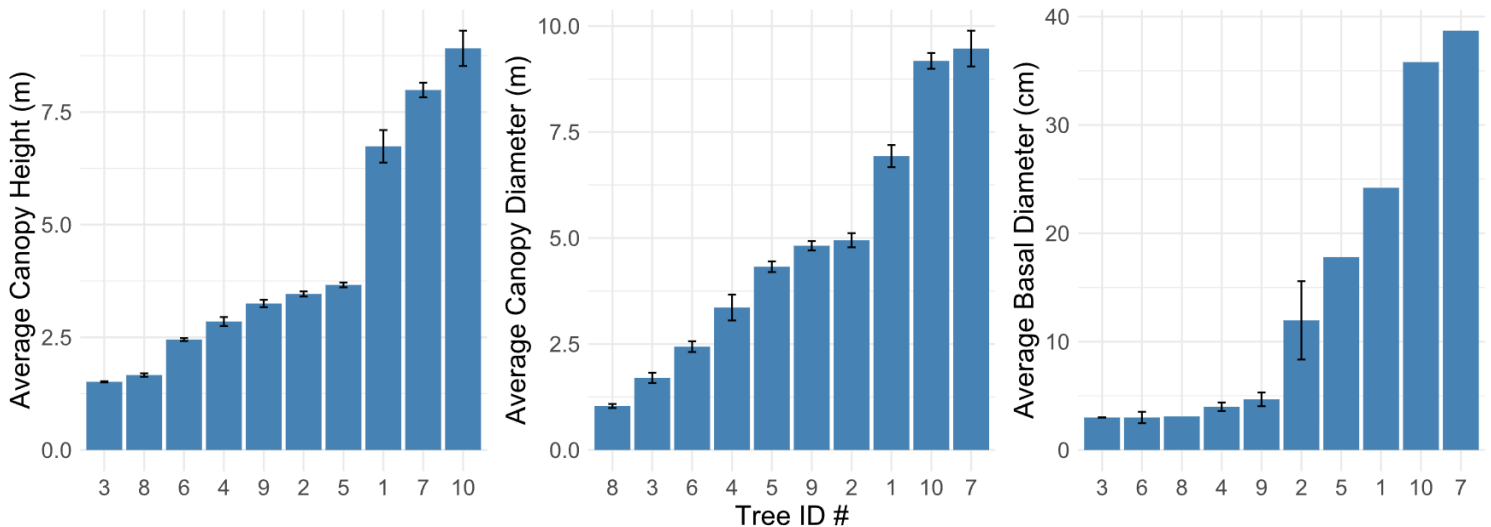


Field Update: 6/13/2025

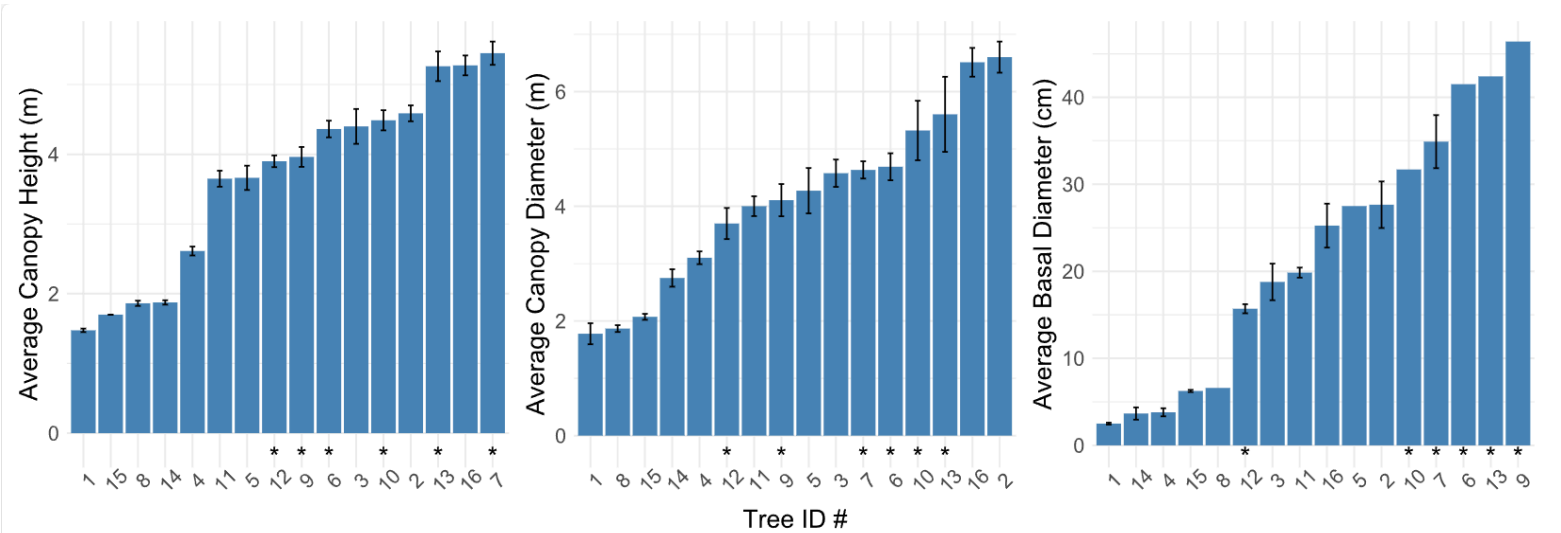
On June 7, 2025, we visited the US-SRG flux site (31.7894, -110.8277) and selected 10 trees within a 30-meter radius of the flux tower to capture a gradient of biometric characteristics, including variation in tree height, canopy diameter, basal diameter, and stem count. Each selected tree was marked with flagging tape. Many trees have additional flagging 1.6 meters to aid hypsometer calibration. Permanent metal identification tags still need to be installed. On June 12, 2025, we conducted a similar sampling at the US-SRM flux site (31.8214, -110.8661). We included 6 trees already equipped with dendrometers (*) and selected 10 additional trees to span a range of biometric attributes. Trees with basal diameters greater than 8 cm and accessible branches were tagged with metal labels, and all trees were marked with plastic flagging.

The table below summarizes the biometric measurements collected at both sites. Gradients in tree height, canopy diameter, and basal diameter are visualized to illustrate the distribution of selected individuals.

US-SRG Biometric Gradient Summary						
ID	Latitude	Longitude	Stem Count	Average Canopy Height (m)	Average Canopy Diameter (m)	Average Basal Diameter (cm)
1	31.78992	-110.82809	1	6.74	6.93	24.20
2	31.78969	-110.82817	3	3.46	4.95	11.97
3	31.78923	-110.82815	2	1.51	1.70	3.00
4	31.78918	-110.82787	7	2.85	3.36	3.99
5	31.78932	-110.8278	1	3.66	4.32	17.80
6	31.78917	-110.82757	5	2.45	2.44	3.00
7	31.78942	-110.82787	1	7.99	9.47	38.70
8	31.78955	-110.82722	1	1.66	1.04	3.10
9	31.7897	-110.82713	1	3.25	4.82	4.68
10	31.78954	-110.82777	1	8.91	9.18	35.80



US-SRM Biometric Gradient Summary						
ID	Latitude	Longitude	Stem Count	Average Canopy Height (m)	Average Canopy Diameter (m)	Average Basal Diameter (cm)
1	31.821522	110.866236	4	1.48	1.78	2.50
2	31.821566	110.866397	2	4.59	6.60	27.65
3	31.821595	110.866470	5	4.40	4.58	18.78
4	31.821453	110.866394	3	2.61	3.10	3.80
5	31.821351	110.866372	1	3.66	4.27	27.50
*6	31.821397	110.866396	1	4.36	4.69	41.50
*7	31.821478	110.866087	2	5.45	4.64	34.90
8	31.821493	110.865876	1	1.86	1.87	6.60
*9	31.821066	110.865920	1	3.96	4.11	46.40
*10	31.821107	110.866043	1	4.49	5.32	31.70
11	31.821057	110.866073	2	3.65	4.00	19.85
*12	31.821222	110.865964	3	3.90	3.70	15.70
*13	31.821336	110.865872	1	5.26	5.61	42.40
14	31.821335	110.866022	5	1.88	2.75	3.66
15	31.821260	110.866218	2	1.70	2.07	6.25
16	31.322039	110.866253	2	5.28	6.51	25.25



Date: 6/6/2025

Purpose

1. To establish 10 trees representing a range of sizes and growth forms at the US-SRM and US-SRG flux tower sites for repeat biometric surveys.
2. To collect biometric measurements for validating remote sensing data.
3. To characterize error associated with ground-based hypsometer measurements and assess the accuracy of field-based tree height observations.

Supplies

- Flagging tape
- Hypsometer
- GPS
- Calipers
- Diameter tape (D-tape)
- Meter stick
- 30-m measuring tape
- Data sheets
- Pencils
- Permanent markers
- Stake flags
- Compass

Protocol

Establishing the gradient 6/7/2025

1. **Prepare all supplies** before traveling to field sites.
2. **Select a candidate tree:**
 - a. Choose trees that represent a unique combination of traits (e.g., height, canopy size, number of stems).
 - b. Ensure that each newly selected tree differs in at least one major trait from previously selected trees to maximize variation.
3. **Label tree:**
 - a. Write the tree ID and survey type (e.g., *BIOMET001*) on flagging tape using a permanent marker.
 - b. Tie the label securely to the tree.
 - c. Mark “Y” in the **Labeled** column on the data sheet.
4. **Record location:**
 - a. Use the GPS unit to record coordinates.
 - b. Log the coordinates on the data sheet and save a waypoint in the GPS unit.
5. **Count stems:**
 - a. Count the total number of live stems and record the value in the **Stem Count** column.
6. **Measure basal diameters:**
 - a. Use calipers and/or D-tape to measure the basal diameter of up to 8 representative live stems.

- b. Record each measurement in the **Basal Diam** column and assign a corresponding stem number (1 through 8) in the **Stem Number** column.
7. **Mark canopy directions:**
 - a. Use a compass to identify 8 cardinal/intercardinal directions (N, NE, E, SE, S, SW, W, NW) around the tree.
 - b. Extend a measuring tape 5 meters from the base of the tree in each direction and mark the endpoint with a stake flag.
8. **Measure canopy height:**
 - a. Using the hypsometer set for a 5-meter distance, measure the canopy height from each flagged location (if canopy is too large, recalibrate for a longer distance).
 - b. Record each value in the **Canopy Height** column of the data sheet.
9. **Measure canopy diameter:**
 - a. Use the 30-meter tape to measure canopy diameter along four axes:
 - i. North–South (N–S)
 - ii. East–West (E–W)
 - iii. Northeast–Southwest (NE–SW)
 - iv. Southeast–Northwest (SE–NW)
 - b. Record each measurement in the **Canopy Diam** column.
10. Make note of any issues, suspect measurements, or unique environmental conditions in the **Comments** column.

