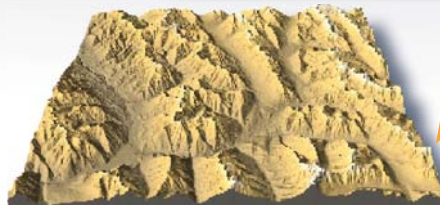
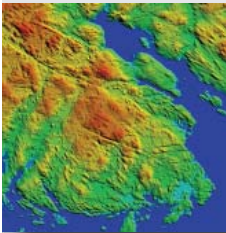
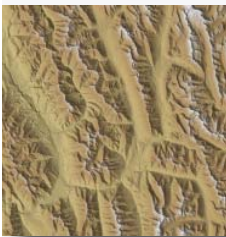
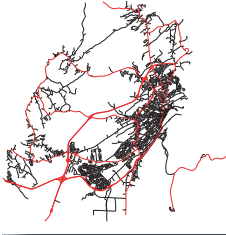


GeoBase

Building on Common Ground...



CANADIAN DIGITAL ELEVATION DATA



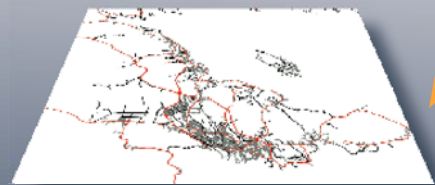
CANADIAN LANDSAT 7 ORTHOIMAGES



CANADIAN GEOGRAPHICAL NAMES



CANADIAN GEODETIC NETWORK DATA



CANADIAN NATIONAL ROAD NETWORK

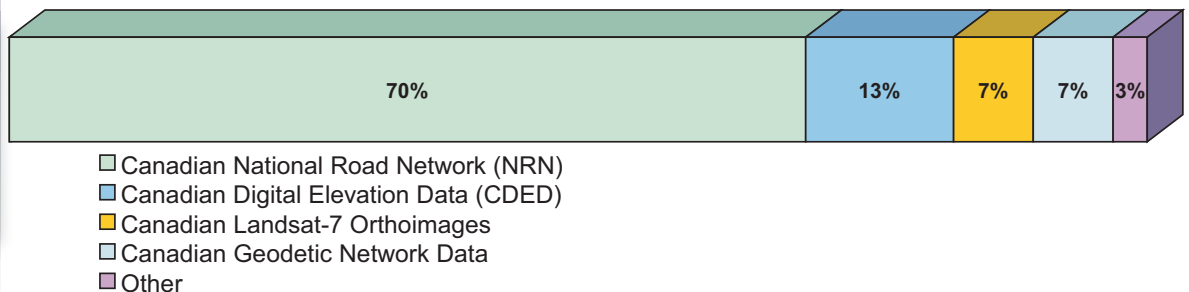


CANADIAN GEOPOLITICAL BOUNDARIES

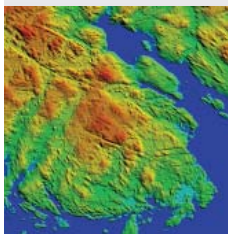
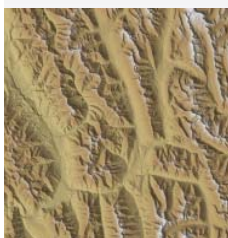
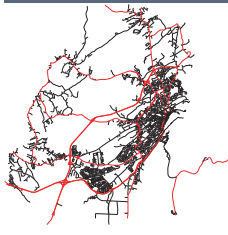
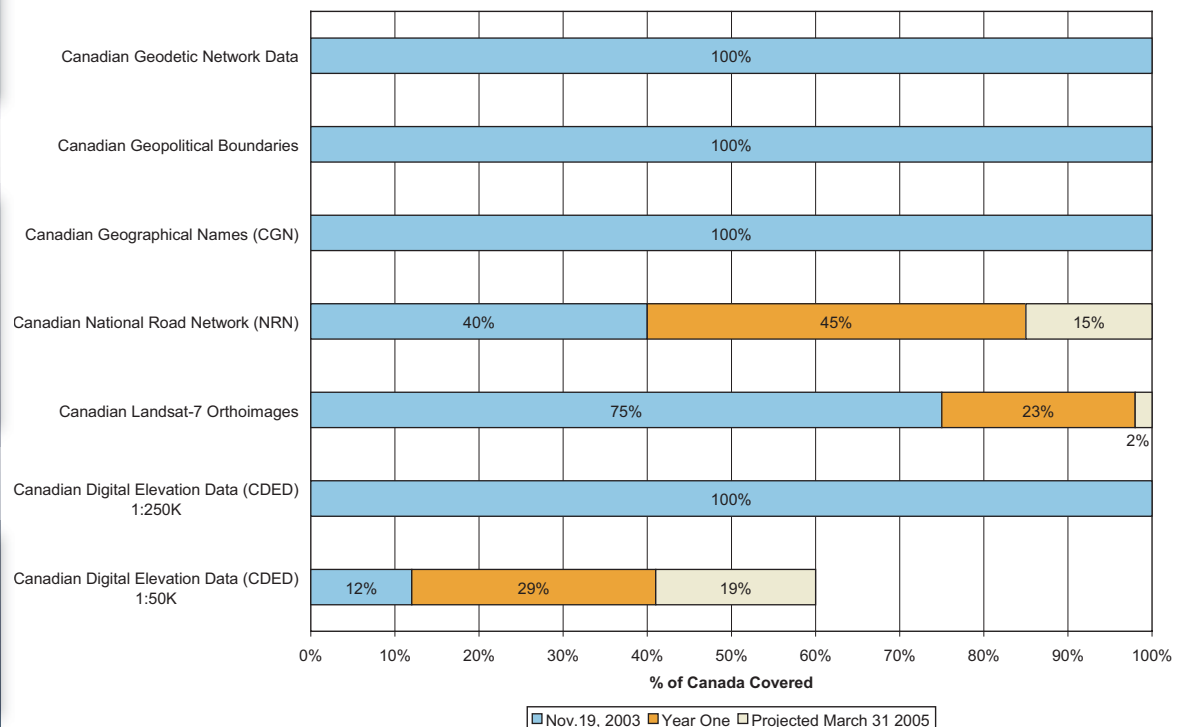
GeoBase Portal Usage Statistics Year One

Number of distinct users	20,000
Number of data orders	59,000
Number of files ordered	409,000
Number of files ordered per month	22,000 - 50,000

Proportion of Downloads by Theme



% of Canada Covered and Growth of Data Coverage



What is GeoBase?

To our users, GeoBase is:

- 6 themes of quality base geographic data for Canada
- Available at no cost to the user
- Free of restrictions on use and redistribution
- Provided by authoritative government sources
- Defined by explicit standards governing content and format

To the GeoBase partners, GeoBase is:

- An effective way to address the limitations of our existing aging and inaccurate map coverage of Canada
- A new approach to cooperation between levels of government in developing and maintaining quality geospatial information for Canada in order to meet modern requirements
- An opportunity for jurisdictions to share in technological developments related to geospatial information in order to maximize the impact of their collective investments
- The framework data component of the Canadian Geospatial Data Infrastructure (CGDI)

To the Canadian taxpayer, GeoBase is:

- An opportunity for greater efficiencies by reducing duplication of effort and overlaps in responsibilities for data collection and maintenance
- An important tool for informed decision-making. High quality, accurate, up-to-date geospatial data makes for better decisions on the environment, energy, conservation and many other areas.
- A common source of no-cost geospatial framework data for Canada that is readily available to governments, businesses, educational institutes, students and all Canadians.

GeoBase is the product of the coordinated efforts of the Canadian Council on Geomatics (CCOG), the national GeoConnections program, and the efforts of many individual government departments and private sector companies. CCOG is a federal-provincial-territorial body that, in October 2001, endorsed the goals of GeoBase and established the GeoBase Steering Committee to make them a reality. GeoConnections is a national partnership devoted to create the CGDI by putting in place the infrastructure of technology, standards, policies and data required to make geospatial information available on the Internet. By October 2001, GeoConnections had already started the work of creating the CGDI. CCOG and GeoConnections joined forces and amalgamated the CCOG GeoBase initiative with the GeoConnections Framework Data Node under the GeoBase Steering Committee. GeoBase was able to utilize the expertise and project funding of GeoConnections, the high level organizational commitments of CCOG, the individual efforts and contributions of provincial, territorial and federal departments and the expertise and production capacity of the Canadian geomatics private sector to make GeoBase a reality.

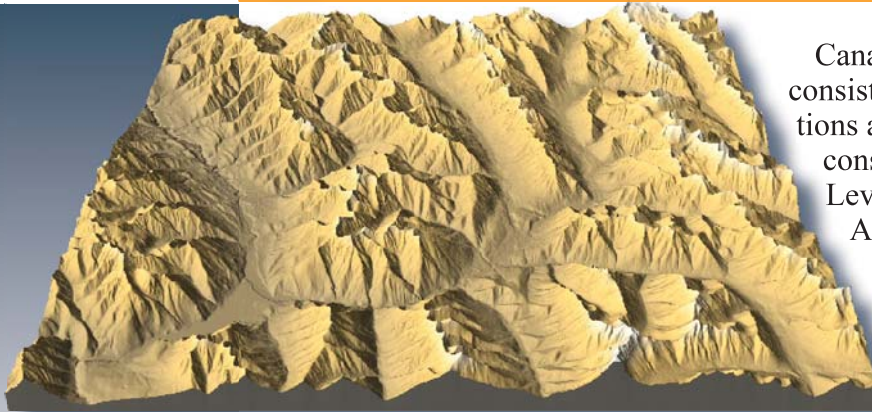
And now the results are in. Canada has a current, consistent and accurate set of framework geospatial data that is collected once, closest to the source and that is used by many. This data is called GeoBase. GeoBase provides a common reference and context for a wide variety of thematic data for government, business and individual applications. It is available at no cost to the user and with no restrictions on use or redistribution. And it is now available to all on the GeoBase Portal.

GeoBase

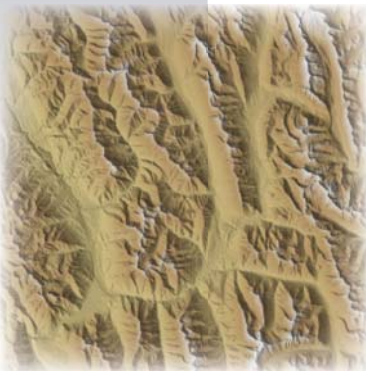
Canadian Digital
Elevation Data

www.geobase.ca

Building on Common Ground...

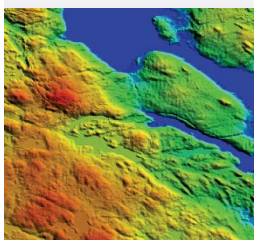


Canadian Digital Elevation Data (CDED) consists of an ordered array of ground elevations at regularly spaced intervals. A CDED file consists of elevation data relative to Mean Sea Level, with coordinates based on the North American Datum 1983 horizontal reference datum. The source for CDED is provincial data sets where possible. Where provincial data was not available, the 1:50,000 and 1:250,000 National Topographic Data Base (NTDB) were used as source materials.



With a few exceptions, each CDED file covers one half of a National Topographic System (NTS) map sheet. Depending on the latitude of the CDED section, the grid resolution varies from 8 to 23 metres for the 1:50,000 NTS tiles, and from 32 to 93 metres for the 1:250,000 NTS tiles respectively (based on geographic coordinates).

The data should be compatible with all translators designed for the United States Geological Survey (USGS) Digital Terrain Elevation Data (DTED).



Data Formats:
CDED
(modified USGS
DTED)

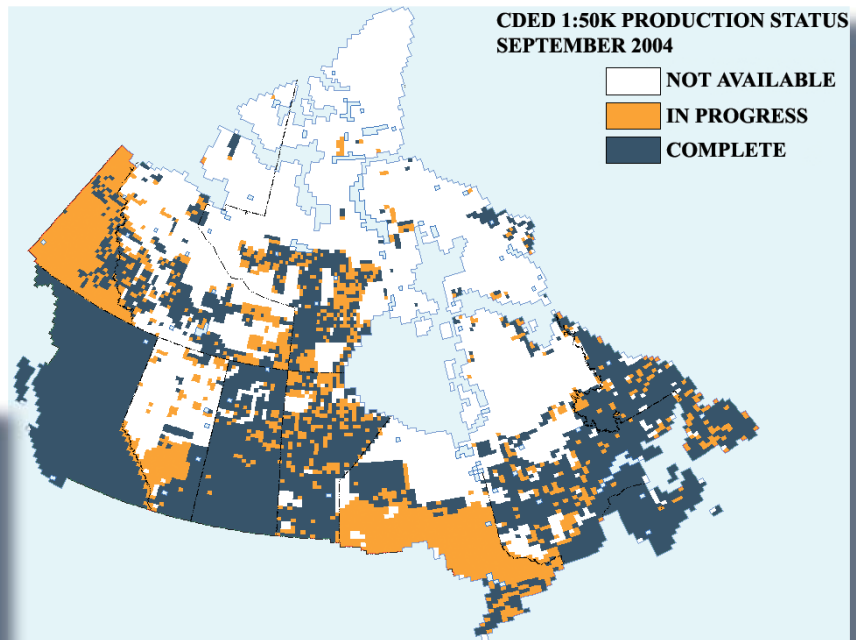
Data Projection:
Geographic
(Lat/Long)

CDED 1:250K
PRODUCTION STATUS



CDED 1:50K PRODUCTION STATUS
SEPTEMBER 2004

NOT AVAILABLE
IN PROGRESS
COMPLETE



Canadian Council
on Geomatics

GeoConnections

Canada

Landsat 7 Orthoimages provide users of GeoBase with a complete set of mostly cloud-free (less than 10% cloud cover) orthoimages covering the Canadian landmass using Enhanced Thematic Mapper data (ETM+) from the Landsat 7 satellite.

The Landsat 7 Orthoimages along with the control points for this imagery comprise the two components of the GeoBase Data Alignment Layer (GDAL). The GDAL control points are a set of geo-referenced points that are

readily identifiable on the GeoBase Landsat 7 Orthoimages and also on other mapping products having various map scales. The GDAL control points can be used to register non-GeoBase data to the GeoBase themes and for simultaneously displaying data from multiple sources that were compiled at different scales or resolutions.

Landsat 7 Orthoimages are stored as raster data and comprise 9 spectral bands:

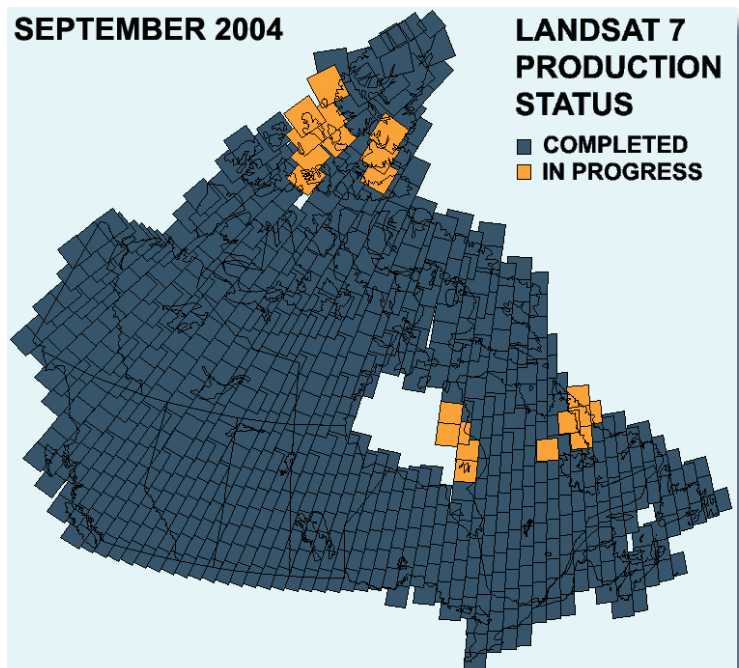
- 1 panchromatic band with a pixel size of 15 m
- 6 multispectral bands with a pixel size of 30 m
- 2 thermal infrared bands with a ground resolution of 60 m

The Landsat images have been orthorectified using the most accurate ground control points available in Canada including geodetic control points, Provincial and Federal vector data and orthophotos.

Production of the Landsat 7 images and GDAL (which is directly related to Landsat 7) will be complete in Spring 2005.

Data Formats:
GeoTIFF, BSQ, PIX (PCI)

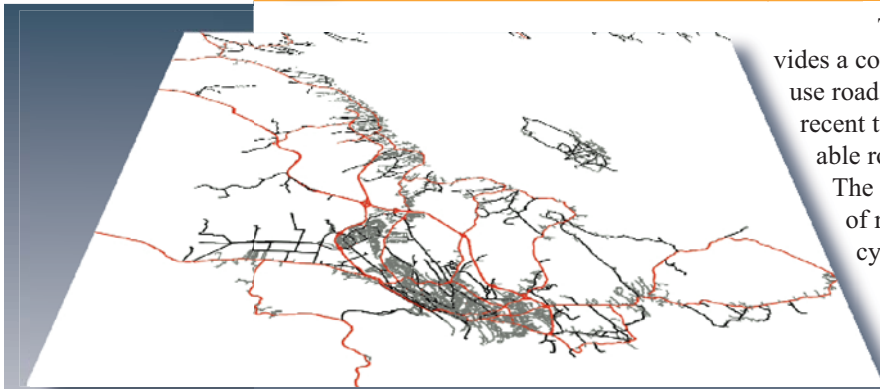
Data Projections:
Lambert Conformal Conic (LCC)
Universal Transverse Mercator (UTM)



GeoBase

Canadian National
Road Network
www.geobase.ca

Building on Common Ground...



The Canadian National Road Network (NRN) provides a continuous, accurate centreline for all non-restricted use roads in Canada. The NRN was produced with the most recent technologies (GPS, satellite imagery) to collect drivable roads (5 m+ width) with no barriers denying access. The GeoBase Portal contains over 1.2 Million kilometres of road network data with a 10-metre or better accuracy, offered at no cost and with no restrictions to users.

Through extensive federal, provincial and territorial partnerships the National Road Network is being produced, managed, and will continue to be maintained into the future. These partnerships

are a key asset in maintaining an accurate, standardized and a shared, single source road network.

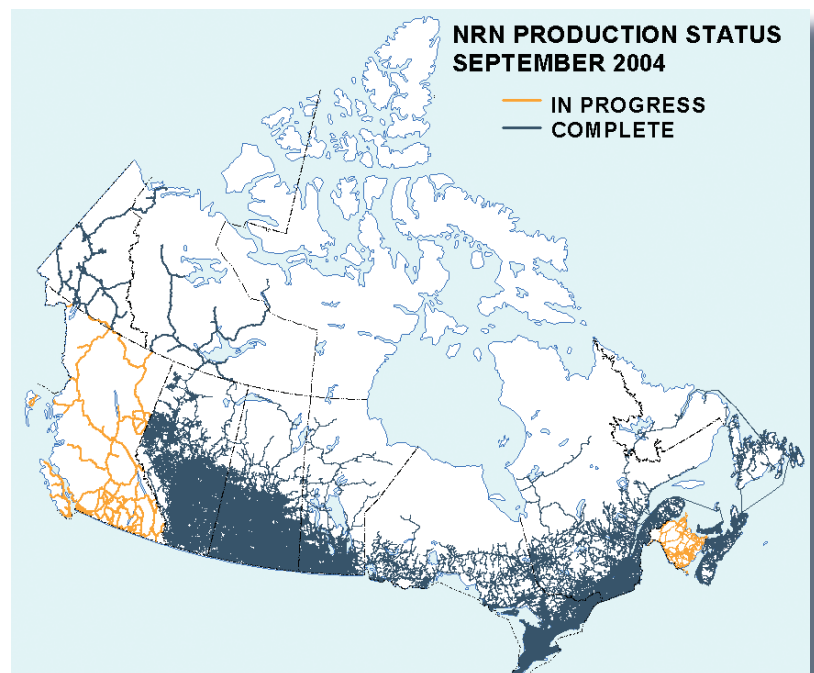
The NRN is modeled in two profiles: the Segmented and the LRS (Linear Referenced System) profile. The Segmented profile is the most commonly used method of describing the road network, whereby each attribute change implies a segmentation of the centerline between intersections. The LRS profile however does not segment the road centerline between intersections instead attributes become measured events from one intersection to the other. The LRS concept stabilizes the geometric framework of the NRN by managing attribute information separately. NRN LRS profiles will be made available sometime in 2005 via the GeoBase portal.

An important feature of the NRN data is that each Road Element and each Event attribute are tagged with a unique identifier. These unique IDs allow the users of NRN data to receive, manage and introduce road network changes over time.

NRN stakeholders are working to provide complete Canadian coverage by March 2005. Where maintenance agreements prevail between federal, provincial and territorial partners, Users can expect to receive annual updates via the GeoBase Portal.

Data Formats:
GML or SHAPE

Data Projection:
Geographic
(Lat/Long)



GeoBase

Canadian
Geographical Names
www.geobase.ca

Building on Common Ground...

Booth House Lake
Coke Hill
Dunsmuir Lake
Near Hill
Thind Lake
Dunsmuir Creek
Filk Lake
Kilbirney Lake
Kilbirney Creek
Beaver Lake
Cordova Bay
Fiddlers Lake
Observatory Hill
Seaford Millstream
Malby Lake
Viaduct Creek
Mount Douglas
Molson Lake
Fike Lake
Colquitz Royal Oak
Gordon Head
Toanook Lake
Blenkinsup Lake
Miniskit
Prior Lake
Palmer
Florence Lake
Thetis Lake
Colquitz River
Swan Lake
Cadboro Bay
Mill Stream
Margold
Sevensnaka
Esquimalt
Tillium
Smith Hill
View Royal
Peacock Hill
Mount Tolmie
Glen Lake
Colwood
Rodd Hill
Highrock
Victoria
Bowker Cr
Colwood Creek
Chatham Islands
Indian Reserve 4
Signal Hill
Golf Hill
James Bay
Fairfield
Anderson
Triangular Hill
Beacon Hill
Albert Head
Lagoon
Goodacre Lake
Chosin Mountain

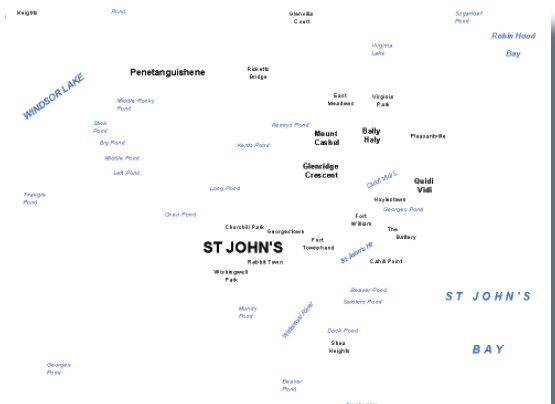
The Canadian Geographical Names (CGN) data set on the GeoBase Portal is a subset of the official Canadian Geographical Names Data Base (CGNDB). The CGNDB stores all names with their attributes that have been approved by the Geographical Names Board of Canada.

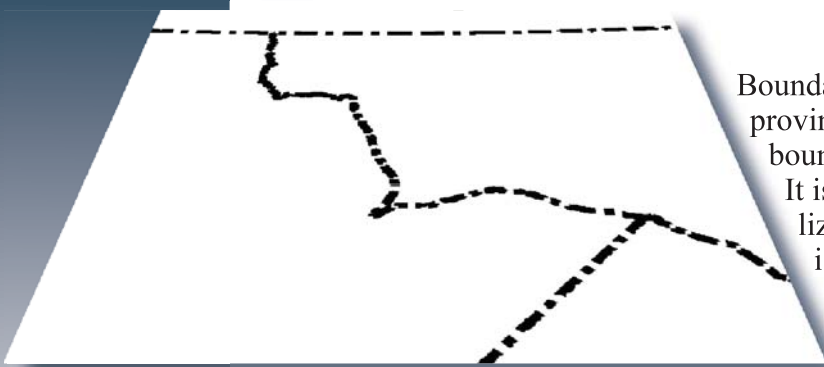
The subset of the CGNDB data on the GeoBase Portal consists of all current, officially approved names stored as point data. The geographic extent of this

data is the Canadian landmass and water bodies. The temporal extent of the data is from 1897 to present. The purpose of the CGN data set is to provide official names for mapping and charting, gazetteer production, World Wide Web reference, and other geo-referenced digital systems.

Data Formats:
GML or SHAPE

Data Projection:
Geographic
(Lat/Long)





The GeoBase Canadian Geopolitical Boundaries layer contains the international, inter-provincial and territorial boundaries, as well as the boundaries of Canada's exclusive economic zone. It is not intended for legal use, and should be utilized for cartographic purposes only. The dataset is comprised of three files: an administrative boundary file, an administrative areas file and a metadata file.

The administrative boundary file is made of non-overlapping, topologically correct (connected segments) simple features. A line that bounds two adjacent administrative areas defines an administrative boundary. An administrative boundary may be split into several smaller segments, due to changes in attribute information. The administrative areas file is made of adjacent (contiguous) polygons. The polygon boundaries are aligned with the corresponding features in the administrative boundary file. Each boundary segment has metadata that provides associated accuracy values.



Depending on the type of boundary, the accuracy of a segment will vary as follows:

Exclusive economic zone of Canada:

1:1,000,000

Inter-provincial/territorial boundary:

1:100,000

International boundary:

1:5,000

Data Formats:

GML or SHAPE

Data Projection:

Geographic (Lat/Long)





GeoBase lets you access horizontal and vertical geodetic control information for thousands of points distributed across Canada. The geodetic control information was created and maintained by the Geodetic Survey Division (GSD) of the Earth Sciences Sector of Natural Resources Canada. The information for each marker includes geographic and UTM coordinates, orthometric height, marker information description, and inspection data. These points belong to four principal control networks:

Canadian Base Network (CBN1)

With a new focus on positioning from space, GSD has created a dynamic infrastructure to serve both present and future needs for positioning. The Canadian Base Network, Level 1 (CBN1) is designed to serve as the new ground segment of monumented survey control in the Canadian Spatial Reference System (CSRS). The CBN1 is a network of pillar monuments with forced-centring plates, positioned three-dimensionally with GPS to centimetre-level accuracy with respect to the Canadian Active Control System (CACS). It provides the link between the existing framework and the CACS. The network consists of an array of pillars at an average spacing of 200 km in the built-up areas of southern Canada, 500 km in the middle regions of Canada, and 1000 km in the northern areas. As well as being a GPS control network, the CBN1 can serve as a monitoring network for deformation studies of the Canadian landmass.

Primary Vertical Network (PVBMC1)

The Primary Vertical Bench Marks, Canada, Level 1 are (approximately 80 000) monuments established about every 2 km along major highways and railways across Canada. Elevations issued by the GSD are those based on the 1928 adjustment of the national levelling networks - Canadian Geodetic Vertical Datum 1928 (CGVD28).

Federal 3D Densification Network (FED3DC1)

The Federal 3-D Densification Network, Canada, Level 1 consists of (approximately 2000) monumented stations, positioned three-dimensionally with GPS to centimetre-level accuracy with respect to the Canadian Active Control Systems (CACS). It provides the link between the existing framework and the CACS. The network densifies 3-D control within the Canadian Base Network (CBN).

Federal 2D Densification Network (FED2DNC1)

GSD provides a horizontal 2-D (NAD83) network of interconnected control surveys with (approximately 13 000) monuments spaced 20 to a maximum of 100 km apart for the Yukon Territory, Northwest Territories and Nunavut. These networks are comprised of physically marked survey stations across Northern Canada for which horizontal coordinates are determined. These networks have been established over the past 90 years to provide consistent and accurate basic frameworks within which project-specific surveys may be carried out.

Data Formats: GML or SHAPE

Data Projection: Geographic (Lat/Long)





Association of Professional
Executives of the Public
Service of Canada



Association professionnelle des cadres
supérieurs de la fonction
publique du Canada

GeoBase Portal Team Wins Apex Award

On October 6, 2004, the NRCan-led GeoBase Portal team was recognized for its efforts by the Association of Professional Executives of the Public Service of Canada (APEX). The Association presented the GeoBase Portal team its 2004 Leadership in Service Innovation Award at the annual Apex Symposium in Ottawa at the National Arts Centre.

GeoBase is the product of the coordinated efforts of the Canadian Council on Geomatics (CCOG), the national GeoConnections program, and the efforts of many individual government departments and private sector companies. CCOG is a federal-provincial-territorial body that, in October 2001, endorsed the goals of GeoBase and established the GeoBase Steering Committee to make them a reality. GeoConnections is a national partnership devoted to create the Canadian Geospatial Data Infrastructure (CGDI) by putting in place the infrastructure of technology, standards, policies and data required to make geospatial information available on the Internet. Working together, these partners created the data and services that are GeoBase. The GeoBase Portal is Internet access point through which users can download the

GeoBase data.

Dr. Irwin Itzkovitch, Assistant Deputy Minister of the Earth Sciences Sector, accepted the award on behalf of the team. "The GeoBase Portal is a perfect example of partnership across the federal government, and partnership with provinces and territories," he said during the award ceremony. The project "is a fantastic example of how you get things done across the government system" through collaboration.

The GeoBase Portal team was nominated for the Service Innovation Award based on their partnership with all levels of government as well as the project's contribution to public services. The Service Innovation Award is the only Apex award given to a team of public servants. It is awarded to team members who have demonstrated a high degree of innovation or creativity in developing a practice that has led to the improved delivery of a particular service.

The portal provides access to a variety of information, including Administrative Boundaries, Canadian Digital Elevation Data (CDED), Canadian Geodetic Network data, Geographical Names of Canada (toponymy), Landsat-7 Orthoimages and Control Points (Geobase Data Alignment Layer), and National Road Network (NRN) data. Ongoing and future developments include the implementation of new standards and the accessibility of information for all of Canada.



ESRI Award of Excellence

ESRI Canada, a leading geographic information systems (GIS) provider, presents an Award of Excellence annually to organizations and individuals across Canada for outstanding achievements in the application of GIS technology. On September 16, 2004, Natural Resources Canada (NRCan) received a joint Award of Excellence from ESRI Canada, at their annual User Conference held in Ottawa attended by more than 350 GIS professionals from the private and public sectors. Mr. Alex Miller, President of ESRI Canada presented the award in recognition of the joint initiative undertaken by NRCan, Elections Canada and Statistics Canada in building name and address attributes on the GeoBase National Road Network (NRN) for Canada.

GeoBase is a current, accurate, and maintained set of base geospatial data that describes Canada. Operating under the banner of the Canadian Council on Geomatics (CCOG), federal, provincial, and territorial governments are working together to make GeoBase possible by offering source data for the creation of the GeoBase themes. The GeoBase Portal hosted by NRCan, promotes the sharing and maintenance of a common, closest to the source base of quality geospatial data.

Jean Cooper, Acting Director General of the Mapping Services Branch (MSB), Earth Sciences Sector accepted the award on behalf of NRCan. Maurice Bastarache, Associate Director, Electoral Geography at Elections Canada, and

Gordon Deecker, Director, Geography Division at Statistics Canada accepted the award on behalf of their respective organizations. Special recognition was given to Heather Kinsley from Elections Canada in her role as Project Manager for the attributed road network project.

“The Award of Excellence recognizes the efforts of Elections Canada, Statistics Canada, and Natural Resources Canada to advance the development of an addressed national road network.” said Mr. Miller. “Between 1997 and 2004 these departments have worked in a coordinated fashion for the betterment of Canadians - I applaud their efforts.”

NRCan has been working with provincial and territorial governments over the past five years to deliver the NRN, which is based on a national standard established through consultation with stakeholders across the country. The NRN data includes basic geometry captured using Global Positioning System (GPS) technology, with additional attributes. The NRN version 1.0 is publicly available on-line through the GeoBase web portal (<http://www.GeoBase.ca>).

“We are moving towards a new geospatial and mapping environment, building on a common base of quality geospatial data, and partnership is key to its success” said Ms. Cooper. “By working together to improve access to a valuable and reliable source of geospatial information, we are improving decision-making of all Canadians from all sectors of the economy.”

University of Ottawa Geography

Researchers Utilize GeoBase

Geography researchers utilize GeoBase in climate, telecommunications and visualization research.

GeoBase

products are being used by Professor Michael Sawada of the University of Ottawa's Laboratory for Applied Geomatics and GIS Science (LAGGISS) for projects ranging from telecommunications to climate change as well as for the introduction of geomatics concepts into the teaching curriculum of multiple programs.

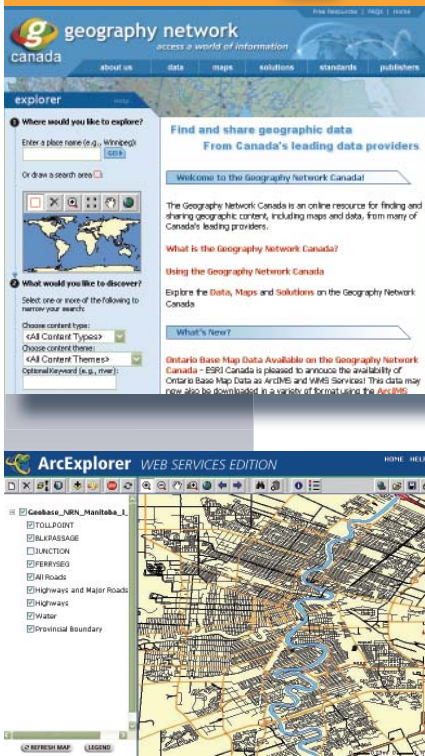
Professor Sawada and graduate student Daniel Cossette are working with the Canadian Communications Research Center and Industry Canada to study the market potential of different broadband wireless technologies to service the almost 5 million Canadians who have no broadband internet access. Population distribution, socio-economic characteristics, and environmental factors all combine to determine the profitability of a given wireless broadband solution. Using GeoBase CDED Level 1 and GeoBase Landsat 7 imagery, the team is able to characterize surface roughness and parameterize the effects of topography on various technologies in rural and remote regions. These studies will identify locations where existing technologies are likely to fail and provide indications of the market potential for targeted innovations to develop better systems. To accommodate these new technologies, frequency licensing and regulatory policies can be updated using this research as its scientific basis.

LAGGISS and Dr. Sawada are also involved in the often heated issue of climate change. A fundamental goal of the Climate System History and Dynamics (CSHD) project, the second largest earth science project in Canada, is to create spatially explicit past (e.g., 6000 years ago) quantitative climate reconstructions using the relation between modern pollen and climate. These reconstructions are compared to past climates modeled from the Canadian Climate Model (CCCma AGCM2) and favorable results suggest increased confidence in model predic-

tions of future warming scenarios. Working with U.S. researchers and the Laboratory for Paleoclimatology and Climatology (LPC) at the University of Ottawa, Professor Sawada and colleagues have produced a geo-referenced database of 4000+ modern pollen samples from the work of individual researchers spanning the last half-century. In the production of this monumental database, GeoBase CDED Level 1 data was indispensable in retrieving missing elevation data for older samples. Good elevation control, particularly in regions of high relief, translates into better atmospheric lapse rate corrections in the assignment of modern climate to the pollen sample sites. The quality of the elevation data directly impacts the quality of the climate reconstructions that are based on the pollen dataset for past time periods. CDED was also used in positional accuracy assessment by comparing original recorded elevations from sites with those extracted from the CDED. Large discrepancies suggested coordinate imprecision and/or error and the need for manual sample reappraisal.

Geomatics principles and approaches are used in research and teaching in such diverse fields as Archaeology, Biology, Ecology, Mathematics, Geology, Canadian Studies, Epidemiology and Engineering. A geomatics approach can contribute to any research endeavor that takes an interest in geographic space – in determining why things are the way they are where they are. Policies, research and practical decisions are based on the output of geomatics analyses; there can be significant fiscal, legal or scientific consequences if the basic theory and associated concepts and capabilities are not fully understood by students. To aid students getting an understanding of this important technology Professor Sawada and graduate student Zoran Reljic are utilizing GeoBase CDED, Landsat 7, and Road Network files to produce 3D photo-realistic animations to convey difficult concepts of geomatics to students. These visualizations will be available in late fall for the general community on the LAGGISS website:

www.geomatics.uottawa.ca



ESRI Canada's Geography Network

Builds on GeoBase

ESRI Canada is a Canadian owned company specializing in geographic information system (GIS) solutions. ESRI Canada provides solutions for many industries including local government, utilities, public safety and defence, business demographics, education, natural resources, and transportation. ESRI Canada's user community consists of over 8,000 Canadian organizations, an extensive business partner network of more than 100 Canadian organizations, and over 3,000 schools that use GIS as part of their curriculum.

Data is the foundation of any GIS. Duplication of effort in collecting and maintaining this data adds unnecessary costs to any project or application. In support of the GeoBase concept of collecting quality data once and making it available for use by many, ESRI Canada is making GeoBase data available on its Geography Network Canada portal (geographynetwork.ca). GeoBase data comes at no cost to the user and has no restrictions on redistribution. This means that developers and GIS users are free to redistribute products containing GeoBase data without cost or licensing issues.

The Geography Network Canada portal is a community-based portal of online resources for finding and sharing geographic content including live maps and data. The availability of GeoBase data on the Geography Network Canada portal will have significant impact by providing immediately usable data as web services for ESRI Canada's installed base of over 50,000 users. GeoBase provides a foundation of quality geospatial framework data to which users can add other thematic data. This allows users to build effective applications while avoiding wasteful duplication of effort in collecting and maintaining these base

layers themselves. And the GeoBase data comes at no cost to the user. Organizations can focus on their core business, collecting only the data that is specific to their application and business.

Beyond live web services, the GeoBase layers on the Geography Network portal will soon be available to users for direct data download in a variety of vector formats. Users will have the ability to navigate to a variety of geographic areas, select from an extensive list of vector data formats including geographic markup language (GML), computer aided design (CAD), shapefiles, and others. Within a few seconds, users will be able to download their personalized dataset to their local machine for further analysis.

ESRI Canada has been very active in promoting geography and geomatics in education. As part of the K-12 program, which has helped get GIS technology into thousands of schools in Canada, ESRI Canada has produced a comprehensive collection of GIS ready data and supporting lesson plans called ArcCanada. Future releases of ArcCanada, already underway, will incorporate the wealth of data available in GeoBase. Teachers will be able to provide meaningful exercises by integrating data from their local area when using GIS to teach geography. GIS is a mandatory component for Grade 9 students in Ontario and is part of the curriculum in many other provinces in subjects such as environmental studies and history.

GeoBase is a current, accurate, and maintained set of base geospatial data that describes Canada. Operating under the banner of the Canadian Council on Geomatics (CCOG), federal, provincial, and territorial governments are working together to make GeoBase possible by offering source data for the creation of the GeoBase themes.



Success Story

www.geobase.ca

Building on Common Ground...

PCI Geomatics Champions for the innovative use of GeoBase data

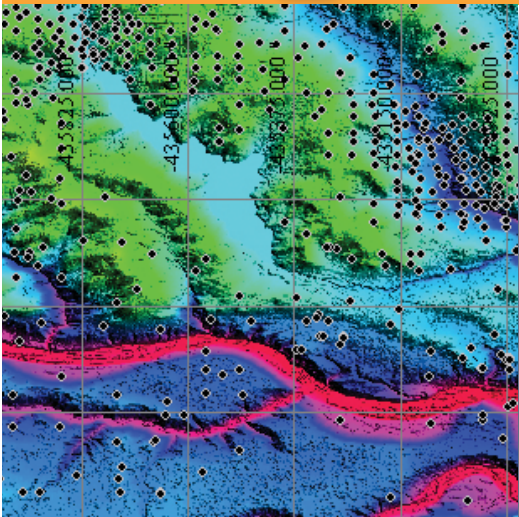
PCI Geomatics is using GeoBase products extensively in their GeoCapacity Information System (GCIS) prototypes. Through investment, funded through Technology Partnerships Canada, PCI Geomatics is creating three separate GeoCapacity Information System prototypes focused on mapping, the environment, and disaster management for homeland security. These systems will provide online geo-information products and services for government and commercial organizations that require open, standards-based, non-proprietary tools to access reliable, accurate and up-to-date geospatial information to support their business decisions.

GeoCapacity Information Systems integrate Canadian leading-edge technology, which enable geospatial communities to connect with sources of data – including GeoBase data – and allow its users to make intelligent decisions in a specific geospatial field. By building capacity for handling spatial information in a rapid, reliable and sustainable way, PCI is not only creating information products, they are developing critical infrastructure which will result in reduced business costs by integrating geospatial technology.

The GeoBase advantage

GeoBase and GeoConnections are two shining examples of programs that link the provinces, industry and academe, uniting the geospatial information of our vast land and making it accessible to all Canadians. As more GeoBase compliant data layers become available in the coming months and years, more services and applications will be developed which enhance the usage of geospatial information in an enterprise-wide environment. The national GeoConnections program philosophy of fostering multi-vendor, interoperable, and nonproprietary solutions will stimulate a successful geomatics industry.

Innovation in science and technology are cornerstones to a healthy economy. Canada's ability to generate and apply key enabling technologies will increase capacity, build knowledge and drive the innovation necessary for sustainable development, on both a national and international level.



Small Canadian data mining company adds GeoBase to its resources

Data Forest Mining Inc. has adopted GeoBase as its source of current, no-cost, and accurate geographic data for Canada.

Data Forest Mining Inc. is using leading-edge statistical methods of data mining and visualization to identify high potential oil and gas exploration sites. To locate potential sites, the company's data miners visually analyze production, engineering, geological, and geographic data plotted in up to six dimensions. Once a potential site is located, other data-mining algorithms are used to refine the results.

Data Forest Mining Inc. uses much the same methodology that the banking and retail industries use to mine their customer-purchase databases in search of new products or markets. What this company adds is strong geographic, geological, and engineering components that assist in effectively identifying new oil and gas sites. And it is effective: these data mining techniques produce a 63 to 94 percent chance of finding new wells that could potentially produce \$30 million in profit. Traditional methods find wells with this profitability only 15 percent of the time.

Powering up new business

Always in search of new markets, Data Forest Mining has extended its methodology to investigate electric power grid losses. These transmission losses typically range from 35 to 46 percent. The company's data mining techniques have identified previously unknown relationships between line loss, power line location, geography, and microclimates. These findings will aid in positioning new power lines and locating major power-consuming facilities such as Internet data farms that house power-hungry web servers and databases.

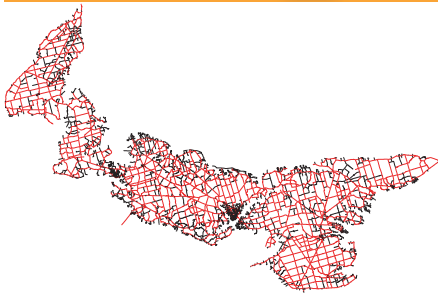
The GeoBase advantage

As a small Canadian company striving to establish itself, Data Forest Mining recognizes the importance of keeping its costs down. Data Forest has helped meet this challenge by adopting POV-Ray freeware for its visualization tool and GeoBase as its source of accurate, up-to-date geographic information for Canada. In particular, the company has found the 30-metre grid digital elevation model from GeoBase highly valuable.

GeoBase is providing large and small companies, government agencies, academics, and individual Canadians with a no-cost, highly accurate, and current source of geographic data. Letting users concentrate on their specialties and on their businesses, GeoBase takes care of the base geographic data and enables organizations such as Data Forest Mining to develop new applications, compete more effectively, and offer cost efficient solutions to their clients.

GeoBase is a current, accurate, and maintained set of base geospatial data that describes Canada. Operating under the banner of the Canadian Council on Geomatics (CCOG), federal, provincial, and territorial governments are working together to make GeoBase possible by offering source data for the creation of the GeoBase themes.

The federal GeoConnections program has been a major catalyst for the creation of GeoBase and the building of the Canadian Geospatial Data Infrastructure (CGDI). For more information on GeoConnections and the CGDI, please visit the GeoConnections web site at www.geoconnections.org.



PEI Department of Transportation uses the NRN

The province of PEI is a keen GeoBase partner and user of the NRN.

The province of Prince Edward Island has adopted the GeoBase National Road Network (NRN), produced by NRCan's Geomatics for the Sustainable Development of Natural Resources program, as its official provincial road network. The advantages to PEI are many: by working within the national framework of GeoBase, PEI can share in the experience and technical expertise of other GeoBase partners; the province can immediately use the NRN data set for provincial projects such as winter snow removal and sanding operations; and the province can benefit from the other GeoBase data sets which are completely aligned with the NRN.

PEI GIS analyst Dan MacDonald says,

"The Prince Edward Island Department of Transportation and Public Works was an early partner in the National Road Network project. Being a small jurisdiction, the Department saw the benefit of participating in a nation wide initiative where we could share our experiences and gain from a wide range of technical and administrative expertise."

The Department has adopted the NRN as its GIS road centreline since January 2003. Asset and network data residing on a previous centreline are being transferred and new mapping projects are now under way. Winter maintenance mapping is one project that has been completed with much of the Department's snow removal and sanding information now mapped using the NRN.

The National Road Network is becoming an integral part of the Department's GIS mapping. The structure of the data combined with its accuracy and currency make it an ideal base on which we can manage and model our Department's assets and activities."

Dan MacDonald
GIS-T Manager
PEIDOT

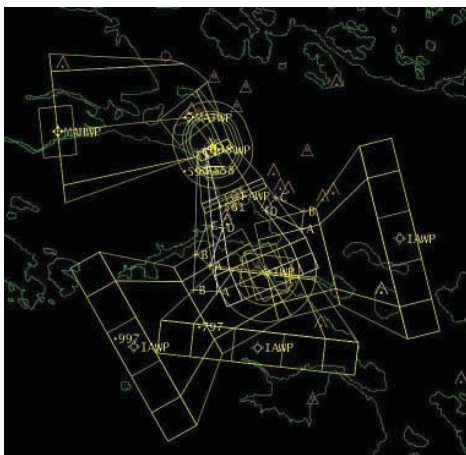
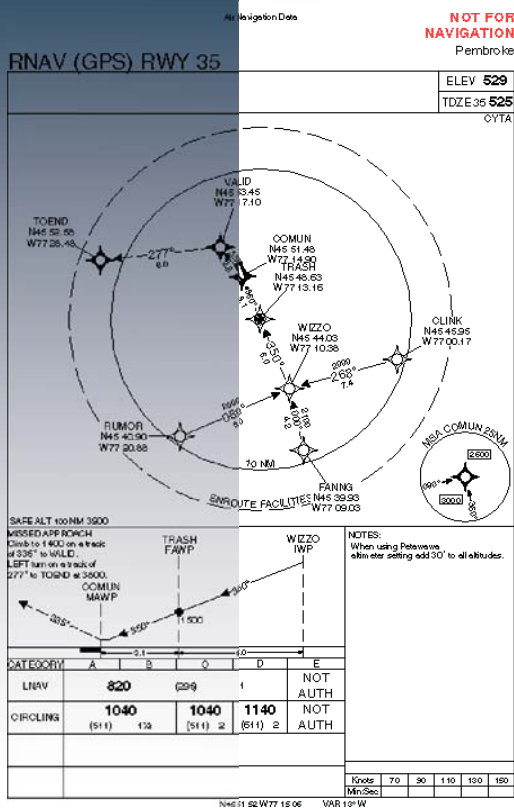
GeoBase Provides Foundation for Instrument Approach Designs

Air Navigation Data has adopted GeoBase as its source of current, no-cost and accurate geographic data for Canada.

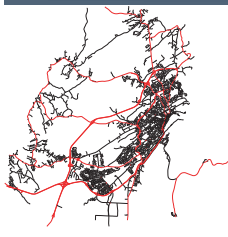
The interface between air and ground is of immense interest to this small Ottawa company. Air Navigation Data, a company with less than a dozen software engineers, produces the software package Final Approach, which is used the world over by military and civilian airport planners to produce instrument approach designs. "The object of an instrument procedure is, for all intents and purposes, obstacle avoidance," says

Air Navigation Data has adopted the GeoBase geospatial data sets for describing the ground for their Canadian clients. "If an airplane has crashed in a valley, it is vital that you have complete and accurate ground elevation data to allow a safe approach to the downed aircraft. GeoBase provides that data for us" says Mr. Ainsworth. GeoBase data also provides the topography and the ability to check other ground-referenced data such as obstacle and road location for airports, runways and helicopter pads. "Our business is approach design. Having a high quality, no cost source of base geographic data allows us to pursue our specialty knowing that we have the information we need to meet our client's needs."

GeoBase evolved out of the Framework Data Node of the Federal GeoConnections Program. Framework data consisted of existing geographically referenced data from many disciplines, which was reformatted to conform with existing data standards. From this seed has grown a commitment by the federal, provincial and territorial governments to support a national data set of elevation, administrative boundaries, road networks, geographical names, satellite imagery and geodetic control points. The commitment of the governmental partners is to develop and maintain this base geographic information. This leaves companies like Air Navigation Data free to concentrate on their areas of expertise and to develop applications that improve the lives of all Canadians.



John Ainsworth, company owner, CEO and President. The software must take into account the terrain, obstacles and airport configuration to produce a safe instrument approach for the pilot to use in poor weather conditions. The software has evolved to the point where the system is now undergoing field tests by Department of National Defence's (DND) Helicopter Search and Rescue program, in cooperation with the National Research Council, to allow helicopter crews to design instrument approach procedures while in the air on route to downed aircraft with an Emergency Locator Beacon.



“GeoBase is an important and innovative step by Natural Resources Canada / CCOG to make geographic information accessible and available to the academic community. Accessibility of geo-referenced data is a key factor for research by students and faculty members alike. The Value added through making this data available to academia is very substantial indeed and will grow in importance over time. Canadian academics welcome the creation of GeoBase and look forward to its further development.”

Dr. Fraser Taylor, Distinguished Research Professor, Carleton University
Chairman International Steering Committee for Global Mapping

“GeoBase data is an important foundation for the Canadian GIS Industry.”

Alex Miller, President, ESRI Canada

“Our business is approach design. Having a high quality, no cost source of base geographic data allows us to pursue our specialty knowing that we have the information we need to meet our client’s needs.”

John Ainsworth, CEO and President, Air Navigation Data

Other User Feedback

“I am working for Alberta Natural Heritage Data Centre and LANDSAT imagery and to some degree CDED is very useful for improving our ability to map appropriately rare and uncommon plants, animals and communities.”

“In my situation, more free data means more work for me. Not having to pay for all data keeps costs down and makes a GIS project more appealing to companies.”

“To my mind the really important innovation with GeoBase is not that the data is free (gratis, doesn’t cost any money). The really important thing is that the data is libre, downstream users are actually allowed to use the data.”

“At last I can tell my clients that I can provide them with data that they have paid for through taxes at no extra charge.”

“I use it (GeoBase LandSat7) for navigation to my forestry research sites across Western Canada, and for labelling and mapping of study sites and vegetation features.”

