Ontario

User Guide for Contour

LIO Data Class

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Additional Information

For more information about this document, please contact Spatial Data Infrastructure at sdi@ontario.ca.

Executive Summary

Key Words

Contours, Elevation, Altitude, Topographic

Abstract

A user guide to the extent and context of information stored in the Contour Land Information Ontario Data Class.

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List of Acronyms

DDS: Data Distribution System

LIO: Land Information Ontario

LIOW: Land Information Ontario (data) Warehouse

LUT: Lookup Table

MNRF: Ontario Ministry of Natural Resources and Forestry

OGF: Ontario Geospatial Feature

WMS: Web Mapping Service

1. Introduction

Contours are lines representing equal elevations. The primary purpose of the contour layer is to represent elevation on a medium scale topographic map. A contour interval is the difference in elevation between adjacent contour lines. Multiple sources were used to develop contours and contour intervals will vary across the province depending on the sources.

The contours represented were captured using stereophotogrammetric methods and calculated based on a digital elevation model (DEM) or may have been captured manually using hard copy maps. In order to create a cartographic product, the contours were cartographically smoothed and attempts were made to remove extraneous contours in water.

Contour intervals are 5m in the southern part of the province, 10m in the central part of the province and are variable in the far north. The variability in the far north is due to the vintage and specifications of the mapping products.

The MNRF has a web map application that includes cartographic representation of contours. For more information visit the Make a Topographic Map application page (http://www.ontario.ca/environment-and-energy/topographic-maps).

Known Issues

- There are no contours in the Toronto area.
- The Hudson Bay Lowlands area contains limited contours.
- There may be overlapping contours along a Ministry of Natural Resources and Forestry district boundary.

For more information on Contour contact sdi@ontario.ca.

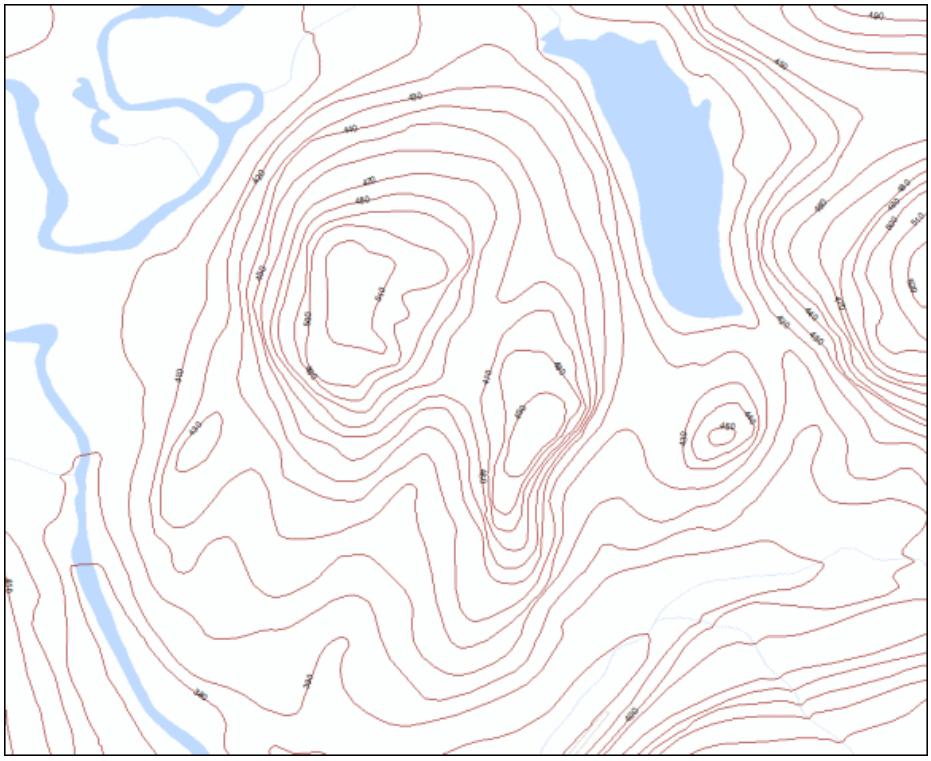


Figure 1: LIO Mapper view of Contour data class layer

2. Objectives

This user guide is intended for users with a general interest in the Contour LIO Data Class. The remainder of this document describes the extent and context of the information collected for this data class.

3. Data Class: Contour

Linear segments that connect contiguous points of the same elevation that are compiled and used to describe terrain relief.

Spatial Management

Contours are represented as linear features (lines) in this data class. Contours are not maintained with exception to the minimal adjustment of contour lines based on reported errors. It is anticipated that future maintenance will occur when a more accurate elevation source is available to support the generation of contours.

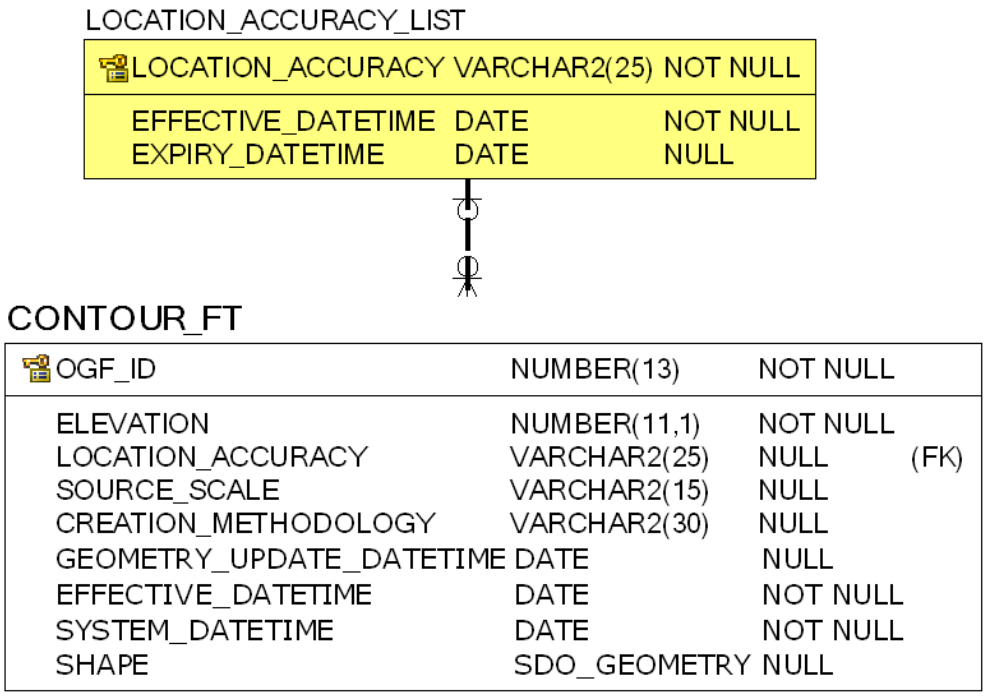
4. Model Diagram: Contour

Physical Model Diagram for Contour

Model Effective Date: 2012-JUN-14

Note: Where applicable to this model:

- Tables with a "_LIST" extension (shaded yellow) = Lookup Table (LUT)



5. Data Description

The main business area table(s) for this model can be found below. Associated lookup tables will be listed in Appendix A of this document and are hyperlinked where referenced in this section.

CONTOUR_FT

Linear segments that connect contiguous points of the same elevation that are compiled and used to describe terrain relief and usually captured at a predefined contour interval.

Column Name	Column Type	Mandatory	Short Name	Description
OGF_ID	NUMBER(13)	Yes	OGF_ID	A unique numeric provincial identifier assigned to each object.
ELEVATION	NUMBER(11,1)	Yes	ELEVATION	Amount in metres that a geographic entity is above mean sea level.
LOCATION_ACCURACY	VARCHAR2(25)	No	ACCURACY	The accuracy of the location of the feature at an OBM scale. The degree of conformity or closeness of a measurement to the true value.
SOURCE_SCALE	VARCHAR2(15)	No	SRCE_SCALE	The scale of the vector base or aerial photography, the cell resolution of a grid, or the pixel resolution of an image used to record the location of the feature. Examples: For a vector source or aerial photography: 1:10,000 1:20,000 1:50,000. For a grid or imagery source: 1 km, 10 m, 15 seconds.
CREATION_METHODOLOGY	VARCHAR2(30)	No	METHODOL	The method used to generate the lines for contours. For example, contours could be generated using a digital terrain model or digitized from hard copy maps.
GEOMETRY_UPDATE_DATETIME	DATE	No	GEO_UPD_DT	Date/time the geometry was created or last modified in the source database.
EFFECTIVE_DATETIME	DATE	Yes	EFF_DATE	Date/time the record was created or last modified in the source database.
SYSTEM_DATETIME	DATE	Yes	SYS_DATE	Date/time the record was loaded into or last modified in the LIO database. **DEFAULT:** SYSDATE
SHAPE	GEOMETRY	No	SHAPE	Geometry attribute.

6. Links to Additional Information

- Official LIO Metadata Record for Contour (https://www.javacoeapp.lrc.gov.on.ca/geonetwork/srv/en/main.home?uuid=aff85cb7-7177-49fd-943a-1f858cd770b9)

APPENDIX A: LIO Lookup Tables and Values

Listing of Lookup Tables (LUT) and values that are used by the Contour Data Class.

LOCATION_ACCURACY_LIST

List of valid location accuracies.

Column Name	Column Type	Mandatory	Short Name	Description
LOCATION_ACCURACY	VARCHAR2(25)	Yes	ACCURACY	The accuracy of the location of the feature at an OBM scale. The degree of conformity or closeness of a measurement to the true value.
EFFECTIVE_DATETIME	DATE	Yes	EFF_DATE	Date/time the record was created or last modified in the source database. **Default**: SYSDATE
EXPIRY_DATETIME	DATE	No	EXP_DATE	Date/time that the record was expired from use.

LOCATION_ACCURACY_LIST Permissible Values

LOCATION_ACCURACY	EXPIRY_DATETIME
Not Applicable	Not applicable
Over 10,000 metres	Not applicable
Within 1 metre	Not applicable
Within 10 metres	Not applicable
Within 10,000 metres	Not applicable
Within 100 metres	Not applicable
Within 1000 metres	Not applicable

LOCATION_ACCURACY	EXPIRY_DATETIME
Within 2 metres	Not applicable
Within 20 metres	Not applicable
Within 200 metres	Not applicable
Within 2000 metres	Not applicable
Within 5 metres	Not applicable
Within 50 metres	Not applicable
Within 500 metres	Not applicable
Within 5000 metres	Not applicable
AC Accurate (to 10m)	2007-01-12
AP Approximate (to 500m)	2007-01-12
GE General (to 10,000m)	2007-01-12
MO Moderate (to 1000m)	2007-01-12
RE Reliable (to 100m)	2007-01-12
VA Very Accurate (to 2m)	2007-01-12
VG Vague (to 100,000m)	2007-01-12
^ Data Load	2007-01-12

APPENDIX B: Table Key Dependency and Relationship Index

Keys are used to link or make relationships between tables through one or more columns. A Parent Table is the source of unique key columns used by a Child Table. The main key types are described below.

Primary Key (PK):

A Primary Key (PK) is a column that uniquely identifies each record in a table. There can be more than one PK defined for a table when additional rules for record uniqueness are needed. Primary Keys cannot contain null values.

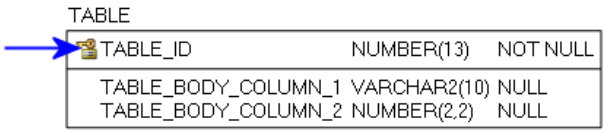


Figure 2: Primary Key example

Foreign Key (FK):

When a Primary Key from a Parent Table appears as a column in the Child Table it is referred to as a Foreign Key (FK). The FK may retain the same name of the Parent Table column, or it may be renamed.

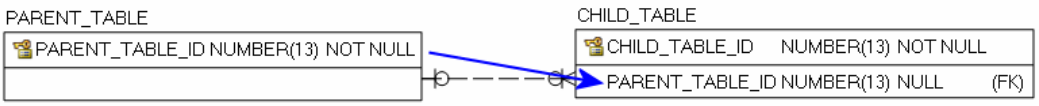


Figure 3: Foreign Key example

Alternate Key (AK):

Alternate Keys (AK) are secondary unique identifiers in a Parent Table. A Child Table can link to a Parent Table AK and use it as a Foreign Key (FK). The FK may retain the same name of the Parent Table column, or it may be renamed. Alternate Keys allow null values.

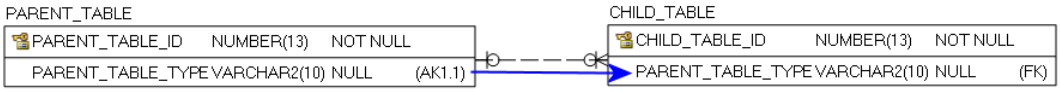


Figure 4: Alternate Key example

There are two relationship type options, identifying and non-identifying, which are described below.

An **Identifying Relationship** occurs when a column from the Parent Table is added to the key section of the Child Table. Though technically a Foreign Key (FK) in the child table, it now forms part of the Primary Key (PK). Identifying Relationships are symbolized with a solid line.

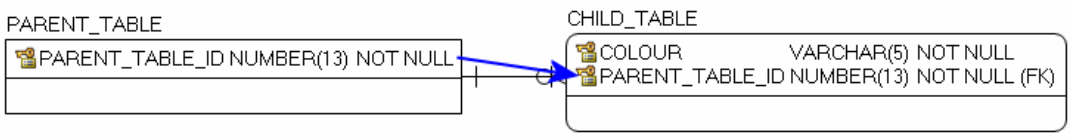


Figure 5: Example of an Identifying Relationship

A **Non-identifying Relationship** occurs when a column from the Parent Table is added to the main body of the Child Table where it is treated as a Foreign Key (FK). Non-identifying Relationships are symbolized with a dashed line.

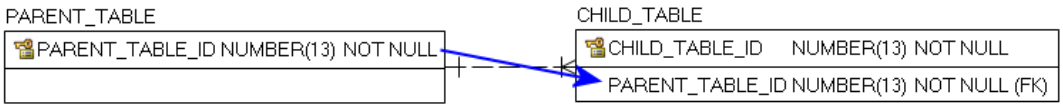


Figure 6: Example of a Non-identifying Relationship

The relationships between tables are set up with cardinality rules describing if the feature record in the Parent Table can relate to zero, one or more records in the associated Child Table and vice versa. These rules are symbolized in the model diagram as follows.

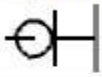
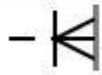
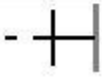
Symbol	Definition
	Zero or one (optional: 1 to 1)
	Zero, one or more (optional: one to many)
	One or more (mandatory: one to many)
	Nulls not allowed (mandatory: 1 to 1)

Figure 7: Model Diagram Relationship Symbology Table

The following section is an index of parent table primary keys identifying, where applicable, associated child table dependencies that have been implemented for the Contour data class.

Lookup Table Indexes

Where a lookup table primary key (PK) is used as a foreign key (FK) in other main business area tables in order to control permissible values.

Note: Relationship type reference is either Identifying (I) or Non-Identifying (NI).

Parent Table: **LOCATION_ACCURACY_LIST**
Primary Key(s): **LOCATION_ACCURACY**
Data Type: **VARCHAR2 (25)**

Child Table	Migrated Foreign Key	Rel. Type	Parent to Child Relationship	Child to Parent Relationship
CONTOUR_FT	LOCATION_ACCURACY	NI	Optional: 1 to many	Mandatory: 1 to1