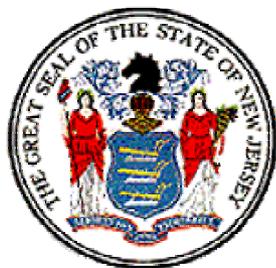




# Hydrography and Land Use / Land Cover Update 2002

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Presented at:  
NJ Water Monitoring Council Meeting  
February 2, 2005



## **2002 New Jersey Statewide Land Use/Land Cover and Hydrography Update**

### **Project Partners:**

**NJ Department of Environmental Protection**

**NJ Department of Transportation**

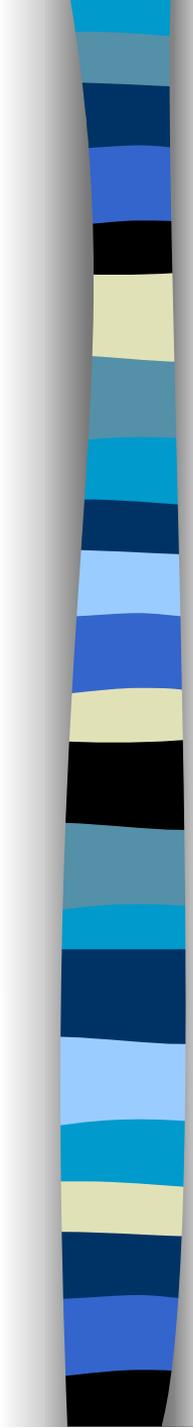
**NOAA - Coastal Non-point Pollution Control Program**



aerial  
information  
systems

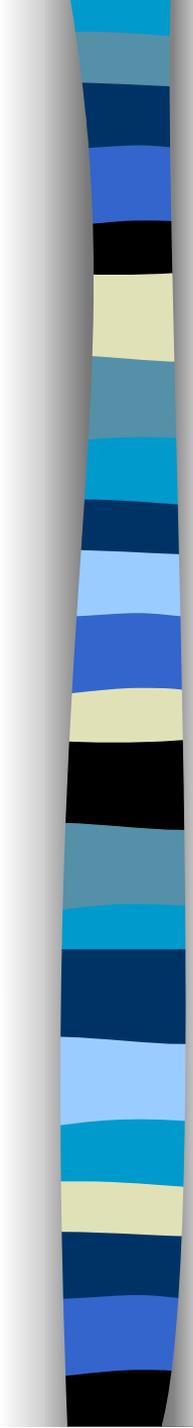
**112 First Street  
Redlands, CA 92373  
(909) 793-9493**

- Geographic Information System (GIS) services to a broad range of private and public agencies for the past 27 years
- NJ 1986 Integrated Terrain Unit Mapping (ITUM) project
- NJ 1995/97 LU/LC Update



## The Project:

- Create hydrography data set - linear and polygonal water features
- Update land use/land cover (LU/LC), 1 acre mmu
- Estimate Impervious Surface Cover
  - 5% increments: 0% to 100%
- Use 2002 Digital Imagery
- Product by Watershed Management Areas (20 WMAs)
- Complete within a 24 month time-frame - by Fall 2005
- Total Cost \$1.6 million



# Land Use / Land Cover Update Project

## ■ 1995-97 Land Use / Land Cover

- statewide mapping at 1 acre minimum polygon
- maintain codes from 1986 and FWW mapping
- added detail to forest categories
- estimated % impervious surface at 5% increments
- identify LULC change from lu86

## ■ 2002 Land Use / Land Cover Update

- same methodology as previous mapping
- statewide mapping at 1 acre minimum polygon
- LULC coding based on modified Anderson et.al. USGS 1976
- maintain codes from 1995-97
- adding detail to Urban, Transportation, and Wetland categories
- estimating % impervious surface at 5% increments
- incorporate 2002 hydrology update as part of the land use
- identify LULC change from lu95

# Hydrography Update

## ■ Existing Hydro data layers:

- source was paper USGS quadrangle data as DLG's
- spatially inaccurate
- incomplete
- ***CODED: SWQS, TMDL, Names***

## ■ NHD (National Hydrologic Database - USGS)

- better water body and stream delineation
- connectivity for modeling
- spatially inaccurate
- incomplete

## ■ 2002 Hydrography Update project objectives

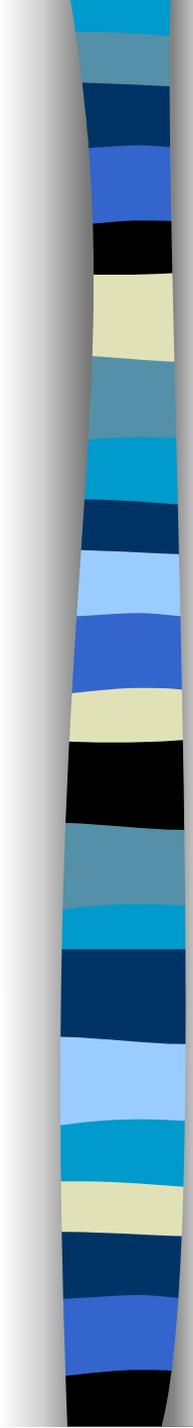
- base update on 2002 imagery
- create accurate Stream and Stream Bank data layer (arcs)
- create Water Body data layer (polygonal)
- incorporate into LULC update



2002 CIR



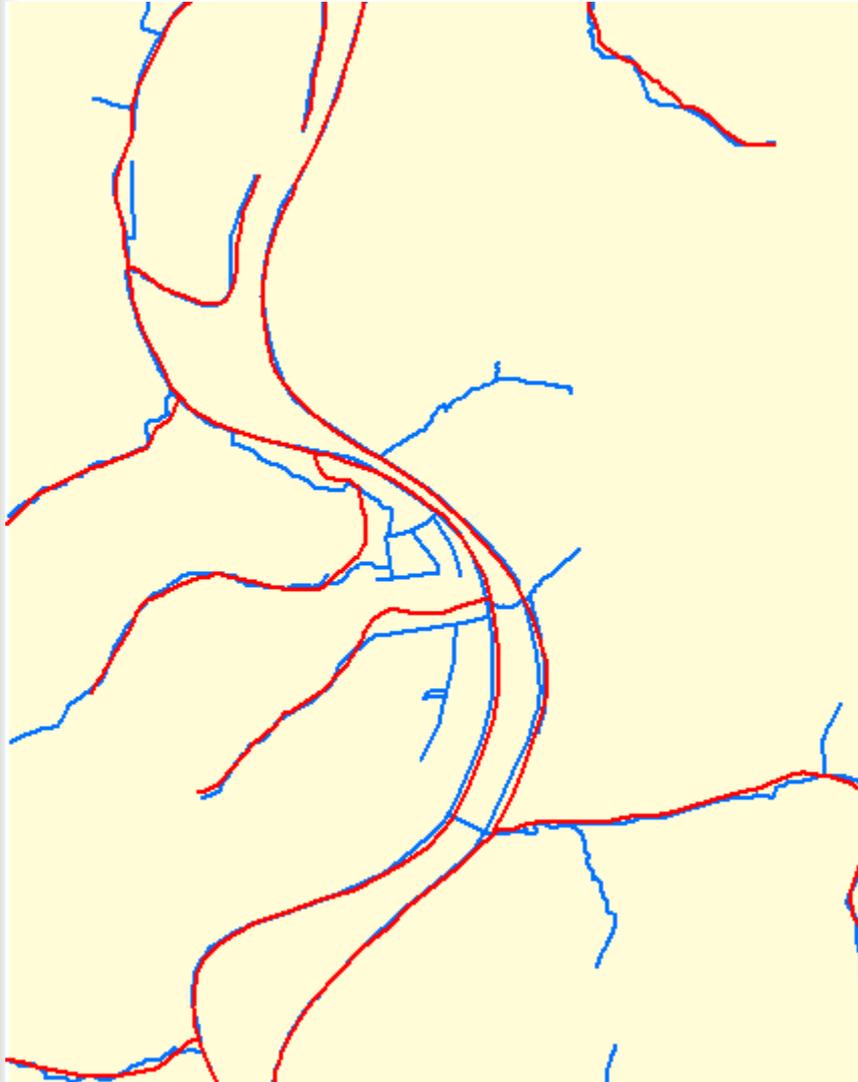
scale 1:1200



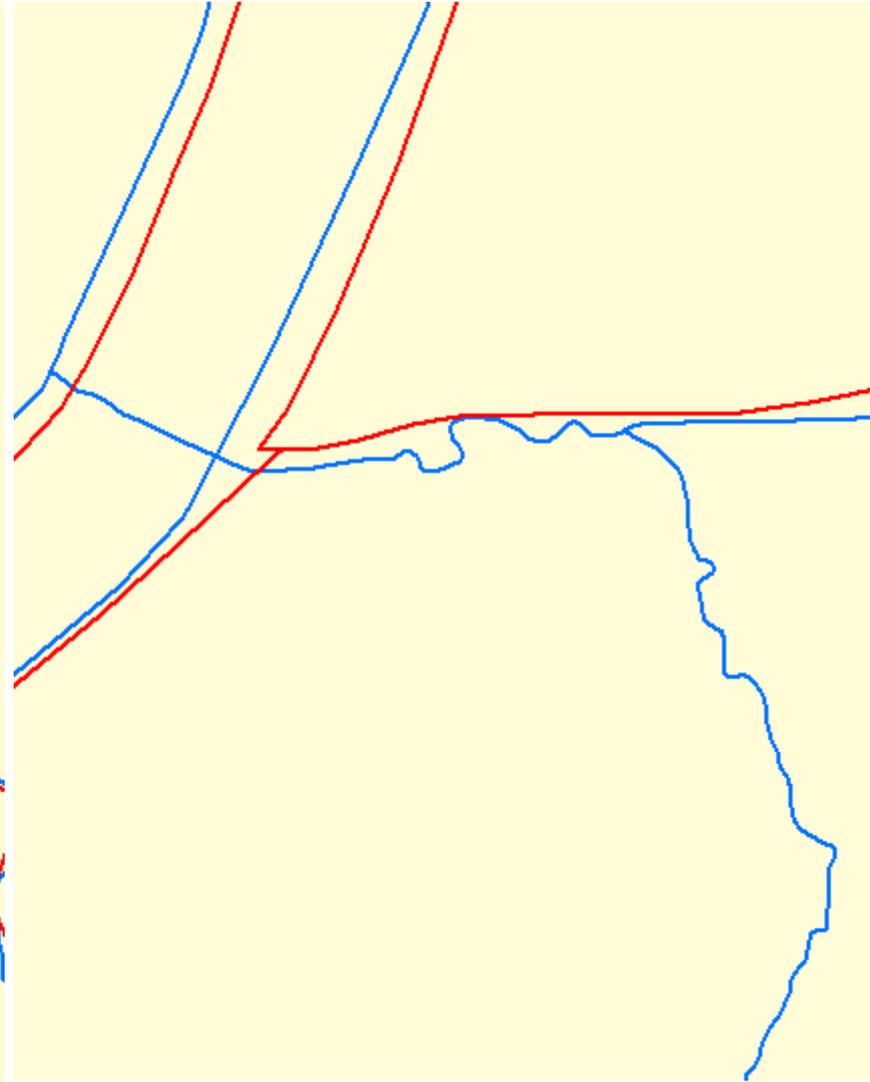
## ■ Stream and Stream Bank data layer (arcs)

- The minimum mapping width for linear streams is 10 feet
- Streams greater than 10 feet but less than 30 feet in width shall be delineated as a single line
- Linear artificial connectors will be digitized as needed to provide connectivity of the stream network
- All single line stream will have direction (upstream/downstream analysis)
- Streams greater than 30 feet in width will be captured as polygons. The stream boundary will be delineated within +/- 5 feet of the land-water interface
- For all polygonal streams, an artificial stream centerline (drainage path) will be digitized down the approximate middle of the polygon, with the correct arc/node topology that can be related to upstream and downstream flow direction analysis
- Each arc in the stream coverage will be assigned one of the following Situation codes:
  - 0 - River/Stream Polygon (River Banks)
  - 1 - Stream (width 10-30 ft)
  - 2 - River/Stream Centerline (artificial drainage within Stream Polygons > 30 ft)
  - 3 - Artificial Connectors (Under Roads, bridges, and other invisible connections to water polygons)
  - 4 - Ditches (other visible altered or man-made water courses)
  - 5 - Stream arcs through unaltered wetlands that were originally mapped by USGS but are not visible on the photography.

**Current Surface Water**  
wma 9 - 654 miles



**New Streams**  
wma 9 - 963 miles



# Current Surface Water Quality Standards

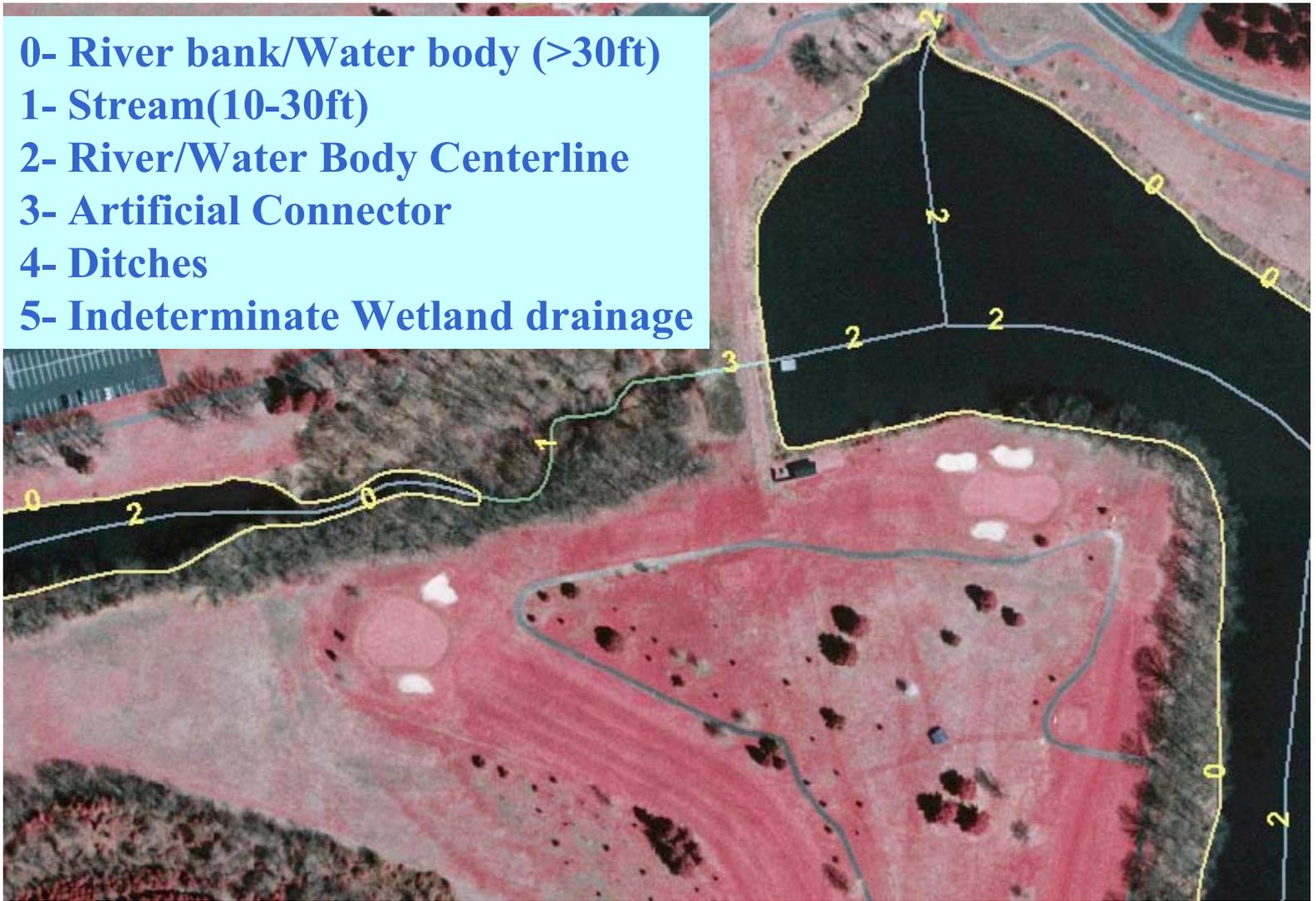


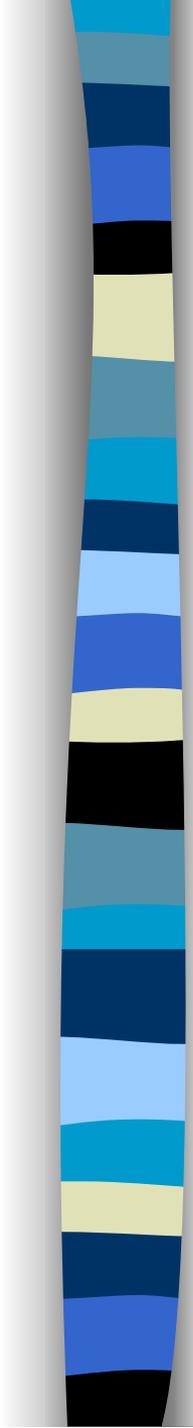
# New Streams



# Stream Situation Code

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





## ■ Water Body data layer (polygonal)

- The minimum mapping unit for non-linear water bodies is 1-acre
- The minimum width for capturing linear water bodies as polygons is 30 feet
- Water bodies captured as polygons will be delineated within +/- 5 feet of the land-water interface as interpreted on the 2002 imagery
- Water polygons will be delivered as separate layer
  
- The following codes for polygons will be used for the final layer
  - 1 - River/Stream Polygons (LU02 = 5100)
  - 2 - Natural Lake (LU02 = 5200)
  - 3 - Artificial Lake (LU02 = 5300)
  - 4 - Bays, Estuaries, Tidal Waters (LU02 = 54XX)
  
- Incorporate into the 2002 LU/LC, replacing the existing 1995/97 water body delineation and code for the appropriately LU/LC water class. Where discrepancies are small, it will be mapped as a correction, not as an actual land use change
- Where large discrepancies exist between the 2002 and the 1995/97 water body boundaries and/or codes, the area will be coded as a change in the LU/LC
- NJDEP will provide lake name file to join tables

# Current Lakes & Streams

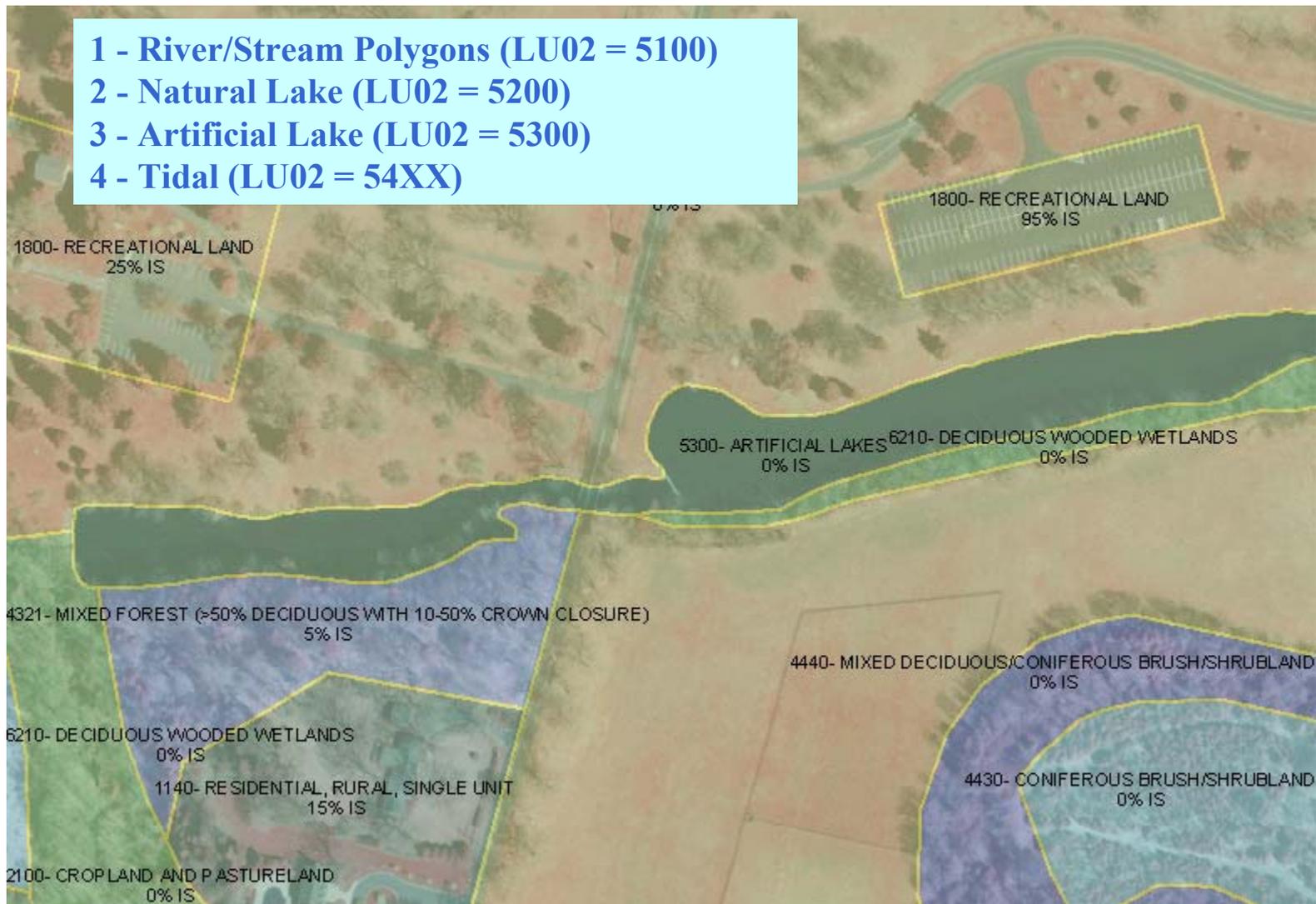


# New Lakes & Streams



# Incorporate Hydrography into Land Use/Land Cover

- 1 - River/Stream Polygons (LU02 = 5100)
- 2 - Natural Lake (LU02 = 5200)
- 3 - Artificial Lake (LU02 = 5300)
- 4 - Tidal (LU02 = 54XX)



# SWQS / New Streams



# SWQS / New Streams



# SWQS / NHD



# New Lakes & Streams



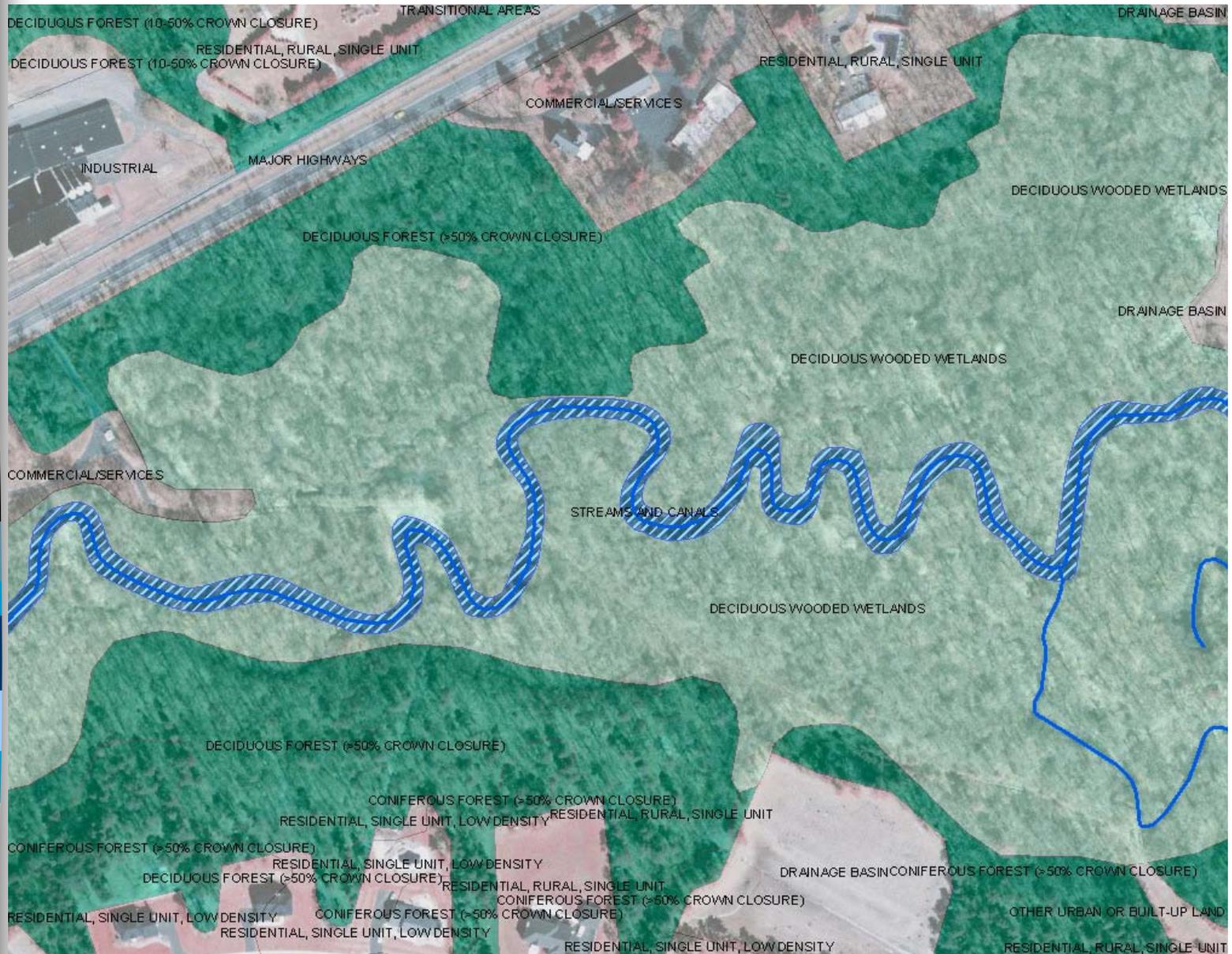
# New Land Use water polygons



# NHD feature type & Streams



# New Land Use & Streams



# SWQS / NHD



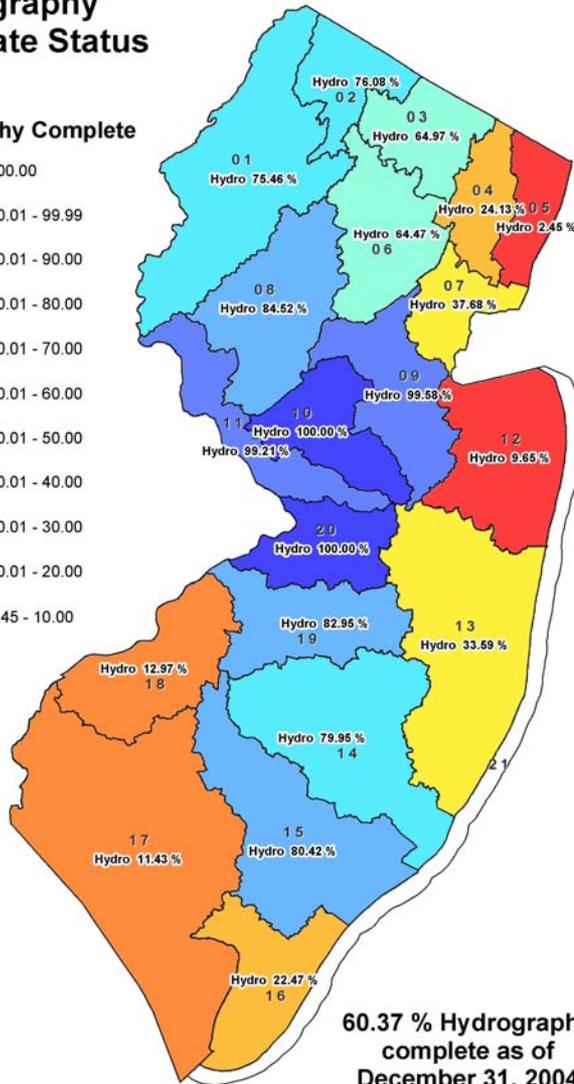
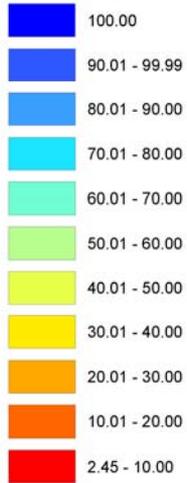
# SWQS / New Lakes & Streams



# Hydrography Status

## Hydrography 2002 Update Status

### % Hydrography Complete

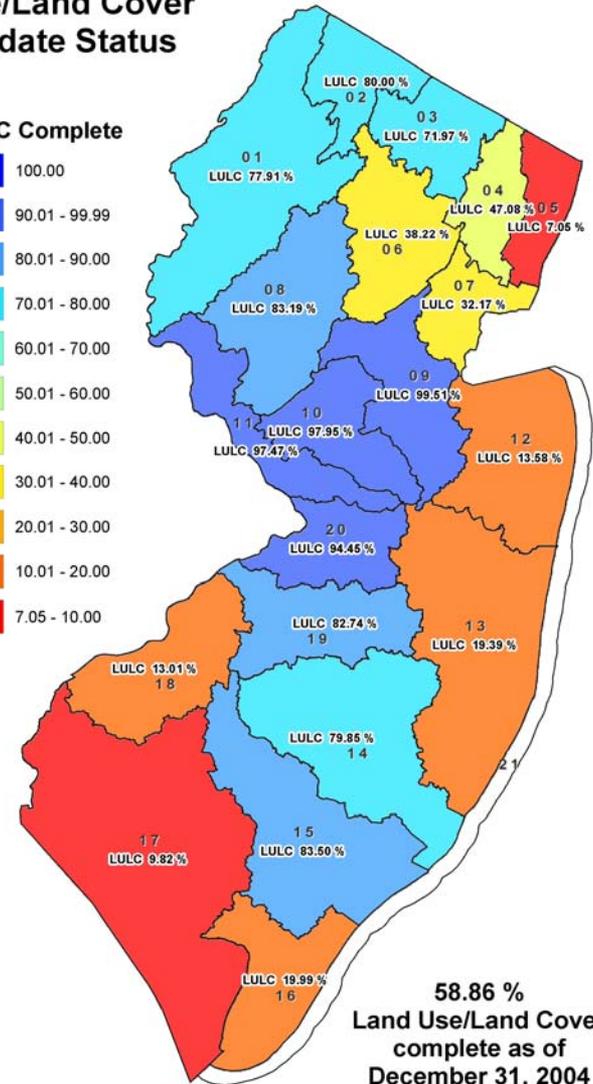
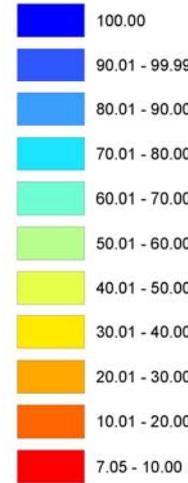


**60.37 % Hydrography complete as of December 31, 2004**

# LULC Status

## Land Use/Land Cover 2002 Update Status

### % LULC Complete



**58.86 % Land Use/Land Cover complete as of December 31, 2004**

# Hydrography ATTRIBUTES ?

Identify Results

Layers: <Top-most layer>

[-] Lakes (Statewide) with Name Attributes  
[-] Weston Mill Pond

Location: (514421.747288 595266.841006)

Field	Value
OBJECTID	9343
LAKES_ID	9623
LABEL95	NATURAL LAKES
NAME	Weston Mill Pond
SOURCE	gnis
ALIAS_NAME	
ALIAS_SRC	
ACRES	62.539
PERIM_FT	17881.781
LAKENUM	4272
SHAPE	Polygon

Identify Results

Layers: <Top-most layer>

[-] Hydrography (state/3rd order or higher)  
[-] SHREWSBURY (PARKERS CREEK)

Location: (630734.337535 550454.217284)

Field	Value
OBJECTID	1768
FNODE_	1959
TNODE_	1951
LPOLY_	0
RPOLY_	0
LENGTH_	1515.785156
MODULE_	83
ORDER_	4
LEVEL_	1
NUMBER_	10000
NAME_	SHREWSBURY (PARKERS CREEK)
DIRECTION_	0
PERIODICIT_	2
SITUATION_	2
REACH_	02030104999
REGION_	02
S_REGION_	0203
A_UNIT_	020301
C_UNIT_	02030104
SHAPE	Polyline
SHAPE.LEN	1515.784180

Identify Results

Layers: <Top-most layer>

[-] Lakes (detailed)  
[-] Delaware and Raritan Canal

Location: (479315.155864 626072.028814)

Field	Value
OBJECTID	13813
NJDEP.lakes_nj.AREA	12129137
PERIMETER	359234.313
HYDPLY_	24593
HYDPLY_ID	24592
NAME	Delaware and Raritan Canal
WATBOD	6
SHAPE	Polygon

Identify Results

Layers: <Top-most layer>

[-] Surface Water Quality Standards  
[-] DELAWARE AND RARITAN CANAL  
[-] RARITAN RIVER

Location: (479070.926254 625997.898150)

Field	Value
OBJECTID	16296
NAME	DELAWARE AND RARITAN CANAL
CATEGORY	FW2-NT
SWC	FW2
ANTIDEG	C2
TROUT	NT
NAMECK	
REFER	0
FISHGAMENM	
LENGTH	10487.288
UNIQUENUM	16300
SHAPE	Polyline
SHAPE.LEN	10487.284637

Identify Results

Layers: <Top-most layer>

[-] TMDL (Lakes)  
[-] Cranberry Lake

Location: (421625.504395 764717.401790)

Field	Value
OBJECTID	14
WMA	1
NAME	Cranberry Lake
LABEL95	
ALIAS_NAME	
ACRES	1922.277
NJDEP.tmdl_lakes.AREA	83734367.794
PERIMETER	49215.635
HECTARES	777.921
SHAPE	Polygon
SHAPE.AREA	83734363.775653
SHAPE.LEN	49215.625847

Identify Results

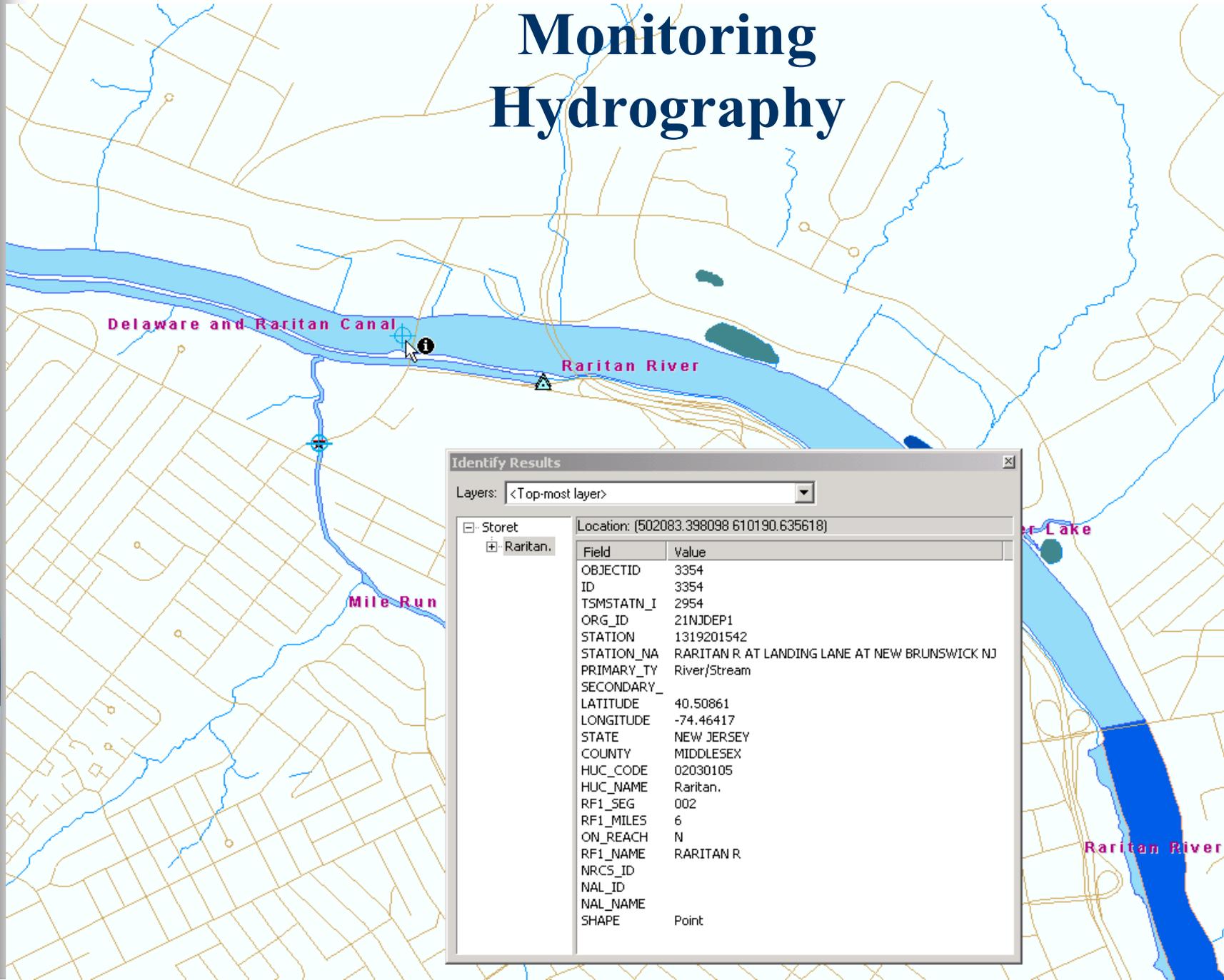
Layers: <Top-most layer>

[-] Streams (detailed)  
[-] RARITAN RIVER

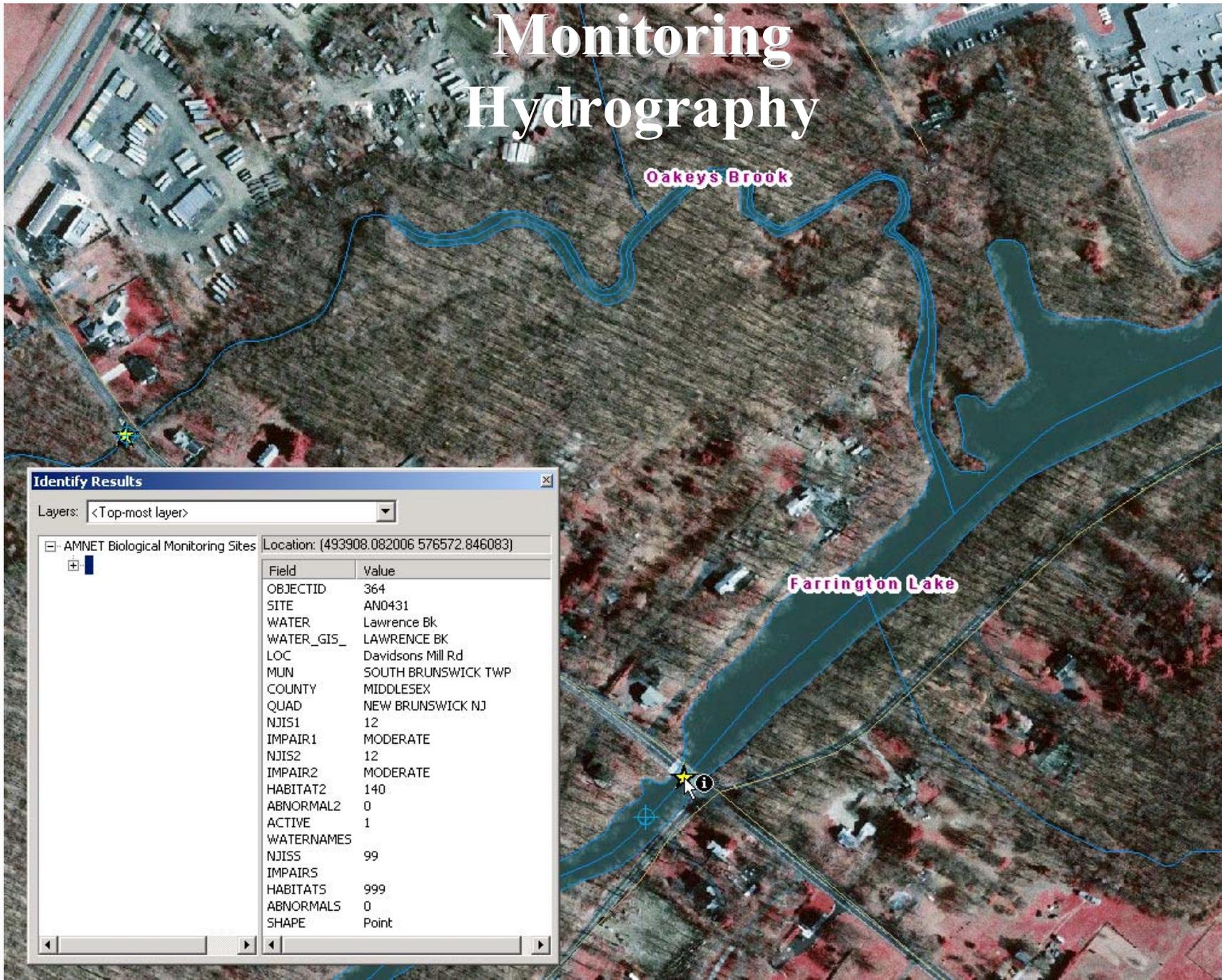
Location: (515709.075724 604116.263589)

Field	Value
FNODE	14439
TNODE	14426
LPOLY	-1
RPOLY	-1
LENGTH	2212.15
HYDBASIN_	12747
HYDBASIN_ID	219565
QUAD	71
ORD_ER	6
LEV_EL	1
NUM_BER	13192
NAME	RARITAN RIVER
DIRECTION	0
PERIODICITY	2
SITUATION	2
REACH	02030105002
OBJECTID	12747
GEOMETRY	Polyline
GEOMETRY.LEN	2212.152256

# Monitoring Hydrography



# Monitoring Hydrography



**Identify Results**

Layers: <Top-most layer>

AMNET Biological Monitoring Sites Location: (493908.082006 576572.846083)

Field	Value
OBJECTID	364
SITE	AN0431
WATER	Lawrence Bk
WATER_GIS_	LAWRENCE BK
LOC	Davidsons Mill Rd
MUN	SOUTH BRUNSWICK TWP
COUNTY	MIDDLESEX
QUAD	NEW BRUNSWICK NJ
NJIS1	12
IMPAIR1	MODERATE
NJIS2	12
IMPAIR2	MODERATE
HABITAT2	140
ABNORMAL2	0
ACTIVE	1
WATERNAMES	
NJISS	99
IMPAIRS	
HABITATS	999
ABNORMALS	0
SHAPE	Point



# Hydrography ATTRIBUTES ?

## What's Next?

1. Identify the important attributes/coding of existing Hydro layers.  
NAMES - SWQS - TMDL - Trout management - NHD
2. Identify any new data/information collected by others and see if it should be incorporated into the new hydro layers.
3. Plan a course of action to get these attributes conflated to the new lines/polygons. Who is willing to contribute resources/expertise/funding?
4. Identify the wish list of what users would like to see the data be capable of accomplishing.
5. Transfer data attributes into Single water body & stream data sets to be served out through a Enterprise Geodatabase in SDE for iMap and DEP-View. Currently we maintain/serve out at least 7.
6. Develop a geometric network linked with monitoring stations for Flow modeling & analysis.  
STORET - AMNET - Surface Water Intakes
7. Incorporate the data into monitoring and reporting programs. Allow for Versioning and data updates.
8. Supply line work to USGS for conflation of existing NHD coding.
9. YOUR IDEAS!!

## How can you help?

Contact [Craig.Coutros@dep.state.nj.us](mailto:Craig.Coutros@dep.state.nj.us)  
609-292-0899