

Interactive Counties Layer

Updated interactive counties layer for the Drinking Water Tool (2023). Data processed and joined by Clare Pace and Ari Libenson, Water Equity Science Shop, UC Berkeley
Contact: cpace@berkeley.edu

File name: Counties_Joined_082923.shp

Spatial Reference

Geographic Coordinate System	NAD 1983	Projected Coordinate System	NAD 1983 (Teale) Albers (Meters)
WKID	4269	Projection	3310
Authority	EPSG	Authority	EPSG
Angular Unit	Degree (0.0174532925199433)	Linear Unit	Meters (1.0)
Prime Meridian	Greenwich (0.0)	False Easting	0.00
Datum	D North American 1983	False Northing	-4000000.0
Spheroid	GRS 1980	Central Meridian	-120.0
Semimajor Axis	6378137.0	Standard Parallel 1	34.0
Semiminor Axis	6356752.314140356	Standard Parallel 2	40.5
Inverse Flattening	298.257222101	Latitude of Origin	0.0

Description

This shapefile contains a feature class with polygons that represent the boundaries of the 58 counties in California. County boundaries and sociodemographics from the 2017-2021 American Community Survey (ACS) were downloaded from the U.S. Census Bureau. To estimate a count of each entity per county, the following fields were spatially joined to the county boundaries: domestic wells locations, Groundwater Sustainability Agencies, public supply well locations, water system boundaries, severely disadvantaged and disadvantaged census places, and drinking water threats.

Methods

Updating county layer attributes

1. Joined ACS 2016-2021, 5-year estimates to county boundaries¹.
2. Spatially joined public supply wells² to county polygons in ArcGIS Pro, using the Completely Contained argument.
 - a. Created a new field, Num_MunPub, populated with the sum of wells per county.
3. Spatially joined domestic well points³ to county polygons, using the Completely Contained argument.
 - a. Created a new field, Num_DW, populated with the count of wells per county.
 - b. Selected all domestic wells with completed depth > 0 ft. Used summarize within function to calculate average and standard deviation of completed well depth.
4. Spatially joined water system boundaries⁴ to county polygons, using the Intersect argument.

- a. Created a new field, CWS_Count, populated with the count of systems per county.
5. Calculated number of disadvantaged communities (DAC) and severely disadvantaged communities (SDAC) census designated places⁵ in each county.
 - a. Intersected 2021 census designated places and county boundaries.
 - b. Selected by DAC and calculated the count of intersections per county.
 - c. Selected by SDAC and calculated the count of intersections per county.
6. Spatially joined with point data for the following drinking water threats layers:
 - a. Wastewater treatment facilities⁶, water samples with any PFAS detection and detections exceeding the proposed maximum contaminant level (MCL)⁷, landfills⁶, refineries and terminals⁶, active oil and gas wells⁸, chrome plating facilities⁶.
 - b. Used the geoprocessing tool “summarize within” function to count the number of each threat by county.
7. Merged drinking water threat polygons representing superfund sites⁹; military installations, ranges, and training areas¹⁰; and airports permitted to use aqueous film-forming foam (AFFF)¹¹ into a single shapefile.
 - a. Removed duplicates, dummy coded polygons based on which dataset (or combination of datasets) it came from.
 - b. Intersected polygons with counties and added the number of each type of facility by county.
8. Calculated total pesticide application¹² (pounds) for each county, 2011-2019.
 - a. Used geoprocessing tool “make feature layer” and selected the option for “use ratio policy” for pesticide sum.
 - b. Intersected layer with county boundaries.
 - c. Dissolved by county ID and calculated sum of pesticides
9. Spatially joined Groundwater Sustainability Agency (GSA) boundaries¹³ to county polygons, using the Intersect argument.
 - a. Created a new field, Num_GSA, populated with the count of GSAs per county.
10. Calculated population served by domestic wells³ for each county.
 - a. Used geoprocessing tool “make feature layer” and selected the option for “use ratio policy” for population field.
 - b. Intersected layer with county boundaries.
 - c. Dissolved by county ID and calculated sum of population.

Attribute Table

Field Heading	Field type	Field Description	Source
FID	Object ID	Object ID	ESRI generated
Shape	Geometry	Polygon	ESRI generated
geoid	Text	Geographic identifier	U.S. Census Bureau

NAME	Text	County name	U.S. Census Bureau
pop	Long	County population estimates	ACS
white	Long	Population that identifies as Non-Latinx White	ACS
afamer	Long	Population that identifies as Non-Latinx African American or Black	ACS
hislat	Long	Population that identifies as Latinx	ACS
aind	Long	Population that identifies as Non-Latinx American Indian/Alaska Native	ACS
asian	Long	Population that identifies as Non-Latinx Asian	ACS
nhpi	Long	Population that identifies as Non-Latinx Native Hawaiian and other Pacific Islander	ACS
other	Long	Population that identifies as Non-Latinx other category alone	ACS
more2	Long	Population that identifies as Non-Latinx Other category, with 2 or more races selected	ACS
mhhi	Long	Median Household Income	ACS
white_per	Double	Percent of population that identifies as Non-Latinx White	ACS/GIN
asian_per	Double	Percent of population that identifies as Non-Latinx Asian	ACS/GIN
afamer_per	Double	Percent of population that identifies as Non-Latinx African American or Black	ACS/GIN
hislat_per	Double	Percent of population that identifies as Latinx	ACS/GIN
nhpi_per	Double	Percent of population that identifies as Non-Latinx Native Hawaiian and other Pacific Islander	ACS/GIN
aind_per	Double	Percent of population that identifies as Non-Latinx American Indian/Alaska Native	ACS/GIN
other_per	Double	Percent of population that identifies as Non-Latinx other category alone	ACS/GIN
more2_per	Double	Percent of population that identifies as Non-Latinx other category, with 2 or more races selected	ACS/GIN
dac_status	Text	3 level factor variable that identifies DAC & SDAC counties, defined as having an MHI under 80% and under 60% of the statewide MHI, respectively.	ACS/GIN

		Levels include: <ul style="list-style-type: none"> - Disadvantaged Community (DAC) - Severely Disadvantaged Community (SDAC) - Not a Disadvantaged Community 	
CWS_count	Float	Count of water systems	WESS
Num_MunPub	Float	Count of public supply wells	WESS
Num_DW	Float	Count of domestic wells	WESS
Av_depth	Float	Average total completed depth of domestic wells	WESS
SD_depth	Float	Standard deviation of total completed depth for domestic wells	WESS
Num_DAC	Float	Count of Disadvantaged Communities	WESS
Num_SDAC	Float	Count of Severely Disadvantaged Communities	WESS
Total_pest	Double	Total pounds of pesticide active ingredients applied in domestic well areas between 2011-2019	WESS
MIRTA	Float	Count of Military Installations, Ranges and Training Areas (MIRTA)	WESS
MIRTA_SPR	Float	Count of sites listed as both a MIRTA and Superfund Site (SRP)	WESS
MIRTASRPP1	Float	Count of sites listed as a MIRTA, Superfund Site, and P-139 Airport	WESS

P139	Float	Count of airports permitted to use aqueous film-forming foam (contains PFAS)	WESS
SRP	Float	Count of Superfund Sites	WESS
SRP_P139	Float	Count of sites listed as both a Superfund Site and P-139 Airport.	WESS
Num_OG	Float	Count of active oil and gas wells	WESS
ChromePlat	Float	Count of chrome-plating facilities	WESS
Landfills	Float	Count of landfills	WESS
RefsTerms	Float	Count of refineries and bulk terminals	WESS
WWTFs	Float	Count of wastewater treatment facilities (WWTFs)	WESS
Excd_MCL	Float	Count of well water samples with PFAS concentrations above any EPA proposed Maximum Contaminant Level (MCL)	WESS
Excd_DL	Float	Count of well water samples with PFAS concentrations above the detection limit but below any EPA proposed Maximum Contaminant Level (MCL)	WESS
Num_GSA	Float	Number of Groundwater Sustainability Agency (GSA) boundaries that fall within the boundary of a county	WESS

SUM_Well_p	Double	Population served by domestic wells	WESS
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References

1. County Boundaries. TIGER/line Shapefiles, US Census. Accessed 08/07/2023.
2. Gailey, R. (2019) Public Supply Well Locations. CWC Drinking Water Tool.
3. Rempel, J., Pace, C., Cushing, L., Morello-Frosch, R. (2023) UC Berkeley Water Equity Science Shop. Domestic well areas version 2.0, Update for the Drinking Water Tool.
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5. U.S. Census Bureau. B19013: MEDIAN HOUSEHOLD INCOME IN ... - Census Bureau Table. 2017-2021 American Community Survey 5-Year Estimates. Available from <https://data.census.gov/table?q=B19013>
6. Karasaki, S., Pace, C., Cushing, L., Morello-Frosch, R. (2023). Additional PFAS sources – Landfills, Chrome plating facilities, water treatment facilities, and refineries and terminals. Drinking Water Tool metadata, prepared by the Water Equity Science Shop, UC Berkeley.
7. Karasaki, S., Pace, C., Cushing, L., Morello-Frosch, R. (2023). PFAS detections in water samples. Drinking Water Tool metadata, prepared by the Water Equity Science Shop, UC Berkeley.
8. All Wells Dataset, GIS Mapping, (2021). California Department of Conservation, California Geologic Energy Management Division (CalGEM), <https://www.conservation.ca.gov/calgem/maps/Pages/GISMapping2.aspx>, Accessed online January 6, 2022.
9. Pace, C., Karasaki, S., Cushing, L., Morello-Frosch, R. (2023). Superfund Sites in California. Drinking Water Tool metadata, prepared by the Water Equity Science Shop, UC Berkeley.
10. Karasaki, S., Pace, C., Cushing, L., Morello-Frosch, R. (2023). Military Installations Ranges and Training Areas (MIRTA). Drinking Water Tool metadata, prepared by the Water Equity Science Shop, UC Berkeley.
11. Karasaki, S., Pace, C., Cushing, L., Morello-Frosch, R. (2023). Airports permitted to use PFAS-containing aqueous film-forming foam (AFFF). Drinking Water Tool metadata, prepared by the Water Equity Science Shop, UC Berkeley.
12. Libenson, A., Pace, C., Cushing, L., Morello-Frosch, R. (2023). Pesticide application in California, 2011-2019. Drinking Water Tool metadata, prepared by the Water Equity Science Shop, UC Berkeley.
13. Dept. of Water Resources (2023) i03 Groundwater Sustainability Agencies MapService. (<https://data.ca.gov/dataset/i03-groundwater-sustainability-agencies-mapservice>). Accessed 08/7/2023
14. U.S. Census Bureau. B03002: HISPANIC OR LATINO ORIGIN ... - Census Bureau Table. 2017-2021 American Community Survey 5-Year Estimates. Available from <https://data.census.gov/table?q=B03002>