

APPENDIX A: Detailed characteristics of streams and watersheds where we collected riparian plant leaves for N isotope analysis, and additional figures showing the distribution of plant species with elevation and patterns in leaf $\delta^{13}\text{C}$ values among species and streams.

TABLE A1. Attributes of streams where riparian vegetation was sampled for N isotope composition.

Watershed	Stream / River	Watershed area (km ²)	Traffic density	Montane / suburban reach comments	Urban /agricultural reach comments
Salt Lake	City Creek	46	< 100	Leashed dogs permitted in lower reach; dogs strictly prohibited in upper reach above drinking water reservoir	City park and residential development
	Red Butte Creek	22	< 5	Research natural area, no public access	Residential and commercial development
	Emigration Creek	55	3100	Dogs allowed in montane reach. In suburban reach, development with septic waste disposal is present immediately adjacent to stream	Residential and commercial development, zoo, golf course
	Parley's Creek	148	46500	Montane sites are downstream of a beaver dam wetland complex; sites adjacent to golf course are denoted suburban; stream is buried below Interstate Highway 80	Wildland park, city park, golf course
	Mill Creek	95	1900	Dogs allowed in montane reach; summer weekends often bring > 500 dogs to the upper trailheads. Vehicle traffic is partially restricted in winter. There are several youth camps adjacent to the stream in the lower section of the canyon	Residential and commercial development; sewage treatment plant near terminus
	Little Cottonwood Creek	105	5300	Dogs strictly prohibited. Major ski resorts and limited private development (with sewers); municipal drinking water source	Residential and commercial development
	Big Cottonwood Creek	210	3100	Dogs strictly prohibited. Major ski resorts and limited private development (with sewers); municipal drinking water source	Residential and commercial development

Watershed	Stream / River	Watershed area (km ²)	Traffic density	Montane / suburban reach comments	Urban /agricultural reach comments
	Jordan River	...	...	...	Commercial, and industrial development. Receives inputs from numerous urban streams (including those listed above) and four POTWs
Cache	Logan River	1400	4000	Intensive cattle grazing in upper reach, portions of which are also designated wilderness. OHV's permitted	Residential and commercial development, golf course
	Spring Creek	26	...	Popular for OHV users	...
	High Creek	61	...	Upper reach is a designated wilderness area. OHV's permitted elsewhere	...
	Summit Creek	61	...	Upper reach is a designated wilderness area. OHV's permitted elsewhere	Residential and commercial development
	Blacksmith Fork Creek	740	400	Concentrated elk feeding (> 500 animals) adjacent to upper reach. Also cattle grazing. OHV's permitted.	Residential and commercial development
	Little Bear River	790	...	...	Valley reaches include suburban ranches and agricultural development include a confined animal feeding operation and meat packing plant
Heber	Snake Creek	80	...	Sparse housing development in montane reach; golf course in suburban reach	...
	Lake Creek	100	200	Montane and suburban sites bracket a 1500 acre suburban development	...
	Rock Creek	...	...	...	Mixed agricultural and suburban development
	Provo River	1060	...	Meanders were dredged and vegetation planted from 1999 - 2008 to restore from channelization. Many homes are on septic systems.	POTW present in the agricultural reach
	Daniels Creek	130	...	Many homes are on septic systems.	...
	Ditches	...	...	...	Residential and commercial development

Notes: Traffic density was obtained from Utah Department of Transportation 2012 data

(public communication, <<http://www.udot.utah.gov/main/f?p=100:pg:0:::V,T:,2256>>). Ellipses

indicate that data were not available or that relevant land use types were not present for a given

waterway. Watershed areas represent the contributing area above the lowest site in the watershed, and were calculated (when possible) using the US Geological Survey Streamstats program (public communication, <<http://water.usgs.gov/osw/streamstats/>>). Data on elk feeding in Blacksmith Fork Canyon were obtained from the Utah Division of Wildlife Resources (public communication, <<http://wildlife.utah.gov/hardwareranch/about.php>>). The acronym “OHV” denotes off-highway vehicles.

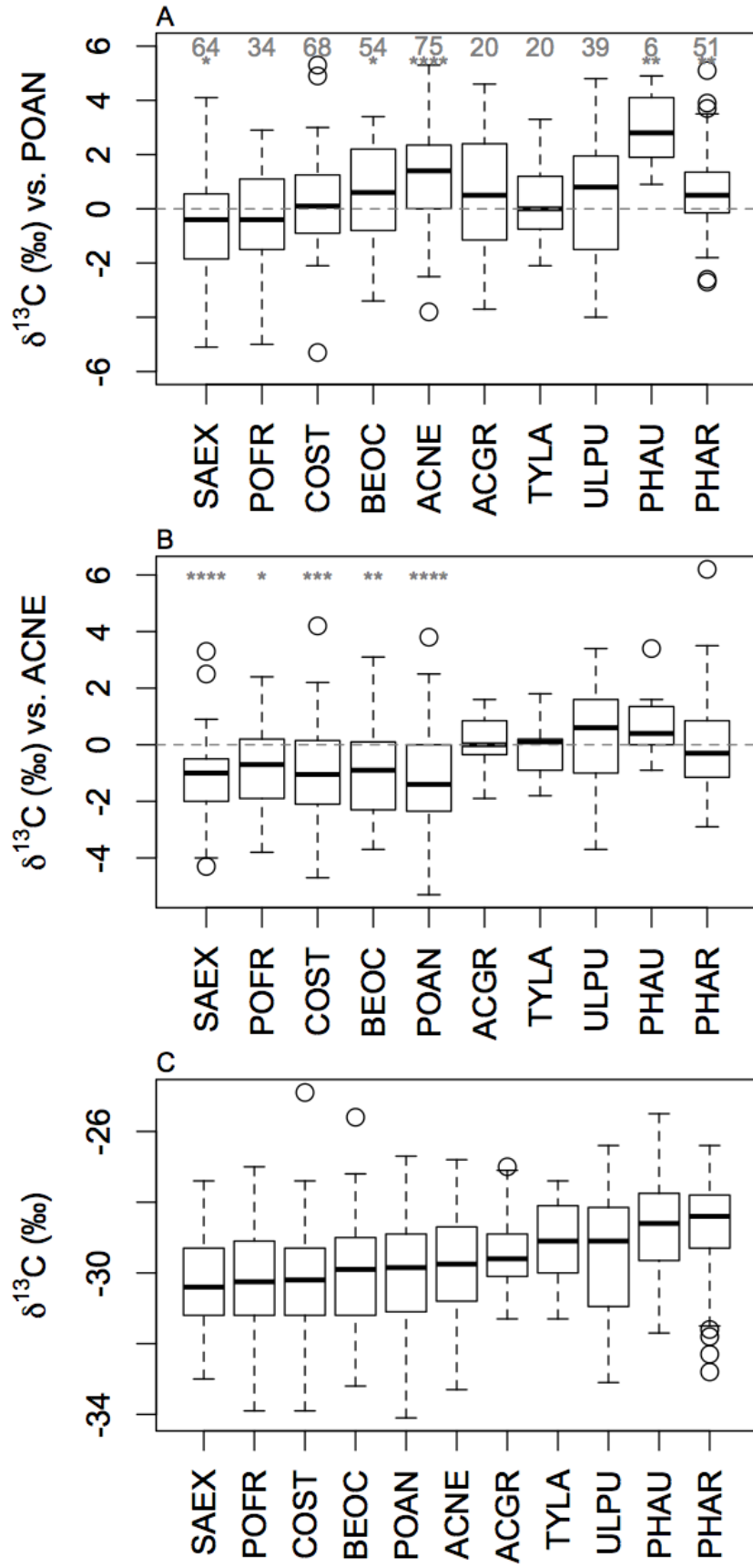


FIG. A1. Intra-site differences in leaf $\delta^{13}\text{C}$ values for each sampled species relative to (A) *P. angustifolia* (POAN), and (B) *A. negundo* (ACNE), and (C) raw leaf $\delta^{13}\text{C}$ values by species. Species abbreviations are provided in Table 1 in the main text. Boxes represent medians and the interquartile range, and circles represent data > 1.5 times the range from the box to the whiskers. Sample size for each comparison is shown in grey text in the upper portion of each panel. Statistical significance (difference from zero) is reflected by asterisks, representing $*P < 0.05$, $**P < 0.01$, $***P < 0.001$, and $****P < 0.0001$, respectively.

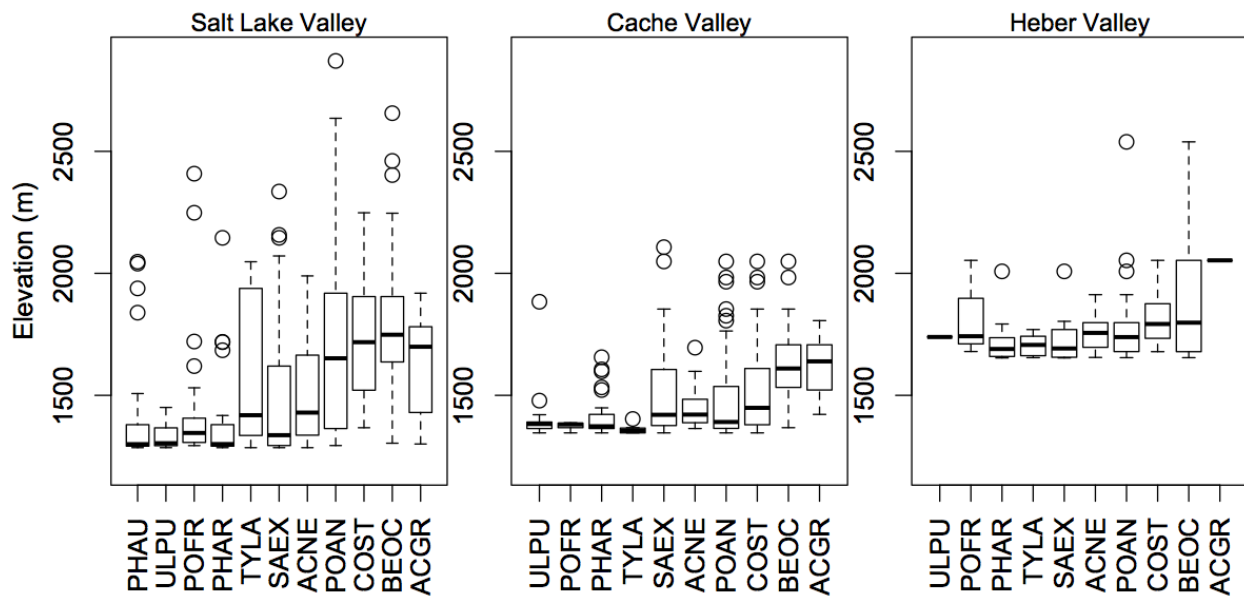


FIG. A2. Boxplots of the elevation distribution of each species among sampled sites. Species abbreviations are provided in Table 1 in the main text.

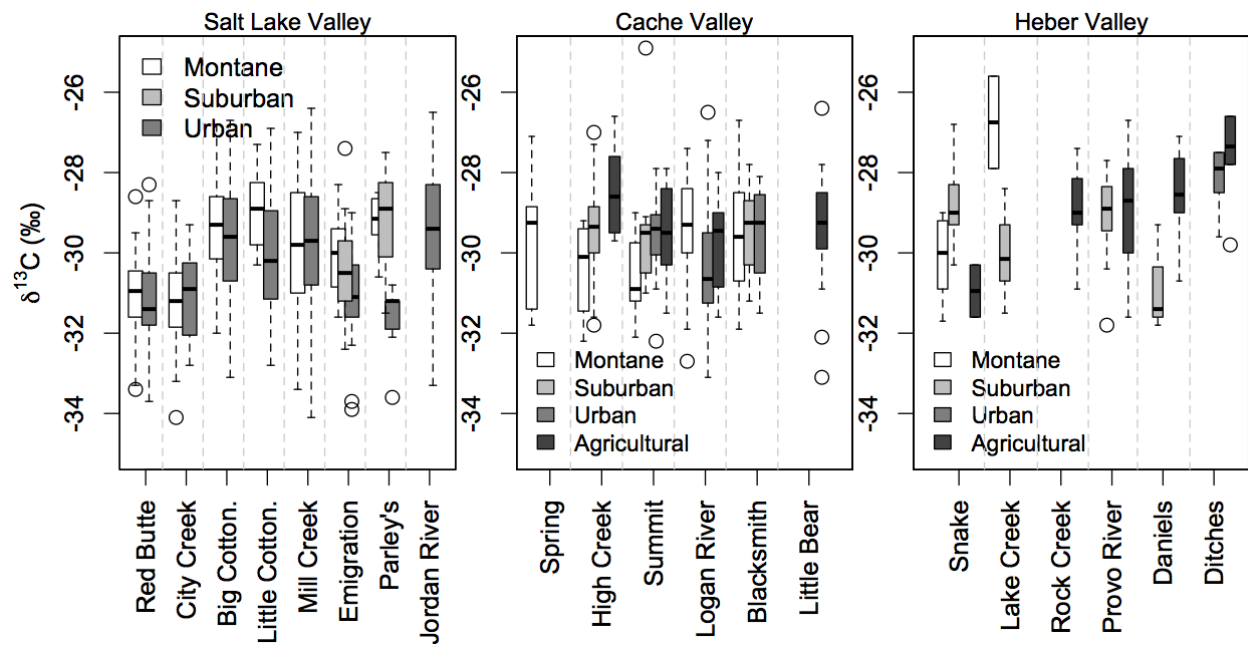


FIG. A3. Boxplots of leaf $\delta^{13}\text{C}$ values by stream and land use categories for the Salt Lake, Cache, and Heber Valleys.