

Report on Data Activities in Canada 2002

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

The following report on data activities in Canada was prepared in conjunction with the 23rd General Assembly of CODATA¹ at Montreal, Quebec in October 2002. To obtain further details on individual items or to submit information on other Canadian data activities for inclusion in the next report (September 2004) please contact:

Le rapport ci-joint, qui fait état des activités du Canada en matière de données, a été préparé conjointement avec la 23^e assemblée générale de CODATA, à Montréal, Québec, en octobre 2002. 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 2004), veuillez communiquer avec:

Secretariat, CNC/CODATA
CISTI, Building M-55, Room 275
National Research Council
Montreal Road
Ottawa, Ontario K1A 0S2

Secrétariat CNC/CODATA
ICIST, Édifice M-55, bureau 275
Conseil national de recherches
Chemin Montréal
Ottawa (Ontario) K1A 0S2

Telephone: (613) 991-5475
Fax: (613) 952-8246
Internet: codata@nrc.gc.ca

Téléphone : (613) 991-5475
Télécopieur : (613) 952-8246
Internet: codata@cnrc.gc.ca

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

(Pour obtenir la version française du rapport, veuillez communiquer avec le Secrétariat)

CONTENTS

I.	Aerospace (A. Jablonski)	page 1
II.	Biology - Ecology (G. Newton)	page 4
III.	Biology – Taxonomy (G. Baillargeon)	page 6
IV.	Chemistry (A. Hakin)	page 7
V.	Geoscience (S. Smith)	page 8
VI.	Goespatial (J.P. Lauzon)	page 9
VII.	Physics – Astrophysics (H. Dabkowska)	page 10
VIII.	Thermodynamics (J. Sangster)	page 10
IX.	Canadian National Committee for CODATA	page 11

23rd General Assembly of CODATA, Quebec, October 2002

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 IX.

I. Aerospace (A. Jablonski)

Aerospace category covers all disciplines associated with aerospace activities in Canada and they include, but are not limited to, the following areas on the space side: space sciences, space technologies and earth observation from space. Several government departments are involved with the leading role being the Canadian Space Agency in all space-related activities (<http://www.space.gc.ca>) and the Institute for Aerospace Research, National Research Council of Canada in all R&D aeronautical activities (<http://www.nrc.gc.ca/>). The present list represents selected existing databases in this category only.

Space Sciences

Canadian Space Agency (CSA) provides the framework for the peaceful use and development of space to meet Canada's social and economic needs, and to develop an internationally competitive space industry. Space sciences activities are supported in 6 areas: space astronomy, space environment, atmospheric environment, space life sciences, microgravity sciences and planetary exploration. National Research Council Canada (NRC) is the national adhering member of the International Committee on Space Research (COSPAR). However, in 1993, NRC and the CSA agreed that the CSA would be responsible for the Canadian Committee (CNC) for COSPAR. Since then, COSPAR obligations have been shared between the two agencies. The National Research Council's Advisory Committee on International Science, Engineering and Technology (CISSET) advises both NRC and CSA on COSPAR issues. Communication between the CNC/COSPAR, and NRC is managed by the NRC's International Relations Office. The CNC is made up of the existing advisory committees to the Space Science Program of the CSA. Dr. David J. W. Kendall of the CSA is the Canadian Representative to COSPAR Council. The following advisory committees comprise the CNC/COSPAR:

Space and Atmospheric Environment Advisory Committee (SAEAC)

The Joint Committee on Space Astronomy (JCSA)

Life Sciences Advisory Committee (LSAC)

Microgravity Sciences Advisory Committee (MSAC)

Canadian Advisory Committee on Scientific Utilization of Space Station (CACSUSS)

Their membership lists are available at the CSA web site <http://www.space.gc.ca>.

CSA has published a 2000 COSPAR Report entitled *Space Science Research in Canada 1998-1999*, ed. T. Hughes and A.M. Jablonski, Ottawa 2000. This report presents a cross section of space research activities in Canada.

Space astronomy

The Canadian Astronomy Data Center (CADC) established in 1984 collects data from the Hubble Space Telescope (HST) and an innovative way of presenting raw and also calibrated files has been developed and is widely used. CADC web site is <http://cadwww.hia.nrc.ca/>.

Space environment

The Canadian Auroral Network for the OPEN Program Unified Study (CANOPUS) is a network of automatic data collection stations located in west central Canada. CANOPUS was designed as an integrated part of the Global Geospace Science Mission (CGS) organized by NASA as part of the International Solar-Terrestrial Physics Program (ISTP). CANOPUS web site is supported by the CSA and is http://www.dan.sp-agency.ca/www/canopus_home.html and serves the Canadian and international space physics communities.

Natural Resources Canada is one of the Government departments collaborating closely with the CSA in the area of the space environment. Both agencies support a newly developed web site on space weather: <http://www.spaceweather.ca>. This web site has been developed and is maintained by the Geophysical Laboratory, Geological Survey of Canada.

Canada also participates in the international Super Dual Auroral Radar Network (SuperDARN). Substantial funding has been provided for SuperDARN by Canada (NSERC, CSA), the United States, France, Great Britain, Japan, South Africa, Australia, and Italy. The Institute of Space and Atmospheric Sciences, University of Saskatchewan team controls the Saskatoon radar, whose partner is U.S.-run radar at Kapuskasing, Ontario, Canada. The Canadian SuperDARN database is available at the web site: http://radar.usask.ca/superdarn/sd_summary.html

Atmospheric Environment

Canadian instrument WINDII (Wind Imaging Interferometer) data are archived at the NASA Goddard Distributed Active Archive Center (DAAC) at http://daac.gsfc.nasa.gov/data/dataset/UARS/01_Instruments/WINDII/index.html. WINDII was launched on NASA's Upper Atmosphere Research Satellite (UARS) on September 12, 1991 and is still operating on orbit. It is a joint project supported by the Canadian Space Agency (CSA) and the Centre National d'Etudes Spatiales of France (CNES). WINDII is a field-widened, thermally stabilized, phase-stepping, Doppler Michelson interferometer. Vertical profiles of the atmosphere are viewed at the limb with a CCD camera placed behind the interferometer.

Canadian instrument MOPITT (Measurements Of Pollution in The Troposphere) data are archived at the NASA Langley DAAC and available from http://eosweb.larc.nasa.gov/PRODOCS/mopitt/table_mopitt.html MOPITT was launched on the US Terra satellite on December 18, 2002. MOPITT is a gas-correlation infrared radiometer operating on nadir mode. Using infrared wavelengths at 2.4 μm and 4.7 μm , it measures carbon monoxide (CO) and methane (CH₄) in the troposphere using both thermal emission and solar reflection techniques.

The Canadian instrument OSIRIS (Optical Spectrograph Infrared Imaging System) was launched on the Swedish Odin spacecraft on February 28, 2001. OSIRIS is an infrared imager to measure the oxygen infrared atmospheric bands. The tomographic analysis will also provide global information on airglow structures that are related to gravity waves and turbulence processes. OSIRIS data are not publicly available at the moment.

Space technologies

The Canadian Space Agency's technology development programs support Canadian industry in developing specific niche technologies, establishing links with foreign firms and assessing international markets. Information about these programs is available at CSA's web site: <http://www.space.gc.ca>.

Space observation

Launched in 1995, RADARSAT-1 is a prominent demonstration of Canadian capabilities in EO. Canada Centre for Remote Sensing (CCRS) operates two satellite telemetry ground stations that provide North American reception coverage: the Prince Albert Satellite Station in Prince Albert, Saskatchewan, and the Gatineau Satellite Station located in Cantley, Quebec. Operating in a multi-mission environment, these stations receive Earth observation data from several satellites. They have created an archive in excess of 270 Terabytes of EO data. Certain data sets are delivered in near real time to support applications such as ice monitoring by the Canadian Ice Service (<http://www.cis.ec.gc.ca>), since 1991, and forest fire monitoring and mapping by the Canadian Forest Service, since 1999. These stations serve also as Canadian ground segment component of RADARSAT-1 operation. The RADARSAT-1 program office maintains a central database cataloguing details all image data acquiring, whether data were down linked in Canada or to any RADARSAT-1 ground station in the world. Presently, access to this database is available through the network of the RADARSAT-1 order desk system. It will be soon available to all customers through the CSA web site <http://www.space.gc.ca>.

The Canadian Earth Observation Network (CEONet) provides users with real-time Internet access to RADARSAT-1 and other remote sensing satellite databases. The Radarsat International Inc. (RSI) RADARSAT-1 catalogue and searchable database are available from anywhere in the world through CEONet. CEONet can be access by visiting <http://www.ccrs.nrcan.gc.ca>.

The Canadian Forest Service (CFS) (<http://www.cfs-scf@nrcan.gc.ca>) of Natural Resources Canada has developed an intelligent system for remote sensing data from satellites and aircraft with geographic information and field data. The project is called System of Experts for Intelligent Data Management (SEIDAM). This project began as part of NASA's Applied Information Systems Research Program.

CCRS in collaboration with the Ontario Geological Survey has developed a satellite-based terrain mapping program (<http://www.gov.on.ca/MNDM/MINES/OGS/mmdogse.htm>).

Global Observation of Forest Cover (GOFc) is a CEOS IGOS project led by Canada (<http://www.ccrs.nrcan.gc.ca/gofc/>). The purpose of this project is to increase international cooperation in the integration and use of data from multiple EO satellites and in-situ data, for mapping and monitoring of the Earth's forests. The CSA and CCRS provide the GOFc Project Office. Its web site has been in operation since March 1999.

Use of the Cryospheric System to Monitor Global Change in Canada (CRYSYS) is an Interdisciplinary Science Investigation (IDS) in the NASA Earth Observing System Program. CRYSYS is hosted and funded by Canadian agencies and universities, and led by Environment Canada's Meteorological Service of Canada (MSC) (http://www.msc-smc.ec.gc.ca/index_e.cfm). The CRYSYS uses remote sensing, modelling, field studies and data integration to improve monitoring of the state of the cryosphere over Canada.

Another program is called BERMS (Boreal Ecosystem Research and Monitoring Sites) and is a joint venture of MSC, CFS and Parks Canada (http://parksCanada.pch.gc.ca/parks/main_e.htm). This is a fully automated system to collect continuous, remote CO₂ flux measurements, and real-time, climate measurements through the forest canopy.

There are other applications of remote EO data and the above list represents a cross-section of different available applications and associated databases only.

G. Aerospace

Aeronautical programs are major activities of the Institute for Aerospace Research, National Research Council Canada. Information about these programs is available via the NRC's web site at <http://www.nrc.gc.ca/> and <http://iar.nrc.gc.ca>

II. Biology - Ecology (G. Newton)

Genome Database (GDB)

The Genome Database was established at Johns Hopkins University in Baltimore, Maryland, USA in 1990, and is the official central repository for genomic mapping data resulting from the Human Genome Initiative. In the Spring of 1999, the Bioinformatics Supercomputing Centre (BiSC) at The Hospital for Sick Children in Toronto, Ontario, assumed the management of GDB. The Human Genome Initiative is a worldwide research effort to analyze the structure of human DNA and determine the location and sequence of the estimated 100,000 human genes. In support of this project, GDB stores and curates data generated worldwide by those researchers engaged in the mapping effort of the Human Genome Project (HGP). <http://www.gdb.org/>

BC Species Explorer

BC Species Explorer is the source for authoritative conservation information on more than 6,000 plants and animals in British Columbia. It provides in-depth information on rare and endangered species, but includes common plants and animals. The Ministry of Sustainable Resource Management supports it. <http://srmwww.gov.bc.ca/cdc/tracking.htm>

Species Lists and Rare Species data collection

The Species Lists and Rare Species data collection is part of the Atlantic Canada Conservation Data Centre (AC CDC). The AD CDC aims to be an authoritative and reliable source for comprehensive, accurate and objective information on Atlantic Canada's natural heritage, with principal focus on the species and ecological communities in our region that are globally, nationally or provincially rare in occurrence and, in some cases, endangered at one or more of these levels. <http://www.accdc.com/>

Arab Genetic Disease Database

The Arab Genetic Disease Database (AGDDB) is a comprehensive repository of clinical and molecular data on genetic diseases occurring in Arab populations. The data is curated by the Arab Genetic Disease Consortium, headed by Dr. Ahmad S. Teebi of the Toronto Hospital for Sick Children.

<http://www.agddb.org/>

Genome Sequence Centre

The Genome Sequence Centre, Vancouver, BC is constructing a BAC-based fingerprint map of the bovine genome. This effort is funded jointly by the United States Department of Agriculture (USDA) and the Alberta Science and Research Authority (ASRA). The resulting map will be an important resource for the field of bovine genomics. The goal is to generate a total of 280,000 whole-clone HindIII fingerprints from the BAC library RPCI-42 constructed by P. de Jong from the Holstein Bull white blood cell DNA, and a second library to be constructed from Hereford DNA. British Columbia Genome Science Centre.

http://www.bcgsc.bc.ca/projects/bovine_mapping/

Wilson Disease Mutation Database

The Wilson Disease Mutation Database is a database collected by Susan Kenney and Dr. Diane W. Cox at the Department of Medical Genetics, University of Alberta.

<http://www.medgen.med.ualberta.ca/database.html>

Calcium Sensing Receptor Locus Mutation Database

The Calcium Sensing Receptor Locus Mutation Database includes mutation, genotype/phenotype, clinical, In Vitro and author searches of the database. It also includes a facility for researchers to submit mutation data. DeBelle Laboratory and C.R. Scriver Biochemical Genetics Unit, McGill University.

<http://data.mch.mcgill.ca/casrdb/>

GRIN-CA

GRIN-CA taxonomic data provide the structure and nomenclature for the accessions of the Canadian National Plant Germplasm System (NPGS). Many plants (35,000 taxa, 13,000 genera) are included in GRIN-CA taxonomy, especially economic plants. Agriculture and Agri-Food Canada

<http://pgrc3.agr.gc.ca/tax/>

Bacillus thuringiensis Toxin Specificity Database

The Bacillus thuringiensis Toxin Specificity Database includes published data on insecticidal activity of toxins that are included in the List of Bt delta-endotoxin genes maintained by Neil Crickmore on behalf of the delta-endotoxin nomenclature committee. Canadian Forestry Service, Natural Resources Canada

http://www.glfsc.cfs.nrcan.gc.ca/science/research/netintro99_e.html

Canadian Poisonous Plants Information System

The Canadian Poisonous Plants Information System presents data on plants that cause poisoning in livestock, pets, and humans. The plants include native, introduced, and cultivated outdoor plants as well as indoor plants that are found in Canada. Some food and herbal plants that may cause potential poisoning problems are also included. Agriculture and Agri-Food Canada

<http://sis.agr.gc.ca/pls/pp/poison>

Ontario Natural Heritage Information Centre (NHIC)

The Ontario Natural Heritage Information Centre (NHIC) compiles, maintains and provides information on rare, threatened and endangered species and spaces in Ontario. This information is stored in a central repository composed of computerized databases, map files and an information library, which are accessible for conservation applications, land use development planning, park management, etc. Ministry of Natural Resources Ontario.

<http://www.mnr.gov.on.ca/MNR/nhic/data/info.cfm>

Canadian Bird Trends

Canadian Bird Trends is a retrieval system that provides information on Canadian bird species including population trends and taxonomy, with links to range maps and life history information, and national conservation designations. Population trends are derived from Breeding Bird Survey in Canada (BBS) data and are updated on an annual basis. Canadian Wildlife Service, Environment Canada.

http://www.cws-scf.ec.gc.ca/cws-scf/birds/Trends/disclaimer_e.cfm

III. Biology - Taxonomy (G. Baillargeon)

Agriculture and Agri-Food Canada

Biological Observations, Specimens and Collections (BiOSC) Gateway

The BiOSC Gateway is a prototype search engine dedicated to biological specimens and observational records available through distributed biodiversity networks such as The Species Analyst (TSA), the World Information Network on Biodiversity (REMIB) and the European Natural History Specimen Information Network (ENHSIN). Similar to regular Internet search engines (e.g. Altavista, Google, etc.) that provide access to standard hypertext documents, BiOSC harvests biological names found in collections on the Internet and connects users to the distributed primary data sources. Actual records are returned directly from data holders to end-users in real time. In addition, those records provided with geographic coordinates (longitude and latitude) are dynamically mapped and users can query the source of individual dots on a world map. The BiOSC Gateway provides access to millions of individual records and is coupled with the Canadian multilingual version of the Integrated Taxonomic Information System (ITIS - <http://sis.agr.gc.ca/itis>), enabling users to search for primary data using common name, scientific names or synonyms.

<http://sis.agr.gc.ca/biosc>

Canadian Biodiversity Information Facility (CBIF)

As a member of the Global Biodiversity Information Facility (GBIF), Canada is exploring new ways to improve the organization, exchange, correlation, and availability of primary data on biological species of interest to Canadians. By enhancing access to these data, CBIF provides a valuable resource that supports a wide range of social and economic decisions including efforts to conserve our biodiversity in healthy ecosystems, use our biological resources in sustainable ways and monitor and control pests and diseases.

<http://www.cbif.gc.ca>

Biomolecular Interaction Network Database (BIND)

BIND is a primary biological database, archiving biomolecular interaction, complex and pathway information for all taxonomies and is freely available through a web interface or via FTP. BIND continues to grow with the addition of individual submissions as well as interaction data from the PDB and a number of large-scale interaction and complex mapping experiments using yeast two hybrid, mass spectrometry,

genetic interactions, and phage display. Continued input from users has helped further mature the BIND data specification to v3.0, which now includes the ability to store detailed information about genetic interactions. The BIND data specification is available as ASN.1 and XML DTD.

<http://www.binddb.org>

IV. Chemistry (A. Hakin)

A. LOGKOW - Databank on Octanol-Water Partition Coefficients

Dr. James Sangster has maintained and upgraded a databank on octanol-water partition coefficients of a large set of molecules. These molecules are 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.

Dr. James Sangster, Sangster Research Laboratories, Montreal, Quebec -

james.sangster@mail.polymtl.ca

B. Data on PAH (polyaromatic hydrocarbon) Aquatic Toxicity

A collection of data on the photochemical activities and aquatic toxicity of polyaromatic hydrocarbons, as well as their photooxidized products is maintained by Prof. Bruce Greenberg and Prof. G. Dixon of the University of Waterloo, Ontario. Data on chemical properties and toxicities recorded in this collection are expected to serve both academia and the chemical industry, providing tools for toxicological risk assessment and environmental action.

Prof. B. Greenberg, Department of Biology, University of Waterloo, Waterloo, Ontario -

<http://sciborg.uwaterloo.ca/~greenber/>

C. Oil Properties Database

This database is maintained by Environment Canada and contains physical and chemical properties of 431 crude oils and oil products.

http://www.etcentre.org/databases/spills_e.html

D. Chemical Synonyms Database

This database is maintained by Environment Canada and is used to find synonyms of a chemical name and to find the standard IUPAC (International Union of Pure and Applied Chemistry) name for that chemical.

http://www.etcentre.org/databases/spills_e.html

E. 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 of Health Canada and Professor Paul Mezey of the University of Saskatchewan.

Professor Paul G. Mezey, Department of Chemistry, Department of Mathematics and Statistics, University of Saskatchewan, Saskatoon, Saskatchewan - mezey@sask.usask.ca

F. Halogenated Organic Molecules Electron Density Databank

A molecular shape database for a series of halogenated organic molecules is maintained and upgraded by Professor Paul Mezey of the 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 the CNTC (Canadian Network of Toxicology Centres) Quantitative Risk Assessment project and in pesticide research.

Professor Paul G. Mezey, Department of Chemistry, Department of Mathematics and Statistics, University of Saskatchewan, Saskatoon, Saskatchewan - mezey@sask.usask.ca

G. 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 under further development by Professor P.M. Huang of the University of Saskatchewan. This database is explored in similarity studies, to enhance the predictability of adverse effects of new pesticides and herbicides entering the market and for suggestions of potential modifications.

Professor P. Ming Huang, Department of Soil Science, University of Saskatchewan, Saskatoon, Saskatchewan - huangp@sask.usask.ca

H. TerraTox™ Data Bases by TerraBase Inc.

Terra Base Incorporated offers a selection of specialized commercial databases including:

- (i) TerraTox™: Explorer - Physico chemical properties and toxicity endpoints for almost 100 species of aquatic and terrestrial organisms and more than 15,000 substances.
- (ii) TerraTox™: Pesticides - Physico chemical properties and toxicity endpoints for almost 100 species of aquatic and terrestrial organisms and more than 1,500 pesticides, pesticide metabolites and degradation products.
- (iii) TerraTox™: Steroids-RBA - Quantitative receptor binding assay data for over 2,600 individual chemicals, normalized to 17 *beta*-estradiol (E20 = 100%), progesterone, testosterone, mibolerone, androgen, and others. For research in health, environment, pharmaceuticals and agriculture.
- (iv) TerraTox™: *Vibrio fischeri* - Physico chemical properties and toxicity endpoints for almost 100 species of aquatic and terrestrial organisms and more than 2,000 substances for which measured *Vibrio fischeri* (formerly Photobacterium phosphoreum) data are available.

TerraBase Inc., 1063 King Street West, Suite 130, Hamilton, ON, L8S 4S3, Canada

<http://www.terrabase-inc.com>

V. Geoscience (S. Smith)

Hazards and Environmental Geosciences

A number of databases compiled by scientists of the Terrain Sciences Division of the Geological Survey of Canada, Natural Resources Canada are now accessible through the Internet. These databases provide key geoscience data that are useful for hazard assessment, environmental impact assessment, land use planning and climate change studies. Included in the collection are the national permafrost database, the Canadian peatland database, the Canadian diatom database, landslide disasters, flood disasters, borehole geophysical

logs, the radiocarbon database and eolian sediment transport data. Databases are accessed through interactive maps. <http://sts.gsc.nrcan.gc.ca/clf/geoserv.asp>

Cryospheric Databases

The Global Terrestrial Network for Permafrost (GTN-P) was established in 1999 by the International Permafrost Association under the Global Climate Observing System of the World Meteorological Organization. The GTN-P is an international network of permafrost observatories designed to provide long-term field observations of active layer and permafrost thermal state. These observations are essential for the evaluation of current permafrost conditions, detection of the terrestrial climate signal in permafrost and its spatial and temporal variability and for the development and validation of climate change models. The Geological Survey of Canada hosts the GTN-P web site and the data management node for the thermal monitoring component.

<http://sts.gsc.nrcan.gc.ca/gtnp/index.html>

The Geological Survey of Canada maintains national permafrost thickness and temperature databases. Permafrost temperature data are available on-line and work is currently underway to make other permafrost related data sets more accessible. These databases provide baseline information that are useful for climate change studies, for planning northern development and for environmental impact assessment.

<http://sts.gsc.nrcan.gc.ca/permafrost/>

CRYSYS (Cryospheric System in Canada) is a specialized research group studying the Canadian cryosphere, which includes snow, glaciers, permafrost and lake and sea ice. Information on the state of the Canadian cryosphere is required for supporting the climate change research community, for development and validation of climate and hydrological models and for the making of operational and policy decisions by government. Maps and imagery showing snow cover distribution, sea ice extent and other aspects of the cryosphere may be accessed through the State of the Canadian Cryosphere section of the CRYSYS web site. The Canadian Cryospheric Information Network (CCIN) is currently under development and will act as a central archive and distribution node for Canadian cryospheric data.

<http://www.crysys.uwaterloo.ca/>

VI. Geospatial (J.P. Lauzon)

Data initiatives in Canada are progressing along the path established over the past several years. The federal government has initiated a number of programs to enhance the quality and accuracy of geographic information being captured. Using Global Positioning System (GPS) technology, the digital representation of the major Canadian road network is being updated. Supplemented by similar efforts among provincial and municipal governments as well as private industry, the enhanced representation of the road network is supporting the adjustment of other geographic entities, particularly administrative boundaries that use the network in their definitions.

There have been efforts at all levels of government and in the private industry to document datasets through standard metadata templates. These templates significantly enhance the ability to find data through data

discovery portals. One example is the increased number of datasets that can be discovered and downloaded through the GeoGratis program <http://geogratias.cgdi.gc.ca>.

Canadian geospatial data standards and approaches to the discovery and manipulation of data using distributed on-line services are synchronized with the ISO TC211 and Open GIS Consortium (OGS) standards (OGIS). The Canadian government and many Canadian private companies now actively participate in these international and industry standards organizations ensuring Canadian contribution and compliance to these evolving standards.

VII. Physics - Astrophysics (H. Dabkowska)

The Canadian Astronomy Data Center (CADC) continues to be the role model in data activities in astronomy. It was established in 1984, and successfully handles the data produced by Canadian astronomers, facilitating the exchange of raw and re-calibrated data. For more information about current activities, please visit their web site at <http://cadcwww.hia.nrc.ca/>

For 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)
- ?? and the Canadian Galactic Plane Survey (on 4 CDs).

To further international collaboration, the CADC web site offers easy access to astronomical data from other countries.

VIII. 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

Prof. 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 CO₂ in water and non-aqueous systems, as well as for solids and liquids in supercritical CO₂.

Alan.Mather@ualberta.ca

Prof. P. Engelezos (University of British Columbia) measures gas hydrate phase equilibria involving methane, CO₂, 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

IX. 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. Andrew Hakin joined as a new member. 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
Dr. Andrew Hakin	Chemistry	hakin@uleth.ca
Mr. Jean Paul Lauzon	Geospatial	jp.lauzon@amec.com
Dr. Francis Ouellette	Biology – Genomics, Proteomics	francis@cmmt.ubc.ca
Dr. Michel Sabourin	Social Sciences	michel.sabourin@umontreal.ca
Observers & CNC Representatives		
Dr. Alex Jablonski	Aerospace – Space Technologies, Space Science, Earth Observation	alexander.jablonski@space.gc.ca
Dr. David Lockwood	Physics	david.lockwood@nrc.gc.ca
Mr. Glen Newton	Biology – Ecology	glen.newton@nrc.gc.ca
Dr. John R. Rodgers	Crystallography	rodgers@snd.cisti.nrc.gc.ca
Dr. James Sangster	Thermodynamics	jsangster@mail.polymtl.ca
Dr. Alvin Shrier	Biomedicine	ashrier@med.mcgill.ca

Dr. Sharon Smith	Geoscience – Environment, Hazards	ssmith@nrcan.gc.ca
Mr. Guy Baillargeon	Biology – Taxonomy	baillarg@em.agr.ca
TBD	Geology	
TBD	Geophysics	
TBD	Oceanography, Hydrology	
Secretariat		
Mrs. Marie-Christine Bernier-Thériault (Secretary)		marie-christine.bernier-theriault@nrc.gc.ca
Dr. Gordon H. Wood (Executive Secretary)	Materials	gordon.wood@nrc.gc.ca

A second Workshop on *Information Visualization* was held in May 2001. The successful one-day gathering drew some 113 computer scientists, information specialists and software developers, primarily from 46 industries, 8 government departments and 5 universities departments in the greater Ottawa area. A copy of the full report is available at <http://www.codata.org/canada/info-vis2001.html>

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.codata.org/codata/welcome.html>

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

<http://www.codata.org/canada>