Annual NJDEP GIS Mapping Contest

April 25, 2012

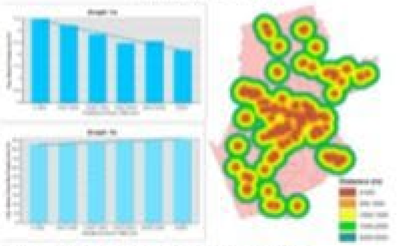
Analytical Presentation

Environmental Equity in NJ Counties

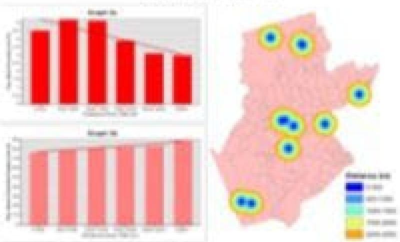
Colleen Carroll
Environmental Science, Adv GIS (ENVL3302), Richard Stockton College of New Jersey

Somerset County

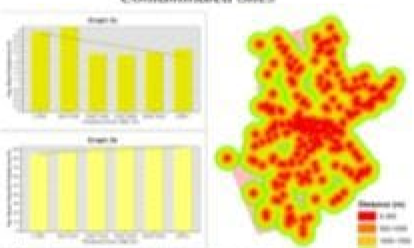
Industrial Zones

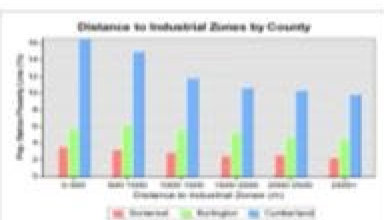


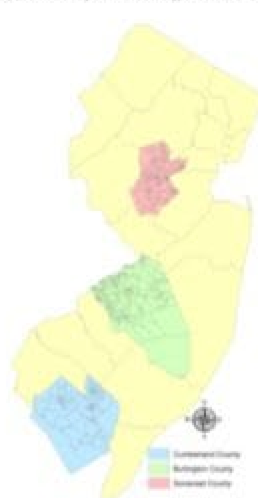
Solid Waste Sites



Contaminated Sites







Abstract

Environmental equity was analyzed for Somerset, Burlington, and Cumberland counties in New Jersey. Poor populations were compared to those that are considered not poor, and the distance of their homes to solid waste sites, industrial zones, and known contaminated sites was analyzed. Overall it was found that poor populations were more concentrated around these areas and not poor populations were less concentrated around the sites. A more significant trend was seen especially for industrial zones, making it clear that environmental inequity is present for lower-income populations in New Jersey.

Introduction

Environmental equity has to do with the fair and equal distribution of both resources and risks across an area. Recent findings, however, suggest that environmental inequity is quite prominent, impacting communities disproportionately and affecting minority and low-income groups. These affected populations may be exposed more to toxic environments and adverse health effects.[1] The New Jersey Interagency Sustainability Working Group set initiatives and strategies to combat environmental inequity and promote sustainability.[2] Although these goals have been implemented for over a decade, it is questionable whether or not progress is notable and if environmental inequity is still prominent in the state. The objective of this study was to determine if there is a correlation between the income level of residents and the distance of their properties to solid waste sites, industrial zones, and known contaminated sites in New Jersey. Three different counties were compared: Somerset County, Burlington County, and Cumberland County.

Data & Methods

For this study, 2010 census data for NJ was downloaded as an excel spreadsheet and used to demonstrate the distribution of populations with varying incomes. People below the poverty line are represented as "poor" and people above twice the poverty line are considered "not poor". Since this data is separated by block groups, maps of Somerset, Burlington, and Cumberland counties that incorporated block groups were downloaded and joined with the census data in order to assign spatial location to the populations. Three different site types were utilized to determine the presence or lack of environmental equity: solid waste sites, industrial zones, and known contaminated sites in New Jersey. Five distance zones were established around each site, incrementing by 500 meters. The percent of poor and not poor populations within each zone is analyzed to determine if there is a pattern in the data, possibly confirming the existence or absence of environmental equity in New Jersey.

Results

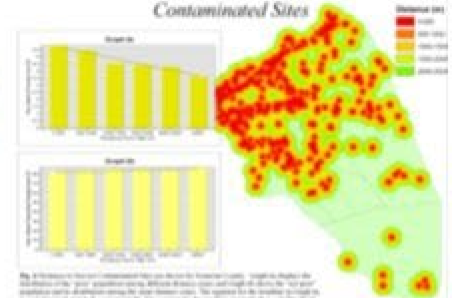
In general it was found that there is a pattern and a distinct difference between the poor and not poor populations. There is a higher concentration of poor populations closer to the sites studied and a higher concentration of not poor populations farther from the sites, as seen in figures 1 through 9. Some of the data trends, however, have high variation and may not be considered significant. The results for industrial zones, on the other hand, have the highest average R-squared values and much less variation making them more significant than the other results. When comparing across the three counties in figures 10 and 11, it was seen that the pattern persists regardless of the difference in location and overall county wealth.

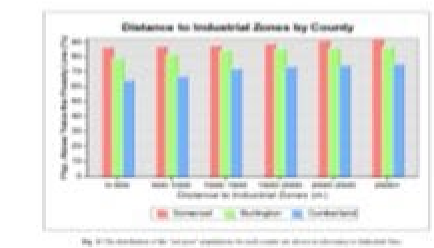
Burlington County

Industrial Zones

Solid Waste Sites

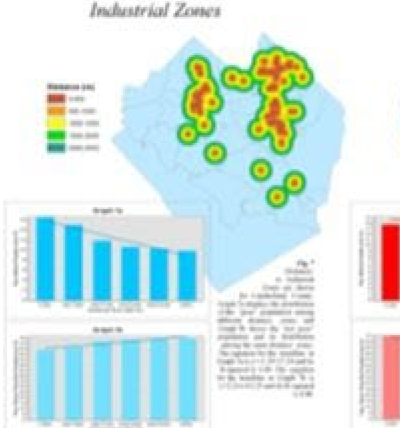
Contaminated Sites



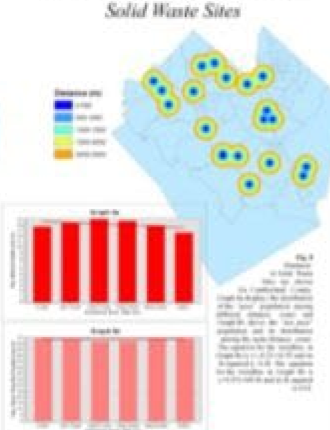


Cumberland County

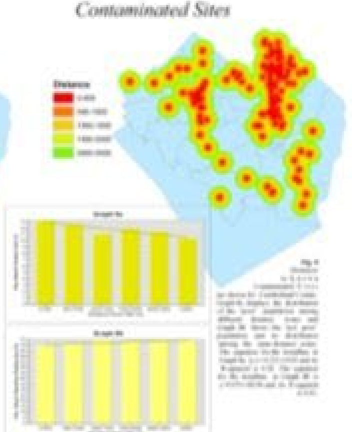
Industrial Zones



Solid Waste Sites



Contaminated Sites



Conclusion

The results of this study show that environmental inequity is a problem in New Jersey regarding low-income residents and their distribution around industrial zones. Although there was a similar pattern surrounding the solid waste and known contaminated sites, the results were not as significant. Although this study is not major and only was evaluated for three counties, it does suggest that further research should be done to determine how the government can act to combat environmental inequity.

New Jersey Gardens and Arboretums

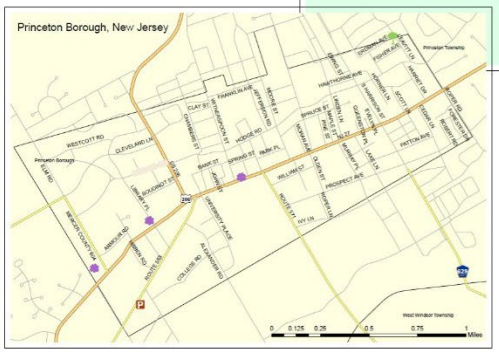
By Heather Merring
Rowan University - March 2012

New Jersey provides many opportunities to spend the day in a botanical garden or arboretum. There are more than fifty official gardens, arboretums, and parks that focus on attracting people for their beautiful plants that are both native and nonnative. These locations are throughout all of New Jersey in more than half of the counties. Most are open through spring and summer, and some in the colder months. Tours are often offered, as well as self hiking trails and paths to observe the scenery.

Botanical gardens are even more common than arboretums in New Jersey. Some are specific to attracting butterflies and hummingbirds, while others may specialize in bird watching or unusual plant species. There are 96 acres of specialty gardens surrounded by 1000 acres of woodlands, this helps to keep New Jersey the actual Garden State.

An arboretum is a collection of trees and shrubs that are cultivated for exhibition. They can be used scientifically, for education, or as simple pleasure. Some of the most common trees present in the New Jersey arboretums are cherry, oak, elm, beech, pine, willow, and maple, and these are only a few examples.

Sources - Rowan University, NJ Department of Agriculture, NJ Botanical Garden, njmonthly.com, youdontknowjersey.com, http://mgessex.org/cms/, www.holmdel-park-nj.medgrp.com



Princeton serves as a great location to walk around and see many different gardens and their arboretum, Hermotown Woods.
This arboretum contains over thirty species of trees, walking trails, shrubs, and flowers. It is 142 acres all of which are preserved in their natural state.

NEW JERSEY DEPARTMENT OF TRANSPORTATION CAPITAL PROGRAM: DECISION SUPPORT MODEL SUPPLEMENT

NJDOT MANAGEMENT SYSTEM DEFICIENCIES

BMS - Inset 'A'

SMS- Inset 'B'

DMS- Inset 'C'

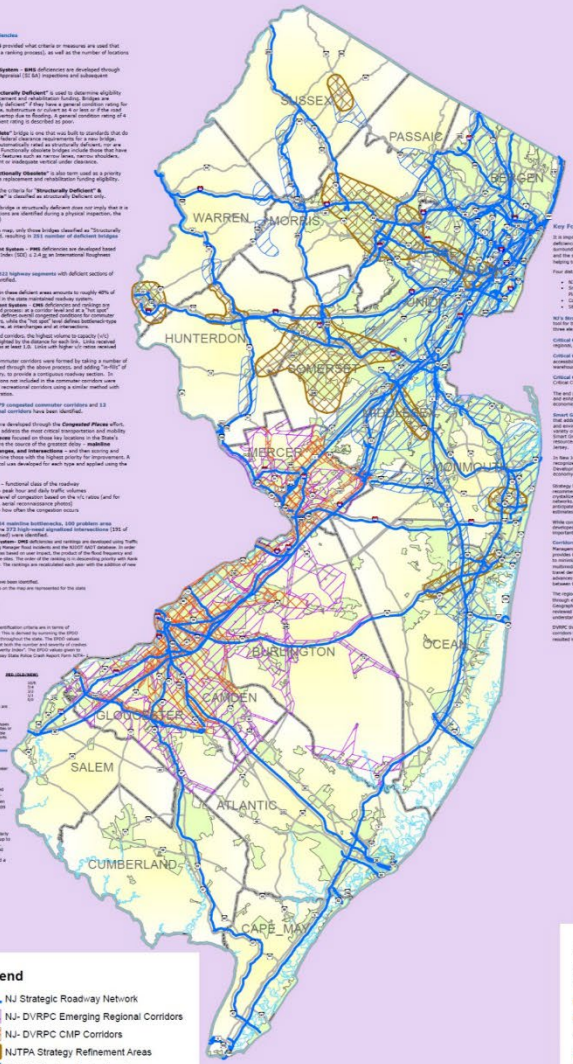
CMS - Inset 'D'

PMS - Inset 'E'

Legend

- Structurally Deficient Bridges (January, 2012)
- High Need Intersections (June, 2011)
- Problem Area Interchanges (March, 2009)
- Congested Commuter Corridors (October, 2011)
- Congested Summer Corridors (October, 2011)
- Mainline Bottlenecks (March, 2009)
- SMS Intersection Crash Locations (2010)
- SMS Right-Angle Crash Locations (2010)
- SMS Pedestrian Crash Corridors (2010)
- Deficient Pavement (September, 2011)
- Deficient Drainage Ranking (September, 2011)

KEY FOCUS AREAS



Legend

- NJ Strategic Roadway Network
- NJ- DVRPC Emerging Regional Corridors
- NJ- DVRPC CMP Corridors
- NJTPA Strategy Refinement Areas
- NJTPA Strategy Evaluation Areas
- NJ Smart Growth Areas

10 5 0 10 Miles

FY2012-2021 STIP

Legend

FY 2012-2121 STIP

CIS Program

- Bridge Assets
- Local System Support
- Multimodal Programs
- Road Assets
- Safety Management
- Congestion Relief Program
- Bridge Structure

Rt 70 over Manasquan River

Zone 2: I 295 Pavement Project

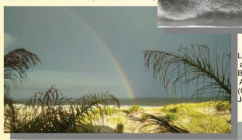
New Jersey Department of Transportation
Bureau of Systems Planning

January, 2012

"The Real Jersey Shore"

Author: Jennifer Wallen
Date: March 21, 2012
Source: NJDEP Data

Above: Seaside Heights rides along the boardwalk(Credit:http://www.seasideheightsnj.com/images/seaside-heights-boardwalk-2.jpg)
Right: Surfing in NJ is a popular sport, with waves from 2-5 feet (Credit: Joe Butler)

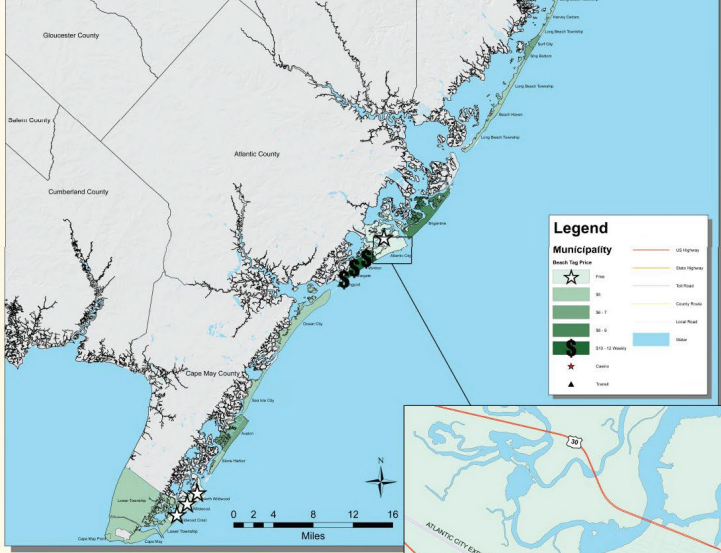


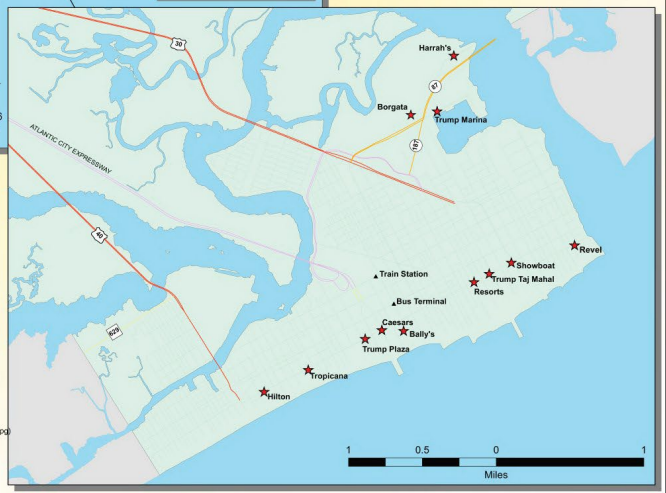
Left: The beach after a rainstorm in Margate
Below: The bay with Atlantic City in the distance
(Credit for both: Jennifer Wallen)

Cape May Lighthouse
(Credit: http://www.leithhall.com/index.php/things-to-do/cape-may-lighthouse/)

The Ocean City boardwalk is great for families with children
(Credit: http://nouveau-jersey.blogspot.com/)

Wildwood boasts 2 water parks, 3 amusement parks, and a wide beach
(Credit: http://www.jerseyshoreguide.net/wp-content/uploads/2008/08/ww-amusement-piers.jpg)

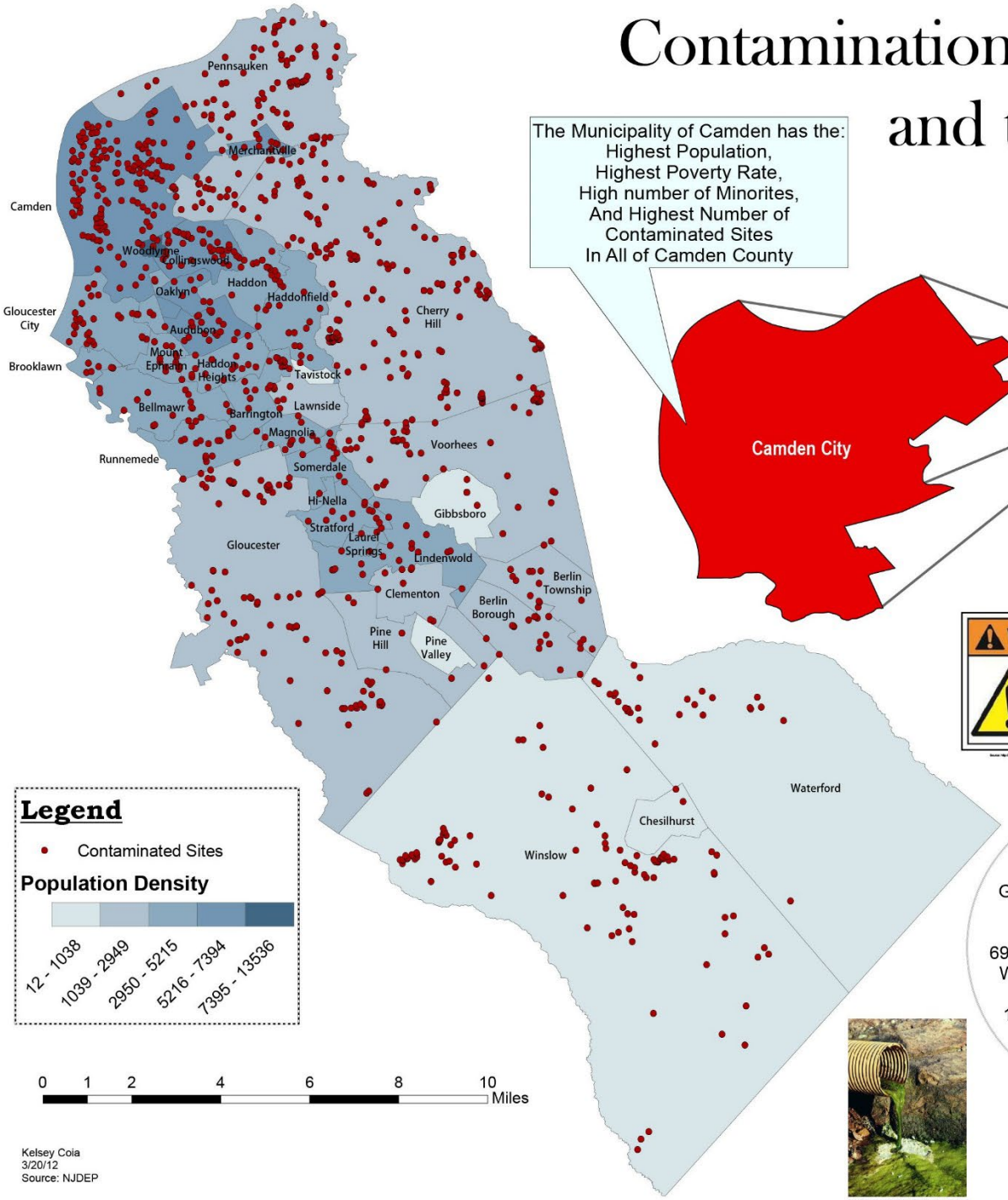




Contamination in Camden County and the People it Affects

The Municipality of Camden has the:
Highest Population,
Highest Poverty Rate,
High number of Minorites,
And Highest Number of
Contaminated Sites
In All of Camden County

The Municipality of Pine Valley has:
A Very Low Population
No One Under Poverty Level
No Minorites
No Contaminated Sites



Legend

- Contaminated Sites

Population Density

12 - 1038
1039 - 2949
2950 - 5215
5216 - 7394
7395 - 13536

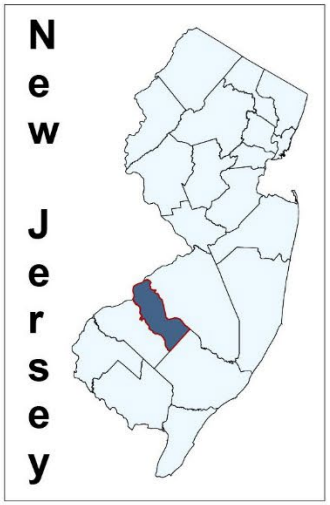
0 1 2 4 6 8 10 Miles

Kelsey Coia
3/20/12
Source: NJDEP

Contaminated Sites Are Areas of Land Where the Soil or Groundwater Toxicity is Above the Standard Level

69% of People Living Near Toxic Waste Facilities are Minorities

1.3 Billion People Around the World Live in Unsafe or Contaminated Areas



A Visual Exploration of Time-Space in the New York Metropolitan Area

Seth Docherty[1], Anthony Ingato[2], Dr. Feng Qi[3] ([1] Undergraduate/NJDEP BGIS employee, [2] Undergraduate Student, [3] Faculty Advisor)

Abstract

Traveling in today's world it's all about time, and how long it takes to get "there". Current maps are based on spatial distances, which have become obsolete when traveling, as physical distance is no longer the main factor that determines traveling time anymore. This is due to the new modes of modern transportation with automobiles in a dense road network and public transportations. This study uses distance cartograms and other visualizations to explore the time-space defined by such modern mode of transportations in the New York Metropolitan Area. According to the 2000 census over 2 million people work in the Borough of Manhattan with 70% coming from outside Manhattan. In this study, we focused on the most populated cities within the New York-Northern New Jersey-Long Island, NY-NJ-PA Metropolitan Statistical Area in hopes to provide effective visual representations of the commuting patterns in and out of Manhattan.

Getting to the "Route" of the Problem

Over a 5 week period ,from Aug. 22nd 2011 – Sept 23rd 2011, **Inbound** (8:30 am morning commute into NYC) and **Outbound** (5:30 pm Afternoon commute out of NYC) commute traffic times were recorded using Bing Maps. To visually analyze the commuting patterns of driving, a routes traveled dataset was created by…

Getting the directions from each city into NYC from Google maps and using the GMapToGPX script to capture the route coordinates and exporting it as a .gpx file.

Each .gpx file is then exported as a shapefile using DNR Garmin

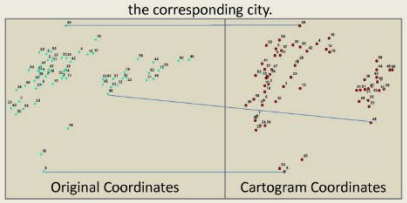
Next, a Python script was created to convert each polyline shapefile into a raster and then reclassified.

The route traveled data set is then summed up using raster calculator to get the final output below of how often a road was traveled from each of the 62 cities into NYC.

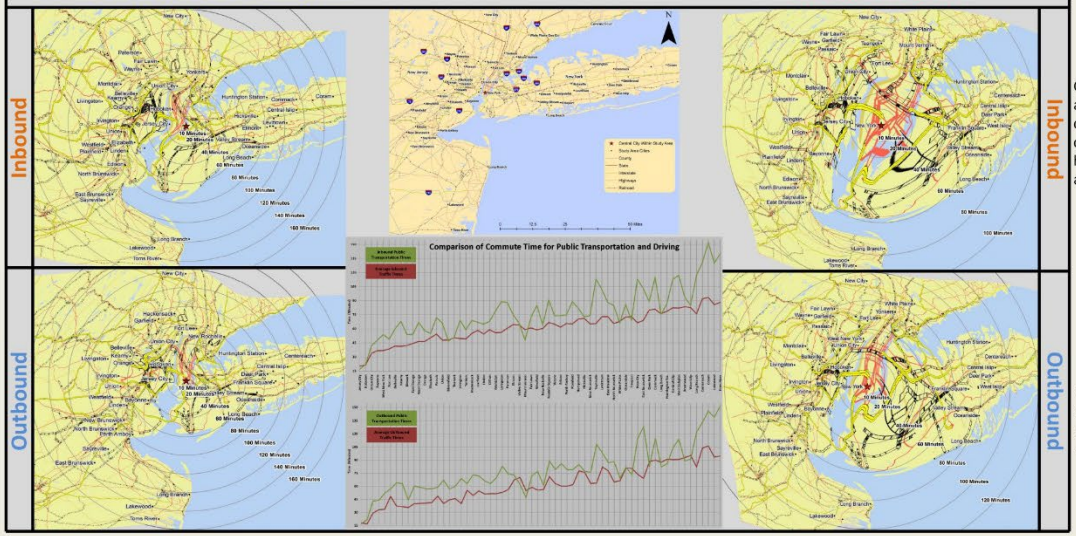
What is a Cartogram?

A cartogram is a type of map that alters geographical features based on a statistical or thematic variable. For this study, we will be looking at distance cartograms. A distance cartogram depicts the proximity between points by distorting the space. This is useful in visualizing relative travels times within a network of points, in this case the NYC MSA.

The time distorted visual was achieved through a rubber-sheeting process. The output coordinates from the distance cartogram program were geo-referenced on a base-map with the corresponding city.



Public Transportation Cartogram — Reference Map of Study Area — Driving Cartogram

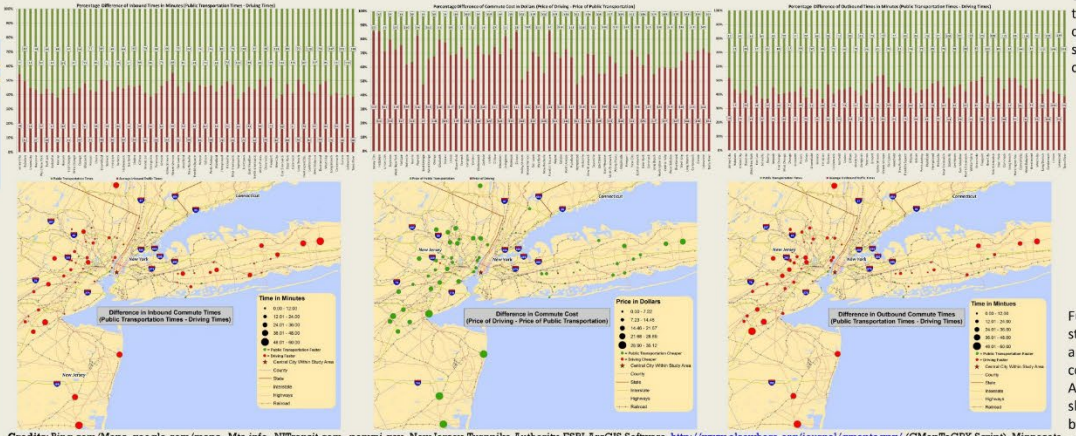


To Drive or Not to Drive?

Commuters have two modes of transportation to chose from to get into New York City; public transportation or driving. One of the main questions that is of interest, is which mode of transportation is the fastest? In order to compare public transportation to driving, the times had to be consistent. Public transportation times were recorded and specifically cross checked for the fastest commute times at 8:30 am and 5:30 pm (within a +/-20 minute range).

The Cost of Commuting

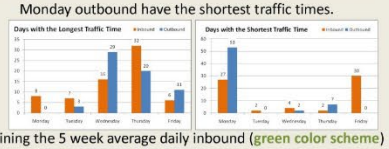
Another option commuters take into consideration is which mode of transportation is the cheapest. The expense of public transportation was found by calculating the cost of each routes' transit type (bus, train, or subway) into New York City. Commuters do not only take into account the cost of road, bridge, and tunnel tolls but the actual cost of driving a car. Based on AAA's yearly calculation of "*Your Driving Costs*", it costs the average commuter 58.5 cents per mile.



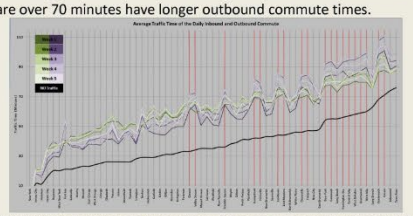
Credits: Bing.com/Maps, google.com/maps, Mta.info, NJTransit.com, panynj.gov, New Jersey, Turnpike Authority, ESRI ArcGIS Software, http://www.elsewhere.org/journal/gmaptogpx/ (GMapToGPX Script), Minnesota Department of Natural Resources (DNR Garmin Program), http://icaci.org/ Publication by Ryo Inoue, Masatoshi Wako, and Eihan Shimizu, http://www.commutesmart.info/download/AAA_DrivingCosts2011.pdf

Results

The two charts below depict the longest and shortest commute time throughout the week for each city. The inbound commute on Wednesday and the outbound commute on Thursday have the have the longest traffic times while the Monday/Friday inbound and Monday outbound have the shortest traffic times.



Combining the 5 week average daily inbound (**green color scheme**) and outbound (**purple color scheme**) traffic times aids in visualizing commuting patterns and analyzing which cities experience the most congestion. The majority of the routes that are under 70 minutes have longer inbound commute times and most of the routes that are over 70 minutes have longer outbound commute times.



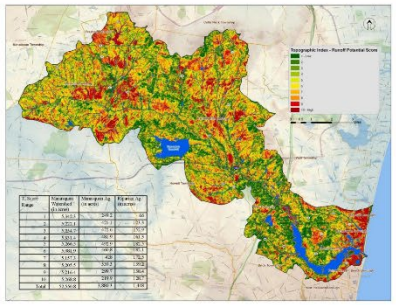
What is interesting are the spikes of average commute times over 70 minutes. The cities associated with spikes (see red lines) in the graph coincide with the with the route (**see map below**) that is most traveled which happens to be I-495 Long Island Expressway.

After analyzing the data, it was found that the cheapest mode of transportation overall was public transportation and the fastest mode of transportation was driving. However, the results showed that public transportation for 6 out of the 62 cities were deemed not only cheaper but faster than driving. 56 out of the 62 cities were best suited for driving due to shorter commute times and out of the 56 cities, 2 were cheaper than public transportation.

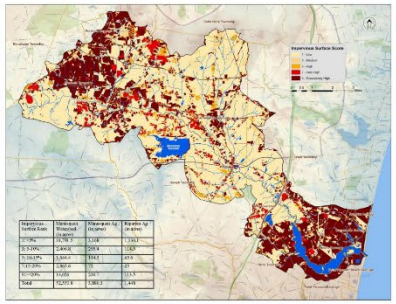
Future Updates

Further in-depth analysis can be done by adding more cities into our study area. This would add more routes to the routes traveled dataset and help fill in large gaps around New York City which yields a more consistent distance cartogram of commute times in and out of the city. A much more consistent distance cartogram would aid in pinpointing slow spots in a transportation system . Additional studies can be done by looking at commuting patterns over a longer period of time and analyzing seasonal and holiday trends.

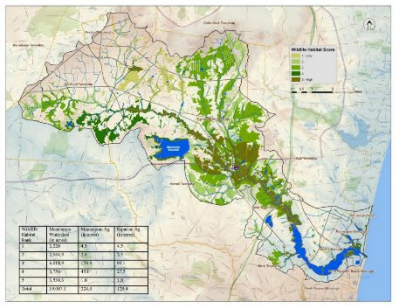
GIS Model for Prioritizing the Agricultural Lands for Stream Buffer Restoration in Manasquan Watershed



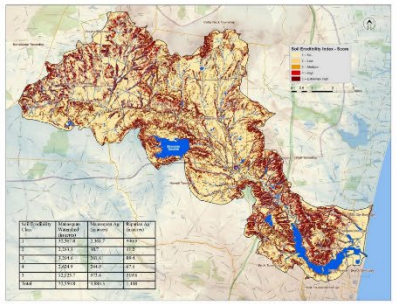
VARIABLE I: Hydrological Sensitivity – Topographic Index



VARIABLE II: Impervious Surface



VARIABLE III: Habitats for Nongame and Endangered Species



VARIABLE IV: Soil Erodibility Index

VARIABLE I: Hydrological Sensitivity – Topographic Index

Hydrological sensitivity indicates the potential of generating runoff for a particular area during a storm event and is measured by a modified topographic index (TI) as follows:

$$A = \ln\left(\frac{\sigma}{\tan(\beta)K_s D}\right)$$

where α is the upslope contributing area per unit contour length (a given point in a watershed, β is the local surface slope angle, D is the local soil depth to the fragipan, bedrock or other type of restrictive layer, and K_s is the mean saturated hydraulic conductivity of the soil profile above the restrictive layer or bedrock. The higher the index, the more likely the grid is saturated during a storm event. In general, the deeper the topsoil (D) and the higher the saturated hydraulic conductivity (K_s), the lower the value of λ, which implies a lower likelihood of generating surface runoff.

The DEM was first processed using the open source ArcGIS extension Terrain Analysis Using Digital Elevation Models (TauDEM) by Tarboton (2005) and the ArcGIS Raster Calculator to obtain a wetness index grid, $\ln\left(\frac{\alpha}{\tan(\beta)}\right)$.

There is a problem in calculating the wetness index when the local surface slope angle, β, is zero. To ensure the full coverage of the topographic index, a minimum surface slope of 0.0001 was assumed for all grids with surface slopes less than 0.0001. The soil depth (D) and the mean saturated hydraulic conductivity (K_s) were extracted for each soil type from the SSURGO soil database. The calculated TI ranges from 1.05 to 34.22 for Manasquan Watershed. In this application, Manasquan is divided into 10 equal zones based on the TI.

VARIABLE II: Impervious Surface

Studies show that watersheds with 10-20% of their area in impervious surfaces have a high potential for physical, chemical, and biological impairments of water quality and other aquatic resources.

Due to the greater concerns of the urban stormwater impacts, the impervious cover is classified into five classes using a discriminover 1 to 9 classification scale to give the impervious surface a greater impact in the final ranking. Areas with the impervious surface rates of less than 5% were given a score of 1. Areas with the impervious surface rates that were greater than 25% were given a score of 9. The scores assigned to the three classes between 1 and 9 in the reclassification are 3, 5, and 7, which correspond to impervious surface rates of 5, 10, and 15%, respectively.

Project Background

This model's main objective is to prioritize the agricultural lands for buffer restoration in Manasquan watershed. The model will include identification of agricultural lands in riparian areas, prioritization of lands for restoration projects. Through this modeling process, areas that are the highest priority for riparian restoration will be identified.

Riparian buffer restoration on agricultural lands is a vital component to grantee clear drinking water. When it rains, rainwater flows over the landscape and into the many streams that feed the Manasquan River. Based on the 2007 NJDEP land use land cover data, there are about a total of 3,040 acres (7% of the whole watershed) of agricultural lands within the Manasquan Watershed. Of all the agricultural lands, there are about 1,448 acres (or 37.3%) located within the riparian buffer area of the streams. For those agricultural lands that located in the riparian buffer zones, anything happens in the farm field, like fertilizers, animal waste, soil erosion; etc will be carried away and discharged to the streams. Some areas in Manasquan watershed has shown stream buffer degradation due to the improper management of farm land. Identifying those high priority agricultural lands within the riparian buffer zone for future stream restoration is very critical to ensure stream health. Restoring the stream buffer area by maintaining the natural habitat conditions will ensure greater drinking water quality.

Project Location

VARIABLE III: Habitats for Nongame and Endangered Species

The datasets used here is the Version 2.1 of the New Jersey Department of Environmental Protection Nongame and Endangered Species Program's Landscape Project maps areas that have the potential for rare species based on a grouping of identified natural resources.

In this application, the habitat maps for forested and emergent wetlands species, wood turtle and bald eagle were extracted for Manasquan Watershed and then were 'combined' all together using spatial analyst. The habitat for all the species were measured by the sum of all ranks for the four species. The habitat scores range from 1 to 12. Since there are only few areas with the habitat scores great than 5, any areas with the habitat score greater than 5 were also given the score of 5.

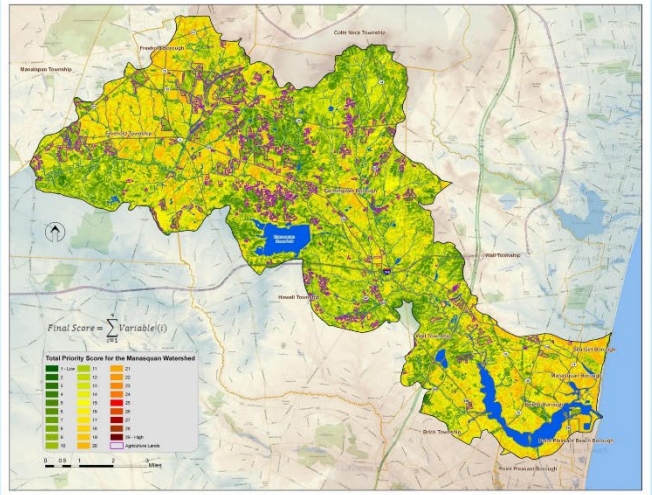
VARIABLE IV: Soil Erodibility Index

Soil erodibility is evaluated using the NRCS erodibility index (EI). EI is determined by dividing the potential erodibility for the soil (RKLS) by the soil loss tolerance (T) value.

$$EI = \frac{RKLS}{T}$$

R: measures the rainfall and runoff intensity. 199.7 for the Manasquan regions.
K: indicates the susceptibility of the soil to water erosion and is measured by K factor for the soil in the NRCS SSURGO database.
LS: describes the combined effects of slope length and steepness and is calculated from DEM.
T Factor: is extracted from the column "Tfact" in the table Component in SSURGO database; the rate is tons per acre per year. Since there is no T values for water and urban soils, 0.01 is assumed to ensure the completion of the calculation.

The procedure to calculate LS factor was borrowed from the "Modeling Soil Detachment with RUSLE 3d using GIS" developed by Geographic Modeling Systems Laboratory of University of Illinois at Urbana-Champaign. The calculated Erodibility Index (EI) ranges from 0 to 832.9, according to NRCS, the soils with EI greater than 8 are considered as highly erodible soils.



Final Composite Priority Score from the Four Variables:
$Final\ Score = \sum_{i=1}^{n} Variable\ (i)$

Model Development

The prioritizing procedure was executed in a vector and raster environment using ArcGIS 10 and the Spatial Analyst. In most of the procedures, vector data format was used to keep the original resolution, if vector data is not feasible, then raster dataset was applied. Agricultural lands in the Manasquan watershed were extracted from the latest land use database in New Jersey (NJDEP 2007 Land Use data). The riparian area dataset used during this model is the GIS file NJWSA developed back in 2005 for Manasquan River Watershed Association. Spatial data from various sources were collected to derive the parameters for the four criteria. After completing each of four criteria values, they were classified into rank at a 0-5 or 1-10 scale. Different classification scales were applied to different criteria to reflect the relative weights of the specific criterion in the final prioritization scale. The final ranking score is a sum up of each of the criterion classification score.

Final Results

The total priority score is the sum up of the individual criteria scores featured on the left. The total scores for individual areas in Manasquan Watershed range from 1 to 29. Agricultural lands have total scores ranging from 2 to 27. Most agricultural areas (88%) have total scores of 5-15. The amount of land in agricultural areas decreases sharply as the total score increases from 15 to 27. Of the 3,886 acres of agricultural lands in Manasquan Watershed, there are 1,448 acres of agricultural lands located in the riparian areas comprising 37.3% of the total agricultural lands in the watershed. The higher the total score, the higher priority of that area for riparian buffer restoration.

Agricultural areas with a total score greater than a certain threshold have a high priority for the placement of conservation buffers. The selection of the threshold would give stakeholders another opportunity to incorporate any objective and subjective factors in the prioritization process. For example, the availability of funding for the buffer programs would determine how many agricultural lands can be prioritized for buffer placement.

This map was prepared by NJWSA, April 2012

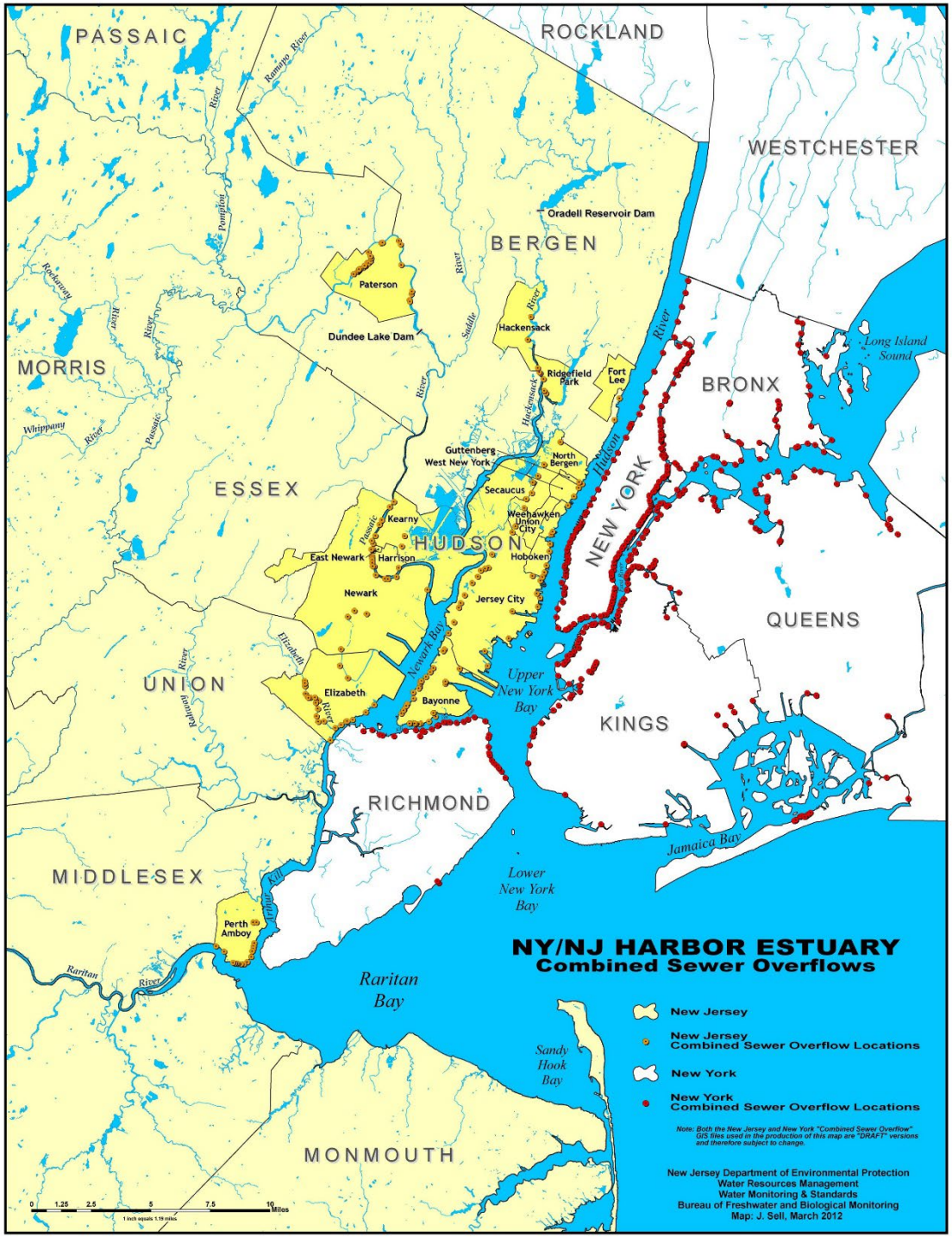
Data Source: NJDEP, NJ USGS, NRCS SSURGO, FEMA, NJGIN, Monmouth County GIS, Microsoft Bing map

Software Used during Modeling: ArcInfo 10, Spatial Analyst, TauDEM, Raster Calculator

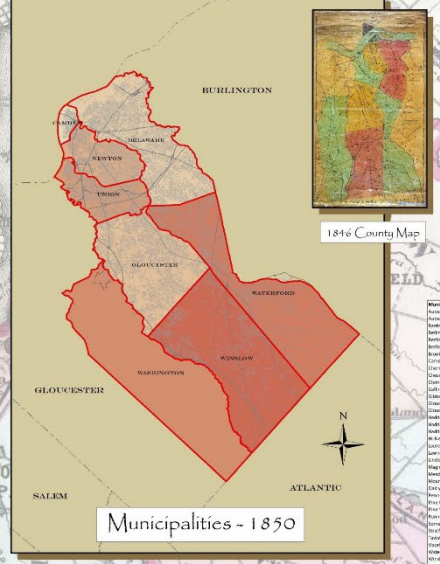
This modeling was accomplished and this poster was prepared by NJWSA and the product has not been reviewed by related organizations and the above agencies. NJWSA does not assume any responsibility related to spatial accuracy, timeliness, errors, omissions or other inconsistencies arising from the underlying data.

Acknowledgement: Thanks given to North Jersey RC&D and NJIT for developing the prioritizing schemes and the modeling process.

Data Integration

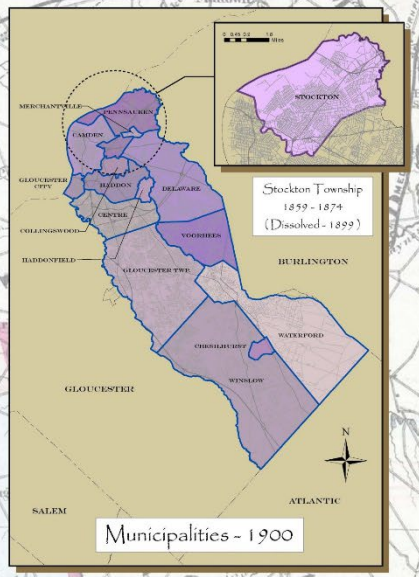

PASSAIC
ROCKLAND
WESTCHESTER
Ramapo River
Pompton River
Oradell Reservoir Dam
BERGEN
Paterson
Dundee Lake Dam
Saddle River
Hackensack River
Rockaway River
Whippany River
Passaic River
MORRIS
Ridgefield Park
Fort Lee
Hudson River
Long Island Sound
BRONX
Hackensack River
Guttenberg
West New York
North Bergen
Secaucus
ESSEX
Kearny
Weehawken
Union City
HUDSON
NEW YORK
East Newark
Harrison
Hoboken
Newark
Jersey City
Passaic River
QUEENS
Newark Bay
Elizabeth River
Upper New York Bay
UNION
Rahway River
Elizabeth
Bayonne
KINGS
RICHMOND
Jamaica Bay
Lower New York Bay
MIDDLESEX
Kill van Kull
Perth Amboy
Raritan River
Raritan Bay
Sandy Hook Bay
MONMOUTH
0 1.25 2.5 5 7.5 10 Miles
1 inch equals 1.19 miles
NY/NJ HARBOR ESTUARY
Combined Sewer Overflows
New Jersey
New Jersey Combined Sewer Overflow Locations
New York
New York Combined Sewer Overflow Locations
Note: Both the New Jersey and New York "Combined Sewer Overflow" GIS files used in the production of this map are "DRAFT" versions and therefore subject to change.
New Jersey Department of Environmental Protection
Water Resources Management
Water Monitoring & Standards
Bureau of Freshwater and Biological Monitoring
Map: J. Sell, March 2012

Historic Boundaries of Camden County



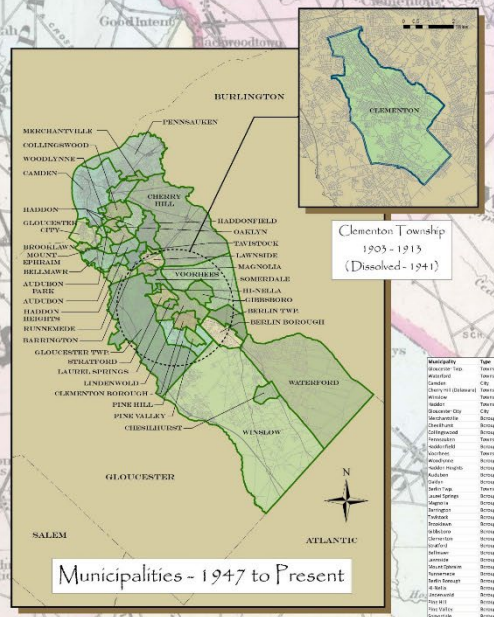
1846 County Map

Municipalities - 1850



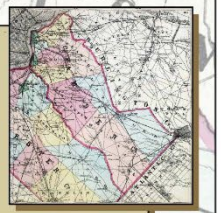
Stockton Township
1859 - 1874
(Dissolved - 1899)

Municipalities - 1900



Clementon Township
1903 - 1913
(Dissolved - 1941)

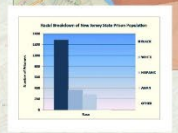
Municipalities - 1947 to Present



1872 County Map

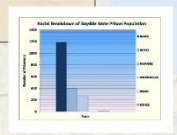
Historical Overlay

New Jersey State Prison

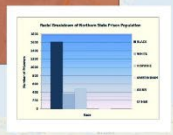


Southwoods State Prison

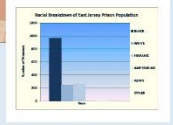
Bayside State Prison



Northern State Prison



East Jersey State Prison



The Inside And Outside:

The Racial Composition Of New Jersey State Prisons And Their Surrounding Communities

This map reflects the location of over 11,000 New Jersey residents in five separate prisons, respectively: Bayside, East Jersey, New Jersey State Prison, Northern and Southwoods.

As prisoners, these residents are subject to the supervision of the New Jersey Department of Corrections and are located in sites often distant from their pre-incarceration residences.

This map, using data from the Department of Corrections, reflects the racial makeup of each of the five facilities. It also reflects their racial composition of the surrounding communities and this data for was gleaned from 2010 Census data.

A comparison of the prison population and the respective populations of their surrounding communities' presents an interesting contrast. Two prisons located in the southern portion of the state, Bayside and Southwoods, are located in rural Cumberland County. The racial composition of the prisons represent a stark contrast to the surrounding areas in which they are located.

The map of the State of New Jersey reflects the concentration of the non-white population to a narrow geographic range of the state, using graduated shading. The two aforementioned Cumberland County sites reflect a locale with a small non-white population.

These incarcerated citizens, and their locations, are an issue of on-going interest for social and political scientists. While residing in prison locations, these individuals confound census statistics and raise issues concerning the effect of their displacement. When counted in their prison for the purposes of the census, they may impact political representation in the districts. The presence of these individuals in their "incarceration" districts may also impact formulae used for purposes of federal funding visa vis the census, for entitlement to educational, health, low-income housing or further such funding.

Prisons

NJ State Boundary

White/Non-White Ratio

0% - 10.73%

10.74% - 33.64%

33.65% - 50.4%

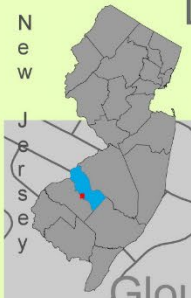
50.41% - 64.9%

64.91% - 77.35%

77.36% - 88.12%

88.13% - 100%

Land Use Progression Along Berlin Cross Keys Rd. Over a 16 Year Span



Gloucester Twp.

Chews Landing Williamstown Rd.

Berlin Cross Keys Rd.

Atlantic City Expressway

Winslow Twp.

Aerial Photograph
Berlin Cross Keys Rd.
Gloucester Twp.
1995

1995

Aerial Photograph
Intersection of
Chews Landing Williamstown Rd.
and Berlin Cross Keys Rd.
1995

Aerial Photograph
Berlin Cross Keys Rd.
Gloucester Twp.
8/24/2005

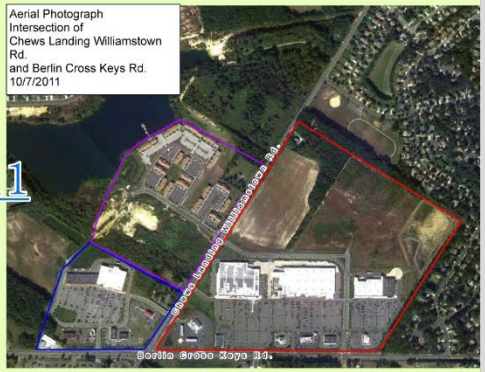
2005

Aerial Photograph
Intersection of Chews Landing
Williamstown Rd.
and Berlin Cross Keys Rd. 8/24/2005

Aerial Photograph
Berlin Cross Keys Rd.
Glousecter Twp.
10/7/2011

2011

Aerial Photograph
Intersection of
Chews Landing Williamstown Rd.
and Berlin Cross Keys Rd.
10/7/2011



Legend

Route Type

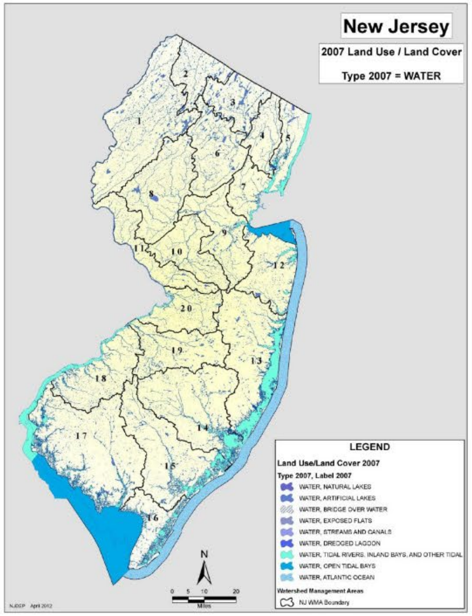
- Limited Access
- County Highways
- Local Roads
- New Jersey Municipalities

0 0.1 0.2 Miles

Author: Kyle Crawford
Date: 03/15/2012
Source: Rowan University Geo Lab / Google Earth

New Jersey

Land Use / Land Cover - National Hydrography Dataset
Integration Project



The New Jersey Department of Environmental Protection, Bureau of GIS (BGIS) are stewards of two very important GIS data layers; the Land Use/Land Cover data and, in cooperation with the USGS, the National Hydrography Dataset (NHD). In 2009 when NJ completed the statewide conflation of 1:24,000 NHD attributes to the land use hydrography data, the 2007 Land Use update was in progress and not used for the NHD. The NHD is currently based on data delineated from the 2002 land use and imagery. In an effort to synchronize the updates to NHD Waterbody, Area and Stream feature classes with Imagery acquisition, the Land Use / Land Cover update and LiDAR collections, BGIS developed the plan to integrate the two. This project integrates the NHD feature coding scheme (FCode) used to identify NHD feature classes into the land use type "Water". This will facilitate the maintenance of the NHD with each Land Use /Land Cover update NJ conducts.

Land Use Anderson Codes for Water

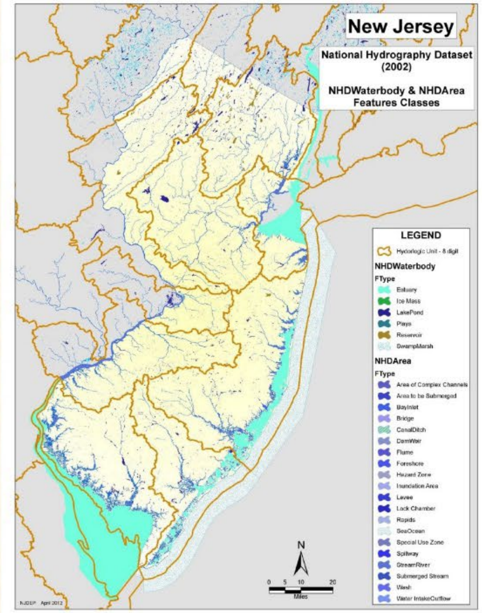
FREQUENCY	LU07	LABEL07
3372	1419	BRIDGE OVER WATER
4883	5100	STREAMS AND CANALS
146	5190	EXPOSED FLATS
3511	5200	NATURAL LAKES
29670	5300	ARTIFICIAL LAKES
8047	5410	TIDAL RIVERS, INLAND BAYS, AND OTHER TIDAL WATERS
475	5411	OPEN TIDAL BAYS
456	5420	DREDGED LAGOON
180	5430	ATLANTIC OCEAN

By integrating NHD FCodes into the land use data layer we have established the framework for a classification system for the water features in New Jersey. Typically we have extracted water from the land use into 8 basic water types. The USGS National Hydrography Dataset (NHD) further identifies water features into subtypes based on the use and other quantifiers. Dissolving the water features based on FCodes will enable the resulting water layer to be in compliance with the schema used in the National Map. In combination much more can be interpreted from the water features. For example a water body associated with a storm water basin with a land use code of 5300 is described as a "Artificial Lakes and Reservoirs" while the FCode of 43614 further describes the feature as a "Reservoir: Reservoir Type = Water Storage; Construction Material = Earthen; Hydrographic Category = Intermittent". The table below shows how much more information can be extracted from a combined analysis.

NHD FCodes

FCode*	Description
30700	Area to be Submerged
31200	Bay/Inlet
31800	Bridge
33400	Connector
33600	Canal/Ditch
33601	Canal/Ditch: Canal/Ditch Type = Aqueduct
34300	Dam/Weir
34305	Dam/Weir: Construction Material = Earthen
34306	Dam/Weir: Construction Material = Nonearthen
36100	Playa
36200	Flume
36400	Foreshore
36700	Gaging Station
36900	Gate
37300	Hazard Zone
37800	Ice Mass
39000	Lake/Pond
39001	Lake/Pond: Hydrographic Category = Intermittent
39004	Lake/Pond: Hydrographic Category = Perennial
39005	Lake/Pond: Hydrographic Category = Intermittent; Stage = High Water Elevation
39006	Lake/Pond: Hydrographic Category = Intermittent; Stage = Date of Photography
39009	Lake/Pond: Hydrographic Category = Perennial; Stage = Average Water Elevation
39010	Lake/Pond: Hydrographic Category = Perennial; Stage = Normal Pool
39011	Lake/Pond: Hydrographic Category = Perennial; Stage = Date of Photography
39012	Lake/Pond: Hydrographic Category = Perennial; Stage = Spillway Elevation
39800	Lock Chamber
40300	Inundation Area
40307	Inundation Area: Inundation Control Status = Not Controlled
40308	Inundation Area: Inundation Control Status = Controlled
40309	Inundation Area: Inundation Control Status = Controlled; Stage = Flood Elevation
41100	Nonearthen Shore
42800	Pipeline
42801	Pipeline: Pipeline Type = Aqueduct; Relationship to Surface = At or Near
42802	Pipeline: Pipeline Type = Aqueduct; Relationship to Surface = Elevated
42803	Pipeline: Pipeline Type = Aqueduct; Relationship to Surface = Underground
42804	Pipeline: Pipeline Type = Aqueduct; Relationship to Surface = Underwater
42805	Pipeline: Pipeline Type = General Case; Relationship to Surface = At or Near
42806	Pipeline: Pipeline Type = General Case; Relationship to Surface = Elevated
42807	Pipeline: Pipeline Type = General Case; Relationship to Surface = Underground
42808	Pipeline: Pipeline Type = General Case; Relationship to Surface = Underwater
42809	Pipeline: Pipeline Type = Penstock; Relationship to Surface = At or Near
42810	Pipeline: Pipeline Type = Penstock; Relationship to Surface = Elevated
42811	Pipeline: Pipeline Type = Penstock; Relationship to Surface = Underground
42812	Pipeline: Pipeline Type = Penstock; Relationship to Surface = Underwater
42813	Pipeline: Pipeline Type = Siphon
42814	Pipeline: Pipeline Type = General Case
42815	Pipeline: Pipeline Type = Penstock
42816	Pipeline: Pipeline Type = Aqueduct
43100	Rapids

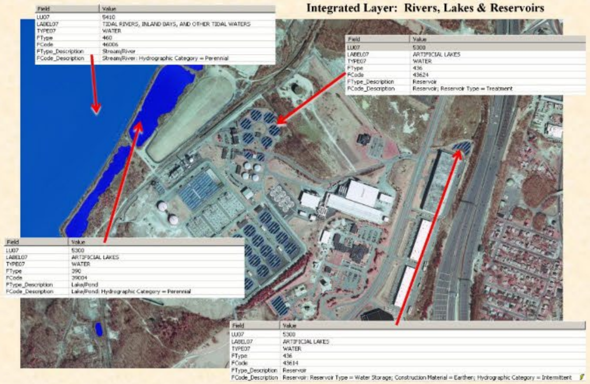
FCode*	Description
43600	Reservoir
43601	Reservoir: Reservoir Type = Aquaculture
43603	Reservoir: Reservoir Type = Decorative Pool
43604	Reservoir: Reservoir Type = Tailings Pond; Construction Material = Earthen
43605	Reservoir: Reservoir Type = Tailings Pond
43606	Reservoir: Reservoir Type = Disposal
43607	Reservoir: Reservoir Type = Evaporator
43608	Reservoir: Reservoir Type = Swimming Pool
43609	Reservoir: Reservoir Type = Cooling Pond
43610	Reservoir: Reservoir Type = Filtration Pond
43611	Reservoir: Reservoir Type = Settling Pond
43612	Reservoir: Reservoir Type = Sewage Treatment Pond
43613	Reservoir: Reservoir Type = Water Storage; Construction Material = Nonearthen
43614	Reservoir: Reservoir Type = Water Storage; Construction Material = Earthen; Hydrographic Category
43615	Reservoir: Reservoir Type = Water Storage; Construction Material = Earthen; Hydrographic Category
43617	Reservoir: Reservoir Type = Water Storage
43618	Reservoir: Construction Material = Earthen
43619	Reservoir: Construction Material = Nonearthen
43621	Reservoir: Reservoir Type = Water Storage; Hydrographic Category = Perennial
43623	Reservoir: Reservoir Type = Evaporator; Construction Material = Earthen
43624	Reservoir; Reservoir Type = Treatment
43625	Reservoir: Reservoir Type = Disposal; Construction Material = Earthen
43626	Reservoir: Reservoir Type = Disposal; Construction Material = Nonearthen
44100	Rock
44101	Rock: Relationship to Surface = Abovewater
44102	Rock: Relationship to Surface = Underwater
44500	Sea/Ocean
45000	Sink/Rise
45400	Special Use Zone
45401	Special Use Zone: Special Use Zone Type = Dump Site; Operational Status = Operational
45402	Special Use Zone: Special Use Zone Type = Dump Site; Operational Status = Abandoned
45403	Special Use Zone: Special Use Zone Type = Spoil Area; Operational Status = Operational
45404	Special Use Zone: Special Use Zone Type = Spoil Area; Operational Status = Abandoned
45500	Spillway
45800	Spring/Seep
46000	Stream/River
46003	Stream/River: Hydrographic Category = Intermittent
46006	Stream/River: Hydrographic Category = Perennial
46100	Submerged Stream
46600	Swamp/Marsh
47800	Tunnel
48300	Wall
48400	Wash
48500	Water Intake/Outflow
48700	Waterfall
48800	Well
49300	Estuary
50300	Sounding Datum Line
50301	Sounding Datum Line: Positional Accuracy = Approximate
50302	Sounding Datum Line: Positional Accuracy = Definite
53300	Special Use Zone Limit
53301	Special Use Zone Limit: Positional Accuracy = Definite
53302	Special Use Zone Limit: Positional Accuracy = Indefinite
53700	Area of Complex Channels
55800	Artificial Path
56600	Coastline



Integrated Layer: Combined Land Use Anderson Codes with NHD FCodes

FREQUENCY	LU07	LABEL07	NHD_FCode	FType	FCode	FType_Description	FCode_Description
104	1419	BRIDGE OVER WATER	33600	336	33600	Canal/Ditch	Canal/Ditch
265	1419	BRIDGE OVER WATER	39004	390	39004	Lake/Pond	Lake/Pond: Hydrographic Category = Perennial
2	1419	BRIDGE OVER WATER	39009	390	39009	Lake/Pond	Lake/Pond: Hydrographic Category = Perennial; Stage = Average Water Elevation
2	1419	BRIDGE OVER WATER	39010	390	39010	Lake/Pond	Lake/Pond: Hydrographic Category = Perennial; Stage = Normal Pool
7	1419	BRIDGE OVER WATER	39011	390	39011	Lake/Pond	Lake/Pond: Hydrographic Category = Perennial; Stage = Date of Photography
3	1419	BRIDGE OVER WATER	43613	436	43613	Reservoir	Reservoir: Reservoir Type = Water Storage; Construction Material = Nonearthen
4	1419	BRIDGE OVER WATER	43615	436	43615	Reservoir	Reservoir: Reservoir Type = Water Storage; Construction Material = Earthen; Hydrographic Category = Perennial
2	1419	BRIDGE OVER WATER	44500	445	44500	Sea/Ocean	Sea/Ocean
2914	1419	BRIDGE OVER WATER	46006	460	46006	Stream/River	Stream/River: Hydrographic Category = Perennial
69	1419	BRIDGE OVER WATER	49300	493	49300	Estuary	Estuary
74	5100	STREAMS AND CANALS	33600	336	33600	Canal/Ditch	Canal/Ditch
56	5100	STREAMS AND CANALS	39004	390	39004	Lake/Pond	Lake/Pond: Hydrographic Category = Perennial
1	5100	STREAMS AND CANALS	39009	390	39009	Lake/Pond	Lake/Pond: Hydrographic Category = Perennial; Stage = Average Water Elevation
8	5100	STREAMS AND CANALS	43614	436	43614	Reservoir	Reservoir: Reservoir Type = Water Storage; Construction Material = Earthen; Hydrographic Category = Intermittent
3	5100	STREAMS AND CANALS	45500	455	45500	Spillway	Spillway
4741	5100	STREAMS AND CANALS	46006	460	46006	Stream/River	Stream/River: Hydrographic Category = Perennial
7	5190	EXPOSED FLATS	39004	390	39004	Lake/Pond	Lake/Pond: Hydrographic Category = Perennial
1	5190	EXPOSED FLATS	39009	390	39009	Lake/Pond	Lake/Pond: Hydrographic Category = Perennial; Stage = Average Water Elevation
138	5190	EXPOSED FLATS	46006	460	46006	Stream/River	Stream/River: Hydrographic Category = Perennial
9	5200	NATURAL LAKES	39001	390	39001	Lake/Pond	Lake/Pond: Hydrographic Category = Intermittent
3467	5200	NATURAL LAKES	39004	390	39004	Lake/Pond	Lake/Pond: Hydrographic Category = Perennial
1	5200	NATURAL LAKES	39005	390	39005	Lake/Pond	Lake/Pond: Hydrographic Category = Intermittent; Stage = High Water Elevation
15	5200	NATURAL LAKES	39009	390	39009	Lake/Pond	Lake/Pond: Hydrographic Category = Perennial; Stage = Average Water Elevation
8	5200	NATURAL LAKES	39011	390	39011	Lake/Pond	Lake/Pond: Hydrographic Category = Perennial; Stage = Date of Photography
10	5200	NATURAL LAKES	43614	436	43614	Reservoir	Reservoir: Reservoir Type = Water Storage; Construction Material = Earthen; Hydrographic Category = Intermittent
1	5200	NATURAL LAKES	46006	460	46006	Stream/River	Stream/River: Hydrographic Category = Perennial
1	5300	ARTIFICIAL LAKES	33600	336	33600	Canal/Ditch	Canal/Ditch
5	5300	ARTIFICIAL LAKES	39001	390	39001	Lake/Pond	Lake/Pond: Hydrographic Category = Intermittent
26597	5300	ARTIFICIAL LAKES	39004	390	39004	Lake/Pond	Lake/Pond: Hydrographic Category = Perennial
2	5300	ARTIFICIAL LAKES	39005	390	39005	Lake/Pond	Lake/Pond: Hydrographic Category = Intermittent; Stage = High Water Elevation
116	5300	ARTIFICIAL LAKES	39009	390	39009	Lake/Pond	Lake/Pond: Hydrographic Category = Perennial; Stage = Average Water Elevation
12	5300	ARTIFICIAL LAKES	39010	390	39010	Lake/Pond	Lake/Pond: Hydrographic Category = Perennial; Stage = Normal Pool
5	5300	ARTIFICIAL LAKES	39011	390	39011	Lake/Pond	Lake/Pond: Hydrographic Category = Perennial; Stage = Date of Photography
57	5300	ARTIFICIAL LAKES	43601	436	43601	Reservoir	Reservoir: Reservoir Type = Aquaculture
3	5300	ARTIFICIAL LAKES	43603	436	43603	Reservoir	Reservoir: Reservoir Type = Decorative Pool
42	5300	ARTIFICIAL LAKES	43611	436	43611	Reservoir	Reservoir: Reservoir Type = Settling Pond
12	5300	ARTIFICIAL LAKES	43612	436	43612	Reservoir	Reservoir: Reservoir Type = Sewage Treatment Pond
30	5300	ARTIFICIAL LAKES	43613	436	43613	Reservoir	Reservoir: Reservoir Type = Water Storage; Construction Material = Nonearthen
2254	5300	ARTIFICIAL LAKES	43614	436	43614	Reservoir	Reservoir: Reservoir Type = Water Storage; Construction Material = Earthen; Hydrographic Category = Intermittent
377	5300	ARTIFICIAL LAKES	43615	436	43615	Reservoir	Reservoir: Reservoir Type = Water Storage; Construction Material = Earthen; Hydrographic Category = Perennial
119	5300	ARTIFICIAL LAKES	43624	436	43624	Reservoir	Reservoir; Reservoir Type = Treatment
22	5300	ARTIFICIAL LAKES	43625	436	43625	Reservoir	Reservoir: Reservoir Type = Disposal; Construction Material = Earthen
16	5300	ARTIFICIAL LAKES	46006	460	46006	Stream/River	Stream/River: Hydrographic Category = Perennial
34	5410	TIDAL RIVERS, INLAND BAYS	33600	336	33600	Canal/Ditch	Canal/Ditch
2	5410	TIDAL RIVERS, INLAND BAYS	39001	390	39001	Lake/Pond	Lake/Pond: Hydrographic Category = Intermittent
2443	5410	TIDAL RIVERS, INLAND BAYS	39004	390	39004	Lake/Pond	Lake/Pond: Hydrographic Category = Perennial
3763	5410	TIDAL RIVERS, INLAND BAYS	46006	460	46006	Stream/River	Stream/River: Hydrographic Category = Perennial
1805	5410	TIDAL RIVERS, INLAND BAYS	49300	493	49300	Estuary	Estuary
5	5411	OPEN TIDAL BAYS	39004	390	39004	Lake/Pond	Lake/Pond: Hydrographic Category = Perennial
8	5411	OPEN TIDAL BAYS	46006	460	46006	Stream/River	Stream/River: Hydrographic Category = Perennial
462	5411	OPEN TIDAL BAYS	49300	493	49300	Estuary	Estuary
441	5420	DREDGED LAGOON	33600	336	33600	Canal/Ditch	Canal/Ditch
7	5420	DREDGED LAGOON	39004	390	39004	Lake/Pond	Lake/Pond: Hydrographic Category = Perennial
4	5420	DREDGED LAGOON	46006	460	46006	Stream/River	Stream/River: Hydrographic Category = Perennial
4	5420	DREDGED LAGOON	49300	493	49300	Estuary	Estuary
180	5430	ATLANTIC OCEAN	44500	445	44500	Sea/Ocean	Sea/Ocean

Integrated Layer: Rivers, Lakes & Reservoirs



In September 2008, the New Jersey Department of Environmental Protection became Stewards of the USGS National Hydrography Dataset (NHD). This responsibility involves working with USGS to maintain and update hydrographic features in a national database which will become the basis for current USGS and EPA water quality monitoring and reporting efforts.

In January 2009, NJDEP began the nations first statewide effort to update the database with Local resolution (1:2,400) scale data. The NHD structure will allow all users of the data to reference any water body, stream segment or monitoring station within the national system.

Integrated Layer: Tidal Rivers, Lakes, Canals, Bridge & Estuary

Data Sources: 2002 Statewide Land Use/Land Cover (LU/LC) and Hydrography data sets.
USGS High Resolution NHD Geodatabase (1:24,000)
2007 Statewide Land Use/Land Cover (LU/LC)

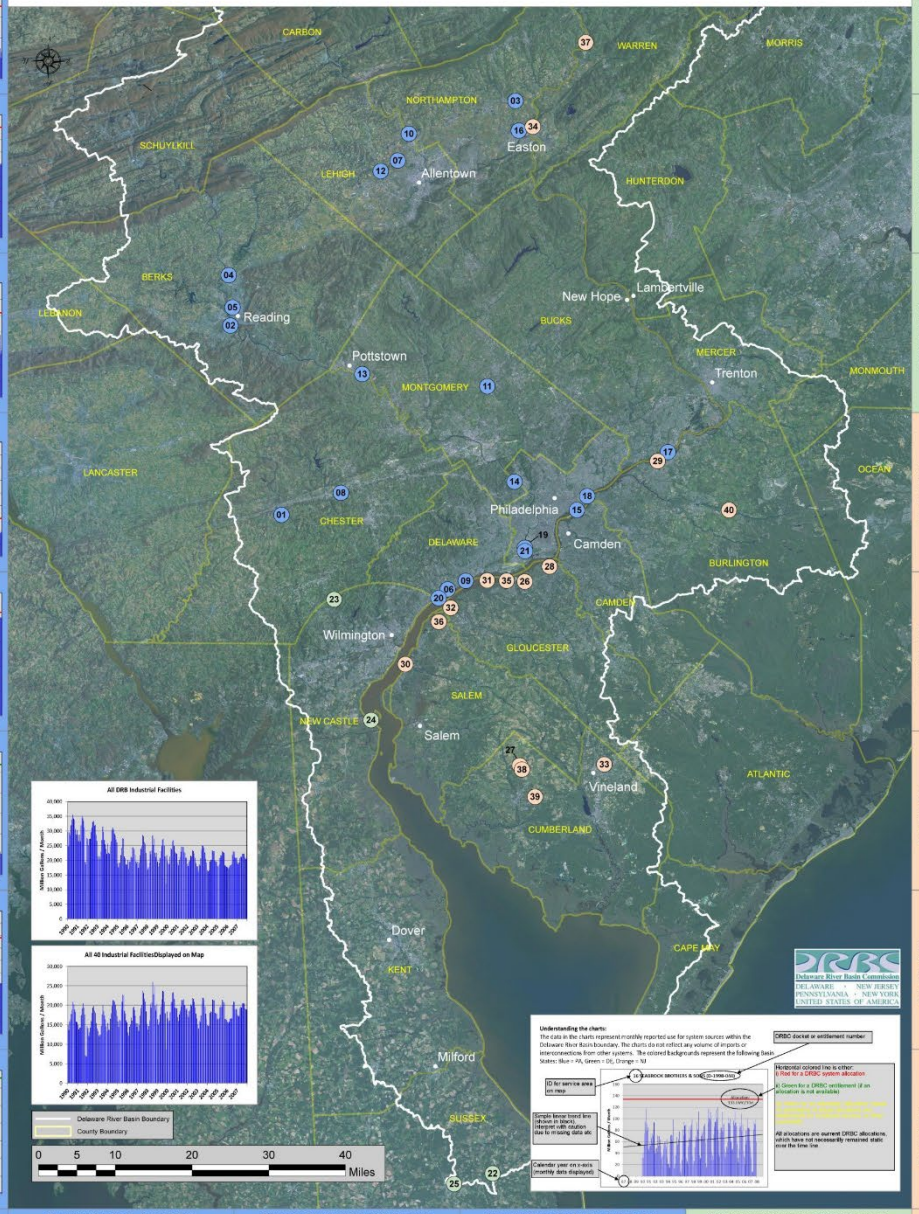
Project Team: Craig Coutros, Seth Hackman, John Tyrawski
Data Production: Aerial Information Systems, Inc. Redlands California

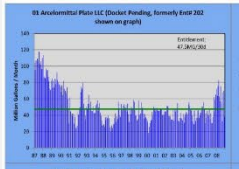
Support Team: Roger Barlow, USGS Geospatial Liaison
David Anderson USGS POC Region 6

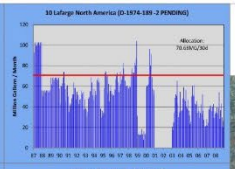
Map Composition by Craig Coutros, GIS Specialist
NJ Department of Environmental Protection, Office of Information Resources Management, Bureau of Geographic Information Systems
April 2012

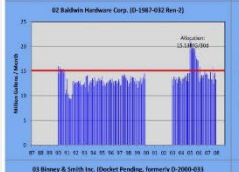
Water Withdrawal History of 40 Industrial Facilities in the DRB

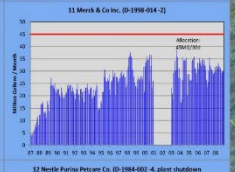
The 40 facilities shown in this graphic represent a cumulative of 92% of total water use by the 195 industrial facilities in the Delaware River Basin

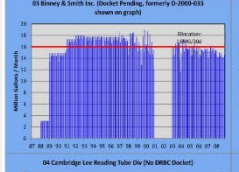


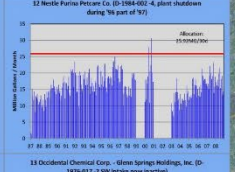


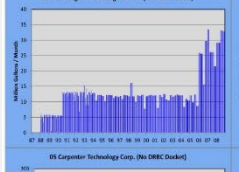


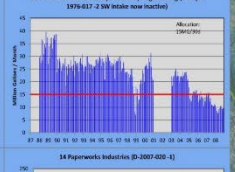


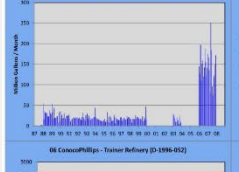


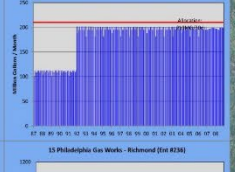


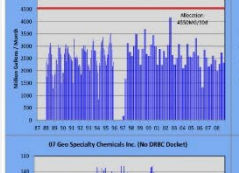


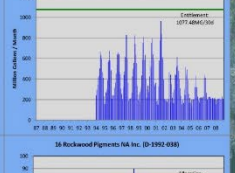


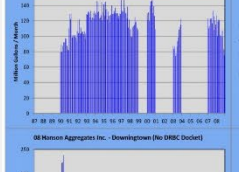


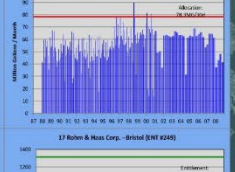


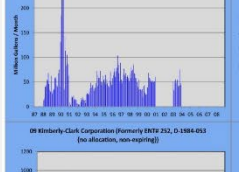


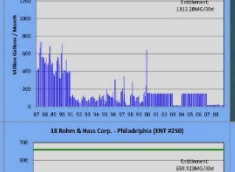


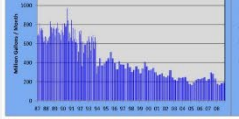


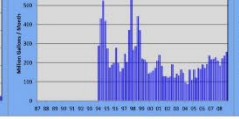


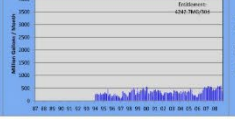


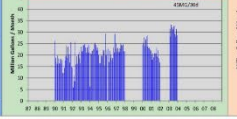


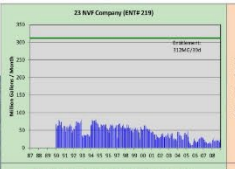


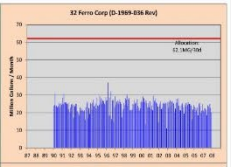


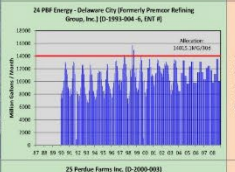


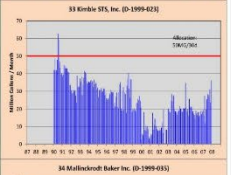


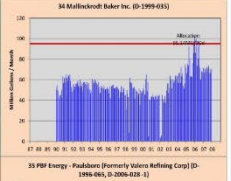


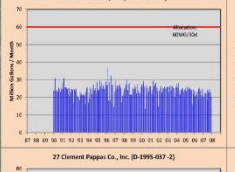


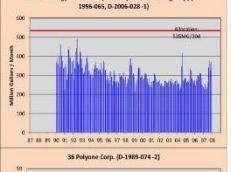


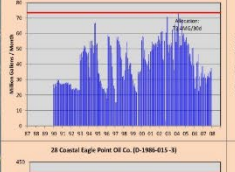


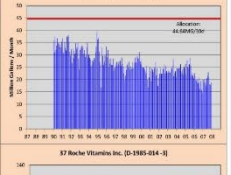


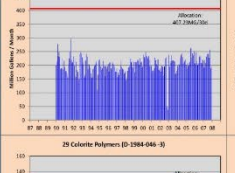


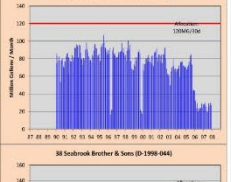


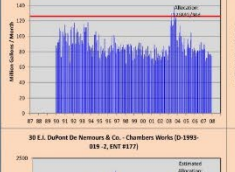


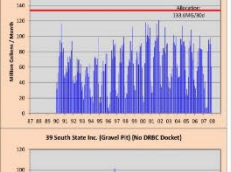


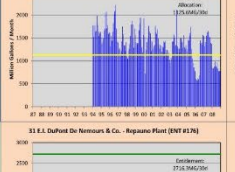


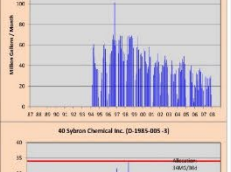


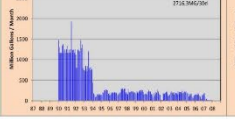






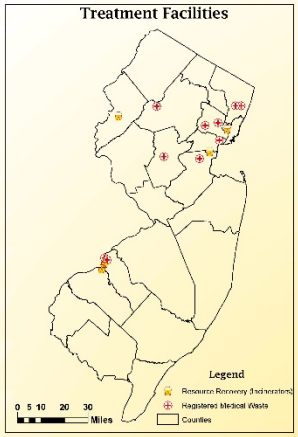


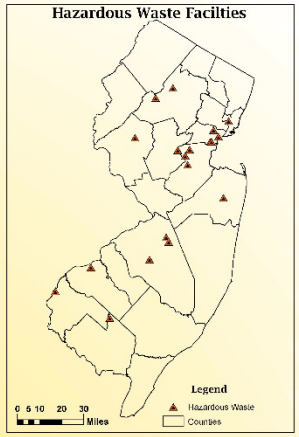


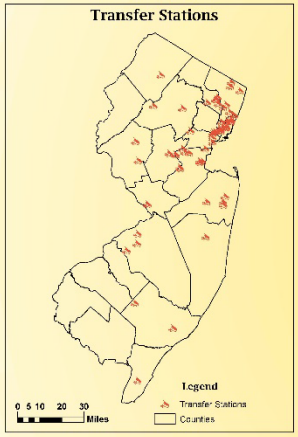


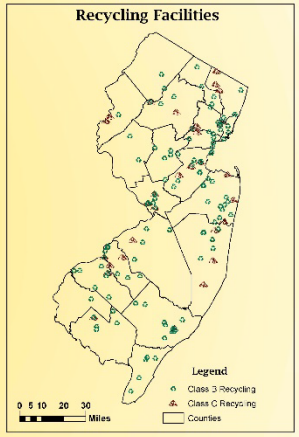
RECYCLING & WASTE MANAGEMENT IN NEW JERSEY

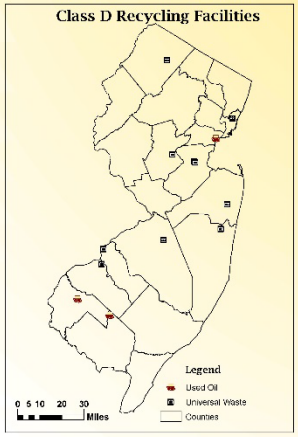
A Comprehensive map for Emergency Response Preparedness

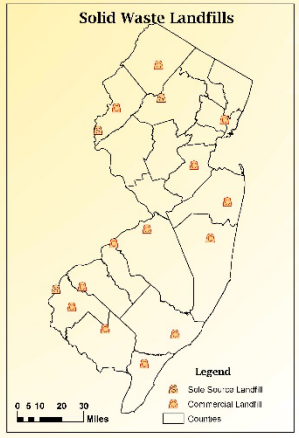


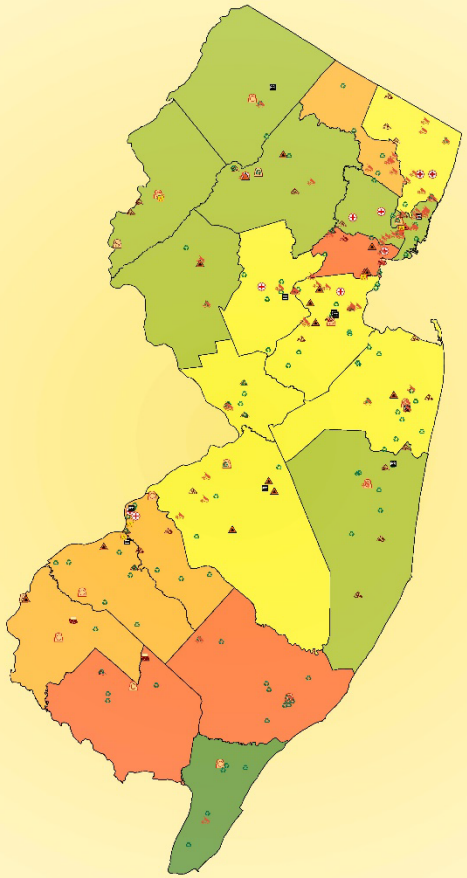


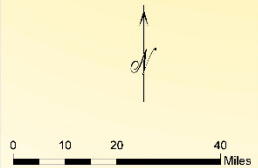












Source: Solid & Hazardous Waste Management Program and Office of Information Technology (NJDEP)

Sanjay Shah and Jessica Hammond
Solid & Hazardous Waste Management Program, NJDEP
April 23, 2012

Instructional Presentation

Parcel Management within the New Jersey Meadowlands

From Paper Maps to Parcel Fabric

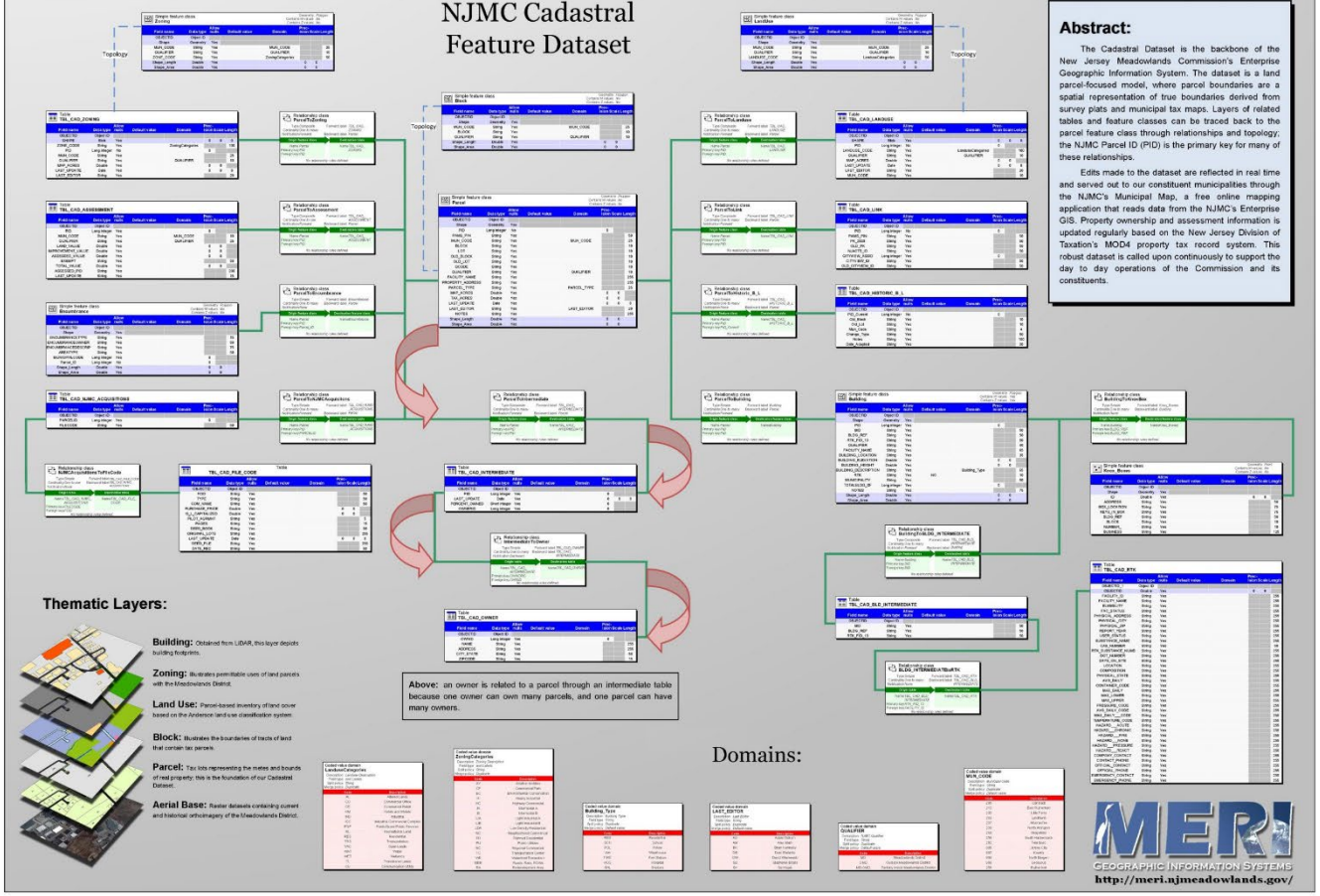
Presented by **Adam Osborn**, *GIS Specialist*

New Jersey Meadowlands Commission (NJMC)

Meadowlands Environmental Research Institute (MERI)

Geographic Information Systems (GIS)

NJMC Cadastral Feature Dataset

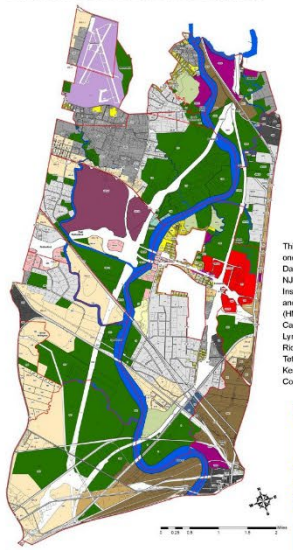


Abstract:

The Cadastral Dataset is the backbone of the New Jersey Meadowlands Commission's Enterprise Geographic Information System. The dataset is a land parcel-focused model, where parcel boundaries are a spatial representation of true boundaries derived from survey plats and municipal tax maps. Layers of related tables and feature classes can be traced back to the parcel feature class through relationships and topology; the NJMC Parcel ID (PID) is the primary key for many of these relationships.

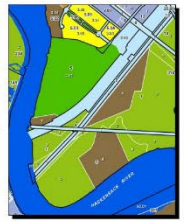
Edits made to the dataset are reflected in real time and served out to our constituent municipalities through the NJMC's Municipal Map, a free online mapping application that reads data from the NJMC's Enterprise GIS. Property ownership and assessment information is updated regularly based on the New Jersey Division of Taxation's MOD4 property tax record system. This robust dataset is called upon continuously to support the day to day operations of the Commission and its constituents.

Meadowlands District Parcel Mapping:



Regional Location:

This Meadowlands District Zoning map (left) is one example of how the NJMC's Cadastral Dataset is employed by the Commission. The NJMC's Meadowlands Environmental Research Institute maintains nearly 100,000 parcels both in and out of the Hackensack Meadowlands District (HMD). The fourteen towns of the HMD are Carlstadt, East Rutherford, Little Ferry, Lyndhurst, Moonachie, North Arlington, Ridgefield, Rutherford, South Hackensack, and Teterboro in Bergen County; and Jersey City, Kearny, North Bergen, and Secaucus in Hudson County.



A parcel-based inventory of land uses within the Meadowlands (right) is kept up to date both in a related table as well as a feature class that shares topology with the parcel feature class.

Thematic Layers:

Building: Obtained from LiDAR, this layer depicts building footprints.

Zoning: Illustrates permittable uses of land parcels with the Meadowlands District.

Land Use: Parcel-based inventory of land cover based on the Anderson land use classification system.

Block: Illustrates the boundaries of tracts of land that contain tax parcels.

Parcel: Tax lots representing the metes and bounds of real property; this is the foundation of our Cadastral Dataset.

Aerial Base: Raster datasets containing current and historical orthoimagery of the Meadowlands District.

Above: an owner is related to a parcel through an intermediate table because one owner can own many parcels, and one parcel can have many owners.

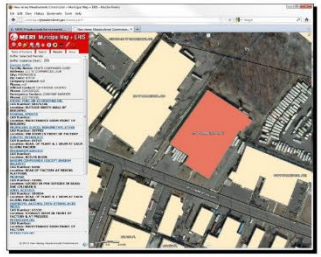
Domains:

MERI GEOGRAPHIC INFORMATION SYSTEMS

http://meri.njmeadowlands.gov/

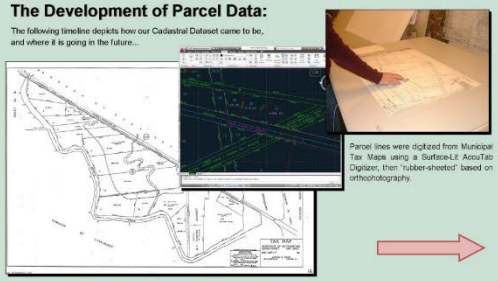
Data Visualization:

The MERI Municipal Map and Emergency Response Information System is one of the most used applications of our Cadastral Dataset. In this example (right) a warehouse building is being queried in order to identify potentially hazardous Right To Know chemicals. Emergency response officials from Hudson and Bergen Counties use this interactive mapping application to prepare for potential emergency situations.



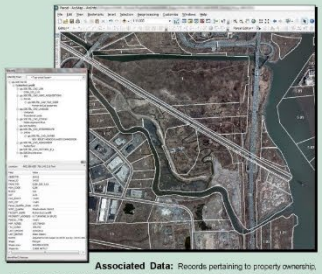
The Development of Parcel Data:

The following timeline depicts how our Cadastral Dataset came to be, and where it is going in the future...

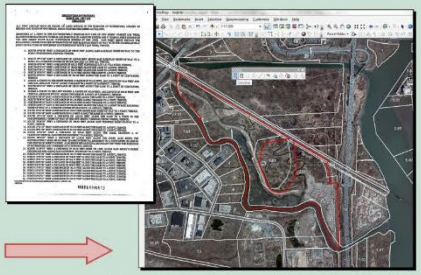


Source Data: Tax Maps like the one above served as the basis for our original parcel feature class. Additional data sources included georeferenced CAD data from select towns and data provided by Hudson and Bergen Counties including survey plats from permit applications submitted to the NJMC.

Parcel lines were digitized from Municipal Tax Maps using a Surface-Lit AccuTab Digitizer, then 'rubber-sheeted' based on orthophotography.

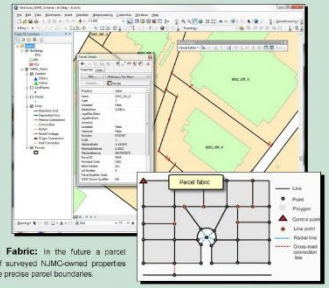


Associated Data: Records pertaining to property ownership, zoning, land use, and MOD4 tax assessment are stored in related tables and updated on a regular basis. All relationships lead back to the Parcel polygon layer. The Parcel ID (PID) is the primary key for many of the relationships within the Cadastral Dataset.



Resurveys: Parcel boundaries are resurveyed based on bearing and distance dimensions derived from raw survey measurements taken from property deeds. For example, the figure above shows a significant difference between the original property lines that were digitized from tax maps (in white) and the resurveyed lines based on survey data (in red). Surveyed data for this parcel was entered using the Traverse tool on the COGO toolbar.

The MERI GIS team hard at work planning our next big mapping endeavor.



Parcel Fabric: In the future a parcel fabric of surveyed NJMC-owned properties will store precise parcel boundaries.

This is where our Cadastral Dataset is heading. Our goal is to maintain highly accurate survey-level property boundaries and control points within the fabric group layer, in addition to tracking parcel history and records of survey. NJMC-owned properties with well documented survey records will serve as the starting point.

Managing Utility Infrastructure: Inspection Reporting and Dataset Collection

As a regional planning agency the New Jersey Meadowlands Commission (NJMC) actively collects utility infrastructure data within 14 member municipalities in Bergen and Hudson County. The Cooperative Equipment Sharing Program (COOP Program), sponsored and run by the NJMC, assists local municipalities to comply with state standards addressing capacity, management, operability and maintenance of sewer/stormwater pipelines. Under this share program a municipality can access maintenance equipment provided by the NJMC to service their utility infrastructure. GIS data is collected from these inspections and other field surveys pertaining to utilities and stores the data in an enterprise geodatabase. The utility data and information collected by this program is shared among municipalities in an easy to use and efficient online application.

Cooperative Equipment Sharing Program:

The COOP program is available to 14 municipalities: Teterboro, South Hackensack, Moonachie, Little Ferry, Ridgefield, Carlstadt, Rutherford, East Rutherford, Lyndhurst, North Arlington, Secaucus, North Bergen, Kearny, and Jersey City. The NJMC staffs two pieces of equipment for these COOP inspections. Picture right, the NJMC Jet-Vac truck and Camera Van. The camera van is the key piece of equipment which operates a camera mounted tractor. The tractor records internal pipe conditions via CCTV for the inspections.

Camera Van Specs:

- Television Inspection System (6 to >50 inches lines)
- Floating tractor camera (1000 feet into the line)
- Reporting software, IT Pipes

Jet-Vac truck Specs:

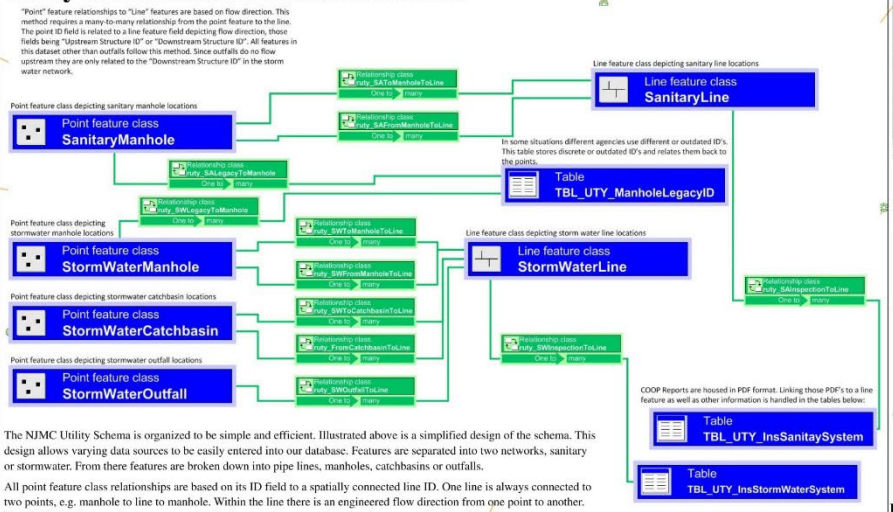
- Jet and Vacuum simultaneously
- Vacuum 2,250 gallons of waste water or 11 yards of debris, 30 feet into a line
- Jet 1,100 gallons of water, 500 feet into a line with a jetting pressure up to 2100 psi

The camera van is segmented into three sections:
Front: driver, passenger
Middle: tractor controls, inspection system PC
Rear: tractor, line reel, tools

Inspection software is provided by I.T. Pipes. This software allows us to collect standardized pipe line inspections, analyze previous reports, and manage collected data.

Deliverables for each inspection are a video of internal pipe conditions and a summarized report of the findings. The report is then integrated into our utility schema. The inspected pipeline is located in the utility dataset and the report is linked to the line.

Utility Infrastructure Dataset Schema:



The NJMC Utility Schema is organized to be simple and efficient. Illustrated above is a simplified design of the schema. This design allows varying data sources to be easily entered into our database. Features are separated into two networks, sanitary or stormwater. From there features are broken down into pipe lines, manholes, catchbasins or outfalls.

All point feature class relationships are based on its ID field to a spatially connected line ID. One line is always connected to two points, e.g. manhole to line to manhole. Within the line there is an engineered flow direction from one point to another. Two fields, in either sanitary or stormwater line feature classes, are designated represent this flow direction, *STRUCTUREFROM & STRUCTURETO*. These fields are populated with the point ID of a feature either upstream or downstream to the flow. This criteria is the basis of the point to line relationships in this dataset.

Methodology:

All datasets begin with data collection. Data collection takes place on multiple fronts, from field GPS collection to digitizing engineering drawings. The type of collection method used is specific depending on the data source and the utility collected.

Field GPS Surveys:

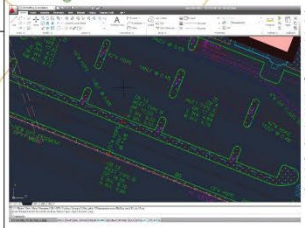
Surveys are preferred for the initial collection. This method of collection requires a physical search through a municipality for a specific feature, either manholes, or catchbasins. The benefit is very accurate qualitative data which requires time and logistics. These surveys must be conducted on every street within a municipality in order to be effective.

Local municipalities are asked to participate with this type of collection. The NJMC provides and trains town employees on how to collect utility features using Trimble handhelds. Having municipality involvement improves the quality of the collection. DPW personnel are very knowledgeable about their utility networks and are sought after to assist with collection.

Digitizing Utility Maps:

Municipal utility maps provide a resource for qualitative data such as top of rim elevations, invert elevations, structure material, pipe diameter, and other utility specific data. The information found on these maps are transferred to the NJMC enterprise database. These maps also show any areas missed by the field survey. Features in missing areas can be digitized from these maps.

More importantly these maps display underground structures such as pipelines, chambers and valves. Digitizing these pipelines and other underground features add to the dataset and provide crucial information for the utility network.



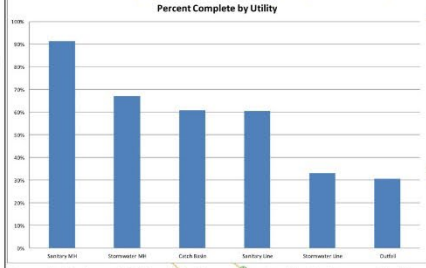
Engineered Drawings:

Digital engineering drawings, as-builts, site plans, and site surveys contain plenty of data. These drawings are very useful for updating the dataset and adding extra information which the municipal utility maps, described above, might not contain. Incorporating this data helps to keep the dataset up to date and accurate.

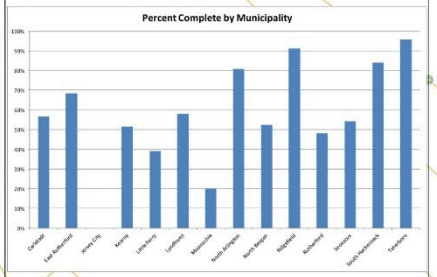
Data Visualization:

The dataset is served to local municipalities via an online NJMC custom built application. Municipal officials are able to go online, map, view, and analyze their local sewer and stormwater systems in order to better understand them.

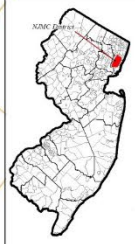
Results:



Data collection began in 2006 and is still progressing. Participation from municipalities is encouraged in order to ensure accuracy and assist with the field collection. The chart above displays percent completion broken down by utility. Below displays percent completion broken down by municipality.



Serving the data is done through the NJMC Municipal Map (http://meri.njmeadowlands.gov/maps/). The Municipal map provides meadowlands district municipalities with access to maps and records on properties, infrastructure and other thematic layers for managing and analyzing municipal assets. Town officials are routinely trained on the program so they can effectively use it in their workflow.



GIS Outreach:

The GIS Outreach program is a collaboration between the NJMC and its constituent municipalities. This program established the COOP Program. Since 2002, this program has been transferring GIS technology and information to the 14 member municipalities. Benefits from this shared resource are the towns' ability to manage and update property information and analyze infrastructure utilities using spatially enabled technology. This program has enabled local officials to view parcel and utility information, and through the web, overlay pertinent datasets in assisting towns in planning, permitting, law enforcement and emergency management.

Author: *Saleh Kojak, GIS Specialist II, New Jersey Meadowlands Commission*

Meadowlands District Emergency Response Information System

Brian Kennedy & Stephanie Bosits
New Jersey Meadowlands Commission

Abstract:

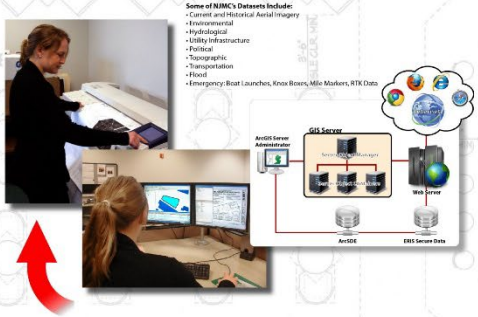
The New Jersey Meadowlands Commission (NJMC) is a regional planning agency encompassing 14 municipalities in Northern New Jersey. Through a centralized Geographical Information System the agency provides information enabling emergency officials to ascertain the geography of an area prior to arriving at or while at the scene of an emergency. This information is provided through a free, user friendly, online application known as the Emergency Response Information System (ERIS).

The ERIS system provides emergency response officials with access to a secure database in which critical information is stored. The latest version of the ERIS application includes building footprints and their floor plans which add detailed information about each facility. This poster demonstrates how emergency responders interact with the system, how the information is visualized, and how officials use the system to gauge an incident prior to or during a emergency. The functionalities of the system have resulted - and continue to result- from the direct feed-back of emergency officials.

Data Collection & Processing

The New Jersey Meadowlands Commission has been building its GIS infrastructure since 1992 through the collection of data in the field and the incorporation of data submitted by town officials or outside organizations. The Emergency Response Information System (ERIS) was created using ESRI ArcGIS Server technology in order to make this data readily available to town officials via the web.

Floor plans are collected from NJMC files associated with buildings in the Hackensack Meadowlands District. Before being displayed in the application, files are scanned, enhanced, and linked to individual buildings using a unique building identifier.

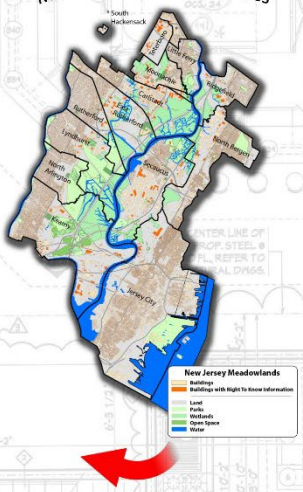


Training and Usage

Town officials receive annual training sessions. During the training sessions, officials are introduced to new features and changes within the application. These sessions are also an opportunity for the GIS staff and town officials to discuss potential additions to the next release.

Trained officials use the application on a regular basis providing feedback and new data that is sent via the ERIS application to the GIS team for analysis and integration.

Meadowlands Municipalities



Web-based Data Access

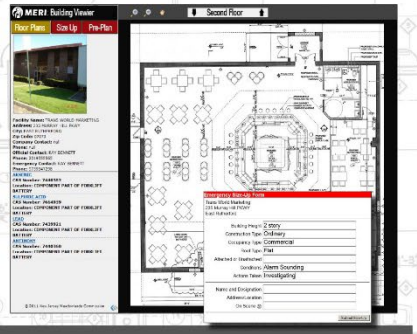
The Emergency Response Information System (ERIS) is a secure database that is accessible to any authenticated user, from any device with internet capabilities. ERIS is an extension of a web based mapping program known as municipal map which easily allows users to interact with numerous NJMC datasets.

Buildings containing Right-to-Know hazardous substance are displayed in orange in ERIS. By clicking on one of these buildings, emergency officials can view emergency contact information as well as lists of hazardous chemicals and their corresponding fact sheets.

Emergency Data Visualization

Floor plans are a general representation of how a building is designed. Different sections of a facility are rendered in the ERIS Building Viewer, providing emergency officials with a detailed look at the spatial arrangement of a facility.

The Pre-Plan Sheet acts as a record of building characteristics to inform responders, and the Size-Up Form serves as an incident report that is prepopulated with these building characteristics. These sheets allow for viewing and editing details about a particular building or incident by emergency officials. Edits made are then incorporated into the ERIS system by the GIS staff.



New Jersey Meadowlands Commission GIS

MERI.NJMeadowlands.gov

Meadowlands Environmental Research Institute

Burlington County Environmental Health Mapping Application

What is it?

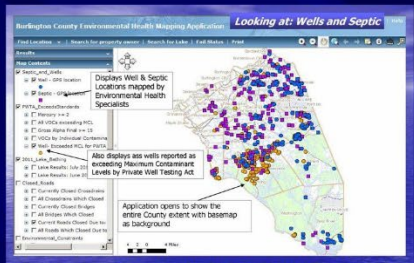
An interactive, Intranet-based map that can be accessed through any computer on the Burlington County network

Purpose:

To enable the Burlington County Health Department, Environmental Unit
- to geographically visualize their information
- see patterns
- explore related datasets

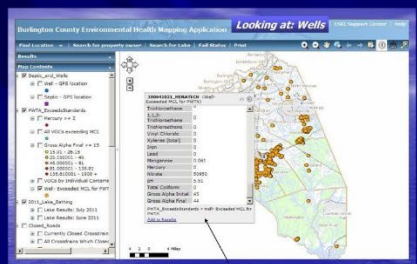
at no additional cost to the County

Looking at: Wells and Septic



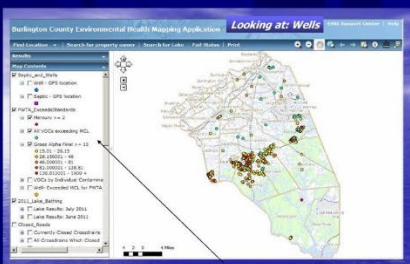
- Users can zoom in/out, move around on the map and turn on/off layers as needed.
- As the user zooms in, layers draw in increasing level of detail.
- Can see proximity of new wells to contaminated ones and visualize patterns

Looking at: Wells



- For all layers, user can click on a feature to find out more information about it
- This example shows the MCL (Maximum Contaminant Levels) for a well

Looking at: Wells



- Can break out PWTA (Private Well Testing Act) wells by type of contamination
- Assists with visualizing patterns, areas of concentration
- For example, Mercury, all VOC contaminants, Gross Alpha Final by concentration

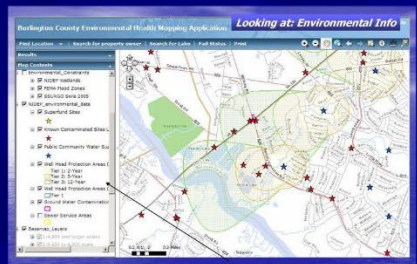
Looking at: Wells

- 26 different VOCs (Volatile Organic Compounds) contaminants are tracked
- The user has the option of looking at each individual type of VOC separately
- This can help in determining the extent of contamination in an area

Looking at: Environmental Info

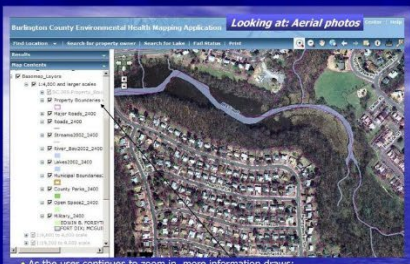
- As the user zooms in, more detailed environmental information from the NJ Department of Environmental Protection (NJDEP) draws including:
  - Superfund Sites, Known Contaminated Sites,
  - Public Community Water Supply Wells, and Sewer Service Areas

Looking at: Environmental Info



- Well Head Protection Areas, prepared by NJDEP, can also be viewed
- Well Head Protection Areas show the recharge area for a particular well over a period of time (ex. 2, 5, 12 years) which can be important when dealing with potential water contamination

Looking at: Aerial photos

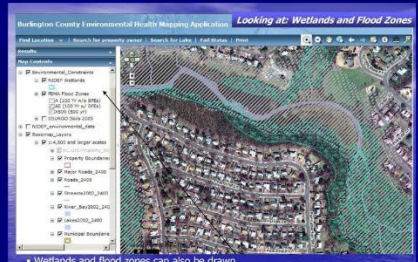


- As the user continues to zoom in, more information draws:
  - aerial photography
  - and property boundaries

Looking at: Aerial photos

- Optionally, the user can view aerial photos in Color-infrared which:
  - provide additional clues to what is happening on the Earth's surface
  - show vigorously growing vegetation in shades of red
  - are useful in determining the land cover of an area

Looking at: Wetlands and Flood Zones

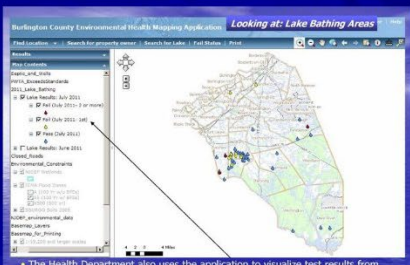


- Wetlands and flood zones can also be drawn
  - Both can be important when dealing with contamination
  - Location of both is important to consider for new wells & septic systems

Looking at: Soils

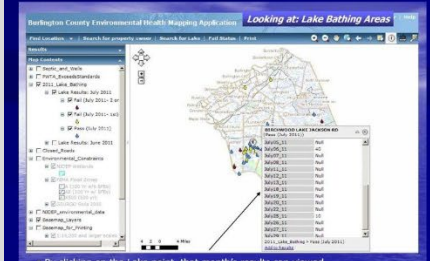
- Polygons showing the soil types for an area can also be drawn
- Each soil type has unique characteristics that are important for dealing with
  - contamination, wells
  - septic systems, new construction, etc.

Looking at: Lake Bathing Areas



- The Health Department also uses the application to visualize test results from Lake Bathing Areas
- For each month from June to September, results are displayed to show
  - lake that Passed, Failed once or Failed 2 or more times

Looking at: Lake Bathing Areas

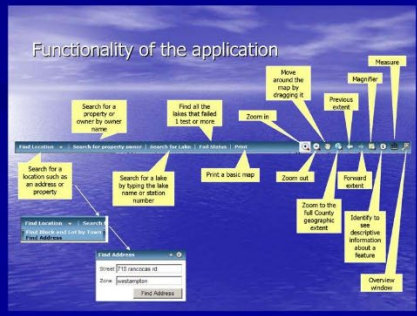


- By clicking on the Lake point, that month's results can viewed

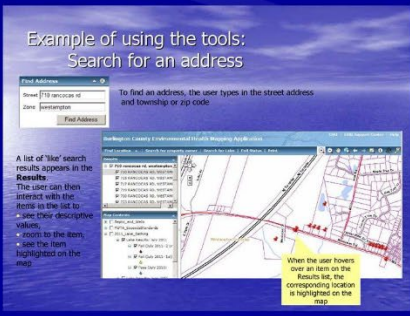
Looking at: Lake Bathing Areas

- Sometimes inspectors need to perform a sanitary survey of a lake
- Inspectors can zoom in on the lake to view the aerial photo which can assist in the survey

Functionality of the application



Example of using the tools: Search for an address



Most Unique

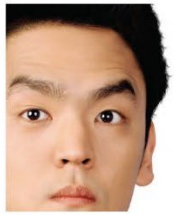
25th Annual NJDEP Mapping Contest


Preserving and Enhancing New Jersey's Great Outdoors
50th
Anniversary
New Jersey Department of Environmental Protection
Green Acres Program
Since 1961

HAROLD & KUMAR GO TO White Castle

The film *Harold & Kumar Go To White Castle* is the story of two friends in search of sliders. If they had only thought to check where the closest White Castle was, they might have gotten their burgers considerably faster.

In total, they traveled over 70 miles to reach a White Castle that doesn't even exist! Along the way they missed all 27 actual White Castles located in New Jersey. However, a trip from Hoboken to Union City may have not made for as good of a movie.



Field Geology of Lambertville "A Teaching Tool"

Washington Rock

Field Stop #1
Grey beds -
Siltstone/Sandstone

Field Stop #1a
Bedding plans

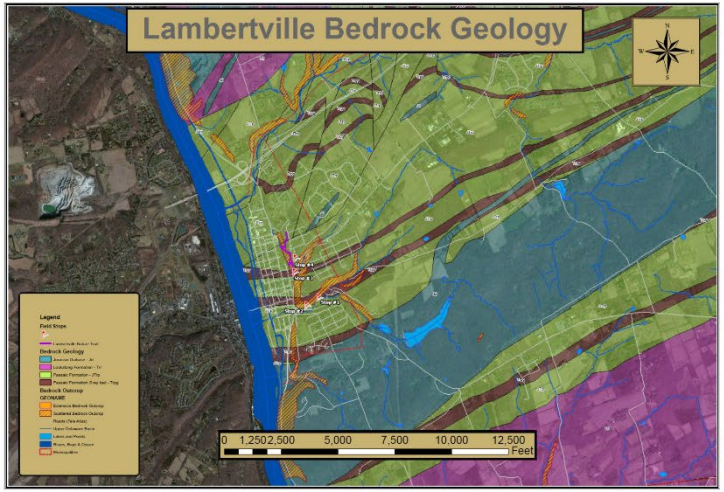
Physiographic
Provinces
of New Jersey

Troop 65

Field Stop #2
Engineering Geology

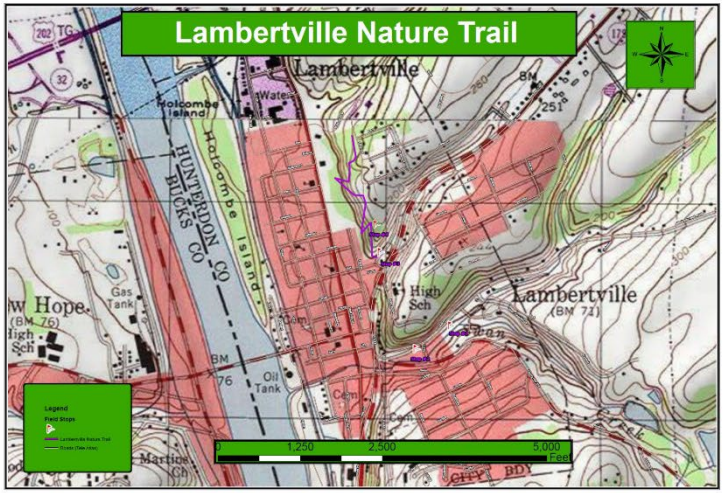
Field Stop #2a
Retaining wall

Field Stop #3
Siltstone and Shale



Abstract
Field Geology of Lambertville, NJ
"A Teaching Tool"

The Mapping project is an illustration of efforts to create a geologic teaching tool in a field setting for upper elementary school age children. This map shows a visual representation of an outdoor teaching environment. One section of the map is an interpretation of the geology in the Lambertville area which is located in the Piedmont Physiographic Province of the State. In creating this section we utilized geologic information from the NJ-GeoWeb application. Digital pictures were added to show Field Stops associated with the accompanied Field Guide. The second part of the map represents the collection of the field points through the use of a hand held Garmin eTrex Vista GPS unit to map the Lambertville Nature Trail. A conversion program was then used to overlay the trail file onto the Lambertville 7.5 min Quadrangle.



Digital Elevation
Model
of New Jersey

Troop 65

Field Stop #4a
Vertical factures - Shale

Field Stop #4b
Wavy micro-lamination

Field Stop #4c
Vertical factures - Shale

Field Stop #3a
Calcite filled bedding plane

Field Stop #3b
Joint surface

Field Stop #4
Shale

Map Created by:
Joe Stefanoni and Ward Ingersoll, PG - NJDEP
Date: 4/25/2012

"The language of any farm is the farmer's portrait of himself."
Aldo Leopold

DESCRIPTION: Using the local New Jersey farm as a unit of study, student projects focused on the farmer's relationships to the land and to the larger community. Students discovered and revealed aspects of these relationships by talking with farmers, and visiting their farms. Using cognitive and artistic mapping techniques, the class documented several New Jersey farms while augmenting their knowledge of broader agricultural literacy issues through readings, guest speakers, documentaries, and class discussions.

CREDITS: Leila Ashour, Ibrahim Bouzine, Adam Cesanek, Brian Curry, Marlon Davis, Stacey Delgado, Joshua Didriksen, Matt Dreheim, Erin Greenwood, Nick Holdorf, John Jensen, Chris Jurgensen, Alex Kozar, Ken Macnish, Erik Maietta, Chantae Moore, Holly Nelson (Instructor), Kevin Perry, Mark Robson, David Specca, Zeina Zahalan

HONEYBROOK FARM

COMMUNITY SUPPORTED AGRICULTURE IN PENNINGTON, NJ

[FARM] MAPS - Interpreting the visitor's view

[FARMER] MAPS - Interpreting the farmer's view

TERHUNE'S APPLE ORCHARD

APPLE ORCHARD IN PRINCETON, NJ

[FARM] MAPS - Interpreting the visitor's view

[FARMER] MAPS - Interpreting the farmer's view

[Imaging the essence of the farm]

EXPERIENTIAL MAPS 1 & 2

[Synthesizing the imaging]

SYNTHESIS MAP

ETSCH FARM

CORN FARM IN MONROE TOWNSHIP, NJ

+

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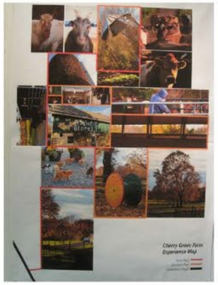
CHERRY GROVE FARM

DAIRY FARM IN LAWRENCEVILLE, NJ



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SNYDER FARM

RESEARCH & EXTENSION IN PITTSTOWN, NJ

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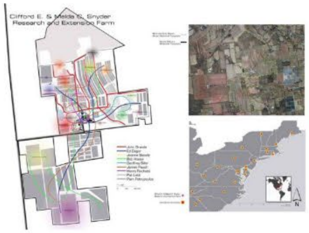

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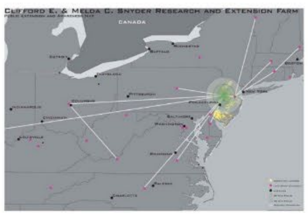

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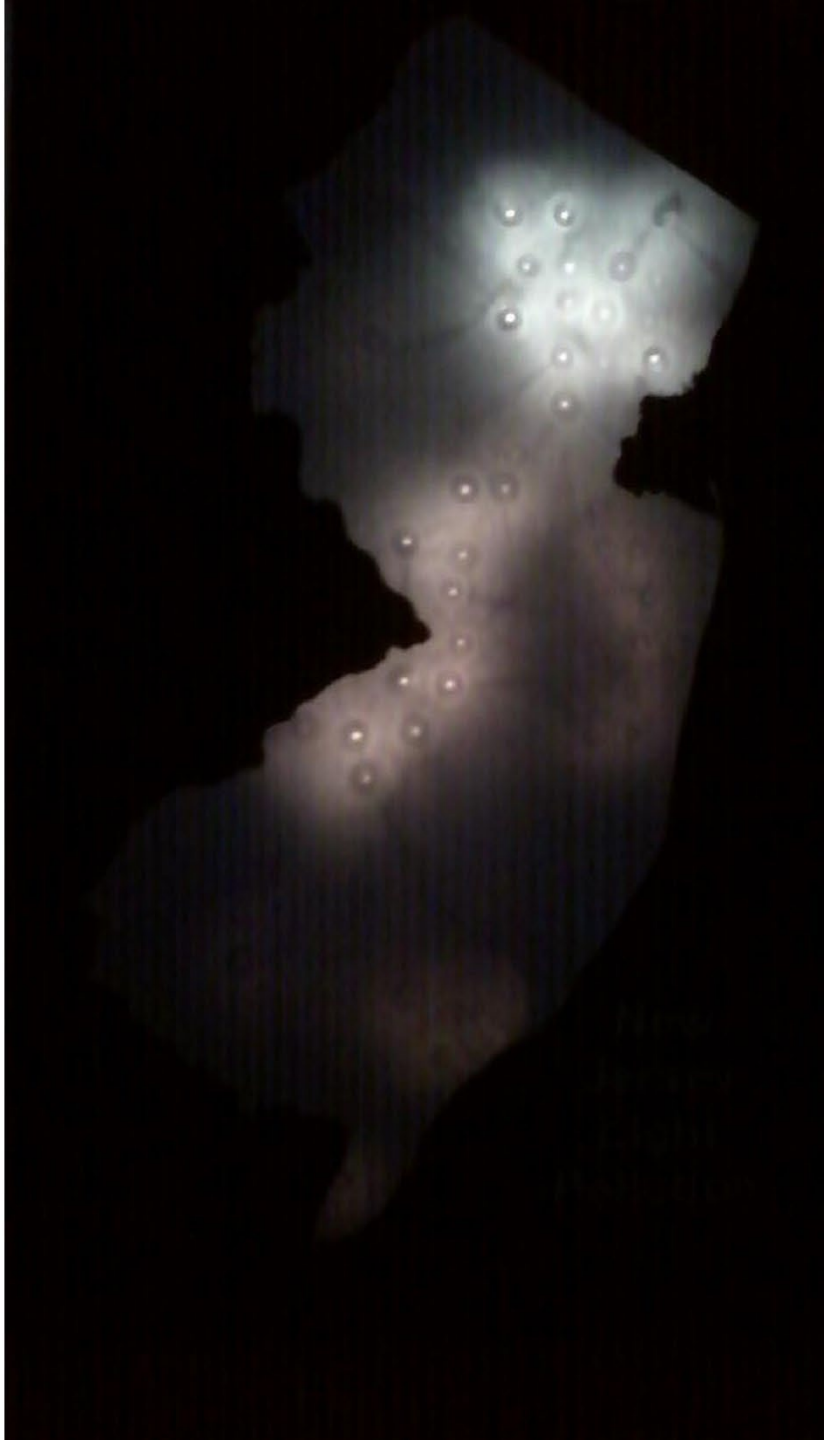


The Garden State

Legend

New Jersey

N

0 5 10 20 30 40 Miles

NJDEP

April 25, 2012

Dnyanada Bhide, Linda Coles, Bridget Sweeney

Small Format

Franklin Township
Hunterdon County, NJ
Trail Network

Capoolong Creek Trail

The Capoolong Creek Trail is on the former 3.9 mile Pittstown branch of the Lehigh Valley RR. This rail line connected Pittstown to the Lehigh Valley main line located at Landsdown. The Pittstown Station opened in July of 1891. During the 1890s, this rail line service supported local peach harvesting; delivering peaches to markets throughout the New York metropolitan area. In 1895 an insect blight destroyed the Hunterdon peach industry. In the early 1900s, the Pittstown station was used by the Pittstown Milk Association, shipping local products to New York area markets. By 1968 the Pittstown branch was abandoned and in 1973 the state purchased the former rail line property and made it into a nature trail. At the other end of this trail was the passenger station at Landsdown on the busy Lehigh Valley main line. Across from the Landsdown train station was the Lehigh Valley Railroad's Clinton branch. After passenger service ended in 1936 on the Clinton branch, the stations at Landsdown and Clinton were demolished.

Today, the New Jersey Division of Fish and Wildlife operates the Capoolong Creek Wildlife Management Area through which the trail wanders along Capoolong Creek, also known locally as Cakepoulin Creek.

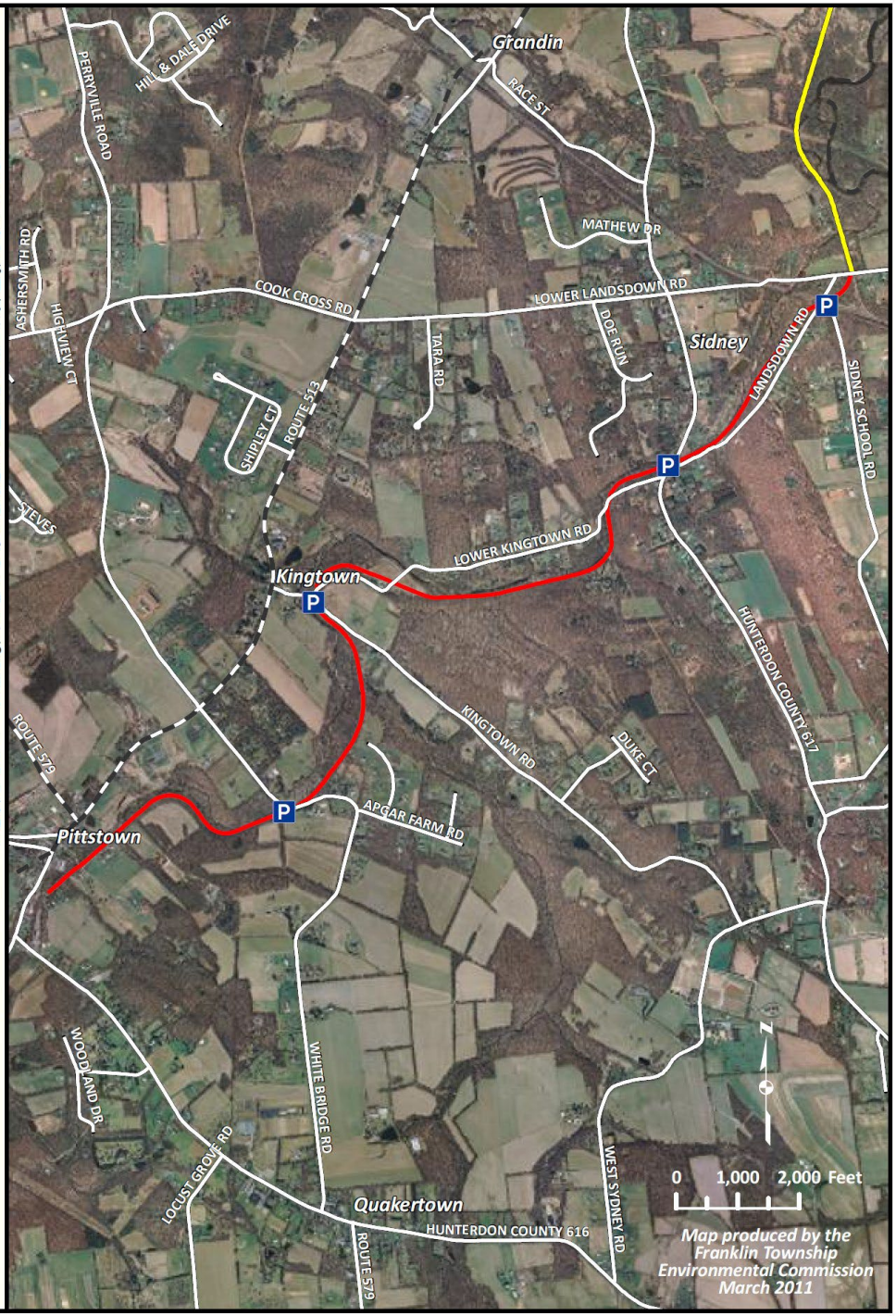
Municipal Boundaries

Roads

Capoolong Creek Trail

Landsdown Trail

Data Sources:
Franklin Township
Environmental Commission
–Capoolong Creek Trail (2010)
Hunterdon County
Dept. of Parks and Recreation
–Landsdown Trail (2009)
New Jersey Office of Geographic
Information Systems
–Municipal Boundaries (2010)
–Aerial Photography (2007)
New Jersey Dept. of Transportation
–Roads (2010)



4/3/12

Working Lands for Wildlife Program
Golden-Winged Warbler Potential Habitat in New Jersey

Focal Area
Elevation >= 500 ft
County boundary

SUSSEX COUNTY
PASSAIC COUNTY
WARREN COUNTY
MORRIS COUNTY
ESSEX COUNTY

Working Lands for Wildlife is a partnership effort of USDA-NRCS and the Department of Interior's U.S. Fish and Wildlife Service to accelerate wildlife conservation for seven targeted at-risk or listed endangered species. The program offers farmers and forest landowners financial assistance to restore and protect priority habitat areas for the bog turtle and golden-winged warbler in New Jersey.

The golden-winged warbler depends upon shrubby, early successional forested habitat and utility rights-of way. Due to competition from other species, the best habitat for this warbler is found at elevations of 500 feet and higher. This map shows areas at those elevations within the nationally defined Focal Area.

The golden winged warbler has undergone significant population declines throughout its breeding range in the greater Appalachian region due to loss, degradation, and modification of its habitat.

NRCS has committed $33 million nationally to share the cost of conservation practices with private landowners in the areas known to support the species.

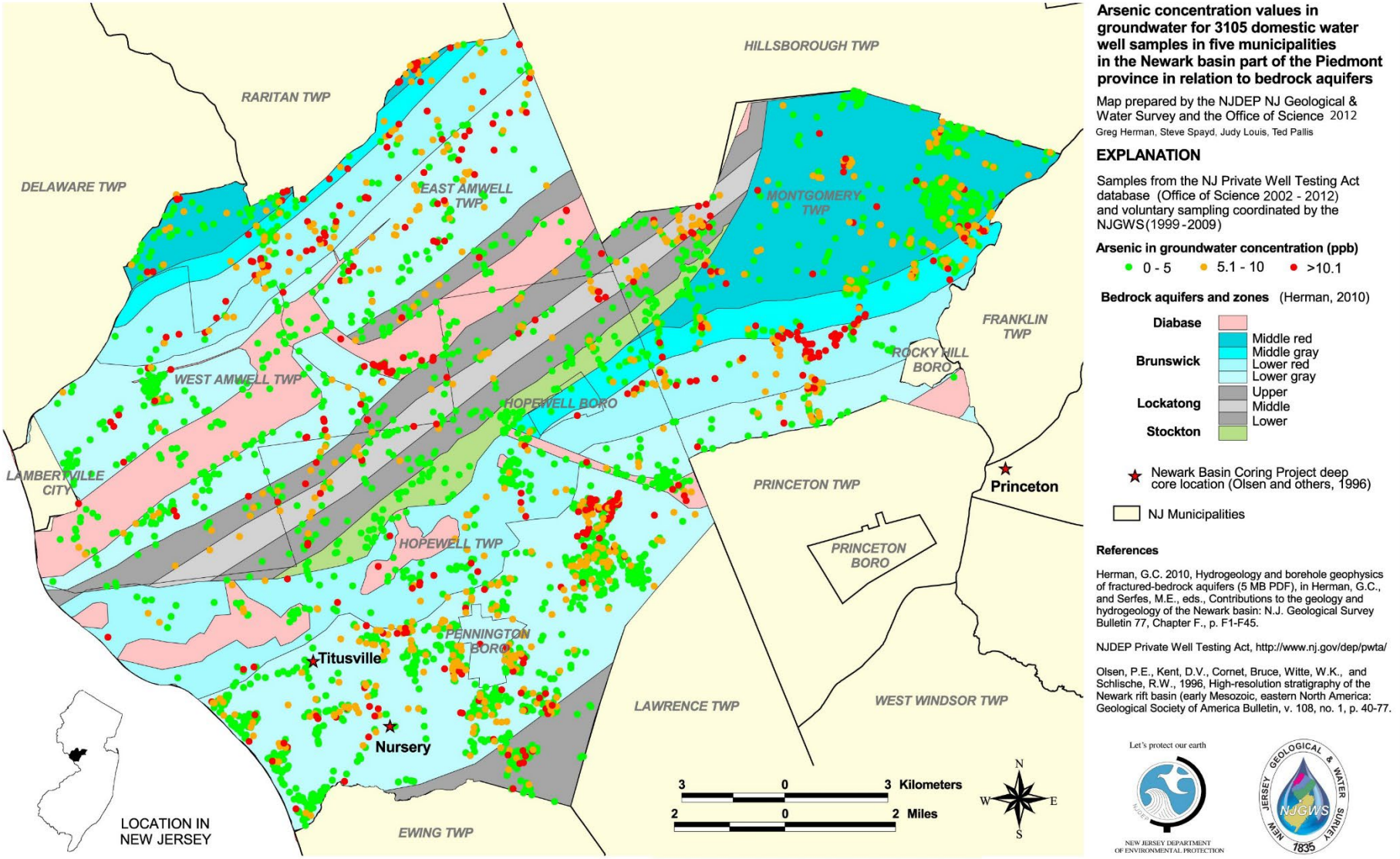
An interactive version of this map can be found at http://bit.ly/HHLhC6

Basemap: ESRI World Street Map
Elevations: USGS DEM 100 meter lattice
Focal Area: NRCS Headquarters

USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

0 5 10 Miles

N



Arsenic concentration values in groundwater for 3105 domestic water well samples in five municipalities in the Newark basin part of the Piedmont province in relation to bedrock aquifers

Map prepared by the NJDEP NJ Geological & Water Survey and the Office of Science 2012

Greg Herman, Steve Spayd, Judy Louis, Ted Pallis

EXPLANATION

Samples from the NJ Private Well Testing Act database (Office of Science 2002 - 2012) and voluntary sampling coordinated by the NJGWS (1999 - 2009)

Arsenic in groundwater concentration (ppb)

- 0 - 5
- 5.1 - 10
- >10.1

Bedrock aquifers and zones (Herman, 2010)

- **Diabase**
- **Brunswick**
  - Middle red
  - Middle gray
  - Lower red
  - Lower gray
- **Lockatong**
  - Upper
  - Middle
  - Lower
- **Stockton**

★ Newark Basin Coring Project deep core location (Olsen and others, 1996)

NJ Municipalities

References

Herman, G.C. 2010, Hydrogeology and borehole geophysics of fractured-bedrock aquifers (5 MB PDF), in Herman, G.C., and Serfes, M.E., eds., Contributions to the geology and hydrogeology of the Newark basin: N.J. Geological Survey Bulletin 77, Chapter F., p. F1-F45.

NJDEP Private Well Testing Act, http://www.nj.gov/dep/pwta/

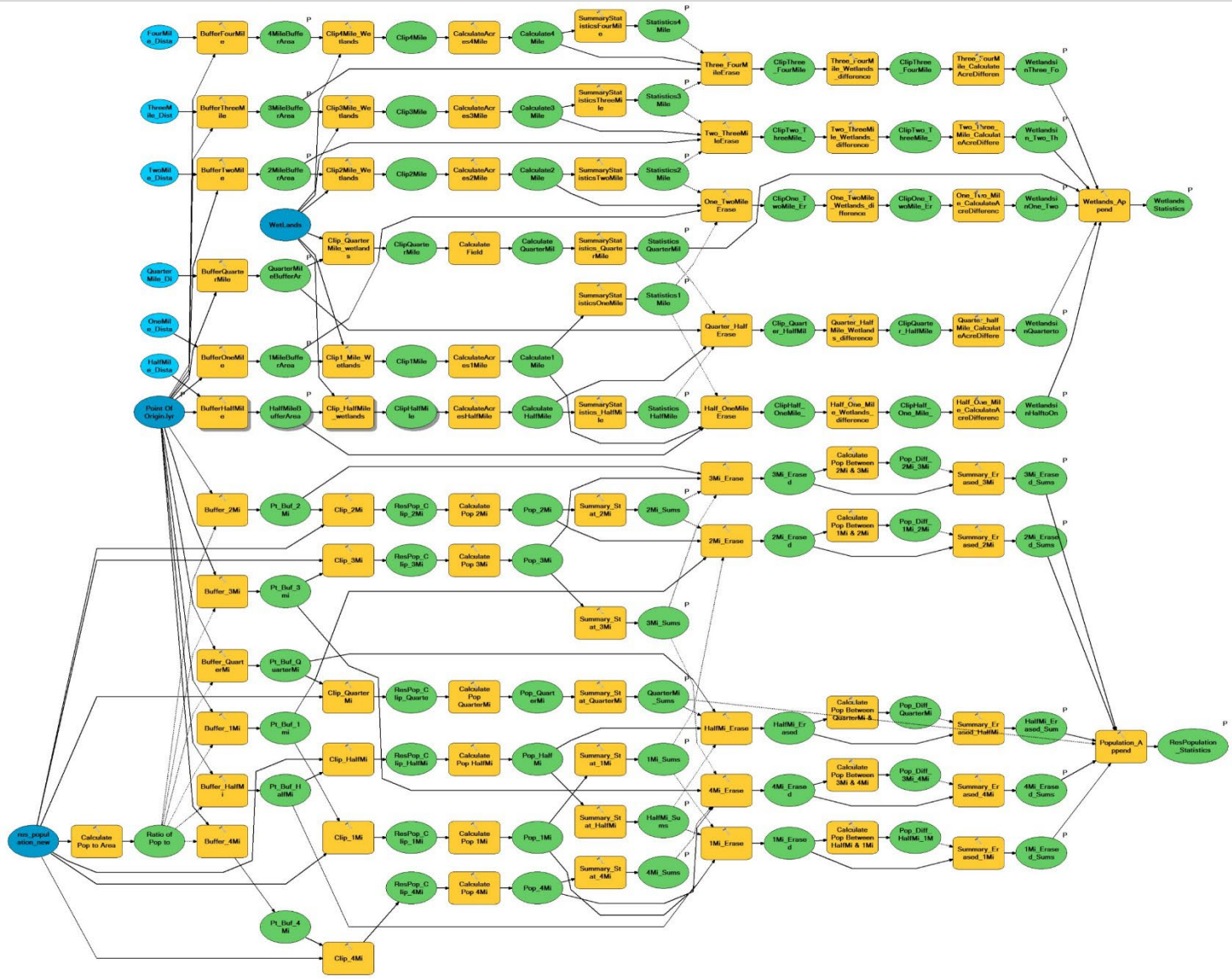
Olsen, P.E., Kent, D.V., Cornet, Bruce, Witte, W.K., and Schlische, R.W., 1996, High-resolution stratigraphy of the Newark rift basin (early Mesozoic, eastern North America: Geological Society of America Bulletin, v. 108, no. 1, p. 40-77.

Let's protect our earth

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

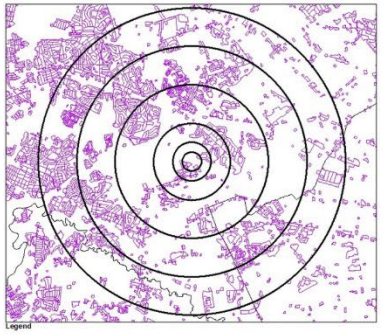
NEW JERSEY GEOLOGICAL & WATER SURVEY NJGWS 1835

Arsenic Concentration Values in Groundwater in Relation to Bedrock In Parts of Mercer, Somerset and Hunterdon Counties



ClipRing Population Map

X: 457713.20, Y:497680.76



Ring 1	(0.00 - 0.25)	has Population:	10
Ring 2	(0.25 - 0.50)	has Population:	121
Ring 3	(0.50 - 1.00)	has Population:	514
Ring 4	(1.00 - 2.00)	has Population:	1506
Ring 5	(2.00 - 3.00)	has Population:	2092
Ring 6	(3.00 - 4.00)	has Population:	2794

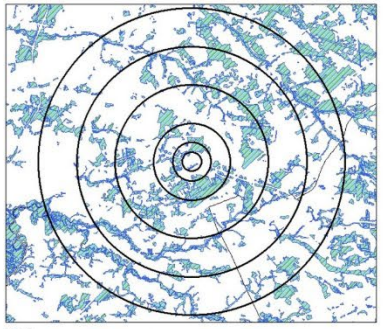
Based on 2010 Census Data and 2007 Landuse/Landcover

NJDEP 4/23/2012

Dnyanada Bhide, Carlton Dudley, Frank Sorce

ClipRing Wetlands Map

X: 457713.20, Y:497680.76



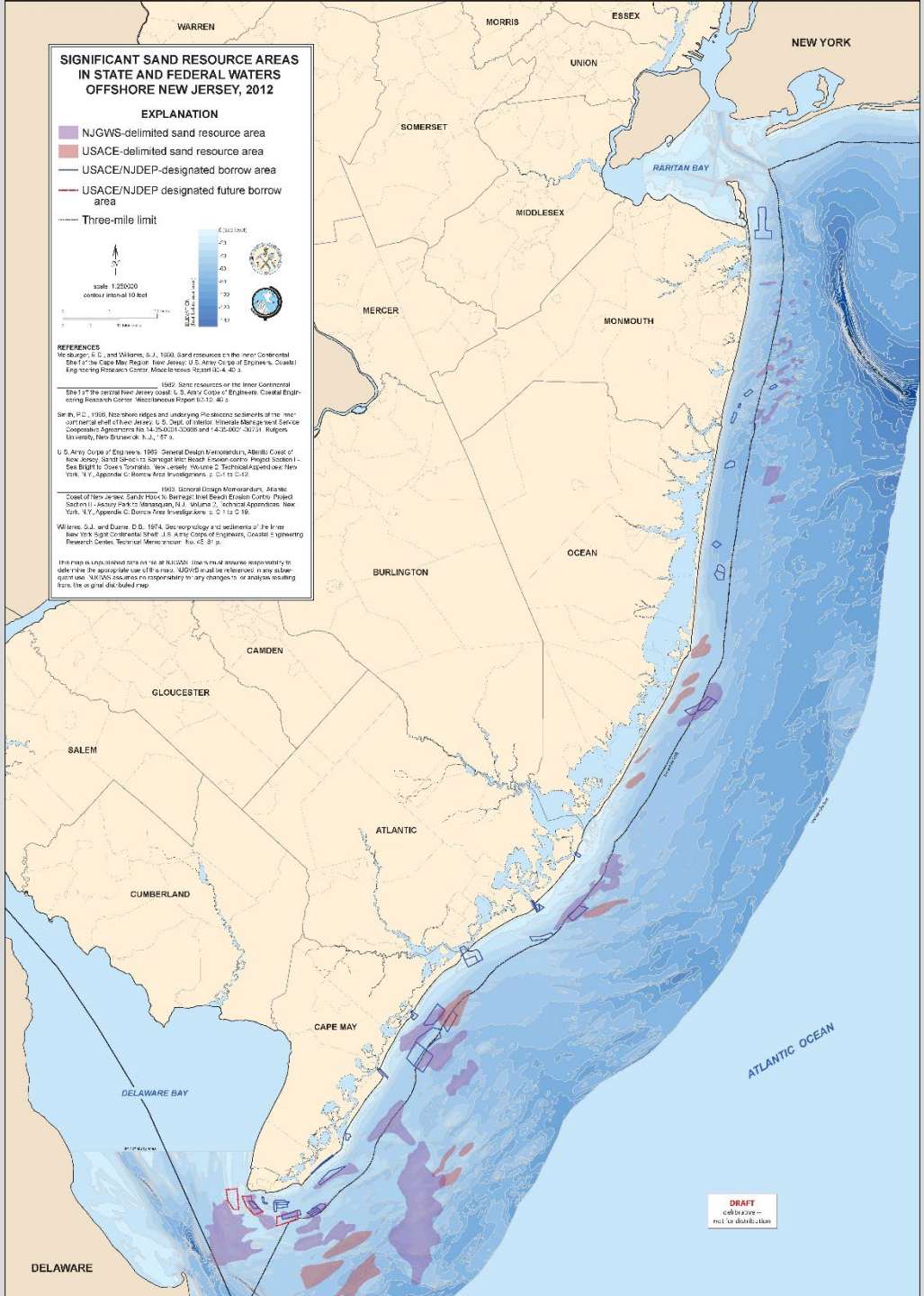
Ring 1	(0.00 - 0.25)	has Wetlands Acres:	164.82
Ring 2	(0.25 - 0.50)	has Wetlands Acres:	474.14
Ring 3	(0.50 - 1.0)	has Wetlands Acres:	1560.25
Ring 4	(1.0 - 2.0)	has Wetlands Acres:	9649.23
Ring 5	(2.0 - 3.0)	has Wetlands Acres:	21382.23
Ring 6	(3.0 - 4.0)	has Wetlands Acres:	26356.29

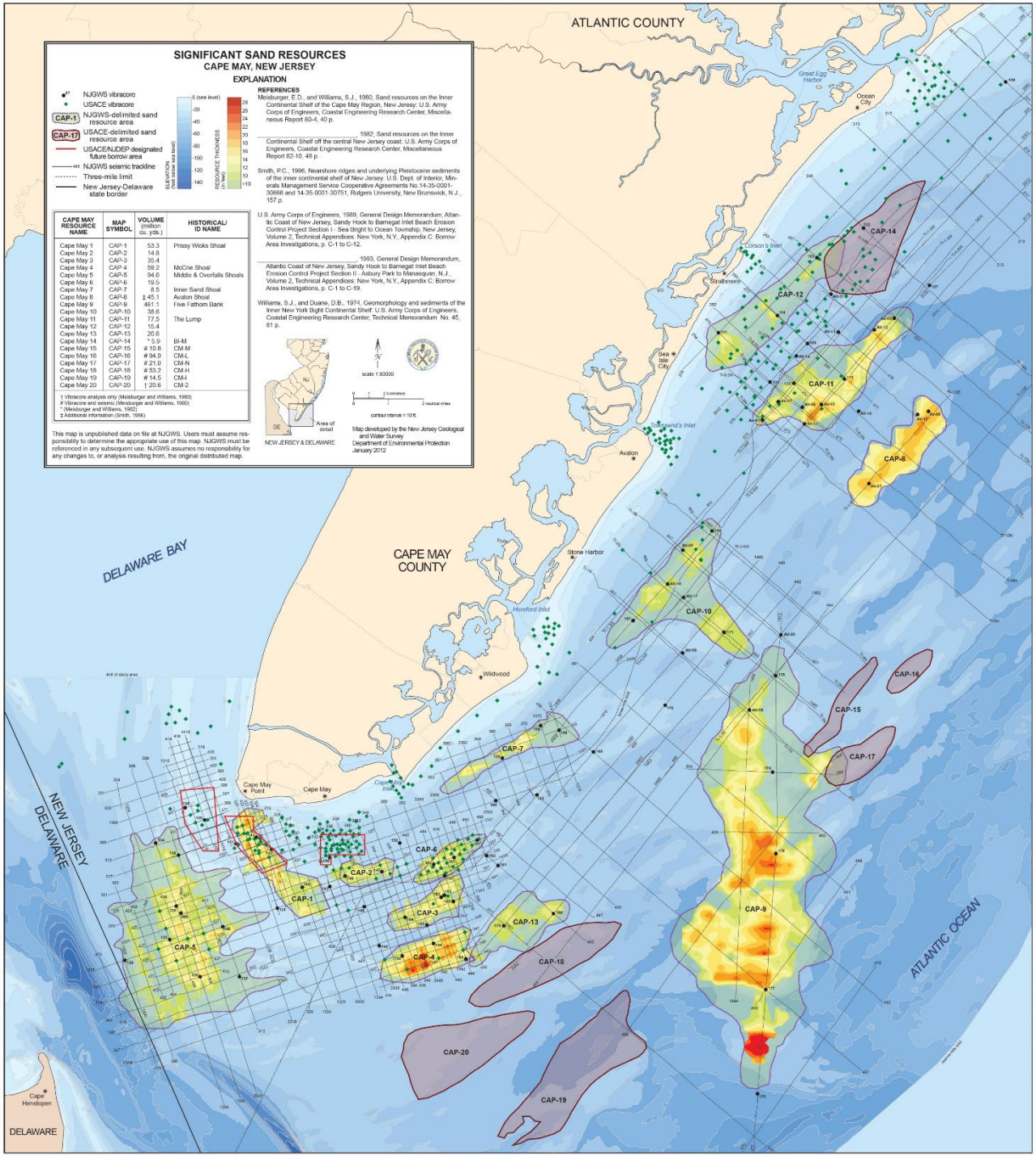
Based on 2007 Landuse/Landcover

NJDEP 4/23/2012

Dnyanada Bhide, Carlton Dudley, Frank Sorce

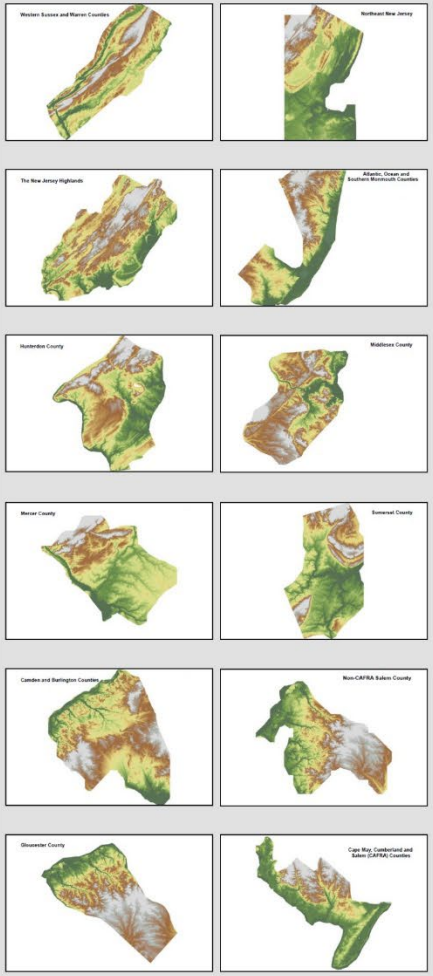
Software Integration


SIGNIFICANT SAND RESOURCE AREAS IN STATE AND FEDERAL WATERS OFFSHORE NEW JERSEY, 2012
EXPLANATION
NJGWS-delimited sand resource area
USACE-delimited sand resource area
USACE/NJDEP-designated borrow area
USACE/NJDEP designated future borrow area
Three-mile limit
scale 1:250000
contour interval 10 feet
REFERENCES
DRAFT
deliberative -- not for distribution
WARREN
MORRIS
ESSEX
NEW YORK
UNION
SOMERSET
RARITAN BAY
MIDDLESEX
MERCER
MONMOUTH
OCEAN
BURLINGTON
CAMDEN
GLOUCESTER
SALEM
ATLANTIC
CUMBERLAND
CAPE MAY
DELAWARE BAY
ATLANTIC OCEAN
DELAWARE

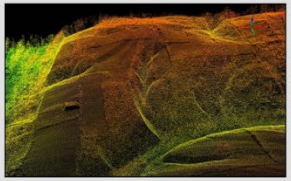

SIGNIFICANT SAND RESOURCES
CAPE MAY, NEW JERSEY
EXPLANATION
NJGWS vibracore
USACE vibracore
CAP-1 NJGWS-delimited sand resource area
CAP-17 USACE-delimited sand resource area
USACE/NJDEP designated future borrow area
NJGWS seismic trackline
Three-mile limit
New Jersey-Delaware state border
0 (sea level)
-20
-40
-60
-80
-100
-120
-140
ELEVATION (feet below sea level)
RESOURCE THICKNESS (in feet)
REFERENCES
Meisburger, E.D., and Williams, S.J., 1980, Sand resources on the inner Continental Shelf of the Cape May Region, New Jersey: U.S. Army Corps of Engineers, Coastal Engineering Research Center, Miscellaneous Report 80-4, 40 p.
1982, Sand resources on the inner Continental Shelf off the central New Jersey coast: U.S. Army Corps of Engineers, Coastal Engineering Research Center, Miscellaneous Report 82-10, 48 p.
Smith, P.C., 1996, Nearshore ridges and underlying Pleistocene sediments of the inner continental shelf of New Jersey: U.S. Dept. of Interior, Minerals Management Service Cooperative Agreements No.14-35-0001-30666 and 14-35-0001-30751, Rutgers University, New Brunswick, N.J., 157 p.
U.S. Army Corps of Engineers, 1988, General Design Memorandum, Atlantic Coast of New Jersey, Sandy Hook to Barnegat Inlet Beach Erosion Control Project Section I - Sea Bright to Ocean Township, New Jersey, Volume 2, Technical Appendices: New York, N.Y., Appendix C: Borrow Area Investigations, p. C-1 to C-12.
1993, General Design Memorandum, Atlantic Coast of New Jersey, Sandy Hook to Barnegat Inlet Beach Erosion Control Project Section II - Asbury Park to Manasquan, N.J., Volume 2, Technical Appendices: New York, N.Y., Appendix C: Borrow Area Investigations, p. C-1 to C-19.
Williams, S.J., and Duane, D.B., 1974, Geomorphology and sediments of the Inner New York Bight Continental Shelf: U.S. Army Corps of Engineers, Coastal Engineering Research Center, Technical Memorandum No. 45, 81 p.
NJ
DE
Area of detail
NEW JERSEY & DELAWARE
scale 1:80000
2 kilometers
0
2 nautical miles
contour interval = 10 ft.
Map developed by the New Jersey Geological and Water Survey
Department of Environmental Protection
January 2012
CAPE MAY RESOURCE NAME
MAP SYMBOL
VOLUME (million cu. yds.)
HISTORICAL/ ID NAME
Cape May 1 CAP-1 53.3 Prissy Wicks Shoal
Cape May 2 CAP-2 14.8
Cape May 3 CAP-3 35.4
Cape May 4 CAP-4 59.2 McCrie Shoal
Cape May 5 CAP-5 94.6 Middle & Overfalls Shoals
Cape May 6 CAP-6 19.5
Cape May 7 CAP-7 8.5 Inner Sand Shoal
Cape May 8 CAP-8 ‡ 45.1 Avalon Shoal
Cape May 9 CAP-9 461.1 Five Fathom Bank
Cape May 10 CAP-10 38.6
Cape May 11 CAP-11 77.5 The Lump
Cape May 12 CAP-12 15.4
Cape May 13 CAP-13 20.6
Cape May 14 CAP-14 * 5.9 BI-M
Cape May 15 CAP-15 # 10.8 CM-M
Cape May 16 CAP-16 # 94.9 CM-L
Cape May 17 CAP-17 # 21.0 CM-N
Cape May 18 CAP-18 # 53.2 CM-H
Cape May 19 CAP-19 # 14.5 CM-I
Cape May 20 CAP-20 † 20.6 CM-2
† Vibracore analysis only (Meisburger and Williams, 1980)
# Vibracore and seismic (Meisburger and Williams, 1980)
* (Meisburger and Williams, 1982)
‡ Additional information (Smith, 1996)
This map is unpublished data on file at NJGWS. Users must assume responsibility to determine the appropriate use of this map. NJGWS must be referenced in any subsequent use. NJGWS assumes no responsibility for any changes to, or analysis resulting from, the original distributed map.
ATLANTIC COUNTY
CAPE MAY COUNTY
DELAWARE BAY
ATLANTIC OCEAN
NEW JERSEY
DELAWARE
Great Egg Harbor
Ocean City
Corson's Inlet
Strathmere
Sea Isle City
Townsend's Inlet
Avalon
Stone Harbor
Hereford Inlet
Wildwood
Cape May Point
Cape May
Cape May Inlet
Cape Henlopen
CAP-1
CAP-2
CAP-3
CAP-4
CAP-5
CAP-6
CAP-7
CAP-8
CAP-9
CAP-10
CAP-11
CAP-12
CAP-13
CAP-14
CAP-15
CAP-16
CAP-17
CAP-18
CAP-19
CAP-20

GENERATING A NEW LiDAR DERIVED DIGITAL ELEVATION MODEL FOR NEW JERSEY

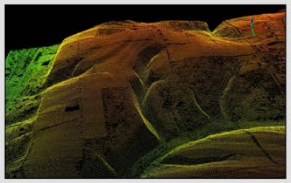
New Jersey now has complete LiDAR coverage for the entire state, collected through the 12 major projects displayed in the panels along the left edge of this composition. While elevation data generated in each project are very accurate, each collection was undertaken independently with some differences existing in in the collection and processing parameters used in each project. As a result, additional processing needs to be done on all data sets before they can be used to create a new consistent resolution statewide LiDAR derived Digital Elevation Model (DEM). These general processing steps are outlined in the panels below.



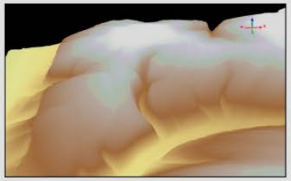
1. The process uses two software packages, QTModeler which is a LiDAR specific software application, and ArcGis (10). The initial step is to load the classified point cloud files for each project into QTModeler. The classified files are generally delivered in LAS file format, which has become the standard file format for LiDAR point cloud data. Each project data set is handled separately during the initial steps using QTModeler.



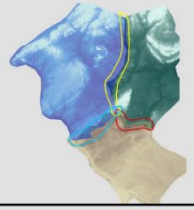
2. Only the bare earth points are used to create the DEM. These are selected from the full point clouds, with all non-bare earth points, such as buildings and roof tops, trees and shrubs, wires, bridges, and the occassional returns generated from passing flocks of birds, eliminated from further processing.



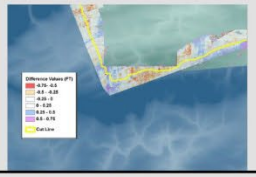
3. The bare earth points are used to generate a new gridded elevation surface for each data set. The points are re-sampled to a standard 10 ft. resolution using an adaptive triangulation mean Z process. The new 10 ft. gridded surfaces are based on a statewide grid that uses as its origin, the true 0,0 origin point of the New Jersey State Plane Feet coordinate grid. In this way, grid cells from all collections will align exactly, in both X and Y.



4. Each of the new 10 FT. surfaces are then converted from the geotiff output format of QTModeler, into an ArcInfo grid in ArcGis (10). Further processing uses tools in the Raster and Spatial Analyst tool sets in ArcGis. All of the project surfaces overlap the adjacent surfaces to some extent, with the overlaps extending only a few thousand feet to several miles.

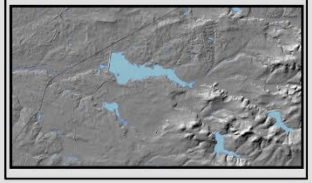


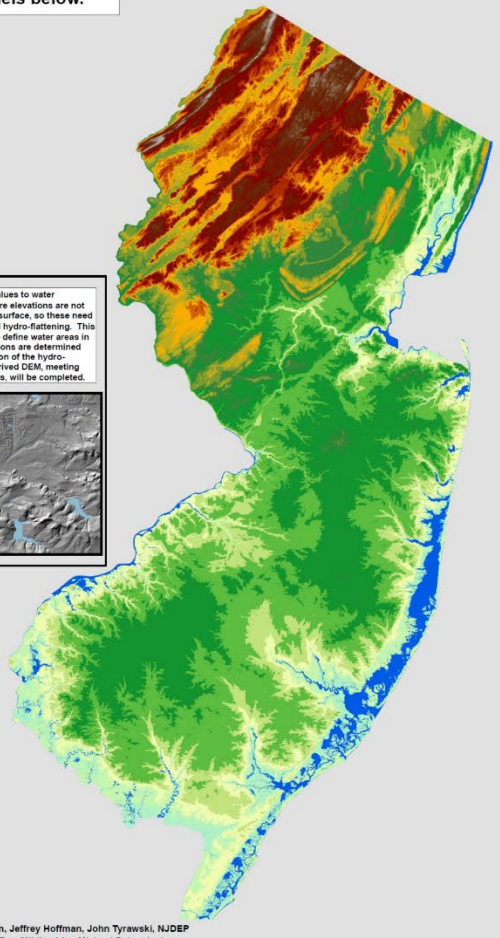
5. Determing elevations to assign pixels in the overlap areas can be done by using algorithms that calculate a mean or blended elevation from the pixel values of each surface, which results in new elevation values in the output pixels. In order to maintain the original values in the final outputl grid surface, a method using cut lines was employed in this project. First, elevation difference grids were created for each of the overlap areas to aid in placing the cuts lines. The intent was to locate the cut lines in areas of least difference to generate as smooth a transition as possible between the overlapping inputs.



6. Individual cut lines were merged to form clipping polygons for each project surface, resulting in the final sections shown below. These were merged to form a seamless statewide layer.

7. A final step will be to assign elevation values to water features in the statewide layer. Water feature elevations are not modeled in generating the bare earth DEM surface, so these need to be assigned in a separate process called hydro-flattening. This process uses vector water feature layers to define water areas in the DEM. Once defined, appropriate elevations are determined for the water feature pixels. With completion of the hydro-flattening, a new statewide 10 FT LiDAR derived DEM, meeting USGS National Elevation Data Set standards, will be completed.





Project Team: Craig Coutros, Seth Hackman, Jeffrey Hoffman, John Tyrawski, NJDEP
Glenn Locke, Craig Wenger, Tom Mihlbachler, Michael Baker Jr., Inc.
Roger Barlow, USGS

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