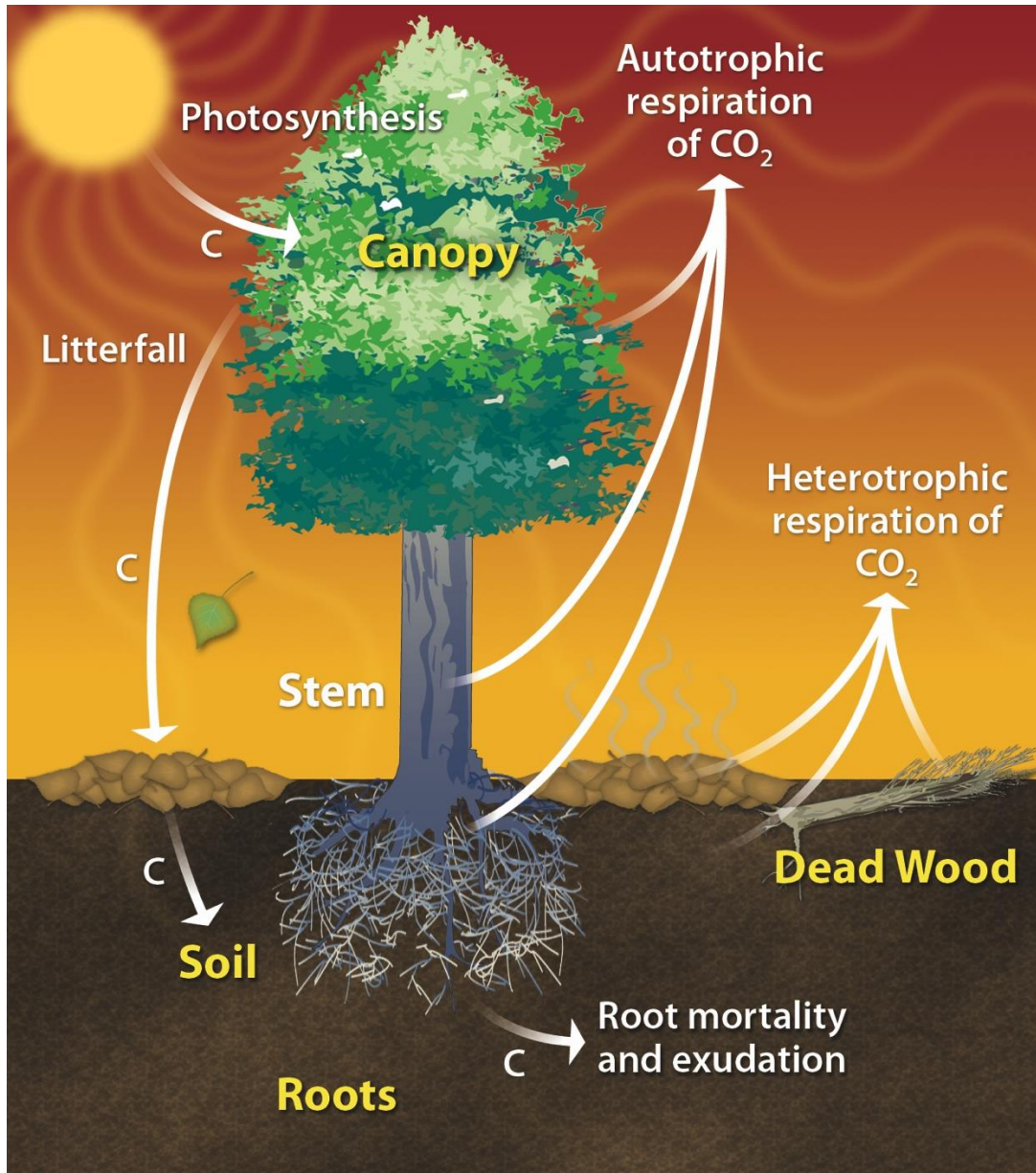




Natural Climate Solutions

Fred Clark, Executive Director, Wisconsin's Green Fire





Biomass and Soil Carbon

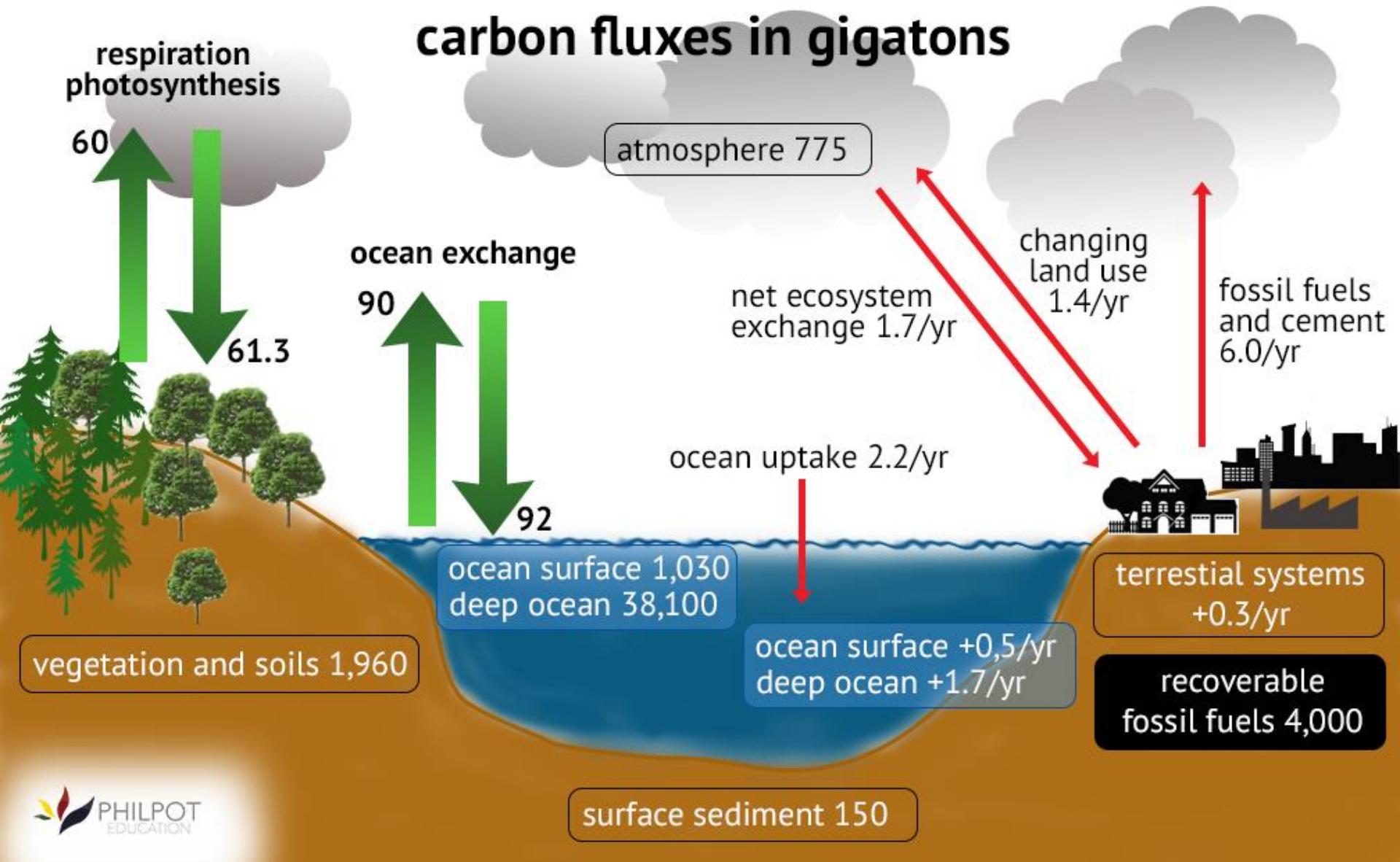
US **forests** store 600 to 700 MMT CO₂eq per year

US **agricultural land:** carbon equilibrium??

Conservation land stores

Urban forests store 90 MMT CO₂eq

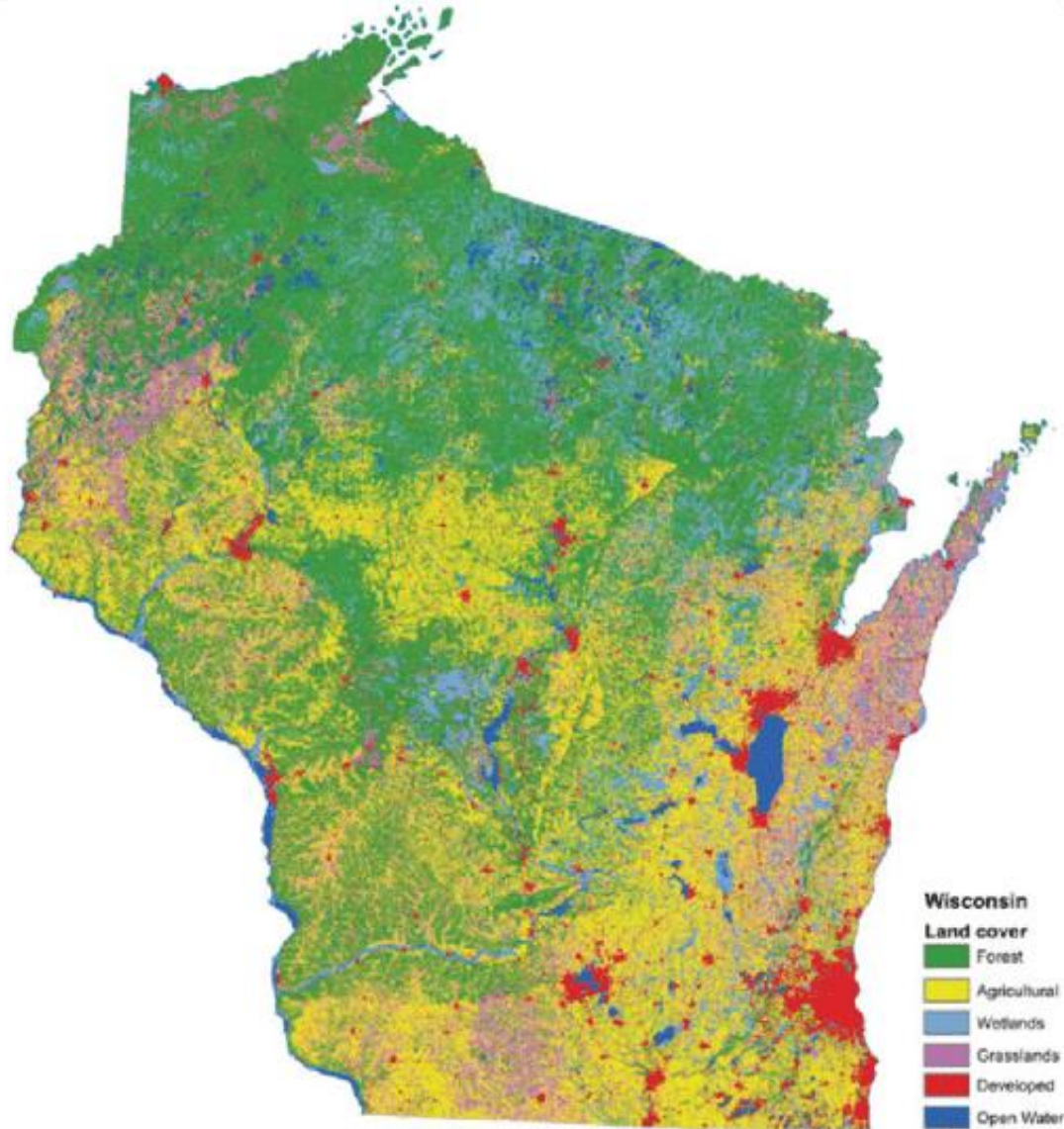
carbon fluxes in gigatons



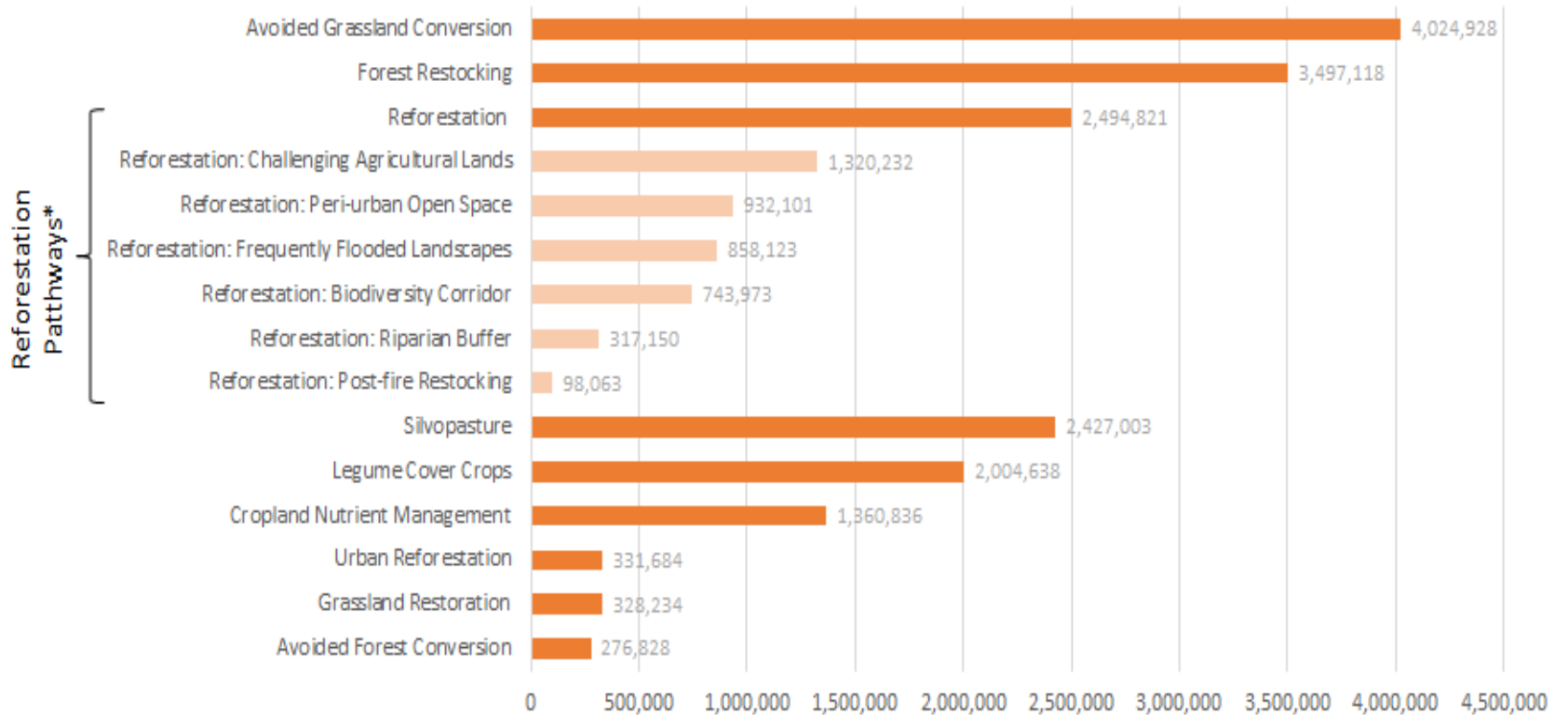
Natural Climate Solutions – Where, How, and How Much??



Wisconsin Land Cover



Wisconsin Carbon Gain Potential



**Reforestation subpathways are not mutually exclusive.*

tCO₂e/yr



Agriculture: Carbon Sink or Source?

US agricultural soils stored 59 MMT CO₂eq in 2000 – and lost 2 MMT CO₂eq in 2013.

Net US agricultural GHG emissions were roughly 486 MMT CO₂eq in 2000, and 600 MMT CO₂eq in 2013:

- N₂O from cropland - 31%
- CH₄ from ruminants - 28%
- Energy use - 14%
- N₂O & CH₄ from grassland - 13%
- CH₄ from stored manure - 12%

Increasing natural carbon storage is a key strategy for reducing agriculture's climate impact, and for increasing agricultural resilience.



Agricultural Carbon Sequestration Strategies

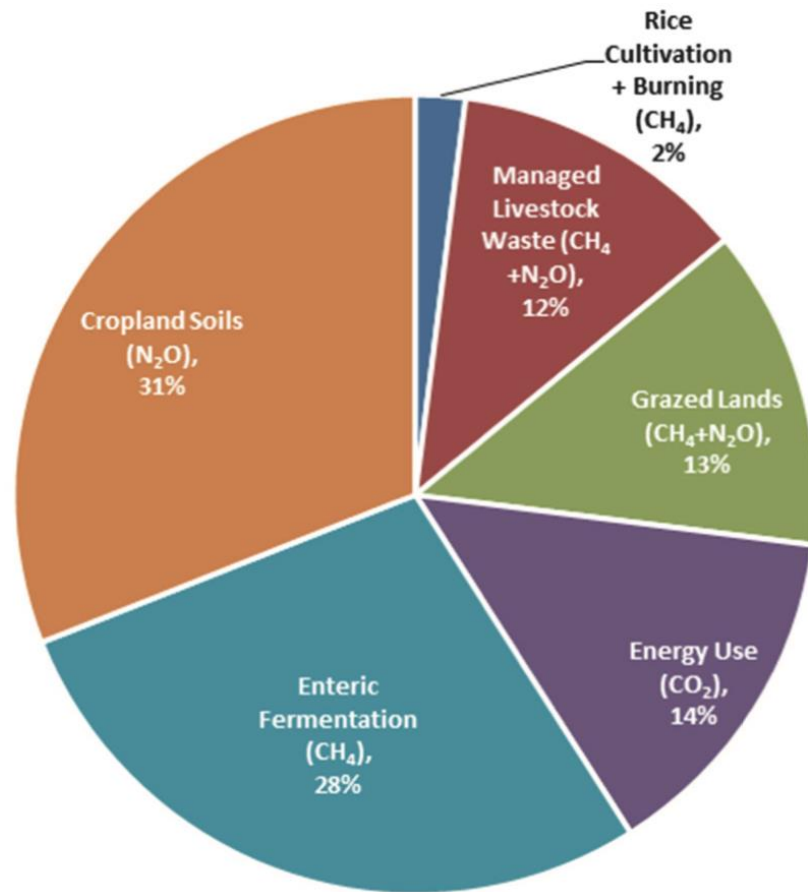
Perennialize

Reduce soil disturbance
(tillage)

Keep soil covered and
roots in soil year-
round (cover crops,
diverse crops)

Convert cropland to
perennials (pasture,
prairie strips)

Plant trees (windbreaks,
silvopasture)



Agricultural Emission Reduction Strategies

Improve Nitrogen fertilizer management – reduce N₂O

Improve ruminant diets – Reduce CH₄ -

Reduce pesticide use

Conserve energy in farm and forest operations

Improve manure management

Utilize tree waste for heating, electricity generation, etc.



Forests – A Powerful Offset for Carbon Emissions

- Forests in the US are estimated to offset over 14% of total US carbon emissions.
- In Wisconsin, with 17 million acres of forest, that number is almost certainly higher.
- With good management and increased investment in forests lands we can increase emission offsets AND have a healthier forest sector.



Forest Carbon Offset Strategies

- Keep Forests In Forest
- Reforestation / Afforestation
- Improved Forest Management
- Build with Wood
- Greening our Cities



Prairies, Wetlands, Conservation Lands

- Wetlands and prairies are a critical source for carbon storage, especially below ground and in soil.
- Wisconsin has around 5 million acres of wetlands, around $\frac{1}{2}$ of our historic total.
- Restoring, protecting and managing conservation lands stores carbon, and stores and filters surface water.



Urban Forests: Carbon Sinks with Benefits

US urban forests store 90 MMT CO₂eq, or about 10% of current land carbon storage.

Urban trees:

- Moderate temperatures
- Improve air quality
- Reduce noise
- Improve public health
- Improve property values
- Create livable communities.



Urban Forest Climate Solutions

Key Strategies

Increase tree canopy and greenspaces in parks and streets.

Increase tree cover at homes and businesses

Emphasize "Tree Equity" to address needs in under-served and low-income communities

Use trees and green engineering for shade, wind protection, air quality, noise reduction, flood abatement, and snow barriers

*American Forests –
Community Re-leaf Program*



Storing Carbon in Wood

Mass Timber in Buildings

- Lighter Weight
- Lower Embedded Carbon
- Higher energy efficiency
- New designs and materials suitable for tall buildings

<https://www.woodworks.org/>



Natural Climate Solutions – Questions?





Natural Climate Solutions – Moving from Science to Policy



Natural Climate Solutions Strategies



- *Protect Carbon Sinks* by keeping forests and conservation lands intact.
- *Restore Carbon Sinks* by restoring forests, conservation lands, and trees in our communities.
- *Tap into Markets* to reward carbon stewardship.

Protect Carbon Sinks

- **Managed Forest Law (MFL)-**
- **Conservation Reserve Program**
- **State and Federal Wetland Protections**



- **Current use property taxation for forests and conservation lands- (“MFL Lite”).**
- **Carbon Incentive Tax Credit – Designed and Administered by State Agencies / DOR, possibly with Private Partners.**

Restore Carbon Sinks

- Conservation Cost-Sharing
- WI Urban Forestry Program
- Agency / Private Partner
Technical Support



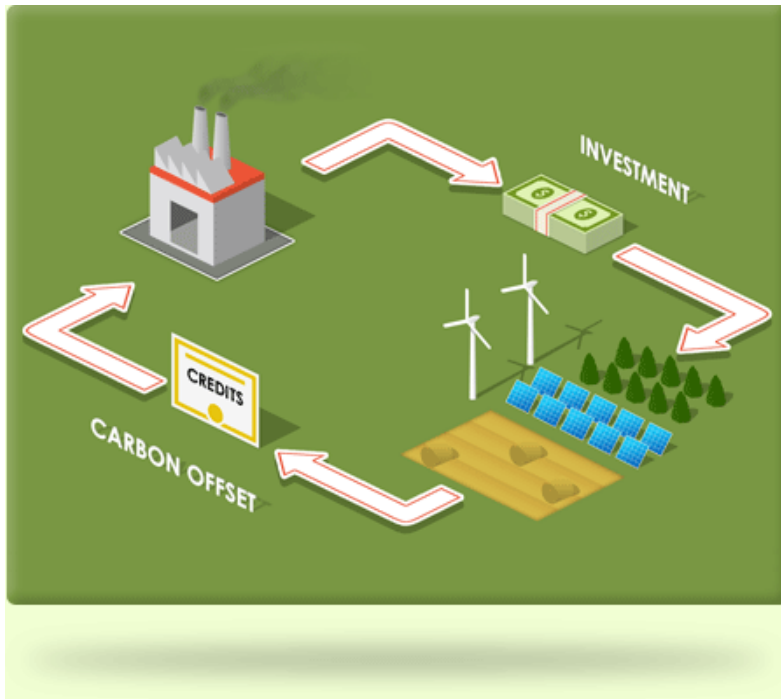
- Federal Stimulus –(e.g.
Plant One Trillion Trees)
- Improved Forest
Management to increase
carbon and adapt to climate
change. WI as Leader.
- Existing programs – new \$\$

Tapping Into Carbon Markets

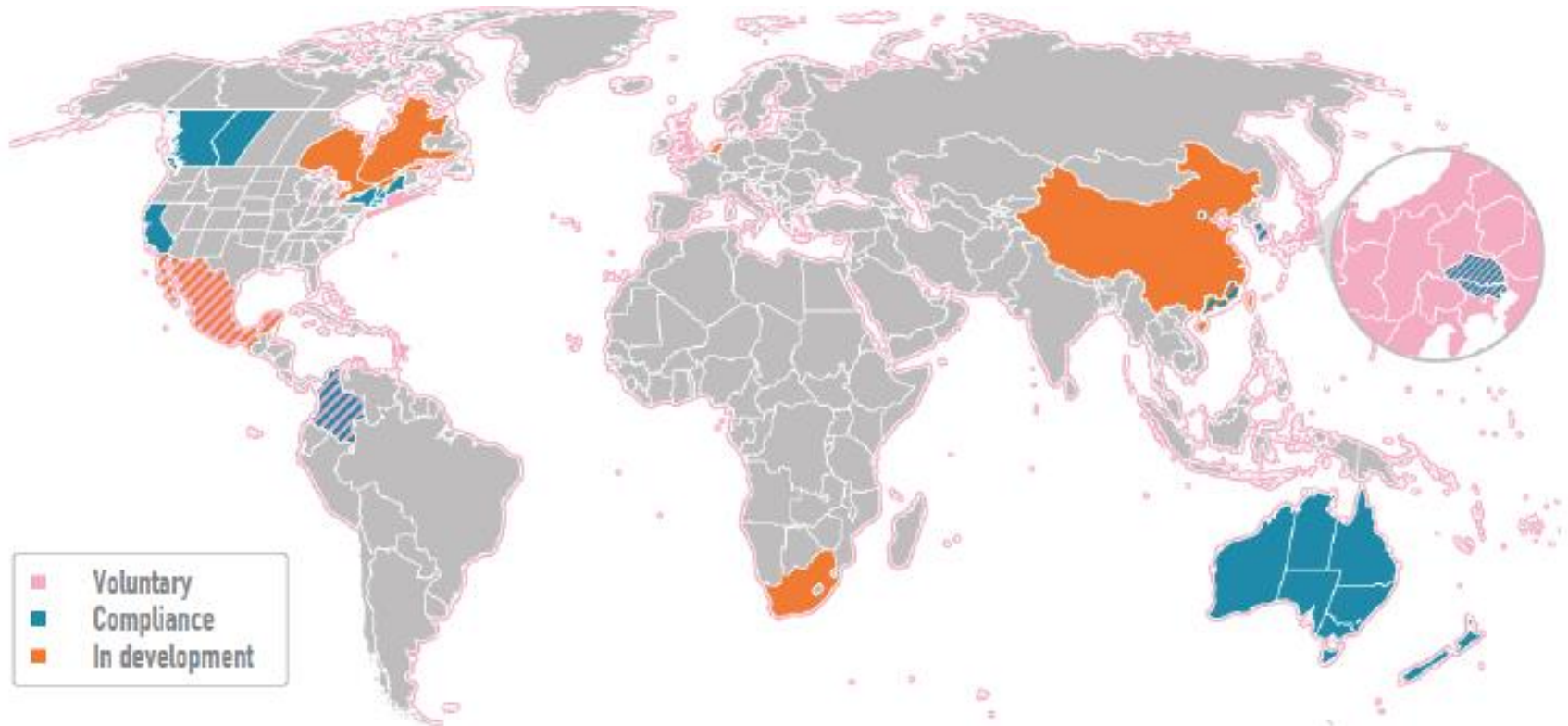
Compliance and Voluntary markets for forest and land use carbon offsets exist, with caveats.

- High transaction costs
- Complex, evolving protocols
- Additionality
- Permanence
- Leakage

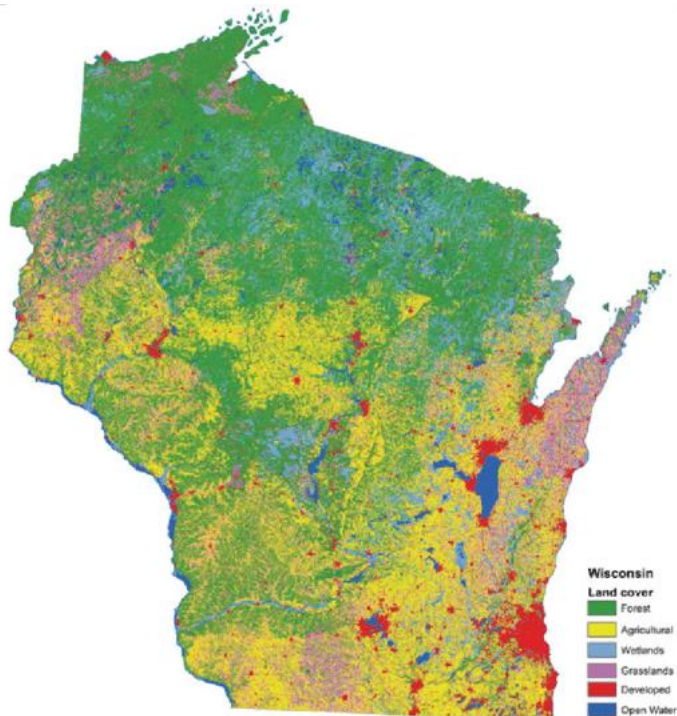
Demand for forest carbon offsets is (was) growing rapidly



Expanding Carbon Markets



Expanding Carbon Markets in Wisconsin



- **A Regional GG Cap and Trade Program**
- **Family Forest and Farm Carbon Program**

Family Forest and Farm Carbon Program



Ex.: American Forest Foundation / The Nature Conservancy

- **Practice-based approach for specific forest management practices**
- **Lower transaction expenses to landowners by 75% while providing fixed payments.**
- **Risks assumed by project program operator – could be private or Govt. entity.**



Thank You

Fred Clark, Executive Director, Wisconsin's Green Fire

fclark@wigreenfire.org

www.wigreenfire.org

