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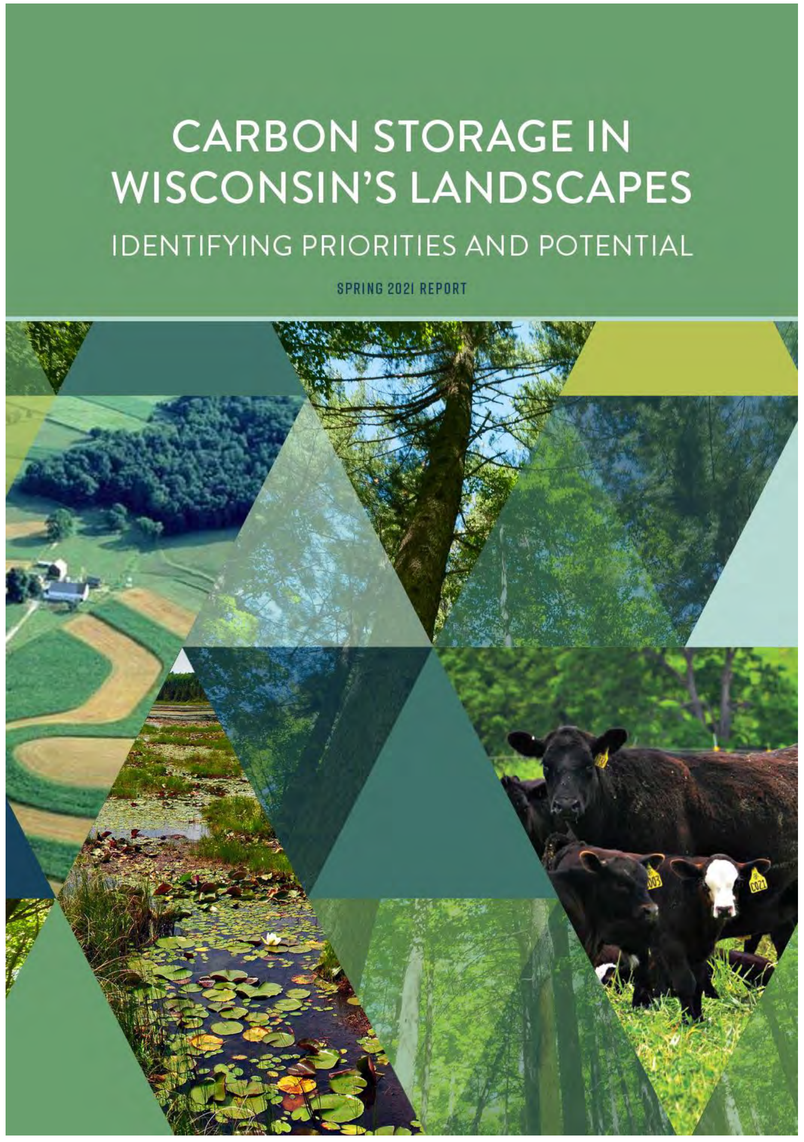

Carbon Storage in Wisconsin's Landscapes

Identifying Priorities and Potential

Spring 2021 Report

View the report at
www.wisconsinacademy.org/CCL_2021Report

Sally Mead Hands Foundation

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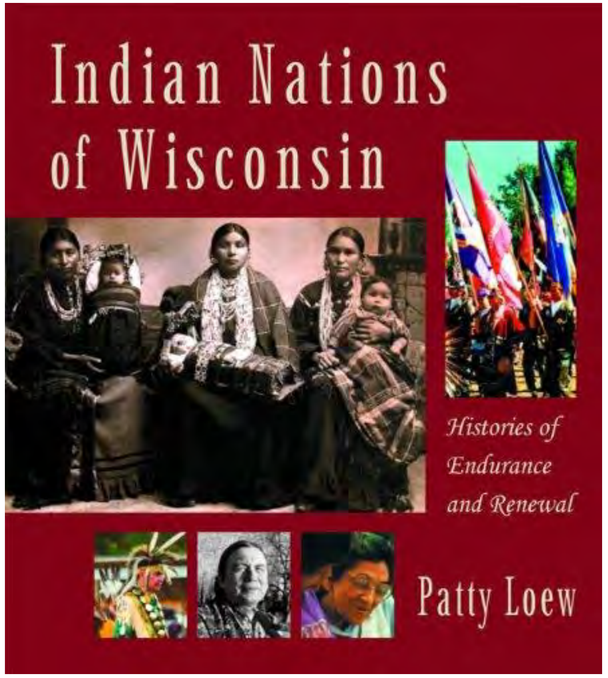
Acknowledgements

The Madison office of the Wisconsin Academy of Sciences, Arts and Letters occupies ancestral Ho-Chunk Land, a place their Nation knows as Teejop, which translates to Four Lakes.

We recognize and respect the sovereignty of the Ho-Chunk Nation, as well as the 11 other First Nations who are caretakers and stewards of the place we now call Wisconsin.



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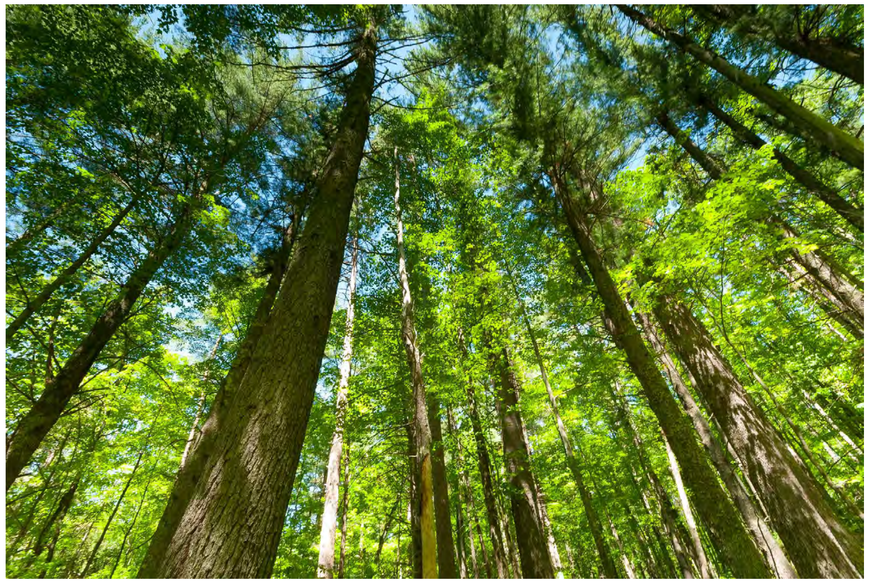

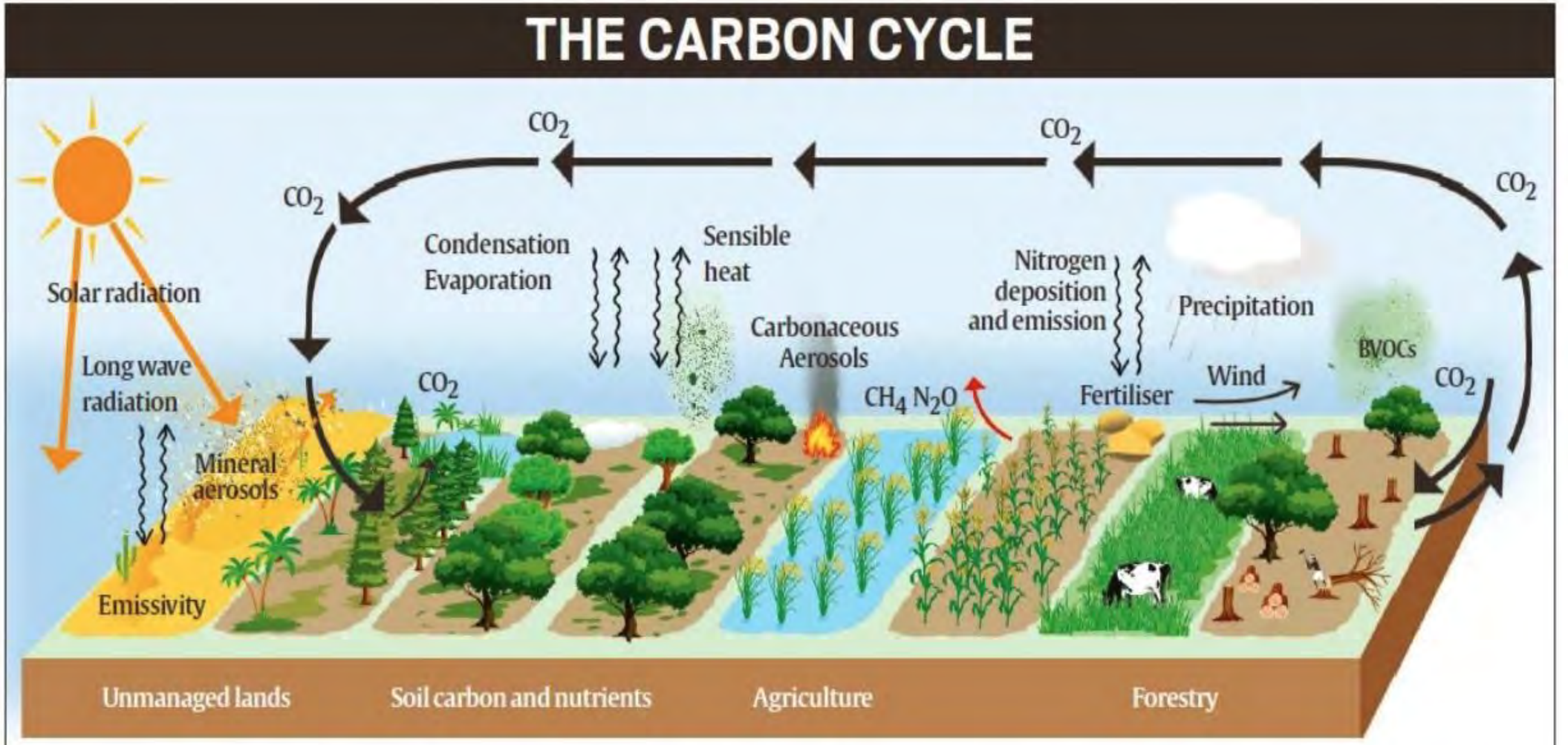

The exchange of carbon dioxide between land and atmosphere. Land use patterns — forestry, agriculture, industries — impact greenhouse gas emissions. Global warming, in turn, impacts activities like agriculture. *IPCC*

Identifying Climate-Critical Landscapes in Wisconsin

Photo courtesy of, Wisconsin Department of Natural Resources

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Framework: Four Dimensions / Four Questions

1. Where, in Wisconsin, is the carbon currently / now?
    1. Where are the places that we can actually point to; put a metaphorical “pin on a map?”
    2. What are the types of places here we would expect to find high amounts of carbon, e.g. a mature forest in a productive environment?
2. Where can more carbon be stored?
3. Where are the threats to carbon storage?
4. What are the co-benefits / co-harms?

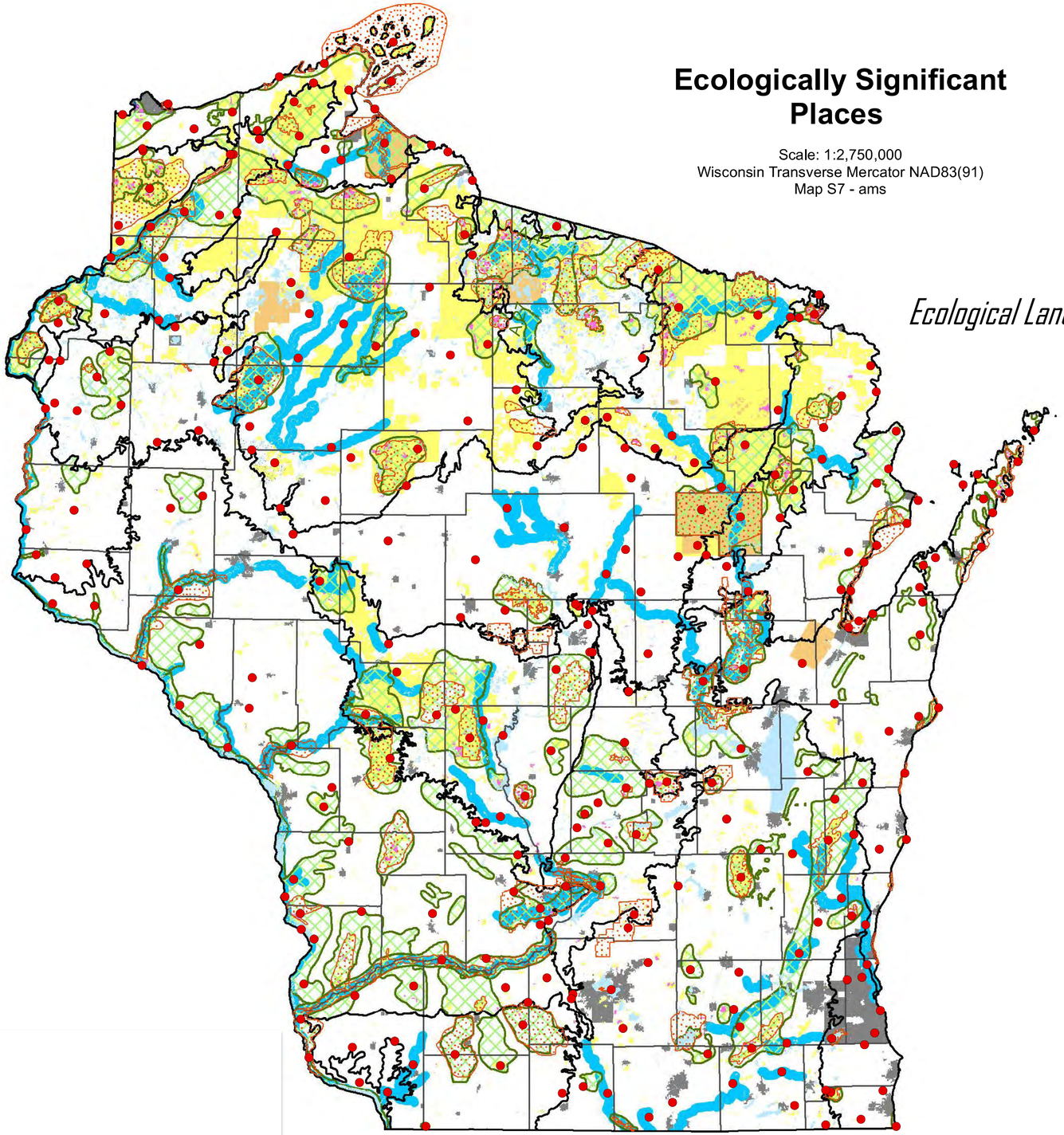
Co-benefits / Co-harms

- In general, looking for increased ecosystem services
- Biodiversity
- Corridors are of great value
- Increased water quality
- A word of caution, just managing for increased carbon alone could have significant unintended consequences
- For agriculture lands, the co-benefits are especially important
- Ecologically Significant Places DNR map
- Resilient and Connected Network TNC map

Ecologically Significant Places

Scale: 1:2,750,000
Wisconsin Transverse Mercator NAD83(91)
Map S7 - ams

Ecological Landscapes of Wisconsin Handbook - WDNR, 2011



Significant Ecological Places

- Land Legacy Places
- Important Bird Areas
- State Natural Areas

Conservation Opportunity Areas

- Terrestrial
- River Systems
- Lakes
- Ecological Landscape
- County Boundaries
- Protected Land
- Native American Land
- Cities or Villages
- Open Water

Nature Conservancy Land Mapping Tool

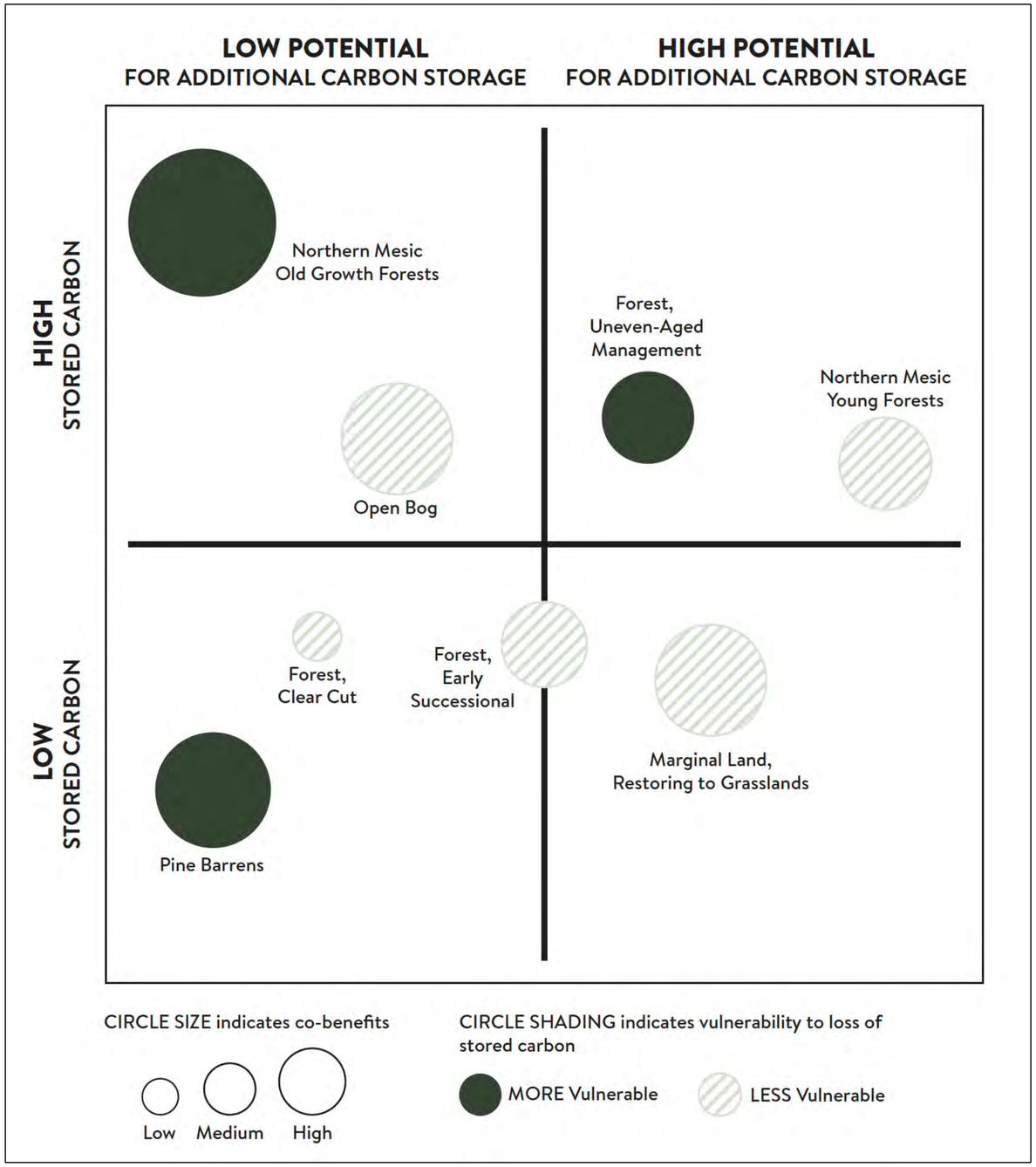
maps.tnc.org/resilientland/

Indigenous lands

Ecoregion Boundaries

Resilient Sites

- Most resilient
- More resilient
- Slightly more resilient
- Average or Median Resilience
- Slightly Less Resilient
- Less Resilient
- Least Resilient
- Developed
- Migration Space for Tidal Habitat
- Resilient Tidal Habitat
- Vulnerable Tidal Habitat
- Sea Level Rise Area



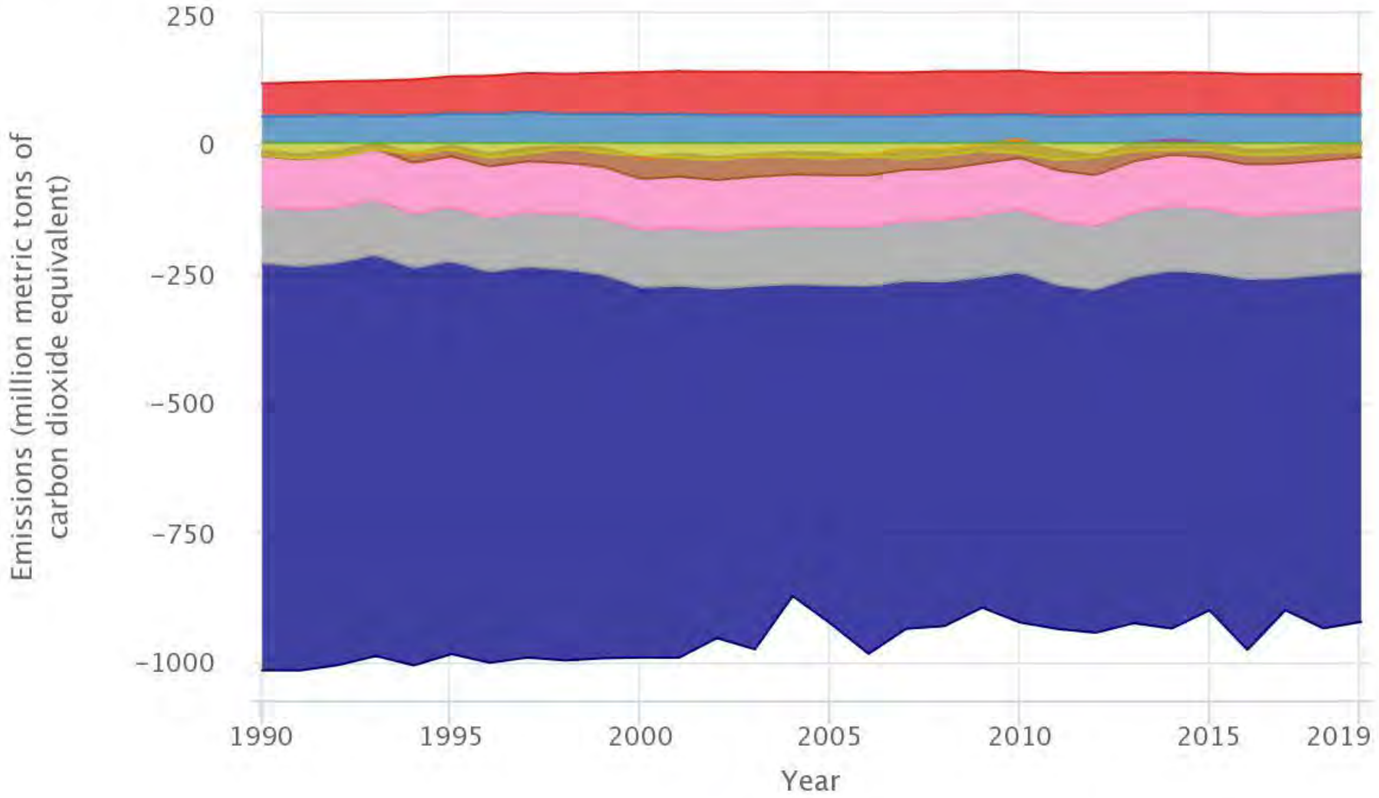
Four-Square Model for Identifying Climate-Critical Landscapes

Note: This figure is for concept purposes only. The locations and sizes of the data circles are approximate.

How can we keep carbon in natural systems?

Photo courtesy of Lyssa Seefeld

U.S. Greenhouse Gas Emissions and Sinks from Land Use, Land-Use Change, and Forestry, by Category, 1990-2019



Source: U.S. EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks

U.S. Agriculture and Forestry Greenhouse Gas Inventory: 1990–2013

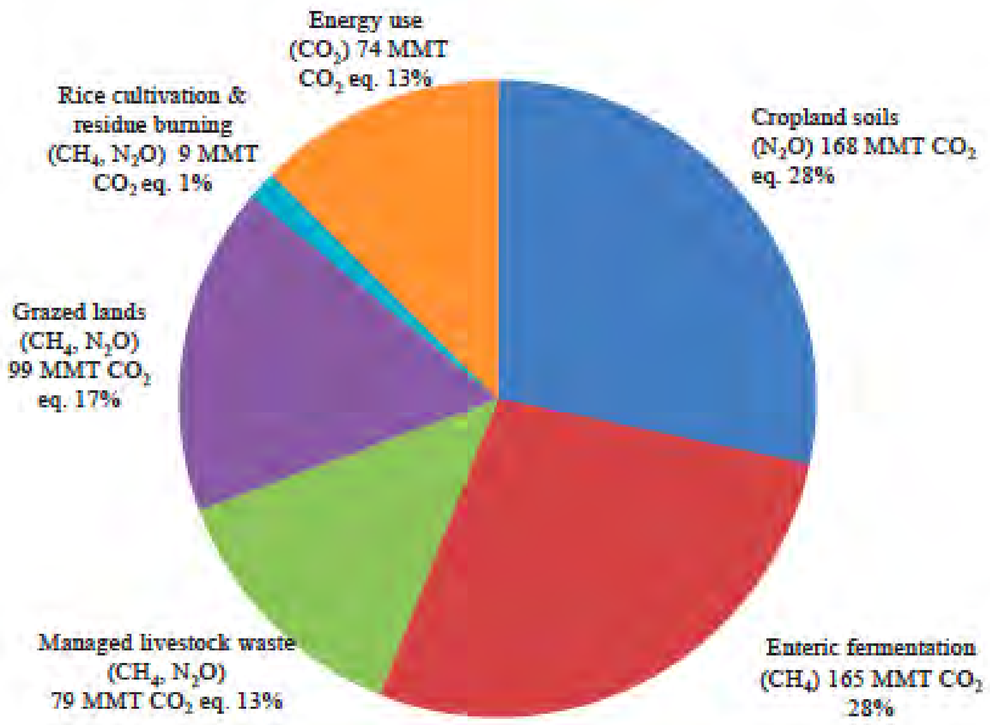


Figure 1-1 Agricultural Sources of Greenhouse Gas Emissions in 2013 *(CH_4 is methane; N_2O is nitrous oxide; CO_2 is carbon dioxide. MMT CO_2 eq. is million metric tons of carbon dioxide equivalent)*

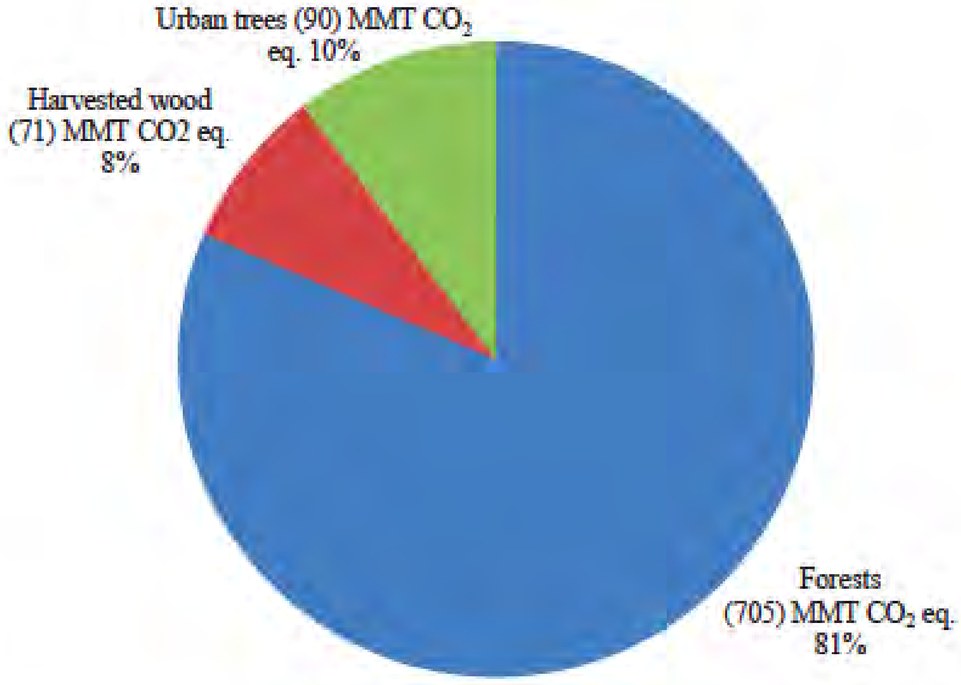


Figure 1-2 Agricultural and Forest Sinks of Carbon Dioxide in 2013 *(MMT CO_2 eq. is million metric tons of carbon dioxide equivalent)*

Net emissions from Agriculture ~ 418 MMT

Net C uptake from forests ~ 700+ MMT

Priority Management Practices

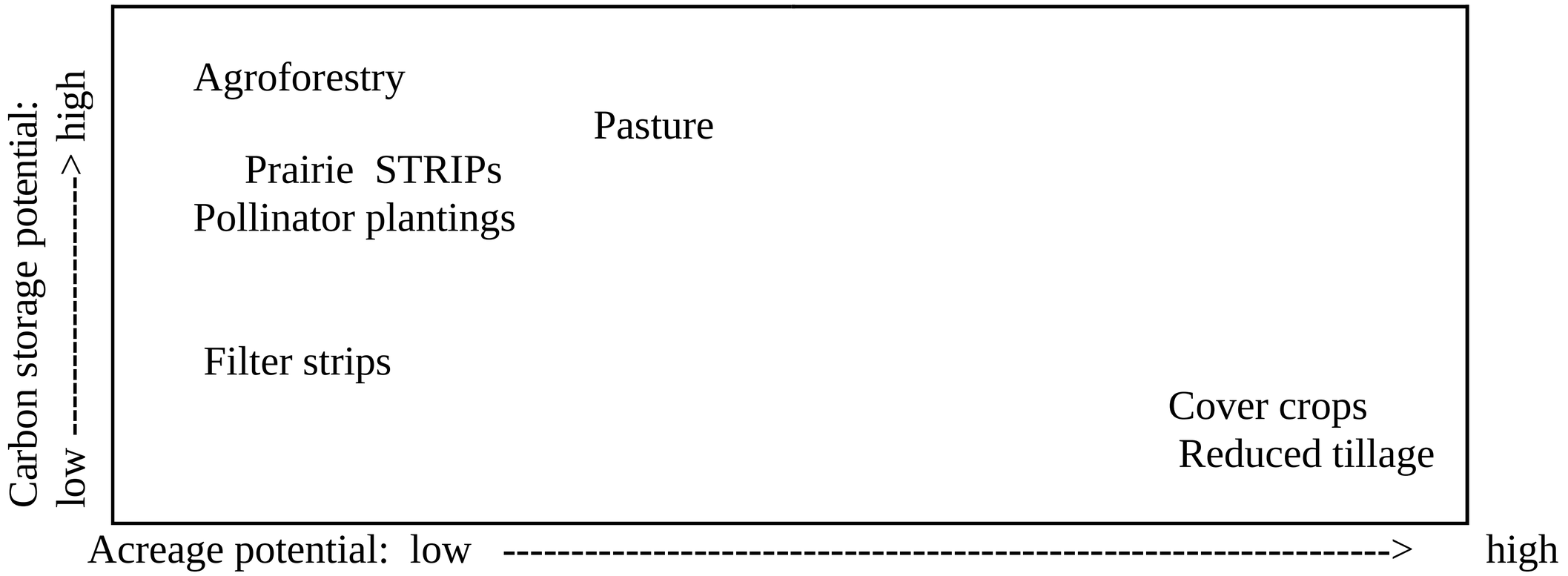
Identified priority management practices with high potential to enhance carbon uptake and/or storage in each of the three main types of lands.

The outcomes and benefits of specific practices are often *context-dependent*, so efforts frequently need to be adapted to fit individual areas.

Agriculture

Priority Management Practices

- Expanding perennial polycultures. (Impact: HIGH)
- Implementing agroforestry practices. (Impact: MEDIUM to HIGH)
- Planting cover crops. (Impact: LOW to MEDIUM)



Role of Existing Programs

Photo courtesy of, Wisconsin DNR

Existing Programs

Challenges and Opportunities

Examples of programs:

- Wisconsin's Managed Forest Law (MFL)
- Conservation Reserve Program (CRP)
- Conservation Stewardship Program (CSP)
- Environmental Quality Incentives Program (EQIP)

Some challenges…

- Complex paperwork and language lead to inequities
- Rapid changes on the federal level leads to uncertainty of what will or won't stick
- Inflexible management plans

Primary Recommendation

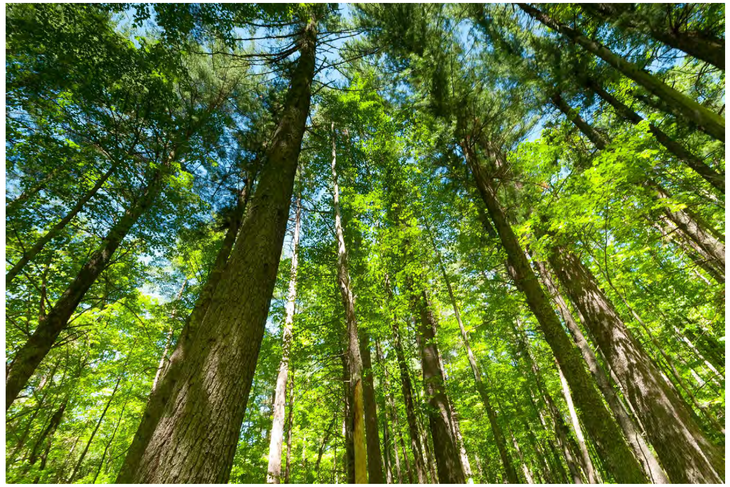
Reimagine existing programs to allow for more flexibilities (i.e., managing for carbon storage)

Communicating with Stakeholders

Photo courtesy of, Wisconsin Department of Natural Resources

What we need to communicate

- ***Which lands** are important*
- *Environmental and social **co-benefits** for natural carbon solutions*
- ***Why** these lands need protection/conservation*
- ***Best approaches** for various landscapes*
- ***Where and how to get information** on current and promising practices*
- And ***how current policies can help or hinder** advances in the field.*



Joshua Mayer

- The need for incentives for landowners/managers to adopt long-term change
- The need to building public support for federal, state, and local policy changes that will support natural climate solutions

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Message guidance: We will need many people and organizations in big and broad partnerships to move this work forward

As a result...

- We need messages that are clear and accessible and will resonate with diverse audiences in land management and ***the values they hold and their concerns about the land or climate.***

Key concepts

- People care about the land for different reasons: legacy, hunting, fishing, biodiversity, history, sense of place, community, etc.
- When we pull together, we achieve great things.
- These climate solutions may appear scientific and technical but they are really about the land and people and our common future.
- This is about healthy Wisconsin lands for all of us.

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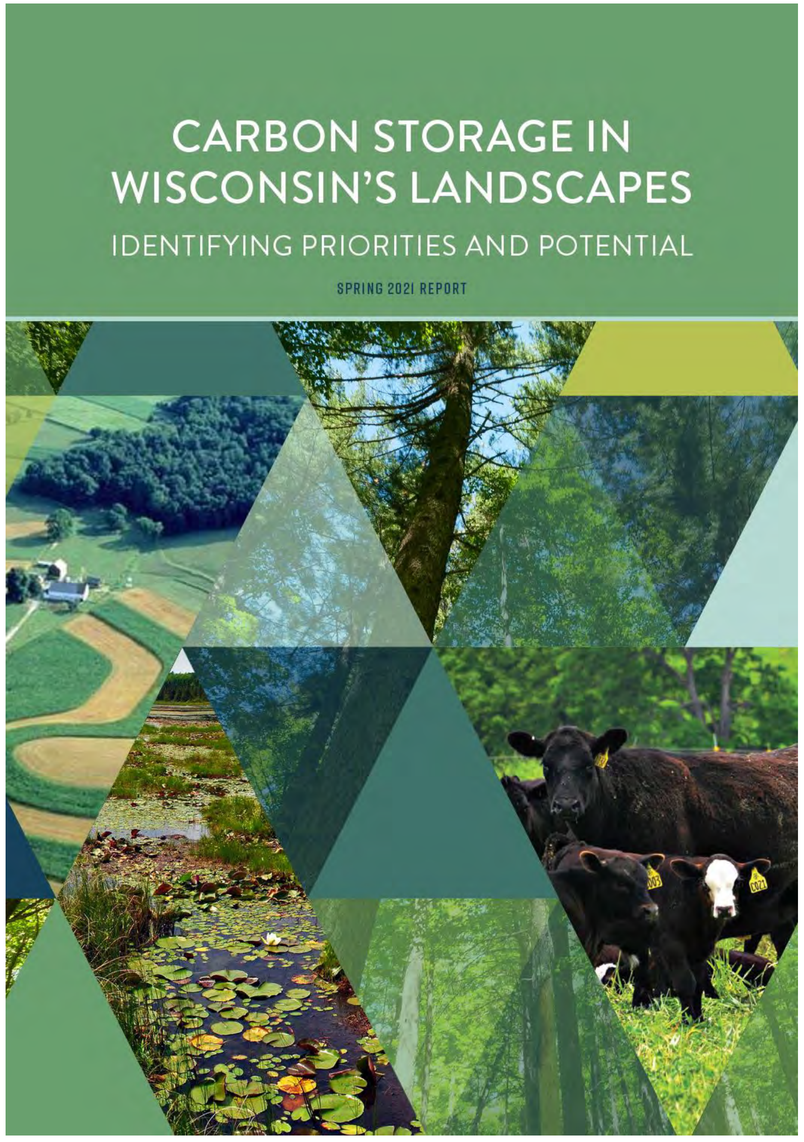

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