

# **PPIC Sacramento Valley and Delta Surface Water Availability**

**September 2021**

## **Notes and data caveats**

The shapefile includes service areas of irrigation districts (ID) and other entities that are members of the groundwater sustainability agencies (GSAs) in 16 Sacramento Valley groundwater subbasins and 3 within the San Joaquin Valley (SJV), that were previously excluded from a map of the SJV. Throughout the ReadMe, the map and corresponding data for all 19 subbasins will be referred to as the “Sacramento Valley.”

The dataset is organized by water districts and/or county and summarizes the land uses within each of them, based on the Department of Water Resources (DWR) 2016 land use data. It also assigns average surface water deliveries for entities that contain irrigated croplands in terms of acre-feet per irrigated acre. Average surface water deliveries were based on reported deliveries from 2010-19 for most districts, with some exceptions due to data availability constraints (which are identified in the dataset).

In the Sacramento Valley, the service area of each irrigation district and other entities was calculated in US acres using ArcGIS. Additionally, within the DWR Water Districts projection, service areas of many water providers overlap. In general, overlapping regions of different entities were assigned to the system with the smallest area (e.g., where small agricultural districts overlap with a larger regional authority, the area is assigned to the smaller district). Where service area idiosyncrasies existed, we reached out directly to irrigation districts to receive the accurate irrigated acreage. Any additional notes on geographic data and caveats are provided by subbasin below.

### **Surface water delivery sources and notes:**

The surface water delivery data come from three major sources: the US Bureau of Reclamation, the Electronic Water Rights Information Management System (eWRIMS), and corresponding Agricultural Water Management Plans. Additionally, agencies helped create an accurate picture of surface water availability by reporting surface water deliveries directly to the research team, when requested. In general, we assume that subbasin areas that are administered by counties, with no established water districts providing surface water, rely on groundwater only. We do not report surface water deliveries to urban water providers. Surface water availability per acre was calculated using the irrigated area derived from the Department of Water Resources (DWR) 2016 land use data, and surface water delivery data. Where overlap or discrepancies existed, we used service area data collected manually via ArcGIS to estimate irrigated acreage.

Suggested citation: Ehrens, Alex, Joy Collins, and Andrew Ayres. 2021. *PPIC Sacramento Valley and Delta Surface Water Availability*. Public Policy Institute of California.

## **Notes and data caveats by groundwater subbasin**

### **5-021.50 Red Bluff**

There are 2 irrigation districts, and 1 non-districted county area located within the Red Bluff subbasin. We use DWR water agency boundaries to split the subbasin area into its member units. Tehama County crossed subbasin boundaries, so the non-districted county lands were assigned to each corresponding subbasin by the amount of irrigated acreage located within that subbasin. In this case, we distinguished counties within the Red Bluff subbasin as “Tehama County (red bluff).”

### **5-021.51 Corning**

There are 8 irrigation districts and 3 non-districted county areas located within the Corning subbasin. We use DWR water agency boundaries to split split the subbasin area into its member units. Some counties crossed subbasin boundaries. In those circumstances, non-districted county lands were assigned to each corresponding subbasin by the amount of irrigated acreage located within that subbasin. For example, we distinguished the Corning subbasin area as “Tehama County (corning).”

For surface water deliveries in Corning, we use delivery data from [Central Valley Project Operations](#), for districts receiving Central Valley Project (CVP) water, alongside additional data provided by US Bureau of Reclamation (USBR). In addition to CVP water, Glenn-Colusa ID also receives diversions from Stone Corral Creek, Hunters Creek, Colusa Basin Drain, and an unnamed stream.

### **5-021.52 Colusa**

There are 47 irrigation districts and 2 non-districted county areas located within the Colusa subbasin. We use DWR water agency boundaries to split the subbasin area into its member units. Some counties crossed subbasin boundaries. In those circumstances, non-districted county lands were assigned to each corresponding subbasin by the amount of irrigated acreage located within that subbasin. For example, we distinguished counties within the Colusa subbasin as “Colusa County (colusa) and “Yolo County (colusa).”

### **5-021.53 Bend**

There is 1 non-districted county area located within the Bend subbasin. This county area is designated as “Tehama County (bend).”

### **5-021.54 Antelope**

There are 2 irrigation districts and one non-districted county area within the Antelope subbasin. We use DWR water agency boundaries to split the subbasin area into its member units. Tehama County crossed subbasin boundaries, so the non-districted county lands were assigned to each corresponding subbasin by the amount of irrigated acreage located within that subbasin. Here, we distinguished the cross-basin county as “Tehama County (antelope).”

#### **5-021.56 Los Molinos**

There are 2 irrigation districts and 2 non-districted county areas within the Los Molinos subbasin. We use DWR water agency boundaries to split the subbasin area into its member units. Some counties crossed subbasin boundaries. In those circumstances, non-districted county lands were assigned to each corresponding subbasin by the amount of irrigated acreage located within that subbasin. For example, we distinguished the cross-basin counties as “Tehama County (los molinos)” and “Butte County (los molinos).”

Los Molinos MWC receives its diversions from both Mill Creek and Antelope Creek. Both Stanford Vina Ranch ID and Deer Creek ID receive deliveries from Deer Creek.

#### **5-021.57 Vina**

There is 1 irrigation districts and 1 non-districted county area within the Vina subbasin. We use DWR water agency boundaries to split the subbasin area into its member units. Butte County crossed subbasin boundaries, so the non-districted county lands were assigned to each corresponding subbasin by the amount of irrigated acreage located within that subbasin. Here, we distinguished the cross-basin county as “Butte County (vina).”

Western Canal WD receives its diversions from Feather River, while Pacific Realty Associates receives diversions from Butte Creek.

#### **5-021.60 North Yuba**

There are 2 irrigation districts and 2 non-districted county areas within the North Yuba subbasin. We use DWR water agency boundaries to split the subbasin area into its member units. Yuba County crossed subbasin boundaries, so the non-districted county lands were assigned to each corresponding subbasin by the amount of irrigated acreage located within that subbasin. Here, we distinguished the cross-basin counties as “Yuba County (north yuba)” and “Butte County (north yuba).”

Cordua ID, and Hallwood ID receive diversions from Yuba River.

#### **5-021.61 South Yuba**

There are 3 irrigation districts and 3 non-districted county areas within the North Yuba subbasin. We use DWR water agency boundaries to split the subbasin area into its member units. Some counties crossed subbasin boundaries. In those circumstances, non-districted county lands were assigned to each corresponding subbasin by the amount of irrigated acreage located within that subbasin. For example, we distinguished the Yuba County area as “Yuba County (south yuba).”

Naumes Well No 9 receives diversions from Feather river and South Yuba WD from the Yuba River.

#### **5-021.62 Sutter**

There are 61 irrigation districts and 4 non-districted county areas within the Sutter subbasin. We use DWR water agency boundaries to split the subbasin area into its member units. Some counties crossed subbasin boundaries. In those circumstances, non-districted county lands were assigned to each corresponding subbasin by the amount of irrigated acreage located within that subbasin. For example, we distinguished the cross-basin counties as “Butte County (sutter)”, “Sutter County (sutter)”, “Colusa County (sutter)”, and “Yuba County (sutter).”

For surface water deliveries in Sutter, we use delivery data from [Central Valley Project Operations](#), for districts receiving Central Valley Project (CVP) water.

#### **5-021.64 North American**

There are 9 irrigation districts and 3 non-districted county areas within the North American subbasin. We use DWR water agency boundaries to split the subbasin area into its member units. Some counties crossed subbasin boundaries. In those circumstances, non-districted county lands were assigned to each corresponding subbasin by the amount of irrigated acreage located within that subbasin. For example, we distinguished two cross-basin counties as “Sacramento County (north american)” and “Sutter County (north american).”

#### **5-021.65 South American**

There are 3 irrigation districts and 1 non-districted county area within the South American subbasin. We use DWR water agency boundaries to split the subbasin area into its member units. Sacramento County crossed subbasin boundaries, so the non-districted county lands were assigned to each corresponding subbasin by the amount of irrigated acreage located within that subbasin. Here, we distinguished the cross-basin counties as “Sacramento County (south american).”

When estimating modeling outputs for the North Delta Water Agency, we reached out directly to agency staff, received the corresponding acre-feet/acre, and calculated the water deliveries in acre-feet.

#### **5-021.66 Solano**

There are 2 irrigation districts within the Solano subbasin and 4 non-districted county areas within the Solano subbasin. We use DWR water agency boundaries to split the subbasin area into its member units. Both Solano ID (SID) and the Maine Prairie WD receive deliveries from the Solano Project. In addition, the Maine Prairie WD receives deliveries from Upslope Drainage and purchases from SID, and various water rights licences.

#### **5-021.67 Yolo**

There are 22 irrigation districts and 3 non-districted county areas within the Yolo subbasin. We use DWR water agency boundaries to split the subbasin area into its member units. Some counties crossed subbasin boundaries. In those circumstances, non-districted county lands were assigned to each corresponding subbasin by the amount of irrigated acreage located

within that subbasin. For example, we distinguished the cross-basin county as “Sutter County (yolo).”

When estimating modeling outputs for the Yolo County Flood Control and Water Conservation District, we reached out directly to agency staff, received the corresponding water deliveries in acre-feet, and calculated the surface water availability in acre-feet/acre.

For surface water deliveries in Yolo we use delivery data from [Central Valley Project Operations](#), for districts receiving Central Valley Project (CVP) water.

#### **5-021.69 Wyandotte Creek**

There is 1 irrigation districts and 1 non-districted county area located within the Wyandotte Creek subbasin. We use DWR water agency boundaries to split the subbasin area into its member units. Butte County crossed subbasin boundaries, so the non-districted county lands were assigned to each corresponding subbasin by the amount of irrigated acreage located within that subbasin. Here, we distinguished the cross-basin county as “Butte County (wyandotte creek).”

#### **5-021.70 Butte**

There is 1 irrigation districts and 3 non-districted county areas located within the Butte subbasin. We use DWR water agency boundaries to split the subbasin area into its member units. Some counties crossed subbasin boundaries. In those circumstances, non-districted county lands were assigned to each corresponding subbasin by the amount of irrigated acreage located within that subbasin. Here, we distinguished cross-basin counties as “Butte County (butte)”, “Colusa County (butte)”, and “Glenn County (butte).”

#### **5-022.01 Eastern San Joaquin (ESJ)**

There are 4 irrigation districts and 3 non-districted county areas located within the Eastern San Joaquin subbasin. We use DWR water agency boundaries to split the subbasin area into its member units. Some counties crossed subbasin boundaries. In those circumstances, non-districted county lands were assigned to each corresponding subbasin by the amount of irrigated acreage located within that subbasin. For example, we distinguished the San Joaquin County area as “San Joaquin County (eastern san joaquin).” A previous map from our research team excluded ESJ from the San Joaquin valley. Therefore, we have included the subbasin into our map and estimated modeling outputs for the Sacramento Valley.

For surface water deliveries in ESJ, we use delivery data from [Central Valley Project Operations](#), for districts receiving Central Valley Project (CVP) water.

#### **5-022.15 Tracy**

There are 9 irrigation districts and 3 non-districted county areas located within the Tracy subbasin. We use DWR water agency boundaries to split the subbasin area into its member units. Some counties crossed subbasin boundaries. In those circumstances, non-districted county lands were assigned to each corresponding subbasin by the amount of irrigated acreage

located within that subbasin. For example, we distinguished the San Joaquin County area as “San Joaquin County (tracy).” A previous map from our research team excluded Tracy from the San Joaquin valley. Therefore, we have included the subbasin into our map and estimated modeling outputs for the Sacramento Valley.

When estimating modeling outputs for the South Delta Water Agency, and Central Delta Water Agency, we reached out directly to agency staff, received the corresponding acre-feet/acre, and calculated the water deliveries in acre-feet.

For surface water deliveries in Tracy, we use delivery data from [Central Valley Project Operations](#), for districts receiving Central Valley Project (CVP) water.

#### **5-022.16 Cosumnes**

There are 3 irrigation districts and 3 non-districted county areas located within the Cosumnes subbasin. We use DWR water agency boundaries to split the subbasin area into its member units. Some counties crossed subbasin boundaries. In those circumstances, non-districted county lands were assigned to each corresponding subbasin by the amount of irrigated acreage located within that subbasin. For example, we distinguished the Sacramento County area as “Sacramento County (cosumnes).” A previous map from our research team excluded Consumnes from the San Joaquin valley. Therefore, we have included the subbasin into our map and estimated modeling outputs for the Sacramento Valley.