

# Multi-year defoliations in southern New England increases oak mortality

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Jeremy Clark – CT DEEP



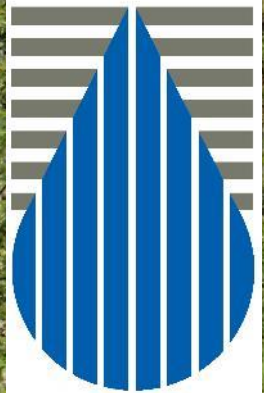
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# Providence Water

# MDC



Chad Jones



Alenka Mora, Sara Sullivan



Joseph P. Barsky

# EVERSOURCE



# What are the effects of repeated defoliation?

- Multi-year events are important
- Loss of lower canopy oaks
- Loss of white oaks
- Loss of low vigor red oaks





# Old-Series tracts – 1927-present

## Defoliation and Mortality in Connecticut Forests

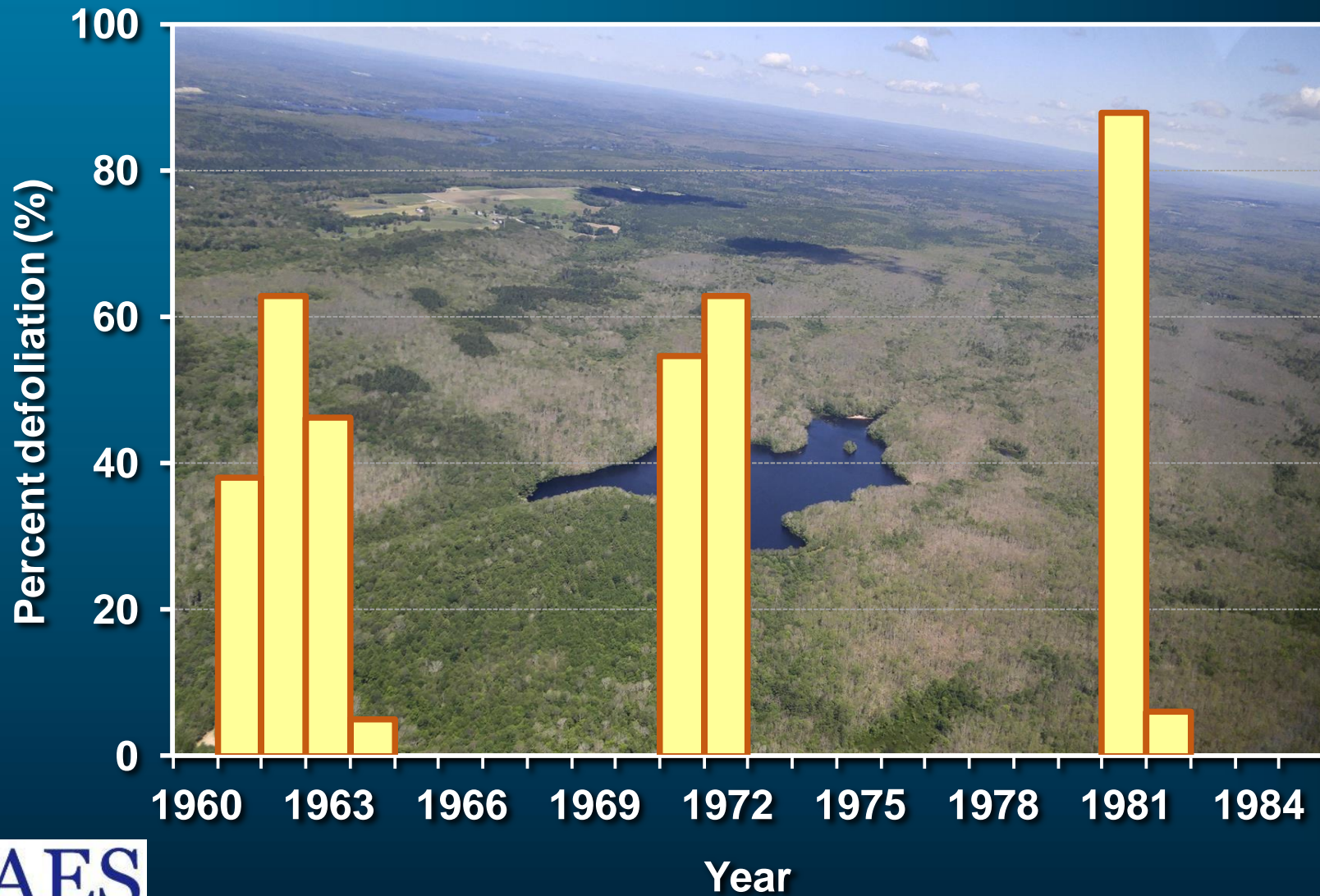
By George R. Stephens



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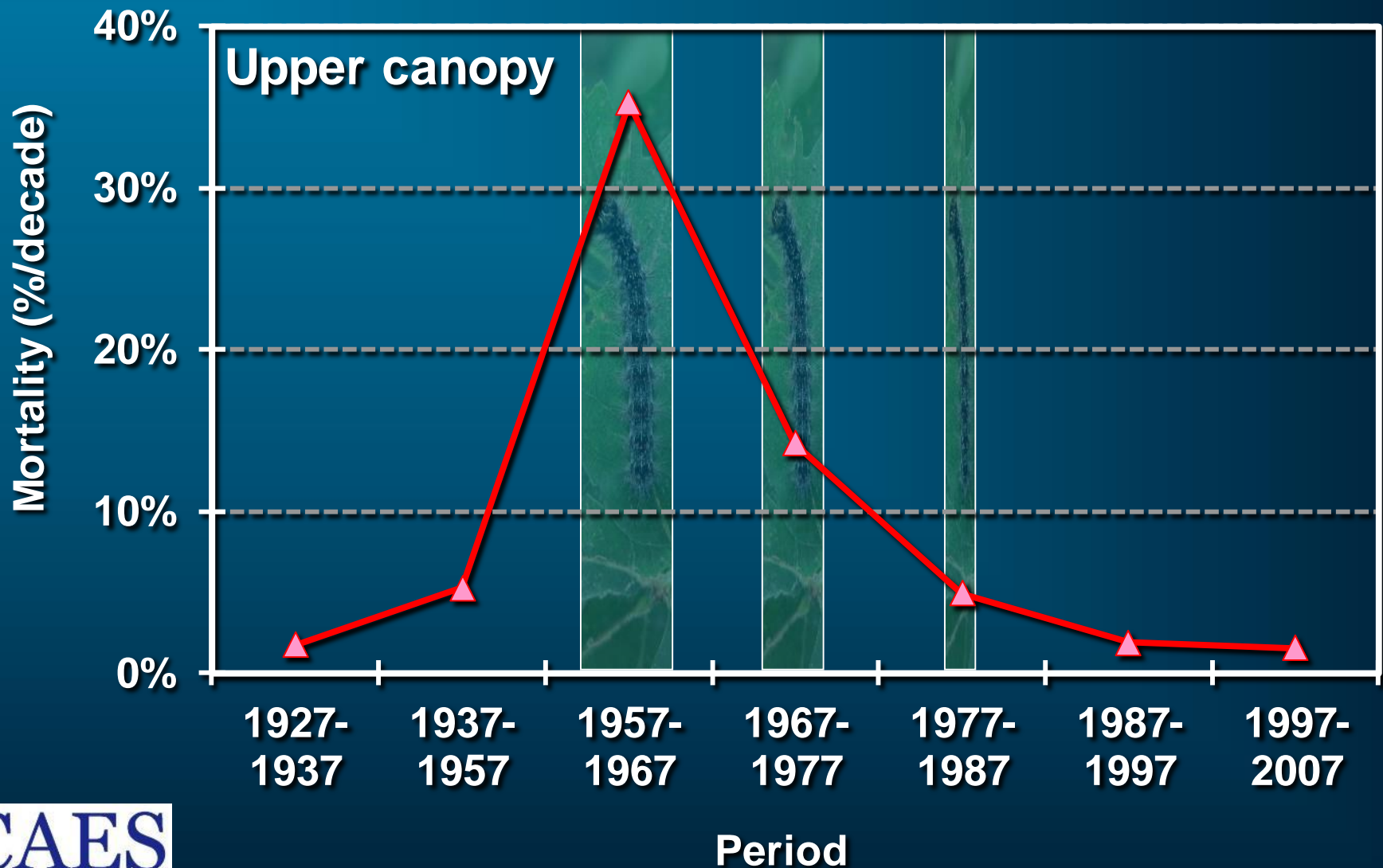


# Old-Series defoliation



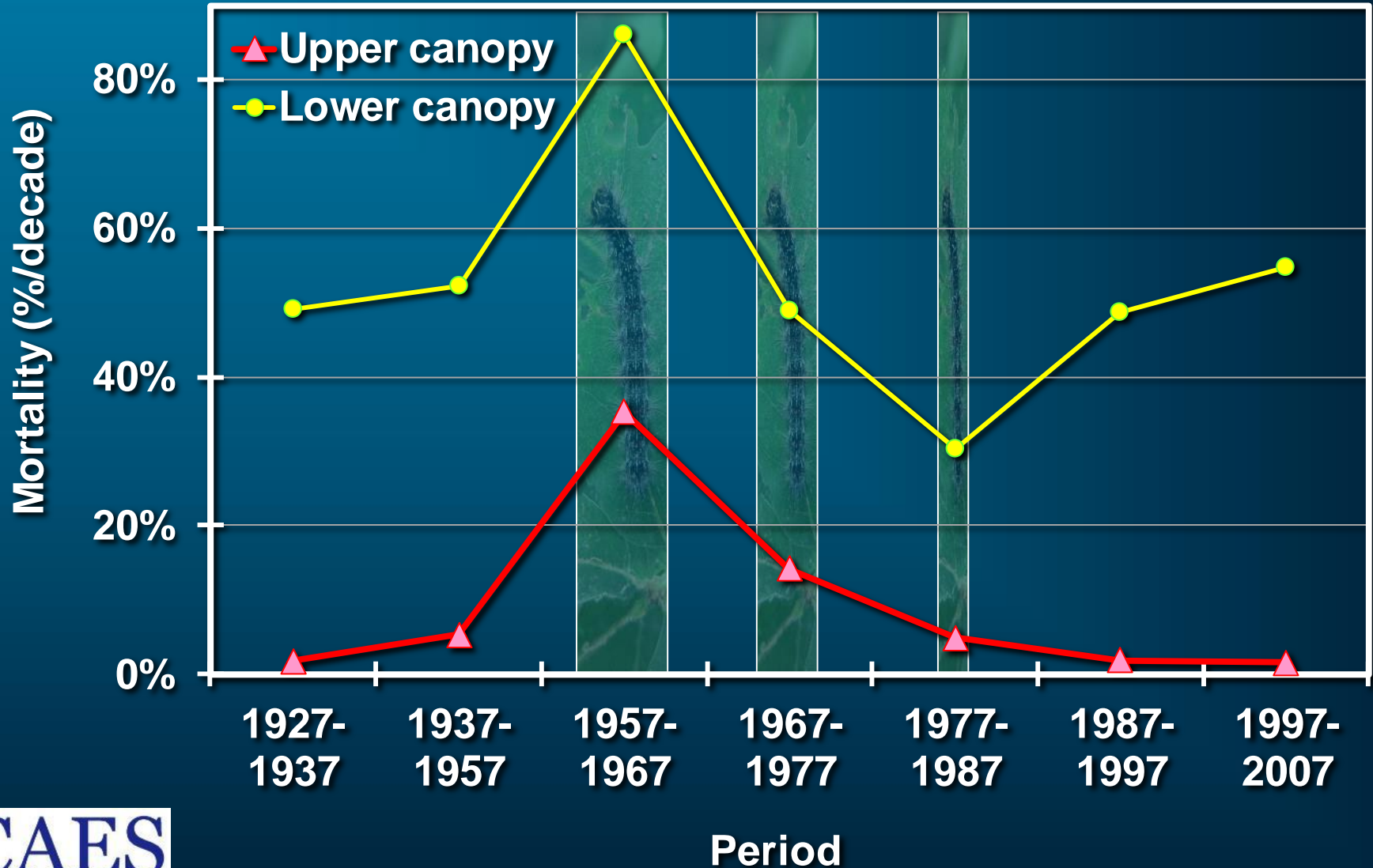


# Repeated defoliation -> higher mortality





# Higher mortality of lower canopy oaks

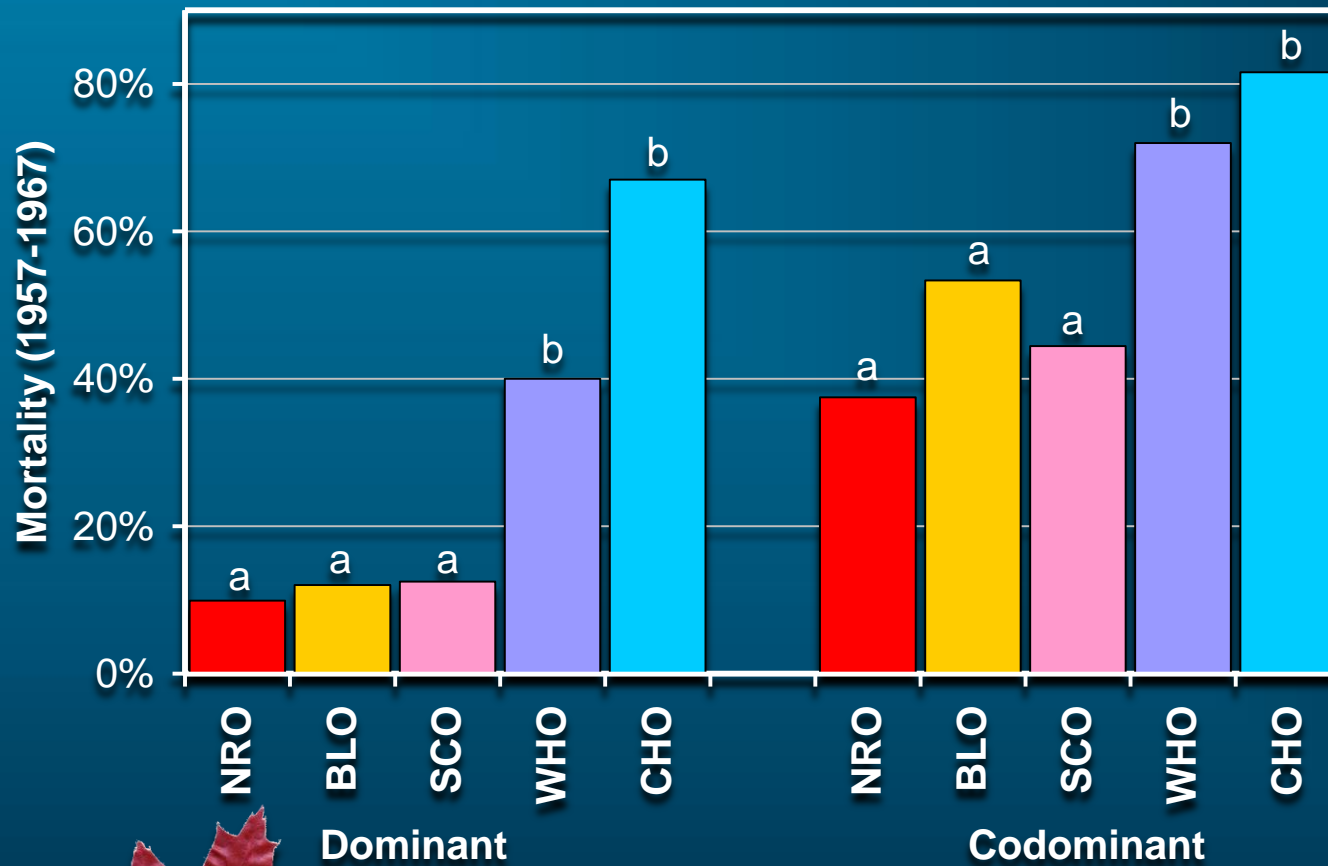






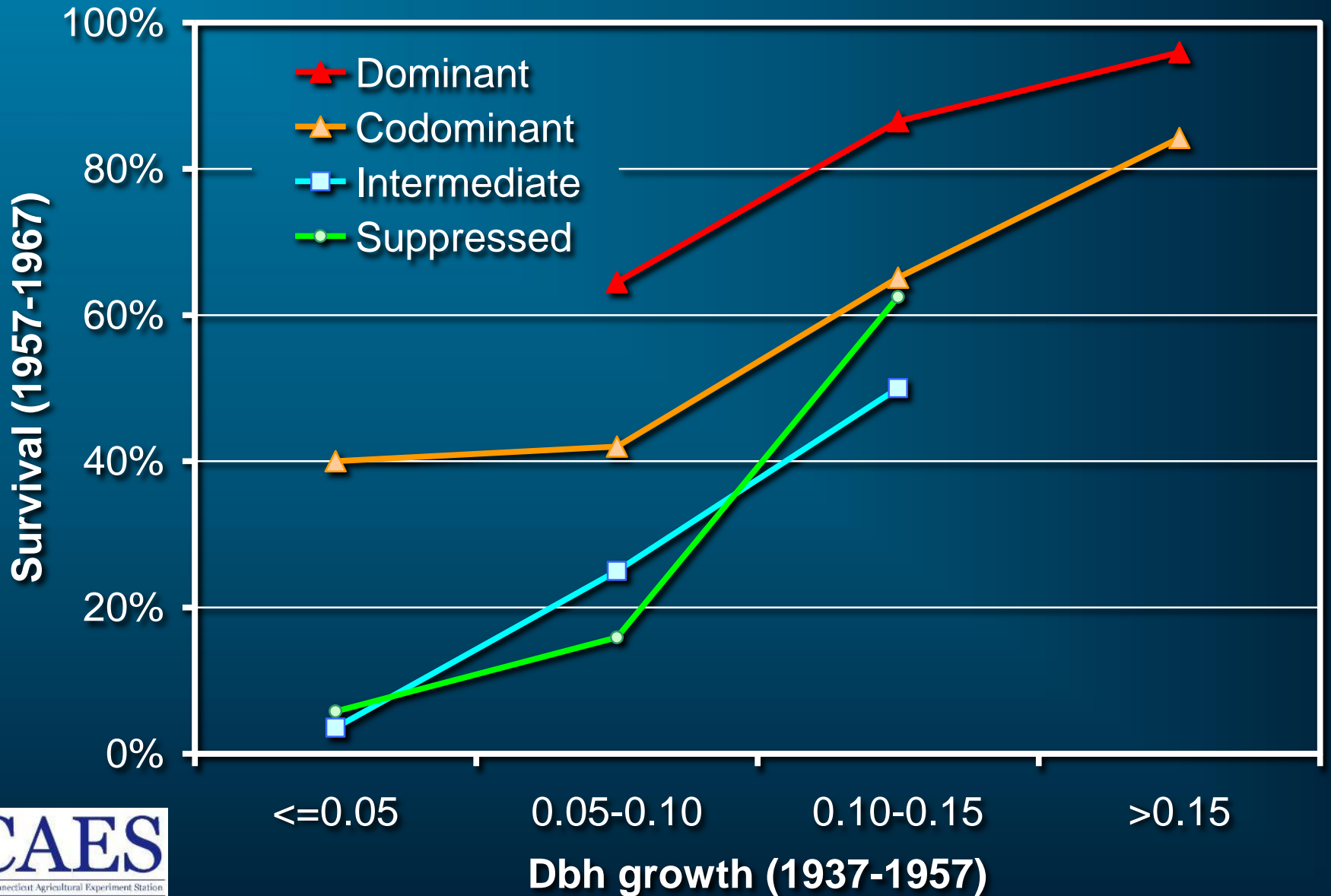


# White oak mortality higher than red oak





# Survival high for fast growing red oaks



Annual growth (inches)



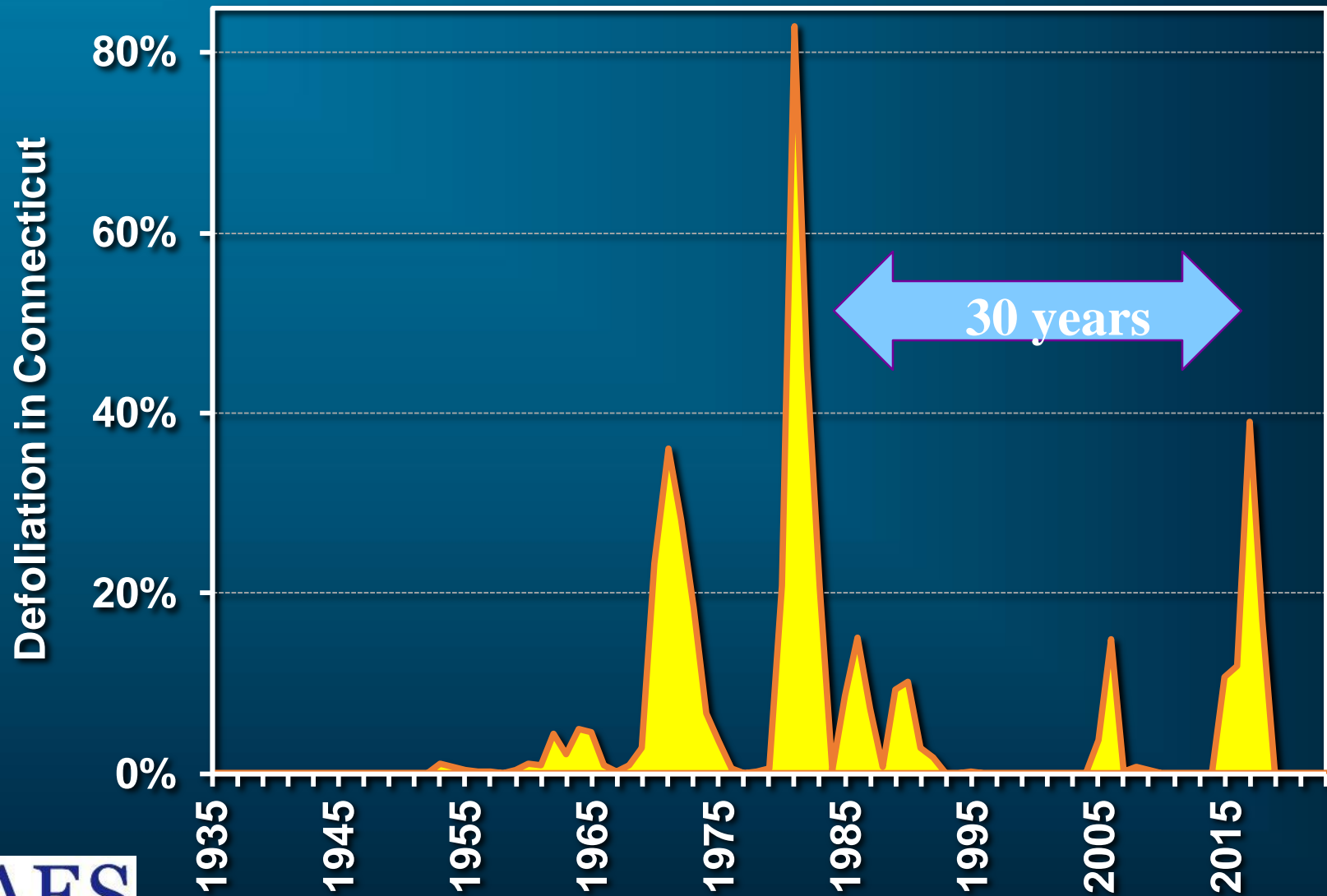
# Bottom line I

**MULTI-YEAR defoliations removed lower canopy oaks, less vigorous oak, and especially white oaks.**

**Surviving trees did recover and showed little longer-term (20+ year) effects.**



# 30 years without a major outbreak





**LDD\*?**

**What, me worry?**

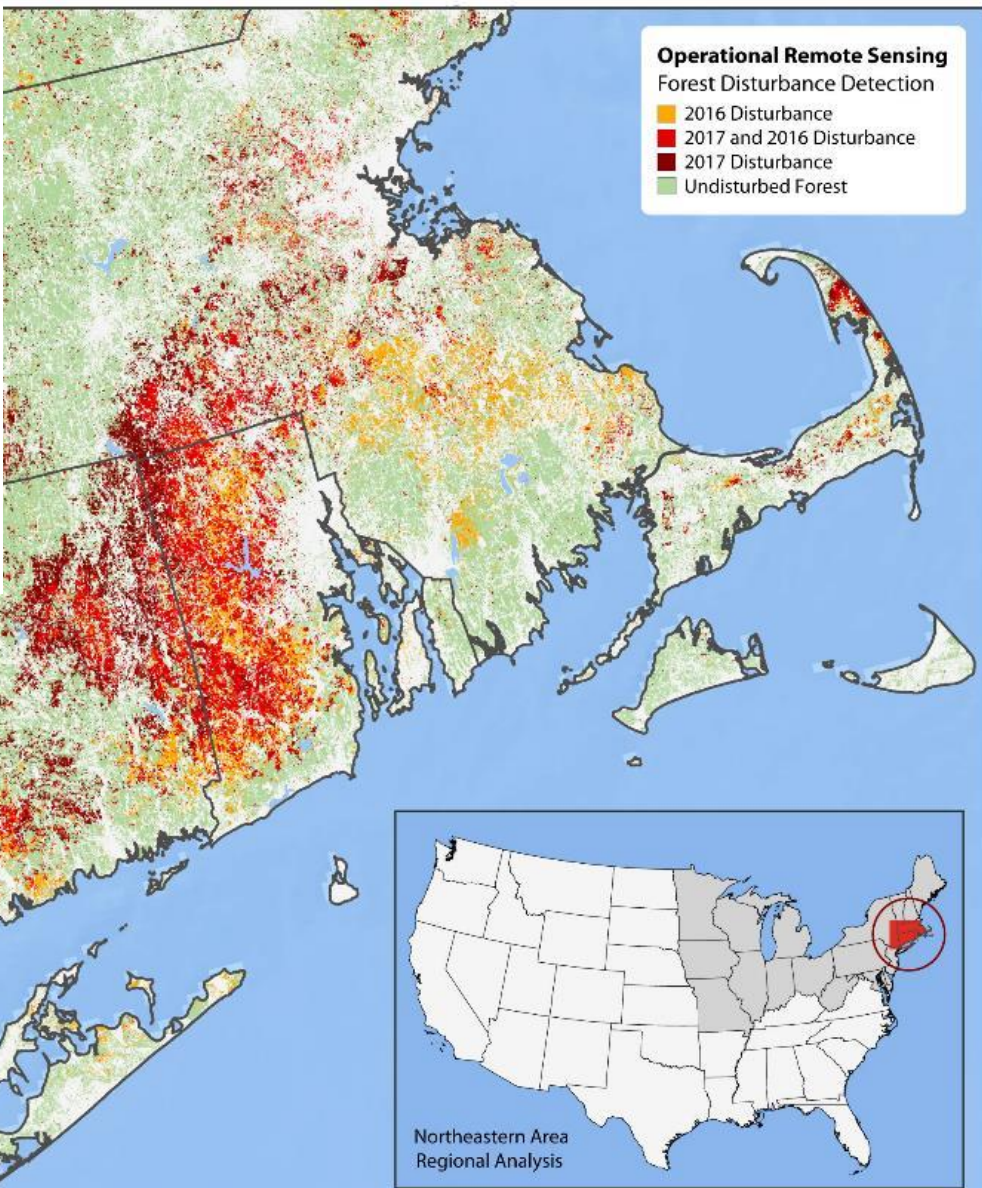
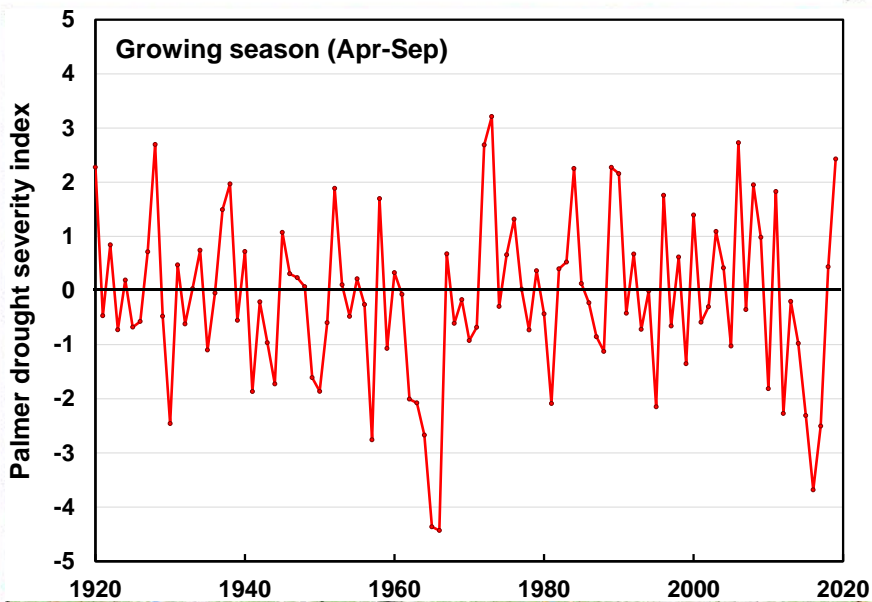


**\*LDD-*Lymantria dispar dispar***  
**(previously gypsy moth)**

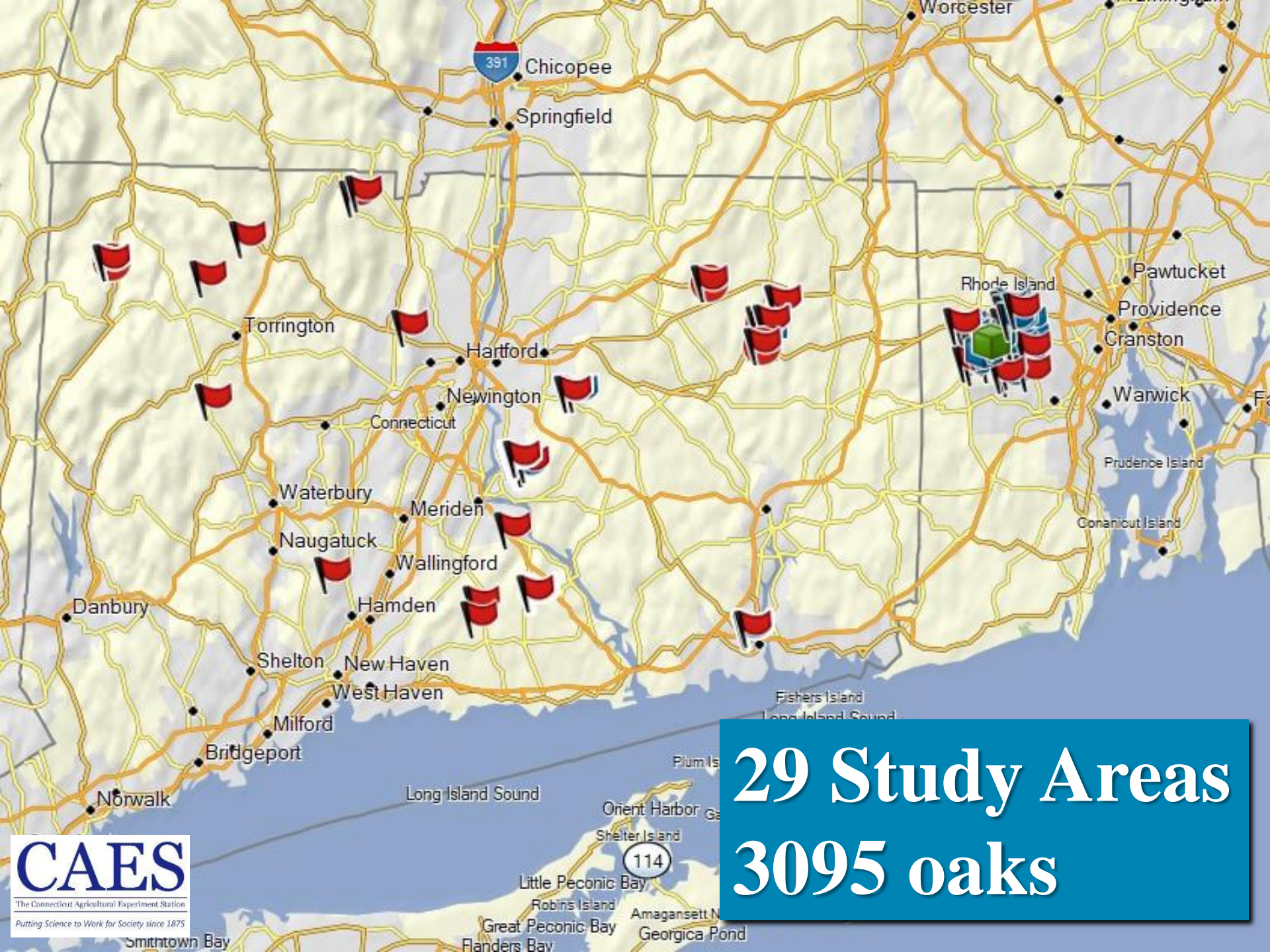


# FOREST HEALTH ASSESSMENT AND APPLIED SCIENCES TEAM

## 2017 and 2016 Gypsy Moth Defoliation\*





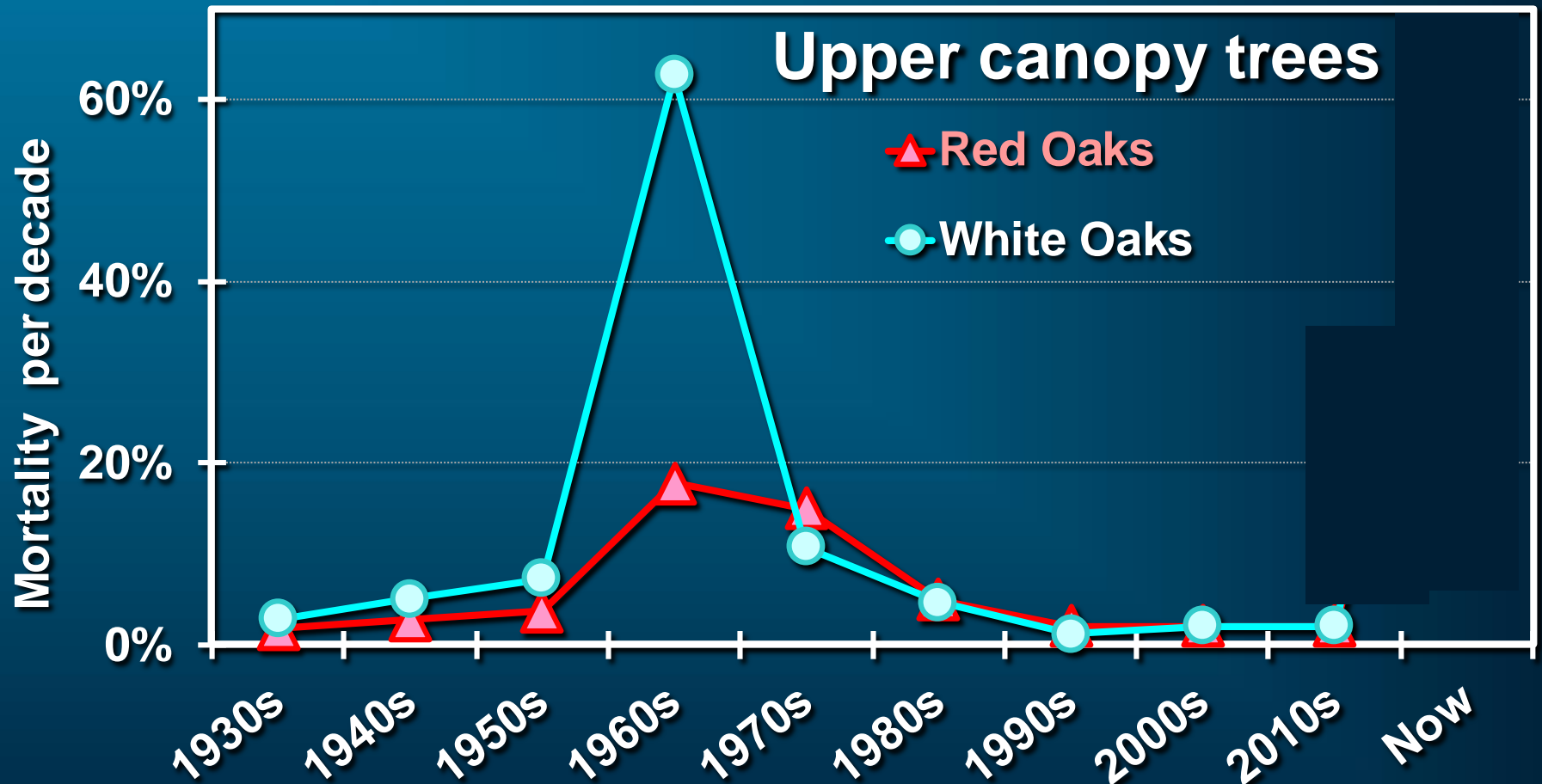


**29 Study Areas**  
**3095 oaks**

**CAES**

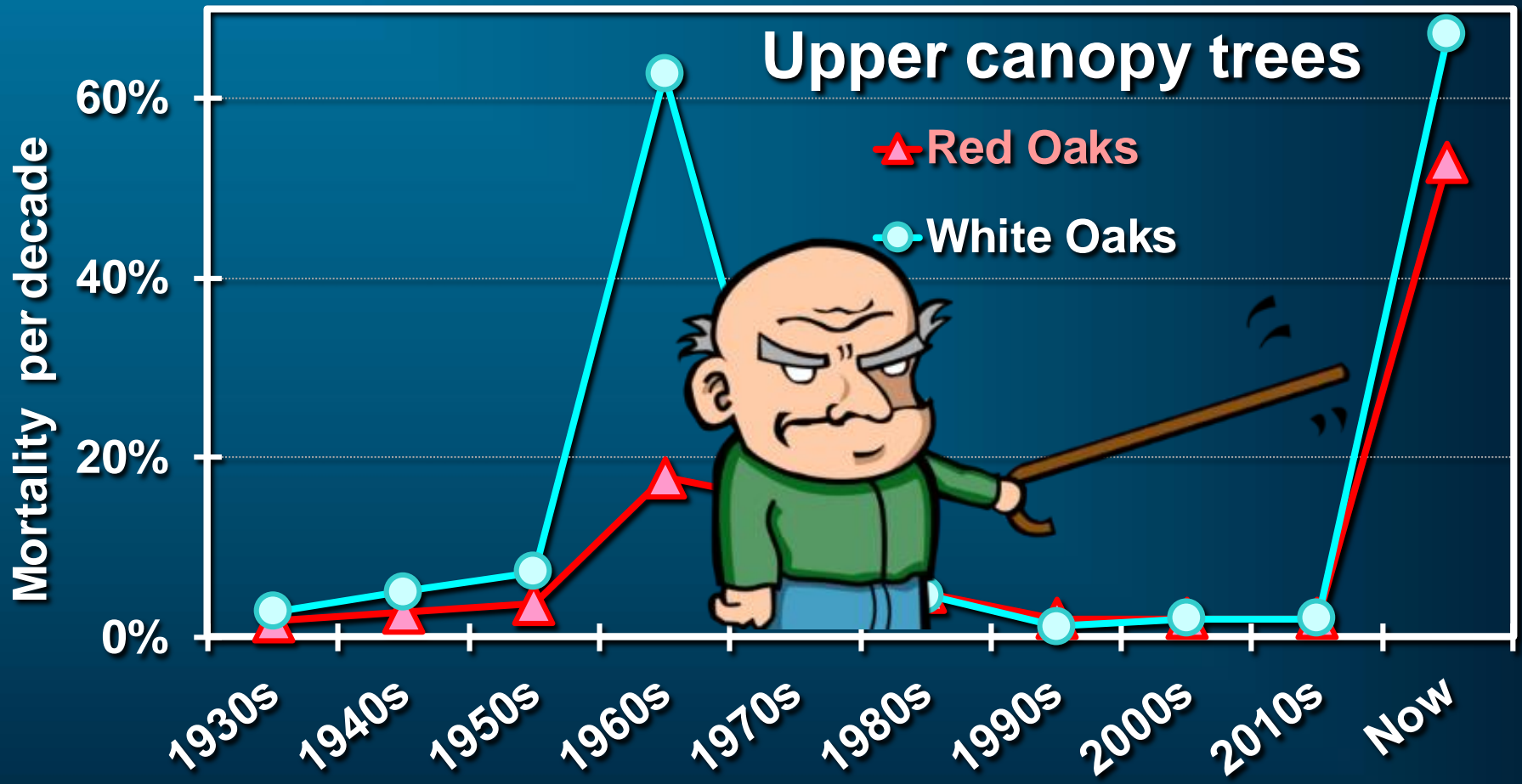
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# Recall: White oaks had higher mortality

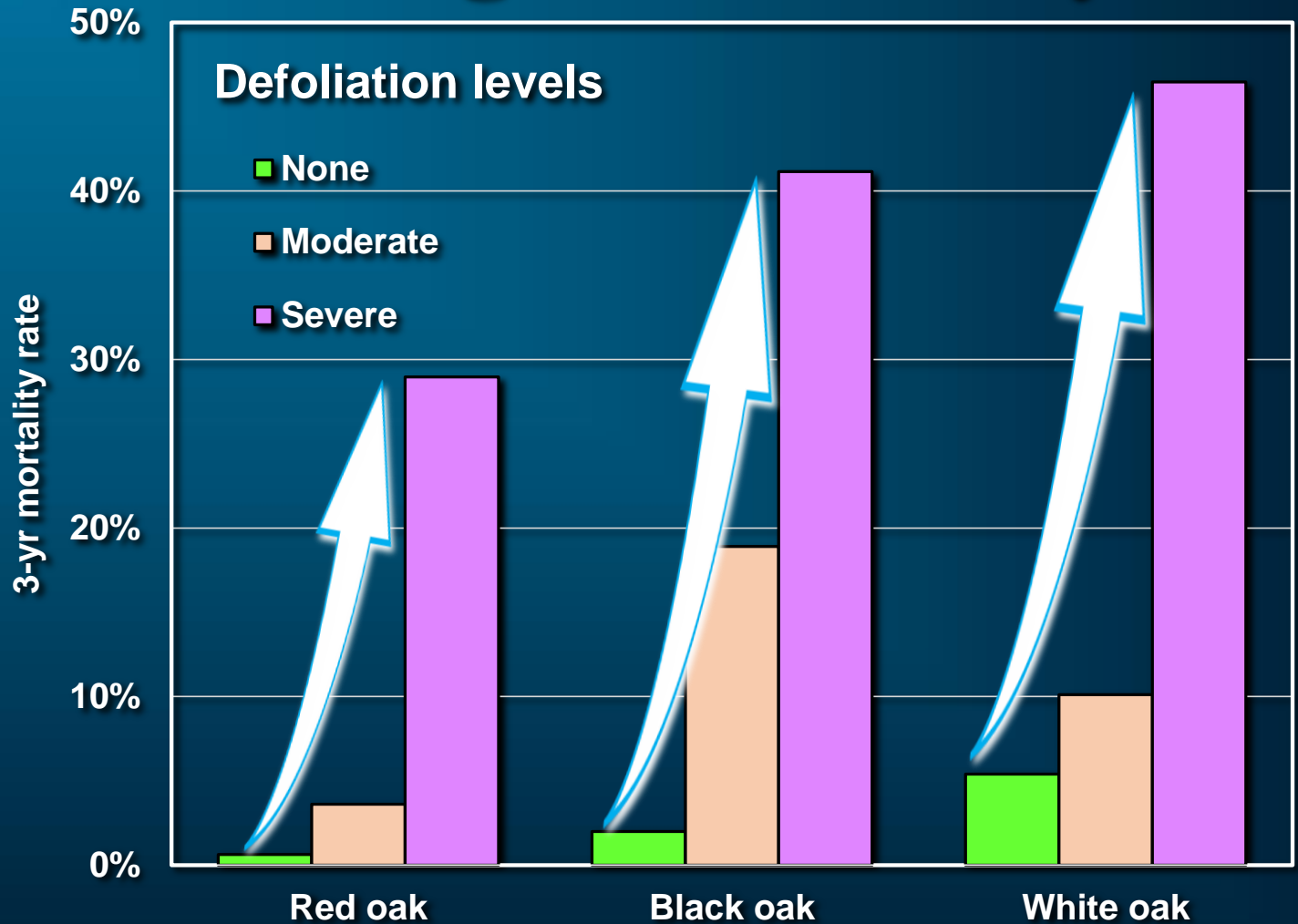




# Red oaks are now dying – what's different (they're old)?

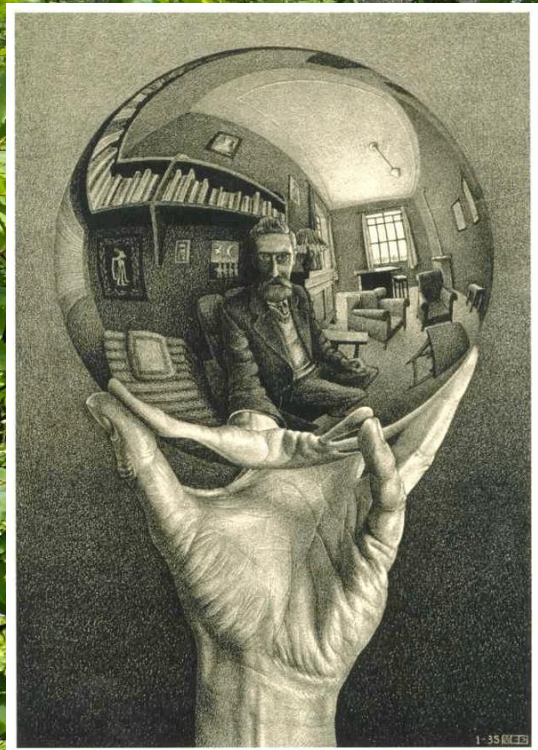


# More defoliation → higher mortality





# Stand recovery





# Trees are older now, so will they recover?





# New Ingrowth

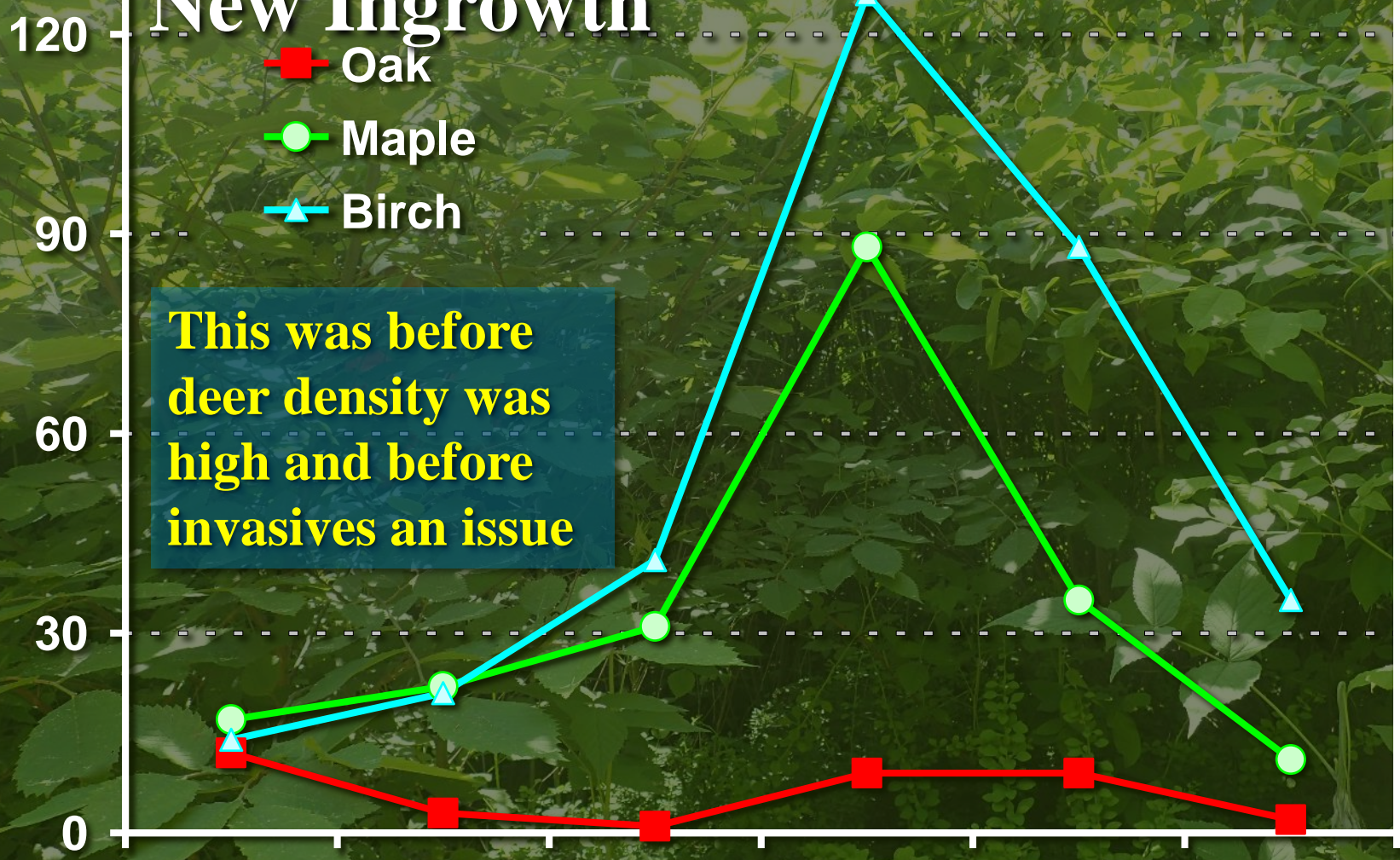
Ingrowth (stems/acre/decade)

- Oak
- Maple
- ▲ Birch

This was before deer density was high and before invasives an issue

1927-37 1937-57 1957-67 1967-77 1977-87 1987-97

Stand age





# Bottom line II

**MULTI-YEAR defoliations removed less vigorous oaks, lower canopy oaks, and white oaks in the past.**

**However, because trees are older, increased mortality of red oaks is now likely the norm.**

**Surviving trees recovered in the past, now ...??**

**Defoliation induced mortality accelerates succession to maple/birch and beech(?).**





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