

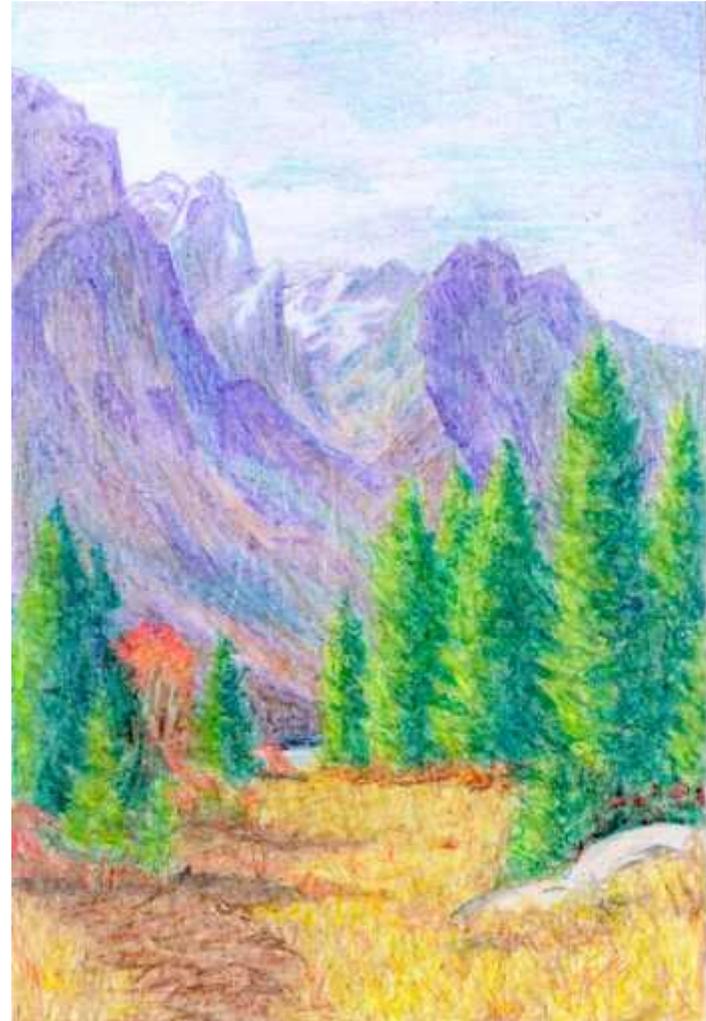
Ownership Considerations For Forest Carbon Sequestration for the United States

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Outline of Talk

- *Terrestrial Carbon Sequestration Across Sectors and Ownerships (“All Lands Approach”**
- *Land use and ownership in the United States**
- *Private Ownership: Land-Use Changes**
- *Public Forest Ownership**
- *Modeling Carbon Changes on Public Forest Lands**
- *Selected Research Needs (Modeling Gaps)**

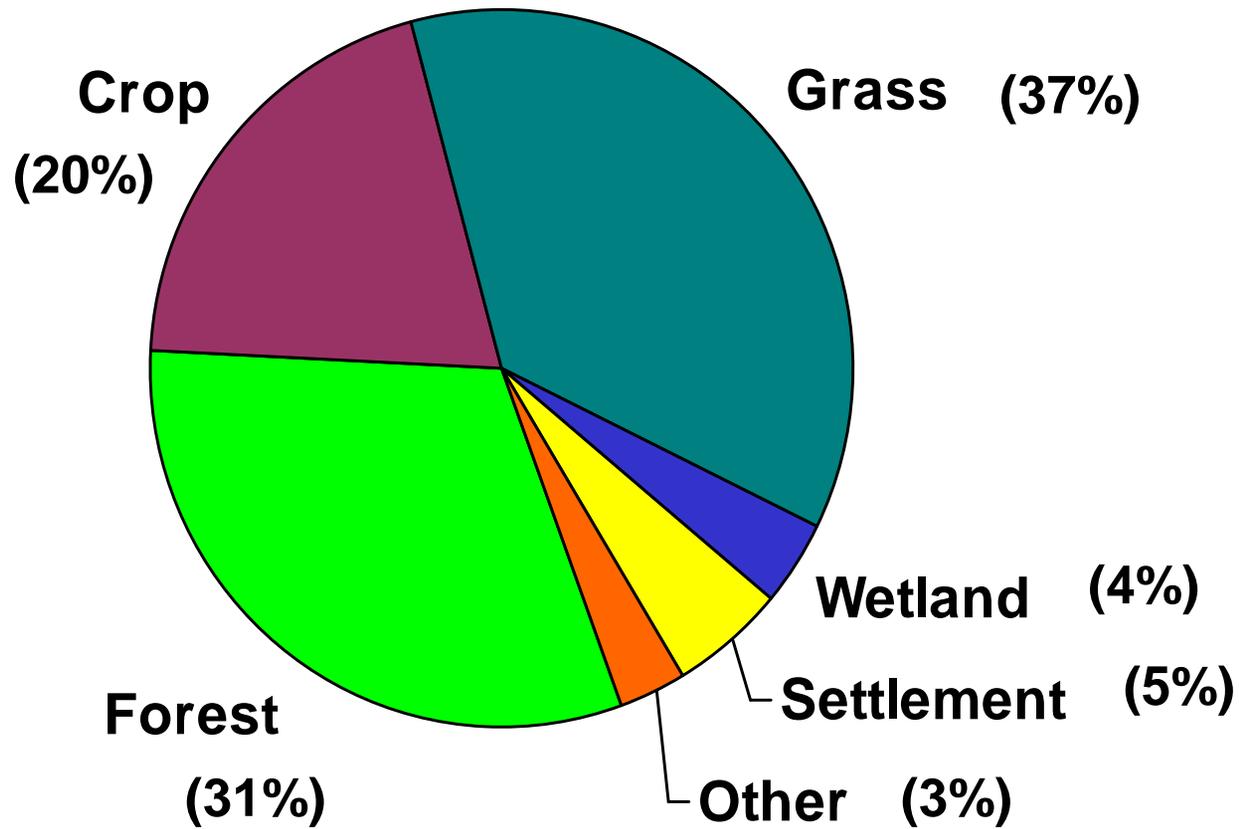


Modeling components

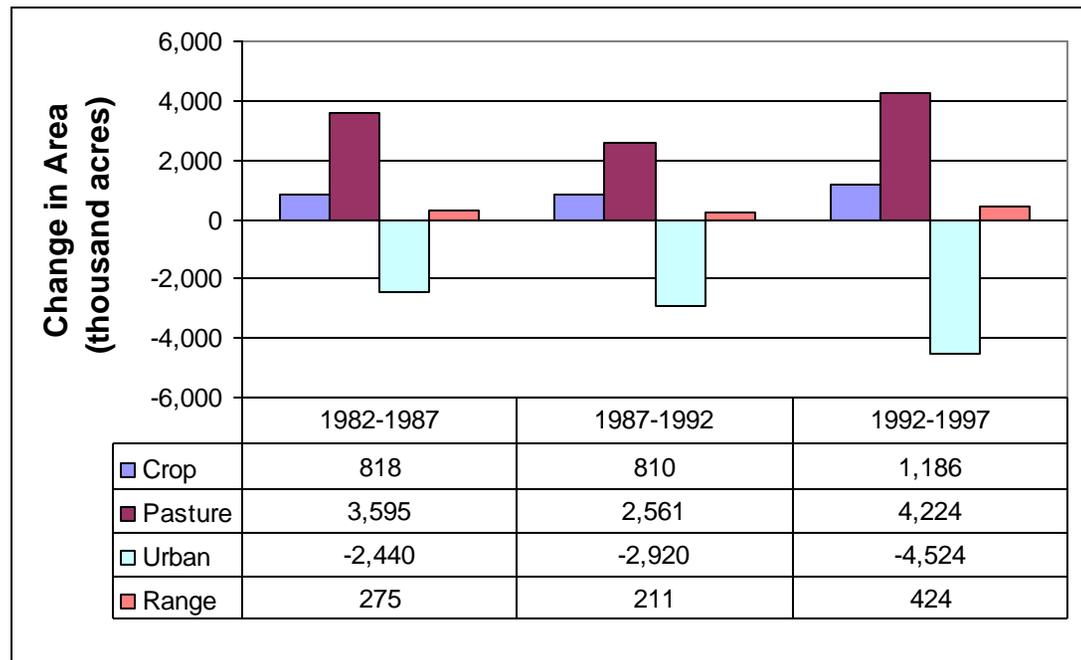
- Land-use modeling, e.g., deforestation for agricultural use
- Forest inventory (e.g., area and volumes per acre) and updating through time
- Forest management and investment (e.g., precommercial thinning), and natural disturbances
- Timber harvest (link to Eric White's talk about forest-based bioenergy)
- Forest and product carbon accounting
- Regeneration Path (link to Greg Latta's talk about voluntary actions)

US land uses, 2006

Source: Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2006, www.epa.gov/climatechange/emissions/index.html#inv

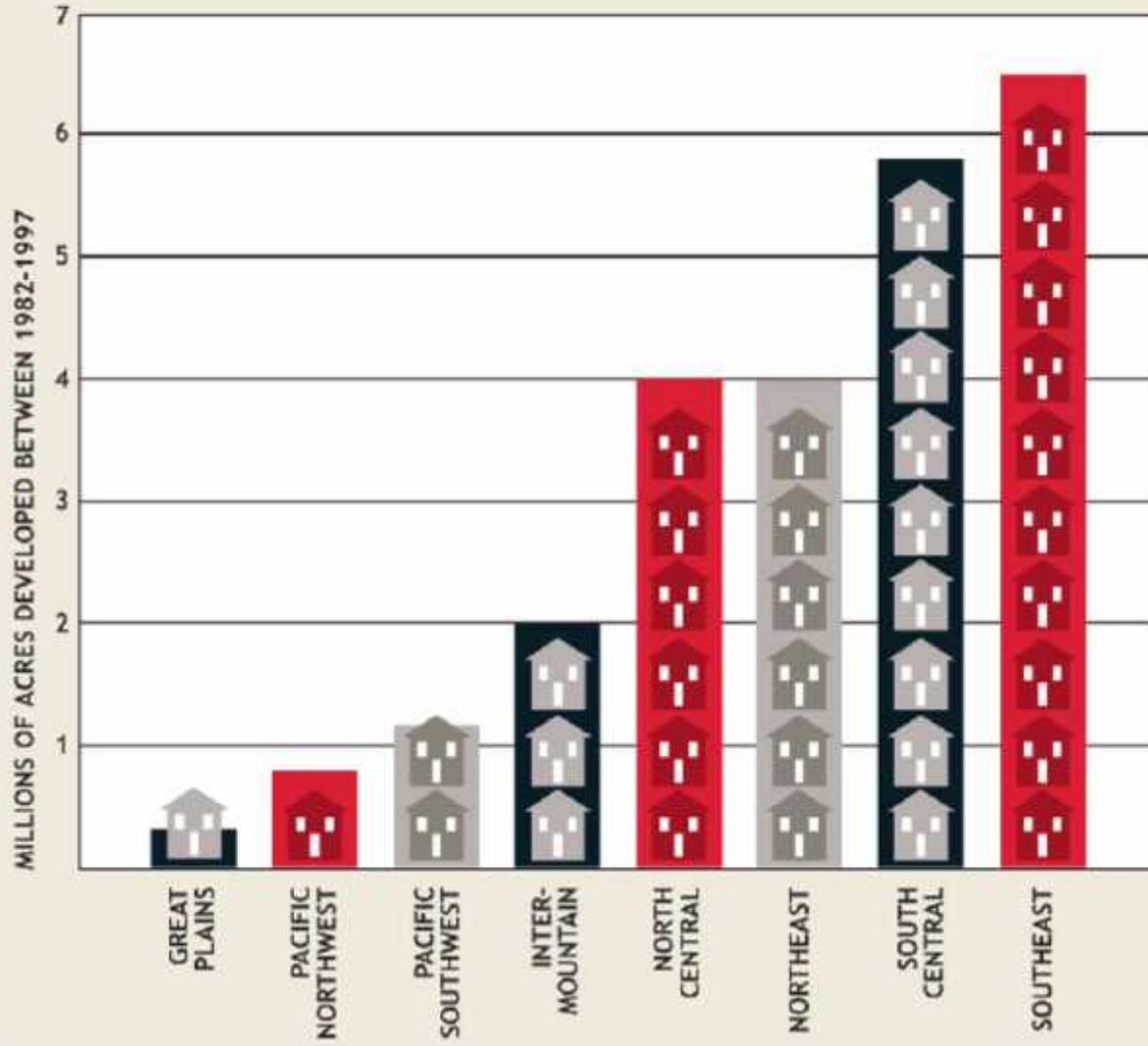


Historical net transitions of forest area to or from other major uses on nonfederal land in the U.S., 1982 to 1997. For example, negative numbers represent loss of forest to other uses.



Data source: NRI

REGIONAL TRENDS



Terrestrial Carbon Sequestration Across Sectors

- Agricultural Lands
 - *annual production and harvesting
 - *farm programs
 - *crops and livestock, e.g., use of corn
 - vast majority of U.S. agricultural land is in private ownership
- Forests
 - *afforestation and forest management on private forestlands
 - *forest management on public forestlands, such as reforestation and responses to disturbances
 - *private and public forestland coordination?
 - diverse forest management mix and array of ecological services.

Land Ownership in the United States

- Forests cover 1/3 of US land base
- Large private and public ownerships, in contrast to agriculture
- Conditions of forests in different ownership groups can differ widely, such as wrt age class distributions and timber volumes per acre
- Public forests are more frequently managed for nonconsumptive uses such as recreation

Private and Public US Forests

- Private forests (56%), and public forests (44%)
- Public forests are more common in the West
- Private forestlands in the East have been reduced in area the most, largely due to conversion to agriculture and development
- Large blocks of public ownership in the West vs. intermingled public/private forests in the East
- Opportunities for linked management of private and public forests include coordinated harvest scheduling and reforestation

Projections of Public Forest Carbon

- Woodbury et al: forests, urban trees, and wood products account for most of the U.S. carbon sink—65–91%.
- Depro et al. 50 Tg annually could be sequestered under BAU; zero harvest could increase it 40 to 50%
- Ince (2008) and Skog et al. (2006): hazardous fuels reduction, along with Abt and Prestemon
- Adams and Latta (2005): federal forestland restoration program

Oregon State Univ. Study of Private and Public Forest Carbon

- **“BASELINE” OR BUSINESS AS USUAL**
- *** PRIVATE SECTOR RESPONSES TO CARBON OFFSET SALES**
 - – **MANDATORY (SUBSIDY/TAX) SYSTEM**
 - – **VOLUNTARY SALES**
- *** PUBLIC SECTOR RESPONSE TO POLICY CHANGES**
 - – **ZERO HARVEST**
 - – **MAXIMUM “NON-DECLINING EVEN FLOW”**
- ***COMBINED PUBLIC AND PRIVATE POTENTIAL**
- ***OPPORTUNITIES FOR “COORDINATED STRATEGIES” BETWEEN PUBLIC AND PRIVATE LANDS – AN EXAMPLE FROM THE PNW**

Public and Private Forest Contributions

- Zero public harvest and \$30 C02e *mandatory* raises forest sector flux by nearly 2 billion tonnes/year
- Zero public harvest and \$30 C02e *voluntary* leads to same forest sector flux as baseline
- Maximum nondeclining even flow and \$30 C02e *voluntary* private leads to same carbon seq. as baseline but much higher timber harvest (Adams and Latta)

Summary

- Large forestland base, with important private and public components
- Private forests have been subjected to more changes, including timber harvest and land-use changes (Greg Latta will discuss in the next talk the importance of voluntary behavior by private forestland owners wrt forest carbon sequestration or fluxes)
- Public forest lands concentrated in the West, many with trees older than on private lands, and managed for multiple objectives
- Projections indicate substantial opportunities to sequester more carbon on public forests
- Linkages between private and public forests include possible timber harvest scheduling to increase net amount of carbon sequestration
- Bioenergy demand is important for both private and public forest management (Eric White will talk later on this subject)

Looking Ahead—Selected Research Needs



- *Interactions between private and public forest land management wrt mitigation costs and opportunities, including woody biomass for bioenergy
- *Landowner behavior in response to climate change programs or incentives
- *Afforestation capacity and adoption likelihood in different regions
- *Retention and condition of mitigation practices in forest sector

Briefing Papers Prepared for Forest Service Decision Makers

- Forest Service PNW GTR 833—White and Alig document role of public forests
- PNW GTR 837—Morzillo and Alig discuss related ecosystem services such as wildlife habitat
- Many studies differ in their assumptions about the form of the carbon market or the policy that compensates private or public owners for carbon sequestered
- White in PNW GTR 825 discuss contributions of forest sector to providing bioenergy
- Haim, Alig, Plantinga, and Sohngen show the importance of land use conversions to development alongside climate change in a recent article in *Climate Change Economics*.

Transition to Elizabeth Reinhardt's Talk

- Elizabeth will give examples of the type of modeling needed to support road map and scorecard work on Forest Service public forestlands for carbon stewardship
- Elizabeth will discuss regional variation and how that impacts setting policies, State Dept (COP 7) discussions about force majeure, modeling disturbances and harvest in scenarios, risk considerations in decision making, life cycle analysis needs, etc.