

CSF ASCC Workshop: Historical Perspective and Carbon Potential

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And lots of help and expertise from the Colorado State Forest Service:

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Carolina Manriquez, Zach Wehr, Amanda West Fordham



Credit: Colorado State Forest Service

History of the Colorado State Forest

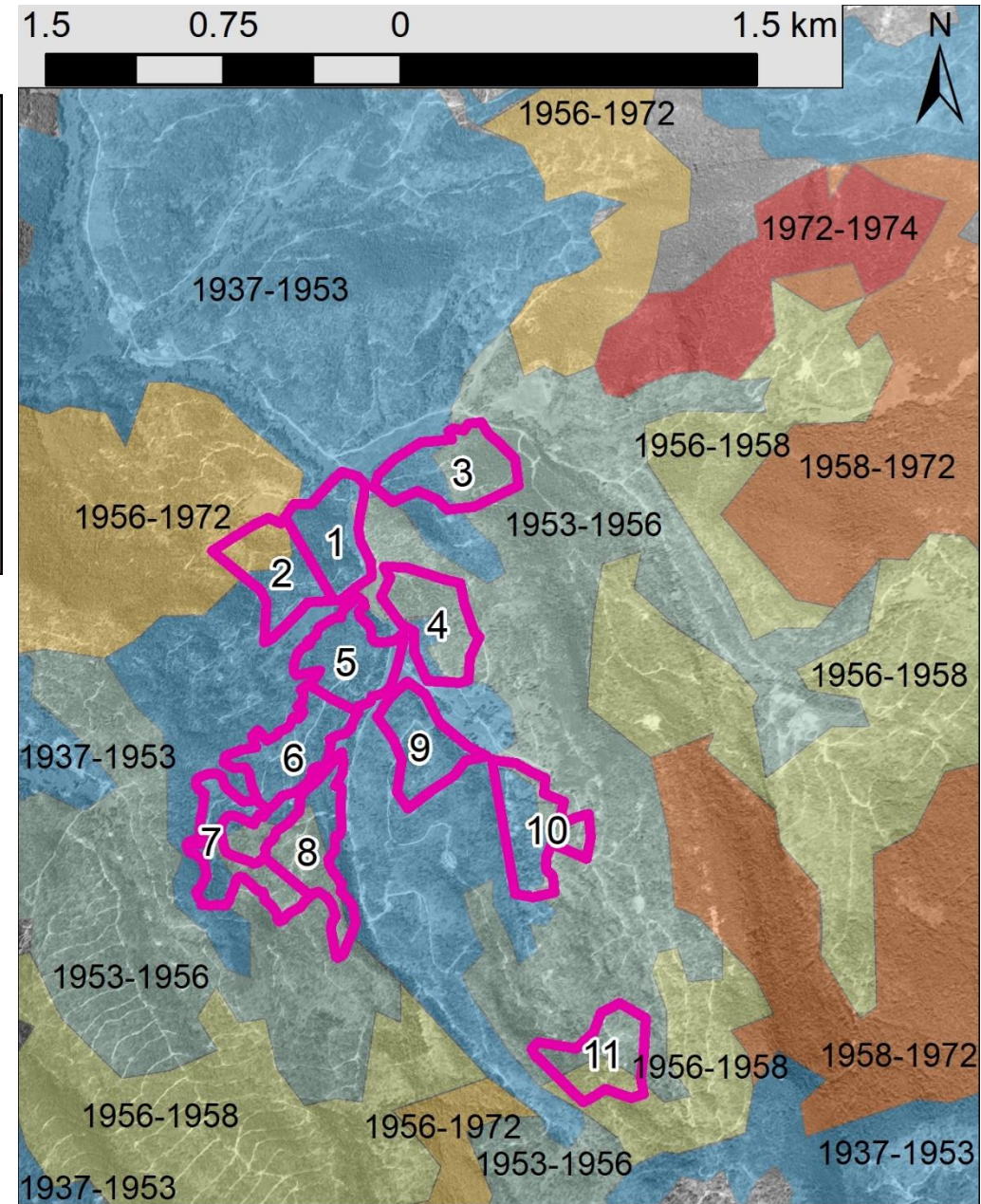
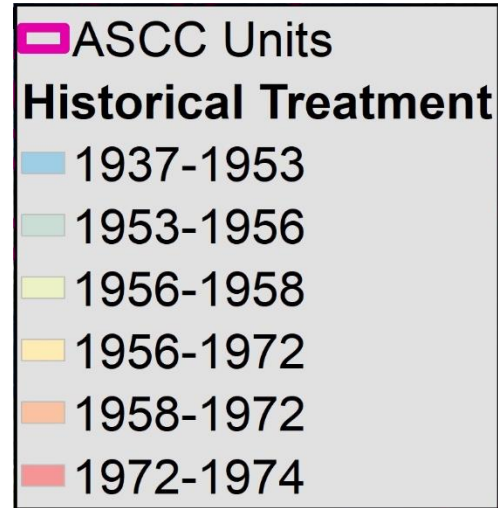
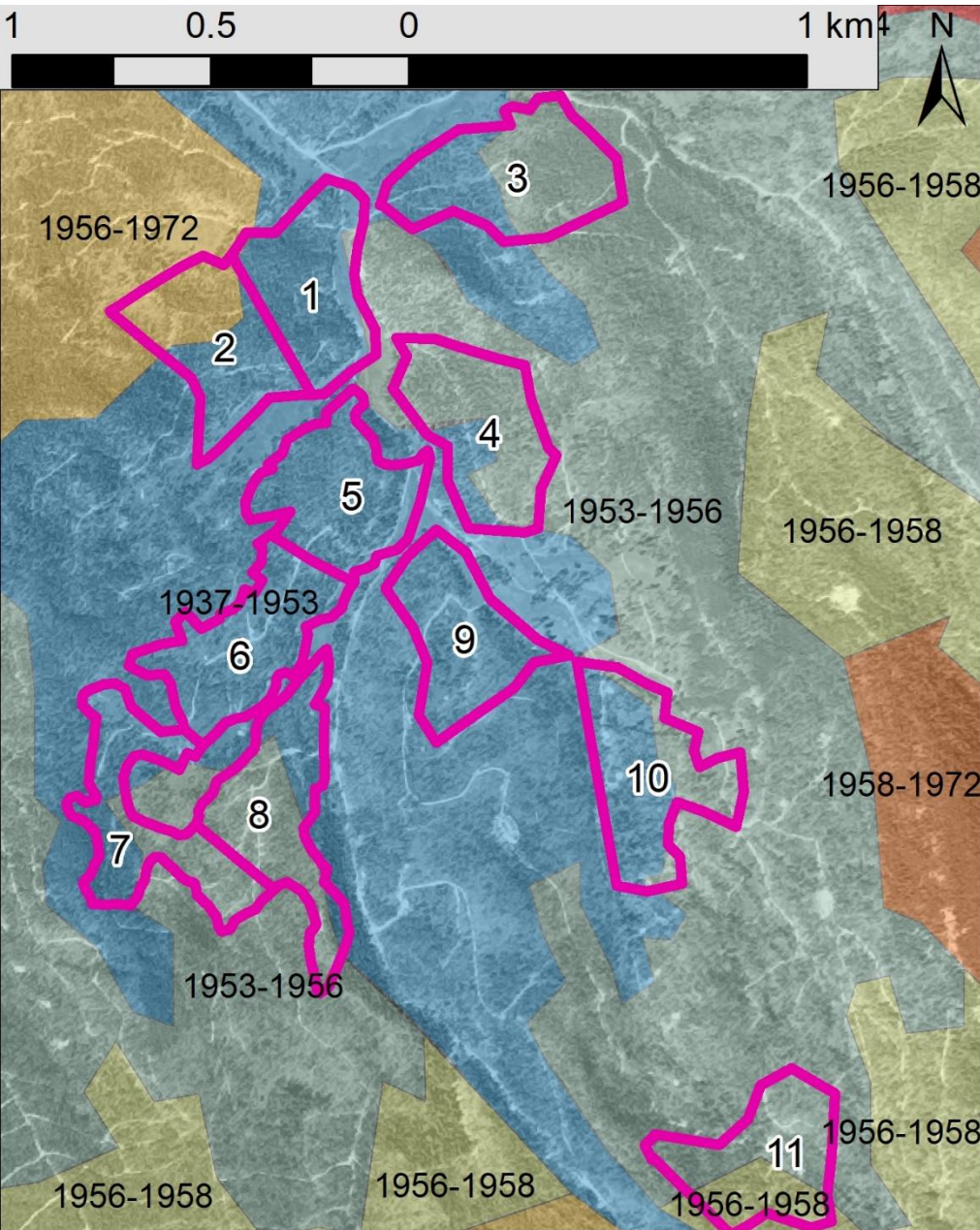
- Established in 1939 in swap of state school lands for USFS land
 - ~71,000 acres, Arapaho and Colorado NF
- Owned by State Land Board, revenues support schools and state infrastructure
- Managed for multiple uses:
 - Forestry
 - Overseen by State Land Board from 1939 to 1986
 - Colorado State Forest Service managed forest since 1986
 - Grazing, hunting, recreation, wildlife, water resource management

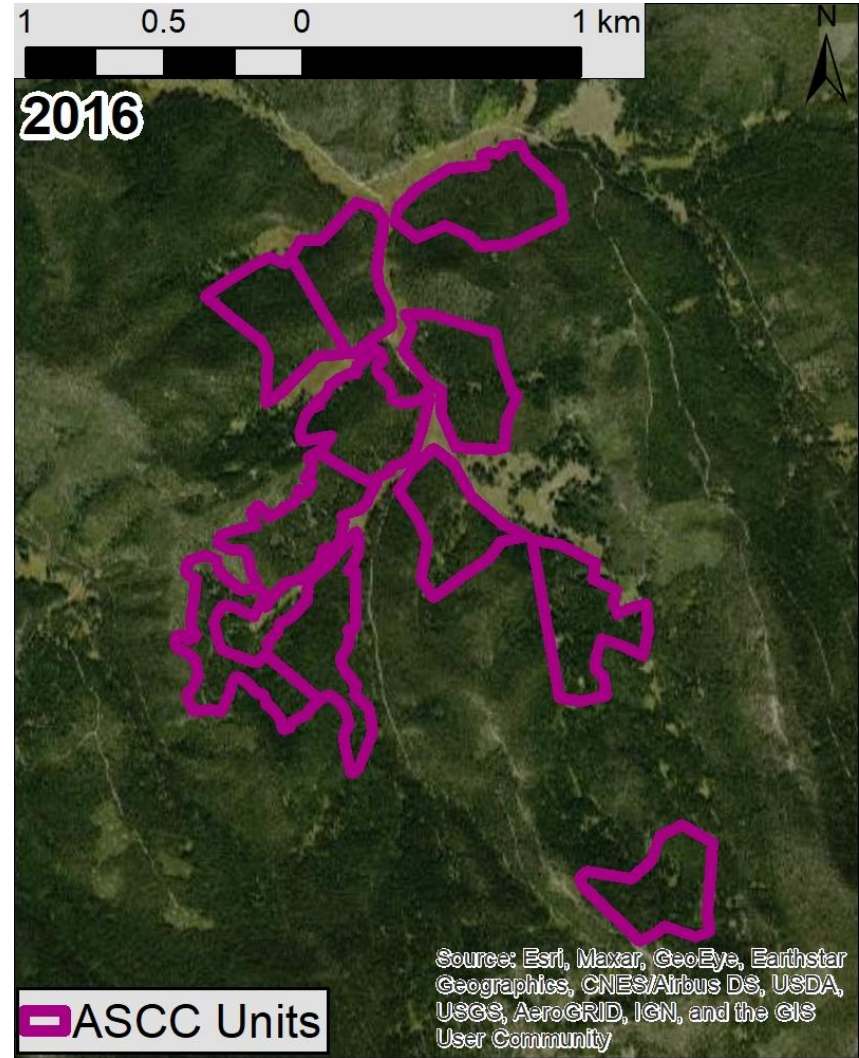
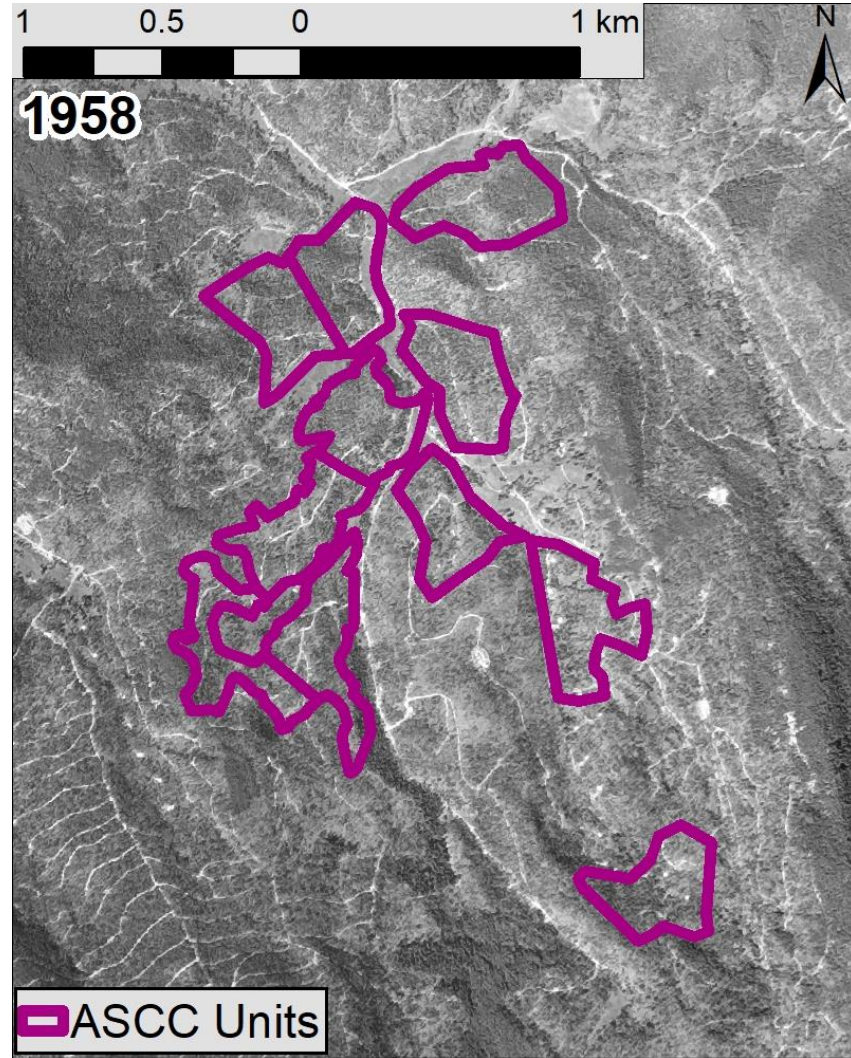
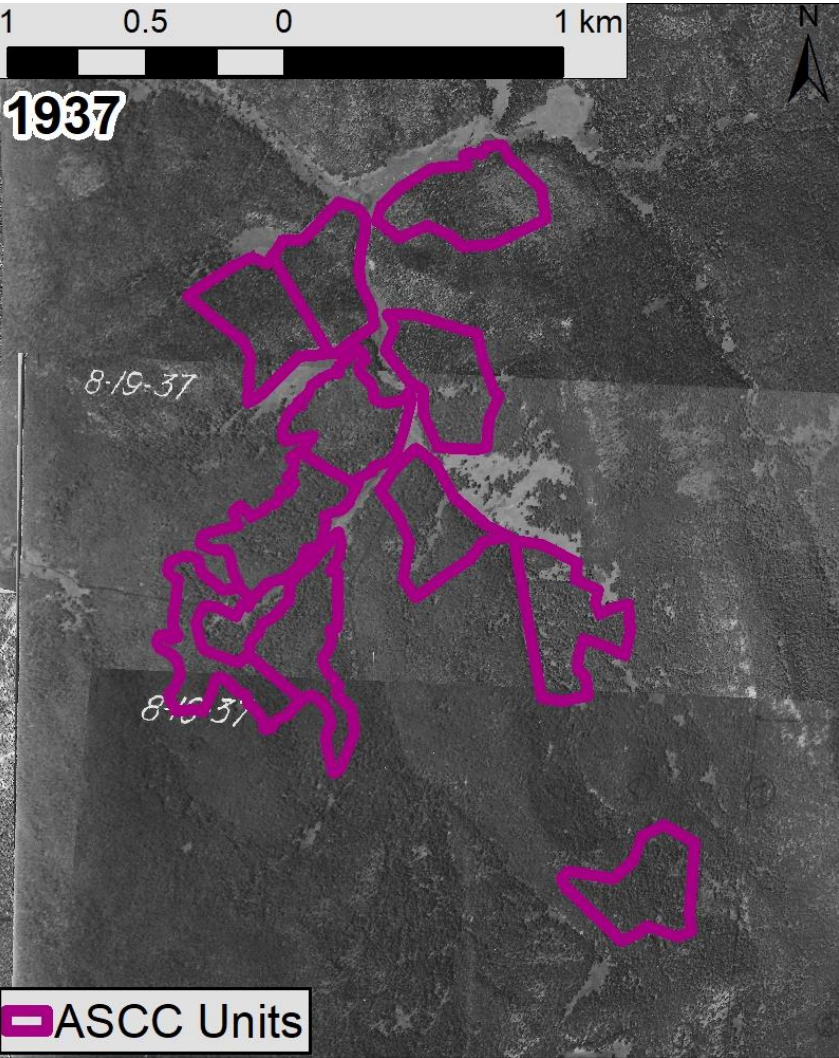


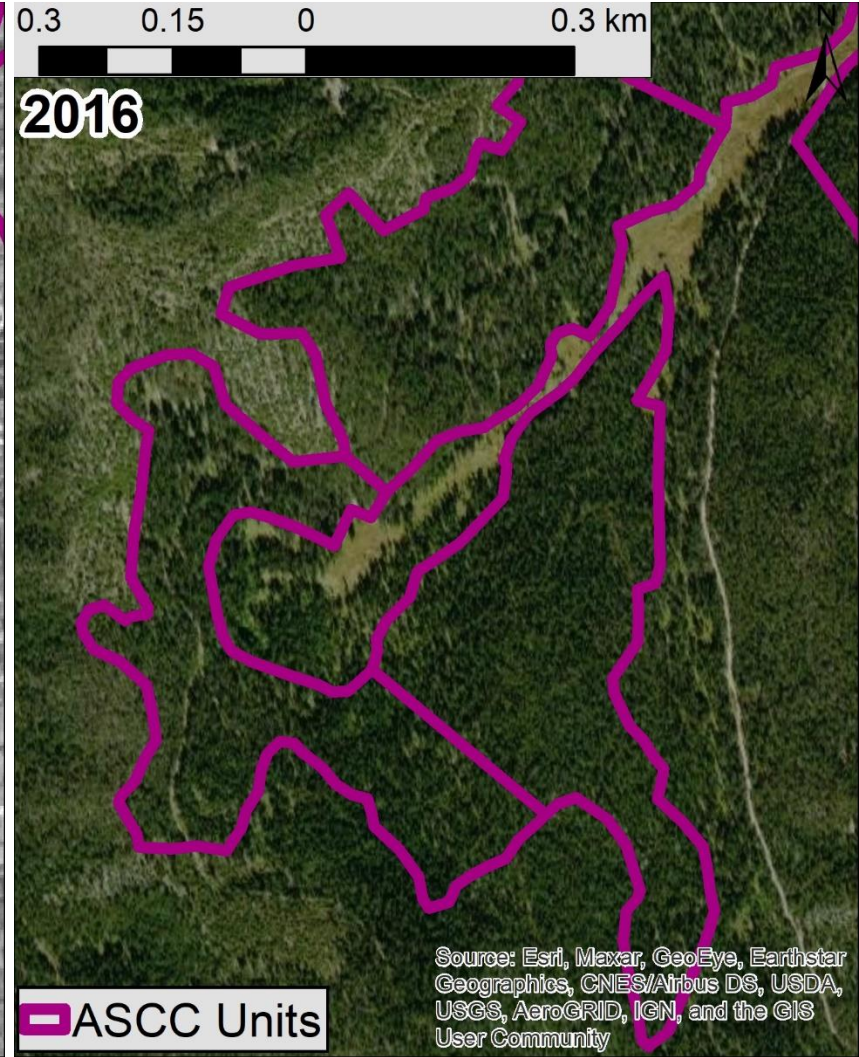
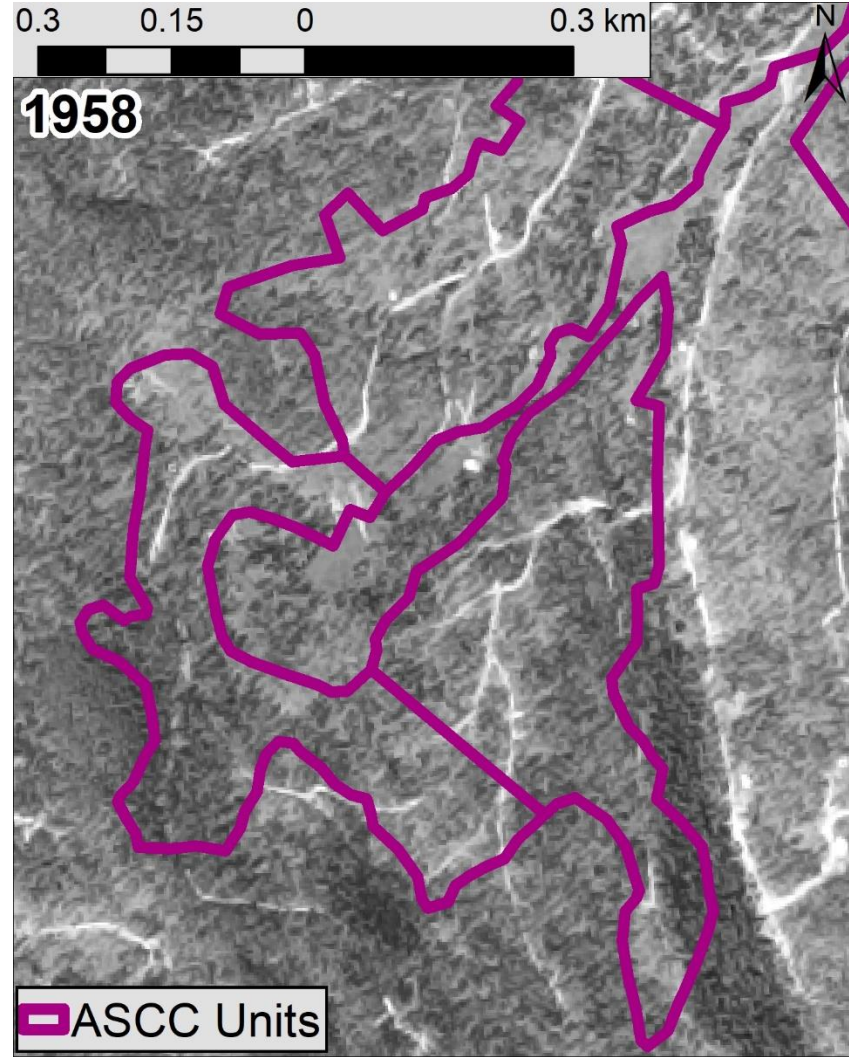
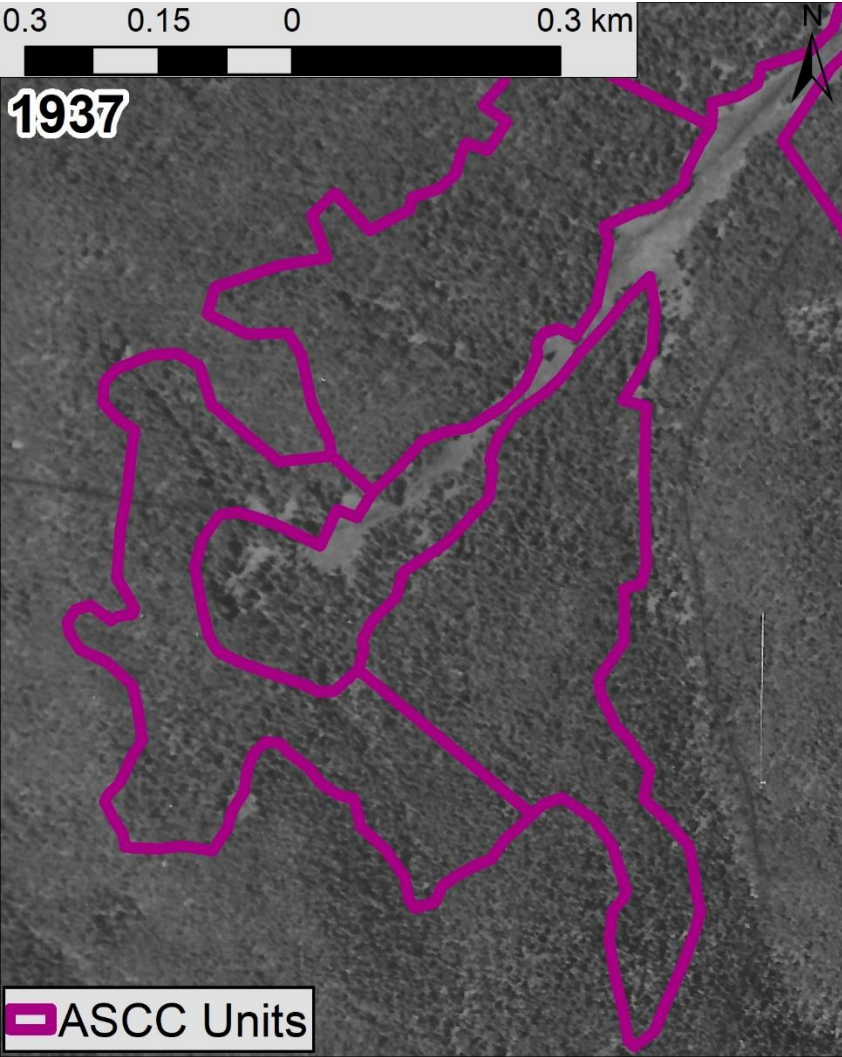
Log trucks in Gould, Colorado

Credit: Colorado State Forest Service

Most of area logged in 1940's and 1950's







Past management of ASCC Units

- Horse logged
 - Machinery only for road construction and loading
- Merchantable trees >11 inch dbh were harvested
- Left cull trees (commonly lodgepole pine with mistletoe)
- Post and pole harvested in some areas
- Mixed reports on the amount of fir cut
- Release of spruce and fir advanced regeneration



Horse logging on the State Forest

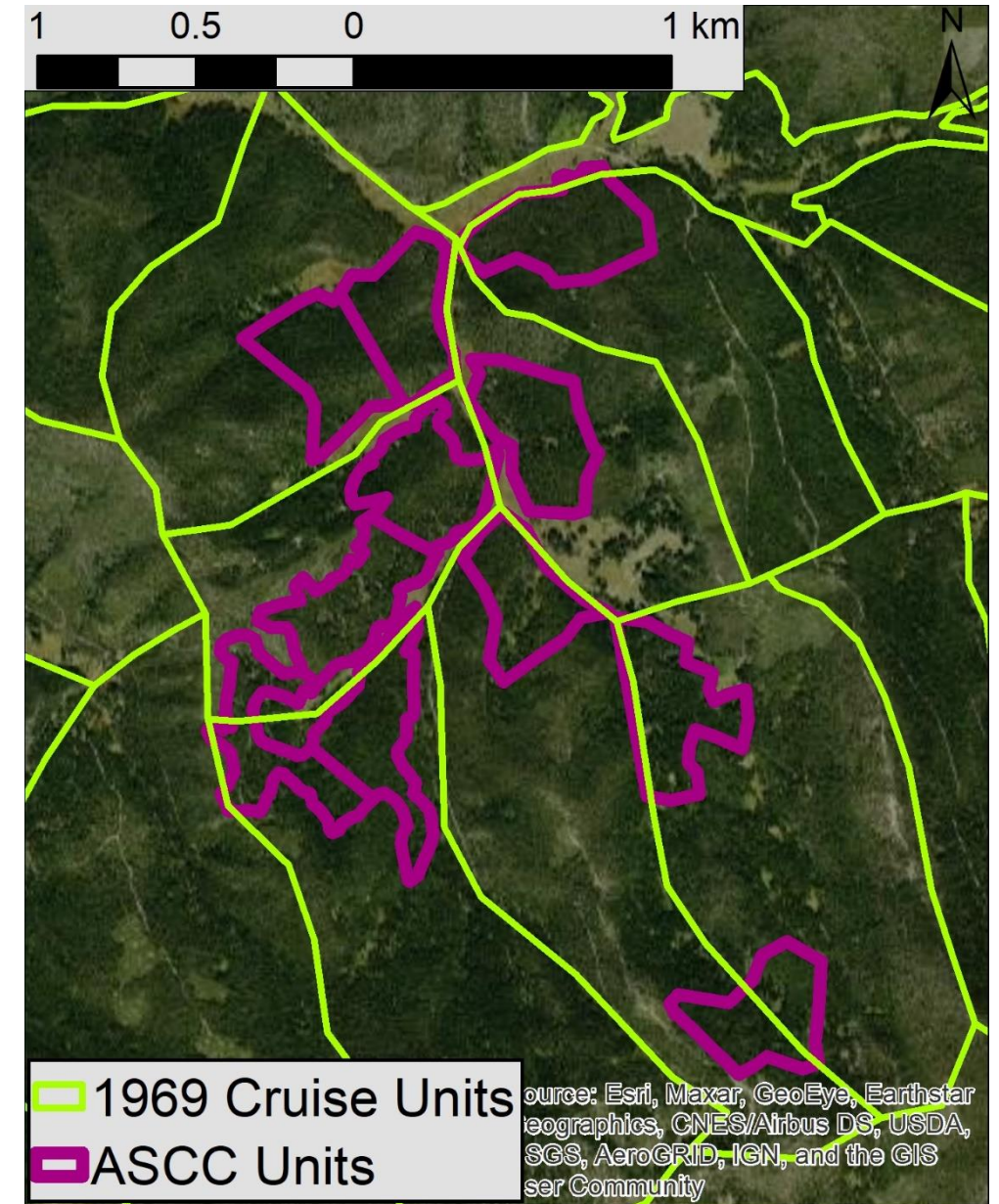
Credit: Colorado State Forest Service

1969 Cruise Data Available

STATE FOREST TIMBER CRUISE DATA 74 POINTS UNIT 36				344.8 ACRES
CRUISED JULY#AUG. 1969				
DIAM. CLASS	EXPANDED CORDS	VOLUMES CU.FT.	BD.FT.	
5-7	1409.8	112786.	--	
8-10	2951.7	236136.	--	
11-14	1118.2	89458.	401860.	
15-19	0.0	0.	0.	
20+	0.0	0.	0.	
TOTAL	5479.8	438380.	401860.	

(CORDS BASED ON 80 CU.FT. PER CORD)
DATA ANALYSIS BY D.L. BROWN, STAFF FORESTER CSFS

T	S	K	T	V	C	GROSS VOLUME /A./ TREE	NET VOLUME /A./ TREE	RGS PER IN.	BASAL AREA		S	A
R	P	I	D	O	I				U	PER	PER	L
E	E	N	B	H	G	L	BDFT	CUFT	11+	5+	O	P
E	C	D	H	T	R	L						
L	1	3	1	0	0	0						
2	1	3	1	11	50	3	1737	484				
2	2	3	1	10	40	2		376				320
3	1	3	1	10	40	1		376				357
4	1	6	1	8	40			342				325
4	2	3	1	6	20	3		114				91
5	1	3	1	7	60	3		547				520
5	2	3	1	11	60	3	2197	575				403
5	1	5	1	6	50			434				412
5	2	3	1	8	60	4		562				450
5	3	3	1	10	50	3		478				454
5	4	6	1	5	30			378				378



Historical Treatments

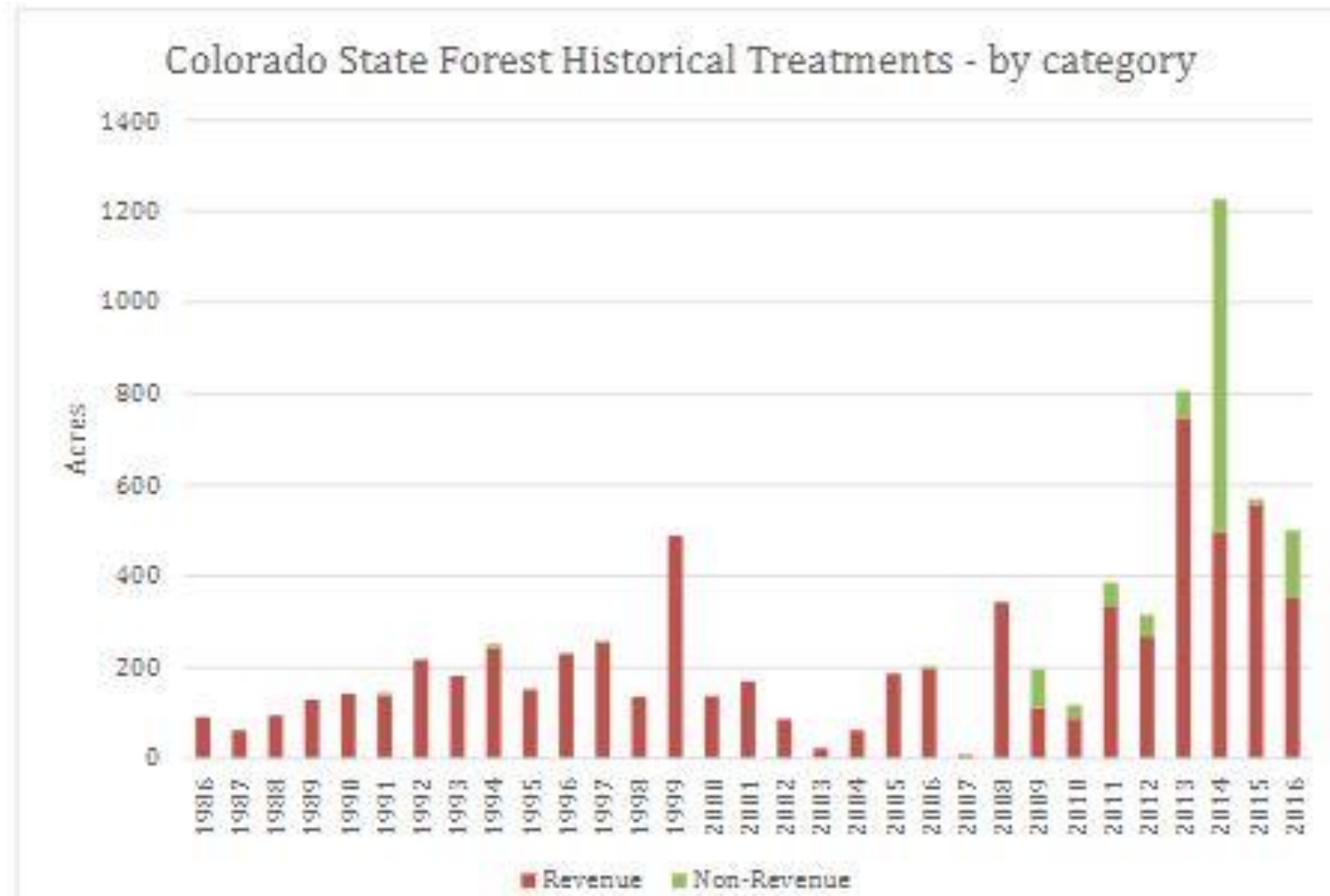


Figure 3. CSF Historical Treatments (by category)

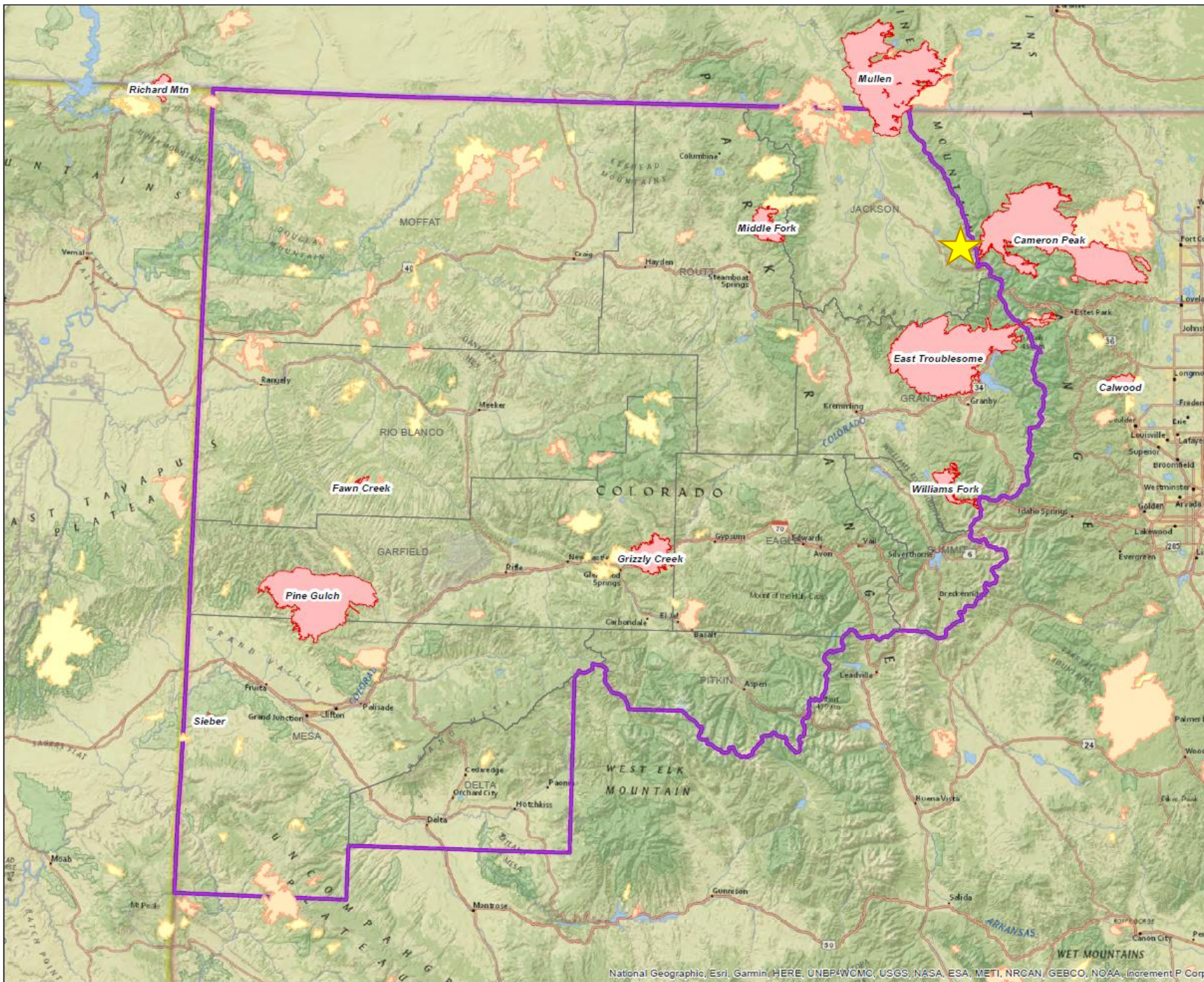
A photograph of a forest with tall, thin trees. The ground is covered in green vegetation. A person is visible in the background on the left, and another person is visible on the right. The text "Other disturbances: Fire and bark beetles" is overlaid in white.

Other disturbances: Fire and
bark beetles

Fire history

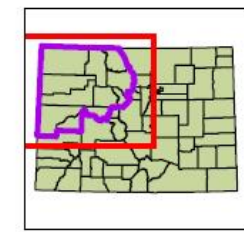
- Fire
 - Inventories show most trees are 80-140 years old
 - Historical accounts of fire in Michigan drainage in late 1800s
 - 2,000 - 3,000 acre fires of mixed severity affected most stands on forest over 40 year period in late 1800s. (~1860-1900)
 - On ASCC sites
 - Trees aged 80-150 years old. Lodgepole is 70-80 years old. Spruce and fir 80-150 years old.

Historical Large Fires CSFS NW Area 2000 - 2020

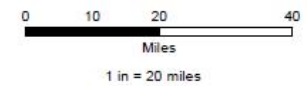


Legend

- 2020 Fires (>1,000 acres)
- 2010-2019 Fires (>1,000 acres)
- 2000-2009 Fires (>1,000 acres)
- NW Area Counties
- NW Area



Prepared By:
Colorado State Forest Service
Steamboat Springs Field Office
November 2, 2020

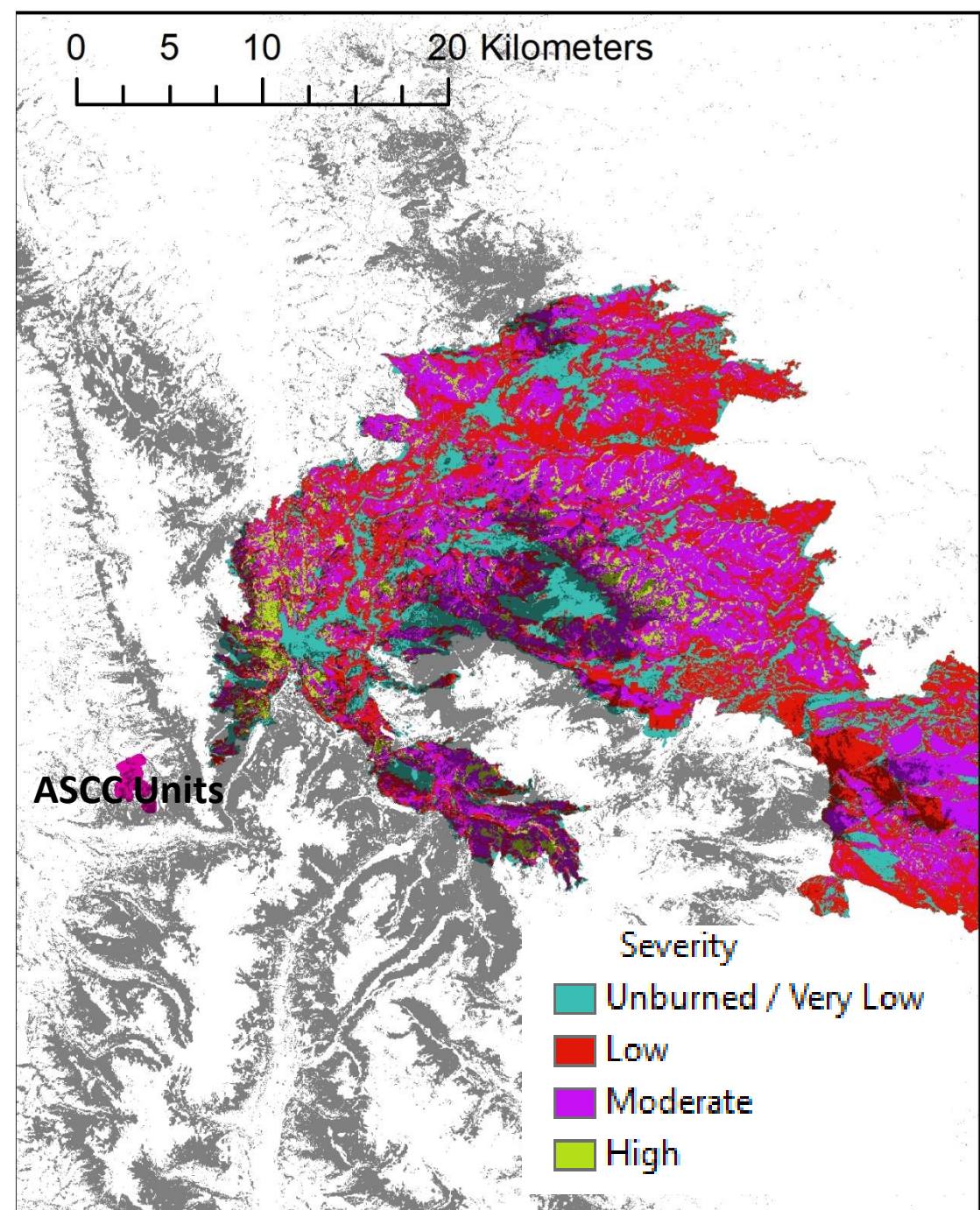


Datum: NAD 1983 UTM Zone 13N

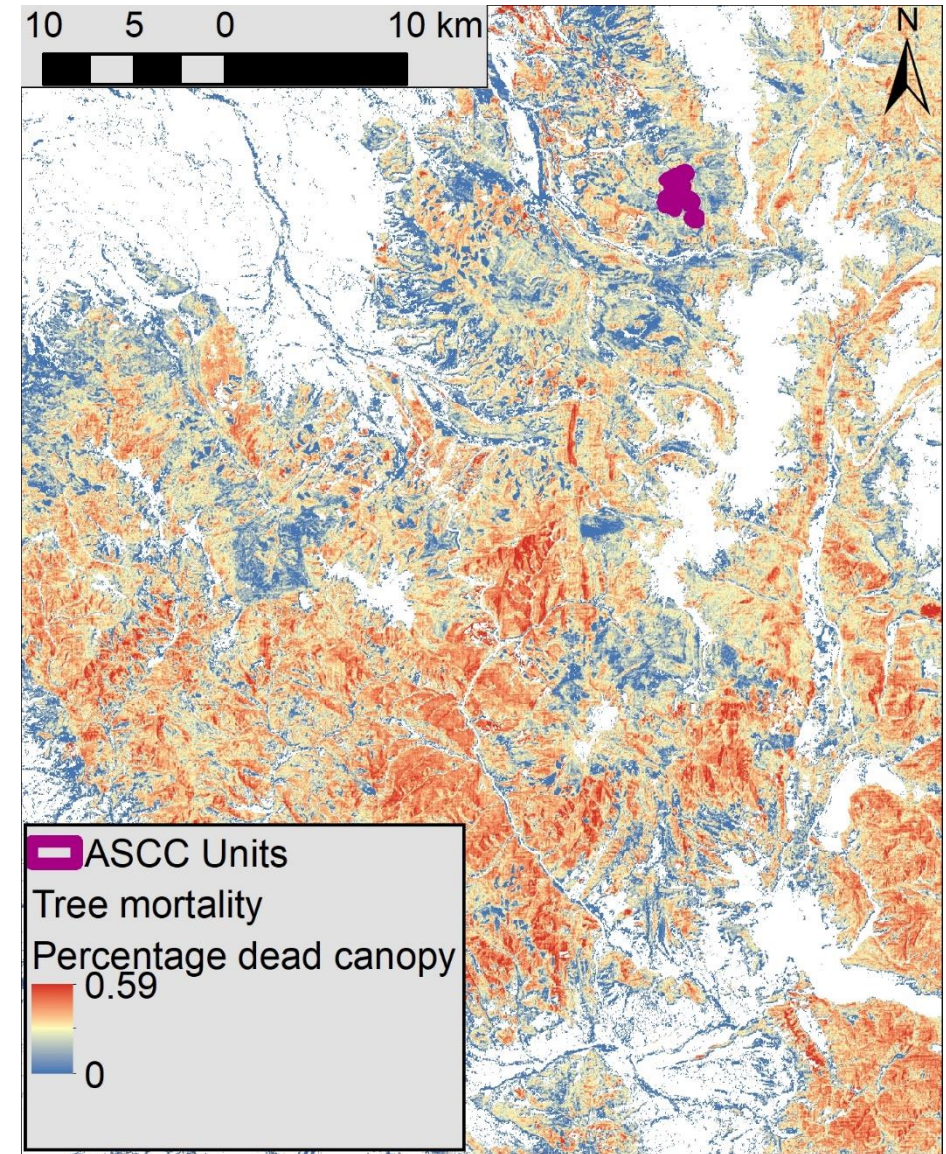
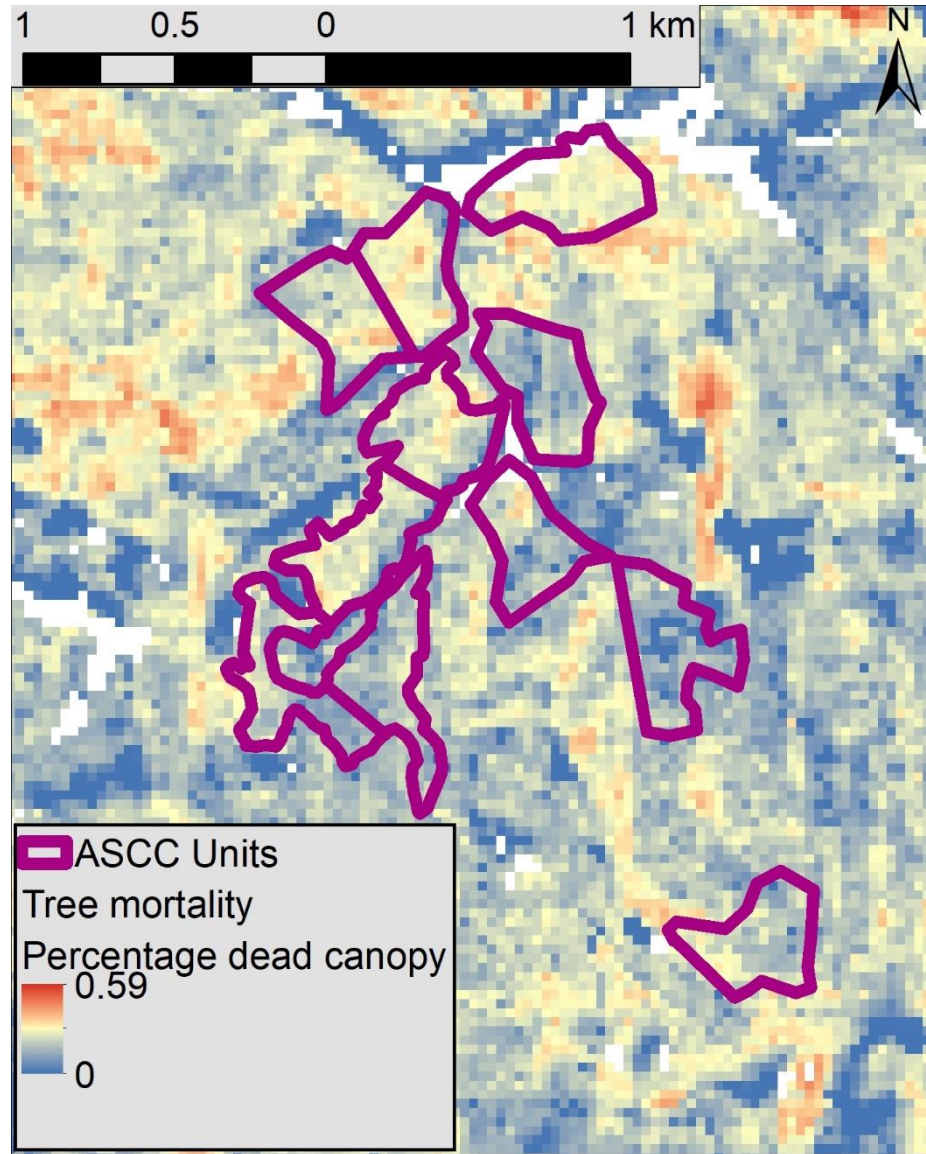


Cameron Peak Fire

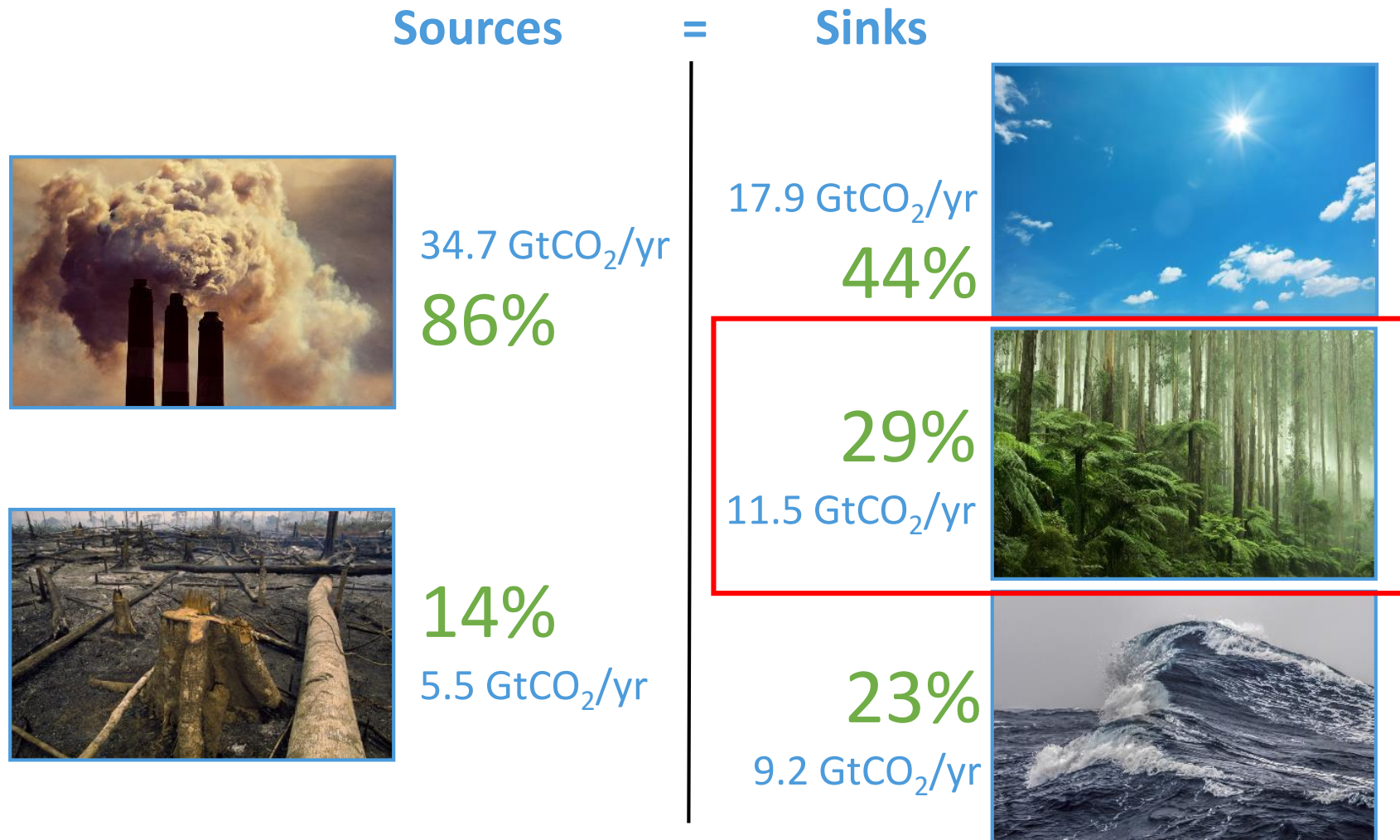
- Spruce fir forest type
 - 37,355 acres burned
 - Unburned/very low: 24%
 - Low: 27%
 - Moderate: 37%
 - High: 12%



Bark beetle caused tree mortality



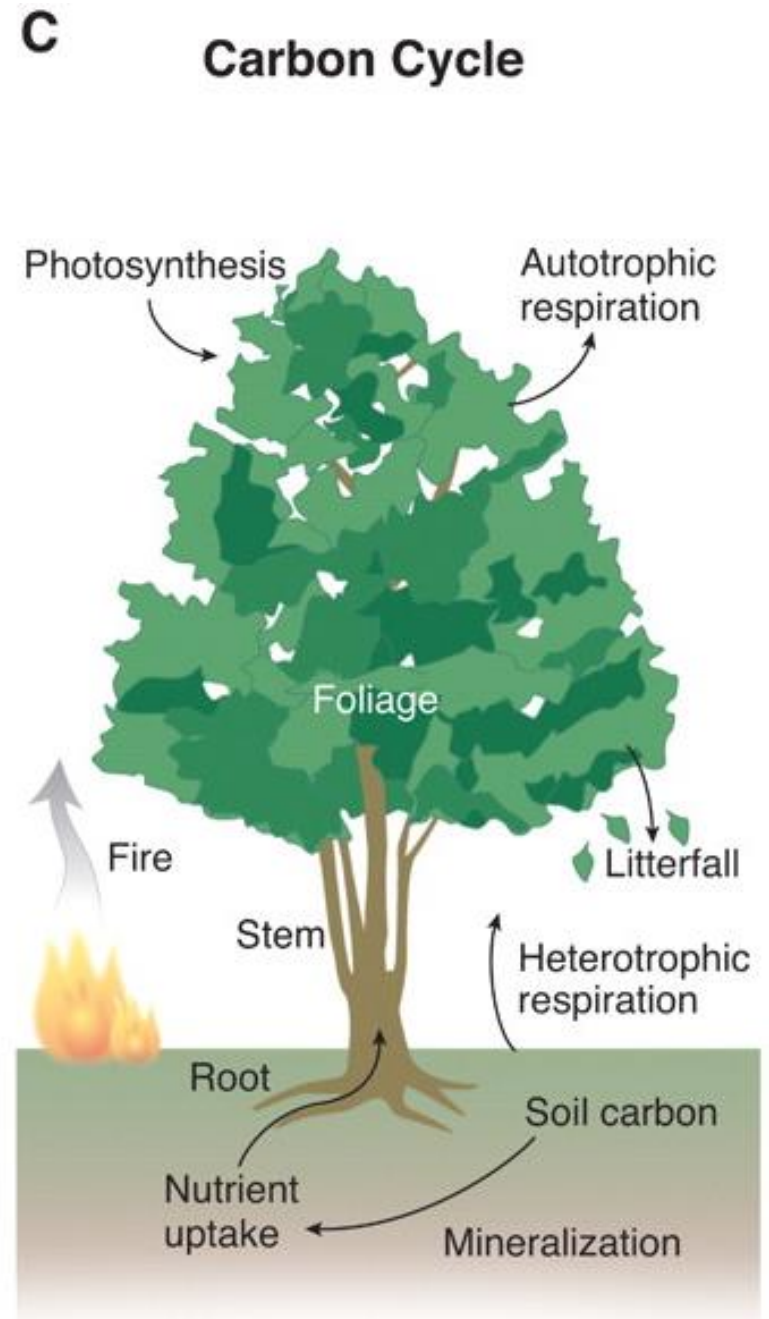
Global carbon cycle 2019



Budget Imbalance: 4%
(the difference between estimated sources & sinks) 1.6 GtCO₂/yr

Forest C Cycle overview

- Trees capture carbon through photosynthesis
- ~1/2 of biomass is carbon
- Disturbances, such as fire and bark beetles, impact the forest carbon cycle



Forest C Cycle overview

What role do forests play in the carbon cycle?

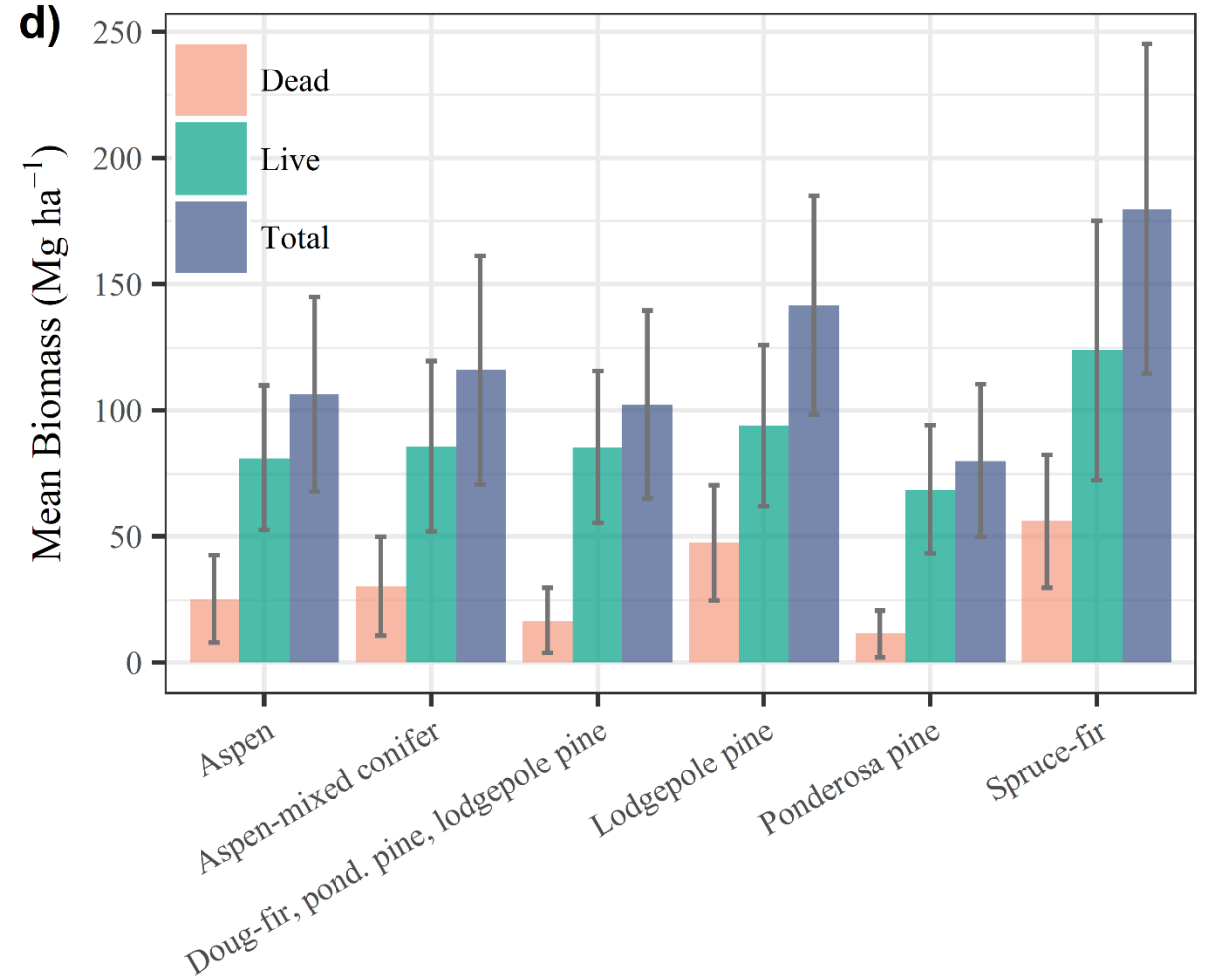
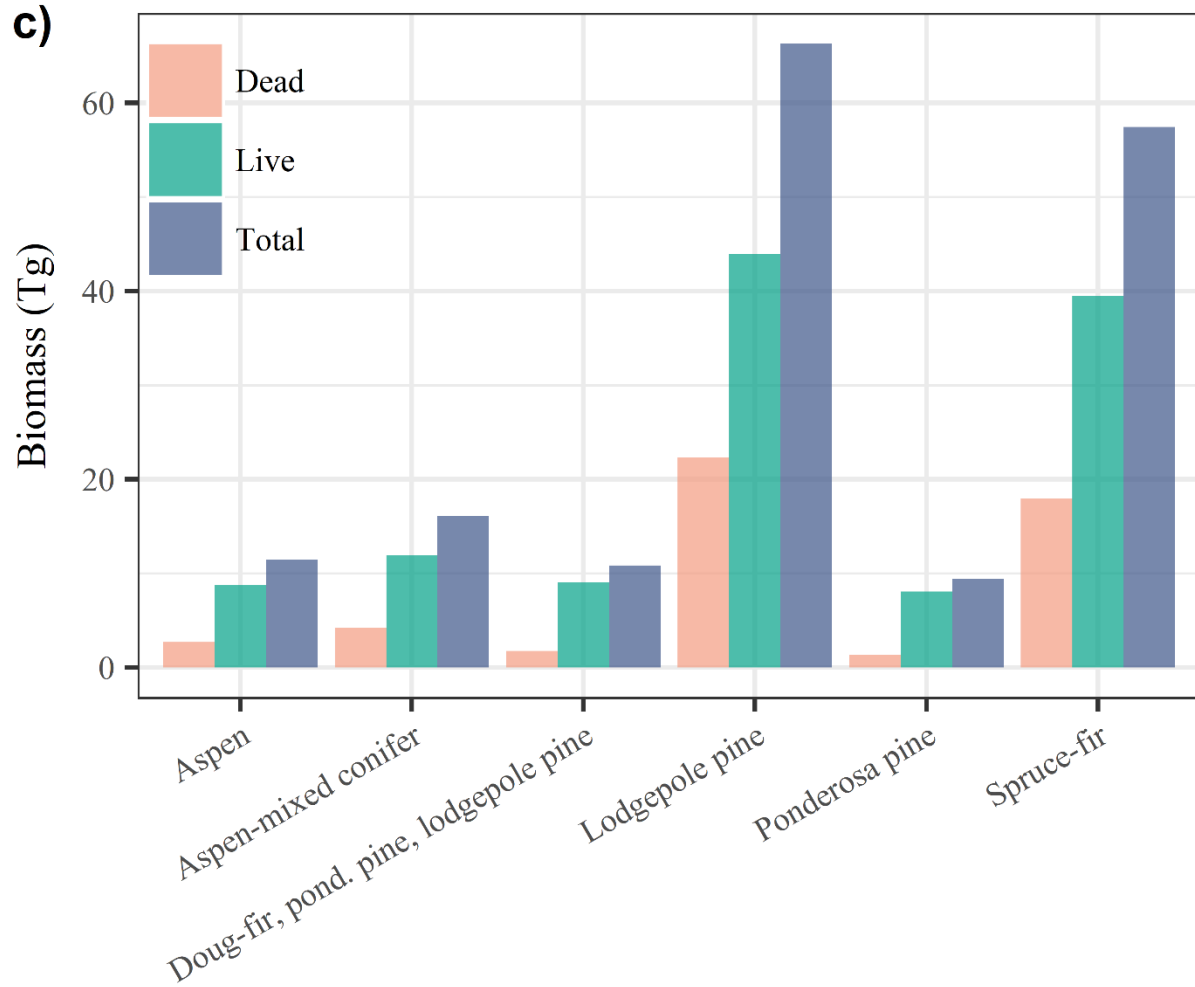
The "carbon cycle" is the movement of carbon from land and water through the atmosphere and all living things. Carbon in the atmosphere exists as CO₂, a greenhouse gas (GHG). Trees absorb carbon during photosynthesis and store it in their stems, branches and roots, removing large amounts of carbon from the atmosphere. A large proportion of this stored carbon also ends up in forest soil through natural processes such as annual leaf fall and tree death.



Trees release carbon back into the atmosphere during respiration, when they die and decay, and if they are burned in a forest fire. This dynamic process of absorbing and releasing carbon constantly affects Earth's carbon balance.

Forests are considered to be "carbon sinks" when they absorb more carbon than they release; and "carbon sources" when they release more carbon than they absorb. How humans manage forests and use wood also affects this balance.

Forest biomass by forest type



Thanks! And questions?