



Forest Products Markets and Forest Carbon Sequestration

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Big question: How to incentivize the expansion of the forest carbon sink in the United States to obtain climate benefits?

Today's objective: look at the potential role of wood products markets in accomplishing this objective.

Forest Carbon Capture and Storage

Forests capture atmospheric carbon through photosynthesis...

Forests emit carbon through respiration, decay, combustion...

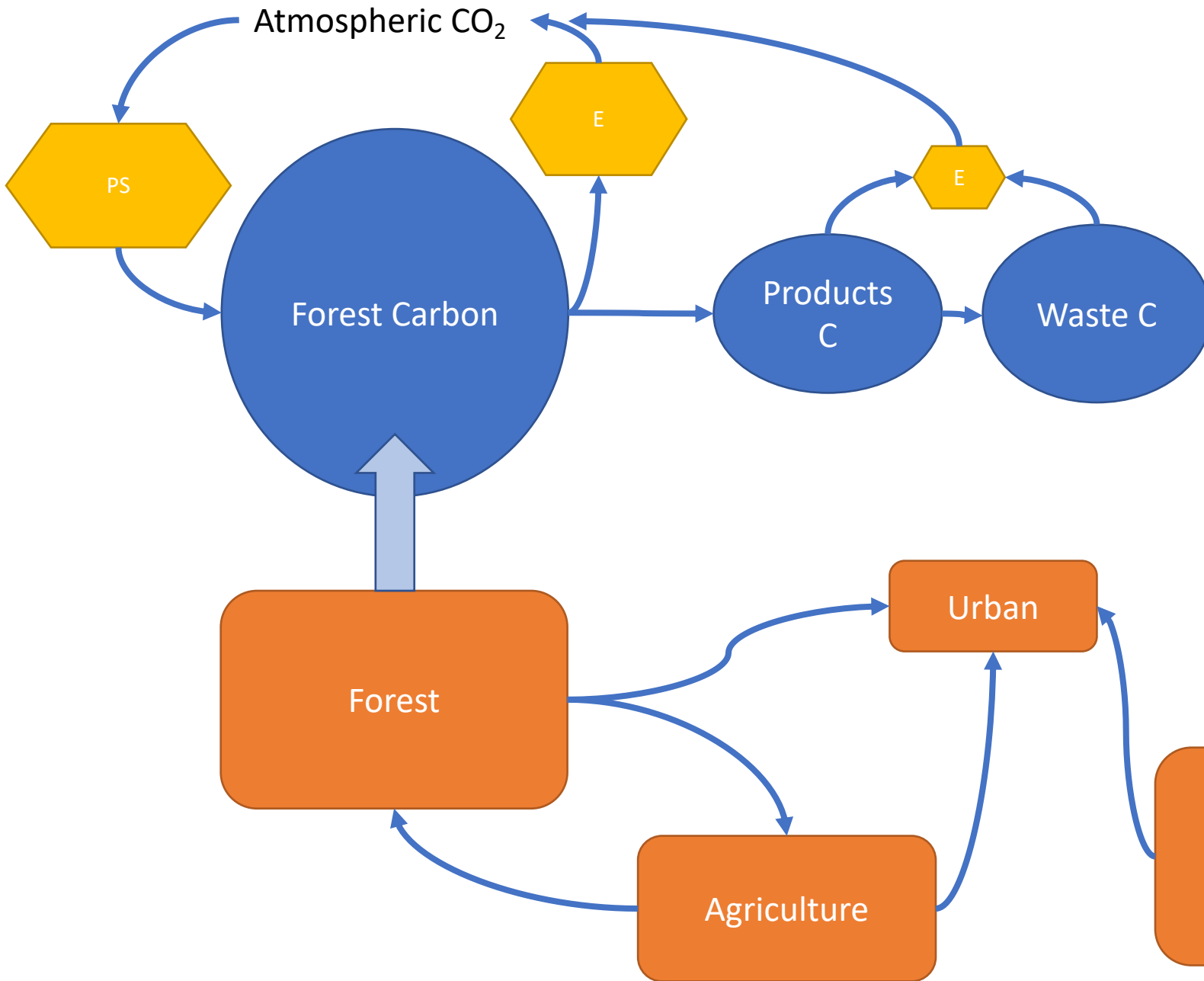
Capture has exceeded emissions for several decades...

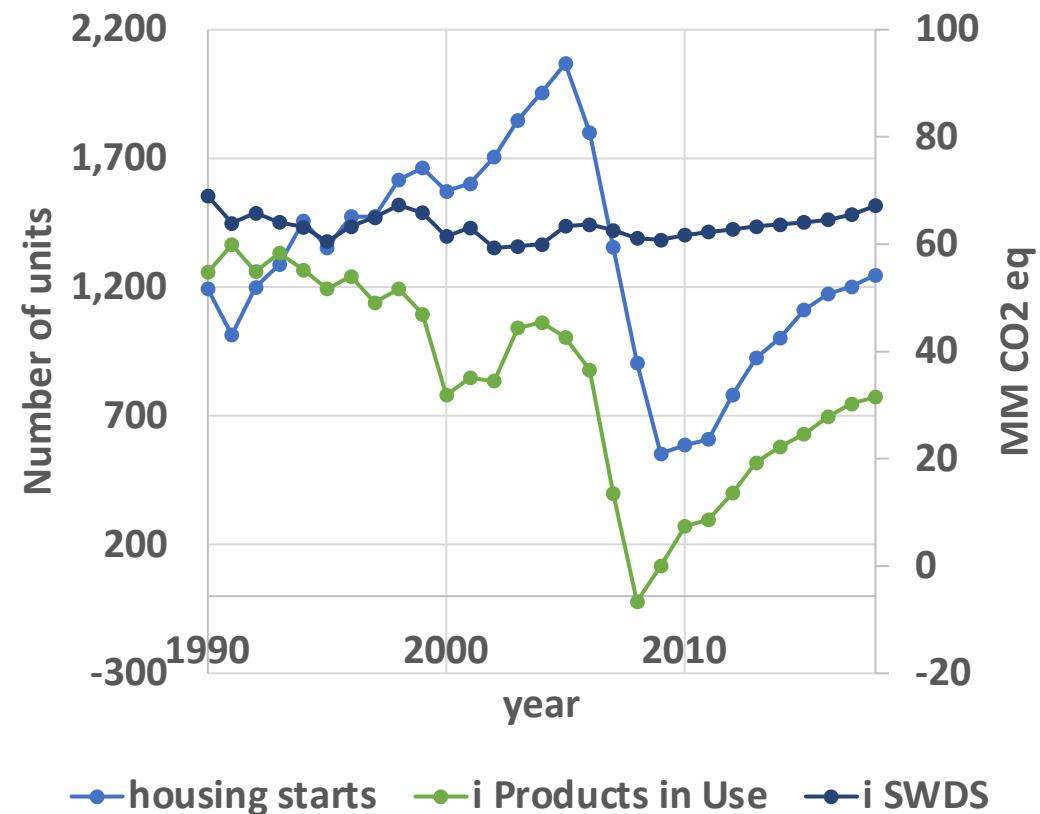
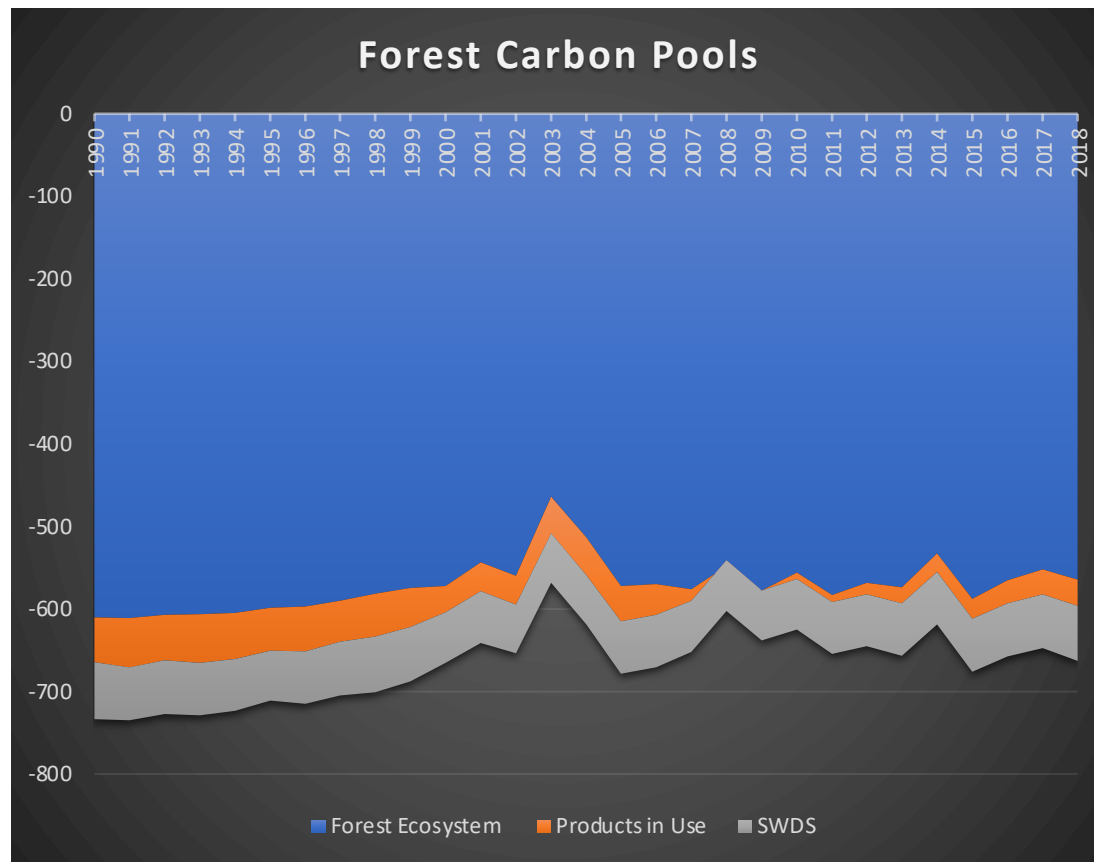
Forest C is a growing asset...net expansion of 0.5% per year from 1990 to 2017

Forest C inventories currently store about 52 years of US greenhouse gas emissions at 2017 levels...

Forest Carbon and Land Use Dynamics

Pool versus sink
Dynamic land use system
Ps=photosynthesis
E=emissions

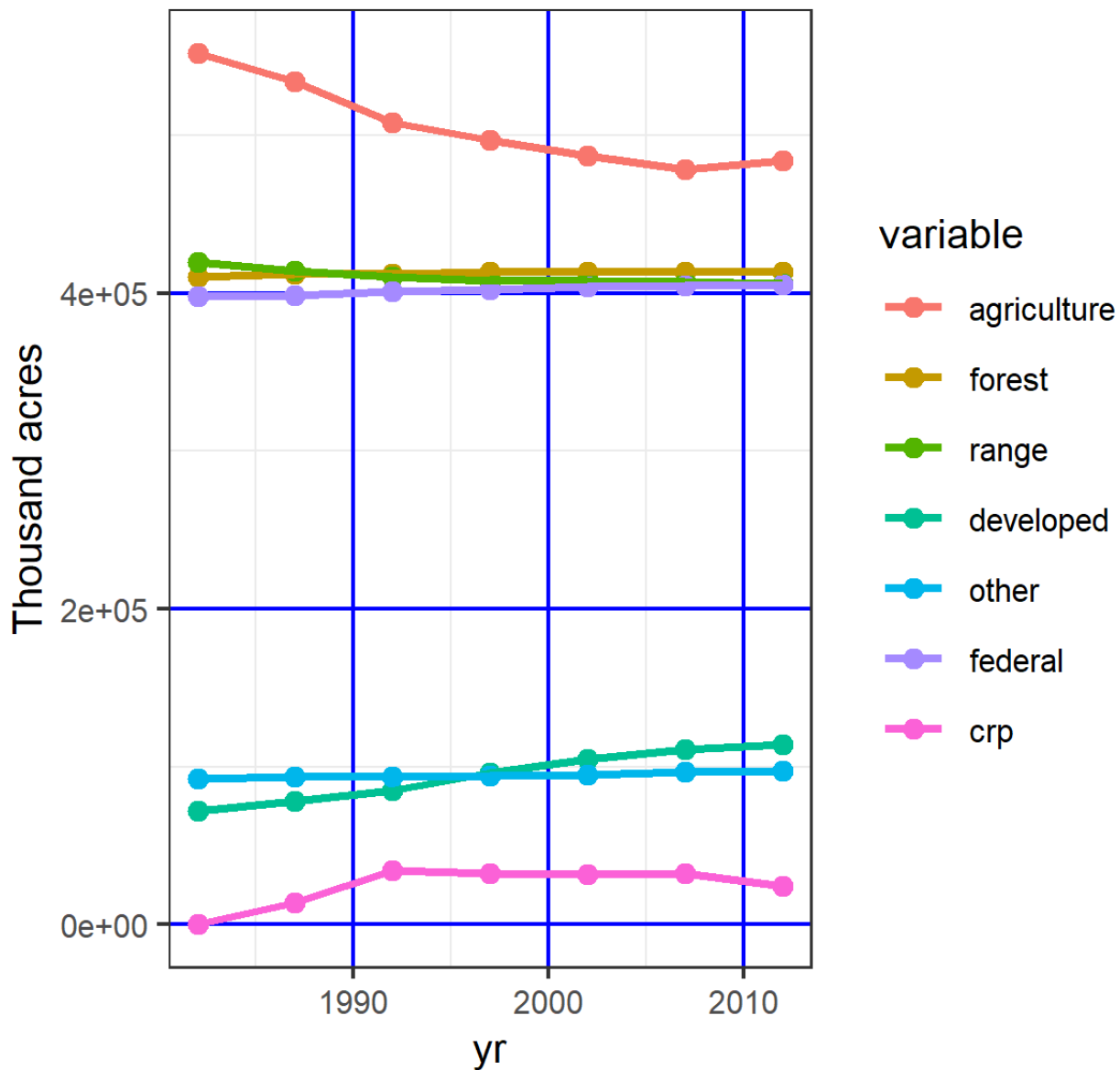




Source: EPA National Greenhouse Gas Inventory (1990-2018).

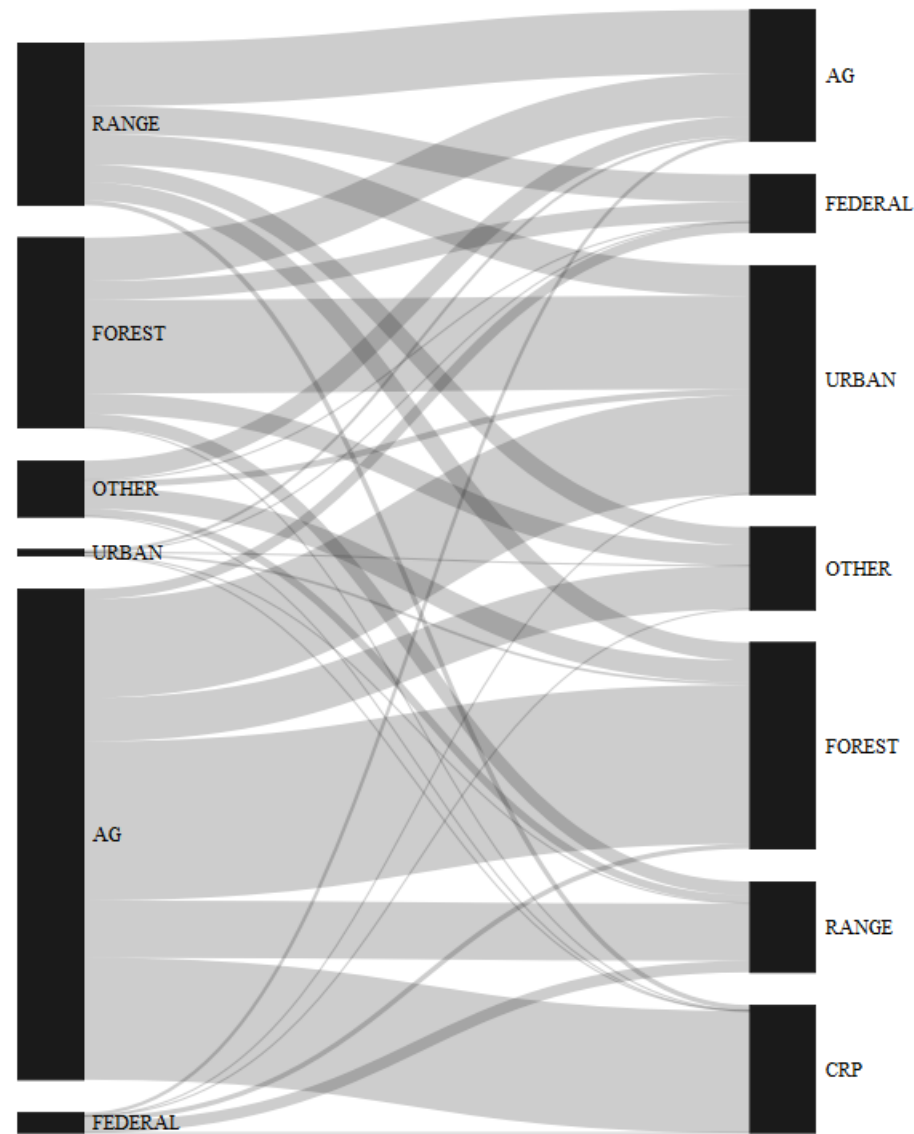
Historical forest carbon dynamics

US area by land use; 1982-2012



Source (1982)

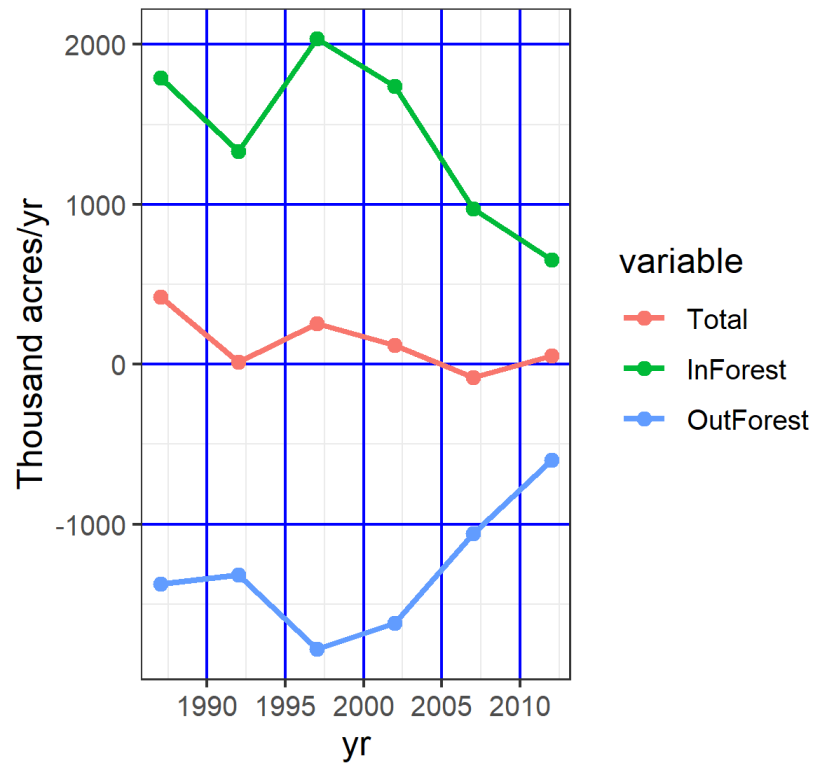
Sink (2012)



Source: National Resource Inventory (NRI) land use database

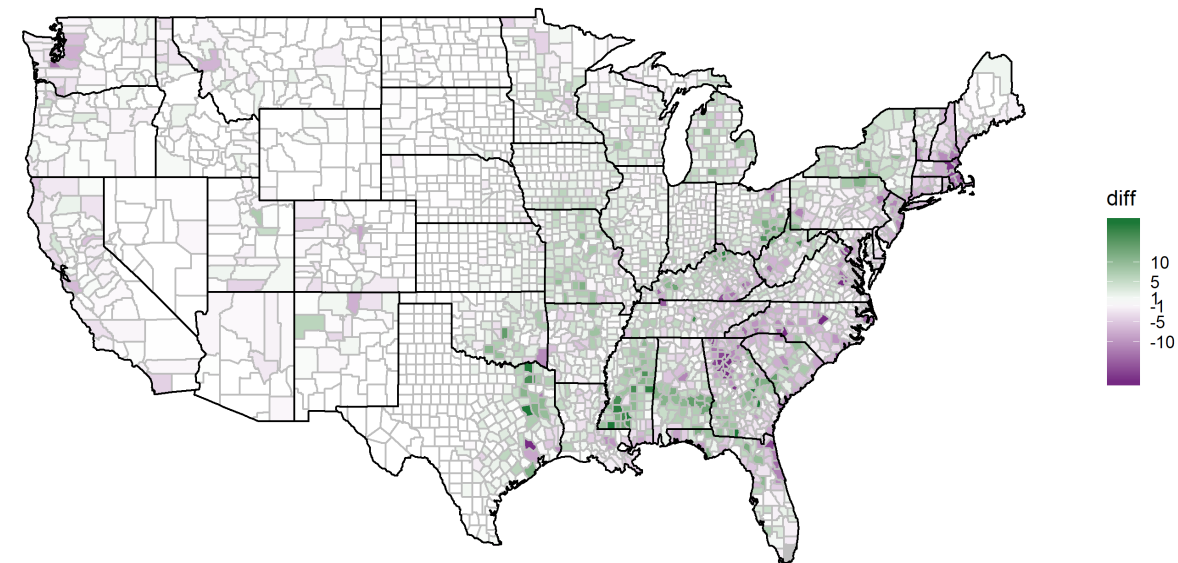
Forest land use change

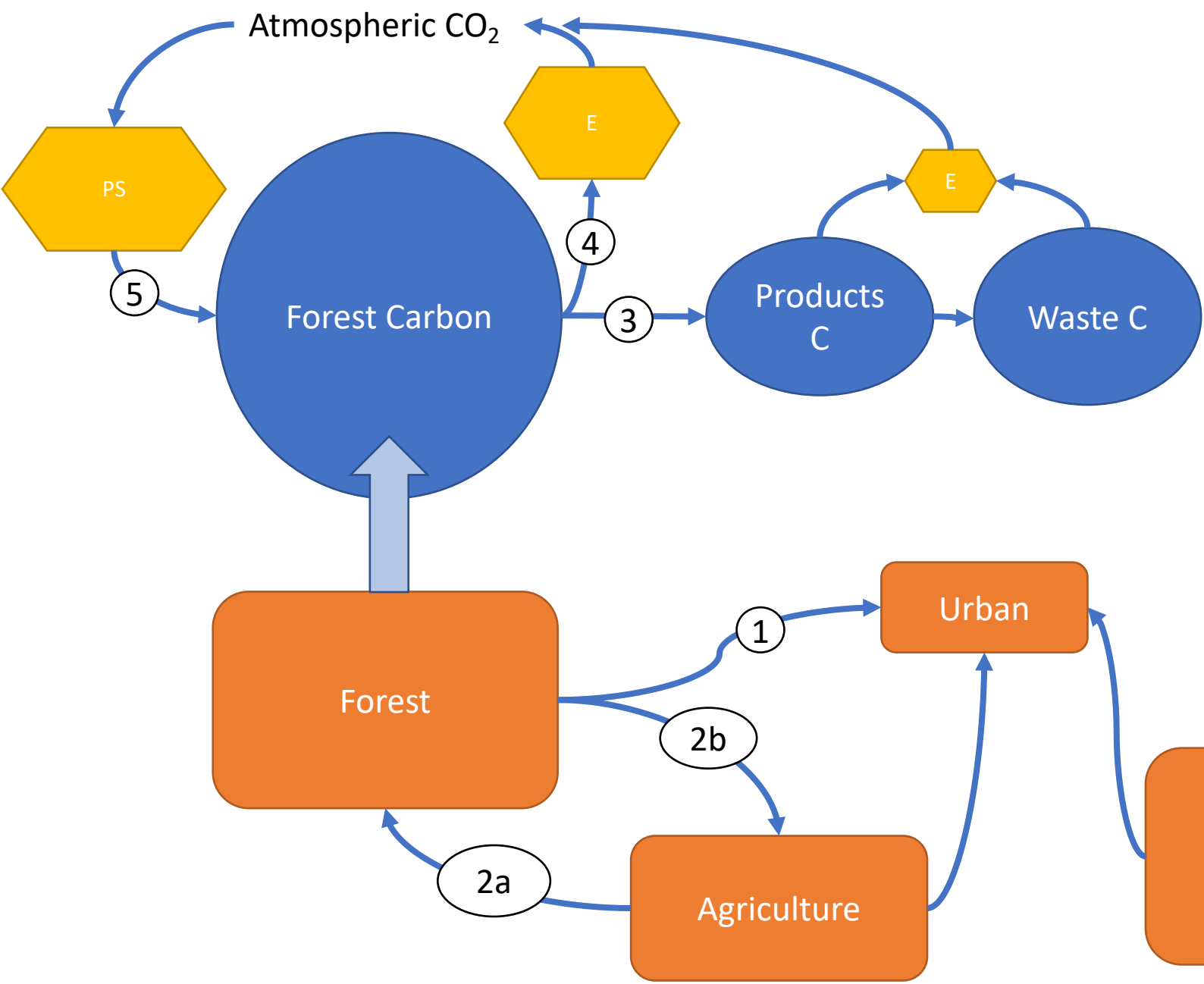
Inflows and outflows of forest land



Source: NRI land use database

Net change in Forest land use: 82 - 12





Expanding the sink:

1. Reduce forest losses to urban uses
2. Shift more rural land to forest use/cover
3. Expand ancillary storage in product stream
4. Increase growth
5. Reduce wildfire emissions

Expanding the sink

Physical Mechanism

- 1.Reduce forest losses to urban uses
- 2.Shift more rural land to forest use/cover
- 3.Expand ancillary storage in product stream
- 4.Increase growth
- 5.Reduce wildfire emissions

Economic mechanism

- Land use choices
 - Relative returns to uses
- Forest management choices
 - Relative returns to management

Policy instruments

- Carbon pricing/markets
- Subsidies/incentive payments
- Tax treatment
- Regulatory changes
 - Encouraging wood product demand
 - Ag policies...

Wood product markets and forest carbon

Direct effects

- Transferring forest C to long term storage in product pools
- Resetting forest age to allow for rapid regrowth

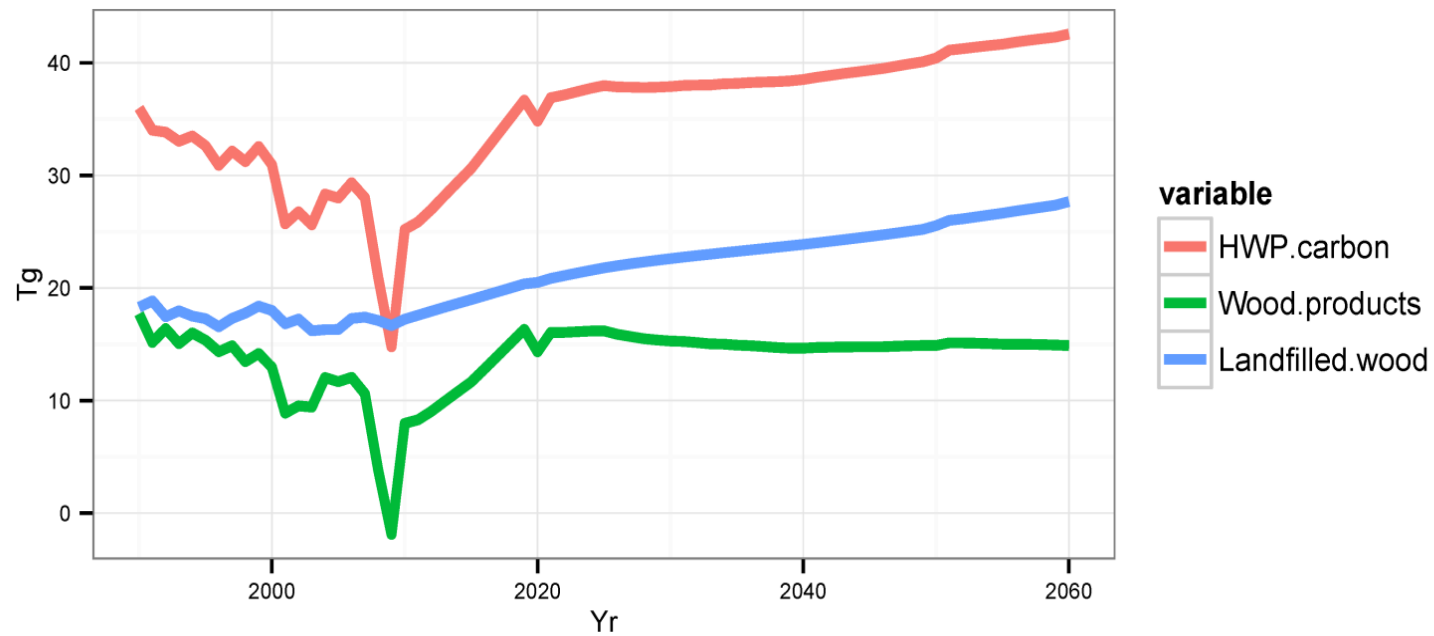
Land use effects

- Increases returns to forestry
- Dampens switching from forest to agriculture and to urban uses
- Investment driven afforestation and reforestation

Other effects

- Supporting fuel treatment harvests
- Eventual impacts on wildfire emissions

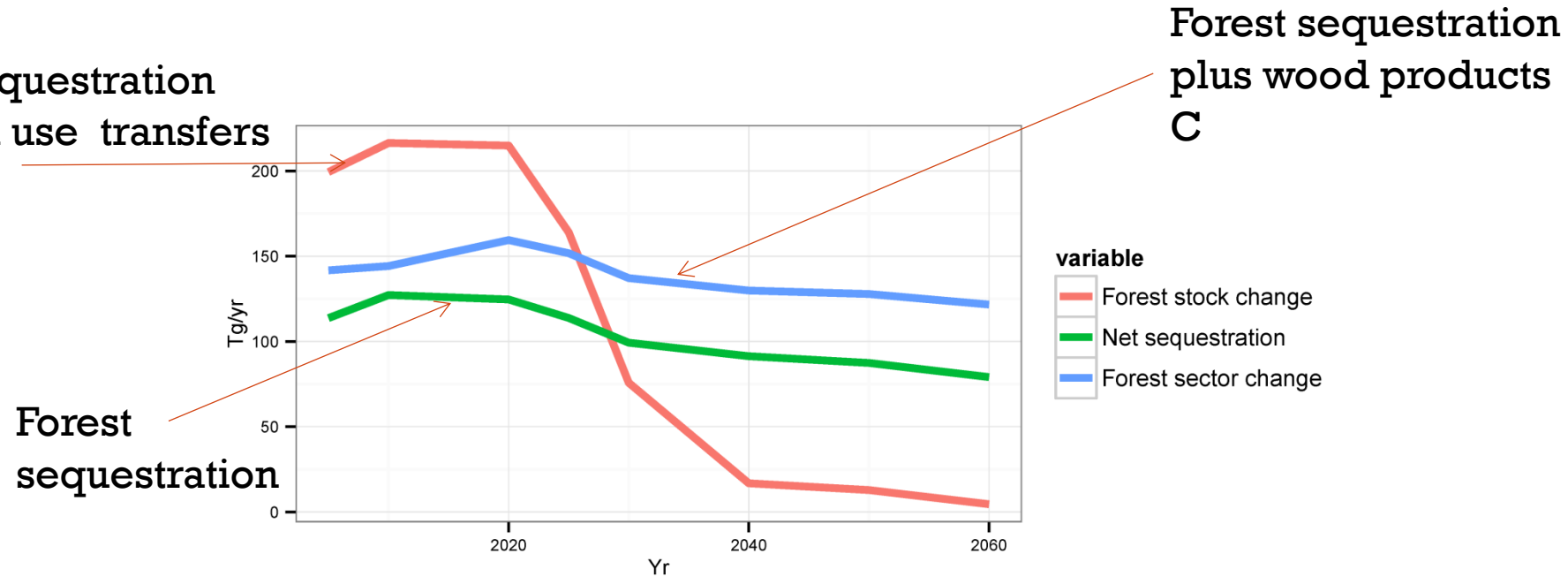
BASELINE PROJECTIONS OF WOOD PRODUCT CARBON POOLS



Source: US Forest Service 2015 RPA Assessment Update

BASELINE PROJECTIONS: FOREST SECTOR

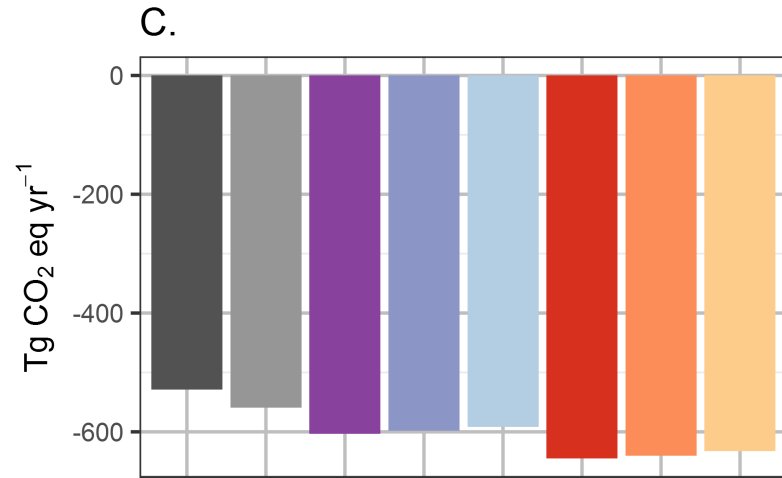
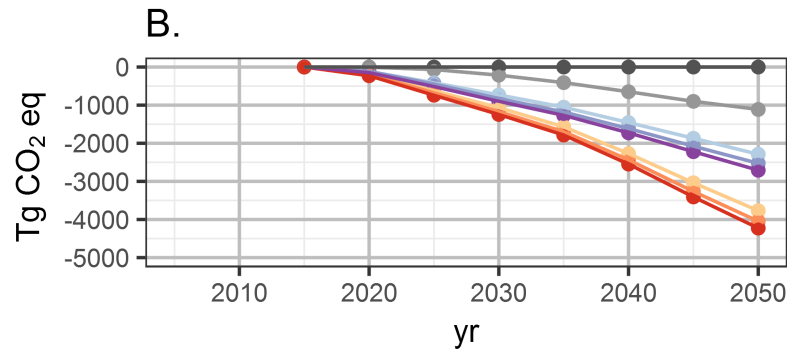
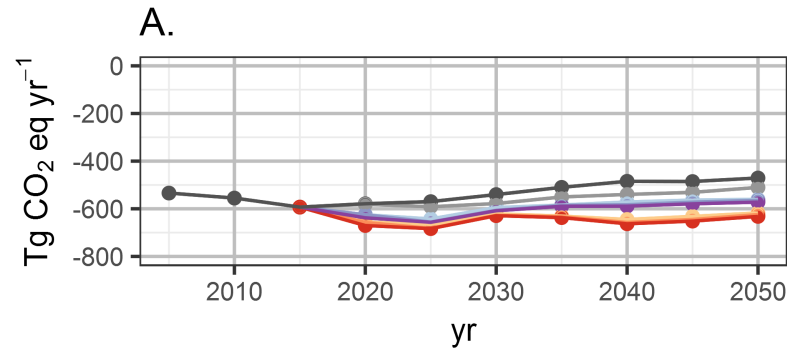
Forest Sequestration
plus land use transfers



Estimates of (1) changes in forest carbon stocks, (2) net forest carbon sequestration, and (3) forest sector sequestration of carbon measured in Tg carbon/year for the Reference scenario, 2005-2060.

Source: US Forest Service 2015 RPA Assessment Update

SCENARIO ANALYSIS



Alternative scenarios:

---increased afforestation (15 million acres) can stabilize ecosystem carbon

---increased wood products pools contribute as well

---timber prices matter

higher prices yield more forest land in projections

CONCLUSIONS

Afforestation provides the greatest increase in forest carbon over time

- Forest product markets have encouraged afforestation over the past thirty years
- Can continue in the future

Expansion in wood products demand has multiple effects

- Increased storage in ancillary pools
- Shifts land use toward forest uses (afforestation)

Thanks for listening