NJ State Watershed and Hydrography Updates

Compliance with the National WBD and NHD

1:2,400 Scale

Presented at: NJ Water Monitoring Council Meeting

September 30, 2009

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NJ NHD Technical POC

Definition of Terms

- **National Hydrography Dataset (NHD)**
  - http://nhd.usgs.gov
  - Surface Water component of The National Map
  - National Framework Dataset using common features – lakes, streams, ponds, rivers, oceans, etc.
  - Includes flow direction network, reach identification system, GNIS name attribute
- **Watershed Boundary Dataset (WBD)**
  - http://www.ncgc.nrcs.usda.gov/products/datasets/watershed/
  - National effort to delineate watershed boundaries (HUCs) at minimum 1:24,000 scale
  - Detail to reach 6th level subwatershed – HUC12.
  - To be integrated with NHD.

NJ Hydrography Update - 2002

- **Original 1986 Hydrography**
  - Source was USGS quadrangle data as DLG's
  - Updated NHD layer to 1:24,000 scale
- **NHD 1:24,000**
  - Used internally sparingly
  - Attribution compliant with Federal Standards
- **2002 Hydrography (1:2,400)**
  - Updated based on 2002 imagery
  - Accurate stream data photo-interpreted (arcs)
  - Water Body data layer delineated (polygonal)

Statistics of Change:

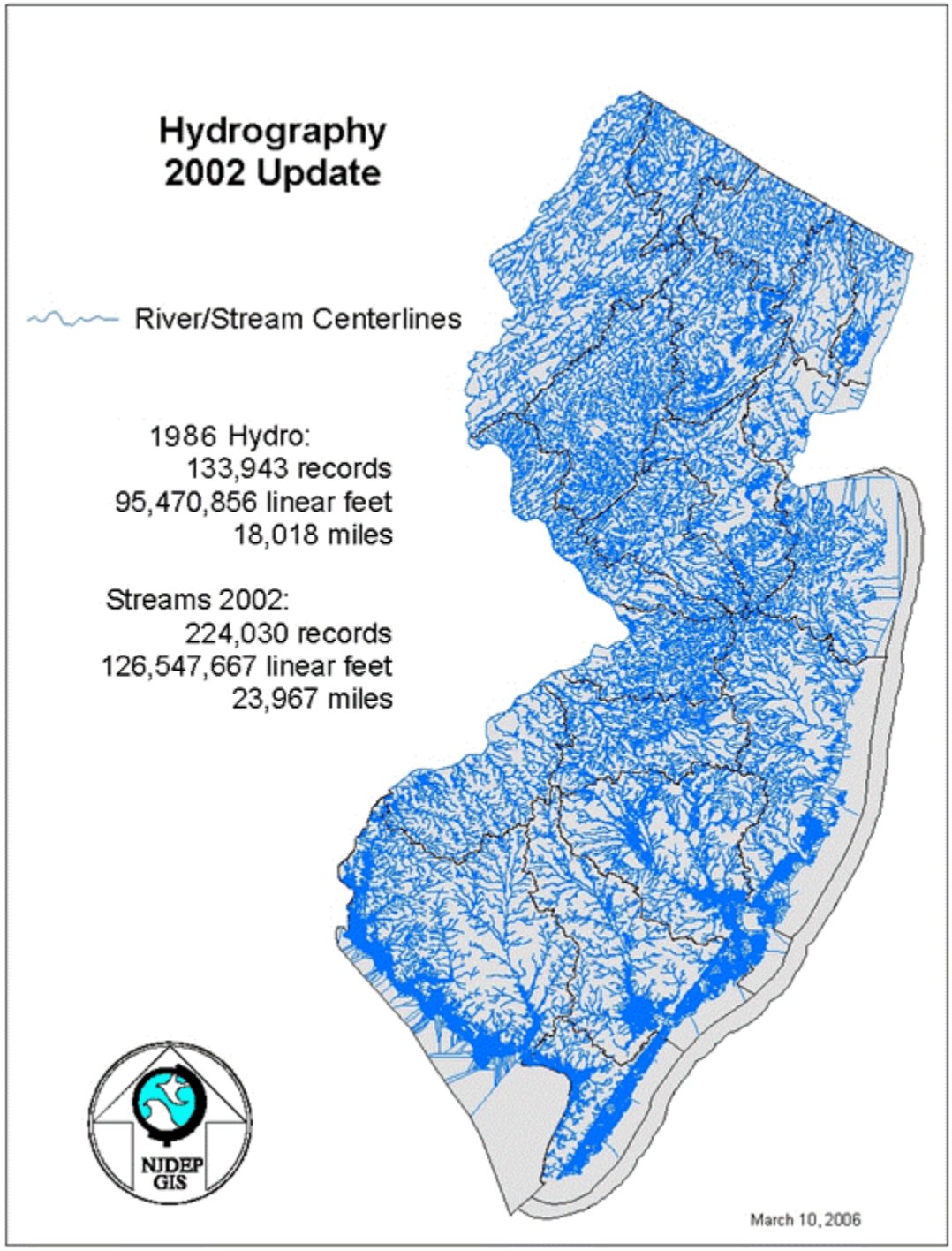
Original Hydro from DLG's © 1986 (NHD 1:24,000)

vs.

Streams 2002 (1:2,400)

Real Numbers:

- Almost 6,000 new miles of stream delineated in NJ.
- Over 90K new segments have been added.
- Approx. 3,000 lakes/ponds added.



Origins of WBD Project

- 2007 – EPA/USGS/NRCS determine national watershed update will move to a 6th level - HUC 12.
- NJ uses HUC 11's and 14's – boundaries not updated since 1986.
- To comply with federal standards, NJDEP met with EPA Region 3 to delineate 6th level - HUC 12 sub-watershed boundaries in NJ using 2002 stream data 1:2,400 scale.
- HUC 14 coverage – important regulatory tool for NJ – is being updated to nest in the new HUC 12's.

Watershed Boundary Dataset (WBD)

- Governed by NRCS - Nation-wide effort to obtain HUC boundaries at a scale of 1:24,000 and larger.
- NJ has updated its statewide WBD coverage to the 6th level – subwatershed (HUC 12).
- HUC 12's have been merged into HUC 8's (4th level sub basins) for the NHD conflation project.

Watershed Definitions

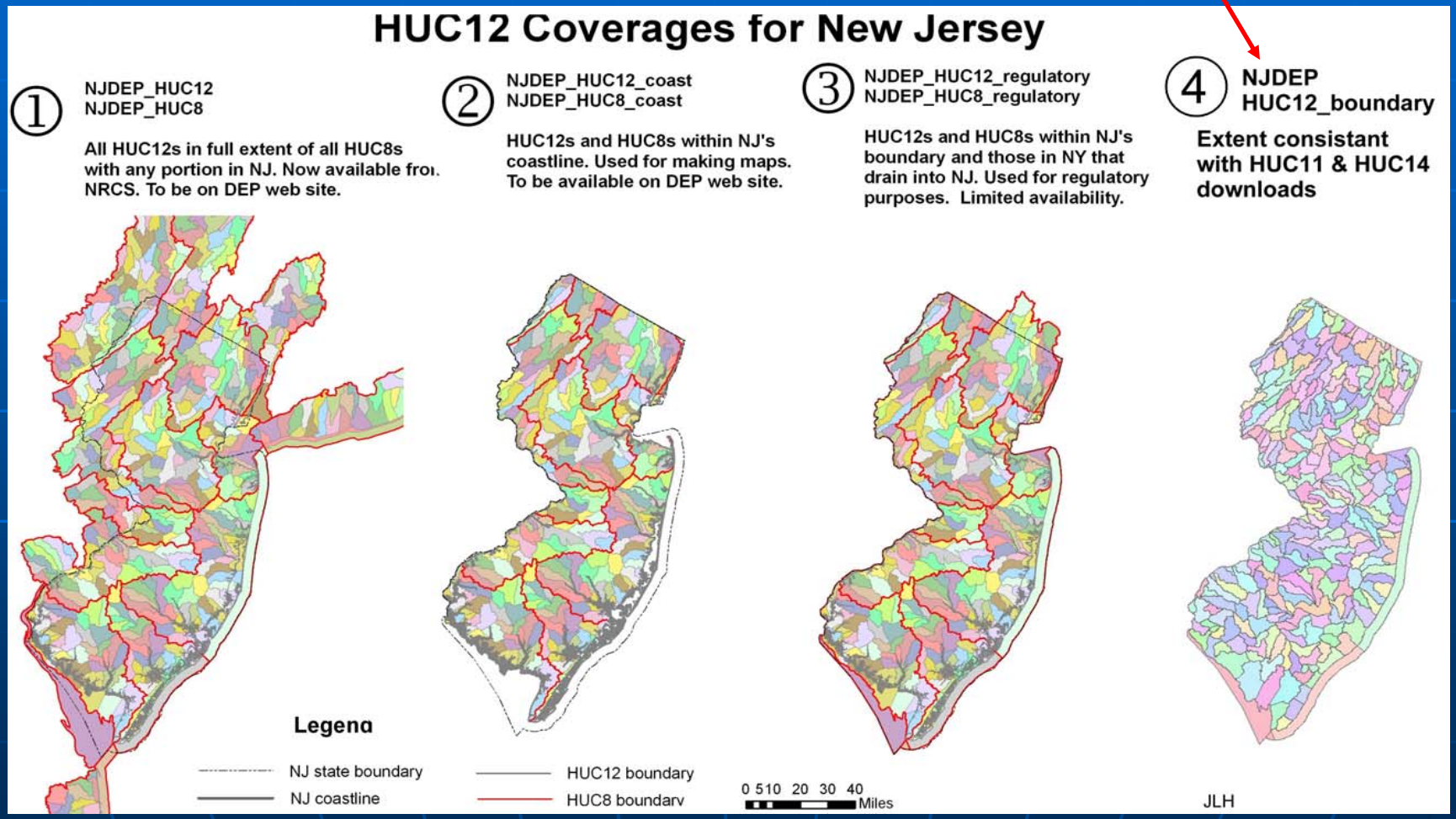
Name	Level	Digit	Number of HUCs
Region	1	2	21
Subregion	2	4	222
Basin	3	6	352
Subbasin	4	8	2,149
Watershed	5	10	22,000
Subwatershed	6	12	160,000

Main Players – WBD Project

- **EPA Region 3**
  - Don Evans
  - Steve Warner
- **NJDEP – NJGS**
  - Jeff Hoffman (NJ WBD State Coordinator)
  - NJDEP QA/QC Subcommittee
    - Members of the Watershed Data Managers Team
- **NRCS – NJ Local Office**

HUC 12 Coverages Available

http://www.state.nj.us/dep/gis/stateshp.html#HUC12



Updated HUC 14 coverage is awaiting metadata – will be available for download soon.

NHD Project Purpose/Details

- New statewide streams/waterbodies delineated in 2002 – 1:2,400 scale.
- New Jersey's water monitoring programs require a surface water network with reach codes for analysis and reporting.
- NHD was selected as the preferred network for the State – Stewardship MOU was signed in 2008.
- Conflation began in January, 2009 to transfer attributes from the NHD 1:24,000 high resolution dataset to the new local res. Network.

NHD Stewardship

NHD Stewardship - Windows Internet Explorer

http://webhosts.cr.usgs.gov/steward/

File Edit View Favorites Tools Help

NHD Stewardship

- Stewardship Process
- Training Schedule
- Request Maintenance
- Report Bugs
- Announcements
- Maint/Revision Status
- Glossary
- FAQ

New Jersey

View MOU Document

MOU
Signed

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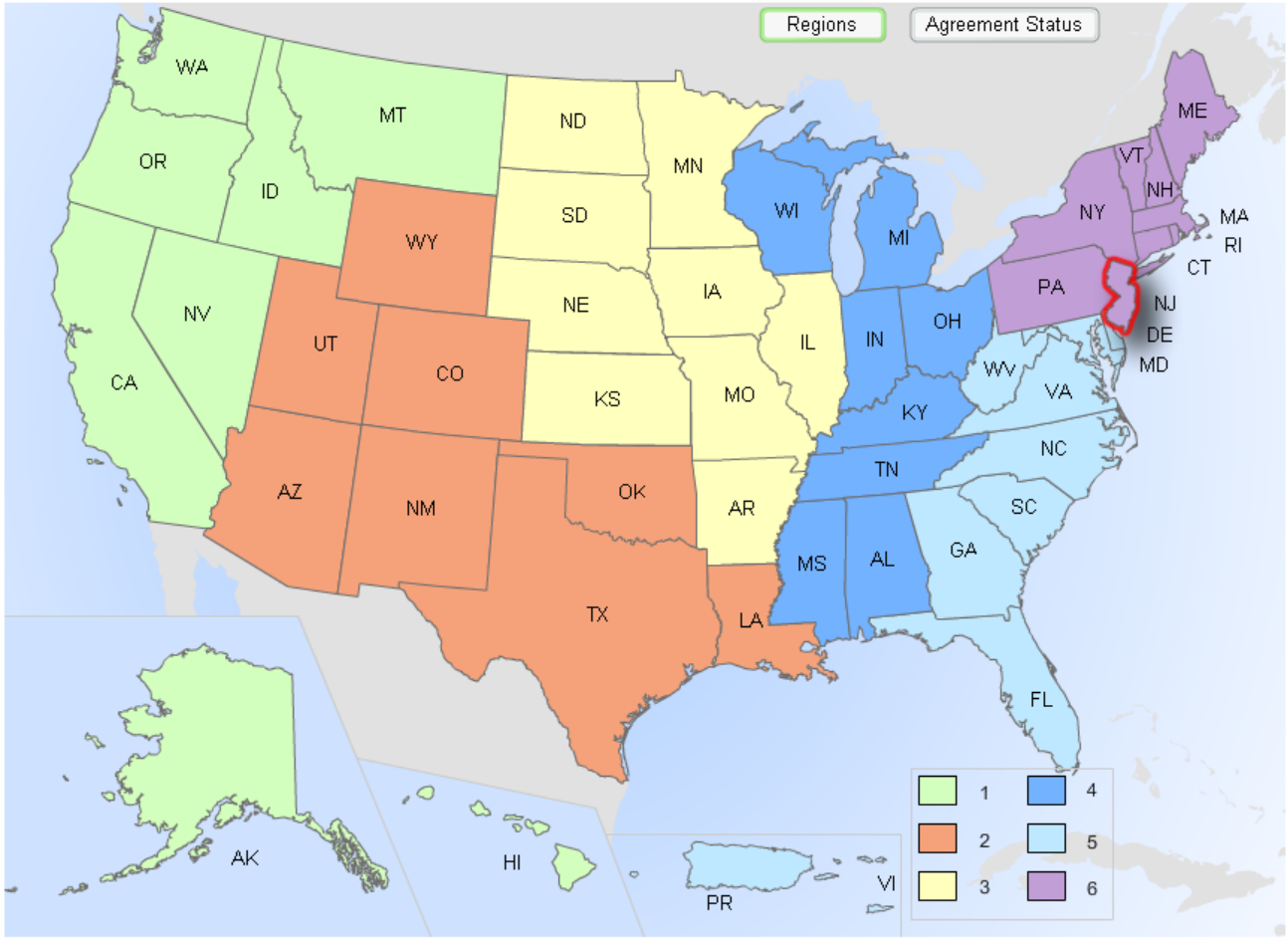


Done Internet 100%

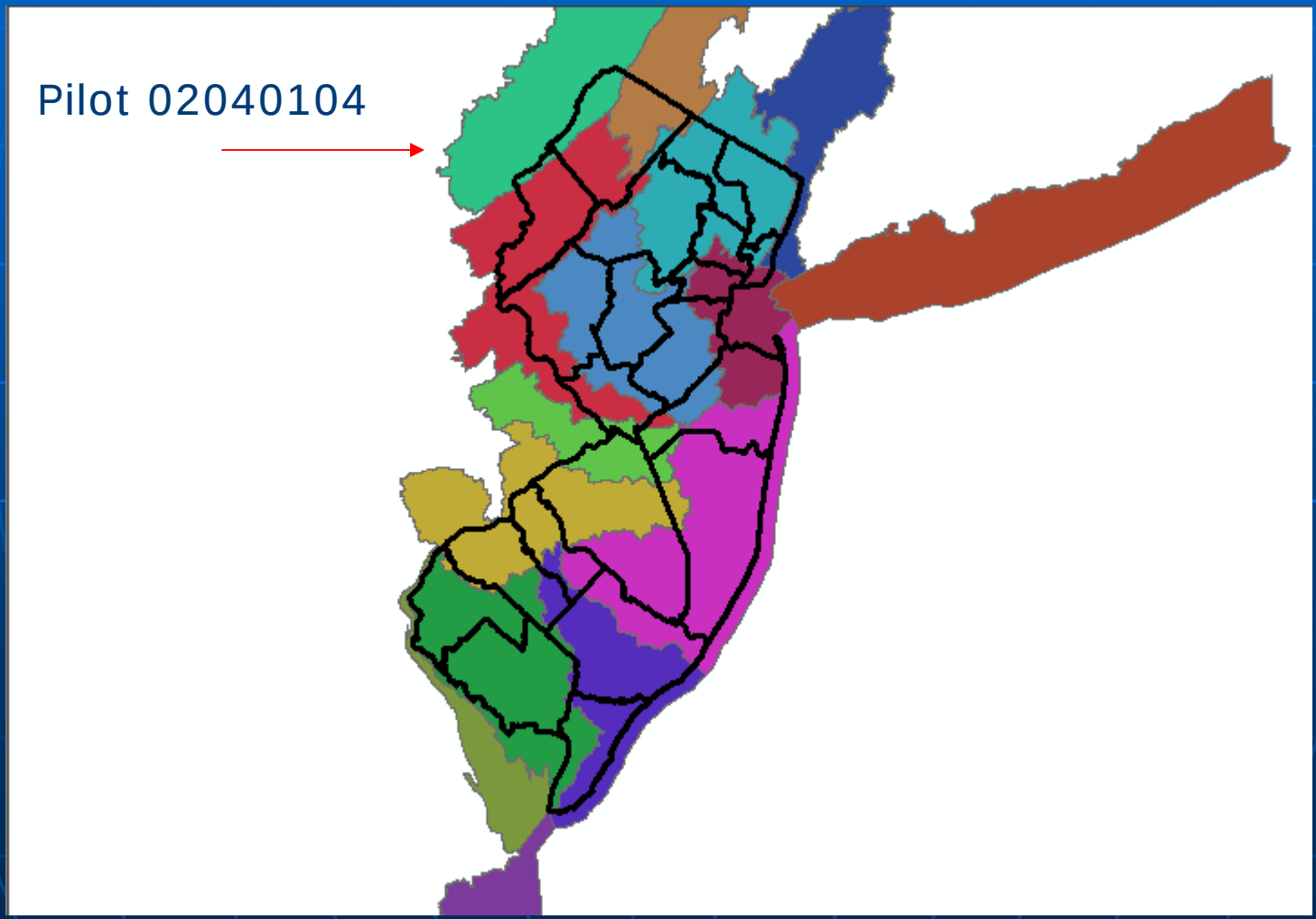
Main Project Players

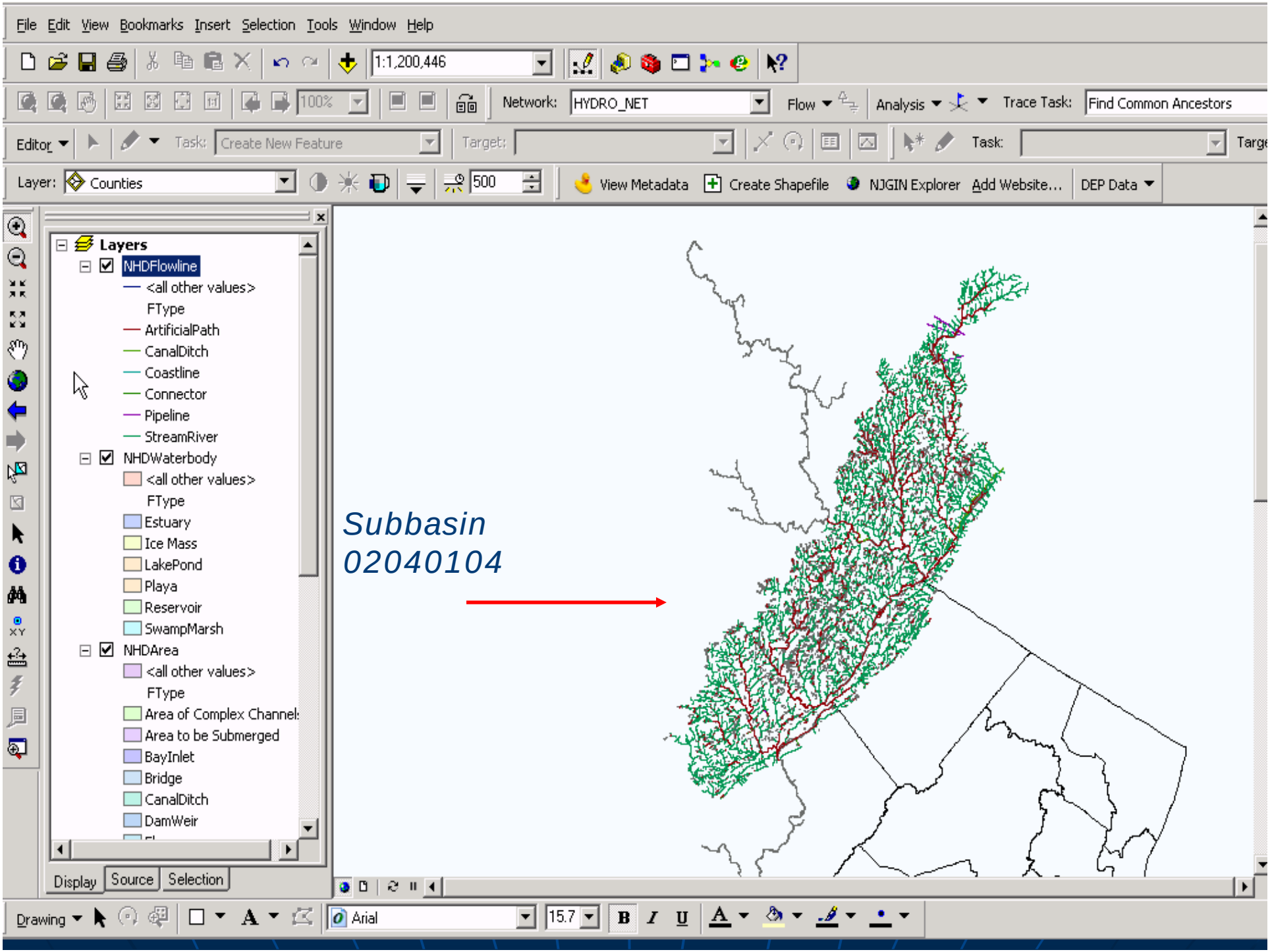
- **State NHD Stewards – NJDEP**
- **USGS – NHD Stewardship Agreement**
  - Dave Anderson – USGS Point of Contact for NJ
  - Roger Barlow – USGS Geospatial Liaison
- **Civil Solutions – Approved Contractor**
  - Subcontractors:
    - DES (Frederick, MD)
    - Watershed Concepts (Charlotte, NC)

Conflation Details

- Transferring attributes from NHD 1:24,000 ⇨⇨ 1:2,400 scale data.
- Adding new reach codes/comID's where new and updated streams/waterbodies are found.
- Deleting surface water features that have been filled in or no longer exist.

NJ by HUC8

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Task: Create New Feature
Target:
Layer: Counties
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View Metadata
Create Shapefile
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Add Website...
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Layers
NHDFlowline
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FType
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CanalDitch
Coastline
Connector
Pipeline
StreamRiver
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Ice Mass
LakePond
Playa
Reservoir
SwampMarsh
NHDArea
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Area of Complex Channel
Area to be Submerged
BayInlet
Bridge
CanalDitch
DamWeir
Display
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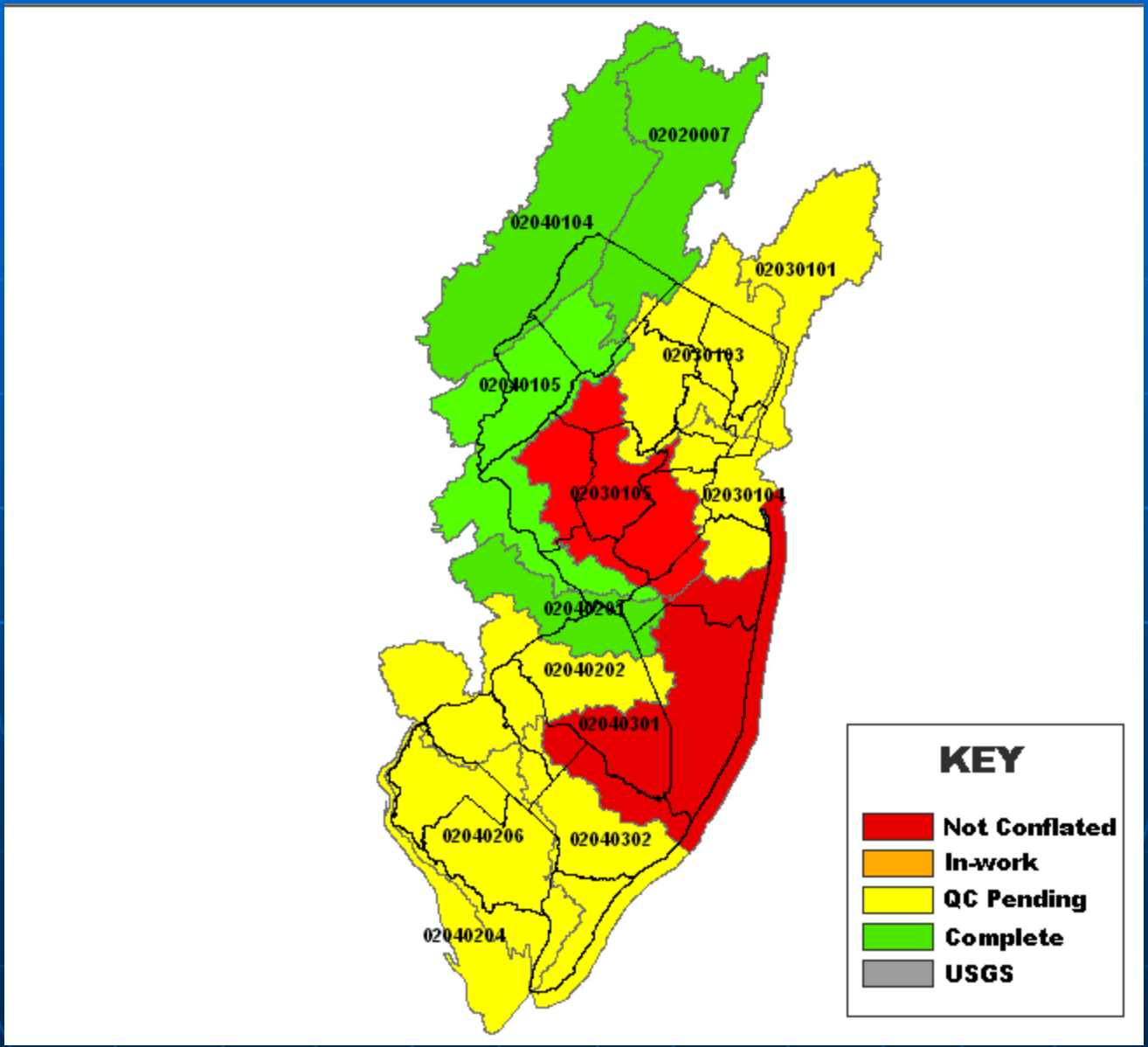
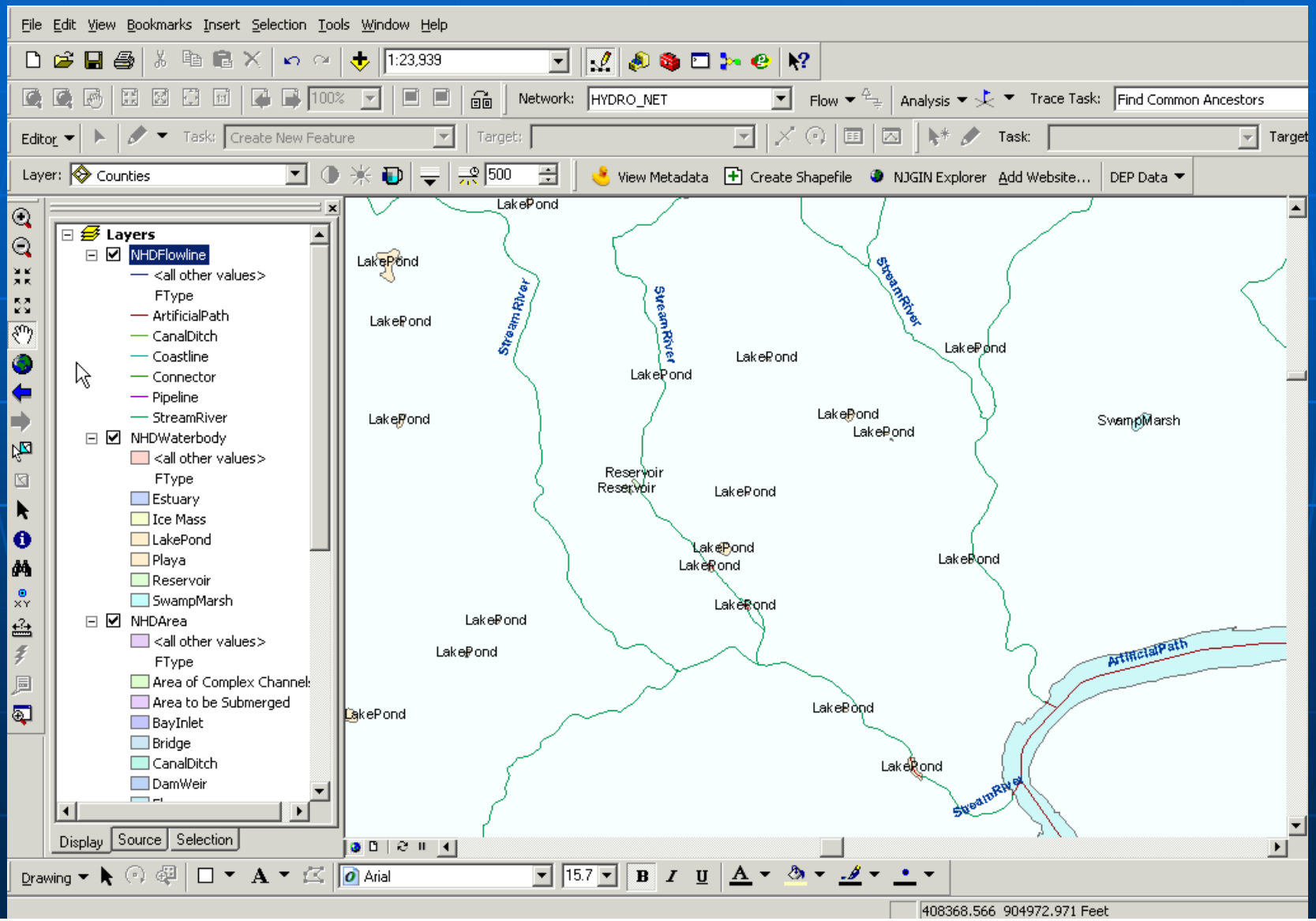
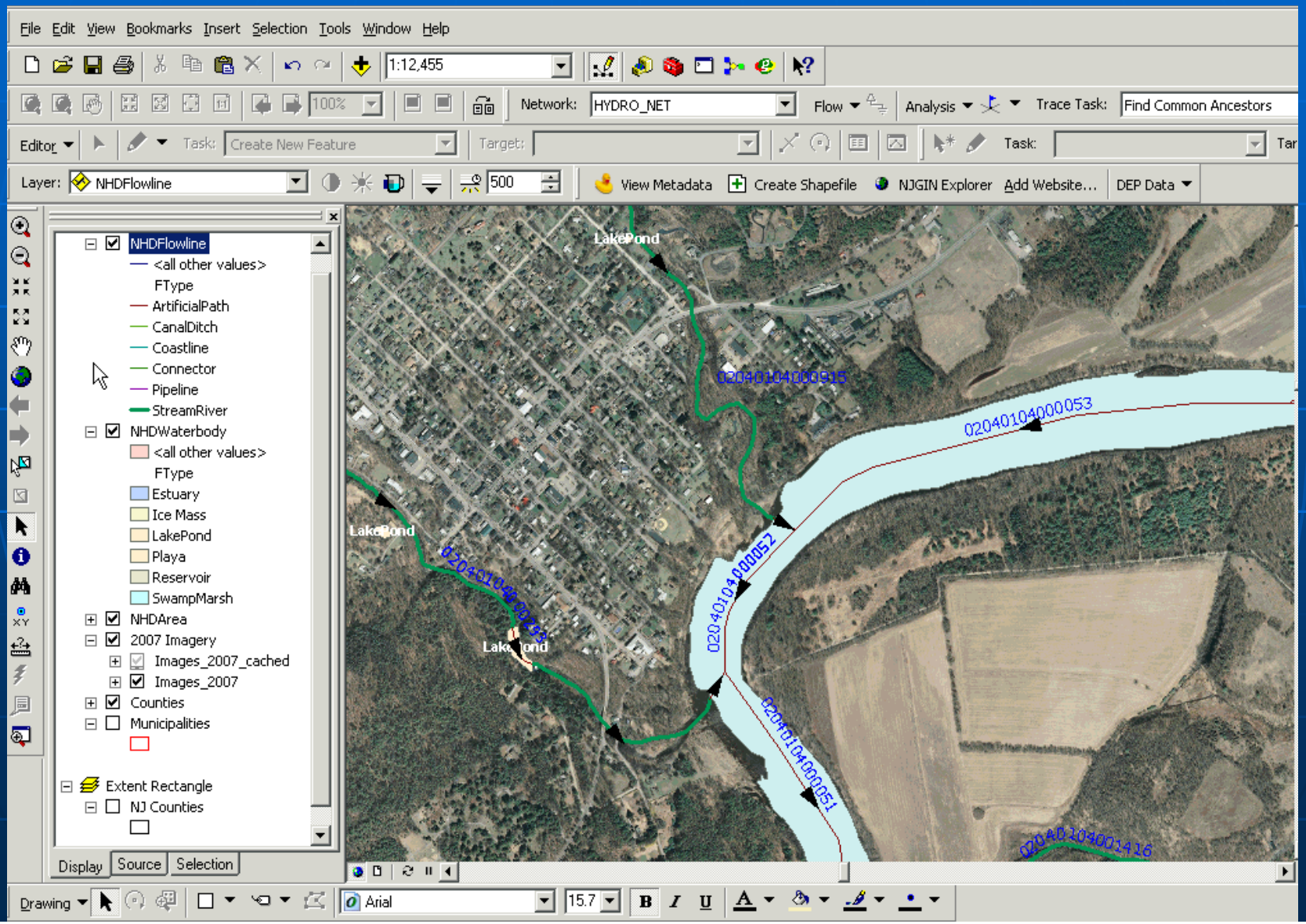
Project Plans



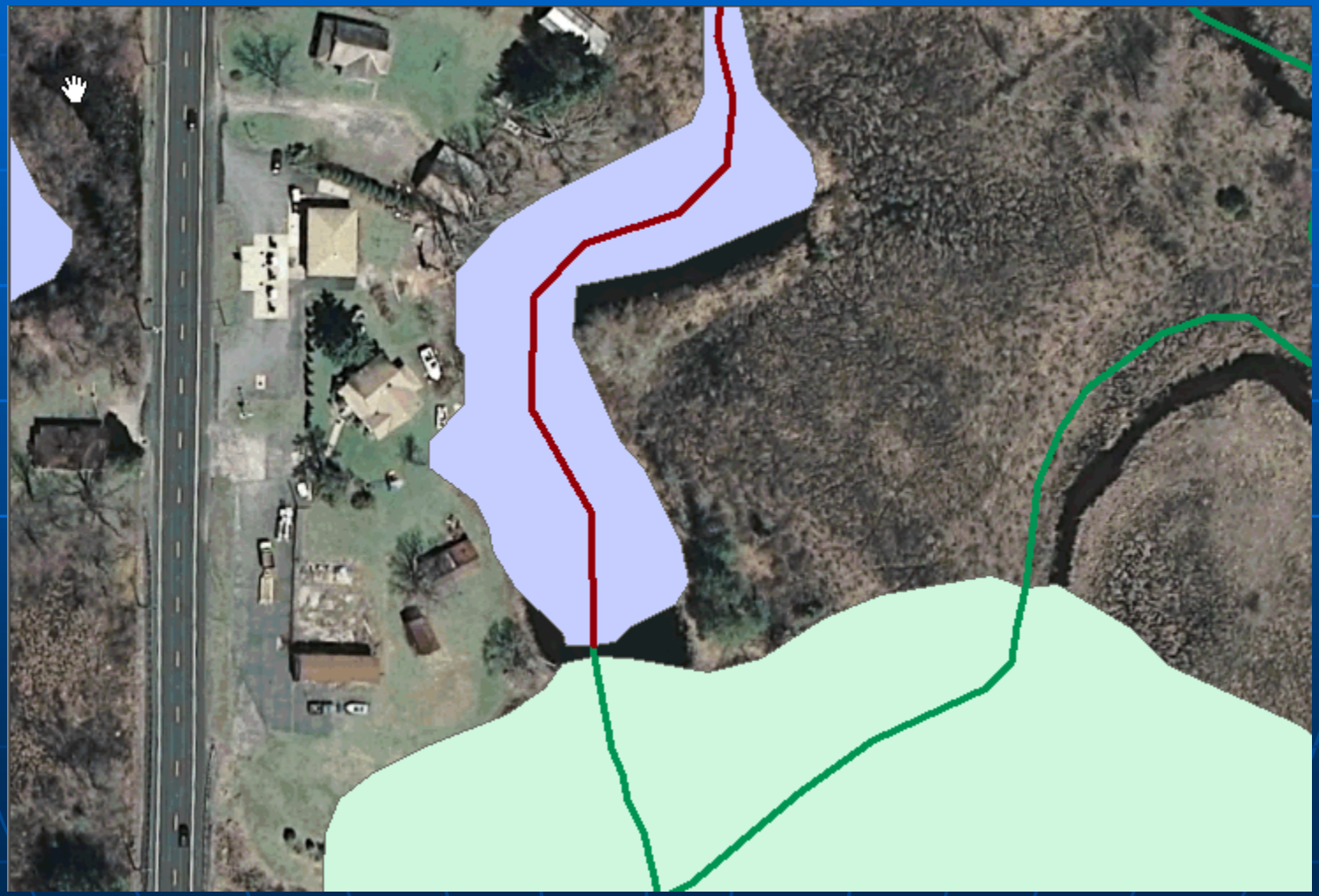
Source NHD 1:24,000



Reach Codes and Flow



24K NHD Flowlines/Waterbodies

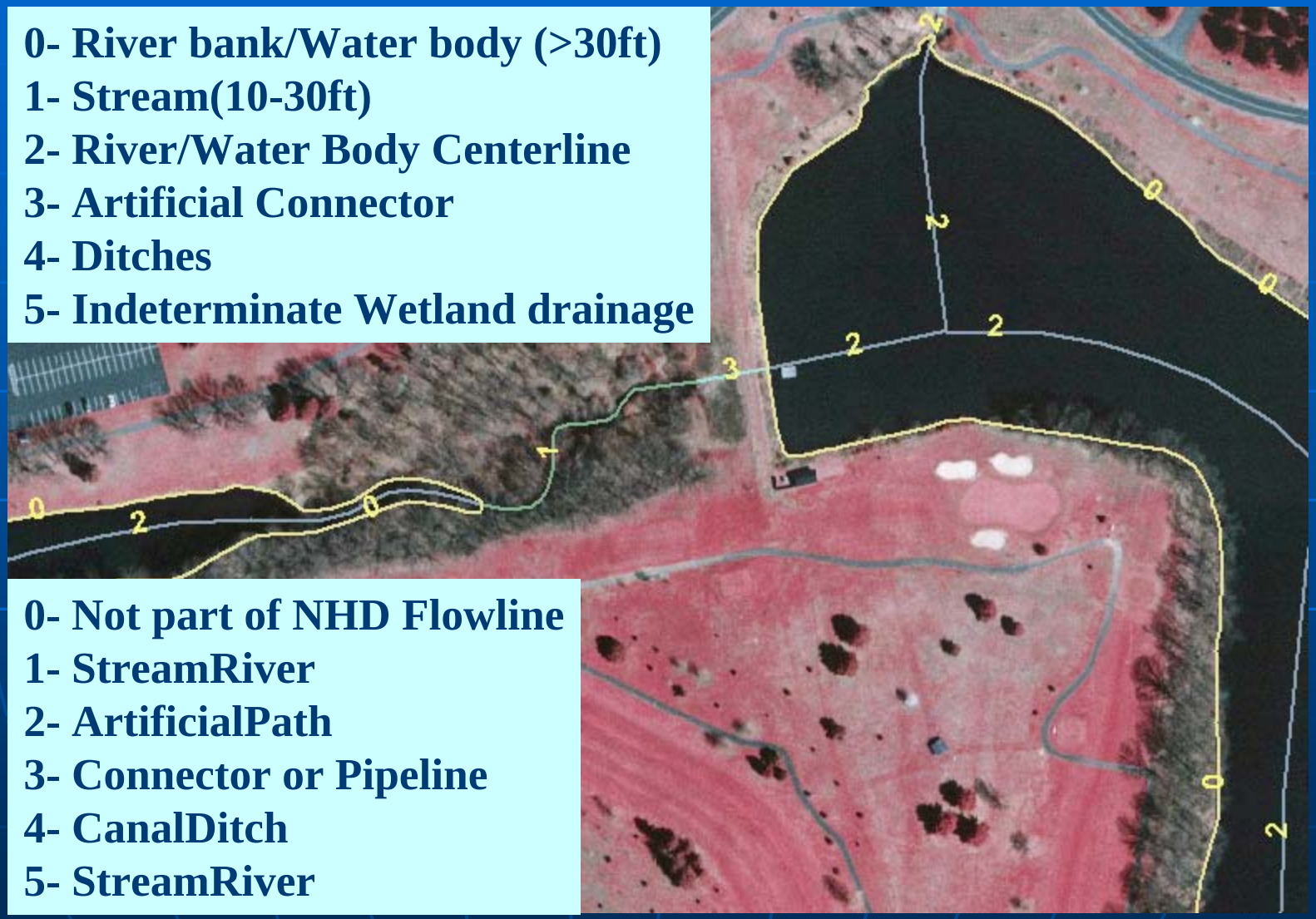


1:2,400 Network/Waterbodies

Stream Situation Codes Crosswalk

2002 NJDEP LU/LC codes

0- River bank/Water body (>30ft)
1- Stream(10-30ft)
2- River/Water Body Centerline
3- Artificial Connector
4- Ditches
5- Indeterminate Wetland drainage



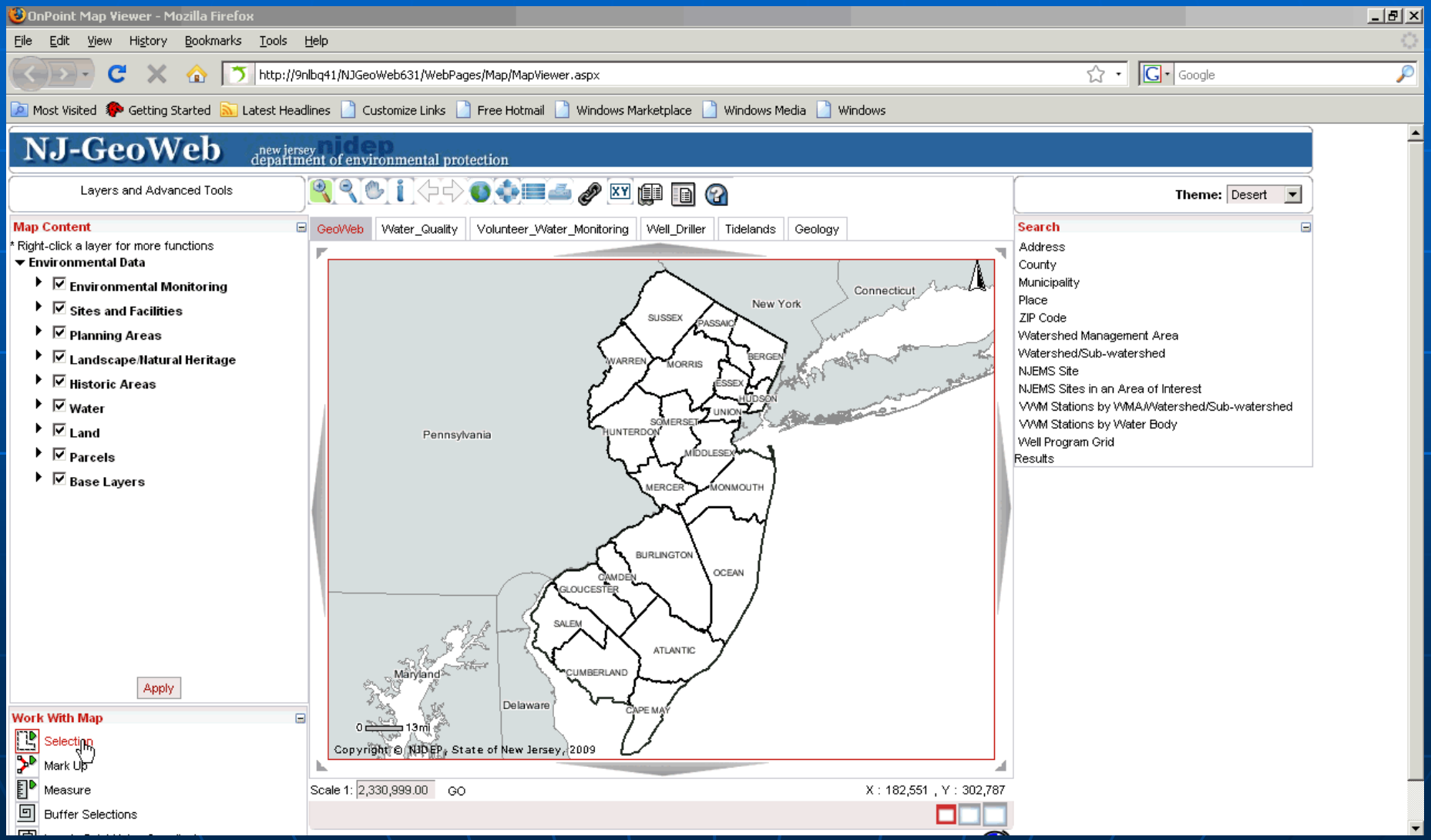
NHD Codes to be Conflated

0- Not part of NHD Flowline
1- StreamRiver
2- ArtificialPath
3- Connector or Pipeline
4- CanalDitch
5- StreamRiver

Where Are We Going?

- Incorporate the needs of NJDEP Water Programs to add new themes and features (known as 'Events') to the NHD Model for NJ.
- Link NHD model to water quality data existing on the new statewide Water Quality Exchange (WQDE).
- Provide an interactive tool which lets users follow stream flow while identifying monitoring point data collections, TMDL statistics, surface water quality designations, and more.
- Link in elevation data and other critical data sets (HUC12 boundaries - WBD) to provide a robust model for framework data collection and reference.

NJ-GeoWeb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Most Visited Getting Started Latest Headlines Customize Links Free Hotmail Windows Marketplace Windows Media Windows
NJ-GeoWeb
new jersey department of environmental protection
Layers and Advanced Tools
Theme: Desert
Map Content
* Right-click a layer for more functions
Environmental Data
Environmental Monitoring
Sites and Facilities
Planning Areas
Landscape/Natural Heritage
Historic Areas
Water
Land
Parcels
Base Layers
Apply
Work With Map
Selection
Mark Up
Measure
Buffer Selections
GeoWeb
Water_Quality
Volunteer_Water_Monitoring
Well_Driller
Tidelands
Geology
New York
Connecticut
Pennsylvania
Maryland
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BERGEN
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MONMOUTH
BURLINGTON
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CAMDEN
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ATLANTIC
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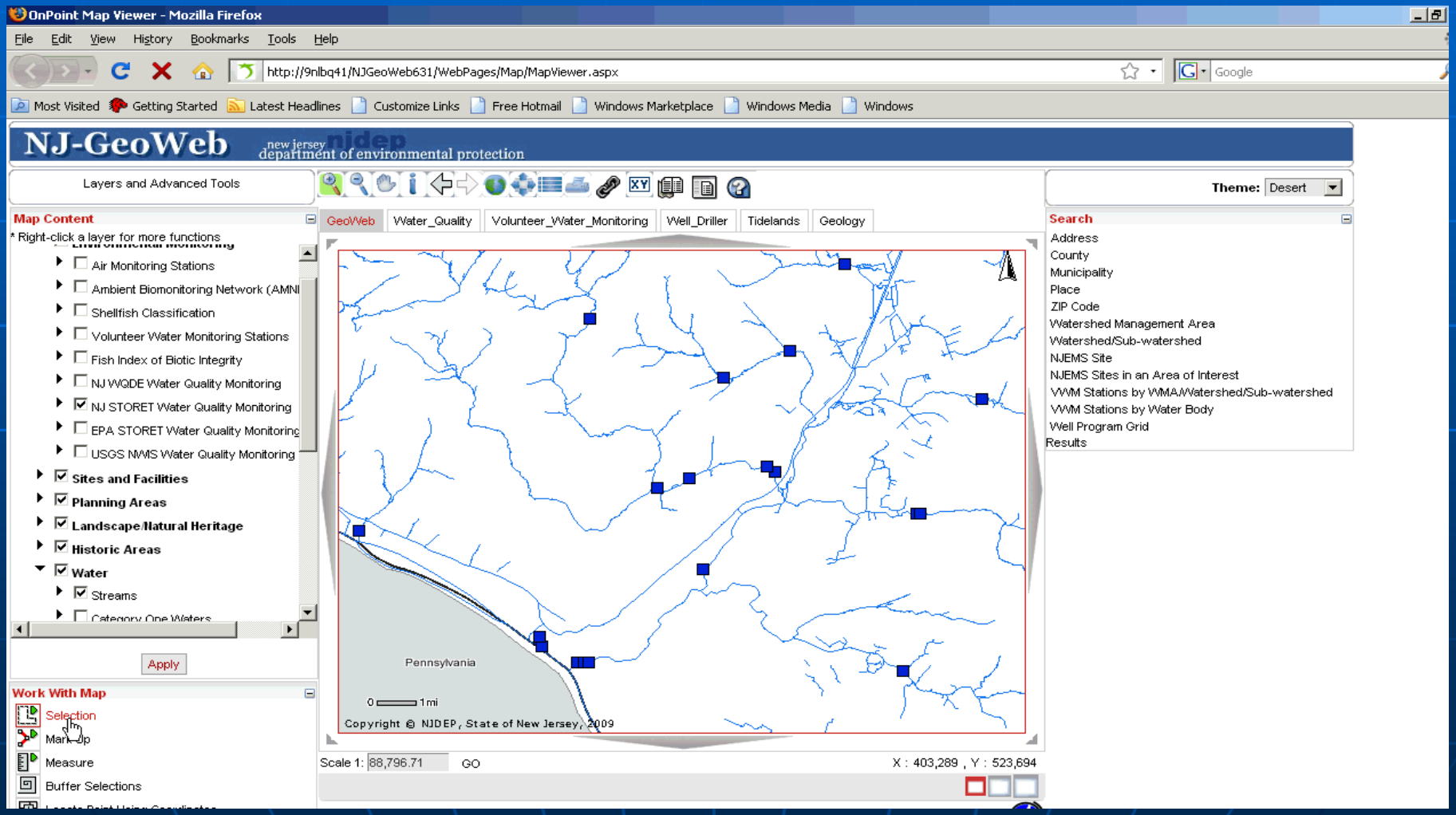
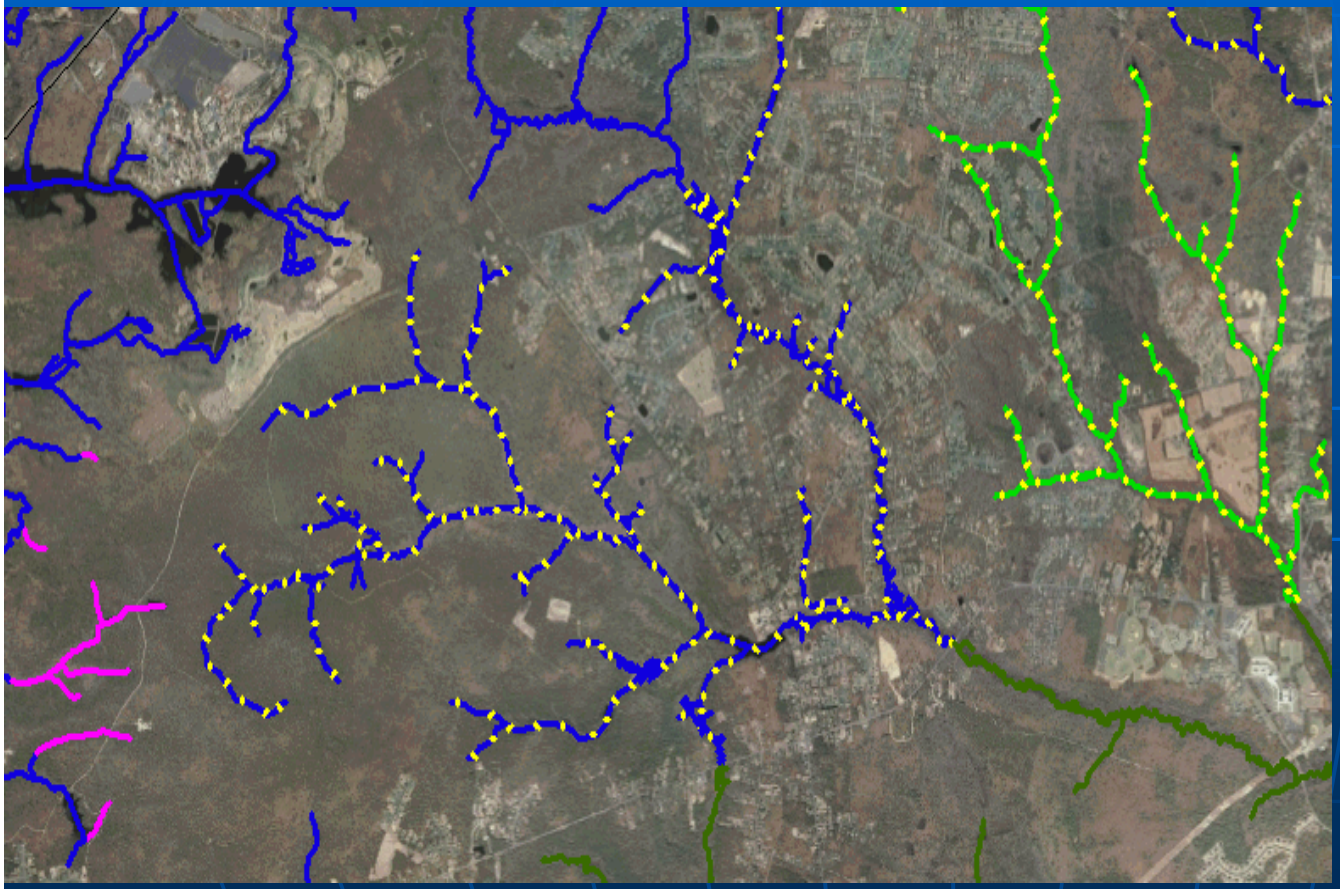
Copyright © NJDEP, State of New Jersey, 2009
Scale 1: 2,330,999.00
GO
X : 182,551 , Y : 302,787
Search
Address
County
Municipality
Place
ZIP Code
Watershed Management Area
Watershed/Sub-watershed
NJEMS Site
NJEMS Sites in an Area of Interest
VWM Stations by WMA/Watershed/Sub-watershed
VWM Stations by Water Body
Well Program Grid
Results

Monitoring Points and Streams



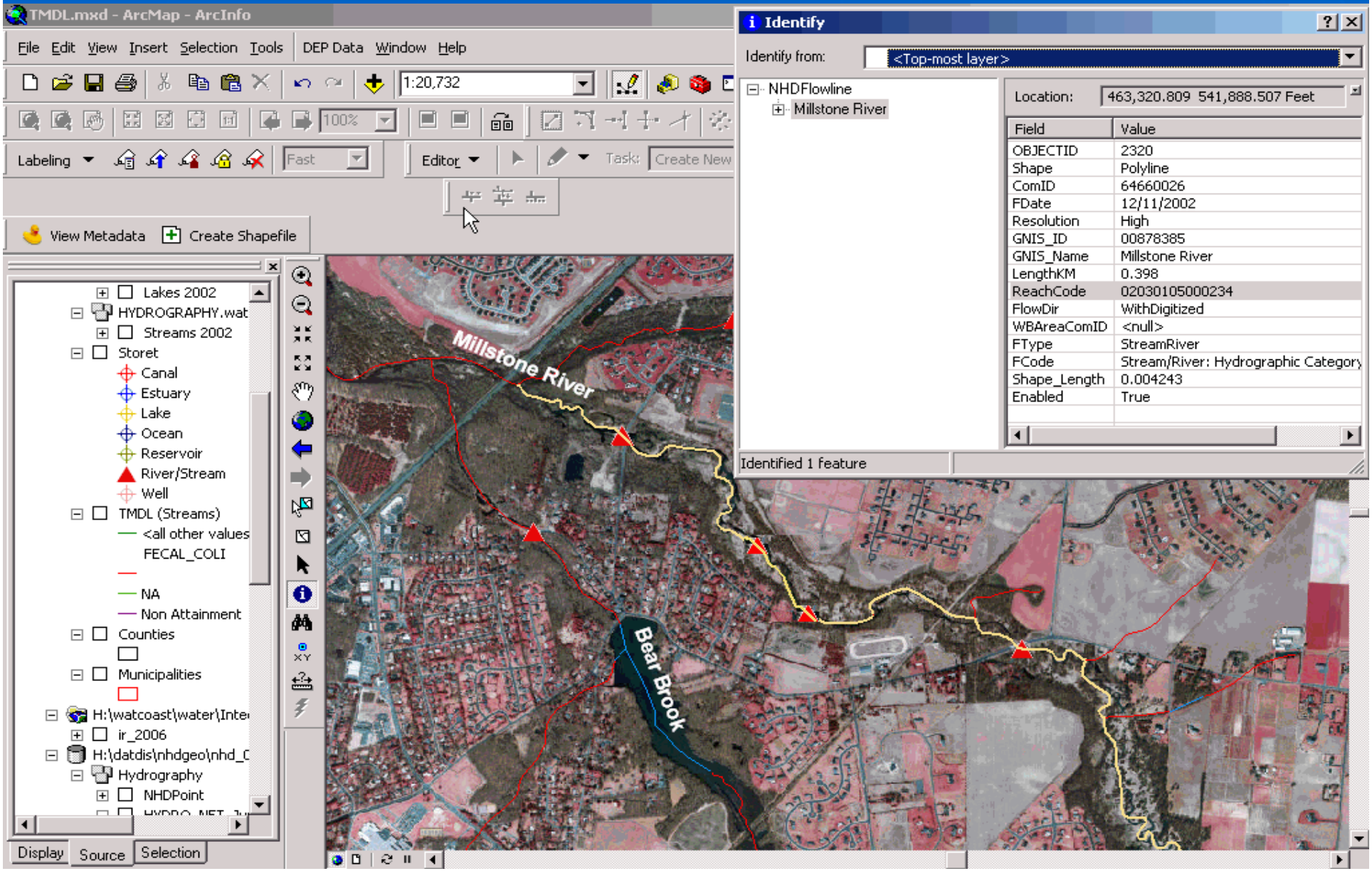
Event: Surface Water Quality Standards



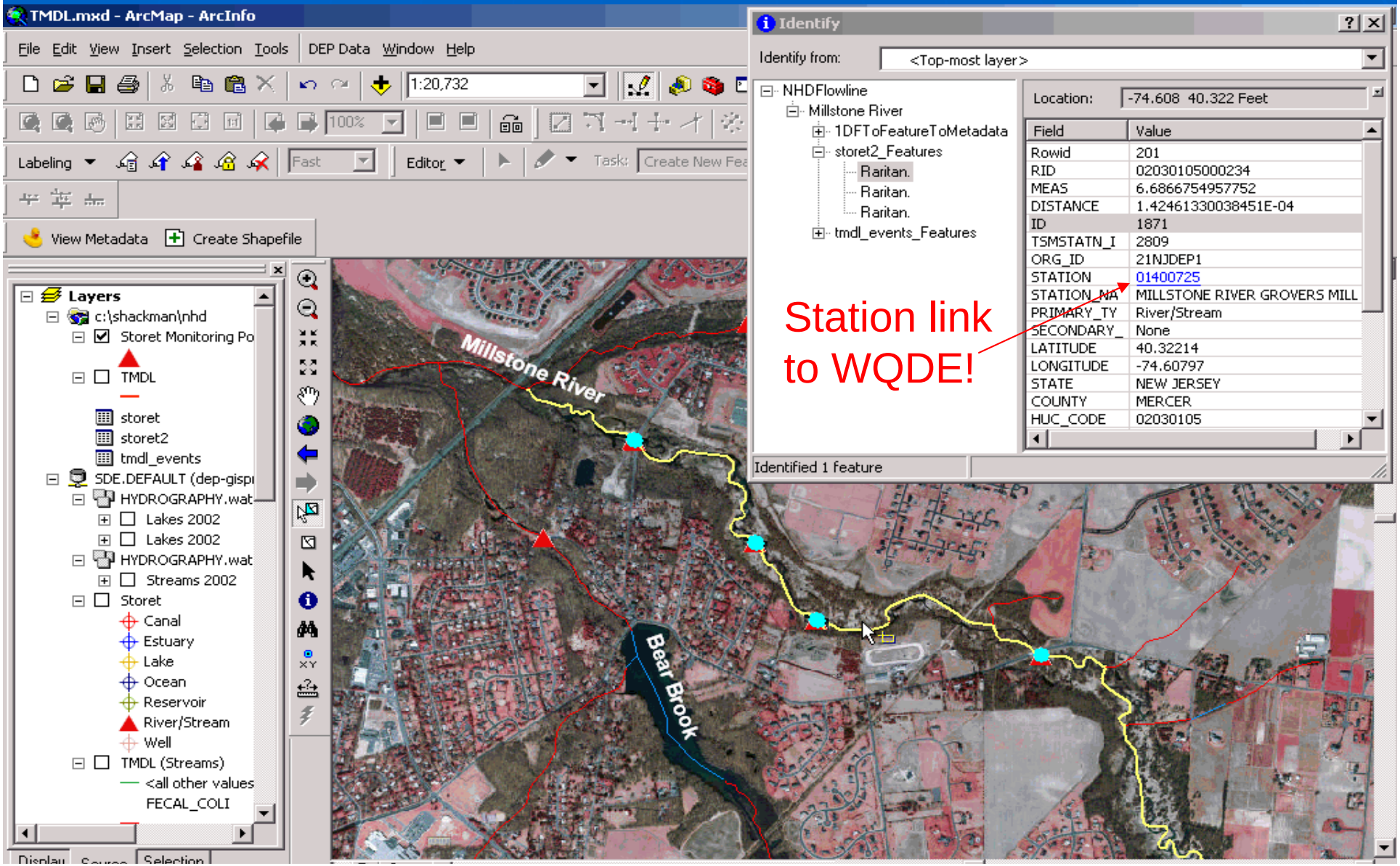
Surface Water Quality Standards
- DRBC-Zone-1C
- DRBC-Zone-1D
- DRBC-Zone-1E
- DRBC-Zone-2
- DRBC-Zone-3
- DRBC-Zone-4
- DRBC-Zone-5
- FW1
- FW1-TM
- FW1-TP
- FW2-NT
- FW2-NT/SE1
- FW2-NT/SE2
- FW2-NT/SE3
- FW2-NTC1
- FW2-NTC1/SE1
- FW2-NTC1/SE1/SC
- FW2-TM
- FW2-TM/SE1
- FW2-TMC1
- FW2-TP
- FW2-TPC1
- PL
- PL-TM
- SE1
- SE1C1
- SE2
- SE3

Accessing WQDE data through the NHD Network..

Identify Stream – NHD Attributes



Monitoring Points connected to Streams



Station Data – Future WQDE View

Welcome

Show in i-Map Download Drill Refresh Edit Save Sen

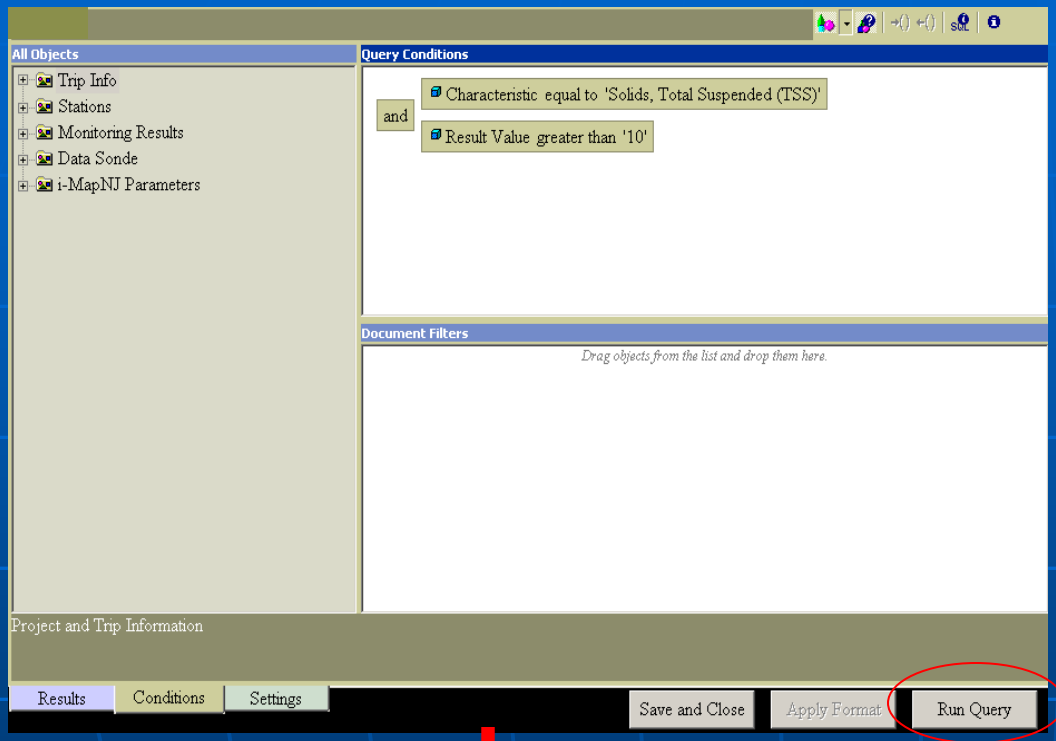
Corporate Documents
Personal Documents
Inbox Documents
Create Documents
Search
Options
Logout
Help

Last refresh: 2/22/2008 03:56:33 PM

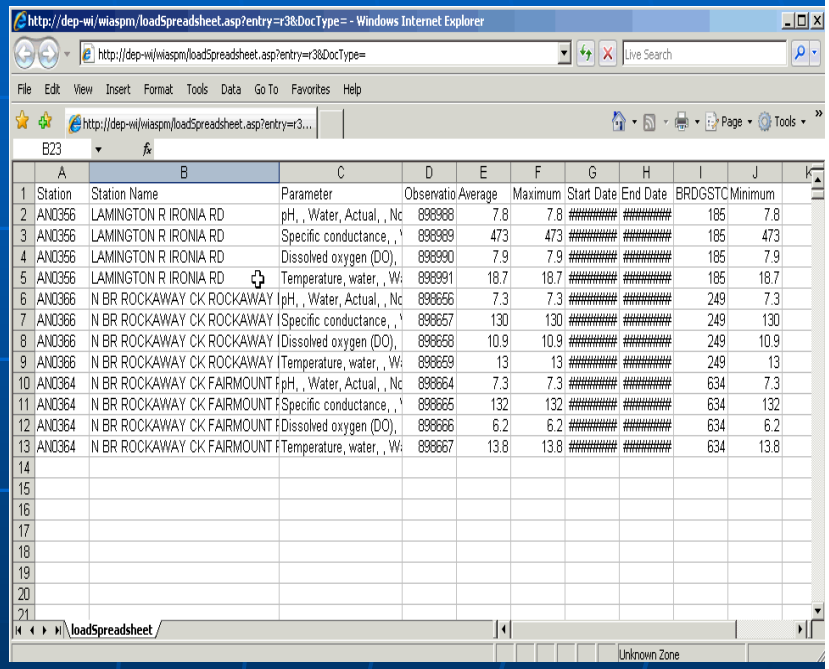
Monitoring Data

Station	Date	Time	Depth	Characteristic	Fraction	Medium	Statistic	Result Value Type	Analysis Procedure Source	Analysis Procedure	Result Value	Result Value Text	Units	Result Status
01400725	03/10/99	09:00		Calcium	Dissolved	Water		Actual	USEPA	200.7(W)	10.30	10.3	mg/l	F
01400725	03/10/99	09:00		Carbon, Total Organic (Toc)	Total	Water		Actual	APHA	5310-C	3.67	3.67	mg/l	F
01400725	03/10/99	09:00		Chloride	Dissolved	Water		Actual	APHA	4500-CL-(B)	33.80	33.8	mg/l	F
01400725	03/10/99	09:00		Chloride	Total	Water		Actual	APHA	4500-CL-(B)	33.90	33.9	mg/l	F
01400725	03/10/99	09:00		Dissolved oxygen (DO)		Water		Actual	21NJDEP1	DO	11.50	11.5	mg/l	F
01400725	03/10/99	09:00		Fluorides	Dissolved	Water		Actual	APHA	4500-F-C	0.00	*Non-detect	mg/l	F
01400725	03/10/99	09:00		Hardness, carbonate	Total	Water		Actual	USEPA	130.1	45.98	45.98	mg/l	F
01400725	03/10/99	09:00		Magnesium	Dissolved	Water		Actual	USEPA	200.7(W)	4.70	4.7	mg/l	F
01400725	03/10/99	09:00		Nitrogen, ammonia as N	Dissolved	Water		Actual	USEPA	350.1	0.10	0.1	mg/l	F
01400725	03/10/99	09:00		Nitrogen, ammonia as N	Total	Water		Actual	USEPA	350.1	0.12	0.12	mg/l	F

Edit your Search



New Results



	A	B	C	D	E	F	G	H	I	J
1	Station	Station Name	Parameter	Observatio	Average	Maximum	Start Date	End Date	BRDGSTC	Minimum
2	AN0356	LAMINGTON R IRONIA RD	pH, , Water, Actual, , Nc	898988	7.8	7.8	########	########	185	7.8
3	AN0356	LAMINGTON R IRONIA RD	Specific conductance, , '	898989	473	473	########	########	185	473
4	AN0356	LAMINGTON R IRONIA RD	Dissolved oxygen (DO),	898990	7.9	7.9	########	########	185	7.9
5	AN0356	LAMINGTON R IRONIA RD	Temperature, water, , W:	898991	18.7	18.7	########	########	185	18.7
6	AN0366	N BR ROCKAWAY CK ROCKAWAY I	pH, , Water, Actual, , Nc	898656	7.3	7.3	########	########	249	7.3
7	AN0366	N BR ROCKAWAY CK ROCKAWAY I	Specific conductance, , '	898657	130	130	########	########	249	130
8	AN0366	N BR ROCKAWAY CK ROCKAWAY I	Dissolved oxygen (DO),	898658	10.9	10.9	########	########	249	10.9
9	AN0366	N BR ROCKAWAY CK ROCKAWAY I	Temperature, water, , W:	898659	13	13	########	########	249	13
10	AN0364	N BR ROCKAWAY CK FAIRMOUNT F	pH, , Water, Actual, , Nc	898664	7.3	7.3	########	########	634	7.3
11	AN0364	N BR ROCKAWAY CK FAIRMOUNT F	Specific conductance, , '	898665	132	132	########	########	634	132
12	AN0364	N BR ROCKAWAY CK FAIRMOUNT F	Dissolved oxygen (DO),	898666	6.2	6.2	########	########	634	6.2
13	AN0364	N BR ROCKAWAY CK FAIRMOUNT F	Temperature, water, , W:	898667	13.8	13.8	########	########	634	13.8
14										
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Monitoring Data

Station	Date	Time	Depth	Characteristic	Fraction	Medium	Statistic	Result Value Type	Analysis Procedure Source	Analysis Procedure	Result Value	Result Value Text	Units	Result Status	BRI
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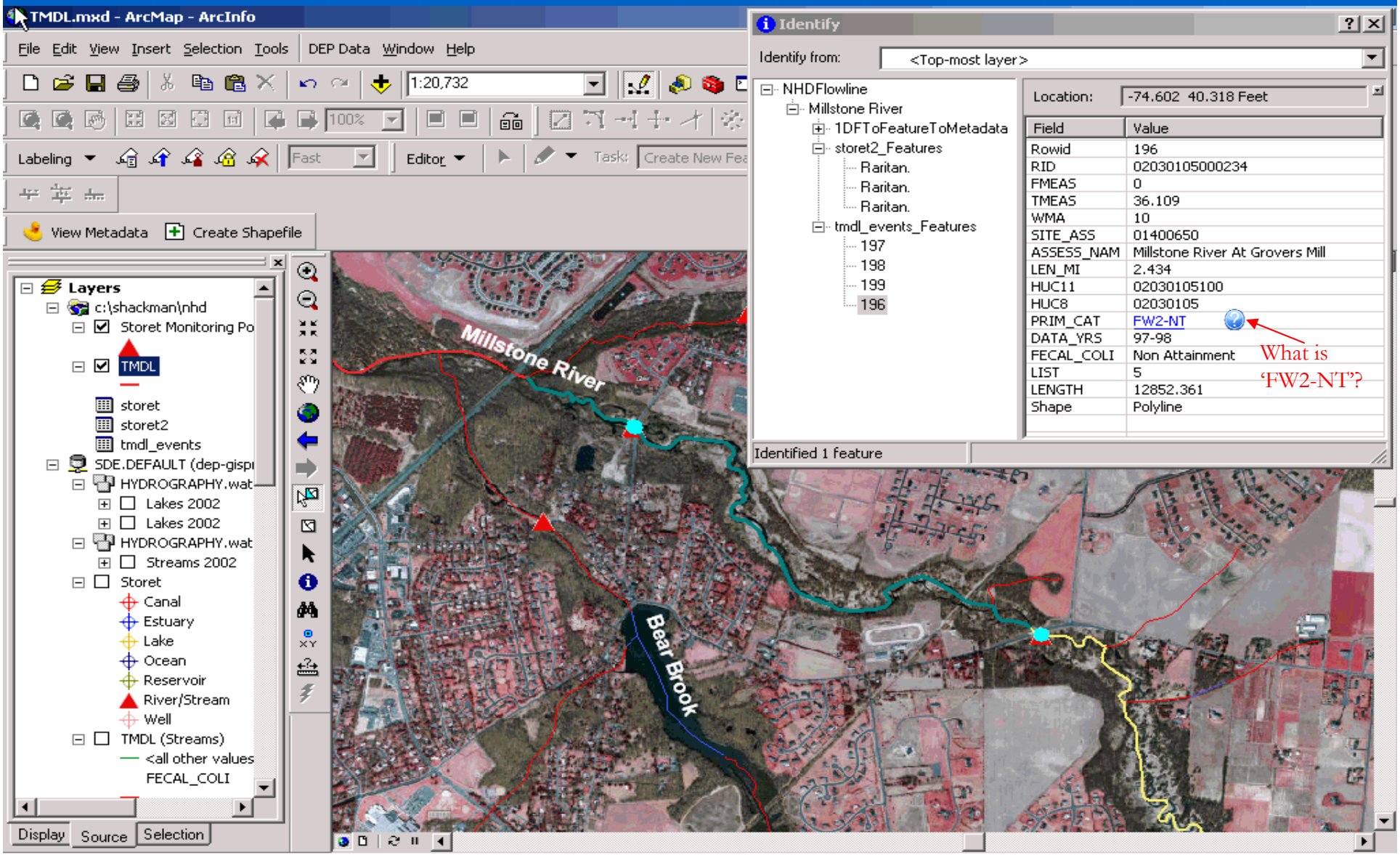
01400725	03/12/99	09:00		Solids, Total Suspended (TSS)	Total	Water		Actual	APHA	2540-D	12.00	12	mg/l	F	

Export data to your Desktop

TMDL Assessments



Attribute Definitions - Metadata

Metadata

Current style sheet: FGDC

Please select a style sheet: FGDC

Enumerated domain value definition:
Delaware River Basin Commission
Enumerated domain value definition source:
NJDEP

Enumerated domain:
Enumerated domain value: FW1
Enumerated domain value definition:
Fresh waters as designated in N.J.A.C. 7:9B-1.15h
Enumerated domain value definition source:
NJDEP

Enumerated domain:
Enumerated domain value: FW2
Enumerated domain value definition:
General surface water classification applied to those fresh waters that are not designated as FW1 or pineland waters.
Enumerated domain value definition source:
NJDEP

Enumerated domain:
Enumerated domain value: PL
Enumerated domain value definition:
General surface water classification applied to pineland waters.
Enumerated domain value definition source:
NJDEP

Enumerated domain:
Enumerated domain value: SE1

Data Availability

- HUC 12 and HUC 14
  - HUC 12 boundary layer available for download - **http://www.state.nj.us/dep/gis/**
  - HUC 12 (4 views) available to DEP employees on DEPView.
  - Updated HUC 14 layer will be available download shortly. Older version downloadable now

- Streams/Waterbodies
  - Non-NHD compliant streams data available for download by HUC 6 –
  - Waterbodies (lakes/ponds) downloadable
  - Separate waterbodies layer for (rivers/bays/oceans) also downloadbale
  - NHD-compliant data available at http://nhd.usgs.gov