

# Our Dynamic Connecticut Forest: 80 years of observations



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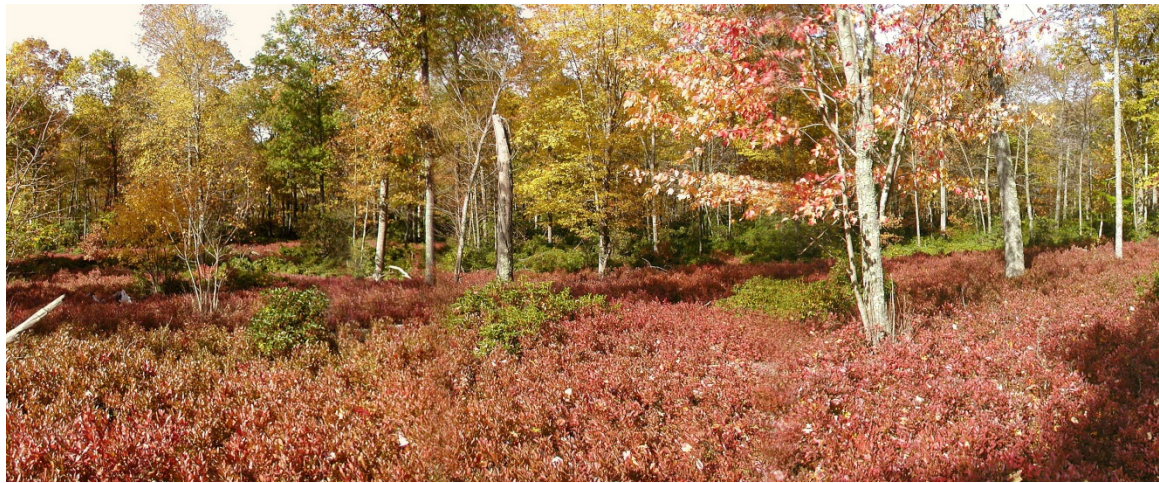
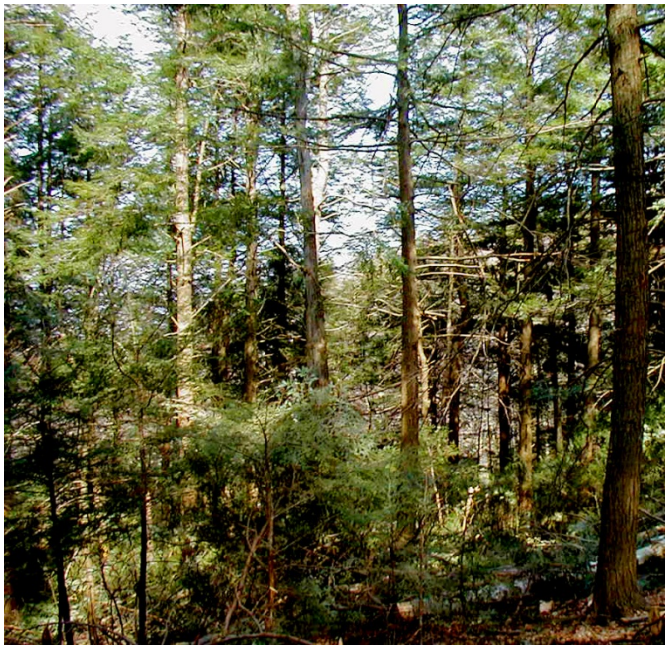


# Diversity – the strength of our forests

- Ecological
- Aesthetic
- Economic















**Credit: Stella Cousins, Yale**



























CAES- Plant Science Day 2010- 100<sup>th</sup> Anniversary

















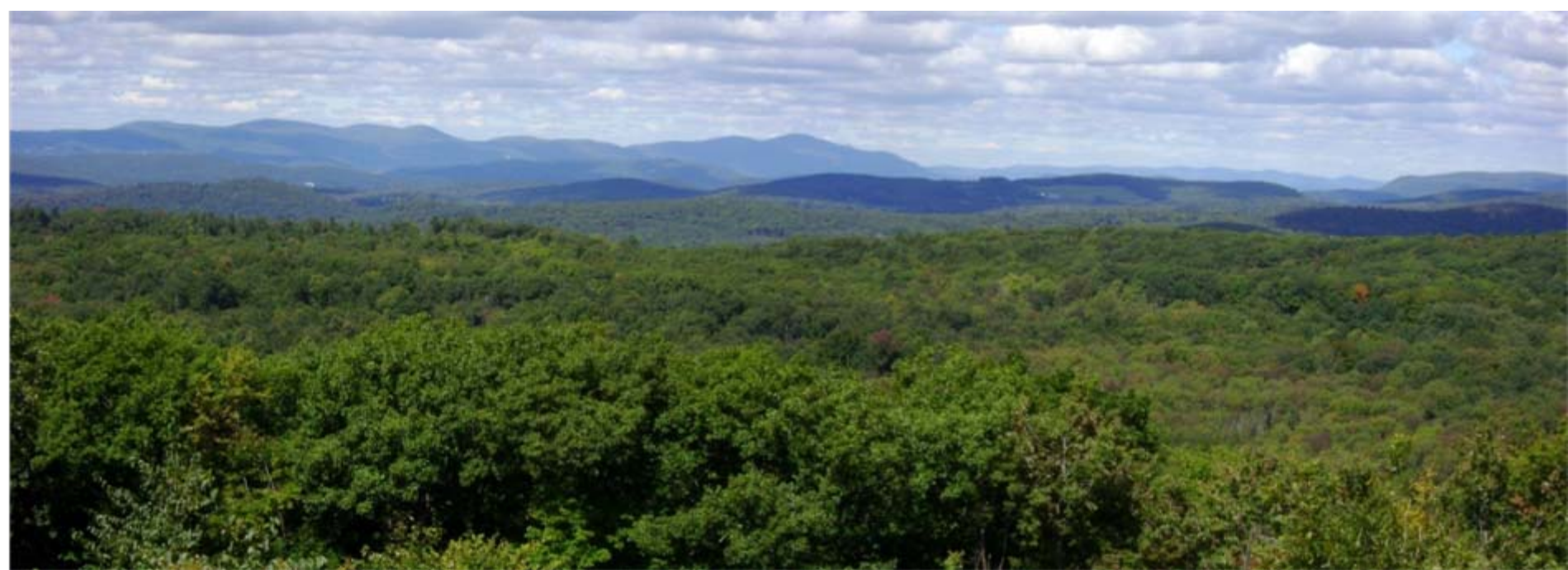


# Forests are not dioramas

- Change happens, whether or not we do anything.
- Natural succession to hurricanes





































# Forests change over time

- Monitor forests over long time periods
- What do we learn?
  - Influence of disturbance
  - Predict composition of future forests - important for water quality, wildlife, tourism, industry.
  - Predict biomass of future forests – important for carbon sequestration and industry.





# Forestry research started in 1901

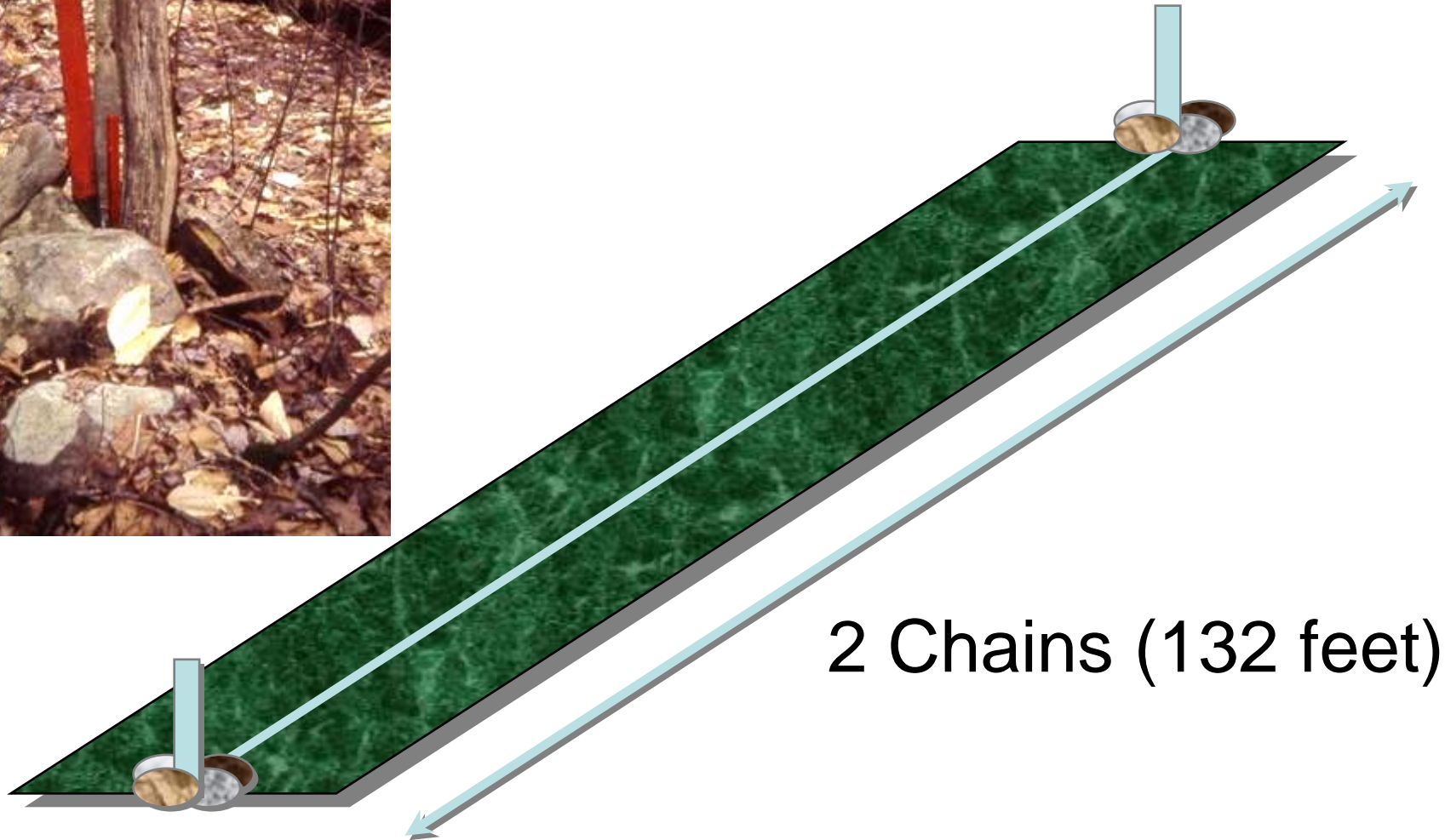




# Old-Series Plots (1927-2007)







1 Rod (16.5 ft)

2 Chains (132 feet)









# Tree measurements

- Diameter (inches) at 4.5 feet, 0.5" minimum
- Species
- Crown class
- Location
- 44,787 trees in database
- 64 species







**Mean diameter of upper canopy oaks in – 6” dbh**





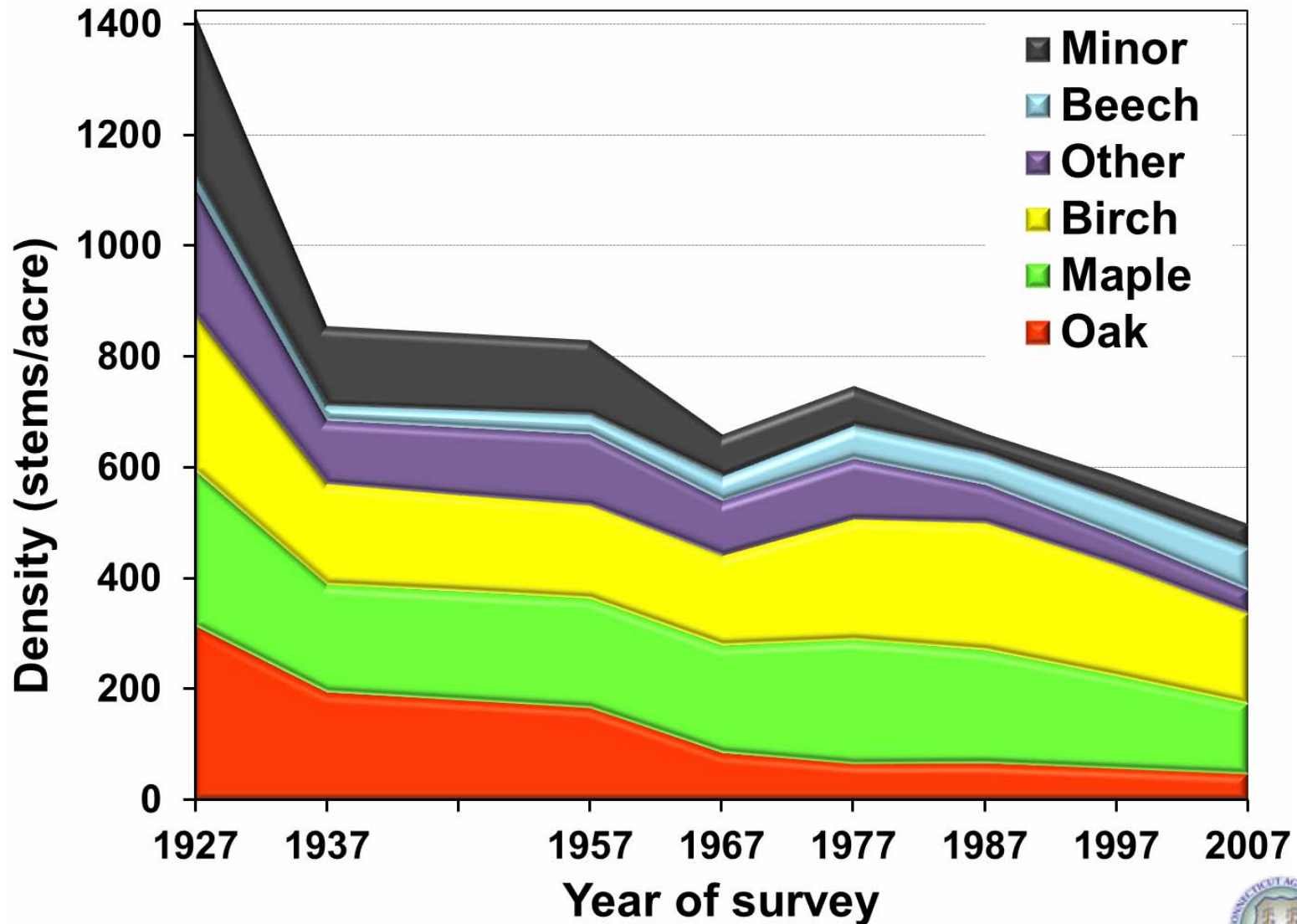


**Mean diameter of upper canopy oaks in 2007 – 17” dbh**





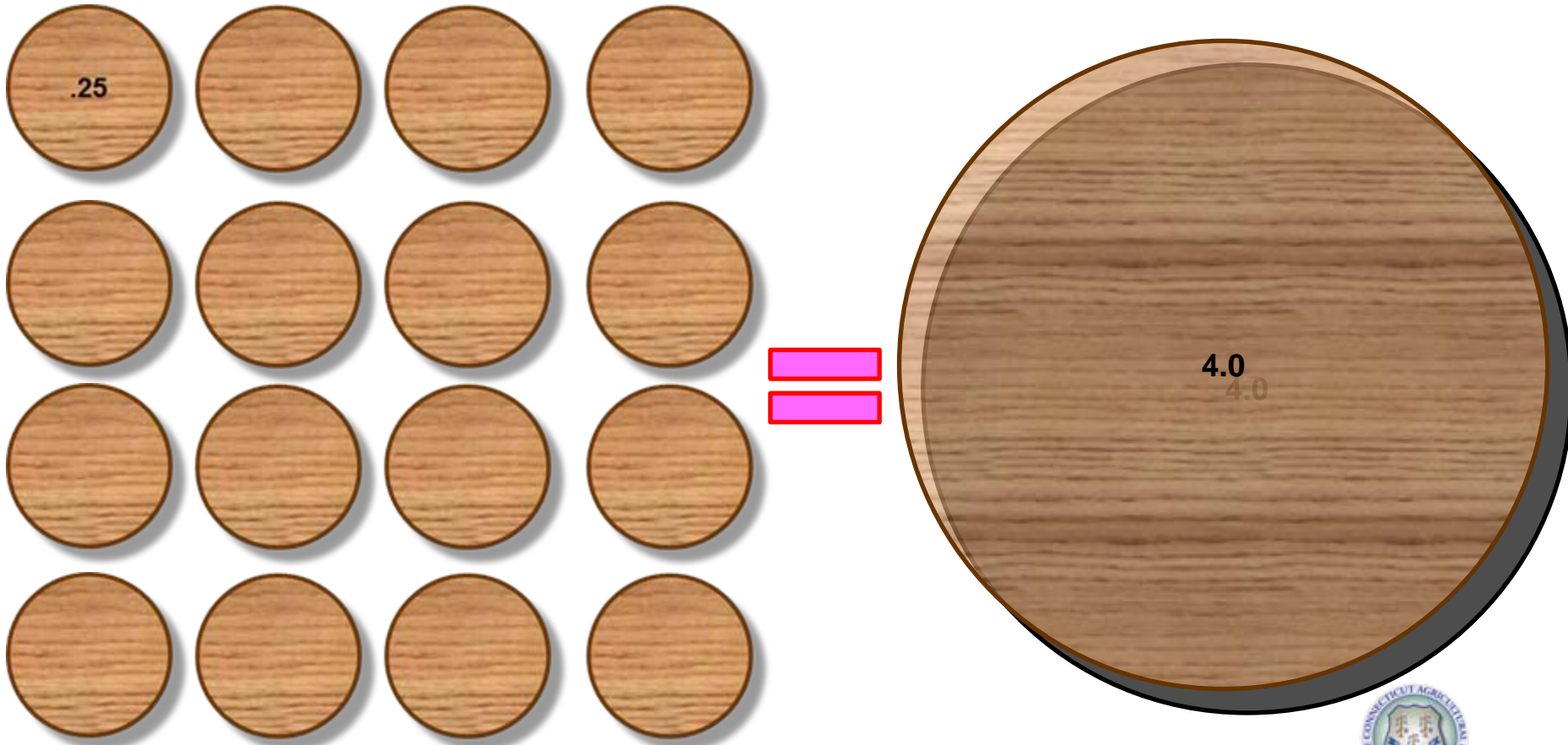
# Density (number of trees)





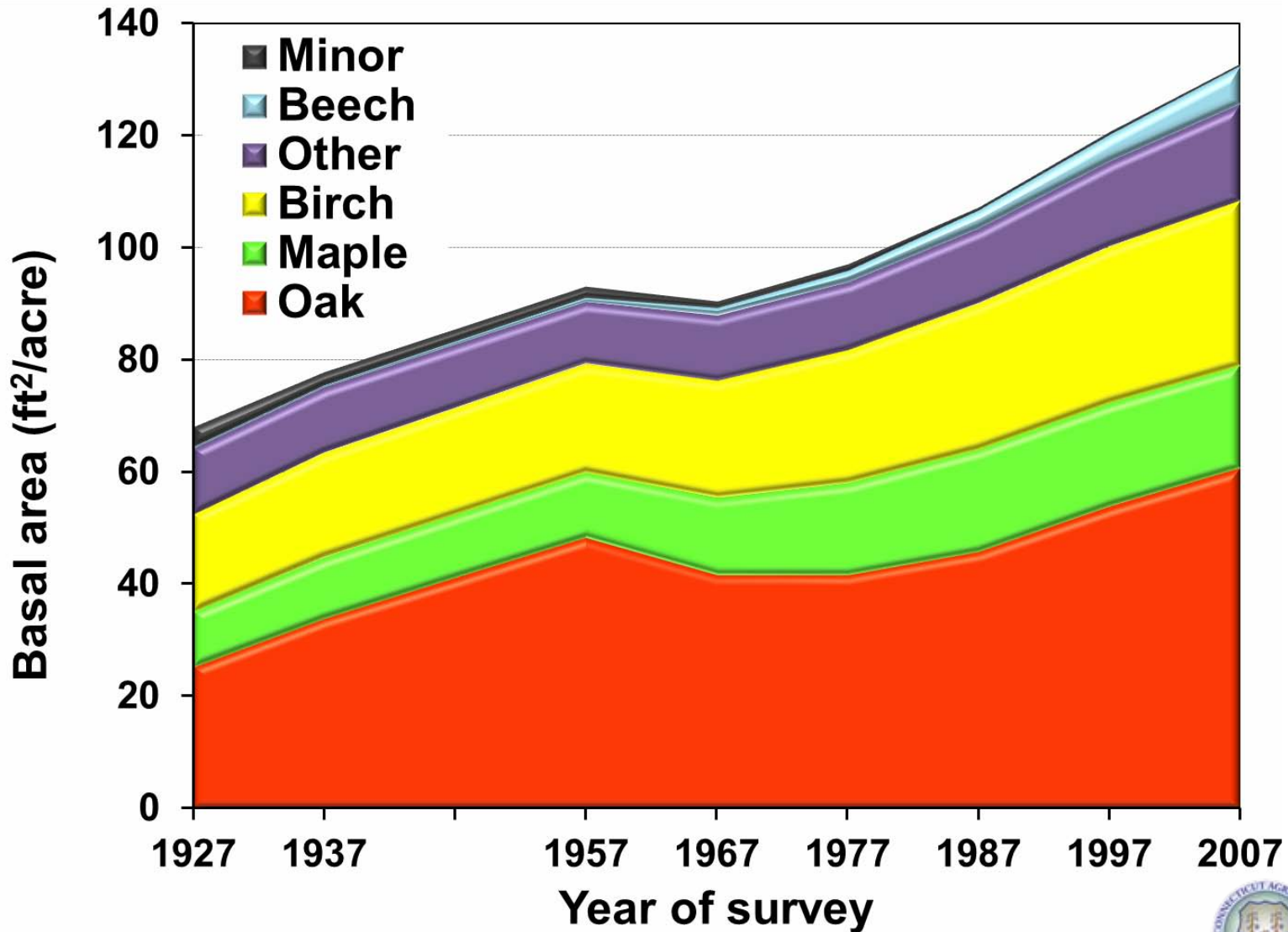
# Basal area explained

Sixteen 1-inch trees has same BASAL AREA as one 4-inch tree



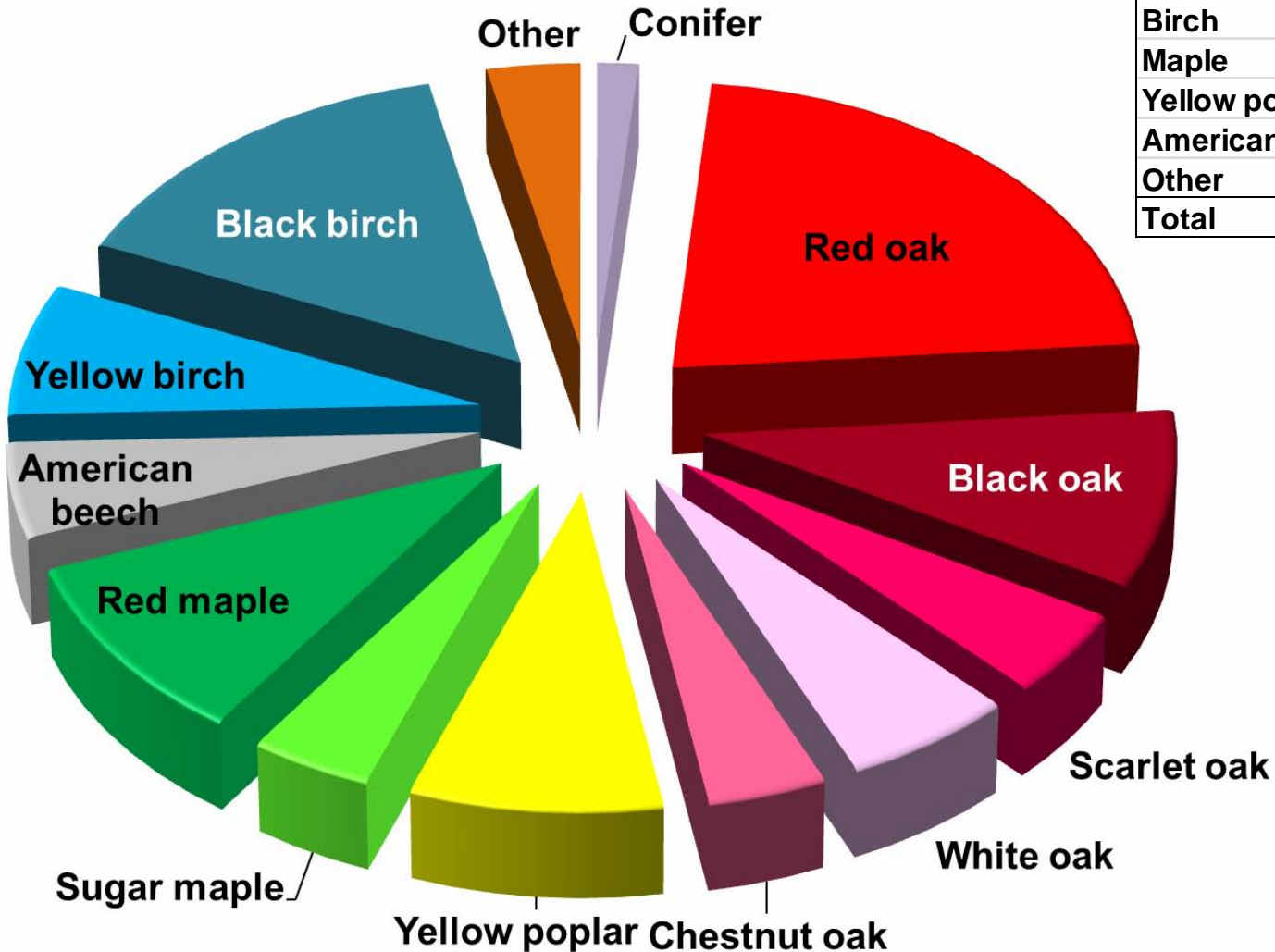


# Basal area (~ forest biomass)





# Most biomass on 11 species



	ft <sup>2</sup> /acre	Percent
Oak	60.8	46%
Birch	29.4	22%
Maple	18.3	14%
Yellow poplar	11.0	8%
American beech	6.7	5%
Other	6.4	5%
<b>Total</b>	<b>132.7</b>	<b>100%</b>





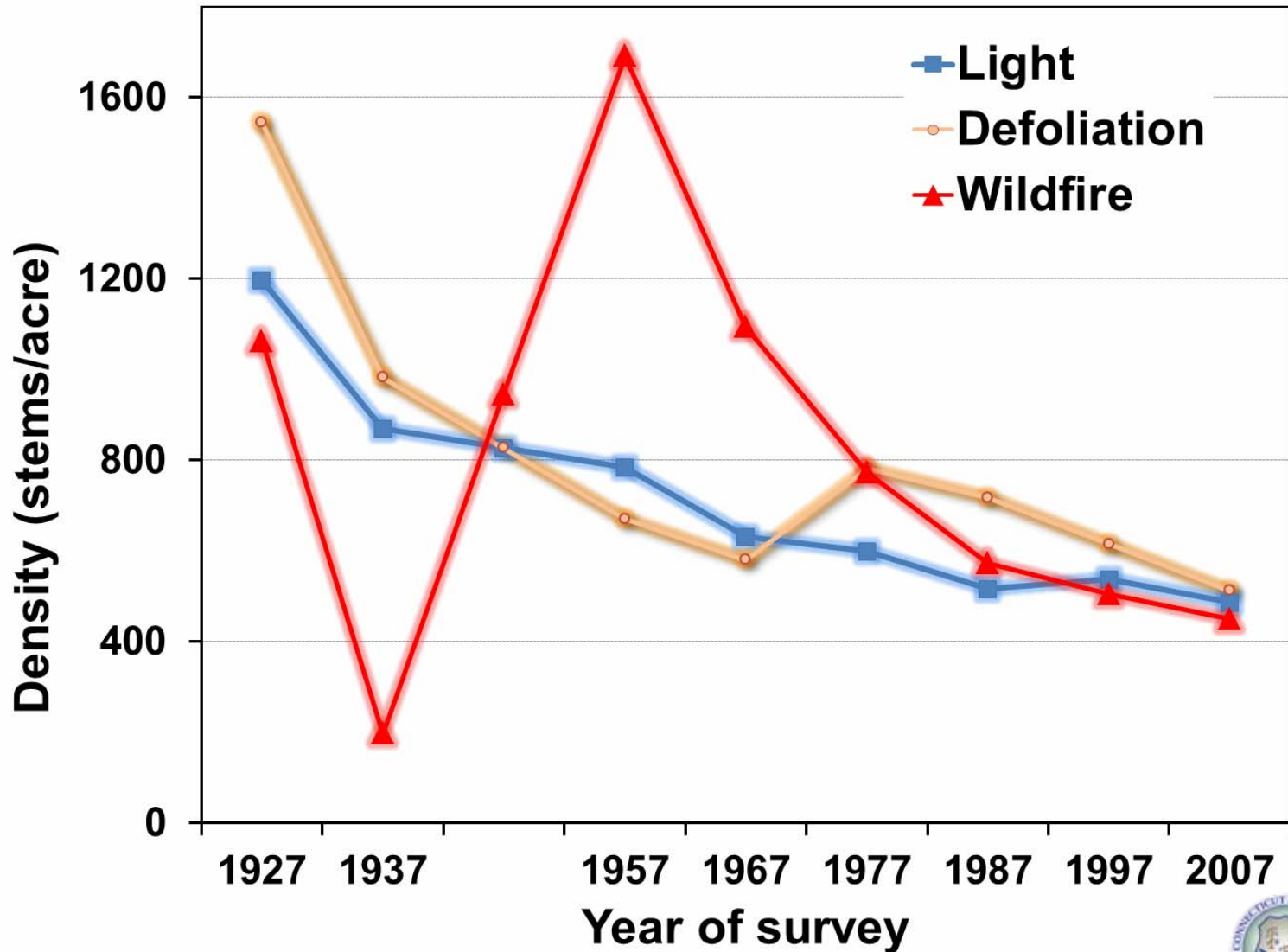
# Disturbance histories

- Wildfire, severe disturbance
  - Turkey Hill (1932 wildfire)
- Defoliation, moderate disturbance
  - Meshomasic plots, multi-year defoliations
- Light disturbance
  - Turkey Hill (unburned), single year defoliations

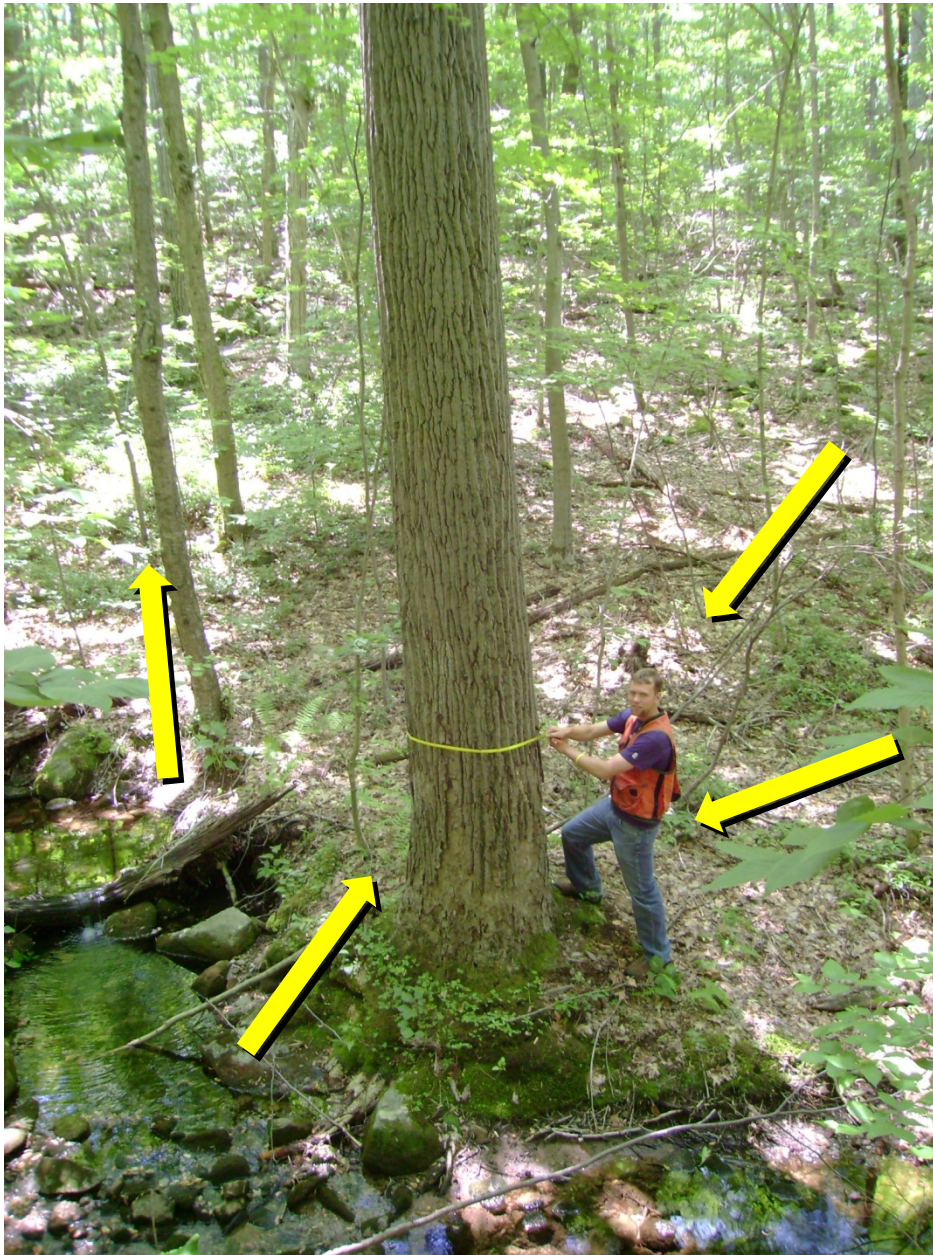




# Density by disturbance type







# Ingrowth – the future forest

The overstory trees in 100-years will arise from the pool of small trees (saplings) found today.

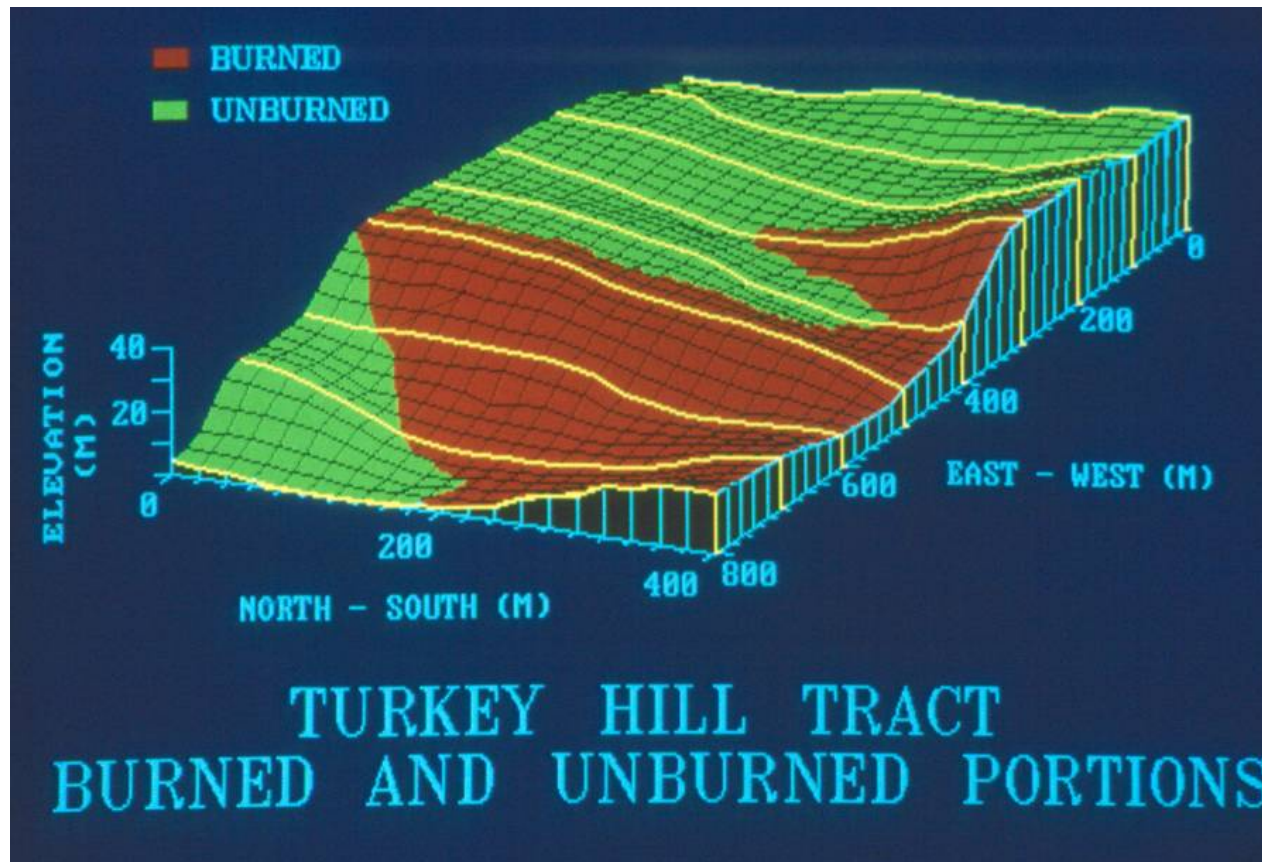
Thus, examining these small trees will provide a glimpse of the future forest





# Forests with wildfire

Part of the Turkey Hill Tract was burned in an 800 acre wildfire in August 1932









# Forests with insect defoliation







UGA1396105



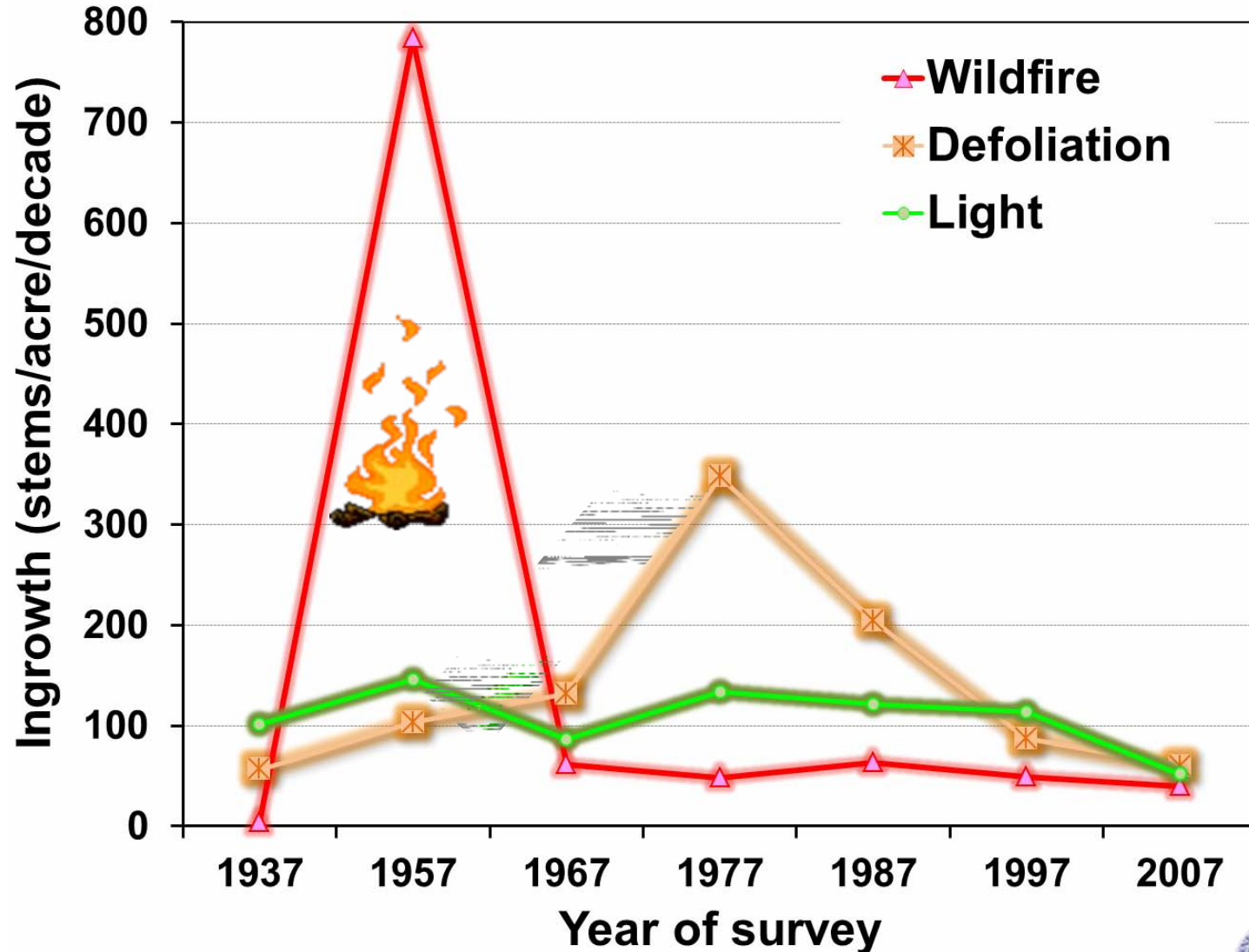


# Forests with light disturbance





# Disturbance increased new saplings



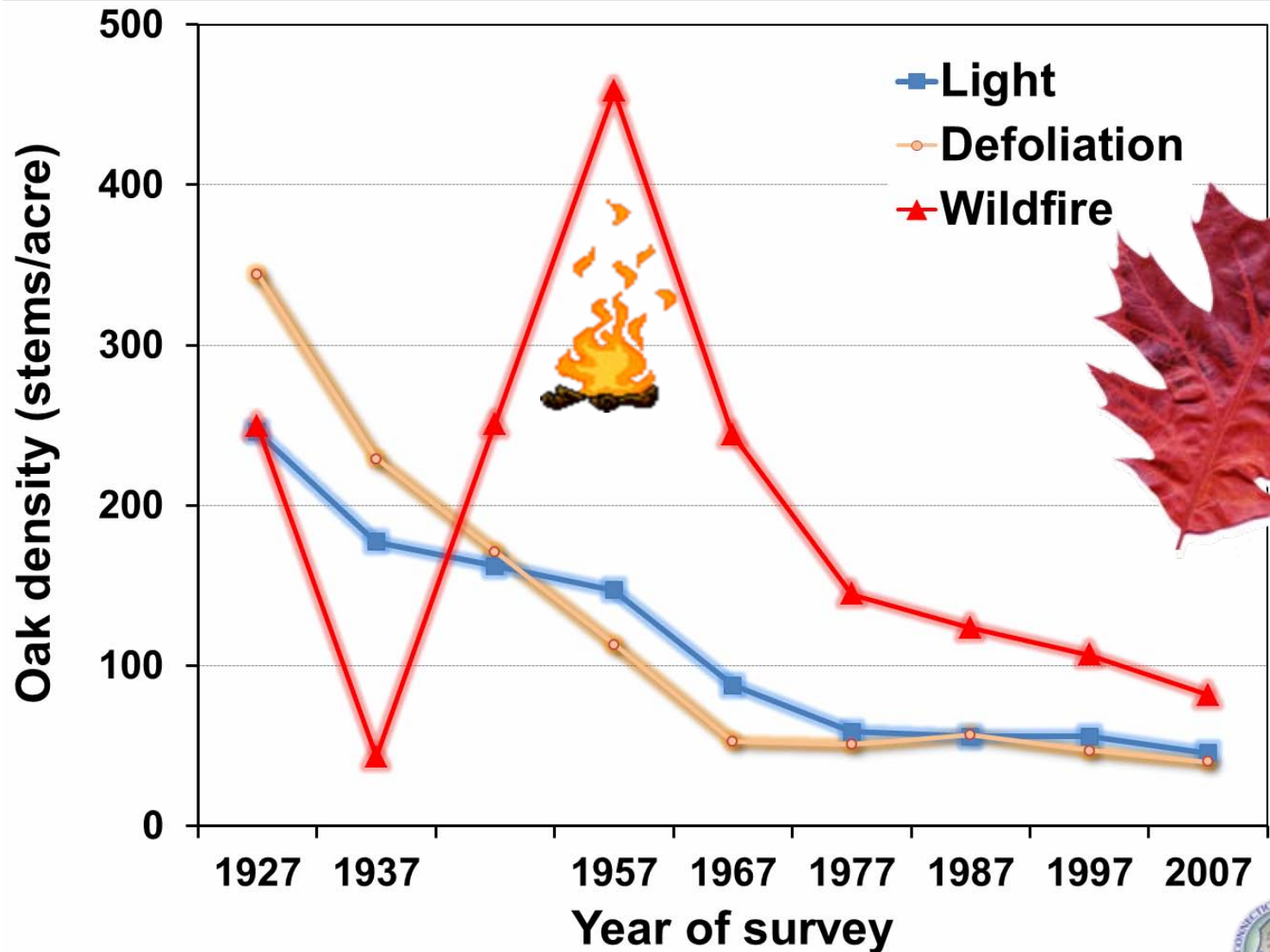


# Fire→Oak    Defoliation→Birch    Natural→Maple





# Increased oak 75-yr after wildfire





# General observations

- Burning (favors oak)
- Repeated defoliation (favors black birch)
- Minor defoliation (favors red maple)

**Disturbance type determines composition of future forest.**





# Invasions are coming

ALB-13 miles  
EAB-25 miles



Regulatory authority since 1901

CAES- Plant Science Day 2010- 100<sup>th</sup> Annivers



[www.ccaes.ca](http://www.ccaes.ca)









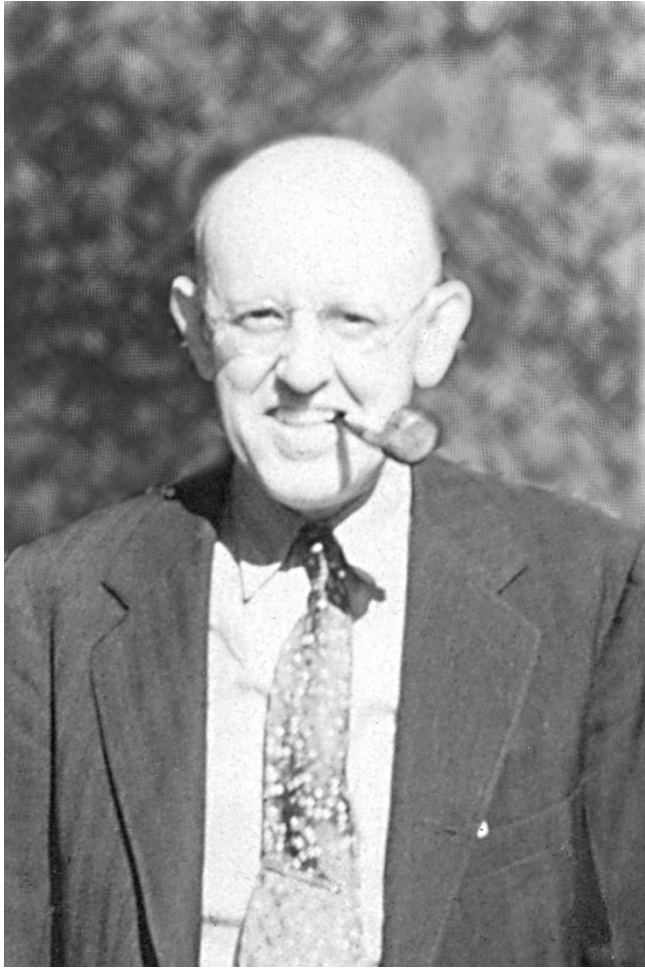




J.P. Barsky (Lead technician), Carolyn Ariori, Jonathan Colon, Emily Kieseewetter, and Daniel Tompkins







**Henry W. Hicock**  
**1927-1957 surveys**



**George R. Stephens**  
**1957-1987 surveys**



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