Forest Carbon – Sustaining an Important Climate Service: Roles of Biomass Use and Markets

Biomass 2014 Conference
Carbon Accounting and Woody Biofuels Session
Washington D.C.
7/30/14

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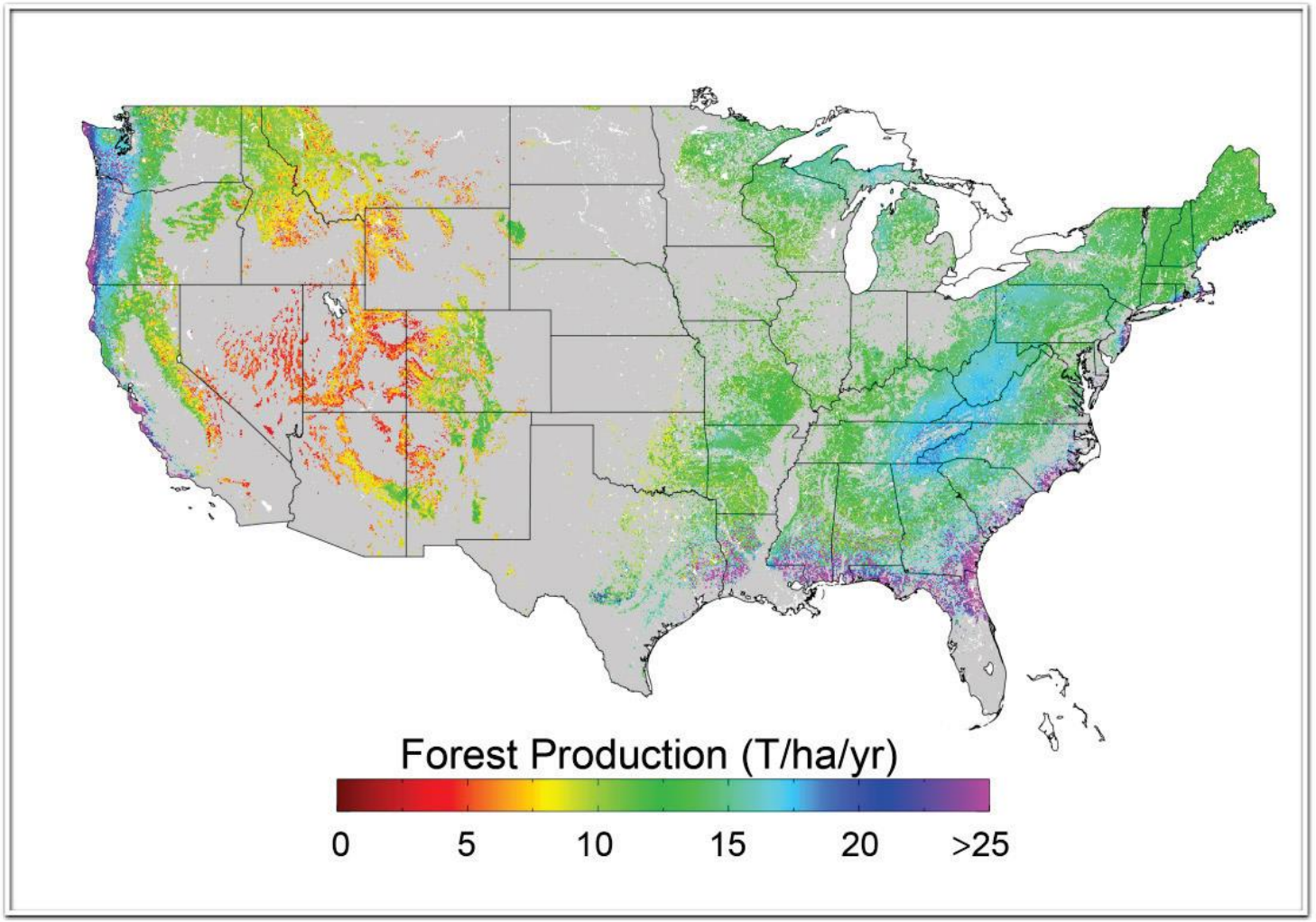
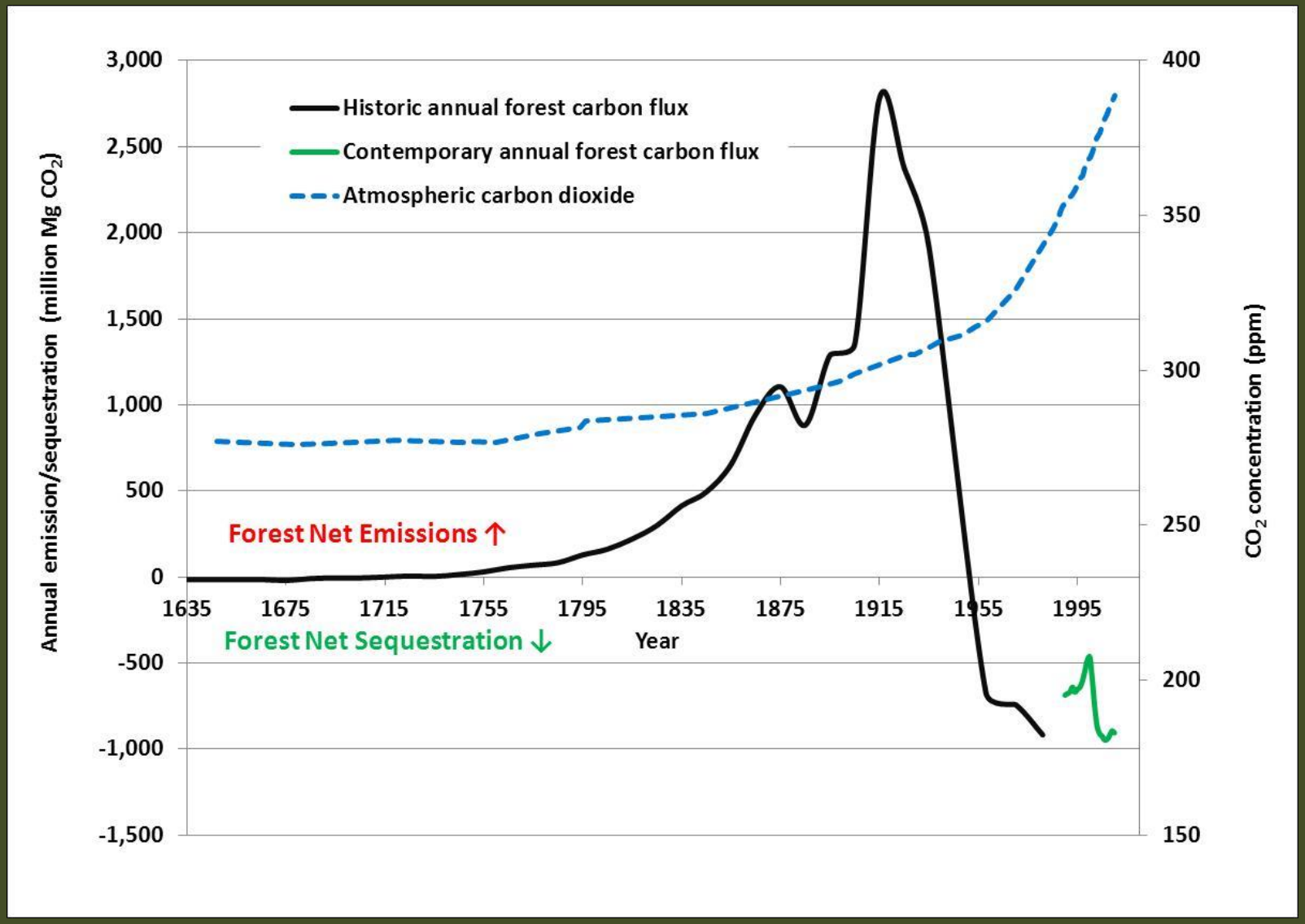
USDA

Resilient Forests... Sustainable Communities

U.S. Forests are Important Carbon Sinks





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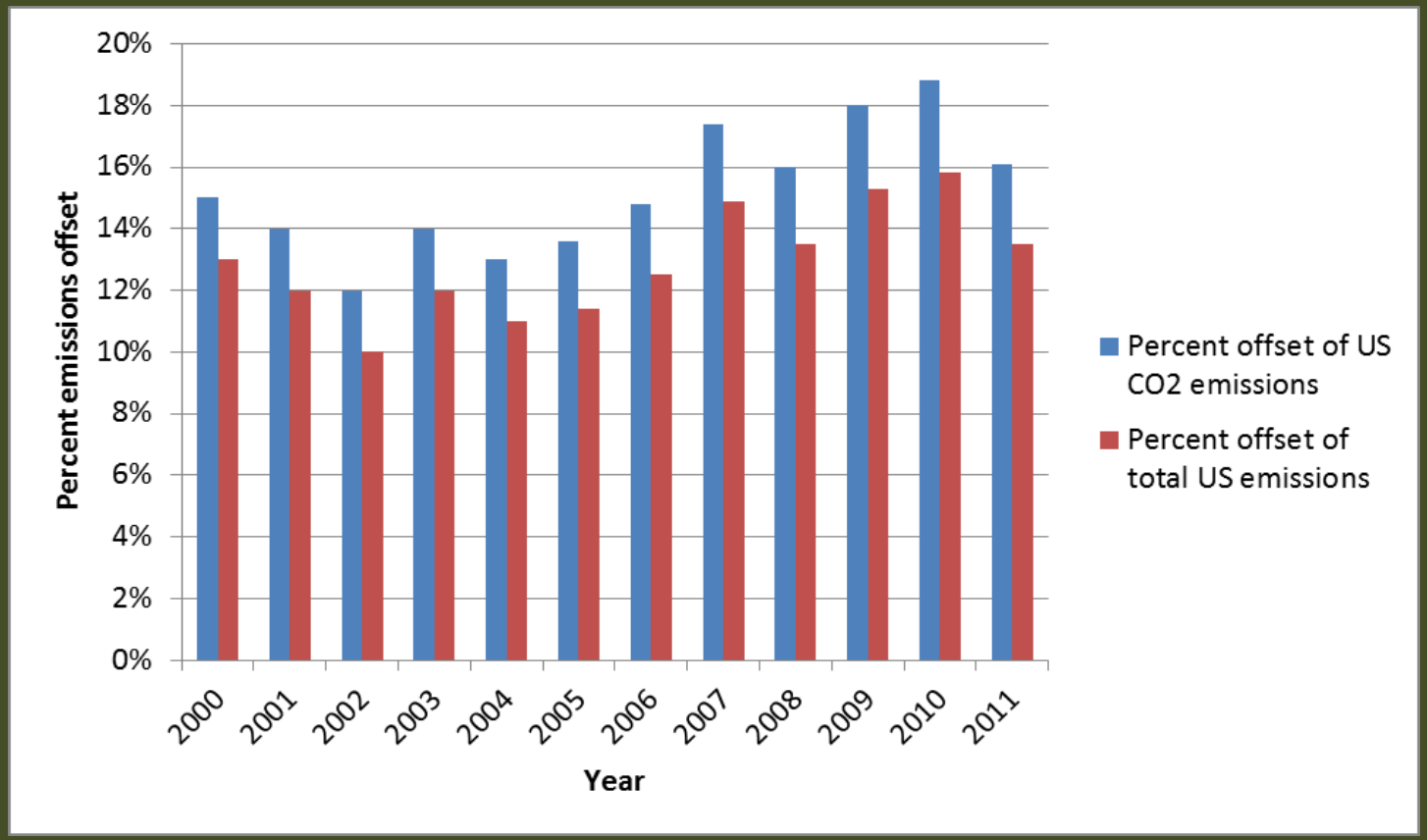
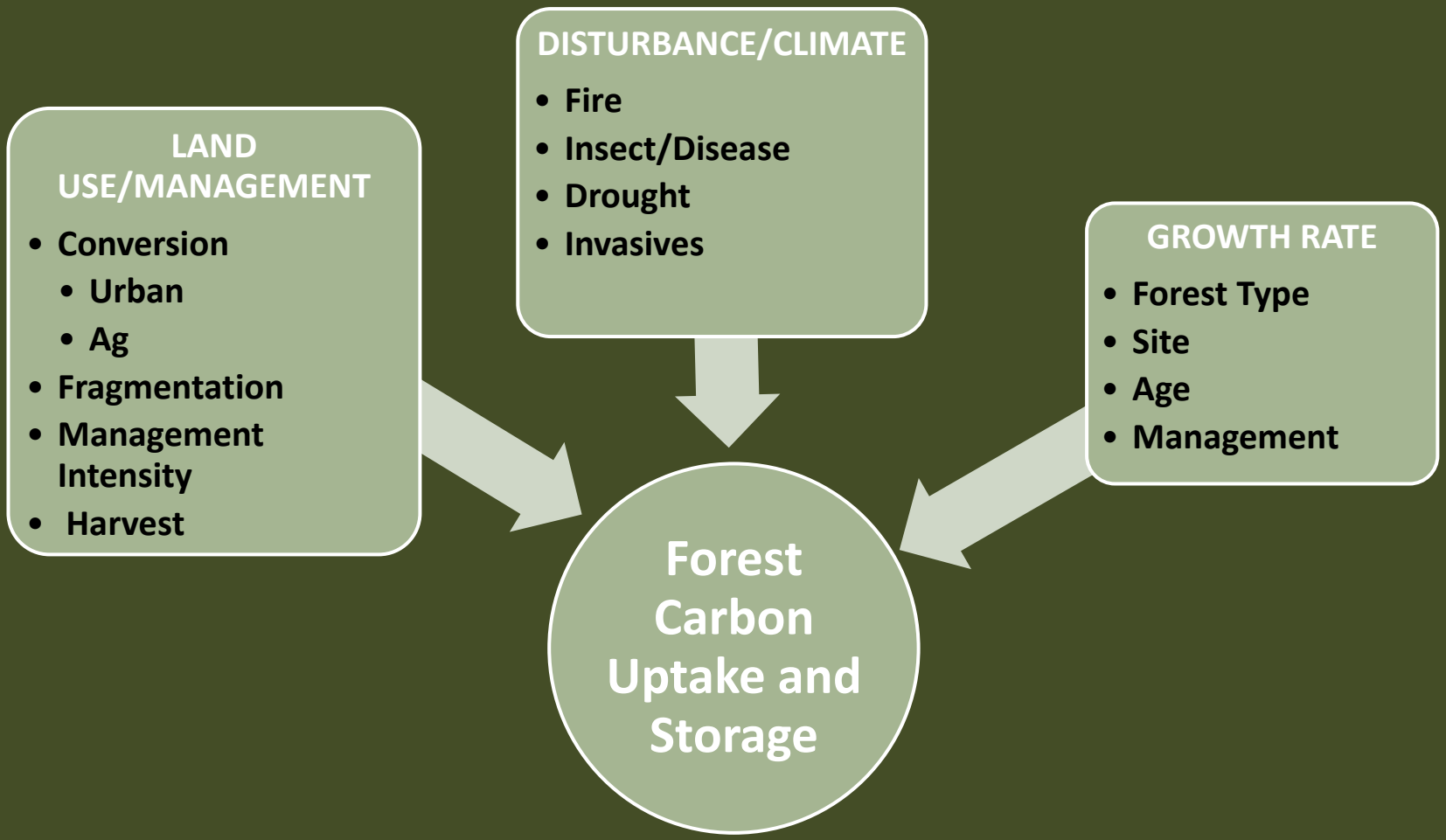
Changing Forests…Enduring Values

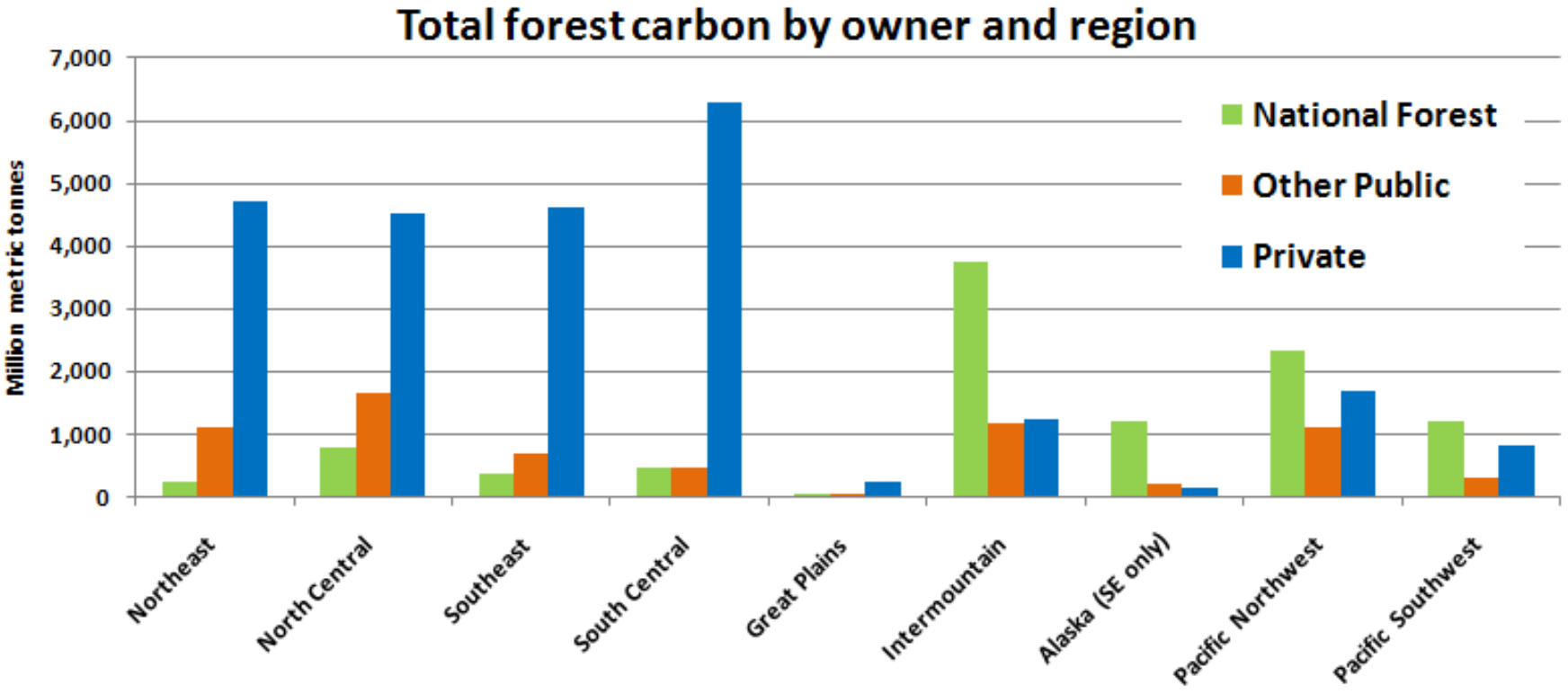
Percent emissions offset by LULUCF



Based on U.S. EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011 Report

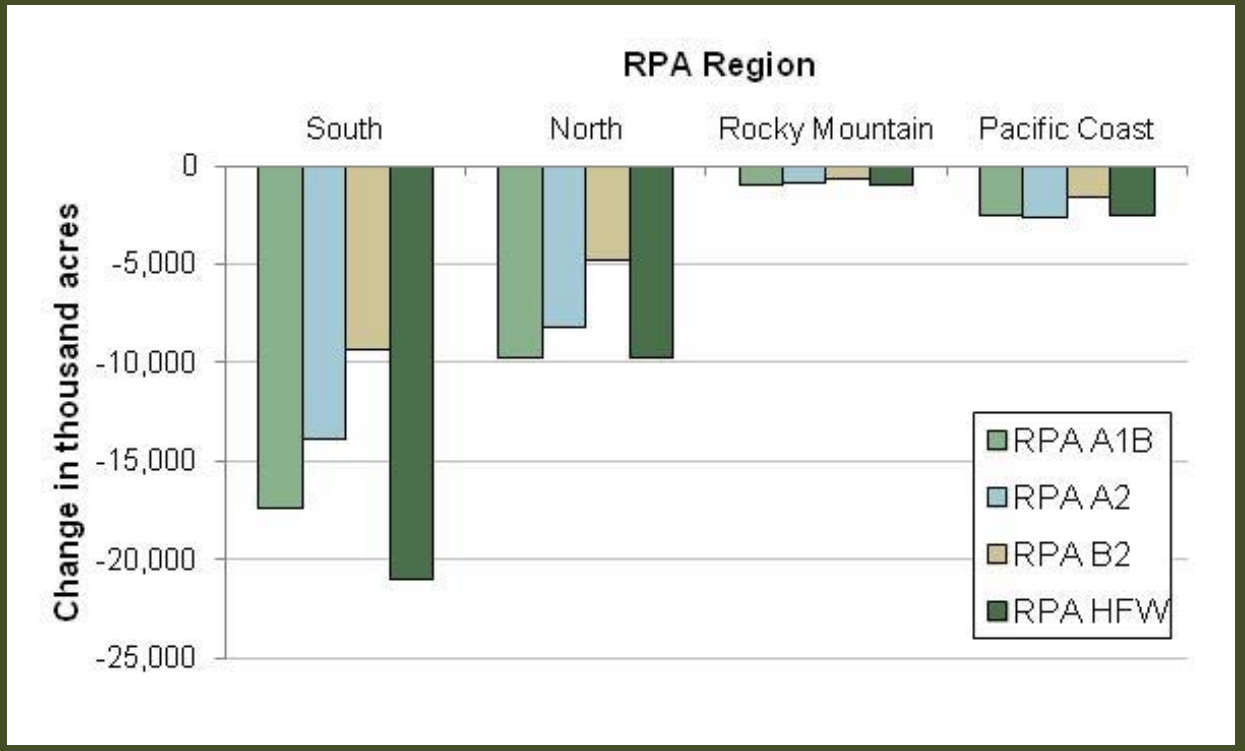
Drivers of Forest Carbon Sequestration




Total forest carbon by owner and region
Million metric tonnes
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
National Forest
Other Public
Private
Northeast
North Central
Southeast
South Central
Great Plains
Intermountain
Alaska (SE only)
Pacific Northwest
Pacific Southwest

Land Development – companion stressor in a changing climate

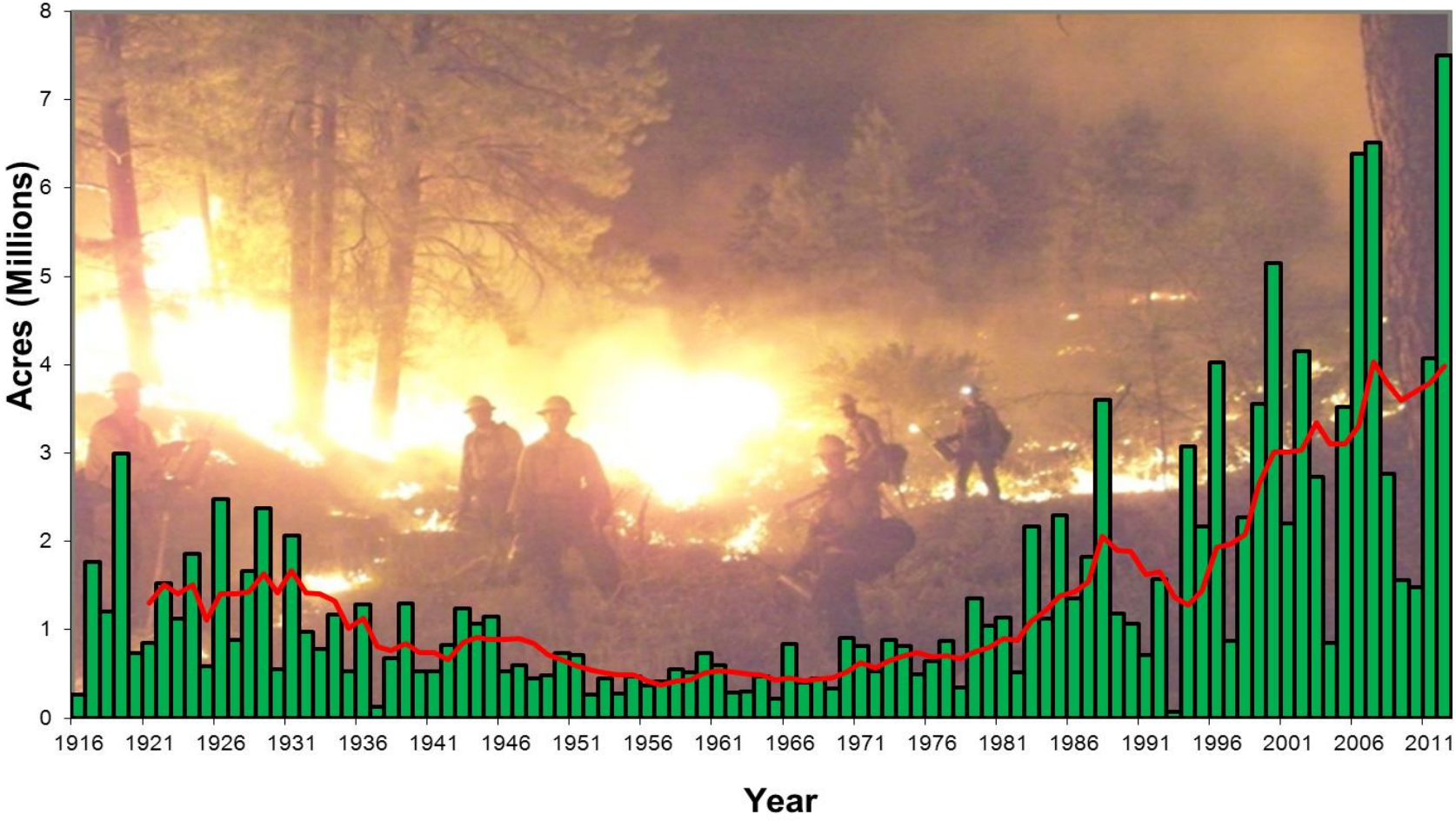
Forests are most impacted by urban and developed uses, with up to 8% of the forest land base in the South lost by 2060.



Change in nonfederal forest area by RPA scenario, 2010-2060, conterminous United States. 2010 RPA Assessment

Acres Burned in the Western U.S.

(Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming)



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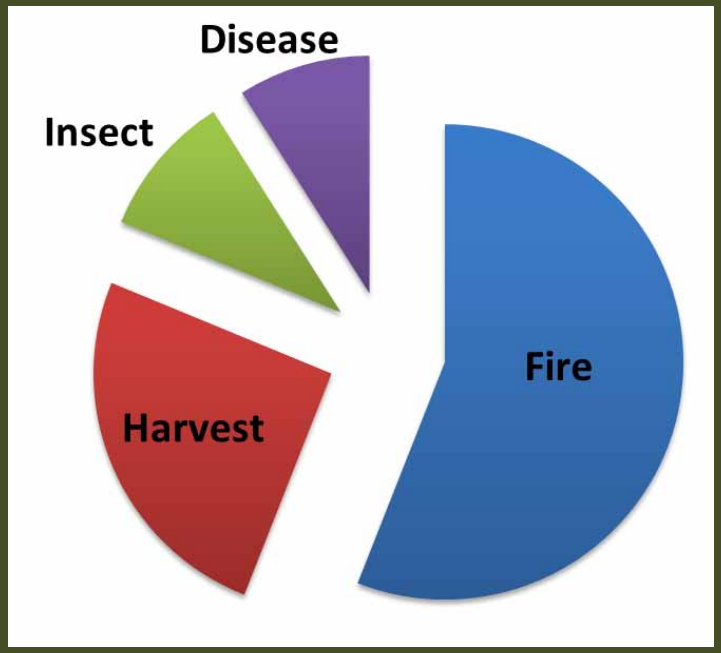
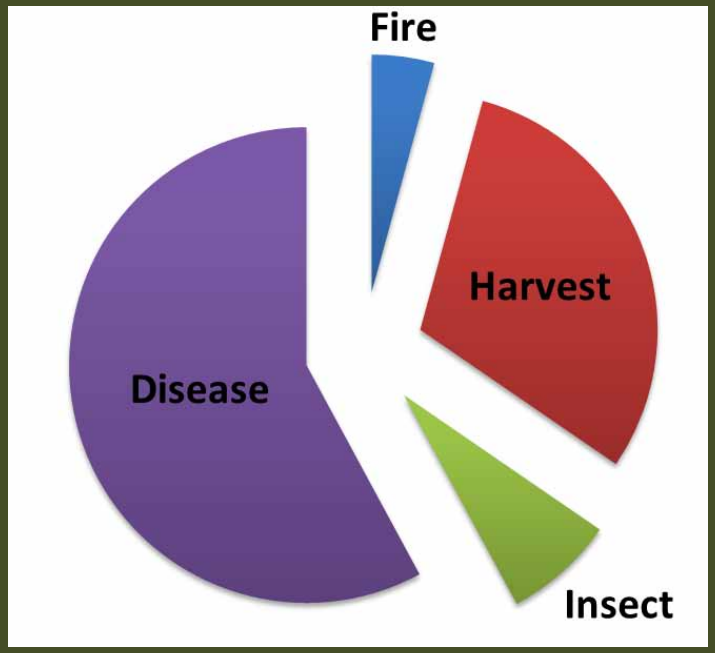
Relative Impact Of Disturbance Processes On Loss Of Potential Carbon Storage

ForCaMF (Forest Carbon Management Framework) Analysis
Two National Forests

Flathead NF more fire, less harvest

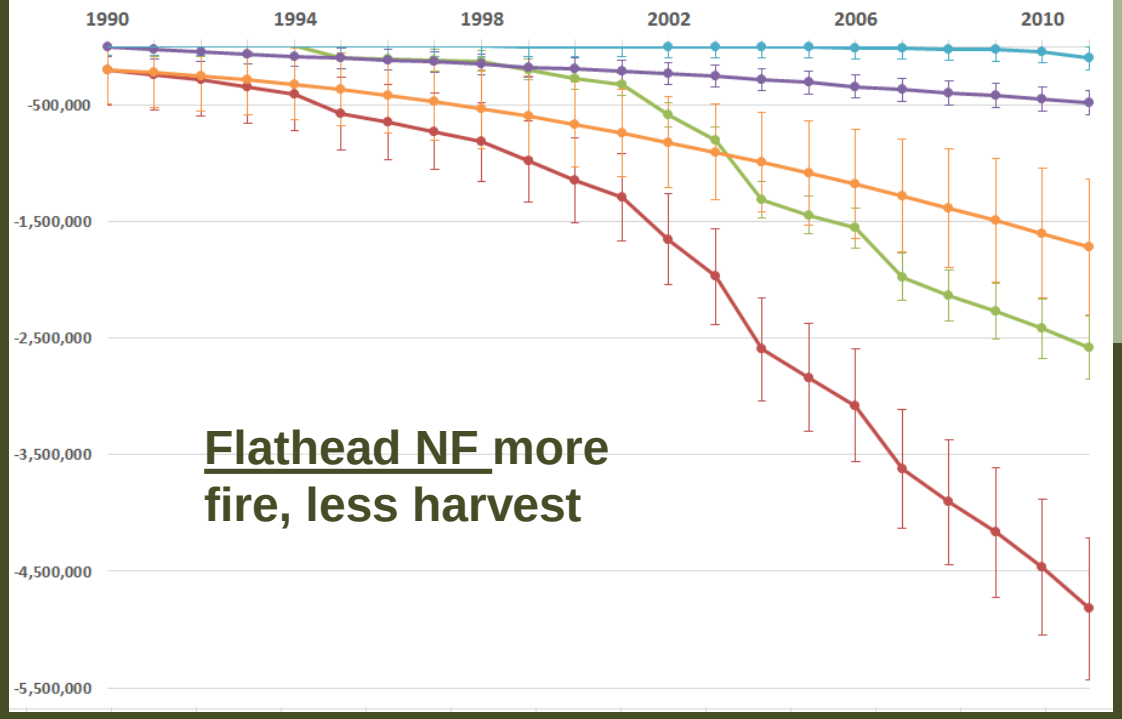


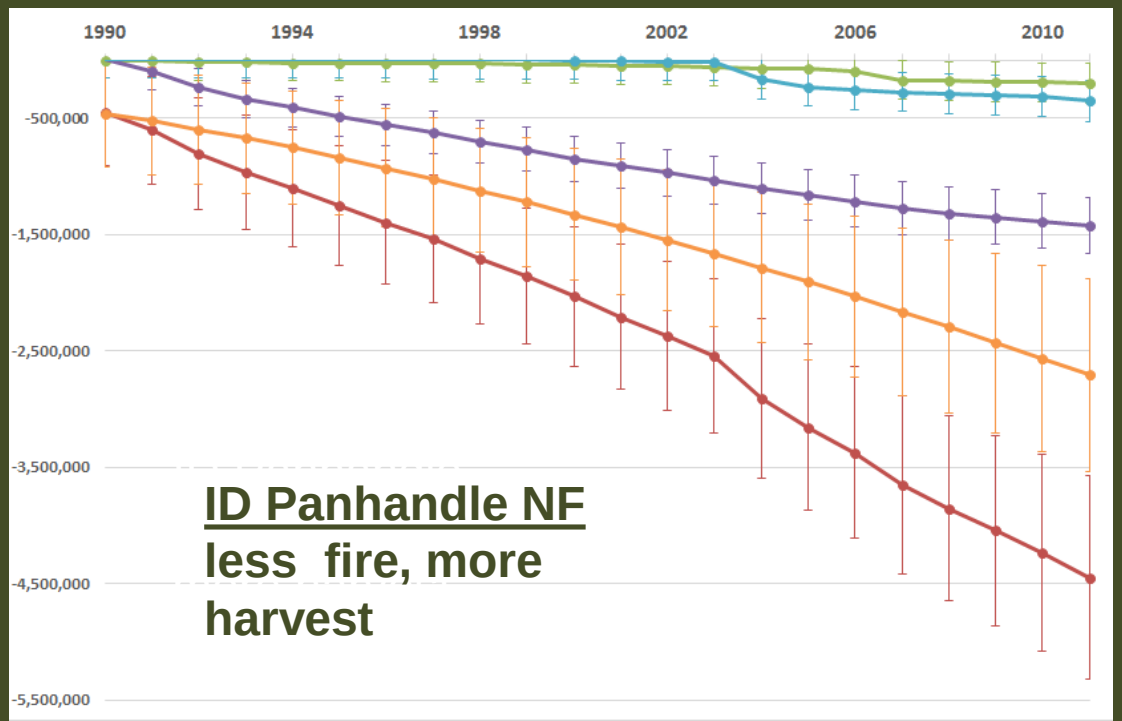
ID Panhandle NF less fire, more harvest



Relative Impact Of Disturbance Processes Over Time

ForCaMF (Forest Carbon Management Framework)



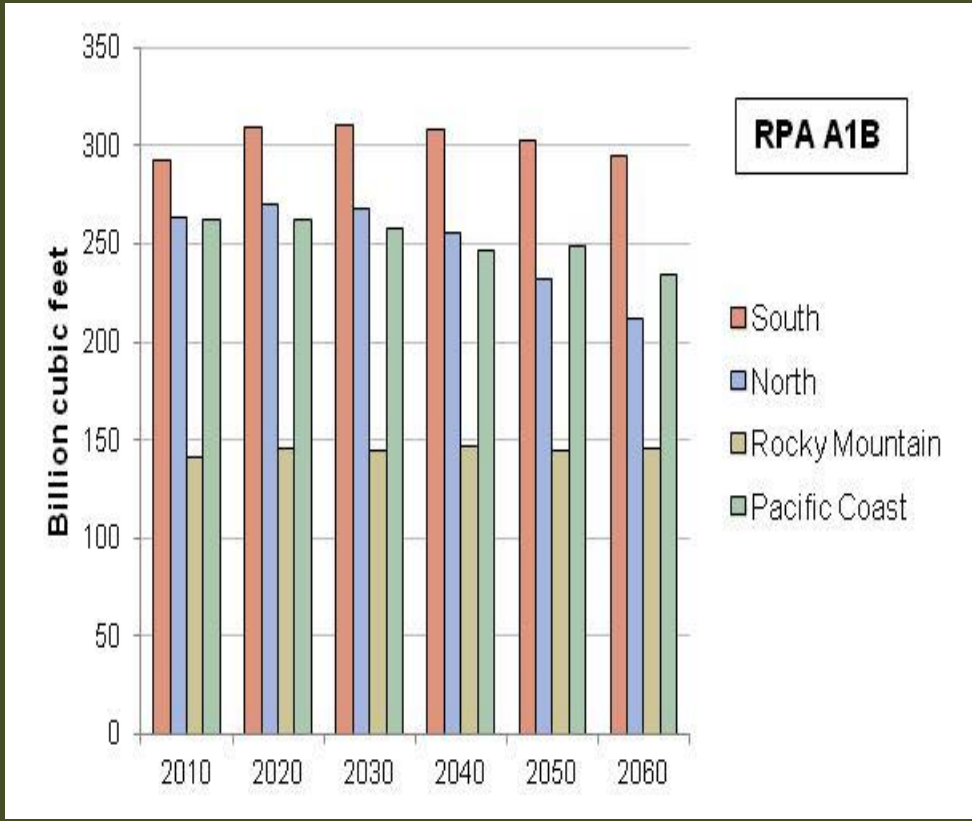


- Total lost sequestration
- Sequestration lost to fire
- Sequestration lost to harvest
- Sequestration lost to insects
- Sequestration lost to root disease

Growing stock – a strategic asset at a turning point

Reduced growth in total forest growing stock:

- *Volume peaks between 2020 and 2030 and declines through 2060.*
- *Softwood inventories remain relatively stable; hardwood inventories show large declines after 2030.*
- *Upland hardwoods are lost to urbanization in North and South regions.*

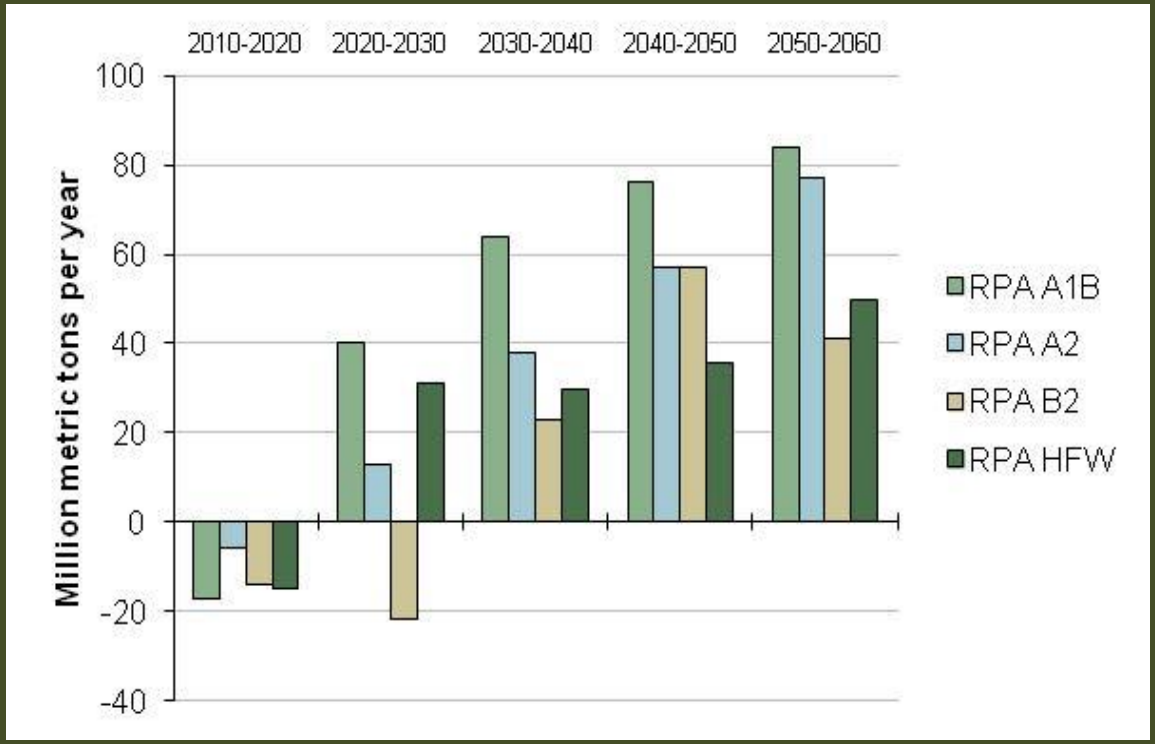


Projected growing stock inventories for the conterminous United States by RPA region, 2010-2060.

Forests may shift from carbon sinks to sources in the future

Reduced forest carbon stocks in forests:

- *Forests shift from their current status as net sequesters of atmospheric carbon to become an emissions source in the future in all scenarios.*



Total carbon flux in conterminous U.S. forests by decade by RPA scenario – 2010 RPA Assessment

Forest Carbon Management is Sustainable Forest Management

“ In the long term, a sustainable forest management strategy aimed at maintaining or increasing forest carbon stocks, while producing an annual sustained yield of timber, fiber, or energy from the forest, will generate the largest sustained mitigation benefit.”

Intergovernmental Panel on Climate Change 2007

Forest Management to Meet Climate Change Challenges

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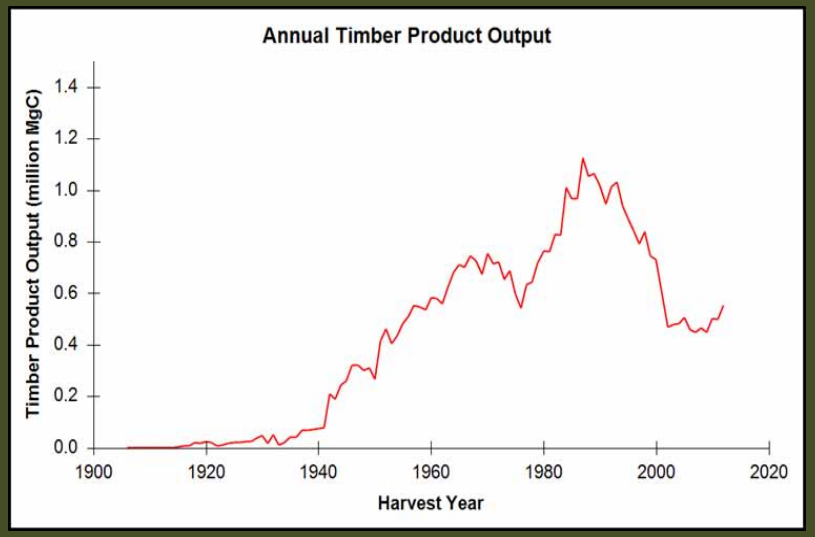
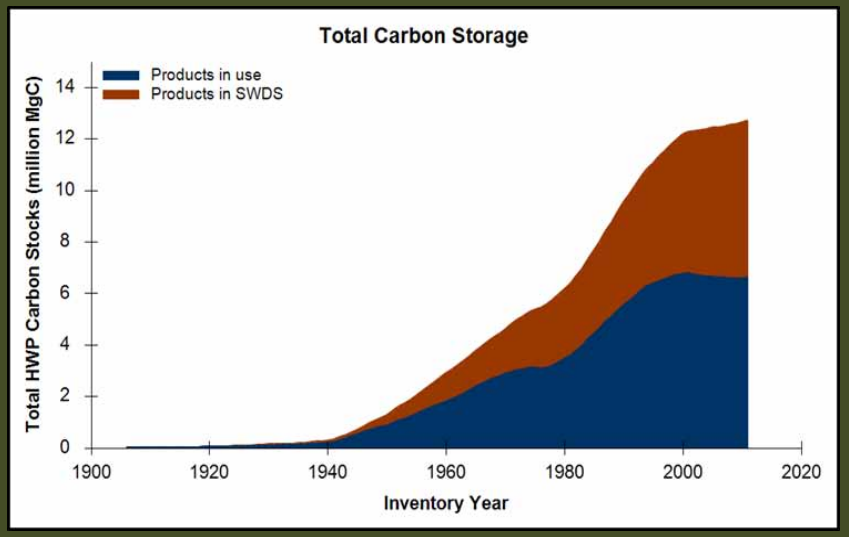
Roles for Wood Use and Markets in Forest Carbon Management

- Financial incentive to retain forests
- Offset costs of forest treatments to improve resilience
- Alternative pathways for waste streams and natural disturbance – emissions
- Extending carbon storage in wood products
- Substitution for fossil fuel use
- Contributing to integration and resilience of wood products base

Harvested Wood Products
National Forest System – Eastern Region

- Annual timber product output in the Eastern Region, 1911 to 2012
- Cumulative total carbon stored in HWP manufactured from Eastern Region timber





Wood Use in the President's Climate Action Plan Look Closer Now ….

(June 2013)

- **Cut Carbon Pollution**
  - Forest carbon sequestration
  - Renewables – woody biomass
  - Energy efficiencies in buildings – wood construction
- **Prepare for Impacts of Climate Change**
  - Assist tribal and other vulnerable communities
  - Regional service "Hubs" – USDA
  - Manage connected risks – fire, drought, floods, insects, etc.
- **Lead International Efforts**
  - Reduce deforestation and degradation
  - Develop renewable energy
  - Keep forest carbon management in negotiations

Uncertainties and Analysis Needs in Addressing Forest Carbon Challenge

1. **Disturbance complex impacts – impacts on carbon dynamics**
2. **Social responses to policy instruments – responses to incentives**
3. **Economic returns and costs by region and practice – guiding targeted investments and partnerships**
4. **Life-cycle analyses – linking forest and wood product/biomass use decisions**
5. **Forest carbon and ecosystem services monitoring** – tracking joint production and tradeoffs
6. **Treatment needs – acres, investment levels, responses, feasibility**

Thank you

- www.fs.fed.us/climatechange/advisor

Changing Forests…Enduring Values