GEORGIA WETLANDS TOOL

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GEORGIA TECH CENTER FOR GIS

OUTLINE

- Project History
- Overview of NWI Data
- 2000 Georgia Basemap Wetlands Toolkit
- Overview of NWI+ Data
- 2013 Georgia Wetlands Toolkit

PROJECT TIMELINE

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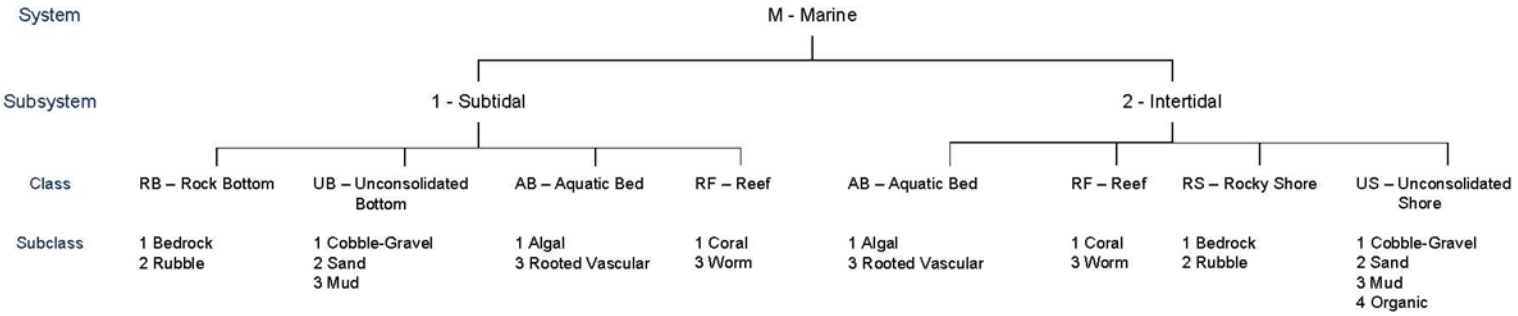
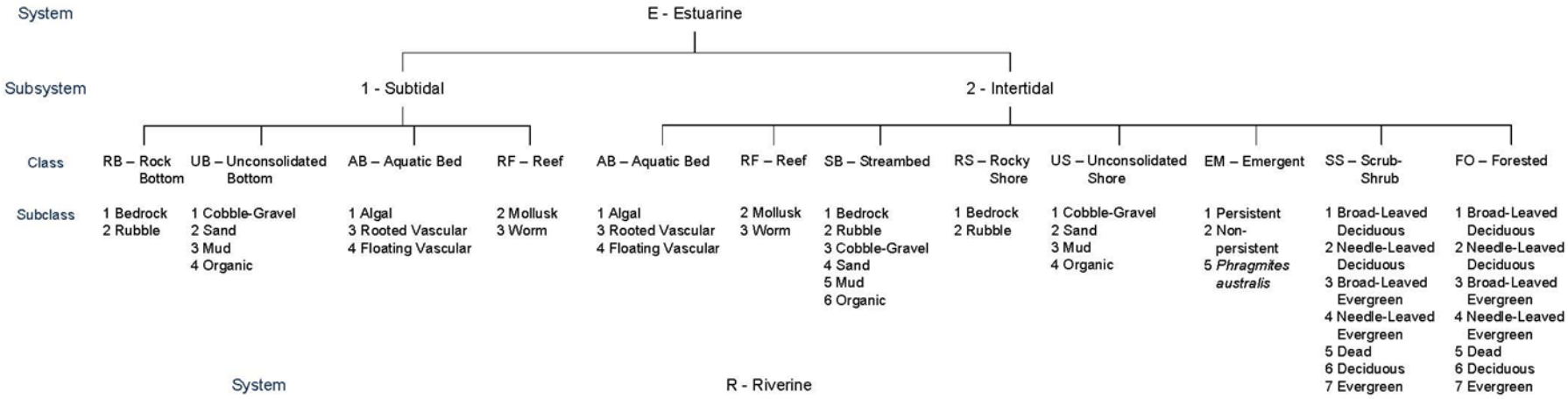
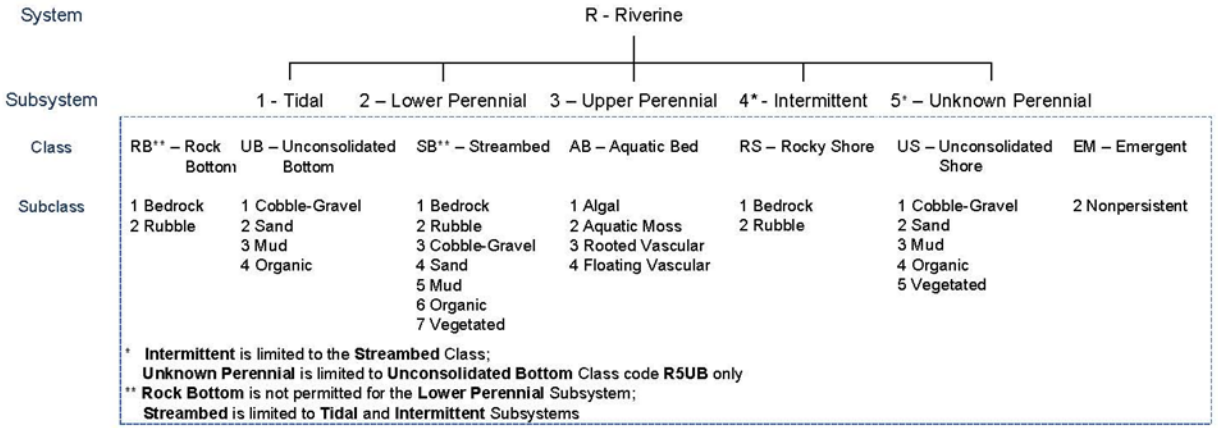
WETLANDS AND DEEPWATER HABITATS CLASSIFICATION







Classification of Wetlands and Deepwater Habitats of the United States, Cowardin *et al.* 1979

DECODING NWI DATA

HTTP://WWW.FWS.GOV/WETLANDS/DATA/WETLAND-CODES.HTML

U.S. Fish & Wildlife Service

National Wetlands Inventory

Ecological Services

Search NWI Website

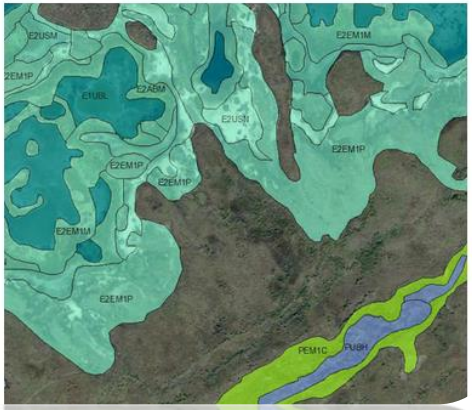
Home | Wetlands Data | Status and Trends | Wetlands Layer | Other Topics | National Wetlands Inventory | Contact Information

Wetland Classification Codes

The wetland classification codes are a series of letter and number codes that have been developed to adapt the national wetland classification system to map form. These alpha-numeric codes correspond to the classification nomenclature that best describes the habitat. (for example, PFO1A)

The Wetland Code Interpreter is a tool that will instantly provide the detailed habitat descriptions for an area represented by the wetland classification code. Enter a wetland area's code into the interpreter and obtain the classification of that wetland area as defined in *Cowardin et al (1979)*.

Click here to open the Wetland Code Interpreter (pop-up window)



Important Documents

- Wetlands and Deepwater Habitats Classification Hierarchy - Wetland Code chart (PDF) shows relationship of wetland systems (ex: estuarine), subsystems (ex: intertidal), and classes (ex: emergent wetland).
- National Wetlands Classification Standard - The codes of wetland habitat types use the classification system in this Service publication: Classification of Wetlands and Deepwater Habitats of the United States (17MB PDF), 1979, by *Cowardin, Lewis M. et al.* Click here to view the HTML version of this document.
- With the adoption of new Federal Wetlands Mapping Standards, the USFWS has developed an important companion document that describes the technical procedures and requirements for wetlands map data. The document entitled "Data Collection Requirements and Procedures for Mapping Wetland, Deepwater and Related Habitats of the United States" (1.8MB PDF) is intended to aid organizations or individuals mapping wetlands and applying the Cowardin *et al.* classification system.
- Wetlands and Deepwater Habitats Mapping Codes table (PDF)

Wetlands Code Interpreter - Google Chrome

107.20.228.18/decoders/wetlands.aspx

U.S. Fish & Wildlife Service

National Wetlands Inventory

Enter Classification code: (Example: **L1UB1Hx**)

For geographically specific information* (optional), please enter a State code: (Ex

DECODE

Description for code **PFO1C** :

P System **PALUSTRINE**: The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, emergents, mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean derived salts is below 0.5 ppt. Wetlands lacking such vegetation are also included if they exhibit all of the following characteristics: 1. are less than 8 hectares (20 acres); 2. do not have an active wave-formed or bedrock shoreline feature; 3. have at low water a depth less than 2 meters (6.6 feet) in the deepest part of the basin; 4. have a salinity due to ocean-derived salts of less than 0.5 ppt.

Subsystem :

FO Class **FORESTED**: Characterized by woody vegetation that is 6 m tall or taller.

1 Subclass **Broad-Leaved Deciduous**: Woody angiosperms (trees or shrubs) with relatively wide, flat leaves that are shed during the cold or dry season; e.g., black ash (Fraxinus nigra).

Modifier(s):

C WATER REGIME **Seasonally Flooded**: Surface water is present for

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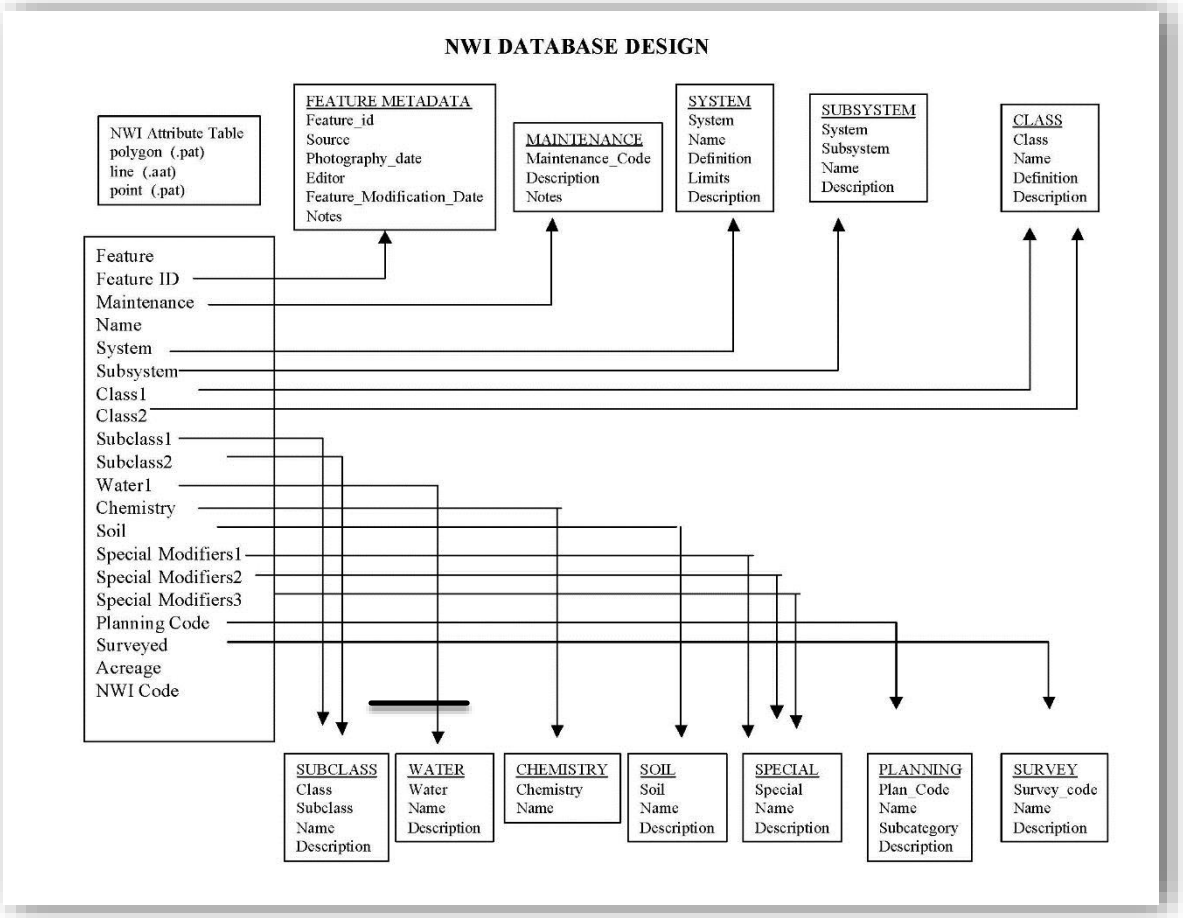
UPDATED GA NWI SCHEMA



Open Water

Non-Forested Emergent

Scrub/Shrub

Forested

Altered

Georgia Planning Wetlands

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PARSED NWI DATA FOR GEORGIA

ARCINFO AML

Attributes of Wet.shp

Nwi_code	System	Subsystem	Class1	Class2	Subclass1	Subclass2	Water1	Chem	Soil	Special1	Special2	Special3	Survey	Plan_code	Acreage
PFO1A	P	0	FO		1	0	A								0
PFO4B	P	0	FO		4	0	B								0
PUBHx	P	0	UB		0	0	H			x					0
PFO1A	P	0	FO		1	0	A								0
PFO4B	P	0	FO		4	0	B								0
PUBHh	P	0	UB		0	0	H			h					0
PSS1Ah	P	0	SS		1	0	A			h					0
PUBHh	P	0	UB		0	0	H			h					0
PFO4/1A	P	0	FO		4	1	A								0
PFO1A	P	0	FO		1	0	A								0
PEM1Ch	P	0	EM		1	0	C			h					0
PFO6Fh	P	0	FO		6	0	F			h					0
PFO1A	P	0	FO		1	0	A								0
PFO1/4A	P	0	FO		1	4	A								0
PFO1/4A	P	0	FO		1	4	A								0
PFO1Ch	P	0	FO		1	0	C			h					0
PFO1C	P	0	FO		1	0	C								0
PFO1/4B	P	0	FO		1	4	B								0
PFO6Ch	P	0	FO		6	0	C			h					0
PFO1/2C	P	0	FO		1	2	C								0
PFO1A	P	0	FO		1	0	A								0
PFO1A	P	0	FO		1	0	A								0
PUBHh	P	0	UB		0	0	H			h					0
PUBHh	P	0	UB		0	0	H			h					0
PUBHh	P	0	UB		0	0	H			h					0
PFO4/1A	P	0	FO		4	1	A								0
PFO1A	P	0	FO		1	0	A								0

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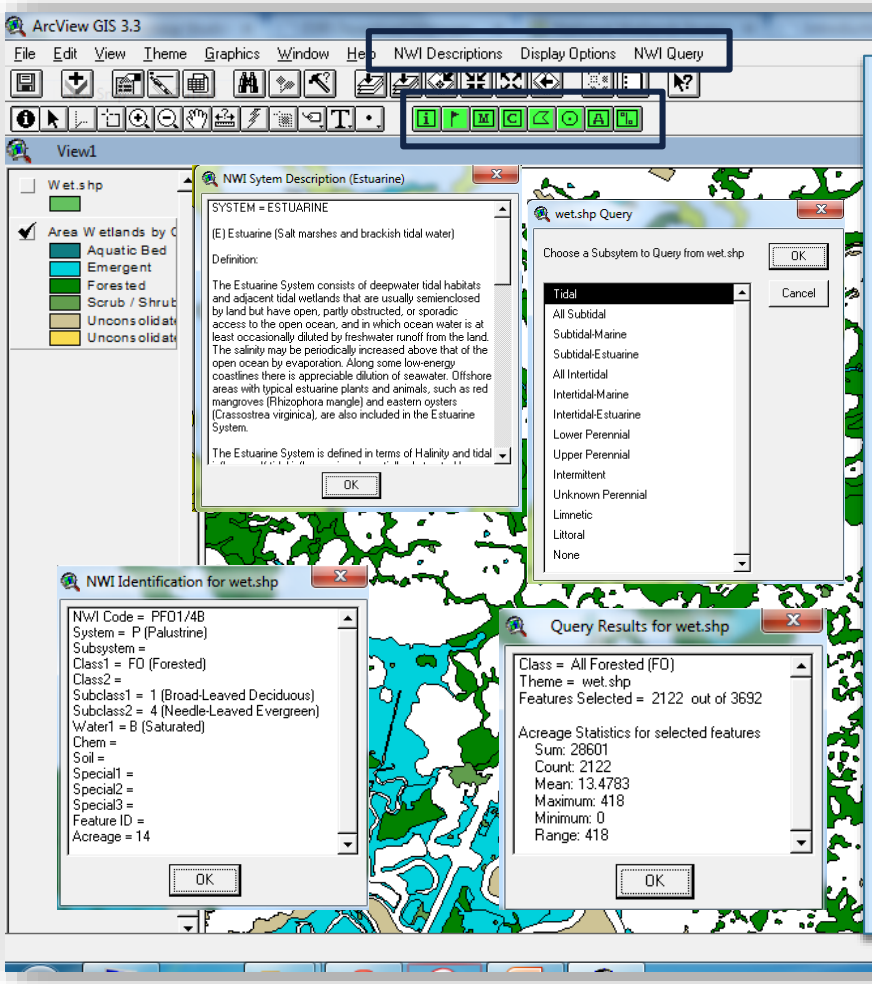
GEORGIA BASEMAP WETLANDS TOOLKIT

ARCVIEW 3X EXTENSION



- New Menus
  - NWI code descriptions
  - Automated symbolization based on attribute
  - “Canned” queries with reports
- New Buttons
  - Enhanced Identify
  - Select and Export
  - Quick Map
  - Clip to Poly, Circle, or other theme
  - Calculate and Report Acreage
  - Percent Calculator

GEORGIA BASEMAP WETLANDS TOOLKIT

ARCVIEW 3X EXTENSION AVAILABLE AT ESRI.COM/ARCSCRIPTS

You are here: > ArcScripts > Search Results

Search ArcScripts

Use the following options to customize your search:

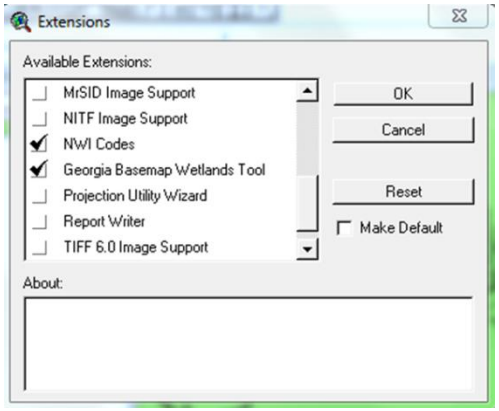
All languages

All ESRI software

10 Results per page Show script summaries

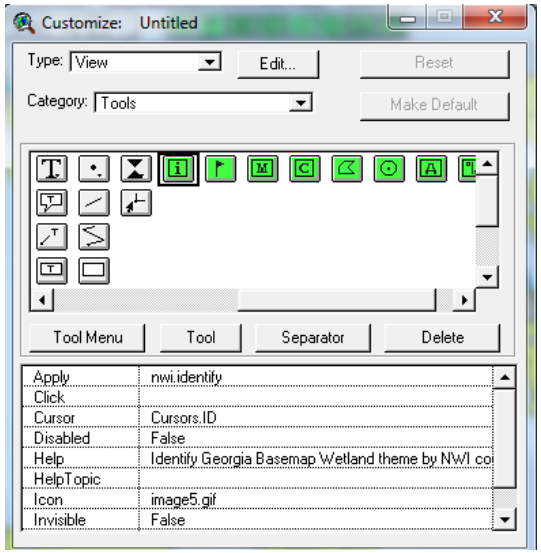
Search for tony search

Tips



Scripts for: All languages AND All ESRI software AND tony
scripts **1-10** of **61**

Resort by Title	Software	Language	Author	Modified	Downloads
Extract Street Name/Type Calculation	ArcGIS Desktop	VBScript	Tony Contreras	Dec 14 2007	195
Area tools	ArcGIS Desktop	Visual Basic	Tony Giarrusso	Jun 17 2004	5539
Georgia Wetlands Tool (ArcGIS)	ArcGIS Desktop	Visual Basic	Tony Giarrusso	Jun 16 2004	671
NWI Codes	ArcView GIS	Avenue	Tony Giarrusso	Sep 13 2001	517
Area tools	ArcView GIS	Avenue	Tony Giarrusso	Jul 19 2002	12116
Georgia Wetlands Tool	ArcView GIS	Avenue	Tony Giarrusso	May 29 2003	430



Avenue

```
'Delete a Color Ramp
elseif (Option = "Delete a Color Ramp") then
  ramps = ODB.Open("$AVHOME/etc/gc_ramps.odb".As
  rampNames = {}
  clrRamps = {}
  for each r in (0..(ramps.Count - 1))
    rampNames.Add(ramps.Get(r).GetName)
    clrRamps.Add(ramps.Get(r))
  end
  toDelete = Msgbox.ChoiceAsString(rampNames,"Wh
  if (toDelete = nil) then exit end
  ramps.commit
```

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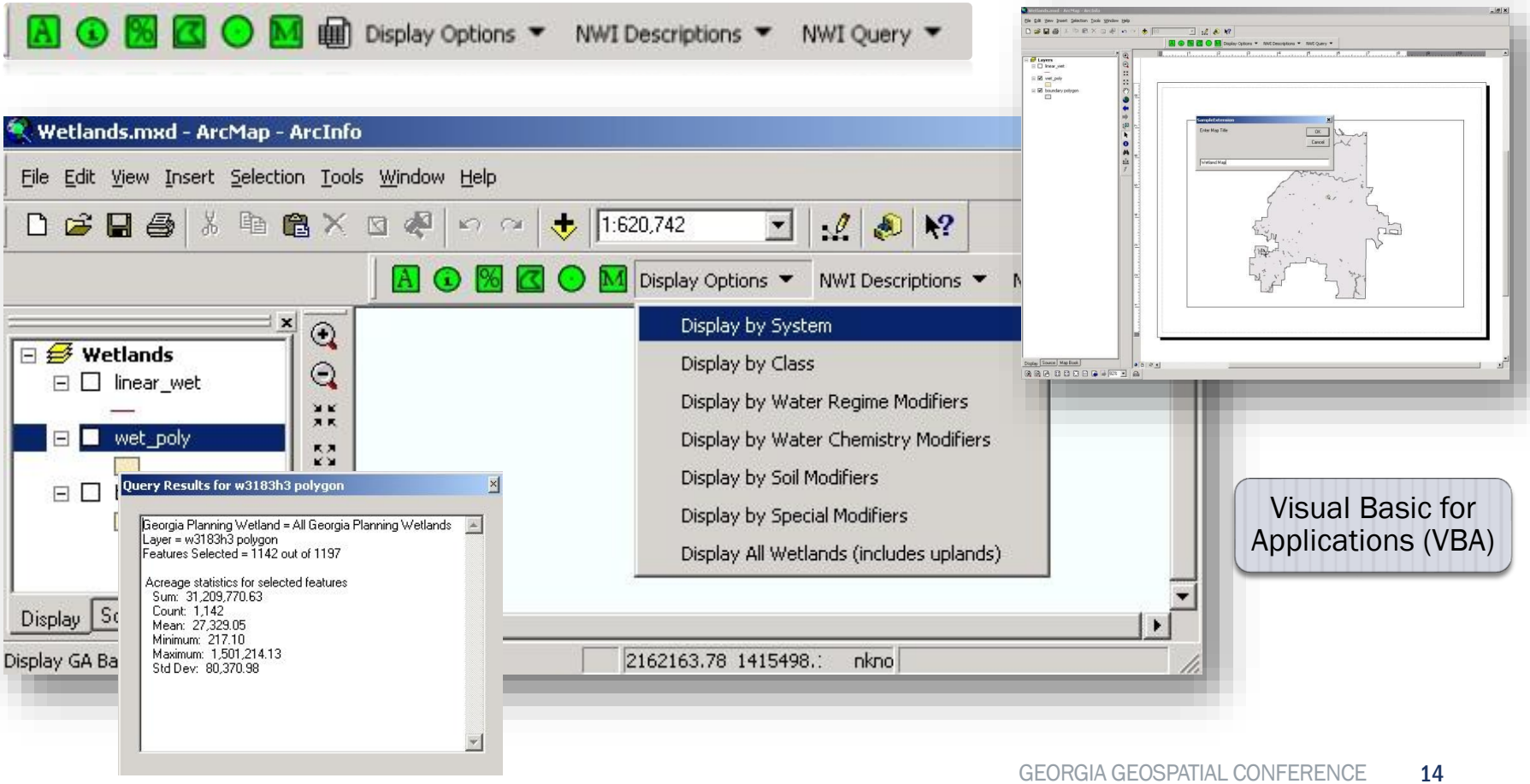

Visual Basic for Applications (VBA)

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NWI+ DATA

LLWW CODE

- 1997 FWS (Tiner) develops set of abiotic descriptors as sets of dichotomous keys
- New wetland code based on Cowardin classification
- More complete description of wetlands
- Predict functions and estimate capacity of functions

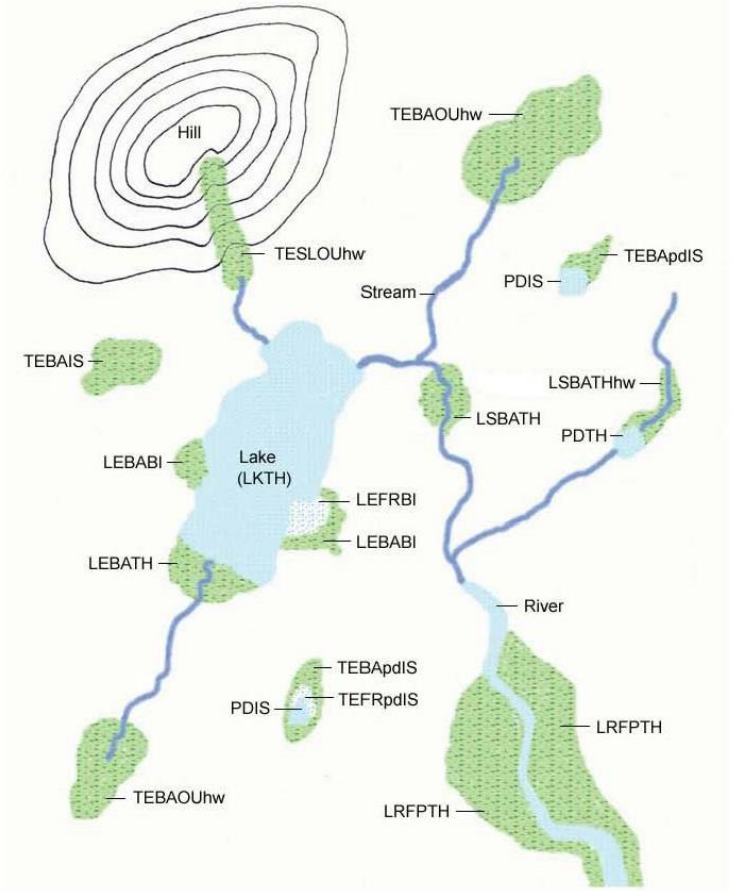

Figure 1. Examples of application of LLWW descriptors to nontidal wetlands. Coding: Landscape position – LE – Lentic, TE – Terrene, LR – Lotic River, LS – Lotic Stream; Landform – BA – Basin, FP – Floodplain, FR – Fringe, SL – Slope; Water Flow Path – BI – Bidirectional-nontidal, IS – Isolated, OU – Outflow, TH – Throughflow; Other descriptors: PD – Pond, LK – Lake, hw – headwater, and pd – pond-bordering wetland. Note: If desired, ponds and lakes can be further classified with landscape position resulting in codes of TEPDIS for the isolated ponds and LSLKTH for the lake shown in this figure.

NWI+ DATA

LLWW CODE DESCRIPTIONS AND DICHOTOMOUS KEYS

Simplified Keys for Classifying Tidal and Nontidal Wetlands byLandscape Position (Adapted from Tiner 2003)

1. Wetland borders a river, stream, lake, reservoir, in-stream pond, estuary, or ocean.....2
1. Wetland does not border one of these waterbodies; it is surrounded by upland or borders a pond that is surrounded by upland.....Terrene
2. Wetland lies along an ocean shore and is subject to tidal flooding.....Marine
2. Wetland does not lie along an ocean shore or if oceanside, it is not subject to tidal flooding.....3
3. Wetland lies along an estuary (salt-brackish waters) and is subject to tidal flooding.....Estuarine
3. Wetland does not lie along an estuary or if along the estuary, it is not subject to tidal flooding.....4
4. Wetland lies along a lake or reservoir or within its basin (i.e., the relatively flat plain contiguous to the lake or reservoir).....Lentic
4. Wetland lies along a river or stream, or in-stream pond, or borders a marine or estuarine wetland or associated waters but is not flooded by tides (except episodically).....5
5. Wetland is associated with a river or stream.....6
5. Wetland is not associated with a river or stream; it is a freshwater nontidal wetland bordering a marine or estuarine wetland or associated waters.....Terrene
6. Wetland is the source of a river or stream and this watercourse does not flow through the wetland.....Terrene
6. A river or stream flows through or alongside the wetland.....7
7. Wetland is periodically flooded by river or stream.....Lotic
7. Wetland is not periodically flooded by the river or stream.....Terrene

NWI+ DATA

LLWW COMES PARSED!!!

NWI Code	LLWW Code	Landscape	Lp_type	Landform	Land_mod	Water_flow	Modifier	Waterbody	Water_type	Water_mod	Wb_flow	Other_mod
PFO1C	LSBATAdr	LS		BA		TA	dr					
PSS1F	LSBATH	LS		BA		TH						
PFO1C	LSBATAdr	LS		BA		TA	dr					
PFO1B	TEFLOUhw	TE		FL		OU	hw					
PFO1C	LSBATH	LS		BA		TH						
PFO4/1A	LSFLTH	LS		FL		TH						
PFO4/1A	LSFLTHhw	LS		FL		TH	hw					
PSS1/FO1Ad	LSFLTAdr	LS		FL		TA	dr					
PSS1C	LSBATH	LS		BA		TH						
PFO1C	TEBAIS	TE		BA		IS						
PFO1C	LSBATH	LS		BA		TH						
PEM1A	LSFLTH	LS		FL		TH						
PFO1C	LSBATH	LS		BA		TH						
PFO1Ad	LSFLTAdr	LS		FL		TA	dr					
PFO1/4C	TEBAOU	TE		BA		OU						
PFO1B	LR5FPflBT	LR	5	FP	fl	BT						
PFO1C	TEBAOUhw	TE		BA		OU	hw					
PFO1C	LSBATAdr	LS		BA		TA	dr					
PFO4/1A	LSFLTH	LS		FL		TH						
PFO1C	TEBAIS	TE		BA		IS						
PEM1B	TEFLIS	TE		FL		IS						
PEM1C	LSBATH	LS		BA		TH						
PFO1F	TEBAOUds	TE		BA		OU			ds			
PFO1B	TEFLOU	TE		FL		OU						
PFO1R	LR5FPbaBT	LR	5	FP	ba	BT						
PFO1B	TEFLOU	TE		FL		OU						
PFO1B	TEFLOUhw	TE		FL		OU	hw					
PFO1B	TEFLIS	TE		FL		IS						
PFO1/4B	TEFLIS	TE		FL		IS						

NWI+ DATA

WETLAND FUNCTIONAL ASSESSMENTS

Surf_water	Coast_stor	Stream_mai	Nutrit_tra	Carbon_seq	Sed_part_	Bank_shore	Prov_fish_	Prov_whow	Prov_other	Prov_hab_u
HIGH			HIGH	HIGH	HIGH	HIGH			HIGH	
HIGH		MOD	HIGH	HIGH	HIGH	HIGH		MOD	HIGH	
HIGH			HIGH	HIGH	HIGH	HIGH			MOD	
MOD		HIGH	MOD	MOD					MOD	
HIGH		MOD	HIGH	HIGH	HIGH	HIGH			HIGH	
MOD			MOD	MOD	MOD	HIGH			HIGH	
MOD		HIGH	MOD	MOD	MOD	HIGH			HIGH	
MOD			MOD	MOD	MOD	HIGH			HIGH	
HIGH		MOD	HIGH	HIGH	HIGH	HIGH			HIGH	
MOD			HIGH	HIGH	MOD				MOD	
HIGH		MOD	HIGH	HIGH	HIGH	HIGH			HIGH	
MOD			MOD	MOD	MOD	HIGH			HIGH	
HIGH		MOD	HIGH	HIGH	HIGH	HIGH			HIGH	
MOD			MOD	MOD	MOD	HIGH			HIGH	
MOD			HIGH	HIGH	MOD				HIGH	
	HIGH		MOD	MOD		HIGH			MOD	
MOD		HIGH	HIGH	HIGH	MOD				MOD	
HIGH			HIGH	HIGH	HIGH	HIGH			HIGH	
MOD			MOD	MOD	MOD	HIGH			HIGH	
MOD			HIGH	HIGH	MOD				MOD	
MOD			MOD	MOD					MOD	
HIGH		MOD	HIGH	HIGH	HIGH	HIGH			HIGH	
MOD		MOD	HIGH	HIGH	MOD			MOD	HIGH	

NWI+ DATA

COASTAL GEORGIA 2010

Table 1. Areas where the Service created a NWIPlus database and where functions have been analyzed or are planned for analysis. (* - functional assessment planned for 2011.)

State	Project Area	Approximate Area (square miles)
Alaska	Anchorage C7 quadrangle*	232
California	Ventura River watershed	232
Connecticut	entire state (planned)*	4,900
Delaware	entire state*	1,900
	Nanticoke watershed	490
Maine	Casco Bay	1,216
Maryland	Coastal Bays watershed	296
	Nanticoke watershed	323
Massachusetts	Boston Harbor and vicinity	232
	Cape Cod and the Islands	665
Minnesota	Fond du Lac reservation*	158
Mississippi	Coastal zone*	1,450
New Jersey	entire state*	7,500
	Hackensack River watershed	197
New York	Greater Buffalo area*	1,200
	Catherine Creek watershed	100
	Catskill watershed	571
	Croton watershed	391
	Cumberland Bay watershed	55
	Delaware River watershed	1,013
	Hackensack River watershed	197
	Hudson River-Snook Kill watershed	254
	Peconic River watershed	92
	Post Creek-Sing Sing Creek watershed	59
	Salmon River-So. Sandy Creek watershed	117
	Sodus Creek watershed	54
	Sodus Bay-Wolcott Creek watershed	65
	Sucker Brook-Grass River watershed	124
	Upper Tioughnioga River watershed	270
	Upper Wappinger Creek watershed	136
	Long Island*	1,400
Pennsylvania	Delaware River and Lake Erie coastal zones	113
Rhode Island	entire state*	1,100
South Carolina	Horry and Jasper Counties*	3,100
Texas	Corpus Christi area*	1,900
Vermont	Southern part of state*	580
Wyoming	Shirley Basin*	290

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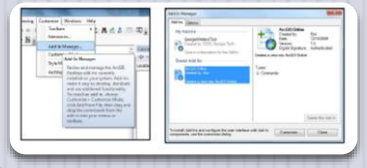
2013 GEORGIA WETLANDS TOOLKIT

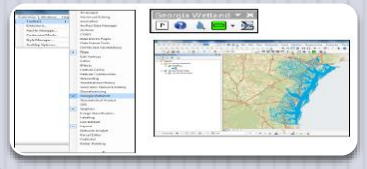
ESRI ADD-IN FOR ARCGIS DESKTOP 10X

PF01C	LSBATH
PF04/1A	LSFLTH
PF04/1A	LSFLTHhw
PSS1/F01Ad	LSFLTAdr
PSS1C	LSBATH
PF01C	TEBAIS
PF01C	LSBATH
PEM1A	LSFLTH
PF01C	LSBATH

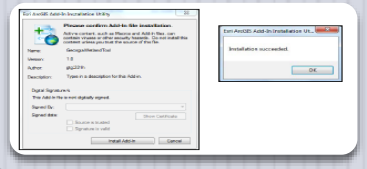
Help users understand, process and analyze Georgia NWI and NWI+ data



Update of 2000 Toolkit, includes new tools



Developed in Visual Studio 2010



Easy to install and use

2013 GEORGIA WETLANDS TOOLKIT

TOOLBAR

NWI Parser

Code Descriptions

Symbolize

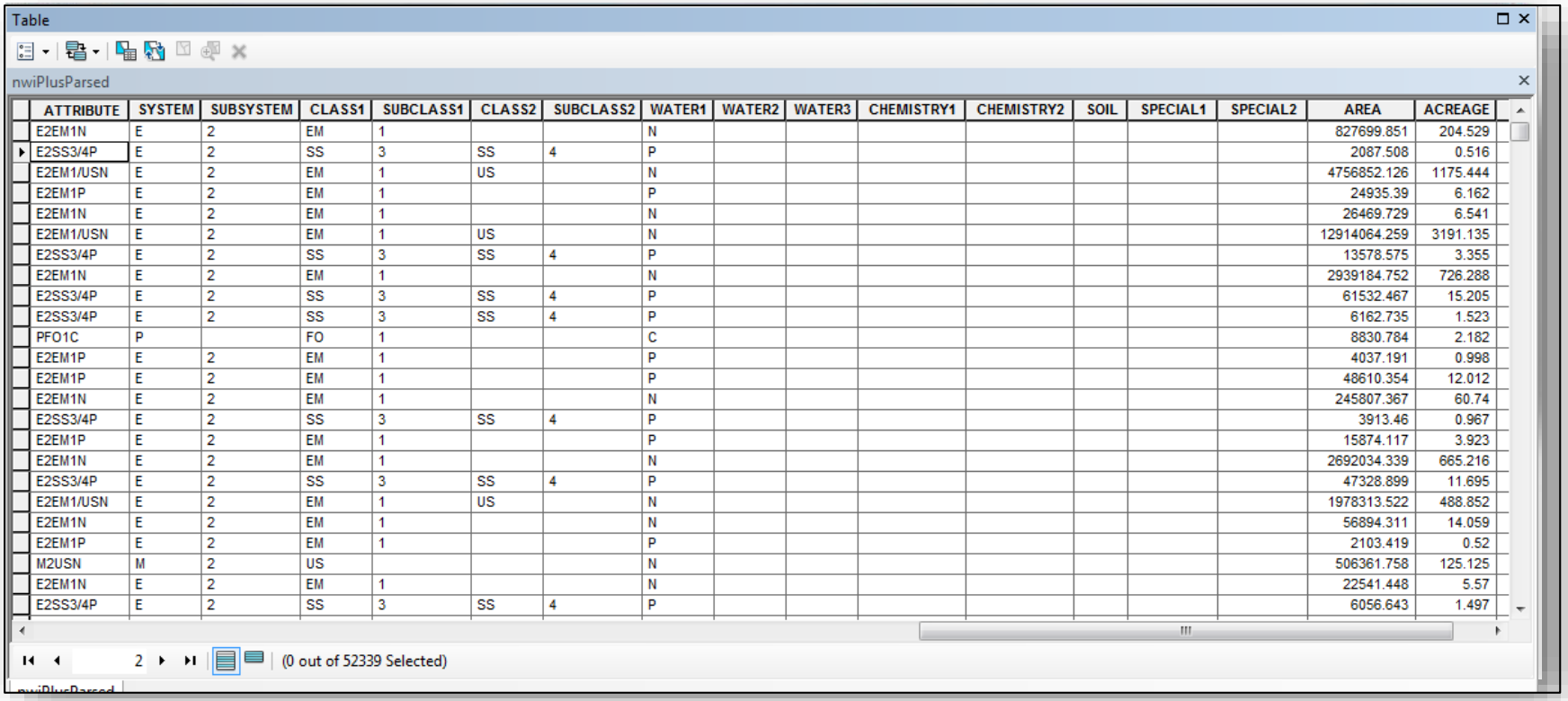
Clip

Query

2013 GEORGIA WETLANDS TOOLKIT

NWI PARSER

- Python script based on original AML splits existing NWI wetland code (Cowardin) into component parts - -works with any NWI data downloaded from FWS (theoretically)
- Developed by Photoscience (Brad Weigle – original project)



Table

nwiPlusParsed

ATTRIBUTE	SYSTEM	SUBSYSTEM	CLASS1	SUBCLASS1	CLASS2	SUBCLASS2	WATER1	WATER2	WATER3	CHEMISTRY1	CHEMISTRY2	SOIL	SPECIAL1	SPECIAL2	AREA	ACREAGE
E2EM1N	E	2	EM	1			N								827699.851	204.529
E2SS3/4P	E	2	SS	3	SS	4	P								2087.508	0.516
E2EM1/USN	E	2	EM	1	US		N								4756852.126	1175.444
E2EM1P	E	2	EM	1			P								24935.39	6.162
E2EM1N	E	2	EM	1			N								26469.729	6.541
E2EM1/USN	E	2	EM	1	US		N								12914064.259	3191.135
E2SS3/4P	E	2	SS	3	SS	4	P								13578.575	3.355
E2EM1N	E	2	EM	1			N								2939184.752	726.288
E2SS3/4P	E	2	SS	3	SS	4	P								61532.467	15.205
E2SS3/4P	E	2	SS	3	SS	4	P								6162.735	1.523
PFO1C	P		FO	1			C								8830.784	2.182
E2EM1P	E	2	EM	1			P								4037.191	0.998
E2EM1P	E	2	EM	1			P								48610.354	12.012
E2EM1N	E	2	EM	1			N								245807.367	60.74
E2SS3/4P	E	2	SS	3	SS	4	P								3913.46	0.967
E2EM1P	E	2	EM	1			P								15874.117	3.923
E2EM1N	E	2	EM	1			N								2692034.339	665.216
E2SS3/4P	E	2	SS	3	SS	4	P								47328.899	11.695
E2EM1/USN	E	2	EM	1	US		N								1978313.522	488.852
E2EM1N	E	2	EM	1			N								56894.311	14.059
E2EM1P	E	2	EM	1			P								2103.419	0.52
M2USN	M	2	US				N								506361.758	125.125
E2EM1N	E	2	EM	1			N								22541.448	5.57
E2SS3/4P	E	2	SS	3	SS	4	P								6056.643	1.497

2 (0 out of 52339 Selected)

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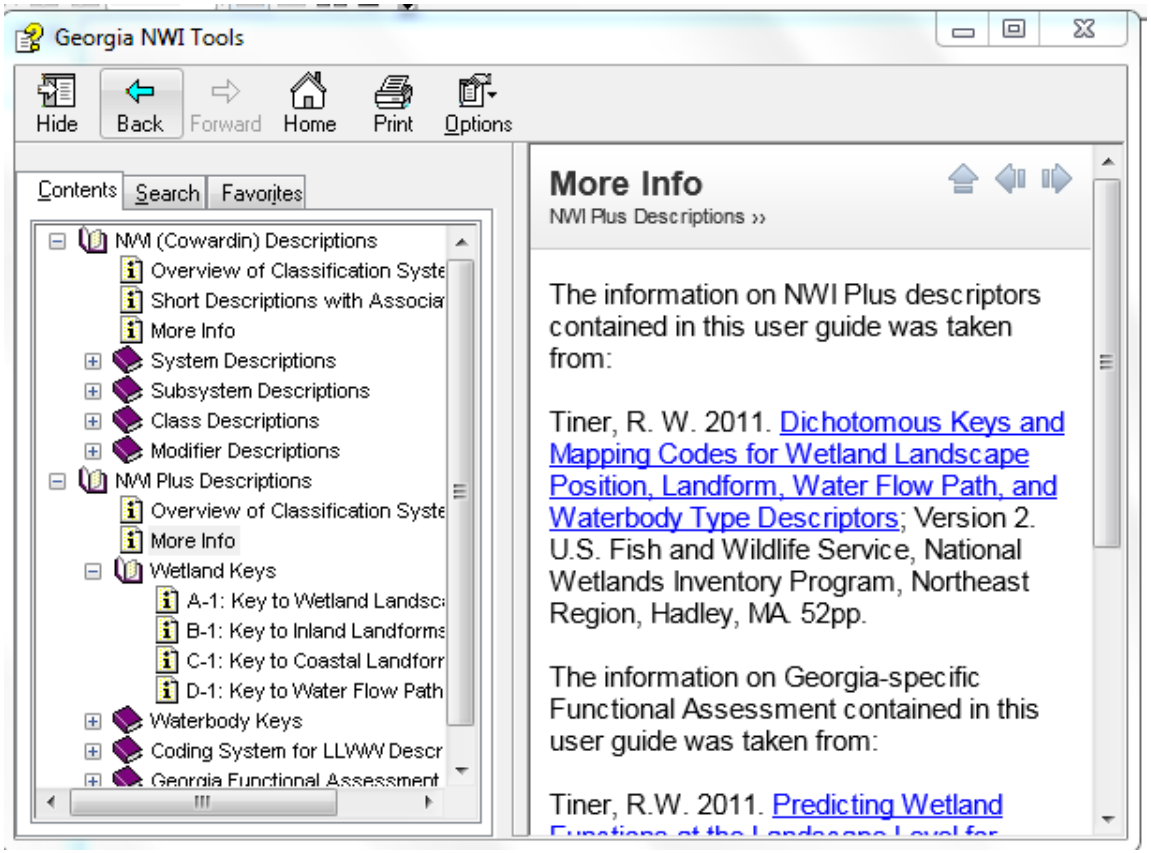
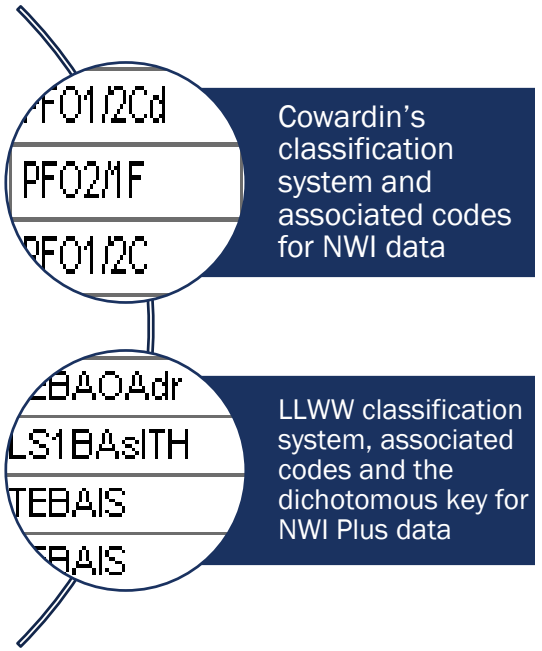
CODE DESCRIPTIONS





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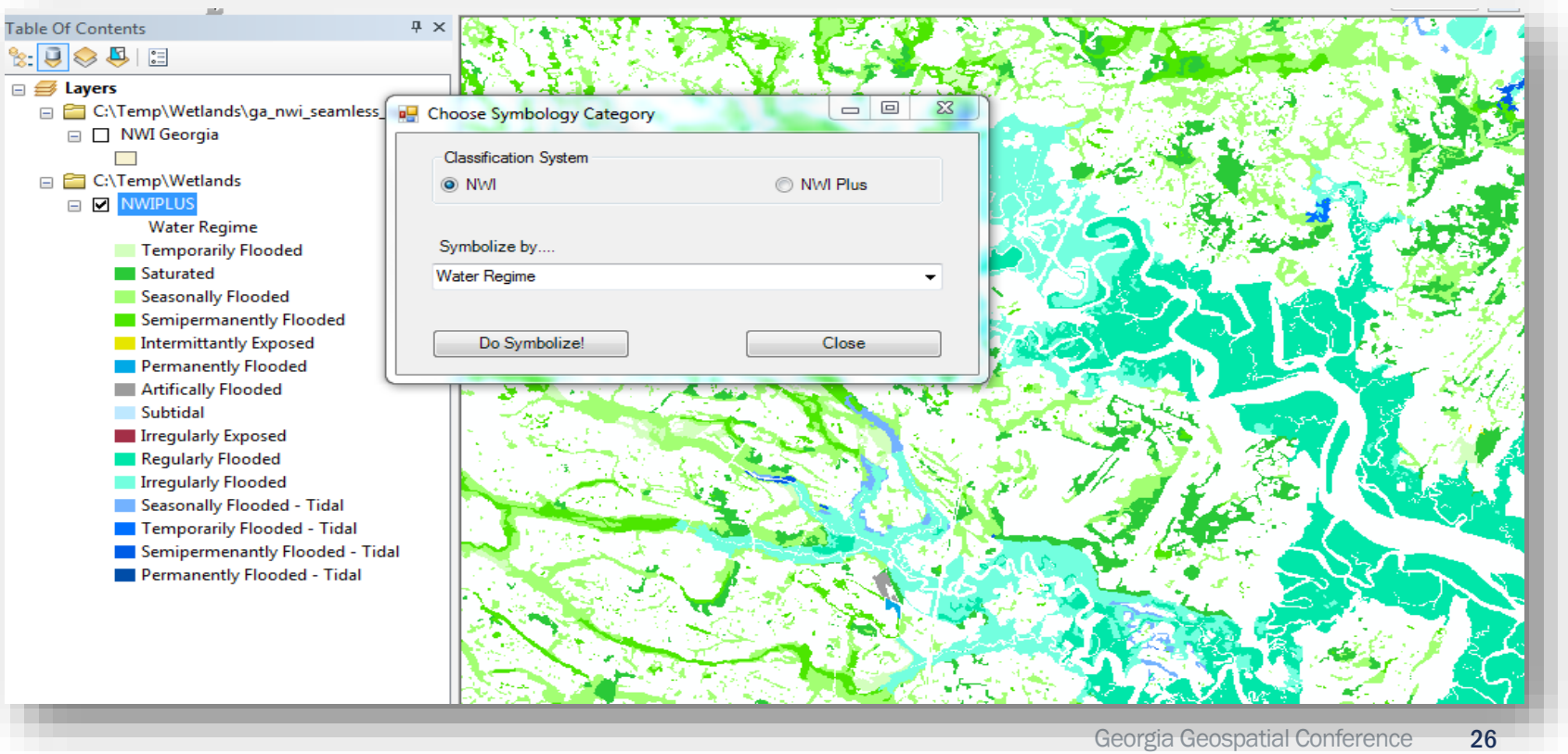
SYMBOLIZE

- Provides users with pre-formatted symbology for the majority of classification levels of NWI and NWI+ data (non-standardized)



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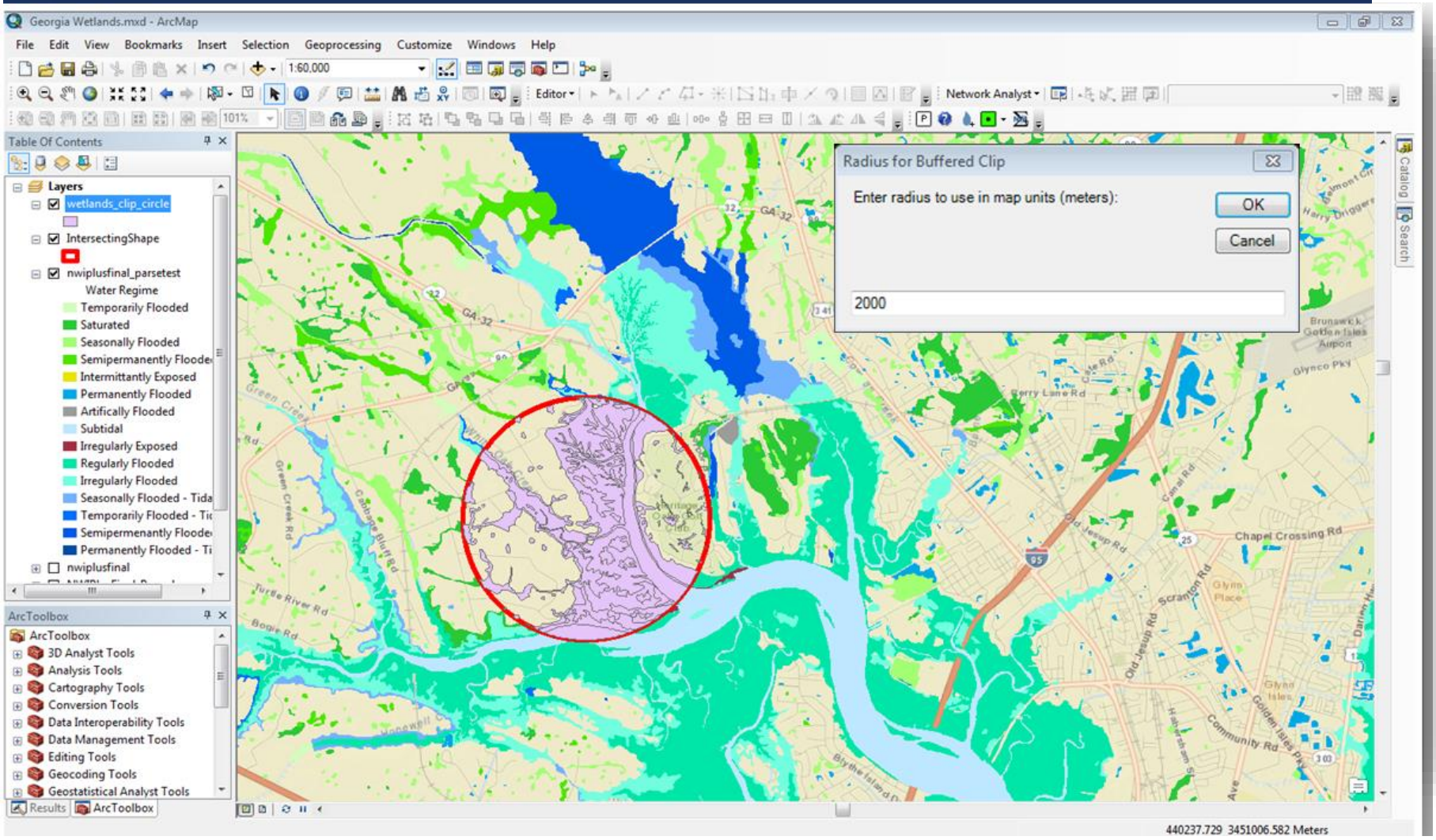
CLIP



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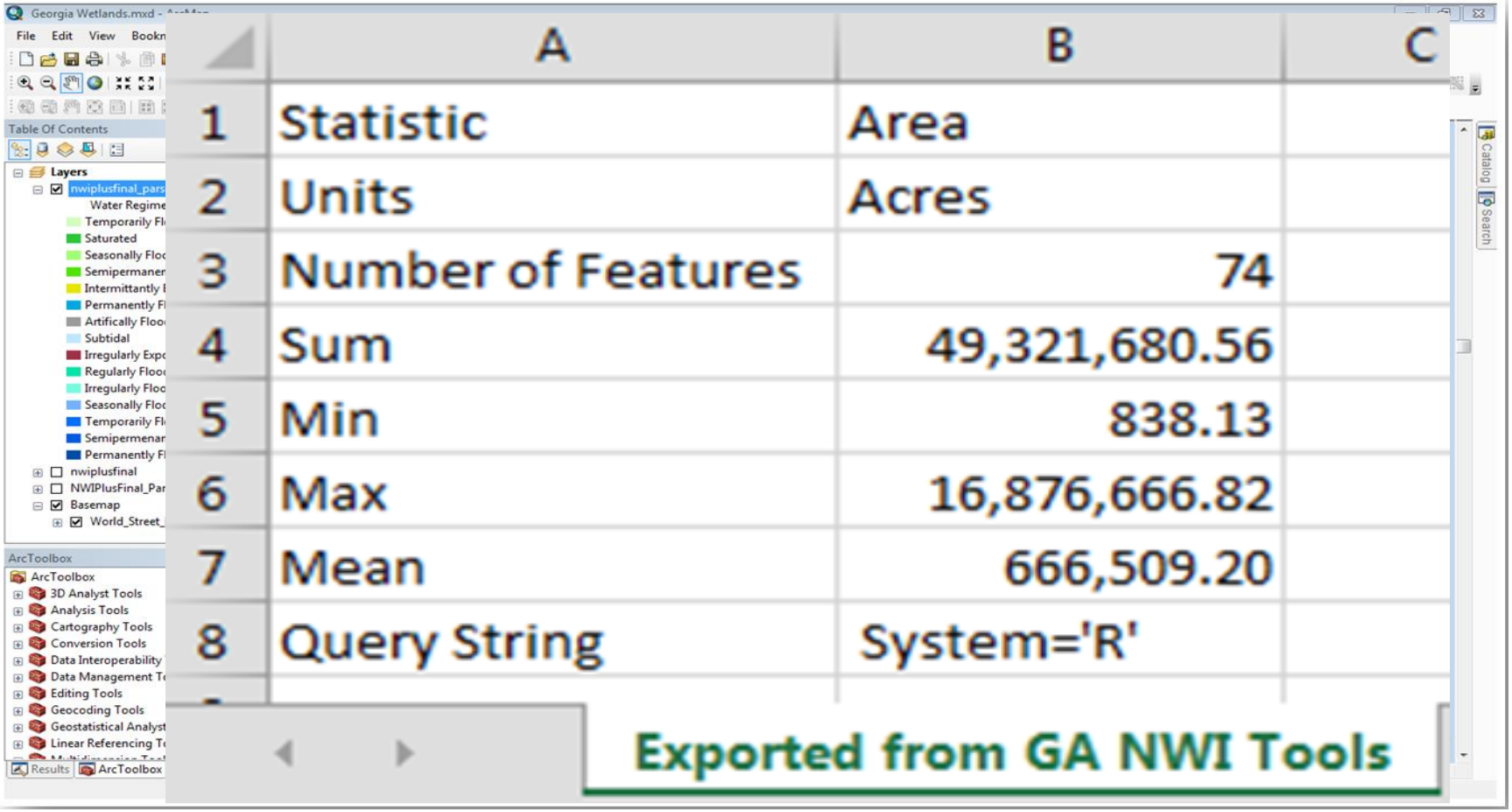
QUERY



	A	B	C
1	Statistic	Area	
2	Units	Acres	
3	Number of Features	74	
4	Sum	49,321,680.56	
5	Min	838.13	
6	Max	16,876,666.82	
7	Mean	666,509.20	
8	Query String	System='R'	

GEORGIA WETLANDS

NEXT STEPS

- Coastal Wetlands Portal (EPA, DNR CRD, Georgia Tech, Skidaway Institute of Oceanography)
- Hack into FWS wetland data servers and parse the national dataset
- Create similar tools for other complex datasets (FEMA Q3, SSURGO, etc.)

GEORGIA WETLAND DATA AND TOOLS

RESOURCES

- Download NWI data

  http://www.fws.gov/wetlands/Data/Data-Download.html

- DownloadGeorgia Basemap 2000 Wetlands ArcView 3x Extensions

  http://geospatial.gatech.edu/Resources/GaWetTool2000.zip

- Download Georgia Basemap 2000 Wetlands ArcMap 8x Extension

  http://geospatial.gatech.edu/Resources/GaWetTool8x.zip

- Download 2014 Toolkit and parsed NWI+ data for coastal Georgia

  http://geospatial.gatech.edu/Resources/GaWetTool2014.zip

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