

Forests and Carbon

Seth Cassell
and
Shawn Lehman

DCNR Bureau of Forestry
Resource Planning & Information Division

www.dcnr.state.pa.us



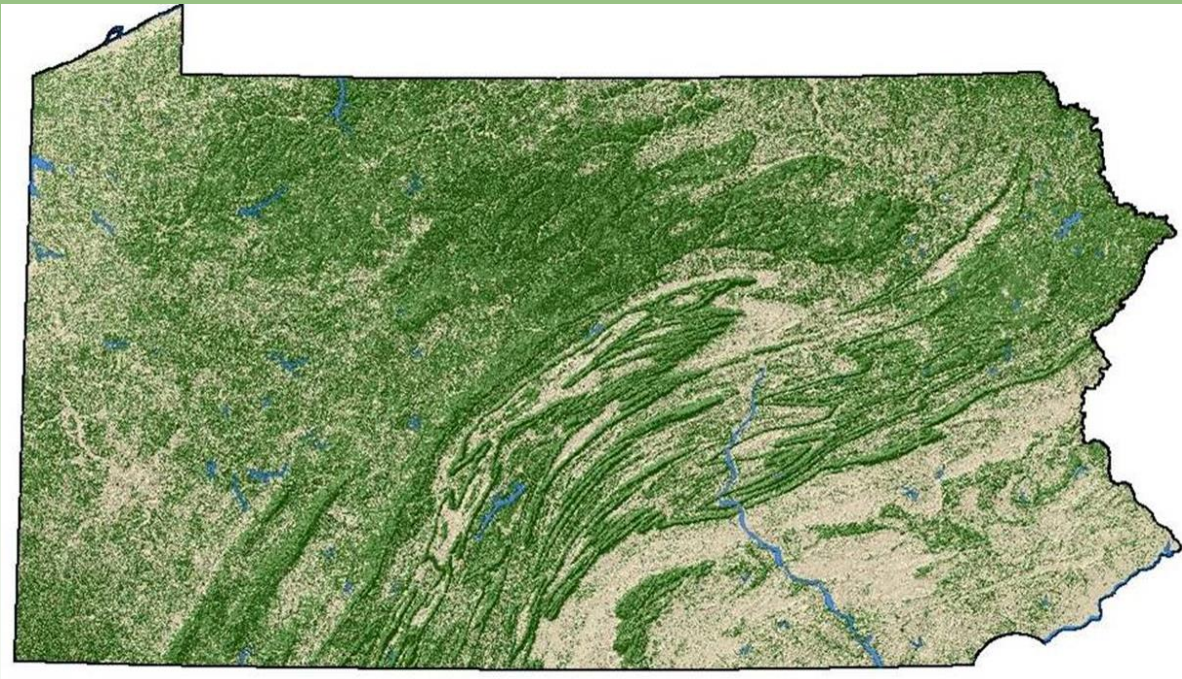
Forests and Carbon

- **Introduction**
 - Forests and carbon
 - Smart practices
 - Looking ahead
 - Grants
 - Research
 - Inventory
 - Carbon markets



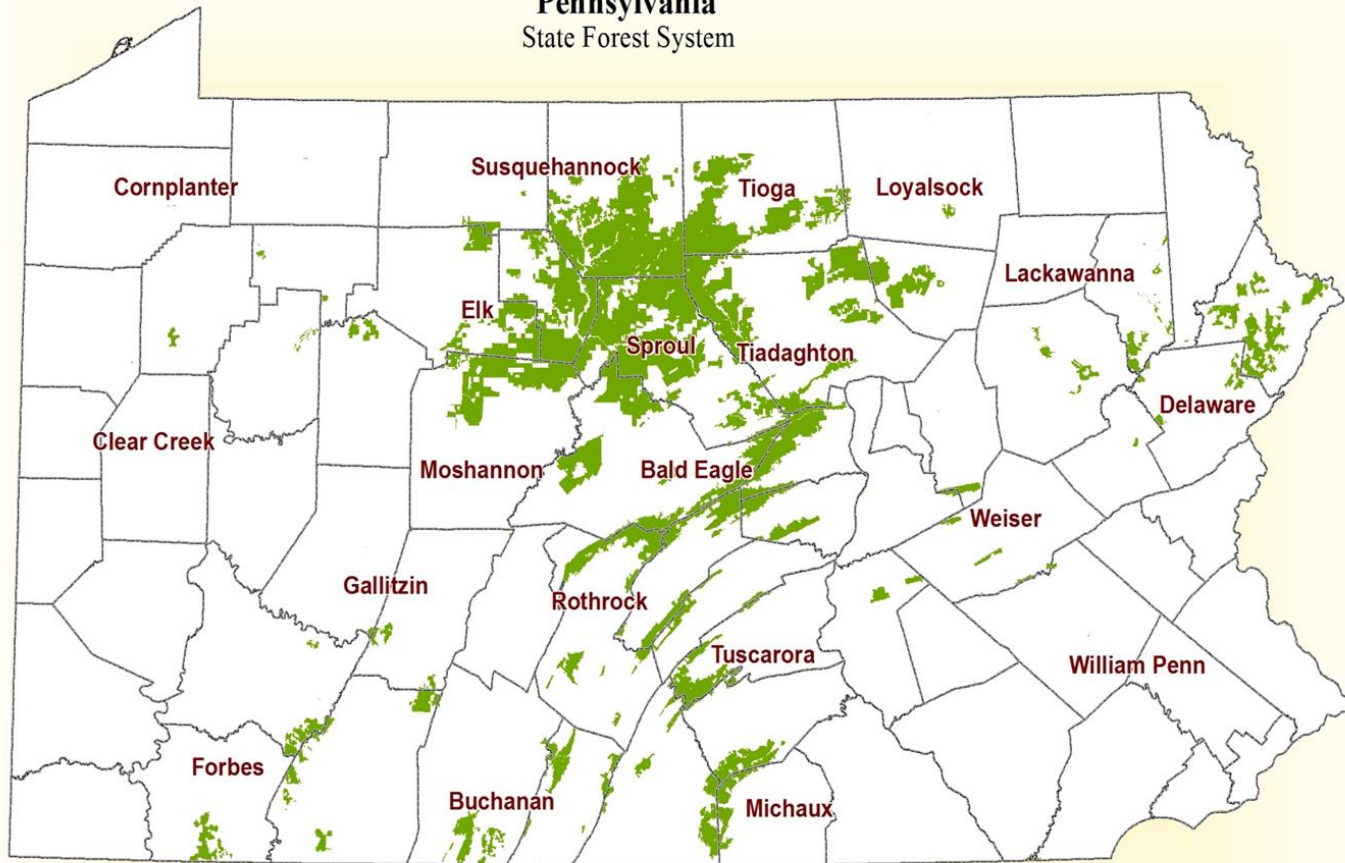
Forests and Carbon

Forests of PA ~ 16.6 million acres



www.dcnr.state.pa.us

Pennsylvania State Forest System



Pennsylvania State Forest – 2.2 million acres

www.dcnr.state.pa.us



pennsylvania
DEPARTMENT OF CONSERVATION
AND NATURAL RESOURCES

Forests and Carbon

Considerations for Climate Change

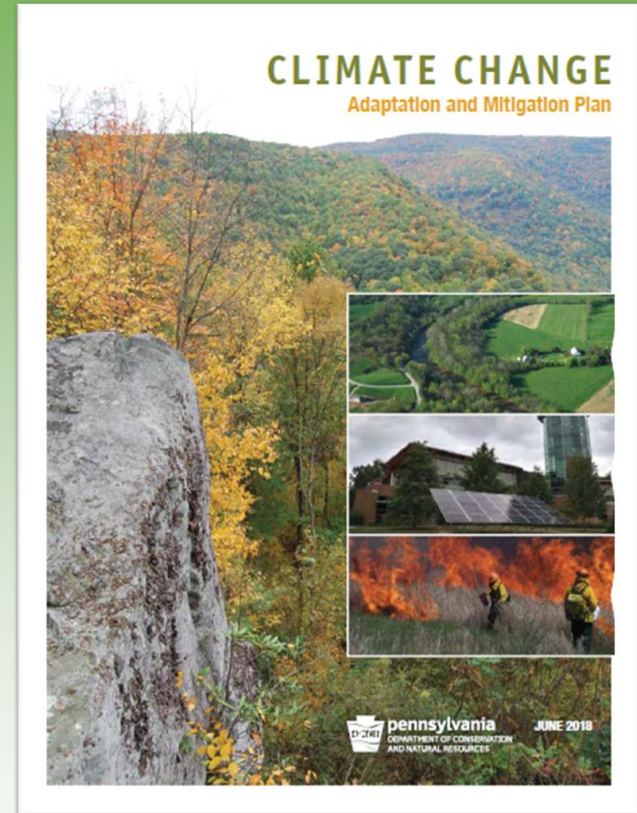
- Forest Resilience
- Mitigation
 - Carbon sequestration
 - Carbon storage

Forests and Carbon

- Significant contributions to carbon management
 - Total C stocks on PA forests 16.6 million acres of forestland is 174 billion tons or 104 tons/acre (2019 USDA FIA).
- Young, middle-aged forests sequester more carbon
- Older forests store more carbon

Forests and Carbon

- Management guidance
 - Bureau of Forestry Strategic Plan
 - Pennsylvania Forest Action Plan
 - State Forest Resource Management Plan
 - Certification Standards



Forests and Carbon

- **Some carbon smart practices:**
 - Keep forests as forests
 - Restore degraded areas
 - Ensure diversity (ages, species)
 - Ensure regeneration
 - Manage invasive pests
 - Healthy durable wood products market
 - Tools for private forest landowners and communities
 - Trade-offs/balanced approach



Forests and Carbon

- Forests play a vital role
- Dynamic learning environment
- How do we adapt our management?



USCA Grant

- July 2019 PA joined USCA
- Partnered with MD DNR, American Forests, and US Forest Service
 - Submitted proposal “*Impacts of Forest Management on Carbon Sequestration and Storage in Maryland and Pennsylvania*”

Modeling Carbon Impacts of Forest Management

Objectives:

- Model carbon impacts of forest mgmt. and wood utilization scenarios
- Understand climate mitigation potential of scenarios/practices
- Integrate carbon in forest management and planning
- Integrate forests in state climate planning



Forest Carbon and Climate Program
Department of Forestry
MICHIGAN STATE UNIVERSITY



Canada
Natural Resources Canada
Canadian Forest Service



Modeling Scenarios

- Changes in rotation length
- Afforestation
- Restock understocked stands
- Increase timber stand improvements
- Keep forest as forest
- Reduce diameter limit cuts
- Control deer browse
- Silvopasture
- No harvest activities
- Climate change impacts on growth
- Climate change impacts on natural disturbance
- Using more mill residues for bioenergy
- Portfolio

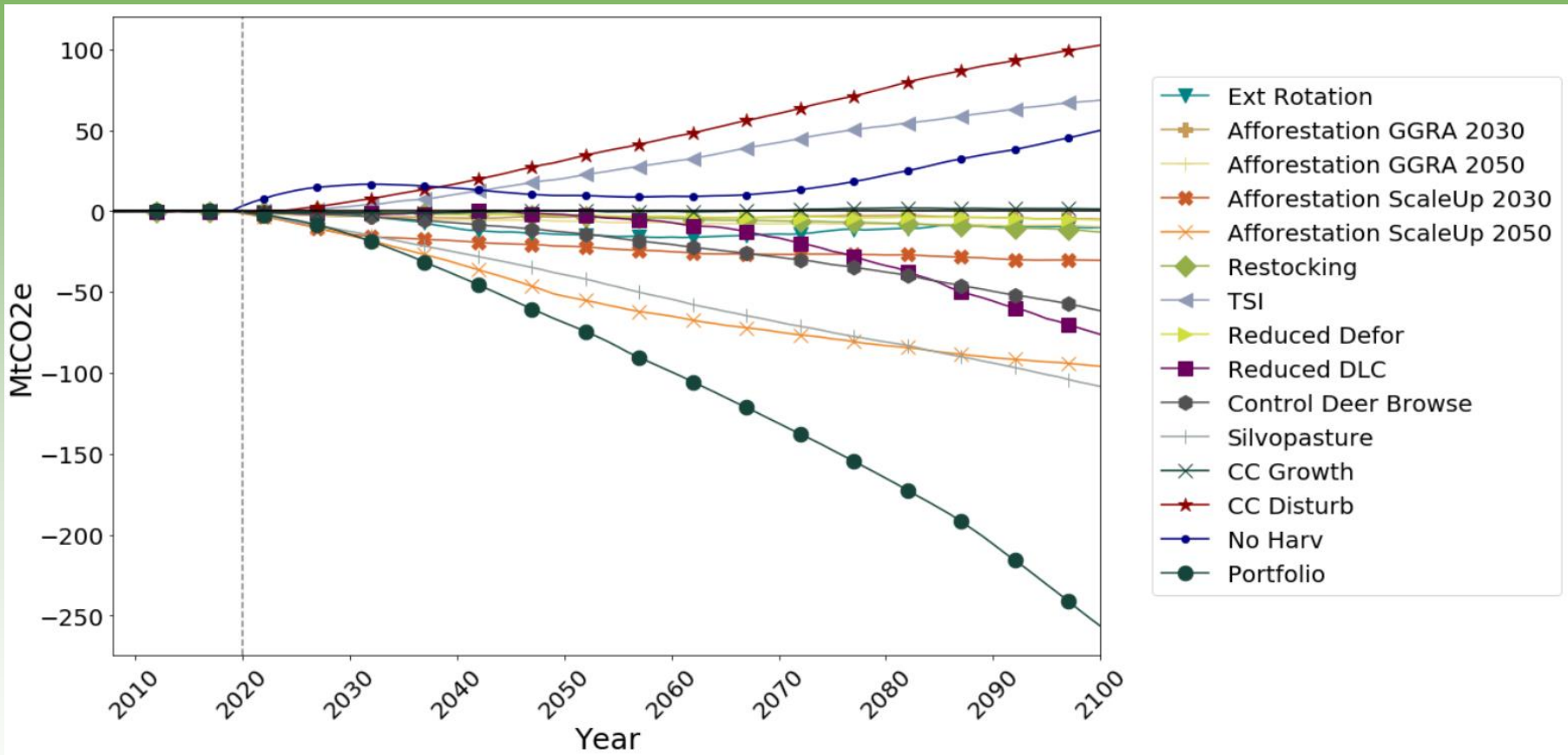
www.dcnr.state.pa.us



pennsylvania
DEPARTMENT OF CONSERVATION
AND NATURAL RESOURCES

Relative to the baseline (Scenario carbon flux – Baseline carbon flux)

Standardized cumulative ecosystem + HWP carbon flux - Pennsylvania



Takeaways & Recommendations

No one answer – Combination of strategies

Good Forest Mgmt. = Good Carbon Mgmt.

- Prioritize forest health and structure, rebalancing age distribution; focus on protecting natural regeneration
- Expand adoption of silvopasture
- Scale up ambition for tree planting
- Incentivize more sustainable management practices on private lands
- Using woody biomass for energy (from existing harvest material) is not likely to yield significant carbon benefits
- Prepare for potential negative impacts of climate change, especially from more pests and disease

www.dcnr.state.pa.us

USFS Supplemental Grant

- USCA grant focused on carbon
- Economic trade-off of management strategies in terms of timber products
- RFP in development
- Completed by December 2022

USFS NE Climate Hub Grant

- May 2021
- PI – Dr. Marc McDill, Associate Professor of Forest Management, PSU Ecosystem Science and Management
 - PSU Forest Economists, Center for Private Forests, Extension, DCNR Bureau of Forestry, DEP and USFS
- “*Evaluating the Feasibility of a Pennsylvania Forest Carbon Cooperative*”
 - Evaluate the legal, technical, and socio-economic feasibility of a proposed Pennsylvania forest carbon cooperative

Voluntary Carbon Markets

- Numerous companies
- Approaches
 - Improved Forest Management
 - Harvest deferral
 - Afforestation
 - Current mgmt. practices compared to regional norms
- Uncertainty of carbon baseline and additivity
- Uncertainty of true climate benefits

PA Carbon Quantification Models

- July 2022
- *“Development of High-Resolution Biomass, Carbon, Volume and Forest Type Prediction Models and Maps for Pennsylvania”*
- Goals
 - Model and map of aboveground forest biomass and timber volume for the state of Pennsylvania with a resolution of 25x25m
 - Forest type map at the same resolution for the state of Pennsylvania
- Utilizing and integrated with CFI

www.dcnr.state.pa.us



pennsylvania
DEPARTMENT OF CONSERVATION
AND NATURAL RESOURCES

Conclusion

- PA Forest Lands are part of the climate solution
- Engagement with research projects
 - Understanding effective strategies
 - Evaluating trade-offs
 - Developing techniques to quantify carbon
- Evaluating carbon offset programs
 - True positive impact to climate
 - Understanding terms and consequences
- Adapt SFL management for optimizing carbon along with other uses and values

Forests and Carbon

Questions?

www.dcnr.state.pa.us

