26th Annual Mapping Contest Maps

Analytical Presentation

An Evaluation of Six Groundwater-quality Parameters Collected Under NJ's Private Well Testing Act

Nicholas Procopio, Judy Louis, Tom Atherholt

NJDEP Office of Science

NJ Private Well Testing Act Program Overview

New Jersey's Private Well Testing Act (PWTA) was passed in March 2001 and sampling commenced in September 2002. It is the nation's first statewide program and among only a few state-run programs. In an effort to protect human health, the Act requires that source water from private wells be tested before the closing of any real-estate transaction or new lease agreement. The Act requires the testing of various water-quality parameters, thirty-two of which are "primary" parameters of human health concern along with three non health-related "secondary" parameters. The data is electronically submitted to the NJDEP by the buyer- or seller-contracted laboratories. The NJDEP uses the data collected to evaluate groundwater quality throughout the State and to inform municipalities, counties, and other government entities of potential hazards. The number of individual wells sampled throughout the state varies by parameter. This poster presents the data of three primary (nitrate/nitrite, arsenic, and radionuclides) and three secondary (pH, iron, and manganese) parameters, all naturally occurring, collected from samples collected between September 2002 and January 2011. The results show the variability in the concentration of each parameter throughout New Jersey or specific region where its analysis is required.

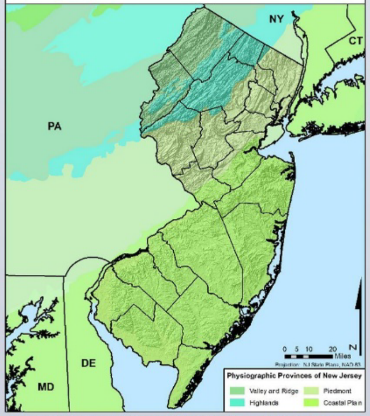
Data Analysis and Results

Raw water samples were analyzed using various EPA-certified laboratory techniques. Various methods were used and detection limits often varied. Each map shows the percentage of samples in 4 square mile quadrants that exceeded the State's MCL or optimal range for each parameter. Data were summarized by the number of samples below detection. Estimates of summary statistics were computed using maximum likelihood methods* with all of the available data.

			Summary Statistics of Sample Concentrations						
			Percntiles						
Parameter (units)	Number of Samples	Percent Below Detection	10^{th}	25^{th}	Median	75^{th}	90^{th}	Average	Std
Nitrate (mg/L)	71,536	33	0.06	0.20	0.70	2.48	7.80	4.11	23.9
Arsenic (μg/L)	27,371	75	0.06	0.16	0.54	1.77	5.17	2.55	11.8
Gross Alpha (pCi/L)	11,440	1	3.72	6.26	11.16	19.88	33.43	16.1	16.7
pH (standard units)	71,400	-	4.94	5.60	6.61	7.30	7.71	6.45	1.1
Iron (mg/L)	71,550	43	0.003	0.015	0.078	0.406	1.781	1.53	29.8
Manganese (mg/L)	71,554	53	0.001	0.003	0.010	0.036	0.113	0.06	0.4

*Helsel, Dennis R. 2012. Satatistics for censored environmental data using Minitab and R. 2nd Ed. Wiley.

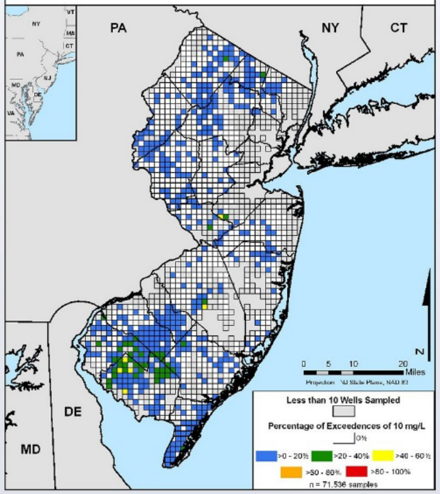
Physiographic Provinces and Relief of New Jersey



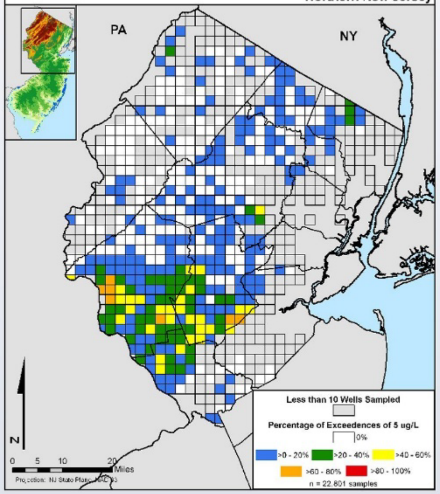
Physiographic Provinces: Environmental Protection Agency. 2011. Level III and IV ecoregions of the continental United States. U.S. EPA, National Health and Environmental Effects Research Laboratory, Corvallis, Oregon, Map scale 1:3,000,000.

The maps below depict the percentage of samples in 4 square mile quadrants that exceeded the State's MCL or optimal range for each parameter. Each map highlights all quadrants where samples occurred and codes them by the percentage of samples within each quadrant that exceeded the MCL. Only quadrants containing ten or more samples were summarized for the map presentation.

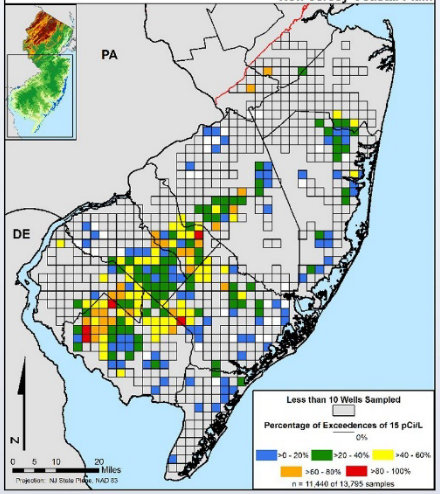
Nitrate Samples and Exceedences of 10 mg/L



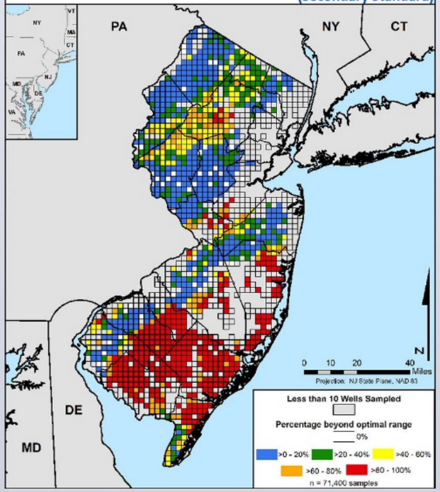
Arsenic Samples and Exceedences of 5 ug/L
Northern New Jersey



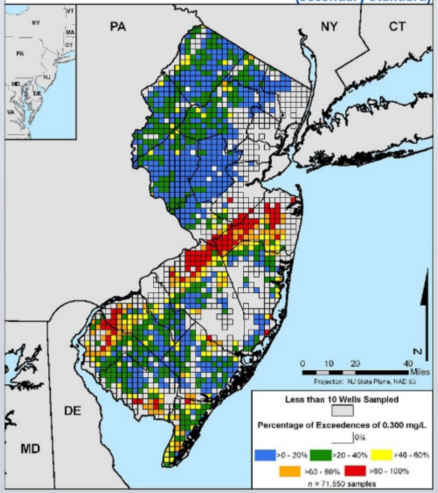
Gross Alpha Samples and Exceedences of 15 pCi/L
New Jersey Coastal Plain



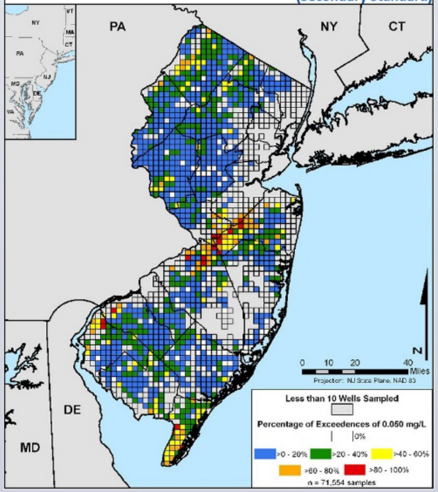
pH Samples Beyond Optimal Range of 6.5 - 8.5
(Secondary Standard)



Iron Samples and Exceedences of 0.300 mg/L
(Secondary Standard)



Manganese Samples and Exceedences of 0.050 mg/L
(Secondary Standard)



NOTICE: Release of individual well data and location is prohibited by the PWTA

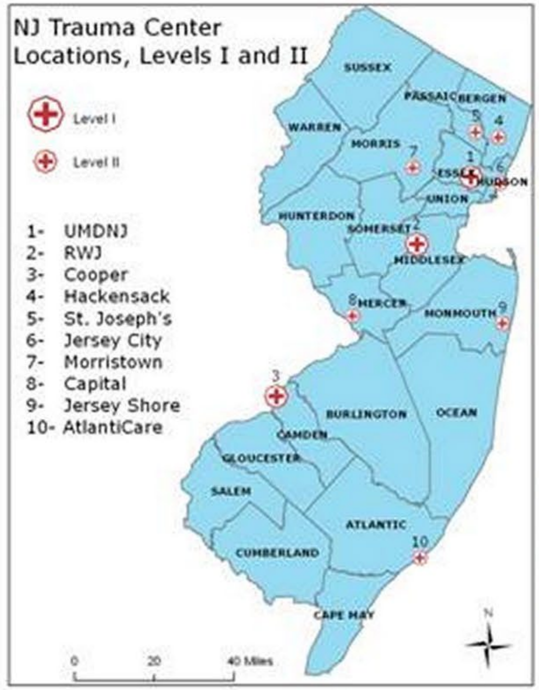
Trauma Center (TC) Access and NJ Population by Census Tract

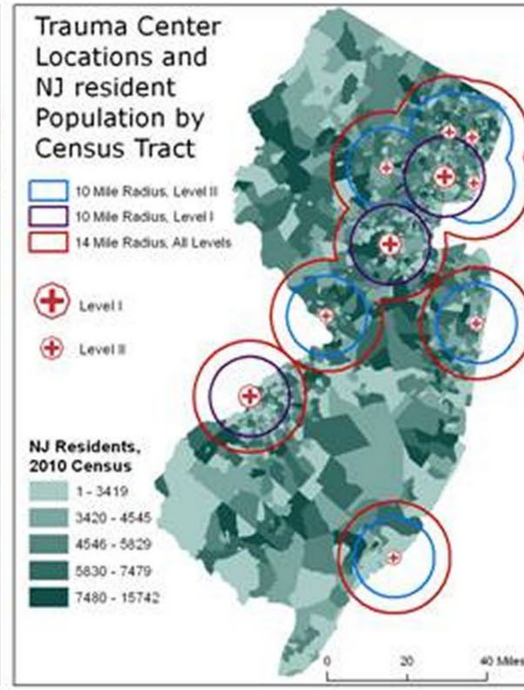
NJ Residents	% Within 10 miles of Level I TC	% Within 10 Miles any TC	% Within 14* mile radius any TC
Total	37.8	64.8	80
Children	37.6	64.1	80
Elderly	33.3	61.9	77
Hispanic	52.7	81	90
Black	57.4	79	88
White NH	27.8	55	73

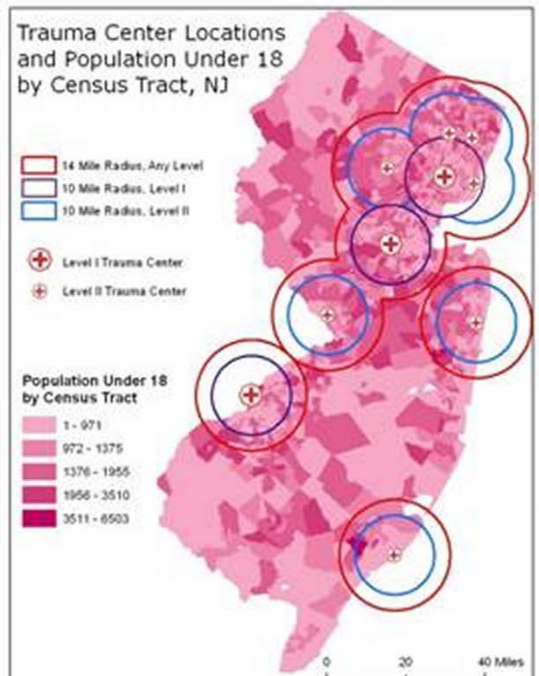
*14 Mile Radius derived based on data from Branas, Mackenzie, et al, JAMA 2005 Jun1; 293 (21): 2626-33.

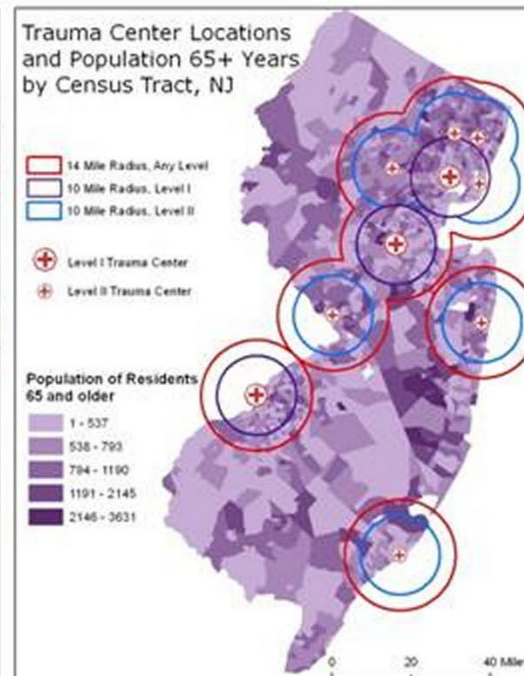
Population Outside of 14 mile radius
1,782, 913 (20%)

Level I Trauma Center	Population NJ Residents Within 10 mile Radius
UMDNJ	1,954,821
RWJ	839,729
Cooper	509,735









Data Sources: ESRI, NJDEP, NJ Hospital Association, US Census

Map: M. Lopreiato, MPH
April 16, 2013

Effects of Hurricane Sandy Storm Surge on Wetlands in New Jersey

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Introduction

Hurricane Sandy made landfall in New Jersey October 29, 2012, wreaking havoc and becoming the most destructive and costliest tropical storm in the state. Since then, many GIS resources have become available showing the effects of Hurricane Sandy on human infrastructure (see Table 1). It is well known that hurricanes' high velocity winds can cause detrimental damage (e.g. shoreline erosion, flooding, property loss) that can cost millions of dollars to repair (Doyle *et al.*, 2009). However, prior studies lack information on impacts of storm surge by hurricanes in general, lack a quantitative analysis of the effects of Hurricane Sandy, and in particular, lack information on the effects of Hurricane Sandy on natural ecosystems.

This study attempts to quantify the extent and effects of storm surge from Hurricane Sandy on the coastal wetlands of New Jersey.

Methods

Data	Data Source	Date
Pre-Sandy Aerial Photography	NJGIN	March 2012
Post-Sandy Aerial Photography	NOAA	October 31 – November 6, 2012
New Jersey Wetlands	NJDEP	1986
Hurricane Sandy Storm Surge	FEMA	November 11, 2012

Table 1: Data used in study with data source and date.

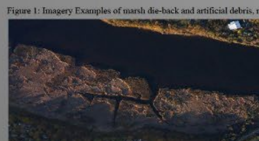
Analysis: Pre- and post-Sandy aerial photography were analyzed in combination with storm surge and wetlands. A layer depicting the intersection of storm surge and wetlands was overlain on top of pre- and post-Sandy photos. Using a ranking system (see Table 2), extent and degree of impact were calculated.

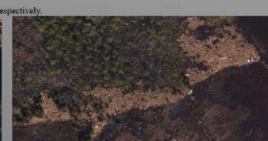
Ranking system: A series of metrics were identified based on the types of wetland degradation that could be found in post-Sandy imagery. Each metric has an associated score (see below). The lowest score is one (e.g., low impact) and the highest score is three (e.g., severe impact). Each wetland area was attributed with the appropriate metric(s), a relative score, and a final calculated score. Low impact wetlands had a score of one to two, moderate impact wetlands had a score of three to four and high impact wetlands had a score of five or more.

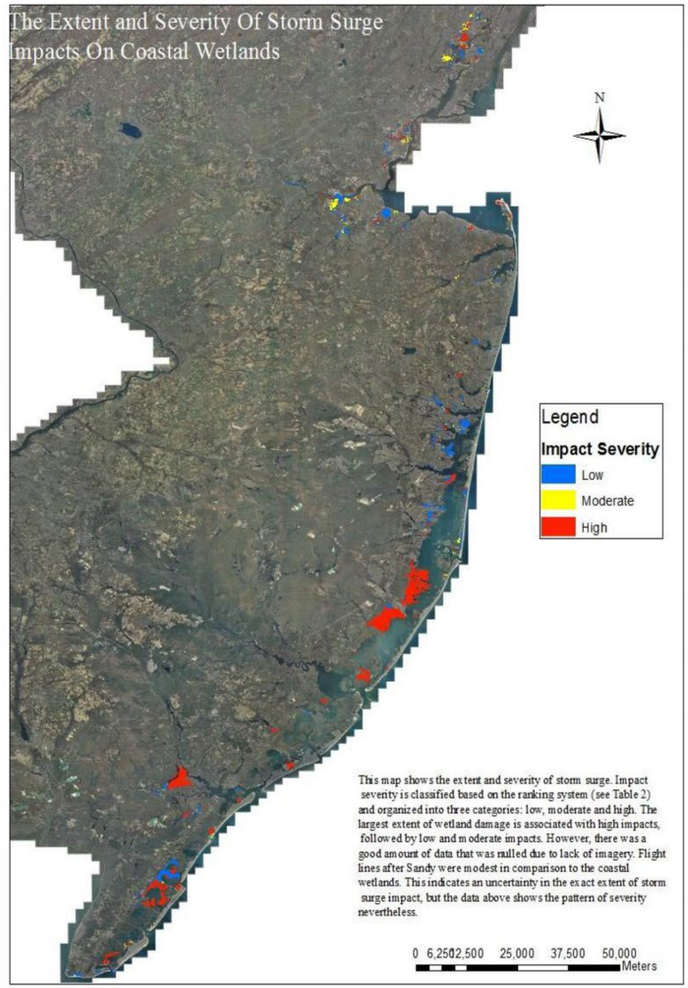
Low (score of one)	Moderate (score of two)	High (score of three)
Minimal flooding, minimal natural debris	Moderate flooding, Moderate natural debris, Minimal artificial debris	Extreme flooding, Moderate- severe artificial debris, Severe natural debris, Marsh dieback (Distinct brown patches)

Table 2: Scoring of each metric.

Figure 1: Imagery Examples of marsh die-back and artificial debris, respectively.







Acknowledgements
I would like to thank Steve Smith for helping to make this project possible.

Morphologic Alteration of Dunes near Atlantic City (NJ) from Hurricane Sandy

NJIT New Jersey's Science & Technology University

Dr. Laramie Potts, Dr. John Miima, Ms. Zayibeth Carballo, Mr. Gregory Schneider

New Jersey Institute of Technology, Department of Engineering Technology – Surveying Engineering Technology Program

Data sources and support from

Credits:

Todd Ehret, Oceanographer, User Services Center for Operational Oceanographic Products and Services

Dietsche, D., et al., (2007), Storm Surge Simulations for Hurricane Hugo (1989) *J. Waterway, Port, Coastal, Ocean Eng.* 2007.**V133**:183-191.

Xu, H. et al (2010), Storm surge simulation along the U.S. East and Gulf Coasts using a multi-scale numerical model approach, *Ocean Dynamics*, **V60**,1597–1619

Potts, L., SET280 Lectures on Marine Surveying

Stormwater Design and Planning on a Barrier Island (Ocean City, NJ)

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[1]Environmental Science, BS, Anticipated Graduation May 2013, Richard Stockton College of New Jersey.

Introduction

Recent storm events have brought attention to stormwater induced flooding in the Merion Park neighborhood in Ocean City, NJ. An analysis of existing infrastructure has exposed multiple design and planning failures as a result of developing at low elevations. A stormwater discharge analysis was carried out using the Natural Resource Conservation Service (NRCS) Rational Method (TR-55) and changes in impervious parcel cover were considered. A comparison of tide heights to a known outfall elevation was looked at and compared to the calculated culvert size for installation feasibility. Out of this assessment, recommendations were offered utilizing changes in parcel impervious cover and other techniques.

Methods

- GIS
  - A digital elevation map (DEM) was acquired from State of New Jersey .
  - A flow accumulation network was created in ArcGIS and overlaid over a sewer pipe network acquired from the City of Ocean City.
  - Drainage areas were created by hand delineation. Parcels and road information was acquired from Cape May County and clipped to each drainage area.
  - Three analyses were carried out on this data:
    1. Parcel impervious area was determined on existing conditions as outline by Ocean City's Article 200 Zoning Regulations manual and field observations.
    2. Stormwater discharge analysis was calculated for the 25-year storm recurrence interval for each parcel of land using the NRCS Rational Method in Microsoft Excel. Additionally, the NRCS Rational Method was carried out for 5% and 10% less impervious area for each parcel for future planning use. This was added to runoff from roads.
    3. Culvert capacity was determined using American Concrete Pipe Association's technical document , DD-11.
- Tide Height
  - Hourly tide height data was collected from the National Oceanic and Atmospheric Administration (NOAA) from January 1st 1985 to December 31st 2010 from Atlantic City and plotted in Microsoft Excel.
  - Tide heights were plotted against Drainage Area #28's outfall elevation.

Conclusions and Future Considerations

Volume analysis of the Merion Park drainage system shows several shortcomings. To meet the 25-year storm capacity, the culverts would have to be installed in such a way that will put them below the high tide elevation. Tidal check valves can be installed to prevent backwash, but are prone to clogging and only work at a specified pressure head. An analysis of changing impervious area shows no change in the required culvert size, however, reducing parcel impervious cover will give a marginal system greater ability to handle larger duration storms. The City of Ocean City is currently exploring the use of a levee and pump system to aid in stormwater management in the Merion Park neighborhood. With a trend in rising sea levels due to climate change, the problem of stormwater induced flooding will only become greater as outfalls are covered on a more frequent basis. A combination of pumps, raising street elevations, and reduction of impervious area will most likely be needed to satisfy stormwater demands.

Citations

- Chew. PE, Arthur. City of Ocean City. Department of Planning & Engineering. *Ocean City Master Drainage Plan* . 2013
- United States. Department of Agriculture. *Urban Hydrology for Small Watersheds (TR-55).* Washington D.C. : 1986. Print.
- American Concrete Pipe Association. *Hydraulic Capacity of Culverts (DD-11).*Irving, TX. : 2009. Web.

Figure 1: Flow Accumulation for the Merion Park Drainage System

Figure 2: Drainage Areas for the Merion Park Drainage System

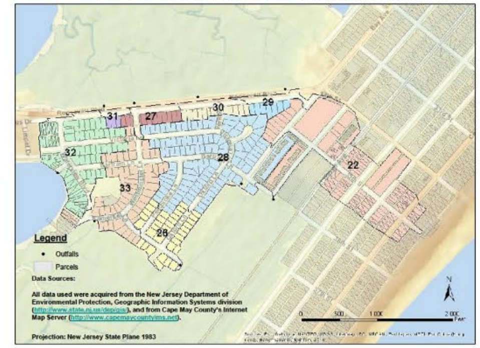


Table 1: Discharge and Culvert Size for the Merion Park Drainage System

Drainage Area	Current Conditions (cfs)	5% Less Parcel Impervious Area (cfs)	10% Less Parcel Impervious Area (cfs)	RCP dia (in)	HDPE dia (in)
22	101.49	98.62	95.76	42	42
26	25.63	24.75	23.89	27	27
27	10.07	9.78	9.51	18	18
28	85.45	82.62	79.78	42	42
29	9.22	9	8.78	18	18
30	10.05	9.77	9.48	18	18
31	3.21	3.14	3.07	12	12
32	48.93	47.32	45.71	33	33
33	42.84	41.35	39.87	30	30

Tide Height vs. Outfall Elevation

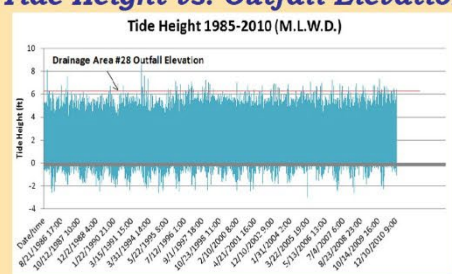


Figure 3: 25 year tide height trend vs. outfall elevation

Drainage area #28's outfall was chosen as a best representation of outfalls in Merion Park. Looking at tide height analysis over the last 25 years as it relates to the outfall elevation of drainage area #28, we can see the source of potential problems. First, we can see periods of increased higher tide elevations, especially starting in the middle 2000s to present. This may account for the increase in awareness of stormwater and tide influenced flooding in this area. Comparing the tide elevations to culvert size, we can see that many of the pipes will be below the high tide line, this is especially true when accounting for pipe slope and their locations beneath the street.

Parcel Impervious Area

Figure 4: Current impervious parcel area

Figure 5: 5% less impervious parcel area

Figure 6: 10% less impervious parcel area

Changes in impervious area were considered. Current parcel impervious cover was modeled, followed by a reduction of 5% and 10%. Culvert size remained the same for all discharges. It is important to remember that 1cfs is equal to 449gpm, and any reduction in discharge can have a positive effect on the system's ability to handle storms of a greater magnitude. Lastly, if additional systems are to be put in place to handle stormwater, such as a levee and pump system, a decrease in impervious cover per parcel will most likely be needed to help minimize loading on the system.

Irene (2011)

Like Sandy, Irene did not make landfall in NJ as a hurricane. It made its landfall as a Tropical Storm.

Category 1-Hurricane Irene vs. Category 1- Hurricane Sandy: Why Sandy Caused the Catastrophic Coastal Damage Not Seen in New Jersey During Irene

Sandy (2012)

Like Irene, Sandy did not make landfall in NJ as a hurricane. It made its landfall as a Post-Tropical Low.

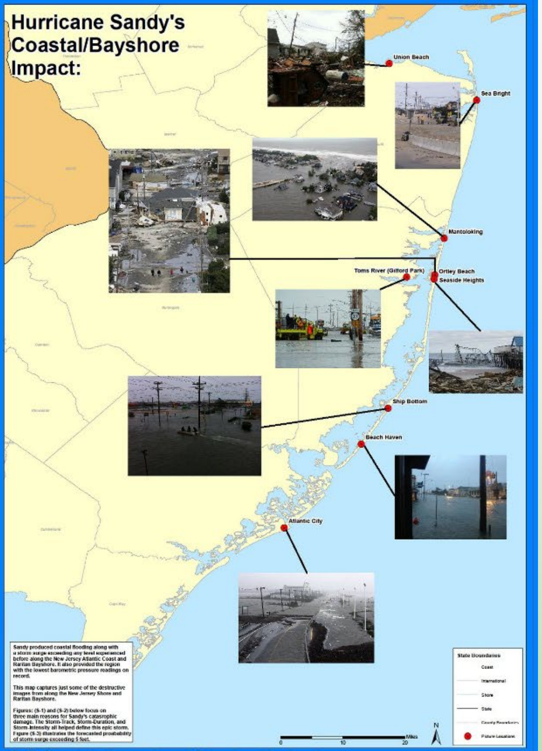
Hurricane Irene's Coastal/Inland Impact:

Irene failed to produce the devistating coastal flooding and storm surge along the New Jersey Atlantic Coast and Raritan Bayshore that Sandy caused. Irene delivered primarily a heavy rain and flooding event that caused damage in its own right further inland.

This map captures just some of the high water and serious flooding images from along the New Jersey Shore and select points inland.

Figures: (I-1) and (I-2) below focus on three main reasons for Irene's lack of catasrophic coastal damage. The Storm-Track, Storm-Duration, and Storm-Intensity are the primary focal points. Figure (I-3) depicts the forecasted probability of the storm surge exceeding 5 feet.

Hurricane Sandy's Coastal/Bayshore Impact:

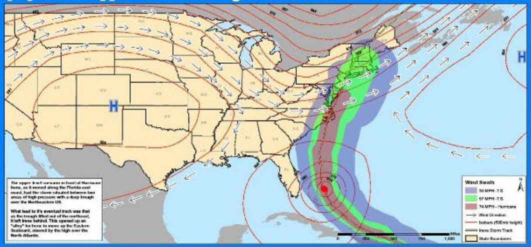


Sandy produced coastal flooding along with a storm surge exceeding any level experienced before along the New Jersey Atlantic Coast and Raritan Bayshore. It also provided the region with the lowest barometric pressure readings on record.

This map captures just some of the destructive images from along the New Jersey Shore and Raritan Bayshore.

Figures: (S-1) and (S-2) below focus on three main reasons for Sandy's catasrophic damage. The Storm-Track, Storm-Duration, and Storm-Intensity all helped define this epic storm. Figure (S-3) illustrates the forecasted probability of storm surge exceeding 5 feet.

(I-1) Irene's Upper-Level Steering Mechanisms:



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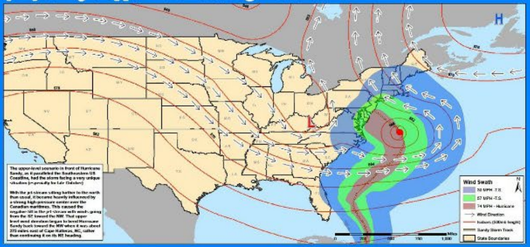
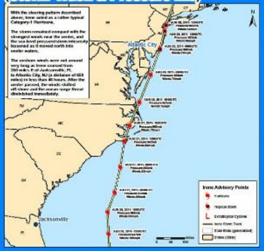
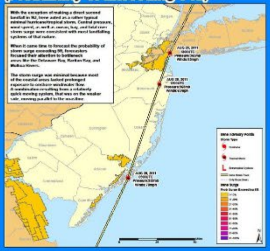


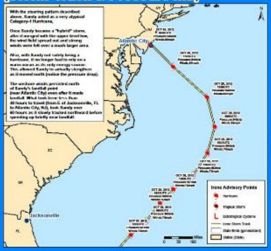
(I-2) Irene's NHC Advisory Points: (Storm-Track & Pressure mb)



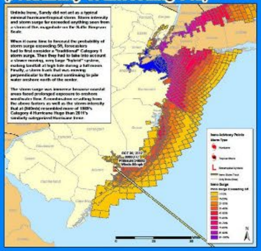
(I-3) Irene's Projected Storm Surge: (Probability of Exceeding 5 ft.)



(S-2) Sandy's NHC Advisory Points: (Storm-Track & Pressure mb)

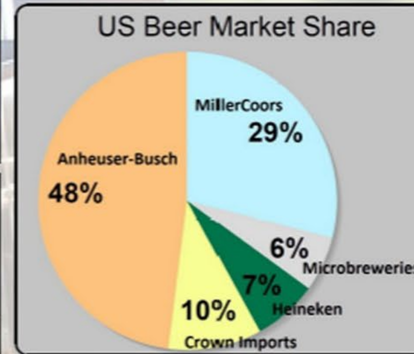


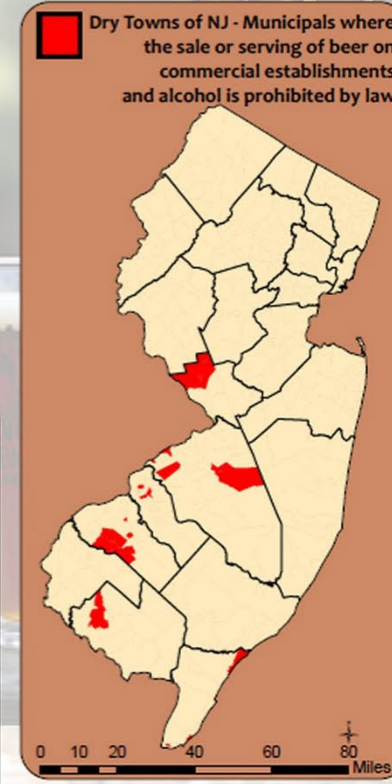
(S-3) Sandy's Projected Storm Surge: (Probability of Exceeding 5 ft.)

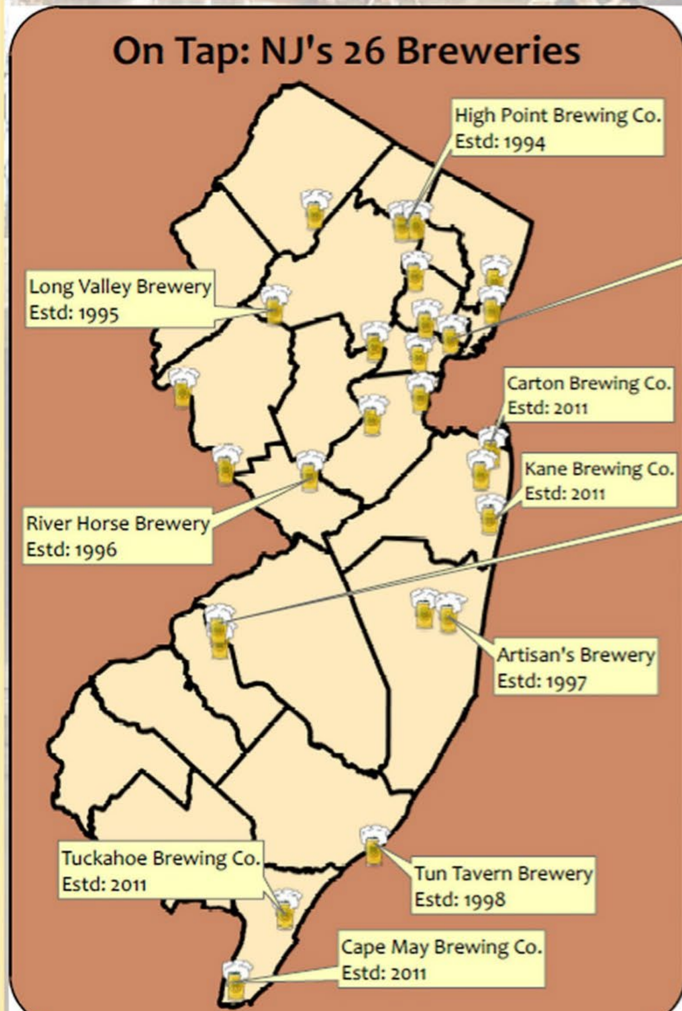


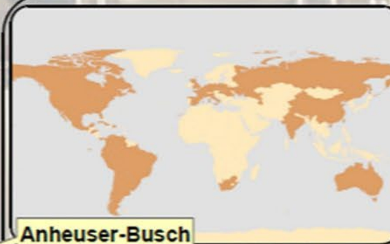
Beer in New Jersey

Within the past decade the U.S has seen a huge rise in the popular interest of craft beer and beer production. The Garden State is home to 25 small scale microbreweries and one large scale brewery. The following maps and charts tell us all about beer production, consumption, and other facts about beer in NJ









Global reach of Anheuser-Busch

Annual Production: 125 Million Barrels

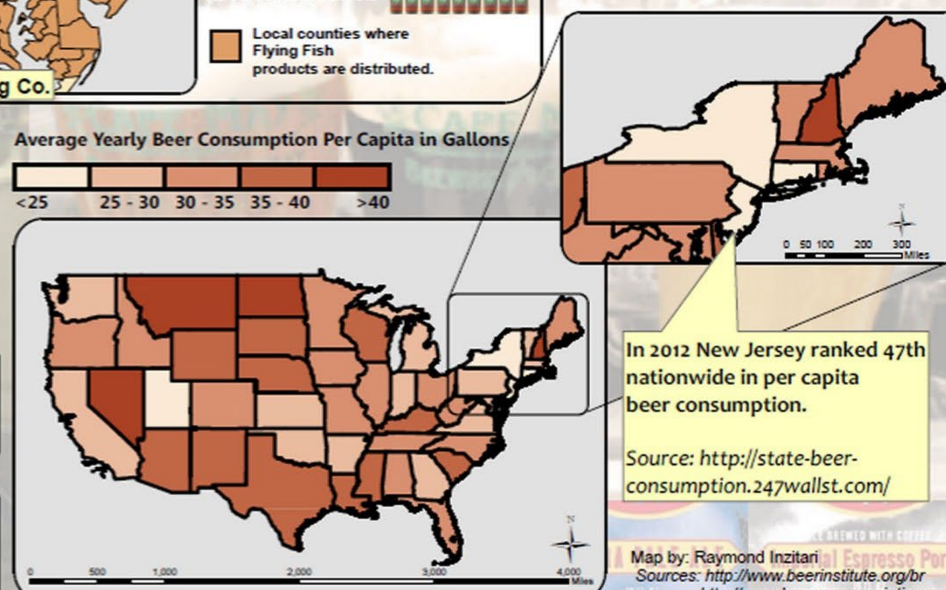
Countries where Anheuser-Busch products are distributed.

Differences between a large scale brewery and a microbrewery.

Local areas where Flying Fish brews are sold

Annual Production: 12 Thousand Barrels

Local counties where Flying Fish products are distributed.



Map by: Raymond Inzitari

Sources: http://www.beerinstitute.org/br

http://www.brewersassociation.org/

Land Cover and Land Use Effect on Hydrologic Response in the Great Egg Harbor Watershed

R. Adams[1], T. J. Baker[2]

[1]Environmental Science, BS, Anticipated Graduation May 2013, Richard Stockton College of New Jersey. [2] Assistant Professor, Environmental Science, Richard Stockton College of New Jersey

Introduction

Recent storm events, such as Hurricane Irene, have brought attention to storm water induced flooding in watersheds throughout New Jersey. An analysis of land cover and land use data in the Great Egg Harbor Watershed Management Area indicates that land uses dominated by impervious surfaces have increased between 1986 and 2007. A preliminary investigation was conducted to compare precipitation and stream flow data over the same 21 year period in the watershed, with a focus on the timing, or lag response, of peak flows after rainfall events. This assessment of the timing of peak flow events produced results, decreased lag time coupled with increased peak flows, which are consistent with the expected response of a watershed to increased impervious surface areas

Hypothesis

It is commonly accepted that that urbanization leads to a greater likelihood of flooding during storm events (Maidment, 1993). Little work has been done on how urbanization effects stream discharge in the Great Egg Harbor Watershed. Continuing development in the headwaters region of the Great Egg Harbor watershed could potentially increase the number of flood events and this needs to be addressed in the context of continuing development of the region. By observing land use and land cover changes over time for the headwaters of the Great Egg Harbor River, we hypothesize that there will be a notable decrease in baseflow to maintain normal streamflow as well as increased flood frequency.

Methods

- GIS
  - Land cover and land use maps acquired from State of New Jersey for 1986, 1995, and 2002.
  - Land cover changes were determined using ArcGIS and then examined at a watershed (Great Egg Harbor River) and subwatershed (area above the USGS Folsom gaging station) scale (Figure 1;Tables 1 and 2).
- Streamflow
  - Streamflow data were downloaded from the USGS Water Data for the Nation web site (http://waterdata.usgs.gov/nwis/rt).
  - Two analyses were carried out on these data
    1. A digital baseflow separation (Mau and Winter, 1997; Figures 2-4) was carried out in Microsoft Excel for the years 1979 -1999.
    2. A flood frequency analysis was carried out using the entire USGS dataset, covering 1926 – 2011 (Figures 5-8).

Literature Cited

Maidment, D.R. 1993. Handbook of Hydrology. McGraw Hill Professional. 1424 pages.

Mau, D.P. Winter, T.C. 1997. Estimating ground-water discharge from streamflow hydrographs for a small mountain watershed in a temperate humid climate, New Hampshire, USA. *Ground Water*. 35(2):291-304.

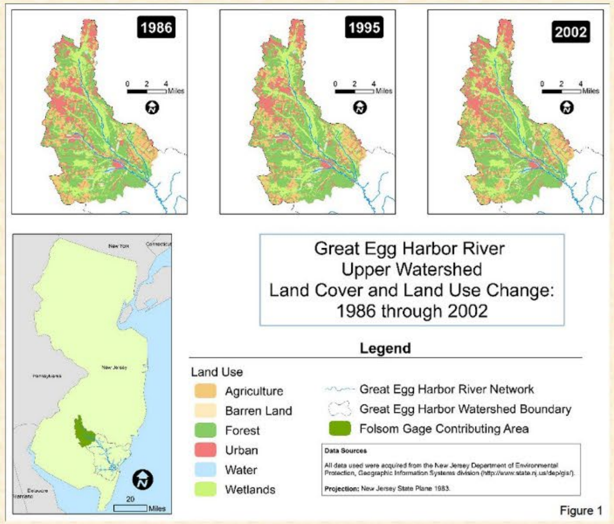


Figure 1

Table 1: Land use changes quantified by acreage for the Great Egg Harbor watershed between 1986 and 1995.

Land Use	1986 (Acres)	1995 (Acres)	2002 (Acres)	Net Change (Acres)
Agriculture	22,880	21,218	20,350	-2,530
Barren Land	4,799	4,725	5,005	206
Forest	156,317	150,424	145,467	-10,850
Urban Land	53,558	60,828	66,533	**12,975**
Wetlands	111,047	110,189	110,208	-839

Table 2: A comparison of land use distribution in the upper Great Egg Harbor watershed area that contributes to streamflow at Folsom, versus the whole watershed.

Land Use Type	Great Egg Harbor WS			Above Folsom Gage		
	1986	1995	2,002	1986	1995	2,002
Agriculture	7%	6%	6%	12%	11%	12%
Barren Land	1%	1%	1%	2%	2%	2%
Forest	45%	43%	42%	43%	40%	39%
Urban Land	15%	18%	19%	15%	22%	23%
Wetlands	32%	32%	32%	27%	25%	25%

Baseflow Response

Decreased stream baseflow supports the hypothesis that an increase in impervious areas due to urbanization has an impact on the hydrologic response in the Great Egg Harbor River Watershed. Observing baseflow data from 1979, 1989, and 1999 we can see there has been a decrease in baseflow, from an approximate average value of 4.5 cubic feet per second in 1986, to less than 4 cubic feet per second in 1999.

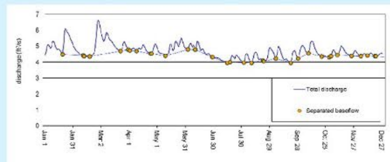


Figure 2: Baseflow separation for 1979

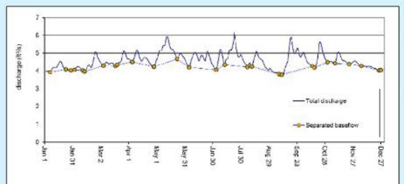


Figure 3: Baseflow separation for 1989

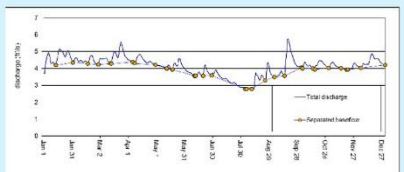


Figure 4: Baseflow separation for 1999

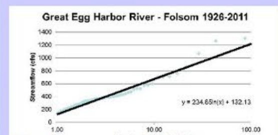


Figure 5

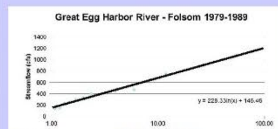


Figure 6

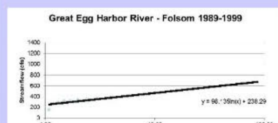


Figure 7

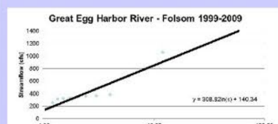


Figure 8

Flood Recurrence Response

Evidence from flood frequency analysis may at first appear less conclusive regarding the potential impact of urbanization on streamflow response. There is a notable increase in the peak flow recurrence interval during 1999-2009 as compared to the long-term average, however. There was a decrease in peak flows from 1989-1999; however, this is attributable to decreased rainfall during this period.

Data Integration

EXPLORE

Cape May County

New Jersey

Welcome to Cape May County!

The unique landscape of Cape May County can be found at the southern end of New Jersey. Throughout the region visitors can experience forests, wetlands, farmland, historic destinations, seashore communities and pristine white sandy beaches.

Cape May County was named by Cornelius Jacobsen Mey. Captain Mey was sent on a journey by the Dutch West India Company along with three ships in the 1620's to explore the New York and Delaware Bay region. Although the spelling has changed the county still bears Captain Mey's name.

In recent years Cape May County has become a year round vacation destination.

Whether coming for a day or coming for an extended stay visitors are sure to discover many exciting activities for all ages. So plan a visit and

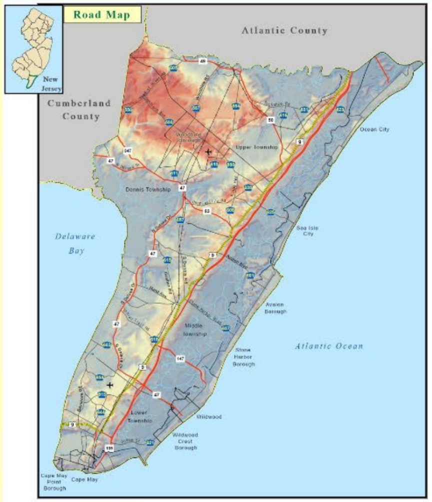
Explore!

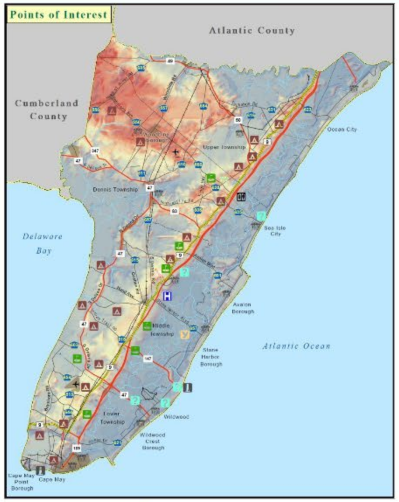
The Jersey Cape
Cape May County

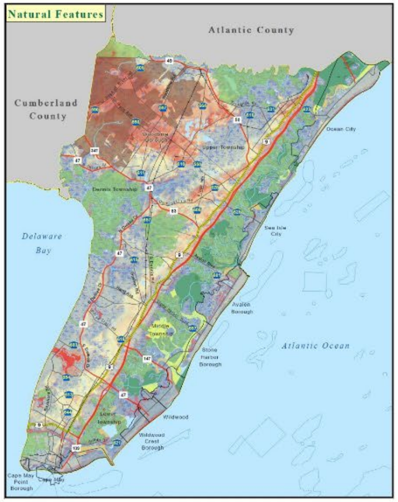
The
Cape May County
Museum

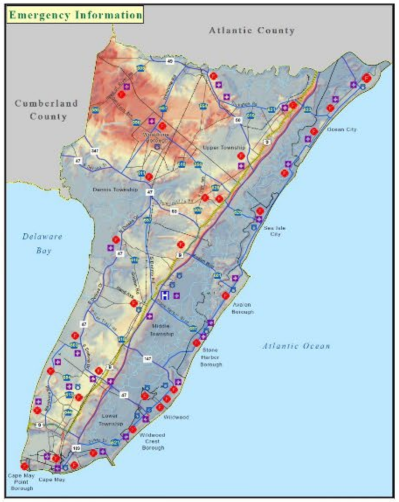
The
Wetlands Institute

The
Cape May County
Park & Zoo









Legend

County Roads
State Highway
U.S. Highway
Railroad
Evacuation Route
Rivers
County

Historical District
Wildlife Management Area
State Forest
Park
Wetlands
Water
Sport Fishing

Shellfish Classification
Approved Area
Seasonal Area
Special Restricted Area
Prohibited Area

EMS
Police Department
Fire Department
Hospital
Rest Stop
Lighthouse
Zoo/Park

Wetlands Institute
Camp Site
Golf Course
Museum
Airport
Information Center

N
W E
S

0 1.25 2.5 5 7.5 10 Miles

Check It Out!

Plan Your Visit...Get Started Here!

Visitors interested in information on Cape May County businesses scan the above access code to Cape May May County Chamber of Commerce website.

Welcome to the Jersey Cape! Scan code to access the Cape May County Department of Tourism for events, attractions, historic sites, nature sites, and information centers.

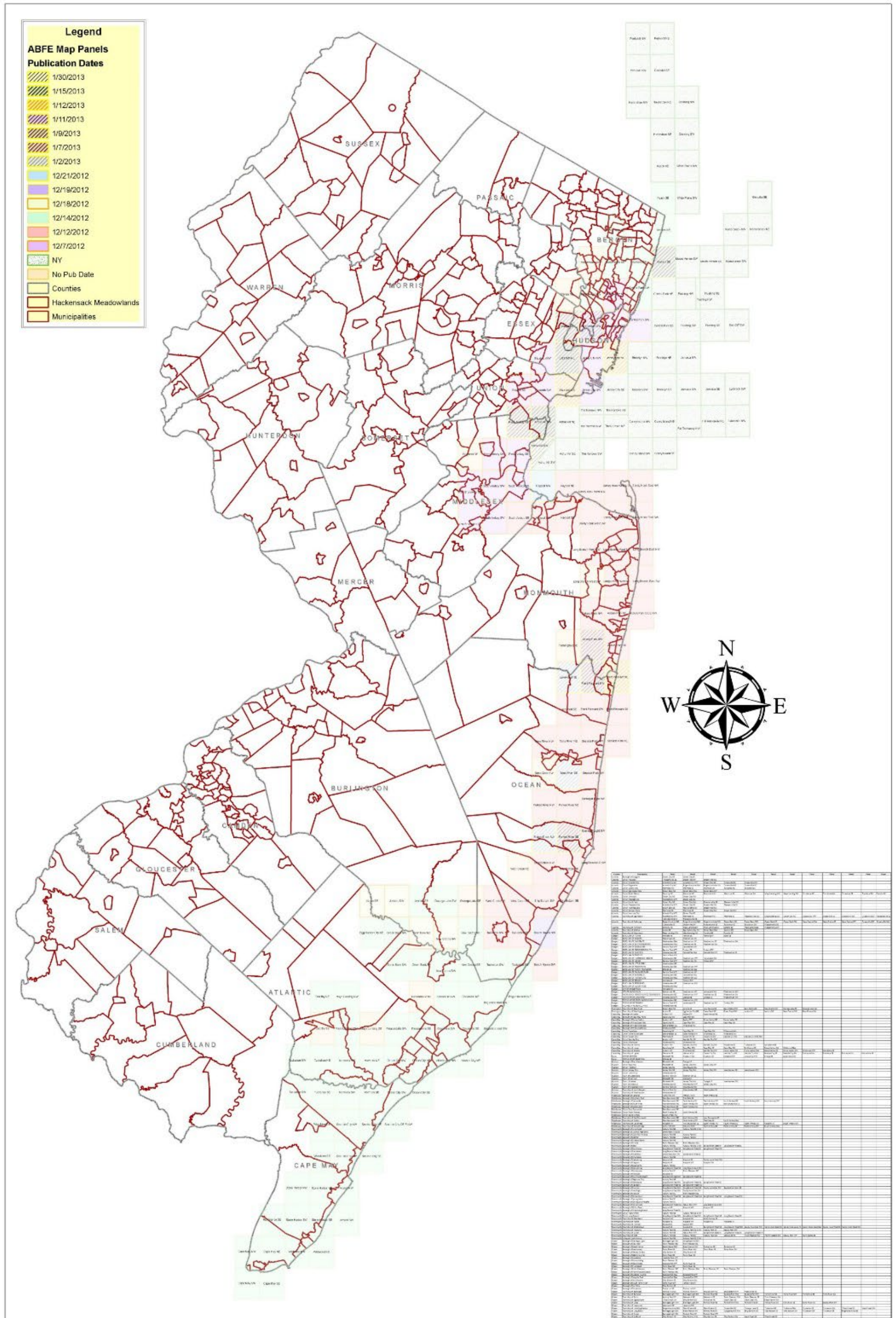
Looking for information on licensing and permitting in New Jersey? Scan here for direct access to the NJ Division of Fish and Wildlife website!

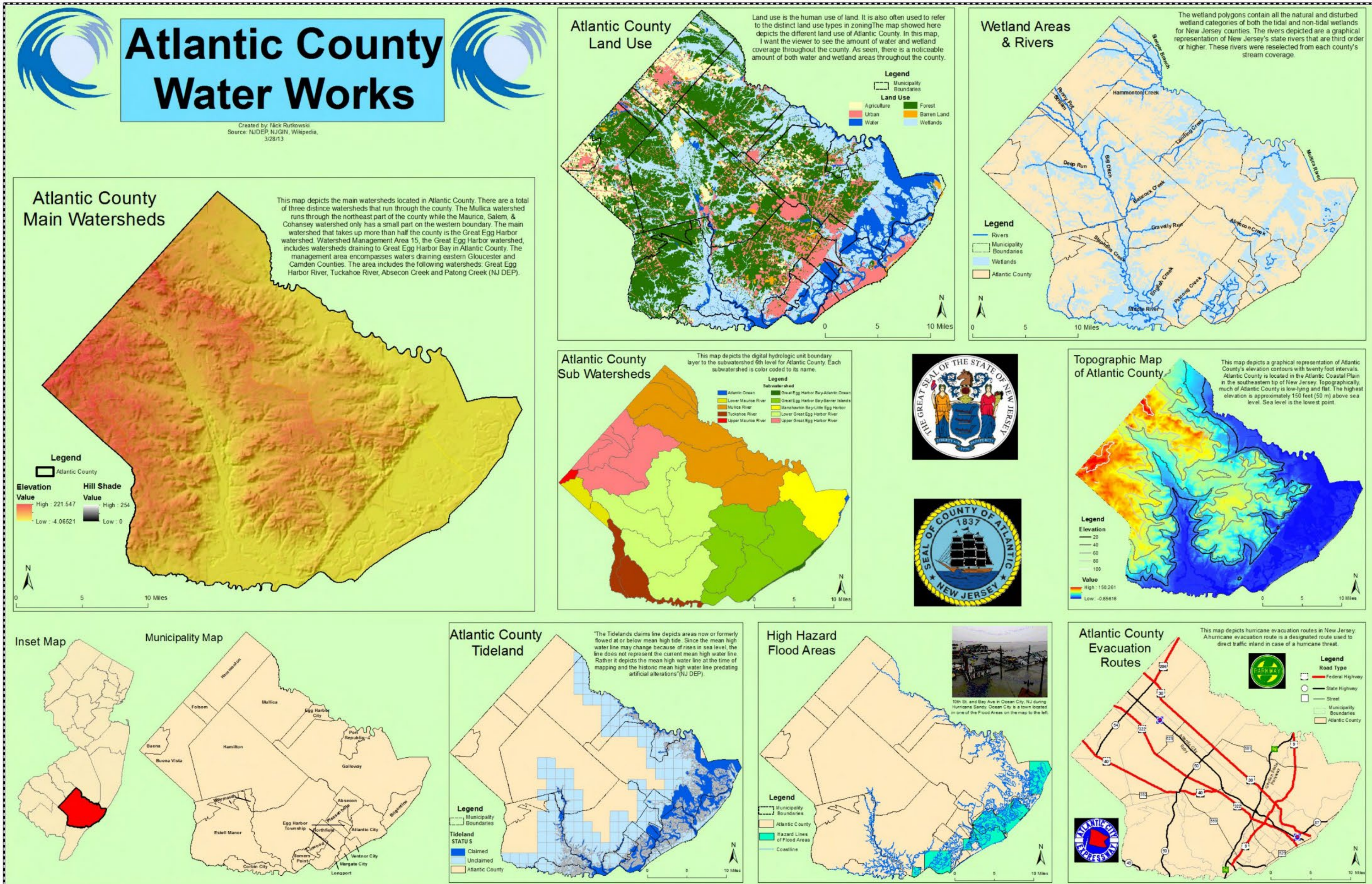
Ashley O. Reardon

Sources: Rowan University New Jersey Department of Environmental Protection, New Jersey Geographic Information Network, www.thejerseycape.net, GoogleMaps, Department of Transportation

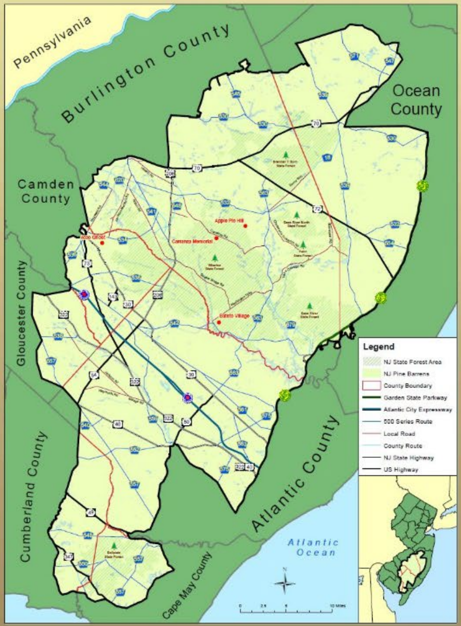
03.27.13

NEW JERSEY ABFE MAP PANELS

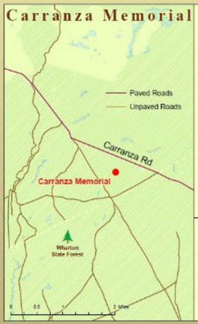



Atlantic County Water Works
Created by: Nick Rutkowski
Source: NJDEP, NJGIN, Wikipedia,
3/28/13
Atlantic County Main Watersheds
This map depicts the main watersheds located in Atlantic County. There are a total of three distince watersheds that run through the county. The Mullica watershed runs through the northeast part of the county while the Maurice, Salem, & Cohansey watershed only has a small part on the western boundary. The main watershed that takes up more than half the county is the Great Egg Harbor watershed. Watershed Management Area 15, the Great Egg Harbor watershed, includes watersheds draining to Great Egg Harbor Bay in Atlantic County. The management area encompasses waters draining eastern Gloucester and Camden Counties. The area includes the following watersheds: Great Egg Harbor River, Tuckahoe River, Absecon Creek and Patong Creek (NJ DEP).
Legend
Atlantic County
Elevation
Value
High : 221.547
Low : -4.06521
Hill Shade
Value
High : 254
Low : 0
0 5 10 Miles
Atlantic County Land Use
Land use is the human use of land. It is also often used to refer to the distinct land use types in zoningThe map showed here depicts the different land use of Atlantic County. In this map, I want the viewer to see the amount of water and wetland coverage throughout the county. As seen, there is a noticeable amount of both water and wetland areas throughout the county.
Legend
Municipality Boundaries
Land Use
Agriculture
Forest
Urban
Barren Land
Water
Wetlands
0 5 10 Miles
Wetland Areas & Rivers
The wetland polygons contain all the natural and disturbed wetland categories of both the tidal and non-tidal wetlands for New Jersey counties. The rivers depicted are a graphical representation of New Jersey's state rivers that are third order or higher. These rivers were reselected from each county's stream coverage.
Sleeper Branch
Hammonton Creek
Mullica River
Deep Run
Big Creek
Babcock Creek
Gravelly Run
Absecon Creek
Stephens Creek
English Creek
Patcong Creek
Legend
Rivers
Municipality Boundaries
Wetlands
Atlantic County
0 5 10 Miles
Atlantic County Sub Watersheds
This map depicts the digital hydrologic unit boundary layer to the subwatershed 6th level for Atlantic County. Each subwatershed is color coded to its name.
Legend
Subwatershed
Atlantic Ocean
Lower Maurice River
Mullica River
Tuckahoe River
Upper Maurice River
Great Egg Harbor Bay-Atlantic Ocean
Great Egg Harbor Bay-Barrier Islands
Manahawkin Bay-Little Egg Harbor
Lower Great Egg Harbor River
Upper Great Egg Harbor River
0 5 10 Miles
THE GREAT SEAL OF THE STATE OF NEW JERSEY
SEAL OF COUNTY OF ATLANTIC 1837 NEW JERSEY
Topographic Map of Atlantic County
This map depicts a graphical representation of Atlantic County's elevation contours with twenty foot intervals. Atlantic County is located in the Atlantic Coastal Plain in the southeastern tip of New Jersey. Topographically, much of Atlantic County is low-lying and flat. The highest elevation is approximately 150 feet (50 m) above sea level. Sea level is the lowest point.
Legend
Elevation
20
40
60
80
100
Value
High : 150.261
Low : -0.85616
0 5 10 Miles
Inset Map
Municipality Map
Hammonton
Folsom
Mullica
Egg Harbor City
Port Republic
Hamilton
Buena
Buena Vista
Galloway
Weymouth
Absecon
Brigantine
Estell Manor
Egg Harbor Township
Pleasantville
Northfield
Atlantic City
Linwood
Somers Point
Ventnor City
Margate City
Corbin City
Longport
Atlantic County Tideland
"The Tidelands claims line depicts areas now or formerly flowed at or below mean high tide. Since the mean high water line may change because of rises in sea level, the line does not represent the current mean high water line. Rather it depicts the mean high water line at the time of mapping and the historic mean high water line predating artificial alterations"(NJ DEP).
Legend
Municipality Boundaries
Tideland STATUS
Claimed
Unclaimed
Atlantic County
0 5 10 Miles
High Hazard Flood Areas
10th St. and Bay Ave in Ocean City, NJ during Hurricane Sandy. Ocean City is a town located in one of the Flood Areas on the map to the left.
Legend
Municipality Boundaries
Atlantic County
Hazard Lines of Flood Areas
Coastline
0 5 10 Miles
Atlantic County Evacuation Routes
This map depicts hurricane evacuation routes in New Jersey. A hurricane evacuation route is a designated route used to direct traffic inland in case of a hurricane threat.
PARKWAY
Legend
Road Type
Federal Highway
State Highway
Street
Municipality Boundaries
Atlantic County
ATLANTIC CITY EXPRESSWAY
0 5 10 Miles

The Road-Tripper's Pinelands Survival Guide



Carranza Memorial



Description

Located deep inside of Wharton State Forest in Tabernacle, the Carranza Memorial is one of the stranger sites in the Pinelands. The monument stands in the middle of a sandy opening off the side of Carranza Road (accessible by County Route 532). The monument was erected in memorial to an aviator named Emilio Carranza, who crashed his plane at this site on route to New York City in 1928. He was returning home from a good-will mission in Mexico. Although not famous in the United States, Carranza was known as "The Mexican Lindbergh" in his home country. This location is an easily accessed and interesting place to visit for any road-tripper who likes history. It also doesn't require any off-road driving, making it more appealing to even the most inexperienced Pinelands adventurer.

DO: pose and take pictures with the monument.

DON'T: write anything on the monument.

Source: njwildtrails.org

Directions

Take NJ Route 70 (East or West depending on where you are coming from) to US Route 206 South.

Take US 206 South, bear left onto Carranza Road.

Continue on Carranza road for several miles, monument will be on your right.

The Atco Ghost

Directions

Take the White Horse Pike (US 30) to Bartram Avenue (turn left or right depending on which direction you are coming from).

Continue on Bartram Avenue until you reach East Atlantic Avenue, turn right. East Atlantic Avenue will turn into the Old White Horse Pike.

Take the Old White Horse Pike until you reach Burnt Mill Road, turn left. Continue on this road for a little bit. The house with the metal fence will eventually be on your left.

Description

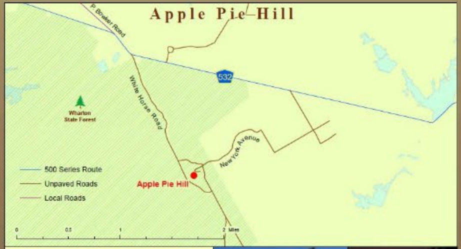
Allegedly spotted on a creepy backroad (Burnt Mill Road, if you continue driving down this road, it will turn to sand) in Atco, the Atco Ghost has been scaring countless road-trippers and bored high school students for years. To make the ghost appear, drivers are supposed to find the house with a metal fence and park three telephone poles down the street from it (all of this at night, of course). Then, they must turn their car to face the direction they came from, honk their horn three times, and blink their lights three times. A young boy's apparition supposedly will chase a ball accross the street. Legend has it that years ago, this boy was killed by careless driver. Shockingly, no newspaper stories or any sort of documentation of this accident has ever been found...

DO: try this with easily scared people who will most likely be more entertaining than the ghost itself.

DON'T: continue honking your horn dozens of times if you don't see the ghost, living people also reside on this road and are most likely trying to sleep.

Source: atcoghost.com

Apple Pie Hill



Description

Located in Tabernacle, this destination offers what is arguably the most amazing view in New Jersey. Apple Pie Hill is one of the highest points in Southern New Jersey, rising 205 feet above the Pinelands. At the top of the hill is a 60 foot fire tower that can be climbed to obtain a completely unobstructed view of the state. From the top, one can see the skylines of both Atlantic City and Philadelphia (the only point the state where this is possible). At night the light from New York City is also visible. Apple Pie Hill is accessible via dirt roads off of County Route 532, or by hiking the Batona Trail. This spot is not very easy to reach, so inexperienced road-trippers beware. This trip requires a few miles of driving on sand roads, so beware of your vehicle's limitations.

DO: bring a camera to capture the breathtaking view from the tower.

DON'T: do anything that will cause your car battery to die.

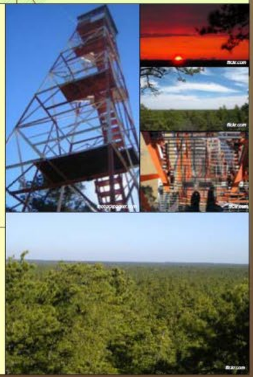
Source: njwildtrails.org

Directions

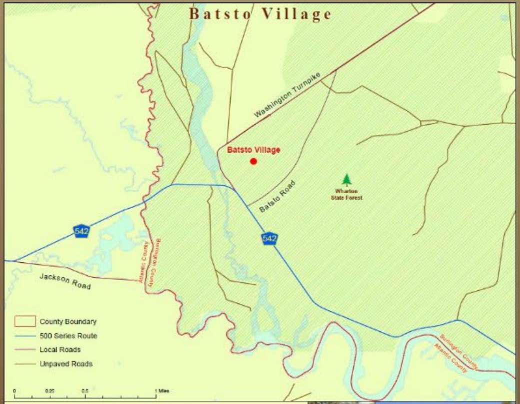
Take NJ Route 70 (East or West depending on where you are coming from) to US Route 206 South.

Take US 206 South, turn left on County Route 532

Continue on Route 532 for several miles. Right after the road merges with Patty Bowker Road, you will see a dirt road ahead before the curve (one some maps this road will be called White Horse Road). Take this road until you reach a left turn (you will see that the road is too narrow to go straight). Continue on this road until you see the tower.



Batsto Village



Description

Batsto Village is an 18th Century ghost town located in Washington Township, Burlington County (the mailing address uses Hammonton). The town was once a thriving village that was once a center of iron works and glass making. In later years, inhabitants began to leave. After several different owners, the state purchased the land in the 1950's and began to renovate the old buildings. The last permanent resident left in 1989. Today the site is classified as historic by the US National Register of Historic Places.

DO: visit the old buildings and learn about a unique part of NJ history.

DON'T: expect this site to be scary or hidden like the previous ones, this is definitely the most "touristy" location in this guide.

Source: batstovillage.org

Directions

Take County Route 542 to Batsto Road in Washington Township, Burlington County. Turn right or left, depending on which direction you are coming from. The entrance to the village will be on your left.

Cartography by Connor Hornibrook, 20 March 2013

Sources: All mapping data from the NJDEP or the Rowan University Geography Dept.

EMERGENCY ACTIVATION DISTRICTS: DIVISION OF ENGINEERING

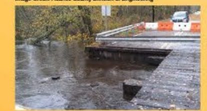
Satellite Image Hurricane Sandy
Image Credit: NOAA

District1 & 7: Route 30 heading into Atlantic City
Image Credit: NJ.com

District1: Somers Point- Long Port Boulevard
Image Credit: Atlantic County Division of Engineering

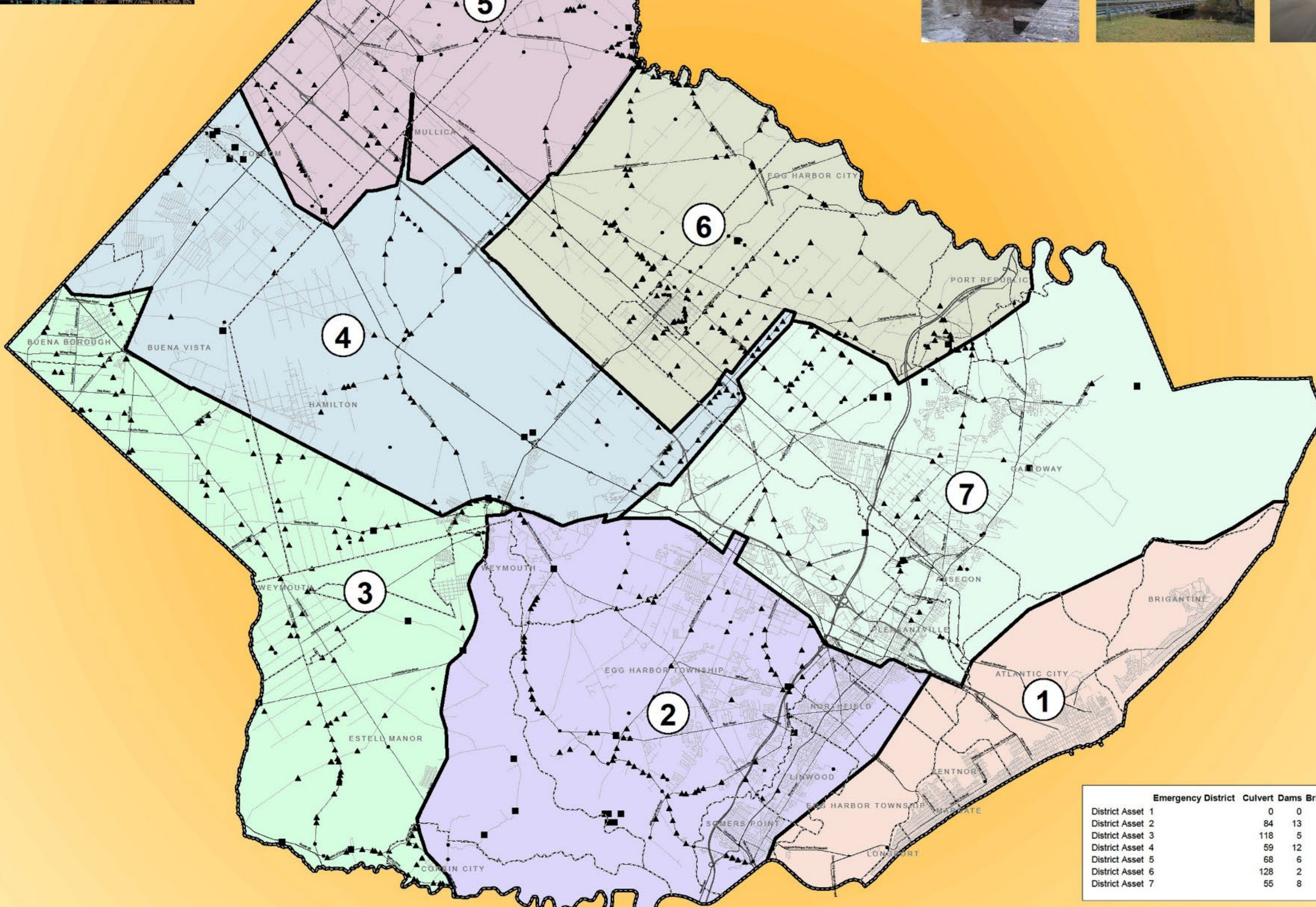
District 4: Hamilton Township Bridge 54
Image Credit: Atlantic County Division of Engineering

District 5: Mullica Bridge 22
Image Credit: Atlantic County Division of Engineering



District 3: Buena Vista Bridge 3
Image Credit: Atlantic County Division of Engineering

District1: Longport Atlantic Avenue
Image Credit: Atlantic County Division of Engineering



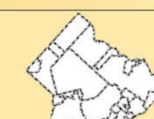
Emergency District	Culvert	Dams	Bridges	County Road Miles
District Asset 1	0	0	4	10.5
District Asset 2	84	13	31	70
District Asset 3	118	5	21	72.6
District Asset 4	59	12	28	29.4
District Asset 5	68	6	31	51.4
District Asset 6	128	2	40	58.7
District Asset 7	55	8	22	73.2

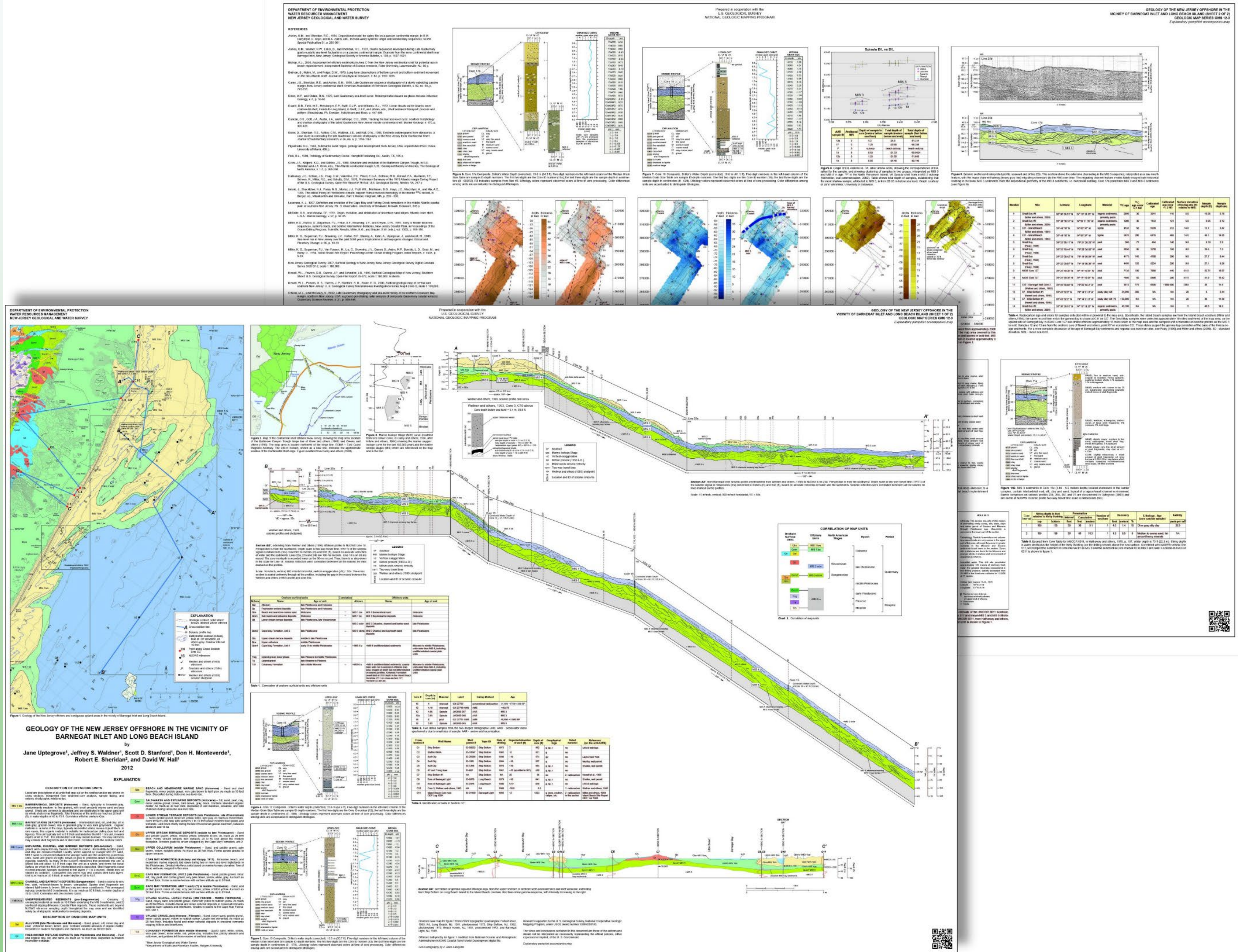
Legend

- Emergency Activation Districts
- Bridges
- Culverts
- Dams
- Municipalities
- US & State Highways
- Garden State Parkway
- Atlantic City Expressway
- County Routes
- Municipal Streets
- Railroad

"This map is for demonstration purposes only and was not developed in accordance with National Map Accuracy Standards. Any use of this product with respect to accuracy and precision shall be the sole responsibility of the user. The map was developed, in part, using New Jersey Department of Environmental Protection Geographic Information System (GIS) digital data, in conjunction with the Atlantic County Office of Geographic Information Systems, but this secondary product has not been verified by NJDEP and is not state authorized.

The geodetic accuracy and precision of the GIS data contained in this map has not been developed nor verified by a professional licensed land surveyor and shall not be nor is intended to be used in matters requiring delineation and location of true ground horizontal and/or vertical controls."




DEPARTMENT OF ENVIRONMENTAL PROTECTION
WATER RESOURCES MANAGEMENT
NEW JERSEY GEOLOGICAL AND WATER SURVEY
Prepared in cooperation with the
U.S. GEOLOGICAL SURVEY
NATIONAL GEOLOGIC MAPPING PROGRAM
GEOLOGY OF THE NEW JERSEY OFFSHORE IN THE
VICINITY OF BARNEGAT INLET AND LONG BEACH ISLAND (SHEET 1 OF 2)
GEOLOGIC MAP SERIES GMS 12-3
REFERENCES
GEOLOGY OF THE NEW JERSEY OFFSHORE IN THE VICINITY OF
BARNEGAT INLET AND LONG BEACH ISLAND
by
Jane Uptegrove¹, Jeffrey S. Waldner¹, Scott D. Stanford¹, Don H. Monteverde¹,
Robert E. Sheridan², and David W. Hall¹
2012
EXPLANATION
DESCRIPTION OF OFFSHORE UNITS
CORRELATION OF MAP UNITS
LEGEND

New Jersey Precipitation: October 2002 – December 2012

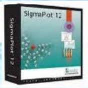
For Analysis of Private Well Testing Act Coliform Bacteria Data

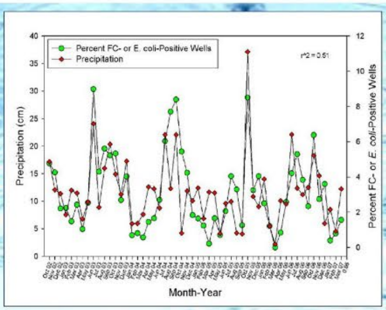
Tom Atherholt, Leo Korn and Terri Tucker, Office of Science, NJDEP

Background

- NJ Private Well Testing Act (PWTA) well monitoring began in late September 2002.
- Coliform bacteria are one of monitored health-related or "primary" parameters (see Procopio et al. poster).
- Data from October 2002 through March 2007 showed that, in addition to temperature and other factors, precipitation affects the probability of detecting coliform bacteria in private well water (Figure 1).

Figure 1. Monthly precipitation and the percentage of private wells in which either fecal coliform (FC) or E. coli bacteria were detected: October 2002-March 2007. Graphing software: SigmaPlot 11.0





- 10 years of PWTA coliform bacteria data (through Sep 2012) will soon be available.
- The effect of precipitation on coliform detection rates will be analyzed at that time.
- This analysis will use two types of data obtained from the National Weather Service:
  (1) precipitation data from all monitoring stations in NJ;
  (2) multi-sensor precipitation estimate (MPE) data.
- This poster explains the derivation and transformation of both types of data.

Precipitation: Monitoring Station Data

- Daily (24-h) precipitation ("PRCP") totals from 391 Global Historical Climatology Network (GHCN) stations in NJ were downloaded (by county), in .csv format, from: http://www.ncdc.noaa.gov/land-based-station-data/climate-data-online, converted to .xls, and then to a consecutive date format using the "=vlookup" command in Excel so that dates with missing data were clearly visible and multiple station data could be compared for quality control purposes (Table 1).
- A separate table with the monitoring station information was created (Table 2). Latitude and longitude was converted from decimal degrees to NJ State Plane coordinates and PRCP amounts (in 0.1 mm) were also created in 0.01 inch amounts to match the previous reporting format.
- There are 3 categories of monitoring stations: ASOS, COOP, and CoCoRaHS.
  1) ASOS: Automated Surface Observing Systems (10 airports & 1 Coast Guard Station);
  2) COOP: Cooperative Observer Program (55 stations);
  3) CoCoRaHS: Community Collaborative Rain, Hail & Snow network (NJ was admitted to the CoCoRaHS program in Feb 2008; 325 stations).

Table 1. Partial data only (8/15/08-9/2/08 only) from a few CoCoRaHS stations in Bergen County.

Scale 133 = 1.33" 1 = 0.01"	TENAFLY 1.3 W	WESTWOOD 0.8 ESE NJ US	RAMSEY 0.6 E NJ US	SADDLE BROOK TWP 0.3 NNE	RIVER VALE TWP 1.5 S NJ US	RUTHERFORD 1.2 N	NORTH ARLINGTON 0.7 WNW	GLEN ROCK 0.7 SSE	PALISADES PARK 0.2 WNW	PARAMUS 1.8 NNW NJ US
DATE	US1NJBG0003	US1NJBG0005	US1NJBG0006	US1NJBG0008	US1NJBG0010	US1NJBG0013	US1NJBG0015	US1NJBG0017	US1NJBG0018	US1NJBG0020
20080201	...	...	...	...	...					
...	...	...	...	...	...					
20080815	48	172	9	8	1					
20080816	129		42	72	143					
20080817	0		0	0	0					
20080818	0		0	0	0					
20080819	0		0	0	0					
20080820	0		0	0	0					
20080821	0		0	0	0					
20080822	0		0	0						
20080823	0		0	0						
20080824	0		0	0						
20080825	0		0	0	0					
20080826	0	0	0	0				0		
20080827		0	0	0	0			0	0	
20080828	0	0		0	0		0	0	0	
20080829	0	0		0	0		0	0	0	
20080830	55			61	6		53	13	61	
20080831	1			0			0	0	0	
20080901	0			0		0	0	0	0	0
20080902	0			0	0	0	0	0	0	0
...	...	...	...	...	...	...	...	...	...	...

(Shaded) Monitoring period start date.
Empty cells = no data.

Table 2. Sample station information (3 of each station type). Station elevation data not shown.

STATION CODE	STATION TYPE	STATION NAME	COUNTY	MUNICIPALITY	START DATE (1)	END DATE (1)	DAYS MONITORED	PERCENT PWTA PERIOD MONITORED (2)	PERCENT STATION PERIOD MONITORED (2)	X	Y	Notes
USW00093730	ASOS	ATLANTIC CITY INTL AP	ATL	Egg Harbor Twp	10/1/2002	12/30/2012	3743	99.97	99.97	470214	226817	Airport
USW00094741	ASOS	TETERBORO AP	BER	Teterboro Boro	10/1/2002	12/30/2012	3696	98.72	98.72	613314	734571	Airport
USW00014734	ASOS	NEWARK INTL AP	UNN	Elizabeth City	10/1/2002	12/30/2012	3744	100.00	100.00	582406	678523	Airport
USC00282805	COOP	ESTELL MANOR	ATL	Estell Manor City	10/1/2002	12/30/2012	3711	99.12	99.12	399198	200356	House
USC00289363	COOP	WERTSVILLE 4 NE	HUN	East Amwell Twp	2/18/2004	12/30/2012	3227	86.19	99.63	406415	590008	House
USC00285728	COOP	MOORESTOWN	BUR	Moorestown Twp	10/1/2002	11/20/2012	3582	95.67	96.73	360480	407487	Wat Treat Plnt
US1NJMC0005	CoCoRaHS	LAWRENCE TWP 1.0 NNW	MER	Lawrence Twp	2/1/2008	12/30/2012	1725	96.10	96.10	429576	537915	House
US1NJWR0007	CoCoRaHS	LIBERTY TWP 1.0 S	WAR	Liberty Twp	4/26/2010	12/30/2012	836	46.57	85.31	367811	735671	House
US1NJBT0002	CoCoRaHS	WOODLAND TWP 2.7 NW	BUR	Woodland Twp	2/10/2008	1/31/2009	356	19.83	99.72	479496	379023	House

1 = ASOS and COOP data download period 10/1/02 through 12/30/12 (or station begin or end date within that period). CoCoRaHS download period 2/1/08-12/30/12 (or begin or end date within that period).
2 = Total PWTA monitoring days: ASOS and COOP (10/1/02-12/30/12) = 3744. CoCoRaHS (2/1/08-12/30/12) = 1795.

Precipitation: Multi-sensor Precipitation Estimate (MPE) Data

- The NWS Multi-sensor Precipitation Estimate (MPE) program uses information from 3 sources to provide estimated hourly precipitation amounts within 17.6 km2 areas or grids (the Hydrologic Rainfall Analysis Project spatial scale). 1,255 complete or partial grid areas overly NJ.
  1) Geostationary Operational Environmental Satellite (GOES) HydroEstimator rainfall estimates (an algorithm product);
  2) WSR-88D Doppler radar rainfall estimates;
  3) near real-time automated hourly rain gauge amounts from several meteorological monitoring networks throughout the US.
- From the hourly data, Joseph Ostrowski (NWS Middle Atlantic River Forecast Center, State College, PA) provided daily MPE totals in a GIS format: (NAD83).
- With programming help from Seema Gopinathan, each of the the 1704 NWS files were converted in an automated way to NJ State Plane polygon shapefiles.
- To date: daily files (grid sets) from October 2002 through March 2007 are available.
- Daily files through Dec 2012 will soon be obtained and compiled.
- A single day grid layer is shown in Figure 5.

- The PWTA data, including sampling date and corrected well location information, resides in a MS Access database.
- Based on its location, each well was linked to one of the MPE grids.
- The presence or absence of fecal coliform (FC) or E. coli (EC) bacteria in each well on the date the well was sampled, was then compared to the amount of rainfall in that grid on that day.
- The presence of bacteria was also examined in conjunction with rainfall amounts for several days prior to the well sample date.
- This was done using a logistic regression model developed to predict the probability of either FC or EC bacteria presence as a function of total rainfall on the sampling day, each of the preceding five days, and natural cubic splines for the sampling day and the preceding five days.

Preliminary Results

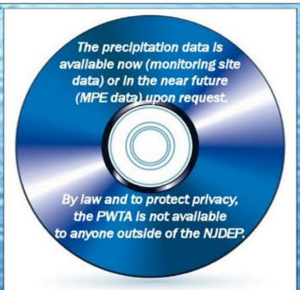
- **From Oct 2002 to Mar 2007, and based on the analysis of over 55,000 well samples, for each centimeter increase in the daily rainfall amount, FC or EC bacteria had a 1.2 higher odds of detection (estimated odds ratio; 95% C.I.; 1.05 – 1.36).**

Future Work

- MPE data: obtain the daily rainfall grid values for 2007-2012 and include temporal, geologic, and microbial test lab & method information in the analysis of 10 years of PWTA coliform data.
- Monitoring station data: convert the station point shapefile to a polygon shapefile, then analyze as the MPE data was analyzed.
- Compare the results from both the monitoring station and the MPE analyses.

Acknowledgments

- Joseph Ostrowski, NWS Middle Atlantic River Forecast Center, State College, PA for the MPE files of daily rainfall totals.
- Seema Gopinathan, Office of Information Resource Management, New Jersey Department of Environmental Protection for conversion of NWS MPE files to polygon shapefiles.
- Nick Procopio, Office of Science, New Jersey Department of Environmental Protection, for some Excel, PowerPoint, and GIS assistance.



Tables with the station information (e.g., Table 2) were imported into ArcView 10.0 (Figures 2 – 4).

Figure 2. All 66 NJ ASOS and COOP stations plus the Philadelphia Intl Airport ASOS station: (left) Percent of total PWTA monitoring period (10/1/02-12/30/12) that was monitored (all ASOS stations > 90%);(right) Percent of total station-specific monitoring period days that was monitored.

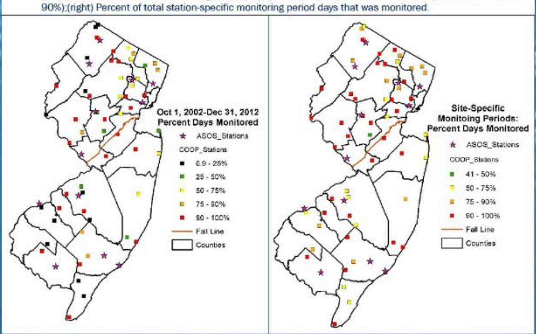


Figure 3. All 142 NJ CoCoRaHS Stations in the Coastal Plain (not shown:183 stations in the northern bedrock provinces). (left) Percent of the CoCoRaHS PWTA monitoring period (2/1/08-12/30/12) that was monitored; (right) Percent of total station-specific monitoring period that was monitored.

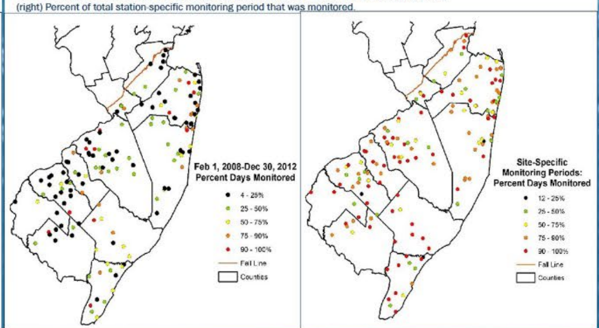


Figure 4. Expanded view of the 13 CoCoRaHS stations in Cape May County showing the monitoring period and the percent of the total days in that period that was monitored.

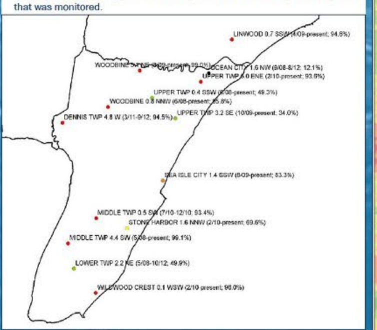
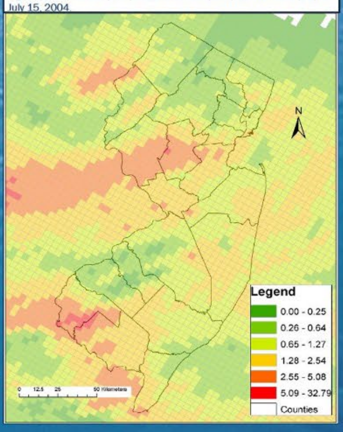


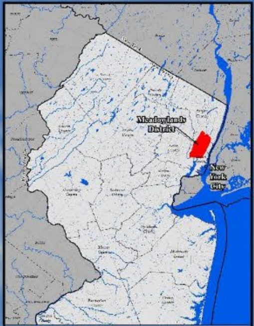
Figure 5. Multi-sensor precipitation estimate (MPE) rainfall totals (cm) for July 15, 2004



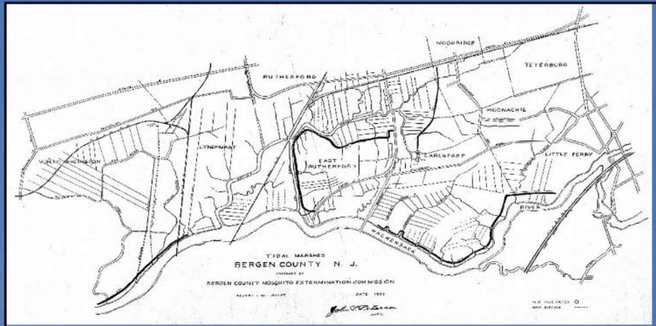
Instructional Presentation

Mapping Earthen Berms in the Meadowlands

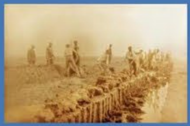
Soft Edges Around the Hackensack River Watershed



The Meadowlands region sits less than five miles from the heart of Manhattan. The 30.4 square mile District includes sections of 14 municipalities within Bergen and Hudson county.



Early ditching efforts by the Mosquito Commission resulted in berms around the Meadowlands and are found throughout the Hackensack River Estuary. These earthen man-made berms were not intended to be flood control structures. In events such as a storm surge these structures are susceptible to overtopping.



Superstorm Sandy:

During this unprecedented storm the towns of Moonachie and Little Ferry were hardest hit. The damage, caused by the upwelling storm surge from the Atlantic Ocean up the Hackensack River, struck residential and commercial areas of the towns with inland flood water levels over 3 feet. Meadowlands Environmental Research Institute (MERI) water sensors on the Hackensack River in Carlstadt recorded a depth of 9 feet of water lasting six hours during the night of the storm. Water levels at this height and duration overtopped many earthen berms in the Meadowlands District. These berms are mainly legacy Mosquito Commission dikes not intended as flood control structures. In an effort to assist the towns MERI is studying and identifying these soft edge areas and their effect on the ingress of storm surge water from the Hackensack River.

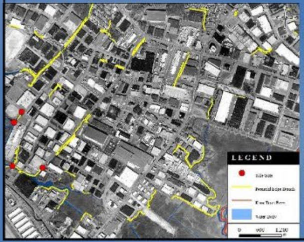
Using elevation rasters, hydrology rasters and vector data MERI is attempting to locate these soft edges. Information on the location of soft edges and studying their impact on the topography will be used for further analysis on flooding in the Meadowlands and the next potential storm surge.

This analysis used a digital elevation model (DEM), a slope raster, a slope aspect raster and a curvature raster. The data from these rasters were combined into a four band raster for use in a classification analysis. Each individual raster being one band in a single composite raster which was then processed for classifications of similar patterns. The idea being that soft edges share similarities:

- Located at low elevations
- High degree of uphill slope on the either side
- Low degree of slope on the top
- Weak points having a concave linear profile
- Breaks in elevation

The results from this ongoing study will be used in combination with our existing flood prediction maps for use in emergency management and preparedness.

Initial Response:



An initial assessment of berms in the District was done by digitizing known locations and interpreting aerials, topo's and slope rasters.

The lines in yellow represent potential soft edges within the project area. Approximately 15 linear miles of these soft edges were found using this method in Carlstadt, Moonachie and Little Ferry.

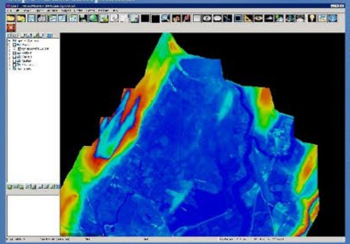
Elevations were taken along the known berms. This effort was to understand the heights of these structures that were overtopped by Superstorm Sandy.

A berm constructed in 2010 within the Richard P. Kane mitigation site was overtopped by the Sandy storm surge. Field work was conducted to collect GPS elevations from the top of the berm and the resulting data complimented MERI water sensor readings.

It should be noted the structure is not intended for flood control.

Edge Detection:

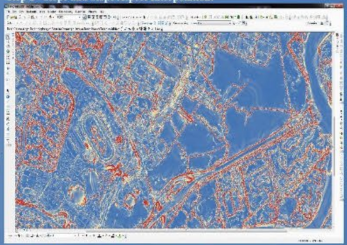
Step 1 - DEM Interpolation:



In order to locate soft edges in cases of flood waters between 1 to 10 feet, a high resolution DEM is needed. The berms which need to be identified are located along wetlands, rivers, streams and other low lying areas.

The DEM used was created using 2009 LiDAR data. The point cloud tiles were imported into QT Modeler and processed as a group to output a bare earth terrain. The resulting data was then exported as a grid file with grid sampling at two feet. This resulted in giving us a DEM compatible with ArcMap and having a 2ftx2ft cell size.

Step 2 - Slope and Slope Aspect Interpolation:

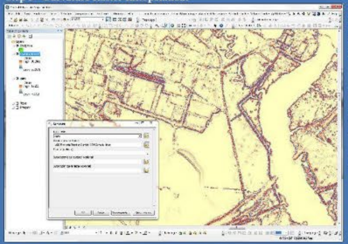


The slope profile of a berm is a high degree on the sides and low degree on the top.

A slope raster was created from the DEM. A slope aspect raster depicting the direction of the downhill slope was created and added another band into the composite raster.

In the analysis slopes of less than 5 degrees were used. This provided the top of the berms and all other flat surfaces. The unneeded areas were erased. These areas being uplands, water bodies and wetlands.

Step 3 - Curvature Raster Interpolation:

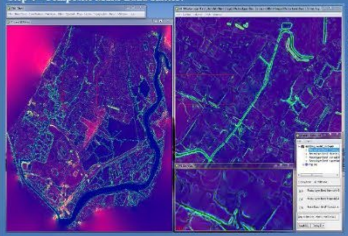


A concave curve along the length of a berm can indicate a weak point depending on the bottom elevation of the curve. Including a curve raster as a band provides another degree of classification.

The Curve Raster was created using Curvature (Spatial Analyst) to show the following:
positive = convex (top of berm)
negative = concave (sides of berm)
close to zero = flat (non-berm)

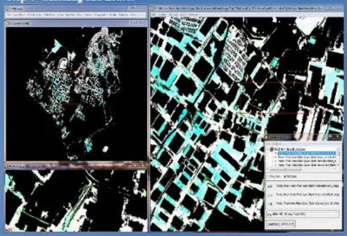
The curve raster also allowed us to differentiate a berm from a ditch.

Step 4 - Composite Multi-Band Raster:



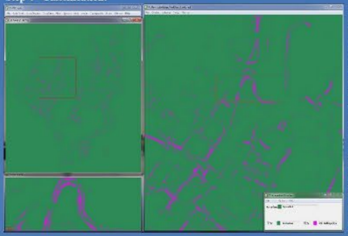
Four raster files: DEM, slope, slope aspect and curvature of the study area - created in ArcGIS 10 environment were converted to .dat format and imported to ENVI® (Environment for Visualization, Excelis Inc.). In ENVI a multi-band image was created using ENVI's Layer stacking feature in order to attempt image classification. The result was a four band image where each pixel had a unique combination of elevation, slope, slope aspect and curvature values.

Step 4 - Masking and Erase:



A mask of wetlands, water bodies and buildings was created in ArcGIS. This mask was then applied to the 4 band image to erase low lying, flat wetland areas and pixels that represented buildings from the image. Additionally a band threshold was applied to the 4 band image, where only pixels showing a slope value between 0 to 5 degrees were selected. The result showed only pixels that were not wetlands or buildings and had a relatively flat surface

Step 4 - Classification:



Training areas were selected prior to image classification, identifying areas with high elevation, that were not berms, areas with low elevation that were not top of the berms, areas that represented creeks or wetlands and areas that were known soft edges. Maximum likelihood classification was applied to the image using these training areas as classes. Maximum likelihood calculates the probability that a given pixel belongs to a specific class. Each pixel is assigned to the class that has the highest probability i.e. the maximum likelihood. The result is a single band image, where each pixel is allocated to the class with the highest probability. All the non-soft edge classes were then combined into one class and named as unclassified. All the various soft edge classes were combined into one class and named as soft edge.

Results:

Pictured above is the result of the classifications; a known soft edge in red was overwhelmed during the Sandy storm surge. The soft edge is along a section of DePeyster Creek in Little Ferry adjacent to a residential area. The residents in this area experienced 3 feet of flooding in this neighborhood. The definition of the classification in red is top of berm with elevations below 5 feet.

New Jersey Meadowlands Commission
Meadowlands Environmental Research Institute
Geographical Information Systems Department
1 DeKorte Park Plaza
Lyndhurst NJ, 07071
Authors: Saleh Kojak, Ildiko Pechmann, Dom Elefante, Adam Osborn

Helping First Responders in Camden City

1. DEP's inspectors walked around Camden and collected information about the abandoned warehouses in forms.

Date: 12/15/2011

Property Name: *Ambivan Medical Transport Building*

Property Address: 1492-1494 Haddon Ave.

Owner Name: Hainsworth, Kathleen J.

Owner Address: P.O. Box 51, Audubon, NJ 08106-0051

Type of Business: Ambulance repair and maintenance on bottom floor/ Offices on top

	YES	NO		YES	NO
Building Secure:	X		Structure Safe:		X
Electrical:		X	Occupied:		X
Gas:		X	Legal:		
Fire Suppression:		X	Closest Hydrant:		

Fire Dept. Conn.:

Bldg Construction:

	YES	NO	Solid Waste	Hazmats
Material in Bldg:	X		X	X

	Petroleum	Other	Unknown
Drums:	4		2
Containers:			

Cylinders: Oxygen cylinders in various sizes- Approximately 20 cylinders

	AGST	UST	Size	Material
Tanks:				

Notes: 55 Gallon Drums: 2 black poly- waste oil; 1 black steel- transmission fluid; 1 blue steel- motor oil; 1 blue poly/ 1 black steel- Unknown

Other Concerns: Second floor joists are cracked and some are rotten.

Also the pictures of the sites were taken.

2. Camden city provided shapefiles with fire hydrants information. Those shapefiles along with the forms and the images were saved in corresponding folders on the C:\ drive. Also the 2012 imagery and other framework data such as schools, hospitals, roads were saved also on the C:\ drive.

3. The addresses were geocoded using ArcGIS desktop software and manually corrected using aerial images and road network feature class.

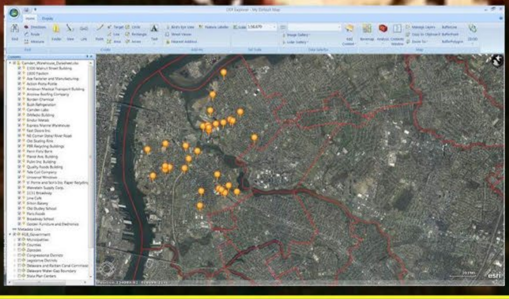
NJDEP/OIRM/BGIS

April 18, 2013

This ArcGIS Explorer application was developed in response to the series of abandoned warehouse fires in Camden. When a fire breaks out in or near an abandoned warehouse, the firefighters need a way of knowing what is in the building before they go in. This free and easy to use tool puts all the information at the responders' finger tips without any internet access. It can be loaded on laptops for easy access.

4. A spreadsheet was set up with all the fields from the forms.
A column was added to assign unique identifier to each abandoned warehouse.
More columns were added to include x and y coordinates from address matching and for the links to the photos and documents.

5. Spreadsheet rendered in ArcGIS explorer along with Municipalities and 2012 imagery.



6. Added Camden fire hydrants, schools and hospitals shapefiles.

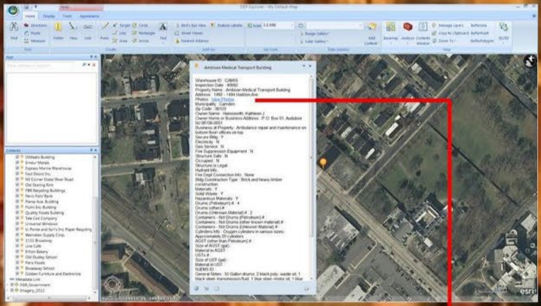
Measured distance to nearest Fire Hydrant

Fire Hydrant

Schools and hospitals in ½ mile buffer

School Hospital

7. Detailed inspection information can be displayed from the spreadsheet.



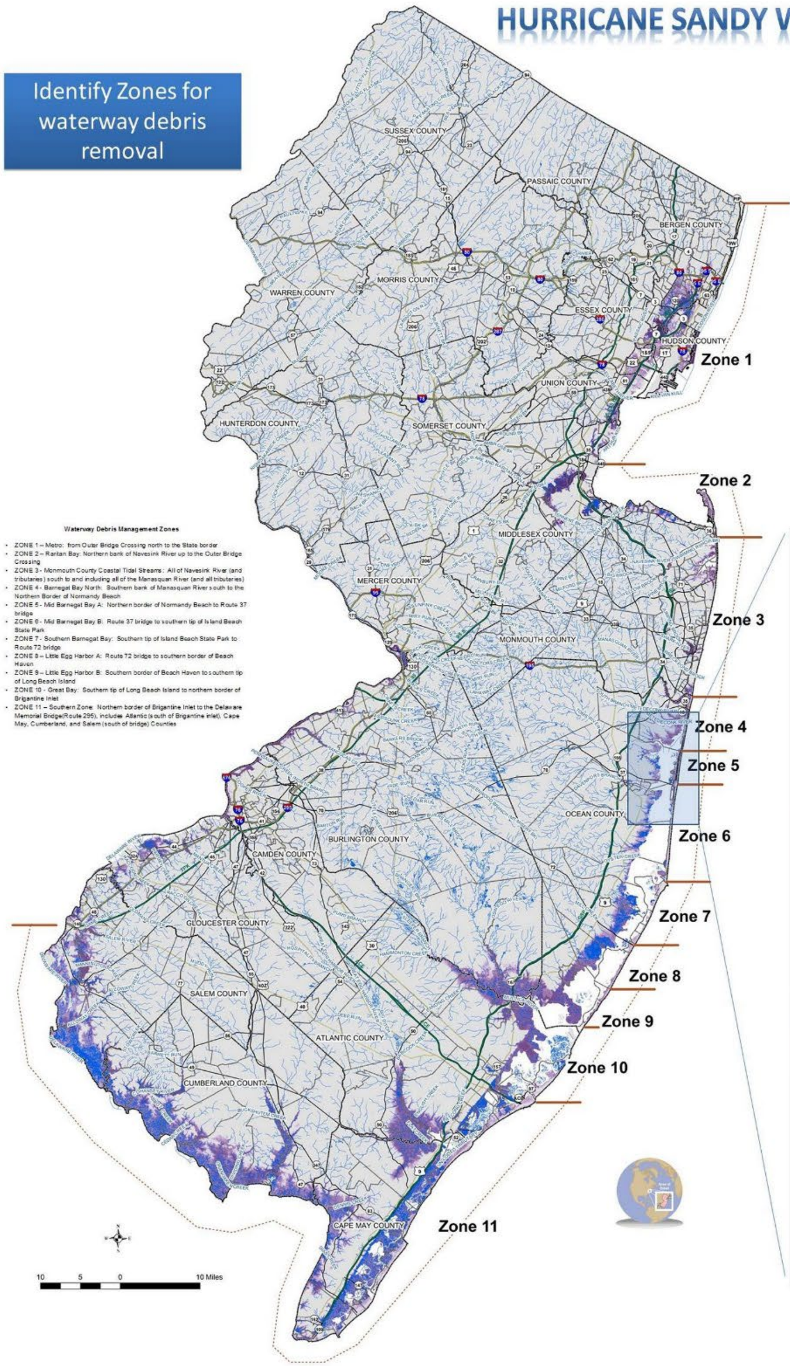
8. Photographs taken by inspectors available through embedded link.

Data Source: NJDEP, City of Camden

Dnyanada Bhide

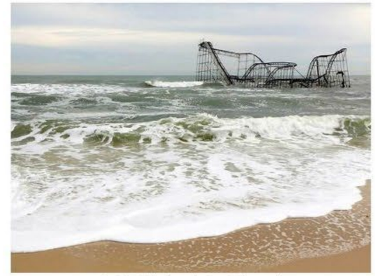
HURRICANE SANDY WATERWAY DEBRIS REMOVAL PROJECT

Identify Zones for waterway debris removal



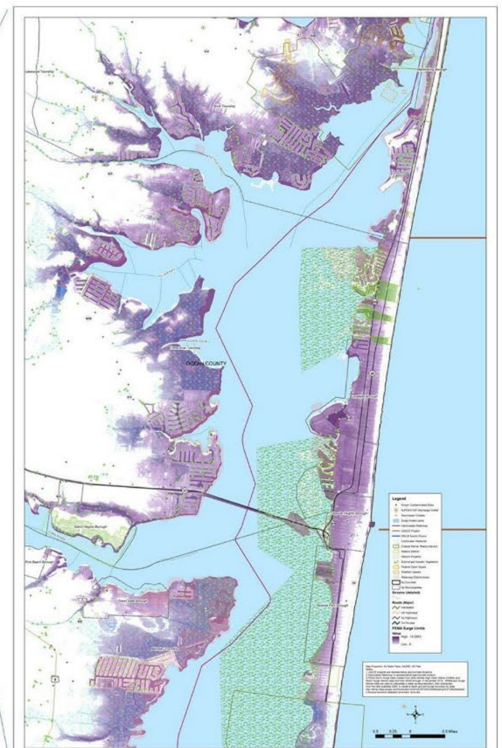
Waterway Debris Management Zones

- ZONE 1 – Metro: from Outer Bridge Crossing north to the State border
- ZONE 2 – Raritan Bay: Northern bank of Navesink River up to the Outer Bridge Crossing
- ZONE 3 - Monmouth County Coastal Tidal Streams: All of Navesink River (and tributaries) south to and including all of the Manasquan River (and all tributaries)
- ZONE 4 - Barnegat Bay North: Southern bank of Manasquan River south to the Northern Border of Normandy Beach
- ZONE 5 - Mid Barnegat Bay A: Northern border of Normandy Beach to Route 37 bridge
- ZONE 6 - Mid Barnegat Bay B: Route 37 bridge to southern tip of Island Beach State Park
- ZONE 7 - Southern Barnegat Bay: Southern tip of Island Beach State Park to Route 72 bridge
- ZONE 8 – Little Egg Harbor A: Route 72 bridge to southern border of Beach Haven
- ZONE 9 – Little Egg Harbor B: Southern border of Beach Haven to southern tip of Long Beach Island
- ZONE 10 - Great Bay: Southern tip of Long Beach Island to northern border of Brigantine Inlet
- ZONE 11 – Southern Zone: Northern border of Brigantine Inlet to the Delaware Memorial Bridge (Route 295), includes Atlantic (south of Brigantine inlet), Cape May, Cumberland, and Salem (south of bridge) Counties

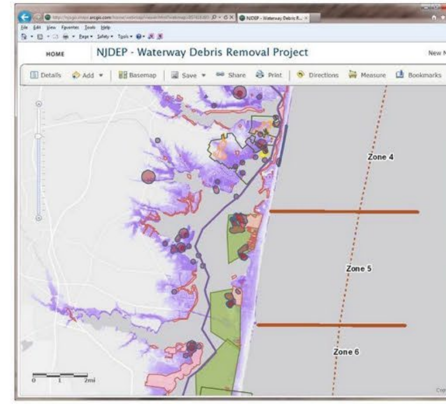


Seaside Heights (www.businessinsider.com)

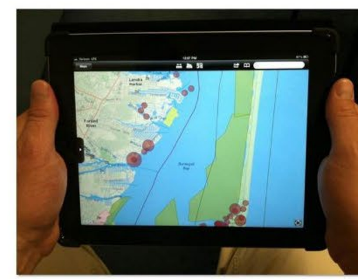
Identify and Map Environmental Laws and Executive Orders Applicable to Hurricane Sandy Disaster Operations



Publish map using Arc GIS Online



Use map during field operations to identify areas with restrictions on mobile devices



Remove Hurricane Sandy waterway debris

Elizabeth River (http://www.nj.gov/dep/)

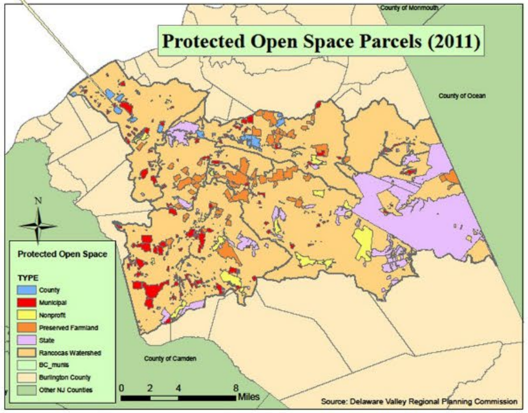
Barnegat Bay (Andrew Mills/The Star-Ledger)

Map Production: Ed Apalinski NJDEP/BGIS, 4/2013

For more information visit : http://www.nj.gov/dep/special/hurricane-sandy/wwdebris.htm

new jersey department of environmental protection

Preserving the Rancocas Creek Watershed



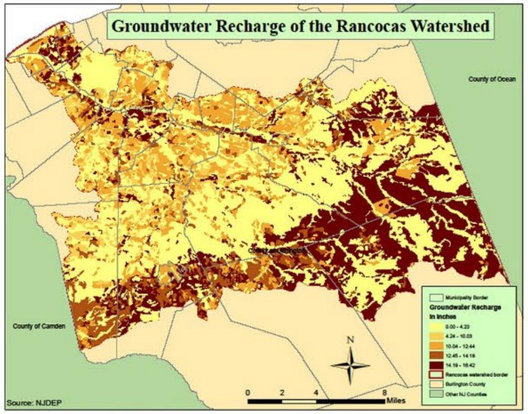
www.dvrpc.org

The Delaware Valley Regional Planning Commission is responsible for a large area which is Bucks, Chester, Delaware, Montgomery and Philadelphia in Pennsylvania; and Burlington, Camden, Gloucester and Mercer in New Jersey. The DVRPC attempts to unite elected officials, planning professionals and the public in an effort to improve the region.

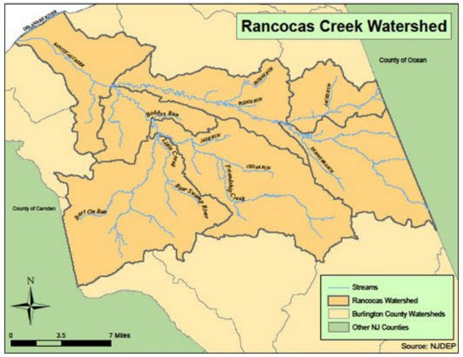
Burlington County, along with many other NJ counties, has an extensive plan to preserve farmland. Burlington County's Farmland Preservation Program started about 25 years ago and continues to stress the importance of a strong agricultural economy. (www.co.burlington.nj.us)

www.state.nj.us

The Green Acres program is a product of the NJDEP. The program buys land to protect and conserve land, water resources and other spaces admired for their history and nature. More than 1.2 million acres of open space have been preserved because of the Green acres program.



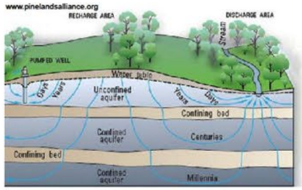
rancocasconservancy.org



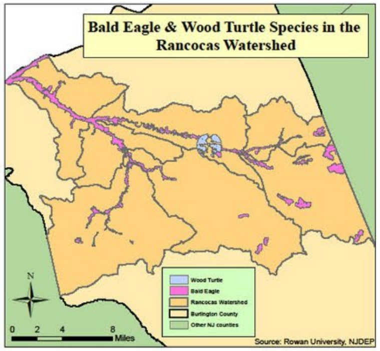
The Delaware Valley Regional Planning Commission has data on their website from 2011 about protected open space parcels that are apart of or have the potential to become a part of a greenway project. The parcels are either owned by a nonprofit conservation organization/landtrust or by the government; municipal, county, and state. The map above shows the protected parcels in the Rancocas watershed. Some of these parcels are a part of the Rancocas Greenway Project.

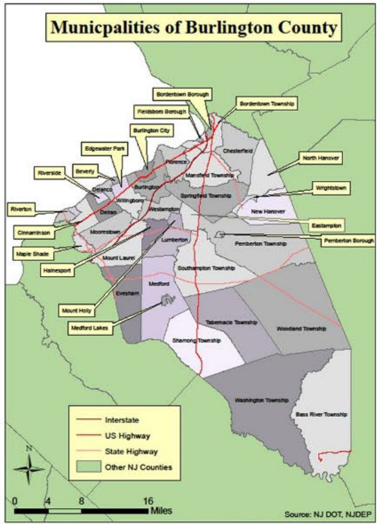
The map above shows the groundwater recharge of the Rancocas watershed. Groundwater recharge is the time it takes for precipitation and runoff to filter back down into the water table. On the map above, the darker areas replenish their water supply more quickly, this means the lighter areas are most likely built with impervious surfaces. A coorelational can be seen with the Groundwater Recharge map and the Urban Development map; areas that are red on the Urban map are more often light colors on the Groundwater Recharge map.

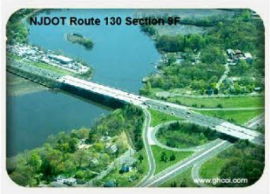
www.pinelandsalliance.org

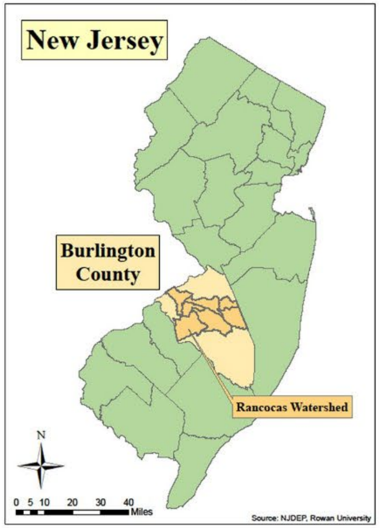


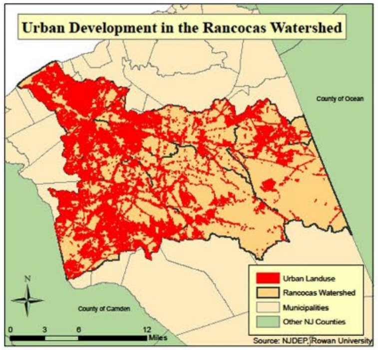
These maps show various aspects of the Rancocas watershed and offer some reasons why preservation along the Rancocas Creek is important. Many organizations are currently working on projects to prevent urbanization on open spaces along streams. The Rancocas Greenway is a project that aims to preserve open spaces along the Rancocas Creek and turn them into public parks with recreation. The Rancocas watershed and its streams can be seen on the map above.





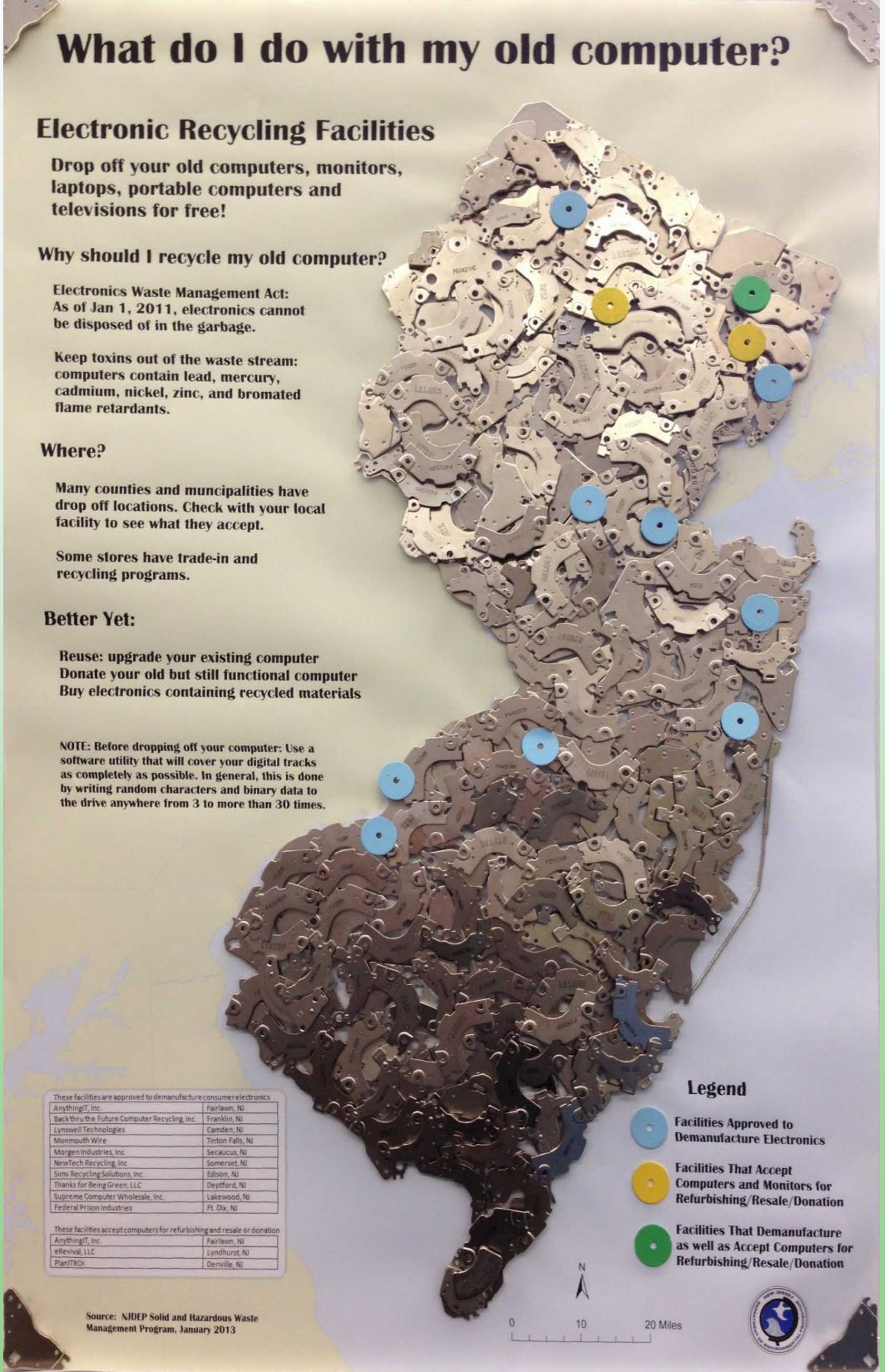




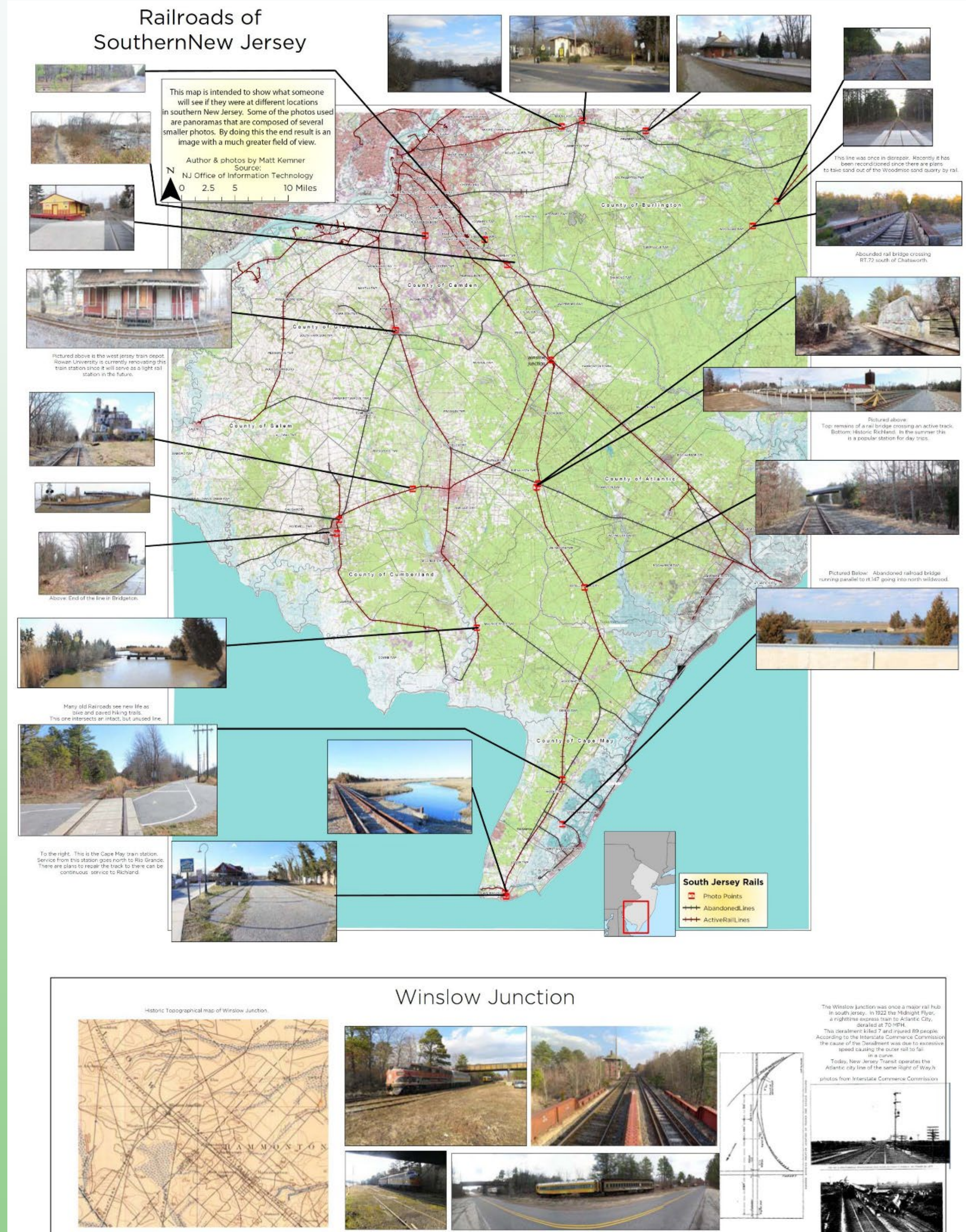


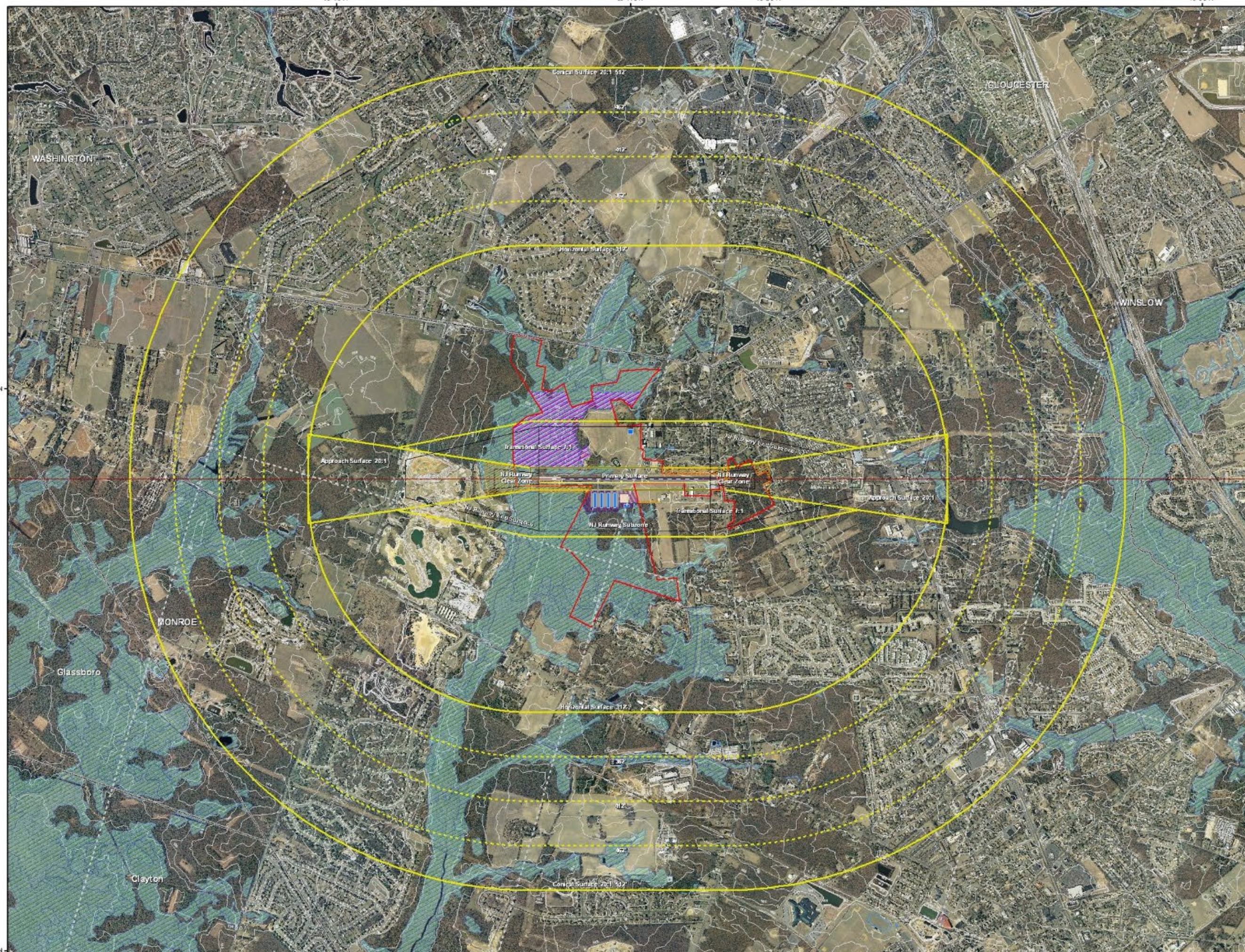
Alexis Palombo
March 28, 2013
Sources: NJDEP, DVRPC, NJDOT, Rowan University

Most Unique



What do I do with my old computer?
Electronic Recycling Facilities
Drop off your old computers, monitors, laptops, portable computers and televisions for free!
Why should I recycle my old computer?
Electronics Waste Management Act: As of Jan 1, 2011, electronics cannot be disposed of in the garbage.
Keep toxins out of the waste stream: computers contain lead, mercury, cadmium, nickel, zinc, and bromated flame retardants.
Where?
Many counties and muncipalities have drop off locations. Check with your local facility to see what they accept.
Some stores have trade-in and recycling programs.
Better Yet:
Reuse: upgrade your existing computer
Donate your old but still functional computer
Buy electronics containing recycled materials
NOTE: Before dropping off your computer: Use a software utility that will cover your digital tracks as completely as possible. In general, this is done by writing random characters and binary data to the drive anywhere from 3 to more than 30 times.
These facilities are approved to demanufacture consumer electronics
AnythingIT, Inc. | Fairlawn, NJ
Back thru the Future Computer Recycling, Inc. | Franklin, NJ
Lynswell Technologies | Camden, NJ
Monmouth Wire | Tinton Falls, NJ
Morgen Industries, Inc. | Secaucus, NJ
NewTech Recycling, Inc. | Somerset, NJ
Sims Recycling Solutions, Inc. | Edison, NJ
Thanks for Being Green, LLC | Deptford, NJ
Supreme Computer Wholesale, Inc. | Lakewood, NJ
Federal Prison Industries | Ft. Dix, NJ
These facilities accept computers for refurbishing and resale or donation
AnythingIT, Inc. | Fairlawn, NJ
eRevival, LLC | Lyndhurst, NJ
PlanITROI | Denville, NJ
Legend
Facilities Approved to Demanufacture Electronics
Facilities That Accept Computers and Monitors for Refurbishing/Resale/Donation
Facilities That Demanufacture as well as Accept Computers for Refurbishing/Resale/Donation
N
0
10
20 Miles
Source: NJDEP Solid and Hazardous Waste Management Program, January 2013


Railroads of SouthernNew Jersey
This map is intended to show what someone will see if they were at different locations in southern New Jersey. Some of the photos used are panoramas that are composed of several smaller photos. By doing this the end result is an image with a much greater field of view.
Author & photos by Matt Kemner
Source:
NJ Office of Information Technology
N
0 2.5 5 10 Miles
This line was once in disrepair. Recently it has been reconditioned since there are plans to take sand out of the Woodmise sand quarry by rail.
Abounded rail bridge crossing RT.72 south of Chatsworth.
Pictured above is the west jersey train depot. Rowan University is currently renovating this train station since it will serve as a light rail station in the future.
Pictured above:
Top: remains of a rail bridge crossing an active track.
Bottom: Historic Richland. In the summer this is a popular station for day trips.
Pictured Below: Abandoned railroad bridge running parallel to rt.147 going into north wildwood.
Above: End of the line in Bridgeton.
Many old Railroads see new life as bike and paved hiking trails.
This one intersects an intact, but unused line.
To the right. This is the Cape May train station. Service from this station goes north to Rio Grande. There are plans to repair the track to there can be continuous service to Richland.
County of Burlington
County of Camden
County of Gloucester
County of Salem
County of Atlantic
County of Cumberland
County of Cape May
South Jersey Rails
Photo Points
AbandonedLines
ActiveRailLines
Winslow Junction
Historic Topographical map of Winslow Junction.
HAMMONTON
The Winslow junction was once a major rail hub in south jersey. In 1922 the Midnight Flyer, a nighttime express train to Atlantic City, derailed at 70 MPH.
This derailment killed 7 and injured 89 people.
According to the Interstate Commerce Commission the cause of the Derailment was due to excessive speed causing the outer rail to fail in a curve.
Today, New Jersey Transit operates the Atlantic city line of the same Right of Way.h
photos from Interstate Commerce Commission

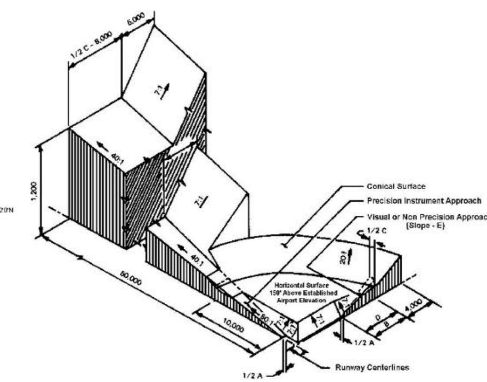


Notes
1. Base map composed of 2007 NJOIT ortho-imagery
2. Tic marks: 2 minute intervals
3. Established airport elevation 162 feet ASML
4. Contour intervals: 5 feet
5. The elevation contours illustrate the height limitations within each zone
6. Assume 80 feet for tree height
7. Assume 30 feet for building height
8. Assume 35 feet for utility pole height
9. Refer to drawing ALP - 05 inner portion of the approach surface drawing, for inner approach obstructions and proposed mediation schedule

LEGEND

Tic Marks	Proposed Taxilane
FAA FAR Part 77 Surfaces	Proposed Apron
NJ Runway Safety Zones	Proposed Building
Primary Surface	Non-Aeronautical Development Area
Existing Runway	Proposed Aeronautical Development Area
Proposed Runway Widening	Airport Property
Proposed Runway Extension	Ground Elevation Contour
Existing Taxiway	Wetlands
Proposed Taxiway Extension	Municipal Boundary
Proposed Easement	

Isometric View of FAR Part 77 Surfaces



Source: http://www.ngs.noaa.gov/AERO/oisspec.html

Magnetic Declination 12° 14' West (7/6/2010)
http://gsc.nrcan.gc.ca/geomag/index_e.php

0 1,200 2,400 3,600 4,800
Feet

REV NO.	ITEM	DATE	SPONSOR APPROVAL	BOA APPROVAL

DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION

Delaware Valley Regional Planning Commission
190 North Independence Mall West, 8th floor
Philadelphia, PA 19106
215-592-1800 (phone)
215-592-9125 (fax)
rpelzer@dvrpc.org
www.dvrpc.org

Cross Keys Airport
Gloucester County Monroe Township, NJ

Airport Airspace Drawing

DATE:	GIS FILE: 06_Part_77_Imaginary_Surfaces.mxd	
PROJECT NO:	STATE CONTRACT NO:	
DESIGNED BY: RP	DRAWN BY: KJT	DRAWING NO: ALP - 06
CHECKED BY: RM	APPROVED BY:	

THIS IS A MAP CONTEST. SO WHERE IS THE MAP???
HERE WE GO WITH ANOTHER RIDICULOUS
GIS FOLD-IN
There's a mapping contest that seems to be where all the cool gis people are. They dig maps out of the archives and submit them hoping to win. They toil and toil over designs that can be tweaked until the cows come home. Here is an example of just such an effort. To find out what map I'm talking about, fold page in as shown.
FOLD PAGE OVER LIKE THIS.
NJ
FOLD PAGE OVER LEFT
DEP
FOLD BACK SO THAT "NJ" MEETS "DEP"
HAVE YOU SEEN
IT?
WHERE
IS
IT?
YOU ARE HERE
N
A
B
C
D
1

Sandy Relief - New Jersey

"An Edible Slice of Relief... on Your Plate"

Created by: Seema Gopinathan, New Jersey Dept. of Environmental Protection
Date: April 18, 2013 **Data Source:** OGIS , Govt_admin_county_bnd layer

Scale: 1 cm ≈ 70 miles

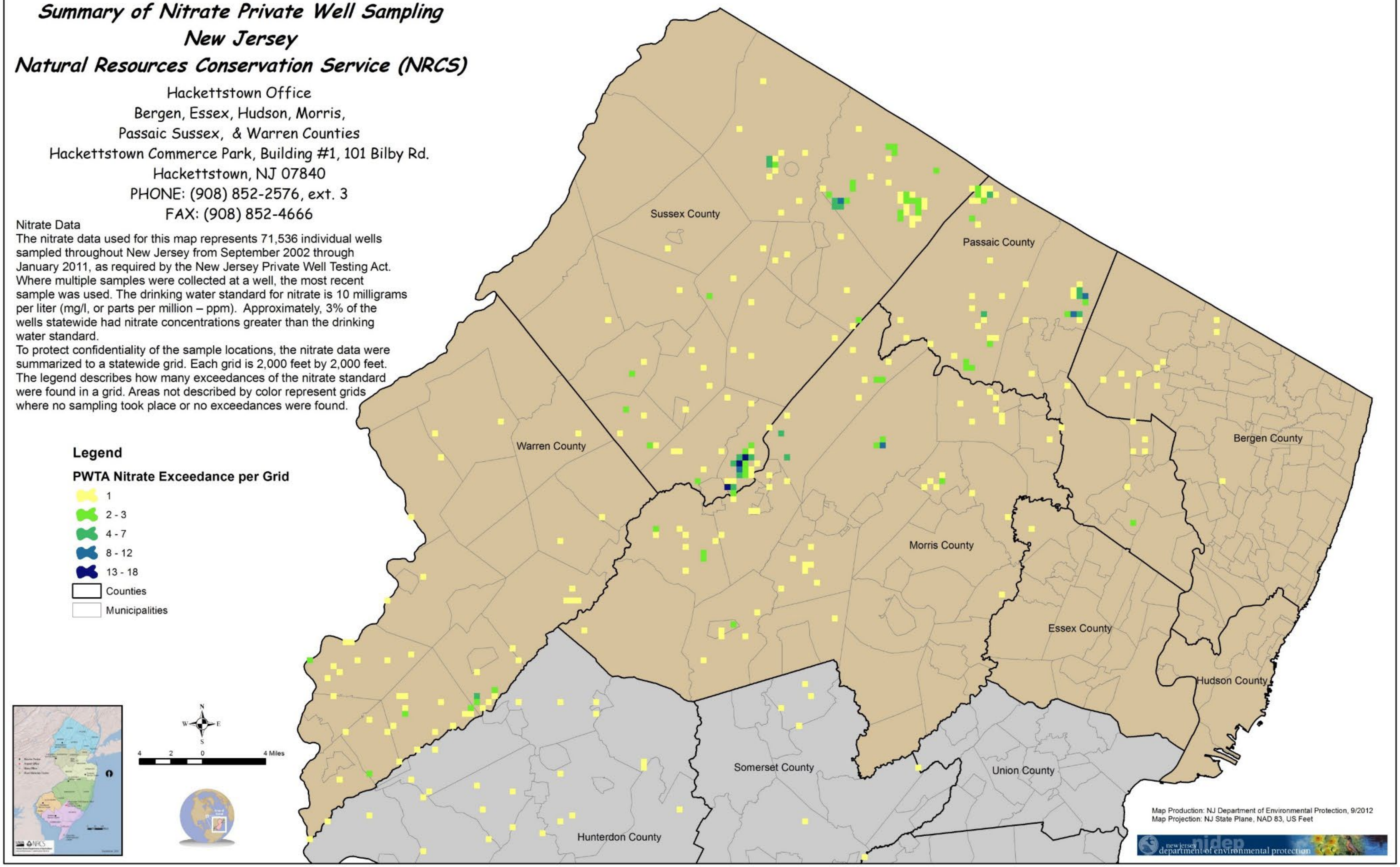
N

Small Format

Summary of Nitrate Private Well Sampling
New Jersey
Natural Resources Conservation Service (NRCS)

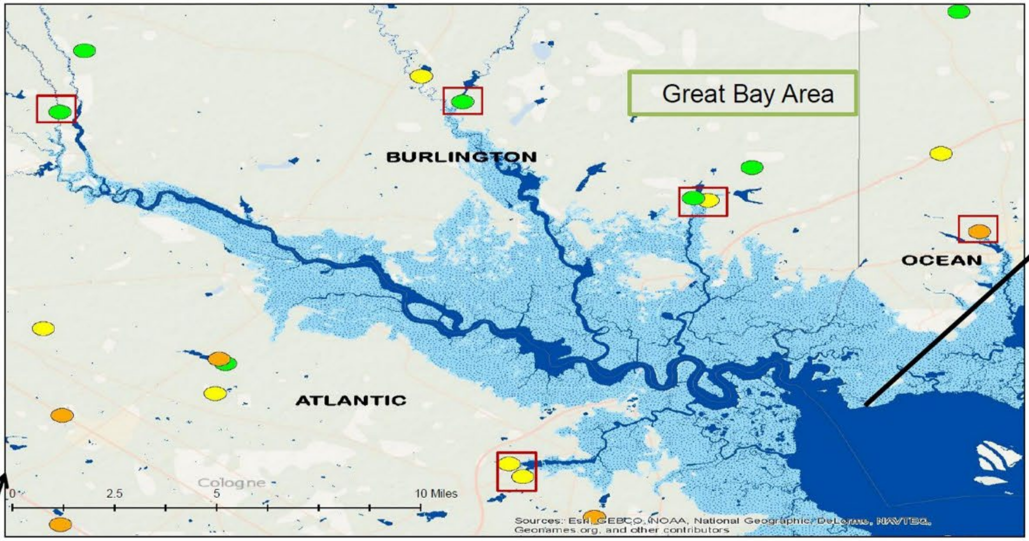
Hackettstown Office
Bergen, Essex, Hudson, Morris,
Passaic Sussex, & Warren Counties
Hackettstown Commerce Park, Building #1, 101 Bilby Rd.
Hackettstown, NJ 07840
PHONE: (908) 852-2576, ext. 3
FAX: (908) 852-4666

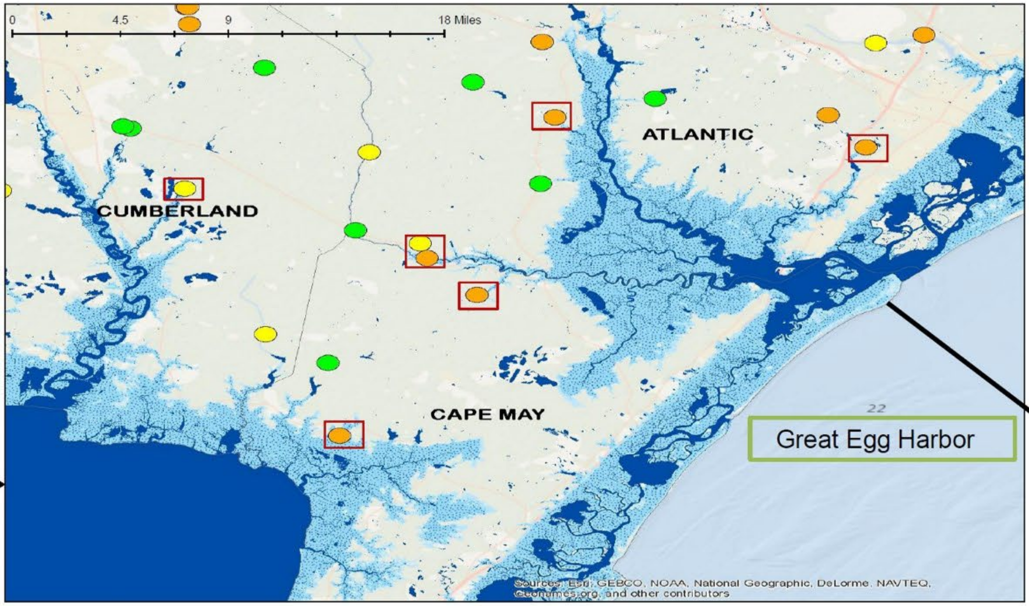
Nitrate Data
The nitrate data used for this map represents 71,536 individual wells sampled throughout New Jersey from September 2002 through January 2011, as required by the New Jersey Private Well Testing Act. Where multiple samples were collected at a well, the most recent sample was used. The drinking water standard for nitrate is 10 milligrams per liter (mg/l, or parts per million – ppm). Approximately, 3% of the wells statewide had nitrate concentrations greater than the drinking water standard.
To protect confidentiality of the sample locations, the nitrate data were summarized to a statewide grid. Each grid is 2,000 feet by 2,000 feet. The legend describes how many exceedances of the nitrate standard were found in a grid. Areas not described by color represent grids where no sampling took place or no exceedances were found.

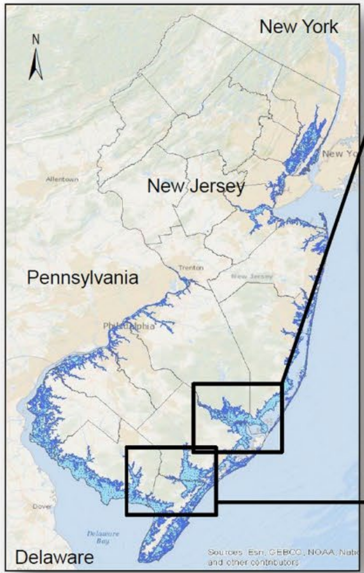


Hurricane Sandy: Storm surge affects on AMNET Biological Monitoring Sites

DESCRIPTION: The Department monitors the health of our freshwater streams using benthic macroinvertebrates which are animals without a backbone (invertebrate) that are large enough to see with the naked eye (macro) and that live within the substrate of a body of water (benthic). Common macroinvertebrates found in freshwaters of NJ include insects, crayfish, snails, mussels/clams, and worms. Benthic macroinvertebrates are a good indicator of water quality over time because they do not move too far from where they hatch. This monitoring is used by the Department to develop the list of impaired waters, known as the 303(d) List. Unfortunately, many of our monitoring stations were inundated by storm surge from Hurricane Sandy. It can take several years for the biological community to recover from a catastrophic event like inundation of saltwater. Sites that scored 'excellent' and "good" during their last sampling visit will be closely watched to determine whether the conditions are a result of a natural transient event (Hurricane Sandy) or other anthropogenic impacts.







Mystic Island

Legend

AMNET sites affected by Sandy

AMNET Biological Monitoring Sites

- Excellent
- Good
- Fair
- Poor

Waterbody 2002 (NHD)

Storm Surge Extent (Vector)

Counties

IMPORTANCE: A decrease in biological quality at these sites due to a naturally occurring transient event, like Hurricane Sandy, may provide justification not to list the waterbody on the 303(d) List as part of the biennial NJ Integrated Water Quality Monitoring and Assessment Report required by the Clean Water Act.

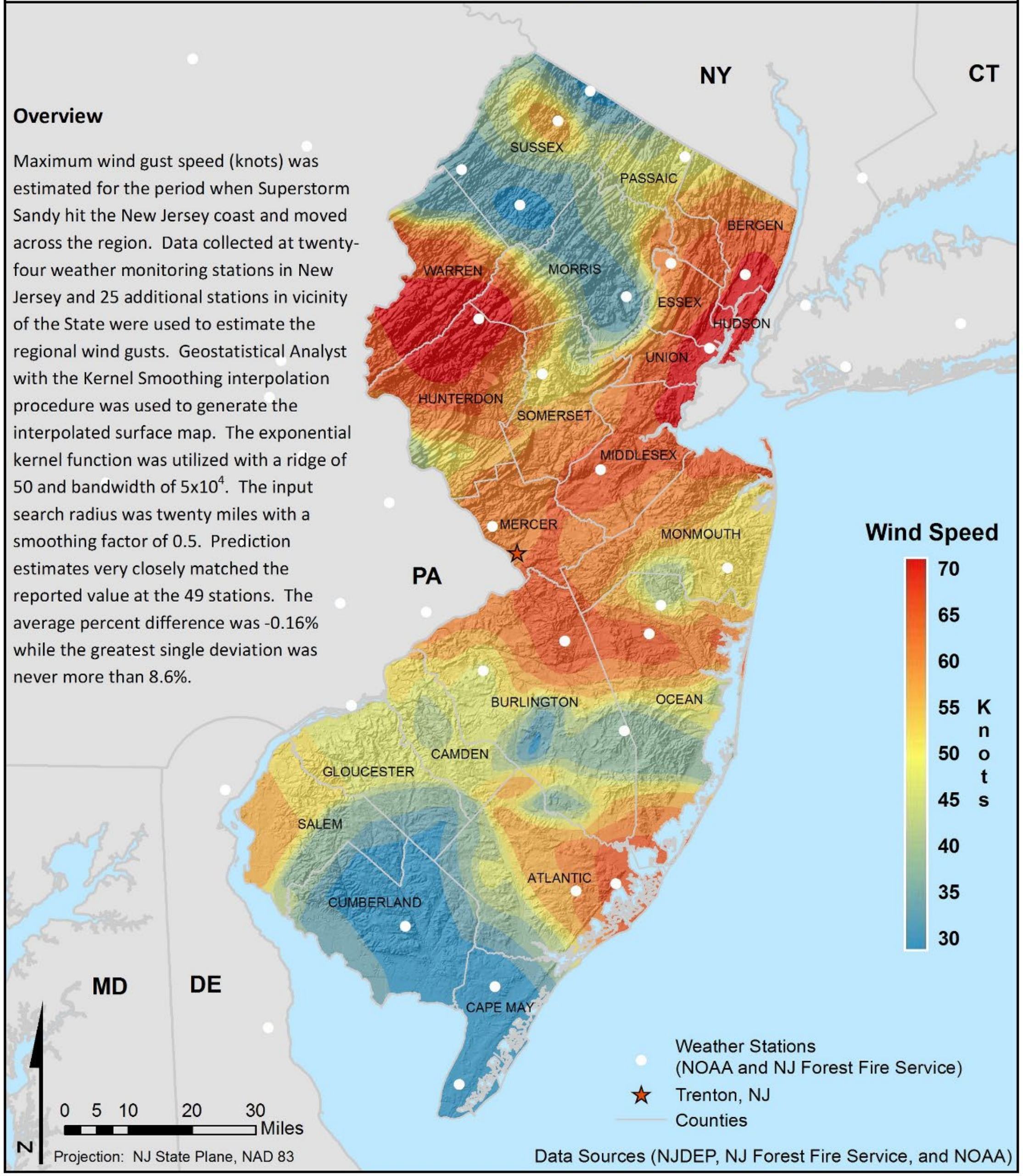
Ocean City

Sarah Staab; Division of Water Monitoring and Standards; Bureau of Water Quality Standards and Assessments; 4-18-13

Wind Gust Estimates During Superstorm Sandy

Overview

Maximum wind gust speed (knots) was estimated for the period when Superstorm Sandy hit the New Jersey coast and moved across the region. Data collected at twenty-four weather monitoring stations in New Jersey and 25 additional stations in vicinity of the State were used to estimate the regional wind gusts. Geostatistical Analyst with the Kernel Smoothing interpolation procedure was used to generate the interpolated surface map. The exponential kernel function was utilized with a ridge of 50 and bandwidth of $5x10^4$. The input search radius was twenty miles with a smoothing factor of 0.5. Prediction estimates very closely matched the reported value at the 49 stations. The average percent difference was -0.16% while the greatest single deviation was never more than 8.6%.



New Jersey DEP - Office of Science
428 E. State. St.
Trenton, NJ 08625

Maximum Wind Gusts Reported for the Period Oct 29, to Oct 30, 2012

Nicholas A. Procopio Ph.D., GISP

Software Integration

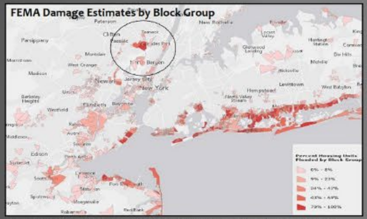
New Jersey Meadowlands Commission

Real-time Sensor Based Superstorm Sandy Surge and Inundation Model for Moonachie, Carlstadt, and Little Ferry: Bergen County, New Jersey

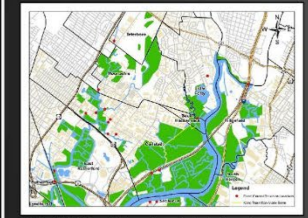
This study examines and recreates the impact of Superstorm Sandy on severely impacted towns within the Hackensack Meadowlands District (HMD) based on real-time water level data continuously collected at tide gates throughout the HMD. The Sensor Tide Gate Monitoring System (SensorTGMS) supports an objective account of the progression of flood events. The visualization of water levels over a time line proved to be a powerful tool for understanding how residents and infrastructure were affected by the tidal surge that occurred during Superstorm Sandy. The data captured by the system in conjunction with GIS layers maintained by the Meadowlands Environmental Research Institute (MERI) and post hurricane field collection, allowed for the recreation of flooding produced by Superstorm Sandy in the towns of Carlstadt, Little Ferry, and Moonachie in Bergen County, NJ.

Authors: Stephanie Bosits, Francisco Artigas

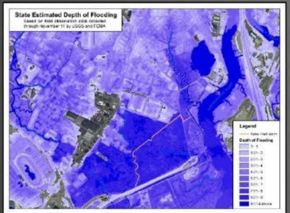
Affected Area



Despite its distance from the coastline, the study area maintains direct hydrological connectivity with the Atlantic and therefore is very much effected by tidal activity.



Carlstadt, Little Ferry, & Moonachie are located in the northern portion of the district. This map shows the towns in relation to the Turnpike and flood control structures (shown in red).

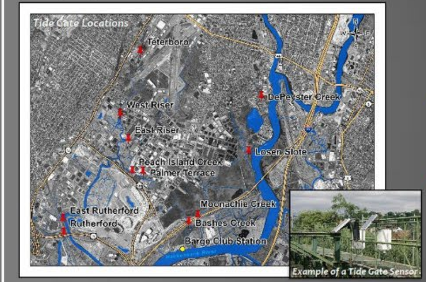


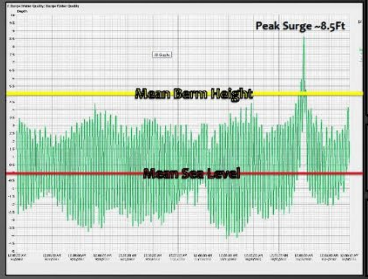
State flood inundation data was visualized and compared to field collected water level marks.

The study area has been historically dredged . The thick black line illustrates a Mosquito Commission berm built at 5Ft in order to keep water from collecting in low lying areas.

Real Time Water Elevation Observations

Tide gates are structures that prevent the passage of water from the sea side to the land side while allowing the free flow of water from the land to the sea. They may malfunction (e.g. clogs from debris) resulting in roads, parking lots and buildings flooding. Because of this possibility, the Tide Gate Sensor Network was developed for tide gates at various locations in the Hackensack Meadowlands District. Each sensor station consists of pressure transducers and solar powered data loggers equipped with satellite phones for data transmission. The Tide Gate Monitoring System has been prototyped and implemented to monitor and share real-time water-levels around tide gates throughout the District.

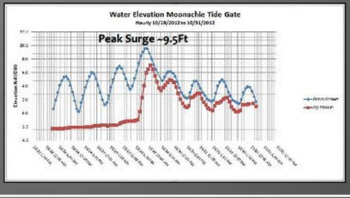


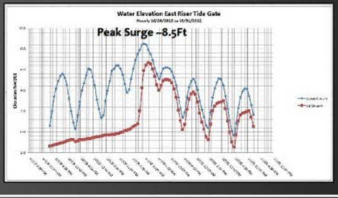


This graph shows the storm's peak surge at ~8.5 Ft in relation to regular tidal cycles typically ranging from 3 ft above sea level to 3 ft below sea level in this region.

Three tidal cycles exceeded the mean historic Mosquito Commission berm height (5 Feet).

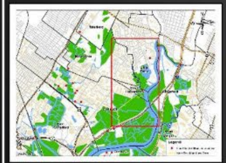
Water elevations remained above 7ft for 6 hours allowing water to disperse throughout the affected area.

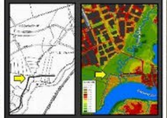




Post Sandy GIS Data/ Field Data Collection

Losen Slote Creek: Little Ferry, NJ



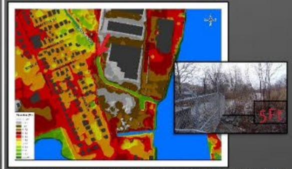


Historical Mosquito Commission earthen berms remain throughout the district such as this one attached to the man-made Kane Tract berm (Carlstadt,NJ).

This earthen berm built at ~5ft proved to be a vulnerable area during Superstorm Sandy

Eventually the Kane Tract Berm (built at 8ft) was also over topped

DePyester Creek: Little Ferry, NJ

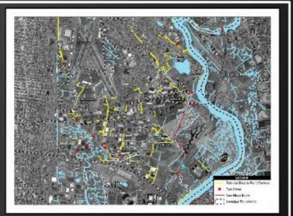


The DePyester pump station has direct hydraulic conductivity with the Hackensack River. The land directly adjacent to the pump station is at an elevation of 5 ft and nearby roads are at an elevation of 5ft or less.

Watermarks measured by a home owner near DePyester Creek measured Hurricane Irene at 12" and Sandy at 38"

Berry's Creek: Carlstadt,NJ

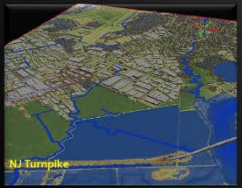
Elevations near the Berry's Creek Tide Gate measured 1.5 Ft. A debris line across the creek measured 6Ft.



Potential breach point markers were placed along boundaries between properties and waterways/wetlands that are < 5ft in elevation.
*Approximately 15 miles of vulnerable areas were identified in the three towns.

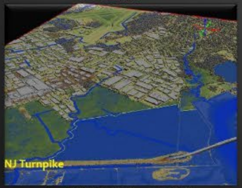
Flood Visualization

7 PM



Landside: 0.0 Ft Seaside: 5.0Ft

8 PM



Landside: 0.2 Ft Seaside: 6.2Ft

9 PM

Landside: 2.3 Ft Seaside: 7.4Ft

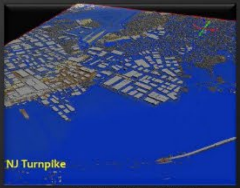
10 PM

Landside: 4.0 Ft Seaside: 8.4Ft

11 PM

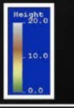
Landside: 5.9 Ft Seaside: 9.0Ft

12 AM



Landside: 8.2 Ft Seaside: 9.5Ft

Based on time stamped water elevation levels recorded by sensors at the Moonachie Tide Gate as well as the East Riser Ditch Tide Gate, approximate inundation levels for the affect area during the night of October 29th were recreated using Quick Terrain Modeler and 2009 LiDAR.



* The yellow line indicated the existence of the Man-Made Kane Tract berm built at approximately 8ft

Hurricane Sandy: Software and Data Integration For Emergency Management

NJDEP GIS Readiness, Response and Recovery

October-November 2012

READINESS: PLANNED RESPONSE STRATEGIES DESIGNED TO MINIMIZE THE EFFECTS OF AN EMERGENCY "BEFORE" IT HAPPENS

RESPONSE: IMPLEMENTATION OF PRE-DETERMINED STRATEGIES "DURING" AN EMERGENCY SITUATION

RECOVERY: CO-ORDINATED SHORT & LONG TERM RESTORATION EFFORTS FOR COMMUNITY REGENERATION "AFTER" AN EMERGENCY

Readiness

Determine extent of inundation of c1 storm surge for Jersey City and Hoboken.

Requested by John Moyle: Sunday, October 28, 2012

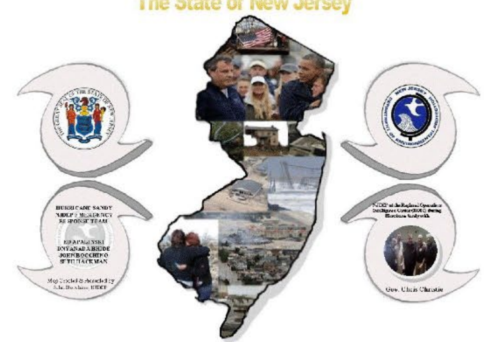
Used slosh data created by Tom Rafferty of NJ State Police.

Utilized the above along with Northeast LiDAR data to indicate critical flooding areas in Hoboken.

Also brought in census block data to indicate areas of higher population in these areas.

Shown to Governor Christie

The State of New Jersey



http://www.state.nj.us/dep/gis/gisemerresp.html

Response

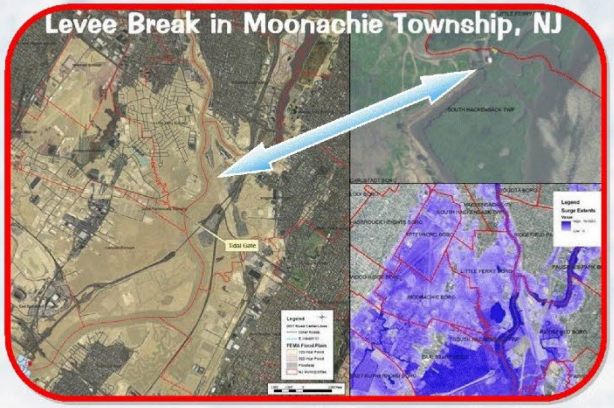
Requests for GIS at the ROIC

Solid Waste Program

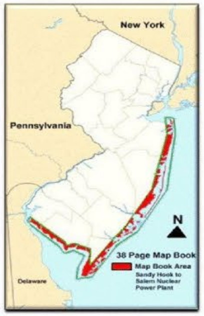
Get statewide point data from **NJEMS** on Solid Waste Recycling Centers and Solid Waste Facilities. **Ran the query first on recycling from NJEMS_CORE_PI (to get PI_ID/SITE ID). Related it to NJEMS_SITE_PI_XREF table then related that to the Envr_NJEMS_site feature class where selected sites could be saved out to another feature class/shapefile.** Added to map. Ran again for facilities.

BPU Reconnection Priority Sites

Generate a map of statewide reconnection priority sites for the Board of Public Utilities. These locations were determined by the DEP and BPU to be prioritized when electrical grids were re-energized due to their importance for wastewater management and overall human health. Some of these locations included various municipal utility authorities or MUA's and treatment plants throughout the State.



Commissioner MAP BOOK



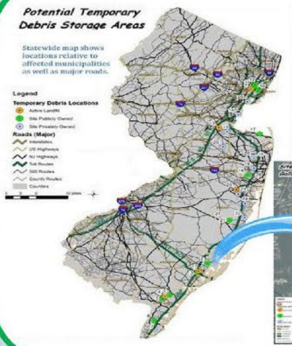
Create a map book of imagery for the coastline from Sandy Hook to the Salem Nuclear Plants.

The book was to be compiled for the Commissioner who was to be flying in a helicopter Tuesday AM to assess damage to the coastline.

Total of 38 maps were compiled in a "flip" format so that the Commissioner could take notes as he traveled the route.

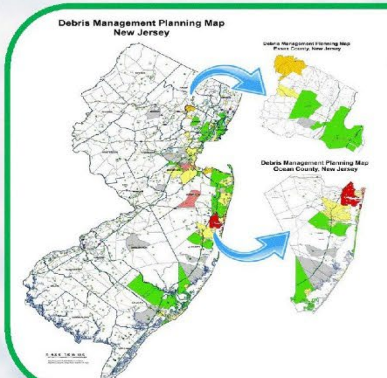
The maps had to be printed for the book, then hole-punched and placed into a binder.

Recovery



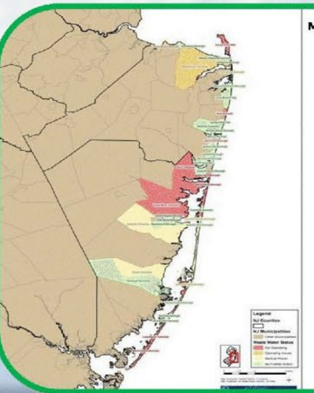
Identify Potential Temporary Debris Storage Areas

- Identify areas greater than 60 acres near Municipalities affected by Hurricane Sandy
- Potential sites include closed landfills, Brownfields, & Privately owned areas
- Feature Classes used;
  - SAGE grouped polygons
  - 2007 Land Use (Barren type)
  - Parcels



SOLID WASTE PROGRAM

- Spatial representation of debris management by Municipality
- Created a dbf table (excel or access) with Municipality ranking (1-5), data source Sharepoint document from NJDEP-Enforcement
- Dbf table joined to Municipality feature class using common id field (muncode or key code)
- Features symbolized using attributes from joined table
- Original dbf file can be edited without breaking the join, so updates will be seen in the layer file
- Produced a State map and individual maps for Atlantic, Essex, Hudson, Monmouth, Middlesex, Ocean, & Union Counties.
- Feature classes: Solid Waste Facilities, Municipalities, Roads, & Railroads



Municipal Wastewater System Priority Status Monmouth & Ocean Counties, NJ

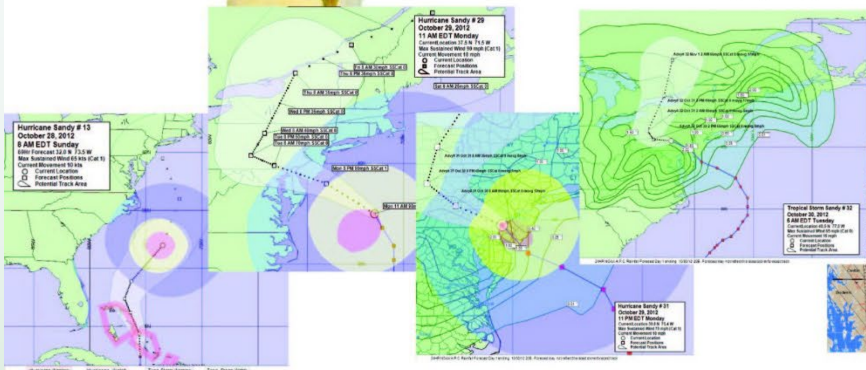
Municipal Wastewater Priority Status

- Spatial representation of municipal wastewater system status
- Same process using dbf table from program
- Dbf table joined to Municipality feature class using common id field (muncode or key code)
- Program data was organized using local names, (may have several pump stations in a municipality using local names)
- Pelican Island is a neighborhood in Toms River Twp, Ocean County
- This took several hours to identify which Municipalities each pump station was in
- Then each Municipality had to summarized using the highest rank for mapping
- Also could lead to misinformation, Pelican Island was the only pump station not operating however all of Toms River Twp is ranked as Not Operating

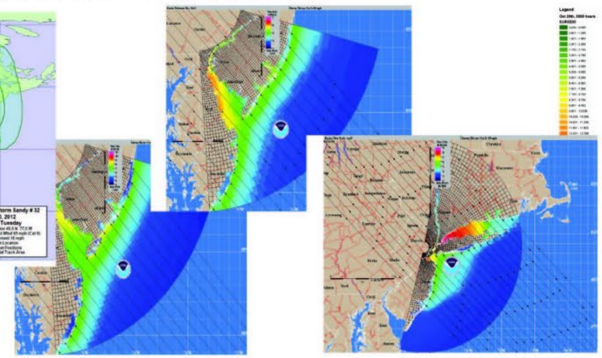
New Jersey's Historic Resources Threatened by Hurricane Sandy

Based upon storm surge predictions
from the National Hurricane Center

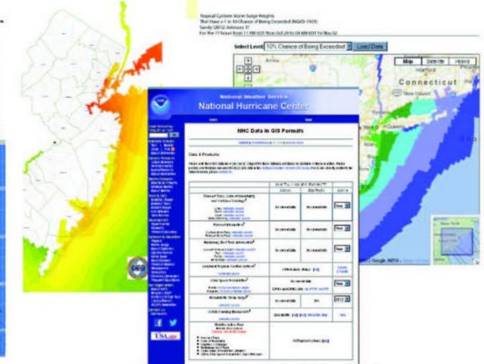
Before, During and After Sandy Situational Awareness



Hurrevac Runs



Slosh Model Runs



Geodata from NOAA NWS and NHC

FEMA Geoplatform

Geoeye Satellite

OIT Aerials

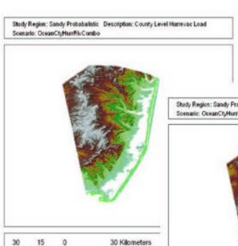
Geoeye Satellite

OIT Aerials

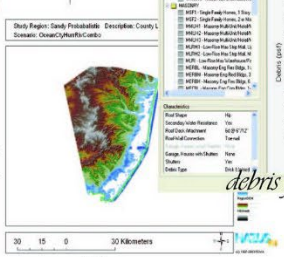
NOAA

OIT Aerials

Pictometry

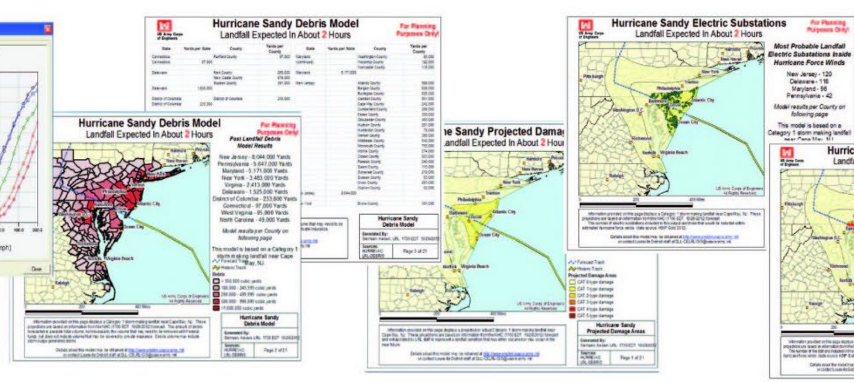


Hazus DEM



Hazus delineated floodplain

debris functions



Larger Scale USACE Model Runs

Div Fire Safety ArcGis Mobile Damage Assessments