



# The 2025 Natural & Working Lands (NWL) Carbon Inventory

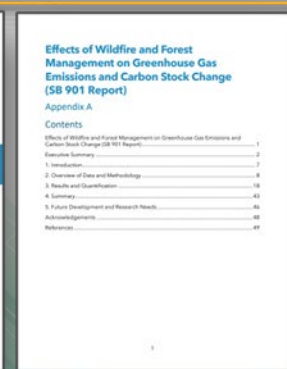
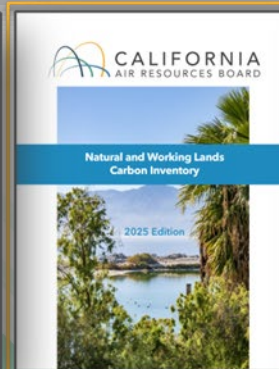
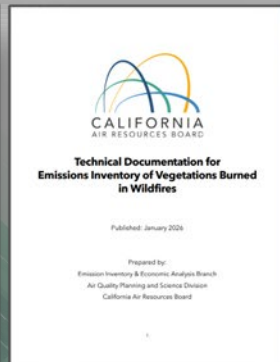
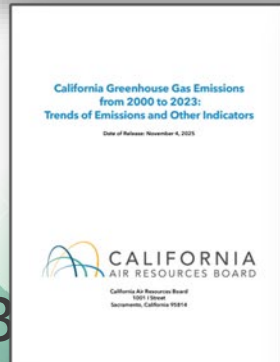
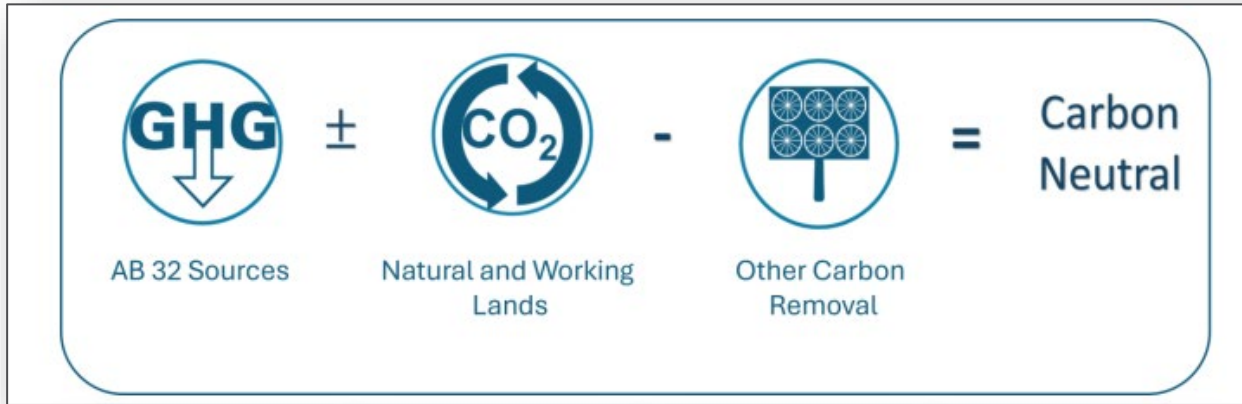
Public Workshop  
April 8, 2026

# CARB is responsible for achieving carbon neutrality by 2045



Losses in ecosystem carbon should not exceed more than 4% compared to 2014 values

# CARB maintains inventories to track progress and provide transparency



# The NWL Carbon Inventory monitors carbon stocks across California through time

- Captures the impacts of climate, wildfires, land use change, and land management activities on carbon stored in plants and soil statewide
- The inventory also assesses:
  - Carbon stocks in harvested wood products
  - Greenhouse gas (GHG) fluxes from wetlands
  - GHG emissions and changes in carbon associated with wildfire and forest management activities



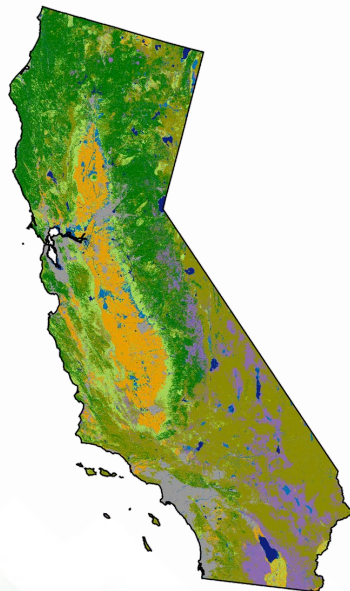
## The 2025 update used robust methodological criteria

- IPCC aligned
- Statewide accuracy
- Complete coverage
- Spatially explicit
- Relevant stratification
- Annualized values
- Comprehensive pools
- Magnitude & directionality
- Transparent, low-cost tools
- Open-source models
- Validated datasets



# Land cover was mapped wall to wall

## Statewide



IPCC categories

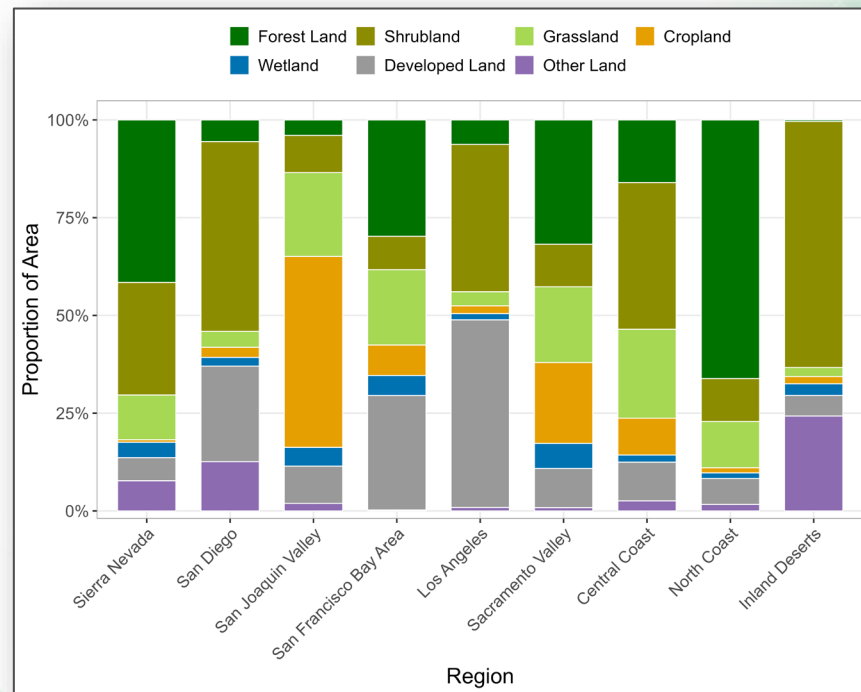
Annual maps  
• 2001-2022

Resolution:  
30 meters

### Category

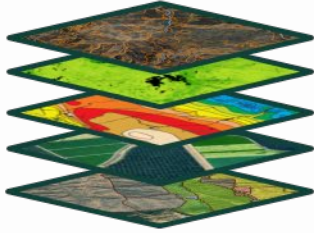


## Regional



# Carbon stocks were estimated for 2001-2022

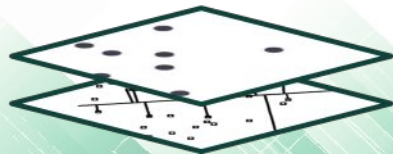
Remote Sensing Data



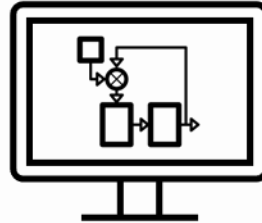
Look-Up Tables & Stock Change Factors



Field Data



Empirical Models

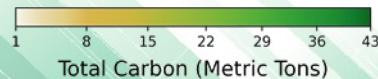


NWL Carbon Stocks & Stock Change



# Annual carbon stock maps were produced statewide and by region

## Statewide



## Regional



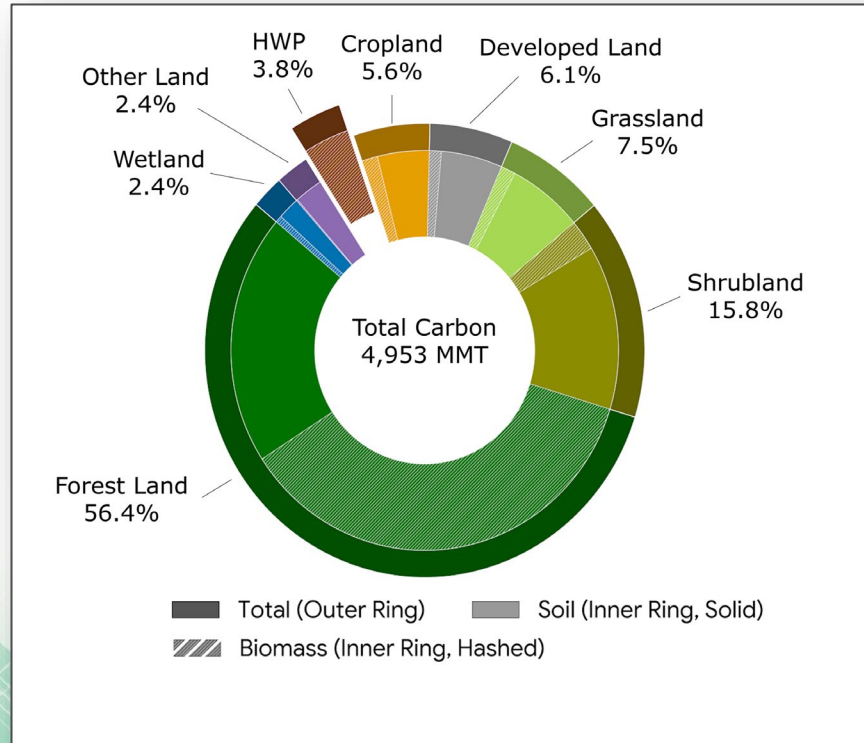
Annual, wall-to-wall maps for soil and biomass carbon covering all land types

21 years (2001-2022)

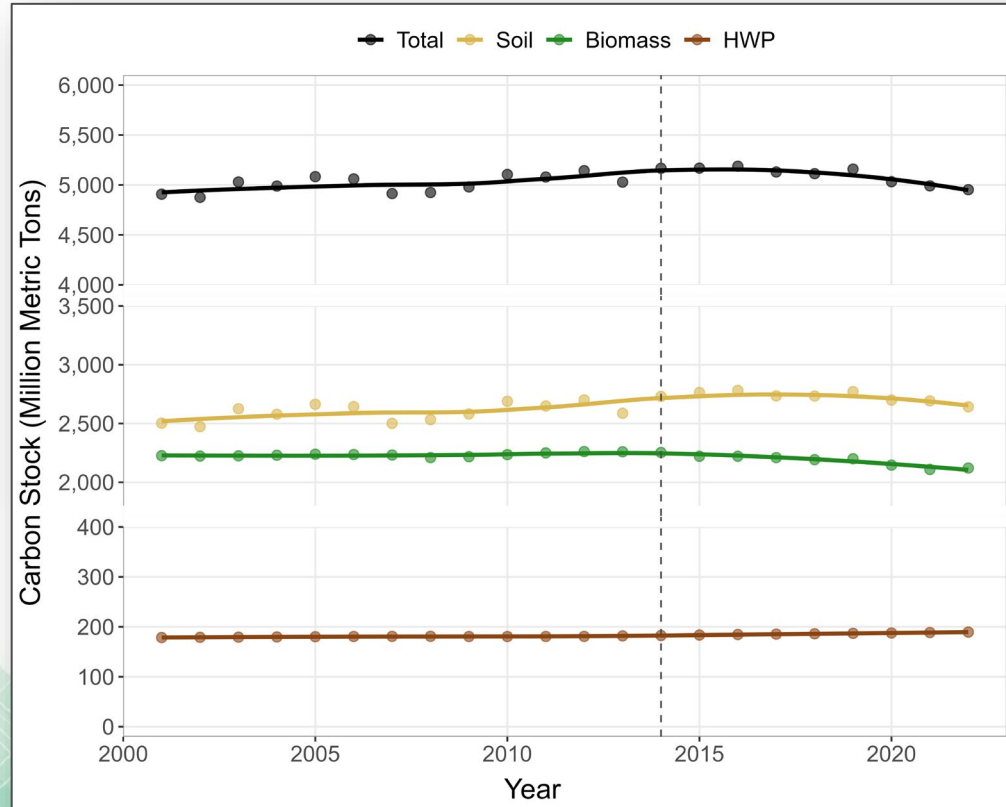
Complete maps:

- 2012
- 2018
- 2022

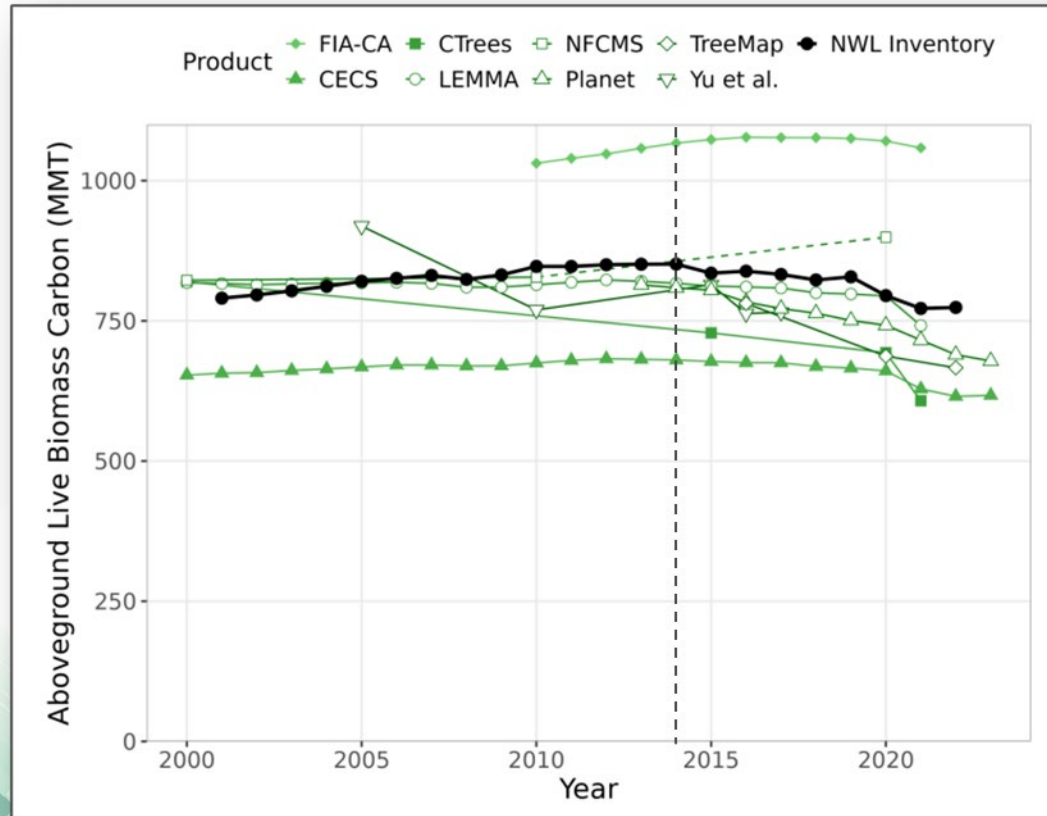
In 2022, almost 5 billion metric tons of carbon were contained within California's lands, with 53% of this carbon stored below ground in soils



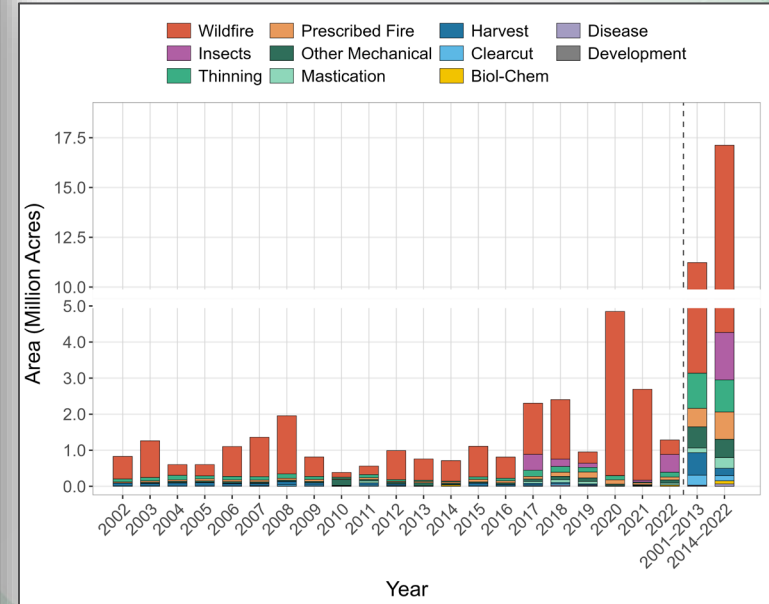
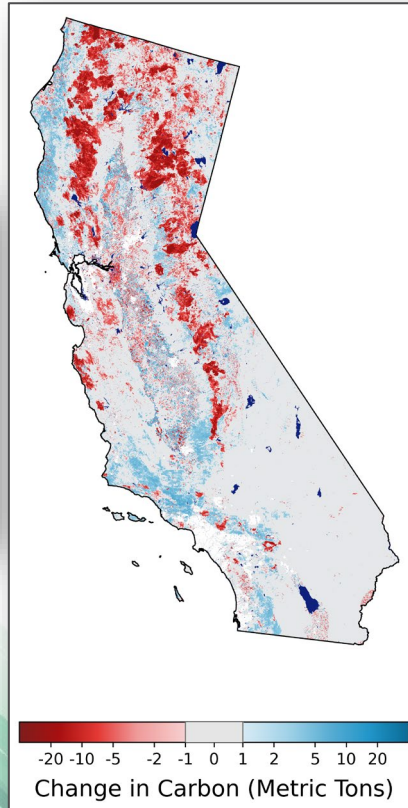
Despite a longer-term storage increase, during the final eight years of the inventory (2014-2022), California's lands decreased by about 4%



# Forest estimates were compared against several independent data sets, which showed similar patterns across California



# Increased wildfire activity and resulting landcover change were the main drivers for the loss of carbon stocks after 2014



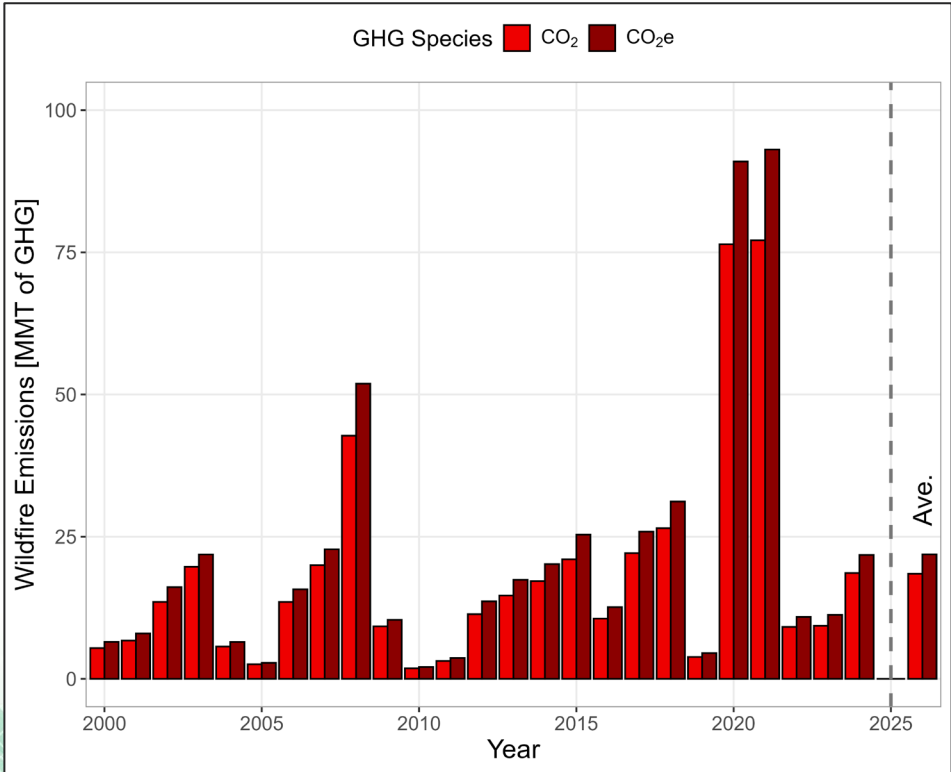
# Wildfire and Forest Management Reporting for SB 901

Senate Bill (SB) 901 – Wildfires (Dodd, 2018)

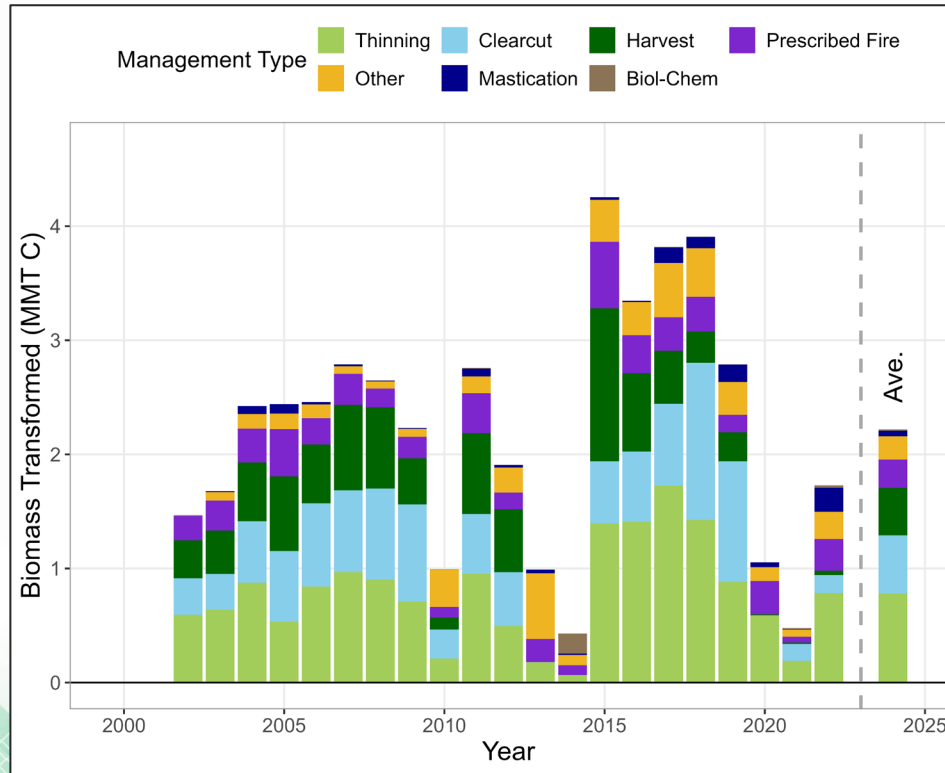
Directs CARB to prepare “every five years.. ...a report that assesses greenhouse gas emissions associated with wildfire and forest management activities.”

- Last report published on Dec 31, 2020
- This report addresses forests, shrublands, and grasslands

# Emissions from wildfires vary from year to year

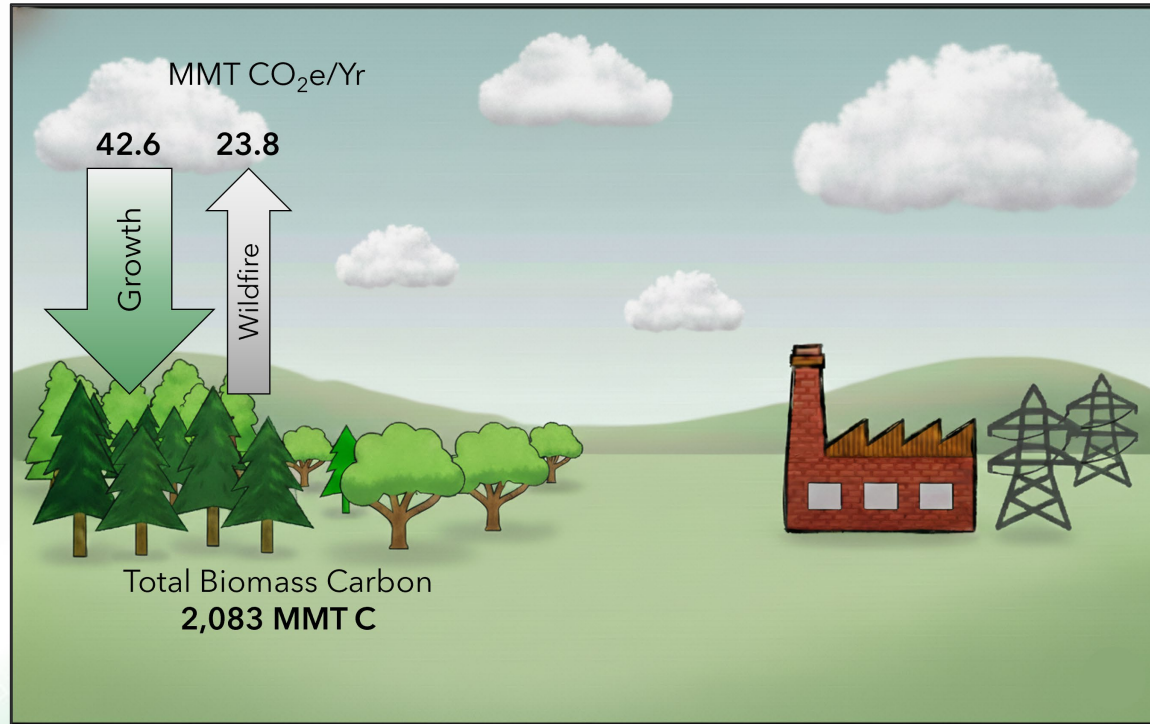


# Effects of vegetation management are also variable



# Emissions from wildfire are ~half of plant growth\*

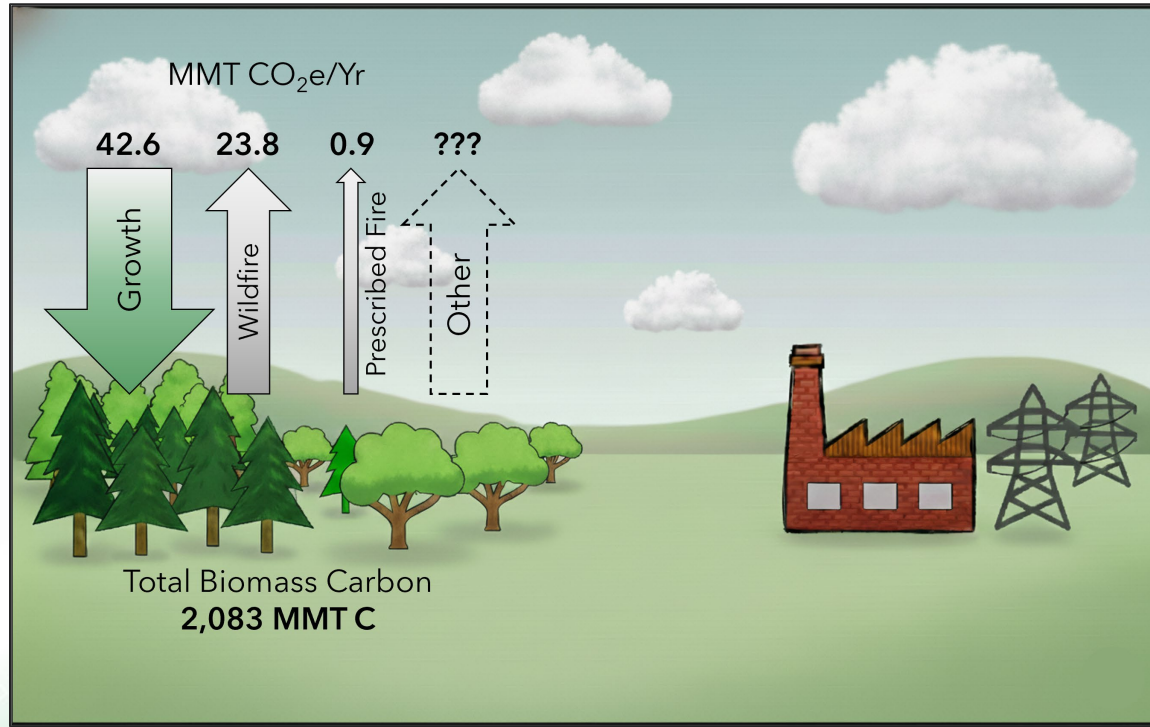
2001 to 2022



\*though wildfire emissions exceeded growth in severe fire years like 2008, 2020, and 2021

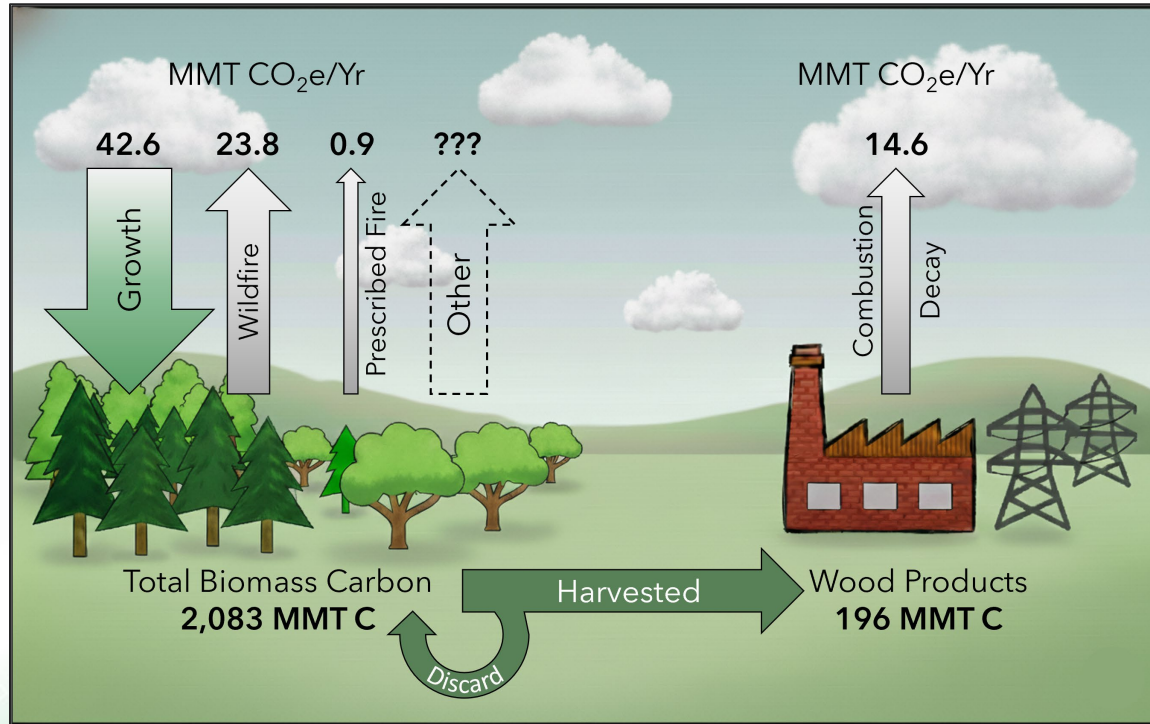
# There is more to emissions than just growth and wildfire

2001 to 2022



# Timber harvesting and the fate of wood products

2001 to 2022



# More information can be found on our website

The screenshot shows the California Air Resources Board (CARB) website. At the top, there is a navigation bar with social media icons, a search bar, and language options (English, Español). Below the navigation bar is the CARB logo and a menu with links: ABOUT, OUR WORK, RESOURCES, SERVICES, RULEMAKING, NEWSROOM, and EQUITY. The main heading is "2025 Natural and Working Lands Carbon Inventory Update".

Under the heading, there is a section for "Nature Based Strategies" with a list of resources:

- About
- Resources
- The Natural and Working Lands Carbon Inventory
  - 2020 SB 901 Report: Effects of Wildfire, Prescribed Fire and Forest Management on Carbon Stocks and GHG
  - 2018 Natural and Working Lands Carbon Inventory
  - 2025 Natural and Working Lands Carbon Inventory Update
- AB 1757: Tracking and Assessing the Effects of Land Management
- Workshops & Meetings
- Subscribe

Two figures are displayed:

(A) Carbon Stocks by Land Type: A donut chart showing the distribution of carbon stocks across different land types. The total carbon is 4,953 MMT. The data is as follows:

Land Type	Percentage
Forest Land	56.4%
Shrubland	15.8%
Grassland	7.5%
Developed Land	6.1%
Cropland	5.6%
HWP	3.8%
Other Land	2.4%
Wetland	2.4%

(B) Carbon Change over Time: A map of California showing the change in carbon stocks over time. A legend indicates the change in carbon in Metric Tons, ranging from -20 to 20. The map shows significant carbon loss (red) in the northern and central regions and carbon gain (blue) in the southern regions.

# There is a LOT more than just the main report

- CARB 2025 Natural and Working Lands Carbon Inventory
- Appendix A: Effects of Fire and Forest Management
- Appendix B: Technical Documentation
- Appendix C: Supporting Results
- CARB 2025 NWL Carbon Inventory Main Report: figure data
- Appendix A: figure data
- Appendix B: figure data
- Appendix C: Statewide figure data
- Appendix C: Forest figure data
- Appendix C: Shrubland figure data
- Appendix C: Grassland figure data
- Appendix C: Other Lands figure data
- Appendix C: Wetlands figure data
- Appendix C: Croplands figure data
- Appendix C: Developed Lands figure data
- Appendix C: Harvested Wood Products figure data
- Aggregated Carbon Inventory Data

# Inventory data is easily accessed through pivot tables

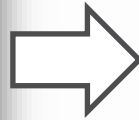
NWL\_Carbon\_Inventory\_2025\_master\_data\_table

Search for tools, help, and more

File Home Insert Share Page Layout Formulas Data Review View Help

M9

	A	B	C	D	E	F	G	H
1	Year	County	Air District	Ownership	Region	Ecoregion	Land Cover	Biomass Carbon IS
2	2001	Alameda	BAY AREA A	City	San Franci	Central Ca	Cropland	0
3	2001	Alameda	BAY AREA A	City	San Franci	Central Ca	Forest Land	93.07092953
4	2001	Alameda	BAY AREA A	City	San Franci	Central Ca	Grassland	77.39314869
5	2001	Alameda	BAY AREA A	City	San Franci	Central Ca	Developed L	0.930233002
6	2001	Alameda	BAY AREA A	City	San Franci	Central Ca	Shrubland	0
7	2001	Alameda	BAY AREA A	City	San Franci	Central Ca	Cropland	0
8	2001	Alameda	BAY AREA A	City	San Franci	Central Ca	Forest Land	29981.88102
9	2001	Alameda	BAY AREA A	City	San Franci	Central Ca	Grassland	4231.584827
10	2001	Alameda	BAY AREA A	City	San Franci	Central Ca	Other Land	0.410876788
11	2001	Alameda	BAY AREA A	City	San Franci	Central Ca	Developed L	71.36402185
12	2001	Alameda	BAY AREA A	City	San Franci	Central Ca	Wetland	12.2964747
13	2001	Alameda	BAY AREA A	City	San Franci	Central Ca	Open Water	0
14	2001	Alameda	BAY AREA A	City	San Franci	Central Ca	Shrubland	402.5881872
15	2001	Alameda	BAY AREA A	City	San Franci	UNDEFINE	Cropland	0
16	2001	Alameda	BAY AREA A	City	San Franci	UNDEFINE	Forest Land	20.03636932
17	2001	Alameda	BAY AREA A	City	San Franci	UNDEFINE	Other Land	0

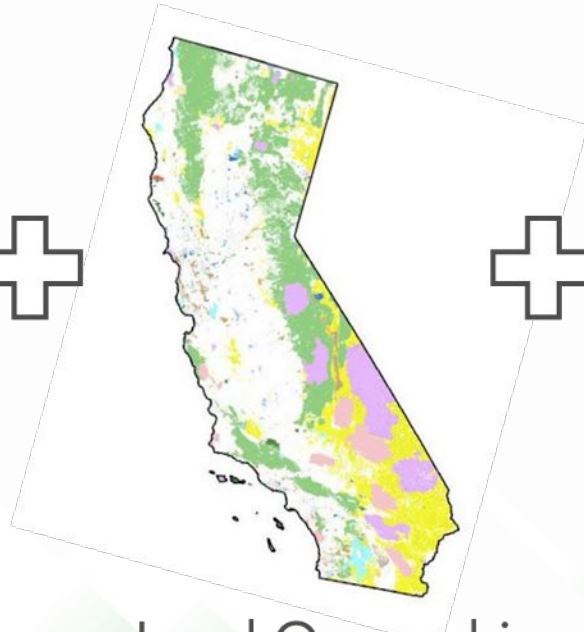


Air District		BAY AREA AQMD		
Year	Total Carbon (MMT)	Biomass Carbon (MMT)	Soil Carbon (MMT)	
2001.0	176.3	64.1	112.2	
2002.0	180.2	64.8	115.5	
2003.0	183.1	64.8	118.3	
2004.0	183.4	65.0	118.4	
2005.0	182.8	65.5	117.4	
2006.0	184.6	65.7	118.9	
2007.0	180.1	66.1	114.0	
2008.0	177.9	66.0	111.8	
2009.0	183.7	66.5	117.2	
2010.0	187.1	66.9	120.2	
2011.0	184.3	67.7	116.6	
2012.0	196.9	72.3	124.6	
2013.0	182.2	69.0	113.3	
2014.0	191.2	69.7	121.5	
2015.0	194.3	69.2	125.1	
2016.0	199.3	70.0	129.2	
2017.0	189.5	67.6	121.9	
2018.0	198.1	72.4	125.7	
2019.0	196.8	69.2	127.6	
2020.0	184.7	65.6	119.1	
2021.0	190.3	66.0	124.2	
2022.0	187.9	70.3	117.6	

# Inventories are available for each county, air district, and region



Land Cover



Land Ownership



Counties



EcoRegions

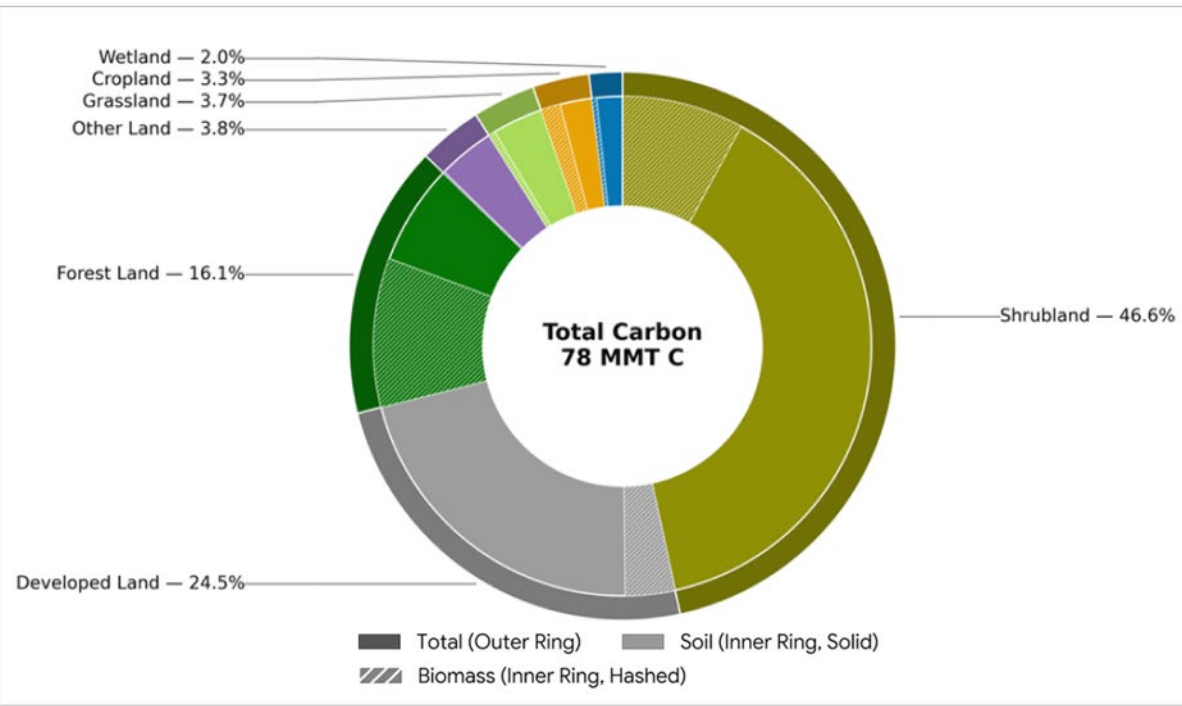


Air Districts

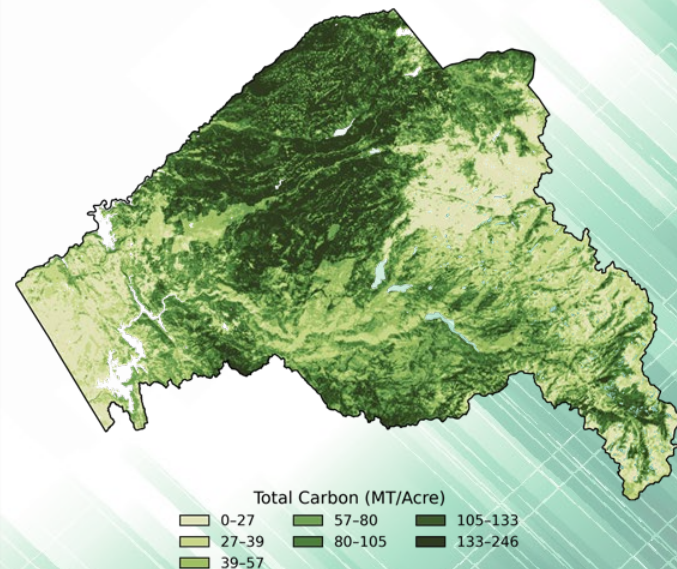
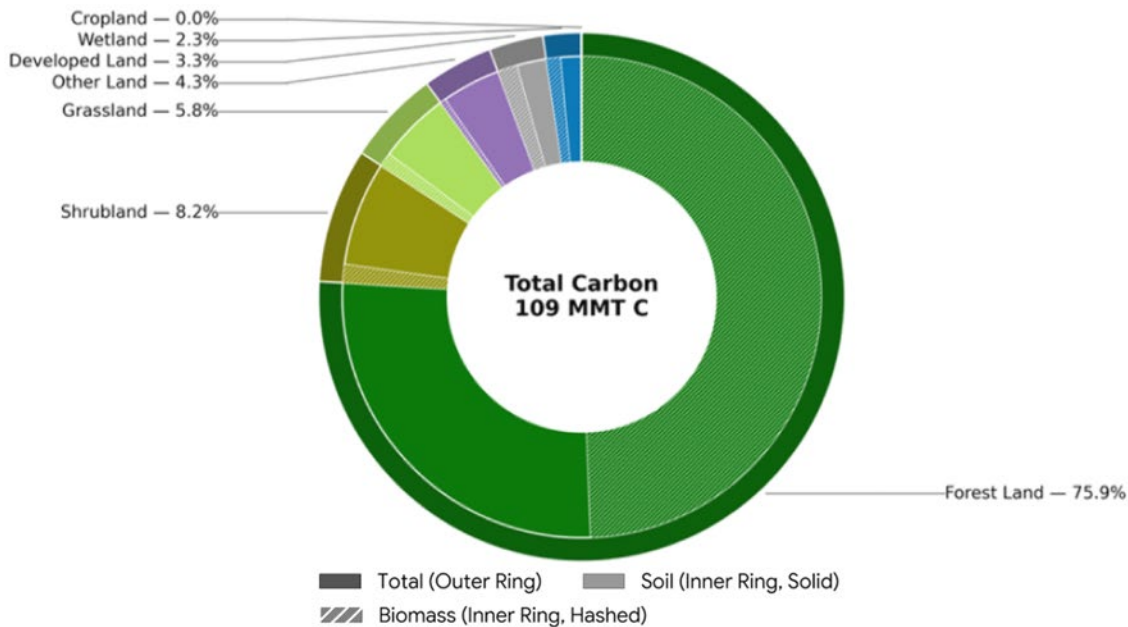


Regions

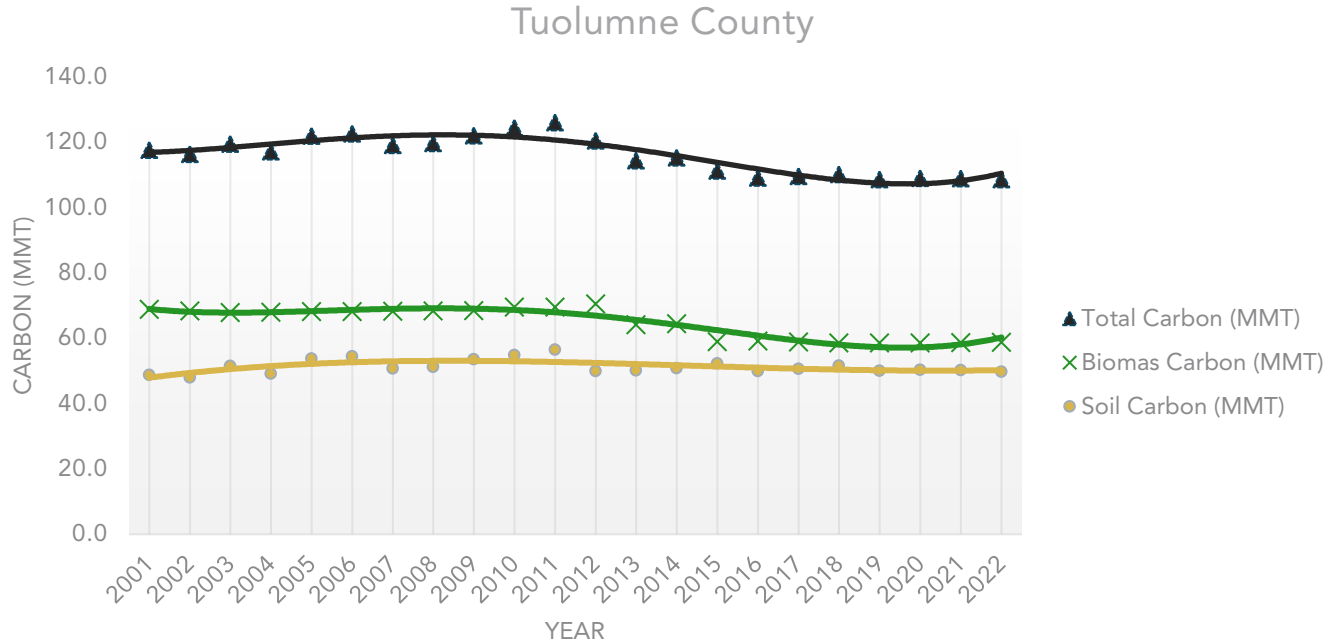
# Inventory data is tailored to your region (San Diego County 2022)



# Inventory data is tailored to your region (Tuolumne County 2022)

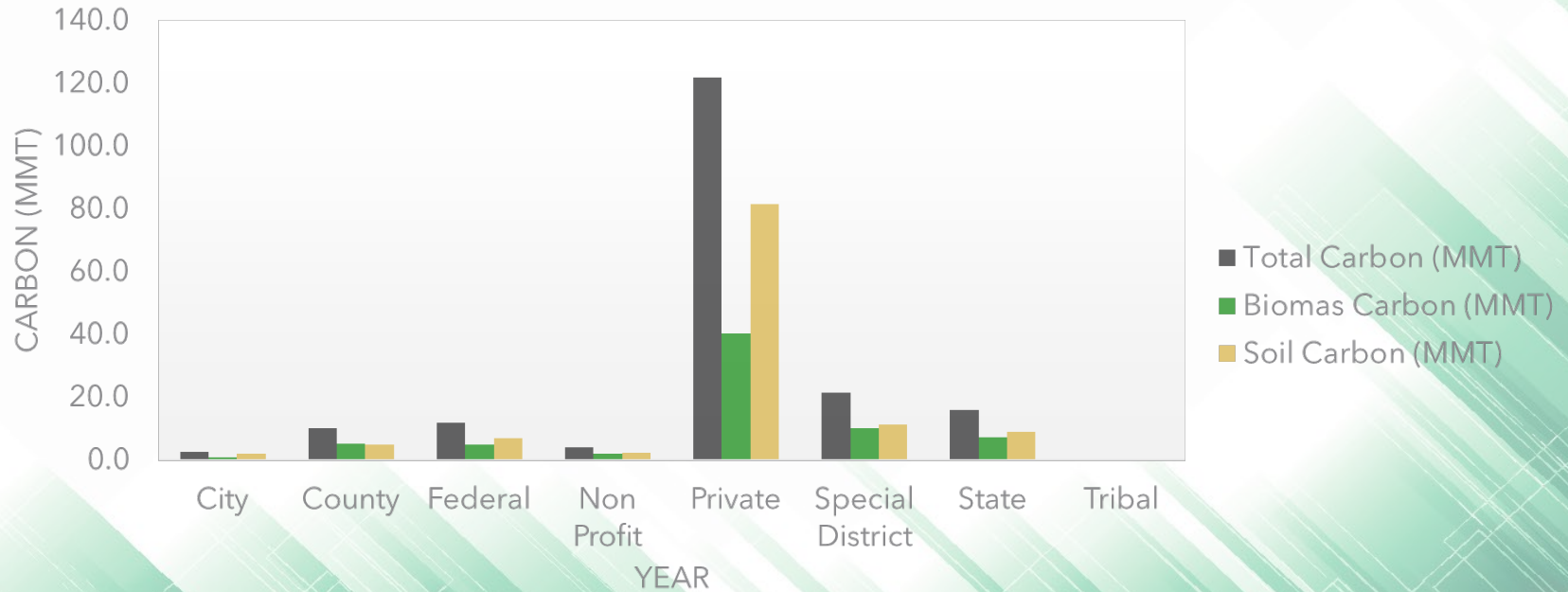


# Carbon stocks are tracked over time



# Carbon stocks are tracked across land ownerships

Bay Area AQMD (2022)



# How to share a comment or question

Limit questions/comments to under 2 minutes

During the meeting:

- Verbal Questions? → Raise your hand
- Written Questions? → Use the Q&A feature

After the meeting:

- For Follow-up Questions → Email us at: [nbs@arb.ca.gov](mailto:nbs@arb.ca.gov)