1991 DIGITAL BOUNDARY FILES

USER GUIDE

Produced by the Geography Division
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La version française de ce guide est disponible sur demande

What's New in the 1991 Digital Boundary Files?

-> Digital Boundary Files are available in a topologically consistent format, with no gaps or overlaps, overshoots or slivers

-> an Enumeration Area Digital Boundary File is available for the first time

-> all levels of Digital Boundary Files are consistent with each other

-> Digital Boundary Files within Street Network File (formerly called Area Master File) coverage are consistent with the Street Network File features (The Street Network Files are other Statistics Canada geography digital products containing streets, railways, hydrography, and other physical features, as well as feature names and street address ranges)

-> the Digital Boundary Files reflect the boundaries as required for the 1991 Census of Population and Housing and the 1991 Census of Agriculture and their statistical data products

PREFACE

This document is intended to provide the user with an understanding of the Digital Boundary File products, their uses and limitations.

The Digital Boundary Files are geographic data files that can provide an infrastructure for many Geographic Information Systems and mapping software. The Digital Boundary Files do not include any software or instructions on how to use the product with specific software packages. These products are basic boundary files in a polygon format with no underlying features such as streets or hydrography.

The Digital Boundary File products cover most levels of Statistics Canada's standard geographic areas:

- Provinces and Territories (PR/TERR)
- Federal electoral districts (FEDs)
- Census divisions (CDs) - equivalent to counties
- Census subdivisions (CSDs) - equivalent to local municipalities
- Census consolidated subdivisions - groupings of CSDs
- Census tracts (CTs) - equivalent to neighbourhoods
- Urban areas (UAs) - dense concentrations of population
- Enumeration areas (EAs) – the smallest geographic area for which census data are usually available

All Digital Boundary File products were derived from the enumeration area digital base.

Detailed information is provided on the creation of the Enumeration Area Digital Boundary File product since the EA is the building-block for creating all other standard geographic areas. By understanding the creation of the EA Digital Boundary Files, the user will be able to analyze and measure the quality of all levels of Digital Boundary Files for their own particular requirements.

TABLE OF CONTENTS

Two supplementary documents are attached:

SUPPLEMENT 1: Examples of geographic units in multiple parts
SUPPLEMENT 2: EA Linkage errors on the Geographic Attribute Data Base and their impact on the Digital Boundary Files

1. ABOUT THIS GUIDE

This User Guide is intended for users of any or all of the Digital Boundary File products.

The first section provides an overview of all the Digital Boundary Files, including the general methodology used to create the products, and a comparison with a 1986 product (CARTLIB).

Each of the next 8 sections focuses on one of the geographic units for which a standard Digital Boundary File is available. For each, the content, data quality and the technical specifications of the product are described in the following terms:

- The content of the file gives the number of polygons and the format of the geographic codes for the particular geographic unit. Some technical information is also provided (such as the total number of line segments and disk storage requirements).

- The data quality statement provides information to users to evaluate the suitability of the data for a particular use. No statistical measurements have been done to date; thus the data quality is descriptive only.

  Details are provided for the data quality of the EA Digital Boundary File since it is the building-block for all other Digital Boundary Files.

  A sub-section for special considerations for each of the Digital Boundary Files is provided. In some cases, this section may be brief or even blank. Space is left for the user to add his/her comments. Statistics Canada would appreciate your comments to add to these sections. Forward them to your nearest Statistics Canada Regional Reference. Updates to this User Guide will be issued as required.

- The technical specifications are provided relative to the ARC/INFO® Geographic Information System. (ARC/INFO® is Statistics Canada's production Geographic Information System.)

A Glossary is provided in Section 11. More details on geographic terms can be found in the 1991 Census Dictionary (Catalogue 92-301E or 92-301ED). Supplementary information is given in Section 12.

Two supplementary documents are included with this User Guide: Supplement 1 provides examples of geographic units in multiple parts. (Supplement 1 will not appear in electronic versions of the User Guide because of the illustrations which cannot be represented in ASCII format.) Supplement 2 lists EA linkage errors on the Geographic Attribute Data Base and their impact on the Digital Boundary Files. Both of these supplements will be updated as required. The user can contact their nearest Regional Reference Centre for information on the latest update.

This User Guide does not provide details on specific software packages for using the Digital Boundary File products. The user is advised to contact the specific software vendor for information. A current list of software vendors able to supply Digital Boundary File products in their own formats is maintained by Statistics Canada. Please contact your nearest Regional Reference Centre for information.

This report is based on the best information available at the time of its release. It in no way constitutes a warranty of the data in the event that users may observe characteristics that deviate from those stated in this document.

In addition, many geographic codes and numbers presented in this guide have been transcribed from computer screens and internal written reports and then key-entered. All efforts have been made to ensure the accuracy of the key-entry operation, however no guarantee can be made that the codes and numbers are 100% correct.

2. OVERVIEW OF THE DIGITAL BOUNDARY FILE PRODUCTS

2.1 Introduction

The 1991 Digital Boundary Files are computer boundary files for the standard Census geographic levels. Digital Boundary Files are available for each of the following geographic levels:

- Provinces and Territories (PR/TERR)
- Federal electoral districts (FEDs)
- Census divisions (CDs) - equivalent to counties
- Census subdivisions (CSDs) - equivalent to local municipalities
- Census consolidated subdivisions (CCSs) - groupings of CSDs
- Census tracts (CTs) - equivalent to neighbourhoods
- Urban areas (UAs) - dense concentrations of population
- Enumeration areas (EAs) – the smallest geographic area for which census data are usually available

With the appropriate computer software, Digital Boundary Files provide the framework for computer analysis and mapping. These files can also be used to create new geographic areas by aggregating standard geographic areas, and for other data manipulations available with the user's software.

2.2 Purpose of the Digital Boundary Files

The digital boundary files were produced to support the 1991 Census of Population and Housing.

- approximately 24,000 collection maps were automatically produced using a pre-census version of the EA digital boundary file.
- approximately 1,200 EA reference maps were automatically produced using a production version of the EA digital boundary file.
- the CSD digital boundary file was used to assist in the production of the 1991 CD/CSD reference maps series.
- all levels of digital boundary files were used for internal quality assurance processes.

2.3 Geographic Reference Date

All census data reflects the census reference date of June 4, 1991. There is also a Geographic Reference Date on which the geographic framework takes effect. This date is earlier than the census reference date in order to give Statistics Canada enough time before Census Day to process the necessary boundary and name changes. For the 1991 Census, the Geographic Reference Date is January 1, 1991. The Digital Boundary Files reflect the legislative/administrative geographic framework as it existed on January 1, 1991, provided that the information on any changes was received by Statistics Canada from the provincial or territorial authorities by March 1, 1991.

The only exception is the EA Digital Boundary File which contains all updates made to the EAs on Census Day as a result of dwellings not identified prior to actual census enumeration.

2.4 Comparison to the 1986 CARTLIB Product

The methodological approach for the 1991 Digital Boundary Files makes these products different from the 1986 digital boundary files that were available as CARTLIBs (Cartographic Library).

A major change is that the 1986 CARTLIB geographic areas were generally digitized independent of each other, and thus, in many cases, the boundaries were not fully compatible (e.g. a CSD boundary may not exactly overlay a matching CT boundary). However, for 1991, a digital boundary file was created for all EAs for the first time. Since EAs are the building-blocks for all other standard geographic areas, EA boundaries were aggregated to create higher level geographic areas. For example, EA boundaries were aggregated to create CT boundaries, rather than digitizing the CT boundaries separately as was done in 1986. In this way, the consistency of all digital boundary products is assured.

Another major change is that, unlike the present boundary files, CARTLIBs were augmented with shorelines and some hydrographic features in order to provide more visually realistic cartographic products. The 1991 Digital Boundary Files do not have cartographic shorelines. Boundaries following rivers depicted as single lines on the original source maps (generally in the more rural parts of the country) follow the natural curves of the river. However, boundaries will extend into major shoreline areas such as the Great Lakes, St. Lawrence River, the Atlantic, Pacific and Arctic Oceans, as well as rivers depicted as double lines on the original source maps. Thus, Digital Boundary Files are not suitable for mapping applications where realistic shoreline is important, or for computing land areas.

Finally, the placement of the EA representative point within the corresponding boundary polygons is 100% guaranteed with the 1991 products. (Statistics Canada defines a representative point (formerly called a "centroid") for each EA in Canada. Section 3.1 gives the definition and method of derivation for these points.) These representative points are used for data retrieval, data analysis or statistical mapping. The method of derivation of these points assures that they are 100% consistent with all of the Digital Boundary Files (i.e. if the points are plotted as an additional layer with the Digital Boundary Files, the points will fall in the correct boundary polygon). This guarantee could not be made with the 1986 EA representative points and CARTLIBs.

2.5 The Census Geography Hierarchies

The Enumeration Area (EA) is defined as the area covered by one enumerator for the Census of Population and Housing. An EA generally contains a minimum of 125 dwellings in rural areas to a maximum of 375 - 400 dwellings in large urban centres. EAs must respect higher level geographic areas recognized by the census; thus, EAs can be aggregated to create all other geographic areas.

The geographic areas are part of the standard hierarchies used by Statistics Canada. The following diagram shows these relationships as they pertain to the Digital Boundary Files (i.e. from the smallest unit aggregated to the larger geographic units).

EA -> CSD -> CCS -> CD -> PROV/TERR -> CANADA

EA -> FED -> PROV/TERR -> CANADA

EA -> CT -> CMA/CA

EA -> UA

Census tracts (CTs) are delineated within all 25 census metropolitan areas (CMAs) and 14 of the 115 census agglomerations (CAs).

2.6 General Methodology

For census purposes, Canada is divided into small geographic areas (EAs), to ensure that all dwellings are enumerated. For the 1991 Census, 45,995 EAs were defined. All EAs are contained in the EA digital boundary file and each EA is represented by one or more polygons. (Sixty-nine of the 45,995 EAs are represented by more than one polygon.) Each EA polygon is identified with the appropriate unique EA code (an 8-digit number representing the province, federal electoral district and EA).

Since the EA is the building-block for all higher order geographic units, the EA digital boundary file was created first. Different methods were used, depending on whether or not the EAs are covered by **Street Network Files**[1]. Most large urban centres and some smaller urban centres are covered by the Street Network Files. The features in the Street Network Files which actually formed the EA boundaries (e.g. streets, rivers) were used. Apartment buildings and collective EAs are represented by small polygons at their approximate location within the Street Network File.

In the remaining large and small urban centres, and in rural areas, the EA boundaries were digitized from the base maps on which the EAs had been manually delineated. Refer to the Data Quality Statement for the EA Digital Boundary File, Section 3.2, for more details on the derivation.

[1] For most large urban centres (and a few small urban centres), Statistics Canada maintains digital Street Network Files (formerly called Area Master Files) containing streets, railways, hydrography and other physical features, municipality boundaries, and other relevant information such as feature names and address ranges. The Street Network Files were originally digitized from maps at various scales ranging from 1:2,400 to 1:50,000. Street Network Files cover more than 60% of the population, but less than 1% of the total land area of Canada.

Since the EA digital boundaries were required for census collection during the pre-1991 census operations, the final EA Digital Boundary File was constructed via a series of "cycle" updates. The final EA Digital Boundary File represents the EA structure in Canada as of June 4, 1991 (Census Day) for disseminating 1991 Census data.

The final EA Digital Boundary File for Canada is the source for creating all other geographic boundary files. Component EAs are aggregated to create all higher order geographic areas as described in the following:

Each EA code in the EA digital boundary file is linked to the higher order geographic codes through the **Geographic Attribute Data Base** (formerly called the Geographic Attribute Data Base or CGDB), a set of data files maintained within Statistics Canada and which provides (among other things) all the linkages within the various geography hierarchies.

The following three diagrams illustrate the process for aggregating EA boundary polygons to the other geographic areas. The example shows the creation of CT boundaries from the EA digital boundary file.

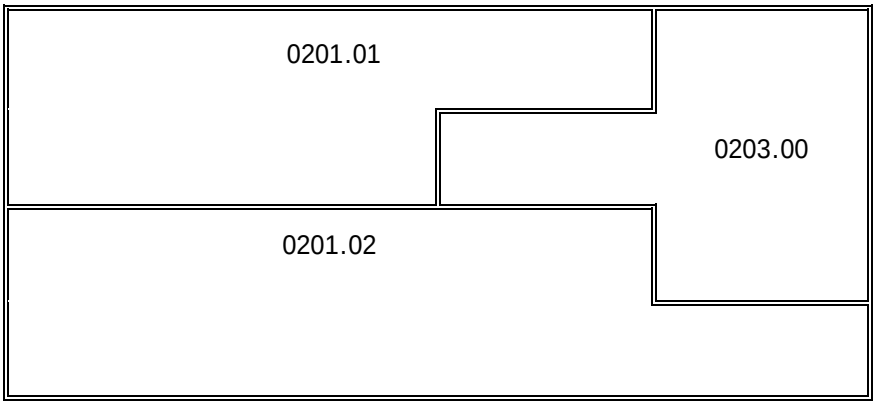
This first diagram depicts a portion of the EA digital boundary file. Each polygon represents one EA with its unique EA code assigned to the appropriate polygon:

10503001	10503002	10503003	10503004
10503008	10503007	10503006	10503005
10503009	10503010	10503011	10503012
10503016	10503015	10503014	10503013

Using the EA code as a link to the Geographic Attribute Data Base, the appropriate CT numerical name is identified and assigned to each EA polygon. The diagram below shows the EA polygons with the appropriate CT numerical name below the EA code.

10503001 0201.01	10503002 0201.01	10503003 0201.01	10503004 0203.00
10503008 0201.01	10503007 0201.01	10503006 0203.00	10503005 0203.00
10503009 0201.02	10503010 0201.02	10503011 0201.02	10503012 0203.00
10503016 0201.02	10503015 0201.02	10503014 0201.02	10503013 0201.02

The EA boundaries common to neighbouring EAs within the same CT are "dissolved" or eliminated. The resulting CT boundary file is depicted below.



This same procedure was used to produce the CSD, FED, UA, CT and PR/TERR Digital Boundary Files. The CSD Digital Boundary File was used to create the CCS and CD Digital Boundary Files (by aggregating component CSDs).

In each case, the Canada EA boundary file was used to create a Canada file of each of the other geographic units. The provincial and territorial files were created from the national file by selecting those geographic units within a particular province or territory.

All processing was done using ARC/INFO Version 4.0 in the Lambert Conic Conformal projection (see Appendix A). As an alternate projection, the Digital Boundary Files are also available in latitude/longitude. This conversion was performed through ARC/INFO®.

30 ENUMERATION AREA (EA) DIGITAL BOUNDARY FILE

3.1 Content

The national coverage of the EA boundary file contains 46,103 polygons representing 45,995 EAs. A list of the EAs comprising more than one polygon is given in Appendix C.

A breakdown of the number of EAs and number of polygons by province/territory, with other information relevant to the content and disk storage requirements are provided below.

PROVINCE/ TERRITORY	NUMBER OF EAs[2]	NUMBER OF POLYGONS	NUMBER OF EAS WITH MORE THAN ONE POLYGON	TOTAL NUMBER OF LINE SEGMENTS[3]	TOTAL NUMBER OF ARCS[4]	DISK STORAGE (BYTES) ARC/INFO® Export files
Newfoundland	1,155	1,156	1	83,167	3,050	554,000
Prince Edward Island	249	249	0	5,605	689	82,000
Nova Scotia	1,442	1,445	1	81,183	4,023	605,000
New Brunswick	1,266	1,268	2	60,333	3,579	491,000
Quebec	10,912	10,919	7	255,971	29,992	3,037,000
Ontario	15,119	15,174	24	262,245	40,700	3,808,000
Manitoba	2,030	2,043	8	55,335	5,385	602,000
Saskatchewan	2,799	2,808	8	65,569	6,678	757,000
Alberta	4,602	4,609	7	115,687	12,037	1,301,000
British Columbia	6,162	6,172	10	207,327	16,477	1,958,000
Yukon Territory	97	98	1	5,484	237	53,000
Northwest Territories	162	162	0	24,566	401	141,000
CANADA	**45,995**	**46,103**	**69**	**1,196,137**	**122,599**	**13,108,000**

[2]As of June 4, 1992. These numbers will differ from those given in the Census Dictionary, (Catalogue 92-301E or 92-301ED) which show numbers of EAs as of November 8, 1991.

[3]All features in the Digital Boundary Files are represented by a series of x,y coordinates (points). A **line segment** joins two consecutive points.

[4]An **arc** is a line between two consecutive intersections. It will generally be composed of more than one line segment.

Geographic Codes:

Each EA is uniquely identified across Canada by an 8-digit code. This code provides unique numeric identification for three types of geographic areas. These are:

- provinces and territories (PR/TERRs)
- federal electoral districts (FEDs)
- enumeration areas (EAs)

The three geographic areas are hierarchically related. EAs aggregate to FEDs, which in turn aggregate to a province or territory. This relationship is reflected in the 8-digit code:

PR/TERR	FED	EA
XX	XXX	XXX
2 digits	3 digits	3 digits

The 2-digit PR/TERR code is the same code as used in the Standard Geographical Classification (SGC) code (see Section 5.1).

ARC/INFO® Polygon "Label Points"

ARC/INFO® automatically computes and uses one point within each polygon for plotting polygon attributes (e.g. the geographic code or name). This point is called the ARC/INFO® "label point", and is located within each polygon at a point suitable for label or symbol placement (an approximation of the visual centre).

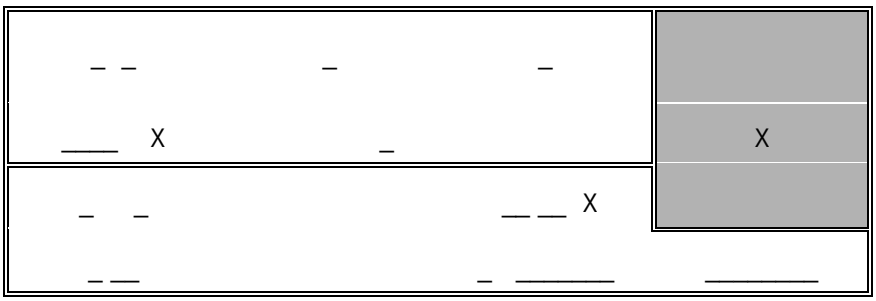
Statistics Canada defines a point in each EA for the purpose of assigning aggregate data to that point for data retrieval, data analysis or statistical mapping. This point is called the **EA representative point** (formerly called a "centroid"). It is defined as a pair of coordinate values (x,y) which is located by the following methods:

1. For EAs within the Street Network Files -- the ARC/INFO® "label point" is used.

2. For EAs outside the Street Network File coverage -- by a manual, judgemental procedure based on the visual inspection of building and/or street patterns on EA census collection maps (some of which have topographic base-map information). The representative point is located, when possible, at or beside a predominant cluster of buildings and/or streets. If there is no predominant cluster, then the point is located between two or more clusters. In the absence of any cluster, the point is placed at the visual centre of the EA. This point was then manually digitized.

In the EA Digital Boundary File, the coordinates of the ARC/INFO® "label point" have been replaced by the coordinates of the **EA representative points**. This will have an impact when plotting with ARC/INFO® in areas not covered by the Street Network File, since the attribute information may not appear at the centre of the polygon as might be expected. An example is given below.

Three EAs are depicted in the diagram below. The shaded EA is in the Street Network File coverage, the other two EAs are not. The symbol _ denotes dwellings/streets as they might appear on the source map. The symbol X indicates the location of the EA representative point.



In the example displayed above, the EA representative point in the Street Network File EA is positioned relative to the centre of the polygon (regardless of the location of the streets or dwellings). Outside Street Network File areas, the EA representative points are positioned based on the dwelling/street concentration as shown on the source base maps within the EA. ARC/INFO® will plot the EA code at these points.

The EA boundary file has some occurrences of EAs in multiple parts as explained earlier. Outside Street Network File coverage areas, only the principal part with the largest dwelling concentration has the manually selected and digitized EA representative point. Label points for the other EA parts were also manually digitized with no special attention to the dwelling criteria (a visual centre was approximated).

The representative point coordinates will be overwritten by the ARC/INFO® "label points" if the ARC CREATELABELS command is executed.

The (x,y) coordinates of the EA representative points are maintained in the Geography Attribute Data Base and contained in the GEOREF and Geography Attribute File products. They are also provided on the Postal Code Conversion File as point locators for postal codes in small urban and rural areas. (Contact your nearest Statistics Canada Regional Reference Centre for more information on these products.)

3.2 Data Quality Statement

The purpose of a data quality statement is to provide detailed information for users to evaluate the suitability of the data for a particular use. Five fundamental components of a data quality statement are: lineage, positional accuracy, logical consistency, completeness and attribute accuracy.

3.2.1 Lineage

Lineage includes descriptions of the source material from which the data were derived and the methods of derivation, including the dates of the source material and all transformations involved in producing the final digital files or map products.

This section relates the history of the 1991 EA Digital Boundary File from the original source materials to the final digital product. This description does not contain all aspects, but tries to cover any information with potential impact on quality.

The EA Digital Boundary File for Canada was created over a period of 3 years. The Federal Electoral District (FED) was used as the processing unit since all EAs must respect FED boundaries and the FED is the principle unit for organizing the census collection operations. First preliminary digital EA boundaries were created (by FED), which were subsequently updated due to municipality boundary changes, updates to the street network, and changes in dwelling counts. The 1991 EA boundaries were finalized with the Census, June 4, 1991. Some EAs may have been "split" during the census collection process if the number of dwellings was greater than expected. These EA splits are included in the EA boundary file. The EA boundary files for each of the 295 FEDs were completed and verified, and finally joined together to create the national file.

Computer processing was primarily done using the geographic information system ARC/INFO® Version 4.0 and the Lambert Conic Conformal projection. (See Appendix A.)

More detailed information on the methods used to create the EA Digital Boundary File is described below.

The EA Digital Boundary File was created using different methodologies, depending on the availability of in-house digital files called Street Network Files. In most large urban centres (and a few small urban centres), Statistics Canada maintains digital Street Network Files (formerly called Area Master Files) containing streets, railways, hydrography and other physical features, municipality boundaries, and other relevant information such as feature names and address ranges. The Street Network Files were originally digitized from maps at various scales ranging from 1:2,400 to 1:50,000. Street Network Files cover more than 60% of the population, but less than 1% of the total land area.

Where available, Street Network Files were used to generate the 1991 digital EA boundary files.

1. EAs covered by Street Network Files (most large urban centres and a few small urban centres):

During the two years prior to the census, a preliminary set of EA boundary files (by FED) was created from the Street Network Files using one of the following methods:

(1) Approximately 12,000 of the 22,000 EAs in Street Network File areas were manually delineated on map plots derived from the Street Network Files. The digital boundaries were then created by extracting the x,y coordinates of the Street Network File features that formed the perimeter of each EA using in-house software. The EAs were then formed into polygons.

(2) The remaining 10,000 digital EA boundaries were created automatically using an ARC/INFO® based Computer-Assisted Districting software system developed in-house.

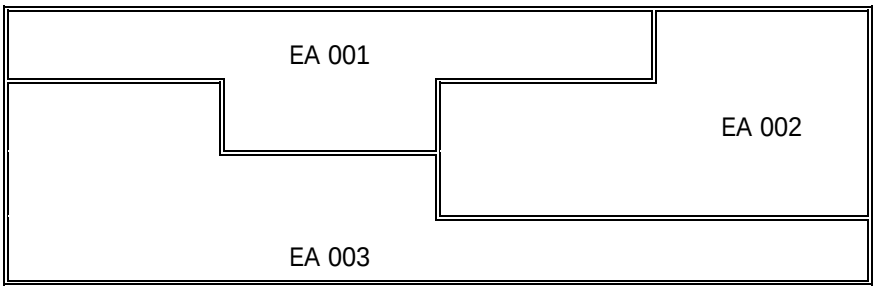
In most cases, the EA boundaries followed Street Network File features. Where this was not possible, line segments representing these portions of the EA boundaries were added to the Street Network Files[5]. These features are referred to as "non-physical" features in the following text. This processing was done in a mainframe environment using in-house developed computer programs and the Universal Transverse Mercator (UTM) projection.

After the preliminary EA digital boundary files were created, the Street Network Files were updated to include final EA boundary non-physical features and more up-to-date street information from municipal documents. They were then converted to ARC/INFO® format and the Lambert Conic Conformal projection. To update the digital EA boundaries, the preliminary EA boundaries were overlaid on the updated Street Network Files to assign each block (polygon) an EA number attribute. EA boundaries were then re-created by "dissolving" the internal Street Network File features based on the EA number attribute. The following diagrams illustrate the process described above.

[5] EAs are delineated for census collection purposes, and should follow visible physical and cultural features where possible so that the census enumerator can easily recognize the boundaries of his/her enumeration area. In densely populated areas, this is not always possible since EAs are delineated to contain a maximum of 375 to 400 dwellings as an acceptable workload for census enumerators in urban centres. Often, "imaginary" lines which go through fields or split large city blocks form an EA boundary. The Street Network Files did not traditionally contain these "imaginary" lines as features unless they also constituted municipality boundaries. Since they were now required in order to generate complete EA boundary polygons, line segments representing these EA boundary features were added to the Street Network Files. In addition, small polygons representing collective EAs or apartment buildings that in themselves were complete EAs, were added. Where apartment buildings contained more than one EA, multiple polygons were added, one for each EA. This ensured that all features making up an EA boundary were included in the Street Network Files. However, this capability was for internal Statistics Canada processing. Purchasers of the Street Network File cannot re-generate the EA boundary file directly from the files themselves.

Thus, for the first time, Street Network Files contain the physical and non-physical features used for EA boundaries.

This diagram represents the preliminary digital EA boundary file with an EA code assigned.



The following diagram represents the updated Street Network File. The lines could represent streets, rivers, etc. or the "non-physical" features added to the Street Network File for those portions of the EA boundary that were "imaginary" and did not follow a physical feature.

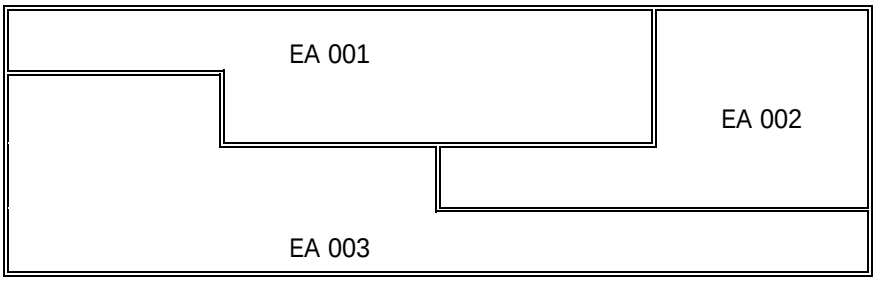
The following diagram depicts the preliminary EA boundary file overlaid onto the updated Street Network File. The EA codes are automatically assigned to each block (polygon).

001	001	001	002
003	001	002	002
003	003	002	002
003	003	003	003

At this point, manual intervention may revise EA codes to change or correct the boundaries as shown below. (Boundaries may change as a result of updated information such as new streets or dwellings. Boundaries may require correcting as a result of ongoing checking procedures.)

001	001	001	002
003	001	~~002~~ 001	002
003	003	002	002
003	003	003	003

The streets common to neighbouring blocks within the same EA are "dissolved" or eliminated. The resulting EA boundary file is depicted below.



Edge-matching

Street Network Files have traditionally been created and maintained as individual files consisting of one or several municipalities (depending on size). The process described above was done prior to the edge-matching of contiguous Street Network Files. Edge-matching was thus required to join the individual EA boundary files created using this process. Subsequent edge-matching of the Street Network Files was performed (ARC/INFO® format) independently from the corresponding EA boundary files. Approximately 120 discrepancies were found at municipality boundaries when comparing the EA boundary file to the Street Network File for the same area. These discrepancies remain in the files, and will be corrected in future updates.

2. EAs not covered by Street Network Files:

Parts of some large urban centres are not completely covered by a Street Network File. In addition, most small urban centres are not covered, nor are rural areas. The EAs in these areas were digitized using conventional digitizing methods with the ARC/INFO® geographic information system. In all of these cases, EAs were manually delineated onto base maps, and the EAs digitized. As EAs were updated on the base maps, the digital EA boundaries were also updated.

The following background base maps were used for EA delineation. The vintage indicated refers to the original map. Updates to the street information as identified from the previous census, had been manually drafted on the maps.

In large urban centres not covered by the Street Network Files:

For these manually-produced maps, with scales ranging from 1:2,400 to 1:75,000, the background base map information was obtained from various source documents: National Topographic System (NTS) maps produced by Energy, Mines and Resources Canada (EMR), municipal town plans, road maps, 1986 census collection maps, and pre-1991 field update maps were used. The map projections vary depending upon the sources.

The user can refer to the approximately 207 manually drafted maps in the 1991 EA Reference Maps Series 1 (formerly called G13s), which are photographically reduced versions of the maps used to digitize the EAs[6].

In small urban centres:

The source maps for digitizing EAs in small urban centres were manually drafted maps depicting EAs in census subdivisions or unincorporated places. Map scales varied from 1:2,400 to 1:250,000. These maps were drafted using information from topographic maps, municipal town maps, road maps, 1986 census collection maps, and 1989/90 census field update maps. The map projections varied, depending on the original source material.

The user can refer to the 1991 EA Reference Map Series 2 (formerly called G14s and G16s), which were produced from the same source maps used to digitize the EAs.

In rural areas:

The user can refer to the 1991 EA Reference Map Series 3 (formerly called G12s), which were produced from the same source maps used to digitize the EAs.

10 Provinces: National Topographic Series (NTS) published by Energy, Mines and Resources, Canada, at scales 1:50,000 and 1:250,000. Map vintages range from 1954 to 1990, with manually drafted updates from previous census collection maps. The map projection is Transverse Mercator.

[6]There are an estimated 2,190 1991 EA Reference Series 1 maps, covering the large urban centres in Canada, of which approximately 1,980 were produced automatically using a pre-release version of the EA Digital Boundary File and the Street Network Files. The remaining 210 EA reference maps are reduced reproductions of manually drafted maps.

Yukon Territory: MCR Series, Map #25, at 1:1,000,000. The map vintage is 1972, with manually drafted updates from the previous census collection maps. The map projection is Lambert Conformal Conic with standard parallels at 49° N and 77° N.

Northwest Territories: MCR Series, Map #36 at 1:4,000,000. The map vintage is 1974, with manually drafted updates from the previous census collection maps. The map projection is Lambert Conformal Conic, with standard parallels at 64° N and 88° N.

As the final step:

Since the EAs were digitized by individual FEDs, FED files were edge-matched as the final operation. The digital boundaries created from the small urban centres were adjusted where necessary to the rural files. This combined file was then adjusted where necessary to match the EA boundaries as created from the Street Network Files.

3.2.2 Positional Accuracy

Positional accuracy is the difference between the "true" position of a feature in the real world and the "estimated" position stored in the digital file.

For this report, the "true" EA boundary is considered to be the boundary as depicted on the source materials.

Positional accuracy depends on the quality of the source material used (EMR's NTS and MCR map series, and the Street Network File, for the position of roads, rail-roads, rivers, lakes, etc.), as well as the manual drafting of the base map features and boundaries. No numerical measurements of positional accuracy have been made. Positional accuracy is presented here in terms of descriptive statements comparing the digital files to the source base materials.

After the preliminary EA boundary files were created (by FED) as described under 3.2.1 Lineage, a complete verification process was conducted where the preliminary EA boundary files were plotted and overlaid on the original source maps. Acceptable tolerances were defined as 1.6 mm East-West and 1 mm North-South as measured on the source map. The following observations were made and actions taken:

In large urban centres (Street Network File coverage): EA boundary errors could only occur if the boundary followed an incorrect feature since the EA limits were generated from the Street Network Files. Errors were marked and subsequently corrected.

In small urban centres: The diversity of source documents and scales used for small urban areas have resulted in poor positional accuracy of the EA boundaries when plotted over the source base maps. Some EA boundaries had errors much greater than the tolerance; these were not corrected due to the difficulty in locating valid control points.

In rural areas: Errors were marked and subsequently corrected. Boundaries crossing map sheets were digitized as they appeared on the source maps. Because of the diversity of source map vintages, digitized features may not appear continuous from one map sheet to the other, even if they are continuous in the real world.

No subsequent verification of EA boundaries was done using the map overlay technique.

As noted earlier, some EA boundaries follow hydrographic features; however major shoreline areas such as the Great Lakes, St. Lawrence River, and the Atlantic, Pacific and Arctic Oceans are not depicted. In these areas, the EA boundaries are drawn (and represented in the digital boundary files) as straight lines which extend into major water bodies to ensure complete coverage of the land area and islands and to follow official municipal boundaries.

In addition, if an EA boundary follows a single line "meandering" feature (such as a river or stream), the EA boundary may appear questionable, depending on the number of points used to represent the feature.

3.2.3 Attribute Accuracy

Attribute accuracy refers to the accuracy of the non-positional information attached to each EA polygon.

The 1991 EA Digital Boundary File product in ARC/INFO® contains an 8-digit PR/FED/EA code as described in Section 3.1.

The following checks were done in order to verify the accuracy of the 8-digit EA codes attached to each EA polygon:

- The EA codes in the digital EA boundary file were matched with the EA codes on the Geographic Attribute Data Base (containing all EA codes and their linkages to other standard geographic areas, such as municipalities, census tracts and federal electoral districts, etc.). The match was 100% correct, ensuring that all EAs were present in the EA boundary file, and that no EAs were missing.

- The preliminary EA boundaries were plotted and overlaid on the original source maps used for EA delineation (as described under Positional Accuracy). The EA codes were manually checked. Corrections were made and verified at the same time as the subsequent cycle of boundary updates as described in the following paragraph.

- Lists of geographic areas with their component EAs was produced from the Geography Attribute Data Base. A manual verification (using lists of other geographic areas with their component EAs produced from the Geography Attribute Data Base) was done to check that all higher order geographic areas contained the correct EAs as they appeared in the Geography Attribute Data Base. Errors were corrected and verified. Although there is assurance that the correct EAs are present within each level of geographic area (e.g. municipality, census tract, federal electoral district), it is possible that even if the boundaries of the two EAs are correct, their EA codes are interchanged. (A test of 2774 non-randomly selected EAs had 2 EAs with their EA codes switched.)

3.2.4 Logical Consistency

Logical consistency describes the fidelity of relationships encoded in the data structure of the digital spatial data (i.e., how well elements of the data structure follow the rules imposed on them).

Automated processing through ARC/INFO® verified that all EA polygons were topologically correct, that they closed, with no overlaps, overshoots or slivers. Lines are intersected only where intended and no lines are entered twice.

There are, however, two polygons ("gaps") within Canada's geographic area that are not associated with an EA. Both of these polygons are within water bodies (one in Georgian Bay, and the other between the three provinces of Prince Edward Island, Nova Scotia and New Brunswick). These two polygons will appear in all Canada level digital boundary files (except the Urban Area (UA) and the Census Tract (CT) files). One of these polygons will also appear in the Ontario digital boundary files (except UA and CT). These polygons are not counted in the total number of polygons in any of these files, since ARC/INFO® associates them with the area outside the Canada boundary. (In ARC/INFO® terminology, these polygons are counted with the "world" polygons, with 3 "world" polygons in the Canada files, and 2 in the Ontario files.)

3.2.5 Completeness

Completeness expresses the degree to which the geographic entities (features) are captured according to the data capture specifications. It also contains information about selection criteria, definitions used and other relevant mapping rules.

The national EA Digital Boundary File contains 46,103 boundary polygons, representing the 45,955 EAs used for the dissemination of 1991 census data. (69 EAs have more than one part; a list of these EAs is given in Appendix C.)

Data are limited to EA boundary polygons. No other major features are present.

In addition, since the objective of the 1991 EA Digital Boundary File is to depict EAs as defined for census collection, major shorelines (as described earlier) are not represented.

3.2.6 EAs comprising more than one part (polygon)

Appendix C lists all the EAs with more than one part (polygon).

An EA can comprise more than one part (polygon) due to the manner of delineation or digitization, or due to technical reasons given below. Examples depicting geographic units in multiple partes are given in Supplement 1 to the User Guide.

1. In general, if an EA consists of a group of islands, or part of the mainland and one or more islands, the EA boundary is drawn (and then digitized) with a line enclosing all of the component parts. However, in some cases, one or more of the islands and/or the mainland portion, were digitized separately. Other discontinuities may be caused by water bodies.

2. Some EAs within CSDs comprising more than one part were delineated in more than one part (for example Indian Reserves).

3. The structure of an EA may create 2 parts joined at a single point when the scale of the source map and the tolerances used in the computer software cause the polygon to be "pinched" when 2 points very close together "snap" to a single point.

4. During the creation of EAs which comprised of one block-face within a Street Network File, a non-physical feature was added using one or more street intersection to enclose the required block-face. In some cases, this caused a surrounding EA to be split into two parts.

5. In a very few cases, EAs will appear as two polygons as the result of appending two contiguous Street Network Files. For example, the Calgary Street Network File was stored as two distinct files, one for the UTM zone 11, the other for UTM zone 12. When the two files were appended, a gap occurred between 2 representations of the same feature (one in each file) which had minor discrepancies in the x,y coordinate values. If an EA crosses that feature, it will appear as 2 polygons joined at one point.

3.2.7 For users of the Digital Boundary Files with the Street Network Files:

The 1991 EA Digital Boundary File created from the Street Network Files will be consistent with the features (physical and non-physical) of the ARC/INFO® version of the Street Network File except in the following:

- approximately 115 cases where non-physical EA boundary features were missed from the Street Network Files. Approximately 200 EAs are affected (see Appendix B) and their digital boundaries subsequently corrected using computer-assisted techniques. The missing non-physical features will be added to the Street Network Files in future updates.

- approximately 120 cases where the edge-matching of some contiguous Street Network Files was done independently of the edge-matching of the corresponding digital EA boundary file.

These discrepancies should not impact the usefulness of the EA boundary file for mapping using the Street Network File an underlying base. An example of this is the 1991 EA Reference Map Series 1 (formerly called G13s), produced automatically using the Street Network Files and a production version of the EA Digital Boundary File. Thus the user can refer to these maps for a physical representation of these digital file products.

These discrepancies between the Street Network File and the EA boundary file may have some impact if the two digital data files are "joined" or "vertically integrated" (using appropriate software). Appendix B lists the EAs which will have portions of their boundaries missing in the Street Network File.

There may be further discrepancies between the EA Digital Boundary File and the Street Network Files obtained in the traditional ASCII format, since these latter files have not been edge-matched.

The user should refer to the Data Quality Statement for the Street Network Files for more information on the source material.

3.2.8 Other Considerations

The 1991 EA Digital Boundary File may be used in conjunction with data available through GEOREF or the Geography Attribute File, which are other Statistics Canada electronic products derived from the Geographic Attribute Data Base. These products contain among other things, the linkages of EAs to all other standard census geography, EA representative point coordinates, and EA population and dwelling counts. This will allow the aggregation of the EA boundary polygons to create the boundaries of the other standard census geographic areas. Errors in the digital boundary files may occur if there are geographic code linkage errors on the Geographic Attribute Data Base. Supplement 2 to the Digital Boundary File User Guide contains a list of all the errors on the Geographic Attribute Data Base that have been identified up to the time of the release of this User Guide. The Supplement indicates the erroneous linkages, as well as showing if the error has been corrected on the appropriate digital boundary file. If the error has been corrected on the digital boundary file, there may be a discrepancy between the Digital Boundary File product as supplied by Statistics Canada and a digital boundary file that a user may create by doing his/her own aggregation by linking the EA code through a digital product created from the Geographic Attribute Data Base. The user should consult the Data Quality Statement of the linkage file used for any aggregations.

The lack of hydrographic features and shorelines may limit the usefulness of the product for cartographic applications where realistic shorelines are required and no underlying digital base features are available from other data files. The lack of shoreline will also limit the usefulness of the product for analysis requiring real land area calculations (e.g. population density).

1991 Census data by EA may be used with the EA boundary file for spatial analysis and some mapping (where the lack of shoreline is not important).

The 1991 EA Digital Boundary File will be consistent with Statistics Canada's other digital boundary products (census subdivision, census tract, urban area, federal electoral district, etc.) since these boundary files were created by aggregating the component digital EA boundaries.

The Digital Boundary File products do not contain any underlying base features (such as major lakes, rivers or roads) that the user may require for referencing the location of the EA boundary polygons. The Street Network Files can be used as a base where they are available. Statistics Canada does not have a corresponding digital base for areas outside of Street Network File areas.

The EA digital boundaries may not be precise if plotted at a larger scale than the scale of the source base maps used for digitizing.

The ARC/INFO® version of the EA Digital Boundary File will plot names at the coordinates of the EA representative points (see Section 3.1) which may not be the visual centre in small urban and rural areas.

3.3 Technical Specifications

The 1991 EA Digital Boundary Files are in ARC/INFO® EXPORT format. They were created using the following ARC commands:

EXPORT COVER *nnn*_EA91 *nnn*_EA91.E00

where ***nnn*** is the abbreviation to represent the level of coverage created.

nnn = NAT for the Canada coverage, or ***nnn*** = the 3 or 4 character abbreviation for each of the province or territories (NFLD, PEI, NS, NB, QUE, ONT, MAN, SASK, ALTA, BC, YUK, NWT) as demonstrated by the following examples:

EXPORT COVER NAT_EA91 NAT_EA91.E00 for the Canada EA Digital Boundary File
EXPORT COVER MAN_EA91 MAN_EA91.E00 for the Manitoba EA Digital Boundary File

The ARC/INFO® coverage can be restored using the following commands:

IMPORT COVER *nnn*_EA91.E00 *username*

where ***username*** is the name selected by the user.

INFO Tables:

The execution of the commands outlined in the previous section will result in the creation of a coverage called *username* and the following INFO table:

DATAFILE NAME: *username*.PAT
5 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	AREA	4	12	F	3	
5	PERIMETER	4	12	F	3	
9	*username*#	4	5	B	0	
13	*username*-ID	4	5	B	0	
17	EA	8	8	I	-	
	** REDEFINED ITEMS **					
17	PROV	2	2	I	-	

A description of this table follows:

Item Description
Polygon Attribute Table

AREA	of the polygon - maintained by ARC/INFO®
PERIMETER	of the polygon - maintained by ARC/INFO®
username#	maintained by ARC/INFO® for internal processing
username-ID	maintained by ARC/INFO® for internal processing
EA	8-digit code identifying the PR/FED/EA; the first 2 digits are the PR/TERR code, the next 3 digits are the FED code, and the last 3 digits represent the EA
PROV	the PR/TERR code (the first 2 digits in columns 17-18 of the 8-digit EA code) can be accessed with this item name PROV

4. 1991 FEDERAL ELECTORAL DISTRICT (FED) DIGITAL BOUNDARY FILE

4.1 Content

The national coverage of the 1991 FED Digital Boundary File contains 299 polygons representing the 295 federal electoral districts (FEDs) according to the 1987 Representation Order.

A breakdown of the number of FEDs by province/territory, the number of polygons per FED, and other relevant information regarding the content of the file is given below:

PROVINCE/ TERRITORY	NUMBER OF FEDs	NUMBER OF POLYGONS	NUMBER OF FEDs WITH MORE THAN ONE POLYGON	TOTAL NUMBER OF LINE SEGMENTS[7]	TOTAL NUMBER OF ARCS[8]	DISK STORAGE (BYTES) ARC/INFO® Export files
Newfoundland	7	7	0	9,429	39	53,000
Prince Edward Island	4	4	0	598	13	17,000
Nova Scotia	11	12	1	4,638	37	34,000
New Brunswick	10	10	0	5,833	41	39,000
Quebec	75	78	3	37,106	287	178,000
Ontario	99	99	0	24,723	310	130,000
Manitoba	14	14	0	11,107	65	62,000
Saskatchewan	14	14	0	12,896	67	69,000
Alberta	26	26	0	20,700	111	102,000
British Columbia	32	32	0	32,739	153	152,000
Yukon Territory	1	1	0	1,947	6	23,000
Northwest Territories	2	2	0	19,623	52	95,000
CANADA	**295**	**299**	**4**	**155,011**	**1,070**	**690,000**

[7] All features in the Digital Boundary Files are represented by a series of x,y coordinates (points). A **line segment** joins two consecutive points.

[8] An **arc** is a line between two consecutive intersections. It will generally be composed of more than one line segment.

Geographic Codes

Each FED is identified across Canada by a 5-digit code. This code provides unique numeric identification for two types of geographic areas. These are:

- provinces and territories (PR/TERRs)
- federal electoral districts (FEDs)

These two geographic areas are hierarchically related in that FEDs aggregate to a province or territory. This relationship is reflected in the 5-digit code:

PR/TERR	FED
XX	XXX
2 digits	3 digits

The 2-digit PR/TERR code is the same code as used in the Standard Geographical Classification (SGC) code (see Section 5.1).

4.2 Data Quality Statement

The 1991 FED Digital Boundary File was created by aggregating EA polygons in the 1991 EA Digital Boundary File as described in Section 2.6 General Methodology. The user should review the Data Quality Statement for the 1991 EA Digital Boundary File (Section 3.2) since the quality of that file has a direct implication on the derived FED Digital Boundary File, and the uses and considerations described therein will also apply to the FEDs.

The particular hierarchy used for the aggregation is:

EA -> FED -> PR/TERR -> CANADA

4.2.1 FEDs comprising more than one part (polygon)

There are four FEDs which are represented by more than one polygon in the FED Digital Boundary File. (Refer to Supplement 1 to this User Guide for illustrations depicting geographic units in multiple parts.)

FED 12008 which includes Sable Island which has been digitized as a separate polygon.

FED 24010 containing a separately digitized island (Îles de la Madeleine),

FEDs 24030 and 24044, each containing an EA at the edge connected to the main portion of the FED by a point. This occurs when the FED polygon is "pinched" when two points along the boundary are so close together that the computer software "snaps" the points together, creating two polygons for that FED, joined at the "snapped" point.

4.2.2 Other Considerations

4.3 Technical Specifications

The 1991 FED Digital Boundary Files are in ARC/INFO® EXPORT format. They were created using the following ARC commands:

EXPORT COVER *nnn*_FED91 *nnn*_FED91.E00

where *nnn* is the abbreviation to represent the level of coverage created.

nnn = NAT for the Canada coverage, or *nnn* = the 3 or 4 character abbreviation for each of the province or territories (NFLD, PEI, NS, NB, QUE, ONT, MAN, SASK, ALTA, BC, YUK, NWT) as demonstrated by the following examples:

EXPORT COVER NAT_FED91 NAT_FED91.E00 for the Canada FED Digital Boundary File
EXPORT COVER MAN_FED91 MAN_FED91.E00 for the Manitoba FED Digital Boundary File

The ARC/INFO® coverage can be restored using the following commands:

IMPORT COVER *nnn*_EA91.E00 *username*

where *username* is the name selected by the user.

INFO Tables:

The execution of the commands outlined in the previous section will result in the creation of a coverage called *username* and the following INFO table:

DATAFILE NAME: *username*.PAT
5 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	AREA	4	12	F	3	
5	PERIMETER	4	12	F	3	
9	*username*#	4	5	B	0	
13	*username*-ID	4	5	B	0	
17	FED	5	5	I	-	
	** REDEFINED ITEMS **					
17	PROV	2	2	I	-	

A description of this table follows:

Item Description
Polygon Attribute Table

AREA of the polygon - maintained by ARC/INFO®
PERIMETER of the polygon - maintained by ARC/INFO®
username# maintained by ARC/INFO® for internal processing
username-ID maintained by ARC/INFO® for internal processing
FED 5-digit code identifying the FED; the first 2 digits are the PR/TERR code, the last 3 digits are the FED code

PROV the PR/TERR code (the first 2 digits in columns 17-18 of the 5-digit FED code) can be accessed with this item name PROV

5. 1991 CENSUS SUBDIVISION (CSD) DIGITAL BOUNDARY FILE

5.1 Content

The national coverage of the 1991 CSD Digital Boundary File contains 6,435 polygons representing 6,006 CSDs. 221 CSDs have more than one polygon (see list in Appendix D).

A breakdown of the number of CSDs by province/territory, the number of polygons per CSD, and other relevant information regarding the content of the file is given below:

PROVINCE/ TERRITORY	NUMBER OF CSDs	NUMBER OF POLYGONS	NUMBER OF CSDs WITH MORE THAN ONE POLYGON	TOTAL NUMBER OF LINE SEGMENTS[9]	TOTAL NUMBER OF ARCS[10]	DISK STORAGE (BYTES) ARC/INFO® Export files
Newfoundland	404	412	8	60,481	922	315,000
Prince Edward Island	126	128	2	3,983	346	51,000
Nova Scotia	118	128	7	17,786	284	104,000
New Brunswick	287	296	6	22,668	801	152,000
Quebec	1,637	1,710	49	92,276	4,788	663,000
Ontario	951	1,050	43	65,737	2,575	436,000
Manitoba	293	352	29	24,123	754	160,000
Saskatchewan	953	989	19	40,133	1,825	305,000
Alberta	438	467	17	45,486	800	255,000
British Columbia	691	794	40	74,400	1,335	412,000
Yukon Territory	36	37	1	2,989	50	30,000
Northwest Territories	72	72	0	21,106	143	109,000
CANADA	**6,006**	**6,435**	**221**	**444,833**	**14,287**	**2,720,000**

[9] All features in the Digital Boundary Files are represented by a series of x,y coordinates (points). A **line segment** joins two consecutive points.

[10] An **arc** is a line between two consecutive intersections. It will generally be composed of more than one line segment.

Each CSD is uniquely identified by its **Standard Geographical Classification (SGC)** code. The SGC is Statistics Canada's official classification providing unique numeric identification for three types of geographic areas. These are:

- provinces and territories
- census divisions (CDs)
- census subdivisions (CSDs)

The three geographic areas are hierarchically related. CSDs aggregate to CDs, which in turn aggregate to a province or a territory. This relationship is reflected in the 7-digit SGC code:

PR/TERR	CD	CSD
XX	XX	XXX
2 digits	2 digits	3 digits

The 7-digit SGC code is assigned to each CSD polygon.

5.2 Data Quality Statement

The 1991 CSD Digital Boundary File was created by aggregating EA polygons in the 1991 EA Digital Boundary File as described in Section 2.6 General Methodology. The user should review the Data Quality Statement for the 1991 EA Digital Boundary File (Section 3.2) since the quality of that file has a direct implication on the derived CSD Digital Boundary File, and the uses and considerations described therein will also apply to the CSDs.

The particular geography hierarchy involved in the aggregation is:

EA -> CSD -> CCS -> CD -> PR/TERR -> CANADA

5.2.1 CSDs comprising more than one part (polygon)

A complete list of all CSDs comprising more than one polygon is given in Appendix D. CSDs can comprise more than one polygon for the following reasons. (Refer to Supplement 1 to this User Guide. Illustrations are provided which depict geographic units in multiple parts.)

- component EAs comprise more than one part (see Section 3.2)
- the CSD is an Indian Reserve which consists of one or more distinct and separate parts.

5.2.2 Other Considerations

- The SGC codes and boundaries are those that were in effect on January 1, 1991 (the Geographic Reference Date of the 1991 Census). Where notification from provincial or territorial authorities was not received or was received after March 1, 1991, the SGC code or limit of the CSD may not correspond with those recognized by provincial or territorial authorities.

- The CSD Digital Boundary File was created by linking EA codes in the EA Digital Boundary files to their corresponding SGC code on the Geographic Attribute Data Base. Thus errors in the CSD Digital Boundary Files may occur if there are geographic code linkage errors on the Geographic Attribute Data Base.

  Supplement 2 to the Digital Boundary File User Guide contains a list of all the errors on the Geographic Attribute Data Base that have been identified up to the time of the release of this User Guide. The Supplement indicates the erroneous linkages, as well as showing if the error has been corrected on the appropriate digital boundary file. If the error has been corrected on the digital boundary file, there may be a discrepancy between the Digital Boundary File product as supplied by Statistics Canada and a digital boundary file that a user may create by doing his/her own aggregation by linking the EA code through a digital product created from the Geographic Attribute Data Base. The user should consult the Data Quality Statement of the linkage file used for any aggregations.

5.3 Technical Specifications

The 1991 CSD Digital Boundary Files are in ARC/INFO® EXPORT format. They were created using the following ARC commands:

EXPORT COVER *nnn*_CSD91 *nnn*_CSD91.E00

where *nnn* is the abbreviation to represent the level of coverage created.

nnn = NAT for the Canada coverage, or *nnn* = the 3 or 4 character abbreviation for each of the province or territories (NFLD, PEI, NS, NB, QUE, ONT, MAN, SASK, ALTA, BC, YUK, NWT) as demonstrated by the following examples:

EXPORT COVER NAT_CSD91 NAT_CSD91.E00 for the Canada CSD Digital Boundary File

EXPORT COVER MAN_CSD91 MAN_CSD91.E00 for the Manitoba CSD Digital Boundary File

The ARC/INFO® coverage can be restored using the following commands:

IMPORT COVER *nnn*_CSD91.E00 *username*

where *username* is the name selected by the user.

INFO Tables:

The execution of the commands outlined in the previous section will result in the creation of a coverage called *username* and the following INFO table:

DATAFILE NAME: *username*.PAT
5 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	AREA	4	12	F	3	
5	PERIMETER	4	12	F	3	
9	*username*#	4	5	B	0	
13	*username*-ID	4	5	B	0	
17	CSD	7	7	I	-	
	** REDEFINED ITEMS **					
17	PROV	2	2	I	-	

A description of this table follows:

Item Description
Polygon Attribute Table

AREA of the polygon - maintained by ARC/INFO®
PERIMETER of the polygon - maintained by ARC/INFO®
username# maintained by ARC/INFO® for internal processing
username-ID maintained by ARC/INFO® for internal processing
CSD 7-digit SGC code identifying the PR/CD/CSD; the first 2 digits are the PR/TERR code, the next 2 are the CD code, the last 3 digits are the CSD code

PROV the PR/TERR code (the first 2 digits in columns 17-18 of the 7-digit CSD code) can be accessed with this item name PROV

6. 1991 CENSUS CONSOLIDATED (CCS) DIGITAL BOUNDARY FILE

6.1 Content

The national coverage of the 1991 CCS Digital Boundary File contains 2,679 polygons representing 2,630 CCSs. 25 CCSs have more than one polygon. (See list in Appendix E.)

A breakdown of the number of CCSs by province/territory, the number of polygons per CCS, and other relevant information regarding the content and storage requirements of the file are given below:

PROVINCE/ TERRITORY	NUMBER OF CCSs	NUMBER OF POLYGONS	NUMBER OF CCSs WITH MORE THAN ONE POLYGON	TOTAL NUMBER OF LINE SEGMENTS[11]	TOTAL NUMBER OF ARCS[12]	DISK STORAGE (BYTES) ARC/INFO® Export files
Newfoundland	87	87	0	29,825	285	149,000
Prince Edward Island	69	69	0	1,878	207	33,000
Nova Scotia	54	54	0	13,751	167	78,000
New Brunswick	150	153	1	14,660	475	99,000
Quebec	1,153	1,161	8	74,789	3,511	512,000
Ontario	526	550	6	41,325	1,585	270,000
Manitoba	127	136	6	16,083	399	101,000
Saskatchewan	302	304	1	25,544	837	165,000
Alberta	73	74	1	31,601	260	154,000
British Columbia	83	85	2	49,615	301	229,000
Yukon Territory	1	1	0	1,947	6	23,000
Northwest Territories	5	5	0	18,818	58	92,000
CANADA	**2,630**	**2,679**	**25**	**293,501**	**7,832**	**1,636,000**

[11] All features in the Digital Boundary Files are represented by a series of x,y coordinates (points). A **line segment** joins two consecutive points.

[12] An **arc** is a line between two consecutive intersections. It will generally be composed of more than one line segment.

The code assigned to each CCS is the Standard Geographical Classification (SGC) code (see Section 5.1) of one of its component CSDs, usually the one with the largest land area.

6.2 Data Quality Statement

The 1991 CCS Digital Boundary File was created by aggregating CSD polygons in the 1991 CSD Digital Boundary File as described in Section 2.6 General Methodology. The user should review the Data Quality Statement for the 1991 CSD and EA Digital Boundary Files (Section 3.2 and Section 5) since the 1991 CSD Digital Boundary File was created by aggregating component EAs. The quality of these files has a direct implication on the derived CCS Digital Boundary File, and the uses and considerations described therein will also apply to the CCSs.

The particular geography hierarchy involved in the aggregation is:

EA -> CSD and then CSD -> CCS -> CD -> PR/TERR -> CANADA

6.2.1 CCSs comprising more than one part (polygon)

The concept of a CCS is a grouping of small CSDs within a containing CSD, created for the convenience and ease of geographic referencing. In general, CCSs should be a contiguous geographic area, however, 25 CCSs comprise two or more non-contiguous parts. A complete list is provided in Appendix E. Twenty-three of the 25 CCSs are non-contiguous because a component CSD comprises more than one part, with one part being non-contiguous from the larger containing CSD.

The remaining two CCSs (2462912 and 2462920) were delineated following the explicit delineation rules, resulting with the non-contiguous parts. The rules will be reviewed and the 2 CCSs will be corrected for the 1996 Census.

Supplement 1 to this User Guide provides examples of geographic units in multiple parts.

6.2.2 Other Considerations

- The CCS Digital Boundary File has been created by linking CSD codes in the CSD Digital Boundary file to their corresponding CCS code on the Geographic Attribute Data Base. Thus errors in the CCS Digital Boundary Files may occur if there are geographic code linkage errors on the Geographic Attribute Data Base.

  Supplement 2 to the Digital Boundary File User Guide contains a list of all the errors on the Geographic Attribute Data Base that have been identified up to the time of the release of this User Guide. The Supplement indicates the erroneous linkages, as well as showing if the error has been corrected on the appropriate digital boundary file. If the error has been corrected on the digital boundary file, there may be a discrepancy between the Digital Boundary File product as supplied by Statistics Canada and a digital boundary file that a user may create by doing his/her own aggregation by linking the EA code through a digital product created from the Geographic Attribute Data Base. The user should consult the Data Quality Statement of the linkage file used for any aggregations.

6.3 Technical Specifications

The 1991 CCS Digital Boundary Files are in ARC/INFO® EXPORT format. They were created using the following ARC commands:

EXPORT COVER *nnn*_CCS91 *nnn*_CCS91.E00

where *nnn* is the abbreviation to represent the level of coverage created.

nnn = NAT for the Canada coverage, or *nnn* = the 3 or 4 character abbreviation for each of the province or territories (NFLD, PEI, NS, NB, QUE, ONT, MAN, SASK, ALTA, BC, YUK, NWT) as demonstrated by the following examples:

EXPORT COVER NAT_CCS91 NAT_CCS91.E00 for the Canada CCS Digital Boundary File
EXPORT COVER MAN_CCS91 MAN_CCS91.E00 for the Manitoba CCS Digital Boundary File

The ARC/INFO® coverage can be restored using the following commands:

IMPORT COVER *nnn*_CCS91.E00 *username*

where *username* is the name selected by the user.

INFO Tables:

The execution of the commands outlined in the previous section will result in the creation of a coverage called *username* and the following INFO table:

DATAFILE NAME: *username*.PAT
5 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	AREA	4	12	F	3	
5	PERIMETER	4	12	F	3	
9	*username*#	4	5	B	0	
13	*username*-ID	4	5	B	0	
17	CCS	7	7	I	-	
	** REDEFINED ITEMS **					
17	PROV	2	2	I	-	

A description of this table follows:

Item Description
Polygon Attribute Table

AREA	of the polygon - maintained by ARC/INFO®
PERIMETER	of the polygon - maintained by ARC/INFO®
username#	maintained by ARC/INFO® for internal processing
username-ID	maintained by ARC/INFO® for internal processing
CCS	7-digit code identifying the CCS

PROV the PR/TERR code (the first 2 digits in columns 17-18 of the 7-digit CCS code) can be accessed with this item name PROV

7. 1991 CENSUS DIVISION (CD) DIGITAL BOUNDARY FILE

7.1 Content

The national coverage of the 1991 CD Digital Boundary File contains 296 polygons representing 290 census divisions (CDs). 5 CDs have more than one polygon. (See list in Appendix F.)

A breakdown of the number of CDs by province/territory, the number of polygons per CD, and other relevant information regarding the content of the file is given below:

PROVINCE/ TERRITORY	NUMBER OF CDs	NUMBER OF POLYGONS	NUMBER OF CDs WITH MORE THAN ONE POLYGON	TOTAL NUMBER OF LINE SEGMENTS[13]	TOTAL NUMBER OF ARCS[14]	DISK STORAGE (BYTES) ARC/INFO® Export files
Newfoundland	10	10	0	13,243	52	70,000
Prince Edward Island	3	3	0	420	10	16,000
Nova Scotia	18	19	1	4,001	56	33,000
New Brunswick	15	15	0	5,778	57	40,000
Quebec	99	103	3	38,254	347	186,000
Ontario	49	49	0	18,567	167	97,000
Manitoba	23	24	1	10,724	90	61,000
Saskatchewan	18	18	0	7,146	64	46,000
Alberta	19	19	0	18,555	81	92,000
British Columbia	30	30	0	34,280	133	158,000
Yukon Territory	1	1	0	1,947	6	23,000
Northwest Territories	5	5	0	18,818	57	92,000
CANADA	**290**	**296**	**5**	**145,398**	**1,001**	**649,000**

[13] All features in the Digital Boundary Files are represented by a series of x,y coordinates (points). A **line segment** joins two consecutive points.

[14] An **arc** is a line between two consecutive intersections. It will generally be composed of more than one line segment.

Geographic Codes

The 290 CDs across Canada are uniquely identified by the first 4 digits of the Standard Geographical Classification (SGC) code (See Section 5.1 for a complete description of the SGC). These 4 digits provide unique identification of CDs, and reflects the hierarchical relationship that CDs aggregate to a province or territory. The 4-digit code is described by:

PR/TERR	CD
XX	XX
2 digits	2 digits

7.2 Data Quality Statement

The 1991 CD Digital Boundary File was created by aggregating CSD polygons in the 1991 CSD Digital Boundary File as described in Section 2.6 General Methodology. The user should review the Data Quality Statement for the 1991 CSD and EA Digital Boundary Files (Section 3.2 and Section 5) since the quality of these files has a direct implication on the derived CD Digital Boundary File, and the uses and considerations described therein will also apply to the CDs.

The particular aggregations involved are:

EA -> CSD and then CSD -> CD -> PR/TERR -> CANADA

7.2.1 CDs comprising more than one part (polygon)

Five CDs have more than one polygon. In general this occurs because the component CSDs comprise more than one part or by a discontinuity caused by a water body. Appendix F provides a list of the 5 CDs. Supplement 1 provides examples of geographic units in multiple parts.

7.2.2 Other considerations

The CD Digital Boundary File was created by linking CSD codes in the CSD Digital Boundary files to their corresponding CD code on the Geographic Attribute Data Base. Thus errors in the CD Digital Boundary Files may occur if there are geographic code linkage errors on the Geographic Attribute Data Base.

Supplement 2 to the Digital Boundary File User Guide contains a list of all the errors on the Geographic Attribute Data Base that have been identified up to the time of the release of this User Guide. The Supplement indicates the erroneous linkages, as well as showing if the error has been corrected on the appropriate digital boundary file. If the error has been corrected on the digital boundary file, there may be a discrepancy between the Digital Boundary File product as supplied by Statistics Canada and a digital boundary file that a user may create by doing his/her own aggregation by linking the EA code through a digital product created from the Geographic Attribute Data Base. The user should consult the Data Quality Statement of the linkage file used for any aggregations.

7.3 Technical Specifications

The 1991 CD Digital Boundary Files are in ARC/INFO® EXPORT format. They were created using the following ARC commands:

EXPORT COVER *nnn*_CD91 *nnn*_CD91.E00

where *nnn* is the abbreviation to represent the level of coverage created.

nnn = NAT for the Canada coverage, or *nnn* = the 3 or 4 character abbreviation for each of the province or territories (NFLD, PEI, NS, NB, QUE, ONT, MAN, SASK, ALTA, BC, YUK, NWT) as demonstrated by the following examples:

EXPORT COVER NAT_CD91 NAT_CD91.E00 for the Canada CD Digital Boundary File

EXPORT COVER MAN_CD91 MAN_CD91.E00 for the Manitoba CD Digital Boundary File

The ARC/INFO® coverage can be restored using the following commands:

IMPORT COVER *nnn*_CD91.E00 *username*

where *username* is the name selected by the user.

INFO Tables:

The execution of the commands outlined in the previous section will result in the creation of a coverage called *username* and the following INFO table:

DATAFILE NAME: *username*.PAT
5 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	AREA	4	12	F	3	
5	PERIMETER	4	12	F	3	
9	*username*#	4	5	B	0	
13	*username*-ID	4	5	B	0	
17	CD	4	4	I	-	
	** REDEFINED ITEMS **					
17	PROV	2	2	I	-	

A description of this table follows:

Item Description
Polygon Attribute Table

AREA	of the polygon - maintained by ARC/INFO®
PERIMETER	of the polygon - maintained by ARC/INFO®
username#	maintained by ARC/INFO® for internal processing
username-ID	maintained by ARC/INFO® for internal processing
CD	4-digit code identifying the CD; the first 2 digits are the PR/TERR code, the last 2 digits are the CD code
PROV	the PR/TERR code (the first 2 digits in columns 17-18 of the 4-digit CD code) can be accessed with this item name PROV

8. 1991 URBAN AREA (UA) DIGITAL BOUNDARY FILE

8.1 Content

The national coverage of the 1991 UA Digital Boundary File contains 929 polygons representing 893 UAs. 16 UAs have more than one polygon. (See list in Appendix G.)

A breakdown of the number of UAs by province/territory, the number of polygons per UA, and other relevant information regarding the content and storage requirements of the file are given below:

PROVINCE/ TERRITORY	NUMBER OF UAs	NUMBER OF POLYGONS	NUMBER OF UAs WITH MORE THAN ONE POLYGON	TOTAL NUMBER OF LINE SEGMENTS[15]	TOTAL NUMBER OF ARCS[16]	DISK STORAGE (BYTES) ARC/INFO® Export files
Newfoundland	42	43	1	4,969	43	38,000
Prince Edward Island	7	7	0	667	7	18,000
Nova Scotia	38	38	0	5,438	41	40,000
New Brunswick	36*	38	1	5,639	46	40,000
Quebec	222*	226	2	18,997	257	114,000
Ontario	246*	248	2	21,483	286	127,000
Manitoba	42*	42	0	1,947	45	26,000
Saskatchewan	69*	69	0	2,432	71	31,000
Alberta	99*	100	1	5,660	102	47,000
British Columbia	92	96	4	12,066	106	72,000
Yukon Territory	1	1	0	566	2	17,000
Northwest Territories	4	4	0	1,018	5	19,000
CANADA	**893**	**929**	**16**	**132,611**	**1,187**	**649,000**

* Urban areas crossing provincial limits are counted in both provinces.

[15] All features in the Digital Boundary Files are represented by a series of x,y coordinates (points). A **line segment** joins two consecutive points.

[16] An **arc** is a line between two consecutive intersections. It will generally be composed of more than one line segment.

Five UAs straddle provincial boundaries. They are:

0122Campbellton (New Brunswick-Quebec)
0365Hawkesbury (Quebec-Ontario)
0616Ottawa-Hull (Ontario-Quebec)
0282Flin-Flon (Manitoba-Saskatchewan)
0478Lloydminster (Saskatchewan-Alberta)

These five UAs are represented as 2 polygons each in the Canada UA Digital Boundary File, with one polygon in each of the two provinces.

Geographic Codes

UAs are uniquely identified across Canada by a 4-digit code. This 4-digit UA code may contain leading zeroes which form an integral part of the code (they should not be replaced with blanks). For example, UA 0001 is valid, UA 1 is not valid.

8.2 Data Quality Statement

The 1991 UA Digital Boundary File was created by aggregating EA polygons in the 1991 EA Digital Boundary File as described in Section 3 General Methodology. The user should review the Data Quality Statement for the 1991 EA Digital Boundary File (Section 3.2) since the quality of that file has a direct implication on the derived UA Digital Boundary File, and the uses and considerations described therein will also apply to the UAs.

The particular geography hierarchy involved in the aggregation is:

EA -> UA

8.2.1 UAs comprising more than one part (polygon)

The five UAs which straddle provincial boundaries comprise 2 polygons in the Canada UA Digital Boundary File (one polygon in each province). The user will need to "dissolve" (i.e. eliminate) the common boundary to a single polygon if required for these UAs. Provincial boundary files will contain only that part of the UA contained in the province.

The 11 other UAs having more than one polygon are presented in Appendix G, with explanations. Supplement 1 to this User Guide provides examples of geographic units in multiple parts.

8.2.2 Other Considerations

Since UAs do not aggregate to provinces, territories or Canada boundaries, the UA Digital Boundary File does not contain the national or provincial/territorial boundaries, nor can these be derived from the UA boundary polygons.

8.3 Technical Specifications

The 1991 UA Digital Boundary Files are in ARC/INFO® EXPORT format. They were created using the following ARC commands:

EXPORT COVER *nnn*_UA91 *nnn*_UA91.E00

where *nnn* is the abbreviation to represent the level of coverage created.

nnn = NAT for the Canada coverage, or *nnn* = the 3 or 4 character abbreviation for each of the province or territories (NFLD, PEI, NS, NB, QUE, ONT, MAN, SASK, ALTA, BC, YUK, NWT) as demonstrated by the following examples:

EXPORT COVER NAT_UA91 NAT_UA91.E00 for the Canada UA Digital Boundary File
EXPORT COVER MAN_UA91 MAN_UA91.E00 for the Manitoba UA Digital Boundary File

The ARC/INFO® coverage can be restored using the following commands:

IMPORT COVER *nnn*_UA91.E00 *username*

where *username* is the name selected by the user.

INFO Tables:

The execution of the commands outlined in the previous section will result in the creation of a coverage called *username* and the following INFO table:

DATAFILE NAME: *username*.PAT
5 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	AREA	4	12	F	3	
5	PERIMETER	4	12	F	3	
9	*username*#	4	5	B	0	
13	*username*-ID	4	5	B	0	
17	PROV	2	2	I	-	
19	UA	4	4	C	-	
	** REDEFINED ITEMS **					
17	PROV_UA	6	6	I	-	

A description of this table follows:

Item Description
Polygon Attribute Table

AREA	of the polygon - maintained by ARC/INFO®
PERIMETER	of the polygon - maintained by ARC/INFO®
username#	maintained by ARC/INFO® for internal processing
username-ID	maintained by ARC/INFO® for internal processing
PROV	the 2-digit code identifying the province or territory
UA	the 4 character code identifying the UA

PROV_UA the PR code (the first 2 digits in columns 17-18 is concatenated to the UA code to allow the unique identification of the part of an UA within a single province)

9. 1991 PROVINCE/TERRITORY (PR/TERR) DIGITAL BOUNDARY FILE

9.1 Content

The national coverage of the 1991 PR/TERR Digital Boundary File contains 14 polygons representing 12 provinces and territories (PR/TERRs). Two provinces have more than one polygon.

Some relevant information regarding the content and storage requirements of the file are given below:

PROVINCE/ TERRITORY	NUMBER OF PR/TERRs	NUMBER OF POLYGONS	TOTAL NUMBER OF LINE SEGMENTS[17]	TOTAL NUMBER OF ARCS[18]	DISK STORAGE (BYTES) ARC/INFO® Export files
CANADA	**12**	**14**	**53,290**	**149**	**508,000**

Geographic Codes

Each province and territory has its own unique 2 digit code which form the first 2 characters of the Standard Geographical Classification code (see Section 5).

9.2 Data Quality Statement

The 1991 PR/TERR Digital Boundary File was created by aggregating EA polygons in the 1991 EA Digital Boundary File as described in Section 2.6 General Methodology. The user should review the Data Quality Statement for the 1991 EA Digital Boundary File (Section 3.2) since the quality of that file has a direct implication on the derived PR/TERR Digital Boundary File, and the uses and considerations described therein will also apply to the PR/TERRs.

The particular geography hierarchy involved in the aggregation is:

EA -> PR/TERR -> CANADA

[17] All features in the Digital Boundary Files are represented by a series of x,y coordinates (points). A **line segment** joins two consecutive points.

[18] An **arc** is a line between two consecutive intersections. It will generally be composed of more than one line segment.

9.2.1 PRs comprising more than one part (polygon)

Nova Scotia consists of two boundary polygons due to the separate digitizing of Sable Island.

Quebec also appears as two polygons with the digitizing of Îles de la Madeleine as a separate part.

9.2.2 Other Considerations

9.3 Technical Specifications

The 1991 PR/TERR Digital Boundary File is in ARC/INFO® EXPORT format. It was created using the following ARC commands:

EXPORT COVER NAT_PROV91 NAT_PROV91.E00

The ARC/INFO® coverage can be restored using the following command:

IMPORT COVER NAT_FED91.E00 *username*

where *username* is the name selected by the user.

INFO Tables:

The execution of the commands outlined in the previous section will result in the creation of a coverage called *username* and the following INFO table:

DATAFILE NAME: *username*.PAT
5 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	AREA	4	12	F	3	
5	PERIMETER	4	12	F	3	
9	*username*#	4	5	B	0	
13	*username*-ID	4	5	B	0	
17	PR	2	2	I	-	
	** REDEFINED ITEMS **					
17	PROV	2	2	I	-	

A description of this table follows:

Item Description
Polygon Attribute Table

AREA	of the polygon - maintained by ARC/INFO®
PERIMETER	of the polygon - maintained by ARC/INFO®
username#	maintained by ARC/INFO® for internal processing
username-ID	maintained by ARC/INFO® for internal processing
PR	2-digit code the province or territory
PROV	the PR/TERR code (the first 2 digits in columns 17-18 of the 5-digit FED code) can also be accessed with this item name PROV (for consistency across all Digital Boundary Files to enable common programming code for similar operations)

10. 1991 CENSUS TRACT (CT) DIGITAL BOUNDARY FILE

10.1Content

The national coverage of the 1991 CT Digital Boundary File contains nnn polygons representing nnn 4068 CTs. Nine CTs have more than one polygon. (See list in Appendix H.)

A breakdown of the number of CTs by province/territory, the number of polygons per CT, and other relevant information regarding the content and storage requirements of the file are given below:

PROVINCE/ TERRITORY	NUMBER OF CTs	NUMBER OF POLYGONS	NUMBER OF CTs WITH MORE THAN POLYGON	TOTAL NUMBER OF LINE SEGMENTS[19]	TOTAL NUMBER OF ARCS[20]	DISK STORAGE (BYTES) ARC/INFO® Export files
Newfoundland	40	40	0	3,766	112	35,000
Prince Edward Island	0	0	0	0	0	0
Nova Scotia	75	75	0	6,634	212	53,000
New Brunswick	67	67	0	4,485	188	43,000
Quebec	1,052	1,054	2	28,580	2,931	301,000
Ontario	1,731	1,733	2	48,756	4,692	489,000
Manitoba	156	156	0	4,115	432	53,000
Saskatchewan	98	99	1	3,488	261	43,000
Alberta	385	386	1	14,169	1,033	133,000
British Columbia	464	466	2	18,100	1,285	163,000
Yukon Territory	0	0	0	0	0	0
Northwest Territories	0	0	0	0	0	0
CANADA	**4,068**	**4,076**	**8**	**131,942**	**11,114**	**1,203,000**

A more detailed list of CMAs and CAs showing the number of CTs within each and other relevant information is provided in Appendix I.

CTs are created within CMAs or CAs which contain a municipality (CSD) with a population of 50,000 or more at the last census. The CT is also identified with any component PCMAs or PCAs if the CMA or CA is consolidated (CTs aggregate to PCMAs and/or PCAs, which in turn aggregate to the CMA or CA).

[19] All features in the Digital Boundary Files are represented by a series of x,y coordinates (points). A **line segment** joins two consecutive points.

[20] An **arc** is a line between two consecutive intersections. It will generally be composed of more than one line segment.

CTs are identified by a 6 character numerical name of the form xxx.xx where x is one digit. This form is referred to as the "CT name". These CT names are designed to be unique within the PCMA or PCA containing the CT. If the CMA or CA does not have any component PCMAs or PCAs, the CT name is unique within the CMA or CA. For the 1991 census geographic structure, the CT names are unique within a CMA or CA regardless if it contains PCMAs and/or PCAs. This uniqueness may not remain in subsequent censuses as more PCMAs and PCAs are created.

In order to identify a CT uniquely within a province or across Canada, the relevant CMA or CA codes are provided with the CT name in the CT Digital Boundary Files.

Leading zeroes in the 6-character CT name and in the 3-digit CMA/CA code must be represented with a "0", and not left blank. For example, 040.00 is a valid CT name, 40.00 or 40 are not valid. Often, if the 2 decimal digits are 00, they may not be shown on Statistics Canada's reference maps, but they must be used processing with digital files which include the CT name.

CMAs and CAs are identified uniquely across Canada by a 3-digit code. Leading zeroes must be specified (not replaced by blanks). Note that the first digit of the 3-digit character code is the second digit of the PR/TERR code if the CMA or CA does not straddle a provincial or territorial boundary (as in the case of the CMA of Ottawa-Hull which straddles the Ontario/Quebec border).

The terms CT name and CT code are not synonymous. The former is the numerical name (described above) that is used to identify CTs on maps and in data products, whereas the CT code is a four-digit numeric identifier used to access a CT on Statistics Canada's internal digital files. The CT name is used in the CT Digital Boundary Files (6-characters) with leading and trailing zeroes specified explicitly.

10.2Data Quality Statement

The 1991 CT Digital Boundary File was created by aggregating EA polygons in the 1991 EA Digital Boundary File as described in Section 2.6 General Methodology. The user should review the Data Quality Statement for the 1991 EA Digital Boundary File (Section 3.2) since the quality of that file has a direct implication on the derived CT Digital Boundary File, and the uses and considerations described therein will also apply to the CTs.

The particular geography hierarchy involved in the aggregation is:

EA -> CT -> CMA/CA

CTs are available for all 25 CMAs and for 14 of the 115 CAs.

CTs also aggregate to PCMAs and PCAs (EA -> PCMA/PCA -> CMA/CA) if the CMA/CA is consolidated with component PCMAs and/or PCAs. However, neither PCMA or PCA boundaries are identified on the CT Digital Boundary File products.

10.2.1 CTs comprising more than one part (polygon)

Eight CTs comprise more than one polygon. A complete list is provided in Appendix H. Supplement 1 to this User Guide provides examples of how geographic units in multiple parts occur in the digital boundary files.

10.2.2 Other Considerations

- Since CTs (and CMA/CAs) do not aggregate to provinces, territories or Canada boundaries, the provincial, territorial or Canada boundaries are not included in the 1991 CT Digital Boundary Files, nor can they be derived from the CTs or CMA/CAs.

- The CT Digital Boundary File was created by linking EA codes in the EA Digital Boundary File to their corresponding CT numerical name on the Geographic Attribute Data Base. Thus errors in the CT Digital Boundary Files may occur if there are geographic code linkage errors on the Geographic Attribute Data Base.

  Supplement 2 to the Digital Boundary File User Guide contains a list of all the errors on the Geographic Attribute Data Base that have been identified up to the time of the release of this User Guide. The Supplement indicates the erroneous linkages, as well as showing if the error has been corrected on the appropriate digital boundary file. If the error has been corrected on the digital boundary file, there may be a discrepancy between the Digital Boundary File product as supplied by Statistics Canada and a digital boundary file that a user may create by doing his/her own aggregation by linking the EA code through a digital product created from the Geographic Attribute Data Base. The user should consult the Data Quality Statement of the linkage file used for any aggregations.

10.3Technical Specifications

The 1991 CT Digital Boundary Files are in ARC/INFO® EXPORT format. They were created using the following ARC commands:

EXPORT COVER CAnnn_CT91

where *nnn* is the abbreviation to represent the level of coverage created.

nnn = NAT for the Canada coverage, or *nnn* = the 3 or 4 character abbreviation for each of the province or territories (NFLD, PEI, NS, NB, QUE, ONT, MAN, SASK, ALTA, BC, YUK, NWT) or the 3-character CMA/CA code, as demonstrated by the following examples:

EXPORT COVER NAT_CT91 NAT_CT91.E00 for the Canada CT Digital Boundary File
EXPORT COVER MAN_CT91 MAN_CT91.E00 for the Manitoba CT Digital Boundary File
EXPORT COVER CA705_CT91 CA705_CT91 for the CT Digital Boundary File for CMA/CA 705

The ARC/INFO® coverage can be restored using the following commands:

IMPORT COVER *nnn*_CT91.E00 *username*

where *username* is the name selected by the user.

INFO Tables:

The execution of the commands outlined in the previous section will result in the creation of a coverage called *username* and the following INFO table:

DATAFILE NAME: *username*.PAT
5 ITEMS: STARTING IN POSITION 1

COL	ITEM NAME	WDTH	OPUT	TYP	N.DEC	ALTERNATE NAME
1	AREA	4	12	F	3	
5	PERIMETER	4	12	F	3	
9	*username*#	4	5	B	0	
13	*username*-ID	4	5	B	0	
17	CA	3	3	C	-	
20	CT_NAME	6	6	C	-	
26	PROV	2	2	I	-	
	** REDEFINED ITEMS **					
17	CA_CTNAME	9	9	C	-	

A description of this table follows:

Item Description
Polygon Attribute Table

AREA	of the polygon - maintained by ARC/INFO®
PERIMETER	of the polygon - maintained by ARC/INFO®
username#	maintained by ARC/INFO® for internal processing
username-ID	maintained by ARC/INFO® for internal processing
CA	3 character CA or CMA code
CT_NAME	6 character code for the CT numerical name form xxx.xx
PROV	2 digit province code
CA_CTNAME	the CA or CMA code is concatenated to the CT name to allow the unique identification of the CT within a province or Canada

11. GLOSSARY OF TERMS

Block-Face

The general concept of a block-face is one of a small, recognizable geographical unit to which census data can be associated. The goal is to approximate, through aggregation, user-defined query areas for census data extraction and tabulation. The block-face refers to one side of a city street, normally between consecutive intersections with streets or other physical features (such as creeks or railways).

Census Agglomeration (CA)

The general concept of a census agglomeration (CA) is one of a large **urban area**, together with adjacent **urban** and **rural areas** which have a high degree of economic and social integration with that urban area.

A CA is delineated around an urban area (called the urbanized core and having a population of at least **10,000**, based on the previous census). Once a CA attains an urbanized core population of at least **100,000**, based on the previous census, it becomes a **census metropolitan area** (**CMA**).

Census Consolidated Subdivisions (CCS)

The concept of a census consolidated subdivision is a grouping of small **census subdivisions** within a containing census subdivision, created for the convenience and ease of geographic referencing.

Census consolidated subdivisions are defined within **census divisions** according to the following criteria:

(1) A census subdivision with a net **land area** greater than 25 square kilometres can form a CCS of its own.
(2) A census subdivision with a net land area greater than 25 square kilometres and surrounded on more than half its perimeter by another census subdivision is usually included as part of the CCS formed by the surrounding census subdivision.
(3) Census subdivisions having a net land area smaller than 25 kilometres are usually grouped with a larger census subdivision.
(4) A census subdivision with a population greater than 100,000 according to the last census usually forms a CCS on its own.
(5) The census consolidated subdivision's name usually coincides with its largest census subdivision component in terms of land area.

Census Division (CD)

Refers to the general term applying to geographic areas established by provincial law, which are intermediate geographic areas between the **census subdivision** and the **province** (e.g. divisions, counties, regional districts, regional municipalities and seven other types of geographic areas made up of groups of census subdivisions).

In Newfoundland, Manitoba, Saskatchewan and Alberta, provincial law does not provide for these administrative geographic areas. Therefore, census divisions have been created by Statistics Canada in co-operation with these provinces.

Census Metropolitan Area (CMA)

The general concept of a census metropolitan area (CMA) is one of a very large **urban area**, together with adjacent **urban** and **rural areas** which have a high degree of economic and social integration with that urban area.

A CMA is delineated around an urban area (called the urbanized core and having a population of at least **100,000**, based on the previous census). Once an area becomes a CMA, it is retained in the program even if its population subsequently declines.

Smaller urban areas, centred on urbanized cores of a population of at least **10,000**, are included in the **census agglomeration (CA)** program.

Census Subdivision (CSD)

Refers to the general term applying to municipalities (as determined by provincial legislation) or their equivalent, e.g., Indian reserves, Indian settlements and unorganized territories.

In Newfoundland, Nova Scotia and British Columbia, the term also describes geographic areas that have been created by Statistics Canada in co-operation with the provinces as equivalents for municipalities.

The type indicates the municipal status of a **census subdivision**. Census subdivisions (CSDs) are classified into various types, according to official designations adopted by provincial or federal authorities.

Census Tract (CT)

The general concept of a census tract (CT) is that of a permanent, small urban neighbourhood-like or rural community-like area established in large urban-centred regions with the help of local specialists interested in urban and social science research.

Census tracts are delineated jointly by a local committee and Statistics Canada according to the following criteria:

(1) Whenever possible, census tract boundaries must follow permanent and easily recognizable physical features.
(2) The population of a census tract must be between 2,500 and 8,000, with a preferred average of 4,000 persons, except for those census tracts in central business districts, in other major commercial and industrial zones, or in peripheral rural or urban areas that may have either a lower or higher population.
(3) When first delineated, or subsequently subdivided, census tracts must be as homogeneous as possible in terms of the economic status and social living conditions of their populations.
(4) Their shape must be as compact as possible.

All **census metropolitan areas (CMAs)** and **census agglomerations (CAs)** in Canada containing a **census subdivision (CSD)**, i.e. municipality, having a population of 50,000 or more at the previous census, are eligible for a census tract program. Once a census metropolitan area or census agglomeration is added to the program, it is retained even if the population subsequently decreases below 50,000. CSDs already within a tracted CMA do not qualify for a separate CT program when they reach a population of 50,000.

CMA/CA Component

Refers to the **census subdivisions** (**CSDs**) which form the building blocks of a **census metropolitan area** (**CMA**), **census agglomeration** (**CA**), **primary census metropolitan area** (**PCMA**) or **primary census agglomeration** (**PCA**).

CMA/CA Parts

The concept of CMA/CA parts distinguishes between central and peripheral **urban** and **rural areas** within a **census metropolitan area** (**CMA**) or a **census agglomeration** (**CA**). There are three CMA/CA parts: urbanized core, urban fringe and rural fringe.

Urbanized core: A large urban area around which a CMA or a CA is delineated. The urbanized core must have a population (based on the previous census) of at least 100,000 in the case of a CMA, or between 10,000 and 99,999 in the case of a CA.
Urban fringe: An urban area within a CMA or CA, but outside the urbanized core.
Rural fringe: All territory within a CMA or CA lying outside urban areas.

Electronic Shelf

This is a new data service for the 1991 Census. For some products, geographic detail not included in the published program will be available.

Users are able to select individual tables in either print or electronic format in a variety of commonly used commercial software data formats.

Enumeration Area (EA)

An enumeration area (EA) is the geographic area canvassed by one census representative.

Federal Electoral District (FED)

A federal electoral district refers to any place or territorial area entitled to return a member to serve in the House of Commons (source: Canada Elections Act, 1990). There are 295 FEDs in Canada according to the 1987 Representation Order.

Federal electoral districts are defined according to the following criteria:

(1) the legal limits and descriptions are the responsibility of the Chief Electoral Officer and are published in the Canada Gazette;

(2) FED limits are usually revised every 10 years after the results of the decennial census.

Geocoding

Geocoding refers to the technique that is used to geographically code and link census households to small geographical units. This supports the retrieval service (commonly known as the geocoding service) by user-specified query areas.

Geographic Attribute Data Base

The Geographic Attribute Data Base (formerly called the Census Geographic Data Base or CGDB) is a set of data attribute files maintained within Statistics Canada and which provides (among other things) all the linkages within the various geography hierarchies.

Map Projection

Latitude/Longitude

A system of measuring location on the surface of the earth which recognizes that the earth is spherical.

The latitude measures the angle north or south of the equator from 0 degrees at the equator (normally in degrees, minutes and seconds) to 90 degrees at the poles. For the land mass of Canada, the latitudes range from roughly 42 to 83 degrees north.

Longitude corresponds to the angle (normally in degrees, minutes and seconds) west of the prime meridian which runs through Greenwich, England. For the land mass of Canada, the longitude ranges from roughly 52 degrees to 141 degrees west.

Universal Transverse Mercator (UTM)

An internationally standardized grid system which involves dividing the earth into 60 separate zones of six degrees of longitude each. Canada is divided into 16 zones bearing numbers 7 to 22 from west to east. For the UTM, the Transverse Mercator projection is employed (Gauss-Kruger type).

West-east positions (eastings) are measured from a separate point for each zone. Eastings are counted from the central meridian (called the 500,000-metre line), those to the west of it having an easting value of less than 500,000 and those to the east of it having a value greater than 500,000. Eastings are all greater than 0 and less than 1,000,000.

South-north positions (northings) are designated by their distance in metres from the equator. Because Canada's southernmost point is about 4,620,000 metres from the equator, all points in Canada have a northing value greater than 4,620,000.

Lambert Conformal Conic Projection

A map projection which is widely used for mapping Canada on one sheet, since it provides good directional and shape relationships for mid-latitude regions having a mainly east-to-west extent. Standard parallels at 49° N and 77° N are most commonly used, as well as a central meridian at 91° 52° W.

Locations are specified in easting and northing co-ordinates in metres relative to a pre-defined origin.

Primary Census Metropolitan Area (PCMA) - Primary Census Agglomeration (PCA)

The primary census metropolitan area (PCMA) or primary census agglomeration (PCA) concept recognizes the fact that adjacent **census metropolitan areas** (**CMAs**) and **census agglomerations** (**CAs**) are socially and economically integrated within a larger consolidated CMA or CA.

Adjacent CMAs and CAs are consolidated into a single CMA or CA if the total commuting interchange between the two is equal to at least **35%** of the employed labour force living in the smaller CMA or CA, based on the previous census. The original CMAs or CAs are known as PCMA or PCA subregions of the CMA or CA.

Province

Refers to the major political division of Canada. From a statistical point of view, it is a basic unit for which data are tabulated and cross-classified.

Provincial Census Tract (PCT)

The general concept of a provincial census tract (PCT) is that of a permanent, small, urban and/or rural neighbourhood-like or community-like area outside those **census metropolitan areas (CMAs)** and **census agglomerations (CAs)** having a **census tract (CT)** program. Taken together, CTs and PCTs cover all of Canada.

Provincial census tracts are delineated to encompass populations between 3,000 and 8,000, with a preferred average of 5,000. Boundaries, as much as possible, follow permanent physical features.

Rural Area

The general concept of a rural area is that of a sparsely populated area.

Statistics Canada defines rural areas as those areas of Canada lying outside **urban areas**.

Standard Geographical Classification (SGC)

The Standard Geographical Classification (SGC) is Statistics Canada's official classification of geographic areas in Canada. The SGC provides unique numeric identification of three types of geographic areas. These are:

- provinces and territories;
- census divisions (CDs);
- census subdivisions (CSDs).

The three geographic areas are hierarchically related. Census subdivisions (CSDs) aggregate to census divisions (CDs), which in turn aggregate to a province or territory. This relationship is reflected in the seven-digit code:

Province/Territory	Census division	Census subdivision
XX - 2 digits	XX - 2 digits	XXX - 3 digits

Subprovincial Region (SPR)

Refers to a subprovincial geographical unit smaller than a **province** (with the exception of Prince Edward Island and the Territories) made up of groupings of complete **census divisions**.

The subprovincial regions were created in response to the requirement for a geographical unit suitable for the analysis of regional economic activity. Such a unit is small enough to permit regional analysis, yet large enough to include a sufficient number of respondents, such that, after confidential data are suppressed, a broad range of statistics can still be released. The regions are based upon work by Camu, Weeks and Sametz in the 1950s with minor adjustments over the years to accommodate changes in census division boundaries and the views of provincial officials.

Subprovincial regions may be economic, administrative or planning regions. In some provinces, these regions are designated by law. In other provinces, the regions were created by agreement between Statistics Canada and the province or territories concerned.

Territory

Refers to two major political divisions of Canada, namely Yukon and Northwest Territories. From a statistical point of view, these territories are equivalent to **provinces**, i.e. a basic unit for which data are tabulated and cross-classified.

Unincorporated Place (UP)

The concept of unincorporated place (UP) is that of a cluster of **dwellings** (i.e. a settlement) lacking legal limits or local government.

A UP is defined as any cluster of five or more occupied dwellings in **rural areas**, locally known by a specific name, but not having a local government or legal limits. A UP has the same **Standard Geographical Classification (SGC)** code as the **census subdivision (CSD)** in which it is located. However, UPs are distinct from CSDs in that a UP has no legal status or limit.

Urban Area (UA)

The general concept of an urban area (UA) is that of an area containing a dense concentration of population.

Statistics Canada defines an urban area as an area which has attained a population concentration of at least 1,000, and a population density of at least 400 per square kilometre, at the previous census. All territory lying outside urban areas is considered **rural**. Taken together, urban and rural areas cover all of Canada.

Urban areas separated by gaps of less than two kilometres are combined to form a single urban area.

12. SUPPLEMENTARY INFORMATION

12.1Related Geographic Products and Services

The following is a summary of other geographic products and services available from Statistics Canada.

REFERENCE MAPS: There are four types of Reference Maps available:

Enumeration Area (EA) Maps are subdivided into three series: Large urban centres (formerly G13 & G13A); small urban centres (formerly G14 & G16); and rural areas (formerly G12).

Census Division (CD) and Census Subdivision (CSD) Maps show boundaries for census divisions (areas such as counties and regional districts) and census subdivisions (such as cities and towns). Boundaries for Census Metropolitan Areas and Census Agglomerations are also shown.

Census Metropolitan Area (CMA), Census Agglomeration (CA) and Census Tract (CT) Maps show the boundaries of CSDs, CMA/CA parts and CTs. Publications in the Census Tract Profile series contain corresponding maps for each tracted CMA or CA.

Federal Electoral District (FED) Map is a colour map showing the federal electoral districts of Canada according to the 1987 Representation Order.

ENUMERATION AREA REFERENCE LISTS: This is a series of national and regional products identifying the linkages between enumeration areas (EAs) and standard geographic areas. Through these Enumeration Area Reference Lists users can determine to which higher levels of geography EAs are linked.

EQUIVALENT ENUMERATION AREAS, 1991 AND 1986: This publication provides direct comparisons between 1991 and 1986 enumeration areas, with tables sorted by both 1991 and 1986 codes. As well, indexes to equivalent groups of EAs are provided for 1991 and 1986.

GEOREF: This is a new diskette product designed for IBM compatible micro-computers. This product is based on the enumeration area (EA) and links EAs to higher levels of Geography. Software is included to allow users to display different standard geographical areas and their relationship to other geographical areas. For example, for any standard geographic area the component EAs can be listed. Or, vice-versa, for any enumeration area its linkage to other standard geographical areas can be shown. It also features 1991 population and dwelling counts, selected land areas, the EA representative point ("centroid") as well as noting which census subdivisions (CSDs) are covered by the Street Network Files (SNFs).

STREET NETWORK FILES (SNF): These computer files provide the street network for most large urban centres in Canada. They include streets, rail-road tracks and other features, as well as relevant information such as street names and address ranges. Street Network Files are used as the base for a user's geographic application software for mapping purposes or special applications such as transportation planning or delivery services. The user should be aware of the vintages of the individual Street Network Files when considering the particular application.

DIGITAL BOUNDARY FILES: Digital Boundary Files are available for most levels of standard geography (from the enumeration area up to the province and territory). In combination with the user's appropriate software, these files provide the user with a spatial analytical tool for designing their own geographical areas (by aggregating standard geographical areas), for mapping, and for other data manipulation operations and analysis offered by the user's software.

POSTAL CODE CONVERSION FILE (PCCF): This computer file links the six character postal code with standard 1991 Census geographical areas (such as enumeration areas, municipalities (CSDs), census tracts, etc.) It also provides the {x,y} coordinates for a point representing the location of the postal code to support mapping applications.

STREET INDEX: This paper product is an alphabetical listing of street and address ranges from the Street Network Files, linked to specific standard geographical areas. Three products will be available: (1) linkage to enumeration areas; (2) linkage to census divisions and census subdivisions; and (3) linkage to census tracts. The Street Indexes will be available as print-on-demand products by census metropolitan areas or census agglomerations which are in the census tract program. Coverage in those areas is restricted to those component CSDs having Street Network Files.

BLOCK-FACE DATA FILE: The block-face is defined as one side of a street between two consecutive intersections in large urban centres. It is the smallest geographical unit available from Statistics Canada. This computer file relates the block-face to most standard levels of geography. Included in the file are the block-face representative point ("centroid"), the street names with corresponding address ranges, geographical area codes, and the block-face 1991 population and dwelling counts.

GEOGRAPHY GUIDE BOOK: In easy to understand language, this publication explains the applications of most of Statistics Canada's geographic areas and their hierarchies . Five brief case studies show the reader what steps to follow in research situations, defines the geographic terms and describes related products and services available.

GEOCODING SERVICE: This custom service allows users to define their own geographical area of study for census data retrievals. This custom geography is produced from an aggregation at the block-face level in large urban areas, and at the enumeration area level for small urban and rural areas.

CUSTOM SERVICE: If the standard geography products do not satisfy a user's need, the Custom Service may be able to produce the product as a special request. Examples include special data retrievals or merges using any of the geography computer files (postal codes, attribute files, boundary files and street network files), special population compilations using basic census collection records, and digitizing user-defined boundaries for a user's own computer software. Some custom mapping is available.

12.2For Further Information

For further information on the Digital Boundary Files or other geographic products and services available from Statistics Canada, contact your nearest Regional Reference Centre. If you live outside the local dialing area, call one of the toll free numbers provided in the list that follows:

Newfoundland and Labrador
Statistics Canada
Advisory Services
3rd Floor
Viking Building
Crosbie Road
St. John's, Newfoundland
A1B 3P2
Local calls: 709-722-4073
Toll free: 1-800-563-4255
Fax: 1-709-772-6433

Ontario
Statistics Canada
Advisory Services
10th Floor
Arthur Meighen Building
25 St. Clair Avenue East
Toronto, Ontario
M4T 1M4
Local calls: 416-973-6586
Toll free: 1-800-263-1136
Fax:1-416-973-7475

Southern Alberta
Statistics Canada
Advisory Services
Room 401
First Street Plaza
138-4th Avenue South East
Calgary, Alberta
T2G 4Z6
Local calls: 403-292-6717
Toll free: 1-800-472-9708
Fax: 1-403-292-4958

Maritime Provinces
Statistics Canada
Advisory Services
North American Life Centre
3rd Floor
1770 Market Street
Halifax, Nova Scotia
B3J 3M3
Local calls: 902-426-5331
Toll free: 1-800-565-7192
Fax: 1-902-426-9538

Manitoba
Statistics Canada
Advisory Services
Suite 300
MacDonald Street
344 Edmonton Street
Winnipeg, Manitoba
R3B 3L9
Local calls: 204-983-4020
Toll free: 1-800-542-3404
Fax: 1-204-983-7543

British Columbia and Yukon
Statistics Canada
Advisory Services
Suite 440F
3rd Floor
Federal Building
Sinclair Centre
757 West Hastings St.
Vancouver, British Columbia
V6C 3C9
Local calls: 604-666-3691
Toll free: 1-800-663-1551

Quebec
Statistics Canada
Advisory Services
200 René-Lèvesque Blvd. West
Guy-Favreau Complex
4th floor, East Tower
Montréal, Quebec
H2Z 1X4
Local calls: 514-283-5725
Toll free: 1-800-361-2831
Fax: 1-514-283-9350

Saskatchewan
Statistics Canada
Advisory Services
9th Floor
Avord Tower
2002 Victoria Avenue
Regina, Saskatchewan
S4P 0R7
Local calls: 306-780-5405
Toll free: 1-800-667-7164
Fax: 1-306-780-5403

(except Atlin, B.C.)
Yukon and Atlin, B.C.
Zenith 08913
Fax: 1-604-666-4863

National Capital Region
Statistics Canada
Statistical Reference Centre
Lobby
R.H. Coats Building
Tunney's Pasture
Holland Avenue
Ottawa, Ontario
K1A 0T6
Local calls: 613-951-8116
If outside the local calling area, dial the toll-free number for your province.
Fax: 1-613-951-0581

Alberta and Northwest Territories
Statistics Canada
Advisory Services
8th Floor
Park Square
10001 Bellamy Hill
Edmonton, Alberta
T5J 3B6
Local calls: 403-495-3027
Toll free: 1-800-282-3907
N.W.T.: Call collect 1-403-495-3028
Fax: 1-403-495-3026

12.3 Additional References and Services

In addition to the Regional Reference Centres and depository libraries, Statistics Canada publications may be ordered through your local bookstore or subscription agent. Contact the nearest Regional Reference Centre for a list of Canadian outlets available, or consult the 1991 Census Catalogue (Catalogue No. 92-302E).

Secondary distributors offer data access and analytical support through a variety of consulting and computer-based services not available at Statistics Canada. The names and addresses of licensed distributors may be obtained from any Regional Reference Centre.

Statistics Canada provides digital geographic products which allow computer manipulation of geographic data. A customized retrieval service is available for users who wish to define their own geographic area of study. A variety of data retrieval files and services provide flexibility in selecting a geographic base.

A complete description of available digital files and services is documented in the 1991 Census Catalogue (Catalogue No. 92-302E).

Information concerning Census of agriculture products and services may be referenced in the 1991 Census of Agriculture Products and Services publication, Catalogue No. 92-303, or by calling toll free 1-800-465-1991.

Users with special data requirements may request post-census survey services. Data are made available on microcomputer diskettes for use with spreadsheet software, or on paper output. For additional information, please contact the nearest Regional Reference Centre.

The Dissemination Division is responsible for CANSIM, Statistics Canada's computerized database network and information retrieval service. Users are provided with access to current and historical statistics in various forms including specialized data manipulation and analysis packages, graphics facilities and a bibliographic search service. For more information about CANSIM, contact any Regional Reference Centre.

Appendix A: Lambert Conformal Conic Projection Parameters

The Lambert Conformal Conic Projection is a map projection which is widely used for mapping Canada on one sheet, since it provides good directional and shape relationships for mid-latitude regions having a mainly east-to-west extent. Standard parallels at 49° N and 77° N are most commonly used, as well as a central meridian at 91° 52° W.

Locations are specified in easting and northing co-ordinates in metres relative to a pre-defined origin.

The specific parameters are:

49° N	- latitude of lower standard parallel
77° N	- latitude of upper standard parallel
91° 52' W	- Central Meridian
63 23 26.43 N	- latitude of projection's origin
6,200,000	- false northing (meters)
3,000,000	- false easting (meters)

Appendix B: EAs not consistent with Street Network Files

The following is a list of EAs which will not be exactly consistent with Street Network Files due to missing non-physical (non-visible) features (see Section 3.2 for details). The list is sorted by PR/FED/EA code.

This list was compiled from internal manual documents, thus, although every effort was made to ensure correctness, errors in transcription and key entry may have occurred.

STREET NETWORK FILE	EA
Moncton	13008010,026
Moncton	13008204,205
Saint John	13010157,203,213
Saint John	13010207,212
Montreal	24002453,458
Montreal	24003219,221
Montreal	24003219,276
Montreal	24003317,318
Montreal	24003360,362
Montreal	24003364,370
Montreal	24003369,370
Chatauguay	24013266
Gatineau	24015057,059
Charlesbourg	24016107,109
Charlesbourg	24016204,205,206
Charlesbourg	24016256,257
Chicoutimi	24019212,213
Chicoutimi	24019262,263
Laval	24021110,112
Aylmer	24025001,002
Montreal	24029211,212
Montreal	24029356,357
Quebec	24031311,313
St-Jerome	24034107,171
Laval	24036215,302,303
Laval	24036311,351,363
St-Nicholas	24038311,312
Ste-Foy	24041159,163
Ste-Foy	24041313,352,353,354
Montreal	24045002,011
Beauport	24046011,013
Beauport	24046012,014
Dollard-des-Ormaux	24051162,166
St-Raphael	24051366,369
Montreal	24062162,305
Montreal	24062254,267
Montreal	24065201,351
Montreal	24065512,560
Sherbrooke	24069016,022,023
Lachine	24071159,160,171
Vaudreuil	24073162,171
Montreal	24075106,107,120,121
Kitchener	35009162,179
Ottawa	35010009,070
Ottawa	35010018,075
North York	35014066,212

STREET NETWORK FILE EA

Port Colborne	35019103,113
Etobicoke	35023413,416
Etobicoke	35024357,369
Rockland	35025314,315
Guelph	35026218,254
Guelph	35026256,270,258
Guelph	35026315,323
Kingston	35037453,460
London	35045416,422,423
Toronto	35046404,417
Markham	35046460,462
Mississagua	35048002,004
Nepean	35050052,077
Nepean	35050113,164
Pickering	35056281,335,336
Pickering	35056401,403
Pickering	35056403,413
Ottawa	35059122,124
Ottawa	35060052,057
Ottawa	35061154,157
Toronto	35069704
Toronto	35069707,801
St-Catharine	35070105,35090267
Sarnia	35072151,152
Sarnia	35072151,152
Scarborough	35074205,215
Thunder Bay	35084018
Vaughan	35096270,280
Winnipeg	46012110
Winnipeg	46012113
Calgary C	48003555,565
Calgary C	48003854,855
Calgary C	48004400,413,414
Calgary C	48005316,317
Edmonton East	48010411
Vancouver C	59001118,151
Delta	59005007,022
Caps Sub B	59006405,406
Matsqui	59008165,172,173,174
North Vancouver	59016165,168
North Vancouver	59016258,264
Central Sanich	59024267,274
Surrey North	59026461,462,464
Surrey	59027215
Vancouver E	59029703,712

Appendix C: EAs comprising more than one polygon in the 1991 EA Digital Boundary File

1991 EA	Number of Parts (polygons)	SGC Code for the1991 EA	Is the EA contained in the Street Network File Coverage?
10007205	2	1001542	NO
12004017	4	1217020	NO
13001262	2	1308019	NO
13004110	2	1305053	NO
24004016	2	2472802	NO
24030006	2	2493908	NO
24039112	2	2458030	YES
24039457	2	2458030	YES
24041163	2	2423060	YES
24042208	2	2497010	NO
24071307	2	2464015	YES
35001011	2	3551016	NO
35001280	2	3557077	NO
35016328	2	3518022	YES
35025018	15	3501007	NO
35025019	2	3501007	NO
35035213	2	3560058	NO
35035214	4	3560065	NO
35035228	7	3560021	NO
35035306	2	3560090	NO
35025326	2	3560055	NO
35035370	2	3560084	NO
35035403	3	3560096	NO
35035405	3	3560085	NO
35035411	5	3560075	NO
35035415	3	3560097	NO
35035418	2	3560087	NO
35039021	3	3539018	NO
35043426	2	3539036	YES
35064204	2	3549073	NO
35080014	5	3543050	NO
35080015	2	3543050	NO
35080219	2	3543076	NO
35080414	3	3543069	NO
46001210	2	4607060	NO
46002021	3	4619052	NO
46002022	3	4619052	NO
46002023	2	4619077	NO
46002441	5	4623065	NO
46003316	2	4615071	NO
46008366	2	4601078	NO
46008370	2	4613056	NO
47001266	2	4712046	NO
47001419	2	4717024	NO
47004424	2	4718822	NO
47004480	2	4718824	NO
47006274	2	4706820	NO
47011463	2	4705031	NO
47013232	2	4716861	NO
47013356	3	4716056	NO
48001258	2	4817025	NO
48001266	2	4817832	NO

Appendix C continued :

1991 EA	Number of parts (polygons)	SGC Code for 1991 EA	Is the EA contained in the Street Network File Coverage?
48001269	2	4817831	NO
48006061	2	4806016	YES
48015462	2	4811061	YES
48015522	2	4811061	YES
48023105	2	4807039	NO
59002323	2	5931012	NO
59015124	2	5929803	NO
59019460	2	5907024	NO
59020375	2	5915063	YES
59028070	2	5915022	YES
59028423	2	5915022	YES
59029068	2	5915022	YES
59029070	2	5915022	YES
59029317	2	5915022	YES
59029808	2	5915022	YES
60001164	2	6001040	NO

Appendix D: CSDs comprising more than one polygon in the 1991 CSD Digital Boundary File

SGC	#PARTS	SGC	#PARTS	SGC	#PARTS	SGC	#PARTS

1001239	2
1001374	2
1001415	2
1001452	2
1002022	2
1004016	2
1005007	2
1007009	2
1102014	2
1103035	2
1205001	2
1207021	2
1209038	2
1212023	2
1214010	3
1215008	2
1217020	4
1308015	2
1309023	2
1309025	4
1313024	2
1313028	3
1315040	2
2402025	2
2406030	2
2406804	2
2409075	2
2409080	3
2414902	2
2423025	2
2423045	3
2423802	2
2430065	2
2431080	2
2432020	2
2434045	2
2443015	2
2444075	2
2445075	2
2450802	5
2454055	2
2457010	2
2466025	3
2466055	3
2466130	2
2470015	2
2471085	2
2472035	2
2472802	14
2477015	2
2478020	2
2479040	2
2480125	2
2483065	4
2484040	2
2485806	3
2486040	2
2487904	2
2488904	2
2491902	2
2493908	2
2497802	2
2497808	2
2498808	2
2499030	2
2499035	2
2499045	2
2499055	2
2499070	3
2499130	2

2499802	3
2499804	2
3501007	17
3512048	2
3514026	3
3514027	6
3518022	2
3519076	3
3529020	3
3538030	4
3539017	4
3539018	6
3541054	2
3541064	2
3543050	10
3543069	3
3543076	2
3544073	3
3546004	2
3547066	2
3548069	2
3549005	3
3549073	2
3549076	2
3552052	2
3556093	2
3557073	3
3557074	2
3557075	2
3557077	2
3558004	2
3560004	2
3560021	8
3560055	2
3560057	2
3560058	2
3560065	4
3560075	5
3560082	2
3560084	2
3560085	3
3560087	2
3560090	2
3560096	3
3560097	3
4601057	4
4601078	2
4601079	3
4601094	3
4606037	2
4607062	2
4608031	2
4609024	2
4609025	2
4613056	4
4613062	2
4615071	2
4616025	3
4618057	4
4618060	2
4618067	4
4618093	2
4619045	4
4619050	2
4619052	6
4619077	2
4620055	2
4621041	3
4621045	2
4621064	2
4622047	3
4622049	2

4622058	10
4623065	5
4704802	3
4705031	2
4705804	9
4705808	2
4706820	3
4711054	2
4715068	2
4716056	4
4716861	2
4717001	2
4717024	2
4717806	5
4717807	4
4717808	2
4717809	3
4717814	2
4717815	2
4718822	2
4718824	2
4803001	3
4803011	2
4803801	2
4805024	3
4805802	5
4806803	2
4807039	2
4808811	2
4815003	2
4815015	2
4815017	3
4815802	3
4817025	2
4817817	3
4817831	3
4817832	5
4819049	2
5901003	2
5901006	3
5903050	2
5907024	2
5907803	2
5915046	3
5915051	2
5915063	13
5917045	3
5919008	4
5919807	2
5929011	3
5929803	29
5931012	3
5931030	2
5931812	2
5931831	2
5933010	2
5933024	2
5933034	4
5933040	2
5933828	2
5933854	2
5937014	2
5937019	2
5941011	2
5941023	2
5941847	2
5941862	2
5943023	2
5947030	3
5947802	3
5949022	3
5949024	4

5951007	2
5951009	3
5951013	3
5951022	2
5951815	3
5951818	10
6001040	2

Appendix E: CCSs comprising more than one polygon in the 1991 CCS Digital Boundary File

PROVINCE	CCS CODE	NUMBER OF PARTS
New Brunswick	1309026	4
Quebec	2414902	2
	2443015	2
	2444075	2
	2462912[1]	2
	2462920[1]	2
	2479040	2
	2493908	2
	2498040	2
Ontario	3501012	18
	3529020	3
	3543069	3
	3547066	2
	3557074	2
	3558004	2
Manitoba	4601057	2
	4601094	2
	4618057	4
	4618060	3
	4618093	2
	4620055	2
Saskatchewan	4705028	3
Alberta	4819049	2
British Columbia	5915063	2
	5917045	2

In general, the CCSs in this table comprise more than one part since their component CSDs comprise more than one part.

[1] Component CCS parts are as a result of the application of the delineation rules producing unexpected results. The rules will be reviewed and the CCSs corrected for the 1996 Census.

Appendix F: CDs comprising more than one polygon in the 1991 CD Digital Boundary File

PROVINCE	CD CODE	NUMBER OF PARTS	EXPLANATION
Nova Scotia	1209	2	Islands digitized separately
Quebec	2444	2	Component CSD in multiple parts
	2493	2	Islands digitized separately
	2497	3	Component CSD in multiple parts
			Component CSD in multiple parts

Appendix G: UAs comprising more than one polygon in the 1991 UA Digital Boundary File

The following table lists the UAs which comprise more than one polygon in the 1991 UA Digital Boundary File:

PROVINCE	UA CODE	UA NAME	NUMBER OF PARTS	EXPLANATION
Newfoundland	0247	Dunville	2	Boundary polygon is "pinched".
New Brunswick	0582	Newcastle	2	Discontinuity is caused by a water body.
Quebec	0500	Maniwaki	4	[1]The application of the population density criterion to CSDs in multiple parts.
	0728	Rouyn-Noranda	2	[1]The application of the population density criterion to CSDs in multiple parts.
Ontario	0347	Haileybury	2	Boundary polygon is "pinched".
	0663	Port McNicoll	2	EA as 2 parts, one being an island.
Alberta	1258	Stony Plain	2	
British Columbia	0112	Cache Creek	2	Boundary polygon is "pinched".
	0567	Nakusp	2	[1]The application of the population density criterion to CSDs in multiple parts.
	0681	Princeton	2	EA as 2 parts, one being an island.
	1091	Westbank	2	Boundary polygon is "pinched".

The following UAs straddle provincial boundaries, thus are represented as 2 polygons in the Canada UA file, one polygon in each of the 2 provinces. The provincial boundary files will contain only that portion of the UA contained within the province.

New Brunswick-Quebec	0122	Campbellton
Quebec-Ontario	0365	Hawkesbury
Quebec-Ontario	0616	Ottawa - Hull
Manitoba-Saskatchewan	0282	Flin Flon
Saskatchewan-Alberta	0478	Lloydminster

[1] UAs comprise more than one part as a result of the application of the delineation rules to CSDs in multiple parts. When the CSD met the population density criterion (400 persons/square kilometre), all parts of the CSD were made Urban. These will be reviewed for the 1996 Census.

Appendix H: CTs comprising more than one polygon in the 1991 CT Digital Boundary File

PROVINCE	CT NAME	CMA/CA NAME	NUMBER OF PARTS	EXPLANATION
Quebec	0101.00	Québec CMA (421)	2	Boundary polygon is "pinched".
	0510.00	Montréal CMA (462)	2	A CSD boundary change split the CT.
Ontario	0101.00	Windsor (559)	2	In reality this CT is in one part, however the merging of 2 Street Network Files created 2 polygons joined at one point.
	0001.00	Thunder Bay (595)	2	The smaller of the 2 parts is caused by an incorrect linkage on the Geographic Attribute Data Base.
Saskatchewan	0100.04	Regina (705)	2	In reality this CT is in one part, however the merging of 2 Street Network Files created 2 polygons joined at one point.
Alberta	0001.04	Calgary	2	In reality this CT is in one part, however the merging of 2 Street Network Files at a UTM zone created 2 polygons joined at one point.
British Columbia	0251.00	Vancouver (933)	2	Two islands within the same CT were digitized separately.
	0155.02	Victoria (935)	2	A group of islands were digitized as a separate part of the CT.

Appendix I: Detailed Information on the CT Digital Boundary Files by CMA or CA

PROVINCE	CMA/CA NAME	CODE	NUMBER OF CT	NUMBER OF POLYGONS	TOTAL NUMBER OF LINE SEGMENTS[1]	TOTAL NUMBER OF ARCS[1]
NEWFOUNDLAND	St. John's (CMA)	001	40	40	3,766	112
NOVA SCOTIA	Halifax (CMA)	205	75	75	6,634	212
NEW BRUNSWICK	Saint John (CMA)	310	44	44	3,235	124
	Moncton (CA)	305	23	23	1,250	64
QUEBEC	Chicoutimi-Jonquière (CMA)	408	35	35	1,909	98
	Montréal (CMA)	462	749	750	16,635	2,047
	Ottawa-Hull (CMA) (n'inclut pas Ottawa)	505	51	51		
	Québec (CMA)	421	152	153	5,735	442
	Sherbrooke (CMA)	433	31	31	1,206	87
	Trois Rivières (CMA)	442	34	34	1,097	98
ONTARIO	Brantford (CA)	543	21	21	926	53
	Guelph (CA)	550	21	21	697	57
	Hamilton (CMA)	537	163	163	4,255	427
	Kingston (CA)	521	35	35	1,379	98
	Kitchener (CMA)	541	82	82	2,348	233
	London (CMA)	555	88	88	2,992	246
	North Bay (CA)	575	20	20	1,415	57
	Oshawa (CMA)	532	49	49	1,524	129
	Ottawa-Hull (CMA) (n'inclut pas Hull)	505	160	160		
	Peterborough (AR)	529	23	23	1,278	64
	Sarnia-Clearwater (CA)	562	24	24	654	66
	Sault Ste. Marie (CA)	590	23	23	935	64
	St. Catharines-Niagara (CMA)	539	83	83	3,742	234
	Sudbury (CMA)	580	38	38	2,294	102
	Thunder Bay (CMA)	595	30	31	1,933	83
	Toronto (CMA)	535	812	812	16,440	2,133
	Windsor (CMA)	559	59	60	1,690	172
MANITOBA	Winnipeg (CMA)	602	156	156	4,115	432

PROVINCE	CMA/CA NAME	CODE	NUMBER OF CT	NUMBER OF POLYGONS	TOTAL NUMBER OF LINE SEGMENTS[1]	TOTAL NUMBER OF ARCS[1]
SASKATCHEWAN	Regina (CMA)	705	49	50	1,980	128
	Saskatoon (CMA)	725	49	49	1,508	133
ALBERTA	Calgary (CMA)	825	153	154	5,087	407
	Edmonton (CMA)	835	195	195	6,946	527
	Lethbridge (CA)	810	21	21	702	55
	Red Deer (CA)	830	16	16	1,334	14
BRITISH COLUMBIA	Kamloops (CA)	925	22	22	1,241	62
	Kelowna (CA)	915	26	26	2,909	72
	Matsqui (CA)	932	29	29	1,438	83
	Prince George (CA)	970	23	23	920	62
	Vancouver (CMA)	933	299	300	8,727	816
	Victoria (CMA)	935	65	66	2,850	187

1 All features in the Digital Boundary Files are represented by a series of x,y coordinates (points). All segment joins two consecutive points. An arc is a line between two consecutive intersections. It will generally be composed of more than one line segment.