

The Slow Storm:

Implications of
Tree Mortality Due to
Gypsy Moth, Drought,
TLCB, Armillaria, etc.

March 5, 2019

Forest Health Meeting

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HEALTH AND NATURAL
RESOURCES

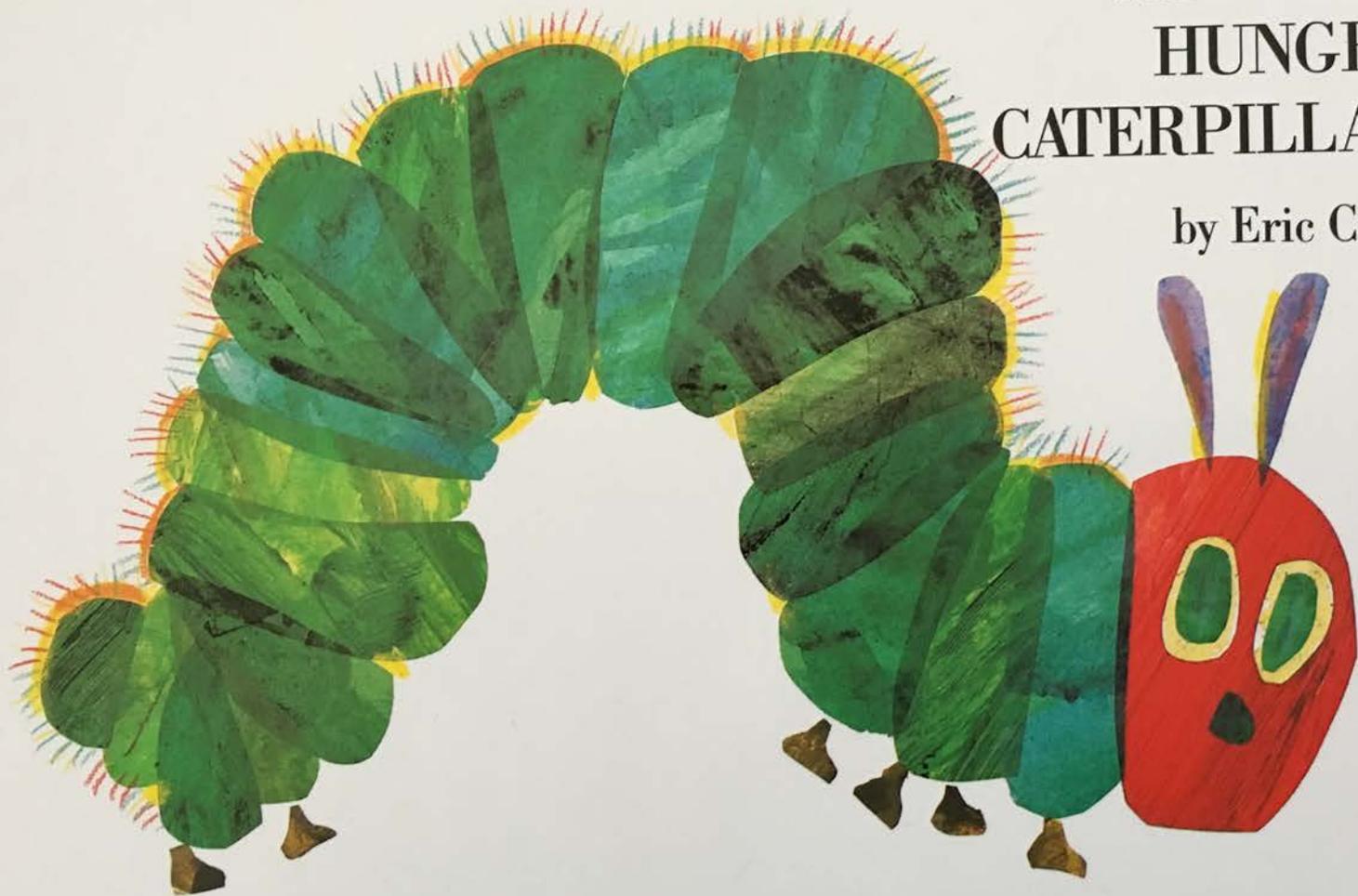


2014 and 2016 Color Imagery



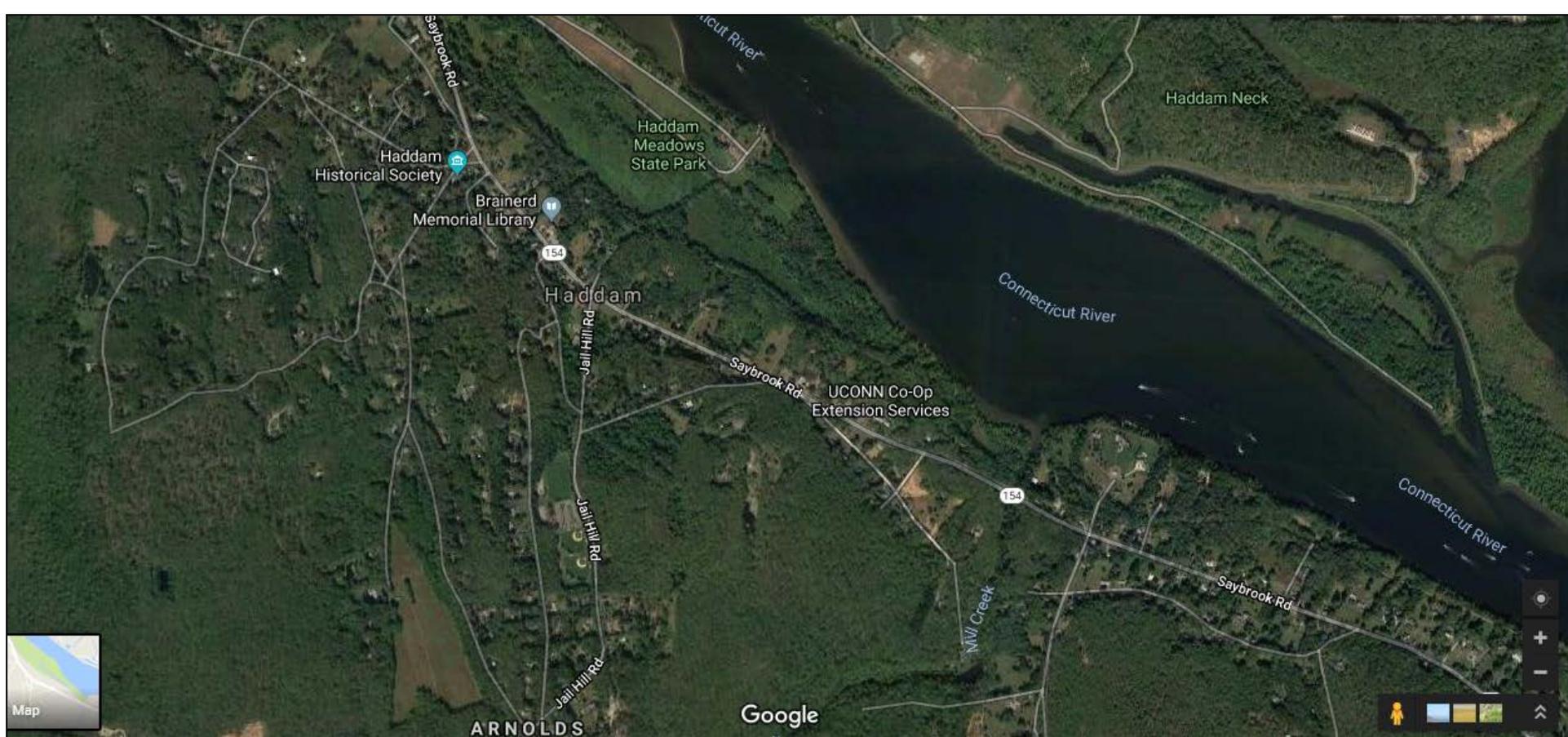
THE VERY HUNGRY CATERPILLAR

by Eric Carle



Assessing:

- Thousands of acres of oak mortality, and partial canopy loss.
- Thousands of dead roadside trees





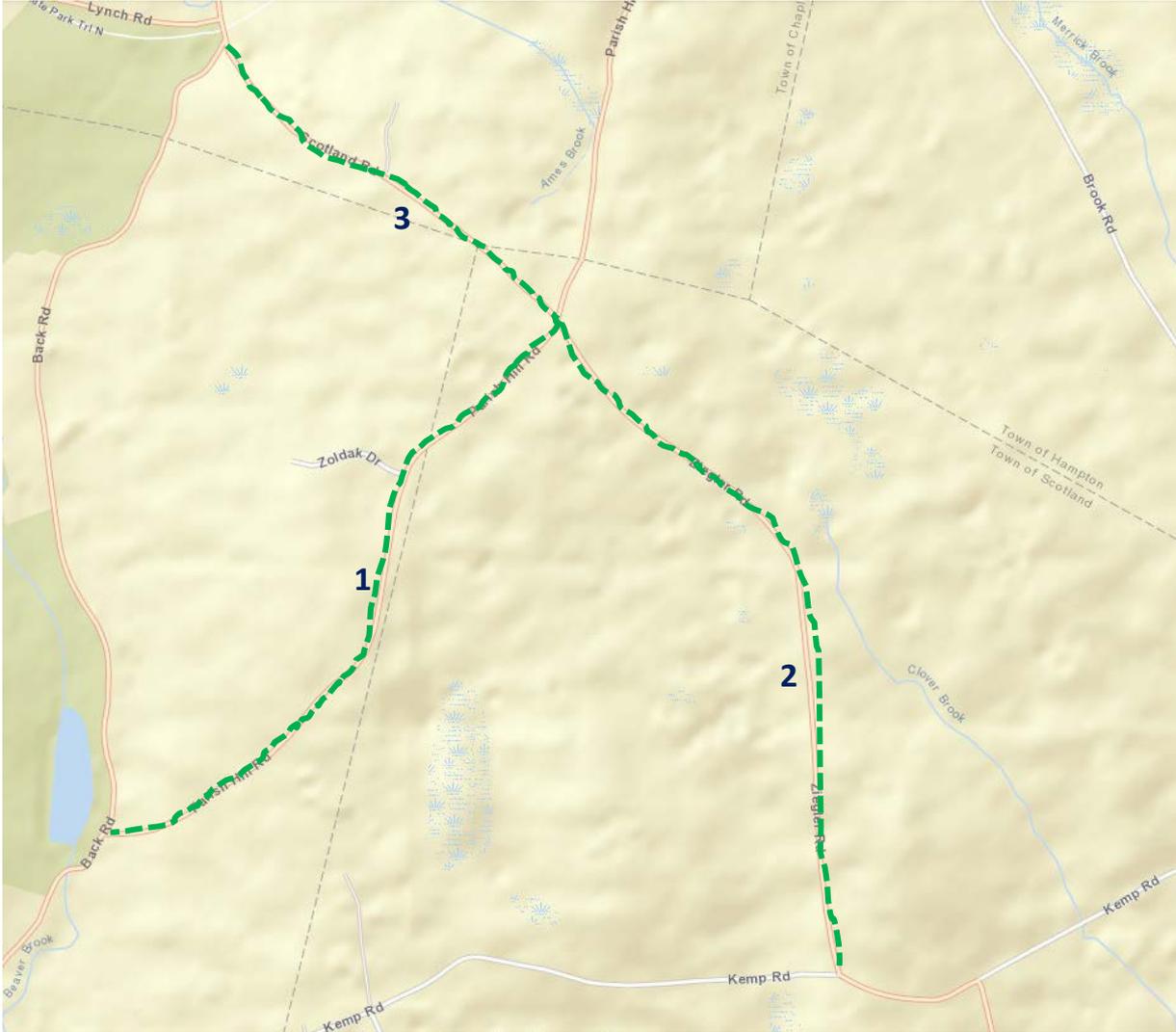
Google

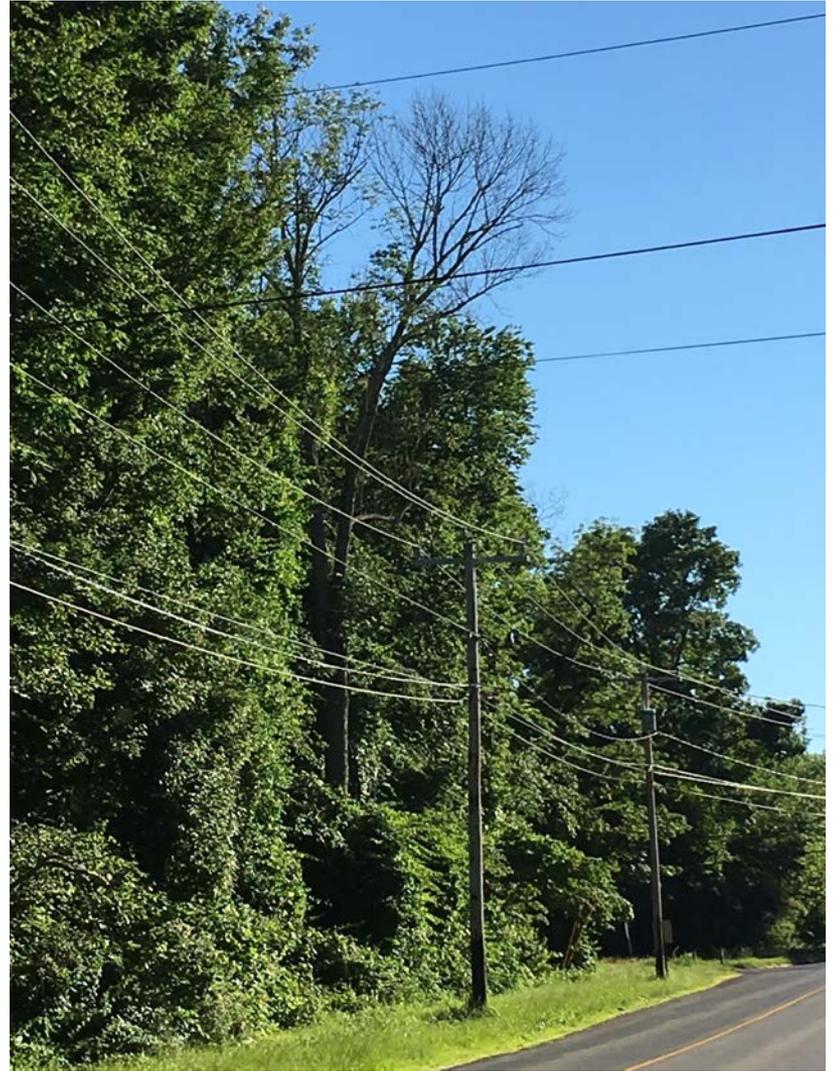


Scotland/Chaplin

3 Segments

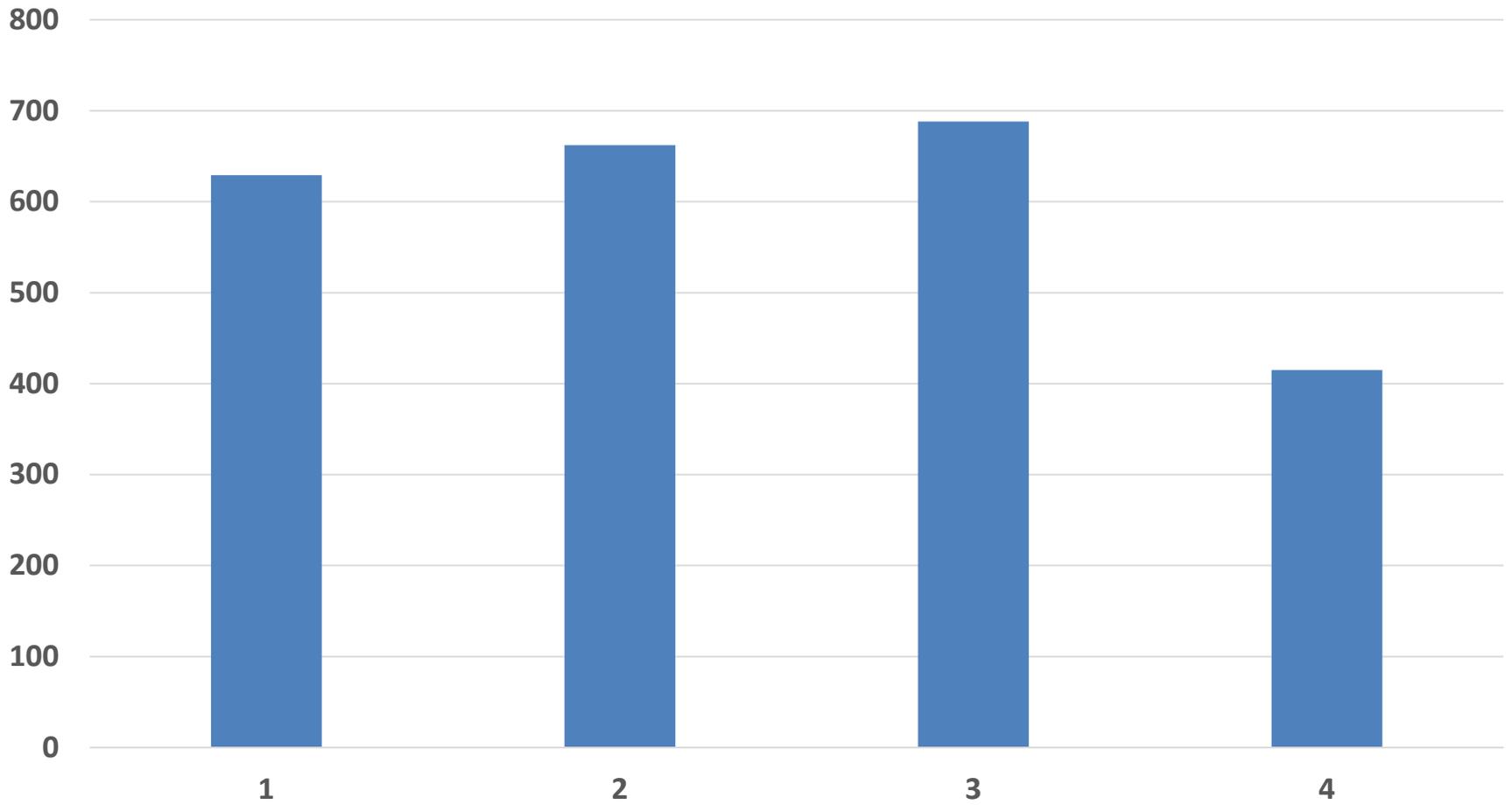
3.44 miles





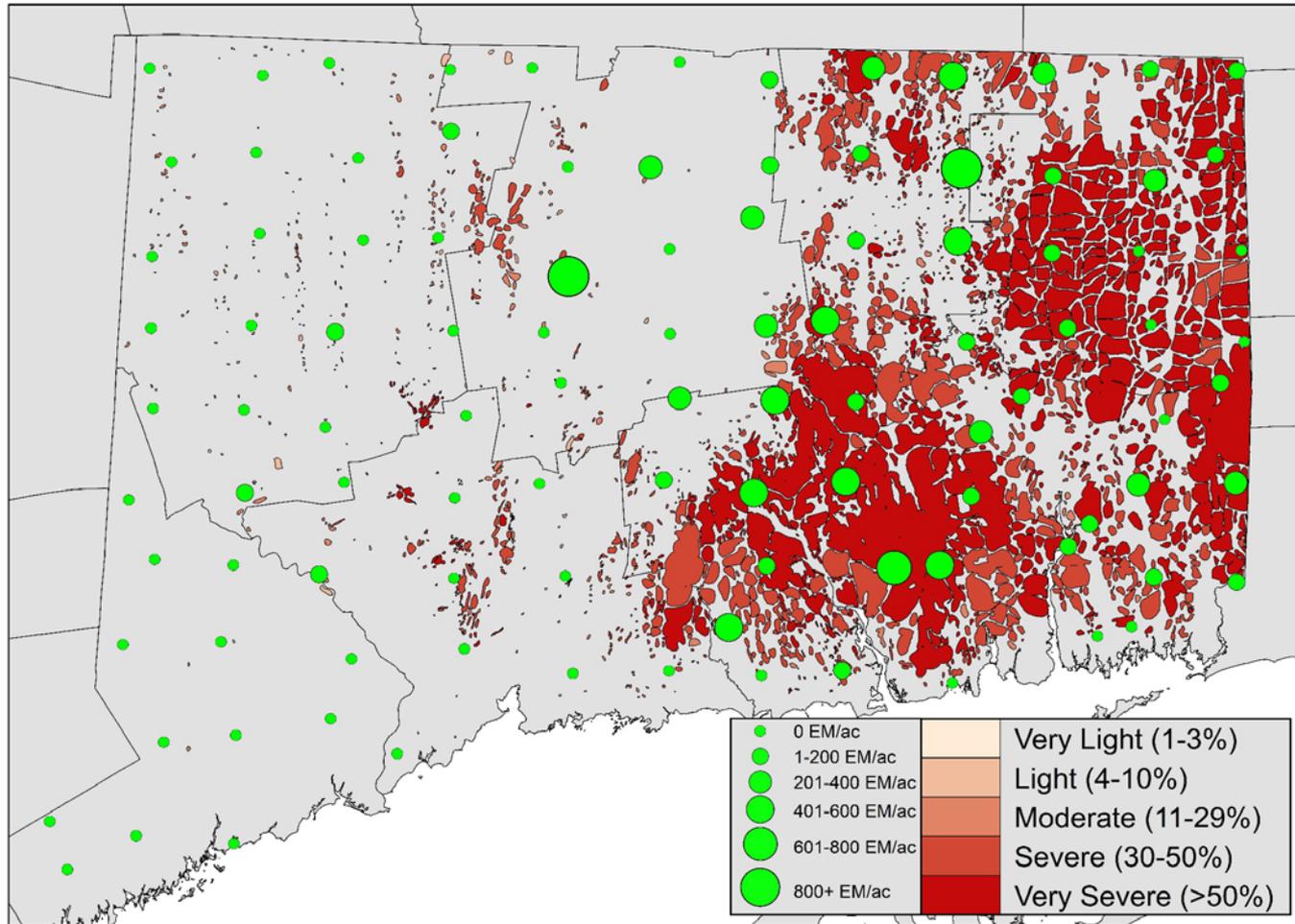


Numbers of trees counted by category



2017-2018 Gypsy Moth Egg Mass 7-Mile Grid Survey Results

From:
Connecticut
Agricultural
Experiment
Station

















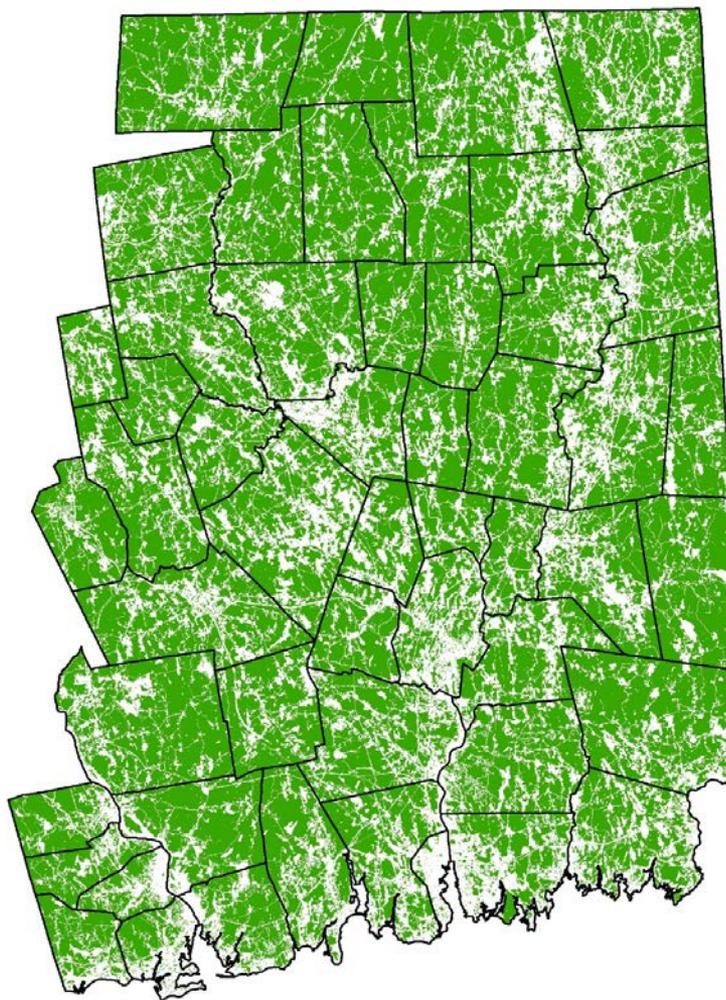
UGAL301008

Bella Vista Dr



700 ft





Normalized Difference Vegetation Index (NDVI) Analysis



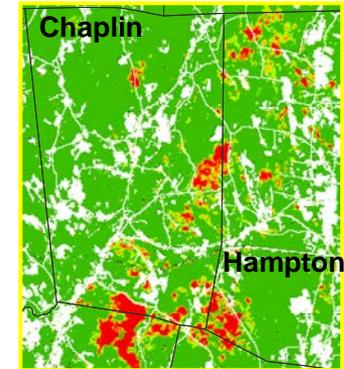
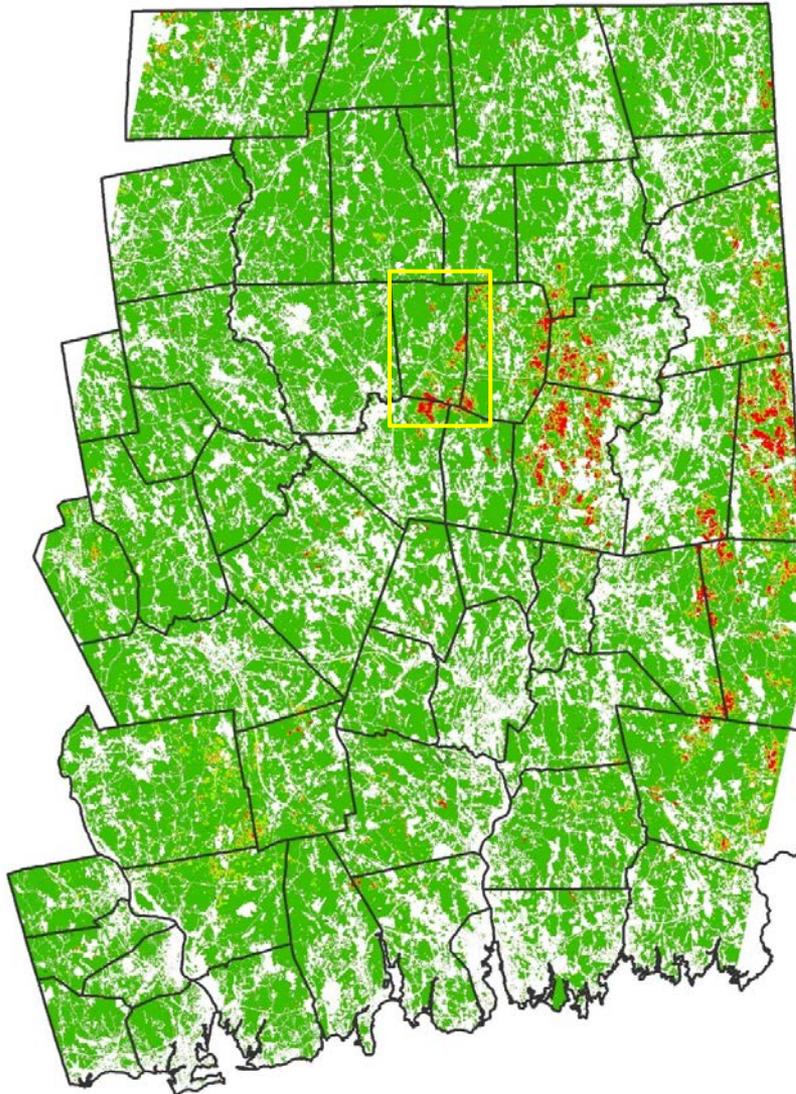
**Connecticut's
Changing
Landscape (CCL)**
land cover

**Eastern Connecticut
53 towns**

Forest Cover - 2015

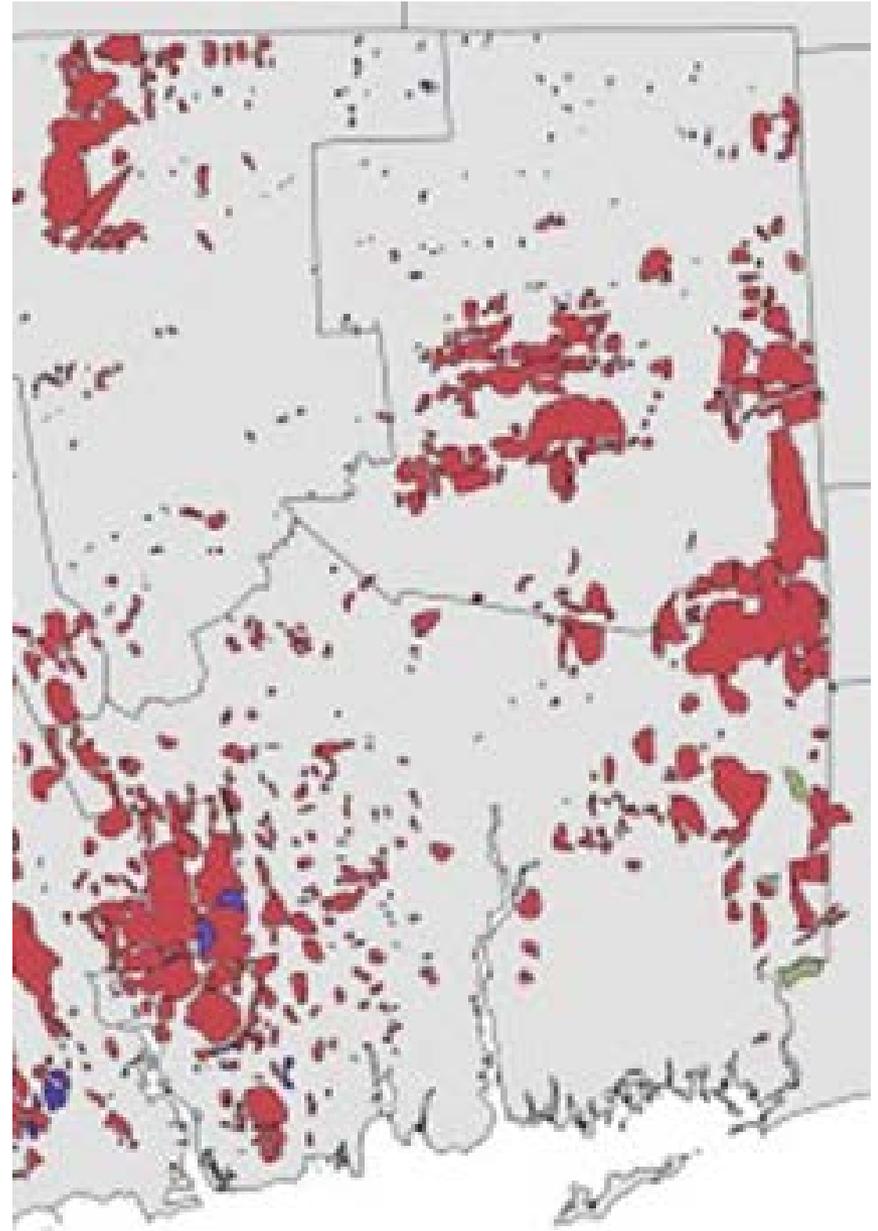
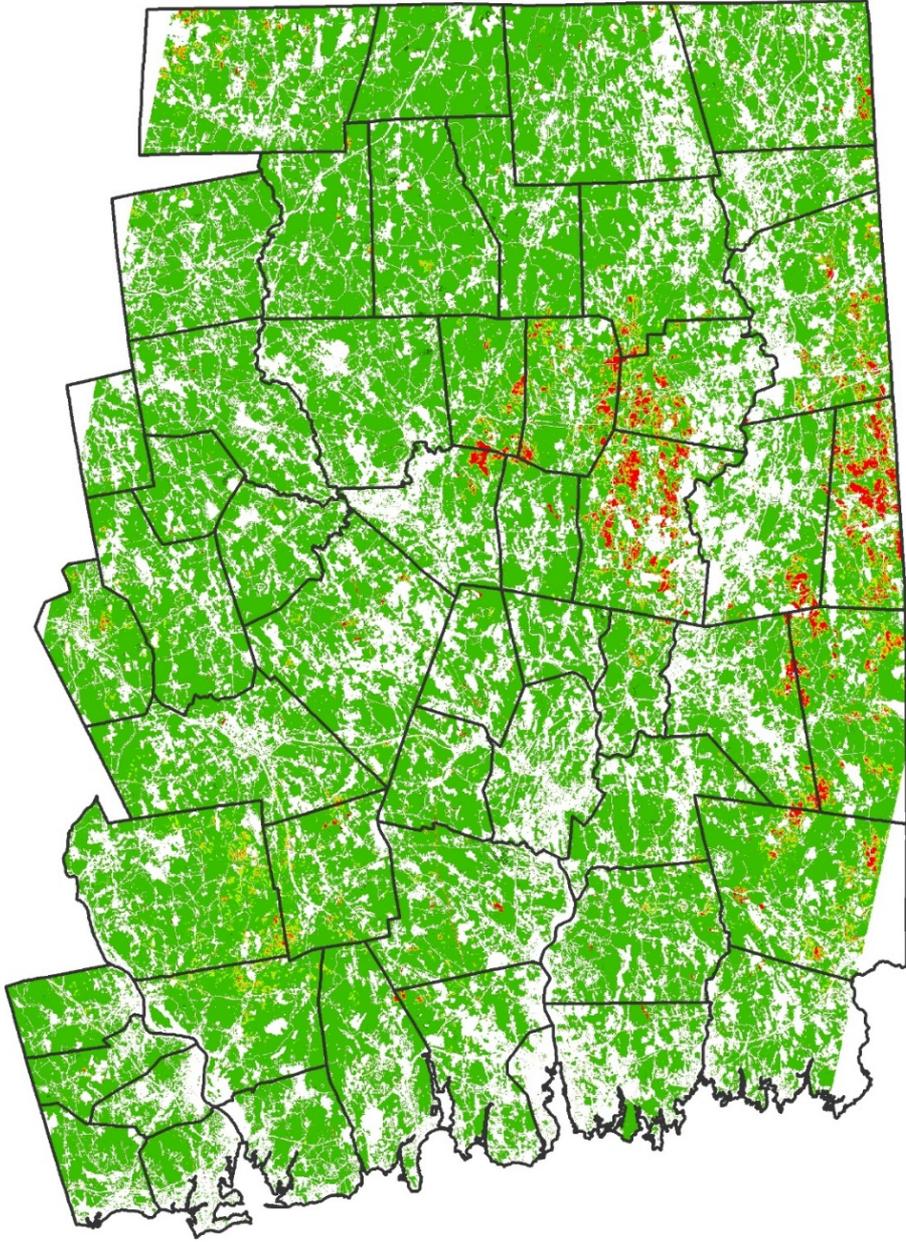
NDVI Difference – Defoliation - July 2015 – July 2016

Analysis by James Hurd, UConn NRE

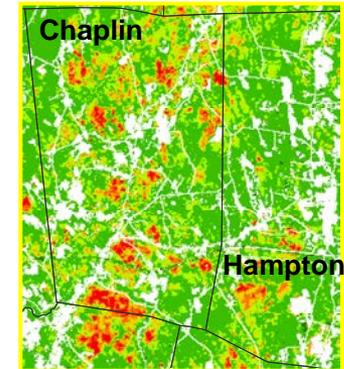
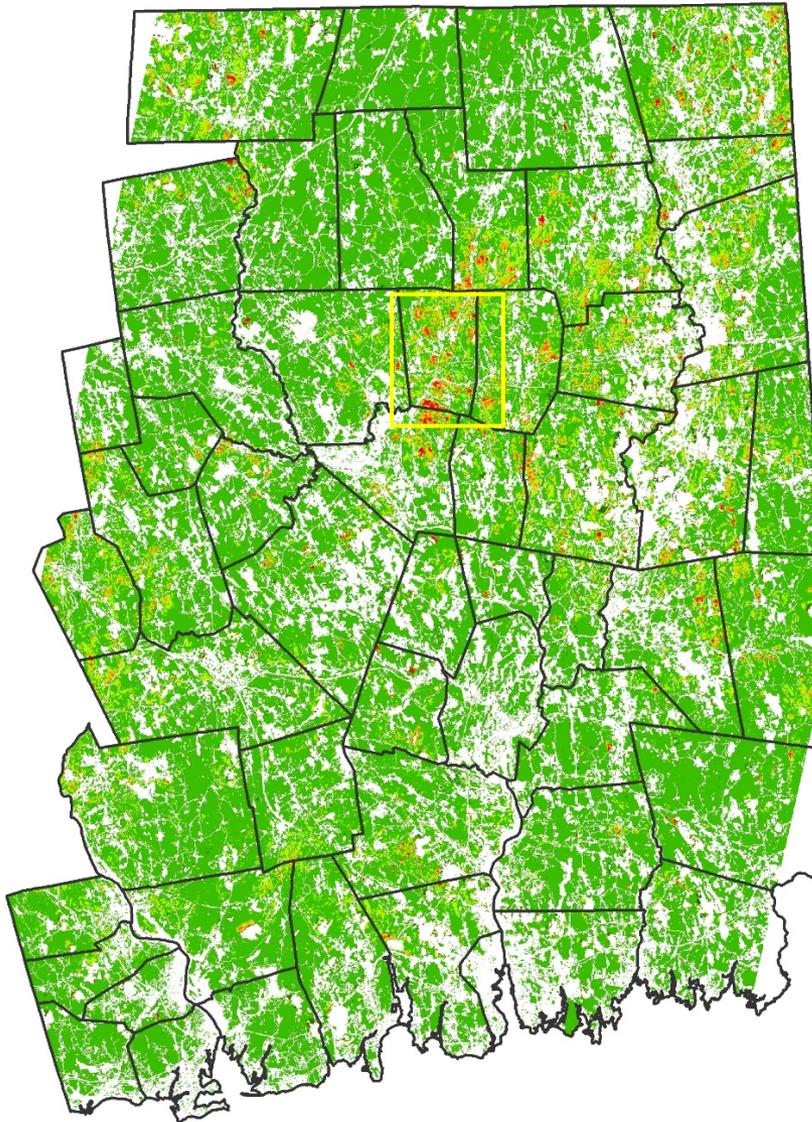


Severity Classes



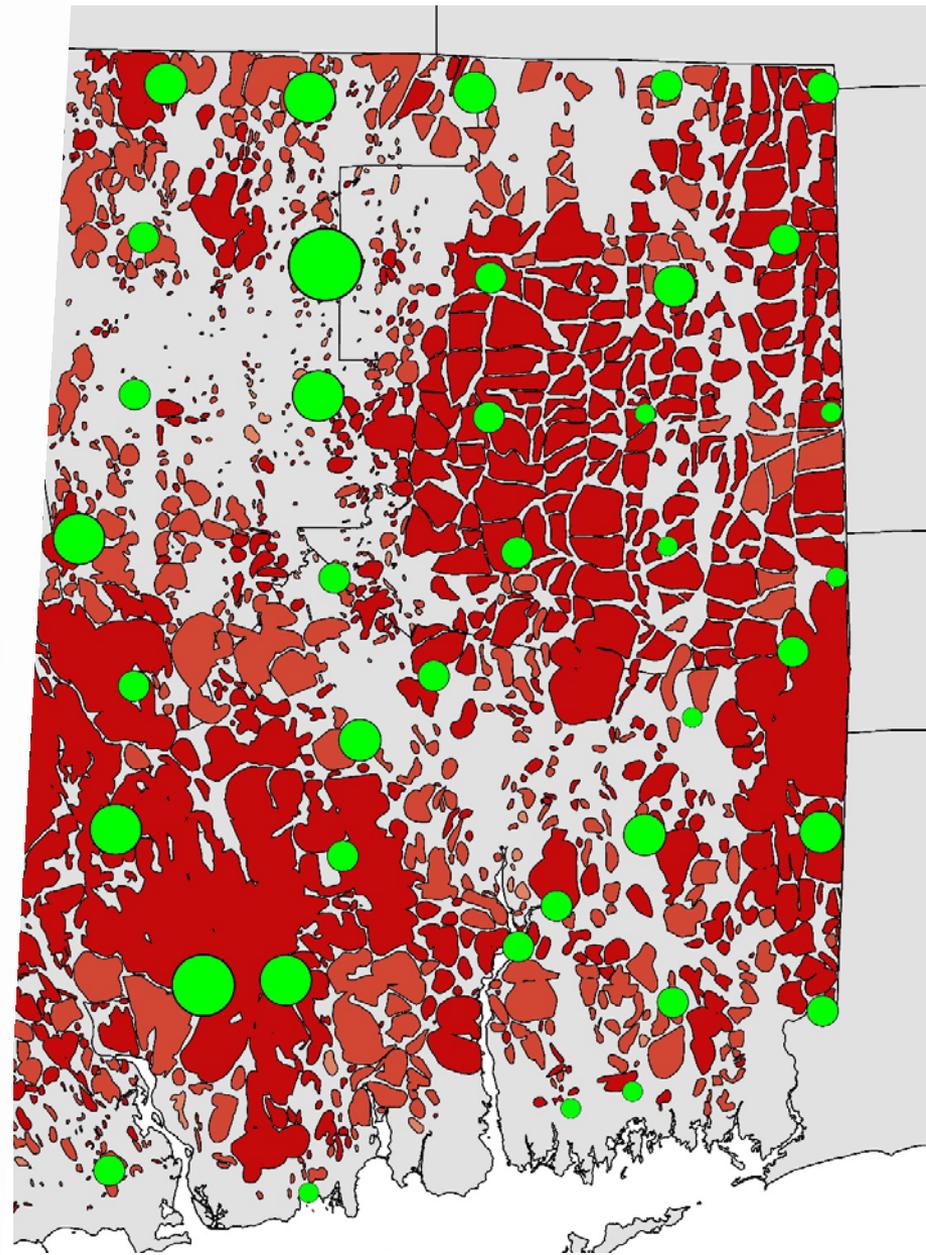
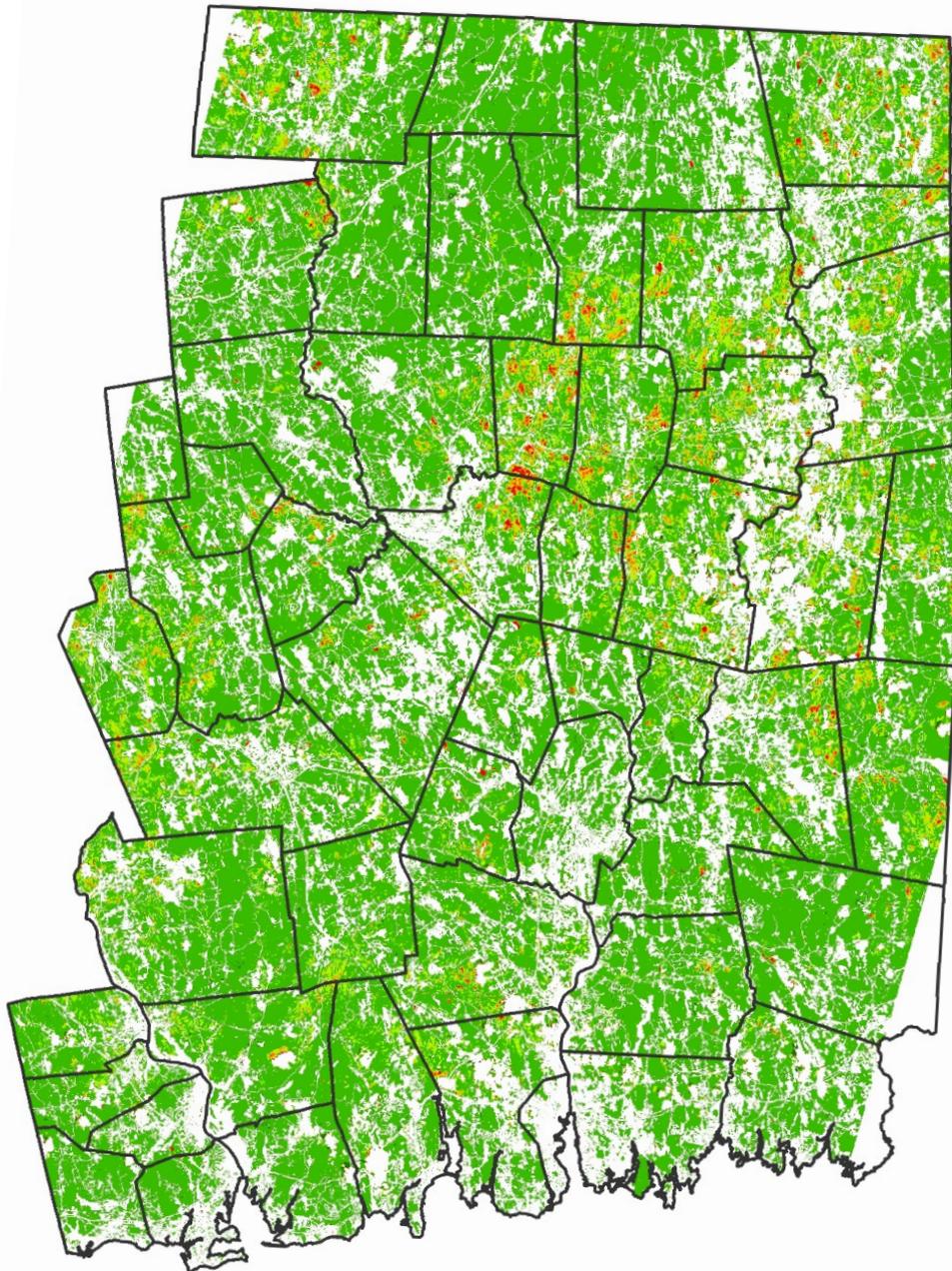


NDVI Difference – Defoliation - Jul 2015 – Jul 2017

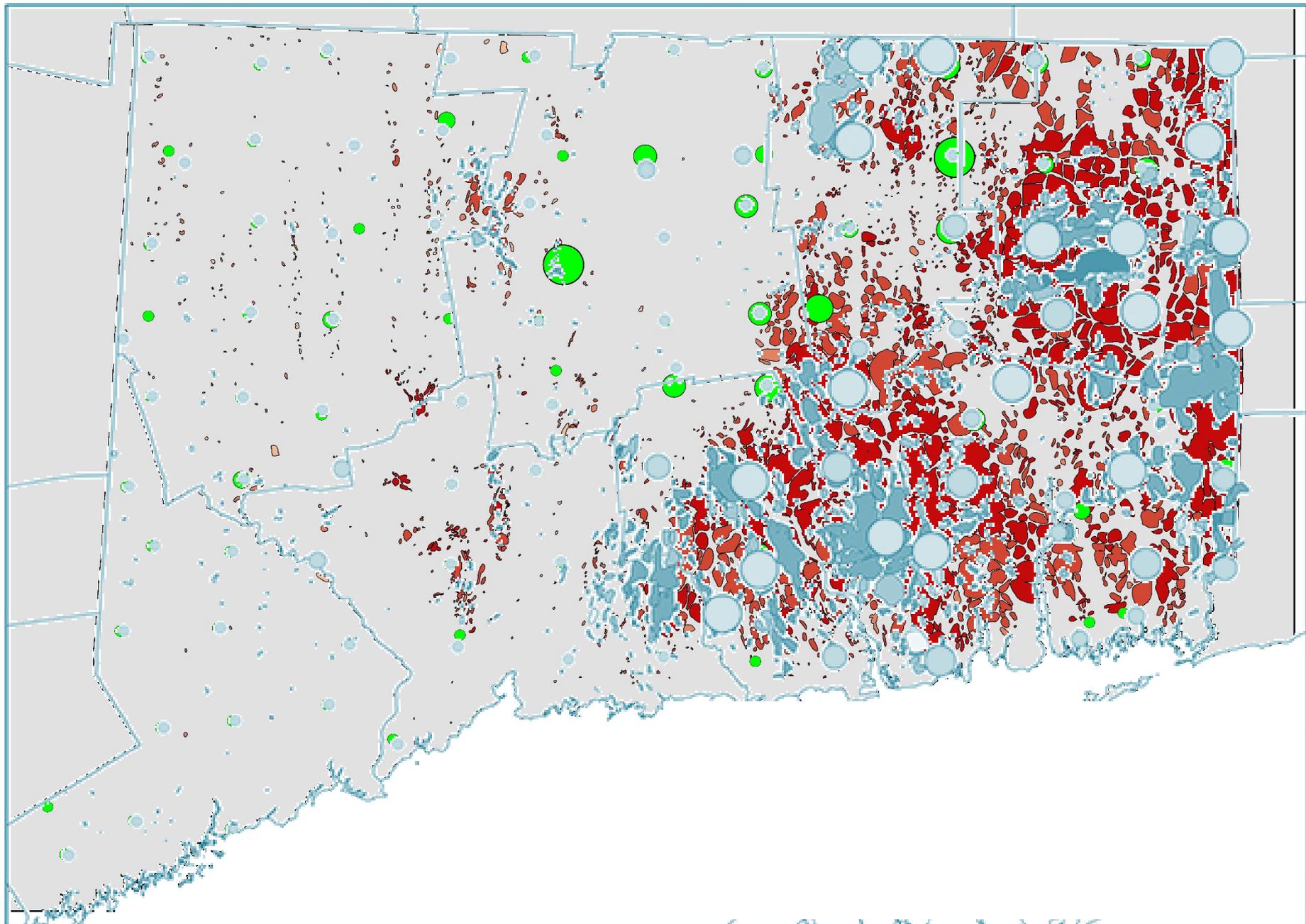


Severity Classes

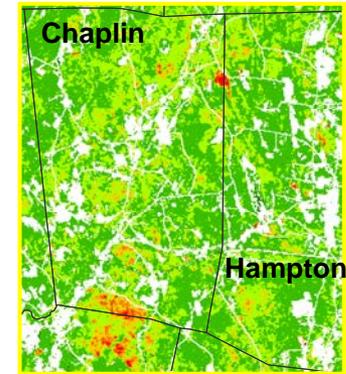
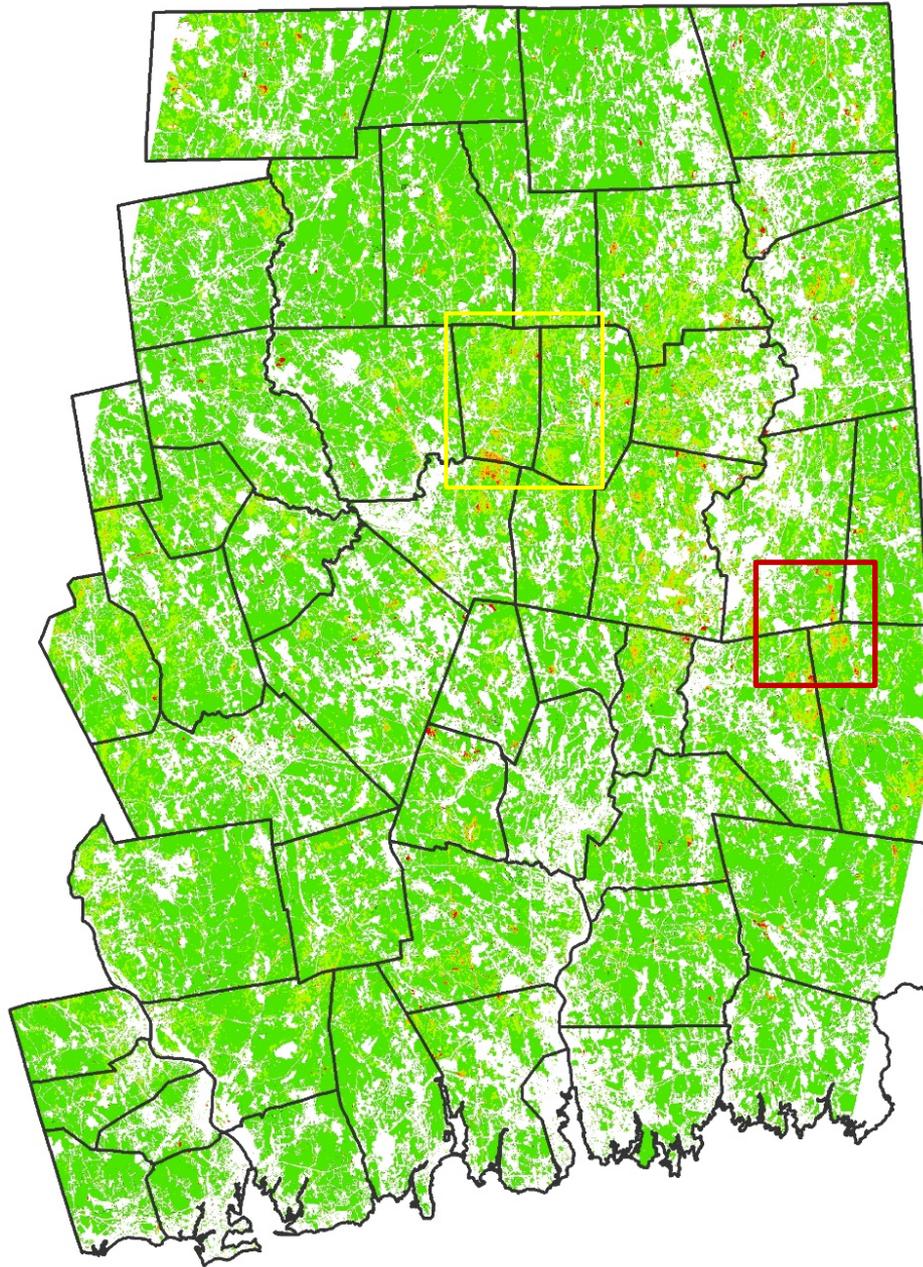




2016-2017 Gypsy Moth Egg Mass 7-Mile Grid Survey Results



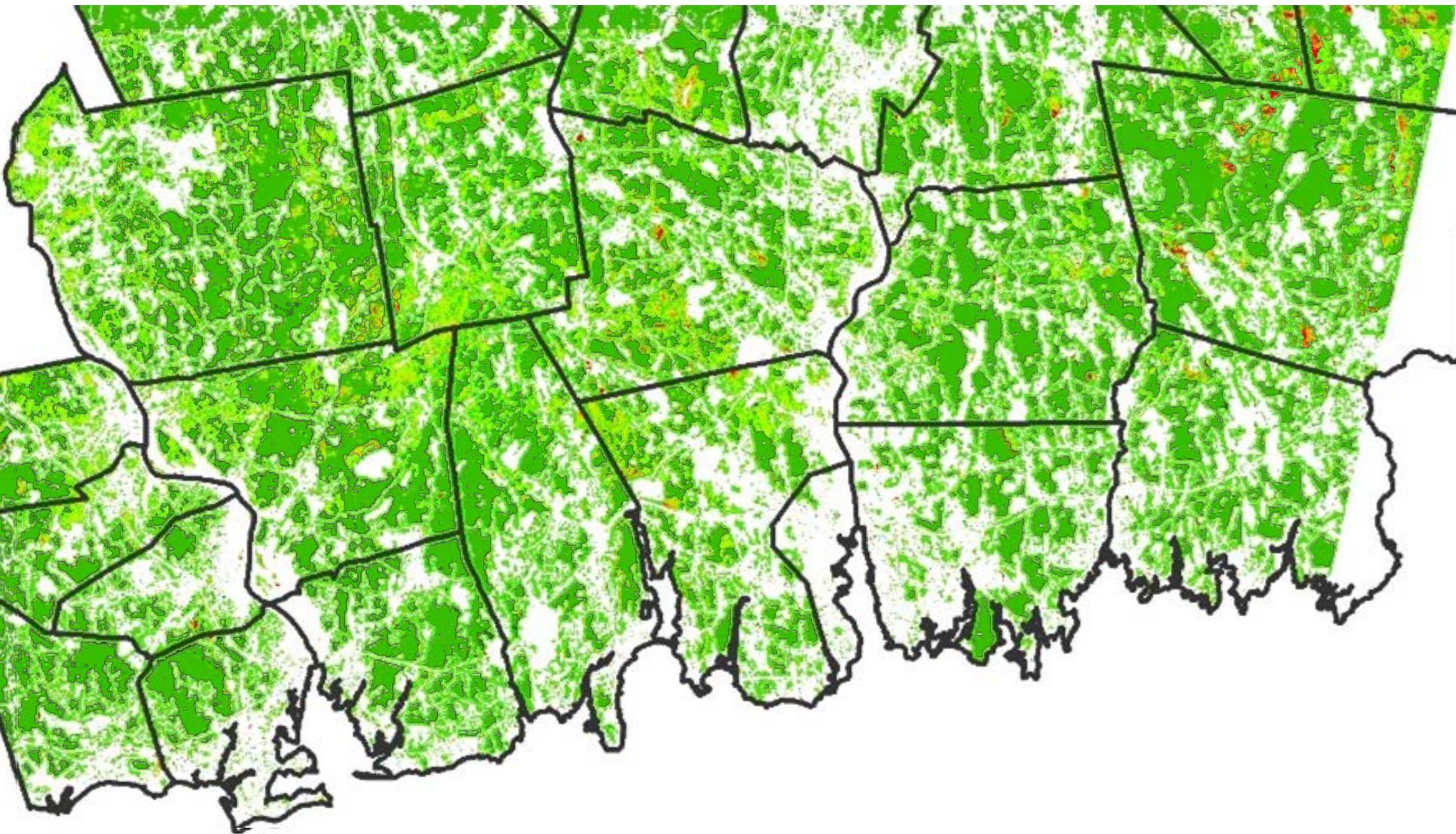
NDVI Difference – Refoliation - Jul 2015 – Sep 2017



Severity Classes



100,000 acres?



Pachaug Forest Area

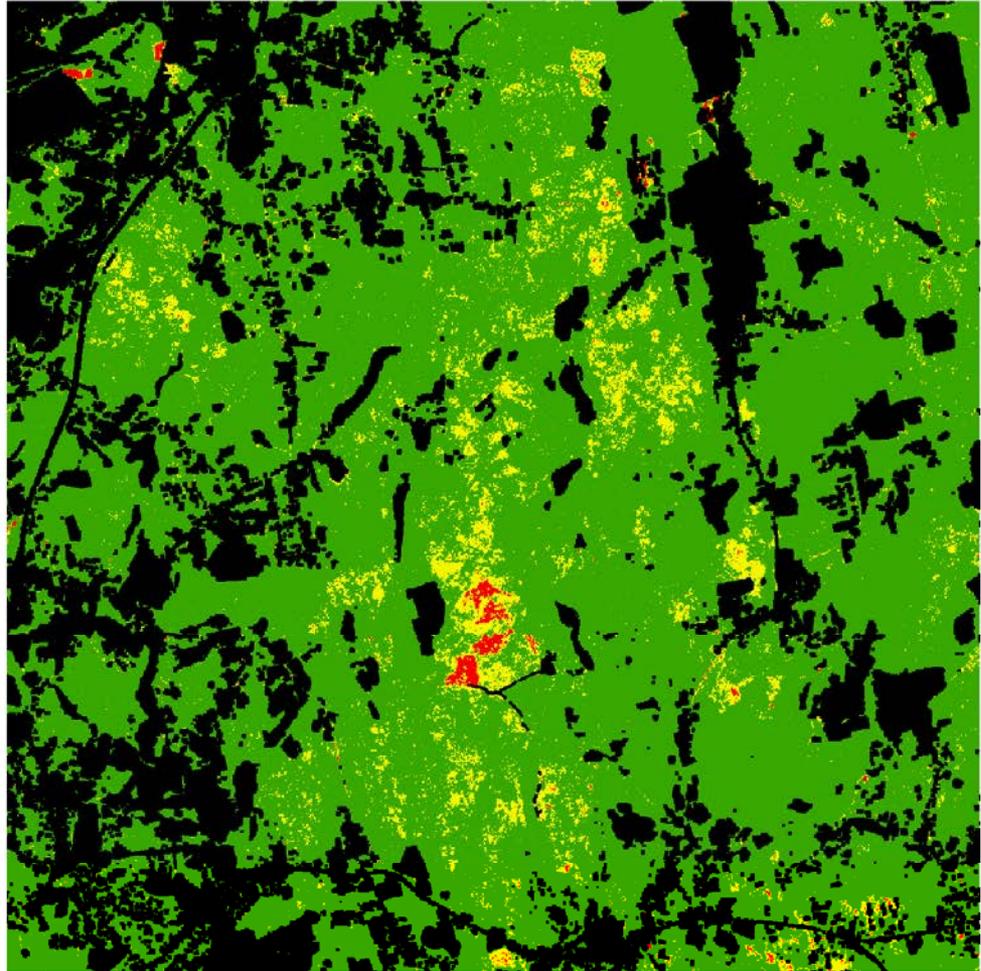
Voluntown, CT

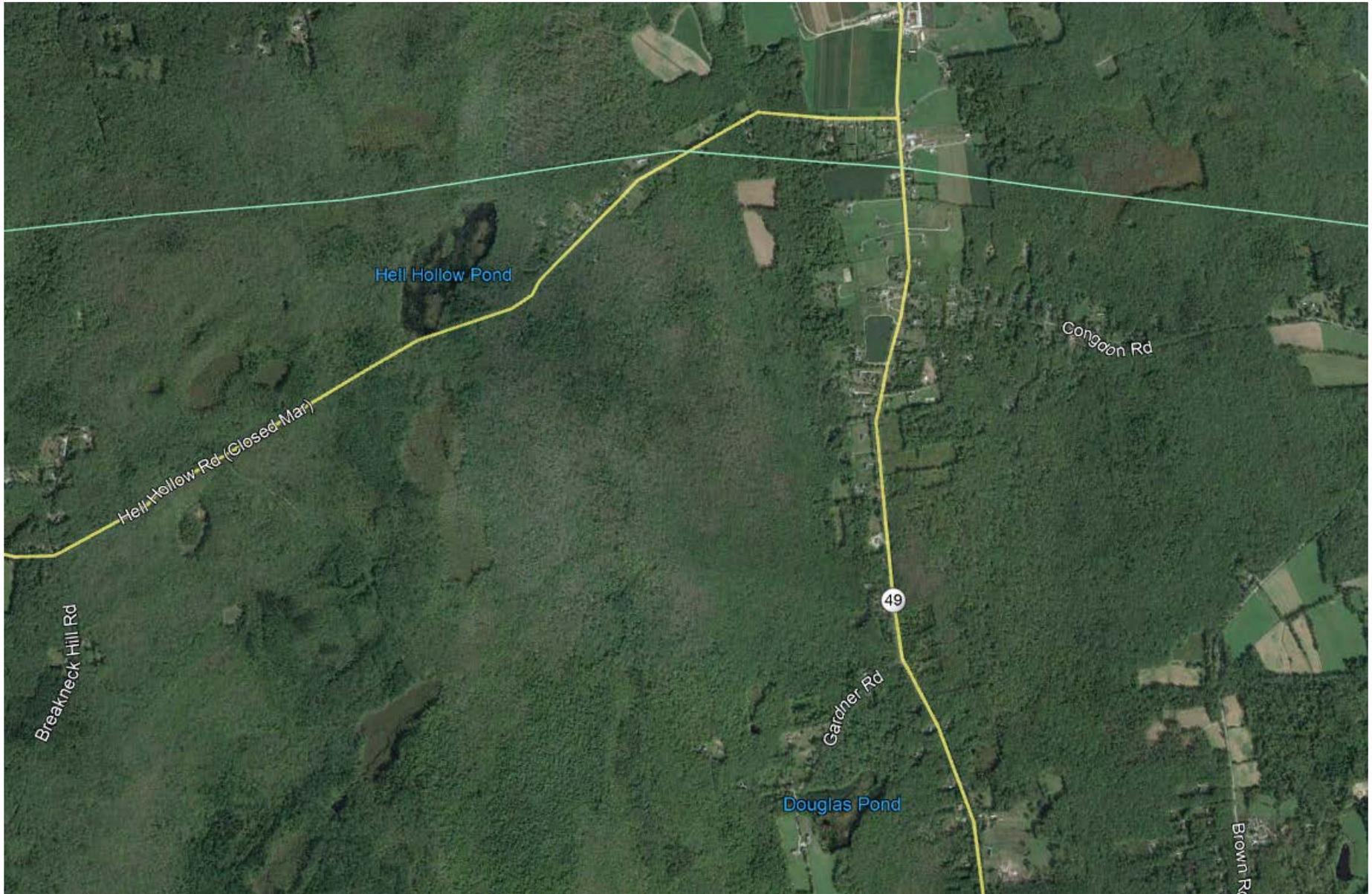
Analysis of the Difference Between
July 11, 2015 Landsat 8 with July 12, 2018
Sentenel-2 NDVI

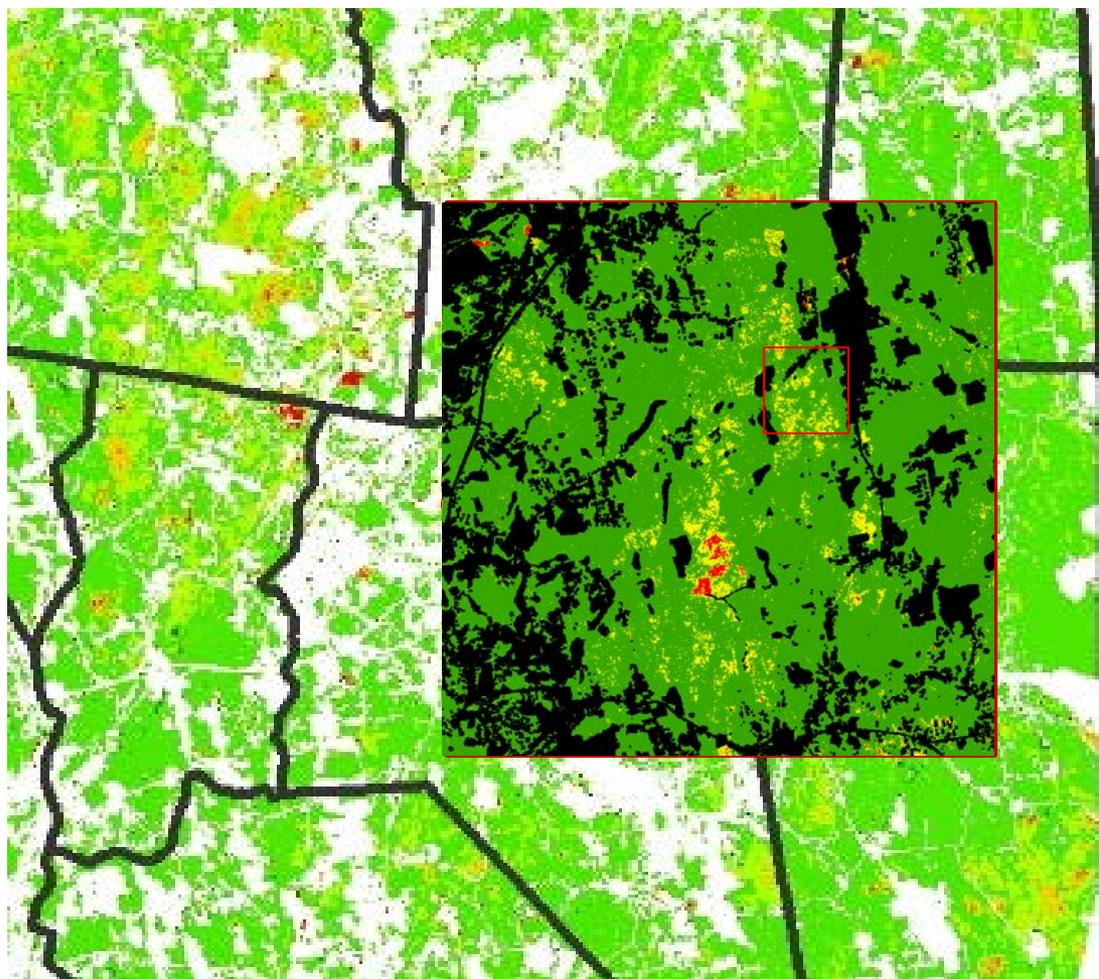
Normalized Difference Vegetation Index (NDVI) – a simple graphical indicator used to analyze remote sensing measurements in the near-infrared (NIR) and red portions of the electromagnetic spectrum to assess whether the target being observed contains live green vegetation or not.

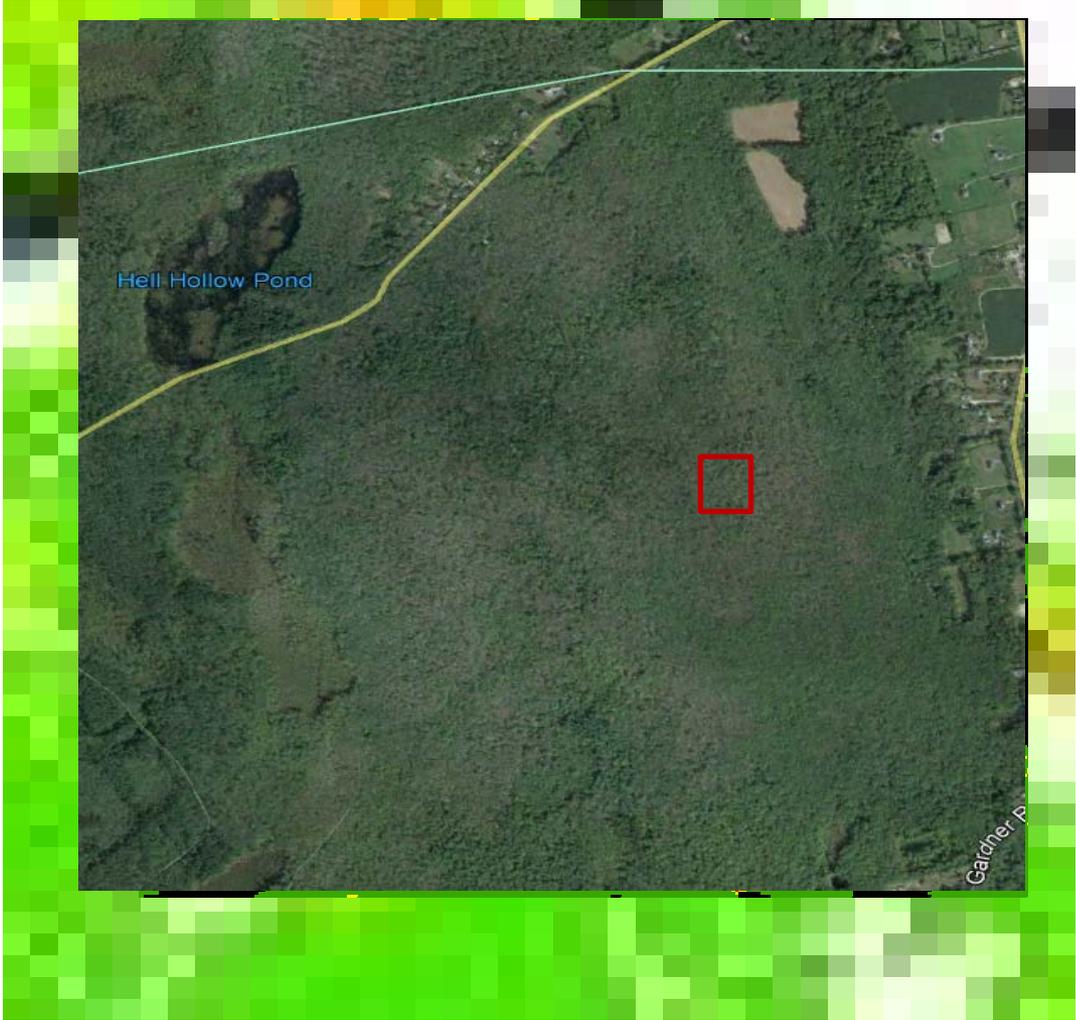
$$\text{NDVI} = \frac{\text{NIR} - \text{RED}}{\text{NIR} + \text{RED}}$$

-  Likely clear cut/removed trees. **113 acres.**
-  Likely trees suffering mortality. **1,316 acres.**
-  Likely healthy trees/forest. **19,783 acres.**





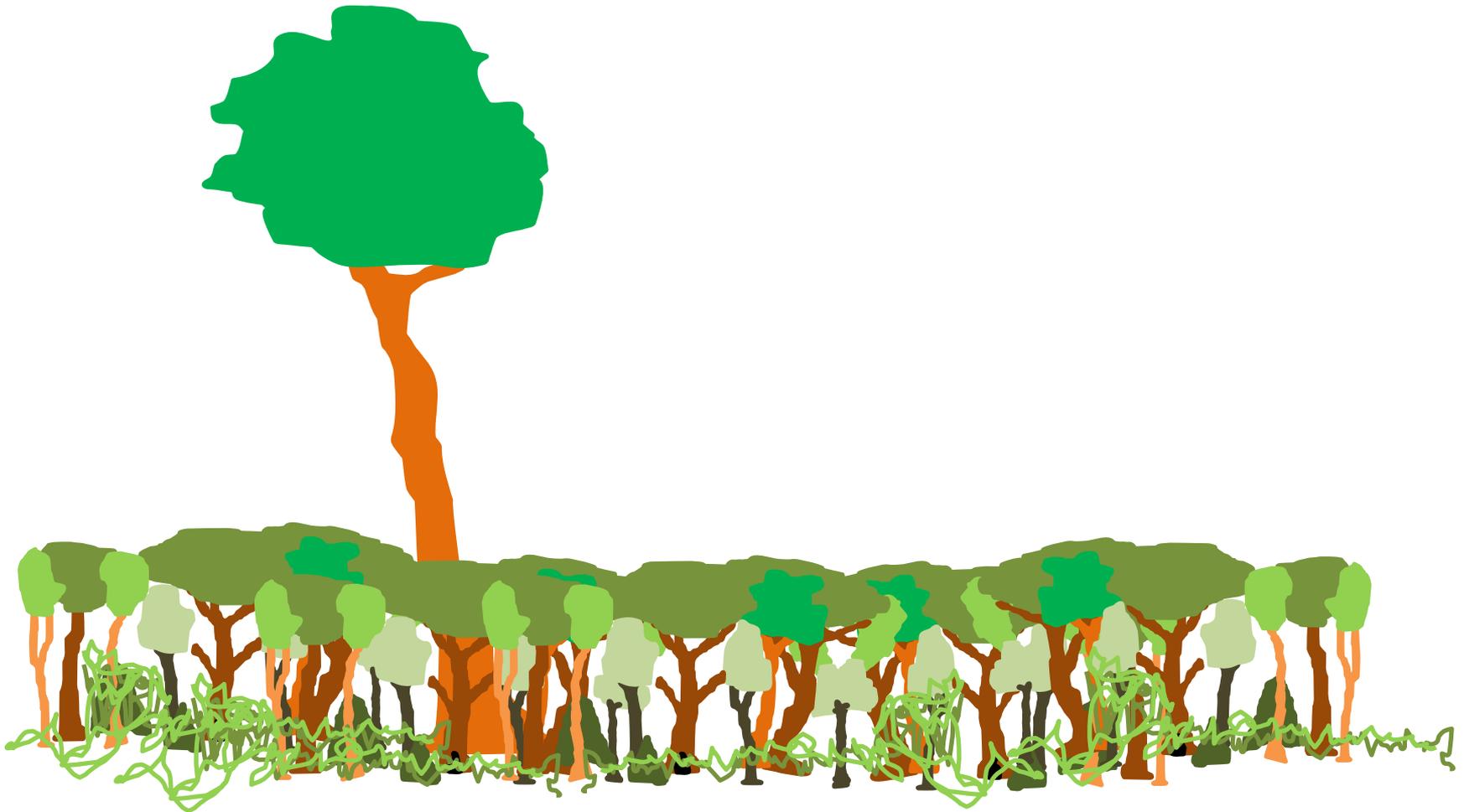








**Condition in the 1920s and 1930s, was post-charcoal-era
young forest and post-agricultural brush land**



During the 1940s, 1950s and 1960s trees grew and the forested landscape was growing and increasing in area



During the 1970s and 1980s, trees were achieving commercial size, and land development was rampant



**Today, forests are maturing and have been essentially un-managed.
In many places we have “even-aged stratified mixtures”.**



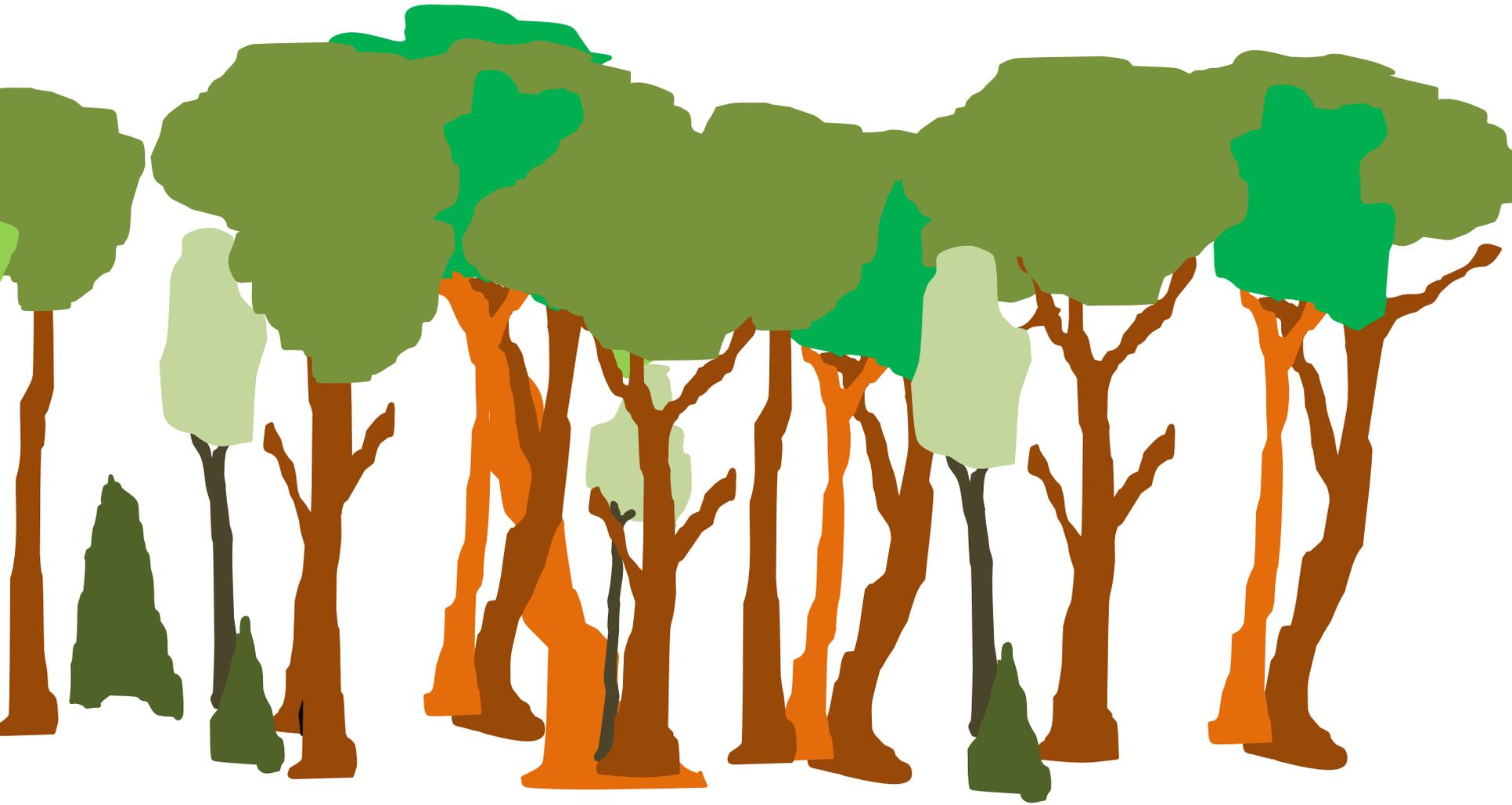
Canopy changes and stand dynamics



Canopy changes and stand dynamics



Canopy changes and stand dynamics



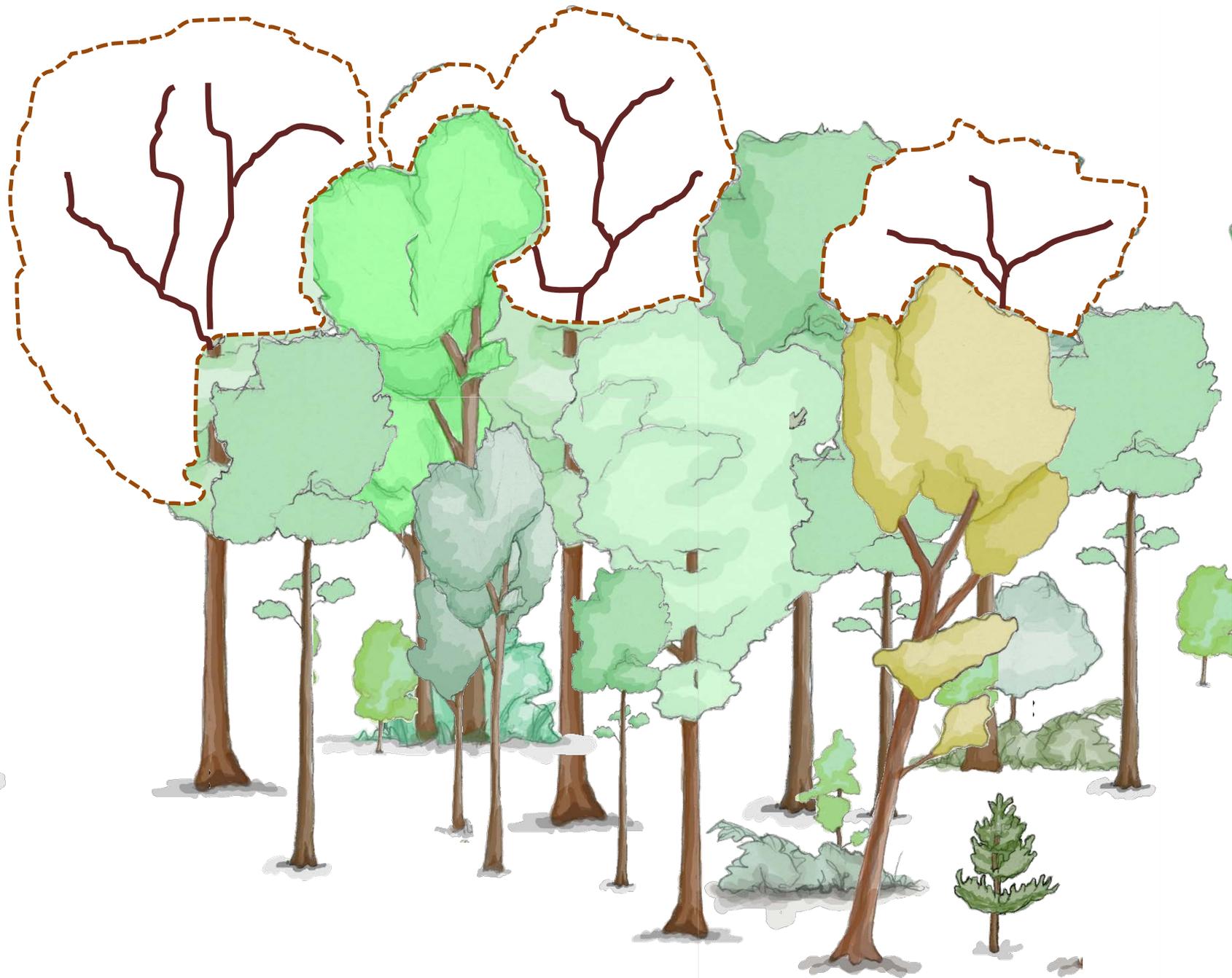
Canopy changes and stand dynamics

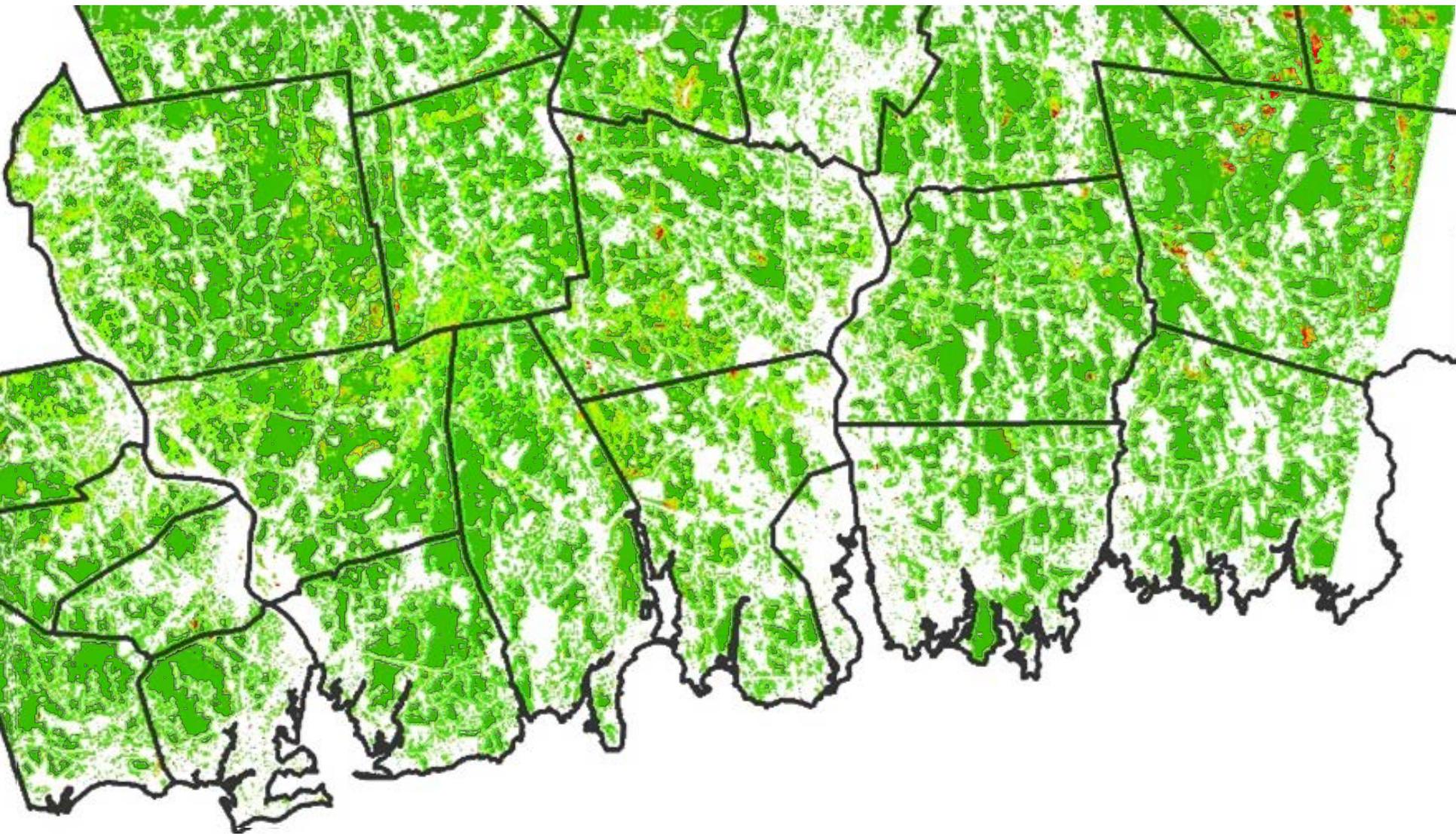


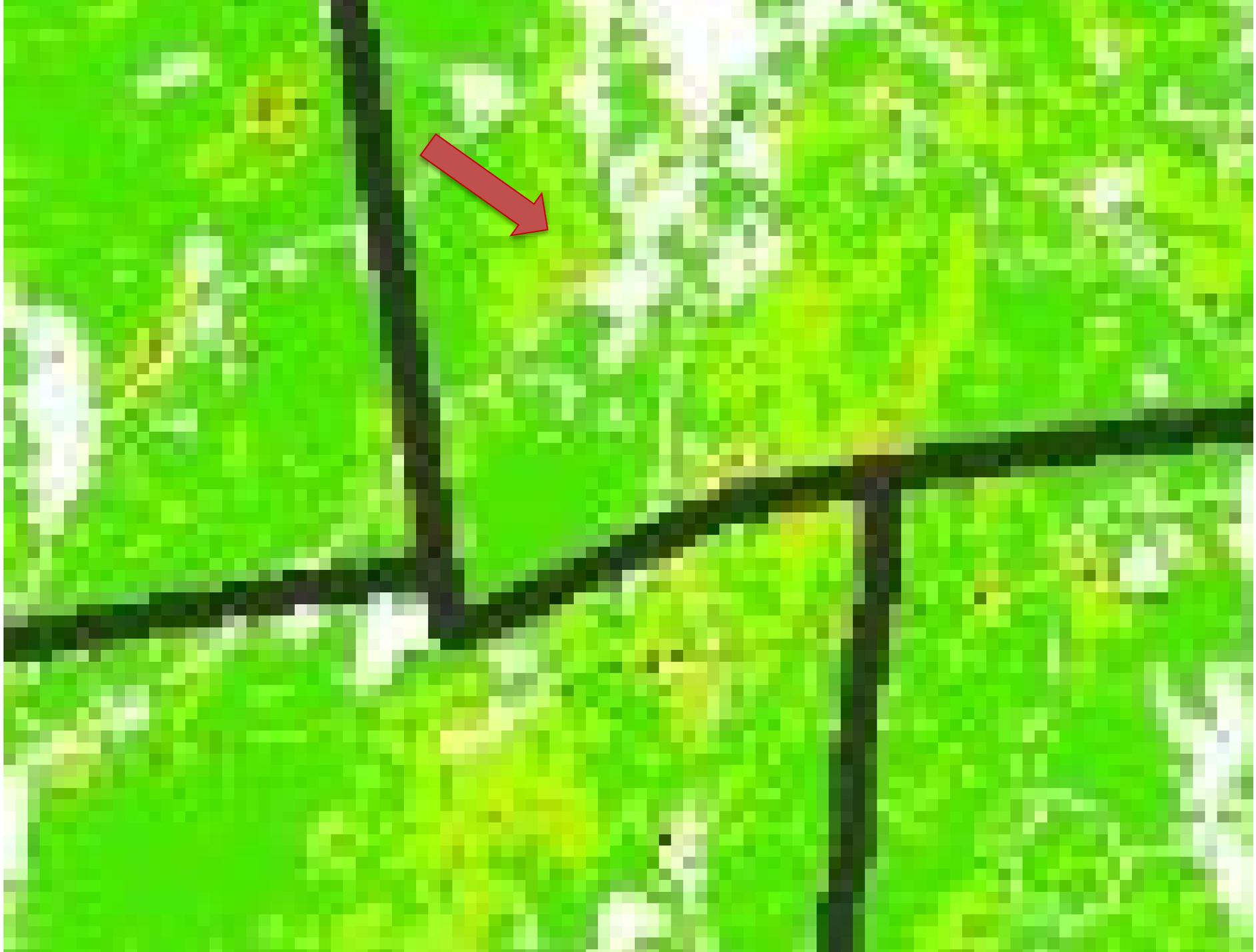


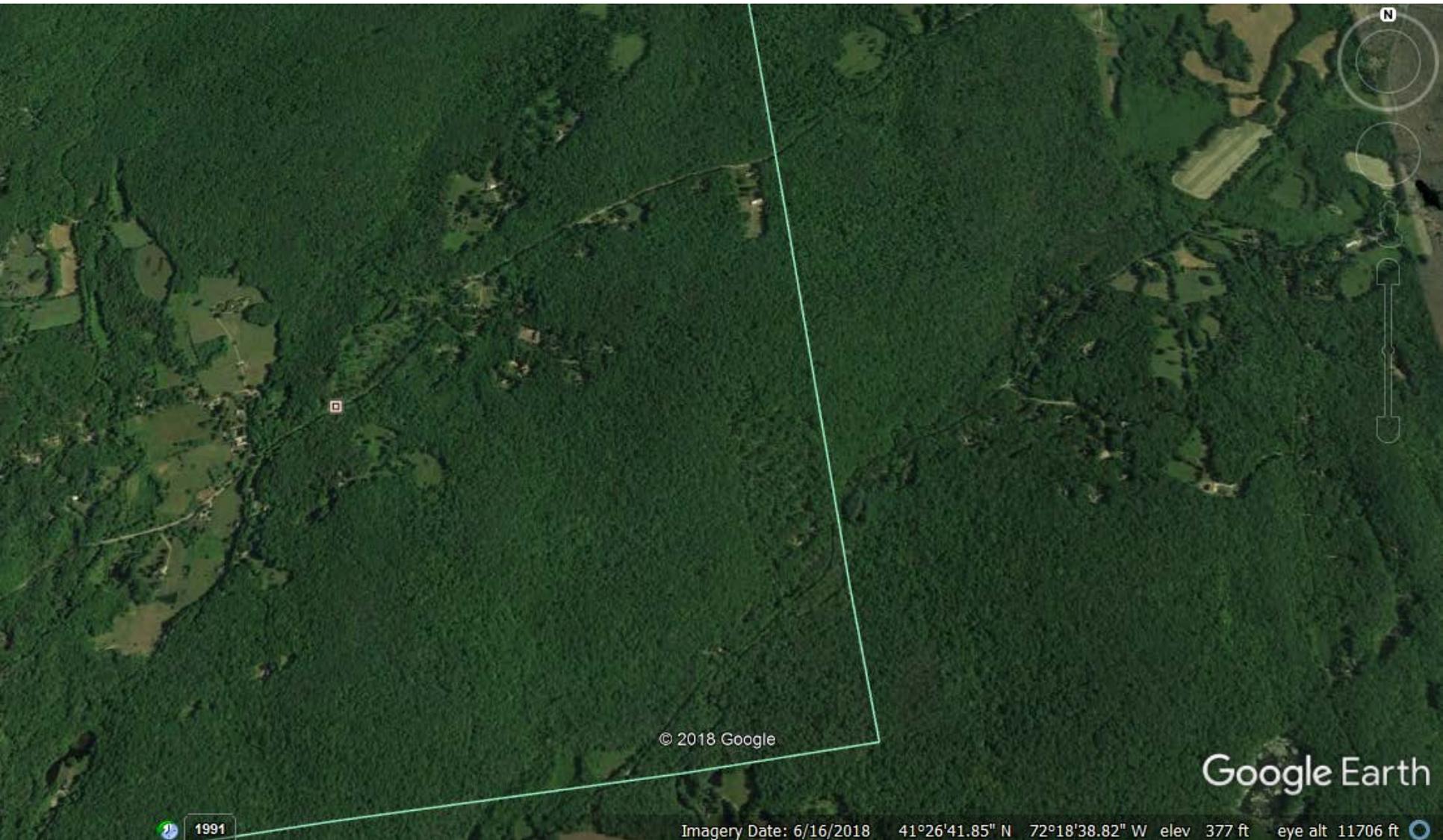












© 2018 Google

Google Earth



1991

Imagery Date: 6/16/2018 41°26'41.85" N 72°18'38.82" W elev 377 ft eye alt 11706 ft



Google Earth

© 2018 Google



200 ft



© 2018 Google

82

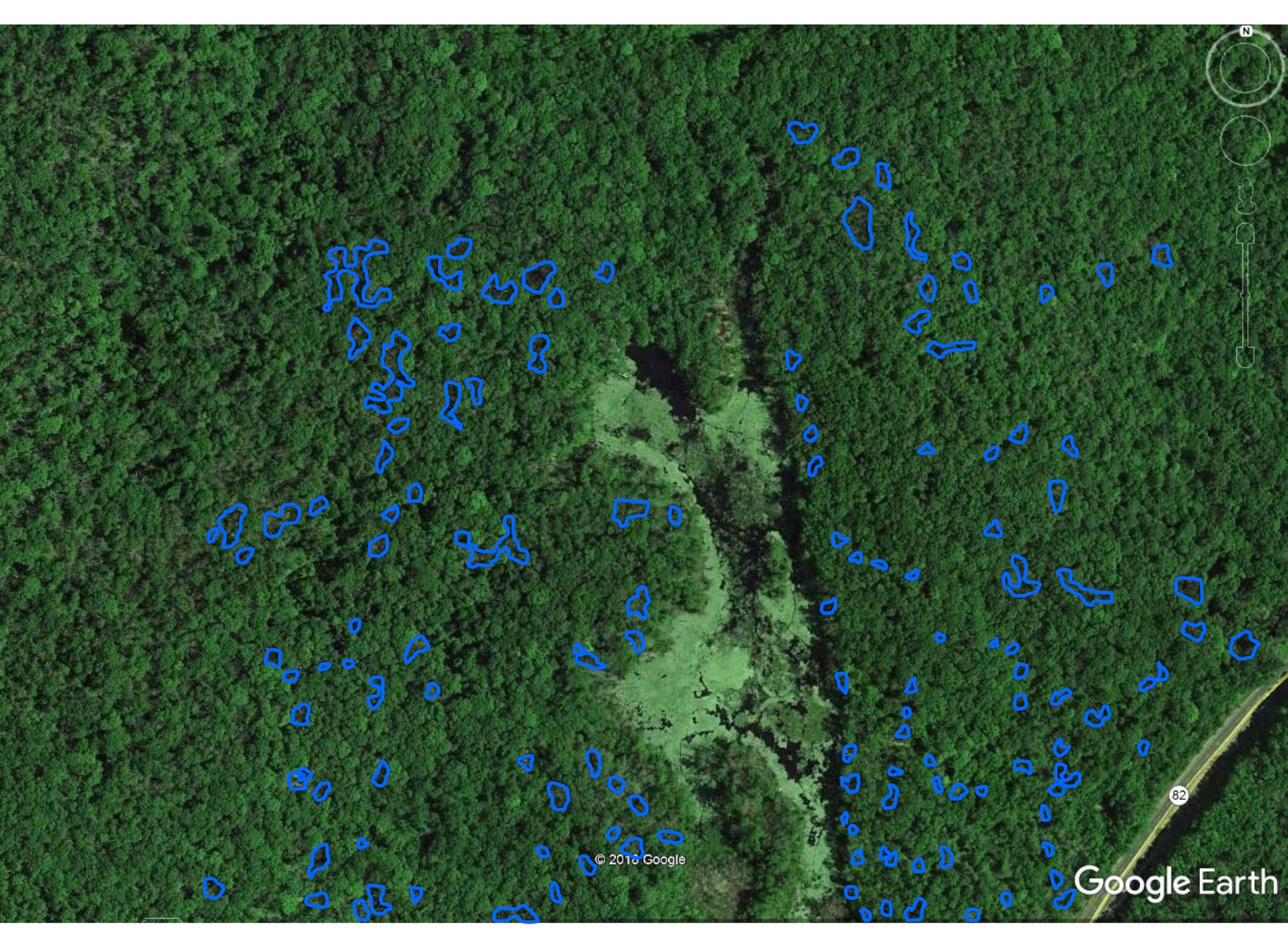
Google Earth



Google

1990

Imagery Date: 6/16/2018 41°26'25.69" N 72°29'45.18" W elev. 418 ft eye al



© 2013 Google

Google Earth

Acreage? TBD

- We should ultimately be able to estimate 75%+ canopy loss fairly accurately. (90,000 to 100,000 acres?)
- Areas with partial canopy loss will be more difficult – but the total is likely substantial. (400,000 to 500,000 acres?)







Thank You.

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Thank You

