

1 **Appendix S2.** Description of land use types, their county of origin, and associated environmental characteristics. Site-specific soil data were
 2 not available for all sites (indicated by N.A.). MAP is mean annual precipitation.

County	Land use	Notes	Soil order	Soil texture	Soil pH class	Elevation (m)	MAP (cm)	Temperature zone
Butte	Coniferous forest	Coniferous forest (site 1)	inceptisol	sandy loam	moderately acidic	500	197.4	mesic
		Coniferous forest (site 2)	alfisol	loam or sandy loam	N.A.	500	168.4	mesic
Colusa	Inland grasslands	Serpentine soils	mollisol	gravelly loam	slightly acidic	425	75.3	thermic
	Rice fields	Periodically flooded	vertisol	clay	neutral	30	53.7	thermic
El Dorado	Coniferous forest	Coniferous forest (site 1)	alfisol	loam	slightly acidic	500	139.5	thermic
		Coniferous forest (representative of 16 sites)	inceptisol	ashy loam	N.A.	2250	158.9	mesic
Fresno	Annual agriculture	Cotton fields (site 1)	aridisol	clay loam	alkaline	80	17.7	thermic
	Annual agriculture	Cotton fields (site 2)	mollisol	clay loam	N.A.	80	22.4	thermic
	Coniferous forest		inceptisol	sandy loam	moderately acidic	2317	130.9	frigid
Kern	Perennial agriculture	Almond orchards	aridisol	clay loam	slightly alkaline	115	24.6	thermic
	Annual agriculture	Cotton fields (site 1)	N.A.	loam, sandy loam, & silty loam	N.A.	100	23.1	thermic
	Annual agriculture	Cotton fields (site 2)	aridisol	clay loam	moderately alkaline	80	18.2	thermic
	Annual agriculture	Cotton fields (site 3)	mollisol	clay	N.A.	100	18.2	thermic
	Desert	Mojave Desert	aridisol	sandy loam	moderately & strongly alkaline	700	11.9	thermic
	Perennial agriculture	Almond orchards	entisol & aridisol	clay loam, loam, & silty loam	slightly acidic	140	28.6	thermic
	Perennial agriculture	Fig orchards	aridisol	loamy sand & sandy loam	N.A.	325	22.4	thermic
Kings	Annual agriculture	Cotton fields	entisol	sandy loam	slightly acidic	80	22.4	thermic
	Perennial agriculture	Walnut orchards	mollisol	loam, loamy sand, & sandy loam	N.A.	80	23.4	thermic

Lake Mendocino	Inland grasslands	Serpentine soils	mollisol	gravelly loam	slightly acidic	500	75.3	thermic
	Perennial agriculture	Vineyards (site 1)	alfisol	loam	neutral	100	89.4	thermic
	Perennial agriculture	Vineyards (site 2)	alfisol & inceptisol	loam	neutral	400	89.4	(iso)mesic
	Perennial agriculture	Vineyards (site 3)	mollisol	loam	moderately acidic	65	89.4	thermic
Mono	Desert	Great Basin Desert Dry-farmed hay fields (representative of 7 sites)	entisol	sand	very strongly alkaline	2000	16.0	N.A.
Monterey	Annual agriculture	Intensively-farmed vegetable fields (representative of 5 sites)	mollisol	sandy loam	N.A.	50	41.3	thermic
	Annual agriculture	Non-serpentine soils (representative of 25 sites)	mollisol	sandy loam	N.A.	50	41.3	thermic
	Inland grasslands		mollisol	sandy loam	N.A.	600	39.2	thermic
Napa	Perennial agriculture	Vineyards (site 1)	mollisol	gravelly loam	moderately acidic	1400	75.6	thermic
	Perennial agriculture	Vineyards (site 2)	entisol	clay loam	slightly acidic	50	59.7	thermic
	Perennial agriculture	Vineyards (site 3)	ultisol	loam	moderately acidic	50	59.7	thermic
Placer	Coniferous forest	Coniferous forest (representative of 9 sites)	inceptisol	ashy loam	N.A.	2250	158.9	mesic
Sacramento	Freshwater wetland	Periodically flooded	histosol	clay	slightly acidic	5	43.1	thermic
Sonoma	Coastal grasslands	Non-serpentine soils	entisol	loamy sand	slightly acidic	25	135.0	isomesic
	Perennial agriculture	Vineyards (site 1)	ultisol	loam	neutral	100	121.2	thermic
	Perennial agriculture	Vineyards (site 2)	entisol	clay loam	neutral	50	59.7	thermic
	Perennial agriculture	Vineyards (site 3)	entisol	sandy loam	very strongly acidic	50	91.1	thermic
	Perennial agriculture	Vineyards (site 4)	mollisol	clay	neutral	100	59.7	thermic
Stanislaus	Perennial agriculture	Almond orchards	entisol	loamy sand	slightly acidic	105	23.0	thermic
	Perennial agriculture	Peach orchards	entisol	sand	slightly acidic	110	23.0	thermic
Yolo	Annual agriculture	Bean fields	entisol	silty loam	slightly acidic	30	53.7	thermic
	Annual agriculture	Corn fields (site 1)	alfisol & inceptisol	silty loam & silty clay loam	slightly acidic	30	53.7	thermic

	Annual agriculture	Corn fields (site 2)	entisol	silty loam	slightly acidic	30	53.7	thermic
	Annual agriculture	Safflower fields	entisol	silty loam	slightly acidic	30	53.7	thermic
	Annual agriculture	Tomato fields (site 1)	alfisol & inceptisol	silty loam & silty clay loam	slightly acidic	30	53.7	thermic
	Annual agriculture	Tomato fields (site 2)	entisol	silty loam	slightly acidic	30	53.7	thermic
Yuba	Coniferous forest	Coniferous forest (site 1)	ultisol & alfisol	clay	N.A.	2317	174.0	mesic
	Coniferous forest	Coniferous forest (site 2)	ultisol	clay	N.A.	2317	174.0	mesic
	Coniferous forest	Coniferous forest (site 3)	ultisol	loam	moderately acidic	1000	163.4	mesic

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