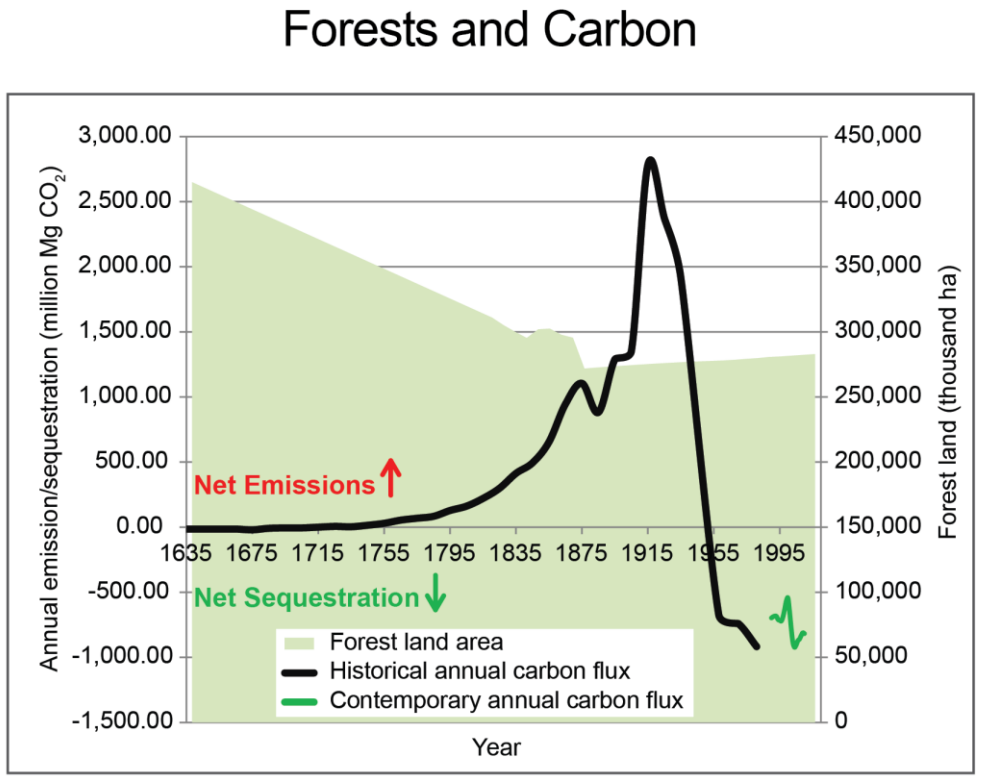
Slides for Discussion Session

Wood Carbon Seminars

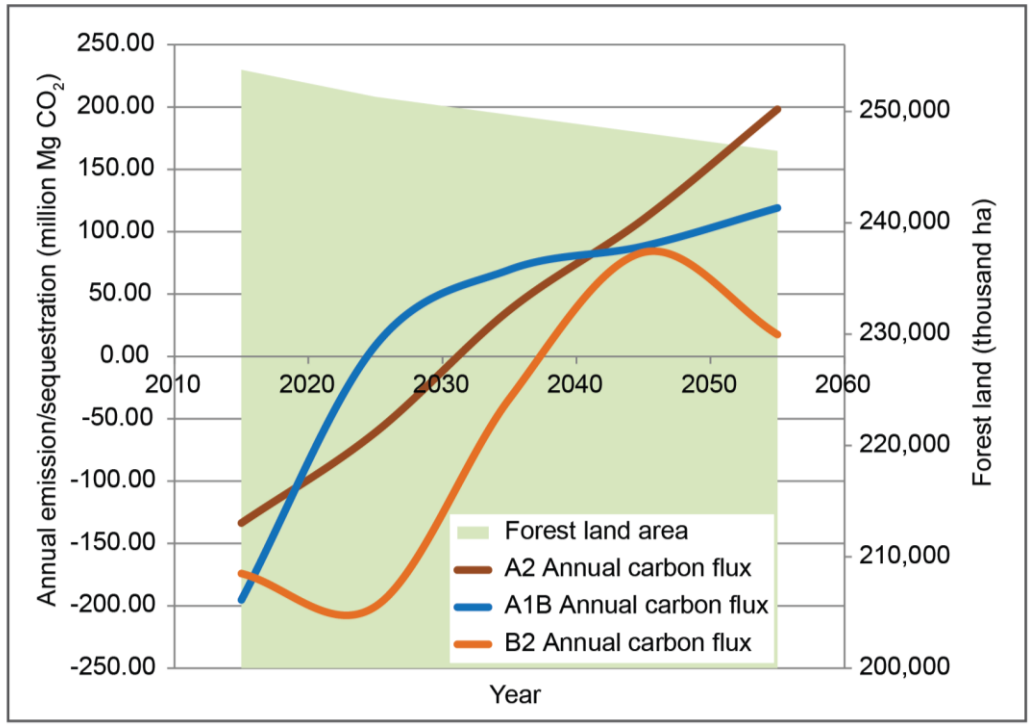
Cynthia West

April 30, 2020

US Forests Net Carbon Flux Over Time



Net Carbon Flux of US forests 1635-2000

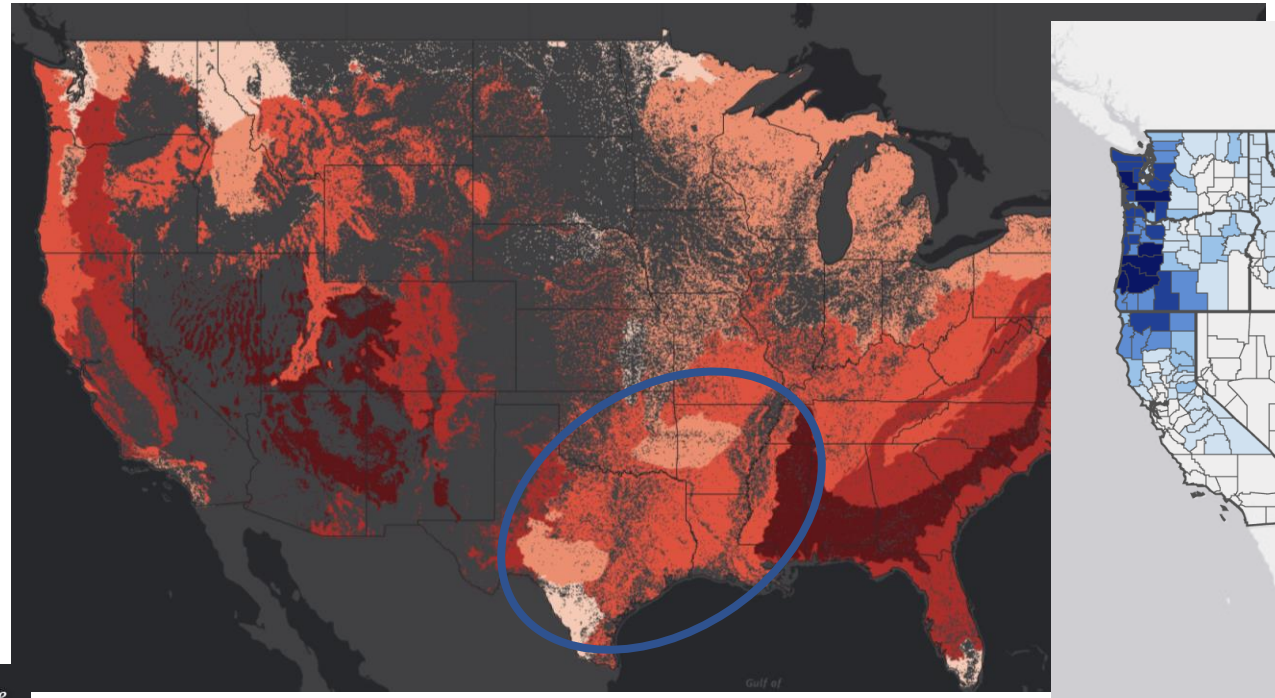


USFS prediction of net carbon flux under different scenarios through 2060

From: USFS, 2012: Future of America's forest and rangelands: 2010 Resources Planning Act assessment. General Technical Report WO-87. 198 pp., U.S. Department of Agriculture, U.S. Forest Service, Washington, D.C. URL

Southeastern plantation forests and biodiversity

Species Richness in US Forests



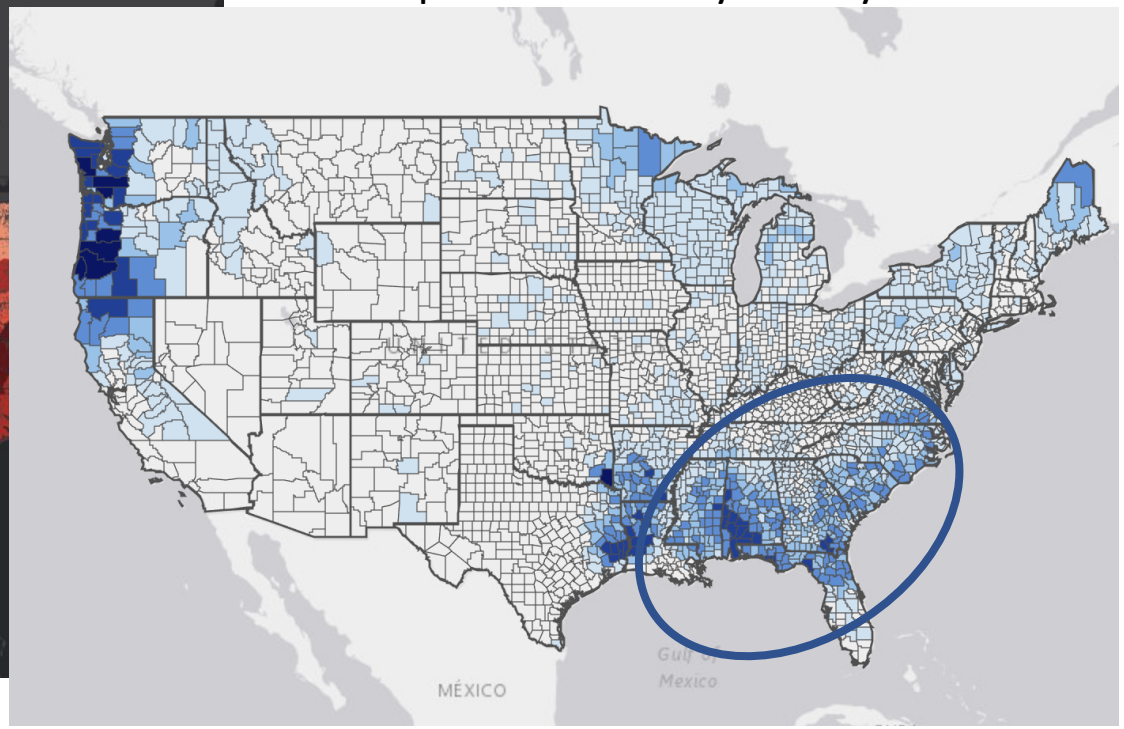
The map shows the occurrence of vascular plants and vertebrates associated with forest habitats.

272–800
800–1250
1250–1700
1700–2150
2150–2600
2600–3032

Map: Nature Serve 2014, Nelson 2015.

Click on an area to see its number of species.

Acres of planted trees by county



Source: State of America's Forests. 2019. https://usaforests.org/

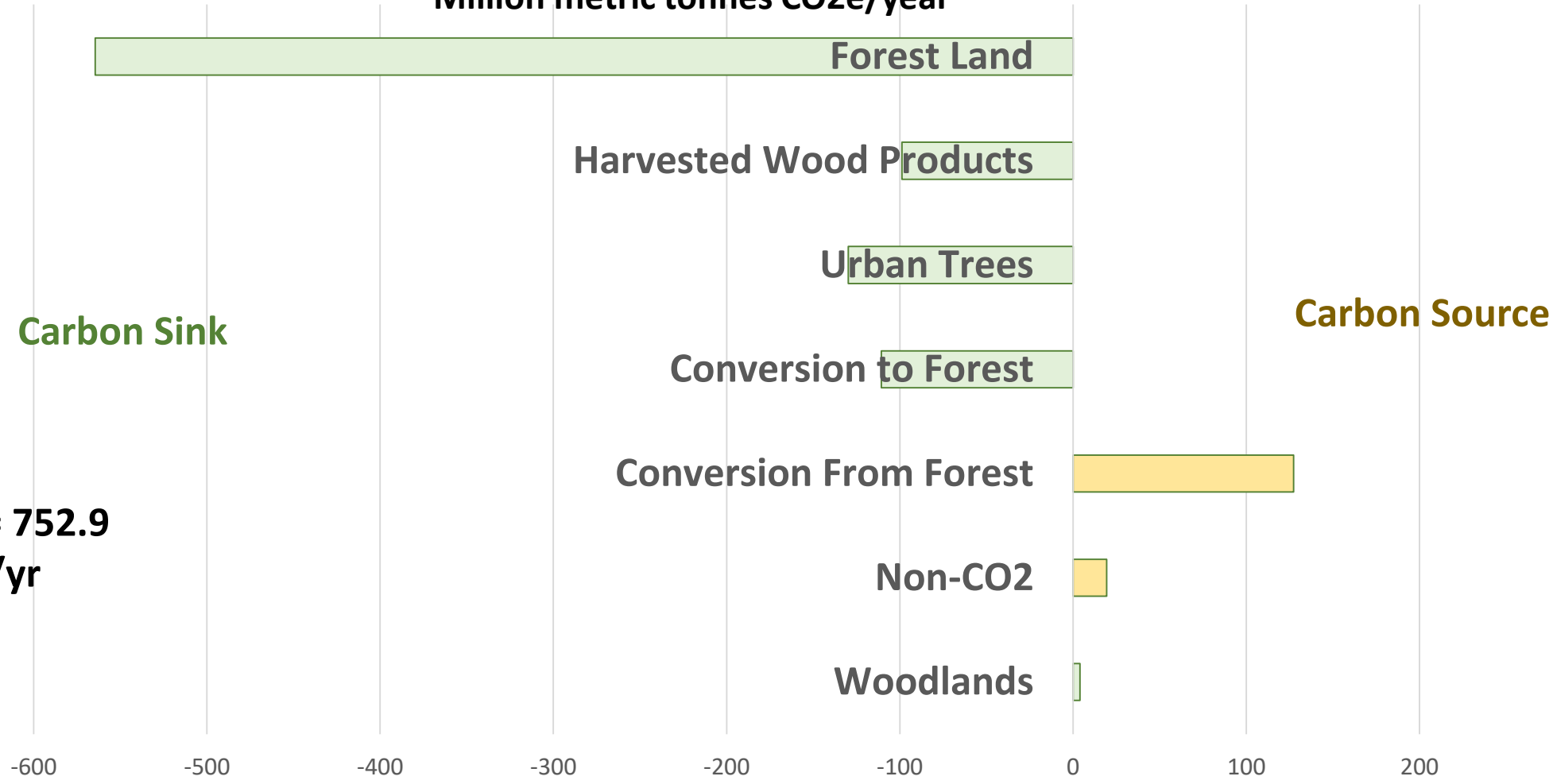
Articles:

Greene et al (2016) A meta-analysis of biodiversity responses to management of southeastern pine forests- opportunities for open pine conservation. *Forest Ecology and Management*

Loehle et al (2009) Achieving conservation goals in managed forests of the Southeastern Coastal Plain *Environmental Management*

Demarais et al (2017) Tamm Review: Terrestrial vertebrate biodiversity and intensive forest management in the U.S. *Forest Ecology and Management.*

Components of the Nation's Forest Sink
EPA 2020 GHG Inventory (2018 data)
Million metric tonnes CO2e/year

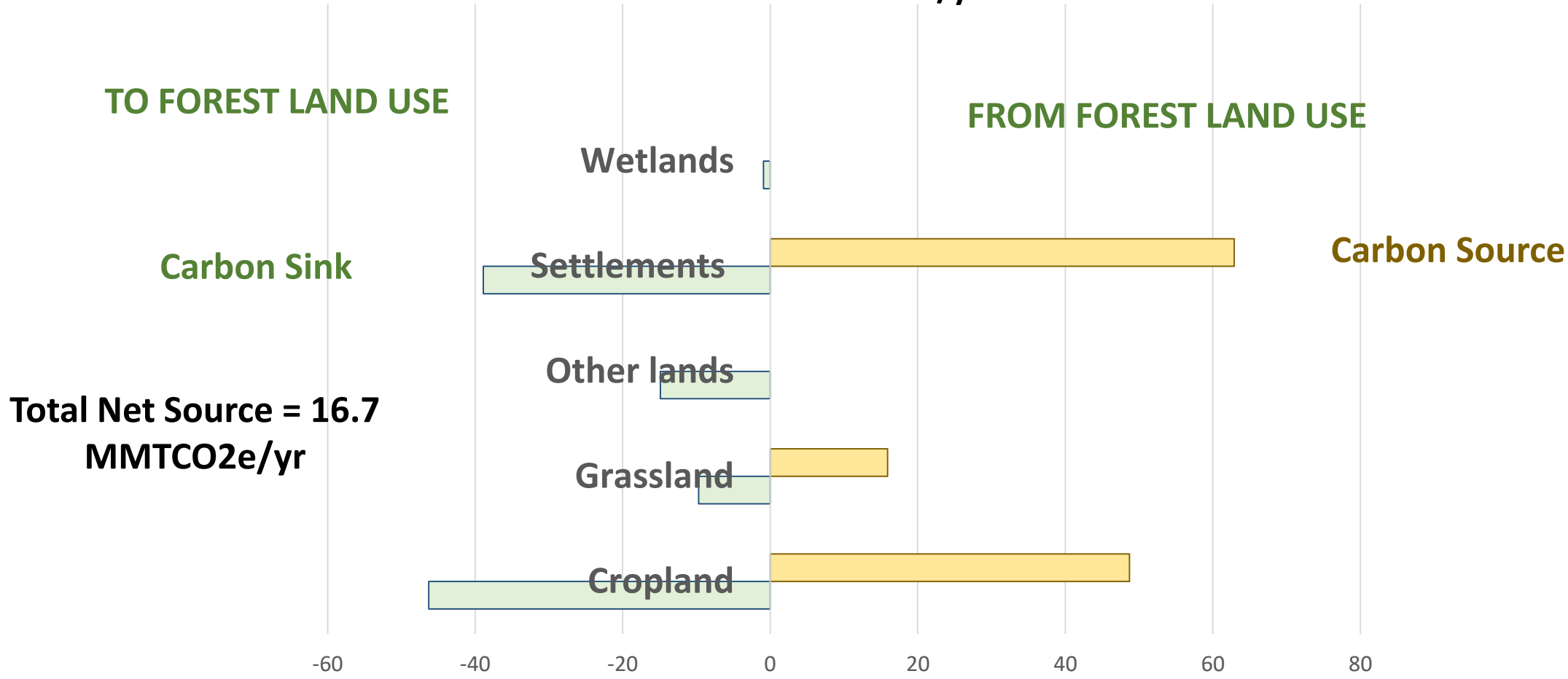


Total Net Sink = 752.9 MMTCO2e/yr

	Woodlands	Non-CO2	Conversion From Forest	Conversion to Forest	Urban Trees	Harvested Wood Products	Forest Land
Emissions	4	19.4	127.4	-110.6	-129.8	-98.8	-564.5

Land Use Conversion
Nation's Forest Sink
EPA 2020 GHG Inventory (2017 data)

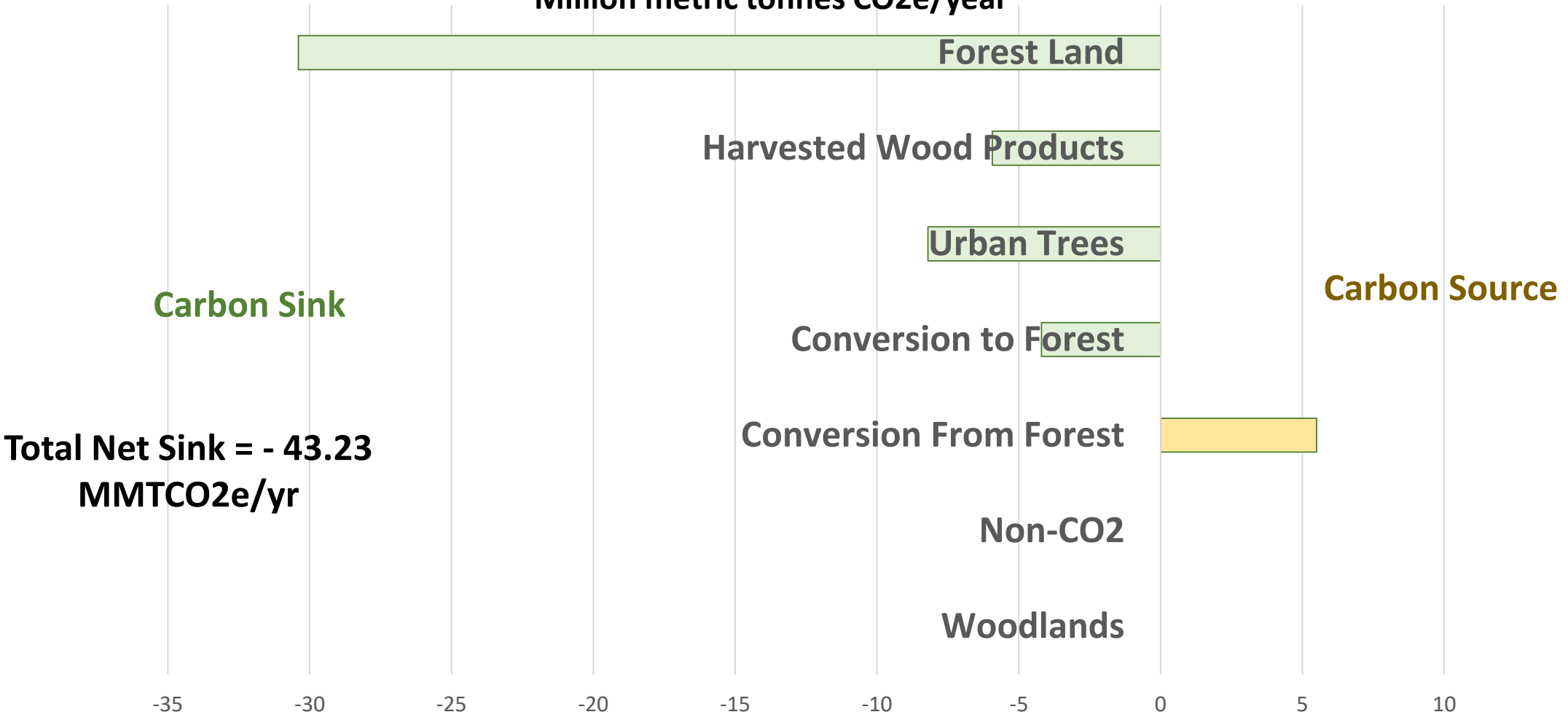
Million metric tonnes CO2e/year



Total Net Source = 16.7 MMTCO2e/yr

	Cropland	Grassland	Other lands	Settlements	Wetlands	
From Forests	48.7	15.9		62.9		
To Forests	-46.3	-9.7	-14.9	-38.9	-0.9	

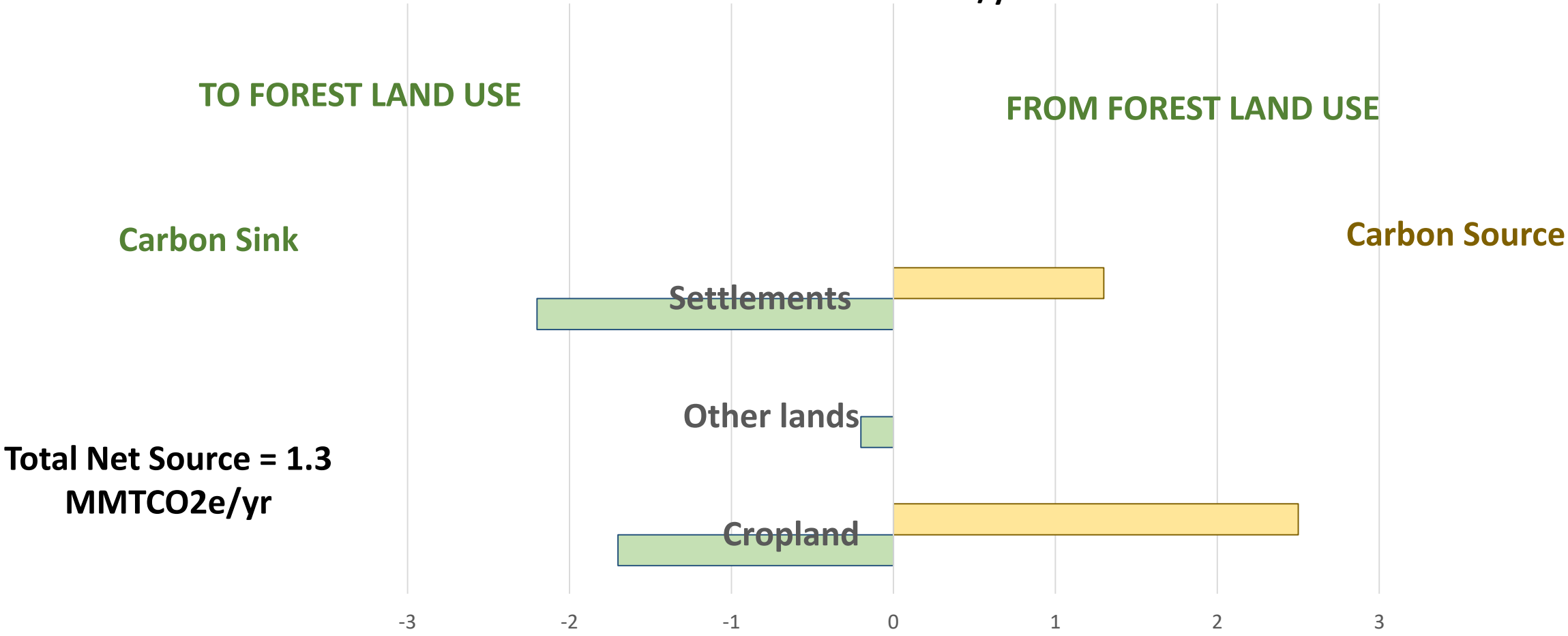
Components of North Carolina's Forest Sink
EPA 2020 GHG Inventory (2018 data)
Million metric tonnes CO2e/year



Total Net Sink = - 43.23 MMTCO2e/yr

	Woodlands	Non-CO2	Conversion From Forest	Conversion to Forest	Urban Trees	Harvested Wood Products	Forest Land
Emissions	0	0	5.5	-4.2	-8.2	-5.93	-30.4

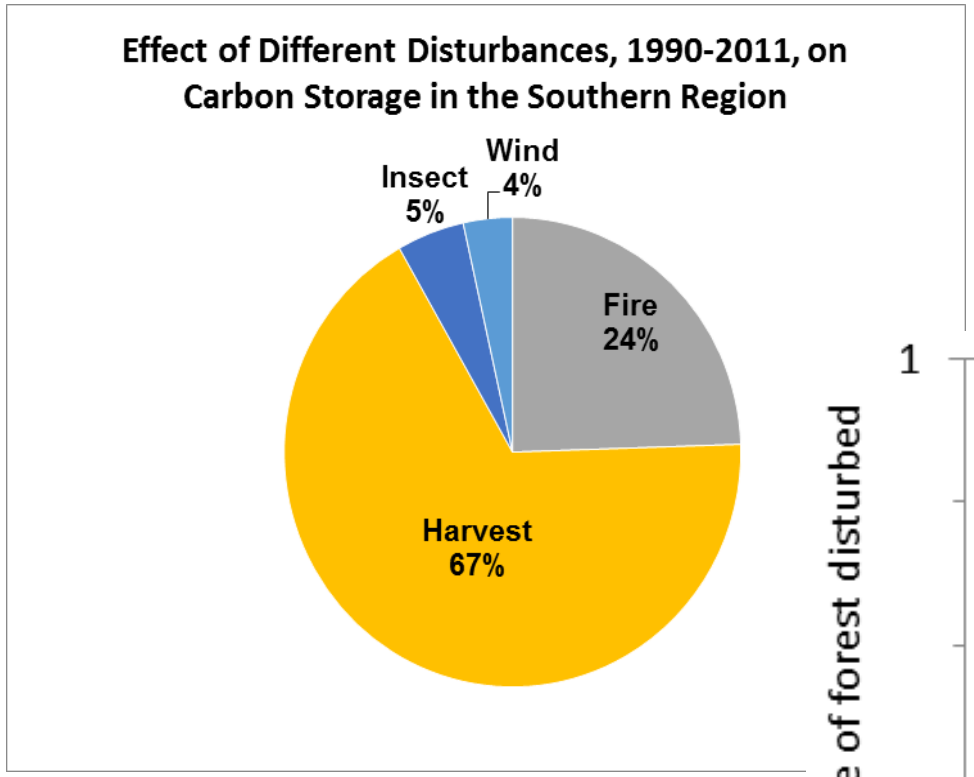
Land Use Conversion
North Carolina's Forest Sink
EPA 2020 GHG Inventory (2017 data)
Million metric tonnes CO2e/year



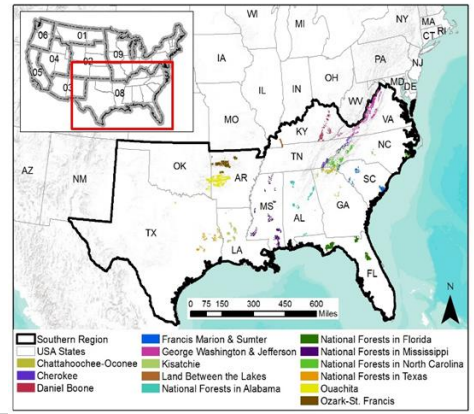
Total Net Source = 1.3 MMTCO2e/yr

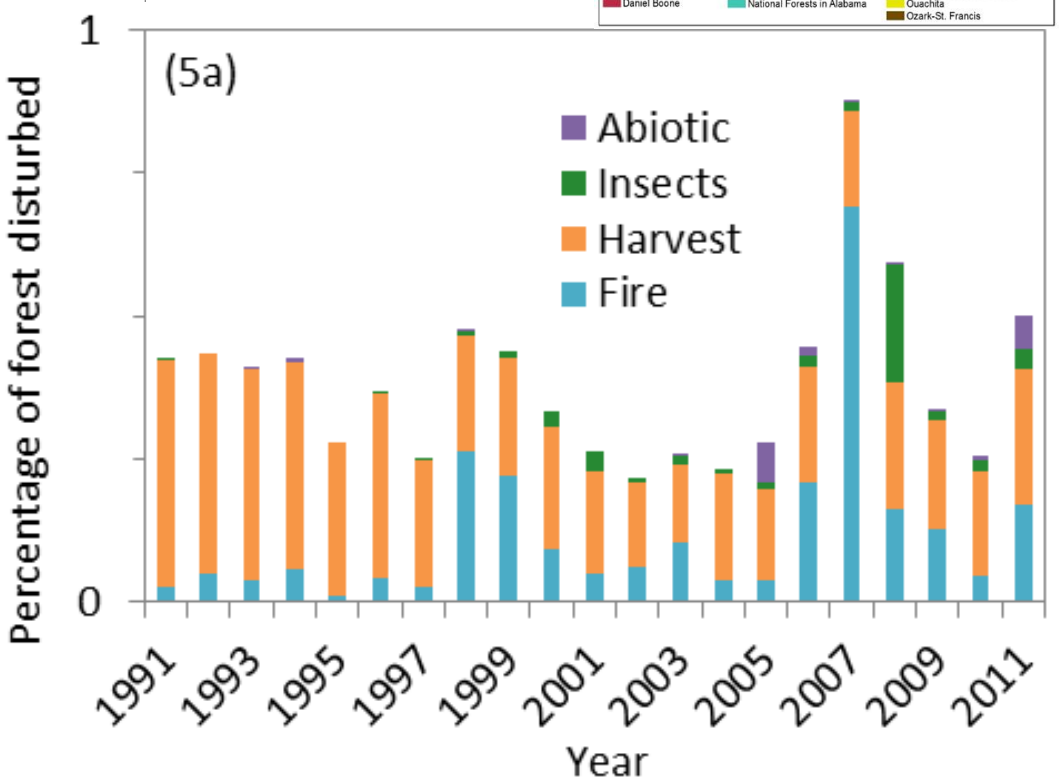
	Cropland	Other lands	Settlements		
From Forests	2.5	0	1.3		
To Forests	-1.7	-0.2	-2.2		

Disturbances in regional context: management dominated



14 National forests



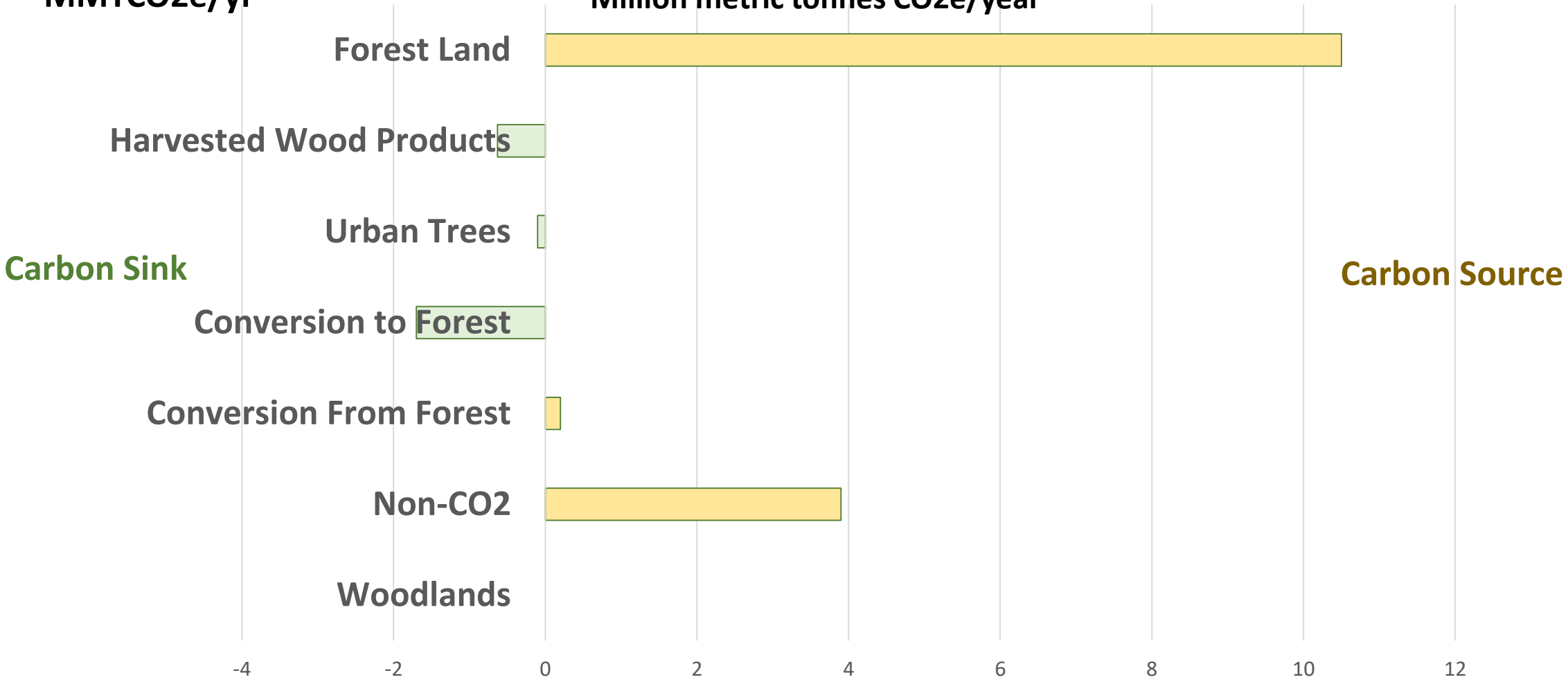


Healey et al. in review

Components of Montana's Forest Sink
EPA 2020 GHG Inventory (2018 data)

Total Net Source = 12.17 MMTCO2e/yr

Million metric tonnes CO2e/year

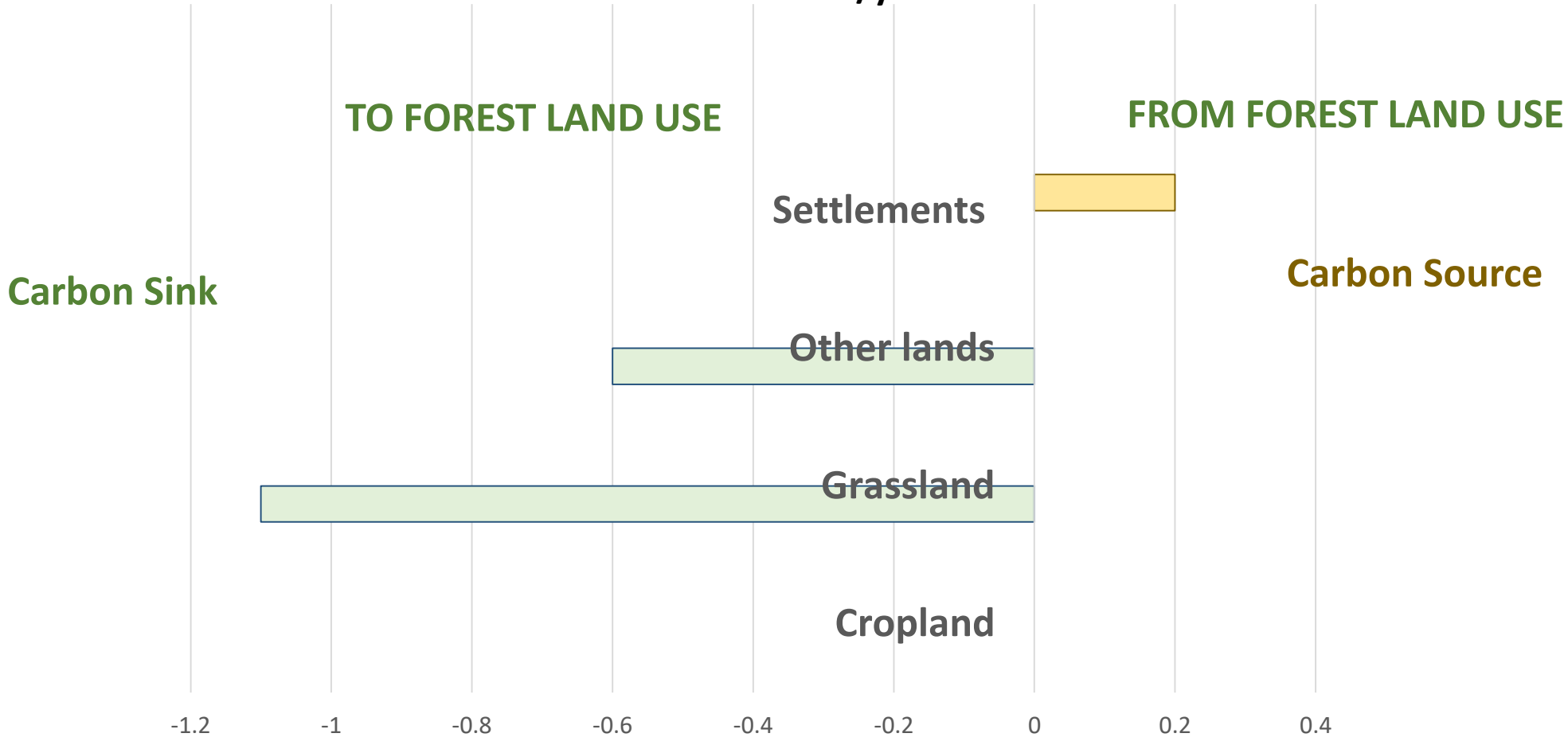


	Woodlands	Non-CO2	Conversion From Forest	Conversion to Forest	Urban Trees	Harvested Wood Products	Forest Land
Emissions	0	3.9	0.2	-1.7	-0.1	-0.63	10.5

Land Use Conversion
Montana's Forest Sink
EPA 2020 GHG Inventory (2017 data)

Total Net Sink = -1.5 MMTCO2e/yr

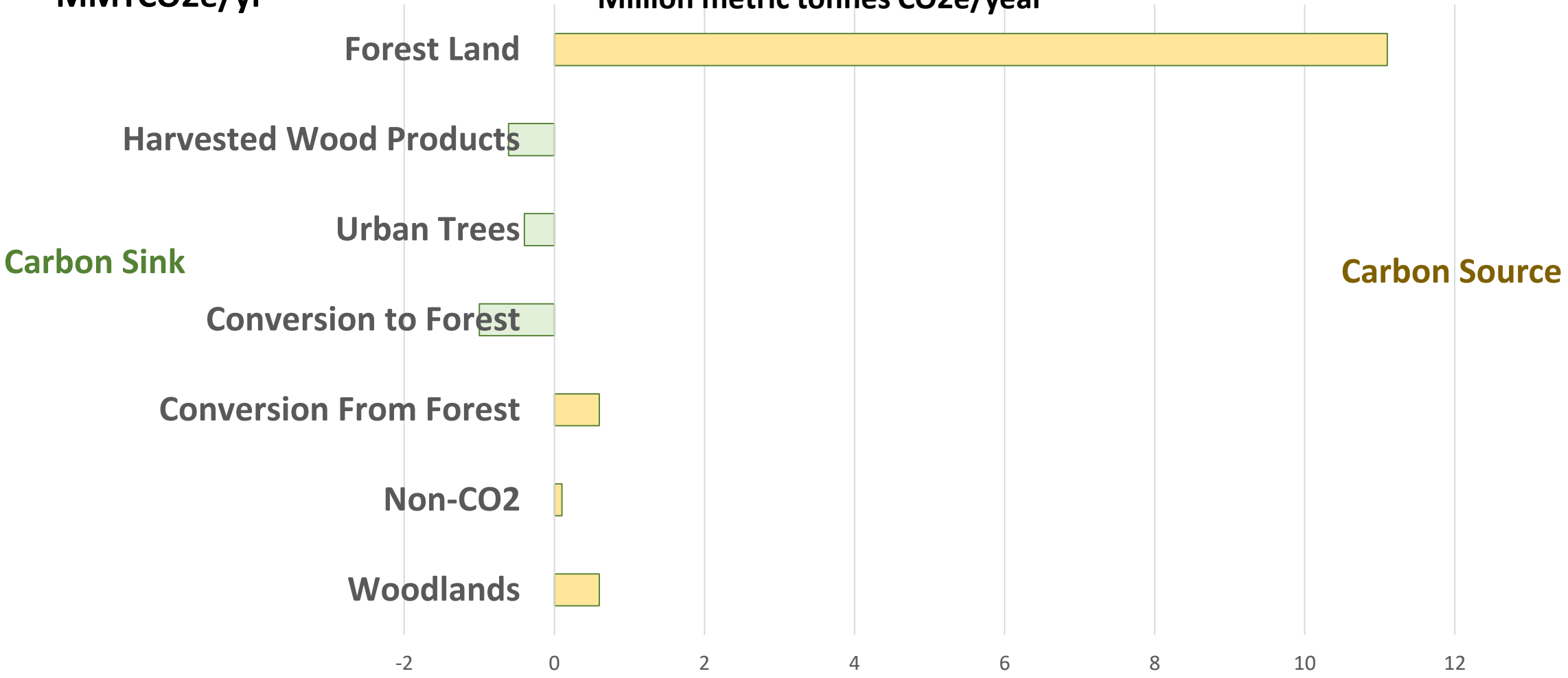
Million metric tonnes CO2e/year



	Cropland	Grassland	Other lands	Settlements	
From Forests	0	0	0	0.2	
To Forests	0	-1.1	-0.6	0	

Components of Colorado's Forest Sink
EPA 2020 GHG Inventory (2018 data)

Total Net Source = 10.39 MMTCO2e/yr

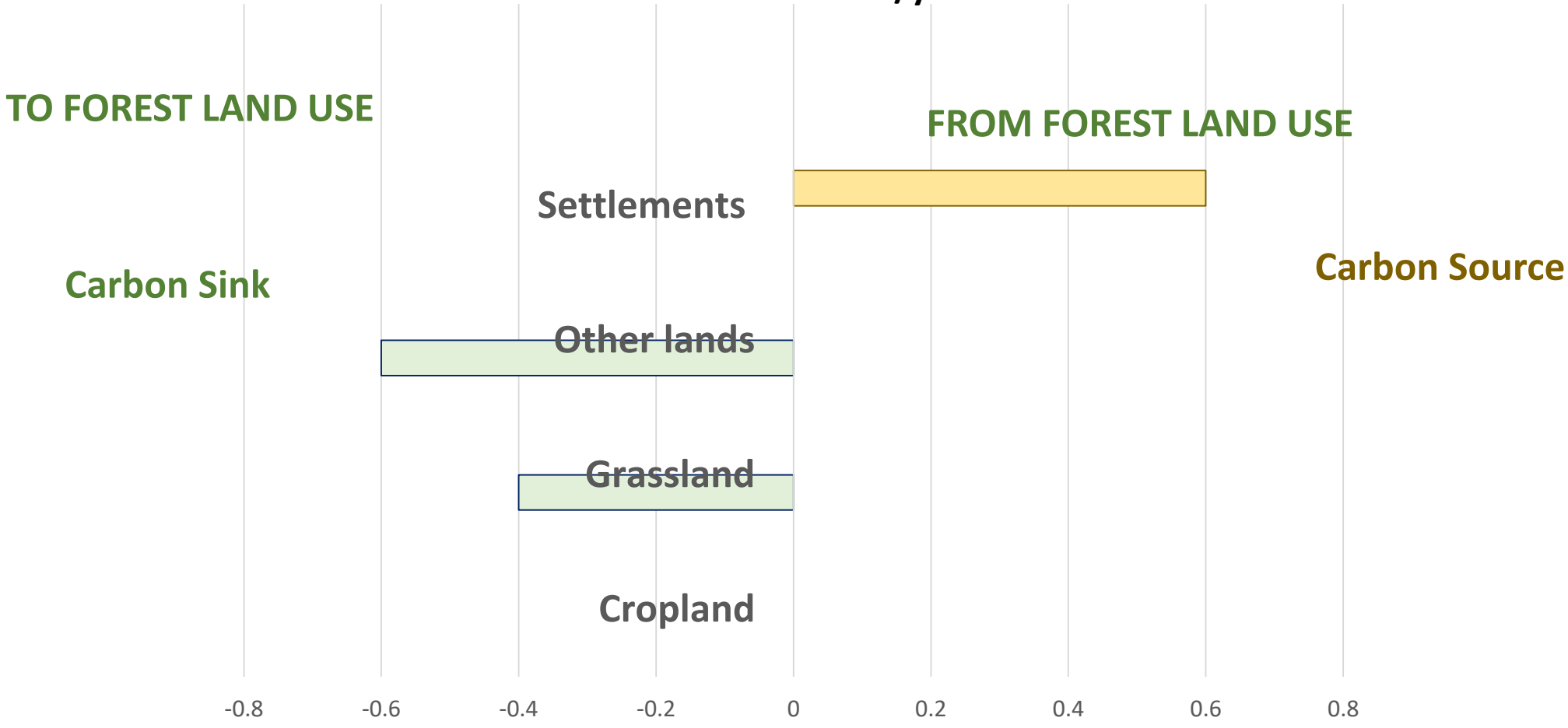


	Woodlands	Non-CO2	Conversion From Forest	Conversion to Forest	Urban Trees	Harvested Wood Products	Forest Land
Emissions	0.6	0.1	0.6	-1	-0.4	-0.61	11.1

Land Use Conversion
Colorado's Forest Sink
EPA 2020 GHG Inventory (2017 data)

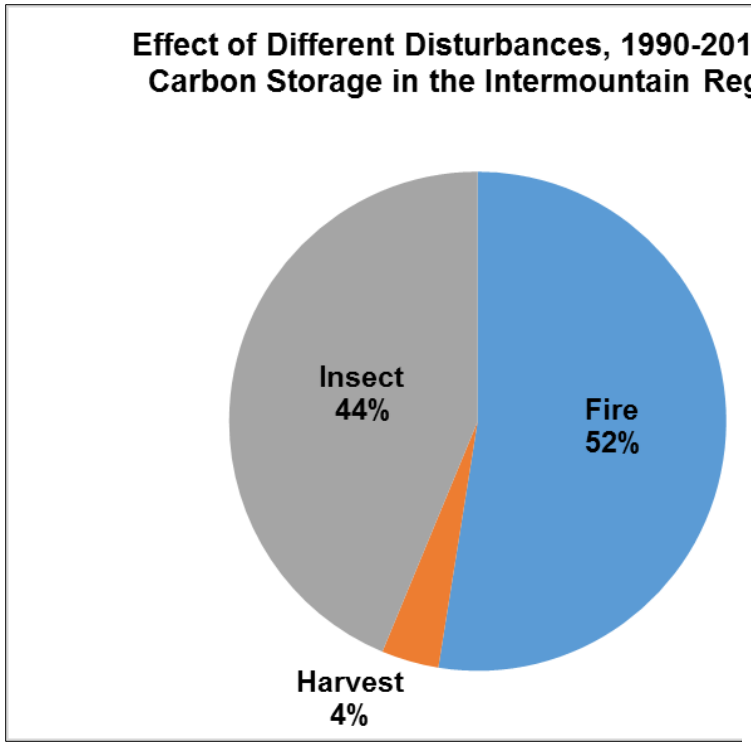
Total Net Sink = -0.45 MMTCO2e/yr

Million metric tonnes CO2e/year

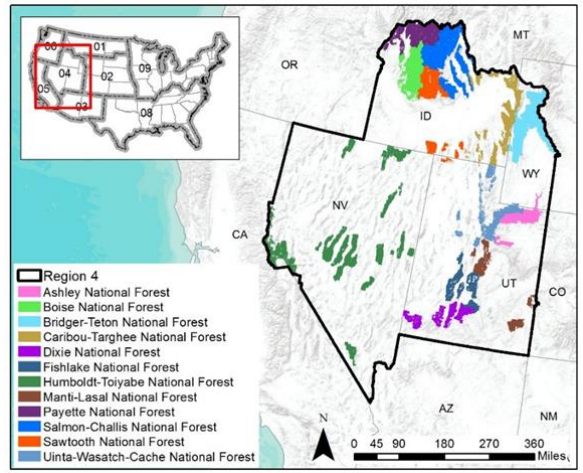


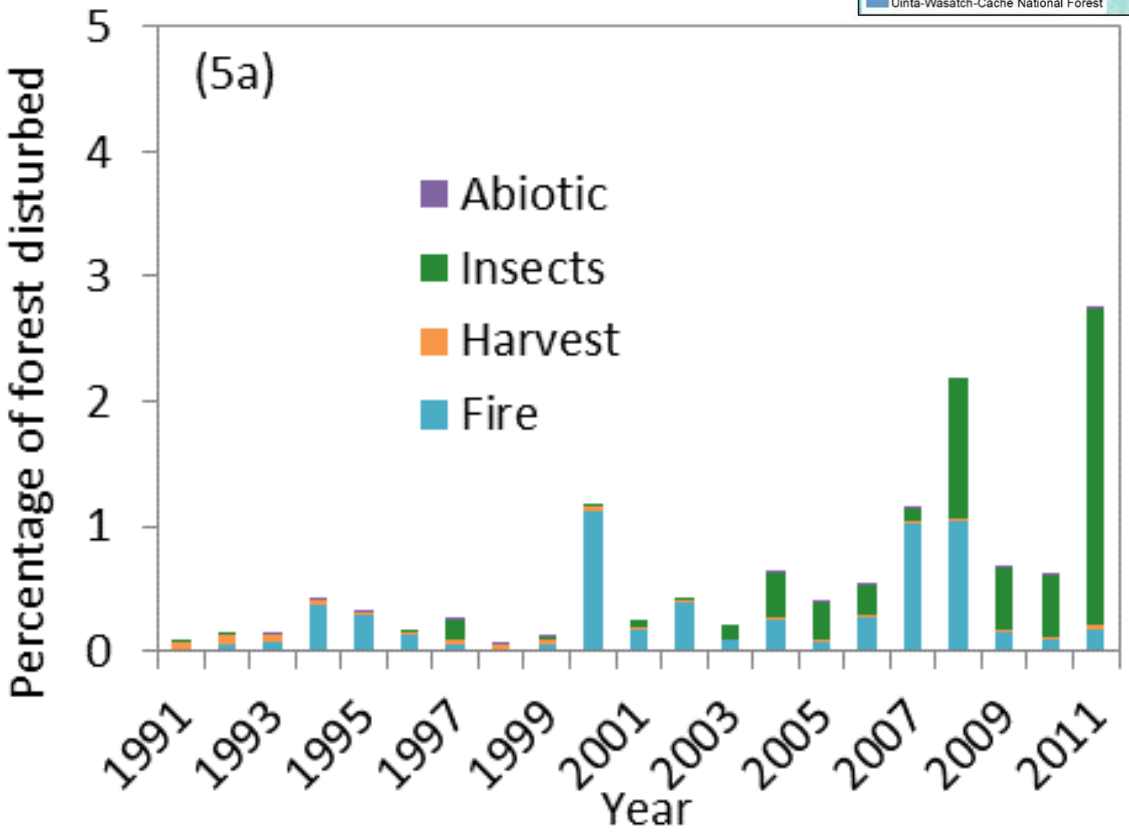
	Cropland	Grassland	Other lands	Settlements	
From Forests	0	0	0	0.6	
To Forests	0	-0.4	-0.6	0	

Disturbances in regional context: natural disturbance dominated



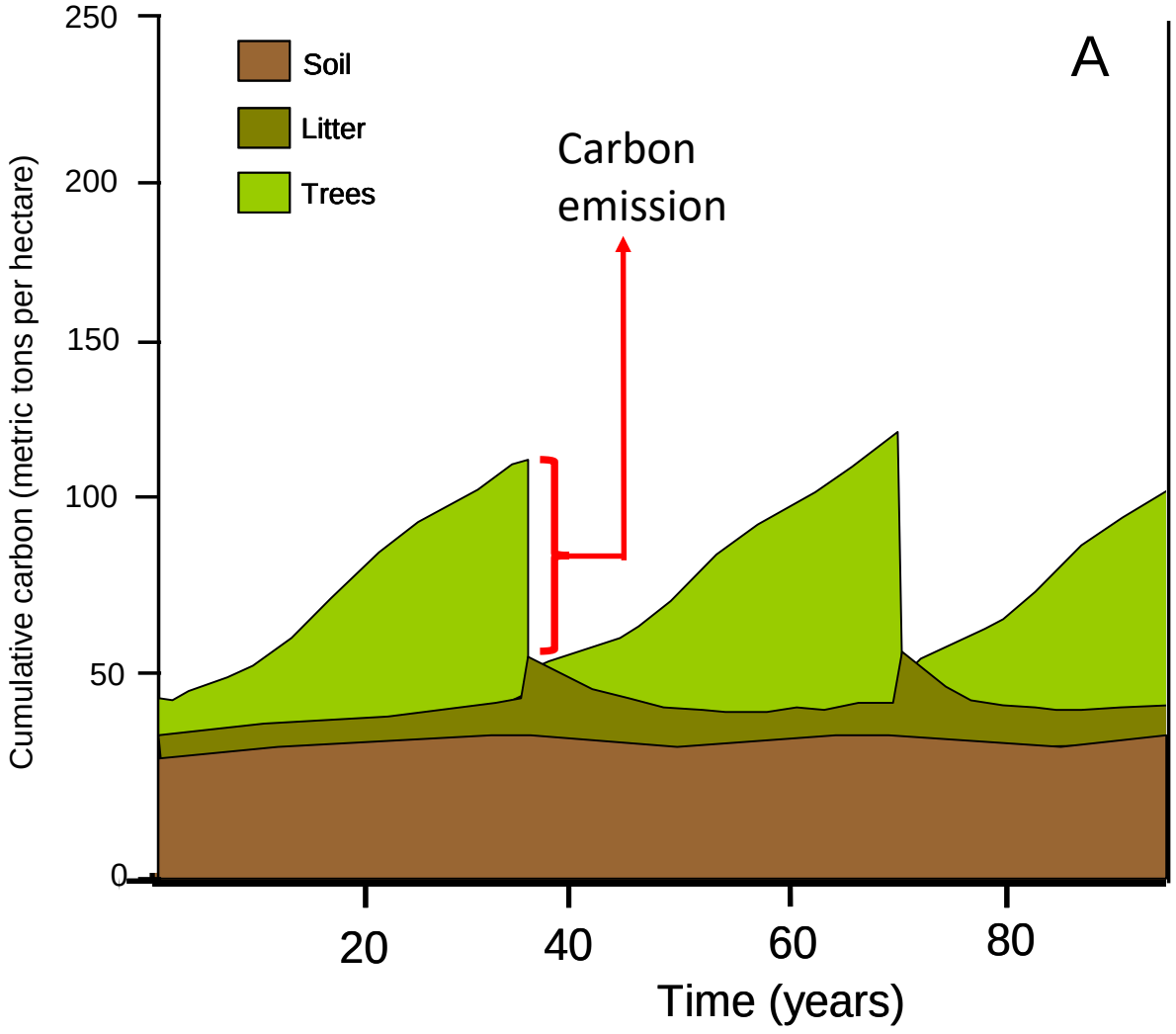
12 National forests





Healey et al. in review

Narrow view of the forest system

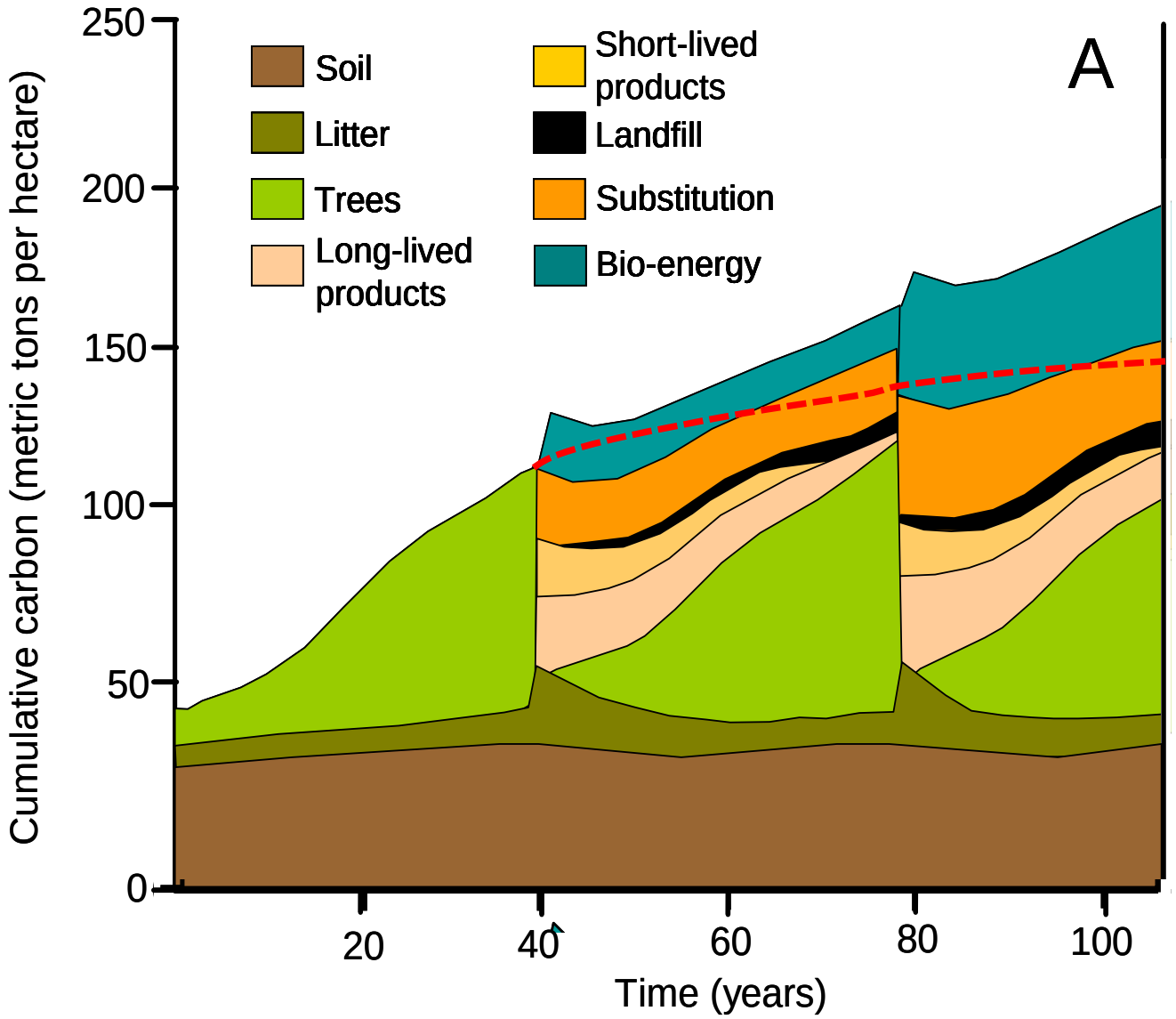


- Concerned with emissions on shorter time scales and limited geographical extent
- Source/sink trends main way to view impacts of management activates
- Considers narrower range of activities that influence carbon positively

E.g., timber harvesting would have an immediate negative impact.

McKinley et al. 2011

Complete View of the Forest System



- Concerned with emissions on longer time scales and broader geographical extent
- Impacts of management activates are considered more holistically – closer to what the atmosphere actually "sees."
- Considers broader range of activities that influence carbon positively

E.g., timber harvesting would have a positive impact right away.

McKinley et al. 2011