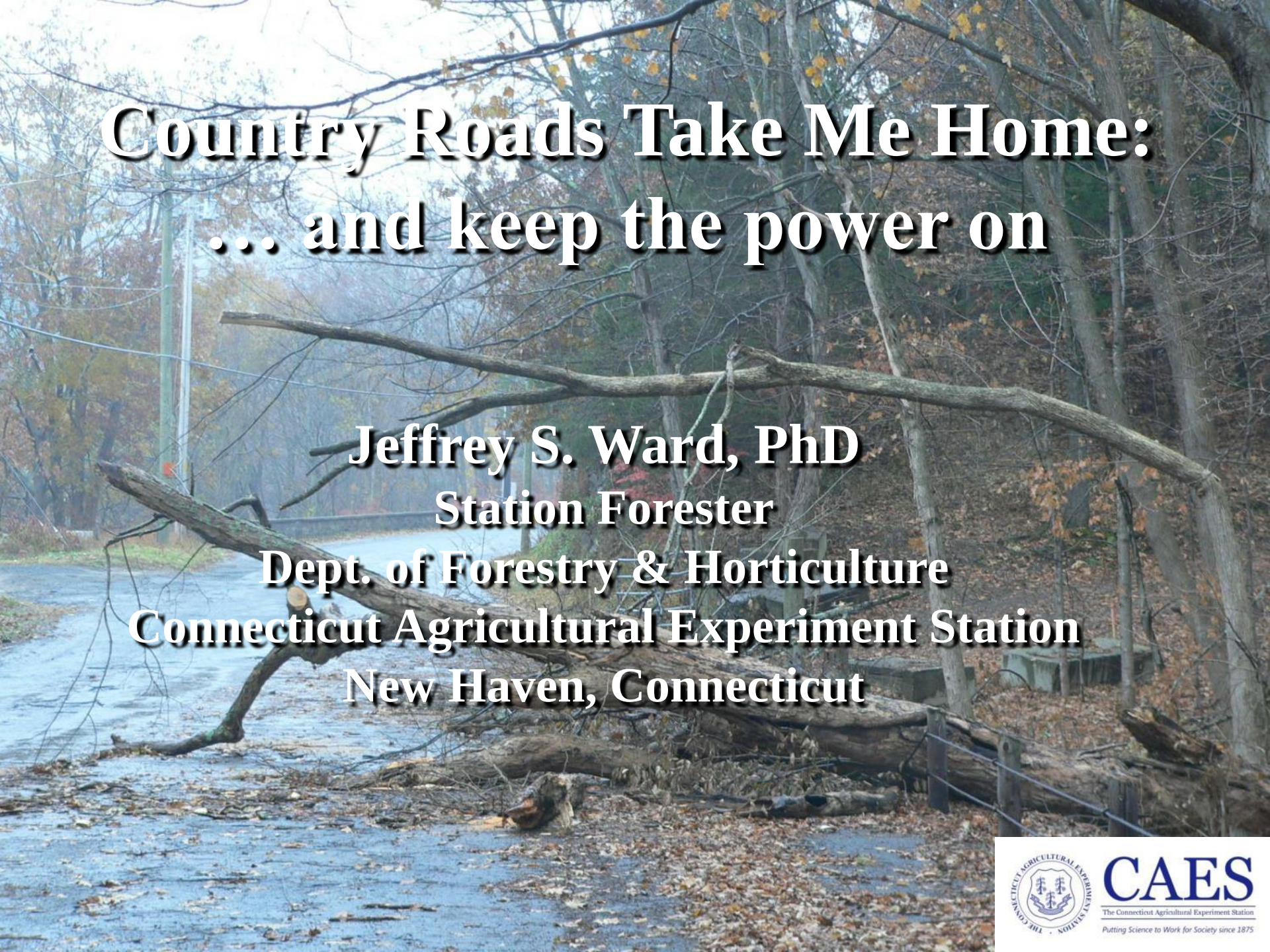

Country Roads Take Me Home: … and keep the power on

Jeffrey S. Ward, PhD
Station Forester
Dept. of Forestry & Horticulture
Connecticut Agricultural Experiment Station
New Haven, Connecticut

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STATE VEGETATION MANAGEMENT TASK FORCE – FINAL REPORT

“Connecticut has the distinction of being the 5th most forested state in the nation (72.6%), and leads the nation in the forest cover found in our urban areas (67.4%).”

“… approximately 36% of Connecticut’s roads – 7,600 of all 21,000 miles – cross landscapes that would be considered forested landscapes in the traditional, rural sense.”

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Tropical storm Irene (2011 Aug) - NOAA

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Wind damage

Hurricane 1938

Wind wrecked trees, Northford, Sept 1919

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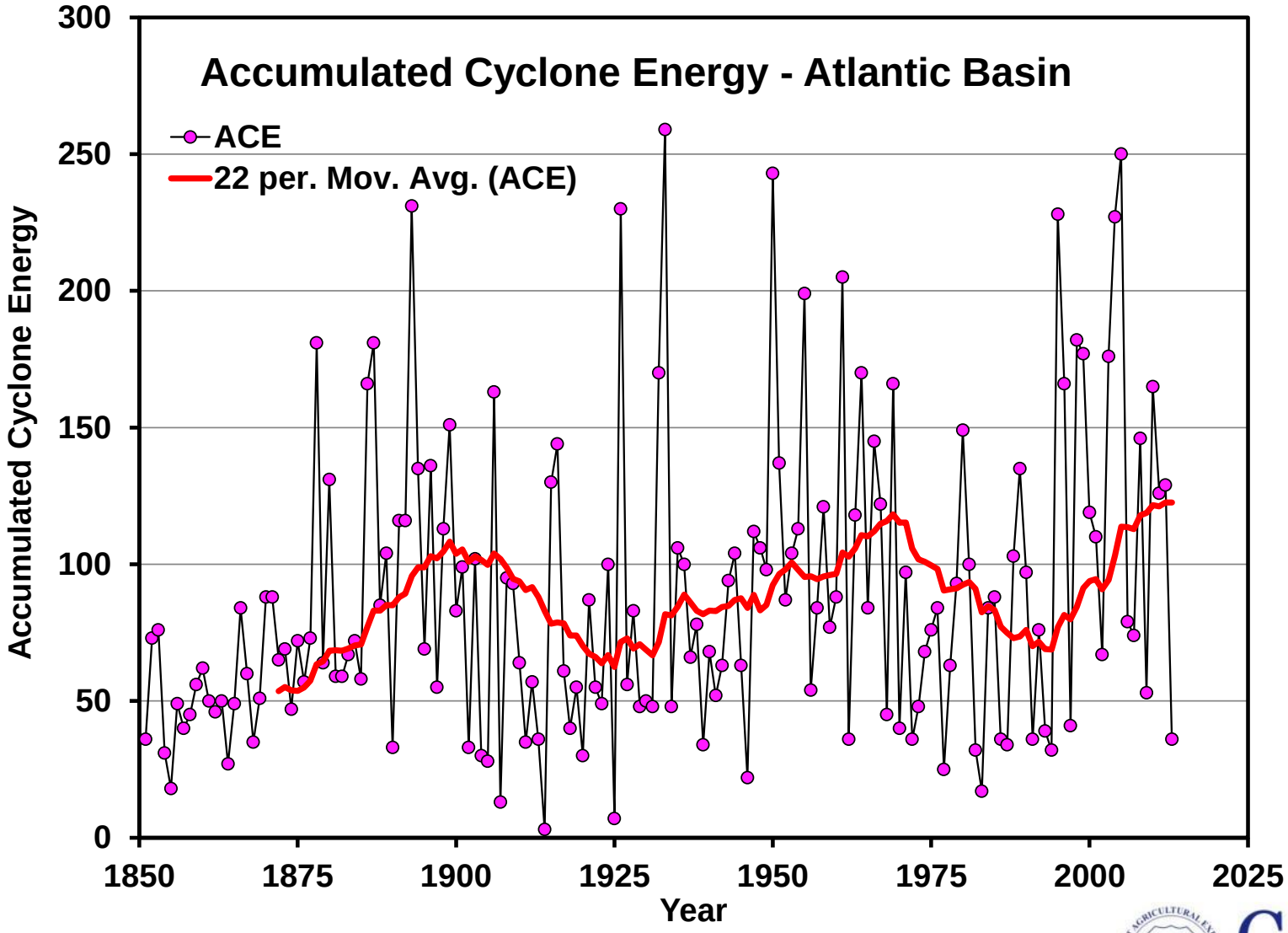
Hurricane energy in the Atlantic



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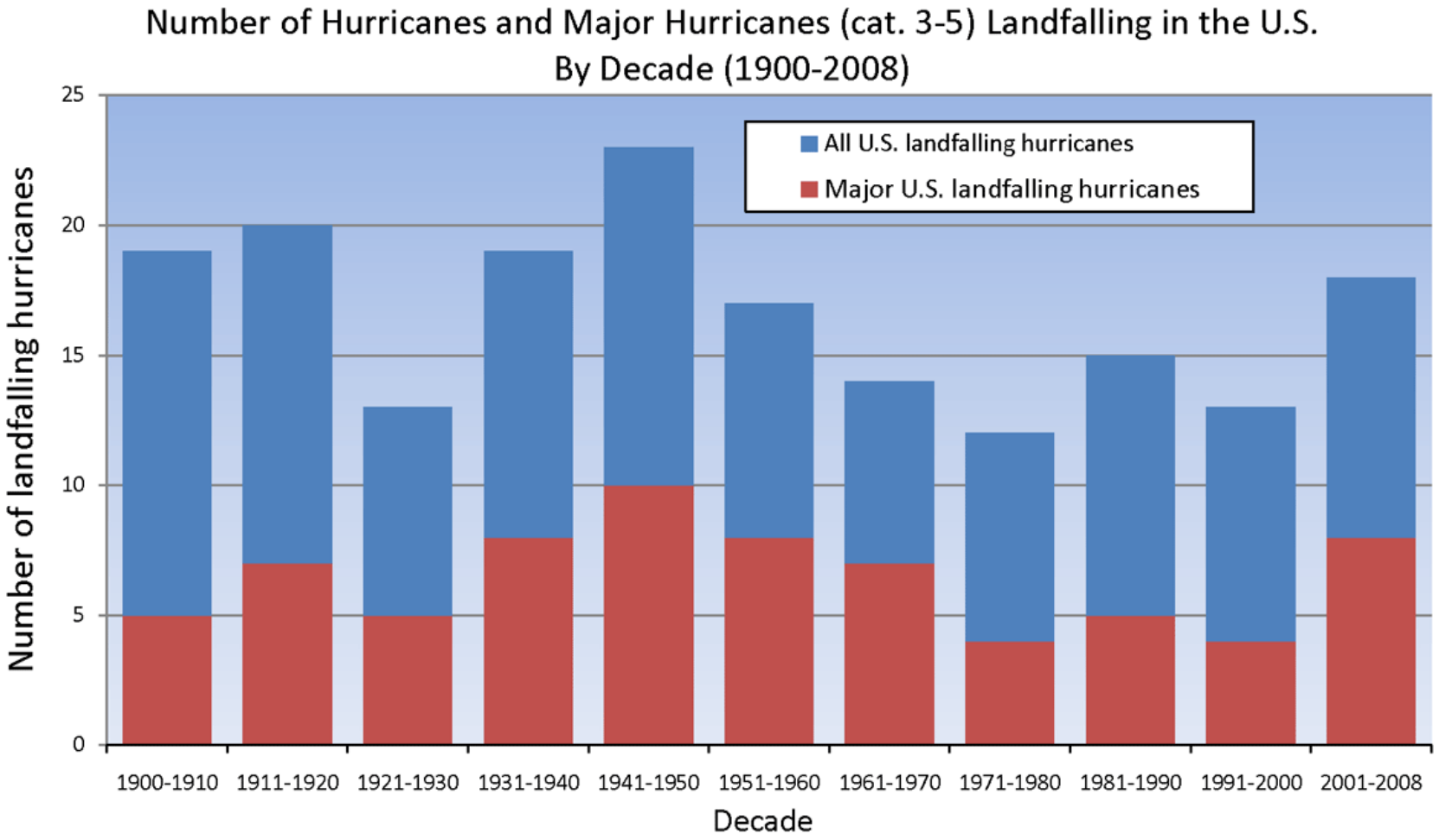

http://www.ncdc.noaa.gov/oa/climate/research/hurricane-climatology.html

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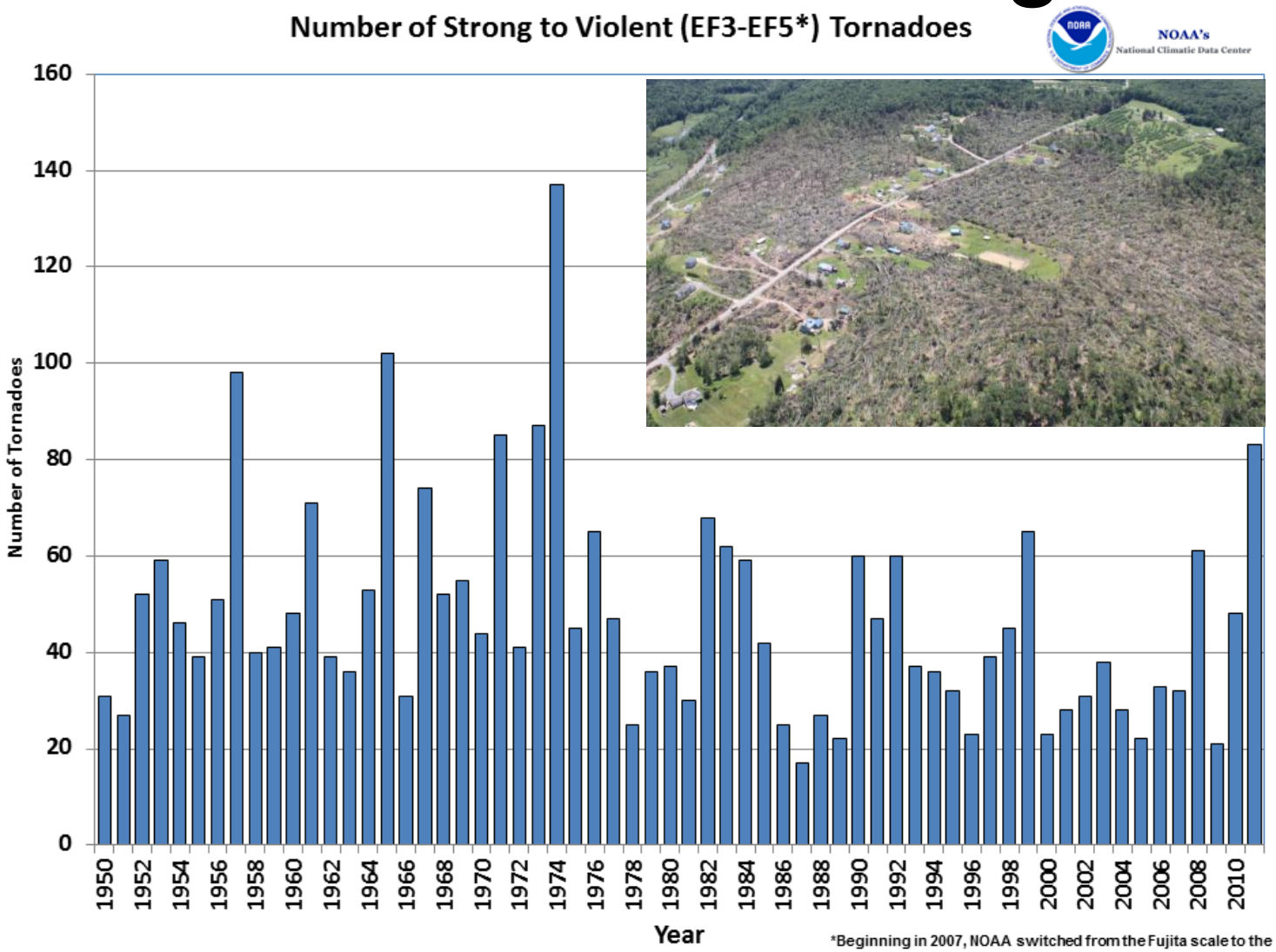
Tornado damage



http://www.ncdc.noaa.gov/oa/climate/severeweather/tornadoes.html#history

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Ice storm damage

Ice storm (1921 Nov),
Ream Place, Thompson

USDA Forest Service

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Urban Tree Problems

Bridgeport – ricane Irene (August 2011)
Source: Connecti ost

Blo eld – A mn snowstorm (Octo 01
Source: n, Hartford Courant

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“Stormwise”

An innovative approach to forest stewardship, public outreach and stakeholder collaboration at the landscape scale.

Audubon Connecticut

Patrick Comins

Connecticut Agricultural Experiment Station

Jeffrey Ward

University of Connecticut

Thomas Worthley, John C. Volin, Mark Rudnicki and Robert Ricard

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University of Connecticut
COOPERATIVE EXTENSION SYSTEM

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Connecticut Light & Power
A Northeast Utilities Company

UCONN
COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

Audubon CONNECTICUT

CONNECTICUT ENERGY ENVIRONMENT

THE WHITE MEMORIAL FOUNDATION, INCORPORATED 1913

TOWN of MANCHESTER CONNECTICUT SEAL 1823

ConnecticutWater

CONNECTICUT Forest & Park ASSOCIATION

FOREST SERVICE U S DEPARTMENT OF AGRICULTURE

“Stormwise” Objectives

- **Develop protocols for integrating arboricultural and silvicultural techniques**.
- Monitor tree, stand, and biodiversity changes in “Stormwise” treated forests relative to adjacent untreated stands.
- Develop product marketing strategies for wood products derived from "Stormwise" treatments.
- Monitor disruptions to utility lines and roads caused by severe weather at treated and non-treated locations.

No management zone (~100 ft)

Except for utility line pruning

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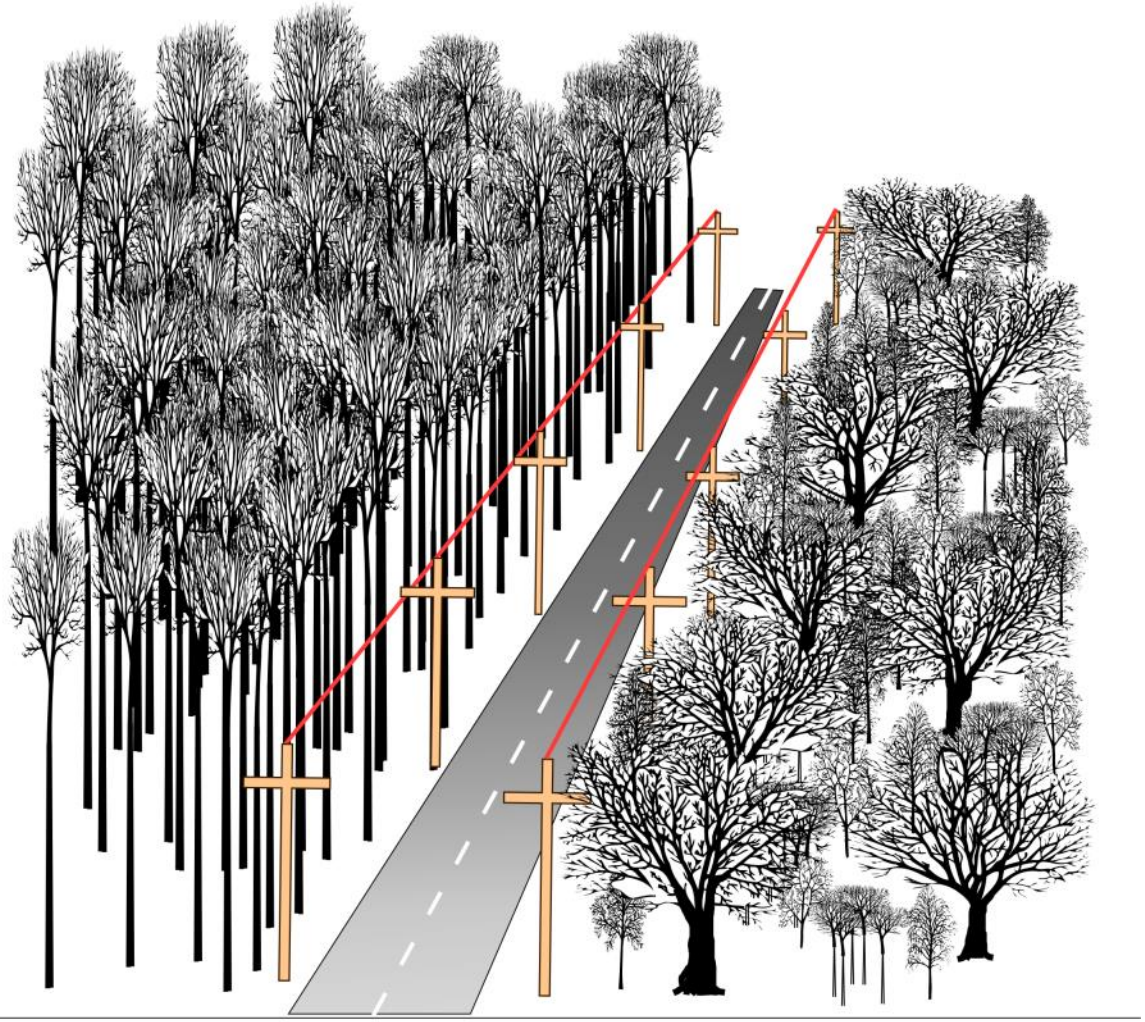


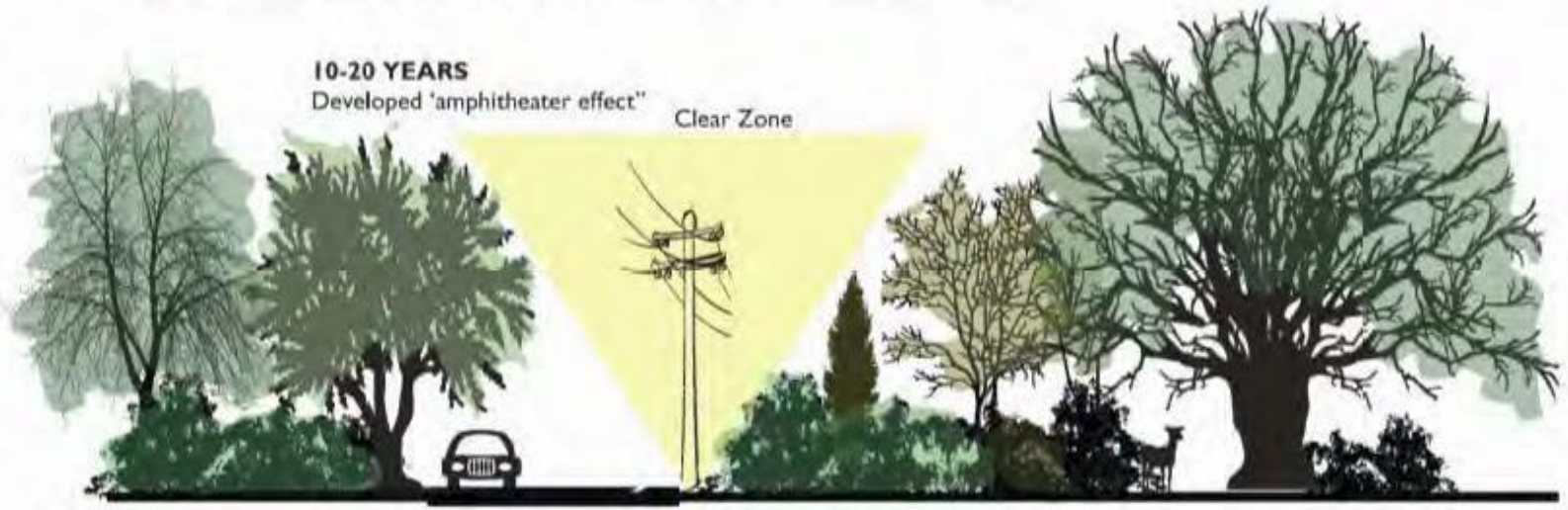
Unmanaged road-side forest with tall trees susceptible to storm damage.

"Storm-resistant" forest of windfirm trees that are wide rather than tall.

Note: utilities are shown on both sides of the street for illustrative purposes

A typical road surrounded by forested land—the branches overarch the roadway and interfere with existing utility lines. Trees are crowded and growing together with narrow silhouettes and small root balls—creating unstable trees along the road opening.

Graphics: Kimberly Barbieri



Further selective clearing over time allows large well rooted and larger canopy trees to develop. A hierarchy of shrubs, understory trees and shade trees are permitted to grow surrounding the roadway maintaining an aesthetic and attractive area surrounding the road without posing any threat to property, or services.

THE PROGRESSIVE DEVELOPMENT OF THE FUTURE ROADSIDE FORE

An illustration of a thin slice of a sample suburban/rural road

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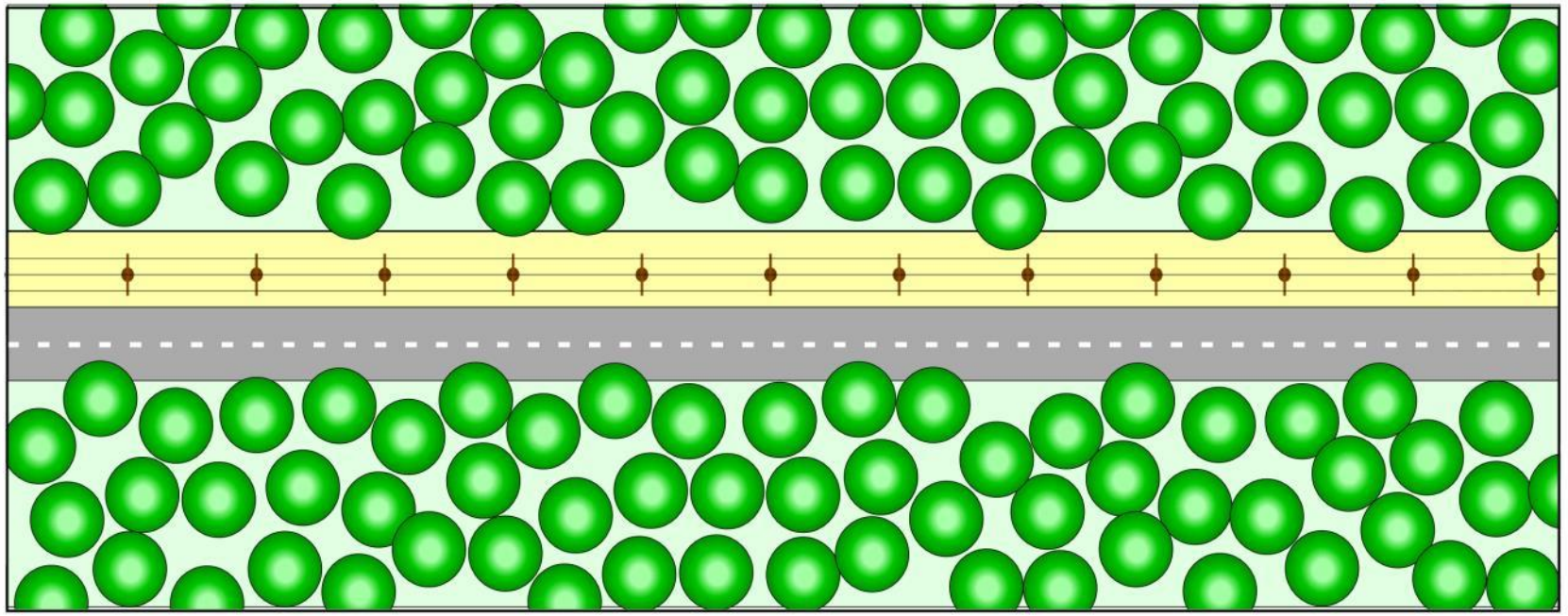
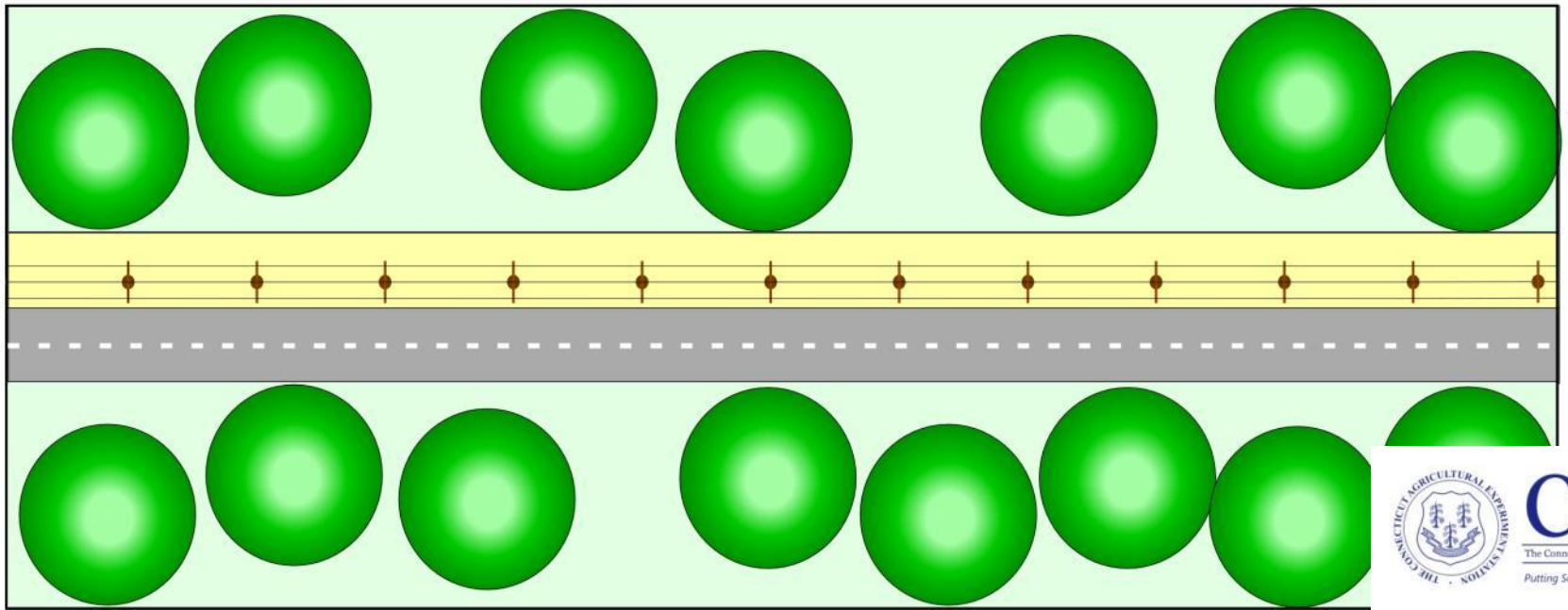


66 trees/acre



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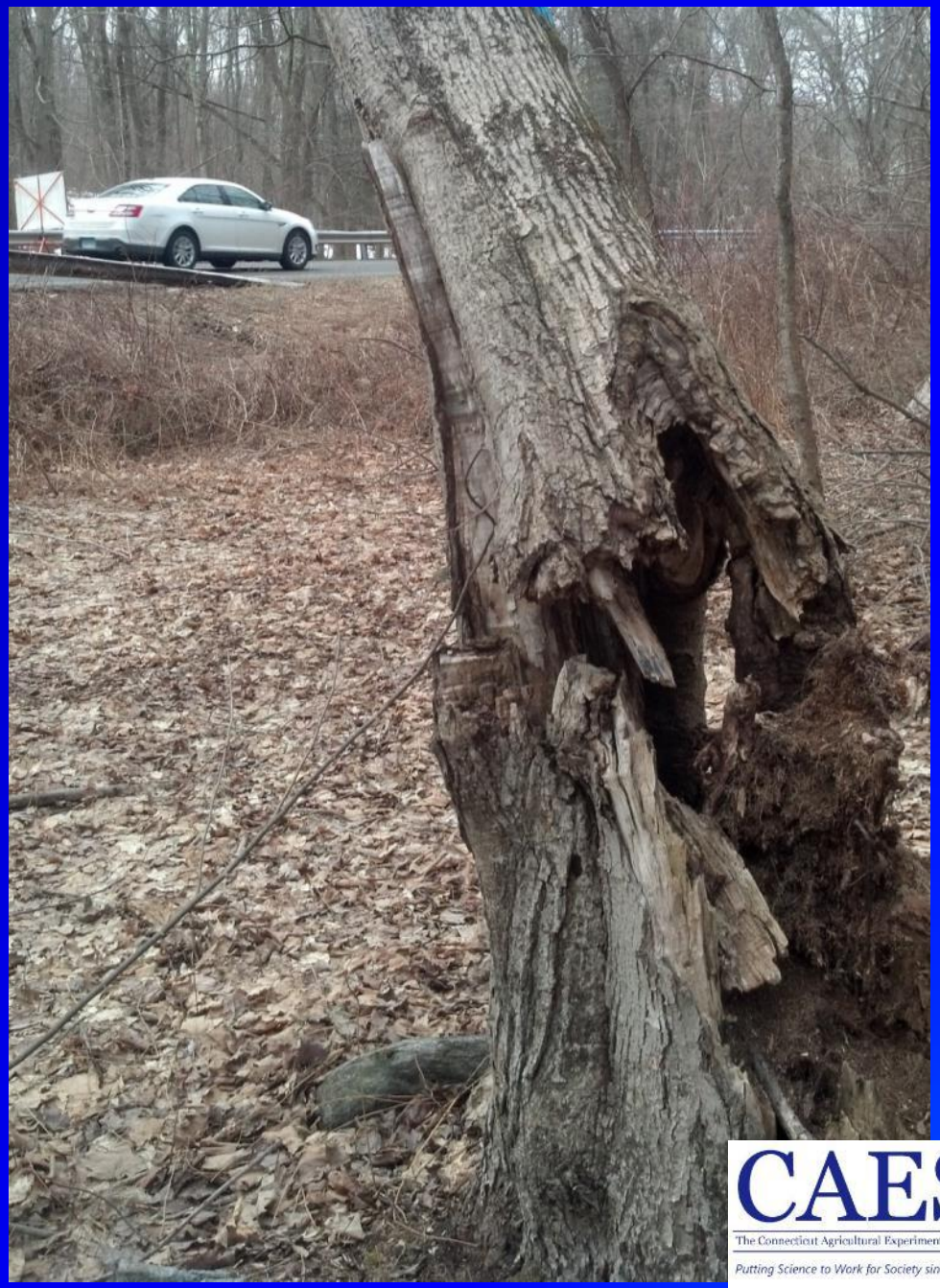

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Monitoring

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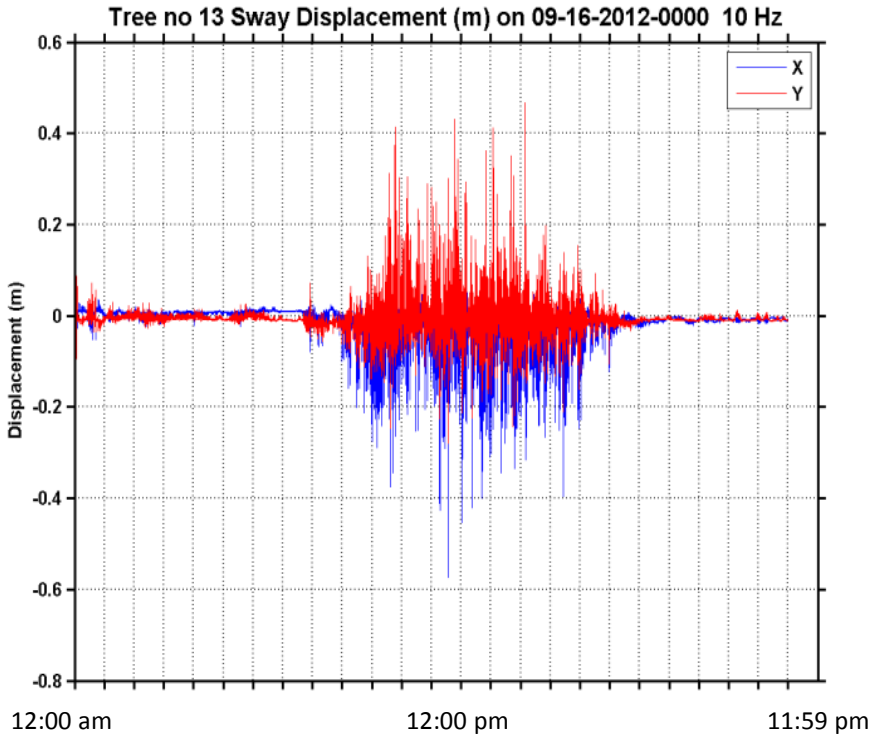
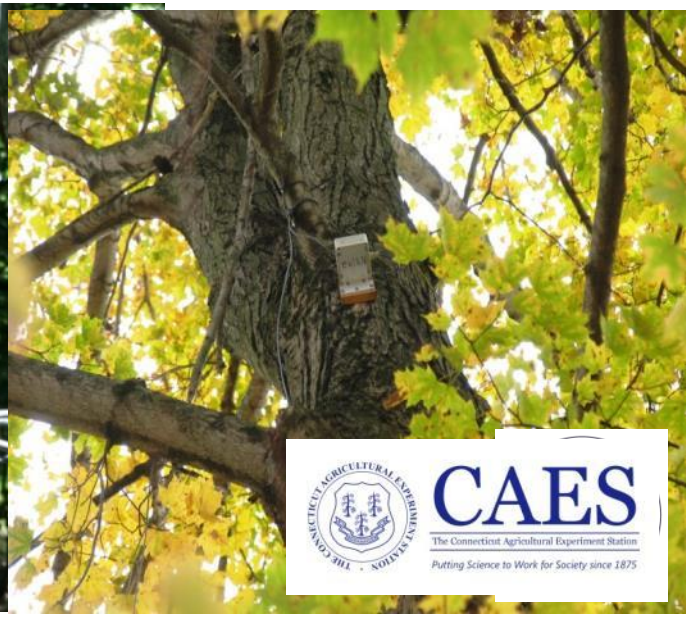
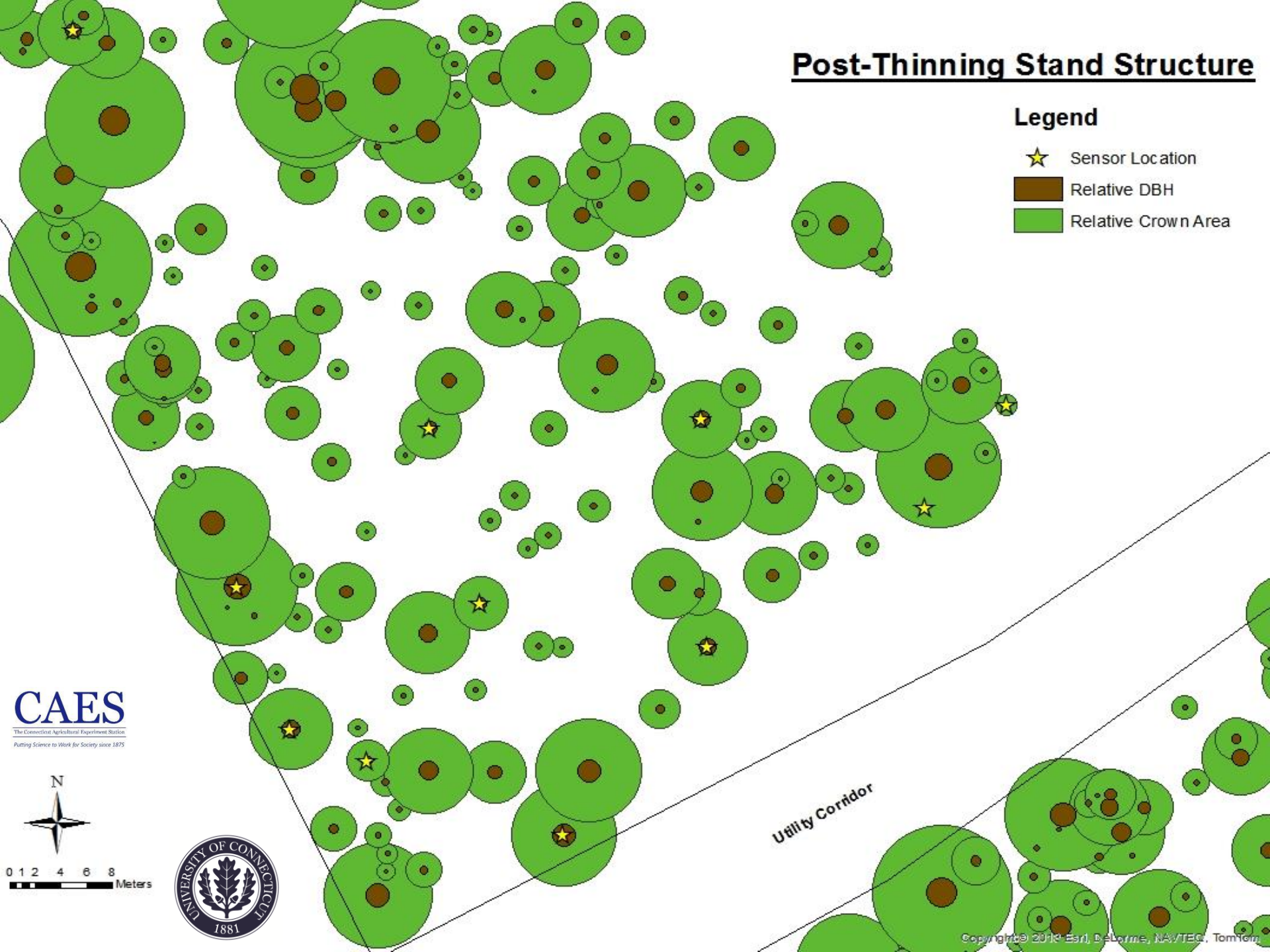
Changes in Tree Sway Dynamics Along a Forested Edge Following a Thinning

- Need to manage up to 100 feet into the forest
  - Insures more wind exposure
  - Light on all sides of crown for symmetrical growth

Biaxial Clinometers constantly measure tree sway of 13 trees ten times per second






Post-Thinning Stand Structure
Legend
Sensor Location
Relative DBH
Relative Crown Area
Utility Corridor
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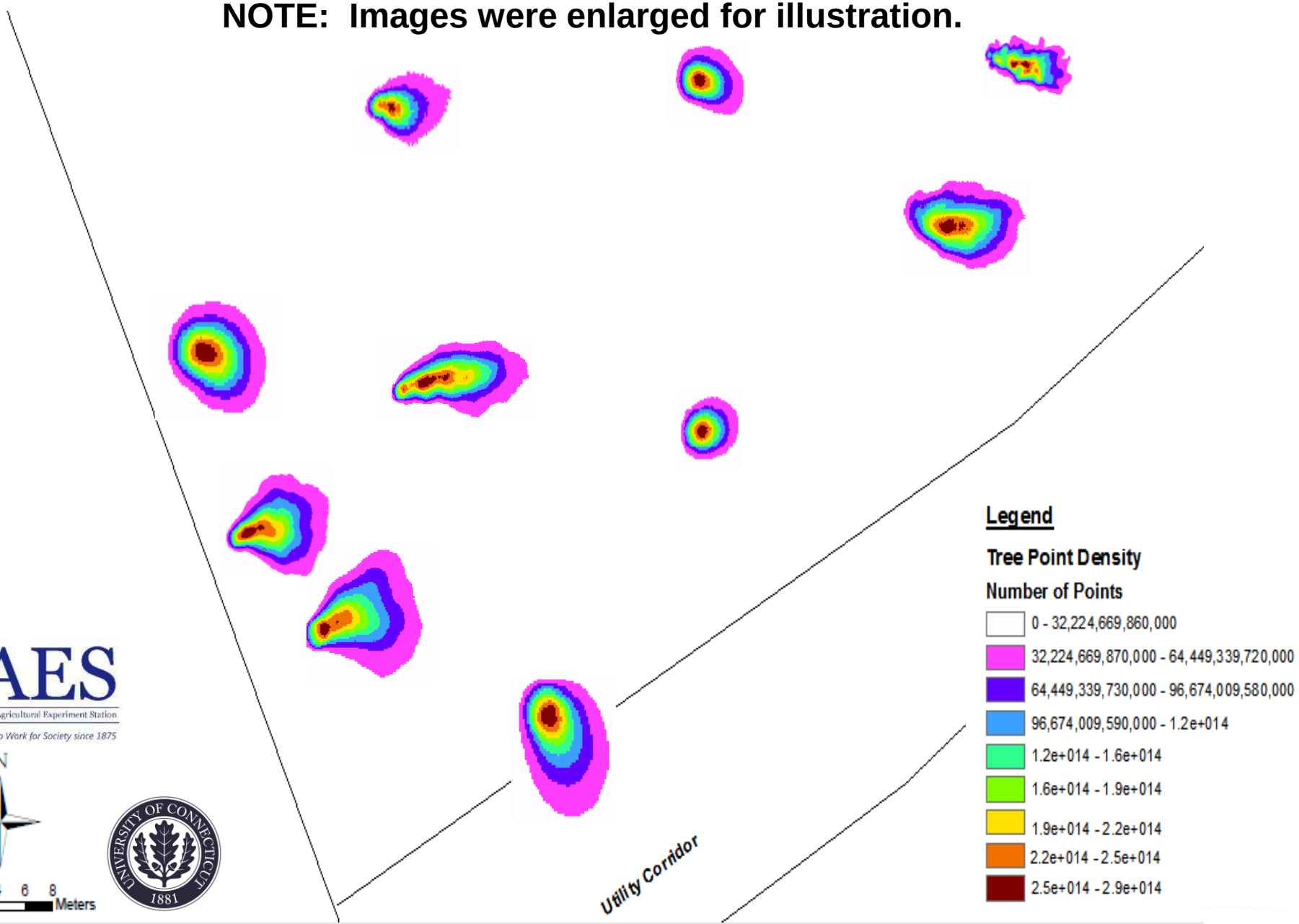
N
0 1 2 4 6 8
Meters
UNIVERSITY OF CONNECTICUT
1881
Copyright© 2013 Esri, DeLorme, NAVTEQ, TomTom

Tree Sway Density Contours

June 8, 2013 11:00 A.M to 2:00 P.M. Average Wind Speed 3.0 – 4.0 m/s (6.7 – 8.9 mph)

NOTE: Images were enlarged for illustration.



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“Stormwise” Objectives

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Quad-copter eye-view:

On-site processed hardwood lumber and RR ties

Grade logs for export market

Cordwood for local market

Chips?

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UConn Demonstration Site
Preliminary value estimate:

- Small-scale harvesting
- Interior trees felled first
- Edge trees felled next by arborist crew
- Logs to be sold roadside
- One-acre cost approx. $6600.00
- Approximate yield:
  - 3600 bd ft of high grade logs, value: $2400.
  - 2800 bd ft of low grade logs, value: $900.
  - 8 cord fuelwood, value: $1200.
  - 1500 bd ft miscellaneous sawn material (portable band sawmill), value: $1800.
- Total estimated product value: $6300.00

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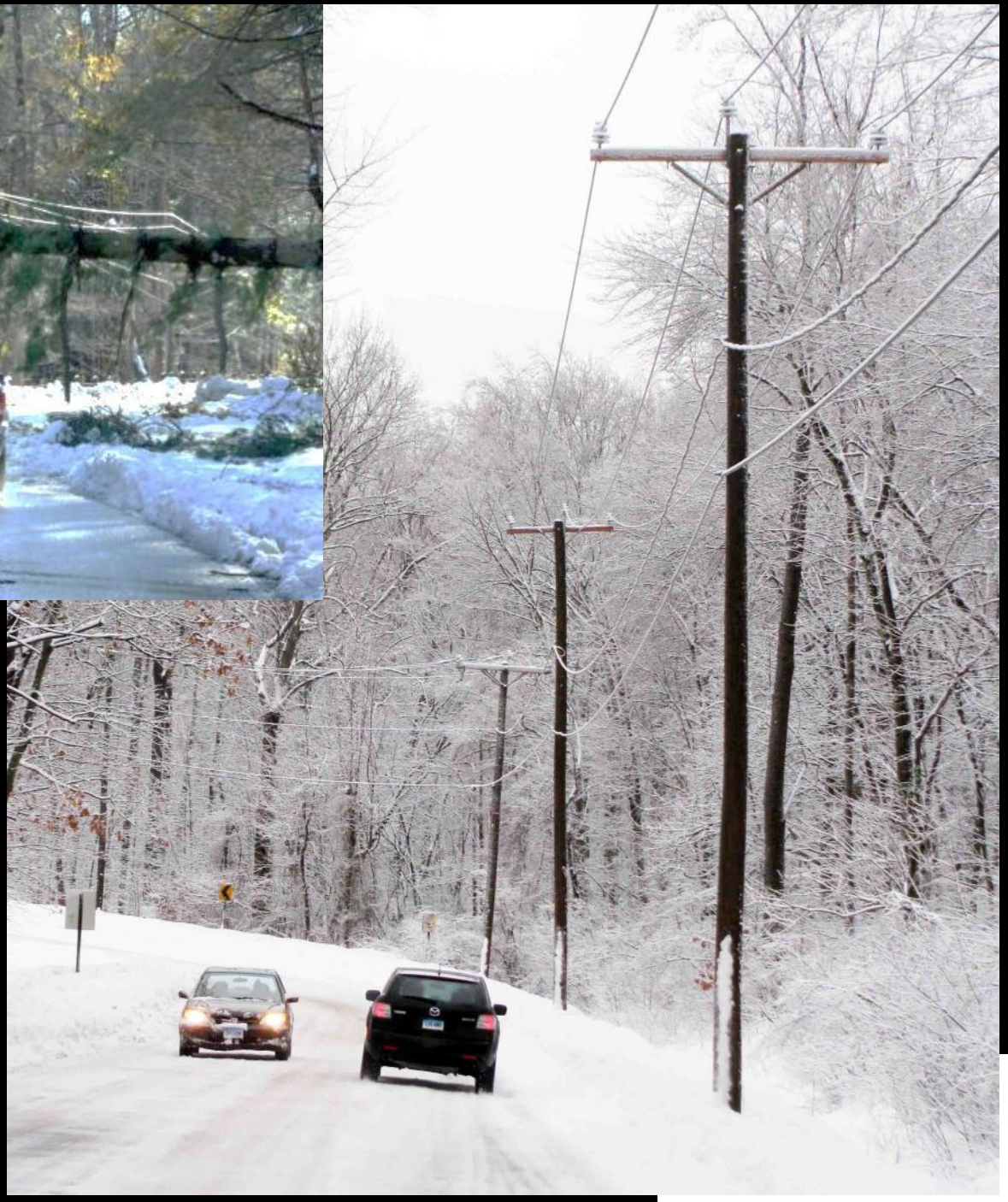
- **Monitor disruptions to utility lines and roads caused by severe weather at treated and non-treated locations.**

Sherman, October 2011
Source: Danbury News-Times



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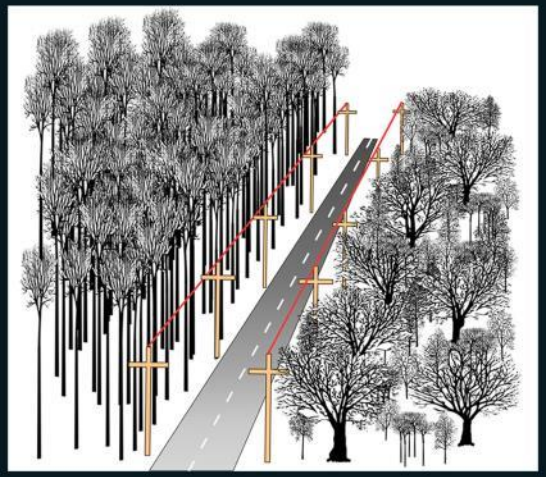
A ROADSIDE FOREST MANAGEMENT PROJECT

This area is one of eight sites established thoughout Connecticut for demonstrating and promoting storm resilient forests.

About 36% of road corridors in Connecticut have conditions similar to these: utility lines alongside a two lane roadway that travels through a forested landscape.

Roadside forests and utility corridors have been managed traditionally by only pruning trees adjacent to utility lines. The *2012 Connecticut State Vegetation Management Task Force* recommended roadside forests be managed to increase utility reliability while also maintaining their aesthetic appeal by integrating silvicultural and arboricultural practices.



This illustration represents the traditional (left) and conceptual (right) methods for roadside forest management.

Please note: The utility poles along both sides of the road are solely illustrative.

Scan here to learn more!

The concept is to create a forest of stout, evenly balanced trees that will be more windfirm and less susceptible to branch breakage and uprooting during severe weather, two of the principle causes of utility line damage.

If you would like to learn more about this project, please visit www.stormwise.uconn.edu or contact :

Jeffrey S. Ward, Chief Scientist
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Connecticut Agricultural Experiment Station
(203) 974-8495
Jeffery.ward@ct.gov

Thomas E. Worthley,
Associate Extension Professor
Middlesex County Extension Center
1066 Saybrook Rd. Haddam, CT
(860) 345-5232
Thomas.worthley@uconn.edu

UCONN | STORMWISE

Resilient Trees, Resilient Power

Tree and forest management to reduce tree-related power outages while retaining the beauty and benefits of Connecticut's woodlands.

Education

Learn more about the program and the science. Learn about the Stormwise app aimed at homeowner Tree Risk Awareness and contribute to the Stormwise tree failure database. How to host a Stormwise town meeting – storm-gemot?

Management

What is the framework of a Stormwise prescription? How will various wood products be handled for optimal utilization? Who is going to pay for all this? Learn about ongoing establishment of demonstration sites and upcoming management workshops.

Research

What is going on with Stormwise related research at UConn and with our partners? How are we using the data from the Stormwise app?

About Stormwise

Resilient trees, resilient power.

Stormwise is a forest vegetation management program with the goal of reducing the risk of tree-related storm damage to power lines. Implementing proper long-term management practices in woodlands along utility corridors will create healthy, storm resistant and aesthetically pleasing trees and forest stands. The development of Stormwise is compelled by recent catastrophic storm events in Connecticut.

More About This Site › ›

Recent Press

WNPR - *2/18/2014*

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>
> Listen to WNPR audio link
>
> Read article on the WNPR website

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What Are The Top 5 Most Expensive Natural Disasters In The U.S.? STORMS! STORMS! STORMS! ow.ly/u4rUW #Stormwise #Firewise #UCONN

Trees Forever @Trees_Forever
@ISArboriculture Learning about t importance of tree risk assessmen

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