



# Oregon Forest Ecosystem Carbon Report

*Overview of Information in Draft Forest Carbon Tables  
from USFS Forest Inventory and Analysis  
For the 2016 Inventory Period*

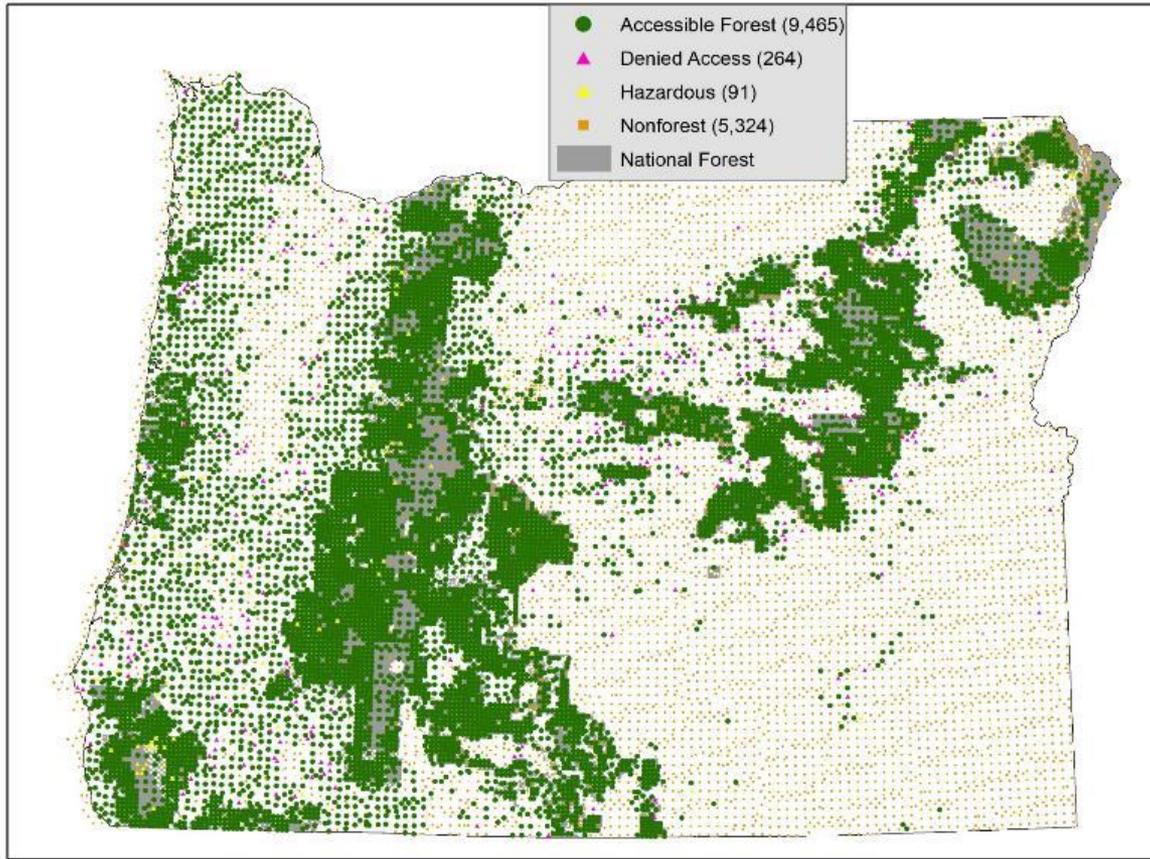
*Board of Forestry  
April 24, 2019*



# Oregon Forest Ecosystem Carbon Report

- The report will provide summaries of total forest carbon stocks and flux by ecoregion, ownership, forest type, and forest pool.
- Report is based on measurements collected by the USFS Forest Inventory and Analysis Program on forest inventory plots in Oregon From 2001 to 2016.
- Forest Carbon Stakeholder group to maintain an open and transparent process.

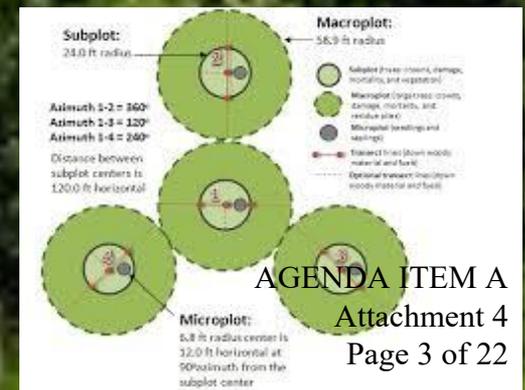
# Forest Inventory and Analysis (FIA) Plots



FIA Field Measured Plots in Oregon: Base grid plus R6 Intensified grid

Adds:

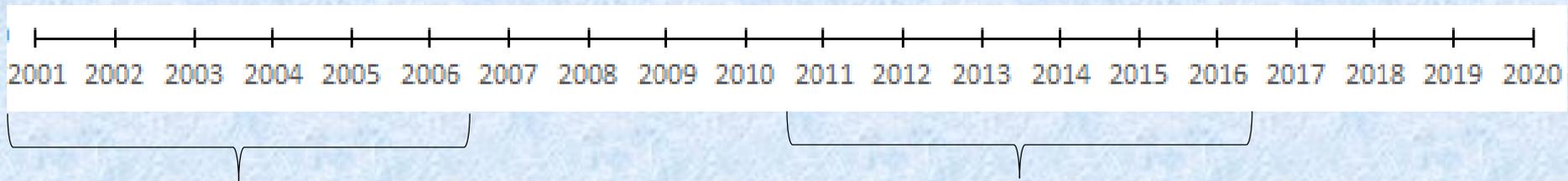
- 4,350 National Forest plots
- Plot density of 1 per 1,850 ac. outside of wilderness



# What we have now: 10-yr cycle

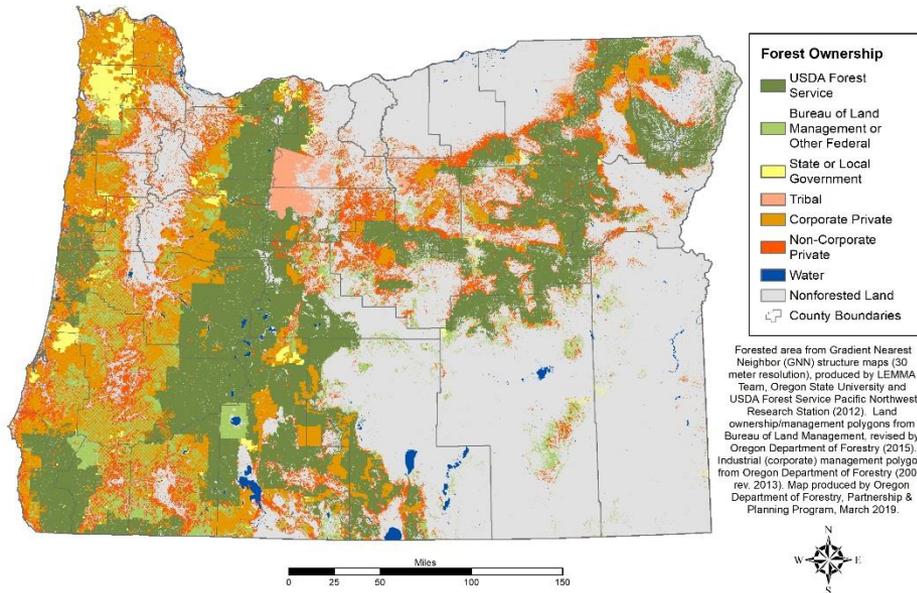
Installation

Re-measurement

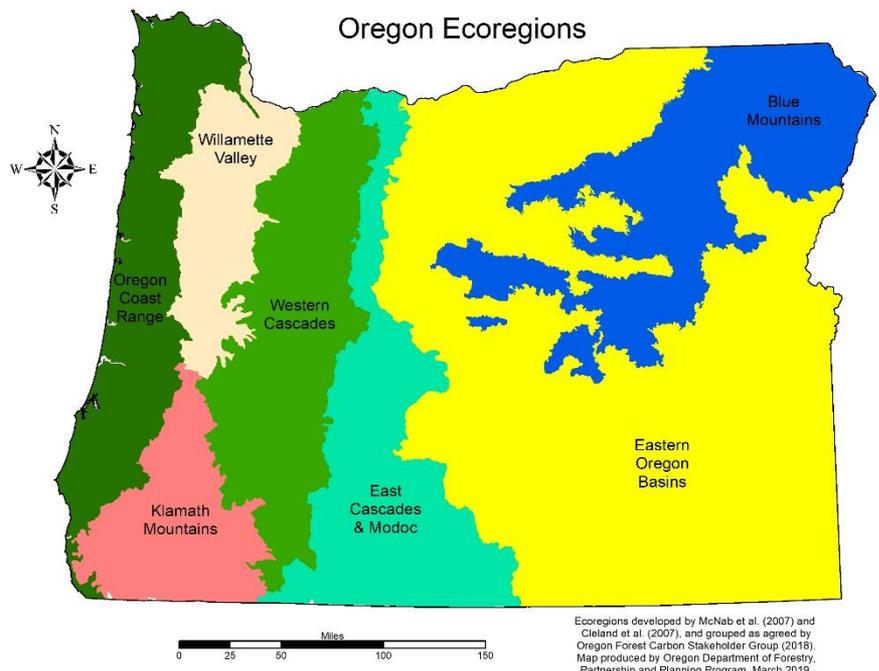


“estimate of average annual carbon flux CO<sub>2</sub>e by pool and ownership, 2001-2006 to 2011-2016”

# Oregon Forest Ownership



# Oregon Ecoregions





# Forest Carbon Stocks

- **Live trees:** Based on FIA regional biomass equations, adds foliage
- **Standing dead trees:** Same as live trees, including reductions for decay
- **Understory vegetation:** As modeled and populated in FIA Database
- **Down wood debris:** Use collected measurements and National FIA estimation protocol, piles not included
- **Forest floor:** Use collected measurements and national estimation protocol
- **Roots** on live and standing dead trees: Uses National FIA protocol
- **Organic soils:** As modeled and populated in FIA Database using Domke et al. (2017)

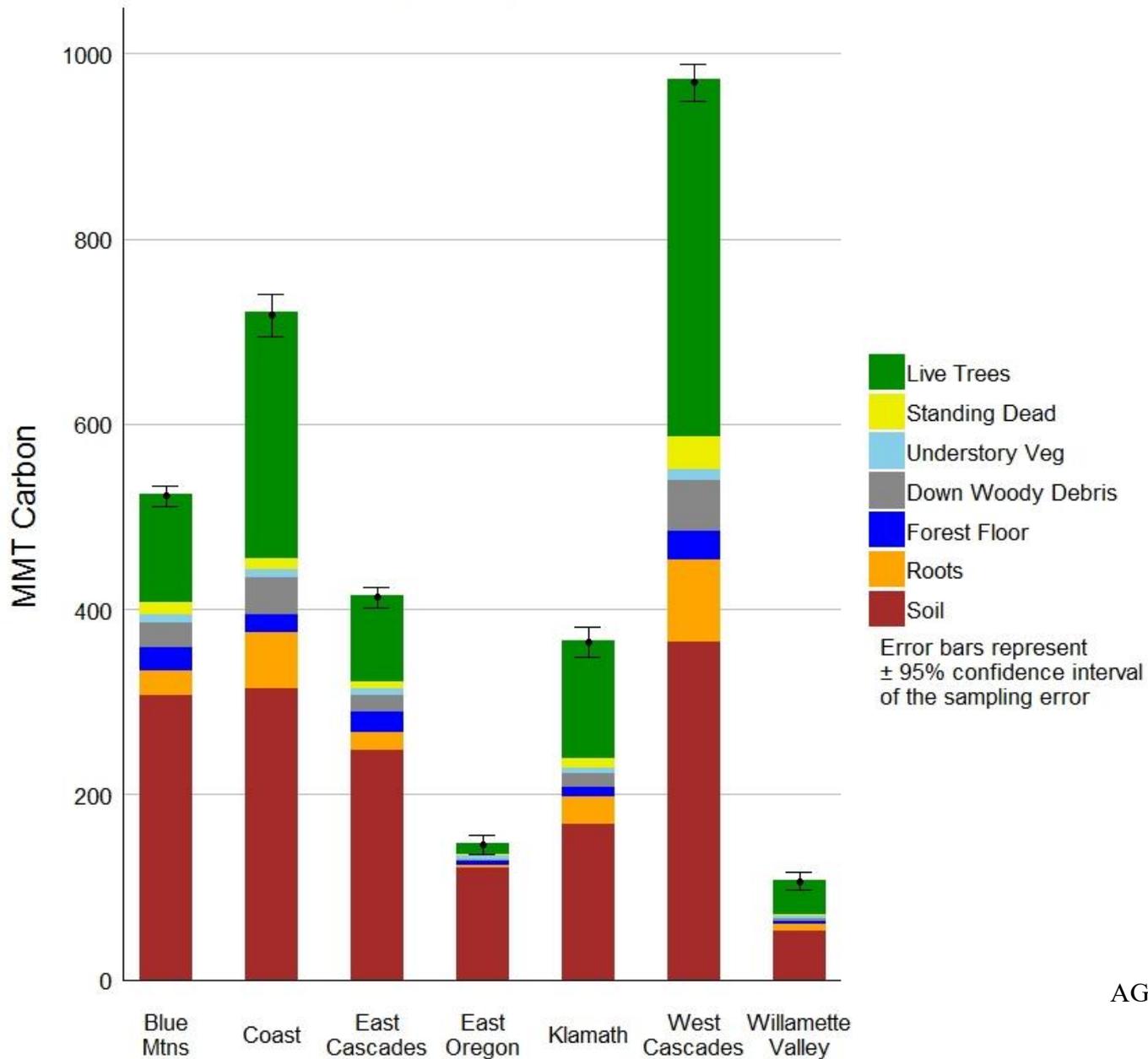


## Forest Carbon Stocks

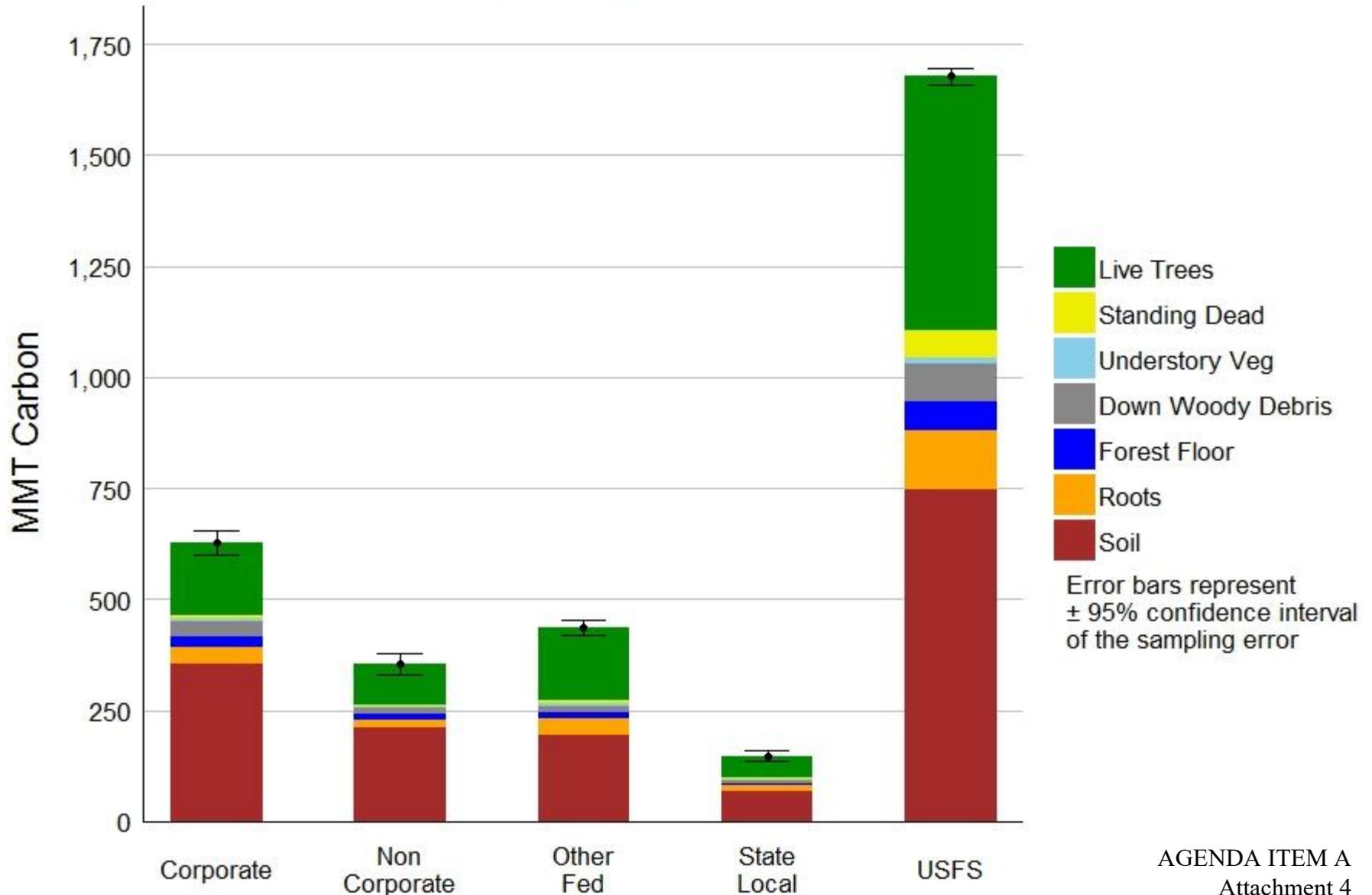
Oregon Statewide Forest Carbon Stocks by Forest Pools, 2007-2016

Forest Carbon Pools	Total Carbon	SE
	million metric tons	
Live Trees	1,039.0	9.6
Standing Dead	79.0	1.6
Understory Veg	34.0	2.1
Down Woody Debris	156.8	1.9
Forest Floor	117.19	0.55
Roots	238.0	2.2
Soil Organic C	1,575.27	7.55
<b>All Pools</b>	<b>3,239.7</b>	<b>16.7</b>

## Carbon Stocks in Oregon's Forests by Ecoregion and Pool For the 2016 Inventory Period

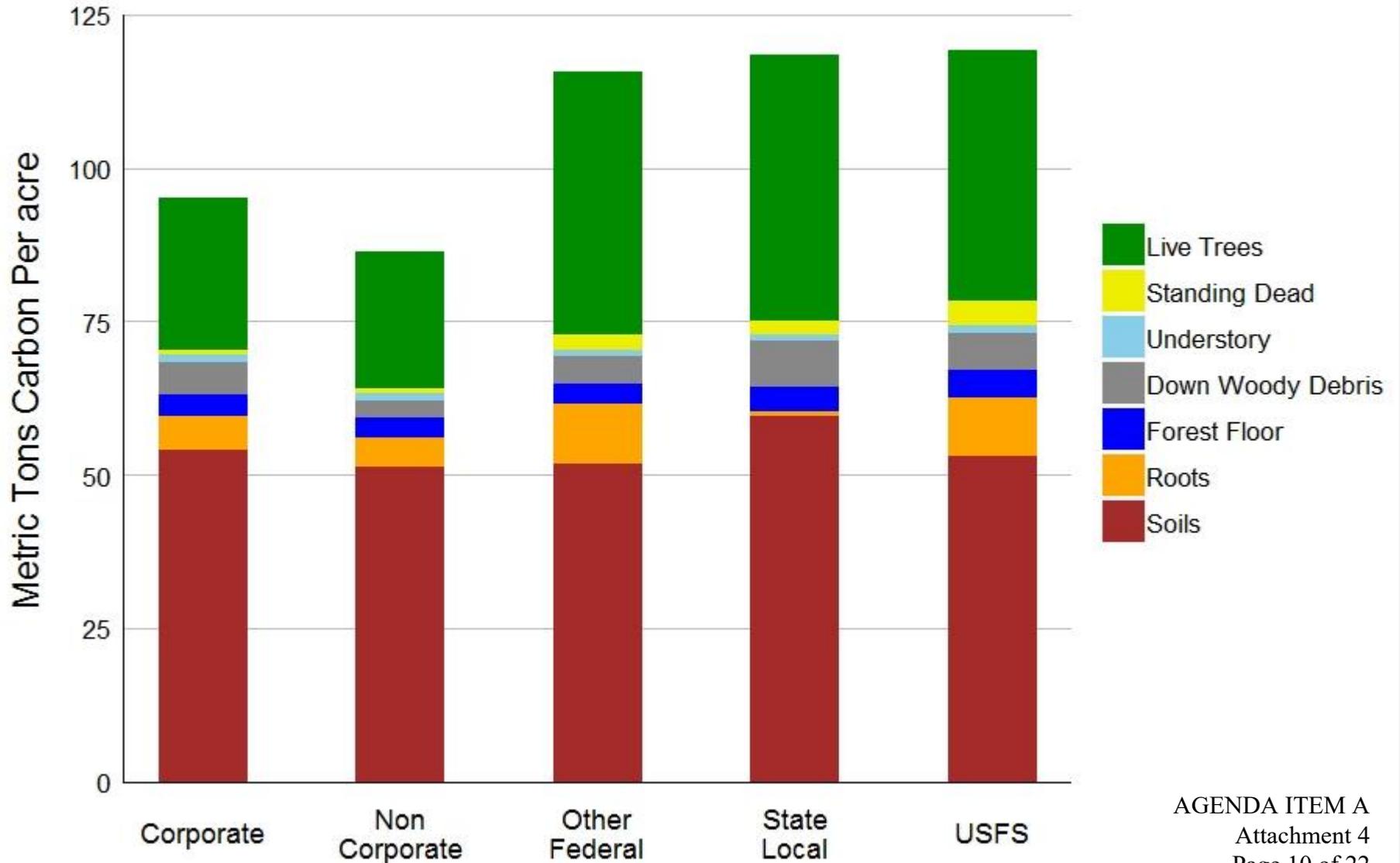


## Carbon Stocks in Oregon's Forests by Owner and pool For the 2016 Inventory Period

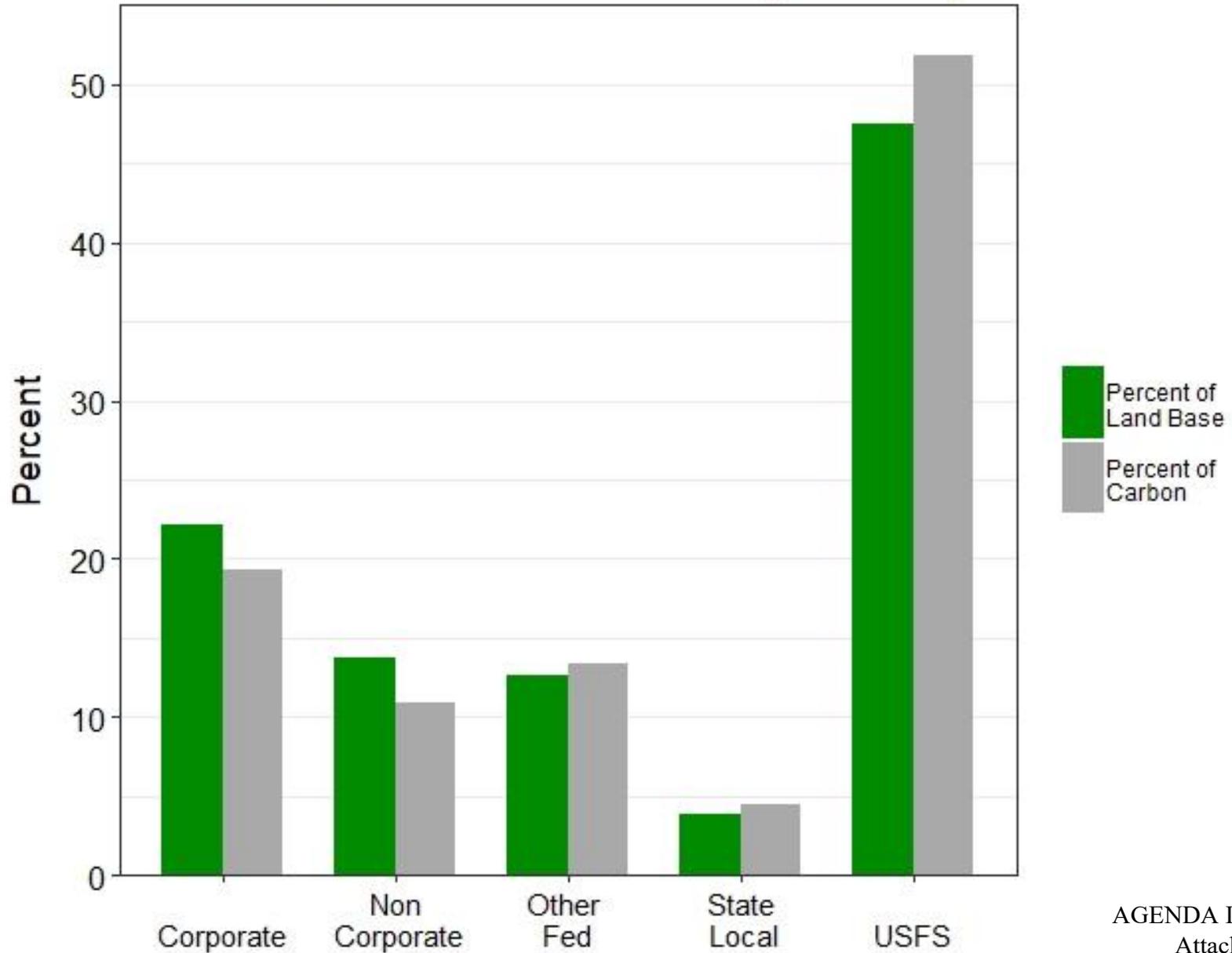


## Density of Forest Carbon by Pool and Ownership

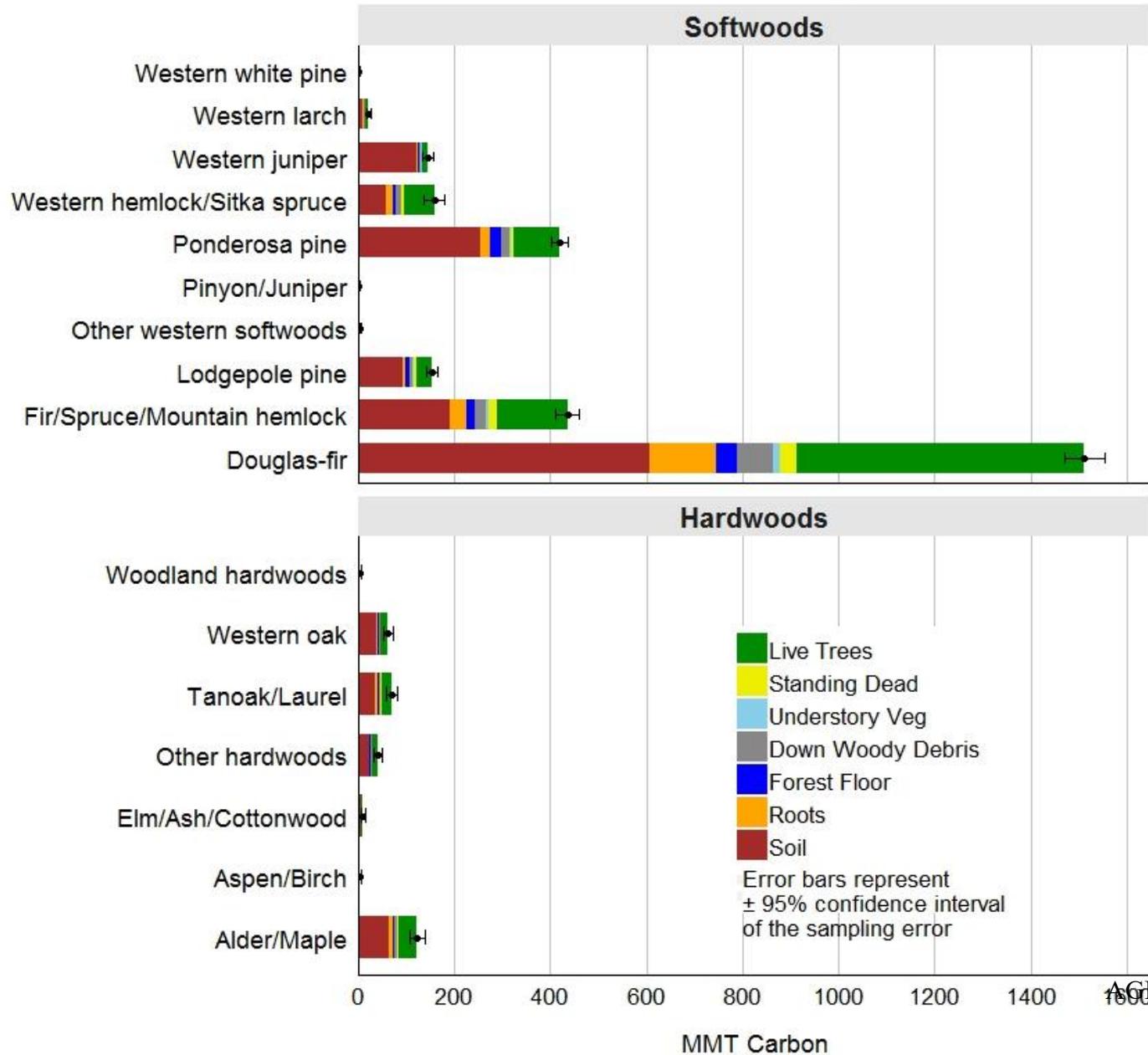
### For the 2016 Inventory Period



## Percent of Land Base and Carbon By Ownership



## Carbon Stocks in Oregon's Forests by Forest Type and Pool For the 2016 Inventory Period





# Forest Carbon Flux

- Every pool of forest carbon has a rate of carbon input and rate of carbon output.
- Flux represents the amount of carbon going into a pool minus the amount going out
- Flux is reported in units of CO<sub>2</sub> equivalents
- Current estimates of forest carbon flux were based on one repeat measurement on 60% of all plots in Oregon.
- 100% of all forest inventory plots will be re-measured by 2020
- Annual forest carbon flux is estimated from actual measurements of growth, removals, and mortality

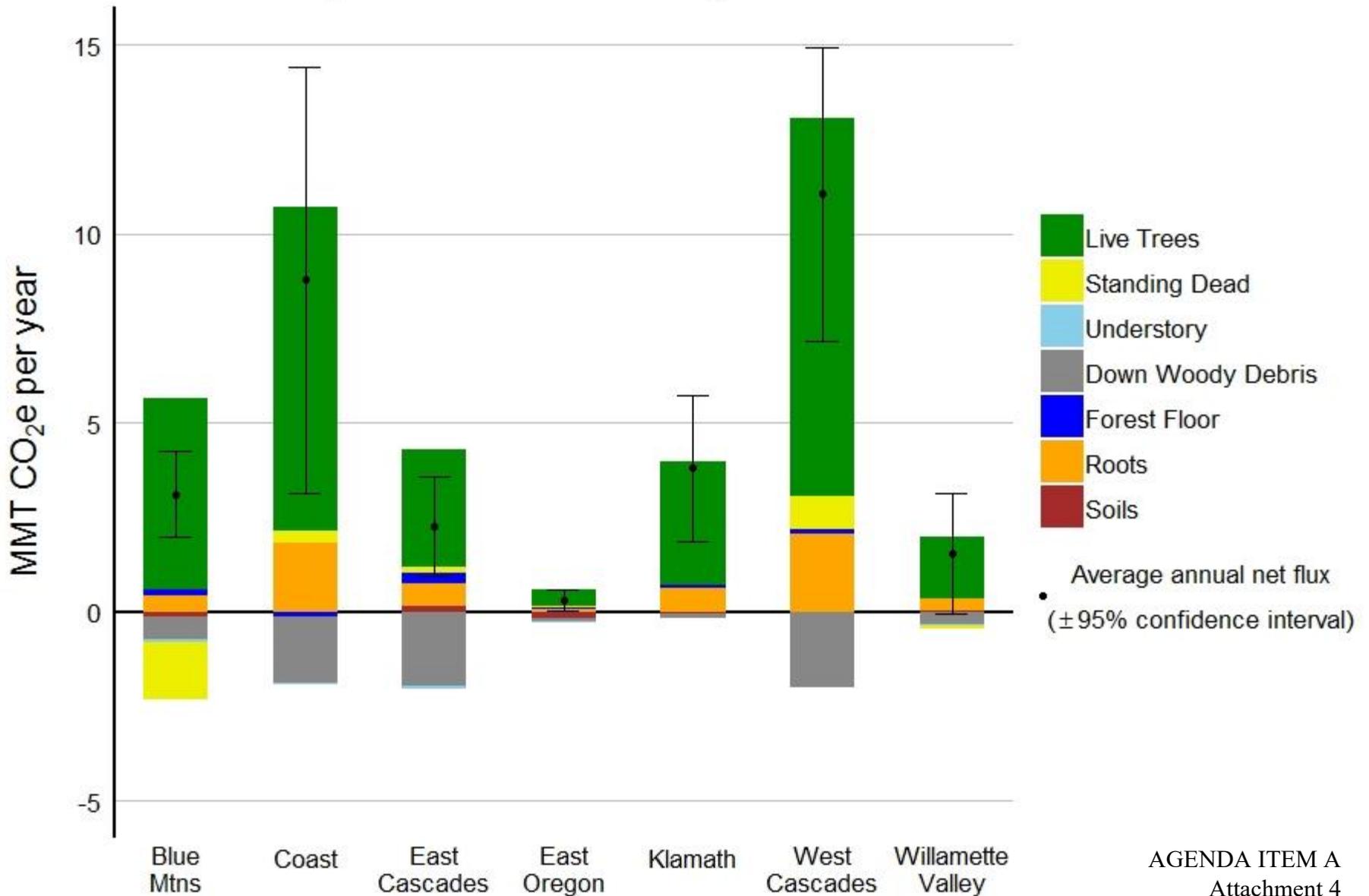


## Forest Carbon Flux

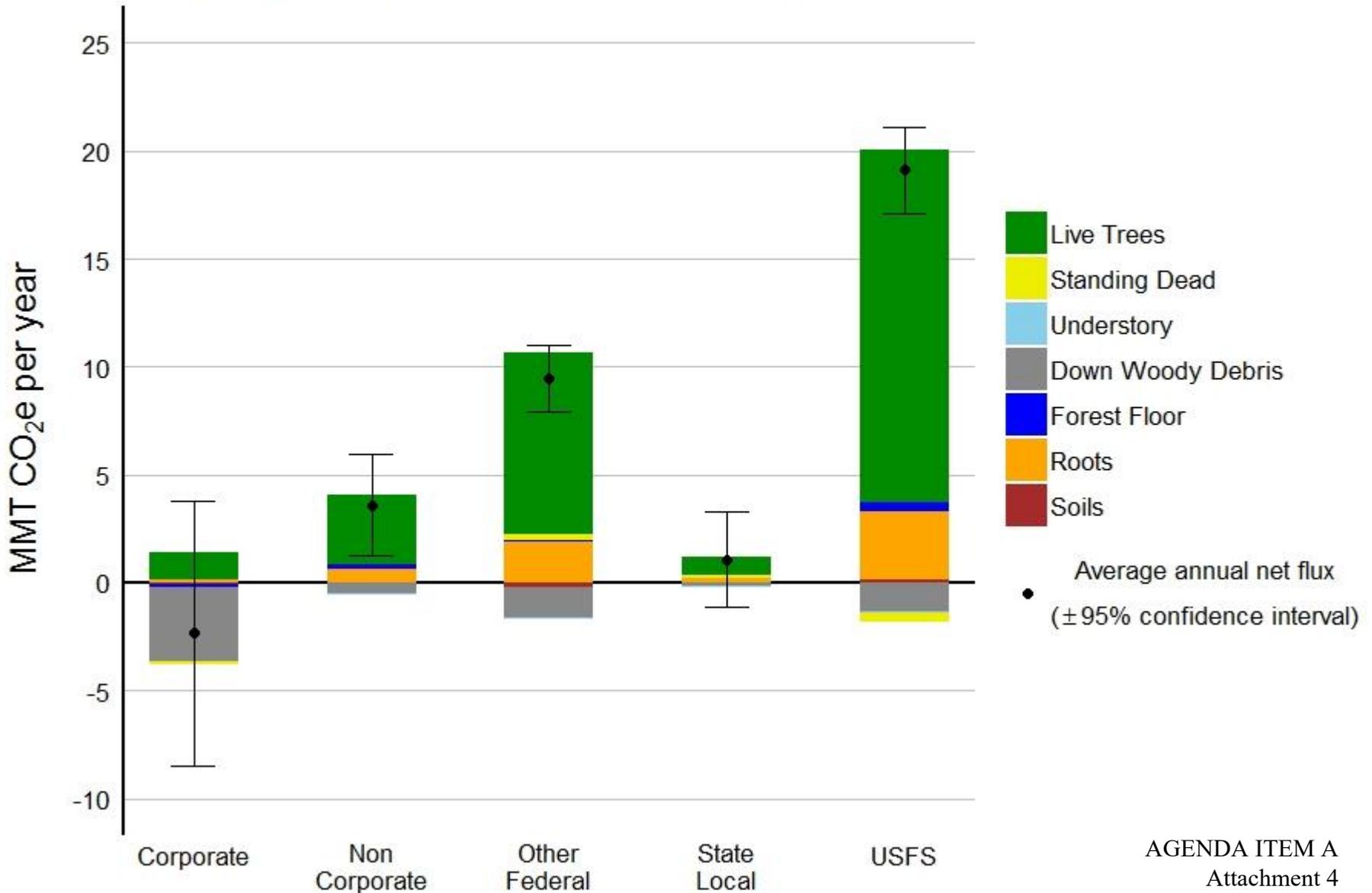
**Annual Net CO<sub>2</sub>e Flux From Forest Pools in Forest Land Remaining Forest Land, 2001-2006 to 2011-2016**

	Net flux	
	Total	SE
	<i>Million Metric Tons CO<sub>2</sub> equivalent/yr</i>	
Forest Carbon Pools		
Live Trees	31.73	2.90
Standing Dead	-.018	0.68
Understory Veg	-0.21	0.04
Down Woody Debris	-6.82	0.82
Forest Floor	0.56	0.13
Roots	5.98	0.69
Soil	-0.17	0.29
<b>Net flux All Pools</b>	<b>30.91</b>	<b>3.77</b>

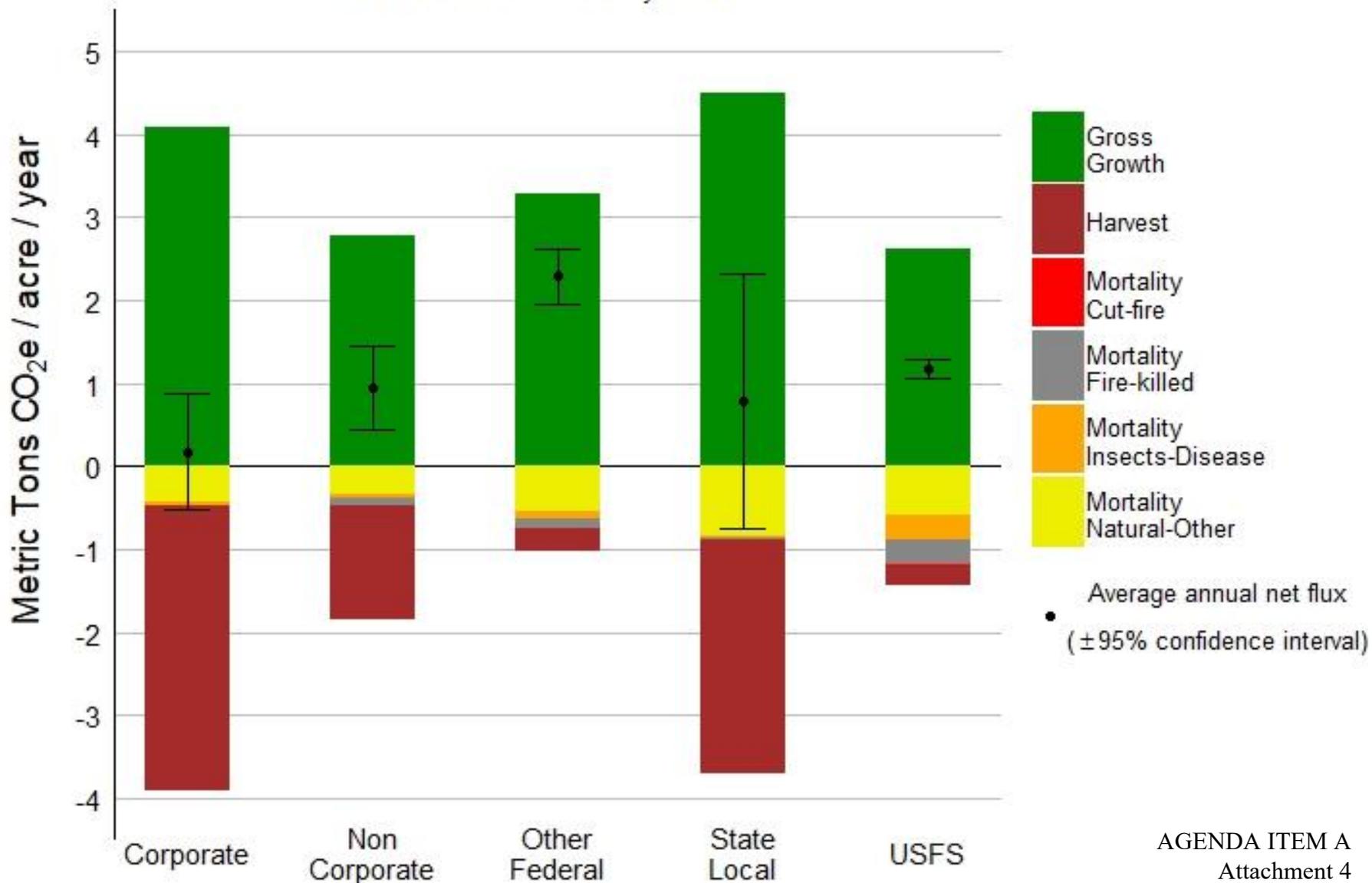
## Annual Carbon Flux in Oregon's Forested Ecoregions by Pool For the 2016 Inventory Period



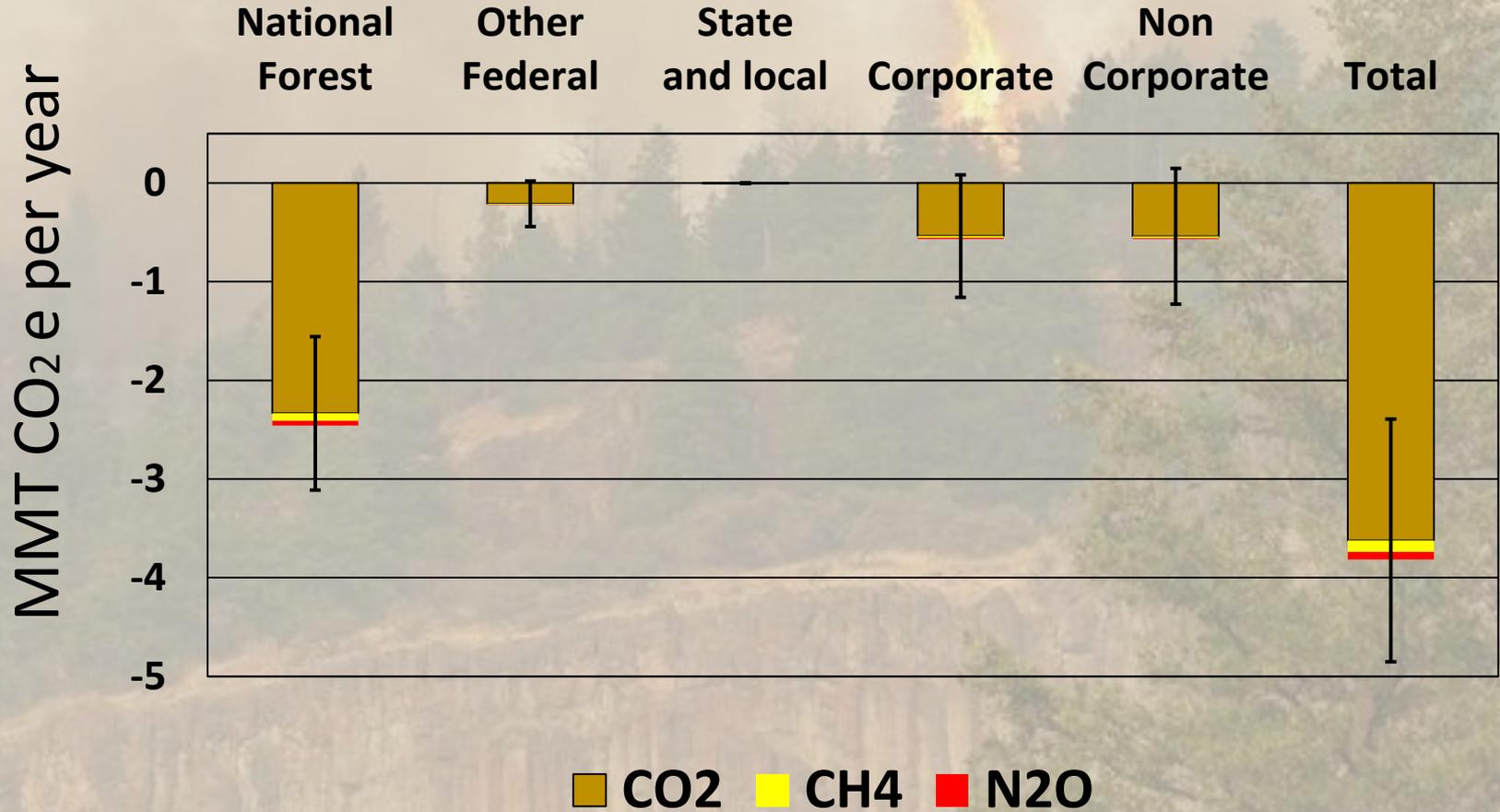
## Annual Carbon Flux in Oregon's Forests by Pool and Owner For the 2016 Inventory Period



## Annual Flux per Acre in Aboveground Live Trees From Growth, Removals and Mortality by Ownership For the 2016 Inventory Period



# Annual Net Emissions of GHG From Fire: All Oregon. 2001-2006 to 2011-2016





## Summary

- Carbon storage in Oregon's forests is about 3.2 billion metric tons.
- Each year, Oregon's forests sequester about 30.9 million metric tons of CO<sub>2</sub> equivalents.
- Flux of carbon released from wildfire was smaller than the standard error of 3.8 on the total net flux of 30.9 million metric tons.



## **Next Steps**

- Complete the Forest Ecosystems Carbon Report.
- Harvested Wood Products Report later this year.
- Research methods for simulating mitigation benefits of forest management alternatives.
- Continued cooperation with California and Washington on forest carbon accounting.



## **Next Steps: Board of Forestry**

- July 2019:
  - Department will summarize the manner in which climate adaptation and resilience are built into existing work.
  - Engage the Board in discussion to identify next steps on the topic.



# Questions?