



**U.S. Fish & Wildlife Service**  
**National Wetlands Inventory**

National Standards and Support Team

# Wetlands Data Verification Toolset

## *Installation Instructions and User Information*

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**Mitchell T. Bergeson**

U.S. Fish and Wildlife Service  
Division of Habitat and Resource Conservation  
Branch of Resources and Mapping Support

## Introduction

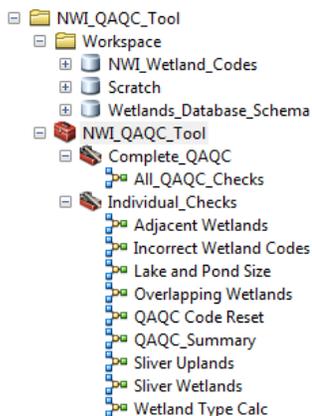
The Wetlands Data Verification Toolset is designed to automate the quality control functions necessary to ensure the data in the Wetlands geodatabase is accurate. It has been designed to address geositional errors, digital anomalies, and logic checks. This toolset was created using Environmental Systems Research, Incorporated's (ESRI) ModelBuilder, is compatible with ESRI's ArcDesktop 10.0 software suite, only works on File Geodatabases, and replaces previous custom Wetlands Verification Tools.

## Getting Started

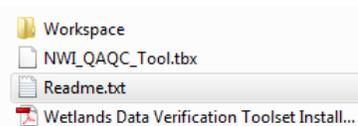
The Verification Toolset and associated files are stored in a 'NWI\_QAQC\_Tool' folder. This folder can be stored in any location on your machine and contains:

- Readme.txt
- Wetlands Data Verification Toolset Installation and User Information.pdf
- Workspace folder
  - Scratch.gdb
  - NWI\_Wetland\_Codes.gdb
  - Wetlands\_Database\_Schema.gdb
- NWI\_QAQC\_Tool.tbx

The Readme.txt provides a general description of the contents and purpose of the folder. The Wetlands Data Verification Toolset Installation and User Information document provides descriptions and procedures on the use of the verification models. The Workspace folder is used for writing intermediate data from the models and contains a file geodatabase named Scratch.gdb that is required for the models to run correctly. This folder also contains a file geodatabase of wetland codes and an example file geodatabase of the wetlands database schema. The NWI\_QAQC\_Tool.tbx is the ArcToolbox that contains the Wetlands QAQC models.



**NWI\_QAQC\_Tool view  
in ArcCatalog.**

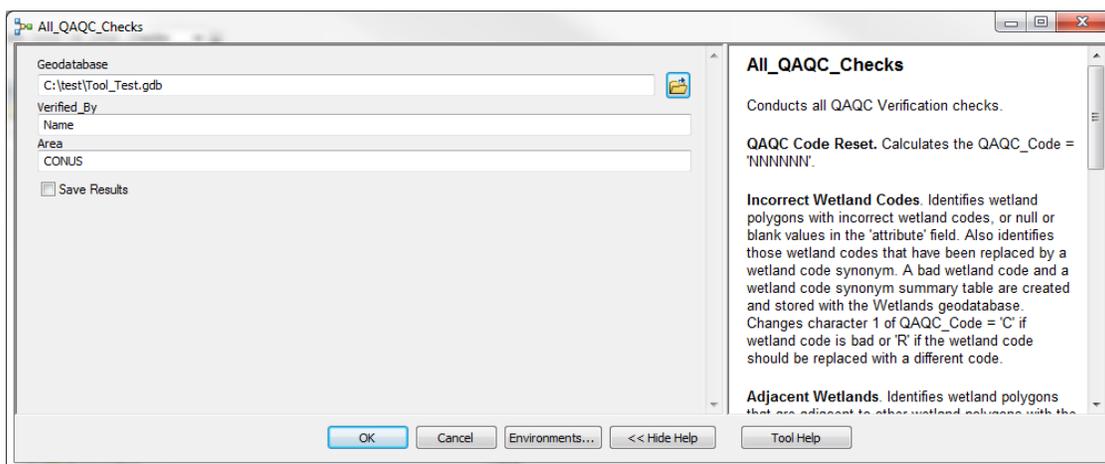


**NWI\_QAQC\_Tool view  
In Windows Explorer.**

## Running the models

This toolset was designed to work on **File Geodatabases** extracted from the FWS Wetlands Database and will only work on data with that schema. In particular it requires the feature class CONUS\_wet\_poly in a CONUS\_wetlands feature dataset, and CONUS\_wet\_projects in a CONUS\_projects feature dataset (substitute AK, HI, PRVI or PactTrust for CONUS in other mapping areas). The CONUS\_wet\_projects feature class must contain a polygon that completely covers the area where wetland mapping was conducted. A sample File Geodatabase is provided with this tool in the Workspace folder. This sample file geodatabase can be copied and loaded with wetlands data or used as a reference to build file geodatabases with the correct schema. Use of this toolbox on other data formats or schemas will likely fail and is not recommended.

To run any of the QAQC models simply navigate to the  **NWI\_QAQC\_Tool** toolbox in ArcCatalog, which is in the NWI\_QAQC\_Tool folder, open the toolbox, open either the  **Complete\_QAQC** toolset or the  **Individual\_Checks** toolset and double-click on any of the models. A window will appear similar to the one below, which will allow the user to select input data and provides a description of the tool on the right pane, if the  button is selected. Click the browse button  next to the Geodatabase text box and browse to the Wetlands file geodatabase you want to conduct verification on, identify the mapping area you are working in, then press 'Ok'. Some models also require the entry of your name in the 'Verified\_By' text box and provide a check box which allows you want to save the results. Each verification check can be run individually to address specific types of errors by using the models in the Individual\_Checks Toolset or all the verification checks can be run at once using the All\_QAQC\_Checks model.



**Example of a model user interface.**

## **Explanations of the Verification Models**

### ***All QAQC Checks***

This model performs complete data verification. It includes the QAQC Code Reset, Incorrect Wetland Codes, Adjacent Wetlands, Sliver Wetlands, Sliver Uplands, Lake and Pond Size, Overlapping Wetlands, Wetland Type Calculation, and QAQC Summary models. Detailed descriptions of these models are explained below.

### ***QAQC Code Reset***

This model calculates the QAQC\_Code = 'NNNNN'. This erases all recorded errors in the dataset and properly attributes the field for use by all other models.

### ***Incorrect Wetland Codes***

This model identifies wetland polygons with incorrect wetland codes, or null or blank values in the 'attribute' field. It also identifies those wetland codes that have been replaced by a wetland code synonym. Bad wetland code and wetland code synonym summary tables are created and stored with your wetlands file geodatabase. The model changes the first character of QAQC\_Code = 'C' if the wetland code is bad or 'R' if the wetland code should be replaced with a different code.

Note: The Bad\_Attribute\_Summary and Attribute\_Synonym\_Summary tables include 'Comments' fields which allow the user to provide justification of a flagged bad wetland attribute for potential inclusion in the accepted wetlands code list. There may be instances of valid codes, identified in the wetland code diagrams and the data collection requirements and procedures documentation that have not yet been included in accepted codes list used in this tool. Comments in the summary tables are overwritten each time the verification tool is run, unless the **'Save Results'** box is checked.

### ***Adjacent Wetlands***

This model identifies wetland polygons that are adjacent to other wetland polygons with the same 'attribute' and changes the second character of QAQC\_Code = 'A'. Adjacent wetlands with the same attribute are not allowed and need to be corrected.

### ***Sliver Wetlands***

This model identifies wetland polygons less than 0.01 acres and changes the third character of QAQC\_Code = 'S'. These wetland features exceed the minimum

mapping standard for wetlands and should be reviewed. Actual wetland features flagged as sliver wetlands can be justified as correct in the comments field of the QAQC\_Summary table. These comments will only be saved if the 'Save Results' box is checked prior to running the All\_QAQC\_Checks model.

### ***Sliver Uplands***

This model identifies upland islands or holes in wetlands that are less than 0.01 acres. These may be actual upland features but are identified as errors as they are typically errors in wetland delineation. The model changes the fourth character of QAQC\_Code = 'U', in wetland polygons adjacent to the upland sliver. The sliver upland polygons are stored in your wetlands file geodatabase to assist in locating these small geographic features for review.

### ***Lake and Pond Size***

This model identifies Lakes that are less than 20 acres in size and Ponds that are greater or equal to 20 acres in size. It changes the fifth character of QAQC\_Code = 'L' for small lakes or 'P' for large ponds. These may or may not be errors and can be justified based on water depth of the identified waterbody or small lake portions on the edge of the mapping project area. Comments can be added to the 'comments' field of the QAQC\_Summary table for those wetland features flagged that are valid based on depth requirements outlined in the wetlands mapping standards.

### ***Overlapping Wetlands***

This model identifies overlapping wetland polygons and changes the sixth character of QAQC\_Code = 'O'. The overlapping portions of these polygons are stored in your wetlands file geodatabase as an Overlapping\_Polygons feature class to assist in locating these features. This model does **not** validate topology of the wetlands file geodatabase. The CONUS\_wet\_poly\_Topology layer in your wetlands file geodatabase can be validated using the topology toolbar in ArcMap and also to view the errors. This model and the wet\_poly\_topology identify the same errors and either can be used. Overlapping wetland features are not allowed in the dataset.

### ***Wetland Type Calculation***

This model calculates the 'wetland\_type' field based on the wetland code in the 'attribute' field. The 'wetland\_type' field provides a general description of the wetland and is used in the cartographic representation of the different wetland types on the Wetlands Mapper.

## QAQC Summary

This model summarizes the QAQC\_CODE field into a 'QAQC\_Summary' table in your wetlands file geodatabase. It also describes each error type and records who conducted the verification and when the verification was run. Comments can be added to the 'comments' field of the QAQC\_Summary table to justify specific types of errors. These comments will only be saved if the 'Save Results' box is checked prior to running the All\_QAQC\_Checks model.

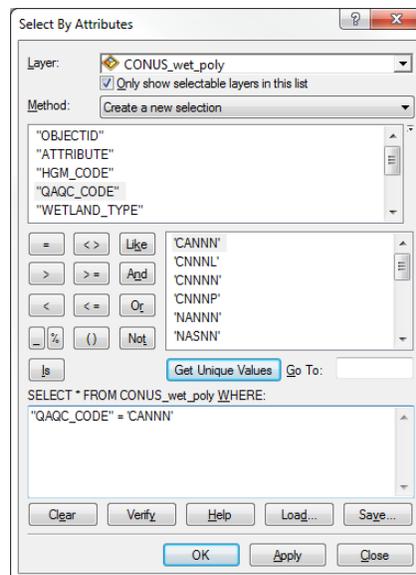
## Reviewing Verification Errors

To find specific instances of an error in ArcMap sort the attribute table by QAQC\_CODE and double-click the gray box associated with a given record on the far left side of the table. This will zoom the ArcMap display to that polygon.

Table

OBJECTID *	ATTRIBUTE *	HGM_CODE	QAQC_CODE	WETLAND_TYPE	ACRES
4377005	PEMKCH	<Null>	CANNN	Freshwater Emergent Wetland	2.006889
14410363	PEMKCH	<Null>	CANNN	Freshwater Emergent Wetland	0.953021
4125560	L2UBHH	<Null>	CNNNL	Lake	17.561729

The 'Select by Attribute' function in ArcMap can also be used to select all records of a defined QAQC\_CODE value. Example below:



To cartographically view the errors create symbology rules on the CONUS\_wet\_poly feature class using the QAQC\_CODE field. (e.g QAQC\_CODE = 'NNNNN' symbolize green, all other values symbolize red).

For further information, assistance or questions contact: Wetlands\_Team@fws.gov