AB 1504 Forest Ecosystem and Harvested Wood Product Carbon Inventory: 2018 Reporting Period

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What's new from the last reports?

- **Soil organic carbon**
  - refinements in the U.S. Digital General Soil Map (STATSGO2)

- **Harvested wood products**
  - 2013-2018 BF:CF ratio
  - End-use products ratios summing to 1
  - ~1% of missing carbon fix
  - Lag times in calculations
  - Pending: narrow confidence intervals

California Forest Carbon Flux 2018 Reporting Period

Forest land remaining forest land

Report table 7.1

	Net flux	
CARBON POOL	MMT CO_2 equivalent	
Forest land remaining forest land (FF)		
Forest ecosystem	**2018**	**2017**
Aboveground live[1]	15.6	19.1
FOREST ECOSYSTEM NET FLUX	26.2	29.2
Harvested Wood		
Products in use	-1.3	-1.1
Products at SWDS	2.0	2.0
HWP NET FLUX	0.7	0.9
TOTAL NET FLUX	26.9	30.0

[1]**includes live trees, foliage, and understory veg**

California Forest Carbon Flux 2018 Reporting Period
24.9 MMT CO2e/yr

Report Table 7.2

	Net flux	
	Total	SE
	million metric tons CO_2 equivalent	
Land-use category		
Forest land remaining forest land (FF)		
Forest ecosystem		
Changes in forest ecosystem carbon	26.2	2.4
Non-CO2 emissions from forest fires	-0.6	0.0
Harvested Wood Products		
Changes in HWP carbon	0.7	TBD
NET FLUX	26.3	2.4[1]
Forest land conversions (LF)		
Changes in forest carbon, forest to non-forest	-2.9	0.4
Changes in forest carbon, non-forest to forest	1.4	0.2
TOTAL NET FLUX (LF)	-1.5	0.5
TOTAL NET FLUX (FF & LF)	24.9	2.4[1]

[1]Excludes HWP C sampling error.

Table 7.3. Statewide average carbon stock for the 2018 CA AB 1504 reporting period.

Carbon pool	Stock (MMT C)
Forest Ecosystem	3,082.2
Harvested wood product	134.8
Total carbon stock	3,217.0

Figure 4.2

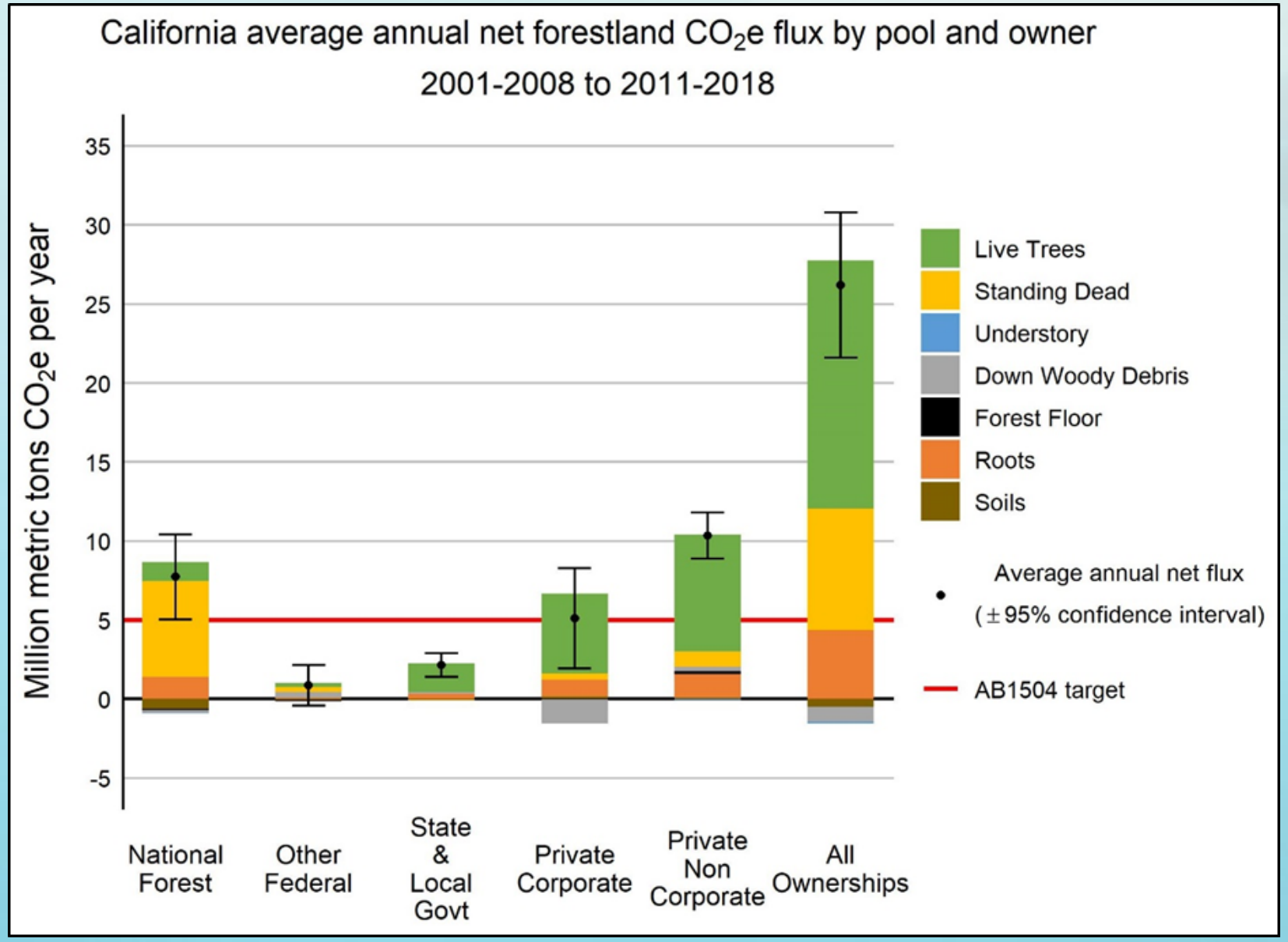

California average annual net forestland CO_2e flux by pool and owner
2001-2008 to 2011-2018
Million metric tons CO_2e per year
35
30
25
20
15
10
5
0
-5
National Forest
Other Federal
State & Local Govt
Private Corporate
Private Non Corporate
All Ownerships
Live Trees
Standing Dead
Understory
Down Woody Debris
Forest Floor
Roots
Soils
Average annual net flux
(±95% confidence interval)
AB1504 target

Figure 4.4a

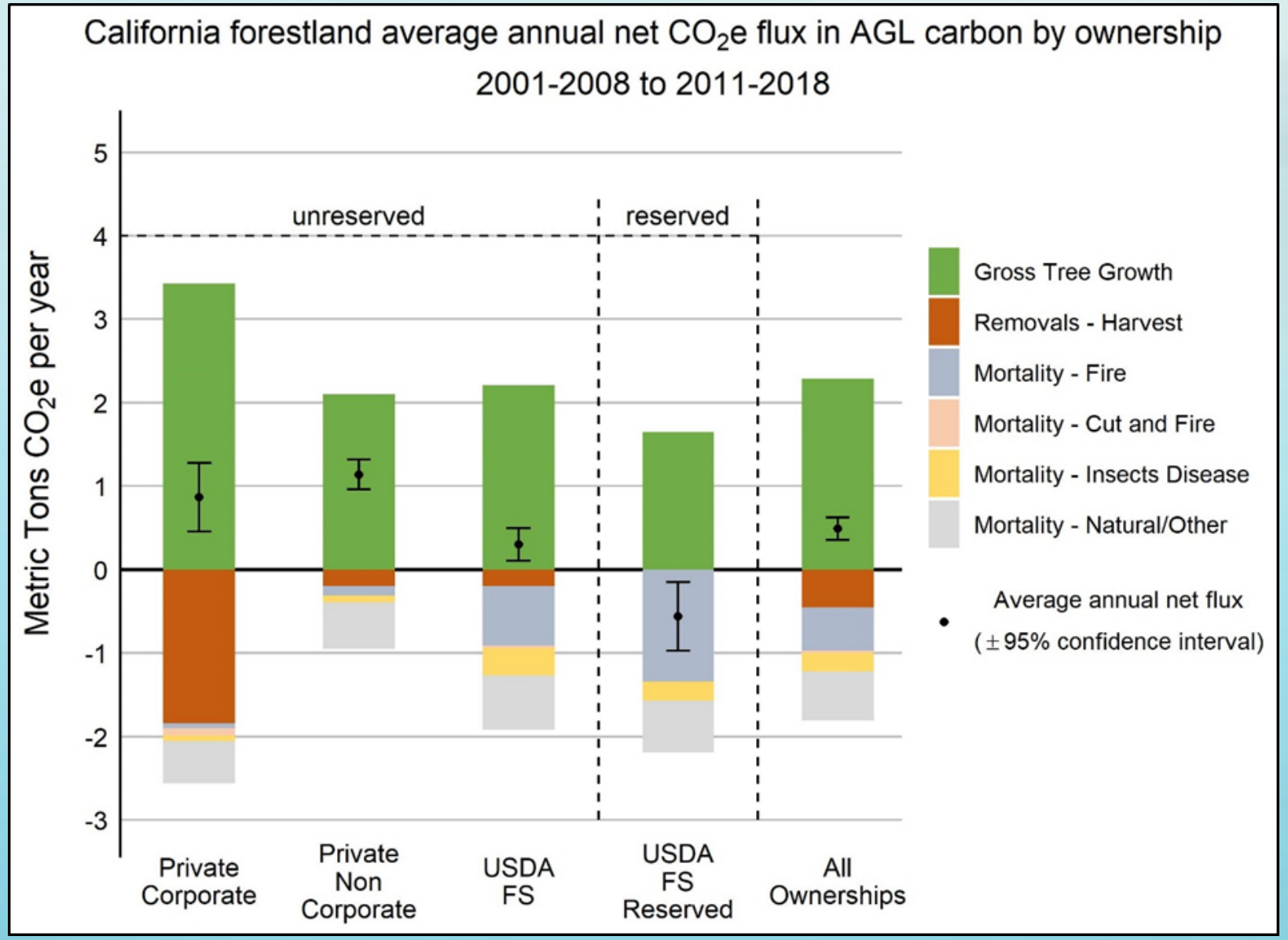

California forestland average annual net CO_2e flux in AGL carbon by ownership
2001-2008 to 2011-2018
Metric Tons CO_2e per year
5
4
3
2
1
0
-1
-2
-3
unreserved
reserved
Private Corporate
Private Non Corporate
USDA FS
USDA FS Reserved
All Ownerships
Gross Tree Growth
Removals - Harvest
Mortality - Fire
Mortality - Cut and Fire
Mortality - Insects Disease
Mortality - Natural/Other
Average annual net flux
(±95% confidence interval)

Figure 4.6a *(new!)*

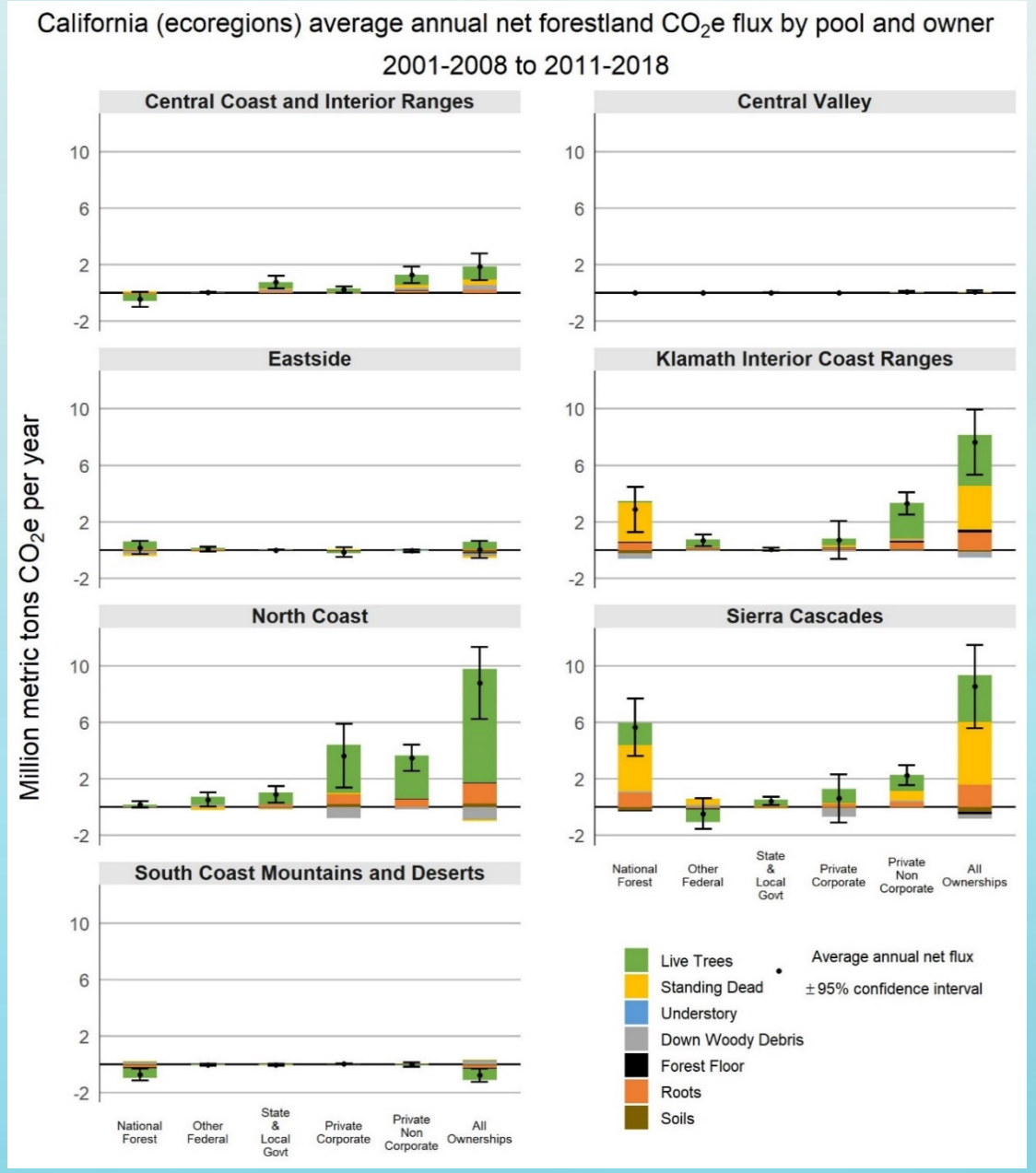


Figure A1.0 *(new!)*

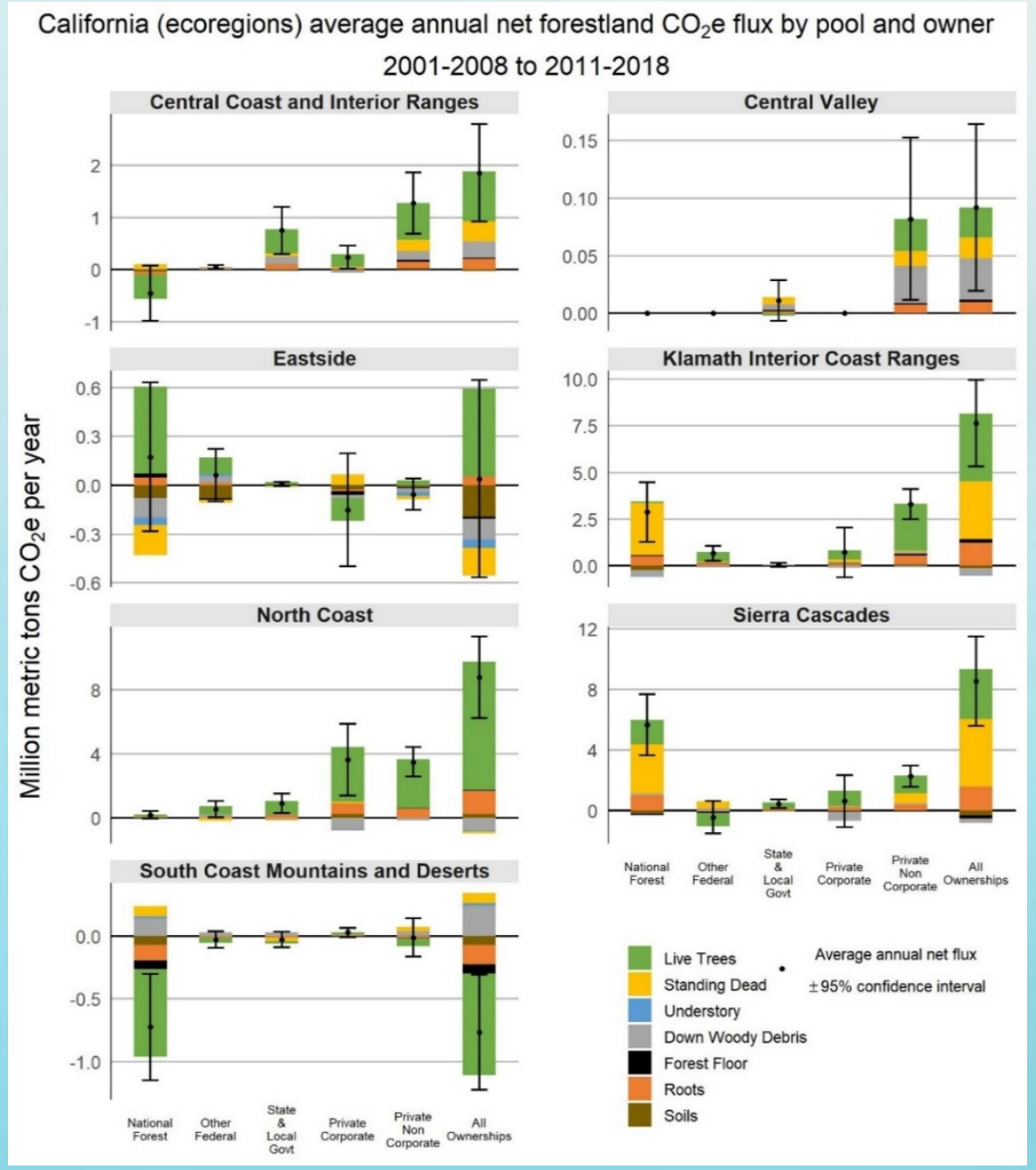
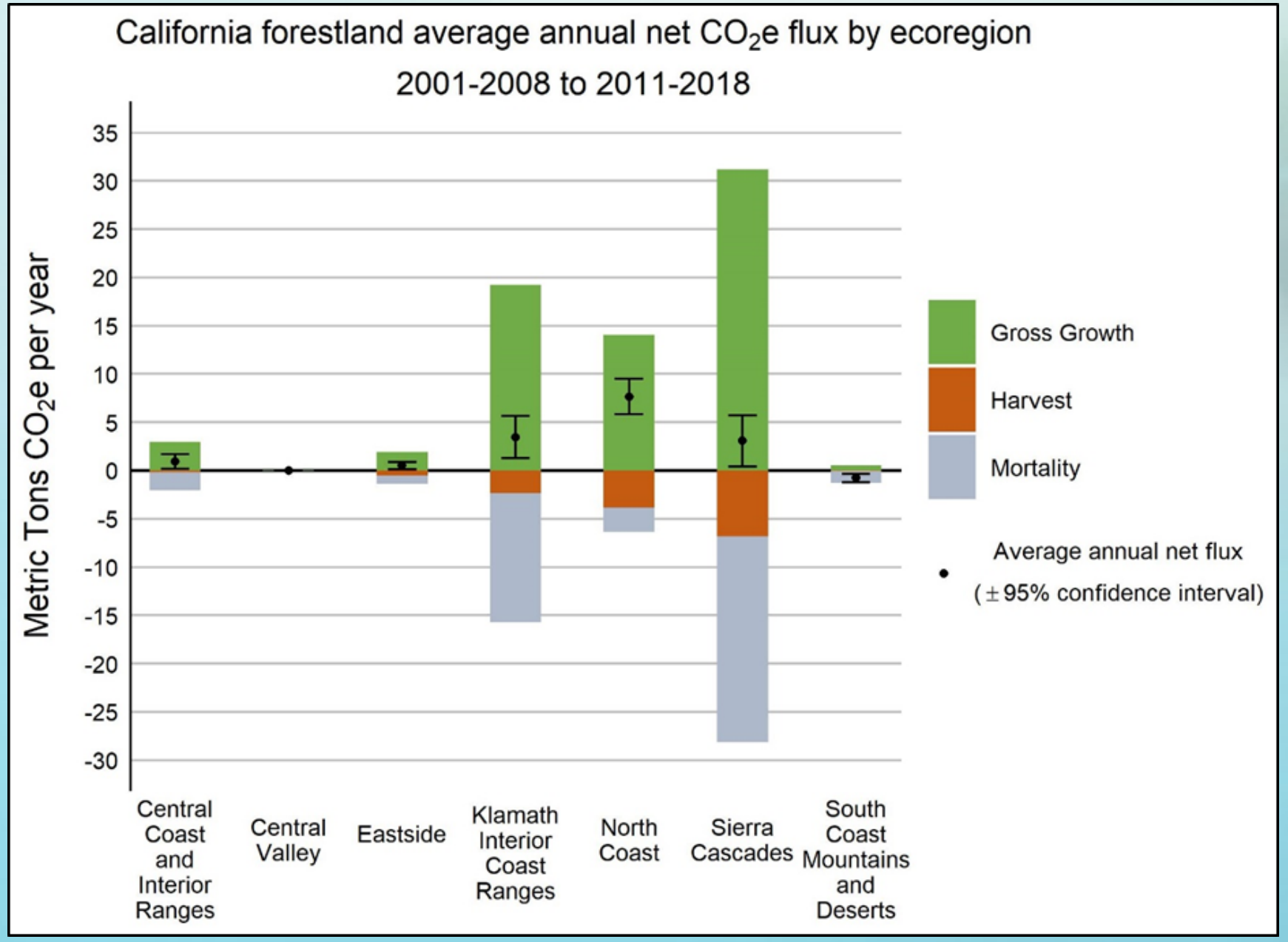


Figure 4.6b

Sierra/Cascades

Tree mortality rate MMT CO2e	
2016	-17.8
2017	-19.6
2018	-21.4



California Forest Carbon Stock, 2008-2017

3.1 Billion Metric Tons C

Figure 4.8

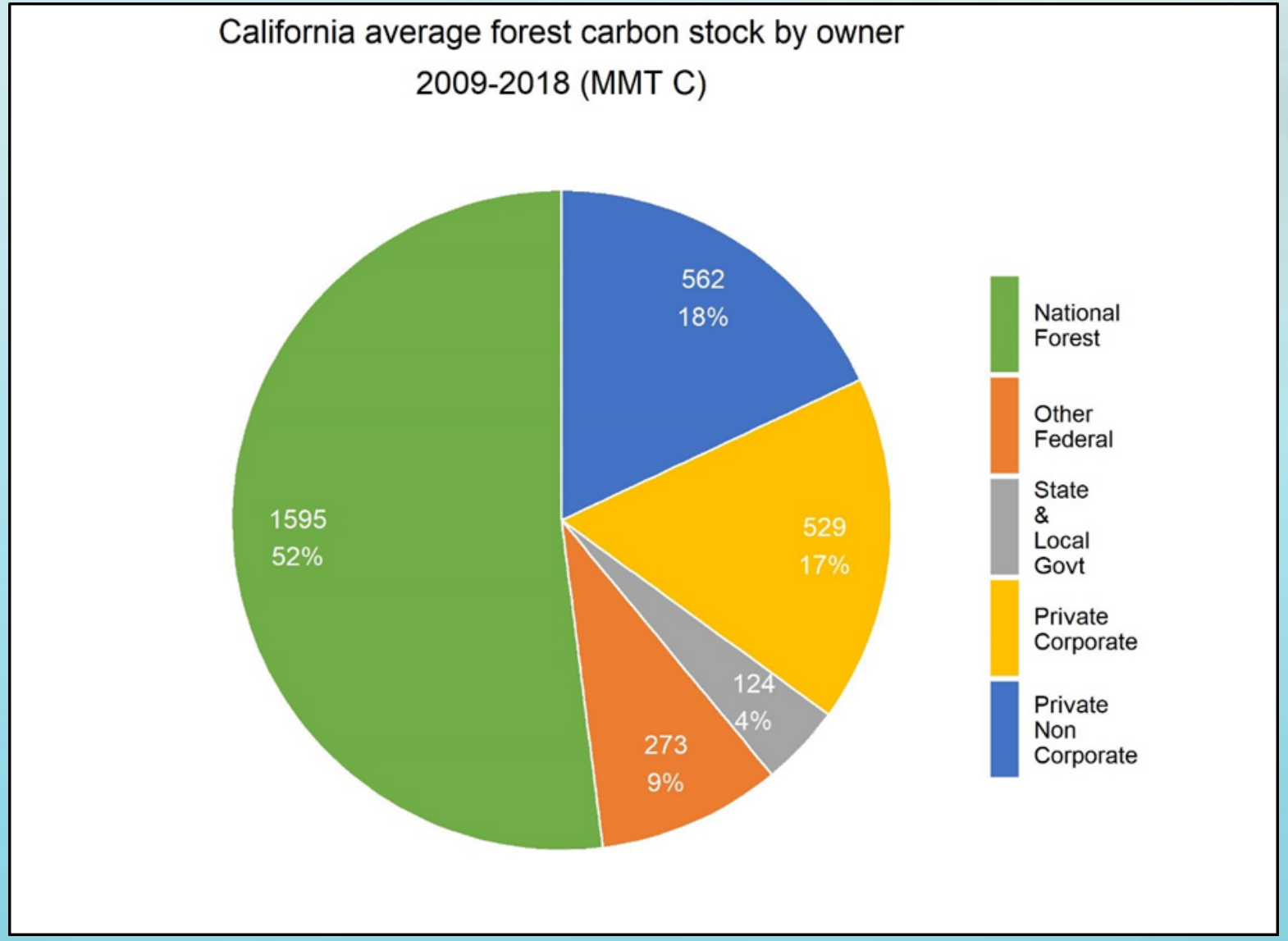
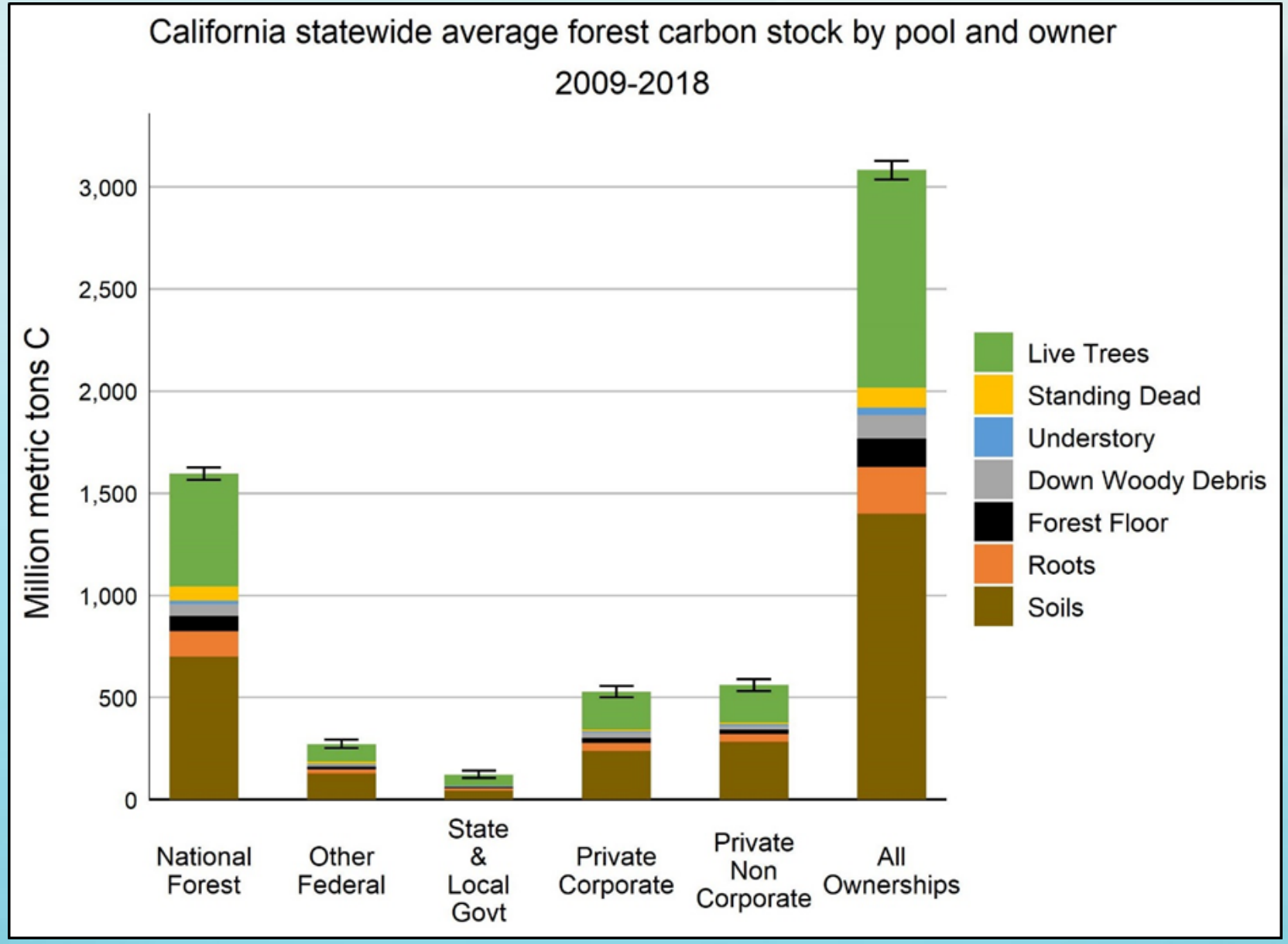


Figure 4.9


California statewide average forest carbon stock by pool and owner
2009-2018
Million metric tons C
3,000
2,500
2,000
1,500
1,000
500
0
National Forest
Other Federal
State & Local Govt
Private Corporate
Private Non Corporate
All Ownerships
Live Trees
Standing Dead
Understory
Down Woody Debris
Forest Floor
Roots
Soils

County data (top 3)

Flux

Counties with net loss:

- San Bernardino (-0.3 ± 0.3 MMT CO_2e per year)
- Santa Barbara (-0.2 ± 0.3 MMT CO_2e per year)
- Tuolumne (-0.2 ± 1.0 MMT CO_2e per year).

Counties with highest sequestration:

- Mendocino (4.8 ± 1.6 MMT CO_2e per year)
- Humboldt (4.7 ± 2.5 MMT CO_2e per year)
- Siskiyou (1.5 ± 1.6 MMT CO_2e per year)

Stock

Counties with highest stock:

- Siskiyou county 341.4 ± 30.0 MMT C
- Humboldt county 248.5 ± 31.5 MMT C
- Trinity county 233.6 ± 26.7 MMT C

National Forest

Flux

Forests with net loss:

- San Bernardino (-0.3 ± 0.3 MMT CO_2e per year)
- Los Padres (-0.3 ± 0.4 MMT CO_2e per year)
- Angeles (-0.05 ± 0.2 MMT CO_2e per year)
- Lake Tahoe Basin (-0.07 ± 0.2 MMT CO_2e per year)

Forest with highest sequestration:

- Shasta-Trinity (2.7 ± 0.9 MMT CO_2e per year)

Stock

National Forest with highest stock:

- Shasta-Trinity 240.9 ± 26.2 MMT C

Table 4.2b – Flux by Forest Practice District

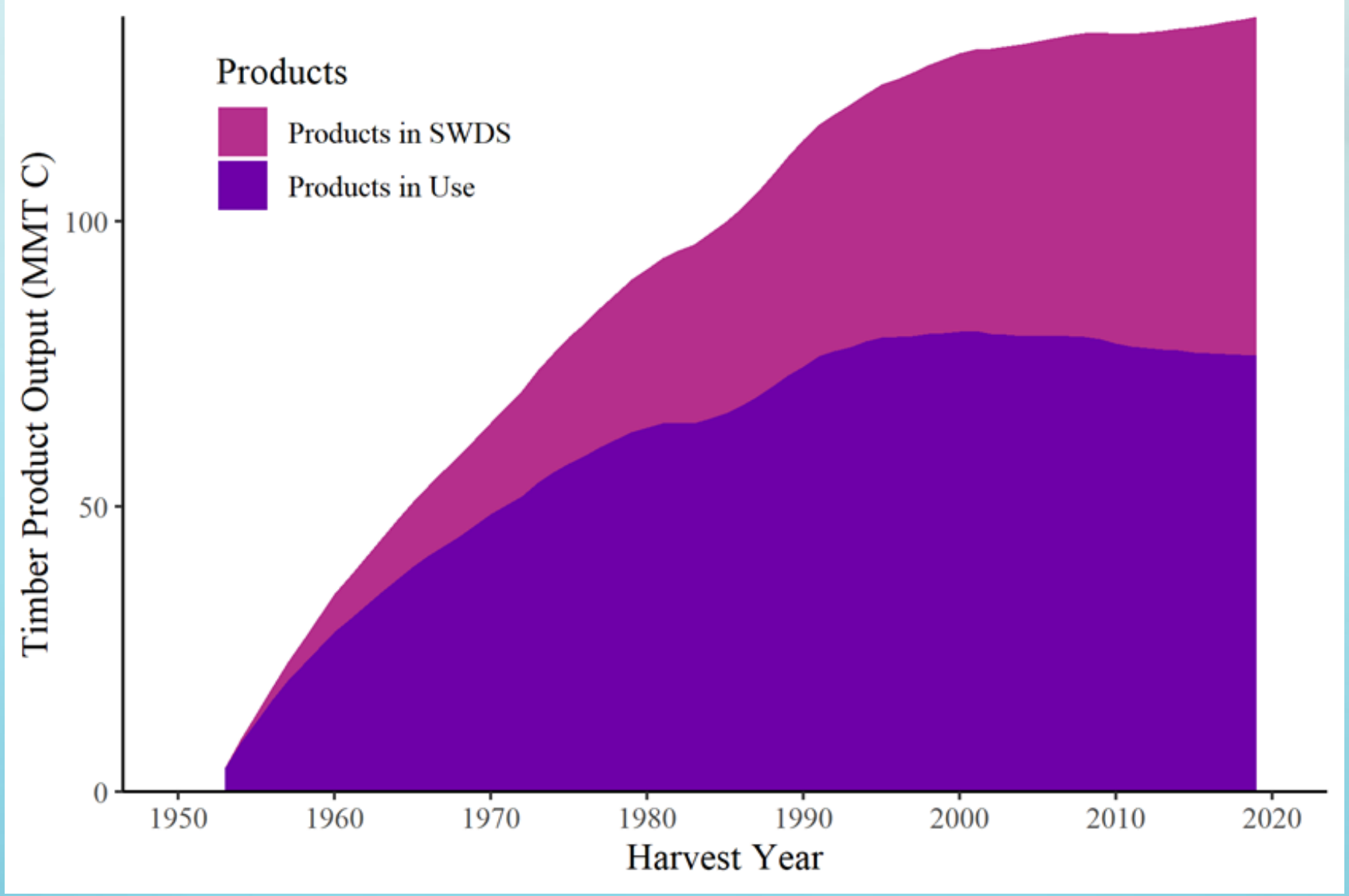
	Forest Pools Net flux		Soil Organic C		Forest Floor		non-CO_2 emissions from forest fires		Total Net Flux	
	Total	SE	Total	SE	Total	SE	Total	SE	Total	SE
	million metric tons CO2 equivalent									
Forest Practice District										
Northern	11.4	1.6	-0.6	0.3	0.1	0.1	-0.3	0.0	10.5	1.7
Southern	5.1	1.0	0.0	0.2	-0.1	0.1	-0.2	0.0	4.9	1.0
Coastal	13.1	1.6	0.0	0.2	0.1	0.0	0.0	0.0	13.3	1.6
All California	29.6	2.4	-0.6	0.4	0.1	0.2	-0.5	0.1	28.7	2.5

Note: negative numbers are a net emission to the atmosphere

HWP C stock, 2018 reporting period

	Products in use	SWDS	Total
		MMT C	
2018	78.1	56.8	134.8
2017 new	78.4	56.3	134.6
2017 old	78.3	55.1	133.4

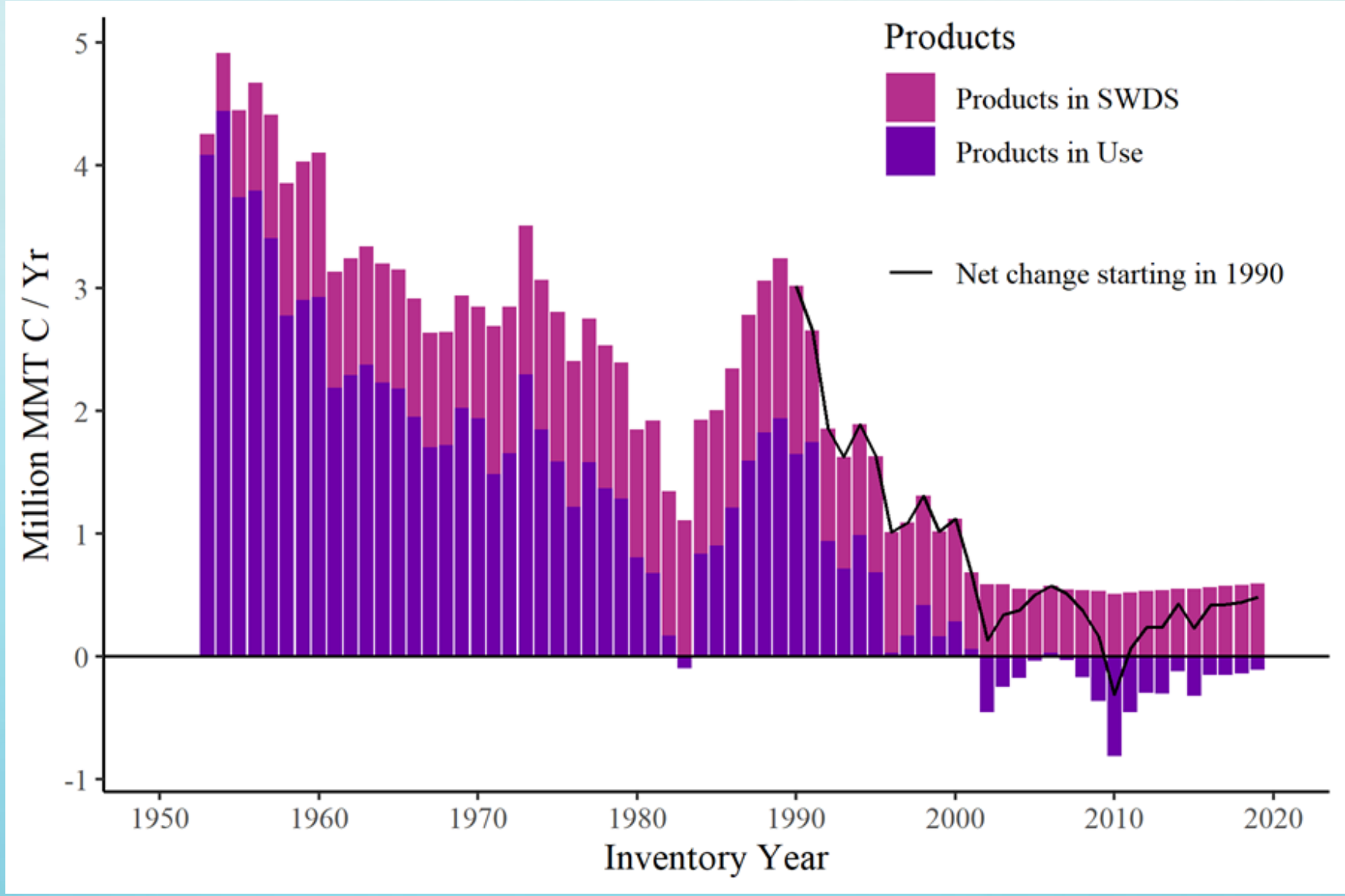
Fig 6.2


Products
Products in SWDS
Products in Use
Timber Product Output (MMT C)
0
50
100
1950
1960
1970
1980
1990
2000
2010
2020
Harvest Year

HWP C flux, 2018 Reporting period

	Products in use	SWDS	Total
		MMT CO2e	
2018	-1.25	1.98	0.73
2017 new	-1.26	1.98	0.72
2017 old	-1.10	2.05	0.95

Fig 6.3


Products
Products in SWDS
Products in Use
Net change starting in 1990
Million MMT C / Yr
5
4
3
2
1
0
-1
1950
1960
1970
1980
1990
2000
2010
2020
Inventory Year

Next steps

- Late 2020
  - ❖2019 data update+
- Late 2021+ - Repeat!
  - ❖2020 Full measurement cycle complete, FULL REPORT [Covid-19, fire delays expected]
- 2021 – start new measurement cycle!
  - ❖Switch to 5-year cycle – Integrated Resource Inventories, Inc.

Ongoing studies

Logging utilization study – BOF, CALFIRE, USFS TPO DELAYED - 2022

- 18 green, 2 dead tree sites completed

Biomass study – USFS PNW ON TRACK

- Further refines biomass equations relied upon for carbon estimates

Mill energy-use study – BOF, CAL FIRE, USFS TPO, Univ. MT

- CA Timber Industry carbon footprint – **COMPLETE**

Pacific Coast Temperate Forest Regional Carbon Report

- California, Oregon, Washington, British Columbia
- Forest ecosystem and harvested wood products
- Includes timber (i.e., log and chip) and finished wood product flow analysis
- Partners: ODF, WA DNR, USFS PNW-FIA, UMT-BBER, UC-B
- Report delivery date: Mid-2022

Pacific Coast Carbon Initiative

Funded studies:

- Carbon Science Synthesis
- Carbon Models Assessment
  - Spin off: Initial comparison of ecosystem models using pilot project areas
- Land Management Scenarios
- Socio-economic Incentives and Drivers Carbon Management by Private Forest Owners
- Belowground carbon cycling in temperate wet forests of AK, WA, and OR
- Analysis of Pacific Coast regional timber and wood product flow from (of the Regional Carbon Report)

Future studies:

- Pacific Coast regional harvested wood product carbon analysis (of the Regional Carbon Report)
  - Comparison of HWP C accounting tools and approaches
- Project ecosystem carbon stock and flux responses to management, disturbance and climate
- Project harvested wood products and substitution effects from management and utilization scenarios

Scenario development

- Develop science-based climate mitigation targets for emissions reductions in forest sector; understand disturbance effects on target development.
- Understand carbon impacts from:
  - Forest management/utilization across different ownerships to improve forest resilience/achieve State-level goals
  - How changes to forest management/utilization in CA may affect the Pacific Coast region
  - Different forest management/utilization activities to help private landowners with carbon accounting in THPs

Questions?