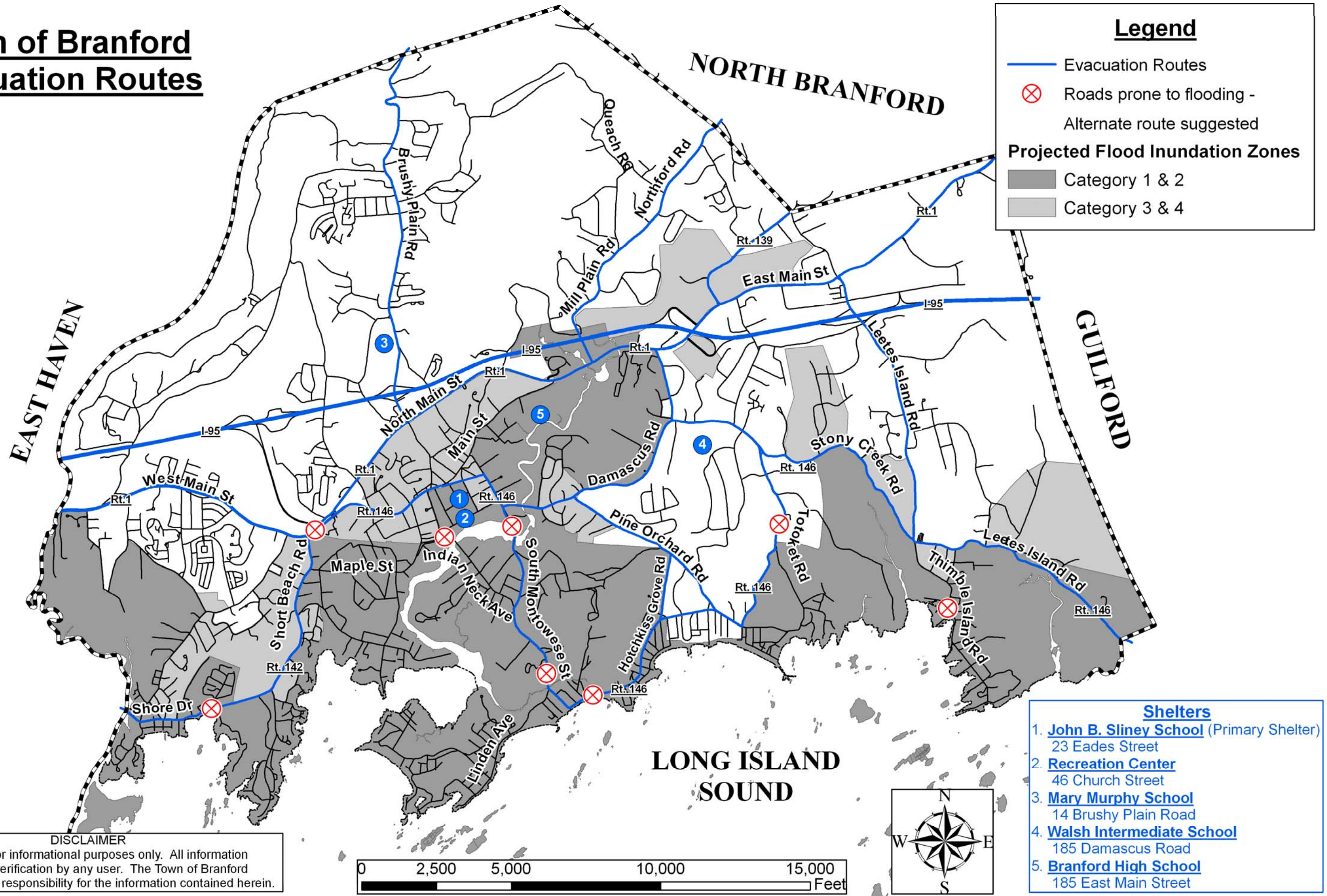
Appendix B

Examples of Maps and Figures
Used During Storm Events

Town of Branford
Evacuation Routes



Legend

- Evacuation Routes
- Roads prone to flooding - Alternate route suggested

Projected Flood Inundation Zones

- Category 1 & 2
- Category 3 & 4

Shelters

1. **John B. Sliney School** (Primary Shelter)
   23 Eades Street
2. **Recreation Center**
   46 Church Street
3. **Mary Murphy School**
   14 Brushy Plain Road
4. **Walsh Intermediate School**
   185 Damascus Road
5. **Branford High School**
   185 East Main Street

DISCLAIMER
This map is for informational purposes only. All information is subject to verification by any user. The Town of Branford assumes no legal responsibility for the information contained herein.

EVACUATION

Branford residents should be prepared to evacuate their homes, workplace, schools or any other location when notified by town officials to do so. Delays in evacuation could result in personal injury or becoming trapped in your vehicle.

It is most important that all Branford residents plan where they and their family (including elderly relatives living in the area) intend on evacuating to.

Whether you choose to evacuate out of the Branford area (to family, friend or hotel in another town) or to utilize a Branford operated shelter, families must pre-plan evacuation routes. When pre-planning evacuation routes, you must consider the following: (Map provided on reverse)

1. Plan a primary and secondary route using as many main thoroughfares as possible.
2. Plan primary and secondary routes to **all** of your sheltering options. Reminder—Branford officials may activate only the primary shelter (Sliney School) or others as needed.
3. Depending on the emergency (hurricane v. winter storm) different routes will be used depending on terrain (hills) and potential flooding (hurricanes).

HOW WILL YOU BE NOTIFIED?

Branford residents may be notified in a number of ways concerning evacuation areas and which shelters are open. They include:

⇒ Local news, (television and radio, BCTV-20)

⇒ NOAA Weather radio is the best means to receive storm info. Battery powered radios can be purchased in most electronic stores.

⇒ Police and Fire officials going door to door or broadcasting in neighborhoods

⇒ **A 2-3 min. constant blast** of local sirens indicates emergency information broadcasts via BCTV Channel 20

⇒ Branford Information Hotline at 315-3909

SHELTERS

It is well recognized that local, state and federal officials will develop community sheltering locations, however most families would prefer to shelter with family or friends outside of the affected area. It is recommended that the minimum distance away from Branford that your family should seek shelter is 15 miles. In the case of a hurricane, the location should be north of Long Island Sound. If this is the primary choice of your family, agreements with the hosting family or friends should be in place well in advance.

If you are unable to arrange for a sheltering location outside of Branford, you and you family may evacuate to a town operated shelter (listed below).

If needed, shelters are opened and operated with the assistance of the American Red Cross (ARC). It is important for all Branford residents to remember, **not all** shelters will be opened unless needed. Therefore, to determine which shelters are open, refer to the "HOW WILL YOU BE NOTIFIED?" guidelines.

BRANFORD SHELTER LOCATIONS

Primary Shelter	John B. Sliney School 23 Eades St (# 1 on Map)
Alternate Shelter	Branford Recreation Center 46 Church St. (#2 on Map)
Alternate Shelter	Mary T. Murphy School 14 Brushy Plain Rd. (#3 on Map)
Alternate Shelter	Walsh Intermediate School 185 Damascus Rd. (#4 on Map)
Alternate Shelter	Branford High School 185 East Main St. (#5 on Map)

What to Bring to Shelters?

☐ Sleeping bags, bed rolls and pillows
☐ Items in Disaster Kit including change of cloths
☐ Essential toiletries, towels, medications, etc.
☐ Games, cards, toys for children

What NOT to Bring to Shelters!

⦸ Pets or animals—Plan ahead for their care—Branford Animal Shelter 747 E. Main St.
⦸ Sick or injured persons requiring specialized care— medical facilities should be used.

FAMILY DISASTER PLAN

Where will you be when disaster strikes? How will you find each other? Families should be prepared for all hazards that could affect their area. Branford Office of Emergency Management urges all families to develop a family disaster plan.

☐ Develop an out-of-state contact that all family members can contact if separated.
☐ Determine evacuation routes
☐ Know shelter locations
☐ Make arraignments for pets
☐ Know how to shut off utilities
☐ Store 3 day supply of non-perishable food
☐ Store 3 gals. of water per day per person for a 3 day minimum.

FAMILY DISASTER KITS

Assemble kits in easy to carry packs or bags.

☐ Basic first aid kit
☐ Battery operated radio, flashlight & spare batteries.
☐ Copies of all important paperwork (insurance plans—deeds etc.)
☐ Prescription medications for 3 days
☐ Special items for infants, elderly or disabled family members.
☐ Credit cards, cash and spare car keys

WEATHER ADVISORIES

A ***TROPICAL STORM WATCH*** is issued whenever Tropical Storm conditions are *possible* in a specified area of the Watch, usually within 36 hours.

A ***TROPICAL STORM WARNING*** is issued whenever Tropical Storm conditions are *expected* in the specified area of the Warning, usually within 24 hours.

A ***HURRICANE WATCH*** is issued whenever Hurricane conditions are *possible* in the specified area of the Watch, usually within 36 hours. During a Hurricane Watch, prepare to take immediate action to protect your family and property in case a Hurricane Warning is issued.

A ***HURRICANE WARNING*** is issued whenever Hurricane conditions are *expected* in the specified area of the Warning, usually within 24 hours.

PREPAREDNESS

Because of its location, Branford is susceptible to a number of potential natural or manmade disasters. These include; hurricanes, winter storms, flash floods, tornados and hazardous material incidents.

Being prepared for emergencies is crucial when at home, work or school.

Disaster can strike quickly and without warning. It can force you to evacuate your neighborhood, workplace, school or can confine you to any one of these places. Although, local officials will be on the scene during and after a disaster, they cannot reach everyone right away. Therefore, the best way to insure your family's safety is to be prepared for a disaster.

This guide is intended to assist you with:

☐ Family planning information including developing Family Disaster Plans and Family Disaster Kits
☐ Developing safe evacuation plans and evacuation routes to all shelters
☐ Branford shelter locations and what items should be taken to shelters.
☐ How Branford residents will be notified when and where to evacuate
☐ Hurricane Advisory Information
☐ Other information sources

OTHER INFORMATION SOURCES

⇒ http://www.ready.gov
⇒ http://www.fema.gov
⇒ http://www.cdc.gov
⇒ http://www.ct.gov/demhs/
⇒ http://www.nhc.noaa.gov
⇒ http://www.weather.com
⇒ http://www.redcross.org
⇒ http://www.branford-ct.gov
⇒ http://www.branfordpolice.com
⇒ http://www.branfordfire.com

Place Postage Here

Town of Branford
1019 Main Street
Branford, Connecticut 06405

Message from
First Selectwoman Morris -

Dear Branford Resident: The information contained in this brochure is important to the health and safety of you and your family during the time of an emergency. Please take the time to review this brochure and keep it on hand for future reference.

Branford Office of Emergency Management
33 Laurel St. Branford, Connecticut

TOWN OF BRANFORD

EVACUATION & SHELTERING GUIDE

EMERGENCY MANAGEMENT

- Hydrants
- Fire Houses
- Road Centerline
- Buildings
- Pavement
- Railroads

N
W E
S

0 1,250 2,500 5,000 7,500 10,000
Feet

Map created by:
Danuta Szostek
GIS Analyst
Town of Branford
August 25, 2011

USING A MAP WHEN THE LIGHTS GO OUT

GIS and storm recovery

By Meghan McGaffin
mmcgaffin@ci.milford.ct.us
GIS Analyst, City of Milford CT

Milford Prepares

- The Police and Fire Departments set up Emergency Operation Centers
- 8 foot by 8 foot street map showing SLOSH data
- Assessor map tiles that cover coastal communities
- All EOC computer work stations were outfitted with links to ArcServer maps, ArcReader projects and an HTML dictionary pointing to relevant PDF maps stored locally on each hard drive
- Multiple data sources were provided

Irene Makes Landfall

Photo by **Jaci Kline source: http://jessakline.blogspot.com/2011/08/hurricane-irene-hits-milford-ct.html**

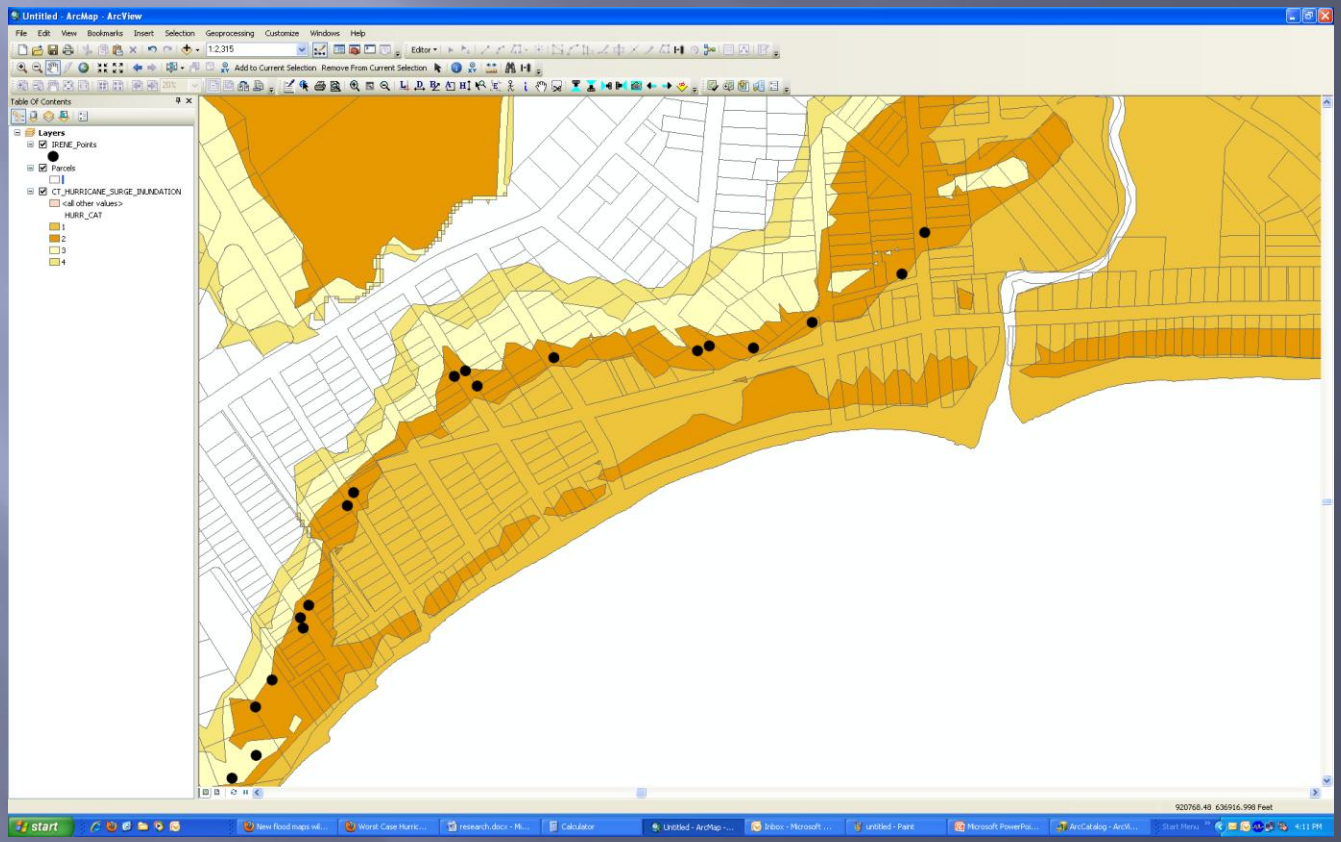
Irene Makes Landfall

Photo by **Jaci Kline source: http://jessakline.blogspot.com/2011/08/hurricane-irene-hits-milford-ct.html**

Photo uncredited, author unknown

Milford Hit By Irene

While Irene was categorized as a tropical storm, Milford tracked the edge of the salt burn. The resulting points over CT SLOSH* Data show this as equal to a Category 2, almost category 3 storm event.



*Worst case Hurricane Surge Inundation areas for category 1 through 4 hurricanes striking the coast of Connecticut. Hurricane surge values were developed by the National Hurricane Center using the SLOSH (Sea Lake and Overland Surge from Hurricanes) Model. This Surge Inundation layer was created by the U.S. Army Corps of Engineers, New England District. Using ArcInfo's Grid extension, LiDAR bare earth elevation data from both the State of Connecticut and FEMA was subtracted from the worst-case hurricane surge values to determine which areas could be expected to be inundated.

Local, Regional Statewide Problems

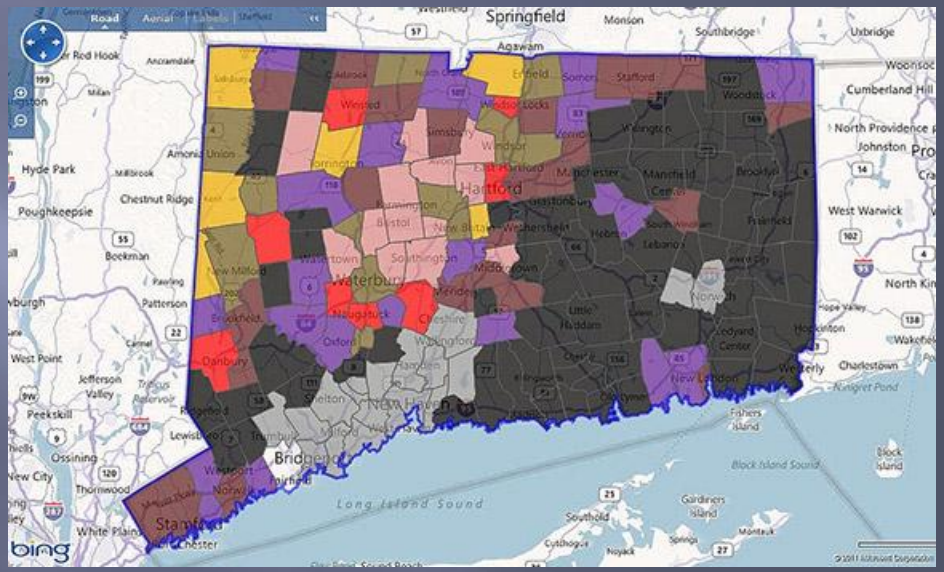
- The coast suffered the most significant damage during Irene
- Entire state suffered from power outages, flooding and wind damage
- Emergency response crews work around the clock

Source: *Irene deals heavy punch to Greater New Milford area* **The Greater New Milford Spectrum, Susan Tuz 08/31/11**

Source: http://blog.fema.gov/2011/09/connecticut-recovery-continues-from.html

Lights Out

UI Outage Map 09/01
Source: reptonyhwang.com



CLP Outage Map from 08/29. 765,000 customers lost power

GIS and Recovery

- Immediately after the storm Milford closed multiple streets. Our GIS Coordinator, John Hangen, was able to remote into the server from home and create street closure maps on demand.
- City Hall never lost power. Our server systems were temporarily shut down preventatively.
- Emergency Operation Centers in town relied on maps for pre-planning and recovery
- About 30% of the City lost power

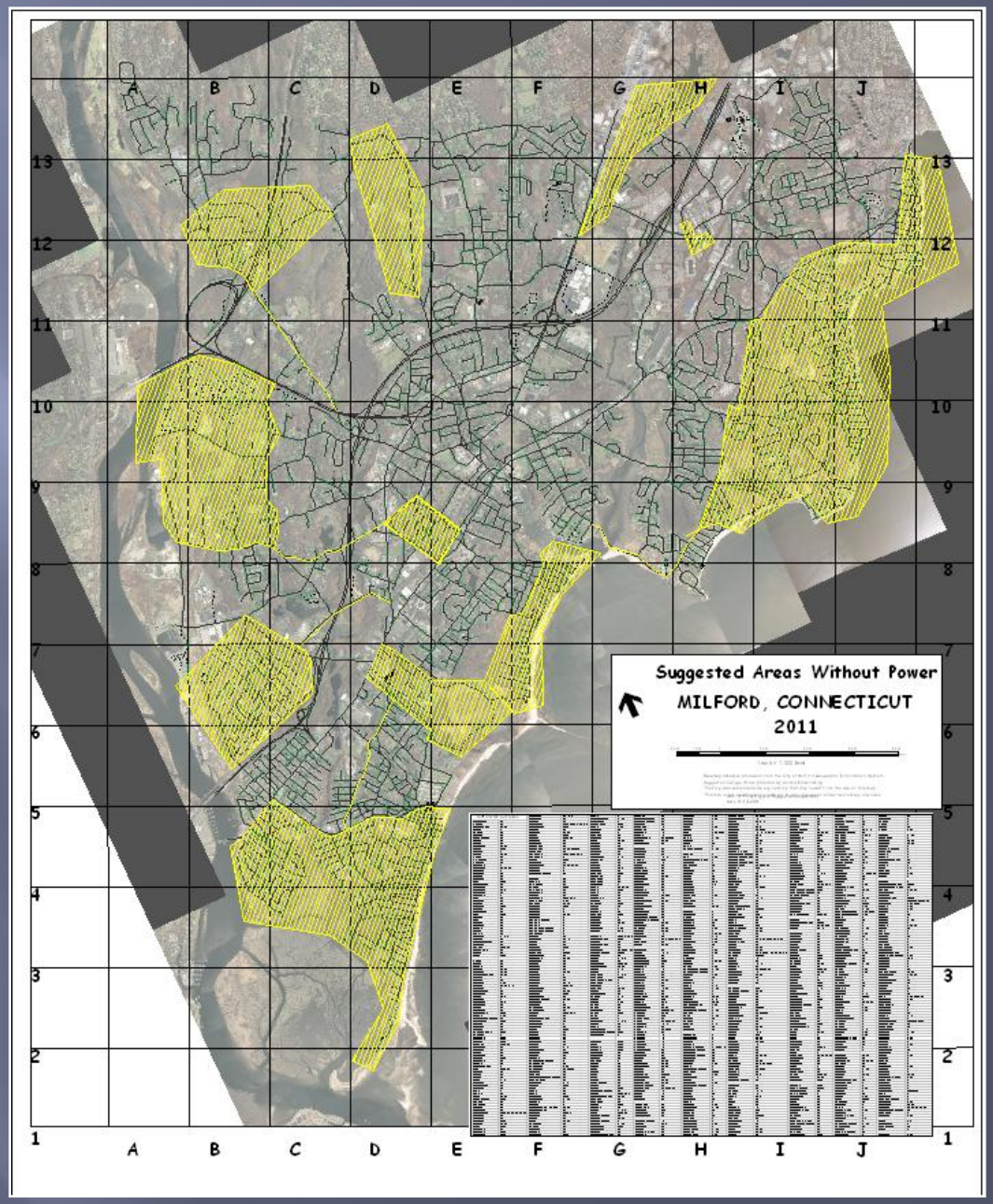
UI sent representatives to Milford to aid in the cleanup and the restoration of power

When asked to provide locations without power in the city areas in town were circled with a highlighter.

There was no specificity

These marks were digitized to give the town an idea of where power was out.

Comic Sans was used on purpose. Only time I ever used Comic Sans on a map.



Recovery cont'd

- After Irene , FEMA required the City of Milford to conduct a post survey of damaged structure and infrastructures. An assessment team was created and GIS was used to identify damage caused by the storm, structures , seawalls , piers, roadways and bridges – MFD Chief LaVecchia
- The Fire Department is conducting a review of flooded roadways and inaccessible areas of town for future pre-planning efforts

12" of Snow in October!?

- October 29 2011 a record setting snowfall ravages the state. Interior portions suffer massive blackouts, greater than Irene
- Trees laden with leaves and weakened from Irene cause significant damage
- Power is out for 13 days in portions of the state
- Utility companies come under fire for storm response

What about a "real" hurricane or ice?

- Irene called a tropical storm, yet storm surges hit category 2, almost cat 3 projections
- When a storm similar to '38 hits CT again we'll incur billions of dollars in damage and power will be out for a month*
- If a major ice storm hits this winter what will happen to people without heat and lights?

*_You Thought Irene Was Bad? A Category 3 Storm Would Devastate the Region_ Hartford Courant, Daniela Altimari 10/25/2011

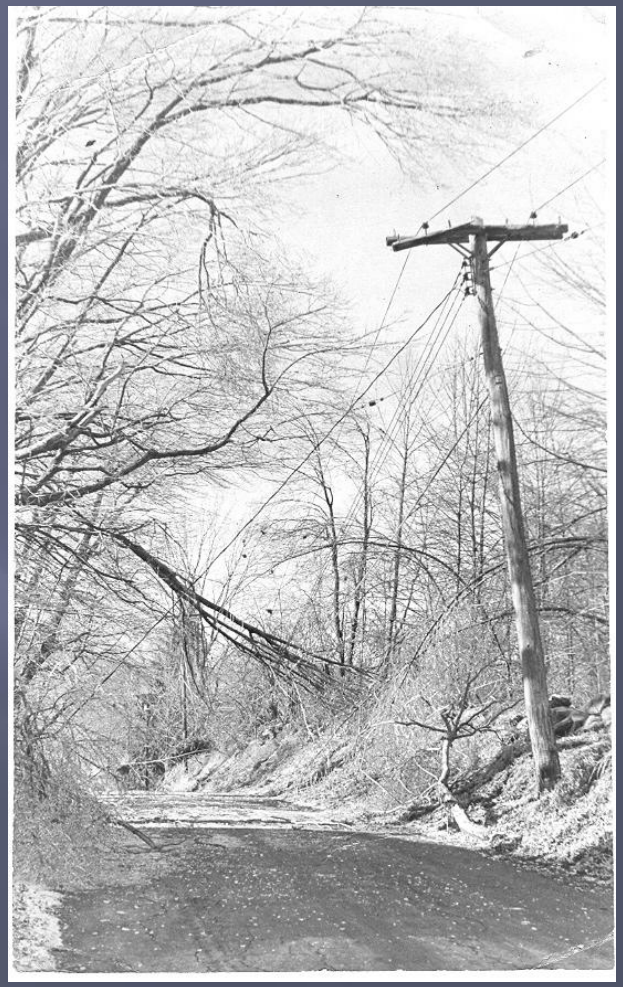


Photo taken by **Harold Hanka after 1973 ice storm in Hampton CT. Source: http://www.wili-am.com/ice.htm**

Data Sharing

- Let's imagine …
  - Power goes out
  - Smaller, rural towns have the GIS capabilities needed to effectively respond to their citizens
  - Utility companies supply an accurate list of customers without power by street
  - Street and building locations are accurate due to communication between utilities and towns
  - Poles with live power are mapped and handed to emergency responders
  - Downed live wire locations are sent via GPS to utilities
  - Towns can use their Code Red or equivalent systems to inform residents when their street is scheduled to be restored

But…

- Utility companies do not share pole data
- Utility companies do not share planimetric information with towns that aren't GIS-capable
- Utility companies do not (or can not) tell with specificity which portions of the service area are down

Why?

U.S. DEPARTMENT OF HOMELAND SECURITY
Homeland Security

What is the risk?

Rand Corporation published this monograph in 2004

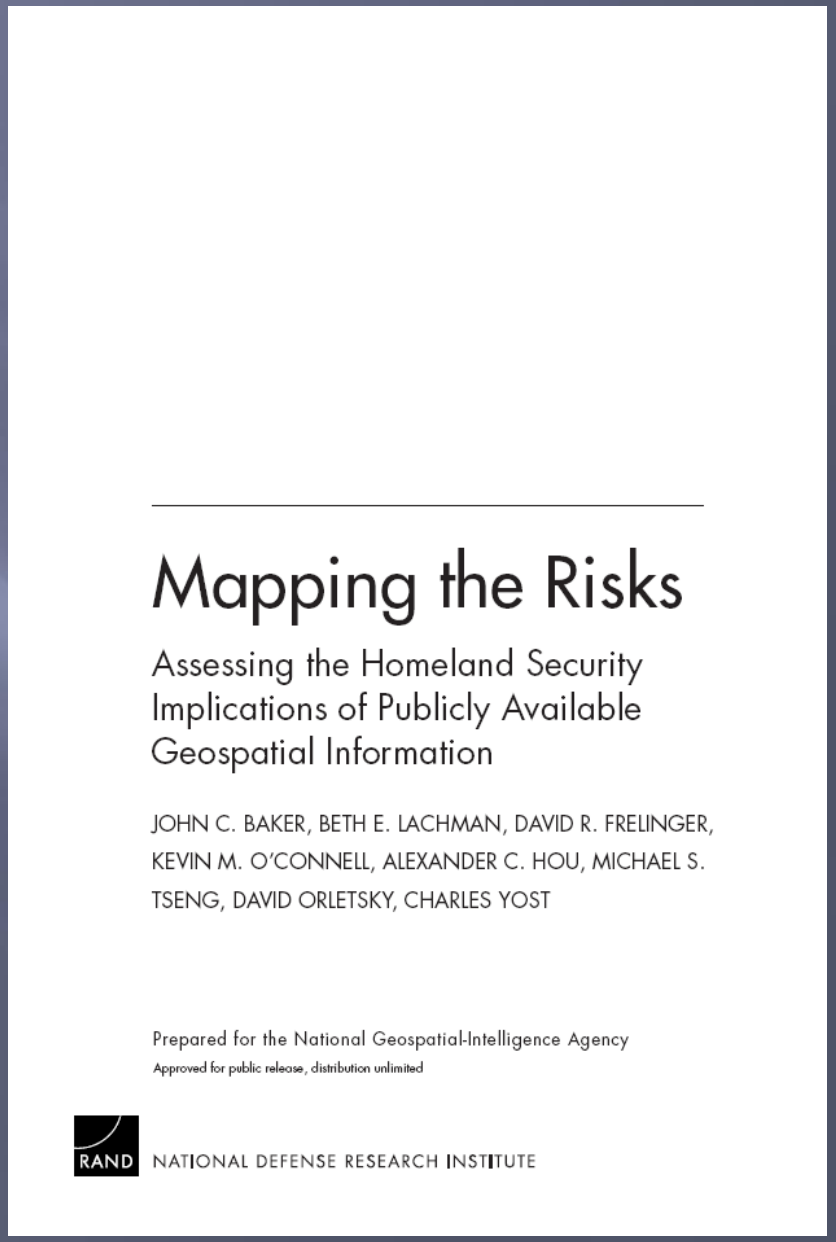
This report dealt with federally published data, not specific to utility companies

Key findings:

"Attackers have substantial flexibility in fulfilling their information needs for attacking U.S. homeland locations " 121/164

"As opportunistic attackers, terrorists usually possess the advantage of having access to diverse sources for meeting their mission critical information needs, as well as the freedom to adjust the attack to meet the amount of information available. " 121/164

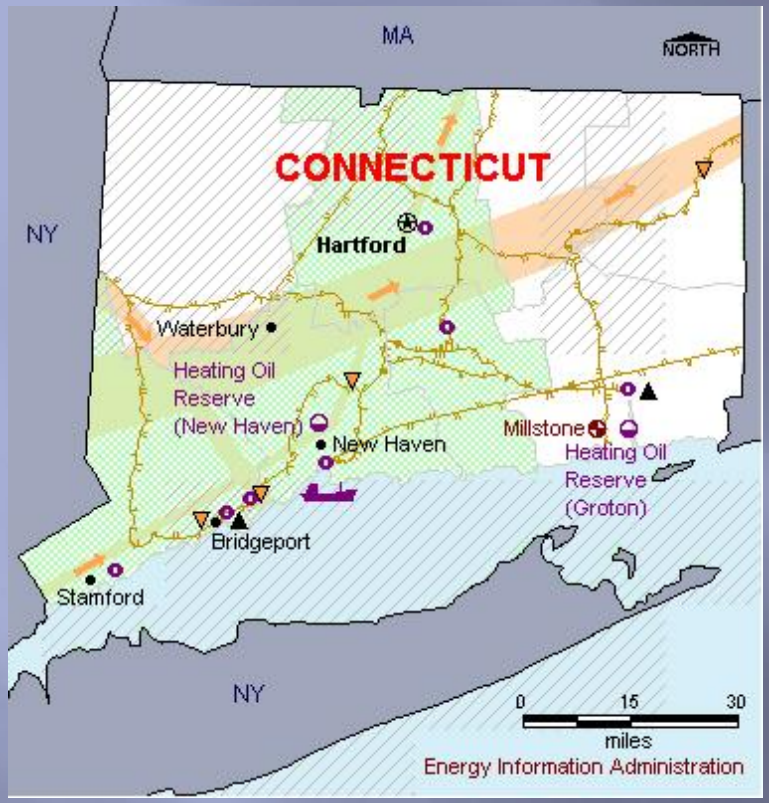
"Assessing the societal benefits and costs of restricting public access to geospatial information is not straightforward. " 126/168

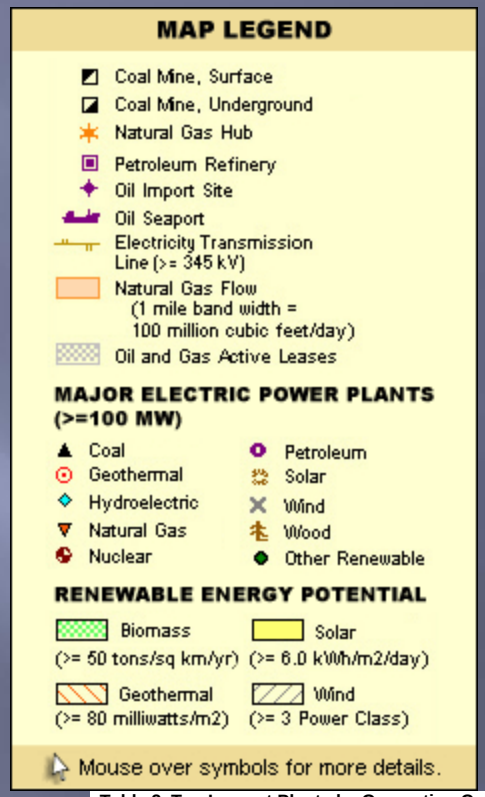


Homeland Security Presidential Directive-7

December 17, 2003

"4. Critical infrastructure and key resources provide the essential services that underpin American society. The Nation possesses numerous key resources, whose exploitation or destruction by terrorists could cause catastrophic health effects or mass casualties comparable to those from the use of a weapon of mass destruction, or could profoundly affect our national prestige and morale. In addition, there is critical infrastructure so vital that its incapacitation, exploitation, or destruction, through terrorist attack, could have a debilitating effect on security and economic well-being."





US Dept of Energy is 4th on the list of 17 Critical Infrastructure Sectors

Connecticut Quick Facts

- Two of the Nation's three Northeast Home Heating Oil Reserve sites, intended to cushion the effects of disruptions in the supply of home heating oil, are located in Groton and New Haven.
- The 2,037-megawatt Millstone nuclear power plant is the State's highest-capacity power plant.

US Department of Energy http://www.eia.gov/state/state-energy-profiles.cfm?sid=CT

Table 2. Ten Largest Plants by Generation Capacity, 2009

Plant	Primary Energy Source or Technology	Operating Company	Net Summer Capacity (MW)
Connecticut			
1. Millstone	Nuclear	Dominion Nuclear Conn Inc	2,103
2. Middletown	Gas	Middletown Power LLC	770
3. Lake Road Generating Plant	Gas	Lake Road Generating Co LP	745
4. Bridgeport Harbor	Coal	PSEG Power Connecticut LLC	532
5. Milford Power Project	Gas	Milford Power Co LLC	511
6. Montville Station	Petroleum	NRG Montville Operations Inc	496
7. Bridgeport Energy Project	Gas	Bridgeport Energy LLC	454
8. New Haven Harbor	Petroleum	PSEG Power Connecticut LLC	448
9. NRG Norwalk Harbor	Petroleum	Norwalk Power LLC	342
10. PPL Wallingford Energy LLC	Gas	PPL Wallingford Energy LLC	190

MW = Megawatt.
Source: U.S. Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

Um..

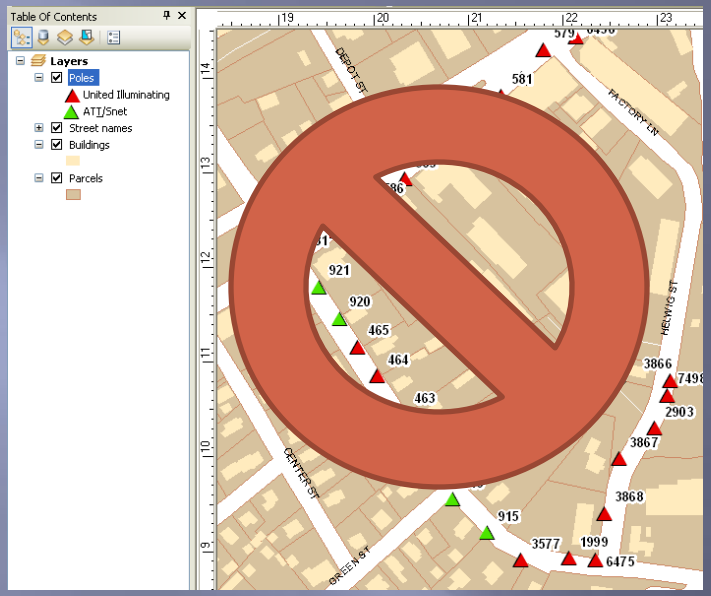


Table Of Contents
Layers
Poles
United Illuminating
AT&T/Snet
Street names
Buildings
Parcels
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FACTORY LN
HEWITT ST
CENTER ST
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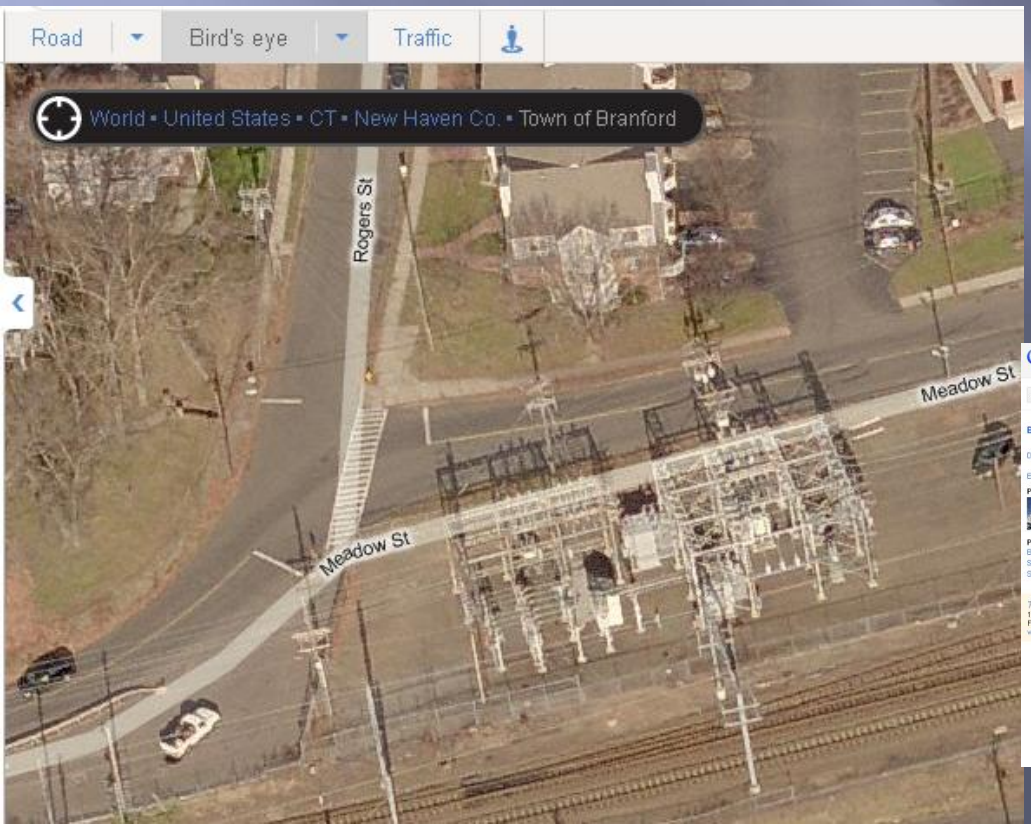
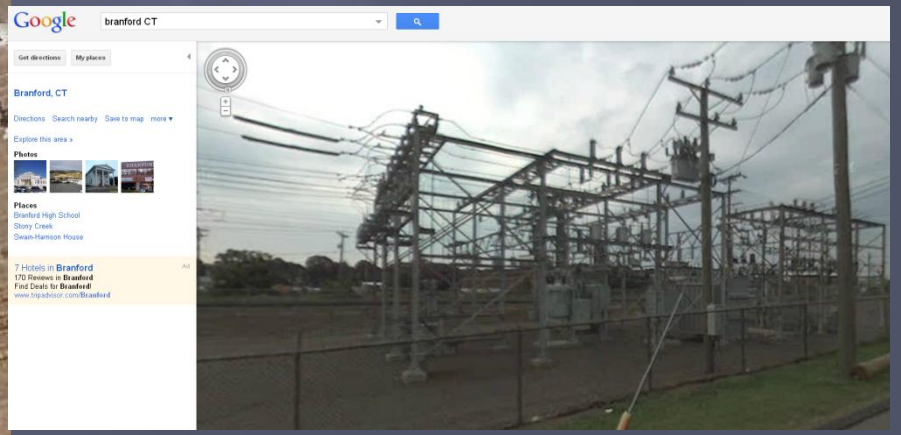

Road
Bird's eye
Traffic
World • United States • CT • New Haven Co. • Town of Branford
Rogers St
Meadow St
Meadow St


Google
branford CT
Branford, CT
Directions
Search nearby
Save to map
Photos
Places
Branford High School
Stony Creek
Swain-Harrison House
7 Hotels in Branford

Municipal Officials Air Concerns Over CL&P's Response

by Christine Stuart | Nov 15, 2011

At one point, feeling pretty much on their own with little help from CL&P, Tolland's public work crews went out and assessed the damage and overlaid that damage on a GIS map which it gave to CL&P, Werbner said.

The CL&P municipal liaison told Werbner the mapping information has never been provided before.

"I can't believe that little Tolland is providing information that the utility can not provide to us in terms of the assessment and charting that on a GIS map," Werbner said

Somers First Selectwoman Lisa Pellegrini said her crews did something similar. They went out and counted the 28 damaged transformers and 116 utility poles and gave CL&P the information about where each was located. She said the CL&P's liaison told her the information was fabulous and no town has done that before.

http://www.ctnewsjunkie.com/ctnj.php/archives/entry/storm_concerns_over_clps_response_amplified_by_municipal_officials/

Actions

- Inventory downed trees
- Identify locations where wires are live or not
- Find alternate access
- Community communication
- Track repair efforts
- Overlay wire data on tree cover

Tools

- GPS-enabled smartphones to take photos
- One stop ArcGIS for Server/ArcGIS online application
- Google Doc spreadsheet
- Have towns and utilities use the same GIS data sets

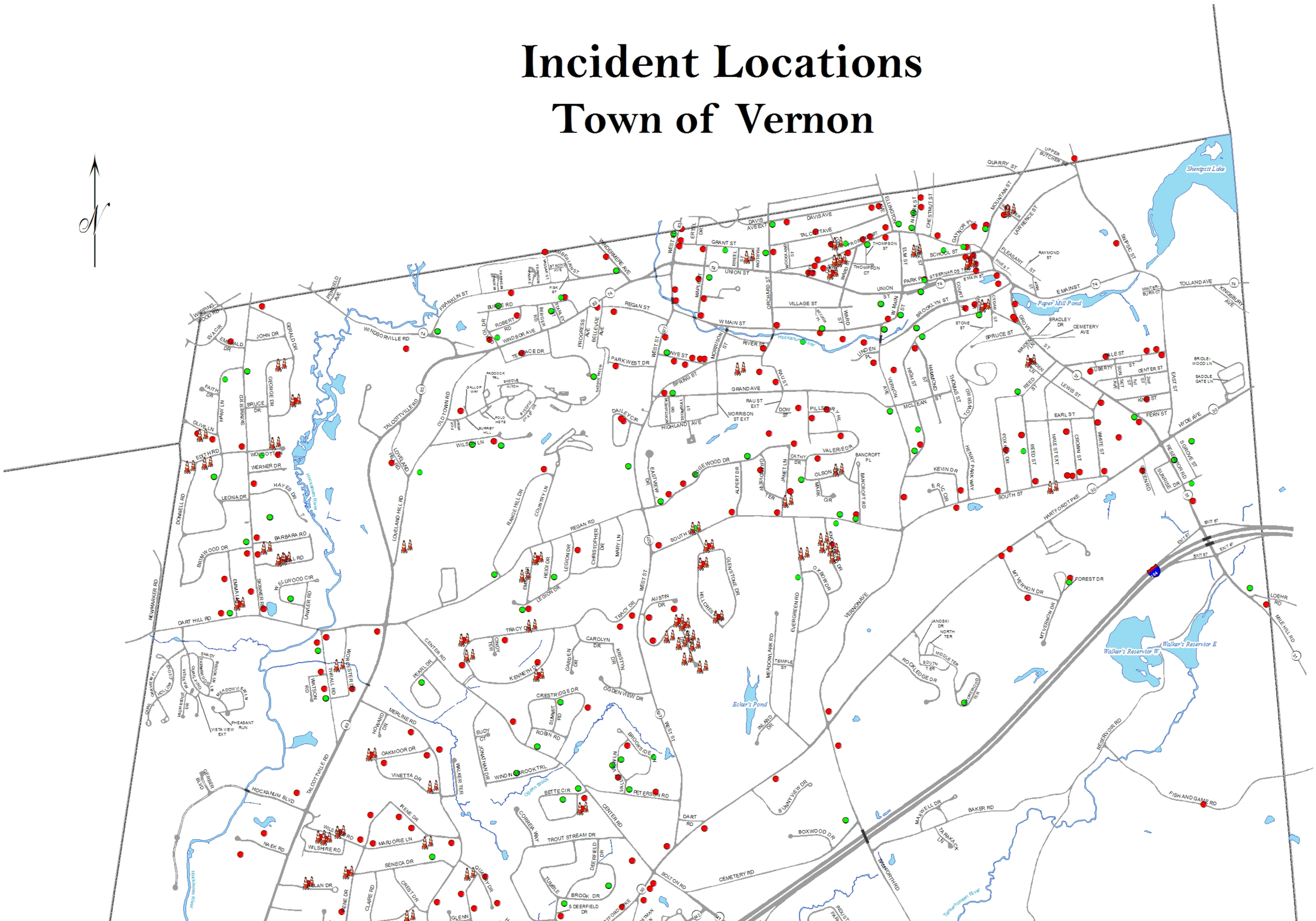
Where Do We Go From Here?

- Panels are questioning utility companies right now in the hopes to make recommendations in January
- To "reduce barriers regarding data sharing; set reasonable data deliverable dates" for critical infrastructure is one recommendation by the CT GIS Data Inventory and Assessment Group http://www.ct.gov/gis/lib/gis/ct_geographic_framework_data_-_1-3-11.pdf
- We need a direct conversation – how can the GIS community help? We have ideas!

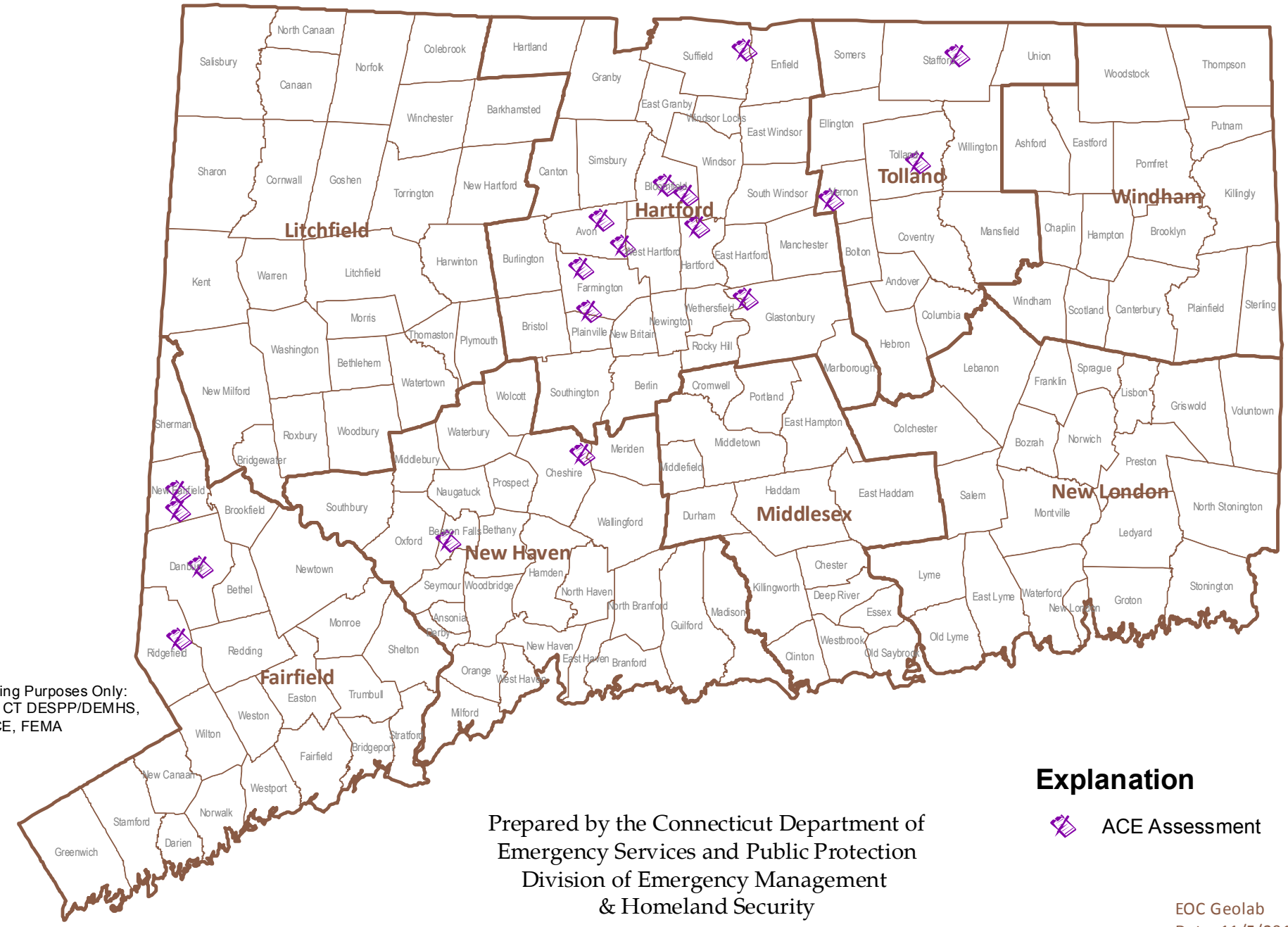
Ideas

- Utility companies provide above-ground infrastructure spatial data without transmission or capacity attributes, planimetric data and aerial photography to all towns
- Towns review and share planimetric data
- Town GIS personnel, emergency responders utilities management and line crew chiefs work with RPO's on storm pre-planning
- Create a method to share information on down wire status – smartphones, google maps, google docs, ArcGIS Online

Incident Locations
Town of Vernon



ASSESSED FACILITIES AS OF 1200 HOURS • 11/5/2011



For Planning Purposes Only:
Sources: CT DESPP/DEMHS, DEEP, ACE, FEMA

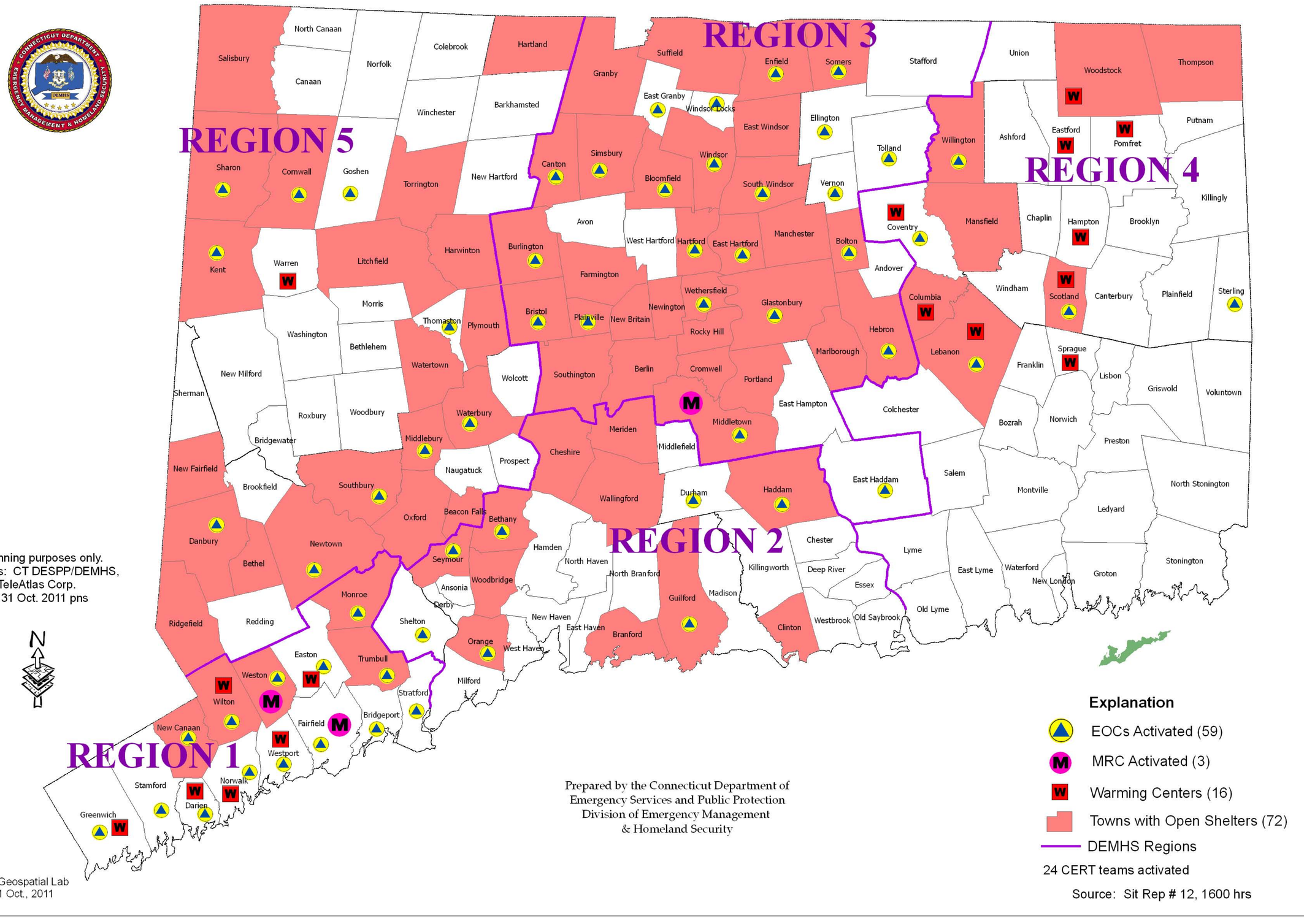
Prepared by the Connecticut Department of Emergency Services and Public Protection
Division of Emergency Management & Homeland Security

Explanation

ACE Assessment

EOC Geolab
Date: 11/5/2011
Time: 10:45:56 AM

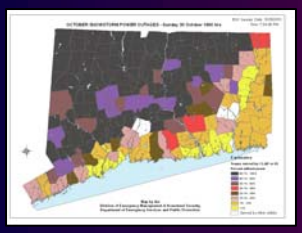
Situation Update - 31 October, 2011 1600 hrs



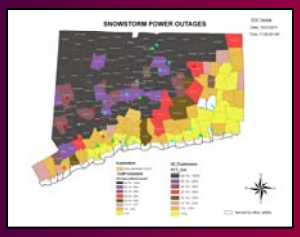
October Snowstorm

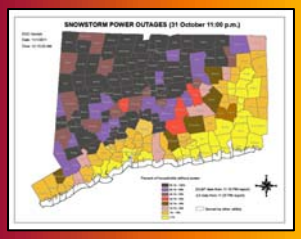
Tracking The Power Outages

By CT National Guard
JOC GIS
Geolab State EOC GIS



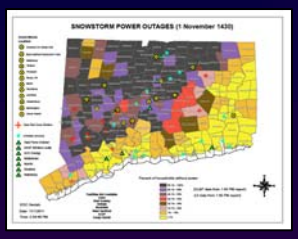
30 OCT

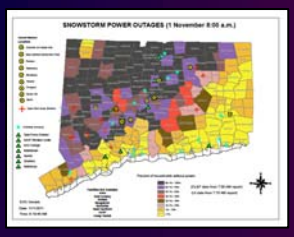




31 OCT

POWER OUTAGES





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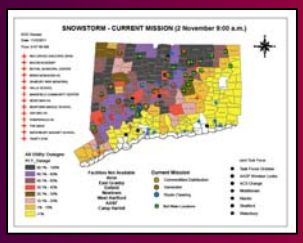
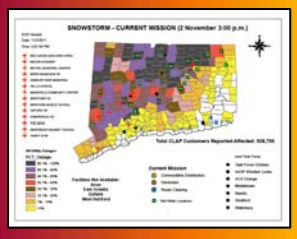
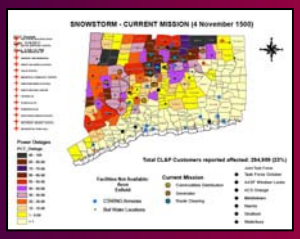
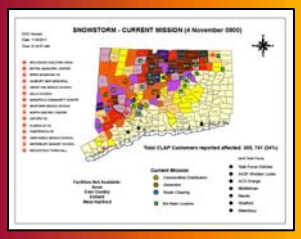




2 NOV

3 NOV





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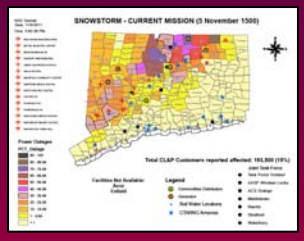
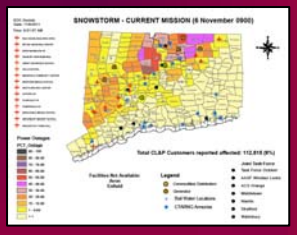
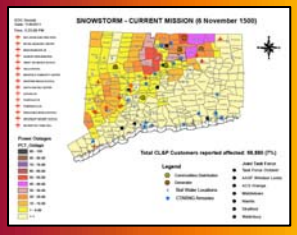
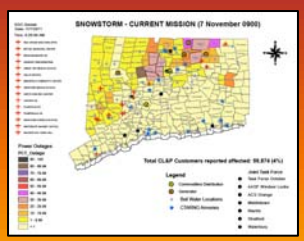


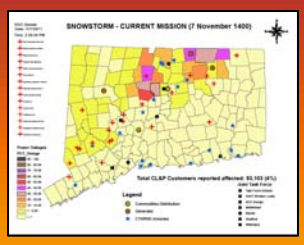
5 NOV



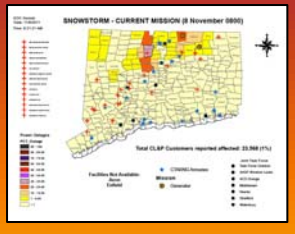


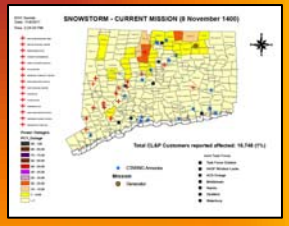
6 NOV





7 NOV





8 NOV

Governor's Two-Storm Panel: Tropical Storm Irene and the October Nor'easter

Geographic Information Systems at CL&P

November 30, 2011

Ken Bowes – Vice President Energy Delivery Services

Topics for Today's Presentation

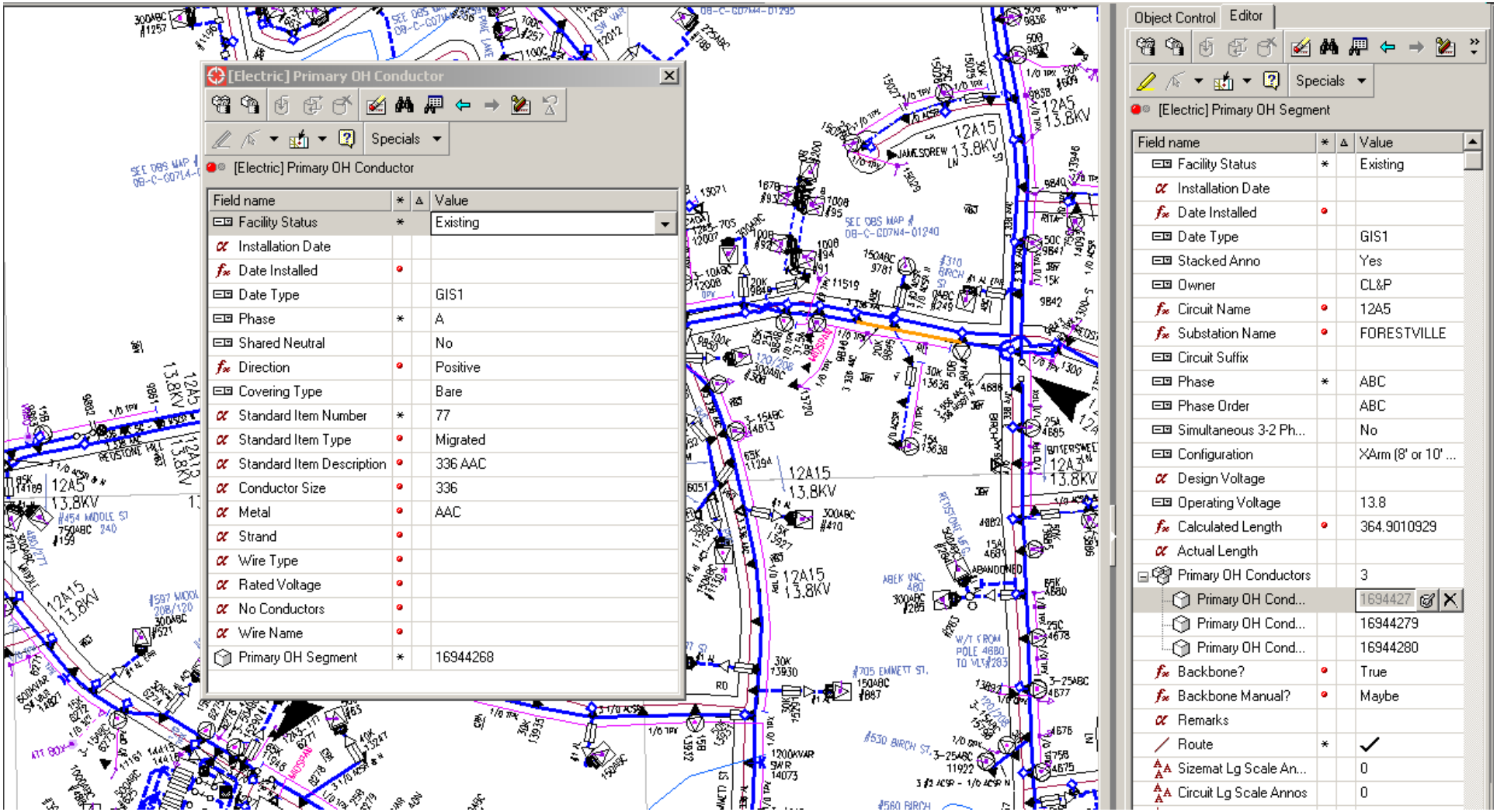
- How CL&P uses Geographic Information Systems (GIS)
- Types of Information Useful for CL&P during Storm Events
- Process to obtain GIS data – Establish a GIS Users Group

How CL&P uses GIS – More than an Asset Registry

- GIS information is the basis for the electric operating model used at CL&P
  - Electrical circuits are displayed on a geographic base map
  - Poles, wires, fuses, circuit breakers (field reclosers) are identified
  - Electric switching is performed using this operating model – including automatic operations and human initiated switching
- This electric operating model feeds the Outage Management System ---> identifies which customers are impacted by an outage ---> feeds the town outage map
- The Outage Management System is connected to our Call Center and the Customer Information System → information passes between the systems

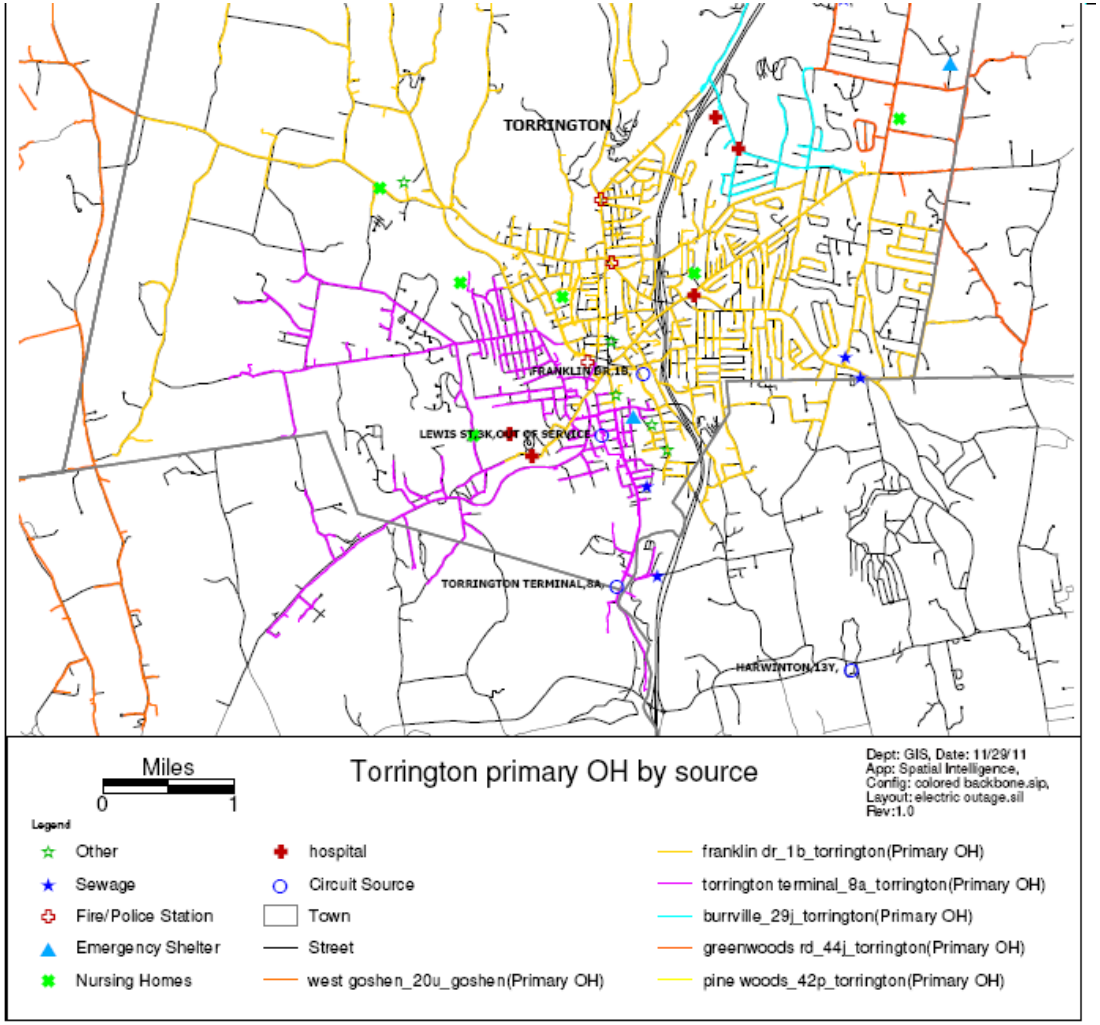
How CL&P uses GIS – More than an Asset Registry

- GIS data and map example



How CL&P uses GIS – More than an Asset Registry

- Possible future use of GIS for Towns



Types of Information Useful for CL&P during Storm Events

- Roads Closed - Trees Blocking Roads
- Wires Down
  - Electric
  - Telco
  - CATV
- Broken Poles
- Transformers on ground

Process to obtain GIS data – Establish a GIS Users Group

- CL&P would welcome the opportunity to participate in a User's Group to define the GIS data requirements and process to gather damage assessment information
- CL&P's data needs are probably a small subset of what GIS could provide during emergencies, but GIS could provide useful information to towns and our customers during the restoration process:
  - Road Closures
  - Trees blocking roads
  - Damage Assessment Information for Electric Infrastructure
  - Town Restoration Priority Locations
  - Areas of Daily Restoration Activity
  - Coordination with Other Utilities
  - Crew Locations

Questions

Approximate Locations of Declared Mandatory Municipal Evacuation Zones

As of 5:47 PM Sat 8/27/11

0 5 Miles

N

Woonsocket
Cumberland
Burrillville
North Smithfield
Smithfield
Glocester
Lincoln
Central Falls
Pawtucket
Johnston
North Providence
East Providence
Foster
Scituate
Cranston
Barrington
Warren
Warwick
Bristol
Coventry
West Warwick
East Greenwich
West Greenwich
Tiverton
North Kingstown
Portsmouth
Exeter
Hopkinton
Richmond
Middletown
Little Compton
Jamestown
Newport
South Kingstown
Narragansett
Charlestown
Westerly
New Shoreham

mandatory evacuation declared
mandatory evacuation under consideration
mandatory evacuation not declared

Notes / Clarifications:

Charlestown:
VOLUNTARY evacuation from Rt 1A South to water/beach front residences.
Mandatory evacuation for residences on beach or pond waterfront.

Coventry:
Mandatory evacuations for mobile homes and campgrounds.

Jamestown:
Fort Getty under mandatory evacuation, remaining evacuation area area may be smaller than that indicated on map.

Portsmouth:
Mandatory evacuation area along the coastline may not be as far inland as indicated on map.

Warwick:
VOLUNTARY evacuation of Conimicut Point, from Waverly Street area south to Mill Cove, and Oakland Beach area from Suburban Parkway to the seawall.

Westerly:
Uncertain if mandatory evacuation in place along Pawcatuck River.

Daily Shelter Report of Shelter Populations

As of 12:00 AM & 9:00 AM Sun 8/28/11

0 1 2 4 6 8 10 Miles

N
W E
S

CUMBERLAND HIGH
28AUG0000: 2
28AUG0900: 2

NORTH SMITHFIELD MID
28AUG0000: 0
28AUG0900: 5

JENKS JR HIGH SCH
28AUG0000: 6
28AUG0900: 21

E PROV SENIOR CTR
28AUG0000: 1
28AUG0900: 1

CRANSTON SR. CENTER
28AUG0000: 0
28AUG0900: 0

PRIMROSE HILL ELE
28AUG0000: 4
28AUG0900: 4

KICKEMUIT MIDDLE
28AUG0000: 70
28AUG0900: 75

WARWICK VETS MEM HS
28AUG0000: 0
28AUG0900: 0

COVENTRY HIGH SCHOOL
28AUG0000: 20
28AUG0900: 20

FRANKLIN COURT
28AUG0000: 0
28AUG0900: 0

TIVERTON MIDDLE
28AUG0000: 4
28AUG0900: 4

WICKFORD MIDDLE SCHL
28AUG0000: 7
28AUG0900: 2

PORTSMOUTH MIDDLE
28AUG0000: 3
28AUG0900: 3

JOSEPH H GAUDET
28AUG0000: 39
28AUG0900: 20

NARRAGANSETT HIGH
28AUG0000: 3
28AUG0900: 33

SOUTH KINGSTOWN HIGH
28AUG0000: 0
28AUG0900: 15

WESTERLY SR CENTER
28AUG0000: 17
28AUG0900: 17

Burrillville, Woonsocket, North Smithfield, Cumberland, Glocester, Smithfield, Lincoln, Central Falls, North Providence, Pawtucket, Providence, East Providence, Johnston, Foster, Scituate, Cranston, West Warwick, Warwick, Barrington, Warren, Bristol, Coventry, West Greenwich, East Greenwich, Exeter, Hopkinton, Richmond, North Kingstown, Tiverton, Portsmouth, Middletown, Little Compton, Jamestown, Newport, South Kingstown, Narragansett, Charlestown, Westerly, New Shoreham

State	mandatory evacuation declared
Community	mandatory evacuation under consideration
Overflow	mandatory evacuation not declared

Notes / Clarifications:

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VOLUNTARY evacuation from Rt 1A South to water/beach front residences.
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RHODE ISLAND EMERGENCY MANAGEMENT AGENCY 1996

RIGIS