

SEEING THE FOREST FOR THE TREES: ROLE OF FIRE IN CARBON DYNAMICS

- I. Fire Regimes & Carbon Dynamics (resistance vs resilience)
- II. Historical Fire Regimes (pine forests & peatlands)
- III. What does this all mean for resilient systems

Jed Meunier, WI DNR Division of Forestry
jed.meunier@wisconsin.gov

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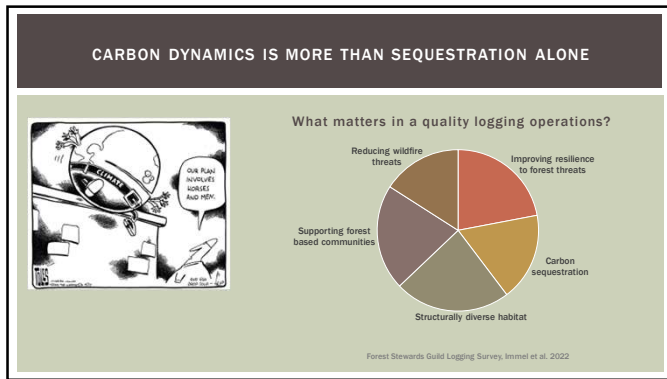
THE KEELING CURVE

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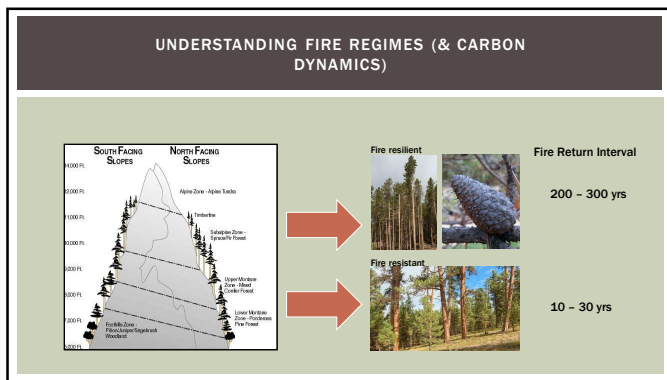
TRILLION TREES CAMPAIGN TO COMBAT CLIMATE CHANGE

- In Wisconsin by Earth Day 2030:
 - Plant - ~~75~~ 100 million trees
 - Conserve - 125,000 acres forest
 - Restore - ??

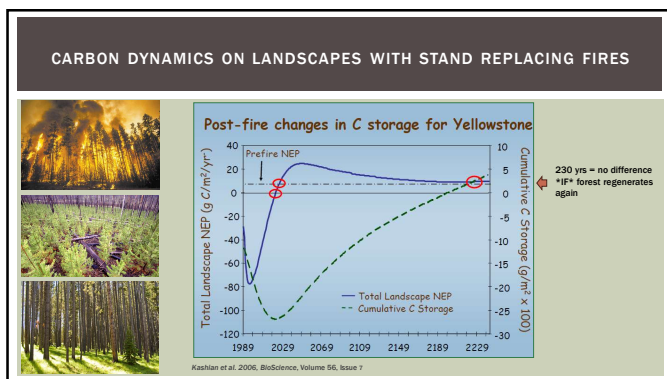
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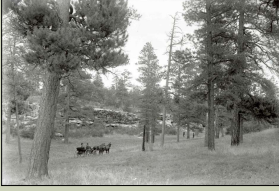


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DYNAMICS IN FREQUENT FIRE LANDSCAPES

Structure (density, spatial arrangement...) is important for resistance/resilience

Kaibab 1905, USGS

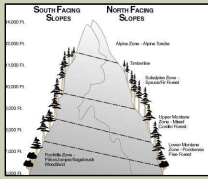


Kaibab today



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WHAT ABOUT WISCONSIN SYSTEMS, DO WE UNDERSTAND FIRE & CARBON DYNAMICS



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PINES IN THE LAKE STATES – EVEN AGED, SINGLE COHORT...

"to increase resilience, we need to restore the range of patterns found in forests with intact disturbance regimes." – Churchill et al. 2009




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"The timber occupying these tracts is peculiar and does not justify the application of the term barrens." - Moses Strong 1877

Photo: US Capitol Library of Congress

Trees/ha
 Forest: >99
 Woodland: 47-99
 Savanna: 0.5-47
 Prairie: <0.5

Curtis 1953, Anderson & Anderson 1975

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DENDROCHRONOLOGY...

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WI FIRE HISTORY SITES

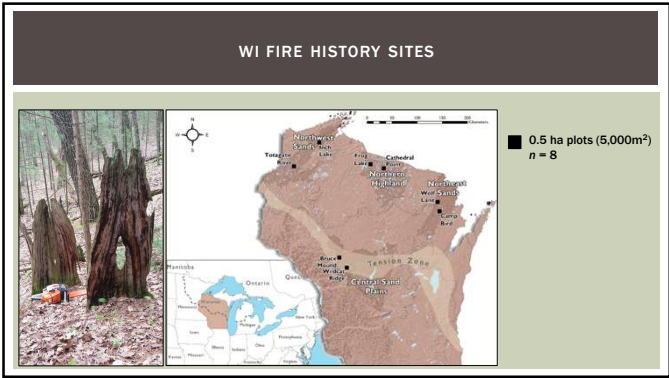
North American Ecoregion

- Yellow
- Subarctic Shield
- Pleistocene Shield
- Pleistocene Plains
- Central USA Plains
- Temperate Plains

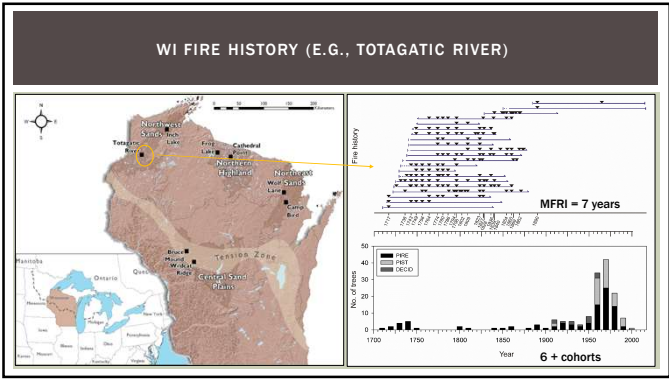
8m radius plots (200m²)
 n = 51

~3,500 tree cores & 700 fire scar sections

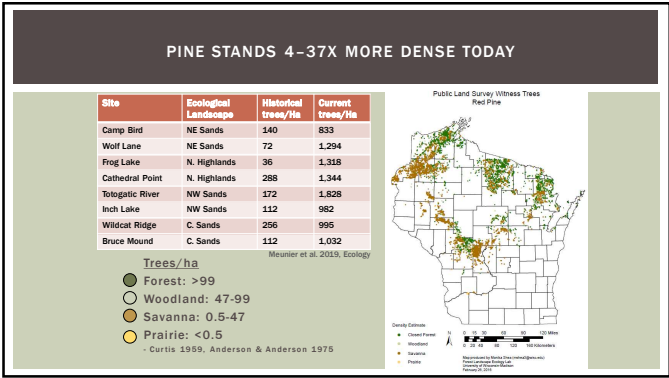
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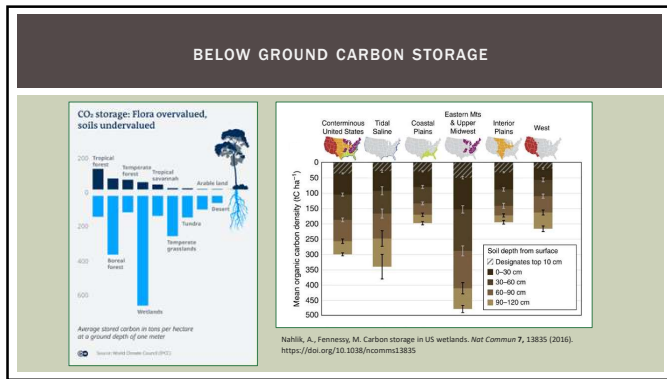
Photo: A. Larson

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Razenkova et al., Forest Ecology & Management, 2024

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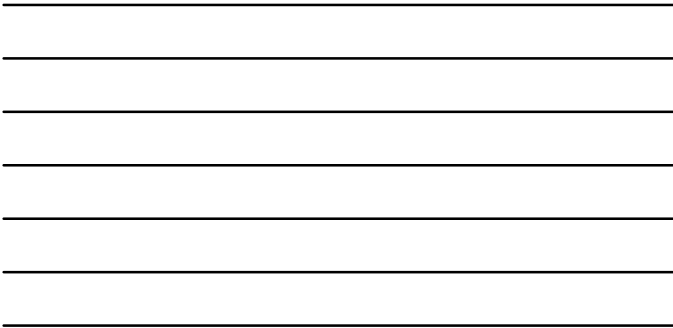
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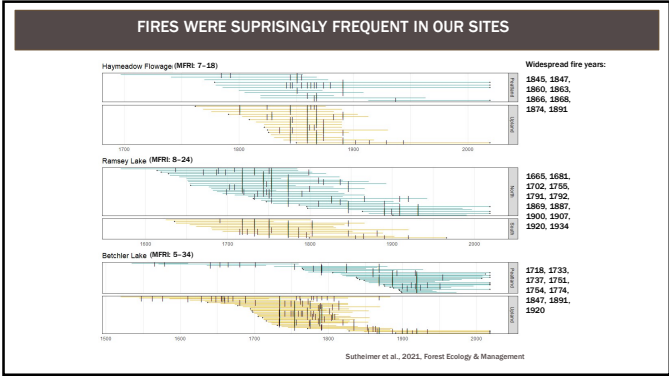


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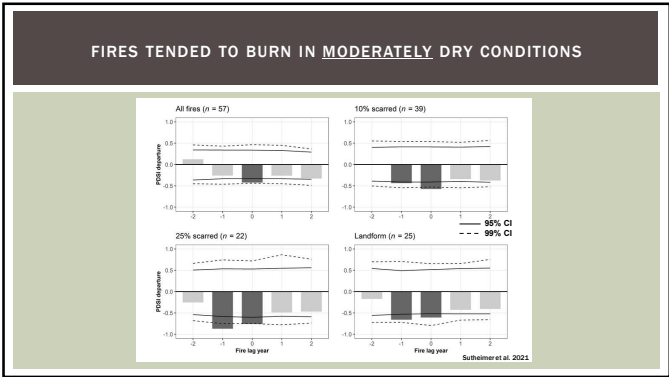


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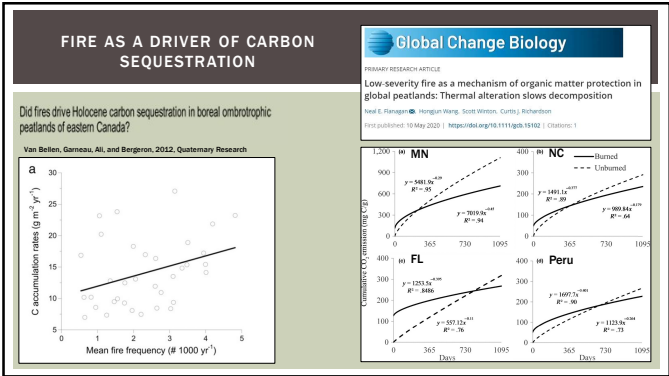




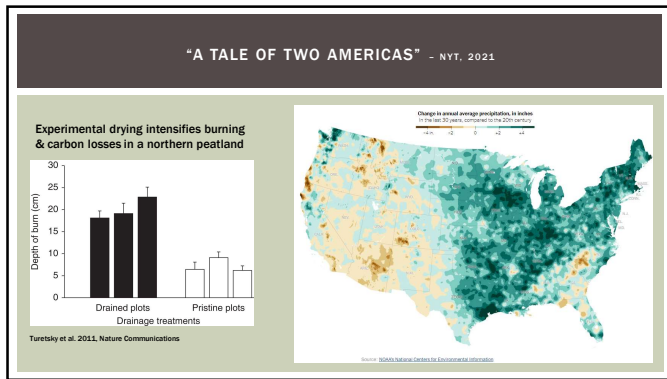
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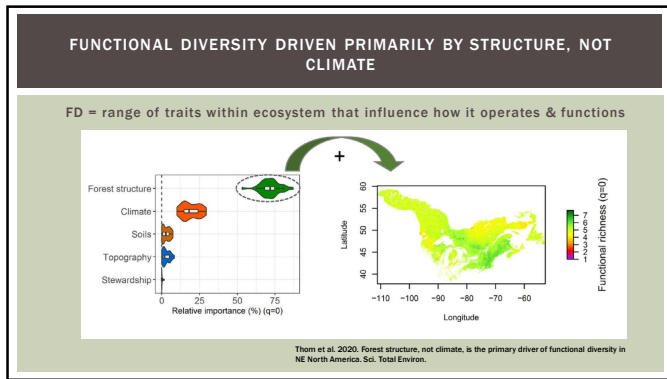
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