Section 12 Auditing place name records

Chapter 30 **The Canadian Geographical Names Data Base – an example of a national system combining data from different jurisdictions**

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30.1 Introduction

Where is *Flin Flon*? Are *St. Lawrence River* and *fleuve Saint-Laurent* both officially recognized names? What was the formerly approved name for *Iqaluit*? In Canada, geographical names constitute a significant part of culture, heritage and identity (Figure 30-1). They are formalized through Canada's national naming authority, the Geographical Names Board of Canada (GNBC), and stored in the national toponymic database, the Canadian Geographical Names Data Base (CGNDB).

The need for toponymic databases

Today toponyms can be gathered into municipal, provincial, national and regional databases to make them accessible, often through Internet-based Spatial Data Infrastructures, to the widest possible audience. A toponymic database can serve many purposes, particularly if linked to other spatial data, as a name is an intuitive entry point to search for associated information.

Figure 30-1 Road sign in New Brunswick, including a bilingual (French/English) town name; Village signage in Saskatchewan; Street signs in Lytton, British Columbia, showing English and Nłeʔkepmxcín (or Thompson) language

In addressing data needs to analyze complex physical and cultural associations, our focus must be on the toponymic data itself, its attributes, storage, and accessibility so that correct geographical names are widely available. For a national toponymic database to be of optimum use, it is necessary to consider such questions as: what geographical names and what attributes should be included; how will data derived from different sources be pulled together; how will data quality (e.g. accuracy, consistency across the country, completeness) be planned and achieved; how will the records be kept up to date (and what does that mean); how will the toponymic data be accessed and linked to other spatial data.

Distributed databases

In some countries, the authority for approving geographical names lies not with a single national committee or names board, but with boards/authorities at the first level administrative unit (e.g. province, state). In these cases, a national database must take into account the harmonization of records from the different authorities, the process(es) for updating the data, and a framework for expanding, modernizing and rationalizing the system, as needed.

As an example of a national toponymic database that includes data from various sources, we will elaborate on the development of the Canadian Geographical Names Data Base (CGNDB) in which toponyms from Canada's 10 provinces and

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3 territories (Figure 30-2) are combined, updated regularly and made generally available through the Internet. The CGNDB, unlike some national databases, is not created for a particular map scale, but is the authoritative database of Canada's toponyms for use by governments, industry, academia and the public.

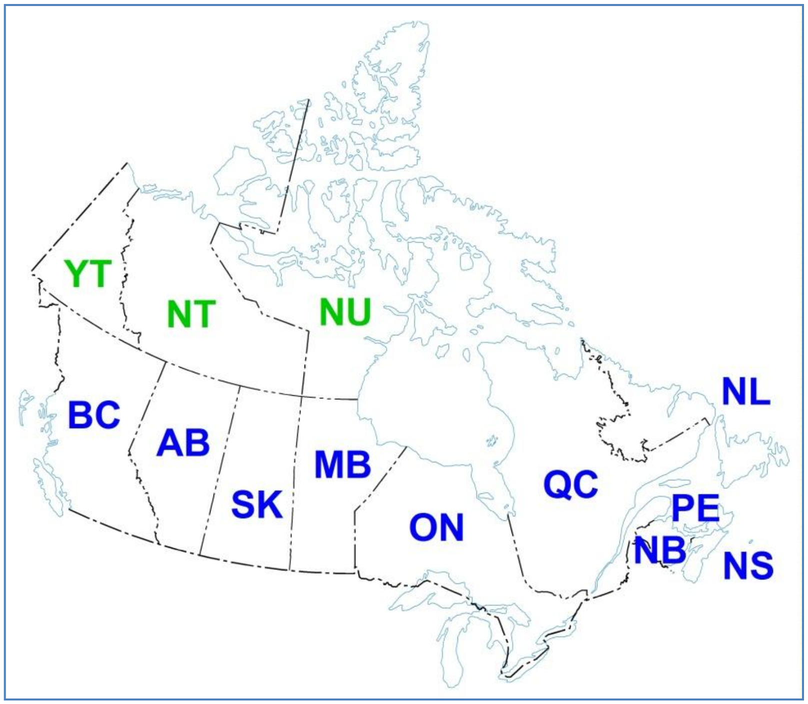


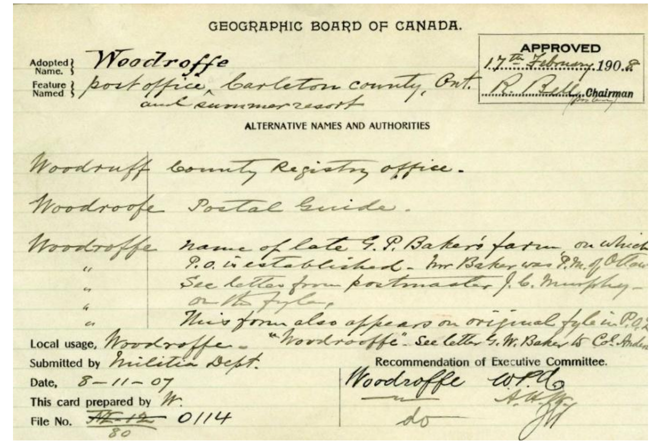
Figure 30-2 Provinces and territories of Canada

- *Provinces (blue): BC British Columbia; AB Alberta; SK Saskatchewan; MB Manitoba; ON Ontario; QC Quebec; NB New Brunswick; PE Prince Edward Island; NS Nova Scotia; NL Newfoundland and Labrador.*
- *Territories (green): YT Yukon; NT Northwest Territories; NU Nunavut*

30.2 Early records of Canada's national names authority

The Geographic Board of Canada was initially created by an Order in Council of the Government of Canada in 1897. At that time the Board Secretariat in Ottawa started keeping card records for the names approved by the Board for places and features across the country. Within a year, provincial representatives were included in the Board to provide advice on name decisions. Not until 1912 did a province (Quebec) create its own names board.

Although the early cards were fairly consistently compiled, the layout of the card, the amount of data recorded and the legibility varied considerably over time (Figures 30-3 and 30-4). However, the cards were a suitable source of data for national names lists, regular reports of officially recognized toponyms, and for compilation of gazetteer volumes for each individual province and territory.


GEOGRAPHIC BOARD OF CANADA.

APPROVED 17th February 1908 R. Bell Chairman (pro tem)

Adopted Name. Woodroffe

Feature Named post office, Carleton county, Ont. and summer resort

ALTERNATIVE NAMES AND AUTHORITIES

Woodruff County Registry office.

Woodroofe Postal Guide.

Woodroffe name of late G.P. Baker's farm on which P.O. is established - Mr Baker was P.M. of Ottaw

See letter from postmaster J.C. Murphy on the fyle.

This form also appears on original fyle in P.O.

Local usage, Woodroffe. "Woodroffe" See letter G.W. Baker to Col. Andr

Submitted by Militia Dept.

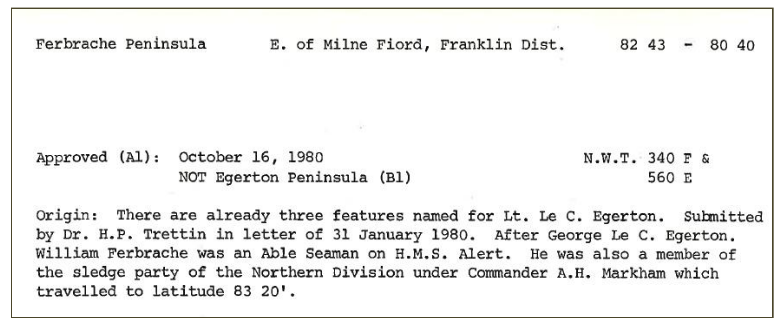
Date, 8-11-07

This card prepared by W.

File No. 0114

Recommendation of Executive Committee. Woodroffe

Figure 30-3 Example of a 1908 hand-written card from Board records (note: no coordinates were included in these early records)


Ferbrache Peninsula E. of Milne Fiord, Franklin Dist. 82 43 - 80 40

Approved (A1): October 16, 1980 N.W.T. 340 F & 560 E
NOT Egerton Peninsula (B1)

Origin: There are already three features named for Lt. Le C. Egerton. Submitted by Dr. H.P. Trettin in letter of 31 January 1980. After George Le C. Egerton. William Ferbrache was an Able Seaman on H.M.S. Alert. He was also a member of the sledge party of the Northern Division under Commander A.H. Markham which travelled to latitude 83 20'.

Figure 30-4 Example of a 1980 card created before the national database became fully digital

Changes in jurisdictional responsibility for geographical naming

By the 1960s, the provinces had all taken over the authority for making the decisions on geographical names within their own jurisdictions, and in the 1970s, the territories also took on these decision-

making responsibilities. However, card records, based on decisions from the jurisdictions, were still kept for the whole country by the Board Secretariat.

Today, representatives of provincial, territorial, and federal naming authorities, together with a Chairperson and advisors, constitute the Geographical Names Board of Canada (GNBC), the national coordinating body responsible for geographical naming activities in Canada. The GNBC members supply their toponymic decisions to the national Canadian Geographical Names Data Base maintained by Natural Resources Canada (NRCan), a department of the Government of Canada. Figures 30-5 and 30-6 compare the composition of the Board in its early years with 2016.

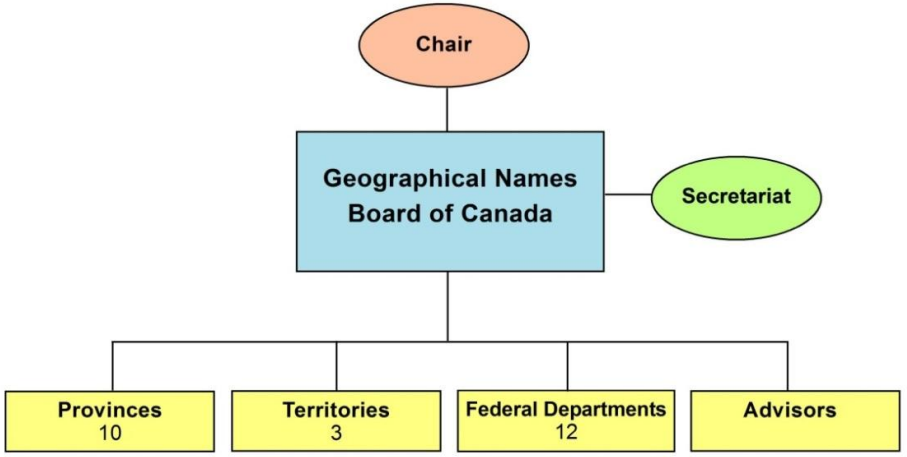


Figure 30-6 Composition of the Geographical Names Board of Canada, 2016

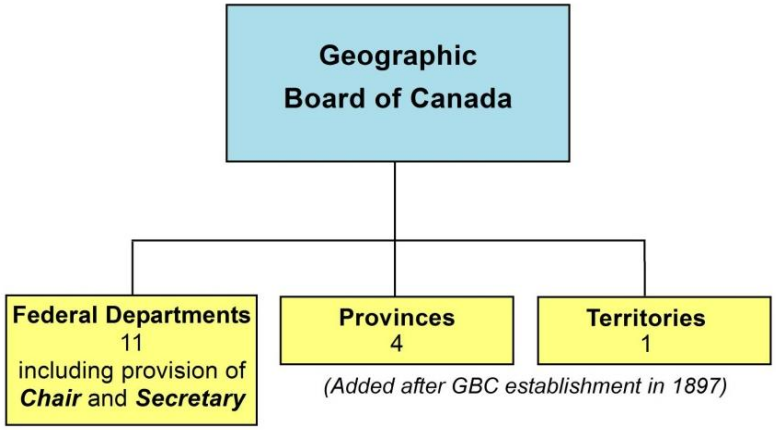


Figure 30-5 Composition of the Geographic Board of Canada, 1900

30.3 Establishing Canada's national geographical names database

The late 1970s saw the development of a digital database from the central card records, to increase efficiency of gazetteer production and names compilation for federal maps. Discussions led to a structural framework more standardized than the rather free-wheeling presentation of material on the card records. Among the most important steps were the development of suitable data fields (e.g. name, feature type, coordinates, etc.); the creation of status codes (for example, "A" status categories for official names, "B" status categories for unofficial names); the coordination of sets of generics / feature type designations that suited each jurisdiction and Canada as a whole. A set of "core fields"[4], necessary for all name records, as well as optional data fields (e.g. unofficial variant names; historical/origin data) were established for consistency across the country's toponymic records.

In the early years of the national database, provinces and territories did not have their own databases. They provided paper decisions in various formats, containing the basic information on new names, changed names, and rescinded names. The data was entered by Secretariat staff, who

[4] Core fields were considered as: geographical name; province/territory; status of name; a cross-reference to an official name, if a name had changed; date of decision; type of feature/place; latitude and longitude; National Topographic System map at 1: 50,000 scale; sub-unit of province/territory; narrative of location; graphic representation showing limits of named feature/place.

consulted the data providers whenever there were questions. Federal departments and agencies responsible for administrative entities (such as national parks and military reserves) also worked with the Secretariat to add their names records to the CGNDB. As well, the Canadian Hydrographic Service contributed undersea feature names to the national data set.

By 1982 the national database was operational, containing some 350,000 approved names and over 100,000 unofficial names.

Database users' manual

Since the 1980s a detailed users' manual for the CGNDB has been compiled and distributed to those who supply data to the national database. As part of the manual's content, lists of codes, with their associated terms and definitions, were reviewed and approved by all GNBC provincial, territorial and federal contributors of geographical names data. To establish standards, the code lists in the manual provided definitions of field contents, and how the data should be entered. New codes were created as required, and updates of the manual have been distributed regularly (see Figure 30-7).

As technology developed, some provinces and territories created their own names databases to meet their specific needs. For some, this was for a mapping program, for others to store cultural and historical information on names. However, all agreed to feed their data into the national database, the CGNDB.

TITLE	SECTION
Name information	***1.0***
Feature name	1.1
Name key	1.2
Cross-reference	1.3
Related names	1.4
Accented characters	1.5
Names with symbols or numbers	1.6
Modified extended Roman alphabet characters	1.7
Syllabics	1.8
Datum	1.9
Record identifiers	***2.0***
CGNDB key	2.1
Feature identifier	2.2
Map Information	***3.0***
Gazetteer map	3.1
Map sheet information	3.2

TITLE	SECTION
Location information	***4.0***
Region code	4.1
Coordinates	4.2
Location information fields	4.3
Geographic location	4.4
Administrative location	4.5
Table of location information	4.6
Location narrative	4.7
Headwaters information	4.8
UTM grid	4.9
Datum	4.10
Attribute information	***5.0***
Status code	5.1
Obscure	5.2
Decision date	5.3
Meeting date	5.4
CGNDB update	5.5
Boundary flag	5.6
National Park code	5.7
Generic code	5.8

TITLE	SECTION
Appendix	***6.0***
Terminology	6.1
Index	6.2
Data input sheet	6.3
Sample CGNDB screen	6.4
Core data fields	6.5

Figure 30-7 Core content for the CGNDB Users' Manual

Key attributes (fields) used in geographical names records

In order to facilitate data transfers, and matching of provincial and national records, each record is given a unique identifier when it is created. This five-letter code, called the CGNDB key, identifies the record for its entire lifespan, whatever changes occur to the data within the record. Names records continue to be stored based on province or territory, and the first letter of this unique identifier indicates the jurisdiction. Additionally, a code identifying the province or territory is included in each name record.

In each record, feature type is identified by a four-character numerical code, called the generic code (see Figure 30-8). There are over 1000 generic codes, with their associated generic terms, which fall into 11 categories, such as Populated Places or Water Features. Some categories are also divided into sub-categories. The Water Features category has seven sub-categories, including Flowing Freshwater, Standing Water, and Tidal Water (Figure 30-9).

Field Name	Example: Ottawa
CGNDB Key	FEOLW
Related Key	FEGRN
Generic Code	0121
Feature Identifier	5997e90fc6ce11d892e2080020a0f4c9

Figure 30-8 Examples of some CGNDB codes

Extract of *CGNDB Users' Manual*

WATER FEATURES	GENERIC CODES
Flowing freshwater	0600 - 0653
Features on flowing water	0700 - 0799
Standing water surrounded by land	0951 - 0997
Water sources	1150 - 1158
Standing water connected to two or more bodies of water	1200 - 1250
Tidal water features	1352 - 1358
Shoreline water features	1400 - 1465

N.B. Numbers in ranges indicate generic codes which currently exist. Space remains in each category to add new generics if required.

Figure 30-9 Generic codes showing ranges for generics in use for water feature toponyms, which constitute more than 50% of the CGNDB records

Origin information exists for many records across Canada, but not for all. A wide variety of information is contained in this field: administrative detail such as approval dates, incorporation dates, or files where decision information is located; historical information or the reason for naming.

Latitude and longitude for a name record were originally stored in degrees and minutes. As mapping at larger scales extended across the country, allowing more precision, coordinates were upgraded to degrees, minutes and seconds. In contrast to national databases in some countries, coordinate values in the CGNDB represent the location of the named feature on the ground, not necessarily the positioning of text on particular map scales.

Currently, to accommodate the varied needs of data users, latitude and longitude are displayed in online query results in both degrees, minutes and seconds (DMS) and decimal degrees. Over 90% of DMS coordinates are precise to the second (exceptions are mainly for very large features, where such precision is of limited value). To ensure point coordinate accuracy and consistency, CGNDB data conforms to the NAD 83 geodetic datum. Today most data providers use NAD 83, but for those who do not the data is converted to this datum before being loaded into the CGNDB.

Canadian toponyms on the web

In 1994, the Geographical Names of Canada website was launched. The name query tool allowed users to query the national database for all official names, as well as formerly official names across the country. Only the core fields were available, and there was a limit on the number of allowable records which could be returned per query. The name query quickly became very popular and was widely used by government, business, and the educational sector. National and regional files were made available, greatly increasing the number of clients, and enabling users to update their data more frequently.

30.4 Current status of the CGNDB

Improved data model

In 2013, a need was identified to update the CGNDB data model to comply with broader data management requirements, as well as a need for individual jurisdictions to upload their data directly into the national database. By 2015, the data model for the CGNDB evolved from an attribute-based model to a geospatial-based model. The new data model was designed using a relational ISO standard model and vastly improves the functionality and interoperability of the national database. The previous data model contained one large table with over 90 fields, whereas, the new data model contains 45 tables, and is capable of handling spatial and relational data, so enabling relationships between toponyms and spatial delineations of the named features. There are currently over 133,000 spatial delineations contained in the CGNDB, predominantly for hydrographic features such as rivers and lakes (Figure 30-10). The new model can handle multiple formats such as decision documents, shapefile delineations, and sound files. It also enables better support for data validation, database monitoring and statistical reporting. The new data model also better serves the needs of the

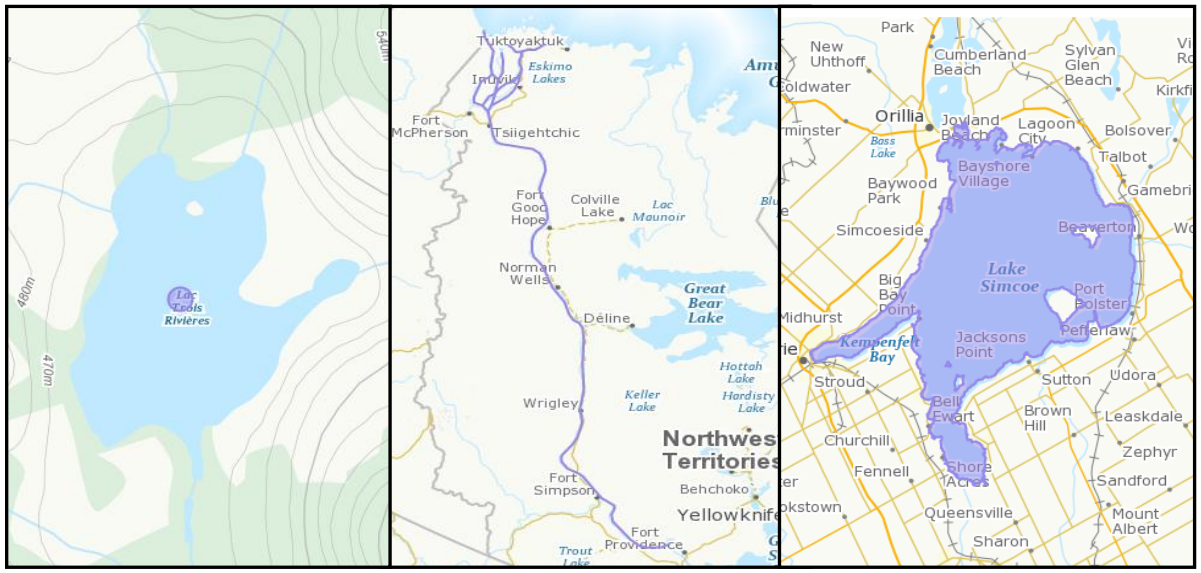


Figure 30-10 Example of spatial delineations for named features: point, line, polygon

provincial and territorial jurisdictions of the GNBC; the new data model supports toponym data entry and editing by each jurisdiction.

Feature identifiers

Key to the transformation of the database from attribute-based to geospatial-based was the inclusion of Feature Identifiers (FIDs). FIDs uniquely identify each named feature; they are implemented as a Universal Unique Identifier containing 32 alphanumeric characters. FIDs remain associated with a feature regardless of any future name changes[5]. FIDs allow for retrieval of all the names with the same spatial extent. The FID is auto-generated for new entries into the CGNDB and is used throughout NRCan for geospatial work flows. In general, if there is a significant change in the spatial extent of the feature, a new FID will be assigned. For example, if a lake were to become two separate lakes, two new FIDs would be assigned, one to each new lake. Criteria are currently being developed to define standard procedures to handle more complex cases, such as successive municipal amalgamations which involve multiple changes to polygons, although the names remain the same.

In 2016, on behalf of the provinces, territories, and federal members of the GNBC, NRCan completed the work to add FIDs to all toponyms in the CGNDB. The process was semi-automated. For example, a related official and former official name that have the same generic definition were automatically assigned the same FID. To handle records that did not meet the automatic assignment requirements, a GNBC working group discussed various scenarios and created a set of FID assignment rules. A thorough examination of the historical relationships and spatial extent of the records was carried out by NRCan's geospatial technicians in consultation with the provincial and territorial naming authorities to ensure that the FIDs were correctly assigned.

Geographical Names Web Application (GNApp-II)

NRCan has also updated a web-based application to support the development of the new data model and facilitate queries and edits to the CGNDB. The new application was launched in February 2016 and supports improved interaction of the GNBC members with the national database (Figures 30-11 and 30-12). The new application was developed with the input of GNBC members through extensive requirements gathering and usability testing. The application offers an improved display and searching functionality, as well as a map visualizer. The GNBC naming authorities can now attach name decisions to database records, as well as upload spatial delineations in shapefile format.

[5] Prior to the use of FIDs, geographical name relationships were handled using a related key (i.e. the unique key of the related name record). The Related Key follows the "history of the name", meaning it follows the various name changes of the feature over time, but does not necessarily track the exact spatial extent of the named place.

Figure 30-11 Screen shot of GNApp-II data entry options

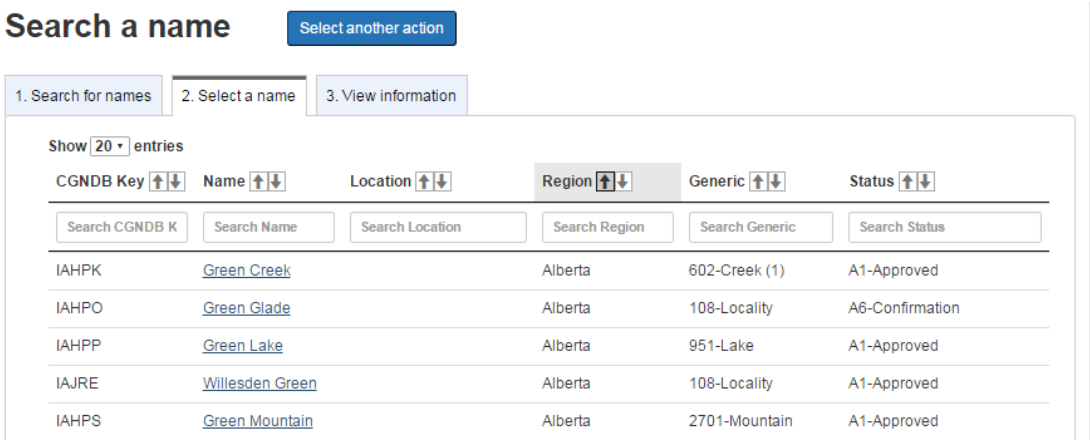


Figure 30-12 Example of results of "Search a name"

By giving the naming authorities of the GNBC direct access to the national database through GNApp-II, NRCan can ensure that the most up to date and accurate names information is contained in the CGNDB. For those provinces and territories that maintain their own jurisdictional databases, an improved batch upload process is being developed. This will involve the jurisdiction submitting the updated names from their database into GNApp-II using a standardized template to ensure efficient data entry into the CGNDB. Currently, jurisdictions that have not adopted the use of GNApp-II submit their new name decisions in batch format, typically through a spreadsheet. The GNBC Secretariat and NRCan's database team clear the data through a validation procedure before adding the records to the CGNDB. Records that do not clear the validation are examined and discussed with the jurisdiction.

Some GNBC naming jurisdictions have their own application programming interface (API) service which allows NRCan's database team to easily access jurisdictional records and update them in the CGNDB. To improve the currency of the CGNDB and its compatibility with jurisdictional databases, NRCan will in future investigate developing an application to query jurisdictional APIs and alert the database team of any updates. In this way data could be fetched as it becomes available.

The data flow process from the various sources into the CGNDB is shown in Figure 30-13.

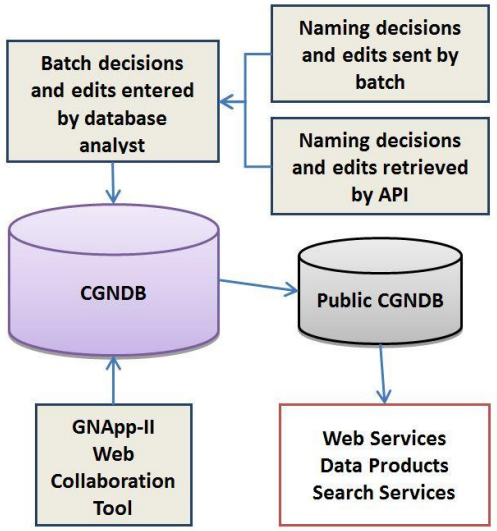


Figure 30-13 Data flow process

For jurisdictions with their own databases, the GNBC Secretariat performs periodic data reconciliations. This is undertaken when the

jurisdiction sends the Secretariat a copy of their database and the records are compared with those in the CGNDB. It is a systematic way to update the CGNDB and ensure that the national database contains the same information as provincial and territorial databases.

Some challenges faced with multiple sources of data

Issues that may be encountered when dealing with geographical names data from multiple jurisdictions include:

- standardization requirements
- handling of features that span jurisdictional boundaries
- quality of the data
- frequency of data updates

As mentioned earlier, each Canadian jurisdiction has different needs and requirements for their names database, and some rely solely on the national CGNDB as their database. Some jurisdictions have wider mandates than others, for example responsibility for street names or tourist route names. To maintain consistency and standardization across all jurisdictions, only records of agreed upon feature types can be entered into the national database.

Canada contains many geographical features that cross provincial and territorial boundaries. When a feature crosses a boundary, both jurisdictions involved will make a decision on the name of the feature, and whenever possible, try to reach an agreement so that the feature has the same name in both jurisdictions. These cross-jurisdictional features are assigned an attribute called a border flag to notify the user that a feature crosses into an adjacent jurisdiction. For every province or territory in which the feature is located, there is a separate record in the database. However, each record will show the same feature identifier.

Another issue faced with combining data from multiple jurisdictions is the varying quality of the data. Validation rules are established and data reconciliations catch the obvious errors. Nevertheless, in order to have consistent and standardized data at the national level, clear data entry guidelines must be in place and cooperative efforts must be undertaken to resolve inconsistencies between the national and jurisdictional databases, as they arise.

The frequency of updating records in the CGNDB is often reviewed to meet user needs for data currency. Collaboration is required between the names jurisdictions, the GNBC Secretariat, and NRCan's database team to aim for timely and consistently updated CGNDB data, and to ensure that the updated data is made available in the public database in a timely manner.

Indigenous languages in the Canadian Geographical Names Data Base

The CGNDB enables naming authorities of the GNBC to indicate the language of the toponym. The language may be defined from a standardized ISO list that contains 74 languages relevant to Canada's Indigenous Peoples, as well as English and French. All provinces and territories have official name records with Indigenous origins. Most are written in Roman alphabet characters that are consistent with English and French. However, the use of the UTF-8 standard encoding in the CGNDB allows representation of special characters of the extended Roman alphabet used in geographical names in Canada (for example, **ã** , **ą̃'**, used in toponyms in the Yukon).

If Inuktitut (an official language of Nunavut) is selected as the language of the toponym in GNApp-II, the application will automatically convert between the Romanized form of the name and the name written in Inuktitut syllabics. Figure 30-14 highlights some examples of the special characters that the CGNDB can handle.

Jurisdiction	Place Name	Syllabic Form	ISO 639-3 Language
Nunavut	Nanuqsiutitalik	ᓇᓄᖅᓱᐅᑎᑕᒃ	Inuktitut-Eastern Canadian
Northwest Territories	Behchokǫ̀		Dogrib
Yukon	Nu Détsyáwa Mą̃n		Northern Tutchone
Nunavut	Aggijjat	ᐊᒡᒋᔭᑦ	Inuktitut-Eastern Canadian
Northwest Territories	Igyųų Yik Thidye'		Kutchin-Gwich'in (Loucheux)
Yukon	Nį̀į'į̀į' Lake		Upper Tanana

Figure 30-14 Names of Indigenous languages, showing examples of extended Roman alphabet characters and Inuktitut syllabics

Publicly available data from the CGNDB

Geographical names in Canada can be accessed using a web-based search tool and through downloadable data products supported by NRCan. The data contains official names of geographical features, including populated places and undersea features.

Web-based toponymic queries can be based on the name, feature type, province/territory, coordinates, rectangular area, or unique identifiers. Users may also search for names containing characters particular to Indigenous languages of Canada (Inuktitut syllabics or extended Roman alphabet characters). A query returns the feature type, region, unique identifiers of both the name and the feature, latitude and longitude, the date when the name was approved or changed status, and (if available) a spatial delineation of the name's application overlaid on a base map in a web map viewer (Figure 30-15). CGNDB records can be accessed at: http://www.nrcan.gc.ca/earth-sciences/geography/place-names/search/9170

An updated and standardized suite of geographical names digital products can be downloaded in Shapefile, KML, GML, and CSV formats from NRCan's GeoGratis portal (http://geogratis.gc.ca/) as well as from the Government of Canada Open Data Portal (http://open.canada.ca/en/open-data).

In addition, NRCan offers an Application Programming Interface (API) as a means of public access to the CGNDB for customized searches.

In some instances the feature boundary may not align with the base map due to the scale and datum at which the feature was collected.

Name	**Sirmilik National Park of Canada**
Language	English
Other official name	Parc national du Canada Sirmilik
Key	OAUQP
Status	Official
Feature Type	Conservation Area
Feature Generic	National Park
Location	
Province/Territory	Nunavut
Latitude - Longitude (DMS)	72° 50' 0" N, 80° 35' 0" W
Latitude - Longitude (decimal)	72.833333, -80.583333
Map	048A16
Relevance at Scale	1: 5 000 000
Toponymic Feature ID	8fde721fba3611d892e2080020a0f4c9
Decision Date	2001-01-12
Source	Parks Canada

Figure 30-15 Result of a public web search for Sirmilik National Park of Canada

Some uses of the CGNDB

When the database was first created, it was invaluable for the production of printed gazetteers and for map production, streamlining the creation of both products. For maps, a names list which previously was made manually from earlier editions could be created automatically, saving considerable time. Conversely, gazetteer and map publishing were important drivers for quality control of database records.

Today the CGNDB serves a broad set of needs and the national data is included in many applications (e.g. GPS and smart phone applications). Museum curators labelling specimens collected by scientists use the name query to verify place names used in field reports, and to locate the sites. Couriers and trucking companies create lists of populated places to find locations not on road maps. Students and teachers use the geographical names data and a radius tool in combination with educational modules to improve their knowledge of geography and history, and to research the connections between place names, culture and heritage. Figure 30-16 shows some uses of CGNDB data.

The CGNDB continues to be a valuable resource for a wide variety of research. Genealogists and historians use it to find names mentioned in historic texts or family documents. It is possible to find the

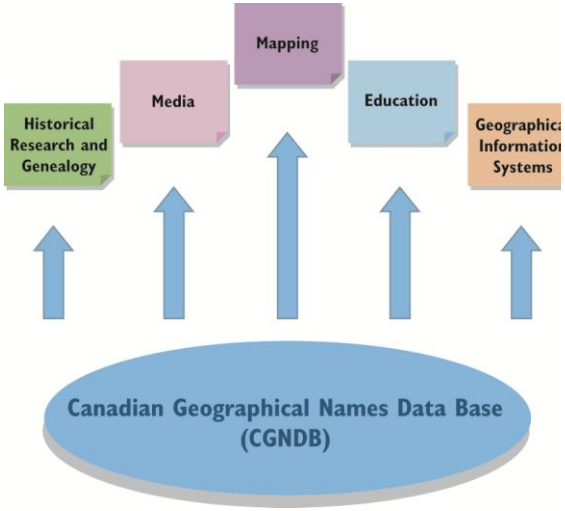


Figure 30-16 Some of the many uses for CGNDB data

longest, shortest or most common names in a province/territory, region, or all of Canada, as well as extracting data for names associated with specific feature types. The CGNDB is used for data analysis, and the collection of statistics. For example, the GNBC has studied the density of official names across the country to identify gaps in fieldwork, and to suggest possible areas for future research.

Although the CGNDB is not designed solely for map production, government maps at various scales use official names from the CGNDB (Figure 30-17). Geographical names data also enhances the value of other datasets. The names provide an easily recognizable frame of reference for thematic maps and help to put other data in context for users.

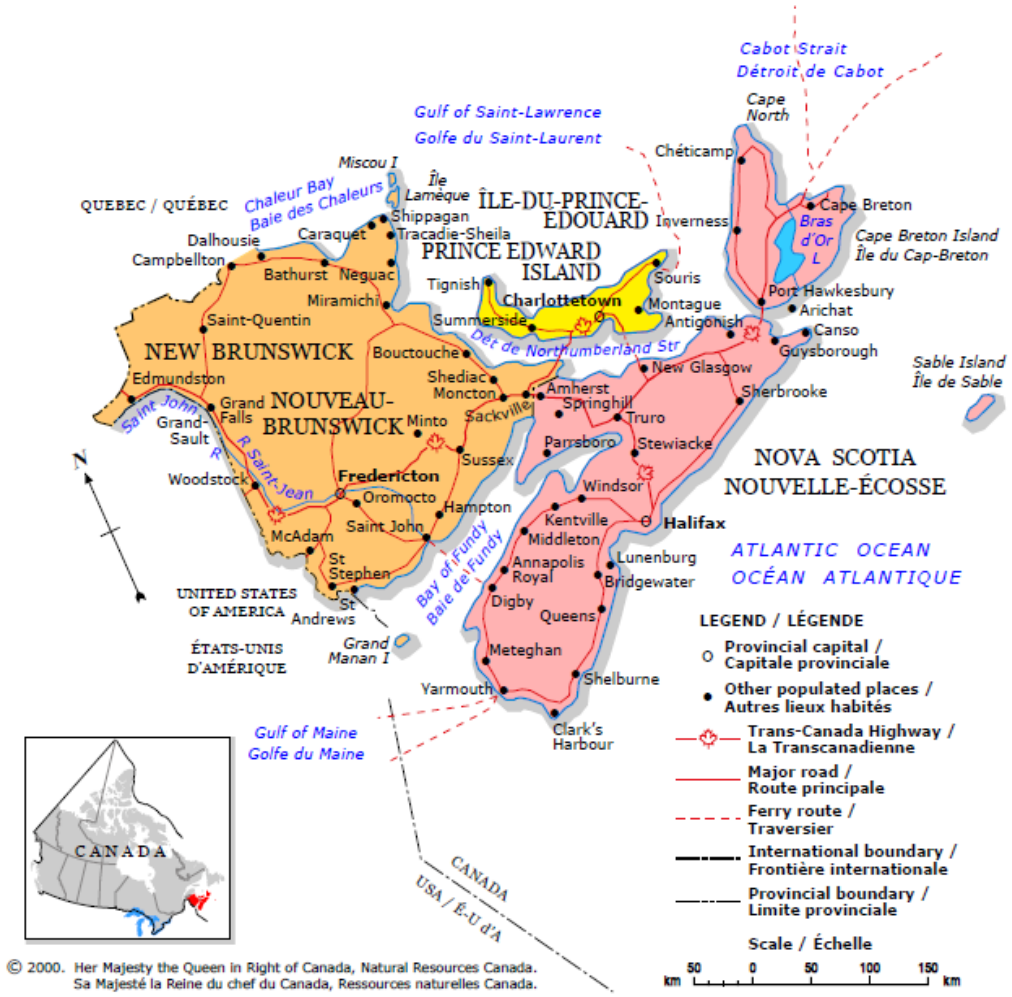


Figure 30-17 A map of Canada's Maritime Provinces, showing official names, including those which are approved in both of Canada's official languages (English and French)

30.5 Further thoughts on multiple source toponymic databases

For a national toponymic database to be of optimum value, the data needs to be accurate, consistent, authoritative and up to date. For databases, such as the CGNDB, where information is combined from multiple jurisdictions, challenges exist in coordinating data that may have been gathered under differing conditions and by various processes. Add to this the different age of records which are accumulated in a database, and it is clear that for consistency, standards must be set and maintained for data fields and their contents. For example:

- an "approved" name entry should use the combination of upper and lower case letters, numerals, diacritics and punctuation, as prescribed by the names authority, and conform to a standard character set, such as UTF-8
- codes for categories of feature types must cover all data contributed to any national database, and should conform to appropriate database modelling standards
- treatment of cross-references (e.g. former names, other language versions, informal variant names) must be consistent
- using unique identifiers for individual name records and feature identifiers for spatial geometries will facilitate linking geographic extents with names and their attributes
- status options for names must be agreed upon by the data providers
- either a regular update schedule, or close monitoring and timely processing of name decisions and updates, is necessary to ensure that national databases remain current

For a successful database, continued discussion and cooperation is essential between those involved with the supply and maintenance of the names data. This collaboration ensures the needs of all parties are considered and the system can be updated to meet technical changes and evolving requirements to access and use the toponymic data.

In future, it is likely that data from municipal governments (such as street and building names) or from research files (e.g. linguistic or historical information on toponyms) will be linked to national systems through location and feature identity. Additionally, the content of geographical names databases is increasingly being associated with other aspects of national (or international) geospatial data, allowing names to be used in conjunction with topographic data, climate data, census data, and so on. For these links and uses to be effective, adherence to well-developed standards for maintaining the national toponymic database cannot be underestimated.

For some, the verification of data being entered (perhaps by several different methods) into the national database will be complicated by multiple language records, by different mandates of the data suppliers, by lack of human and financial resources, or by technical issues. Nevertheless, whether a national database is simple or complex, the goal remains the same – to provide for global users a reliable and accessible view into the toponyms that form a significant part of every country's history and culture.

30.6 References

Listed by date; documents are available on the UNGEGN website (http://unstats.un.org/unsd/geoinfo/UNGEGN/)

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