



# **Canadian Digital Bathymetric Model Gridded at 500 meters**

## **Product Specifications**

**Edition 4.0**

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## List of Reviews

<b>Date</b>	<b>Edition / version</b>	<b>Section / sub-section</b>	<b>Description</b>
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June 2008	3.0	On various locations in the document	Minor modifications
June 2008	4.0	On various locations in the document	Created two different documents
	-		

## **Abbreviations**

ASCII	American Standard Code for Information Interchange
LLWLT	Lower Low Water, Large Tide
CDBM-500m	Canadian Digital Bathymetric Model gridded at 500 meters
NAD83	North American Datum of 1983
NRCAN	Natural Resources Canada
CHS	Canadian Hydrographic Service
NTSC	National Topographic System
CD	Chart Datum

## **Terms and Definitions**

### **Lower Low Water, Large Tide**

Average of the lowest low waters, one from each of 19 years of prediction.

### **NTS Sheet**

Organisational unit of the National Topographic System (NTS).

### **North American Datum of 1983 (NAD83)**

Planimetric reference system for the USA, Canada, Mexico and Central America, based on the geocentric reference ellipsoid of the Geodetic Reference System of 1980 (GRS80).

### **National Topographic System (NTS)**

The National Topographic System offers map coverage for general purposes of the whole of Canada.

### **Chart Datum**

Level of reference to which the charted depths are reduced which, usually, match the Lower Low Water, Large Tide (LLWLT).

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## **1. Overview**

The 500 metre gridded Canadian Digital Bathymetric Model data (CDBM-500m) files are accessible through the Fisheries and Oceans Canada GeoPortal; the latter contains various geospatial datasets. The data which are presently accessible come from Canadian Hydrographic Services' (CHS) validated source databases. They represent the best available data. The CDBM-500m consists of a grid of depth values expressed in metres and decimetres, interpolated at equally spaced points and released under an ASCII-type XYZ format. The CDBM-500 reference cut-off is the one from the National Topographic System (NTS) sheets and the coverage of one dataset equals a sheet at a 1:250,000 scale. The North-American Datum of 1983 (NAD83) is used as a reference system for planimetric coordinates. The depths are orthometric and reduced to the Chart Datum (CD).

## **2. Data identification**

### **2.1 Spatial resolution**

The regular CDBM-500m point grids come from interpolated surfaces at a 500 metre resolution.

### **2.2 Font set**

The data are entered in ASCII in text format (TXT).

### **2.3 Encompassing geographic rectangle**

The geographical rectangle delimiting the whole of the existing CDBM-500m files coverage is as follows:

South delimiting coordinate: 46° 46' N.

West delimiting coordinate: 71° 15' W.

North delimiting coordinate: 51° 31' N.

East delimiting coordinate: 57° 07' W.

## **2.4 Geographical coverage description**

The geographical area includes the Saint Lawrence River and estuary, from Île d'Orléans to Blanc-Sablon and is bordered at the South-East by the limit established according to the banks' contour intervals; the line is drawn at an equal distance from the adjacent provinces' banks.

## **2.5 Depths**

The depths are orthometric and are reduced to the CD represented by the Lower Low Water, Large Tide (LLWLT). These depths have a positive axis pointing downwards, i.e. the values below the Chart Datum are positive and those above are negative.

# **3 Geospatial characteristics**

## **3.1 Spatial representation**

Not all the sheets contain the same amount of nodes as the terrestrial part is not represented in the CDBM-500m. The nodes spaced by 500 metres in the straight Mercator Projection (scaling latitude is the Equator) represent approximately 330 metres on the field at the 49° North latitude.

## **3.2 Coverage and continuity**

The CDBM-500m is divided into files like the NTS sheets, at the 1:250,000 scale. There is not layering of nodes between the various sheets (files) and it may happen that the distance between the nodes and the subsequent sheets is other than 500 metres. On the other hand, the nodes come from surfaces with a consistent continuity between sheets.

# **4 Coordinates reference system**

A tridimensional geocentric reference system is used with the CDBM-500m with a positive Z-axis pointing downwards (longitude, latitude and depth).

## **4.1 Planimetric reference system**

North-American Datum of 1983 (NAD83).

#### **4.1.1 Planimetric coordinates system**

The data are saved according to their geographical coordinates (long/lat) in degrees, minutes and seconds, followed by the letter N or W for the North and West coordinates.

#### **4.1.2 Planimetric measuring unit**

The measuring unit used to save the planimetric data is the seconds of arc with 3 significative digits after the decimal point ( $1 \times 10^{-3}$ ).

### **4.2 Bathymetric reference system**

The depths are reduced to the CD, i.e. the Lower Low Water, Large Tide (LLWLT); the values are positive below the CD and negative above the CD.

#### **4.2.1 Bathymetric measuring unit**

The measuring unit used to save the depth data is the metre with 1 significant digit after the decimal point ( $1 \times 10^{-1}$ ).

## **5. Data quality**

### **5.1 Genealogy**

The CDBM-500m source digital data (depths) are provided by the Canadian Hydrographic Service. They are all validated depths and represent the best information available at the time of the model creation. They originate from various acquisition techniques and from different points in time. These data have been interpolated according to the Natural Neighbour's interpolation technique.

### **5.2 Depth precision**

The depth precision varies a lot within one sheet (file) and is generally larger when the depth is larger.

## **6. Metadata**

Each CDM-500m file complies with a corresponding US Federal Geographic Data Committee FGDS-STD-001-1998 metadata standard. The records are available in XML format.

The following metadata are available for each of the CDBM-500m entries:

1. Identification information
2. Spatial data organisation information
3. Distribution information
4. Metadata reference information

## **7. CDBM-500m files delivery**

### **7.1 Information on the format**

The CDBM-500m exchange format is an ASCII text file (TXT).

### **7.2 Use of data and restrictions**

These data are produced to meet needs other than those of navigation. Please note that charts are navigational documents with a legal value. Obligation to identify the source: Canadian Hydrographic Service. Commitment to not distribute without the Canadian Hydrographic Service's consent.

### **7.3 Naming conventions**

The files are named after the NTS Sheets, followed by the grid's resolution

E. g.: *22g\_500m.txt*

### **7. File access**

The CDBM-500m files and the corresponding metadata files can be downloaded in two distinct files from Fisheries and Oceans Canada's GeoPortal. A Text file containing the data, and an XML file containing the metadata.

## **8. Data entry and update**

The files are updated on a regular basis (once a year, or once every other year) with the newly acquired and digitized data.

# Annex A

## Example of XYZ data file

47-00-04.212N 61-59-50.025W 47.76  
47-00-04.212N 61-59-33.855W 44.00  
47-00-04.212N 61-59-17.686W 45.92  
47-00-04.212N 61-59-01.516W 46.02  
47-00-04.212N 61-58-45.346W 46.03  
47-00-04.212N 61-58-29.177W 46.00  
47-00-04.212N 61-58-13.007W 47.30  
47-00-04.212N 61-57-56.837W 47.55  
47-00-04.212N 61-57-40.668W 48.00  
47-00-04.212N 61-57-24.498W 45.85  
47-00-04.212N 61-57-08.328W 44.00  
47-00-04.212N 61-56-52.159W 45.34  
47-00-04.212N 61-56-35.989W 46.00  
47-00-04.212N 61-56-19.819W 45.59  
47-00-04.212N 61-56-03.650W 44.00  
47-00-04.212N 61-55-47.480W 45.02  
47-00-04.212N 61-55-31.310W 46.00  
47-00-04.212N 61-55-15.141W 48.54  
47-00-04.212N 61-54-58.971W 55.00  
47-00-04.212N 61-54-42.801W 44.00  
47-00-04.212N 61-54-26.632W 44.83  
47-00-04.212N 61-54-10.462W 44.00  
47-00-04.212N 61-53-54.292W 42.64  
47-00-04.212N 61-53-38.123W 40.00  
47-00-04.212N 61-53-21.953W 44.00  
47-00-04.212N 61-53-05.783W 42.64  
47-00-04.212N 61-52-49.614W 42.00  
47-00-04.212N 61-52-33.444W 41.68  
47-00-04.212N 61-52-17.274W 42.00  
47-00-04.212N 61-52-01.105W 41.04  
47-00-04.212N 61-51-44.935W 42.00  
47-00-04.212N 61-51-28.765W 41.53  
47-00-04.212N 61-51-12.595W 41.56  
47-00-04.212N 61-50-56.426W 42.00  
47-00-04.212N 61-50-40.256W 40.00  
47-00-04.212N 61-50-24.086W 42.00  
47-00-04.212N 61-50-07.917W 40.75  
47-00-04.212N 61-49-51.747W 40.00  
47-00-04.212N 61-49-35.577W 41.47  
47-00-04.212N 61-49-19.408W 44.02