

Great Lakes Coastal Wetland Inventory

Metadata:

Identification_Information:

Citation:

Citation_Information:

Originator: Environment Canada, Canadian Wildlife Service - Ontario Region

Originator: U.S. Geological Service, Water Resources Discipline

Originator: Michigan Natural Features Inventory

Originator: Ontario Ministry of Natural Resources

Publication_Date: November 2004

Title: Great Lakes Coastal Wetland Inventory

Edition: 1st

Geospatial_Data_Presentation_Form: vector digital data

Online_Linkage: <http://glc.org/projects/habitat/coastal-wetlands/cwc-inventory/>

Description:

Abstract:

The Great Lakes Coastal Wetland Inventory was developed through the Great Lakes Coastal Wetland Consortium (GLCWC) as a bi-national initiative to create a single, hydrogeomorphically classified inventory of all coastal wetlands of the Great Lakes Basin. This inventory is built upon the most comprehensive coastal wetland data currently available for the Great Lakes and connecting channels. For the U.S., National Wetlands Inventory (NWI); Wisconsin Wetland Inventory (WWI); Ohio Wetland Inventory (OWI); and U.S. Fish and Wildlife Service (USFWS) reports and corresponding topographic maps by Charles E. Herdendorf which describe coastal wetlands in the Great Lakes Basin (Herdendorf Wetland Inventory, HWD); are the major datasets included. Additional wetland projects were utilized for each lake if available. The Canadian dataset is built off 'The Ontario Great Lakes Coastal Wetland Atlas'. Published in March 2003, this document summarized all known data to-date for coastal wetlands and identifies numerous data gaps in the current information. Ontario Ministry of Natural Resources (OMNR) digital Evaluated Wetlands polygon data provided the spatial extents for digital wetland boundaries where available. Data gaps have been filled in using air photograph interpretation following National Biological Service guidelines, and digitization techniques following GLCWC guidelines. The inventory contains the spatial extents, hydrogeomorphic classification, name, centroid position and area measurement for all known coastal wetlands of the Great Lakes basin. Hydrological modifiers imposing on each system are also identified. Hydrogeomorphology dictates wetland delineations per criteria developed by the Great Lakes Coastal Wetlands Consortium (GLCWC) working group and described in the Great Lake Commission's (GLC) Great Lakes Coastal Wetlands Classification First Revision (July 2003; original November 2001). This data is not intended for use finer than scale of sources used. The Inventory includes both a point, GLCWC_CWI and polygon coverage, GLCWC_CWI_pt.

Purpose:

To create a single, hydrogeomorphically classified inventory of all coastal wetlands for the Great Lakes Canadian shoreline. This inventory will be built on the most comprehensive coastal wetland data currently available and incorporate a standard classification process. It is result of the Great Lakes Coastal Wetlands Consortium (GLCWC) priority for a broadly accessible bi-national wetlands inventory and database of relevant coastal wetland-monitoring information and will provide the foundation for subsequent GLCWC projects.

Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:
Beginning_Date: 1981
Beginning_Time: unknown
Ending_Date: 2003
Ending_Time: unknown
Currentness_Reference: source wetland inventory date
Status:
Progress: Complete
Maintenance_and_Update_Frequency: As needed
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -92.539207
East_Bounding_Coordinate: -73.767132
North_Bounding_Coordinate: 49.100283
South_Bounding_Coordinate: 41.020228
Keywords:
Theme:
Theme_Keyword_Thesaurus: none
Theme_Keyword: wetlands
Theme_Keyword: coastal wetlands
Theme_Keyword: hydrogeomorphic classification
Theme_Keyword: lacustrine
Theme_Keyword: riverine
Theme_Keyword: barrier-protected
Theme_Keyword: freshwater
Theme_Keyword: open embayment
Theme_Keyword: protected embayment
Theme_Keyword: barrier beach
Theme_Keyword: drowned river mouth
Theme_Keyword: open shoreline
Theme_Keyword: sand spit embayment
Theme_Keyword: sand spit swales
Theme_Keyword: ridge and swale
Theme_Keyword: tombolo
Theme_Keyword: delta
Theme_Keyword: Great Lakes Wetlands Consortium
Theme_Keyword: Coastal Wetland Atlas
Theme_Keyword: bi-national
Place:
Place_Keyword_Thesaurus: none
Place_Keyword: Great Lakes Basin
Place_Keyword: Great Lakes Region
Place_Keyword: Great Lakes
Place_Keyword: United States
Place_Keyword: Canada
Place_Keyword: Ontario
Place_Keyword: New York
Place_Keyword: Pennsylvania
Place_Keyword: Ohio
Place_Keyword: Indiana
Place_Keyword: Illinois

Place_Keyword: Michigan
Place_Keyword: Wisconsin
Place_Keyword: Minnesota
Place_Keyword: Lake Ontario
Place_Keyword: St. Lawrence River
Place_Keyword: Lake Huron
Place_Keyword: Georgian Bay
Place_Keyword: Lake St. Clair
Place_Keyword: St. Clair River
Place_Keyword: Lake Superior
Place_Keyword: Lake Michigan
Place_Keyword: Detroit River
Place_Keyword: St. Mary's River
Place_Keyword: Lake Erie

Access_Constraints:

Data accessibility will be determined by the Great Lakes Coastal Wetland Consortium

Use_Constraints:

It is advised that users of this dataset fully read and comprehend all metadata associated with this product before use. Acknowledgement of the U.S. Geological Survey, Water Resources Discipline (USGS, WRD), Environment Canada Canadian Wildlife Service-Ontario Region (EC,CWS-OR), Michigan Natural Features Inventory (MNFI) and Ontario Ministry of Natural Resources (OMNR) would be appreciated for any products derived from these data. Data should not be used beyond the limit of its scale

Point_of_Contact:

Contact_Information:

Contact_Person_Primary:

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Hours_of_Service: 7:30am to 4:00pm

Data_Set_Credit:

The U.S.G.S, CWS-OR, MNFI and OMNR would like to acknowledge the Great Lakes Commission Wetland Constortium (GLCWC), Ohio State SeaGrant, and Mary Moffett, U.S. Environmental Protection Agency, Mid-Continent Ecology Division for their help in the acquisition of the primary wetland datasets used in this project. Also, thanks to Doug Wilcox and Martha Carlson, USGS Great Lakes Science Center, for additional wetland information. Funding was provided by the GLCWC.

Security_Information:

Security_Classification: Unclassified

Security_Handling_Description:

Some wetland information may be considered sensitive, and as such may have restrictions. Contact the GLCWC for access restraints

Native_Data_Set_Environment:

Microsoft Windows 2000 Version 5.1 (Build 2600) Service Pack 1; ESRI ArcCatalog 8.3.0.800

Cross_Reference:

Citation_Information:

Originator:

D. A. Albert, J. Ingram, T. Thompson, D. Wilcox, on behalf of the Great Lakes Coastal Wetland Consortium (GLCWC)

Publication_Date: March 2003

Title: Great Lakes Hydrogeomorphic Classification Schema

Edition: 1st

Geospatial_Data_Presentation_Form: document

Other_Citation_Details: submitted

Data_Quality_Information:

Attribute_Accuracy:

Attribute_Accuracy_Report:

Accuracy issues related to individual attributes in the dataset are discussed below.

Quantitative_Attribute_Accuracy_Assessment:

Attribute_Accuracy_Value: Hydrogeomo

Attribute_Accuracy_Explanation:

Wetland hydro-geomorphic classification type field. This attribute was based on the hydro-geomorphic classification schema Great Lakes Coastal Wetlands Classification (Albert et. al, 2003). Geomorphic attributes were reviewed by wetland experts using air photos(Canada) or existing base data maps (US).Dennis Albert also reviewed all attributes assigned to any US single source coastal wetlands added to the final coverage. No additional field verification was done.

The following issues should be noted:

- 1) The classification schema developed accounts for all general types of wetlands one would expect to find in the Great Lakes basin, but the fact is, not all wetlands fit these 'typical' descriptions in the classification. Many systems have anthropogenic alterations and no longer resemble the original hydrological connection to the lake. In these situations, the wetland was classified in accordance to its hydrogeomorphic connection prior to the alteration, and all system modifiers were noted in the attribute table. This should be considered when making area estimates of wetland types. For example, a dyked wetland that was once an open embayment wetland is now quite extensive, resembling more of a protected embayment wetland, than the fringing wetland it was, if left unaltered.
- 2) A number of wetland systems could be typed into one or more hydrogeomorphic classifications. The GLCWC decided to include a secondary classification for the wetlands, which is provided for in the attribute table. Systems such as barred, drowned rivermouths, which have created large lagoons at their mouths, and only a small portion of the riverine wetland is classified as coastal, will be typed primarily as a riverine,barred,drowned rivermouth and secondarily typed as a barrier beach lagoon. However, these classifications are a matter of scale and subjective. What are primary vs secondary in the classification is arguable.
- 3) The classification schema separates out all wetlands of connecting channels, so that a lacustrine, open embayment wetland can be given different consideration from a riverine, channel, open embayment wetland. However, there were coastal stretches within the connecting channels containing wetlands that were more lake-like than channel-like. Many times, this was due to anthropogenic influence, e.g. a control structure, which changes the shape and expanse of the wetland. The secondary classification may be used to denote the lacustrine feature of the wetlands. As stated previously, wetland classification prior to alteration may skew true wetland area estimates of one type to another and needs to be considered in certain analyses.

4) The Great Lakes have many drainage ditches entering into the basin. These are not riverine systems and could not be classified as such. However, on a small scale, these drains most resemble small riverine wetlands. Most drains entered into an embayment and thus, were classified as part of a continuous embayment wetland.

5) Regarding Canadian data, occasionally, there were discrepancies between the OMNR's Evaluated Wetland boundaries and the air photo interpretation. In most cases, the evaluated polygon was accepted, as per the protocol, and classified to best ability. In cases where the discrepancies could be concluded beyond a doubt that there was serious error with the wetland boundary (e.g. including large non-wetland areas, omitted large wetland areas or seriously shifted), the evaluated wetland boundary was altered through air photo interpretation, re-digitized and classified accordingly.

6) Regarding Canadian data, each wetland was confirmed using air photo interpretation techniques. In a few cases, no air photos were available or had incomplete coverage. In these situations, a classification was estimated based on auxiliary data and it was noted in the comments that the site was not photo verified.

Quantitative Attribute Accuracy Assessment:

Attribute Accuracy Value: Wetland_Na

Attribute Accuracy Explanation:

Wetlands were named to represent hydrogeomorphic wetland entities. There were slight differences in US and Canada naming strategies, due to the dissimilarity in underlying data sources. However, measures were taken to try to provide some consistency in naming conventions. The following describe the country specific protocols.

USA:

1. A wetland complex recognized by the HWI took the HWI name listed in the USFWS reports (Herdendorf, C. E., S. M. Hartley, and M. D. Barnes (Eds). 1981a-f). 2.If HWI wetlands were subdivided, the first complex followed rule 1. Each additional complex took the HWI name followed by a number starting with 1. Examples: a.The wetland High Marsh was subdivided into 3 separate wetland complexes and was named as follows : 1.High Marsh 2.High Marsh #1 3.High Marsh #2 b.If the HWI wetland complex already had numeric character in its name, the wetland followed the above described rule, but was followed by a letter. 1.High Marsh 5 2.High Marsh 5a 3.If two or more HWI wetlands were combined into one geomorphic complex, the wetland name consisted of condensed version of all the associated HWI wetland names. 4.If no HWI wetland name was available, and another wetland inventory data source had a name for the wetland complex, this name was used. 5.If the HWI wetland name is not available and the wetland inventory data source did not have a name for the wetland complex, then the feature was named after the closest location or topographic feature (for example, after the closest town, river, etc). If more than one complex occurred in this situation, use numbering system stated in rule 2. 6.If no unique naming source was available, the closest HWI wetland name was used along with the numbering scheme stated in 2. The fifth naming rule was slightly altered during the Lake Huron classification, to simplify the naming process for wetlands not recognized by the HWI. The rule stated below was implemented for all the lakes and connecting channels except Lake Ontario and the Saint Lawrence River: 1.If no unique name was available (for example, no town, river, or road nearby) the closest HWI name was used followed by "area." For example, if the closest HWI wetland is called High Marsh Wetland, the new geomorphic complex was named High Marsh Area Wetland. If more than one wetland complex resulted, the numbering rule as stated in rule 2 was used. However, if the closest Herdendorf wetland already included "area" in the name, for example, New Marsh Area Wetland, the new complex took the HWI name and used the same numbering scheme as stated in rule 2 as explained in the previous rule 5, for example, New Marsh Area Wetland #1.

Canada:

The Wetland name is as determined by "The Ontario Great Lakes Coastal Wetland Atlas: A summary of Information (1983-1997)" March 2003, where available. This is, in most cases, the same name as recorded in the OMNR Evaluated Wetlands. For all newly identified wetlands, the naming scheme is as follows: 1. Gazetteer names are used where available 2. Proper names are used where available (e.g.

Lynde Creek). 3. When wetlands are not named, the name of the area was used (e.g. Grenadier Island Wetlands). 4. When proper names and area names are not available, the direction from a nearby landmark was used (e.g. North of Sheephead Point). 5. When multiple wetlands are identified within a complex, and/or within close proximity, they are numbered from west to east (e.g. Riverside Marsh 1, Riverside Marsh 2) A couple of issues arose in using this schema 1) Multiple names for the same wetland 2) Spelling discrepancies e.g. Mill Wetland, Mills Wetland, Mill's Wetland. 3) No close land feature from which to associate a name In the afore listed scenarios, the Atlas centroid data was given first priority. Where an atlas centroid was not available, the evaluated wetland name was used. Where neither of these primary data layers are available, National Topological Survey (NTS) map sheets were used to derive a name. 4) Some MNR complexed wetlands were very large and could have been split into entities e.g. a creek portion and an embayment portion. In this case, the MNR evaluated wetland name as a complex was given priority and the entity names, where applicable, are identified in the comments.

Quantitative Attribute Accuracy Assessment:

Attribute Accuracy Value: Area

Attribute Accuracy Explanation:

Limitations include:

Conceptual Constraints

* any subjectivity in GLCWC hydrogeomorphic classifications

* OMNR wetland evaluation date

* the wetland evaluation process protocol limits wetland size to be greater than 2 hectares

Digitizing Constraints

* the limitations in using aerial photography (1:10 000 and 1:20 000)

* scanning resolution for transparencies; 0.39m ground pixel * RMS error in orthorectification process, must be less than 0.5m * the wetland evaluation process protocol limits wetland size to be greater than 2 hectares

* Software limitations

Quantitative Attribute Accuracy Assessment:

Attribute Accuracy Value: Hectares

Attribute Accuracy Explanation:

Hectares were derived by dividing the area field (meters), which was generated by establishing topology in ArcInfo, by 10,000. For U.S. point only wetlands (HWI point coverage), hectares were derived by dividing the ACREAGE field by 2.471

Logical Consistency Report: ArcINFO maintained topological relationships between features

Completeness Report:

This project is in accordance with the Federal Geographic Data Committee's (FGDC) National Spatial Data Infrastructure (NSDI) standards. The data set is at least as complete as the sources used. Additional inventories could be incorporated into the data set as they are derived. The attribute tables from the original US data sources used were maintained by attributing them with the unique wetland identifier number field, GEOID. They are included on the product CD as a separate dbase tables. All wetlands were mapped from existing polygon data sources. See Process Steps for a more through discussion of polygon alteration and additions.

Additional Datasets: Additional datasets were used when available as gap fillers and or to map new hydro-geomorphic coastal wetland extents. The IJC's Lake Ontario Wetland Inventory (LOWI) was used to fill gaps along the St. Lawrence only. It was received to late in the project to be utilized for all of Lake Ontario.

Canadian Evaluated Wetland Standards: This project builds off of existing NRVIS Evaluated Wetland data which was derived from Wetland Evaluation records. These are the most detailed surveys currently available for wetlands in Ontario. The Wetland Evaluation reports were collected from OMNR District

Offices and range from 1983 to 1997. The data consists of polygon features designated as wetland through the Ontario Wetland Evaluation System. All data in the evaluations were interpreted and field verified. The NRVIS data standards for horizontal accuracy in this dataset is +/-5 meters. In the Ontario Wetland Evaluation Process, wetlands smaller than 2 hectares will not be evaluated, the wetland boundary was drawn where 50% of the plant community consists of upland species and a 2 meter depth contour (at low water) was used to define the deep water boundary between wetland and open water. (Ontario Ministry of Natural Resources. "Ontario Wetland Evaluation System, Southern Ontario Manual. 3rd Edition" March 1993.)

Digitizing and Data Registration Standards: Where Canadian coastal wetlands have been identified but do not have suitable digital polygon data, the wetland boundary and corresponding area will be generated through delineation. The preferred method due to time and project constraints was to complete this digitally. Accuracy performance criteria are essential when digitizing to reduce the error introduced during conversion of 3-D real world objects into 2-D map objects. The peer group and project leads have accepted the accuracy criteria for this conversion as follows: 1) Air photos for identified wetlands will be scanned into digital image format that produces an obtainable minimum resolution. For the 1:10 000 and 1:20 000 scanned photos must produce an acceptable sub meter pixel resolution. For 1:10 000 photos, scanning the image at 600dpi will produce a pixel of approximately 0.4m. The 1:20 000 photos will also be scanned at 600dpi, due to data storage constraints, and will produce a pixel resolution of 0.8m. 2) The quality of the scanned imagery, including the evenness of contrast and brightness ranges, should be radiometrically colour-balanced across the wetland area to assist in the photo mosaic. 3) The georegistration of image-to-ground coordinates will be done using ArcGIS 8.2. 4) All images will be compiled using the 6 Degree Universal Transverse Mercator (UTM) projection expressed in meters, with appropriate UTM zone specified. The horizontal datum will be North American Datum Adjustment 1983(NAD 83). 5) For the purpose of establishing ground control points (GCP), high precision network data will be derived from the OMNR's Natural Resources Values Information System (NRVIS), provided in ARC/INFO export interchange format. Coverages of permanent positions, including roads, railways and utility lines, are most effective for use in determining GCPs. Wherever possible transport features (e.g. road intersections) should be selected. 6) The accuracy of GCPs is absolutely critical. The images must have a Root Mean Square (RMS) error within a measured positional accuracy of +/- 5 meters, with the corresponding RMS text files saved to confirm this result. 7) As georeferencing accuracy is contingent to the base data and to the scale of the photo, the RMS standard has been set to best meet the areas within the investigating extent. 8) The GCPs should be well distributed throughout the photo rather than clustered together, with a minimum of 5 points collected. Where photos are mosaiced together for complete wetland coverage, there should be at least 3 tie points per adjacent photo. Each GCP must be selected and referenced at a scale of 1:500 9) All georeferenced photos will be saved to CD in a .tiff or .sid format and be accompanied by the tiff world file (.twf) or sid world file (.swf) accordingly, and the RMS text file. These criteria are consistent with the protocol utilized by the OMNR in the creation of the evaluated wetland polygons, and assisted the maintenance of data integrity through the developing coastal wetland dataset. For more detailed information on NRVIS spatial accuracy please see the NRVIS Guide for End Users.

Each coastal wetland identified was classified hydrogeomorphologically. The classification schema was decided and agreed upon by the Great Lakes Coastal Wetlands Consortium Working Group. In conducting this classification on a wetland-by-wetland basis, certain rules and/or assumptions were made: 1) It was assumed that all coastal wetlands of the Great Lakes will meet the criteria of at least one of the hydrogeomorphic classifications listed. 2) If a wetland was complexed with more than one hydrogeomorphological type, the existing wetland polygon was split to best represent each individual. A new wetland name was given to each hydrogeomorphic type. In a complexed and or evaluated wetland system, each hydrogeomorphically typed wetland was given the name of the wetland complex followed by a number, sequentially from west to east 3) In cases, where anthropogenic alteration has disrupted the

hydrology of the system, the wetland hydrogeomorphic classification was to best represent its original connection to the lake, before alteration occurred. 4) Coastal wetlands must reside within the lake specific, historic high water level contour, as recorded by the Canadian Hydrological Service. If a continuous wetland extends outside of this boundary, it will also be included in the Inventory. A basin flood plain provides a reference to the upper extent of the coastal wetland located in that basin. The flood plain is a maximum average of a fluctuating boundary and is therefore, by nature not very accurate. It was not used as a definitive boundary but as a guide of reference to a possible upper extent. The extent delineation will occur after air photo interpretation and will be based on the natural wetland continuum. A continuous wetland was included in this Coastal Wetland Inventory in its entirety but where it was not continuous, the flood plain provides the upper limit of what was included with the wetland complex.

Wetland Boundary Delineation : The polygon extents in the coastal wetland database were provided by the OMNR and were mostly accepted as true. Spatial editing and/or the creation of new data, only occurred in 3 cases: 1) the absence of a digital wetland boundary 2) splitting/removing the non-continuous upper extents of an existing wetland boundary because it was not considered coastal and 3) complexed wetlands whose current boundaries need to be split into hydrogeomorphological entities.

For the Canadian portion of this dataset, remote images were necessary for the classification and were needed, boundary delineation. The OMNR has colour IR photos at a scale of 1:10 000, taken in the summer months between the years of 1994 and 2000. They were available for the entire southern basin of the Great Lake's extending to the southern half of Lake Huron. The CIR coverage ended just north of the Parry Sound district border. The northern basin had to be compensated with an alternative image source. Forest Resource Inventory (FRI) black and white contact prints provided this alternative. They were available for the remaining coastal wetlands of the basin at a scale of 1:20 000. These photos were also all taken during summer months, but their date range is a little older, from 1986 to 1994. The scale and quality of the FRI's still allowed for proper geomorphic classification of the wetland and between these two sources, there was full coverage of the Great Lake's basin with relative consistency. All acquired photos were analyzed in analog form with the assistance of a stereoscope. In cases where the digital wetland boundary polygons did not exist for identified coastal wetlands, or significant spatial alterations needed to occur, the aerial photos were scanned into digital format and georeferenced to OMNR NRVIS data. This provided a digital tablet from which to on-screen digitize the coastal wetland boundary in ArcGIS 8.2. Delineation of the wetland boundary was generated using standardized air photo interpretation techniques (Owens and Hop 1995) and was limited to wetland areas greater than 2 hectares. The 2 hectare minimum is consistent with the OMNR's evaluated wetland polygon data. In areas where large wetland complexes exist it was more efficient and thus, cost-effective to obtain satellite imagery than aerial photos. Such areas include St. Clair Marsh Wetland Complex, Wapole Island in Lake St. Clair and Long Point Wetland Complex in Lake Erie. For these areas, digital 5m panchromatic imagery and 15m multispectral imagery was obtained through the OMNR. The Coastal Wetland Inventory is considered complete for the entire Great Lakes basin.

Hydrogeomorphic types and descriptions are outlined in the classification schema developed by D. A. Albert, J. Ingram, T. Thompson and D. Wilcox, on behalf of the Great Lakes Coastal Wetland Consortium (GLCWC). See "Great Lakes Hydrogeomorphic Classification Schema.doc". A workshop held in partnership with U.S. project leads and the GLCWC, created this peer accepted classification. It is to be submitted for peer review into the Journal of Great Lakes Research (International Association for Great Lakes Research (IAGLR))

There is potential for updates in the upper Great Lakes. Data gaps were very extensive for Lake Superior and north Lake Huron on the Canadian side. This dataset accounted for all data gaps outlined in the Environment Canada and OMNR's March 2003 publication "Coastal Wetland Atlas, A Summary of

Information (1983-1997)" and photo coverage was received for all these areas. However, if a potential wetland lay outside of the obtained photo coverage, it would not be included in the dataset. Due to the extensiveness of island archipelagos and rocky outcroppings found in these areas, it is most likely that coastal wetlands greater than 2 hectares are missing from the final dataset. Future updates, may want to give priority to these areas. The lower Great Lakes have extensive datasets available and photo coverage extended for the entire shoreline. The Coastal Wetland Inventory is very comprehensive from Lake St Clair to the Cornwall Dam on the St Lawrence River.

Positional_Accuracy:

Horizontal_Positional_Accuracy:

Horizontal_Positional_Accuracy_Report:

Accuracy is equal to the largest source scale. The horizontal accuracy matches that shown in the source coverage from which this dataset was derived. However, there was a slight horizontal shift that occurred between polygon data sources in Lake Ontario, St. Lawrence River. The average horizontal shift between LOWI and NWI was 77.81ft. This meets the National Standards for Spatial Data Accuracy at the 1:24,000 scale (80ft).

Horizontal accuracy for the Evaluated Wetland polygon layer is estimated to be on the order of +/- 5 meters (NRVIS, Technical Reference Guide for End-Users, Ontario Digital Geographic Database(ODGD) Natural Resources Values and Information (NRVIS) Guide. April 2000) The horizontal accuracy of all newly digitized polygons is based on the control data and methodology used to extract and position control points on the image. The OMNR base data used in the rectification process has a horizontal accuracy of +/- 5 meters. All photo registration RMS error was maintained to less than 0.5m. Text files have been saved for verification.

The positional accuracy of the data set has not been tested under the National Standards for Spatial Data Accuracy.

Vertical_Positional_Accuracy:

Vertical_Positional_Accuracy_Report: NA

Lineage:

Source_Information:

Source_Citation:

Citation_Information:

Originator:

Mary F. Moffett, USEPA, Mid-continent Ecology Division, Duluth, MN 55804

Originator: Thomas P. Simon, USFWS, Bloomington, IN 47401

Publication_Date: Unpublished Material

Publication_Time: NA

Title: Lake_Erie_QAdone_toSimonson03

Geospatial_Data_Presentation_Form: spreadsheet

Other_Citation_Details: personal communication

Source_Scale_Denominator: 24000 to 62500

Type_of_Source_Media: excel spreadsheet

Source_Citation_Abbreviation: HWI, Lake Erie

Source_Contribution:

An excel spreadsheet of describing wetlands and their attributes for all wetlands located in Lake Erie as described in Charles. E. Herdendorf's USFWS 1981 reports.

Source_Information:

Source_Citation:

Citation_Information:

Originator:

Mary F. Moffett, USEPA, Mid-continent Ecology Division, Duluth, MN 55804

Originator: Thomas P. Simon, USFWS, Bloomington, IN 47401

Publication_Date: Unpublished Material

Publication_Time: NA

Title: Lake_Ontario_EPAtSimonson

Geospatial_Data_Presentation_Form: spreadsheet

Other_Citation_Details: personal communication

Source_Scale_Denominator: 24000 to 62500

Type_of_Source_Media: excel spreadsheet

Source_Citation_Abbreviation: HWI, Lake Ontario

Source_Contribution:

An excel spreadsheet of describing wetlands and their attributes for all wetlands located in Lake Ontario as described in Charles. E. Herdendorf's USFWS 1981 reports.

Source_Information:

Source_Citation:

Citation_Information:

Originator:

Mary F. Moffett, USEPA, Mid-continent Ecology Division, Duluth, MN 55804

Originator: Thomas P. Simon, USFWS, Bloomington, IN 47401

Publication_Date: Unpublished Material

Publication_Time: NA

Title: Lake_HUR_QAdone_toSimonsonAug03

Geospatial_Data_Presentation_Form: spreadsheet

Other_Citation_Details: personal communication

Source_Scale_Denominator: 24000 to 62500

Type_of_Source_Media: excel spreadsheet

Source_Citation_Abbreviation: HWI, Lake Huron

Source_Contribution:

An excel spreadsheet of describing wetlands and their attributes for all wetlands located in Lake Huron as described in Charles. E. Herdendorf's USFWS 1981 reports.

Source_Information:

Source_Citation:

Citation_Information:

Originator:

Mary F. Moffett, USEPA, Mid-continent Ecology Division, Duluth, MN 55804

Originator: Thomas P. Simon, USFWS, Bloomington, IN 47401

Publication_Date: Unpublished Material

Publication_Time: NA

Title: Lake_SUPERIOR_QApartlydone_toSimonsonAug03

Geospatial_Data_Presentation_Form: spreadsheet

Other_Citation_Details: personal communication

Source_Scale_Denominator: 24000 to 62500

Type_of_Source_Media: excel spreadsheet

Source_Citation_Abbreviation: HWI, Lake Superior

Source_Contribution:

An excel spreadsheet of describing wetlands and their attributes for all wetlands located in Lake Superior as described in Charles. E. Herdendorf's USFWS 1981 reports.

Source_Information:

Source_Citation:

Citation_Information:

Originator: Simon, T.P., R.L. Dufour, P.M. Stewart, and M.F. Moffett

Publication_Date: 2004

Publication_Time: Unknown

Title: Lake_MICH_QAdone_toSimonsonMar04

Geospatial_Data_Presentation_Form: spreadsheet

Source_Scale_Denominator: 24000 to 62500

Type_of_Source_Media: excel spreadsheet

Source_Citation_Abbreviation: HWI, Lake Michigan

Source_Contribution:

An excel spreadsheet of describing wetlands and their attributes for all wetlands located in Lake Superior as described in Charles. E. Herdendorf's USFWS 1981 reports.

Source_Information:

Source_Citation:

Citation_Information:

Originator: Great Lakes Commission

Publication_Date: 05092003

Title: Indiana & Illinois Coastal Counties

Edition: Version 1

Geospatial_Data_Presentation_Form: atlas

Series_Information:

Series_Name: Great Lakes Coastal Wetlands Consortium

Issue_Identification: Mapping Area

Publication_Information:

Publication_Place: Ann Arbor, MI

Publisher: Great Lakes Commission

Source_Scale_Denominator:

NWI photography date; varies for each 7.5 min quad. see quad-specific metadata

Type_of_Source_Media: Electronic GIS shapefile

Source_Time_Period_of_Content:

Source_Currentness_Reference: source photography dates

Source_Citation_Abbreviation: NWI, IN-IL

Source_Contribution: Boundaries, locational and type information

Source_Information:

Source_Citation:

Citation_Information:

Originator: Great Lakes Commission

Publication_Date: 20030509

Publication_Time: Unknown

Title: Michigan Coastal Counties, Great Lakes Wetlands Inventory

Edition: Version 1

Geospatial_Data_Presentation_Form: atlas

Series_Information:

Series_Name: Great Lakes Coastal Wetlands Consortium

Issue_Identification: Mapping Area

Publication_Information:

Publication_Place: Ann Arbor, Michigan

Publisher: Great Lakes Commission

Source_Scale_Denominator:

NWI photography date; varies for each 7.5 min quad. see quad-specific metadata

Type_of_Source_Media: Electronic GIS shapefile

Source_Citation_Abbreviation: NWI, Michigan

Source_Contribution: Boundaries, locational and type information
Source_Information:
Source_Citation:
Citation_Information:
Originator: Great Lakes Commission
Publication_Date: 20030509
Title: New York Coastal Counties, Great Lakes Wetlands Inventory
Edition: Version 1
Geospatial_Data_Presentation_Form: atlas
Series_Information:
Series_Name: Great Lakes Coastal Wetlands Consortium
Issue_Identification: Mapping Area
Publication_Information:
Publication_Place: Ann Arbor, MI
Publisher: Great Lakes Commission
Source_Scale_Denominator:
 NWI photography date; varies for each 7.5 min quad. see quad-specific metadata
Type_of_Source_Media: Electronic GIS shapefile
Source_Citation_Abbreviation: NWI, New York
Source_Contribution: Boundaries, locational and type information
Source_Information:
Source_Citation:
Citation_Information:
Originator: Great Lakes Commission
Publication_Date: 20030509
Publication_Time: unkown
Title: Pennsylvania Coastal Counties, Great Lakes Wetlands Inventory
Edition: version 1
Geospatial_Data_Presentation_Form: atlas
Series_Information:
Series_Name: Great Lakes Coastal Wetlands Consortium
Issue_Identification: Mapping Area
Publication_Information:
Publication_Place: Ann Arbor, MI
Publisher: Great Lakes Commission
Source_Scale_Denominator:
 NWI photography date; varies for each 7.5 min quad. see quad-specific metadata
Type_of_Source_Media: Electronic shapefile
Source_Citation_Abbreviation: NWI, Pennsylvania
Source_Contribution: Boundaries, locational and type information
Source_Information:
Source_Citation:
Citation_Information:
Originator: Great Lakes Commission
Publication_Date: 20030509
Publication_Time: Unknown
Title: Minnesota Coastal Counties, Great Lakes Wetlands Inventory
Edition: Version 1
Geospatial_Data_Presentation_Form: atlas
Series_Information:
Series_Name: Great Lakes Coastal Wetlands Consortium

Issue_Identification: Mapping Area
Publication_Information:
Publication_Place: Ann Arbor, MI
Publisher: Great Lakes Commission
Source_Scale_Denominator:
 NWI photography date; varies for each 7.5 min quad. see quad-specific metadata
Type_of_Source_Media: Electronic shapefile
Source_Citation_Abbreviation: NWI, Minnesota
Source_Contribution: Boundaries, locational and type information
Source_Information:
Source_Citation:
Citation_Information:
Originator: Great Lakes Commission
Publication_Date: 20030509
Publication_Time: Unknown
Title: Wisconsin Coastal Counties, Great Lakes Wetlands Inventory
Edition: version 1
Geospatial_Data_Presentation_Form: atlas
Series_Information:
Series_Name: Great Lakes Coastal Wetlands Consortium
Issue_Identification: Mapping Area
Publication_Information:
Publication_Place: Ann Arbor, MI
Publisher: Great Lakes Commission
Source_Scale_Denominator: Wisconsin Wetland Inventory source photography date
Type_of_Source_Media: Electronic shapefile
Source_Time_Period_of_Content:
Source_Currentness_Reference: publication date
Source_Citation_Abbreviation: WWI
Source_Contribution: Boundaries, locational and type information
Source_Information:
Source_Citation:
Citation_Information:
Originator: Bruce R. Motsch and Gary M. Schaal , ODNR
Publication_Date: 1/1/1991
Title: Ohio Wetlands Inventory - Ashtabula County
Edition: unknown
Geospatial_Data_Presentation_Form: vector digital data
Online_Linkage: <<http://www.dnr.state.oh.us/geodata/Ashtabula/abowi.exe>>
Source_Scale_Denominator:
 produced from May 1987 Landsat Thematic mapper data (cell size 30 meters by 30 meters)
Type_of_Source_Media: Export file
Source_Citation_Abbreviation: abowi
Source_Contribution: Indicator of wetland sites and type information
Source_Information:
Source_Citation:
Citation_Information:
Originator: Bruce R. Motsch and Gary M. Schaal, ODNR
Publication_Date: 1/1/1991
Publication_Time: unknown
Title: Ohio Wetland Inventory - Cuyahoga County

Edition: unknown
Geospatial_Data_Presentation_Form: vector digital data
Online_Linkage: <<http://www.dnr.state.oh.us/geodata/Cuyahoga/cuowi.exe>>
Source_Scale_Denominator:
produced from May 1987 Landsat Thematic mapper data (cell size 30 meters by 30 meters)
Type_of_Source_Media: Export file
Source_Citation_Abbreviation: cuowi
Source_Contribution: Indicator of wetland sites and type information
Source_Information:
Source_Citation:
Citation_Information:
Originator: Bruce R. Motsch and Gary M. Schaal, ODNR
Publication_Date: 1/1/1991
Publication_Time: Unknown
Title: Ohio Wetland Inventory - Erie County
Edition: unknown
Geospatial_Data_Presentation_Form: vector digital data
Online_Linkage: <<http://www.dnr.state.oh.us/geodata/Erie/erowi.exe>>
Source_Scale_Denominator:
produced from May 1987 Landsat Thematic mapper data (cell size 30 meters by 30 meters)
Type_of_Source_Media: Export file
Source_Citation_Abbreviation: erowi
Source_Contribution: Indicator of wetland sites and type information
Source_Information:
Source_Citation:
Citation_Information:
Originator: Bruce R. Motsch and Gary M. Schaal, ODNR
Publication_Date: 1/1/1991
Publication_Time: Unknown
Title: Ohio Wetland Inventory - Lake County
Edition: unknown
Geospatial_Data_Presentation_Form: vector digital data
Online_Linkage: <<http://www.dnr.state.oh.us/geodata/Lake/lkowi.exe>>
Source_Scale_Denominator:
produced from May 1987 Landsat Thematic mapper data (cell size 30 meters by 30 meters)
Type_of_Source_Media: Export file
Source_Citation_Abbreviation: lkowi
Source_Contribution: Indicator of wetland sites and type information
Source_Information:
Source_Citation:
Citation_Information:
Originator: Bruce R. Motsch and Gary M. Schaal, ODNR
Publication_Date: 1/1/1991
Publication_Time: Unknown
Title: Ohio Wetland Inventory - Lorain County
Edition: Unknown
Geospatial_Data_Presentation_Form: vector digital data
Online_Linkage: <<http://www.dnr.state.oh.us/geodata/Lorain/lrowi.exe>>
Source_Scale_Denominator:
produced from May 1987 Landsat Thematic mapper data (cell size 30 meters by 30 meters)
Type_of_Source_Media: Export file

Source_Citation_Abbreviation: lrowi
Source_Contribution: Indicator of wetland sites and type information
Source_Information:
Source_Citation:
Citation_Information:
Originator: Bruce R. Motsch and Gary M. Schaal, ODNR
Publication_Date: 1/1/1991
Publication_Time: Unknown
Title: Ohio Wetland Inventory - Sandusky County
Edition: Unknown
Geospatial_Data_Presentation_Form: vector digital data
Online_Linkage: <<http://www.dnr.state.oh.us/geodata/Sandusky/saowi.exe>>
Source_Scale_Denominator:
produced from May 1987 Landsat Thematic mapper data (cell size 30 meters by 30 meters)
Type_of_Source_Media: Export file
Source_Citation_Abbreviation: saowi
Source_Contribution: Indicator of wetland sites and type information
Source_Information:
Source_Citation:
Citation_Information:
Originator: Bruce R. Motsch and Gary M. Schaal, ODNR
Publication_Date: 1/1/1991
Publication_Time: Unknown
Title: Ohio Wetlands Inventory - Lucas County
Edition: Unknown
Geospatial_Data_Presentation_Form: vector digital data
Online_Linkage: <<http://www.dnr.state.oh.us/geodata/Lucas/luowi.exe>>
Source_Scale_Denominator:
produced from May 1987 Landsat Thematic mapper data (cell size 30 meters by 30 meters)
Type_of_Source_Media: Export file
Source_Citation_Abbreviation: luowi
Source_Contribution: Indicator of wetland sites and type information
Source_Information:
Source_Citation:
Citation_Information:
Originator: Bruce R. Motsch and Gary M. Schaal, ODNR
Publication_Date: 1/1/1991
Publication_Time: Unknown
Title: Ohio Wetlands Inventory - Ottawa County
Edition: Unknown
Geospatial_Data_Presentation_Form: vector digital data
Online_Linkage: <<http://www.dnr.state.oh.us/geodata/Ottawa/otowi.exe>>
Source_Scale_Denominator:
produced from May 1987 Landsat Thematic mapper data (cell size 30 meters by 30 meters)
Type_of_Source_Media: Export file
Source_Citation_Abbreviation: otowi
Source_Contribution: Indicator of wetland sites and type information
Source_Information:
Source_Citation:
Citation_Information:
Originator:

Douglas A. Wilcox and Martha L. Carlson, USGS Great Lakes Science Center

Publication_Date: 1/2003

Publication_Time: Unknown

Title: Lake Ontario Wetland Inventory

Geospatial_Data_Presentation_Form: vector digital data

Source_Scale_Denominator:

Source aerial photography date and NWI coverage publication date

Type_of_Source_Media: Electronic shapefile

Source_Citation_Abbreviation: LOWI

Source_Contribution: Boundaries, locational and type information

Source_Information:

Source_Citation:

Citation_Information:

Originator: Rebecca Bohem

Publication_Date: 20031008

Publication_Time: Unknown

Title: Biotics Database

Edition: NA

Geospatial_Data_Presentation_Form: vector digital data

Publication_Information:

Publication_Place: Lansing, MI

Publisher: Michigan Natural Features Inventory

Source_Scale_Denominator: source Elements Occurance Data Standards

Type_of_Source_Media: Electronic shapefile

Source_Citation_Abbreviation: MNFI Wetland Communities

Source_Contribution: Boundaries, locational and type information

Source_Information:

Source_Citation:

Citation_Information:

Originator: C. E., S. M. Hartley, and M. D. Barnes (Eds)

Publication_Date: 1981

Publication_Time: Unknown

Title:

Fish and wildlife resources of the Great Lakes coastal wetlands within the United States, Vol. 1:

Overview

Geospatial_Data_Presentation_Form: document

Publication_Information:

Publisher: U.S. Fish and Wildlife Service

Other_Citation_Details: FWS/OBS-81/02-v1

Online_Linkage: <<http://nsgd.gso.uri.edu/diglib.html>>

Source_Scale_Denominator: 24000 to 62500

Type_of_Source_Media: document

Source_Contribution:

Text information describing coastal wetlands in the Great Lakes Basin

Source_Information:

Source_Citation:

Citation_Information:

Originator: Herdendorf, C. E., S. M. Hartley, and M. D. Barnes (Eds).

Publication_Date: 1981

Publication_Time: Unknown

Title:

Fish and wildlife resources of the Great Lakes coastal wetlands within the United States, Vol. 2: Lake Ontario

Geospatial_Data_Presentation_Form: document

Publication_Information:

Publisher: U.S. Fish and Wildlife Service

Other_Citation_Details: FWS/OBS-81/02-v2

Online_Linkage: <<http://nsgd.gso.uri.edu/diglib.html>>

Source_Scale_Denominator: 24000 to 62500

Type_of_Source_Media: document

Source_Contribution:

Text information describing coastal wetlands in the Great Lakes Basin

Source_Information:

Source_Citation:

Citation_Information:

Originator: Herdendorf, C. E., S. M. Hartley, and M. D. Barnes (Eds).

Publication_Date: 1981

Publication_Time: Unknown

Title:

Fish and wildlife resources of the Great Lakes coastal wetlands within the United States, Vol.3: Lake Erie

Geospatial_Data_Presentation_Form: document

Publication_Information:

Publisher: U.S. Fish and Wildlife Service

Other_Citation_Details: FWS/OBS-81/02-v3

Online_Linkage: <<http://nsgd.gso.uri.edu/diglib.html>>

Source_Scale_Denominator: 24000 to 62500

Type_of_Source_Media: document

Source_Contribution:

Text information describing coastal wetlands in the Great Lakes Basin

Source_Information:

Source_Citation:

Citation_Information:

Originator: Herdendorf, C. E., S. M. Hartley, and M. D. Barnes (Eds)

Publication_Date: 1981

Publication_Time: Unknown

Title:

Fish and wildlife resources of the Great Lakes coastal wetlands within the United States, Vol. 4: Lake Huron

Geospatial_Data_Presentation_Form: document

Publication_Information:

Publisher: U.S. Fish and Wildlife Service

Online_Linkage: <<http://nsgd.gso.uri.edu/diglib.html>>

Source_Scale_Denominator: 24000 to 62500

Type_of_Source_Media: document

Source_Contribution:

Text information describing coastal wetlands in the Great Lakes Basin

Source_Information:

Source_Citation:

Citation_Information:

Originator: Herdendorf, C. E., S. M. Hartley, and M. D. Barnes (Eds).

Publication_Date: 1981

Title:

Fish and wildlife resources of the Great Lakes coastal wetlands within the United States, Vol. 5: Lake Michigan

Geospatial_Data_Presentation_Form: document

Publication_Information:

Publisher: U.S. Fish and Wildlife Service

Other_Citation_Details: FWS/OBS-81/02-v5

Online_Linkage: <<http://nsgd.gso.uri.edu/diglib.html>>

Source_Scale_Denominator: 24000 to 62500

Type_of_Source_Media: document

Source_Contribution:

Text information describing coastal wetlands in the Great Lakes Basin

Source_Information:

Source_Citation:

Citation_Information:

Originator: Herdendorf, C. E., S. M. Hartley, and M. D. Barnes (Eds)

Publication_Date: 1981

Publication_Time: Unknown

Title:

Fish and wildlife resources of the Great Lakes coastal wetlands within the United States, Vol.6: Lake Superior

Geospatial_Data_Presentation_Form: document

Publication_Information:

Publisher: U.S. Fish and Wildlife Service

Other_Citation_Details: FWS/OBS-81/02-v6.

Online_Linkage: <<http://nsgd.gso.uri.edu/diglib.html>>

Source_Scale_Denominator: 24000 to 62500

Type_of_Source_Media: document

Source_Contribution:

Text information describing coastal wetlands in the Great Lakes Basin

Source_Information:

Source_Citation:

Citation_Information:

Originator: Illinois State Geological Survey

Title:

Illinois Natural Resources Geospatial Data Clearinghouse Digital Raster Graphic (DRG) Files for Illinois

Geospatial_Data_Presentation_Form: raster digital data

Other_Citation_Details: accessed April 22, 2004

Online_Linkage: <<http://www.isgs.uiuc.edu/nsdihome/webdocs/drgs/>>

Source_Scale_Denominator: 24000

Type_of_Source_Media: Electronic Raster Data

Source_Citation_Abbreviation: DRG

Source_Contribution:

Digital topographic map providing locational information as well as land features

Source_Information:

Source_Citation:

Citation_Information:

Originator:

Indiana Spatial Data Portal, Massive Data Storage and Retrieval of Indiana GIS Data

Title: Topographic Maps USGS Digital Raster Graphic Enhanced (DRGe)

Geospatial_Data_Presentation_Form: raster digital data
Other_Citation_Details: accessed April 22,2004
Online_Linkage: <http://www.indiana.edu/~gisdata/topo_maps.htm>
Source_Scale_Denominator: 24000
Type_of_Source_Media: Electronic Raster Data
Source_Citation_Abbreviation: DRG
Source_Contribution:
Digital topographic map providing locational information as well as land features
Source_Information:
Source_Citation:
Citation_Information:
Originator:
Michigan.Gov Center for Geographpic Information Department of Information Technology
Title:
Michigan Geographic Data Library Digital Raster Graphic (DRG) Geographic Theme
Geospatial_Data_Presentation_Form: raster digital data
Other_Citation_Details: : accessed April 22,2004
Online_Linkage:
<<http://www.mcgi.state.mi.us/mgdl/?rel=thext&action=thmname&cid=13&cat=Digital+Raster+Graphic+%28DRG%29>>
Source_Scale_Denominator: 24000
Type_of_Source_Media: Electronic Raster Data
Source_Citation_Abbreviation: DRG
Source_Contribution:
Digital topographic map providing locational information as well as land features
Source_Information:
Source_Citation:
Citation_Information:
Originator: Minnesota Department of Natural Resources
Title: Data Deli
Geospatial_Data_Presentation_Form: raster digital data
Other_Citation_Details: accessed April 22,2004
Online_Linkage: <<http://deli.dnr.state.mn.us/index.html>>
Source_Scale_Denominator: 24000
Type_of_Source_Media: Electronic Raster Data
Source_Citation_Abbreviation: DRG
Source_Contribution:
Digital topographic map providing locational information as well as land features
Source_Information:
Source_Citation:
Citation_Information:
Originator: New York State GIS Clearinghouse
Title: 1:24,000 Digital Raster Quadrangles
Geospatial_Data_Presentation_Form: raster digital data
Other_Citation_Details: accessed April 22, 2004
Online_Linkage: <<http://www.nysgis.state.ny.us/quads/usgsdrg.htm>>
Source_Scale_Denominator: 24000
Type_of_Source_Media: Electronic Raster Data
Source_Citation_Abbreviation: DRG
Source_Contribution:
Digital topographic map providing locational information as well as land features

Source_Information:

Source_Citation:

Citation_Information:

Originator: OhioDAS Geographic Information Systems Support Center

Title: Digital Raster Graphics

Geospatial_Data_Presentation_Form: raster digital data

Other_Citation_Details: accessed April 22, 2004

Online_Linkage: ftp.geodata.gis.state.oh.us/geodata/drg/

Source_Scale_Denominator: 24000

Type_of_Source_Media: Electronic Raster Data

Source_Citation_Abbreviation: DRG

Source_Contribution:

Digital topographic map providing locational information as well as land features

Source_Information:

Source_Citation:

Citation_Information:

Originator: Pennsylvania Spatial Data Access, PASA

Title: USGS Digital Raster Graphics-24K

Geospatial_Data_Presentation_Form: raster digital data

Other_Citation_Details: accessed April 24, 2004

Online_Linkage: <<http://www.pasda.psu.edu/access/drg24klist.cgi>>

Source_Scale_Denominator: 24000

Type_of_Source_Media: Electronic Raster Data

Source_Citation_Abbreviation: DRG

Source_Contribution:

Digital topographic map providing locational information as well as land features

Source_Information:

Source_Citation:

Citation_Information:

Originator: Wisconsin Department of Natural Resources

Title: Digital Raster Graphics (DRGs) a.k.a Topographic Maps

Geospatial_Data_Presentation_Form: raster digital data

Other_Citation_Details: accessed April 22,2004

Online_Linkage: <<http://www.dnr.state.wi.us/maps/gis/datadrg.html#data>>

Source_Scale_Denominator: 24000

Type_of_Source_Media: Electronic Raster Data

Source_Citation_Abbreviation: DRG

Source_Contribution:

Digital topographic map providing locational information as well as land features

Source_Information:

Source_Citation:

Citation_Information:

Originator: Albert, D.A., J. Ingram, T. Thompson, and D. Wilcox

Publication_Date: 2003

Publication_Time: July

Title: Great Lakes Coastal Wetlands Classification

Edition: First Revision

Geospatial_Data_Presentation_Form: document

Other_Citation_Details:

was created on behalf of the Great Lakes Coastal Wetland Consortium (GLCWC). Great Lakes Coastal Wetlands Classification. (Revision Schema (July 2003; original November 2001).

Online_Linkage: <http://projects.glc.org/wetlands/inventory_classification.html>

Type_of_Source_Media: document

Source_Citation_Abbreviation: NA

Source_Contribution: Hydro-geomorphic classification key for coastal wetlands

Source_Information:

Source_Citation:

Citation_Information:

Originator:

Albert, D. A., G. A. Reese, M. R. Penskar, L. A. Wilsmann, and S. J. Ouwinga

Publication_Date: 1989

Publication_Time: Unknown

Title:

A Survey of Great Lakes Marshes in the Northern Half of Michigan's Lower Peninsula and Throughout Michigan's Upper Peninsula

Geospatial_Data_Presentation_Form: document

Other_Citation_Details:

Report to the Michigan Department of Natural Resources, Land and Water Management Division. Michigan Natural Features Inventory report number 1989-01 124pp.

Type_of_Source_Media: document

Source_Citation_Abbreviation: NA

Source_Contribution: Text information describing marsh wetlands in Michigan

Source_Information:

Source_Citation:

Citation_Information:

Originator:

Albert, D. A., G. A. Reese, S. R. Crispin, M. R. Penskar, L. A. Wilsmann, and S. J. Ouwinga

Publication_Date: 1988

Publication_Time: Unknown

Title:

A Survey of Great Lakes Marshes in the Southern Half of Michigan's Lower Peninsula

Geospatial_Data_Presentation_Form: document

Other_Citation_Details:

Report to the Michigan Department of Natural Resources, Land and Water Management Division. Michigan Natural Features Inventory report number 1988-07. 116pp.

Type_of_Source_Media: document

Source_Citation_Abbreviation: NA

Source_Contribution: Text information describing marsh wetlands in Michigan

Source_Information:

Source_Citation:

Citation_Information:

Originator:

Albert, D. A., S. R. Crispin, G. A. Reese, L. A. Wilsmann, and S. J. Ouwinga

Publication_Date: 1987

Publication_Time: Unknown

Title: A Survey of Great Lakes Marshes in Michigan's Upper Peninsula

Geospatial_Data_Presentation_Form: document

Other_Citation_Details:

Report to the Michigan Department of Natural Resources, Land and Water Management Division. Michigan Natural Features Inventory report number 1987-02. 73pp

Type_of_Source_Media: document

Source_Citation_Abbreviation: NA

Source_Contribution: Text information describing marsh wetlands in Michigan

Source_Information:

Source_Citation:

Citation_Information:

Originator: Minc, Leah D

Publication_Date: 1997

Publication_Time: Unknown

Title:

Great Lakes Coastal Wetlands: An Overview of Controlling Abiotic Factors, Regional Distribution, and Species Composition. A report to Michigan Natural Features Inventory

Geospatial_Data_Presentation_Form: document

Other_Citation_Details:

A report to Michigan Natural Features Inventory. Michigan Natural Features Inventory report number 1997-01. 307pp.

Type_of_Source_Media: document

Source_Citation_Abbreviation: NA

Source_Contribution: Text information describing Great Lakes Coastal Wetlands

Source_Information:

Source_Citation:

Citation_Information:

Originator:

Owens, T. and K. D. Hop. National Biological Service, Environmental Management Technical Center, Onalaska, Wisconsin,

Publication_Date: August 1995

Title:

Long Term Resource Monitoring Program standard operating procedures: Field station photo interpretation.

Geospatial_Data_Presentation_Form: document

Other_Citation_Details: LTRMP 95-P008-2. 13 pp. + Appendixes A-E.

Type_of_Source_Media: Published Paper

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: Aug 1995

Source_Currentness_Reference: publication date

Source_Citation_Abbreviation: Photo Interpretation

Source_Contribution:

Provided the guidelines to air photo interpretation, the standard used in this project.

Source_Information:

Source_Citation:

Citation_Information:

Originator: OMNR

Publication_Date: Ranges between 1994 to 2002

Publication_Time: Summer months

Title: Colour Infrared Aerial Photographs

Geospatial_Data_Presentation_Form: remote-sensing image

Other_Citation_Details:

All colour infrared aerial photography used in this project was obtained from the OMNR. The photos were taken in the summer months between the years of 1994 and 2002. These photos were available for all of the Great Lake's southern basin, extending to the southern half of Lake Huron (to the district border of Parry Sound, Ontario).

Source_Scale_Denominator: 10 000

Type_of_Source_Media: Colour Infrared Aerial Photographs

Source_Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 1994

Ending_Date: 2002

Source_Currentness_Reference: ground condition

Source_Citation_Abbreviation: Aerial Photos1

Source_Contribution:

Colour infrared aerial photography was used, where available, to confirm and/or create wetland boundary extents and to classify the hydrogeomorphology of each coastal wetland of the Great Lakes. Boundary and hydromorphic classification was completed by an expert using air photo interpretation standard techniques.

Source_Information:

Source_Citation:

Citation_Information:

Originator: National Air Photo Library, Ottawa, Canada

Publication_Date: Ranges between 1986 and 1994

Publication_Time: summer months

Title: Black and White Aerial Photography

Geospatial_Data_Presentation_Form: remote-sensing image

Other_Citation_Details:

Back and white FRI aerial contact prints were taken between 1986 and 1994 at a scale of 1:20 000

Source_Scale_Denominator: 20000

Type_of_Source_Media: Forest Resource Inventory (FRI) Aerial Photos

Source_Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 1986

Ending_Date: 1994

Source_Currentness_Reference: ground condition

Source_Citation_Abbreviation: Aerial Photos2

Source_Contribution:

Black and white FRI aerial photography was used to confirm and/or create wetland boundary extents and to classify the hydrogeomorphic type of each coastal wetland of the upper Great Lakes, where colour infrared aerial photography was not available. The photography was interpreted by an expert to determine a wetland boundary and wetland hydromorphic classification.

Source_Information:

Source_Citation:

Citation_Information:

Originator: Environment Canada and Ontario Ministry of Natural Resources

Publication_Date: March 2003

Title:

The Ontario Great Lakes Coastal Wetland Atlas: A Summary of Information (1983 - 1997)

Edition: 1st

Geospatial_Data_Presentation_Form: document

Other_Citation_Details:

Also contains supplementary MS Excel spreadsheet containing wetland attribute data and centroid point position.

Type_of_Source_Media: Published Document / Electronic Spreadsheet

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: March 2003

Source_Currentness_Reference: publication date

Source_Citation_Abbreviation: Coastal Wetland Atlas

Source_Contribution:

A summary of information for known Ontario Great Lake's coastal wetlands. This publication includes wetland centroid XY positions and identifies data gaps in all existing data sources. It provides a thorough background assessment to build the digital Coastal Wetland Inventory.

Source_Information:

Source_Citation:

Citation_Information:

Originator: Ministry of Natural Resources

Publication_Date: April 2003

Title: Evaluated Wetlands (Wetland Unit)

Geospatial_Data_Presentation_Form: vector digital data

Other_Citation_Details:

Evaluated Wetlands (boundaries and attributes) are designated through the Ontario Wetland Evaluation System (3rd ed. OMNR March 1993.). Data represents a time frame from October 1997 to December 1999 and coverage was obtained in three sections: northwest,northeast and south central Ontario. More information can be found in the report: "NRVIS, Technical Reference Guide for End Users", OMNR. April 2000.

Online_Linkage:

http://www.lio.mnr.gov.on.ca/lioweb/land_info/warehouse-overview.asp

Source_Scale_Denominator: 10000

Type_of_Source_Media: e00 file, digital data

Source_Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: October 7 1997

Ending_Date: December 14 1999

Source_Currentness_Reference: publication date

Source_Citation_Abbreviation: Evaluated Wetlands

Source_Contribution:

The OMNR Evaluated Wetland Polygon Data was the foundation data for this dataset. Coastal wetland coverage was extensive for the lower Great Lakes and variable for the upper Great Lakes. The most current version of this dataset was utilized in this project (June 2003)

Source_Information:

Source_Citation:

Citation_Information:

Originator: Ministry of Natural Resources

Publication_Date: November 1996

Title: Waterpolys (OBM Drainage)

Geospatial_Data_Presentation_Form: vector digital data

Other_Citation_Details:

This polygon coverage was digitized from the Ontario Base Mapping (OBM) program, as part of the 1:10 000 OBM drainage. The data was obtained in OMNR district specific coverages. It recognizes potential wetland and open water areas of drainage, and has detailed digitization of islands and shoreline. More information can be found in the report: "NRVIS, Technical Reference Guide for End Users", OMNR. April 2000.

Online_Linkage:

<http://www.lio.mnr.gov.on.ca/spectrasites/internet/lio/media/documents/ODGDV3.pdf>

Source_Scale_Denominator: 10000

Type_of_Source_Media: e00, digital polygon data

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 1995

Source_Currentness_Reference: publication date

Source_Citation_Abbreviation: Waterpolys

Source_Contribution:

A secondary dataset. It assisted in the identification of potential wetland locations and their boundaries.

Source_Information:

Source_Citation:

Citation_Information:

Originator: Ministry of Natural Resources

Publication_Date: October 2000

Title: Spot Height

Geospatial_Data_Presentation_Form: vector digital data

Other_Citation_Details:

Land topography heights (z-values) digitized from 1:10 000 OBM map tiles. Obtained in OMNR district specific coverages More information can be found in the report: "NRVIS, Technical Reference Guide for End Users", OMNR. April 2000.

Source_Scale_Denominator: 10000

Type_of_Source_Media: e00, digital point data

Source_Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: January 1977

Ending_Date: January 1996

Source_Currentness_Reference: publication date

Source_Citation_Abbreviation: Spot Heights

Source_Contribution:

Spot height data was used to generate 1m contours. Both the contour lines and original spot height data were used as a general frame of reference for the high water boundary of each Great Lake basin. The historic high water levels, along with the hydrology of the system was used to separate coastal wetlands from non-coastal wetlands.

Source_Information:

Source_Citation:

Citation_Information:

Originator: Ministry of Natural Resources

Publication_Date: October 2000

Title: Road Segment

Geospatial_Data_Presentation_Form: vector digital data

Other_Citation_Details:

Digitized from the OBM mapping program and updated in localized areas with the FRI mapping program. Obtained in OMNR District specific coverages. It represents linear transport features and recognizes primary, secondary and tertiary roads. More information can be found in the report: "NRVIS, Technical Reference Guide for End Users", OMNR. April 2000. More information can be found in the report: "NRVIS, Technical Reference Guide for End Users", OMNR. April 2000.

Source_Scale_Denominator: 10000

Type_of_Source_Media: e00,digital line data

Source_Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: January 1977

Ending_Date: January 1996

Source_Currentness_Reference: publication date

Source_Citation_Abbreviation: Road Segment

Source_Contribution:

The permanent roads of this NRVIS layer was used as supplementary data in georeferencing of digital air photos.

Source_Information:

Source_Citation:

Citation_Information:

Originator: Ministry of Natural Resources

Publication_Date: October 2000

Title: Railway (OBM Transport Lines)

Geospatial_Data_Presentation_Form: vector digital data

Other_Citation_Details:

Data digitized as part of the OBM Base Mapping Program. Obtained as a seamless provincial coverage. More information can be found in the report: "NRVIS, Technical Reference Guide for End Users", OMNR. April 2000.

Source_Scale_Denominator: 10000

Type_of_Source_Media: e00, digital line data

Source_Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: January 1977

Ending_Date: January 1996

Source_Currentness_Reference: publication date

Source_Citation_Abbreviation: Railway

Source_Contribution: Supplementary data for georeferencing digital air photos.

Source_Information:

Source_Citation:

Citation_Information:

Publication_Date: October 2000

Title: Utility Line

Geospatial_Data_Presentation_Form: vector digital data

Other_Citation_Details:

Linear utility features digitized as part of the OBM Base Mapping Program. Obtained from OMNR as a seamless provincial coverage. More information can be found in the report: "NRVIS, Technical Reference Guide for End Users", OMNR. April 2000.

Source_Scale_Denominator: 10000

Type_of_Source_Media: e00, digital line data

Source_Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: January 1977

Ending_Date: January 1996

Source_Currentness_Reference: publication date

Source_Citation_Abbreviation: Utility Line

Source_Contribution: Supplementary data for georeferencing digital air photos.

Source_Information:

Source_Citation:

Citation_Information:

Originator: The Canadian Hydrographic Service, Central and Arctic Region

Publication_Date: December 2003

Title: Great Lakes Historic Water Levels

Geospatial_Data_Presentation_Form: tabular digital data

Other_Citation_Details:

Lake monthly mean water levels from 1918 to 2000. Data measured in meters and vertical datum referenced to IGLD 1985. Obtained online from the Canadian Hydrological Service, Central and Arctic Region.

Online_Linkage: <http://biachss.bur.dfo.ca/danp/historical_e.html>

Type_of_Source_Media: online, tabular data

Source_Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: January 1918

Ending_Date: December 2003

Source_Currentness_Reference: publication date

Source_Citation_Abbreviation: Great Lakes Historic Water Levels

Source_Contribution:

Provided the reference high water level for each Great Lake's basin. A benchmark to separate coastal from non-coastal wetlands

Source_Information:

Source_Citation:

Citation_Information:

Originator: OMNR

Publication_Date: 1998/08/12

Title: Indian Remote Satellite Imagery 1

Geospatial_Data_Presentation_Form: remote-sensing image

Other_Citation_Details:

Images obtained as orthorectified 5-meter panchromatic in .tif and .twf format. Images were not contrast stretched.

Source_Scale_Denominator: 5-meter resolution

Type_of_Source_Media: Digital panchromatic image in .tif format

Source_Citation_Abbreviation: IRS_1

Source_Contribution:

Supplementary imagery for the large wetlands of St. Clair Marsh including the St. Clair River delta and Long Point Wetland. To assist in digitization and/or hydrogeomorphic classification of these wetlands.

Source_Information:

Source_Citation:

Citation_Information:

Originator: OMNR

Originator: Space Imaging LLC

Publication_Date: 1996/08/29

Title: Indian Remote Satellite Imagery 2

Geospatial_Data_Presentation_Form: remote-sensing image

Other_Citation_Details:

Image obtained as orthorectified 5-meter panchromatic in .tif and .twf format. Images were not contrast stretched.

Source_Scale_Denominator: 5-meter resolution

Type_of_Source_Media: Digital panchromatic image in .tif format

Source_Citation_Abbreviation: IRS_2

Source_Contribution:

Supplementary imagery for the large wetlands of St. Mary's River. To assist in digitization and/or hydrogeomorphic classification of these wetlands.

Source_Information:

Source_Citation:

Citation_Information:

Originator:

Adaptation and Impacts Research Group, Meteorological Service of Canada, Environment Canada

Originator: Canadian Wildlife Service

Title: Long Point

Geospatial_Data_Presentation_Form: vector digital data

Other_Citation_Details:

Polygon coverage obtained in UTM,zone 17, NAD 83 format. Copyright, Her Majesty the Queen in Right of Canada, Department of the Environment

Source_Scale_Denominator: 1:10 000

Type_of_Source_Media: ArcInfo Coverage

Source_Citation_Abbreviation: Long_Point

Source_Contribution:

Provided the digital boundary for Long Point Wetland on Lake Erie.

Source_Information:

Source_Citation:

Citation_Information:

Originator: Ontario Ministry of Natural Resources

Publication_Date: April, 2000

Title:

NRVIS, Technical Reference Guide for End-Users, Ontario Digital Geographic Database(ODGD) Natural Resources Values and Information (NRVIS) Guide

Geospatial_Data_Presentation_Form: document

Online_Linkage: <<http://www.lio.mnr.gov.on.ca/ogdedescription.cfm>>

Online_Linkage:

<<http://www.lio.mnr.gov.on.ca/spectrasites/internet/lio/media/documents/ODGDV3.pdf>>

Online_Linkage:

<http://www.lio.mnr.gov.on.ca/lioweb/land_info/warehouse-overview.asp>

Type_of_Source_Media: document, on-line publication

Source_Citation_Abbreviation: NRVIS Guide to End Users

Source_Contribution: Metadata reference for all OMNR base data used in this project.

Process_Step:

Process_Description:

The US Dataset development will be described first:

Data collection a preparation: Arc View 3.3 projects were set up containing all of the existing digital datasets described in the citation section of this metadata. Datasets were classified on the basis of land-use, to assist in locating, delineating, and classifying coastal wetlands. The working projection for most lakes was Albers Equal Area. However, to save processing time, the working projection for wetlands in Michigan and Wisconsin was Michigan GEOREF and Wisconsin Transverse Mercator (WTM), respectively, and projected to Albers upon lakewide coverage completion. Michigan's data was projected with the help of a projection tool offered on the Michigan Center for Technology's website at <<http://www.michigan.gov/cgi/>>, Wisconsin coastal wetland data was projected with ArcINFO 8.3 and

ArcToolbox 8.3. Additional Data Sources: Doug Wilcox and Martha Carlson's International Joint Commission work, Lake Ontario Wetland Inventory, LOWI, was utilized for the St. Lawrence River when it became available. The LOWI data could be utilized for all of Lake Ontario; however, the scope of this project does not allow us to go back incorporate this data for areas of the lake that were complete before receiving the data. MNFI provided a polygon wetland coverage for Lake Michigan, MNFI Wetland Communities inventory. The original Herdendorf hardcopy topographic maps are missing for the Isle Royal area in Michigan (Herdendorf wetlands 320-348), all of Lake Michigan, and locally in the Erie Island and Sandusky area of Lake Erie. Thus, all hydro-geomorphic wetland extents for the HWI on Lake Michigan in Michigan were based on MNFI's hard-copy maps of field-verified wetland communities. On Lake Superior, MNFI made interpretations of coastal wetland complexes based on the 1978 color infra-red aerial photography and the Herdendorf USFWS reports (Herdendorf, C. E., S. M. Hartley, and M. D. Barnes (Eds). 1981a). For these areas, the NWI was still considered the most accurate source of data for the digital mapping of hydro-geomorphic coastal wetland complexes. Also a digital inventory, MNFI Wetland Communities Inventory was selected to create new geomorphic complexes over the NWI coverage when it was deemed a more accurate representation of the hand-drawn hydro-geomorphic wetland extents (Dennis A. Albert, MNFI, personal commun., 2004).. Lastly, some additional wetland locations from the Regional Environmental Monitoring and Assessment Program (REMAP) projects by USFWS and USEPA were included with each Herdendorf Wetland Inventory point coverage (HWI).

Source_Used_Citation_Abbreviation: all digital sources

Process_Date: 2003-2004

Source_Produced_Citation_Abbreviation: Base Map

Contact_Information:

Contact_Person_Primary:

Contact_Person: Laura Simonson

Contact_Organization: US Geological Survey

*Contact_Position:*Biologist

Contact_Address:

Address_Type: mailing and physical address

Address: 6480 Doubletree Ave.

City: Columbus

State_or_Province: Ohio

*Postal_Code:*43229-1111

*Country:*United States

*Contact_Voice_Telephone:*614-430-7745

*Contact_Facsimile_Telephone:*614-430-7777

*Contact_Electronic_Mail_Address:*lsimonson@usgs.gov

Hours_of_Service: 7:30am to 4:30pm, Mon. to Fri.

Contact_Instructions: call, email or write.

Process_Step:

Process_Description:

CWAtlas: An attribute table, Coastal Wetland Atlas or CWAtlas, was created in Microsoft Access 2002. This table was populated with attributes for each hydro-geomorphic coastal wetland complex. It is comprised of the following fields: a. GEOID, the unique identification number for newly created geomorphic wetland complexes b. NWI, WWI, OWI, HWI, LOWI, and Other, a series of source fields c. Lk_Basin, indicates the lake basin the wetland complex is located in d. Wetland_Na, name of the wetland complex-see below for naming protocols e. Hydrogeomo, the primary hydrogeomorphic classification f. Hydrogeo_1, the secondary hydrogeomorphic classification g. ditch_con, dikes, dams, dredging, jetty, road_const, filled, residential, marina, industrial, and waste_sewa, a series of wetland modifier fields h. comments, a field which will includes additional comments about the wetland

complex i. X centroid, UTM easting coordinate of the complex centroid j. Y Centroid, the UTM northing coordinate of the complex centroid k. hectares, the area of wetland complex in hectares

Process_Date: 2003-2004

Process_Step:

Process_Description:

Coastal Wetland Identification: Topographic maps and (or) aerial photos will be utilized to identify those wetlands not directly influenced by the Great Lakes and these are not included in this mapping project. Elevation descriptions in Herdendorf's USFWS (Herdendorf, C.E., Hartley, S.M., and Barnes, M.D., (eds.), 1981a-f) provided supplemental information to determine if a wetland complex was coastal. Coastal wetlands were first identified and their extent (see Wetland Boundaries below) was hand-drawn on hard-copy topographic maps. Once determined to be coastal, each was classified and any wetland modifiers present in the complex was noted. Wetlands were then identified in GIS under three different circumstances, (1) areas where wetlands were recognized by HWI as well as another wetland inventory (polygons and point representation), (2) wetlands recognized only by a wetland inventory (polygons representation), and (3) wetlands recognized only by HWI (point representation). Wetland complexes that had only one source were mapped based on the following criteria: (1) Only those polygons visibly connected to the lake, that is the polygon physically touches the polygon lake boundary, are considered for inclusion; (2) Once determined to be connected or "coastal" the following characteristics were assessed a.High elevation. It was concluded that wetlands that occurred at high elevations, greater than 600ft, were not connected to the lake (Dennis A. Albert, MNFI, personal commun., 2003). b.Riverine wetland, narrow channel features. If a potentially open or barred drown river-mouth wetland occurred near or in a river with narrow channel features, it was not included as lake effected rivers have wide channel features (Dennis A. Albert, MNFI, personal commun., 2003). c.Wetland features from original HWI wetland extents that were excluded by MNFI from the hydro-geomorphic interpretation of that complex, were not mapped as additional wetlands. 3.JPEGS were made for all additional coastal wetlands, and their classification, connectivity to the lake, and modifiers were reviewed by MNFI using either topographic maps, aerial photos, or both to more accurately attribute the wetlands. For some of these coastal wetlands, lake connection is uncertain and can not be positively determined without further field verification. Such cases of uncertainty were individually attributed in CWAtlas.

Source_Used_Citation_Abbreviation: all digital and hard copy sources

Process_Date: 2003-2004

Source_Produced_Citation_Abbreviation: Coastal wetland identification

Process_Step:

Process_Description:

Wetland Boundaries: MNFI used copies of Herdendorf's original topographic maps, at scales of 1:24,000 or 1:62,500, and corresponding text in the USFWS reports to determine wetland to lake connectivity to a given Great Lake or connecting channel. If a wetland appeared to be lake-connected, the associated text information in the USFWS reports in combination with the hard-copy topographic maps, and in some cases aerial photographs, provided the necessary information to determine if the wetland was truly coastal or merely close to the lake. Once the site of a coastal wetland complex was identified, MNFI determined wetland extent based on the following protocols developed for wetland boundaries: 1. Boundaries for wetlands were based on the corresponding wetland inventory polygons. 2. Where polygons did not exist, wetland boundaries were not mapped, but instead wetland centroids were mapped, with the centroid occurring within the actual bounds of the wetland. 3. Where additional coastal wetlands are mapped, the landward boundary of coastal wetlands on the basis of lacustrine processes. For example, in swale complexes, all of the swales were created along the shoreline of the Great Lakes when Great Lakes wave actions were responsible for the creation of beach ridges and adjacent swales. These ridges and wetland swales are presently influenced more by ground water flow than Great Lakes water levels, but they were considered coastal and included due to their formation process. 4. Deltas in a Great Lakes bay or portions of the stream channel itself were considered part of the Great Lakes wetland

regardless of the present Great Lakes water level. 5. The lakeward boundary of the wetland was based on photo interpretation of emergent and floating weed beds, which typically occurred in less than 2 meters of water. Weed beds at depths greater than 2 meters of water, such as those found in Lake St. Clair and portions of the Les Cheneaux Islands, were not mapped as part of this project. After determining extent, MNFI outlined coastal hydro-geomorphic wetlands on copies of the Herdendorf topographic maps and classifications as well as modifiers were assigned. All coastal wetlands were then mapped digitally based on the interpretations of the hardcopy maps and DRG comparisons with ArcView 3.3.

Source_Used_Citation_Abbreviation: DRG

Source_Used_Citation_Abbreviation: HWI and hardcopy topos

Source_Used_Citation_Abbreviation: NWI

Source_Used_Citation_Abbreviation: LOWI

Source_Used_Citation_Abbreviation: OWI

Source_Used_Citation_Abbreviation: WWI

Source_Produced_Citation_Abbreviation: Coastal wetland extent

Process_Step:

Process_Description:

Coastal Wetland Complex, Polygon creation: Polygons from the wetland datasets that made up the hydro-geomorphic complex were selected in GIS, the data source attribute table was attributed with GEOID, and the selected polygons were converted to a new shape file. If applicable, the HWI attribute table also was attributed with the same GEOID. Attributing the data source tables ensured that none of the original data was lost and would be used to link datasets upon completion of the hydro-geomorphic inventory. If applicable, individual polygon boundaries from the elected data source were then removed with ArcGIS. The new geomorphic coastal wetland complex was attributed in CWAtlas.

Source_Used_Citation_Abbreviation: all digital data sources

Process_Date: 2003-2004

Source_Produced_Citation_Abbreviation: Geomorphic coastal wetland complex

Process_Step:

Process_Description:

Layer Creation: Once all wetlands for a lake were identified and shapefiles were made for the wetland complex, the corresponding shapefiles were merged into one with ArcGIS producing a lakewide hydro-geomorphic coastal wetland inventory.

Source_Used_Citation_Abbreviation: NA

Process_Date: 2003-2004

Source_Produced_Citation_Abbreviation: Lake-wide geomorphic coastal wetland inventory

Process_Step:

Process_Description:

XY Centroids: Universal Transverse Mercator (UTM) northing and easting coordinates were computed in ArcGIS for all hydro-geomorphic complexes. Centroids for all geomorphic coastal wetland polygons were computed with ArcGIS. For multi-source coastal complexes, the associated HWI points were re-located to the centroid of the complex. Inland wetlands mapped by HWI were removed from the dataset using GIS. Determinations of "inland wetland" status were based on MNFI's photo or map interpretation, as well as comments within the USFWS publications (Herdendorf, C. E., S. M. Hartley, and M. D. Barnes (Eds), 1981a). The final position of all Herdendorf points, except for those that fell on the true centroid of a polygon, were interpreted to be the central location of the hydro-geomorphic wetland complex rather than the centroid.

Source_Used_Citation_Abbreviation: NA

Process_Date: 2003-2004

Source_Produced_Citation_Abbreviation: Locational coordinates of complex centroid

Process_Step:

Process_Description:

Coastal Wetland Attributing: Once all the coastal wetlands for the active lake had been attributed in Access, CWAtlas was exported as a DBF file and joined to the attribute table of the geomorphic wetland layer by GEOID. This process was repeated for each lake and again for the basinwide coverage.

Source_Used_Citation_Abbreviation: NA

Process_Date: 2003-2004

Source_Produced_Citation_Abbreviation: Attributes table

Process_Step:

Process_Description:

Data source boundary modification Deletions and additions: After creating the new geomorphic wetland polygon shapefile, it was sometimes necessary to modify an existing wetland inventory polygon extent, in order to adhere to protocols regarding wetland boundaries. For example, a NWI wetland polygon may include a lagoon area as well as shoreline next to that lagoon. For the purposes of this project, it was only necessary to include the lagoon area of the polygon, not the shoreline. Thus, the shoreline would be cut from the existing polygon with GIS. A snapping environment based on the vertexes of the original datasets was established to ensure that boundary modifications were exact. Polygons were also cut to remove inland riverine wetlands from the coastal wetland complex. Decisions were made for polygon modification based on topographic features on the DRG and (or) aerial photos of the area. Indications that the river channel was no longer influenced by coastal processes (i.e. a narrowing of the river channel), that lagoon areas were part of the wetland complex, and that shoreline areas were not a part of the wetland complex due to boundary restrictions, resulted in modifications. All modifications were hand drawn interpretations of hard copy maps. The following source wetland inventory polygons were modified: Cut to remove open water and or shoreline: NY_NWI: 14324, 14307, 10215, 9368, 8945, 8946, 13765, 8734, 14186, 13045, 9471, 16229, 17781, 17726, 16660, 16555, 16907, 15141, 15925, 6404, 4723, 6941, 5362, 13232, 17744 MI_NWI: 30358, 5668, 5026, 5263, 5133, 59386, 1496, 62981, 62116, 39129, 36894, 38619, 31213, 18897, 18894, 30189, 29116, 57871, 8176, 20330, 20535, 20610, 20557, 3429, 2766, 38360, 37682, 37683, 36556, 36594, 36810, 36766, 36862, 50772, 50776, 50763, 50607, 50602, 50918, 39117 WWI: 20314, 20253, 20244, 20598, 20618, 20507, 22439, 6495, 22341, 22340, 22339, 9071 OWI: Unique polygon identifiers lost when the 8 separte OWI coverages were merged into one uniform coverage. Thus the documentation below consists of the GEOID of the new complex and the number of polygons modified: OWI: 1851(2), 1855(1), 1857(1), 1858(1), 1863(1), 1864(1), 1891(1) Cut to remove inland wetlands or portions of wetland that are part of another geomorphic complex : NY_NWI: 11016, 11438, 10777, 10790, 13045, 8914, 8893, 9387, 9372, 1665, 4 LOWI: US1-005 MI_NWI: 30562, 5597, 5025, 60637, 1503, 1502, 62888, 63062, 62782, 62748, 62437, 62379, 53565, 52926, 52767, 52746, 37308, 37114, 36327, 37919, 18485, 18497, 63024, 13227, 38065, 38526, 38561, 18794, 18779, 31213, 19063, 17674, 19052, 16815, 16500, 16885, 16670, 16177, 15866, 16137, 18853, 15769, 14619, 14520, 18844, 14925, 14293, 14296, 14317, 13989, 13982, 14066, 13826, 16914, 13503, 13510, 16695, 14944, 15307, 65639, 66380, 66234, 66271, 66689, 44493, 26238, 26366, 26309, 26435, 26264, 24803, 25267, 28031, 28020, 28150, 46328, 46219, 46300, 46347, 46332, 29118, 29087, 28984, 28954, 28964, 29043, 30286, 30289, 21775, 21746, 21696, 21752, 10242, 10492, 61384, 61421, 33101, 9846, 9660, 9632, 9630, 45220, 45307, 45657, 45736, 42473, 42662, 42752, 42861, 43836, 48972, 49904, 48270, 56741, 58961, 8169, 8177, 40598, 40096, 39579, 21575, 21492, 21157, 19505, 20535, 19709, 19564, 19563, 19600, 21299, 20956, 20699, 20534, 20702, 20610, 20557, 20185, 20165, 19770, 19809, 19714, 19330, 19392, 2766, 2699, 2736, 2721, 3065, 38360, 36969, 36168, 36061, 35809, 35637, 36510, 36292, 36434, 36633, 36594, 36810, 36766, 38749, 38860, 63857, 50907, 50876, 50792, 50456, 308, 11284, 62563, 38506, 44701, 17940, 17613, 17198, 10334, 36389, 32539, 32538, 20520, 20528 WI_WWI: 4134, 4472, 4488, 5803, 5851, 5860, 526, 10228, 21108, 11573, 19662, 19620, 19623, 19618, 19617, 19580, 19575, 19586, 19551, 19528, 20814, 18545, 18527, 18511, 18531, 20695, 18630, 20314, 20618, 19001, 19840, 19838, 19844, 18976, 20714, 20176, 20211, 20815, 20795, 18658, 22266, 22254, 22230, 22356, 6405, 6406, 9132, 6910, 9048, 8046, 7944, 7704 IN_NWI: 6330, 5029, 5069 IL_NWI: 3393, 3331, 3405, 3383, 3380, 257 MI_MNFI: 5996 OWI: 1857(1),

1858(1), 1859(1), 1862(1), 1863(1), 1864(1), 1873(1), 1874(1), 1877(1), 1883(1), 1887(2), 1889(1), 1891(1)

Source_Used_Citation_Abbreviation: NWI

Source_Used_Citation_Abbreviation: OWI

Source_Used_Citation_Abbreviation: WWI

Source_Used_Citation_Abbreviation: LOWI

Source_Used_Citation_Abbreviation: MNFI Wetland Communities

Process_Date: 2003-2004

Source_Produced_Citation_Abbreviation: Hydro-geomorphic coastal wetland complexes

Process_Step:

Process_Description:

New Polygon Creation: Various HWI coastal wetland complexes had to be sub-divided into smaller individual geomorphic complexes or combined into one coastal wetland complex of the same geomorphic type. In order to maintain existing attributes of the original datasets, any one polygon could not be selected to represent more than one wetland complex. Thus, new polygons had to be created in order to show the distinct boundaries of various coastal geomorphic complexes accurately. Creating new polygons was not originally in the scope of this project, it only occurred under the following conditions:

(1) The lake only had one polygon dataset available and one large polygon required subdivision into several separate polygons, or (2) The lake only had one polygon data source available and two or more separate wetland polygons needed to be combined into one polygon. This process eliminated polygon sharing and ensured that all existing attributes were maintained. A vertex snapping environment was established when creating the new polygons and the original NWI polygons were traced in order to provide spatial representation with accuracy equal to that of the original dataset. HWI wetlands that include new polygons (GEOID numbers followed by number of new polygons): Lake Huron: 50 (9 new), 56 (1 new), 57 (1 new), 68(1 new), 75+76(1new), 80 (1 new), 81 (2 new), 146 (1 new), 461 (1 new) Lake Superior: 778(1), 791(1), 808(1), 813(1), 817(2), 820(1), 827(1), 838(1), 903(1), 954(1), 1039(3) Lake Michigan: 1229(1), 1266(1), 1317(1), 1323(1), 1349(1), 1372(1), 1385(1), 1395(1), 1414(1), 1431(1), 1453(1), 1456(1), 1467(1), 1479(1), 1505(1), 1507(1), 1508(1), 1514(1), 1517(3), 1526(1), 1540(1), 1541(1), 1542(1), 1549(1), 1551(2), 1552(1), 1553(1), 1563(1), 1566(1), 1567(1); 1698 (3) Lake Erie: 1862(1), 1888(3)

Source_Used_Citation_Abbreviation: NWI

Source_Used_Citation_Abbreviation: OWI

Source_Used_Citation_Abbreviation: WWI

Source_Used_Citation_Abbreviation: LOWI

Source_Used_Citation_Abbreviation: MNFI Wetland Communities

Process_Date: 2003-2004

Source_Produced_Citation_Abbreviation: Hydro-geomorphic coastal wetland complexes

Process_Step:

Process_Description:

HWI point modification: Inland wetland complexes represented in Herdendorf's original topographic maps were removed from the Herdendorf coverage, as the mapping of inland wetlands is not part of this project. The table was edited and the inland wetlands were deleted from the coverage with GIS. It was also necessary to delete HWI points where duplicate entries were created for the same complex. HWI points described in the USFWS reports, but not represented in the coverage, were added to the coverage. Lastly, some REMAP points also were included with the HWI and thus, were removed if the referenced wetland could not be identified on the DRG. Herdendorf Points Deleted, inland wetlands: Lake Ontario: 247, 239,238,166, 202, 211,141,142, 118, 116, 109, 112, 114, 137, 134, 57, 60-65, 58, 82, 77, 100-102,107, 109, 14, 12, 49, 50, 51, 52, 53, 55, 47, 44, 45, 19-23, 25-27, 16 Lake Huron: 19, 20, 25, 38, 70, 88, 94, 95, 104, 164, 165, 181, 182, 191, 196, 197 Lake Superior: 1, 3-6, 8, 9, 11, 12, 14-16, 18, 20-22, 36, 37, 42, 72, 73, 93, 97, 102, 104, 106-110, 112,114, 116-118, 133-135, 140, 142, 143,145, 146, 150, 155, 160, 165, 183, 185-190, 200, 223-226, 230, 231, 243-247, 250-253, 255, 256, 270, 274, 275, 317,

318, 321, 325, 328, 330, 331, 336, 338, 339, 343, 347 Lake Michigan: 1, 7, 15, 17-19, 23, 27, 29, 30-31, 36, 42, 48, 99, 103, 120-121, 175-184, 187, 189, 191a, 192, 210, 214, 227, 235, 237-239, 287, 302, 312, 324, 336, 386, 415 Lake Erie: 7-8, 17-19, 22 Herdendorf Multi-point Deleted: Lake Ontario: 277, 264, 257, 167, 223, 137, 129, 80, 72, 85 Lake Michigan: 110 Herdendorf Points Added: Lake Ontario: 186 Lake Huron: 138 Lake Superior: 112a Herdendorf Not Mapped: Lake Ontario: 70- see USFWS report, not represented in database or on the original topographic maps. Lake Superior: 290- eliminated from coverage, mapping on hard copy topographic maps unclear REMAP Points deleted, inland or referenced wetland could not be located: Lake Huron: 701-702, 706, 708 Lake Superior: 705-708, 711-712, 715, 730, 802, 805-806, 811, 813 Lake Michigan: 501-502, 505, 509-511, 513-514, 526, 532, 534-536 Lake Erie: 701, 703-704

Source_Used_Citation_Abbreviation: HWI

Process_Date: 2003-2004

Source_Produced_Citation_Abbreviation: HWI point modification

Process_Step:

Process_Description: Metadata imported.

Process_Step:

Process_Description:

The following outlines the Canadian dataset development:

The published document entitled "The Ontario Great Lakes Coastal Wetland Atlas: A summary of information (1983 - 1997) consolidated and evaluated all available coastal wetland data. It identifies a UTM zone specific centroid position for these wetlands. Supplementary digital spreadsheets of this data were available with the publication. The MS Excel zone specific spreadsheets are imported into ArcGIS 8.2. The 'display XY data' function in ArcMap was used for the import. This digital point data was saved as a zone specific shapefile. Each shapefile was reprojected into zone 18 and merged into one coverage using ArcMap's Geoprocessing Tool. The resultant dataset are starting point locations of known coastal wetlands of the Great Lakes.

Source_Used_Citation_Abbreviation: Coastal Wetland Atlas

Process_Date: April 2003

Process_Step:

Process_Description:

To meet the criterion defining a coastal wetland, topography was used to determine the upper and lower extents of the coastal wetland boundary. Landscape contours can approximate the upper extent, where upland was separated from wetland, based on documented historical influence of the lake through fluctuating water levels. The maximum floodplain describes the level (in meters) to where water will rise as a result of a given rain or natural event. The Canadian Hydrological Service (CHS) has detailed records of the historical mean and maximum water levels for each basin from 1918 to 2003. All data in this range, was used to determine a lake specific, maximum floodplain. The CHS historic water levels reference the International Great Lakes Datum 85 (IGLD85) vertical datum. For compatibility with the OMNR spot height data, the historic high water level values were converted from IGLD 85 datum into CGD 28 datum using a lake specific conversion factor. The conversion factors can be obtained from CHS. The output is a maximum flood plain value for specific to each Great Lake. This was used in conjunction with known topographical spot heights of the basin to reference an upper extent of Great Lakes influence on coastal wetlands. The study area was limited to the upper extent of the Great Lakes flood plain. All wetlands beyond the maximum flood plain boundary were not included in the database unless they were determined continuous with wetland that lay within the lake influence boundary.

Source_Used_Citation_Abbreviation: Great Lakes Historic Water Levels

Source_Used_Citation_Abbreviation: Spot Height

Process_Date: April 2003

Source_Produced_Citation_Abbreviation: GL Flood Plain reference

Process_Step:

Process_Description:

OMNR Spot height data describes the topological heights (z value) of land at a scale of 1:10 000 and was used to create a 1m contour coverage. The spot height data is OMNR District specific, so to reduce processing time the data for each district was clipped using a 2km buffer of the Great Lakes shoreline. The clipped data was then merged together to create a seamless coverage. Both the 'clip based on another layer' and the 'merge' function are completed using the Geoprocessing Tool of ArcMap. Contours are created using the 'Surface Analysis' tool of the Spatial Analyst extension of ArcGIS 8.2. The previously calculated, basin specific flood plain values in CGD datum were used as reference values to query out the flood plain for each Great Lake basin, each saved to a shapefile. The end result was five, basin-specific contour line shapefiles referencing each Great Lake flood plain level. Each provided a spatial reference of the upper limit of lake influence on surrounding wetlands.

Source_Used_Citation_Abbreviation: Spot Heights

Process_Date: June 2003

Source_Produced_Citation_Abbreviation: GL Contours

Source_Produced_Citation_Abbreviation: GL Flood Plains

Process_Step:

Process_Description:

Create a new project workspace. Import into workspace all spatial data sources from which the final product will derive information from. Ensure all data is in compatible spatial reference. Reproject as necessary (Reprojection Tool in ArcToolbox). Overlay all data sources in a new GIS project. Create new empty Coastal Wetland Inventory coverage in NAD 83, UTM Zone 18. This is to be the final product when complete. Define attributes in polygon attribute table.

Source_Used_Citation_Abbreviation: GL Flood Plains

Source_Used_Citation_Abbreviation: Spot Heights

Source_Used_Citation_Abbreviation: Evaluated Polygons

Source_Used_Citation_Abbreviation: Waterpolys

Source_Used_Citation_Abbreviation: Great Lakes Shoreline

Source_Used_Citation_Abbreviation: Coastal Wetland Centroids

Source_Used_Citation_Abbreviation: Peat

Source_Used_Citation_Abbreviation: Geology

Process_Date: June 2003

Source_Produced_Citation_Abbreviation: Coastal Wetland Inventory

Process_Step:

Process_Description:

All coastal wetlands will be delineated and classified by CWS staff through air photo interpretation, using the final Consortium classification system agreed to at the experts workshop. Where available, wetland evaluation polygon data will be used to identify wetland boundaries and generate coastal wetland area estimates. For wetlands that do not have suitable digital polygon data, the wetland boundary and corresponding area will be defined using standardized air photo interpretation techniques (Owens and Hop 1995) and delineated using the on-screen digitizing capabilities of ArcMap. See "Digitizing and Data Registration Standards for the Great Lakes Coastal Wetland Inventory" in the Logical Consistency Report of this metadata for georeferencing and digitization standards.

Source_Used_Citation_Abbreviation: Aerial Photos

Source_Used_Citation_Abbreviation: Aerial Photos 1

Process_Date: June - Dec 2003

Process_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Krista Holmes

Contact_Organization: Canadian Wildlife Service, Ontario Region. Environment Canada

Contact_Position: Wildlife Conservation Biologist
Contact_Voice_Telephone: (416) 739-5971
Contact_Facsimile_Telephone: (416) 730-5845
Contact_Electronic_Mail_Address: krista.holmes@ec.gc.ca
Hours_of_Service: 8:30am to 4:30pm, Mon - Fri

Process_Step:

Process_Description:

Select all OMNR Evaluated Wetland Polygons where a Coastal Wetland Atlas Centroid has been identified. Add to this selection all Evaluated Wetland polygons that lie within a 2 km distance of the Great Lakes Shoreline. Use Load Objects function of ArcGIS 8.2 to transfer spatial and attribute data of the Evaluated Wetland Polygons into the new empty Coastal Wetland Inventory polygon coverage. Every wetland extent will be confirmed, updated, added or deleted as necessary for coastal designation. This designation was provided by an expert in the field, supplemented through air photo interpretation.

Source_Used_Citation_Abbreviation: Coastal Wetland Atlas

Source_Used_Citation_Abbreviation: Evaluated Wetlands

Source_Used_Citation_Abbreviation: Photo Interpretation

Process_Date: June 2003

Process_Step:

Process_Description:

The OMNR Waterpoly layer depicts polygon extents where wetlands have been designated on 1:10 000 OBM Map sheets. It provides a spatial boundary for unevaluated wetlands and will fill some data gaps in the Evaluated Wetland polygon data. Perform a spatial query to select all OMNR Waterpoly polygons where a Coastal Wetland Atlas Centroid has been identified. Use Load Objects function of ArcGIS 8.2 to transfer spatial and attribute data into the Coastal Wetland Inventory polygon coverage. Perform a spatial query to select all OMNR Waterpoly polygons that lie within a 2 km distance of the Great Lakes Shoreline. Reselect this selection for polygons greater than 2 hectares (20 000m²) to satisfy the minimum mapping unit for this project. Use Load Objects function of ArcGIS 8.2 to transfer spatial and attribute data of the Evaluated Wetland Polygons into the Coastal Wetland Inventory polygon coverage. All unevaluated wetlands added to the final dataset were verified through air photo interpretation. If photo coverage was not available for the wetland, the polygon was not included in the dataset.

Source_Used_Citation_Abbreviation: Waterpolys

Source_Used_Citation_Abbreviation: Evaluated Wetlands

Source_Used_Citation_Abbreviation: Coastal Wetland Atlas

Process_Date: June - Dec 2003

Process_Step:

Process_Description:

Where digital wetland polygon data does not exist, air photos provide a template to delineate and digitize a wetland boundary. The photo(s) of the wetland are scanned into digital image format and georeferenced to NRVIS data in ArcGIS 8.2. (as outlined in the Digitizing and Data Registration Standards). The photos are brought into the GIS in .tif format and registered to OMNR permanent feature data e.g. roads, using the georeferencing toolbar in ArcMap. This tool provides coordinate information to the photo so that it was rotated and registered to a real-world position. It also provides RMS accuracy information. The RMS must be less than 0.5 to meet the project's Digitizing and Data Registration Standards. All RMS error text files were saved with the photo's georeferencing information. The corresponding georeferenced image provides a digital tablet from which to create a wetland boundary polygon. This was completed through on-screen digitizing along side the use of a stereoscope to confirm land features, in accordance with standardized air photo interpretation techniques (Owens and Hop, 1995). For complete digitizing and data registering standards, please see Logical Consistency Report of the Coastal Wetland Inventory metadata. The criteria standards are consistent with the protocol utilized by the OMNR in the creation of the evaluated wetland polygons,

and assisted the maintenance of data integrity through the developing coastal wetland dataset. For more detailed information on NRVIS spatial accuracy please see the NRVIS Guide for End Users

Source_Used_Citation_Abbreviation: Coastal Wetland Inventory

Source_Used_Citation_Abbreviation: Photo Interpretation

Source_Used_Citation_Abbreviation: Aerial Photos1

Source_Used_Citation_Abbreviation: Aerial Photos2

Source_Used_Citation_Abbreviation: Road Segment

Source_Used_Citation_Abbreviation: Railway

Source_Used_Citation_Abbreviation: Utility Line

Process_Date: June - Dec 2003

Process_Step:

Process_Description:

Every coastal wetland in the database was hydrogeomorphically typed as per the Great Lakes Wetland Hydrogeomorphic Classification Schema (See "Completeness_Report" of this metadata). The designation will be made by an expert in the field, supplemented through air photo interpretation. Each coastal wetland was verified and where needed, complexes split into hydrogeomorphic individuals. Wetlands were renamed where needed to reflect hydrogeomorphic designation. In the case of complexes, the wetland name remains the same but now includes a number (in west to east sequence) to reflect the hydrogeomorphic entity. In the final dataset, each wetland extent reflects its connection to the lake and was classified accordingly.

Source_Used_Citation_Abbreviation: Aerial Photos1

Source_Used_Citation_Abbreviation: Aerial Photos2

Source_Used_Citation_Abbreviation: Photo Interpretation

Source_Used_Citation_Abbreviation: Coastal Wetland Inventory

Process_Date: June - Dec 2003

Process_Step:

Process_Description:

Modifiers are noted as a presence/absence (yes or no, Boolean attribute) in the polygon attribute table upon air photo interpretation of the wetlands. The list of modifiers includes 8 scenarios: dykes, dams, road construction, dredging, jetty, filled, waste and/or sewage and marina

Source_Used_Citation_Abbreviation: Aerial Photos1

Source_Used_Citation_Abbreviation: Aerial Photos2

Source_Used_Citation_Abbreviation: Air Photo interpretation

Source_Used_Citation_Abbreviation: Coastal Wetland Inventory

Process_Date: June - Dec 2003

Process_Contact:

Contact_Information:

Contact_Person_Primary:

Process_Step:

Process_Description:

The completed coverage was edited in ArcEdit, a component of ArcInfo Workstation 8.2. It was corrected for arc, node and label errors and was given clean polygon topology using the 'clean' function.

Source_Used_Citation_Abbreviation: Coastal Wetland Inventory

Process_Date: December 2003

Process_Step:

Process_Description:

Wetland area was generated automatically upon topography creation. This area was converted into hectares to populate the "Hectares" field

Source_Used_Citation_Abbreviation: Coastal Wetland Inventory

Process_Date: Dec 2003

Process_Step:

Process_Description: Metadata was created.
Source_Used_Citation_Abbreviation: Coastal Wetland Inventory
Process_Date: January 2004
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Krista Holmes
Contact_Organization: Canadian Wildlife Service, Ontario Region
Contact_Position: Wildlife Conservation Biologist
Contact_Address:
Address_Type: mailing and physical address
Address: Environment Canada
Address: ECB/CSD/CWS, Ontario Region
Address: 4905 Dufferin Street
City: Downsview
State_or_Province: Ontario
Postal_Code: M3H 5T4
Country: Canada
Contact_Voice_Telephone: (416) 739-5971
Contact_Facsimile_Telephone: (416) 739-5845
Contact_Electronic_Mail_Address: krista.holmes@ec.gc.ca
Hours_of_Service: 8:00am to 4:30pm, Mon. to Fri.
Contact_Instructions: call, email or write.
Process_Step:
Process_Description:
The two clean coverages were merged together to create a seamless product using the MapJoin command in Arc/Info. The final coverage was cleaned a final time and exported into interchange file format (.e00).
Process_Date: October 2004

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Vector
Point_and_Vector_Object_Information:
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: Complete chain
Point_and_Vector_Object_Count: 38819
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: Label point
Point_and_Vector_Object_Count: 0
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: GT-polygon composed of chains
Point_and_Vector_Object_Count: 20246
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: Point
Point_and_Vector_Object_Count: 0

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:
Planar:
Map_Projection:
Map_Projection_Name: Albers Conical Equal Area

Albers_Conical_Equal_Area:
Standard_Parallel: 42.246417
Standard_Parallel: 46.814250
Longitude_of_Central_Meridian: -83.452694
Latitude_of_Projection_Origin: 44.530333
False_Easting: 0.000000
False_Northing: 0.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: coordinate pair
Coordinate_Representation:
Abscissa_Resolution: 0.009521
Ordinate_Resolution: 0.009521
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222
Vertical_Coordinate_System_Definition:
Altitude_System_Definition:
Altitude_Resolution: 0.000010
Altitude_Encoding_Method:
Explicit elevation coordinate included with horizontal coordinates

Entity_and_Attribute_Information:

Detailed_Description:

Entity_Type:

Entity_Type_Label: glcwc_cwi.pat

Entity_Type_Definition:

Hydrogeomorphic classification for all previously identified coastal wetlands in the Great Lakes Basin

Attribute:

Attribute_Label: FID

Attribute_Definition: Internal feature number.

Attribute_Definition_Source: ESRI

Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: Shape

Attribute_Definition: Feature geometry.

Attribute_Definition_Source: ESRI

Attribute_Domain_Values:

Unrepresentable_Domain: Coordinates defining the features.

Attribute:

Attribute_Label: AREA

Attribute_Definition: Area of feature in internal units squared.

Attribute_Definition_Source: ESRI

Attribute_Domain_Values:

Unrepresentable_Domain: Positive real numbers that are automatically generated.

Attribute:

Attribute_Label: PERIMETER

Attribute_Definition: Perimeter of feature in internal units.

Attribute_Definition_Source: ESRI

Attribute_Domain_Values:

Unrepresentable_Domain: Positive real numbers that are automatically generated.

Attribute:

Attribute_Label: GLCWC_CWI#

Attribute_Definition: Internal feature number.

Attribute_Definition_Source: ESRI

Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: GLCWC_CWI-ID

Attribute_Definition: User-defined feature number.

Attribute_Definition_Source: ESRI

Attribute_Domain_Values:

Unrepresentable_Domain: Whole numbers that are automatically generated.

Attribute:

Attribute_Label: OTHER

Attribute_Definition: Other Sources Field

Attribute_Definition_Source: User Defined

Attribute_Domain_Values:

Enumerated_Domain:

Enumerated_Domain_Value: MNFI

Enumerated_Domain_Value_Definition:

Michigan Natural Features Wetland Communities is a source for the wetland complex

Enumerated_Domain:

Enumerated_Domain_Value: EPA

Enumerated_Domain_Value_Definition:

USFWS/EPA's work done for REMAP is a source for the wetland complex

Attribute:

Attribute_Label: USGS_QUAD

Attribute_Definition:

Name of US Geological Survey topographic map the coastal wetland complex is located on

Attribute_Definition_Source: User Defines

Attribute:

Attribute_Label: LK_BASIN

Attribute_Definition: Great Lakes Basin wetland complex found in

Attribute_Definition_Source: User Defined

Attribute_Domain_Values:

Enumerated_Domain:

Enumerated_Domain_Value: DR

Enumerated_Domain_Value_Definition: Detroit River

Enumerated_Domain:

Enumerated_Domain_Value: LKE

Enumerated_Domain_Value_Definition: Lake Erie

Enumerated_Domain:

Enumerated_Domain_Value: LKH

Enumerated_Domain_Value_Definition: Lake Huron

Enumerated_Domain:

Enumerated_Domain_Value: LKM

Enumerated_Domain_Value_Definition: Lake Michigan

Enumerated_Domain:

Enumerated_Domain_Value: LKO

Enumerated_Domain_Value_Definition: Lake Ontario

Enumerated_Domain:

Enumerated_Domain_Value: LKS

Enumerated_Domain_Value_Definition: Lake Superior

Enumerated_Domain:

Enumerated_Domain_Value: LSC

Enumerated_Domain_Value_Definition: Lake St. Clair

Enumerated_Domain:

Enumerated_Domain_Value: NR

Enumerated_Domain_Value_Definition: Niagara River

Enumerated_Domain:

Enumerated_Domain_Value: SCR

Enumerated_Domain_Value_Definition: St. Clair River

Enumerated_Domain:

Enumerated_Domain_Value: SLR

Enumerated_Domain_Value_Definition: St. Lawrence River

Enumerated_Domain:

Enumerated_Domain_Value: SMR

Enumerated_Domain_Value_Definition: St. Mary's River

Attribute:

Attribute_Label: WETLAND_NA

Attribute_Definition: Name of coastal wetland complex

Attribute_Definition_Source: User defined

Attribute:

Attribute_Label: HGM_CLS1

Attribute_Definition:

Primary hydro-geomorphic classification of coastal wetland complex

Attribute_Definition_Source:

User defined; Albert, D.A., J. Ingram, T. Thompson, and D. Wilcox, on behalf of the Great Lakes Coastal Wetland Consortium (GLCWC). Great Lakes Coastal Wetlands Classification. (Revision Schema (July 2003; original November 2001)

Attribute_Domain_Values:

Enumerated_Domain:

Enumerated_Domain_Value: BL

Enumerated_Domain_Value_Definition: Barrier-Protected Beach Lagoon

Enumerated_Domain:

Enumerated_Domain_Value: BLS

Enumerated_Domain_Value_Definition: Barrier_Protected Successional Barrier Beach Lagoon

Enumerated_Domain:

Enumerated_Domain_Value: BLT

Enumerated_Domain_Value_Definition: Barrier_Protected, Tombolo

Enumerated_Domain:

Enumerated_Domain_Value: BSR

Enumerated_Domain_Value_Definition: Barrier-Protected Ridge and Swale Complex

Enumerated_Domain:

Enumerated_Domain_Value: BSS

Enumerated_Domain_Value_Definition: Barrier-Protected Sand Spit Swales

Enumerated_Domain:

Enumerated_Domain_Value: LOE
Enumerated_Domain_Value_Definition: Lacustrine, Open Embayment
Enumerated_Domain:
Enumerated_Domain_Value: LOS
Enumerated_Domain_Value_Definition: Lacustrine, Open Embayment
Enumerated_Domain:
Enumerated_Domain_Value: LPP
Enumerated_Domain_Value_Definition: Lacustrine, Protected Embayment
Enumerated_Domain:
Enumerated_Domain_Value: LPS
Enumerated_Domain_Value_Definition: Lacustrine, Sand-Spit Embayment
Enumerated_Domain:
Enumerated_Domain_Value: RCD
Enumerated_Domain_Value_Definition: Riverine, Channel, Delta
Enumerated_Domain:
Enumerated_Domain_Value: RCOE
Enumerated_Domain_Value_Definition: Riverine, Channel, Open Embayment
Enumerated_Domain:
Enumerated_Domain_Value: RCOS
Enumerated_Domain_Value_Definition: Riverine, Channel, Open Shoreline
Enumerated_Domain:
Enumerated_Domain_Value: RCPP
Enumerated_Domain_Value_Definition: Riverine, Channel, Protected Embayment
Enumerated_Domain:
Enumerated_Domain_Value: RCPS
Enumerated_Domain_Value_Definition: Riverine, Channel, Sand-Spit Embayment
Enumerated_Domain:
Enumerated_Domain_Value: RCRB
Enumerated_Domain_Value_Definition: Riverine, Channel, Barred, Drowned River-Mouth
Enumerated_Domain:
Enumerated_Domain_Value: RCRO
Enumerated_Domain_Value_Definition: Riverine, Channel, Open, Drowned River-Mouth
Enumerated_Domain:
Enumerated_Domain_Value: RD
Enumerated_Domain_Value_Definition: Riverine, Delta
Enumerated_Domain:
Enumerated_Domain_Value: RRB
Enumerated_Domain_Value_Definition: Riverine, Barred, Drowned River-Mouth
Enumerated_Domain:
Enumerated_Domain_Value: RRO
Enumerated_Domain_Value_Definition: Riverine, Open, Drowned River-Mouth
Attribute:
Attribute_Label: HGM_CLS2
Attribute_Definition:
 Secondary hydro-geomorphic classification of coastal wetland complex
Attribute_Definition_Source:
 User defined, Albert, D.A., J. Ingram, T. Thompson, and D. Wilcox, on behalf of the Great Lakes Coastal Wetland Consortium (GLCWC). Great Lakes Coastal Wetlands Classification. (Revision Schema (July 2003; original November 2001)).
Attribute_Domain_Values:
Enumerated_Domain:

Enumerated_Domain_Value: same as Hydrogeomor

Enumerated_Domain_Value_Definition: same as Hydrogeomor

Attribute:

Attribute_Label: COMMENTS

Attribute_Definition:
Field containing additional comments about the coastal wetland complex

Attribute_Definition_Source: User defined

Attribute:

Attribute_Label: X_CENTROID

Attribute_Definition:
Easting information for the centroid of the geomorphic wetland complex in UTM, zone 16.. For HWI, points were relocated to represent the centroid of the associated polygons where applicable.

Attribute_Definition_Source: Computed

Attribute:

Attribute_Label: Y_CENTROID

Attribute_Definition:
Northing information for the centroid of the geomorphic wetland complex in UTM, zone 16.. For HWI, points were relocated to represent the centroid of the associated polygons where applicable.

Attribute_Definition_Source: Computed

Attribute:

Attribute_Label: HECTARES

Attribute_Definition: Area of feature in hectares

Attribute_Definition_Source: Computed

Attribute:

Attribute_Label: NWI

Attribute_Definition: National Wetlands Inventory source field

Attribute_Definition_Source: User defined

Attribute_Domain_Values:

Enumerated_Domain:

Enumerated_Domain_Value: True

Enumerated_Domain_Value_Definition: NWI is a data source for the wetland complex

Enumerated_Domain:

Enumerated_Domain_Value: False

Enumerated_Domain_Value_Definition: NWI is not a data source for the wetland complex

Attribute:

Attribute_Label: WWI

Attribute_Definition: Wisconsin Wetland Inventory source field

Attribute_Definition_Source: User defined

Attribute_Domain_Values:

Enumerated_Domain:

Enumerated_Domain_Value: True

Enumerated_Domain_Value_Definition: WWI is a data source for the wetland complex

Enumerated_Domain:

Enumerated_Domain_Value: False

Enumerated_Domain_Value_Definition: WWI is not a data source for the wetland complex

Attribute:

Attribute_Label: OWI

Attribute_Definition: Ohio Wetland Inventory source field

Attribute_Definition_Source: User defined

Attribute_Domain_Values:

Enumerated_Domain:

Enumerated_Domain_Value: True
Enumerated_Domain_Value_Definition: OWI is a data source for the wetland complex
Enumerated_Domain:
Enumerated_Domain_Value: False
Enumerated_Domain_Value_Definition: OWI is not a data source for the wetland complex
Attribute:
Attribute_Label: HWI
Attribute_Definition: Charles E. Herdendorf wetland inventory source field
Attribute_Definition_Source: User defined
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: True
Enumerated_Domain_Value_Definition: Charles E. Herdendorf is a data source for the wetland complex
Enumerated_Domain:
Enumerated_Domain_Value: False
Enumerated_Domain_Value_Definition:
 Charles E. Herdendorf is not a data source for the wetland complex
Attribute:
Attribute_Label: LOWI
Attribute_Definition:
 Doug Wilcox and Martha Carlson's IJC project, Lake Ontario Wetland Inventory, was a data source used for the wetland
Attribute_Definition_Source: User defined
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: True
Enumerated_Domain_Value_Definition: LOWI is a data source for the wetland complex
Enumerated_Domain:
Enumerated_Domain_Value: False
Enumerated_Domain_Value_Definition: LOWI is not a source for the wetland complex
Attribute:
Attribute_Label: H_NUM
Attribute_Definition: Original number of wetland complex from USFWS reports
Attribute_Definition_Source: User defined
Attribute:
Attribute_Label: DITCH_CONS
Attribute_Definition: Coastal wetland modifier currently impacting the complex
Attribute_Definition_Source: User defined
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: True
Enumerated_Domain_Value_Definition: Modifier is present in the wetland complex
Enumerated_Domain:
Enumerated_Domain_Value: False
Enumerated_Domain_Value_Definition: Modifier is absent from wetland complex
Attribute:
Attribute_Label: DYKES
Attribute_Definition: Coastal wetland modifier currently impacting the complex
Attribute_Definition_Source: User defined
Attribute_Domain_Values:
Enumerated_Domain:

Enumerated_Domain_Value: True
Enumerated_Domain_Value_Definition: Modifier is present in the wetland complex
Enumerated_Domain:
Enumerated_Domain_Value: False
Enumerated_Domain_Value_Definition: Modifier is absent from wetland complex
Attribute:
Attribute_Label: DAMS
Attribute_Definition: Coastal wetland modifier currently impacting the complex
Attribute_Definition_Source: User defined
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: True
Enumerated_Domain_Value_Definition: Modifier is present in the wetland complex
Enumerated_Domain:
Enumerated_Domain_Value: False
Enumerated_Domain_Value_Definition: Modifier is absent from wetland complex
Attribute:
Attribute_Label: DREDGING
Attribute_Definition: Coastal wetland modifier currently impacting the complex
Attribute_Definition_Source: User defined
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: True
Enumerated_Domain_Value_Definition: Modifier is present in the wetland complex
Enumerated_Domain:
Enumerated_Domain_Value: False
Enumerated_Domain_Value_Definition: Modifier is absent from wetland complex
Attribute:
Attribute_Label: JETTY
Attribute_Definition: Coastal wetland modifier currently impacting the complex
Attribute_Definition_Source: User defined
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: True
Enumerated_Domain_Value_Definition: Modifier is present in the wetland complex
Enumerated_Domain:
Enumerated_Domain_Value: False
Enumerated_Domain_Value_Definition: Modifier is absent from wetland complex
Attribute:
Attribute_Label: ROAD_CONST
Attribute_Definition: Coastal wetland modifier currently impacting the complex
Attribute_Definition_Source: User defined
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: True
Enumerated_Domain_Value_Definition: Modifier is present in the wetland complex
Enumerated_Domain:
Enumerated_Domain_Value: False
Enumerated_Domain_Value_Definition: Modifier is absent from wetland complex
Attribute:
Attribute_Label: FILLED

Attribute_Definition: Coastal wetland modifier currently impacting the complex
Attribute_Definition_Source: User defined
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: True
Enumerated_Domain_Value_Definition: Modifier is present in the wetland complex
Enumerated_Domain:
Enumerated_Domain_Value: False
Enumerated_Domain_Value_Definition: Modifier is absent from wetland complex
Attribute:
Attribute_Label: MARINA
Attribute_Definition: Coastal wetland modifier currently impacting the complex
Attribute_Definition_Source: User defined
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: True
Enumerated_Domain_Value_Definition: Modifier is present in the wetland complex
Enumerated_Domain:
Enumerated_Domain_Value: False
Enumerated_Domain_Value_Definition: Modifier is absent from wetland complex
Attribute:
Attribute_Label: WASTE_SEWA
Attribute_Definition: Coastal wetland modifier currently impacting the complex
Attribute_Definition_Source: User defined
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value: True
Enumerated_Domain_Value_Definition: Modifier is present in the wetland complex
Enumerated_Domain:
Enumerated_Domain_Value: False
Enumerated_Domain_Value_Definition: Modifier is absent from wetland complex
Attribute:
Attribute_Label: GEO_ID
Attribute_Definition:
Unique identification number for hydro-geomorphic coastal wetlands
Attribute_Definition_Source: User defined
Attribute:
Attribute_Label: COUNTRY
Attribute_Definition: Originating Country
Attribute_Definition_Source: User defined

Distribution_Information:

Distributor:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Ric Lawson
Contact_Organization: Great Lakes Commission
Contact_Position: Project Manager
Contact_Address:
Address_Type: mailing and physical address
Address: Eisenhower Corporate Park

Address: 2805 S. Industrial Hwy, Suite 100
City: Ann Arbor
State_or_Province: Michigan
Postal_Code: 48104-6791
Country: United States
Contact_Voice_Telephone: 734-971-9135
Contact_Facsimile_Telephone: 734-971-9150
Contact_Electronic_Mail_Address: rlawson@glc.org
Hours_of_Service: 7:30am to 4:30pm

Resource_Description:

Digital coastal wetland inventory for all identified coastal wetlands in the Great Lakes basin. Wetlands are classified based on hydro-geomorphic processes responsible for forming the wetland, and other descriptive attributes are also included such as: wetland name, hectares, and centroid position. This inventory was created by US and Canadian partners for a complete bi-national coastal wetland inventory for the entire Great Lakes Basin.

Distribution_Liability:

Although these data have been processed successfully, they are provided "as is" and no warranty, expressed or implied, is made regarding the accuracy or utility of the data on any other system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty. This disclaimer applies both to individual use of the data and aggregate use with other data. It is strongly recommended that these data are directly acquired from the GLCWC and not indirectly through other sources which may have changed the data in some way. It is also strongly recommended that careful attention be paid to the contents of the metadata file associated with these data. Government agencies shall not be held liable for improper or incorrect use of these data described and/or contained here in. Mention of trade names or manufacturers does not imply government endorsement of commercial products.

Standard_Order_Process:

Digital_Form:

Digital_Transfer_Information:

Transfer_Size: 34.112

Ordering_Instructions:

online at: <http://projects.glc.org/wetlands/inventory.html>

Metadata_Reference_Information:

Metadata_Date: 20041029

Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Krista Holmes

Contact_Organization: Canadian Wildlife Service, Ontario Region. Environment Canada

Contact_Position: Wildlife Conservation Biologist

Contact_Address:

Address_Type: mailing and physical address

Address: Environment Canada

Address: CWS-OR/CSD/ECB

Address: 4905 Dufferin Street

City: Downsview

State_or_Province: Ontario

Postal_Code: M3H 5T4

Country: Canada

Contact_Voice_Telephone: (416) 739-5971

Contact_Facsimile_Telephone: (416) 730-5845

Contact_Electronic_Mail_Address: krista.holmes@ec.gc.ca

Hours_of_Service: 7:30am to 4:30pm, Mon-Fri

Contact_Instructions: call, email, or write

Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

Metadata_Extensions:

Online_Linkage: <<http://www.esri.com/metadata/esriprof80.html>>

Profile_Name: ESRI Metadata Profile

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