A View from the Minnesota Woods

Eli Sagor
Cloquet Forestry Center

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Your favorite place in the Minnesota woods

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Context: Forests and Forestry

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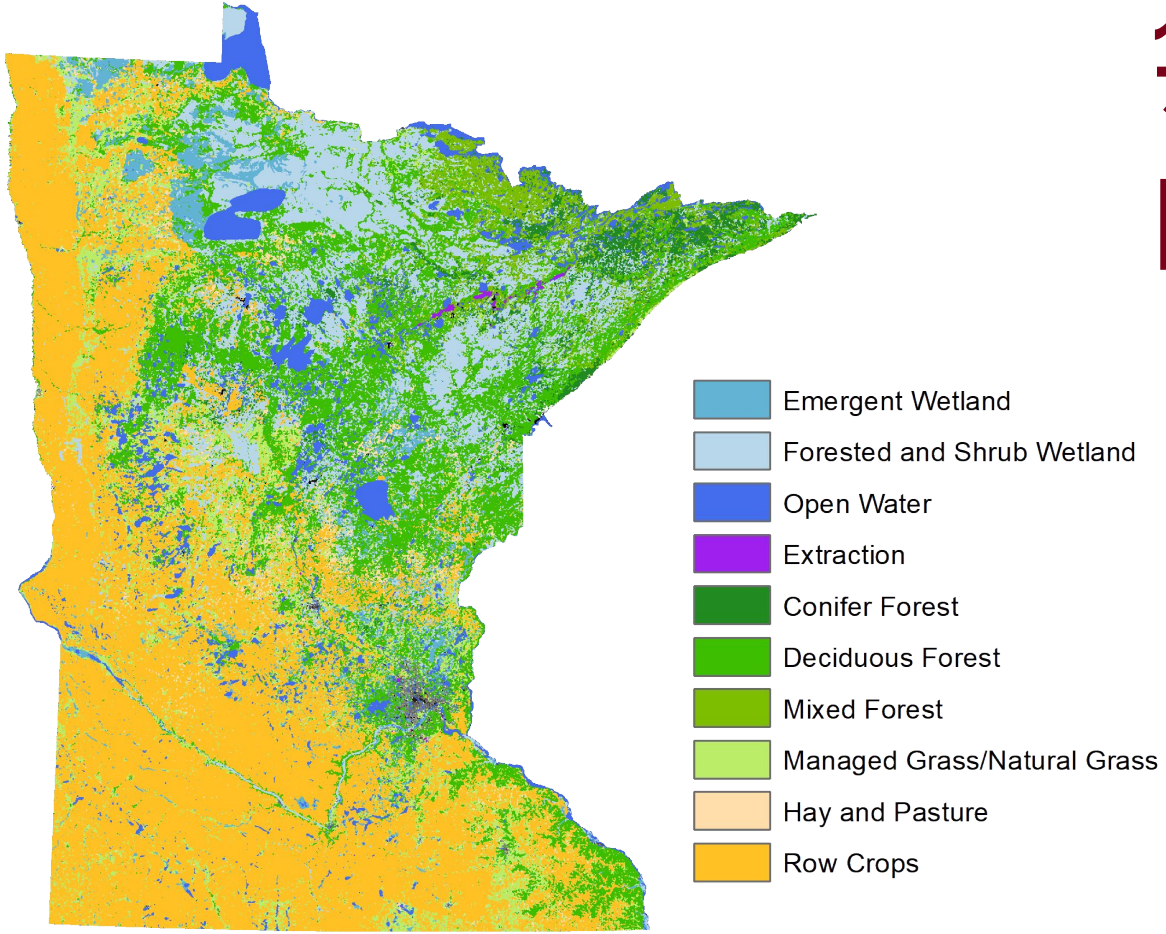
Source: USDA Forest Atlas, Ecological Divisions

⅓ of MN is Forest



Land cover map by Rampi, Knight, and Bauer (2016). Source.

About Minnesota's forests

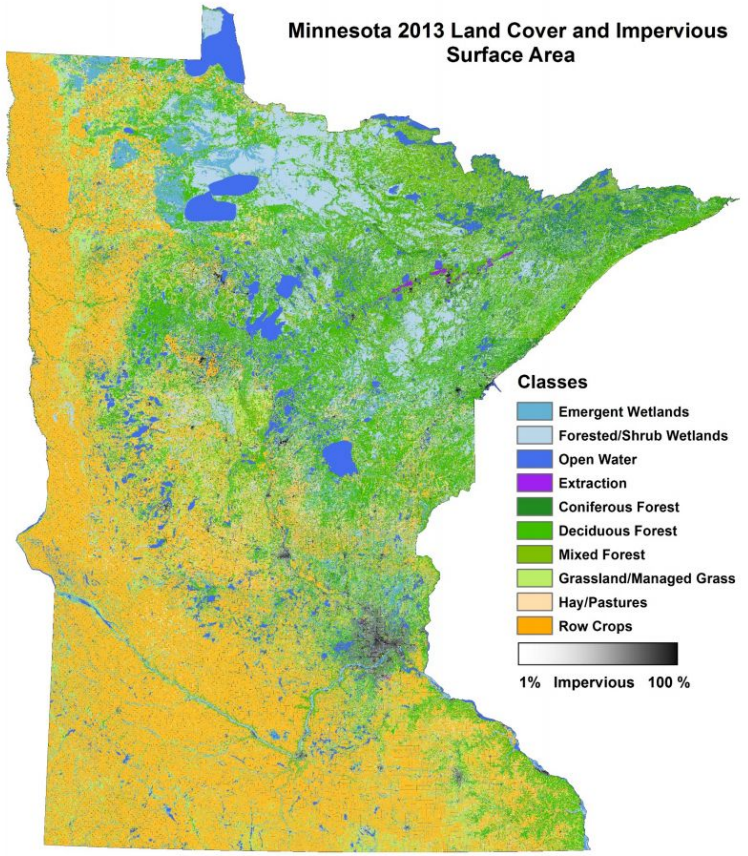
MN's 5th largest manufacturing sector

$17.8B in gross sales

900 species of wildlife

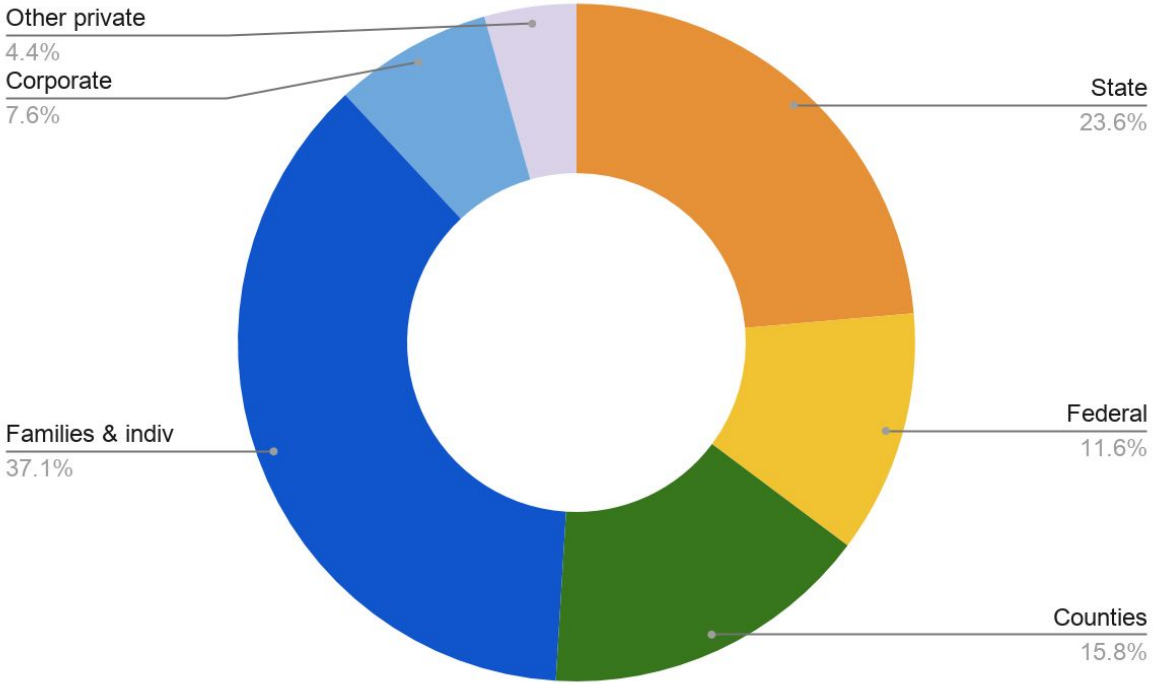
Recreation

Water quality



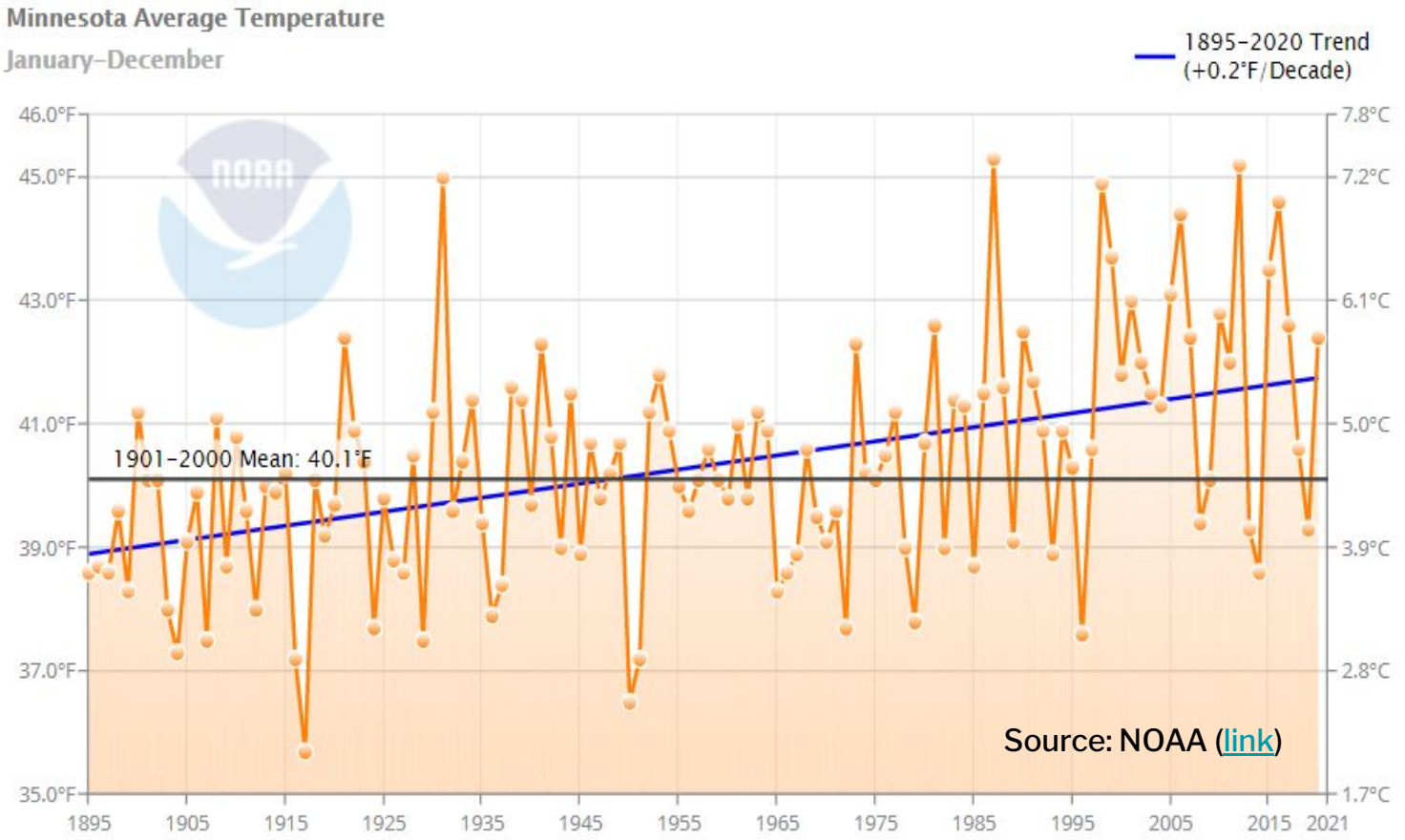
Minnesota forest ownership

~17 million acres total



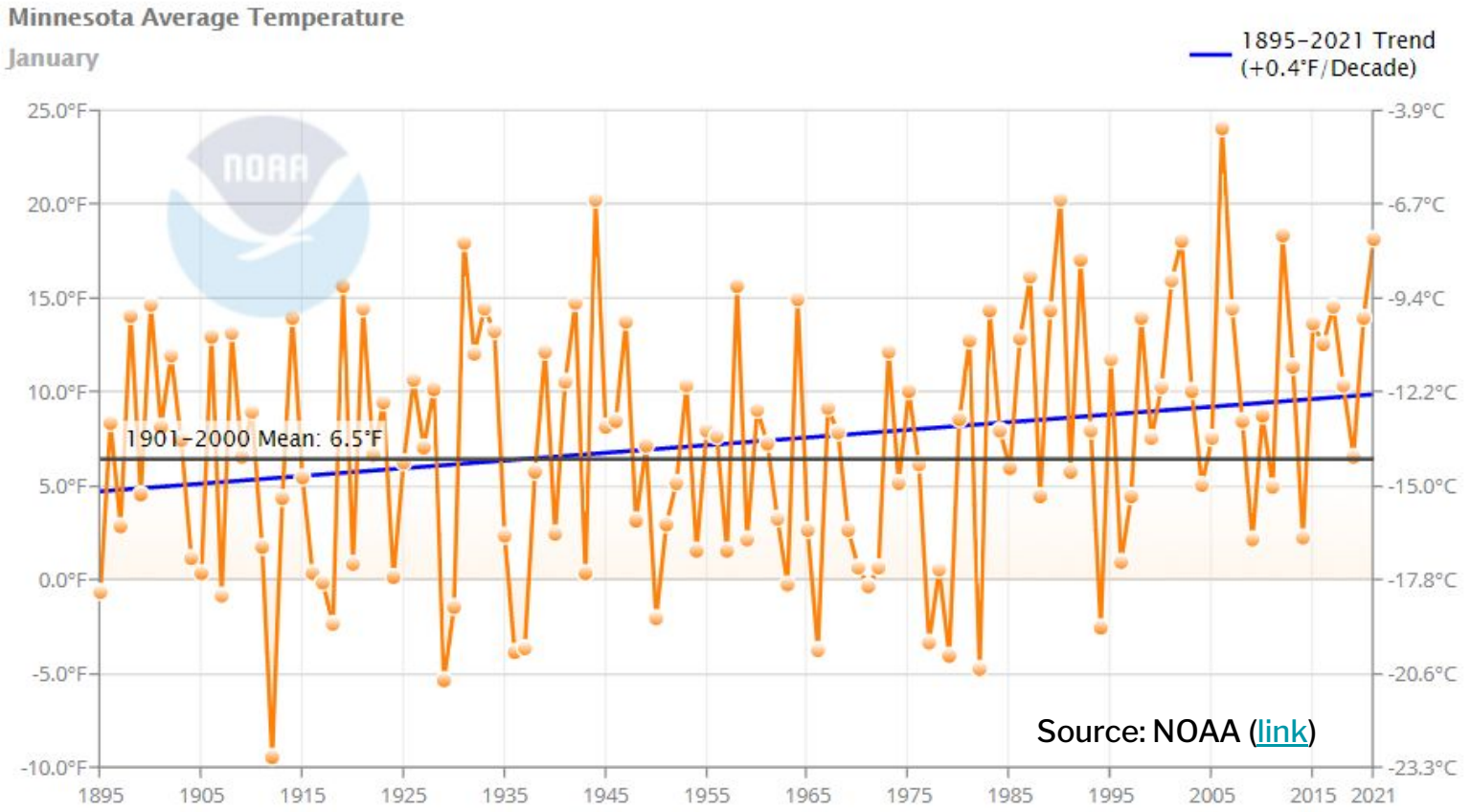
More on MN forest ownership

Minnesota mean annual temp, 1895-2021



Apx. 1˚ C

Minnesota mean January temp, 1895-2021



} Apx. 2˚ C

Gregory Edge

Invasive species

Major invasives

Buckthorn (soybean aphid issue)

Emerald ash borer (EAB)

Eastern larch beetle

Garlic mustard

Gypsy moth

Knapweeds, tansy, etc

Deer, too many others...

Ecosystem changes

Ecosystem processes have changed:

- *Diplodia / Sirrococcus*
- Earthworms
- Deer
- Emerald ash borer
- Eastern larch beetle
- …

Photo: Diplodia damage on red pine.

Ecosystem changes

Warmer winters

Shorter harvest season

Much of Minnesota wood harvest requires frozen ground

Photo by Darin Erickson, UPM-Blandin Paper Co.

Most of these changes make life BETTER for invasive species, and WORSE for native forests.

Forest Management

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Forest area: 17,000,000 ac.
Timber harvest: 150,000 ac/yr


Clearcutting: ~70% of harvest acreage


Thinnings & selection ~30% of harvest acreage

Carbon

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Wood is 50% Carbon by dry weight.

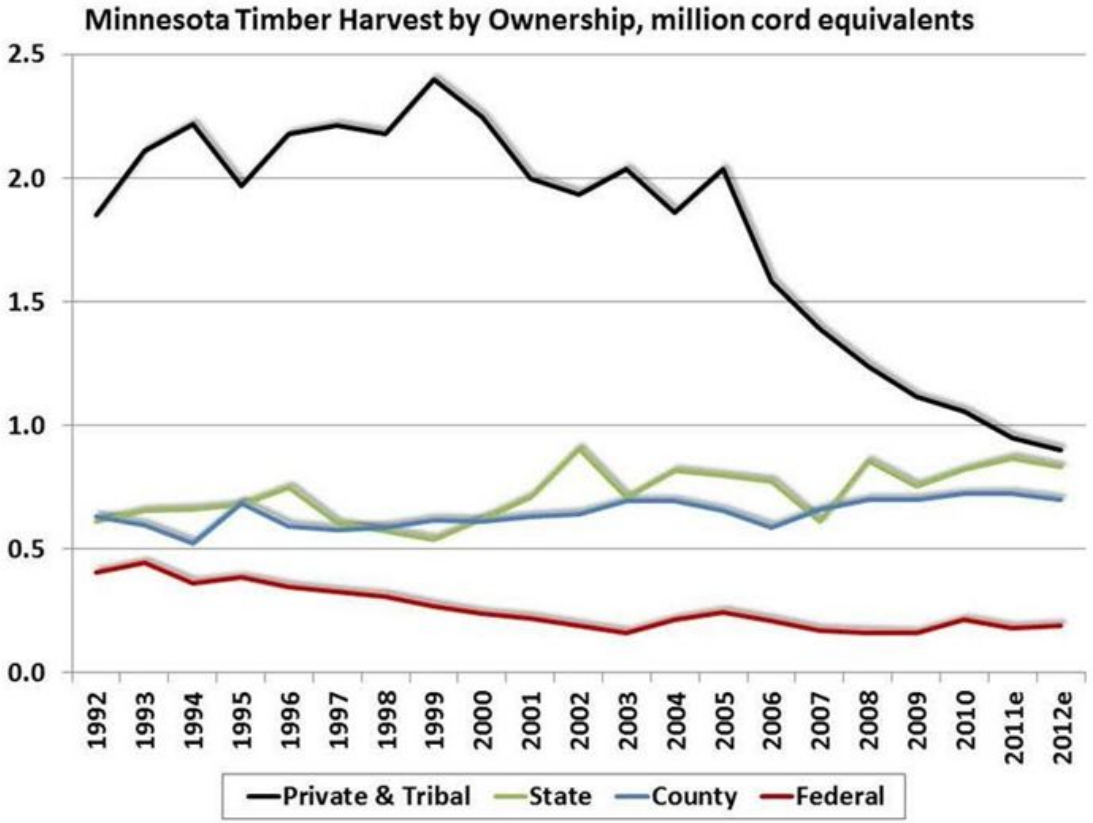
All of that Carbon is from the atmosphere.

When trees grow, they sequester Carbon.

Growing and harvesting trees can be part of a climate solution.

Need for Active Forest Management

Invasives, Carbon, forest health, renewable resources



Source:

DEPARTMENT OF NATURAL RESOURCES

Adaptation

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Adaptation activities

Research and continuing education: Projected changes, how to prepare

Managing systems: plant community-based silviculture

Attention to forest health threats / maintaining process

Resilience through diversity and heterogeneity

Managing for uncertainty

(Wait… What is silviculture?)

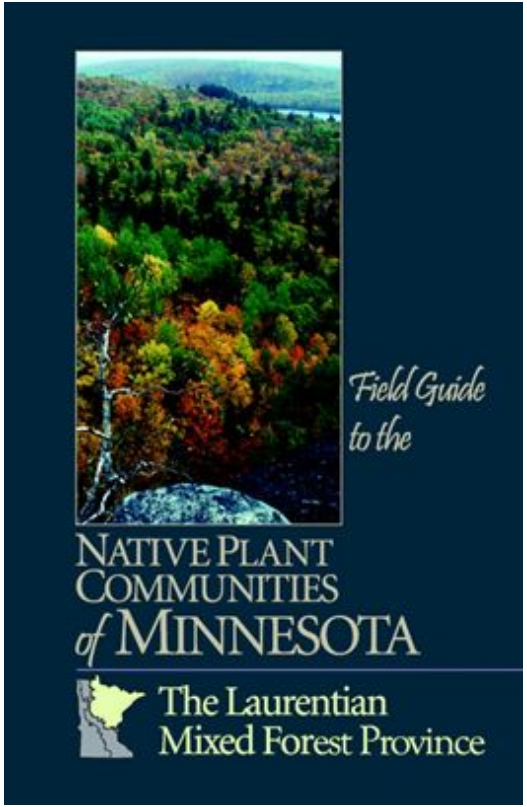
The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis.

Plant community-based silviculture

Away from “cover types,” toward systems.

Ecological classification systems give insight into dynamics in system composition and process, development trajectory, etc.

Good silviculture works with this trajectory.



Quickly treating forest health threats

Emerald ash borer

Bark beetle outbreaks

Diplodia and *Sirrococcus*

Others

Resilience: Planning for uncertainty

Goal is to increase response diversity within the system.

Strategy is to increase diversity and complexity in species, age, stand structure, seed source, etc.

Multiple scales from stand to landscape

Favoring future-adapted species

Tilting balance / trajectory toward future-adapted natives.

Mostly experimental at this point. (Ponderosa pine, black hills spruce, etc)

Increasingly common: Mixed seed lots that include southern / western sources.

Photo: Ponderosa pine at UMN Lamberton ROC by Brian Anderson

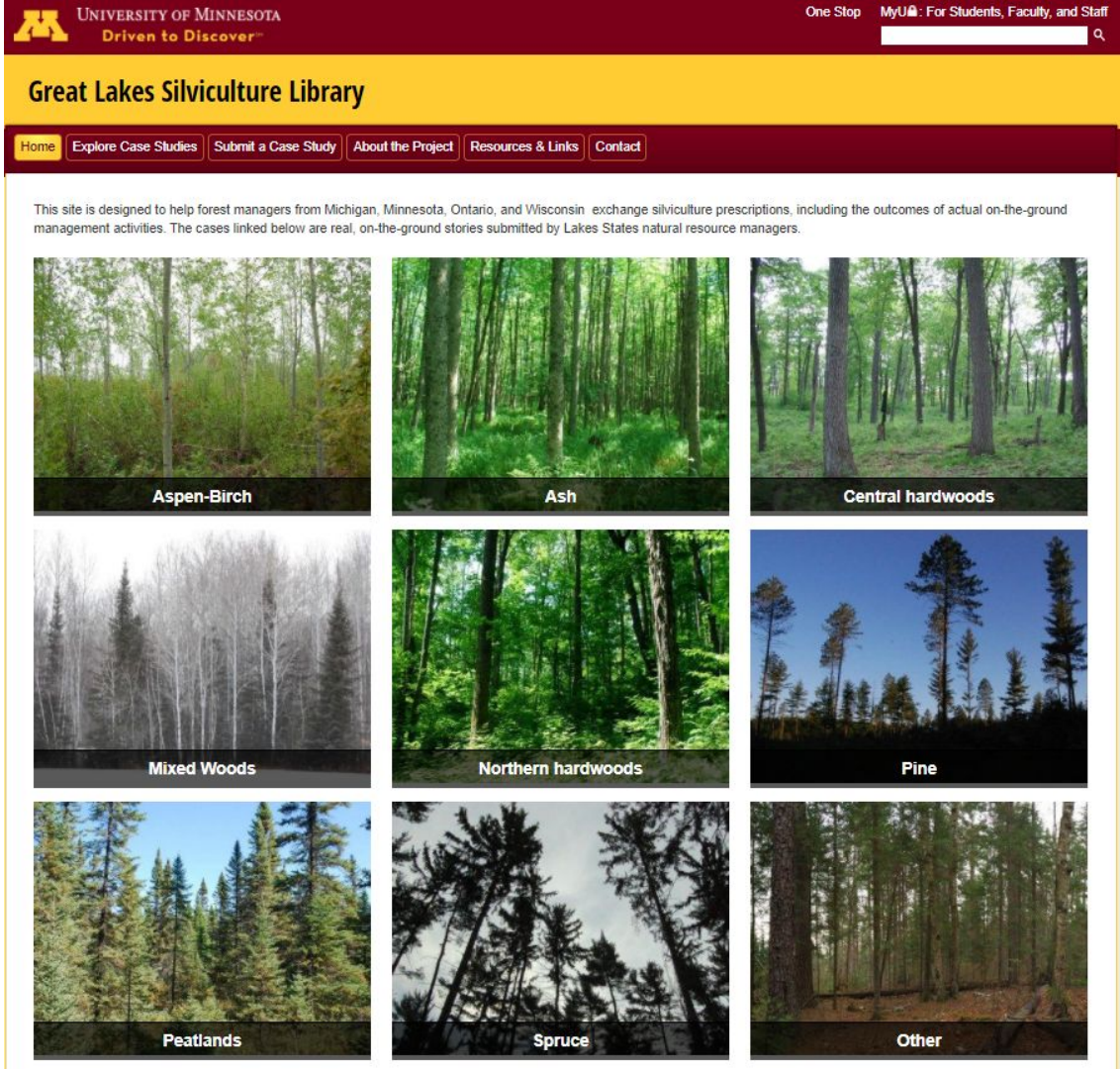
More applied research

Great Lakes Silviculture Library

What are others doing and learning in the woods?

(Free)

https://silvlib.cfans.umn.edu/



Summary:
What it all means

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Forests are important economically, ecologically, socially

Forest are changing

Invasive threats, climate, global markets, disturbance patterns,…

Active management is crucial to maintain healthy, productive forests.

Thanks!

Eli Sagor
(218) 409-6115
esagor@umn.edu

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