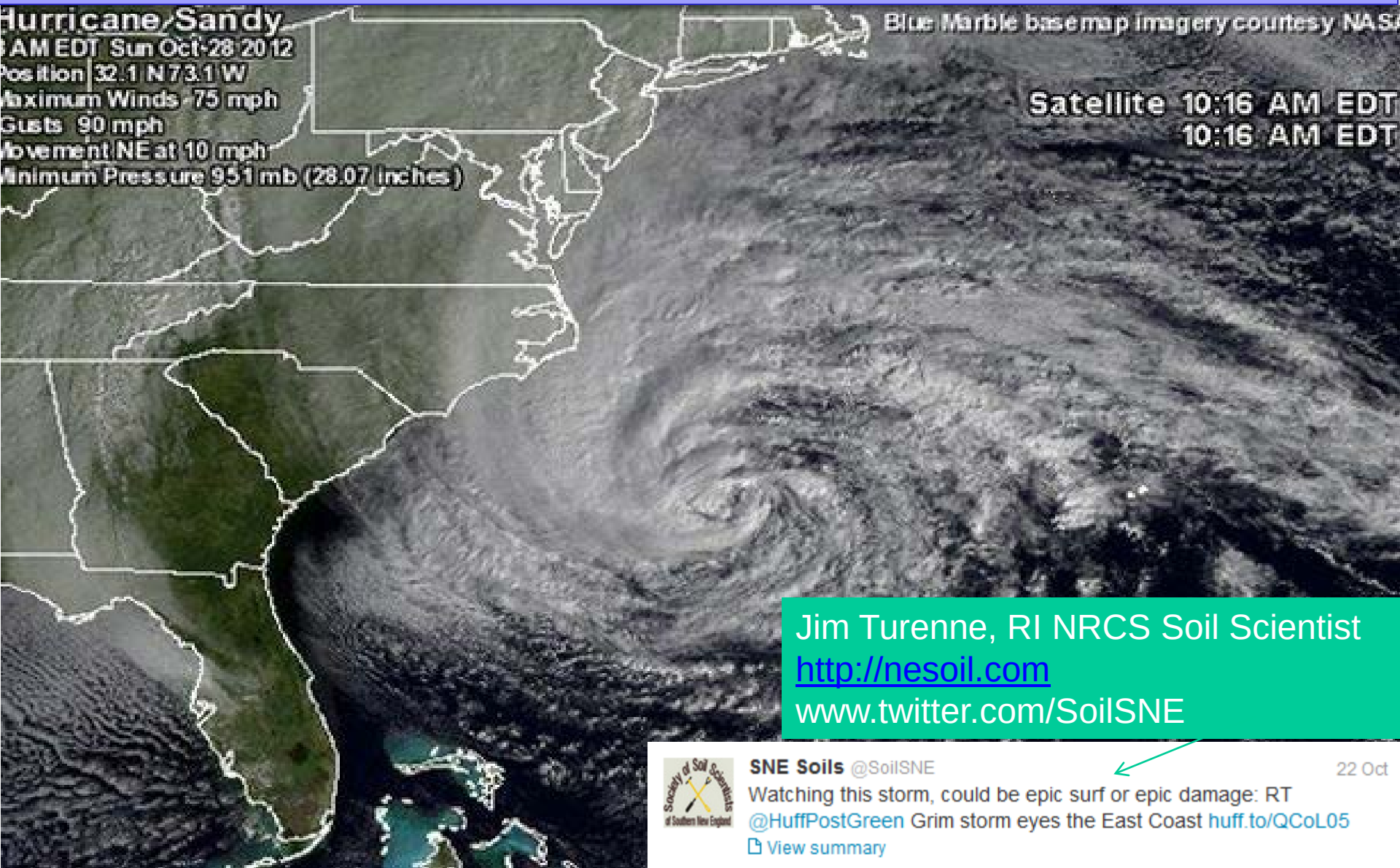
Examining The Soil Interpretations for the Coastal Zone of the Northeast:



Jim Turenne, RI NRCS Soil Scientist
http://nesoil.com
www.twitter.com/SoilSNE

SNE Soils @SoilSNE 22 Oct
Watching this storm, could be epic surf or epic damage: RT @HuffPostGreen Grim storm eyes the East Coast huff.to/QCoL05
View summary

Consider The Past Two Seasons:

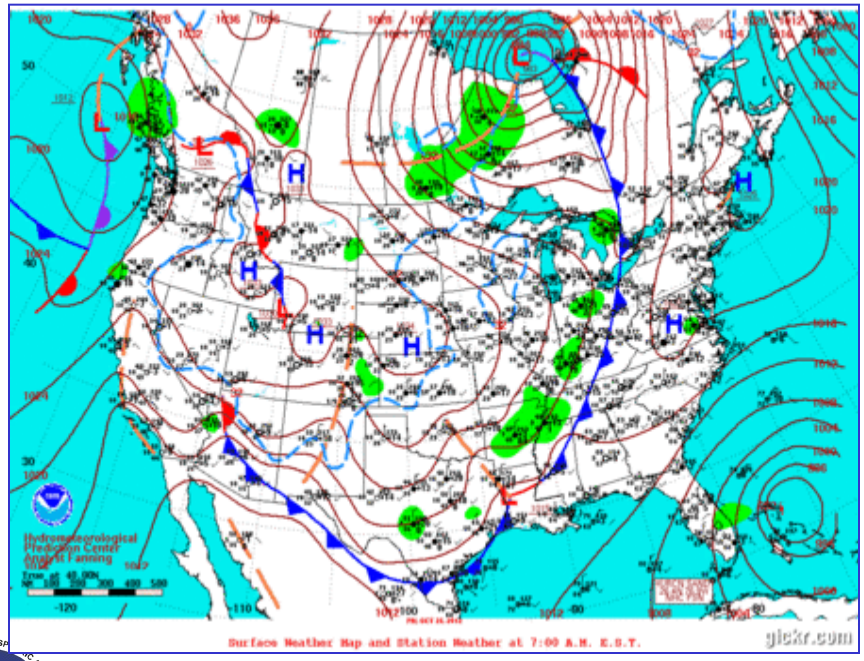
IRENE

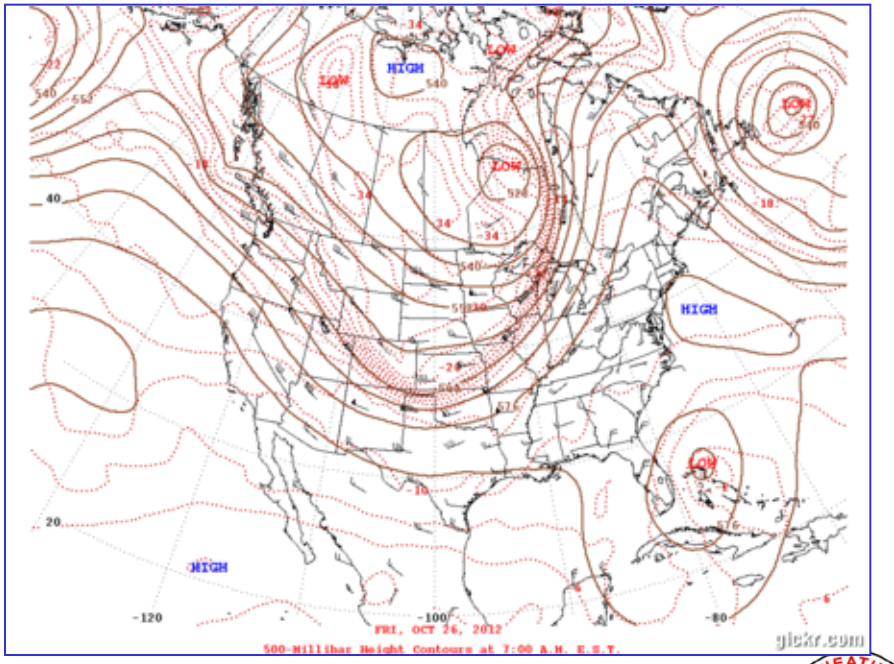
SANDY

- **Irene: Widespread wind damage & power disruption in the east & devastating flooding rains in the west**
  - "It's all about the wind and rain!"
- **Sandy: Significant coastal flooding but with less wind and little if any rain**
  - "It's all about the coastal flooding!"

Frankenstorm Sandy: A Perfect Storm of Sorts

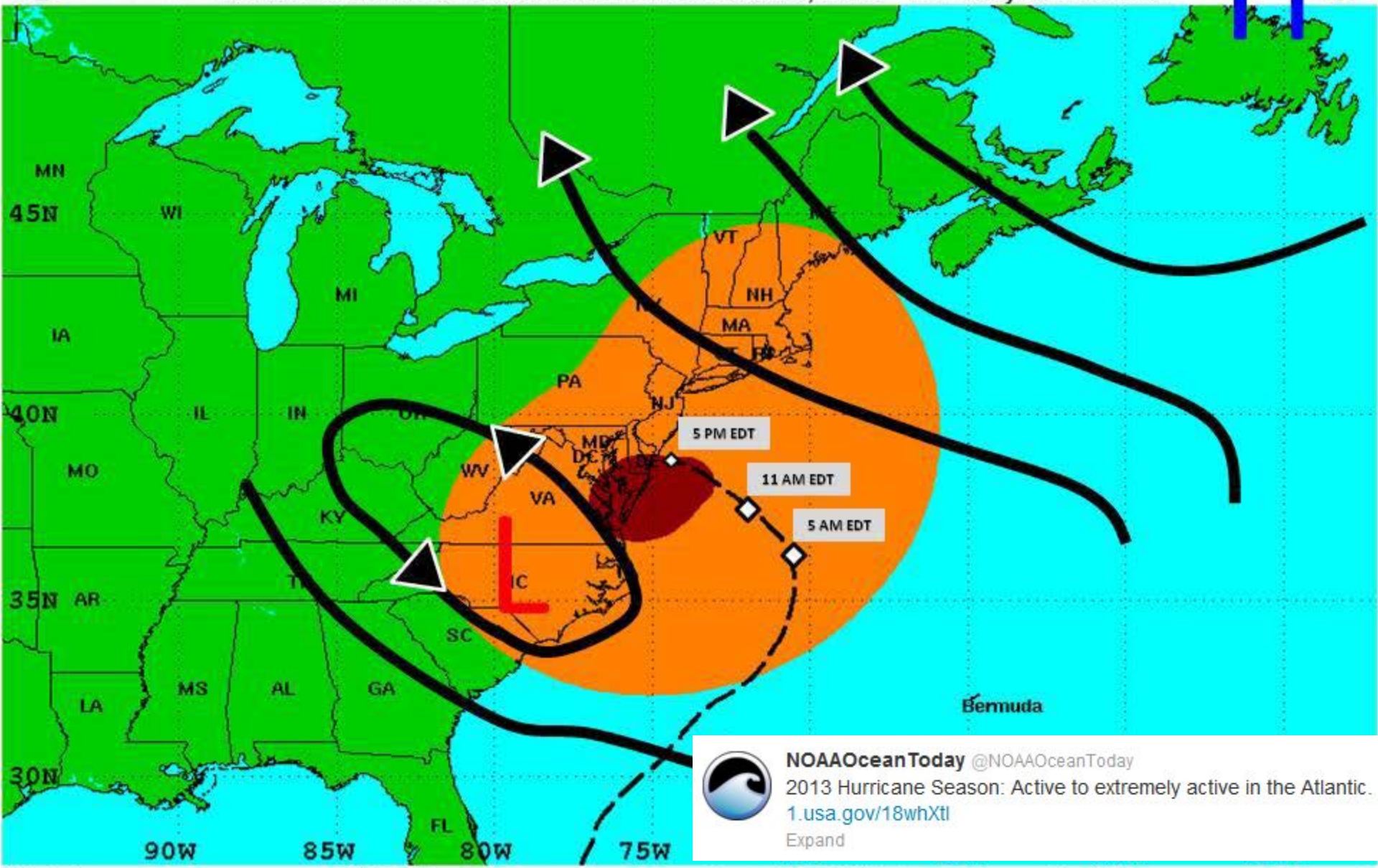
- **Formed in the western Caribbean**
  - Not at all unusual for late October
- **Encountered a very deep trough of Low Pressure in the eastern United States and very strong High Pressure moving southward from the Canadian Maritimes**
  - A winter-type dual jet stream set up (classic for a New England Hurricane)
  - Captured Sandy & blocked her attempt to race out to sea





Surface Wind Field of Hurricane Sandy

Sustained Winds as of 500 PM EDT Mon Oct 29, 2012 Advisory Number 30



NOAAOceanToday @NOAAOceanToday
2013 Hurricane Season: Active to extremely active in the Atlantic.
1.usa.gov/18whXtl
Expand

Watches:
- Hurricane Watch
- Tropical Storm Watch

Warnings:
- Hurricane Warning
- Tropical Storm Warning

Sustained Winds:
- Hurricane Force
- Tropical Storm Force

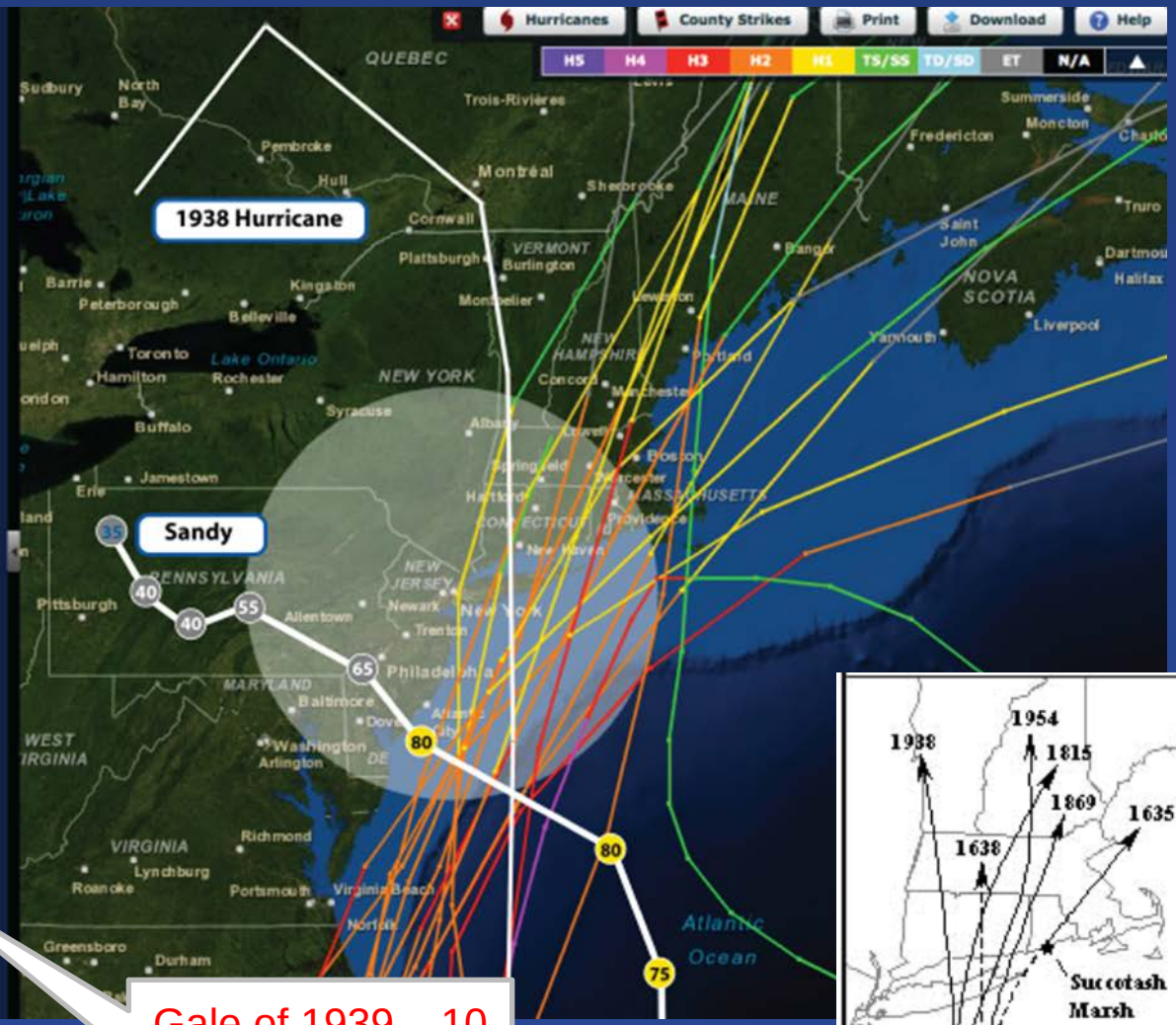
Position:
- Center as of 500 PM EDT
- Past Track

All tropical cyclones ranked **Cat. 2–5** within **200 nautical miles** of New York City, **1851–2011**

plus Sandy
intensity shown in knots

Also highlighted:
Long Island Express (1938)

1851–2011 tracks from NOAA Historical Hurricane Tracks website; Sandy track added by Bob Henson, UCAR, using NOAA data



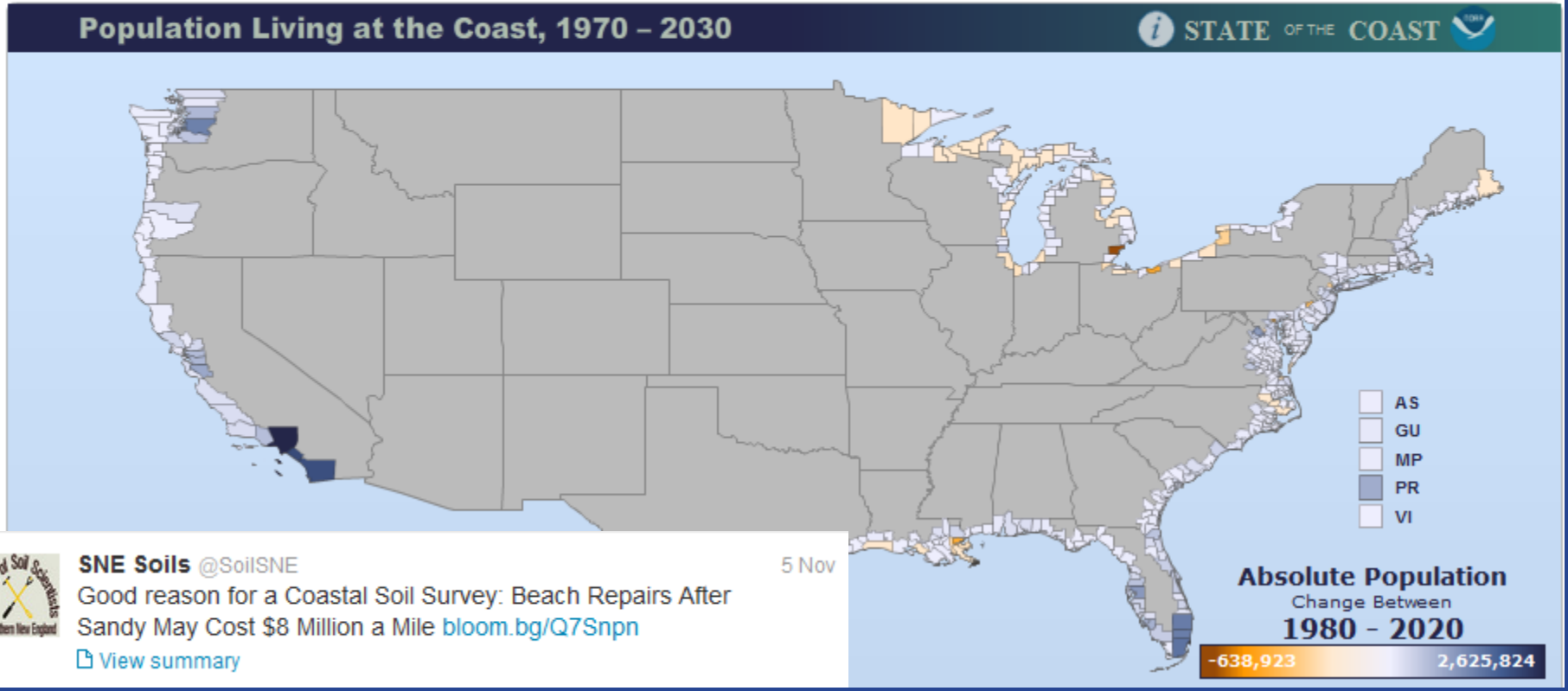
Gale of 1939 – 10 foot surge vs. 4 for Sandy

39%
Percent of the nation's total population that lived in Coastal Shoreline Counties in 2010 (less than 10% of the total land area excluding Alaska).
Source: U.S. Census Bureau, 2011

34.8 million
Increase in U.S. Coastal Shoreline County population from 1970 to 2010 (or a 39% increase).
Source: U.S. Census Bureau, 2011

446 persons/mi²
Average population density of the Coastal Shoreline Counties (excluding Alaska). Density in U.S. as a whole averages 105 persons/mi².
Source: U.S. Census Bureau, 2011

37 persons/mi²
Expected increase in U.S. Coastal Shoreline County population density from 2010–2020. Expected increase for entire U.S. is 11 persons/mi².
Source: Woods & Poole, 2011; NOAA, 2012



SNE Soils @SoilSNE 5 Nov
Good reason for a Coastal Soil Survey: Beach Repairs After Sandy May Cost $8 Million a Mile bloom.bg/Q7Snpn
View summary

Bottom Line: lot of people live along coast = need for accurate soil data (spatial and tabular)!

Obama's post-Sandy speech

Message to Governors "Anything they need the fed will be there to help, not bogged down with bureaucracy". Call on all branches to assist in anyway they can…

RI Coastal Zone Soil Survey

- 2004 plan was to establish a CZSS for the MLRA – shot down. RI MapCoast setup.
- Detailed re-map of the coastal soils (dunes, marshes, beaches) and initial mapping on subaqueous soils.
- Building interpretations for coastal uses (marine spatial planning).
- Only data (I know of) that provides this level of detail and data for the coastal zone.
- Use traditional soil survey methods along with remote sensing, pictometry, Lidar, high resolution imagery.
- Coastal flooding workplan 2014.

Below: 2010 RI Soils – Including the Coastal Zone Soil Survey

Below: 1996 RI Soils – No information for shalow water or coastal soils

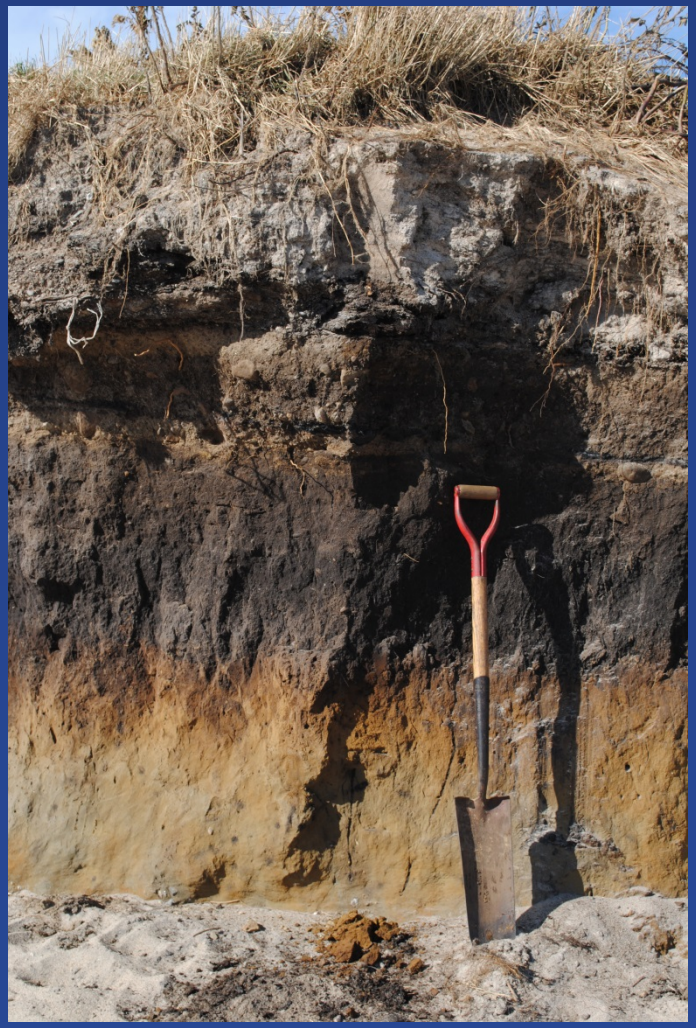
Post Sandy RI

- Followed Obama's call to assist in any way we could.
- Emails sent to SS along affected area to see what impacts were, what assistance could we provide.
- Made review of Interps on WSS for development.
- Toured the impacted area of RI to assess the soils.
- Organized a fact-finding tour with SS, coastal geologist, etc. to learn more about what we can do in future for the coastal zone.

SNE Soils @SoilSNE 12 Nov
Posted a few more photos of the erosion caused by Sandy - Narragansett Town Beach - Hooksan soils:
picasaweb.google.com/10776031276531...
Expand

RI Coastal Tour – findings: HTM

Fun Morphology



A1

C1

2^Ab

3Apb

3Bwb

RI Coastal Tour – findings: Till

The Great Fragipan Debate
or
The Never Ending Story

Background

In 1976 fragipans soils were mapped throughout Northern New England. In New Hampshire they were described with Cx horizons that were typically firm and brittle with weak to moderate thin to thick platy structure. They extended from about 15 inches to more than 65 inches below the surface. A lower boundary was rarely described. There was a cambic or spodic horizon described in the solum.

RI coastal tour findings: Dunes

RI coastal tour findings: Breach

Trustom Pond breached and water level dropped ~5 feet exposing the SAS, gave great chance to observe the submerged map units!

TSS - EWP

- EWP (~26 million) was allocated for Sandy.
- DSR team sent to barrier to look for potential projects.
- Removal of washover sand from back barrier and lagoon.
- CZSS data (pre-bathy, and cores) was useful for baseline.
- DSR team urged to watch presentation by State Geologist.

511.4 Limitations

A. EWP program funds may not be used to—

channel, is allowable. Sediment and debris removal is not considered new construction.
(9) Repair coastal erosion to beaches, dunes, and shorelines, including those along the Great Lakes.
(10) Landscaping practices exclusively for aesthetic purposes

United States Department of Agriculture
Natural Resources Conservation Service

USDA NRCS

Map Legend

Map Legend

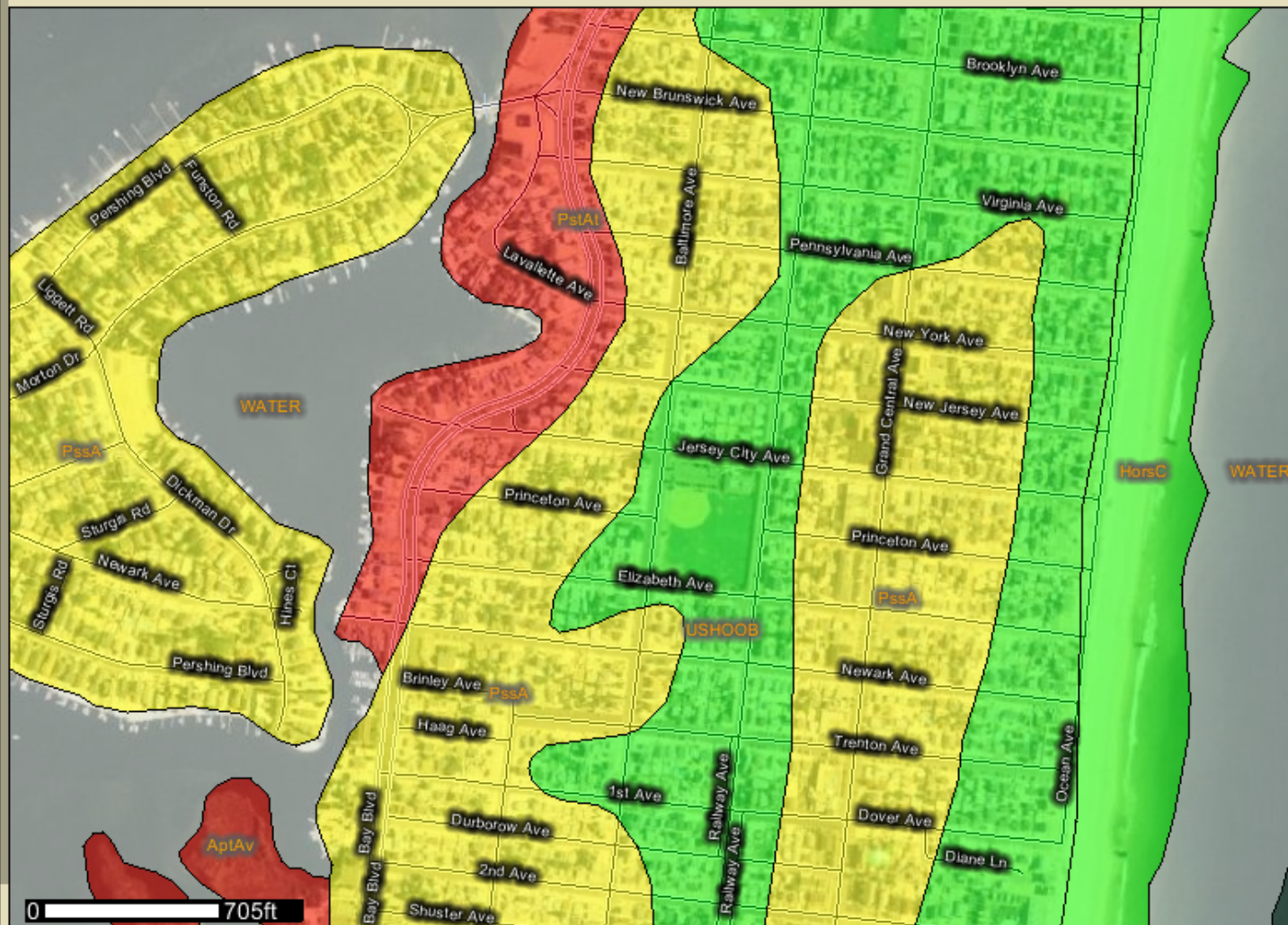
- Area of Interest (AOI)
  - Area of Interest (AOI)
  - Location Marker
- Soils
  - Soil Survey Areas
  - Soil Map Units
  - Soil Ratings
    - Very limited
    - Somewhat limited
    - Not limited
    - Not rated or not available
  - Special Point Features
  - Special Line Features
- Political Features
  - States
  - Counties
  - Urban Areas
  - Cities
  - Postal Code
  - PLSS Township and Range
  - PLSS Section
- Federal Land
  - Bureau of Land Management
  - Bureau of Reclamation
  - Department of Defense
  - Fish and Wildlife Service
  - Forest Service

Detailed Description

r Use | Soil Properties and Qualities | Ecological Site Assessment | Soil Reports

Map — Dwellings With Basements

Scale (not to scale)



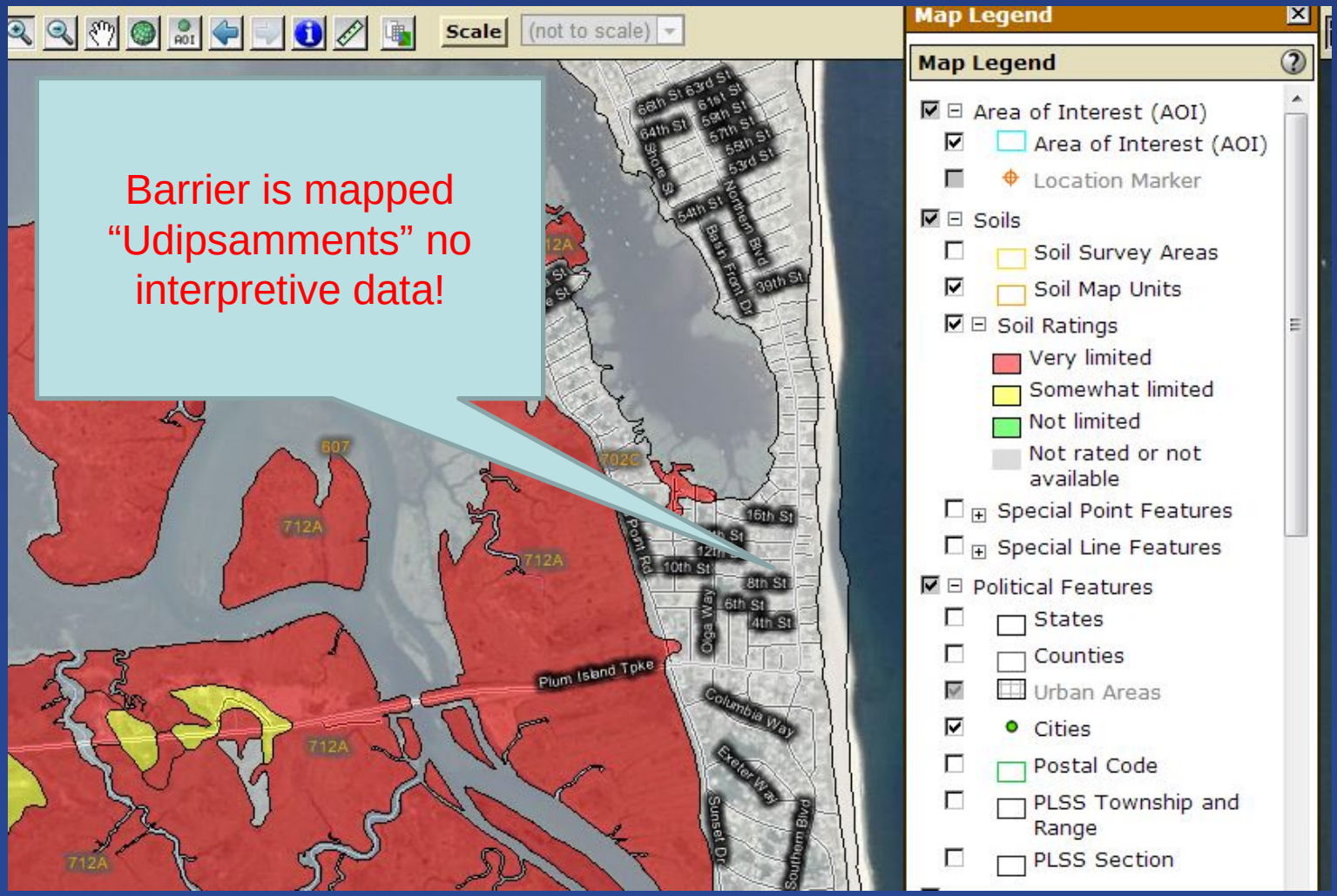
Saturday, March 9, 2013

Havoc on Plum Island

Superstorm Nemo

A house on the Plum Island seacoast in Newbury, Mass., sits partially collapsed into the churning surf. (THE ASSOCIATED

Superstorm Nemo – Plum Is, MA

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Soil Ratings
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Somewhat limited
Not limited
Not rated or not available
Special Point Features
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Counties
Urban Areas
Cities
Postal Code
PLSS Township and Range
PLSS Section
Federal Land
Bureau of Land Management
Bureau of Reclamation
Department of Defense
Island Park
Waterford Rd
Kildare Rd
Kent Blvd
Kent Rd
Quebec Rd
Austin Blvd
Island Pkwy
Jefferson Ave
Radcliffe Rd
Petit Pl
Carl St
Park Pl
State St
Fulton St
Hudson St
Market St
Pine St
Chester St
Monroe Blvd
Neptune Blvd
Barnes St
Heron St
Clark St
Park Ave
Regent Dr
Lido Blvd
Pacific Blvd
Maple Blvd
Blackheath Rd
Fairway Rd
Lincoln Blvd
Taft Ave
Penn St
Shore Rd
Bay Dr
Lindell Blvd
Walnut St
Olive St
Beech St
Oceanfront St
Oceanview St
Virginia Ave
Delaware Ave
Arizona Ave
California St
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Department of Defense
Fish and Wildlife Service
Briggs Rd
Stedman Rd
Chappell Rd
Tidal St
West St
Gooseberry Rd
Perrywinkle Rd
Island Rd
Gale Dr
Dory Ct
Hartford Ave
Conch Rd
Periwinkle Rd
Teal Pond Rd
Edith Rd
Basin Rd
Shove Rd
HkC
FtA
WMg0
RaB
Mk
Pw
WNa0
Sa
RbB
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UD
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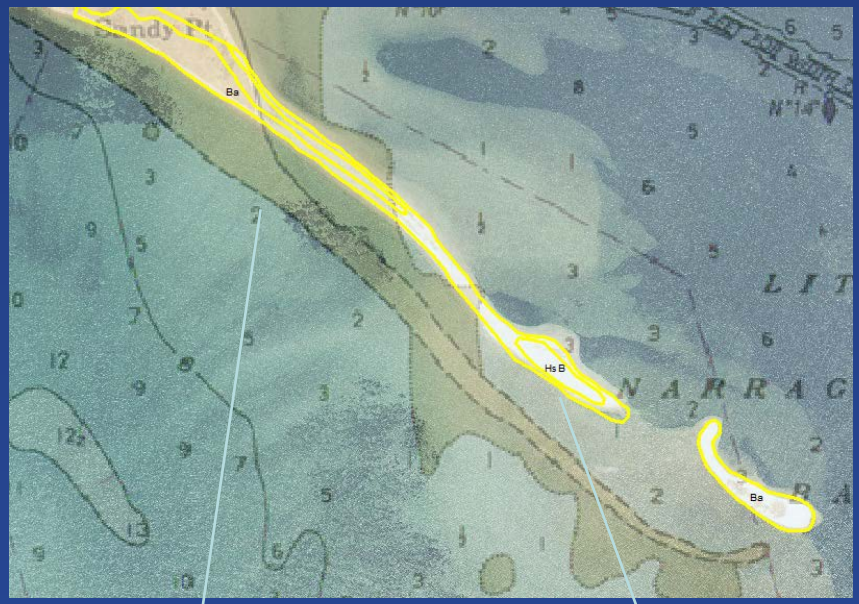
HsB
SU
HU
RaA
Ws

Spatial Data



Ortho SSURGO

NOAA SSURGO/Ortho
NOAA ~500 ft off!

Spatial Data

Above 2010 SSURGO Soil Polygons

Above 2012 SSURGO Polygons


Mohegan Trail
GBC
SoA
BmA
PbC
W
RaB
GBD
Rc
PbB
CdB
UBE
Bax
Ba
Baz
Wa

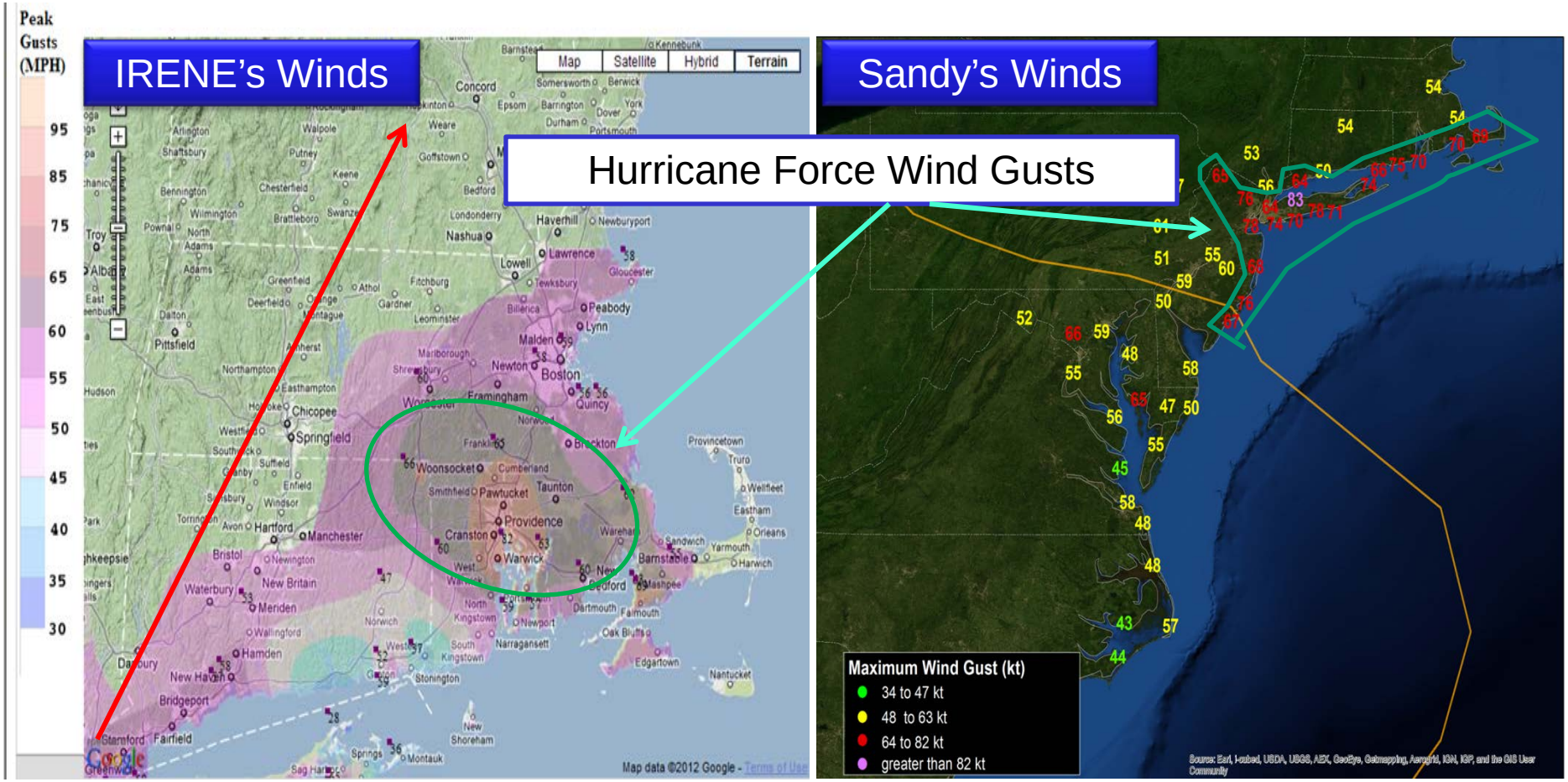
My Recommendations:

- Top priority on coastal zone:
  - Remap undifferentiated units to series. Map high/low marshes/halinity classes.
  - Adjust beaches to current ortho (or National Shoreline).
  - Utilize Lidar, High res aerial and Pictometry.
  - Map storm surge zones as phases.
- Tabular:
  - Populate data – coastal features should have some flooding/erosion.
  - Look at interps to check if accurate.
  - Populate data for beaches (SAMP)
- TSS:
  - Train RSS in coastal soils/hazards.
  - Sampling/RS techniques for collecting data (bathy/cores).

End / Questions?

"One should never be where one does not belong" B Dylan

Irene's Winds vs. Sandy's Winds



* Irene's winds were predominantly from the southeast

- Sandy's were mostly northeast except immediate south coast late Monday afternoon
- Difference between widespread damage vs. scattered shorter duration damage