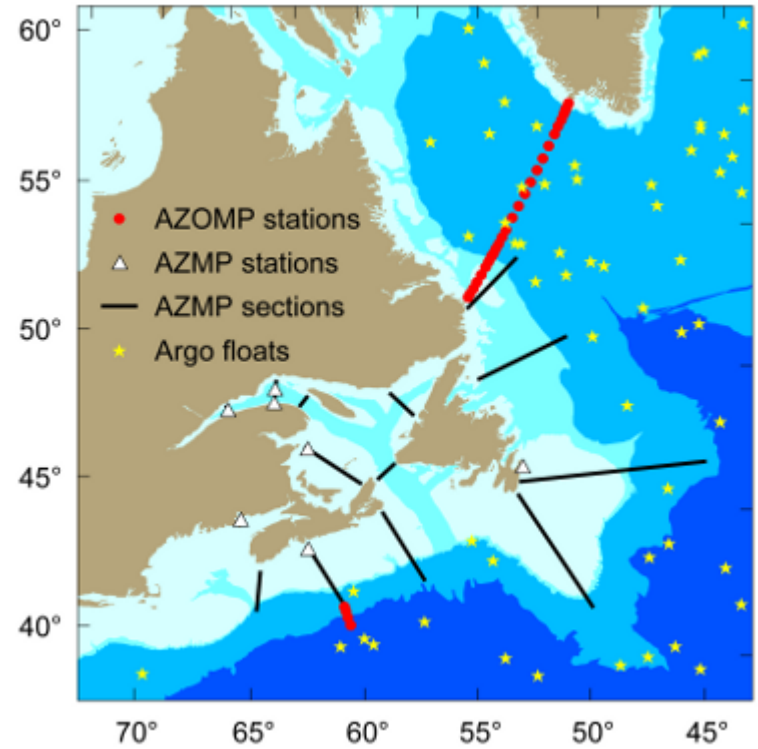
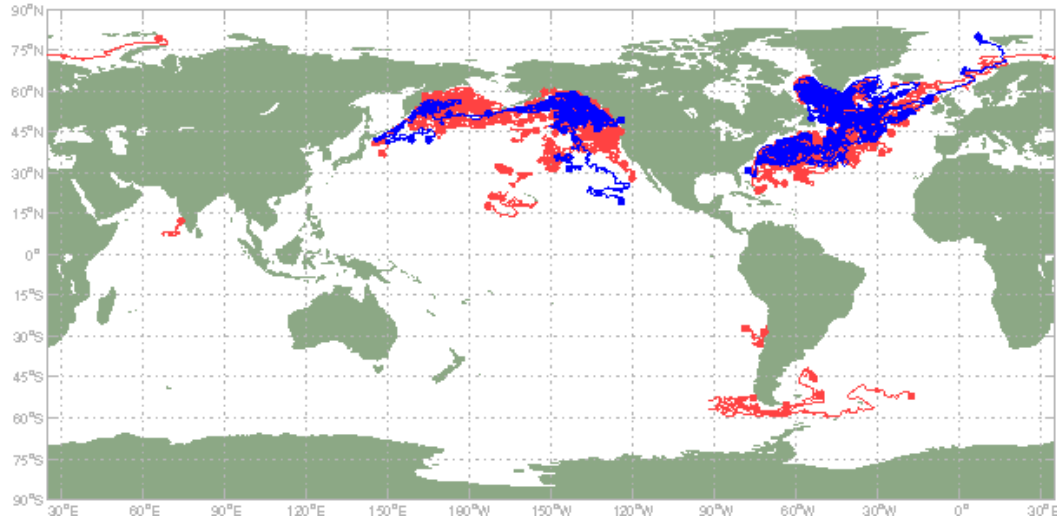
- Phytoplankton, zooplankton and bacteria biomass, primary productivity, chlorophyll, ...
- Carbon and nitrogen and total matter inventories (dissolved/particulate, organic/inorganic), nutrients, dissolved oxygen, pH, alkalinity, tracers (CFC, SF6), dimethylsulfide, fluorescence, ...
- Temperature, salinity, pressure, current velocity, ...



Data Collected (cont'd)

Programs (monitoring):

- **Line P:** Seasonal occupation of 27 stations along a 1400 km long line off Vancouver Island, since 1956
- **Atlantic Zone (Off-Shelf) Monitoring Program:** Biweekly and seasonal occupation of 7 fixed stations and 15 sections in St. Lawrence (Gulf and Estuary), Bay of Fundy, Newfoundland and Labrador Shelves, Scotian Shelf/Slope/Rise, Labrador Sea (since 1999; 1924)





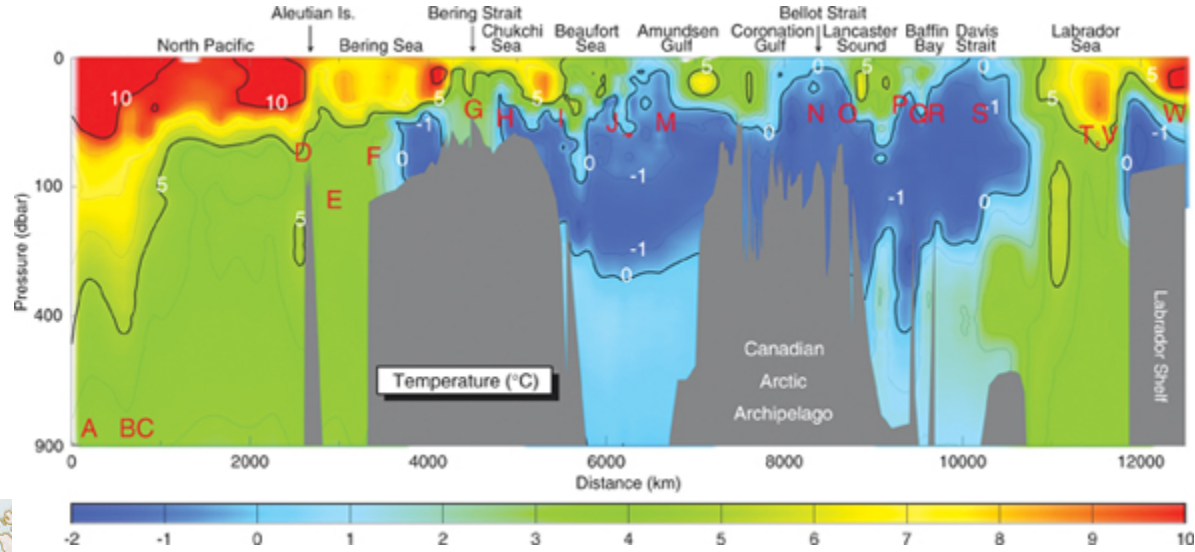
Data Collected (cont'd)

Programs:

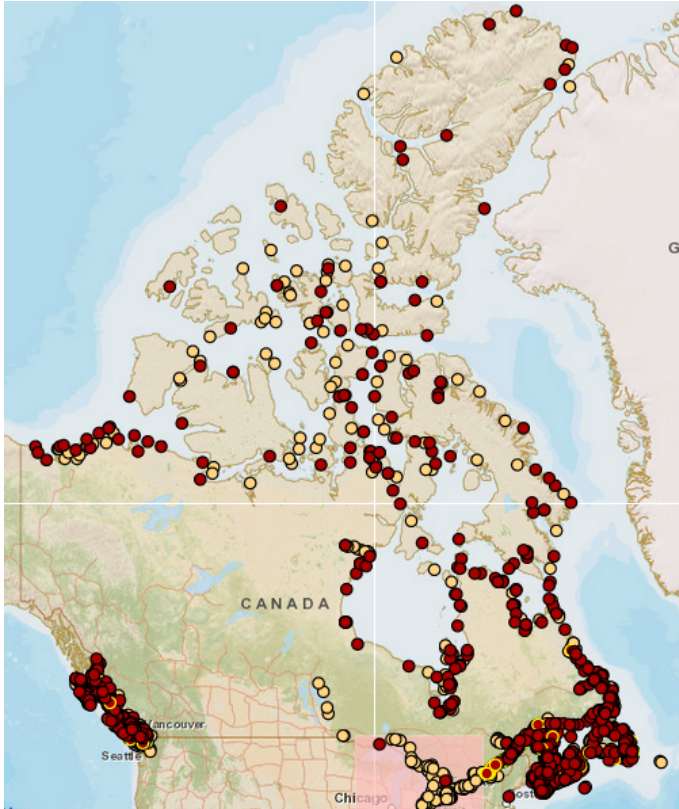
- **Canada's Three Oceans:** 15 000 km (2007-)
- **Argo Canada:** over 300 floats deployed since 2000, 98 of which active, Atlantic and Pacific (soon Arctic)
- **Canadian Hydrographic Service water level network:** 89 stations in Atlantic, St. Lawrence (Gulf, Estuary, River), Great Lakes, Pacific, Arctic
- Network of real-time buoys, thermographs and HF radar (UQAR) in the Gulf of St. Lawrence



C30



Water level gauges:



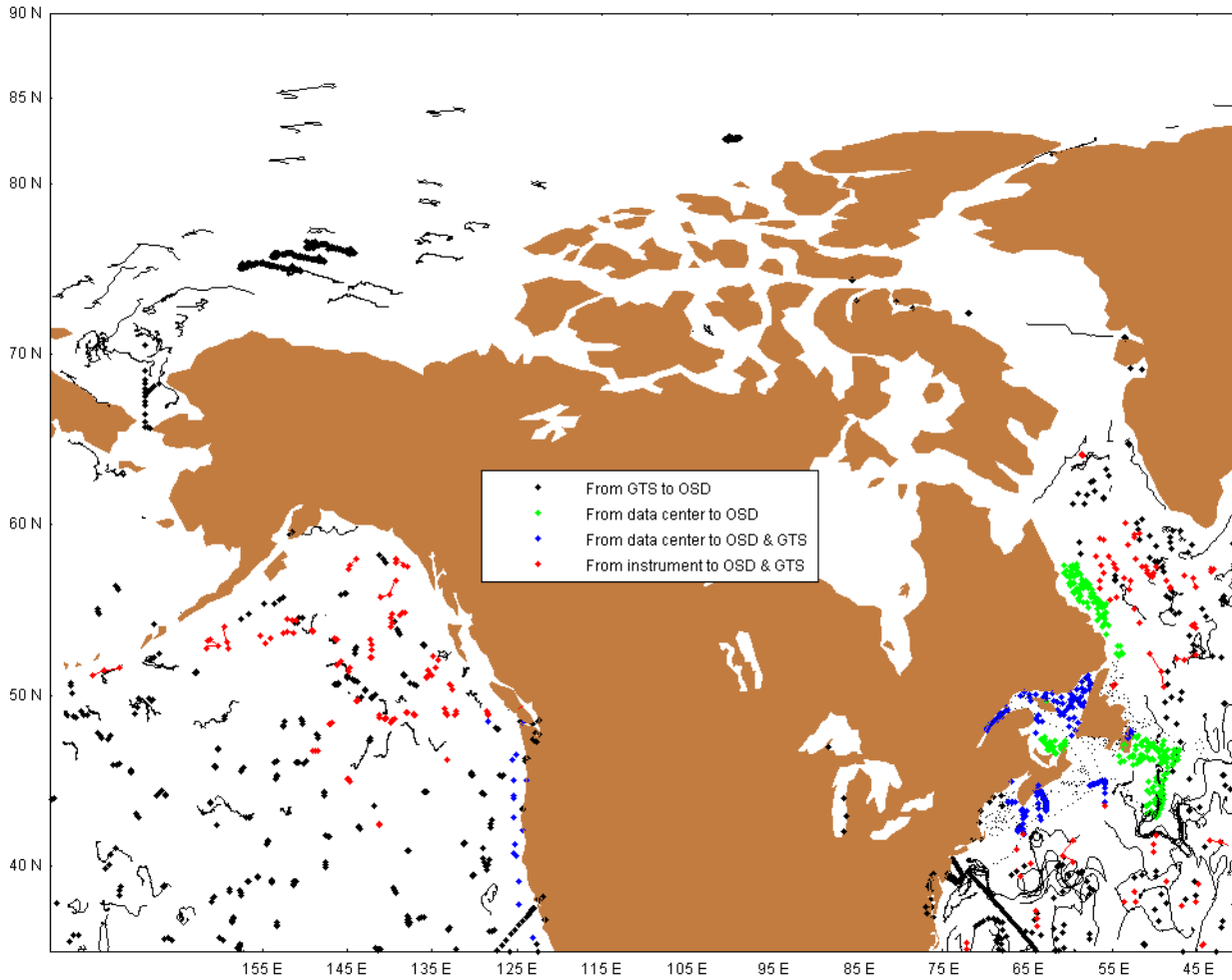
MLI/
UQAR



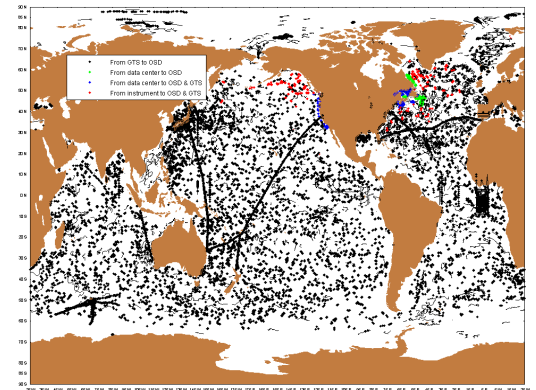


Data Acquired

- Remote sensing (chlorophyll, temperature, salinity, primary production, altimetry, ocean colour)
- Oceanographic profiles collected by universities or other countries in Canadian zone of interest
- Global oceanographic profiles and buoy data from the Global Telecommunication System of WMO
- Wave spectral and statistical data from Environment Canada's ODAS and MSC hindcast



GTS Data Distribution October 2013





Data Acquired (cont'd)

- Physical environment data collected as per National Energy Board regulations (waves, currents, t&s)
- Drifting buoy derived surface velocity field by NOAA's Atlantic Oceanographic & Meteorological Laboratory
- Continuous plankton recorder data by Sir Alister Hardy Foundation for Ocean Science



Stakeholders

Data Recipients / Users :

- Canadian Coast Guard (DFO)
- Environment Canada
- Department of National Defence
- U.S. Army Corps of Engineers (USA)
- NOAA (CDC, NODC)
- University of Hawai'i Sea Level Center (USA)



Stakeholders (cont'd)

- Canadian universities (UBC, Dal, MUN, UQAR, ..)
- U.S universities (WHOI, Rutgers, MIT, Columbia, ..)
- China (Beijing Normal University, Chinese Academy of Sciences, Xiamen University, University of Science and Technology)
- France (CLS, CNRS, Ifremer)
- Australia (AODC, Bureau of Meteorology, uni...)
- UK (SAHFOS, Met Office Hadley Centre, College..)



Needs, issues, opportunities

Issues: IT support (storage, communication technologies, human resources)

Needs: More flexibility in information technologies allowed, dissemination platforms, security credentials

Opportunities:

- Federal Geospatial Platform
- World Class Tanker Safety
- Oceanographic Services Framework
- Inter-departmental collaborations (CONCEPTS)



Funding Structure

- Operating funds, capital funds, grants/contributions
- Overall DFO spending will be 1.6B, compared to 1.8B in 2013-2014
- Planned spending for 2014-2015:
 - **Ocean Forecasting (97 FTE) 8.8 M**
 - Environmental Response Services (107 FTE) 12.9 M
 - Species at Risk Management (115 FTE) 22.4M
 - Climate Change Adaptation Program (7 FTE) 2.3M

Source: Report on Plans and Priorities 2014-2015



International Linkages

- The *Oceanography and Scientific Data (OSD)* branch is Canada's *National Oceanographic Data Centre (NODC)* in the *International Oceanographic Data and Information Exchange (IODE)* panel of the *Intergovernmental Oceanographic Commission (IOC)*



- *Argo Canada* is part of the international *Argo* programme, recognized by the *Global Climate Observing System (GOOS)*



International Linkages (cont'd)

- **OSD** contributes water levels from ocean coastal stations to several initiatives under the *World Meteorological Organization (WMO)* and **IOC** (the *Global Sea Level Observing System*, which is recognized by **GOOS**)



- **OSD** provides trans-boundary water level data to the *International Joint Commission (IJC)*



International Linkages (cont'd)

DFO's involvement in **JCOMM** encompasses all structure areas:

- Observations (Data Buoy Cooperation Panel, Ship Observation Team, OceanSITES, GTSP, Argo, GLOSS, GOSUD)
- Data Management (Marine Climatology Data System, Practices/Standards, GTS code forms, Ocean Data Portal)
- Services and Forecasting Systems (Waves Coastal Hazards Forecast, Operational Ocean Forecasting)





International Linkages (cont'd)

- **OSD** is a *Global Data Assembly Center* for two programmes of the *Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM)* of the *World Meteorological Organization* and IOC:
 - *Data Buoy Cooperation Panel (DBCP)*
 - *Global Temperature-Salinity Profile Programme (GTSP)*



⇒ Both programs contribute to **GOOS**





International Linkages (cont'd)

- The *Institute of Ocean Sciences* (Sidney, BC) and *Bedford Institute of Oceanography* (Dartmouth, NS) contribute to **GOOS**, sharing data with:
 - *Carbon Dioxide Information Analysis Center*
 - *CLIVAR & Carbon Hydrographic Data Office*
 - *International Ocean Carbon Coordination Project*
- The *Bedford Institute of Oceanography* hosts the long term archive for *OBIS Canada* and DFO contributes data to **OBIS** (part of **IODE**).

