

Report on Data Activities in Canada 2000

Prepared by
The Canadian National Committee for CODATA (CNC/CODATA)

The following report on data activities in Canada was prepared in conjunction with the 22nd General Assembly of CODATA¹ at Stresa, Italy in October 2000. To obtain further details on individual items or to submit information on other Canadian data activities for inclusion in the next report (September 2002) please contact:

Le rapport ci-joint, qui fait état des activités du Canada en matière de données, a été préparé conjointement avec la 22^e assemblée générale de CODATA, à Stresa, Italie, en octobre 2000. Pour obtenir de plus amples renseignements sur des points particuliers ou pour soumettre de l'information sur d'autres activités canadiennes sur les données aux fins d'insertion dans le prochain rapport (septembre 2002), veuillez communiquer avec:

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(For a copy of the report in French, please contact the Secretariat.)

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22nd General Assembly of CODATA, Italy, October 2000

Report on Data Activities in Canada

Activities in Canada, as known to the Canadian National Committee for CODATA (CNC/CODATA), are reported below in the categories shown. Further information may be obtained either from the contact information appearing in conjunction with most items or from the rapporteurs listed in Section XI.

I. Biological Sciences (B. Malone)

A. *Data Banks with Public Access Via the Internet:*

1. Organelle Genome Database (GOBASE)

GOBASE is a taxonomically broad organelle genome database that organizes and integrates diverse data related to organelles. The current version focuses on the mitochondrial subset of data.

<http://megasun.bch.umontreal.ca/gobase/gobase.html>

2. Integrated Taxonomic Information System (ITIS)

A comprehensive online resource for biological names of importance to North America. ITIS is an international attempt by the United States, Canada and Mexico to build the first comprehensive, standardized reference for the scientific names of the flora and fauna of importance for North America. ITIS focuses on the biota of North America and surrounding oceans, but also includes world treatments of selected groups such as birds, mammals, fish, amphibians, reptiles, mollusks, corals and others.

<http://res.agr.ca/itis>

3. Canadian Collection of Fungal Cultures

The Canadian Collection of Fungal Cultures(CCFC) currently holds 10,500 strains of fungal cultures representing about 2,500 species. The collection originated as an amalgamation of individual research collections and now serves as the primary repository for fungal cultures in the Agriculture and Agri-Food Canada research branch and accepts patent strains. It functions as a gene bank for this microbial resource and provides pure cultures to scientists in agriculture, forestry, medicine, private industry and biotechnology. Many species held in the collection are unique, and a number are new to science.

<http://res.agr.ca/brd/ccf/>

4. Directory of Canadian Culture Collections

Information was collected on the numbers of collections, diversity, availability, funding and methods of preservation used. Three types of collections emerged. A few collections were large in terms of taxa and isolates held. Others contained few species but represented important national or international collections of characterized

strains. Most of these collections received institutional support for facilities and operations. Those

remaining could be characterized as working collections of individual researchers. These were maintained with program budgets or from academic research grants.

<http://res.agr.ca/brd/ccc/ccfdir/ccfdire.html>

5. Cystic Fibrosis Mutation Database

The information contained in this database is compiled with information collected by the Cystic Fibrosis Genetic Analysis Consortium.

<http://www.genet.sickkids.on.ca/cftr/>

6. The Androgen receptor mutations database WWW Server

This resource contains a database of Androgen Receptor gene mutation, mutation maps and links to the references and the related EMBL site.

<http://www.mcgill.ca/androgendb>

B. Organizations or Systems Providing Access to the International Data Banks

7. Canadian Bioinformatics Resource (CBR)

CBR is a national facility dedicated to providing Canadian researchers with convenient, effective access to biotechnology-related databases and bioinformatics software tools. CBR is the national EMBnet (European Molecular Biology Network) node for Canada and a member of Asia Pacific Bionet. Not only does CBR provide access to over 70 databases, it offers a complete set of software tools.

<http://www.cbr.nrc.ca>

8. CIAR Program in Evolutionary Biology (CIAR-PEB)

The Canadian Institute for Advanced Research (CIAR) supports a network of researchers across Canada as well as in other countries. The goal of the Program in Evolutionary Biology (CIAR-PEB) is to use the comparative database of genome sequences, to which this project will contribute, for developing concepts of genome, cell and population evolution, and for constructing algorithms for molecular structure/function analysis which may be later applied to problems in biotechnology, microbial diversity and genetic/genome technology. The CIAR-PEB Home Page contains information about its programs and activities as well as provides links to world wide Molecular Evolution and Computational Biology resources.

<http://megasun.bch.umontreal.ca/ciar/>

C. Main Sequencing Projects, Which Make Their Data Available to the Public

9. Sulfolobus Solfataricus Genome Data

The *Sulfolobus solfataricus* genome-sequencing project, a collaboration among seven laboratories worldwide: three Canadian (W. Ford Doolittle, Dalhousie University; Robert Charlebois, University of Ottawa; Mark Ragan, NRC-IMB) and four European (Roger Garrett, University of Copenhagen; John van der Oost, Wageningen Agricultural University; Michel Duguet, Universite Paris-Sud; Ib Groot Clausen, Novo Nordisk, Copenhagen) has been completely finished. Details about the project can be found at:

<http://niji.imb.nrc.ca/sulfhome>.

The *Sulfolobus* data are being prepared for database submission and subsequent publication. Currently, the genome analysis and annotation are accessible from the *Sulfolobus* MAGPIE site at:

<http://www.cbr.nrc.ca/sulfolobus>.

10. Organelle Genome Megasequencing Program (OGMP)

The OGMP is an interdisciplinary collaboration of seven Canadian research groups from Eastern Canada, each of which is interested in molecular evolution, mainly focusing on mitochondria, plastids and bacteria. This collaborative project, supported by the Canadian Genome Analysis and Technology Program (CGAT), concentrates on organelle phylogeny and includes the establishment of a centralized sequencing facility (the Megasequencing Unit) that serves as the major research hub. The "Megasequencing Unit" is located at the University of Montreal. The OGMP bioinformatics division is responsible for the data handling and analysis. The sequences of mitochondrial genomes from the "Megasequencing Unit" will be made available to the scientific community through GenBank and GOBASE.

<http://megasun.bch.umontreal.ca/ogmproj.html>

11. Fungal Mitochondrial Genome Project (FMGP)

FMGP, a project of B. F. Lang's research group (Department of Biochemistry, University of Montreal), is supported by the Medical Research Council of Canada (MRC). The goal of the FMGP is to sequence complete mitochondrial genomes from all major fungal lineages, to resolve the fungal branch of the 'tree of life' and to investigate mitochondrial gene expression, introns and mobile elements. The webpages of the FMGP include extensive information on subjects such as general organismal information, gene map, complete sequence, phylogeny, etc.

<http://megasun.bch.umontreal.ca/People/lang/FMGP/FMGP.html>

II. Chemistry (P. Mezey)

A. LOGKOW - Databank on Octanol-Water Partition Coefficients

Dr. James Sangster, of Sangster Research Laboratories, Montréal, Québec, has maintained and upgraded a databank on octanol-water partition coefficients of a large set of molecules, important in a variety of chemical and biochemical fields, including human health. In the study of biochemical activities of potential drug molecules as well as environmental toxicants, these data are essential in making comparisons and potential predictions. (james.sangster@mail.polymtl.ca)

B. Canadian Domestic Substances & Non-Domestic Substances Databank

TerraBase Inc. has released its Canadian Domestic Substances & Non-Domestic Substances List (DSL&NDSL) on CD-ROM. The DSL&NDSL covers over 66,400 substances scheduled under the Canadian Environmental Protection Act (CEPA). The Toxicity Data & QSAR Database, an integral part of the TerraTox / TerraFit Software Suite, contains records on more than 8000 compounds, many of which are known or suspected carcinogens, mutagens, pesticides, endocrine disruptors. It also contains at present more than 5000 references of recent scientific publications on quantitative structure-activity relationships (QSARs) and closely related subjects (including data sources). (klaus.kaiser@cciw.ca)

C. PAH (polyaromatic hydrocarbon) Aquatic Toxicity Databank

A databank on the photochemical activities and aquatic toxicity of polyaromatic hydrocarbons, as well as their photooxidized products is maintained and further developed by Prof. Bruce Greenberg and Prof. G. Dixon, University of Waterloo, Ontario. Data on the chemical properties and toxicities recorded in this

database are expected to serve both academia and the chemical industry, providing tools for toxicological risk assessment and environmental action.

(Prof. Bruce Greenberg, Prof. G. Dixon, Department of Biology, University of Waterloo, Ontario.)

D. Pesticide, Herbicide, Metal Contaminants, Synergistic Toxicity in Soil Database

A database of pesticide and herbicide activities in the presence of metal contaminants, affecting the soil - plant root system interface is maintained and further developed by Prof. Huang, University of Saskatchewan. This database is explored in similarity studies, in order to enhance the predictability of adverse effects of new pesticides and herbicides entering the market and for suggestions of potential modifications.

(Prof. P. Ming Huang, Dept. of Soil Science, University of Saskatchewan, Saskatoon, SK Canada)

E. Hemoglobin Binding Affinity Constants Database

A database on the hemoglobin binding affinity constants of a large series of organic molecules has been maintained and further developed by Prof. Krishnan, Université de Montréal. This database is already being applied for the study of some of the adverse effects of toxic substances.

(Prof. Kannan Krishnan, Dép. Médecine du Travail et d'Hygiène du Milieu, Faculté de Médecine, Université de Montréal, Québec.)

F. Cadmium and Zinc Uptake by Grain Varieties Databank

A database on the toxicity of various metals, including Cadmium and Zinc, with special emphasis on their uptake by grain varieties, is being maintained and upgraded by the research groups of Prof. Beverly Hale, University of Guelph, Ontario, and Prof. Francine Denizeau, Dép. Chimie, Université du Québec à Montréal, Québec.

G. Functional Group Electron Density Databank for Carcinogenic Carbonyl Compounds

A functional group electron density database of carcinogenic carbonyl compounds involved in vehicle exhausts is being developed by Dr. Serge Lamy, Health Canada and Dr. Mezey, University of Saskatchewan. (mezey@sask.usask.ca)

H. Halogenated Organic Molecules Electron Density Databank

A molecular shape database for a series of halogenated organic molecules is maintained and upgraded by Prof. Mezey, University of Saskatchewan. The earlier polyaromatic hydrocarbon (PAH) shape database is continuously updated. These shape databases have new applications in the pharmaceutical industry, in new lead search, in toxicological risk assessment within the framework of CNTC (Canadian Network of Toxicology Centres) Quantitative Risk Assessment project, and in pesticide research.

(mezey@sask.usask.ca)

III. Crystallography (J. Rodgers)

A. NRC Metals Crystallographic Database (CRYSTMET)

CRYSTMET, a database of intermetallic crystal structures, developed and maintained by Toth Information Systems, is now available within the Materials ToolKit computing environment for crystallographic databases. In addition to CRYSTMET, the Inorganic Crystal Structure Database (ICSD) from FIZ-Karlsruhe, Germany, can also be accessed using this environment. For both these databases, in addition to the structure data, the calculated powder patterns are available within Materials ToolKit. A web version of this environment, for intranet use, will be available in April 2001. More information on these crystallographic databases and tools are available at <http://www.TothCanada.com>

B. Cambridge Structural Database (CSD)

The CSD is distributed in Canada by Dr. George Ferguson at the University of Guelph. The CSD CD-ROMs are distributed to the sites in mid-April and mid-October each year. Access to the CSD is then available to the group covered by the relevant site-license at each university. (george@angus.chembio.uoguelph.ca)

IV. Oceanography (G. Needler)

A. The Marine Environmental Data Service -MEDS (Ottawa, Ontario, Canada)

MEDS (http://www.meds-sdmm.dfo-mpo.gc.ca/meds/Home_e.htm) is a branch of Canada's federal Department of Fisheries and Oceans (DFO) and is the lead organization for archival and dissemination of oceanographic data. In addition to the archival of ocean data collected by DFO programs, Furthermore, MEDS acquires and archives a variety of oceanographic data distributed via GTS, and is the designated archival centre for many of these data. MEDS also acquires through international exchange programs data from programs conducted in ocean areas adjacent to Canada. MEDS is in the process of making its data holdings available on the web, and currently maintains the site for the Atlantic Zone Monitoring Program (http://www.meds-sdmm.dfo-mpo.gc.ca/zmp/main_zmp.html) which provides near real time observations for a number of fixed stations and standard sections on the East Coast of Canada as well as a number of long term climatological time series.

In addition to the national data centre, the individual regions also maintain large data holdings and data products specific to their own needs. If MEDS does not have the required information, they will refer enquiries to the appropriate organization below.

B. The Northwest Atlantic Fisheries Centre

(St. John's, Newfoundland, Canada) provides a number of oceanographic data products and databases as well as data products from individual research programs, including T/S profiles, moored current meter and thermograph time series, and moored and vessel mounted Acoustic Doppler Current Profiler (ADCP) data.

<http://oceanography.nwafc.nf.ca:81/>

C. The Bedford Institute of Oceanography (Dartmouth, Nova Scotia, Canada)

The Ocean Science Division provides a number of oceanographic data products and databases as well as data products from individual research programs. Among the databases are Climate (500,000 TS profiles for the NW Atlantic), SST (AVHRR sea surface temperatures since 1981 for the NW Atlantic) and ODI (inventory and monthly time series statistics for moorings of current meters, thermographs and water level gauges in the NW Atlantic). Information and access to these databases are available from

http://www.mar.dfo-mpo.gc.ca/science/ocean/database/data_query.html

D. Maurice Lamontagne Institute (Mont-Joli, Québec, Canada)

The St. Lawrence Observatory provides a number of oceanographic data products specific to the Gulf of St. Lawrence and Estuary. Products include both observational and remotely sensed temperatures, water levels and numerical models.

<http://www.osl.gc.ca/en/index.htm>

E. The Institute of Ocean Sciences - Patricia Bay (British Columbia, Canada)

The Ocean Science and Productivity Division provides a number of data products including sections from Line P and real-time air and sea temperature, winds, and barometric pressure from an array of buoys off the British Columbia coast.

<http://www.pac.dfo-mpo.gc.ca/sci/osap/>

V. Geophysical (R. Coles)

Geomagnetic Data

The National Geomagnetism Program of the GSC maintains the archive of Canadian magnetic observatory data, describing the variations with time in the Earth's magnetic field at points across Canada. This archive of about 7 GB contains high-resolution digital data from 13 observatories for the past 24 years plus historical data back to the time of the International Geophysical Year and earlier. The most recent two years of data are maintained on-line. The database is accessed by researchers and others from all parts of the world. An automatic DRM (data request manager) using electronic mail is in operation, and custom requests can be handled using Internet ftp. Descriptive material on data acquisition, data availability, and conditions of access can be found at <http://www.geolab.nrcan.gc.ca> Data can be viewed in graphical form on the Web without restriction.

VI. Geospatial (J.P. Lauzon)

Geospatial Data Access

Natural Resources Canada, through CEONet, continues to provide infrastructure tools and services for the discovery of, and access to, geospatial products and services. There are currently over 7,000 databases registered by 1500 organizations, 500 of which are Canadian. These databases may be viewed by the type of data (e.g., paper map, satellite image, ground measurement) or by application (e.g., geology, forestry, climate change). Functionality at the CEONet website supports search and visualization capabilities including a Metadata directory of interlinked Data, Services and Organizations; a Distributed Search that allows metadata search/retrieval to heterogeneous information communities; a Map Server; and a Gazetteer. Many Canadian datasets are available at no charge through the GeoGratis program.
<http://geogratis.cgdi.gc.ca>

CEONet provides a list of approximately 200 services, most of which are Canadian. Services are provided by organizations and may apply to specific databases. Services include professional services offered by industry, government services, education (professional training or academic programs), and on-line services. CEONet is planning to adopt the on-line services catalogue specification being developed by ISO TC211 committee and the Open GIS Consortium.

VII. Environment (B. Malone)

A Selection of Canadian Federal and Provincial Government Environmental Databases

A. Environment Canada

1. IJC Great Lakes Herring Gull Contaminant Monitoring Program

Herring Gull eggs from several sites throughout the Great Lakes are monitored on an annual basis for a wide variety of organochlorine and heavy metal contaminants in order to assess the biological damage caused by the presence of persistent pollutants in the environment and to assess the effectiveness of efforts to prevent or reduce contamination by toxic chemicals in the Great Lakes basin. The survey has been ongoing since 1972. The data are stored in a LIMS database, accessible via ACCESS.

Environment Canada, Canadian Wildlife Service

www.cciw.ca/green-lane/wildlife/wild-monitoring/wild-toxicology/toxicology.html

2. Contaminants in Eggs of Fish-eating Colonial Birds of the Great

This is a study of the contaminant levels in Great Lakes populations of fish-eating birds and their possible biological effects in response to studies that showed lowered productivity, declining population levels and extremely high contaminant levels. The survey has been ongoing at 67 sites in the St. Lawrence Great Lakes (including US locations) monitoring eggs of *Larus argentatus* (herring gull), *Phalacrocorax auritus* (double-crested cormorant), *Sterna caspia* (caspien tern), *Sterna hirundo* (common tern), *Nycticorax nycticorax* (black-crowned night heron), *Larus delawarensis* (ring-billed gull), *Sterna forsteri* (Forster's tern) for organochlorine and heavy metal contaminants. The data are stored in a LIMS database, accessible via ACCESS. This program is conducted in concert with the IJC Herring Gull Monitoring Program.

Lakes Environment Canada, Canadian Wildlife Service

www.cciw.ca/green-lane/wildlife/wild-monitoring/wild-toxicology/toxicology.html

3. Canadian Migratory Game Bird National Harvest Survey (NHS) and

Species Composition Survey (SCS)

These surveys are intended to obtain annual information on the total, seasonal and spatial harvest of ducks, geese and other game birds in Canada, on the ecological characteristics of waterfowl harvested in Canada and the hunter activity associated with that harvest. The NHS is based on a questionnaire that asks hunters to provide information on the number, location and timing of their hunting trips and on migratory game birds killed. The SCS asks hunters to send in the wing from each duck killed and the tail feathers from each goose killed along with the hunting details. The survey covers all of Canada divided into 23 zones and has been carried out annually since 1966. The bilingual database currently contains 9000000+ records.

Environment Canada, Canadian Wildlife Service
(helene.levesque@ec.gc.ca)

4. National Air Pollution Surveillance Network (NAPS)

Continuous air quality data from major population centres. Continuous gaseous - sulphur dioxide, carbon monoxide, nitrogen dioxide, ozone and soiling index; total suspended particulates - mass, lead, sulphate and nitrate; inhalable particulate - coarse, fine particulates and associated metals and ions including sulphate, nitrate and lead, toxics including VOC, PAH, dioxin/fluran, metals, SO₂, NO_x, VOC, O₂, O₃, TSP.

Environment Canada, Atmospheric Environment Branch
(william.moores@ec.gc.ca)

5. Nutrient and Biological Productivity in Atlantic Region Waters

Collects data relating water chemistry to biological production. Includes water temperature, colour; dissolved oxygen, major ions, phosphorous nitrogen, metals; aquatic birds, fish, chlorophyll and invertebrates.

Environment Canada, Canadian Wildlife Service
(joe.kerekes@ec.gc.ca)

6. Water Related Issues Database

Includes soil erosion, floods, droughts; contamination, pesticide issues, acid rain; municipal infrastructure, economic development, water use, waste disposal and conservation. Used to monitor water use and associated problems.

Environment Canada, Environmental Conservation Branch
(francine.rousseau@ec.gc.ca)

7. National Ecological Monitoring and Assessment (EMAN)

EMAN's aim is to understand the changes occurring in ecosystems by establishing long-term multidisciplinary monitoring programs in conjunction with research, experimentation and with a program of developing national environmental indicators. EMAN has 4 overall objectives: 1) To provide a national perspective on how Canadian ecosystems are being affected by environmental stresses; 2) To provide scientific rationale for pollution control and resource management; 3) To evaluate and report on the effectiveness of these policies; 4) To identify new environmental issues at the earliest possible stage. Ninety sites are studied across Canada with at least one site in each of 15 terrestrial and 5 marine ecozones. There are 2 databases, one in mSQL and one (metadata) in z39.50.

Environment Canada, Indicators, Monitoring and Assessment Branch

<http://www.cciw.ca/eman-temp/search/search.html>

8. Marine Climatological Data

Database on winds, waves, temperature, ice, icebergs, weather, etc. Includes ice cover, wind speed, wind direction, wave height, wave period, air temperature, sea surface temperature, etc.

Environment Canada, Atmospheric Environment Branch
(stu.porter@ec.gc.ca)

9. Oceanbase

Ocean dumping data for harbours and dumping sites throughout the Atlantic Region. Includes sediment grain size; carbon, oil and grease, cadmium, mercury, lead, zinc, copper, PCB, DDT, PAH in sediments; locations of dredging and dumping operations.

Environment Canada, Environmental Protection Branch
(adrian.macdonald@ec.gc.ca)

10. Toxic Chemicals Database (NAQUADAT)

Database on toxic chemicals in water, sediments and fish in the Atlantic Provinces. Includes PCB, PAH, chlorophenols and other organic contaminants in water, sediments and fish. Used to monitor ambient concentrations of toxic chemicals.

Environment Canada, Environmental Conservation Branch
(hugh.o'neill@ec.gc.ca)

11. Climate

Climate data are used to meet many needs: climate change detection, development and input to Global Climate Models (GCMs), environmental assessments, building codes, hydro-meteorological applications (flood forecasting and flow regulation), and to meet International Commitments for data such as the Global Climate Observing System (GCOS) and Reference Climate Stations. Data are collected on precipitation, humidity, pressure, rate of rainfall, evaporation, snow depth (point and survey), wind speed and direction, hours of sunshine, soil (temp and moisture) ice thickness, freeze-up/break-up dates for inland and coastal waters.

Environment Canada, Atmospheric Environment Service
<http://www.cmc.ec.gc.ca/climate>

12. Hydrometric Database (Water Quantity)

Hydrometric data are used to meet a broad range of needs: environmental assessment, sustainable development of the resource, climate change impacts, aquatic and ecosystem health, water supply management, (e.g. apportionment, irrigation) flood prediction and control, engineering design (e.g. dams, bridges), etc. to support Federal Water Policy, Canada Water Act, Federal-Provincial Water Quantity Cost-Share Agreement, Boundary Water Treaty Act and the International Rivers Improvement Act. Data on water level, discharge, water velocity, freeze-up/break-up dates, ice thickness and water temperature are currently collected from 2,650 stations across Canada.

Environment Canada, Atmospheric Environment Service
<http://www.cmc.ec.gc.ca/climate>

13. Sediment

Sediment data (suspended sediment concentration, suspended sediment particle size, turbidity, bed material particle size, bed load) from 315 stations are used to meet a variety of needs: contaminant transport, environmental assessments, regulations, loading to reservoirs, lakes and oceans, dredging and in-stream mining, erosion control, river engineering, etc. This database is integrated with the hydrometric program. Environment Canada maintains the national database (HYDAT), which houses the sediment data, and the SEDEX metadata database in Downsview.

Environment Canada, Atmospheric Environment Service

<http://www.cmc.ec.gc.ca/climate>

14. Industrial Water Use Survey

Water Use Databases containing data on water and sewage, intake, discharge, re-circulation, intake treatment and discharge treatment (with category details) as well as cost components for water acquisition, re-circulation and both intake and discharge treatment for the four sectors surveyed: manufacturing, mineral extraction, thermal power and hydro power for the major water-using industrial (SIC) groups selected for each survey (about 7000 in each survey year universe). The maintenance of an Access database (NAWUDAT) of the past four completed surveys will be updated with the addition of the 1996 data.

Background descriptions and information are available for each survey upon request. Data are available for Canada, region, province, city, town or basin etc. , identified by Statistics Canada Standard Geographic Codes and Water Survey Hydrometric Codes. Summary data at the aggregate level are available upon request. Summary tables and Survey summary publication are prepared by Environmental Economics Branch (P&C).

Environment Canada, Environmental Economics Branch

(dave.scharf@ec.gc.ca)

15. CWS Seabird Egg Monitoring Program

The seabird egg contaminant monitoring program was established by the Canadian Wildlife Service (CWS) to provide an index to contamination of the marine ecosystem and possible implications for seabird health. The program is divided into three components: Atlantic, Pacific and Arctic. Collection of eggs as an index to contamination was chosen as a non-intrusive way of obtaining information for an ongoing survey. The objective is to determine if levels of organochlorine and metal contaminants in seabird eggs are representative of the marine environment of Canada. The data are stored in LIMS (computerized Laboratory Inventory Management System). Some data are published in scientific literature. Unpublished data are available upon request.

Environment Canada, Canadian Wildlife Service

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16. National Survey of Contaminants in Waterfowl

Safety of waterfowl and other wild foods for consumption is a major concern of native peoples and hunters. Environment Canada is expected to have information on levels of contaminants in migratory game birds and other edible wildlife of federal interest. A review of toxic chemical residues in Canadian game birds revealed that there are very few data prior to 1988. Elevated levels of some chemical compounds have, however, been found in waterfowl from certain areas. A national survey of contaminants in waterfowl was conducted between 1988 and 1995. The objective of the project is to provide a comprehensive database on contaminants in waterfowl collected from across Canada to Health Canada so that the risk to human health of eating those waterfowl may be assessed. The data are stored in LIMS (computerized Laboratory Inventory Management System) and in QuattroPro and Excel data files and are Data are published in CWS Tech. Report No. 326. The entire report including data is available at

<http://www.cws-scf.ec.gc.ca/nwrc/tr/tech326/index.html>

Environment Canada, Canadian Wildlife Service
(birgit.braune@ec.gc.ca)

17. Municipal Water Use Database (MUD)

There is an increasing emphasis on correlating environmental impacts and health effects across Canada and therefore a need for a relational database containing water use data, accessible by governments and the public. The database consists of basic municipal population as well as water and sewage flow information from 1355 Canadian municipalities. It also includes simple raw data summations. Some water use groups, water treatment and wastewater treatment types, and effluent data are available as well. The database is available at <http://www.ec.gc.ca/water/index.htm>

Environment Canada, Environmental Economics Branch
(dave.lacelle@ec.gc.ca)

18. Forest Bird Monitoring Program

The Ontario Forest Bird Monitoring Program (FBMP) is a volunteer-based program whose goals are: 1) compile a habitat-specific baseline inventory of forest songbirds; 2) describe changes over time in relation to habitat and landscape; 3) understand population trends for forest birds. Data are collected at 298 sites from large, mature forests throughout Ontario and a few sites in Saskatchewan and New Brunswick.

Environment Canada, Canadian Wildlife Service

<http://www.cciw.ca/green-lane/wildlife/wildspace>

19. Great Lakes Open Lakes Surveillance Program

A coordinated surveillance and monitoring program that monitors throughout the Great Lakes. Lakes are sampled on a rotational basis to provide water quality trend information and to describe and quantify cause (loads) and effect (water quality) relationships to help understand how the Great Lakes physical, biological and chemical systems operate. Data collected include temperature, major ions, conductivity and pH, alkalinity, conductivity, color, turbidity, transparency, residues, secchi depth, depth, ammonia, carbon, chloride, dissolved oxygen, nitrogen, phosphorous, sulphates, nutrients, metals, organochlorines bacteria zooplankton and phytoplankton counts and biomass.

Environment Canada, Ontario Region

<http://www.cciw.ca/glimr>

20. Water Quality Monitoring Network

The purpose of the program is to provide data and assessments on the quality of the aquatic environment in BC and the Yukon for use by federal and provincial agencies and other clients, in support of uses such as long-term trend analysis, resource management programs, pollution control regulations, environmental assessment studies and legislative formulations. Water is sampled biweekly for major ions, nutrients, metals, fecal coliforms, general variables, conductivity, turbidity, OCs and other pesticides in fish and sediment and other variables of site-specific importance from approximately 30 federal-provincial and 13 federal stations-sites mainly located on rivers of federal interest in BC and the Yukon (near transboundary locations, national parks, major fisheries).

Environment Canada, Pacific and Yukon Region
(andrea.ryan@ec.gc.ca) (beverly.mcnaughton@ec.gc.ca)

21. Great Lakes Satellite Data

Data are downloaded from the Advanced Very High Resolution Radiometer (AVHRR) aboard the NOAA Polar Orbiting Environmental Satellites (POES) in order to obtain a time series of aquatic and basin colour and temperature from the Great Lakes that can be related to possible natural and/or anthropogenic environmental stressors and can assist in the development and validation of chlorophyll concentration algorithms and optical/water quality models.

Environment Canada, National Water Research Institute
(robert.bukata@cciw.ca) (john.jerome@cciw.ca)

22. Environmental Effects Monitoring (EEM)

Required under the Pulp and Paper Effluent Regulations to determine if pulp and paper effluents are causing effects in the aquatic environment, and thereby to determine the adequacy of the regulation in protecting fish, fish habitat and the use of fisheries resources. Each pulp and paper mill or off-site treatment facility (OSTF) in Canada covered by the regulation must monitor fish populations and benthic invertebrate communities at sites exposed to effluent and compare the results to sites not exposed to effluent in order to determine if the effluent is causing an effect on the aquatic environment. Some 123 pulp and paper mills and off-site treatment facilities across Canada are monitored for depth, velocity, dissolved oxygen, conductivity, resin acids, chloride, nutrients, chloroform sulphate, nitrate/nitrite, phosphorous, metals, organochlorines biological characteristics and toxicity.

Pulp and Paper Mill Environmental Effects Monitoring, National EEM Office
(Ed.Porter@ec.gc.ca)

23. Breeding Bird Survey in Canada (BBS)

Conducted in cooperation with the US Breeding Bird Survey, this program collects information on the distribution and abundance of breeding birds across Canada. Over 170 species are monitored in Canada.

Environment Canada, Canadian Wildlife Service

<http://www.cws-scf.ec.gc.ca/trends/bbs.html>

24. CWS Long Range Transport of Air Pollutants (LRTAP) Biomonitoring Program

The CWS LRTAP Biomonitoring Program aims to document the rate, nature and scope of biological recovery in aquatic ecosystems of eastern Canada following implementation of acid rain controls in Canada and the U. S. by monitoring waterfowl, loons and their habitats in selected regions sensitive to or affected by acid rain. Approximately 640 waterbodies in 3 regions in Ontario and one in Nova Scotia are monitored for waterfowl and loon density, broods and young produced, fish status, aquatic pH, alkalinity, conductivity, major ions, dissolved organic carbon, total phosphorus, ammonia, nitrate/nitrite, total nitrogen, some trace metal (subset), water colour, lake size, length, location and depth, riparian habitat features, forest cover types and surficial/bedrock geology.

Environment Canada, Canadian Wildlife Service
(Don.McNicol@ec.gc.ca)

B. Fisheries and Oceans Canada

25. The Experimental Lakes Area (ELA) Project Northwestern Ontario Ecosystem Database

This is a multidisciplinary collection of databases including biological (zooplankton, phytoplankton, benthos and fish), chemical, physical, hydrological and meteorological information about pristine and manipulated lakes, streams, and watersheds in the area. The databases support the whole-lake ecosystem research conducted at the Experimental Lakes Area (ELA) and a lake size series study (NOLSS) in northwestern Ontario. Over 100 lakes and 50 associated streams in northwestern Ontario are sampled every two weeks to one month. Variables measured include metals, organic chemicals, isotopes, radionuclides, trace metals, stable isotope ratios, radioisotopes, organochlorines, nutrients, major ions, silica, pH, alkalinity, conductivity, chlorophyll, phytoplankton, zoobenthos and zooplankton species and abundance, fish species, age, length, weight, phytobenthos meteorology, physical limnology, hydrology. The data are in an ORACLE database.

Fisheries and Oceans Canada, Freshwater Institute
(kasians.dfo.dfo-mpo.gc.ca)

26. DFO National LRTAP Biomonitoring Program

Fish and benthic macroinvertebrates at sites in eastern Canada are sampled annually to monitor the response of sensitive lakes and rivers to expected decreases in sulphate deposition resulting from emission controls. Some 36 lakes and 21 rivers in eastern Canada are covered.

Fisheries and Oceans Canada, M.A. Shaw
(705) 942-2848

27. National Contaminants Information System (NCIS)

This is a warehouse of information in an ORACLE database on toxic chemicals in freshwater and marine fish, marine mammals, other aquatic and marine organisms and their habitats from the Northwest Territories and southern Canada.

Fisheries and Oceans Canada, Freshwater Institute

(RowesK@dfo-mpo.gc.ca)

28. Great Lakes Fish Contaminants Surveillance Program [GLFCSP]

GLFCSP is a database on contaminant levels in fish from the Canadian Great Lakes (Ontario, Erie, Huron, Superior) designed to monitor these levels for fisheries management purposes. *Salvelinus namaycush* [lake trout], *Osmerus mordax* [rainbow smelt], *Stizostedion vitreum* [walleye], *Cottus cognatus* [slimy sculpin], *Aosa pseudoharengus* [alewife], and 7 other species, benthic invertebrates and net plankton are monitored annually at 45 sites on the Great Lakes. The data are stored in NCIS (see item #27 above).

Fisheries and Oceans Canada

(mike.whittle@c-a.dfo.dfo-mpo.x400.gc.ca)

C. British Columbia

29. BC Environmental Monitoring System (EMS)

The BC Environmental monitoring system contains physical/chemical, biological, bioassay and associated quality assurance data for ambient and discharge monitoring locations in an ORACLE database.

BC Ministry of Environment

(npeppin@epdiv1.gov.bc.ca)

D. Ontario

30. Ontario Herpetofaunal Summary (OHS)

The purpose of the OHS is to: 1) gather and publish information on distribution of Ontario amphibians and reptiles; 2) to gather and publish information on the ecology and life histories of amphibians and reptiles and; 3) to provide baseline data for futurework and to monitor endangered, threatened and rare species.

Ongoing since 1984, the database currently contains 80000+ records.

Ontario Ministry of Natural Resources, WWF Canada, the Canadian Reptile Conservation Society and the Essex Region Conservation Authority, Michael Oldham

(519) 773 9241

31. Ontario Sport Fish Contaminant Monitoring Program (OSFCMP)

The program tests as many angling areas as possible to assess the occurrence, uses, accumulation and trends through time of contaminants in fish. At 1600+ locations in Ontario 20 fish of each type to be tested from each location representative of the greatest potential for accumulation (i. e larger individuals from species with high lipid content for OC's)are tested for Organochlorines, metals. The Oracle database contains 800000 (to 1997) and is available on a cost recovery basis.

Ontario Ministry of the Environment and Ontario Ministry of Natural Resources

<http://www.ene.gov.on.ca/envision/guide/index.htm>

VIII. Materials Properties Data (G. Wood)

A. Ageing of concrete structures in a nuclear environment

The International Reunion of Laboratories for Testing of Structures and Materials (RILEM) continued work on a concrete ageing database during this period. A Task force of three, C.Seni (Canada), B. Oland (USA) and Michael Johnston (UK), working within the Technical Committee TC-160 MLN (Methodology for Life prediction of concrete structures in Nuclear power plants) finished and published the structure of the Concrete Ageing Database. For more details visit <http://www.rilem.ens-cachan.fr/> under Publications/Reports/Report19/Contents/4 Database for ageing management of NPP concrete structures

This work and the results of 3 Workshops sponsored by the Organization for Economic Cooperation and Development/Nuclear Energy Agency (OECD/NEA) during 1997-2000, were taken over by the International Atomic Energy Agency in Vienna (IAEA) which started in September 2000 work on a International Database of Concrete related to the ageing of nuclear structures. Participants in this task are a panel of specialists from four countries: C. Seni, Chair (Canada), L. Smith (UK), Y. Klimov (Ukraine) and Ashar (USA). (senic@istar.ca)

IX. Physics - Astrophysics (H. Dabkowska)

The Canadian Astronomy Data Center (CADS), established in 1984, continues to be the role model in data activities in astronomy. It handles the data produced by Canadian astronomers, facilitating the exchange of raw and recalibrated data. From their web page different kind of information can be obtained quickly and for different purposes.

For the data from the Hubble Space Telescope (HST) an innovative way of presenting raw and calibrated files was developed and is widely used.

The other accessible data collections are:

?? Canada-France-Hawaii Telescope (CFHT) archive,

?? James Clerk Maxwell Telescope (JCMT) archive,

?? Digital Sky Survey (more than 300 CDs).

?? IRAS HCON (Infrared Sky Atlas)

as well as the recently released Canadian Galactic Plane Survey (on 4 CDs). All these databases can be searched via the web by astronomers from around the world.

Easy access to other country's astronomical data bases is also available from the CADC web site at <http://cadewww.hia.nrc.ca/>

X Thermodynamics (J. Sangster)

A. Facility for the Analysis of Chemical Thermodynamics (F*A*C*T)

F*A*C*T is a fully integrated Canadian thermochemical database system which couples proven software with self-consistent critically assessed thermodynamic data. It currently contains data on over 5000 chemical substances as well as solution databases representing over 100 non-ideal multicomponent solutions (oxides, salts, sulfides, alloys, aqueous, etc.). F*A*C*T is available for use with Windows.

<http://www.crct.polymtl.ca>

B. University Research Programs

Profs. C. B. Alcock and V. Itkin (University of Toronto) assess thermodynamic data of the elements (Debye temperature, $C_p(T)$, enthalpy, third law entropy and fusion properties). C_p data are described by several equations and recommended data are given. (itkin@ecf.toronto.edu)

Prof. A. E. Mather (University of Alberta) measures vapour-liquid equilibria and enthalpies of reaction and solution for acid gases in aqueous solution of polar organic solvents (application in gas purification). He has contributed to the IUPAC Solubility Data Series in compilation and assessment of data for CO_2 in water and non-aqueous systems, as well as for solids and liquids in supercritical CO_2 . (Alan.Mather@ualberta.ca)

Prof. P. Englezos (University of British Columbia) measures gas hydrate phase equilibria involving methane, CO_2 , hydrocarbons and nitrogen. Measurements also include the solubility of calcium carbonate in the presence of adsorbed substances. (engelezos@interchange.ubc.ca)

Prof. P. R. Tremaine (Memorial University, Newfoundland) measures thermodynamic and spectroscopic properties of aqueous ions, complexes and non-electrolytes over an extended range of conditions up to and including the near-critical regime. These properties are sensitive to solvation effects and are being used at Memorial and elsewhere to develop semi-theoretical "equations of state" for modelling the behaviour of aqueous solutes in systems of geochemical and industrial interest. (tremaine@morgan.ucs.mun.ca)

XI. Canadian National Committee for CODATA

The Committee continued to meet annually during this biennium under the sponsorship of the Canada Institute for Scientific and Technical Information (CISTI). Dr. Hanna Dabkowska, Mr. Jean Paul Lauzon and Dr. Francis Ouellette joined as new members; Drs. Maria Korab-Laskowska, Roger Tomlinson and Daniel Durand completed their terms. In addition two new Observers, Mr. Glen Newton and Prof. Michel Sabourin were added. Current membership, along with rapporteur responsibilities for this report, is shown in the following table:

Chairman	Rapporteur - Section	Email address
Dr. Gordon H. Wood		
Members		
Dr. Hanna Dabkowska	Physics-Astrophysics	dabkoh@mcmaster.ca
Mr. Jean Paul Lauzon	Geospatial	jp.lauzon@agra.com
Dr. Paul Mezey	Chemistry	mezey@sask.usask.ca
Dr. George Needler	Oceanography	needlerg@mar.dfo-mpo.gc.ca
Dr. Francis Ouellette	Biology – Genomics	francis@cmmt.ubc.ca
Dr. James Sangster	Thermodynamics	jsangster@mail.polymtl.ca
Observers		
Dr. Robert Berman	Geological	berman@gsc.emr.ca
Dr. Richard L. Coles	Geophysical	coles@geolab.emr.ca
Dr. Hamid Jorjani		hamid.jorjani@nrc.ca
Mr. Brian Malone	Biology – Environment	bmalone@synapse.net
Mr. Glen Newton	Biology – Ecology	glen.newton@nrc.ca
Dr. John R. Rodgers	Crystallography	rodgers@snd.cisti.nrc.ca

Dr. Michel Sabourin	Psychology	Michel.Sabourin@UMontreal.ca
Dr. Larry Speers	Biology – Taxonomy	speersli@em.agr.ca
Dr. Barry M. Wood		barry.wood@nrc.ca
Secretariat		
Mrs. Marie-Christine Bernier-Therriault (Secretary)		marie-christine.bernier-therriault@nrc.ca
Dr. Gordon H. Wood (Exec. Secretary)	Materials	gordon.wood@nrc.ca

At its meeting in May 1997, the Committee initiated a pilot project to promote awareness in Canada of the need for data quality and data consistency. Prof. Mezey, who led this initiative, was successful in having it recognized as a CODATA Task Group at the 1998 General Assembly.

In co-operation with the CODATA Task Group on Data/Information and Visualization and the Ottawa Carleton Research Institute, the Committee organized a *Tutorial Workshop on Information Visualization* in June 1999. With its theme of 'Gaining Understanding from Information', the Workshop's thrust was to demonstrate the state-of-the-art of information visualization and to define future directions for research, development and implementation. The successful one-day gathering drew some 85 computer scientists, information specialists and software developers, primarily from 27 industries and 8 government departments in the greater Ottawa area. A copy of the full report is available at http://www.nrc.ca/codata/meet_reports/InfVis99.htm

A Second Workshop is planned for May 23, 2001.

The Committee continued its responsibility for distributing the CODATA Newsletter to over 400 addresses in Canada. CISTI, as the Secretariat for the Committee, has the distinction of hosting the main web site for CODATA which links to all the other CODATA activities world wide and includes electronic versions of the Newsletter, Handbook, various reports, etc. <http://www.cisti.nrc.ca/programs/codata/welcome.html>

In addition, CISTI assumed responsibility for hosting the web site for CNC/CODATA. Mrs Mary Zborowski served as webmaster.

<http://cadcwww.dao.nrc.ca/cnc-codata/>