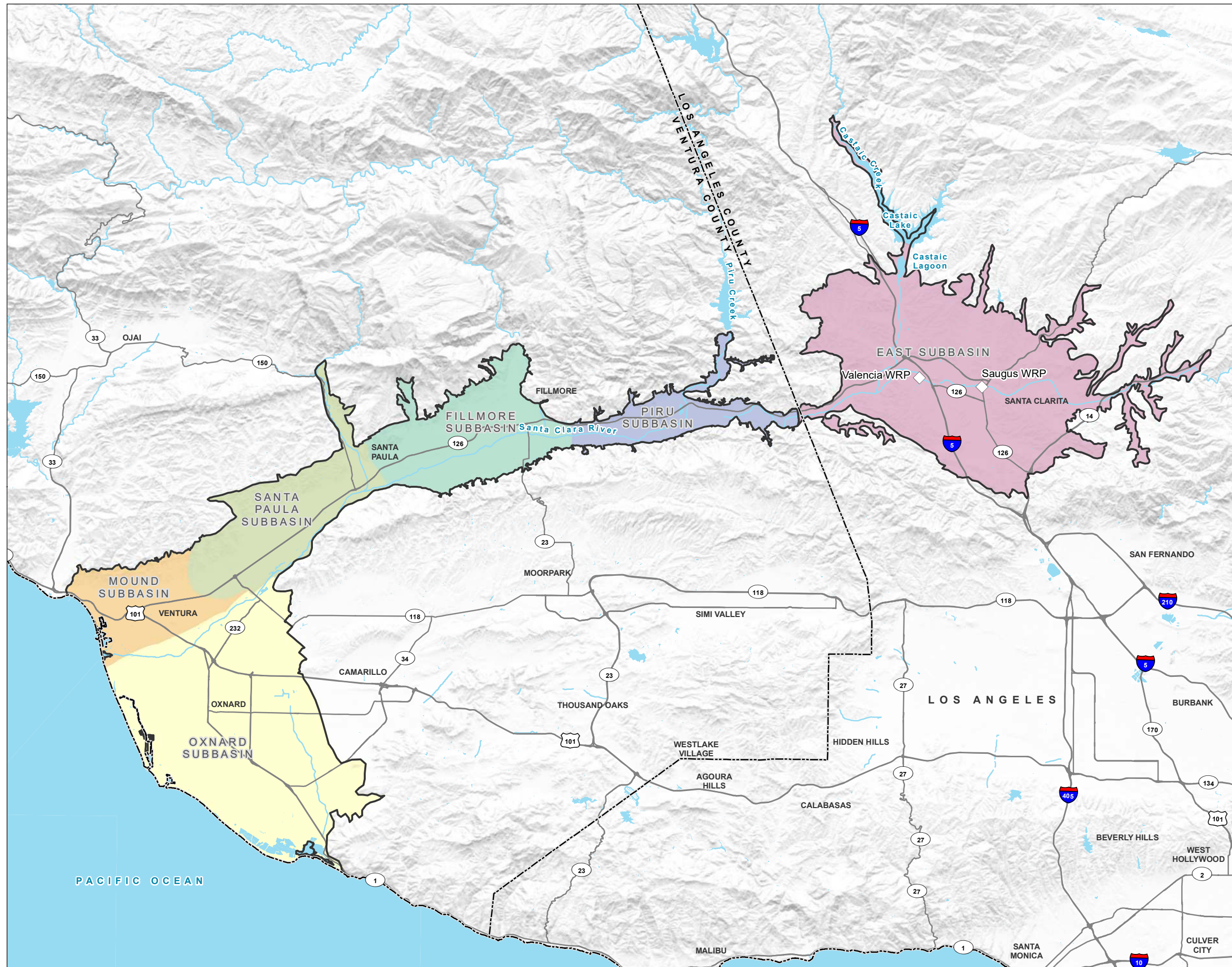


**FIGURE 1-1**  
**Santa Clara River Valley**  
**Groundwater Basin and**  
**Subbasins**

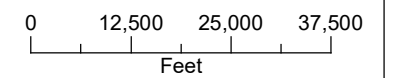
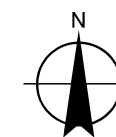
Water Budget Development for the  
 Santa Clara River Valley  
 East Groundwater Subbasin

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**LEGEND**

- ◊ Wastewater Reclamation Plant (WRP)
- ⬭ Santa Clara River Valley Groundwater Basin
- Santa Clara River Valley Subbasins**
- Santa Clara River Valley East
- Piru
- Fillmore
- Santa Paula
- Mound
- Oxnard
- All Other Features**
- ⬭ County Boundary
- Major Road
- ~ Watercourse
- Waterbody



Date: October 6, 2020  
 Data Sources: USGS, DWR Bulletin 118








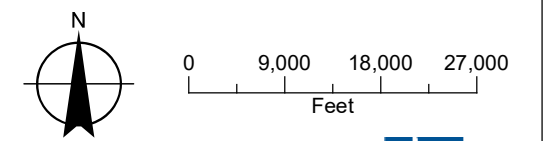
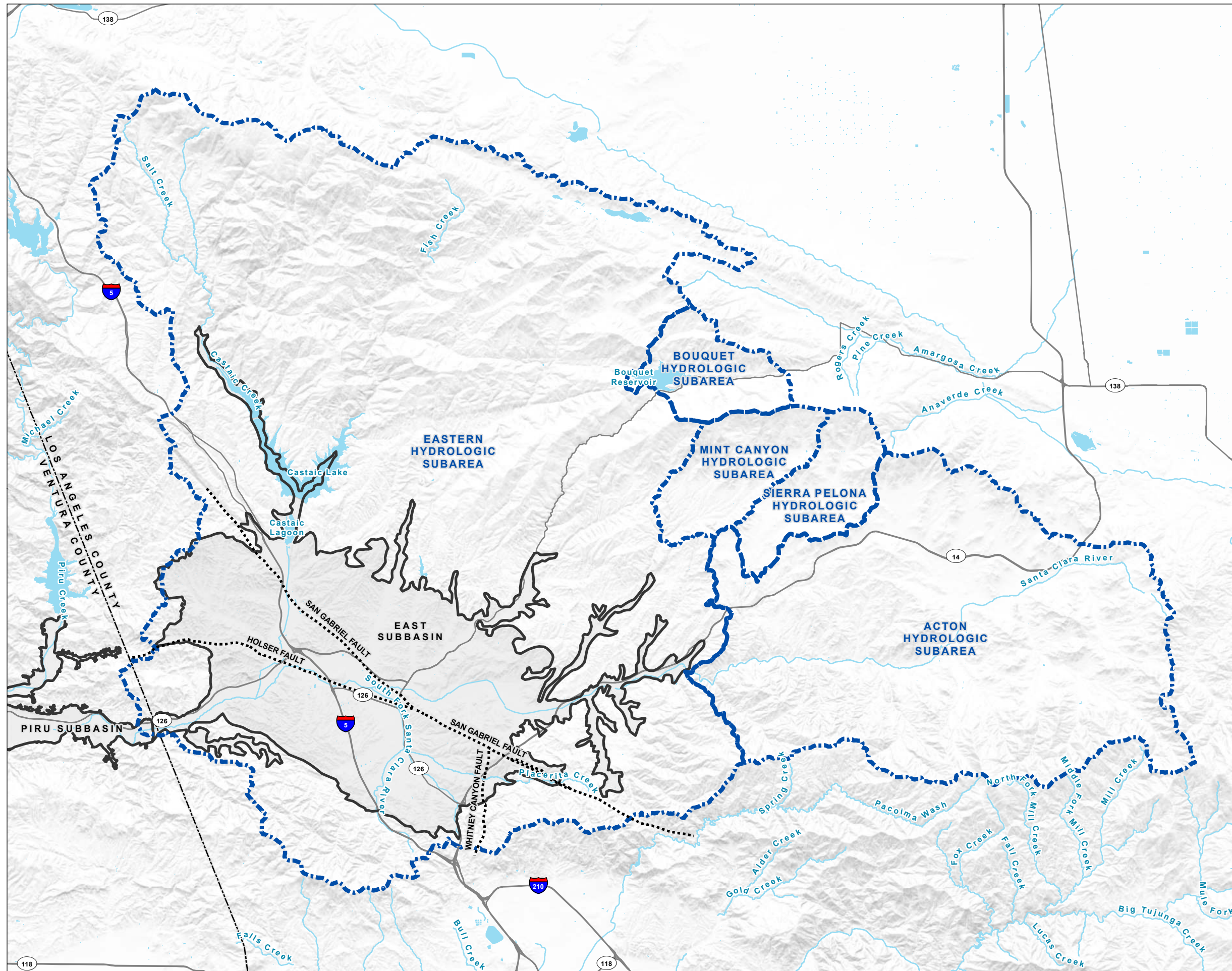
**FIGURE 1-2**  
**Watershed Boundaries for**  
**Upper Santa Clara River**  
**Hydrologic Area and Subareas**

Water Budget Development for the  
 Santa Clara River Valley  
 East Groundwater Subbasin

**DRAFT**

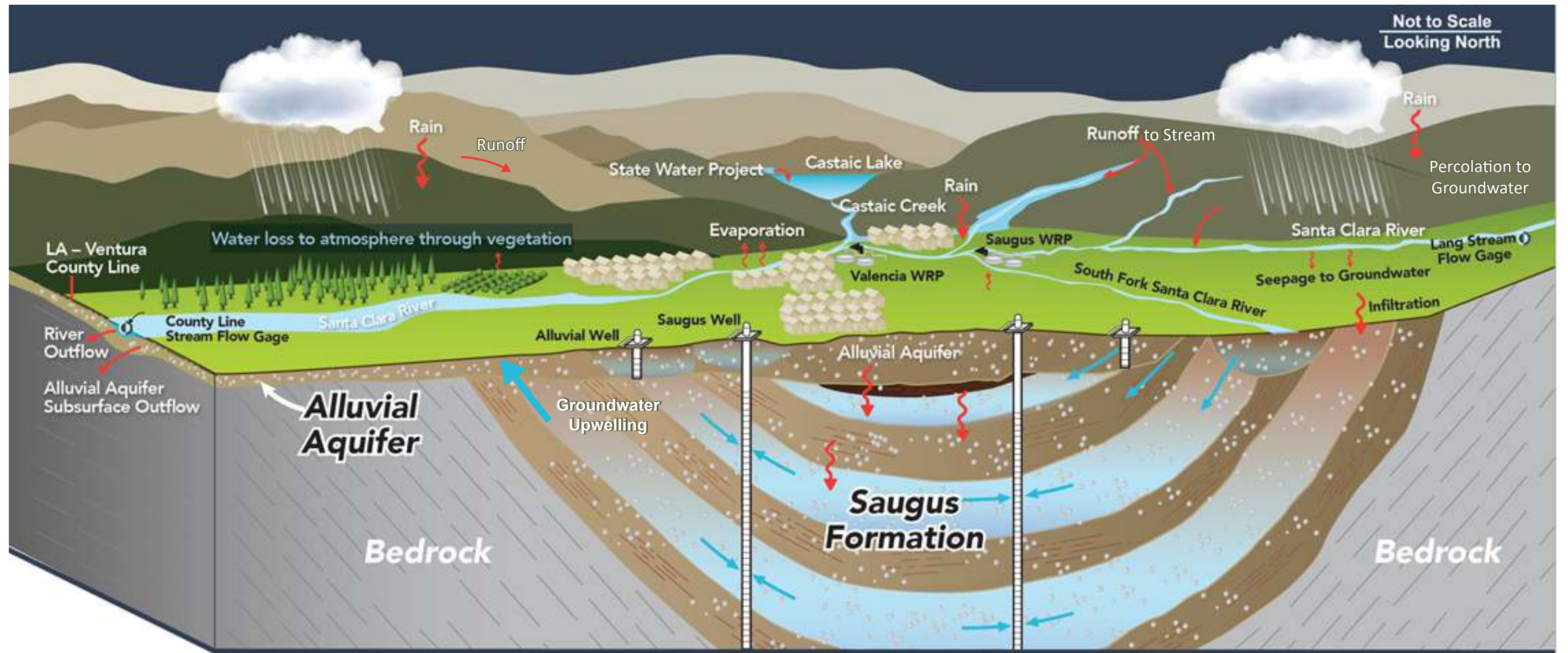
**LEGEND**

-  Santa Clara River Valley Groundwater Basin
-  Upper Santa Clara River Hydrologic Subarea
- All Other Features**
-  Major Road
-  Watercourse
-  Waterbody



Date: September 10, 2020  
 Data Sources: USGS, DWR Bulletin 118





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FIGURE 1-3

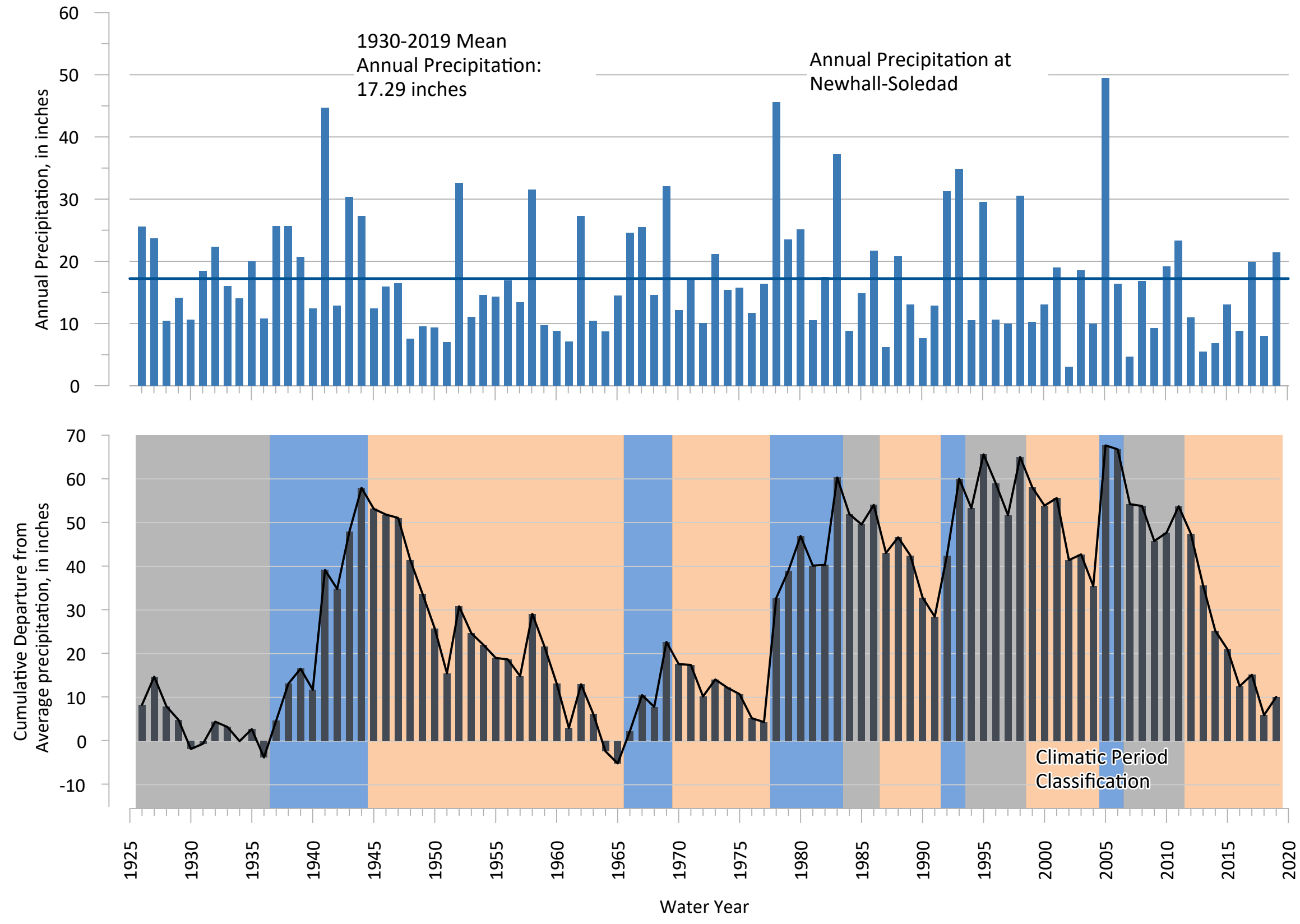
Conceptual Groundwater and Surface Water Flow Diagram  
 Santa Clara River Valley Groundwater Basin, East Subbasin

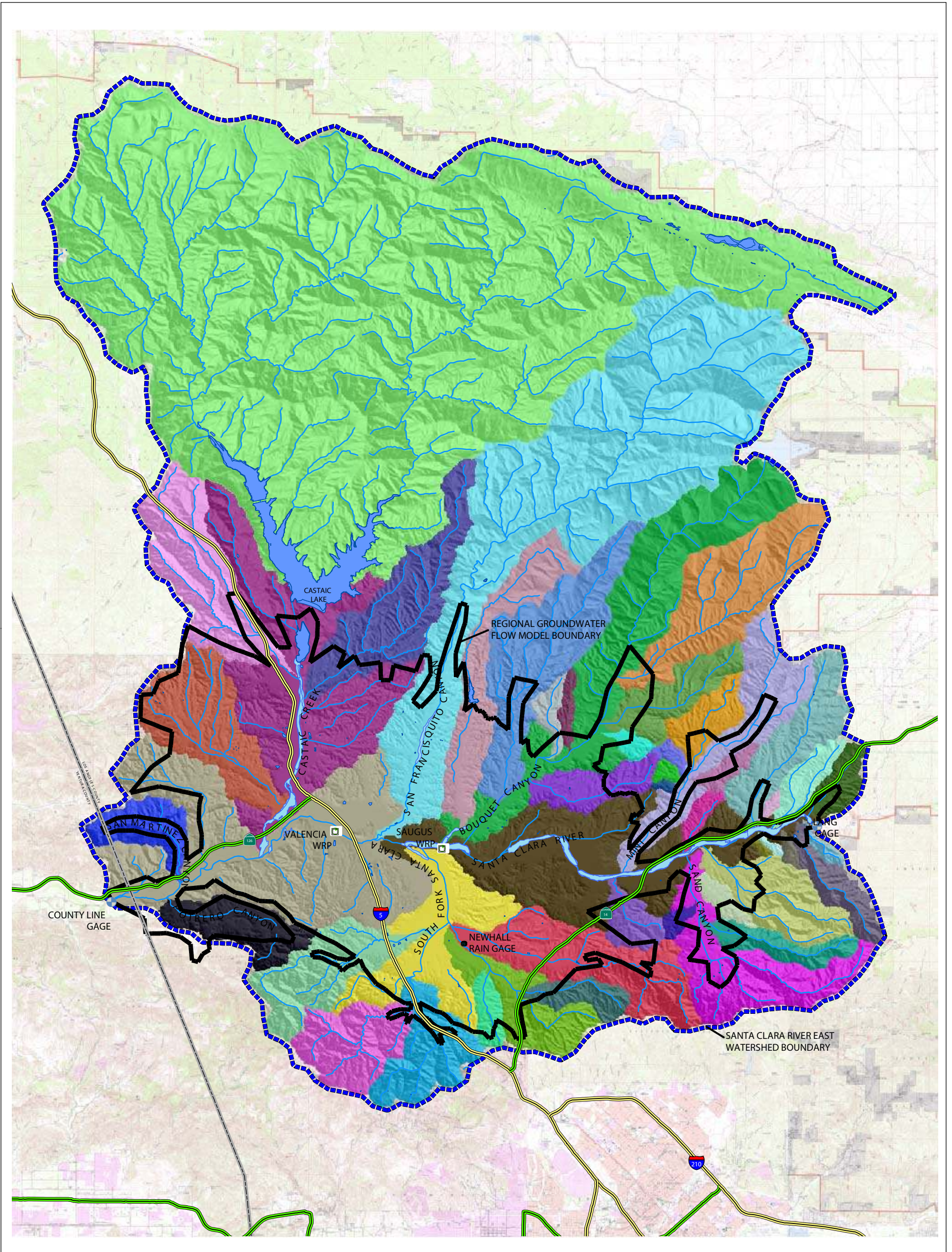
Water Budget Development for the Santa Clara River Valley East Groundwater Subbasin



**FIGURE 1-4**  
**Annual Precipitation at the**  
**Newhall-Soledad**  
**(Newhall Fire Station #73)**  
**Rain Gage and Water Year Types**  
**for the Santa Clara River Valley**  
**East Groundwater Subbasin**  
 Water Budget Development for the  
 Santa Clara River Valley  
 East Groundwater Subbasin

**DRAFT**





**LEGEND**

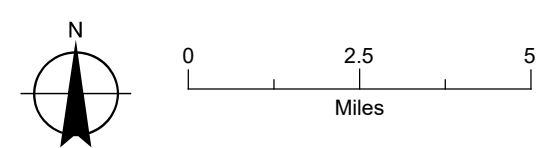
- Hydrography**
- Lake
  - Stream
  - Stream Gage
- Major Road**
- Interstate
  - State Highway

**DRAFT**

Date: October 6, 2020  
Data Sources: CH2MHILL, 2004

**FIGURE 1-5**

**Contributing Watersheds to the Santa Clara River Valley  
East Groundwater Subbasin**  
Water Budget Development for the  
Santa Clara River Valley  
East Groundwater Subbasin

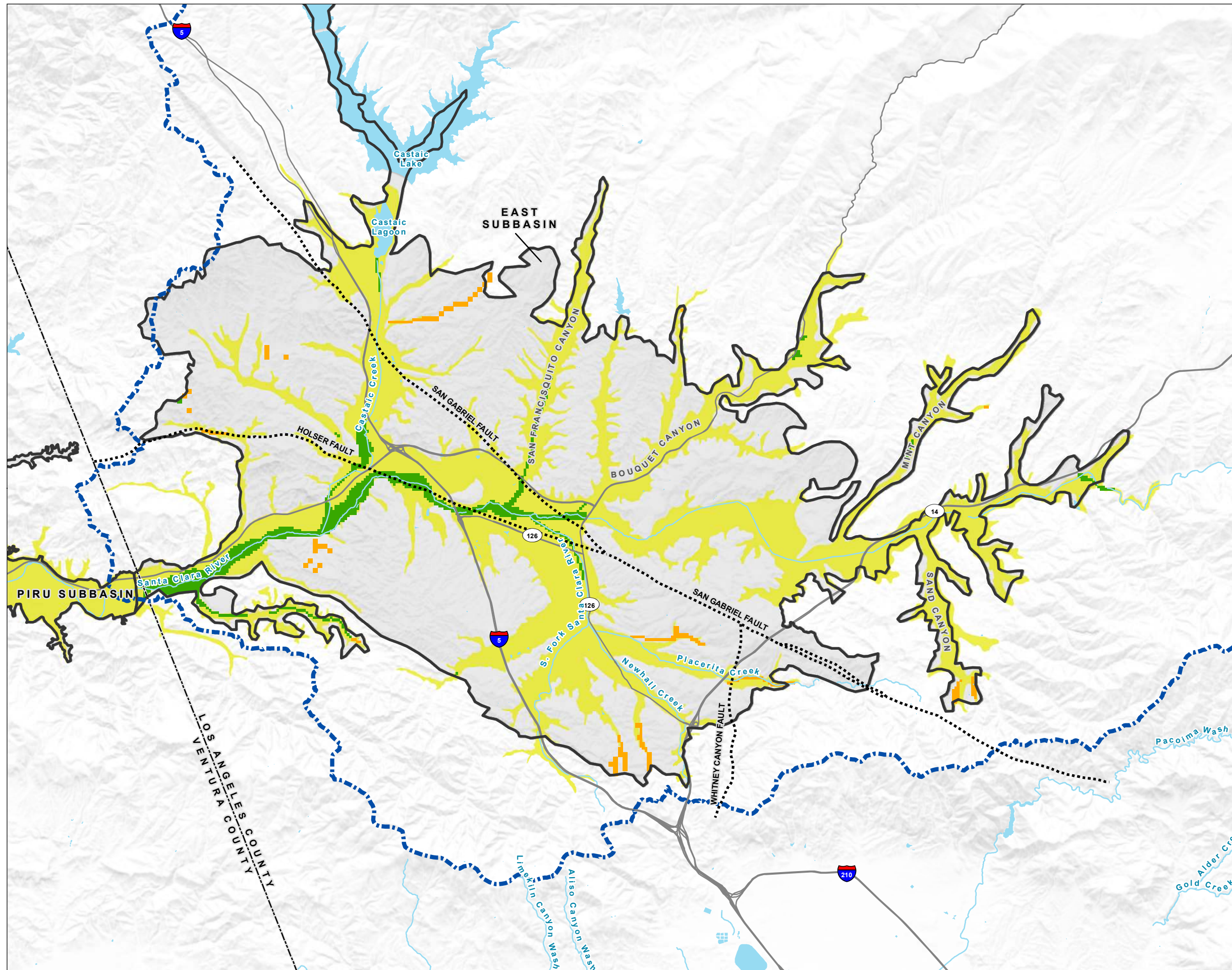


**FIGURE 1-6**

**Phreatophyte Locations  
in the Model Grid**

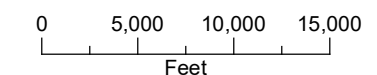
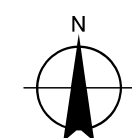
Water Budget Development for the  
Santa Clara River Valley  
East Groundwater Subbasin

**DRAFT**



**LEGEND**

- Alluvium
- Santa Clara River Valley Groundwater Basin
- Watershed Boundary
- Phreatophyte Locations**
  - Riparian Mixed Hardwood
  - Coast Live Oak Woodland
- All Other Features**
  - Major Road
  - Watercourse
  - Waterbody



Date: October 5, 2020  
Data Sources: USGS, DWR Bulletin 118,  
ESA (2020)

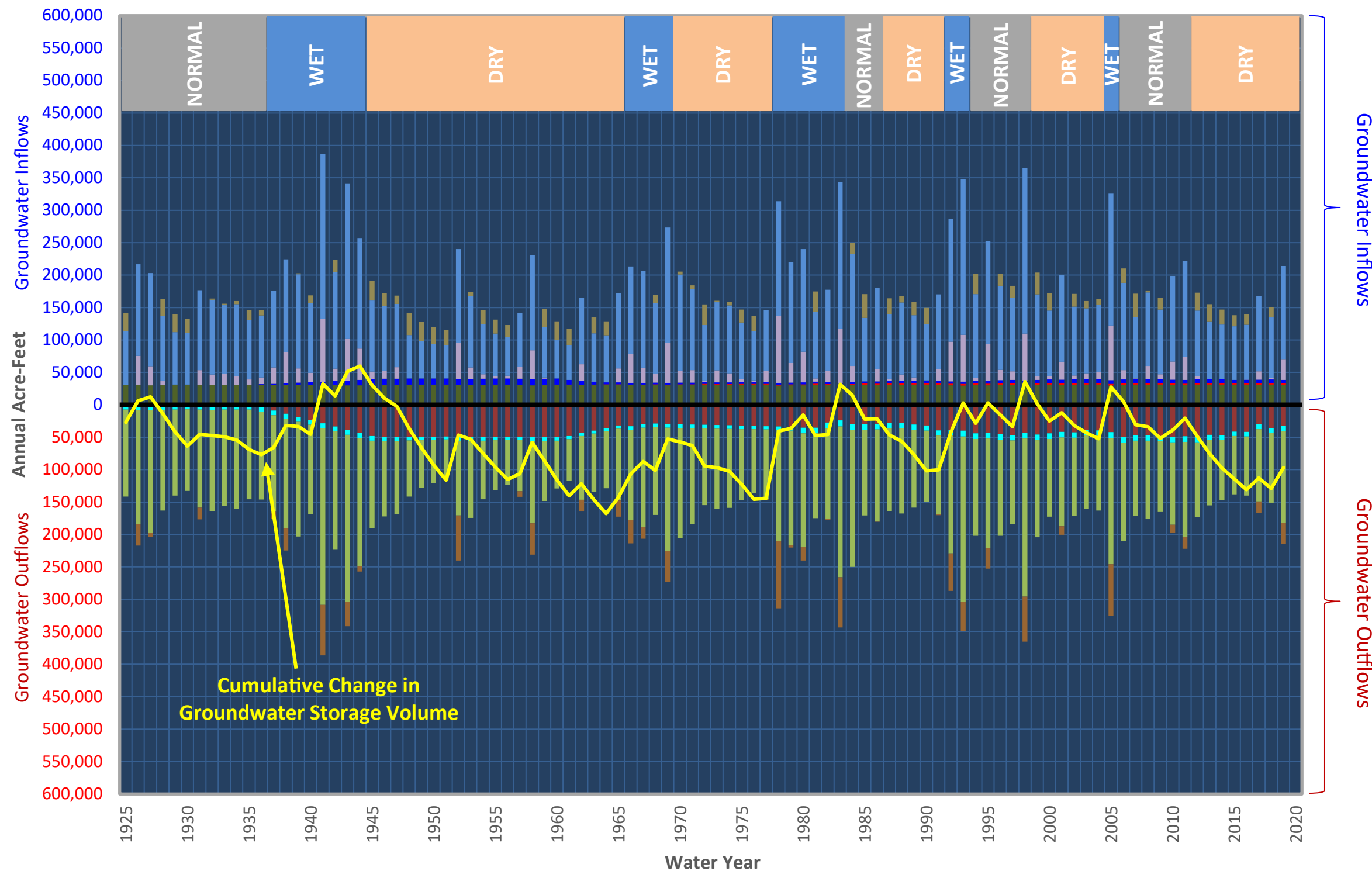


**FIGURE 1-7**

**Historical Groundwater Budget  
(Water Years 1925-2019)**

Water Budget Development for the  
Santa Clara River Valley  
East Groundwater Subbasin

**DRAFT**



**LEGEND**

- Stream Gains
- Stream Losses
- Precipitation
- Ag+Muni Irrigation
- Subsurface Inflow in Tributaries
- Septic
- Pumping
- ET
- Groundwater Storage Increase
- Groundwater Storage Reduction

**NOTES**

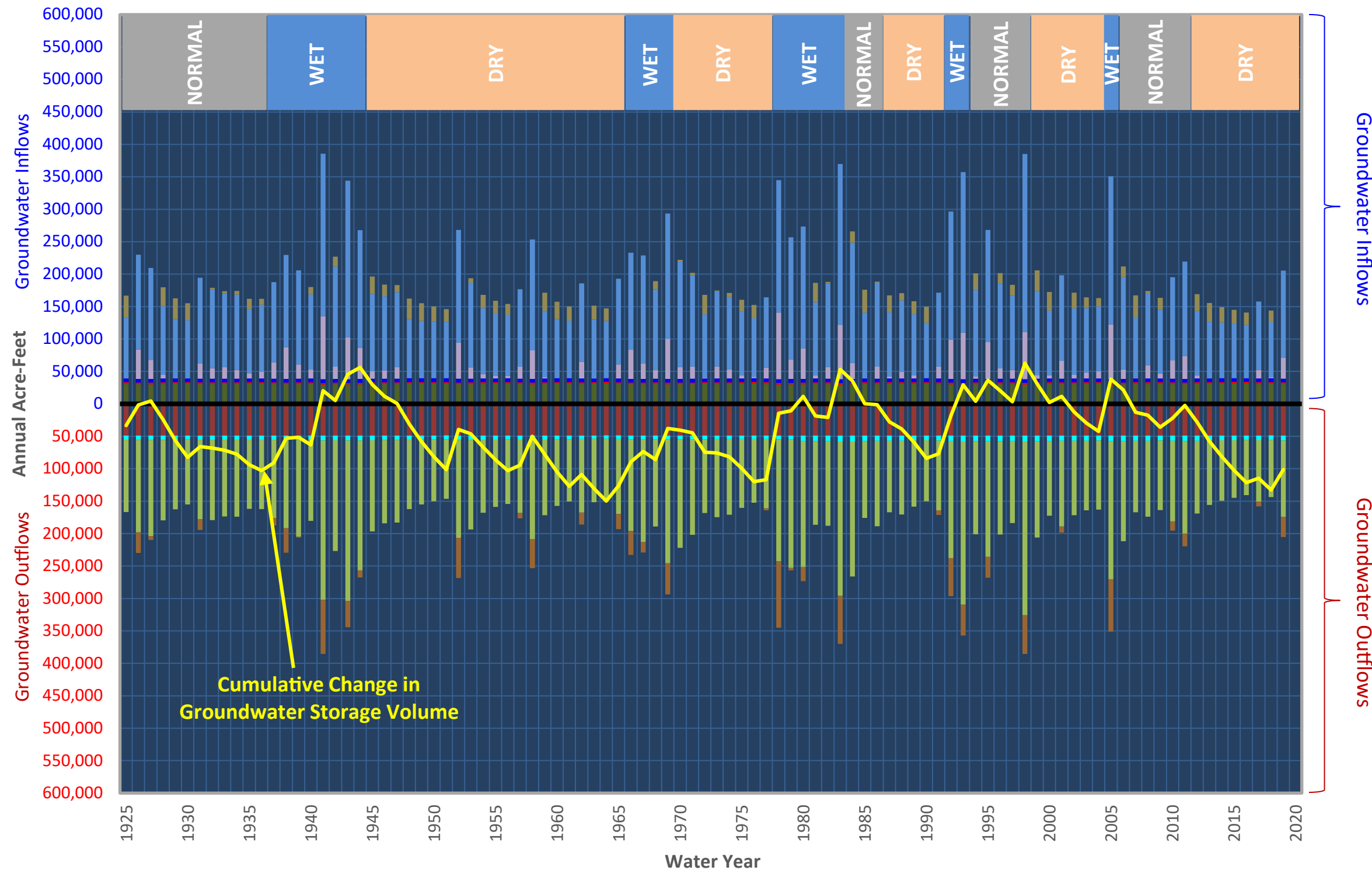
This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
Ag: agriculture  
Muni: municipal  
ET: evapotranspiration



**FIGURE 1-8**  
**Current Groundwater Budget**  
**Under the 2014**  
**Level of Development**

Water Budget Development for the  
 Santa Clara River Valley  
 East Groundwater Subbasin

**DRAFT**



**LEGEND**

- Stream Gains
- Stream Losses
- Precipitation
- Ag+Muni Irrigation
- Subsurface Inflow in Tributaries
- Septic
- Pumping
- ET
- Groundwater Storage Increase
- Groundwater Storage Reduction

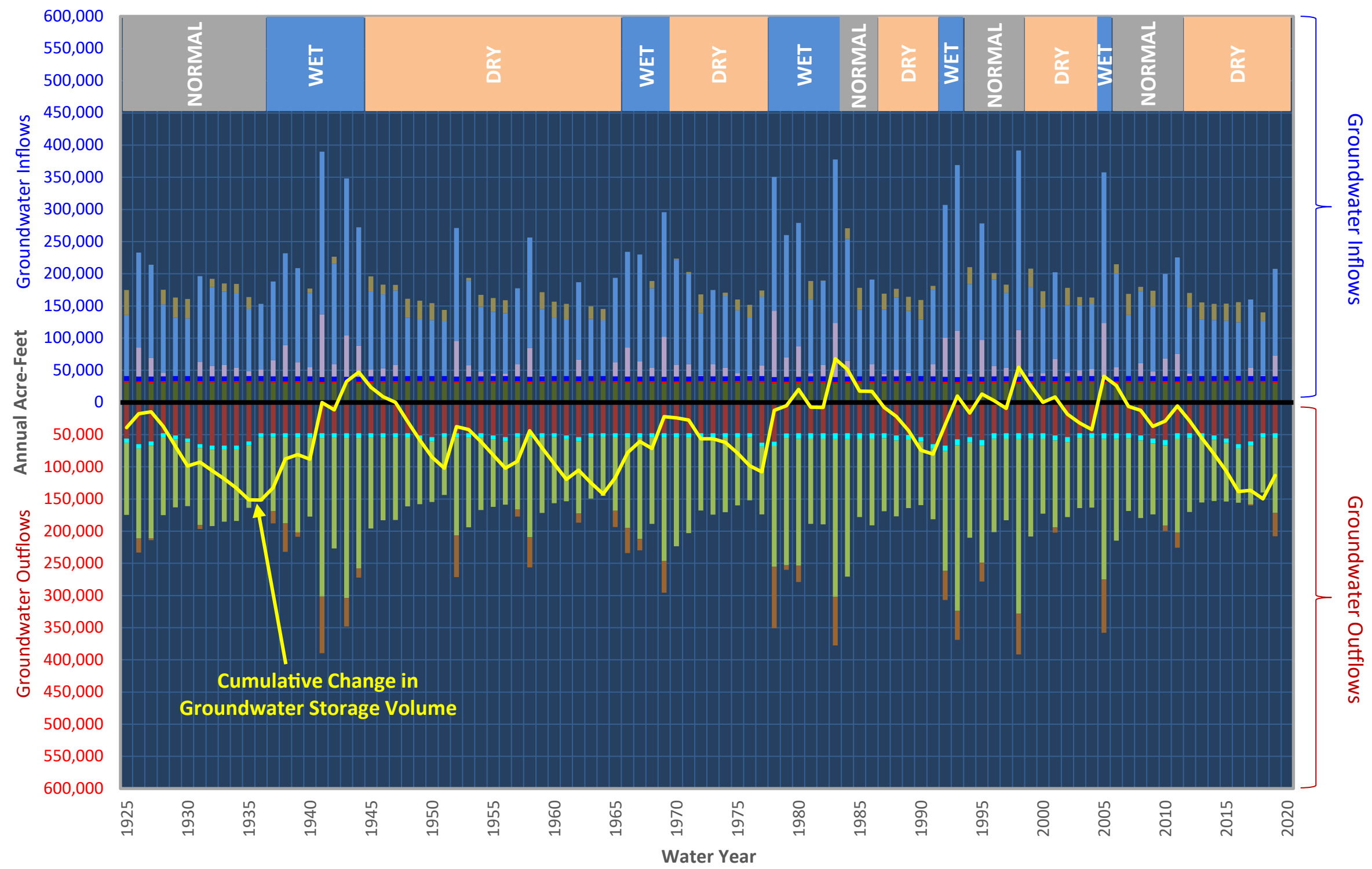
**NOTES**

This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
 Ag: agriculture  
 Muni: municipal  
 ET: evapotranspiration





**FIGURE 1-9**  
**Projected Groundwater Budget Under Full Buildout Conditions Without Climate Change**  
 Water Budget Development for the Santa Clara River Valley East Groundwater Subbasin  
**DRAFT**

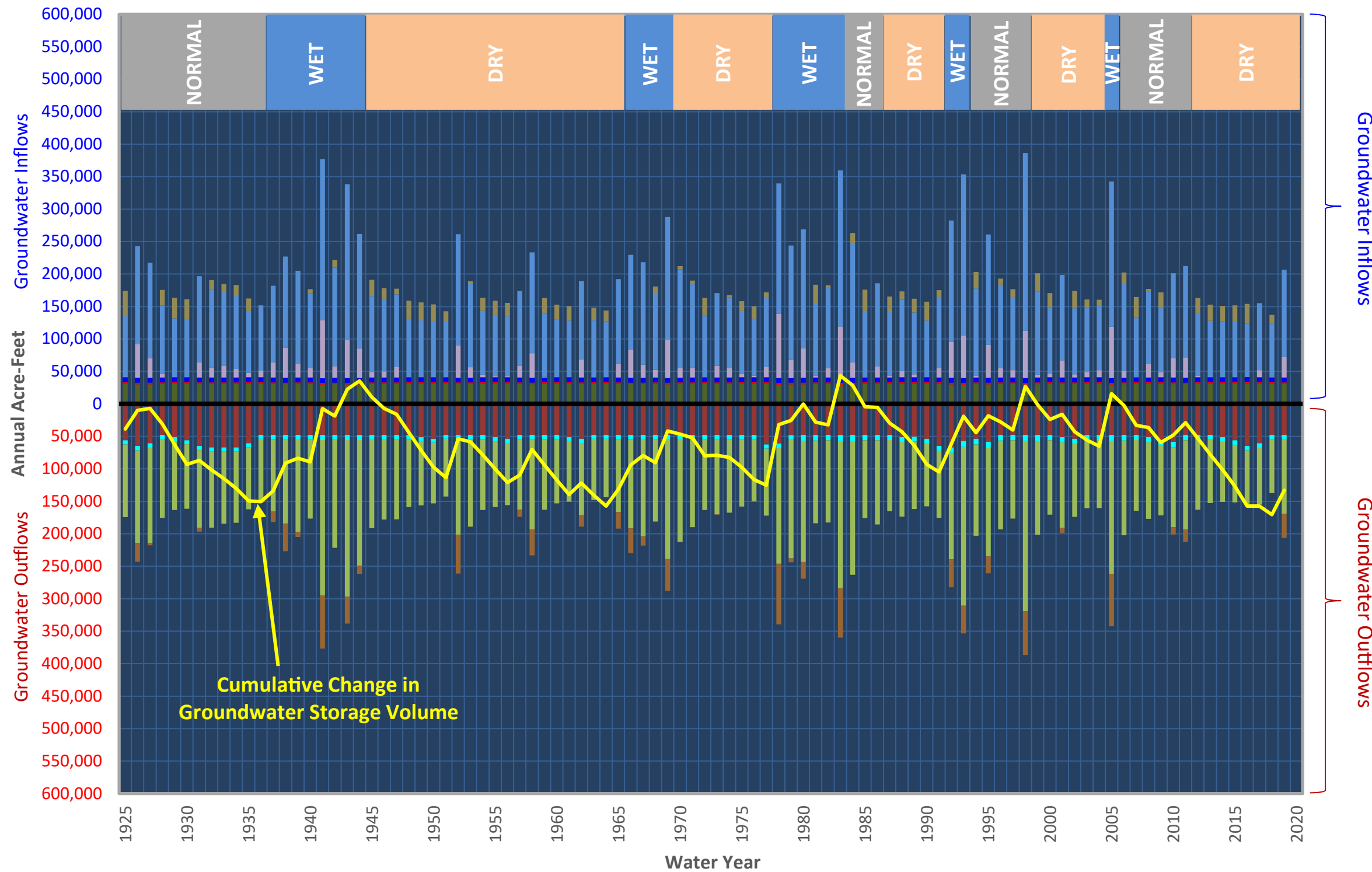


- LEGEND**
- Stream Gains
  - Stream Losses
  - Precipitation
  - Ag+Muni Irrigation
  - Subsurface Inflow in Tributaries
  - Septic
  - Pumping
  - ET
  - Groundwater Storage Increase
  - Groundwater Storage Reduction

**NOTES**  
 This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
 Ag: agriculture  
 Muni: municipal  
 ET: evapotranspiration



**FIGURE 1-10**  
**Projected Groundwater Budget**  
**For Year 2042 (Full Buildout**  
**Conditions With 2030 Average**  
**Climate Change)**  
 Water Budget Development for the  
 Santa Clara River Valley  
 East Groundwater Subbasin  
**DRAFT**



**LEGEND**

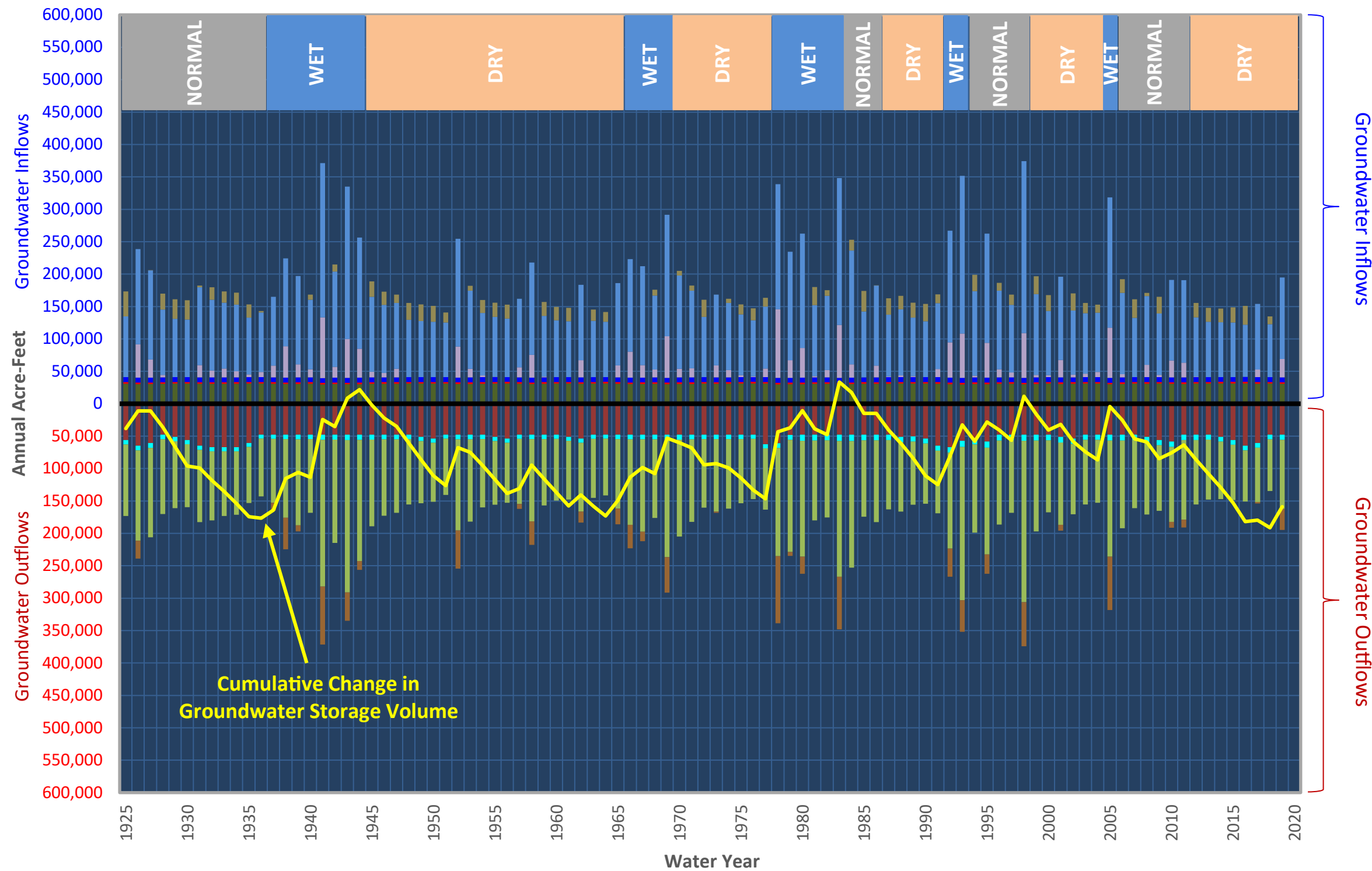
- Stream Gains
- Stream Losses
- Precipitation
- Ag+Muni Irrigation
- Subsurface Inflow in Tributaries
- Septic
- Pumping
- ET
- Groundwater Storage Increase
- Groundwater Storage Reduction

**NOTES**

This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
 Ag: agriculture  
 Muni: municipal  
 ET: evapotranspiration



**FIGURE 1-11**  
**Projected Groundwater Budget**  
**For Year 2072 (Full Buildout**  
**Conditions With 2070 Average**  
**Climate Change)**  
 Water Budget Development for the  
 Santa Clara River Valley  
 East Groundwater Subbasin  
**DRAFT**



**LEGEND**

- Stream Gains
- Stream Losses
- Precipitation
- Ag+Muni Irrigation
- Subsurface Inflow in Tributaries
- Septic
- Pumping
- ET
- Groundwater Storage Increase
- Groundwater Storage Reduction

**NOTES**

This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
 Ag: agriculture  
 Muni: municipal  
 ET: evapotranspiration



**FIGURE 2-1**  
**Rainfall-Recharge Relationship**  
**Under Historical Conditions**  
**and the 2030 and 2070**  
**Average Climate Change Scenarios**

Water Budget Development for the  
 Santa Clara River Valley  
 East Groundwater Subbasin

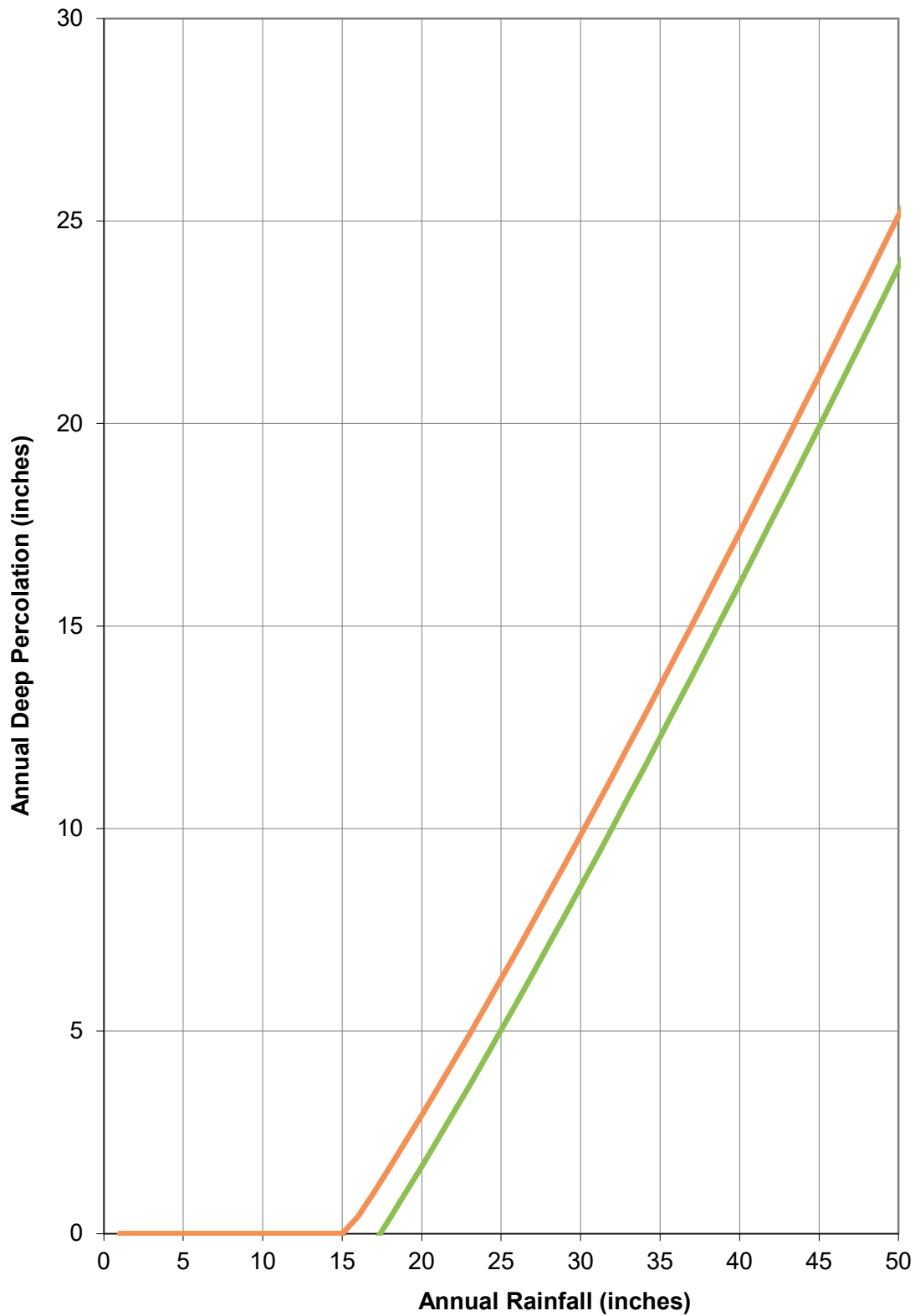
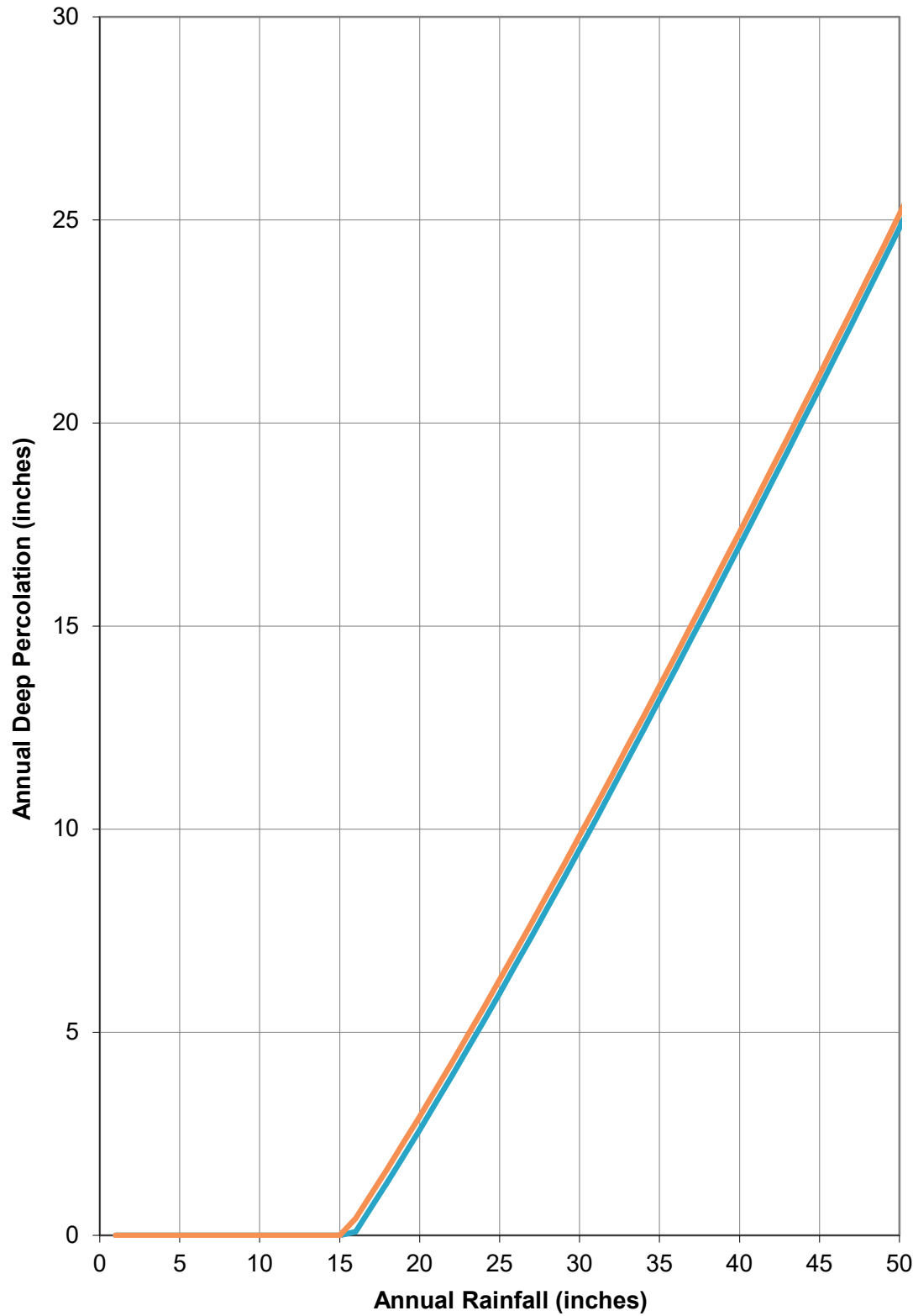
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**LEGEND**

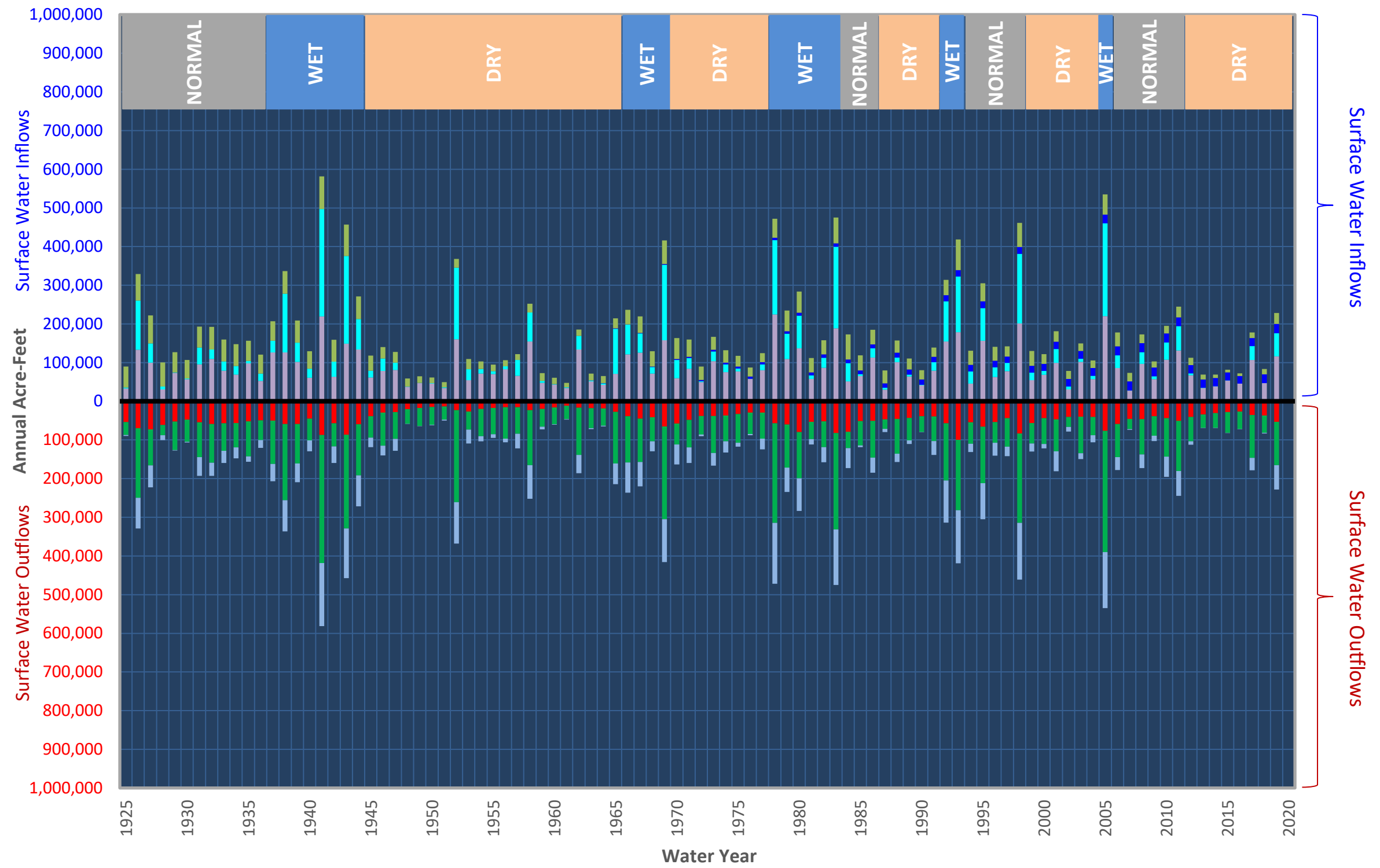
- 2030 Climate Change
- 2070 Climate Change
- Historical Conditions

**NOTES**

For historical conditions, the rainfall-recharge relationships are derived from model calibration.  
 For 2030 and 2070 climate change, the rainfall-recharge relationship is developed using factors for rainfall and ET that are provided by DWR for the East Subbasin on its SGMA web portal <https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#waterbudget>  
 DWR: California Department of Water Resources  
 ET: evapotranspiration  
 SGMA: Sustainable Groundwater Management Act




**FIGURE 3-1**  
**Historical Surface Water Budget**  
**(Water Years 1925-2019)**  
 Water Budget Development for the  
 Santa Clara River Valley  
 East Groundwater Subbasin  
**DRAFT**

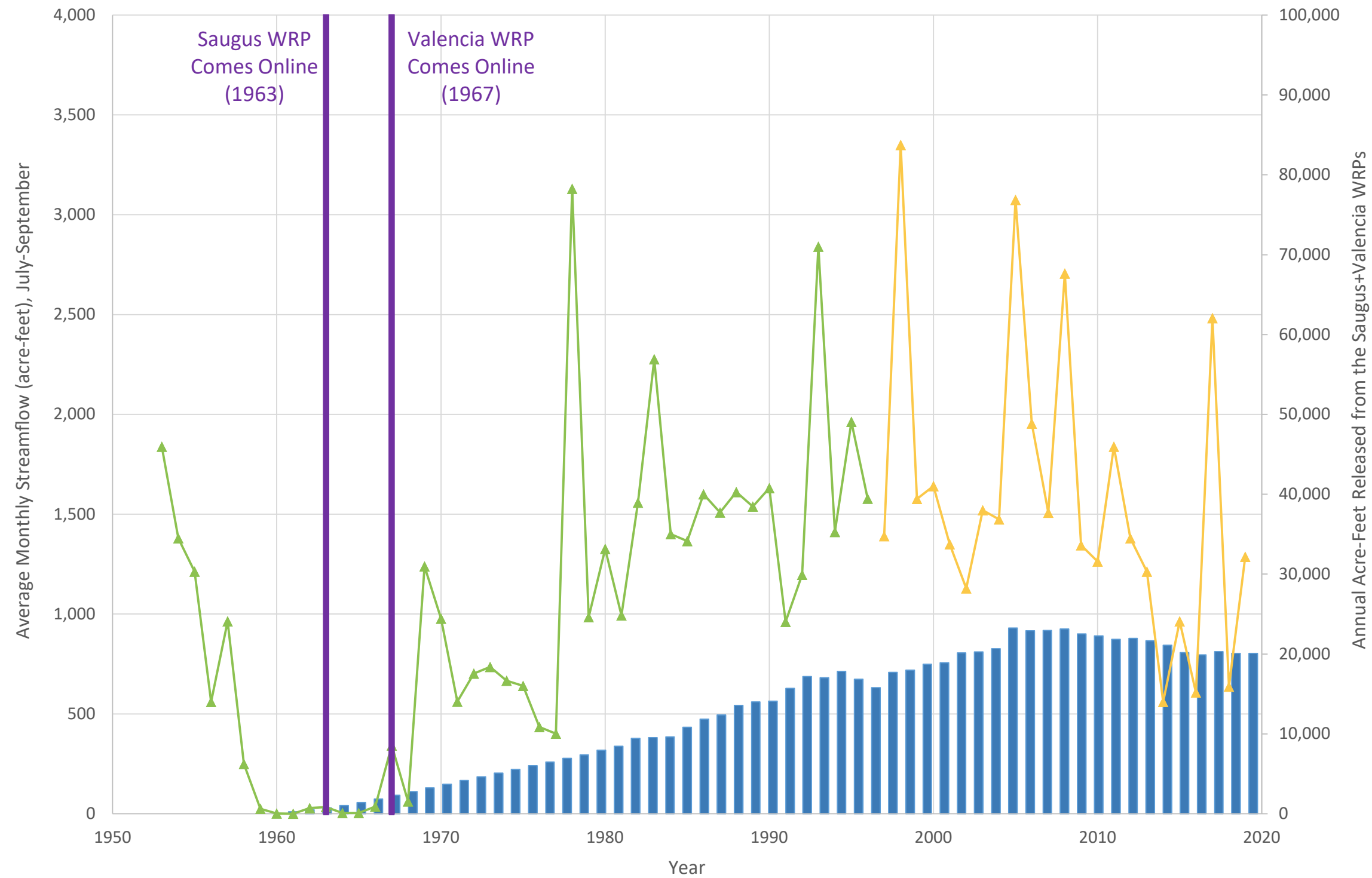


- LEGEND**
- Precipitation
  - Stream Inflows
  - Point-Source Flows to Streams
  - Net Inflow from Groundwater
  - Non-Storm Flow at County Line
  - ET and Storm Outflows
  - Groundwater Recharge from Streams and Rainfall

**NOTES**  
 This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
 ET: evapotranspiration



**FIGURE 3-2**  
**Historically Measured Annual WRP Flow Volumes and Summer-Season Streamflow Volumes in the Santa Clara River at the LA/Ventura County Line and Piru Stream Gages**  
 Water Budget Development for the Santa Clara River Valley East Groundwater Subbasin  
**DRAFT**



**LEGEND**

- Annual WRP Discharge Volume (Saugus+Valencia)
- ▲ LA/Ventura County Line Stream Gage
- ▲ Piru Stream Gage

**NOTES**  
 LA: Los Angeles  
 WRP: water reclamation plant

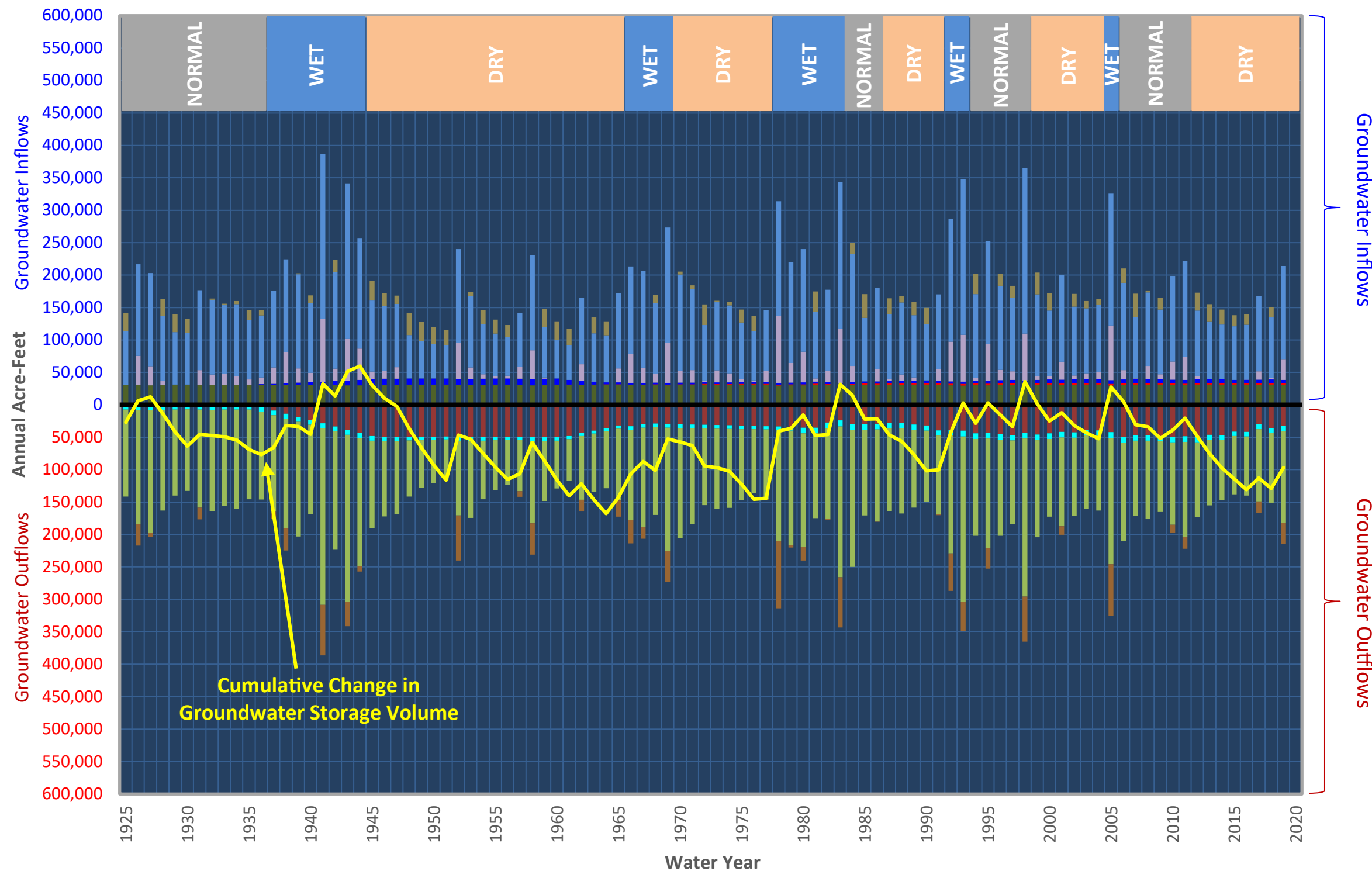


**FIGURE 3-3**

**Historical Groundwater Budget  
(Water Years 1925-2019)**

Water Budget Development for the  
Santa Clara River Valley  
East Groundwater Subbasin

**DRAFT**



**LEGEND**

- Stream Gains
- Stream Losses
- Precipitation
- Ag+Muni Irrigation
- Subsurface Inflow in Tributaries
- Septic
- Pumping
- ET
- Groundwater Storage Increase
- Groundwater Storage Reduction

**NOTES**

This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
Ag: agriculture  
Muni: municipal  
ET: evapotranspiration

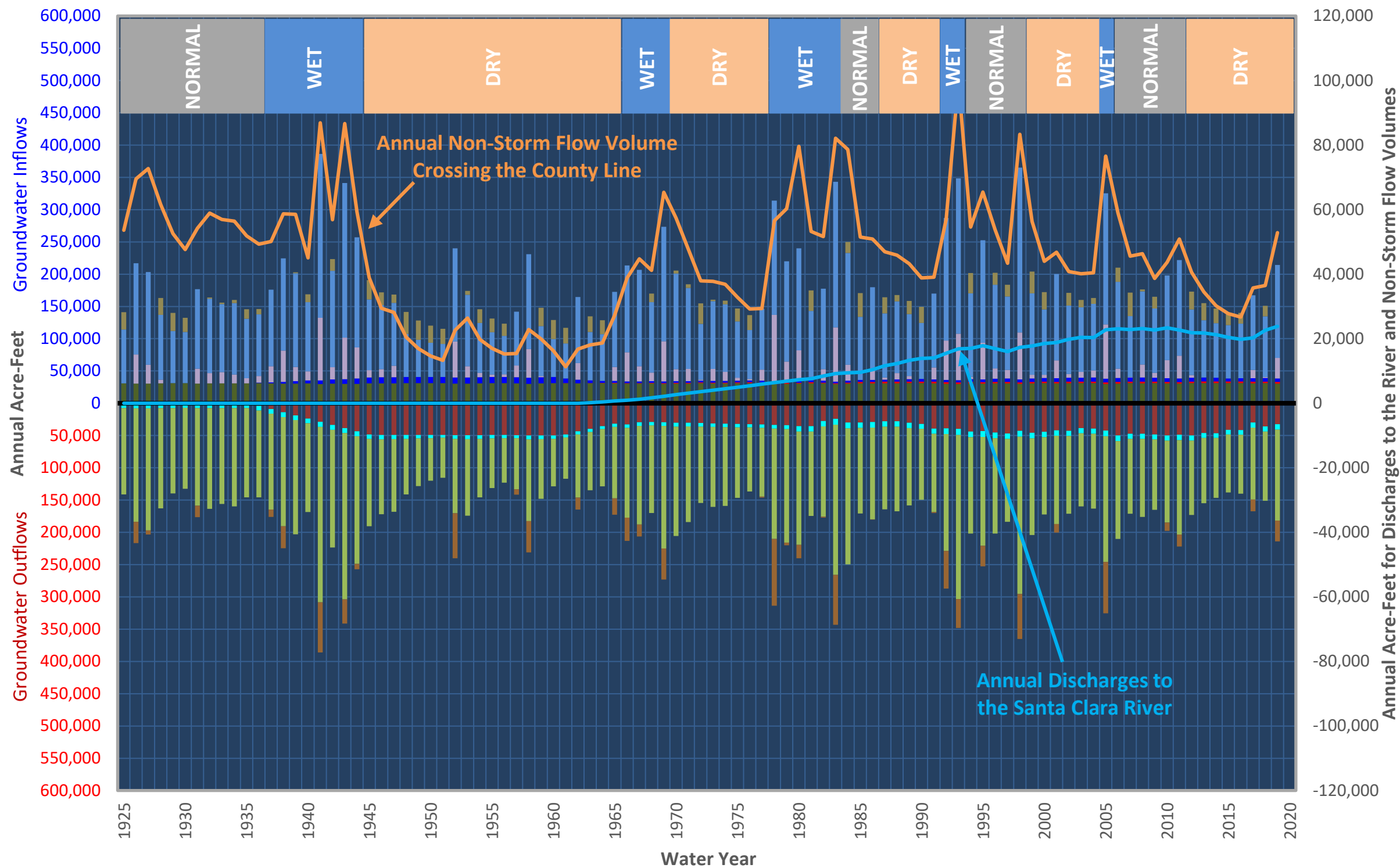


**FIGURE 3-4**

**Historical Groundwater Budget and Annual Non-Storm Flows at the LA/Ventura County Line**

Water Budget Development for the Santa Clara River Valley East Groundwater Subbasin

**DRAFT**



**LEGEND**

- Stream Gains
- Stream Losses
- Precipitation
- Ag+Muni Irrigation
- Subsurface Inflow in Tributaries
- Septic
- Pumping
- ET
- Groundwater Storage Increase
- Groundwater Storage Reduction

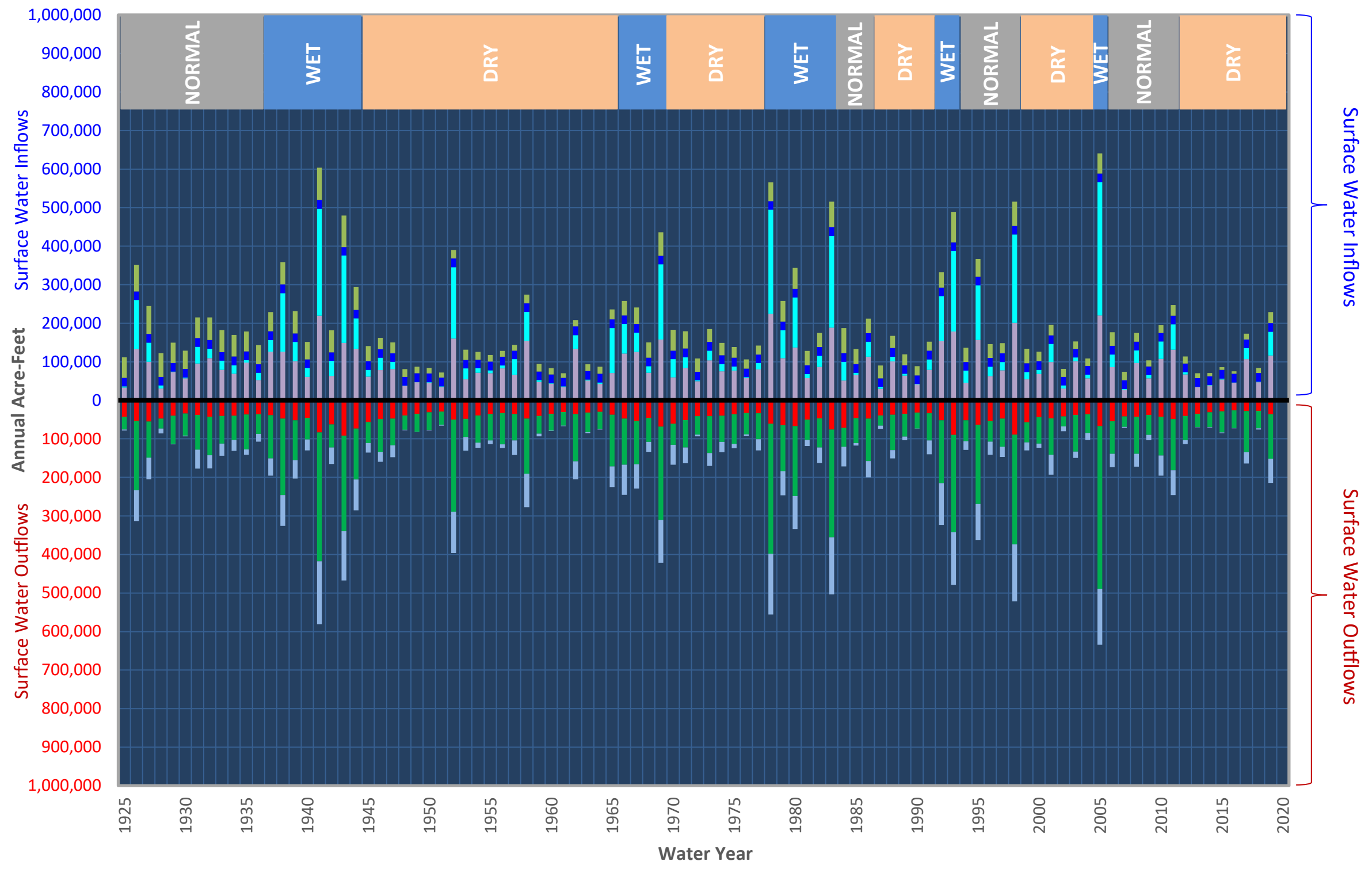
**NOTES**

This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
 Ag: agriculture  
 Muni: municipal  
 ET: evapotranspiration





**FIGURE 4-1**  
**Current Surface Water Budget**  
**Under the 2014**  
**Level of Development**  
 Water Budget Development for the  
 Santa Clara River Valley  
 East Groundwater Subbasin  
**DRAFT**



**LEGEND**

- Precipitation
- Stream Inflows
- Point-Source Flows to Streams
- Net Inflow from Groundwater
- Non-Storm Flow at County Line
- ET and Storm Outflows
- Groundwater Recharge from Streams and Rainfall

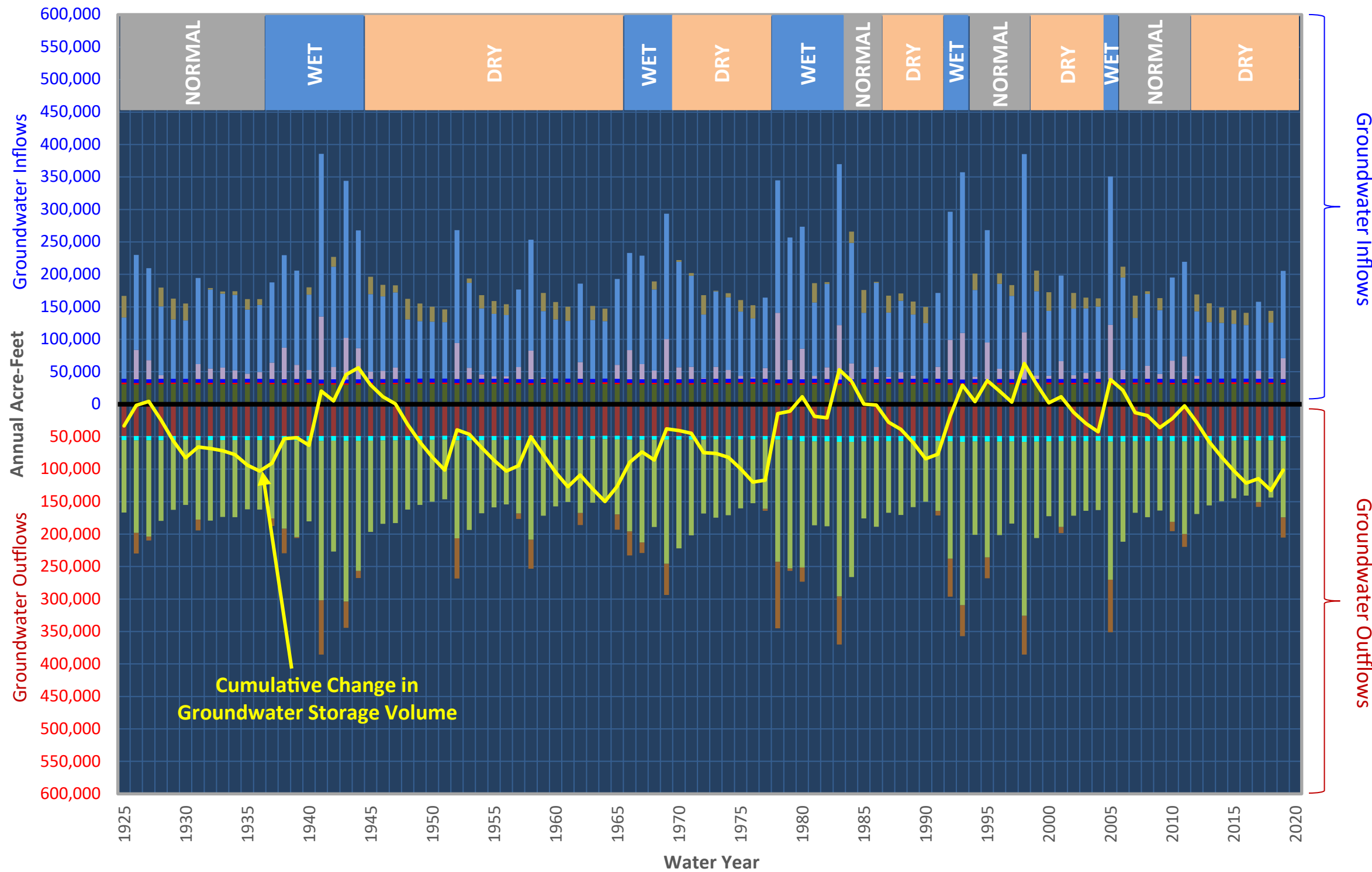
**NOTES**  
 This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
 ET: evapotranspiration



**FIGURE 4-2**  
**Current Groundwater Budget**  
**Under the 2014**  
**Level of Development**

Water Budget Development for the  
 Santa Clara River Valley  
 East Groundwater Subbasin

**DRAFT**



**LEGEND**

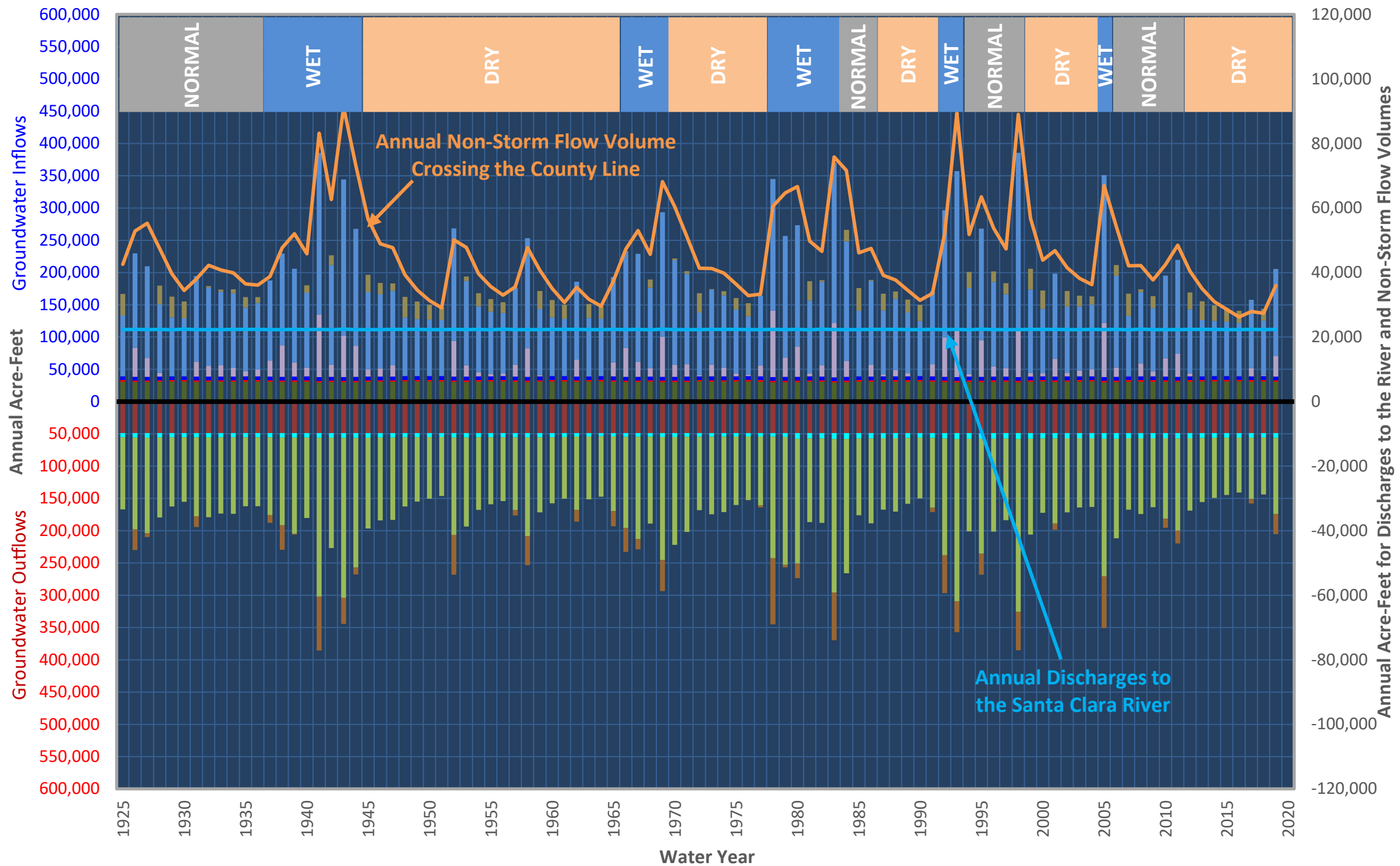
- Stream Gains
- Stream Losses
- Precipitation
- Ag+Muni Irrigation
- Subsurface Inflow in Tributaries
- Septic
- Pumping
- ET
- Groundwater Storage Increase
- Groundwater Storage Reduction

**NOTES**

This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
 Ag: agriculture  
 Muni: municipal  
 ET: evapotranspiration



**FIGURE 4-3**  
**Projected Groundwater Budget and Annual Non-Storm Flows at the LA/Ventura County Line Under the 2014 Level of Development**  
 Water Budget Development for the Santa Clara River Valley East Groundwater Subbasin  
**DRAFT**

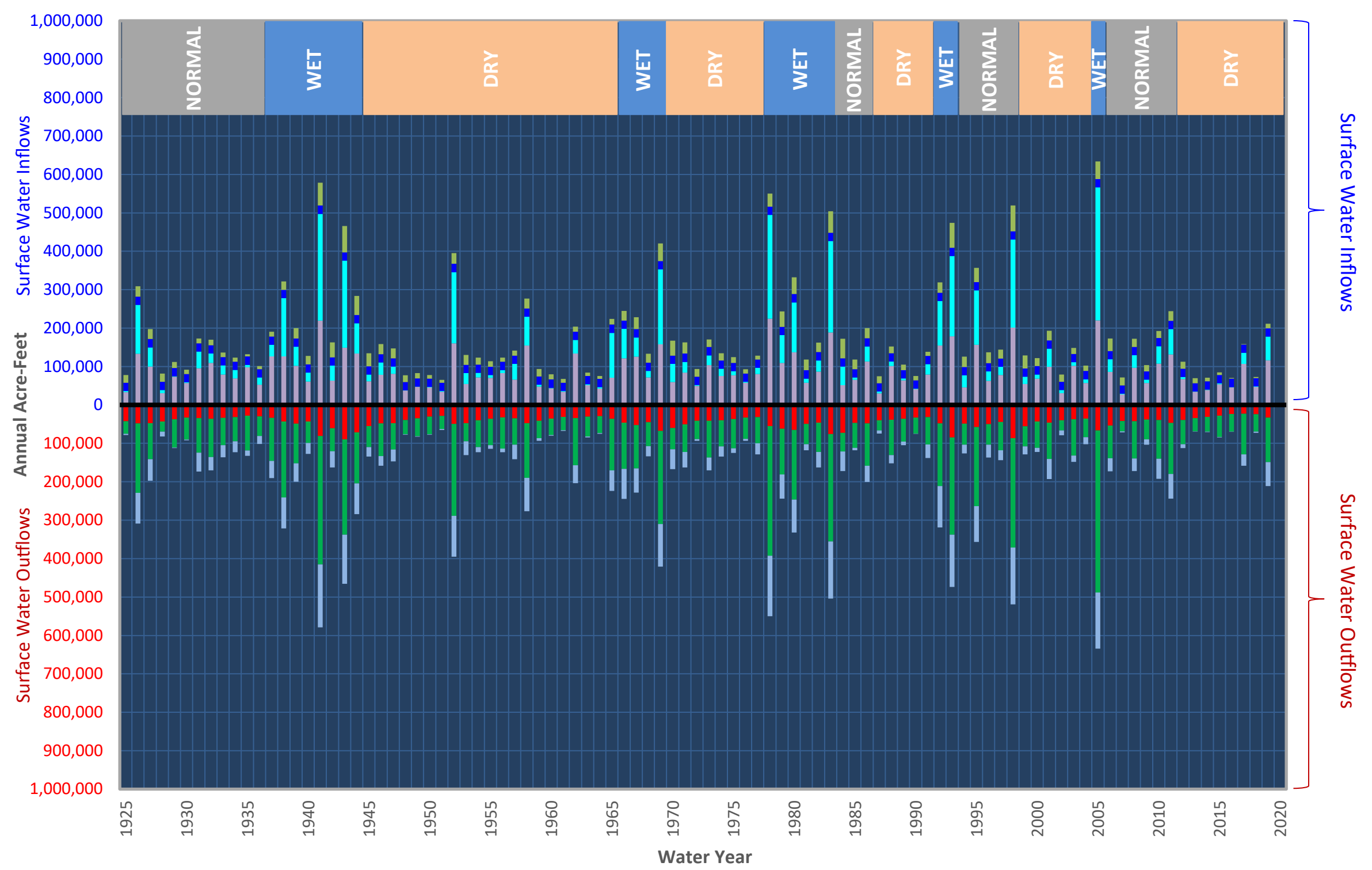


- LEGEND**
- Stream Gains
  - Stream Losses
  - Precipitation
  - Ag+Muni Irrigation
  - Subsurface Inflow in Tributaries
  - Septic
  - Pumping
  - ET
  - Groundwater Storage Increase
  - Groundwater Storage Reduction

**NOTES**  
 This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
 Ag: agriculture  
 Muni: municipal  
 ET: evapotranspiration



**FIGURE 5-1**  
**Projected Surface Water Budget**  
**Under Full Buildout Conditions**  
**Without Climate Change**  
 Water Budget Development for the  
 Santa Clara River Valley  
 East Groundwater Subbasin  
**DRAFT**

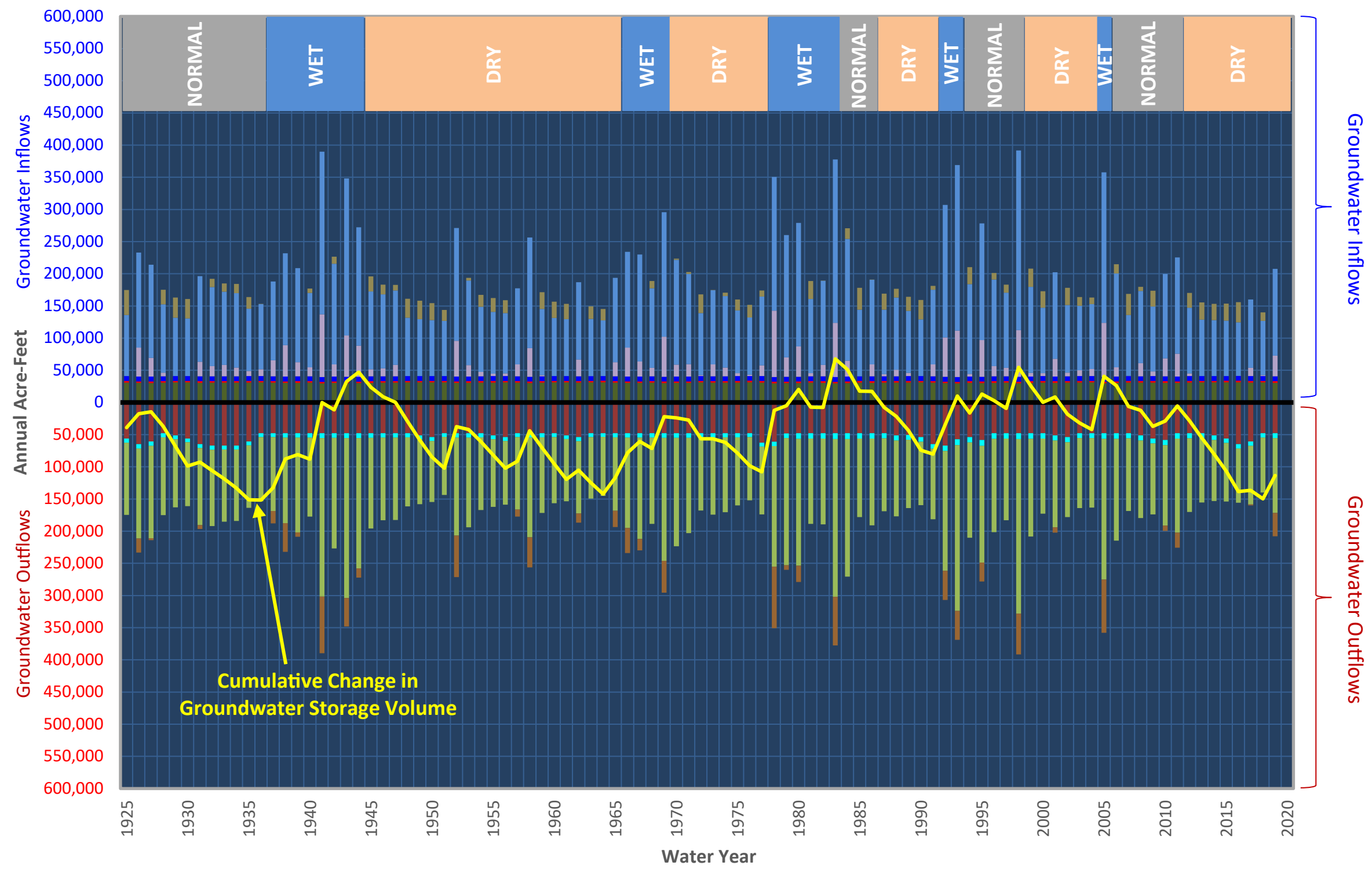


- LEGEND**
- Precipitation
  - Stream Inflows
  - Point-Source Flows to Streams
  - Net Inflow from Groundwater
  - Non-Storm Flow at County Line
  - ET and Storm Outflows
  - Groundwater Recharge from Streams and Rainfall

**NOTES**  
 This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
 ET: evapotranspiration



**FIGURE 5-2**  
**Projected Groundwater Budget Under Full Buildout Conditions Without Climate Change**  
 Water Budget Development for the Santa Clara River Valley East Groundwater Subbasin  
**DRAFT**

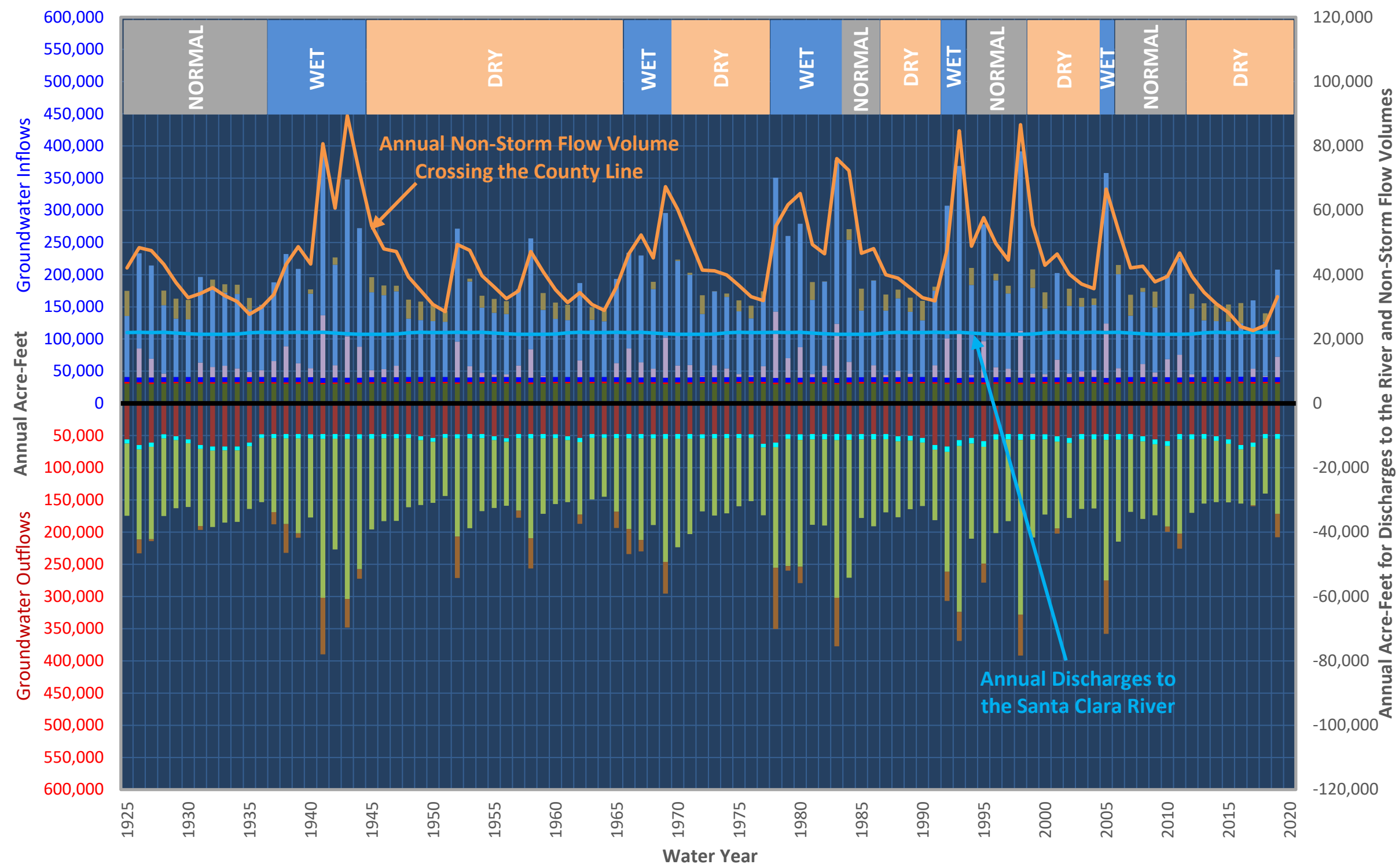


- LEGEND**
- Stream Gains
  - Stream Losses
  - Precipitation
  - Ag+Muni Irrigation
  - Subsurface Inflow in Tributaries
  - Septic
  - Pumping
  - ET
  - Groundwater Storage Increase
  - Groundwater Storage Reduction

**NOTES**  
 This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
 Ag: agriculture  
 Muni: municipal  
 ET: evapotranspiration



**FIGURE 5-3**  
**Projected Groundwater Budget and Annual Non-Storm Flows at the LA/Ventura County Line Under Full Buildout Conditions Without Climate Change**  
 Water Budget Development for the Santa Clara River Valley East Groundwater Subbasin  
**DRAFT**

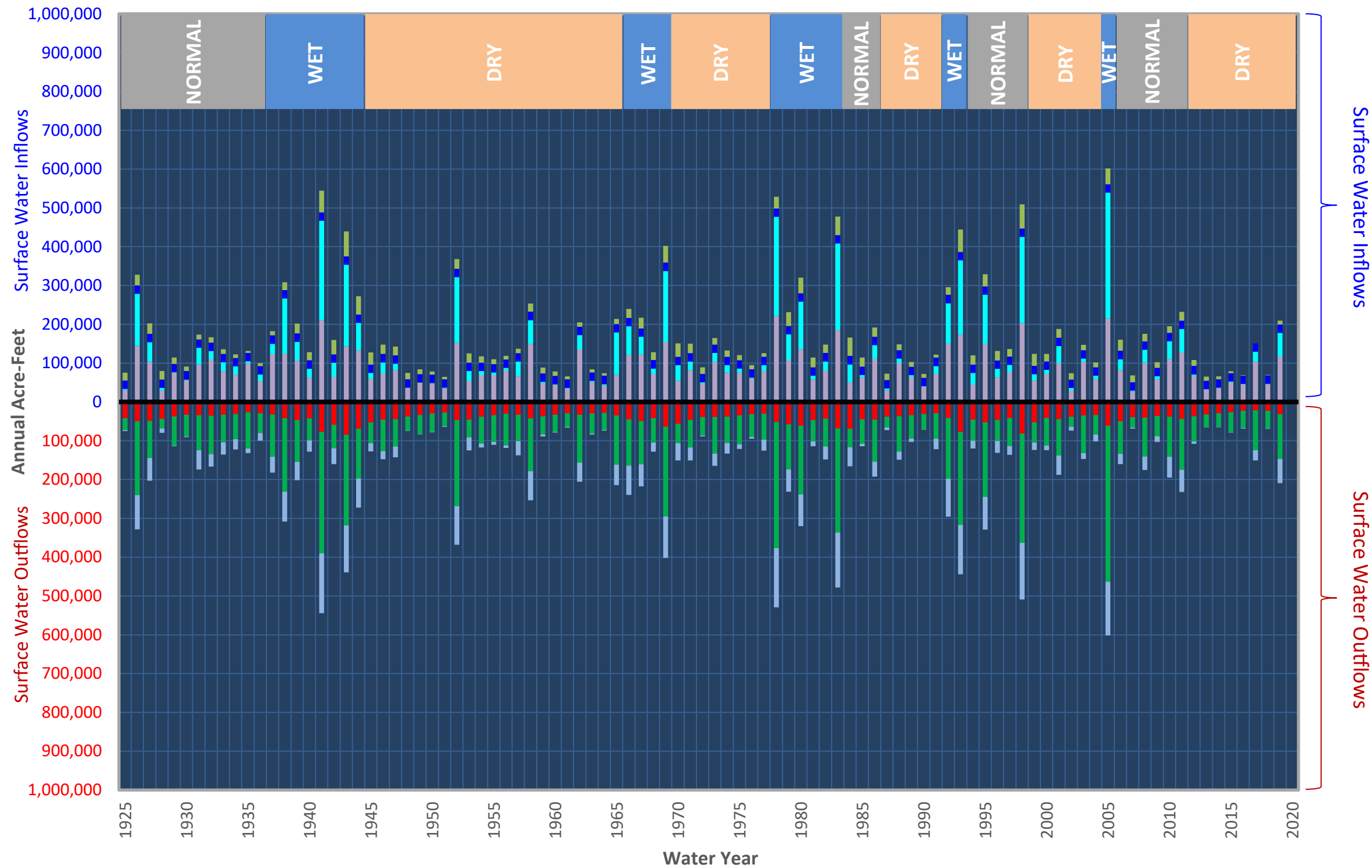


- LEGEND**
- Stream Gains
  - Stream Losses
  - Precipitation
  - Ag+Muni Irrigation
  - Subsurface Inflow in Tributaries
  - Septic
  - Pumping
  - ET
  - Groundwater Storage Increase
  - Groundwater Storage Reduction

**NOTES**  
 This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
 Ag: agriculture  
 Muni: municipal  
 ET: evapotranspiration



**FIGURE 5-4**  
**Projected Surface Water Budget for Year 2042 Under Full Buildout Conditions With 2030 Average Climate Change**  
 Water Budget Development for the Santa Clara River Valley East Groundwater Subbasin  
**DRAFT**



**LEGEND**

- Precipitation
- Stream Inflows
- Point-Source Flows to Streams
- Net Inflow from Groundwater
- Non-Storm Flow at County Line
- ET and Storm Outflows
- Groundwater Recharge from Streams and Rainfall

**NOTES**

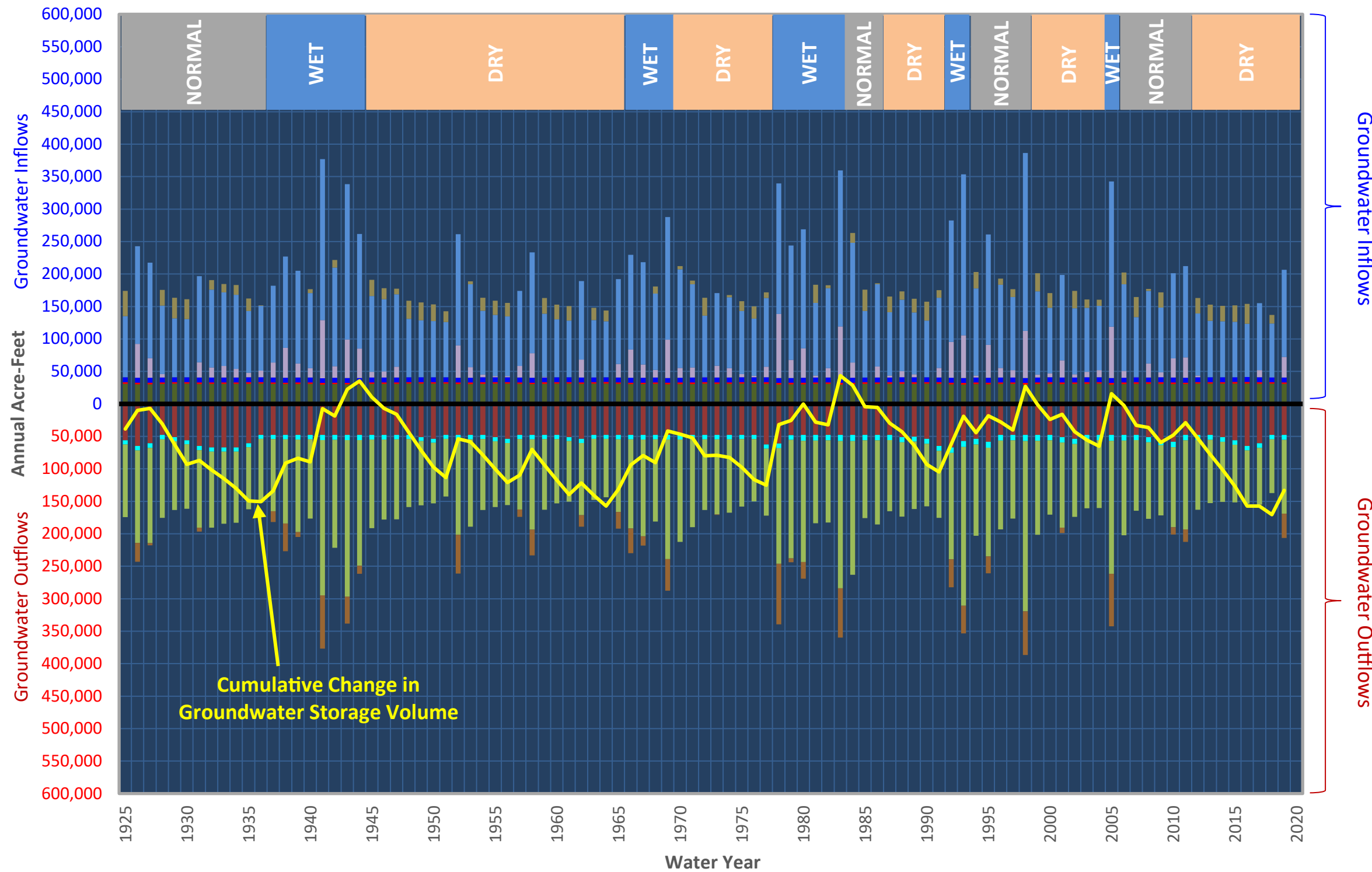
This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
 ET: evapotranspiration



**FIGURE 5-5**  
**Projected Groundwater Budget**  
**for Year 2042 Under Full Buildout**  
**Conditions With 2030 Average**  
**Climate Change**

Water Budget Development for the  
 Santa Clara River Valley  
 East Groundwater Subbasin

**DRAFT**



**LEGEND**

- Stream Gains
- Stream Losses
- Precipitation
- Ag+Muni Irrigation
- Subsurface Inflow in Tributaries
- Septic
- Pumping
- ET
- Groundwater Storage Increase
- Groundwater Storage Reduction

**NOTES**

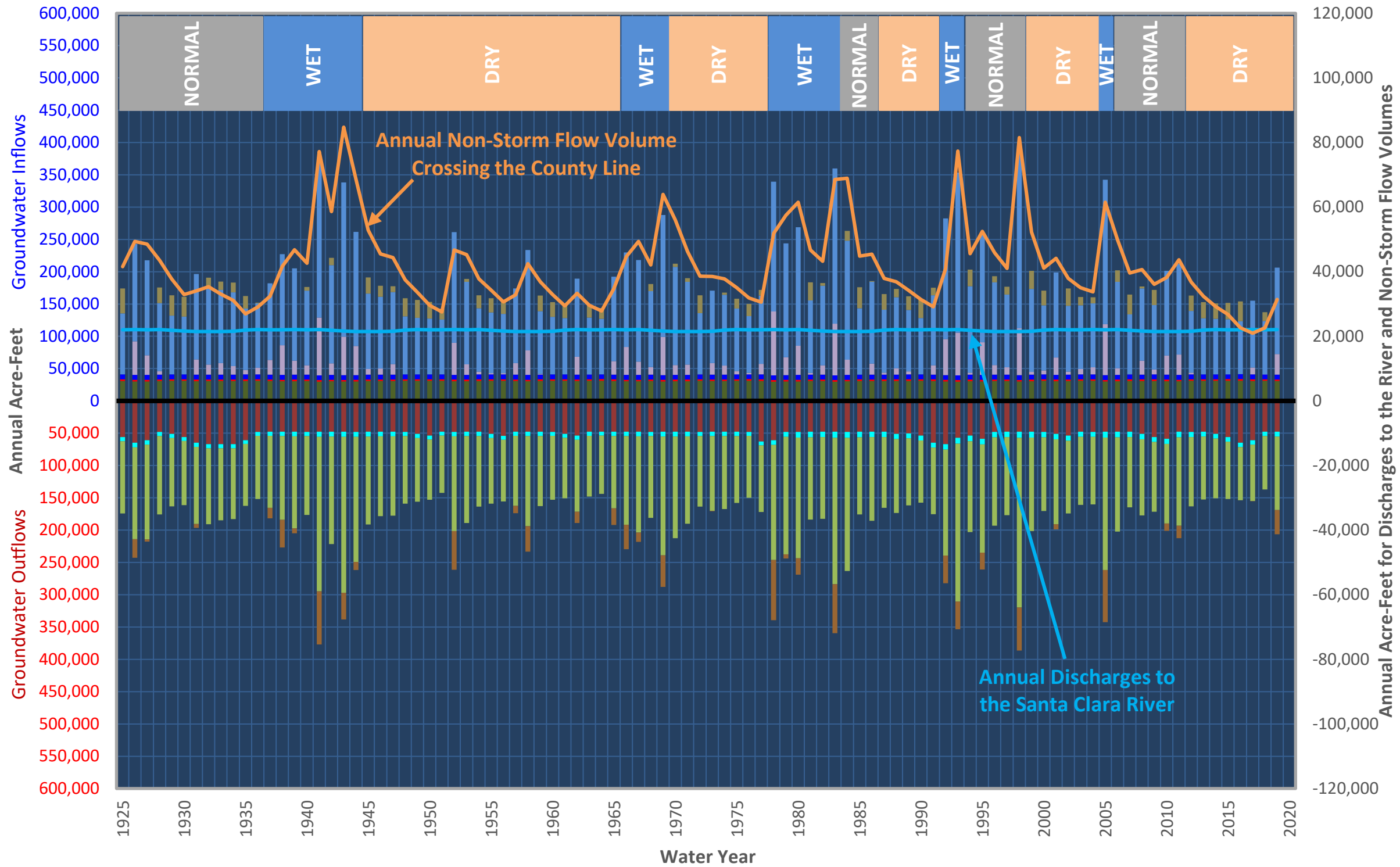
This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
 Ag: agriculture  
 Muni: municipal  
 ET: evapotranspiration





**FIGURE 5-6**  
**Projected Groundwater Budget and Annual Non-Storm Flows at the LA/Ventura County Line for Year 2042 Under Full Buildout Conditions With 2030 Average Climate Change**  
 Water Budget Development for the Santa Clara River Valley East Groundwater Subbasin

**DRAFT**



**LEGEND**

- Stream Gains
- Stream Losses
- Precipitation
- Ag+Muni Irrigation
- Subsurface Inflow in Tributaries
- Septic
- Pumping
- ET
- Groundwater Storage Increase
- Groundwater Storage Reduction

**NOTES**

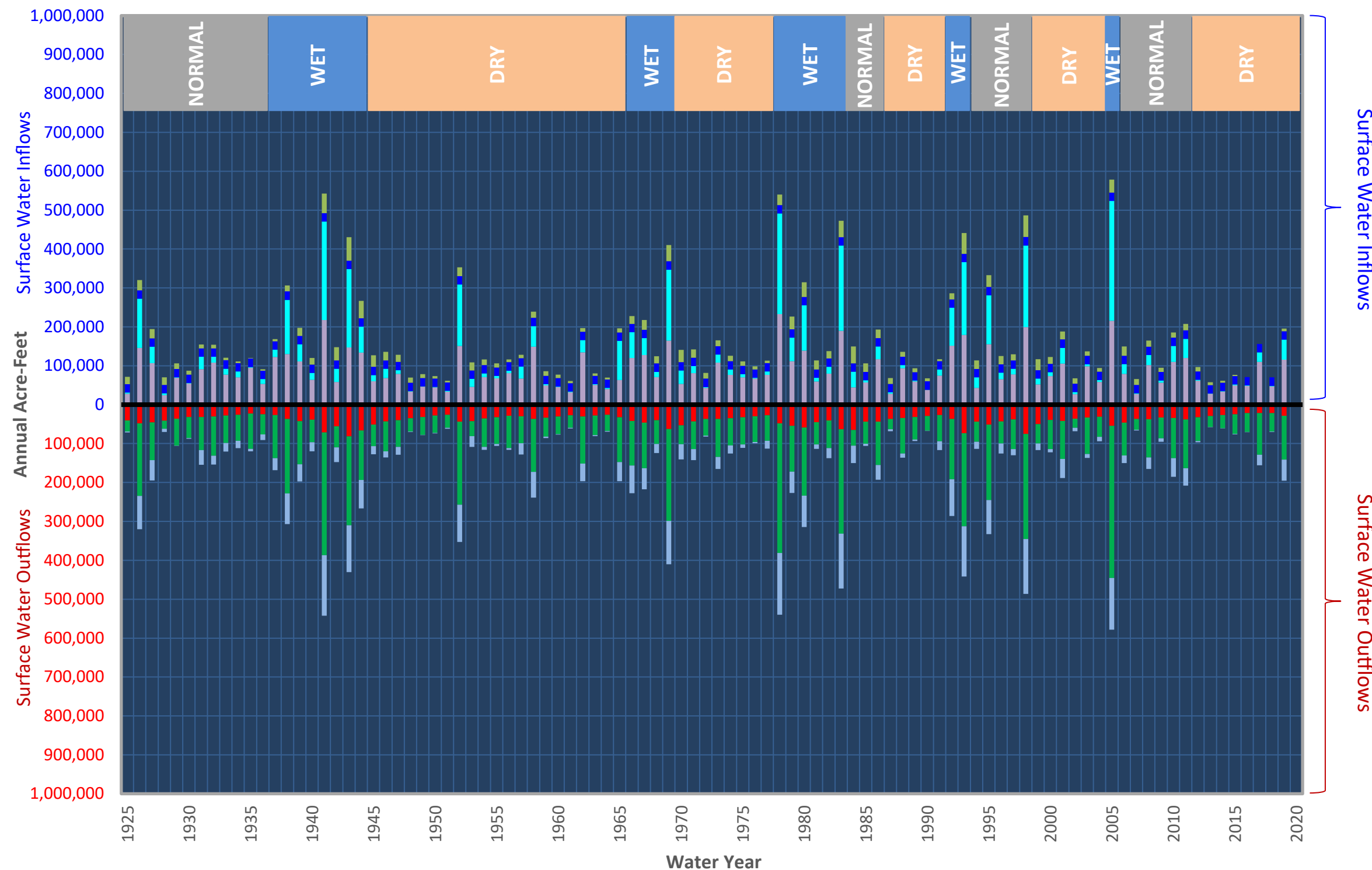
This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
 Ag: agriculture  
 Muni: municipal  
 ET: evapotranspiration



**FIGURE 5-7**

**Projected Surface Water Budget for Year 2072 Under Full Buildout Conditions With 2070 Average Climate Change**  
 Water Budget Development for the Santa Clara River Valley East Groundwater Subbasin

**DRAFT**



**LEGEND**

- Precipitation
- Stream Inflows
- Point-Source Flows to Streams
- Net Inflow from Groundwater
- Non-Storm Flow at County Line
- ET and Storm Outflows
- Groundwater Recharge from Streams and Rainfall

**NOTES**

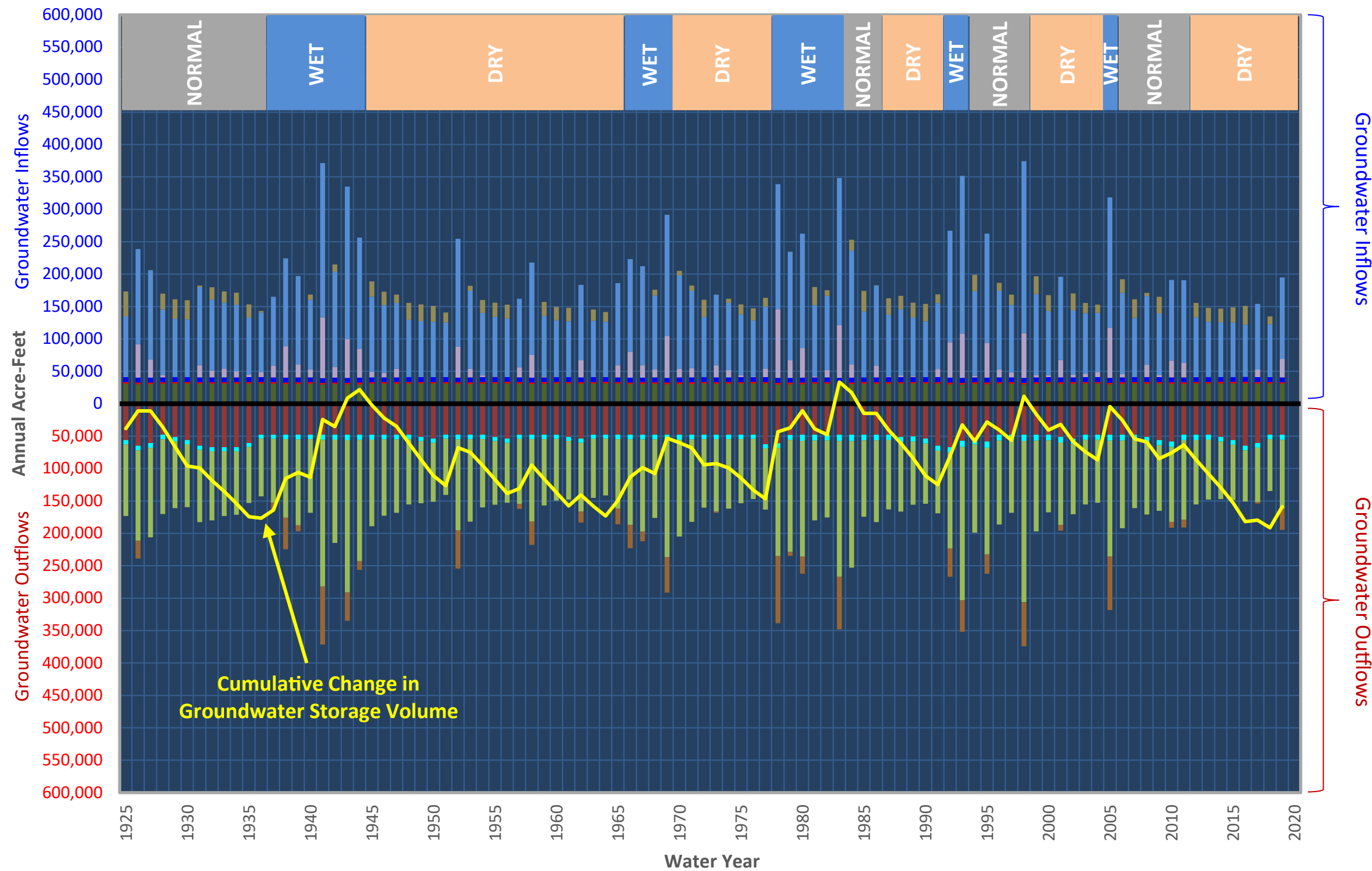
This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
 ET: evapotranspiration



**FIGURE 5-8**  
**Projected Groundwater Budget**  
**for Year 2072 Under Full Buildout**  
**Conditions With 2070 Average**  
**Climate Change**

Water Budget Development for the  
 Santa Clara River Valley  
 East Groundwater Subbasin

**DRAFT**



**LEGEND**

- Stream Gains
- Stream Losses
- Precipitation
- Ag+Muni Irrigation
- Subsurface Inflow in Tributaries
- Septic
- Pumping
- ET
- Groundwater Storage Increase
- Groundwater Storage Reduction

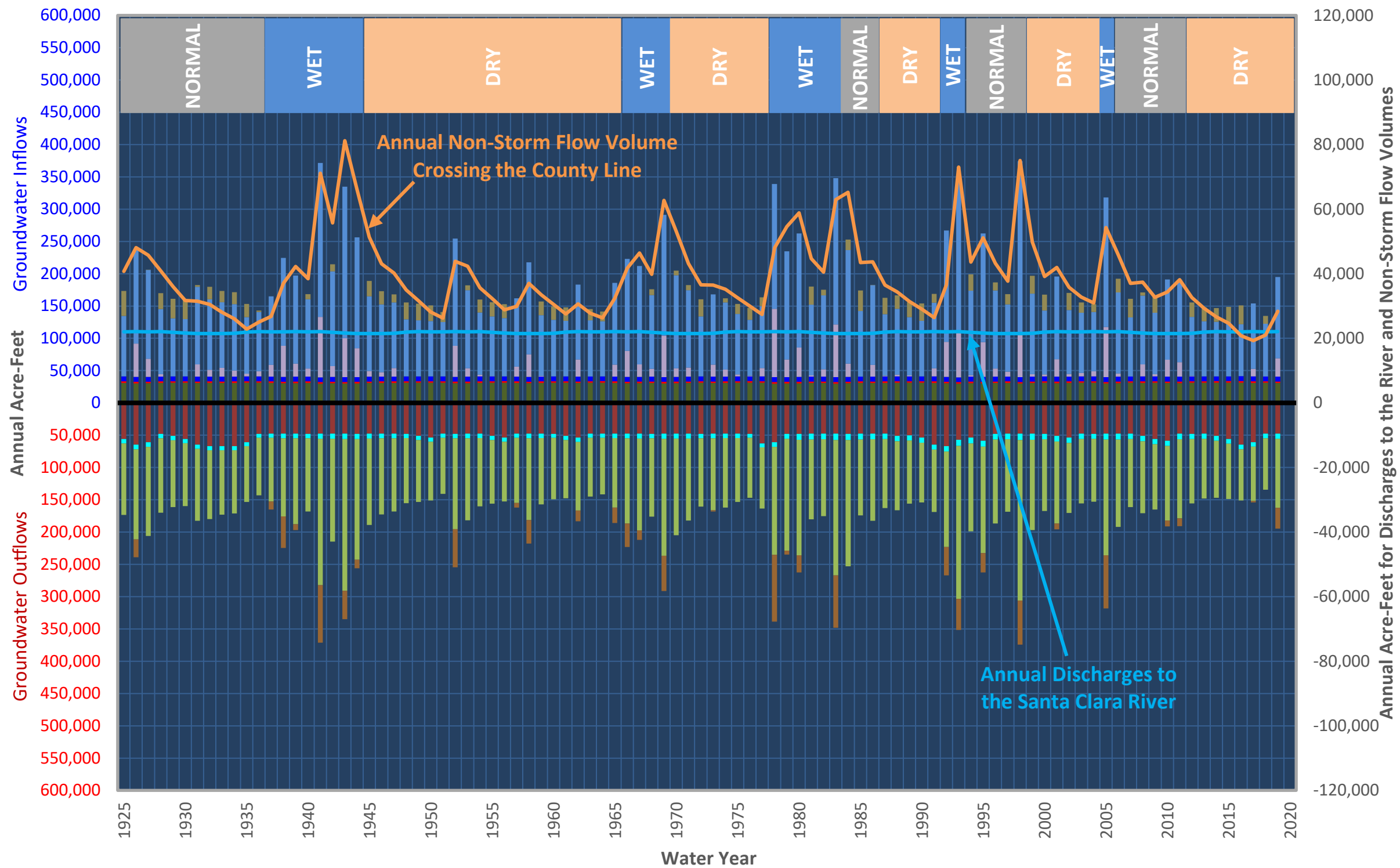
**NOTES**

This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
 Ag: agriculture  
 Muni: municipal  
 ET: evapotranspiration



**FIGURE 5-9**  
**Historical Groundwater Budget and Annual Non-Storm Flows at the LA/Ventura County Line for Year 2072 Under Full Buildout Conditions With 2070 Average Climate Change**  
 Water Budget Development for the Santa Clara River Valley East Groundwater Subbasin

**DRAFT**



**LEGEND**

- Stream Gains
- Stream Losses
- Precipitation
- Ag+Muni Irrigation
- Subsurface Inflow in Tributaries
- Septic
- Pumping
- ET
- Groundwater Storage Increase
- Groundwater Storage Reduction

**NOTES**

This projected water budget is developed by projecting the 1925-2019 historical hydrology forward in time.  
 Ag: agriculture  
 Muni: municipal  
 ET: evapotranspiration

