2022 Mission Creek Subbasin Alternative Plan Update

WORKSHOP #2

OCTOBER 22, 2020

Agenda

- Introductions
- Alternative Plan Overview
- Hydrogeologic Conceptual Model
- Groundwater Model Overview
- Overview of the Future
  - Population Growth Estimates
  - Water Demand Estimation Approach
  - Supply Estimation Consideration
- Public Comment

Introductions

Alternative Plan Update Team

MISSION CREEK SUBBASIN SGMA

MCSB Management Committee

Coachella Valley Water District (CVWD)

Desert Water Agency (DWA)

Mission Springs Water District (MSWD)

Consultants

Wood Environment & Infrastructure Solutions, Inc.

- Richard Rees, P.G., C.Hg.
- David Bean, P.G., C.Hg.

Kennedy Jenks Consultants

- Sachi Itagaki, P.E.
- Melanie Rivera
- Connor Rutten, P.E.

WATER DISTRICT

DESERT WATER

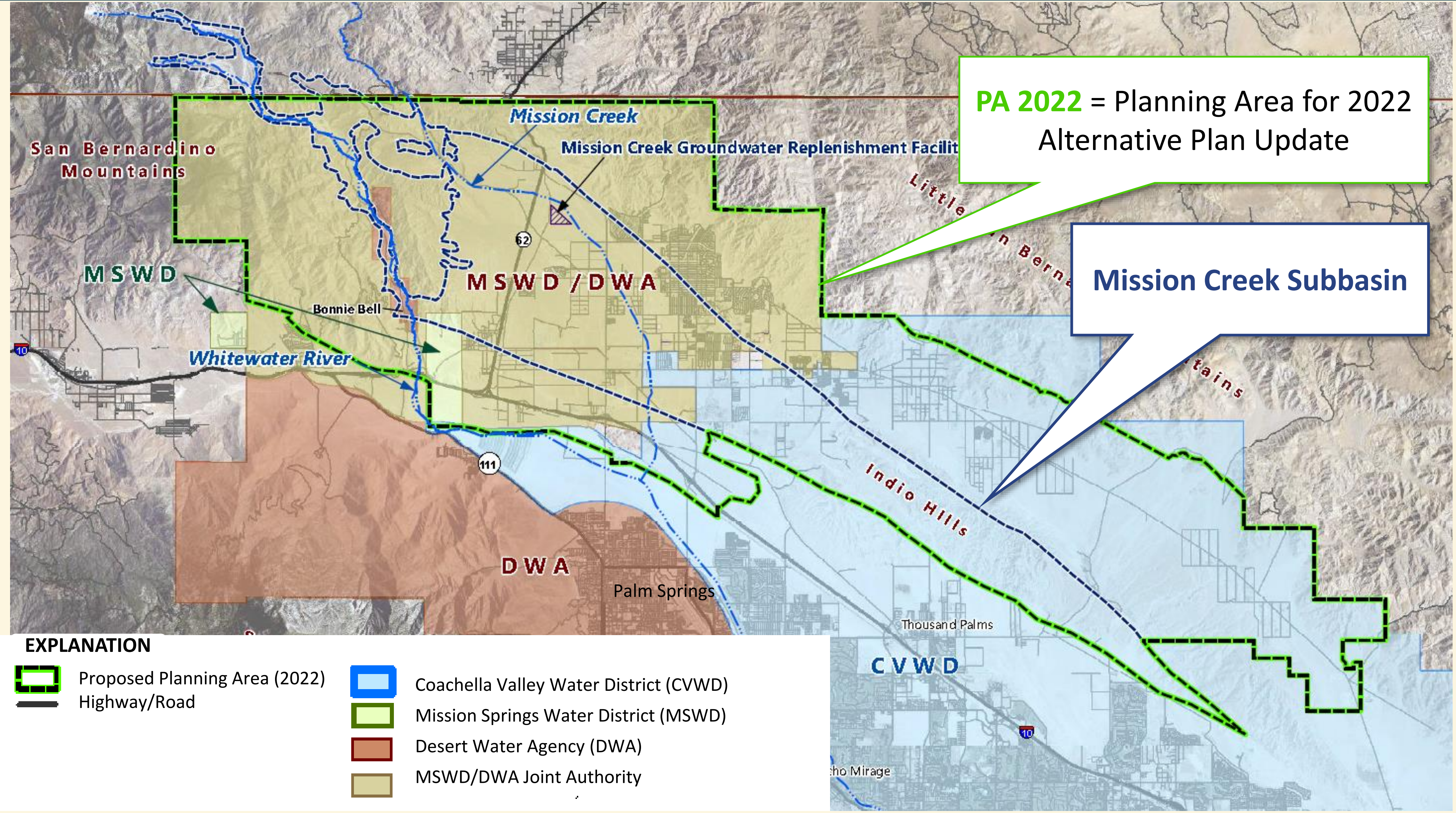
MSWD Mission Springs Water District

wood.

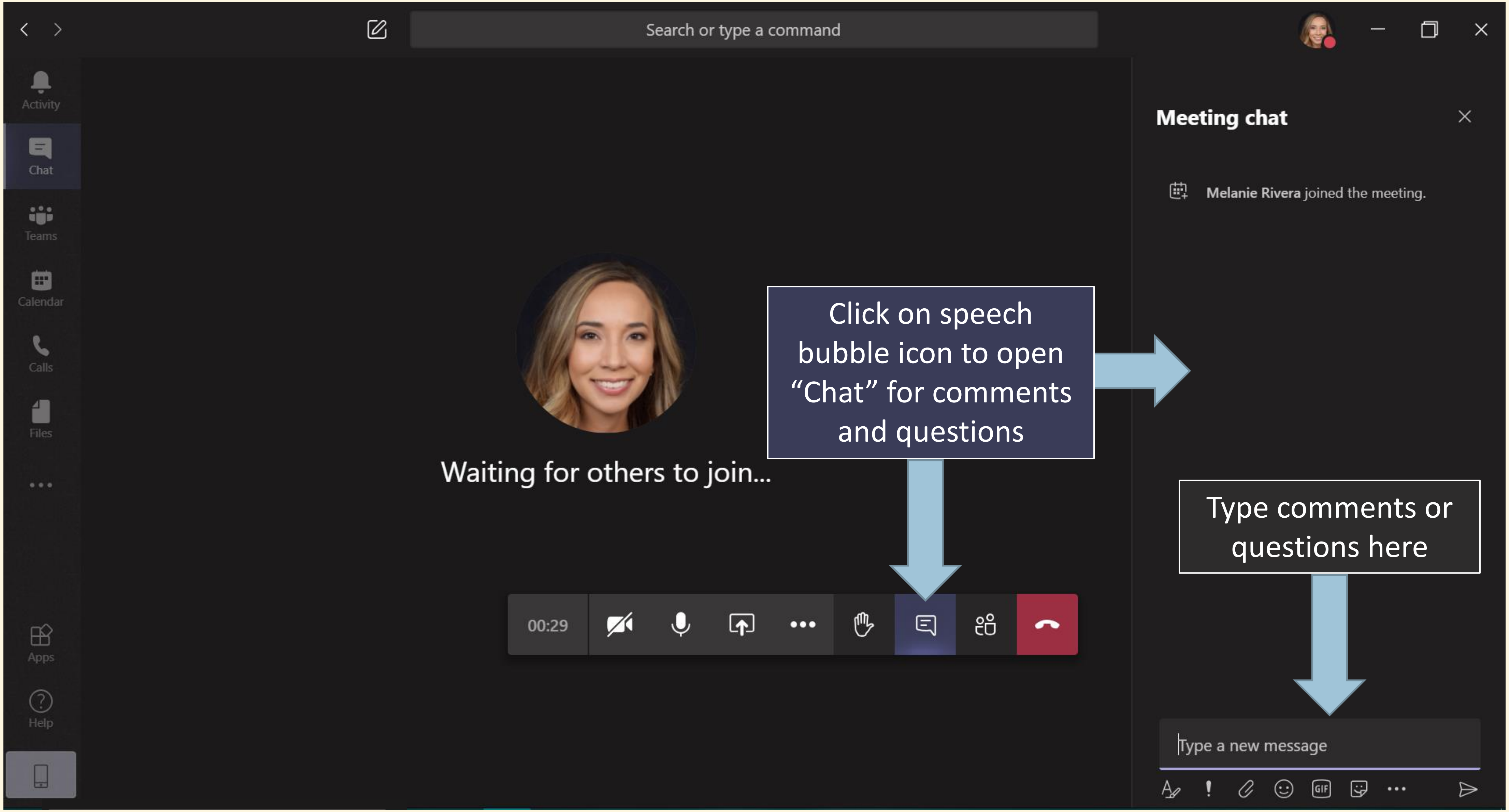
KJ Kennedy Jenks

Management Committee Agencies

MISSION CREEK SUBBASIN SGMA



The Virtual Experience: **Comments**



The Virtual Experience: **Polls**

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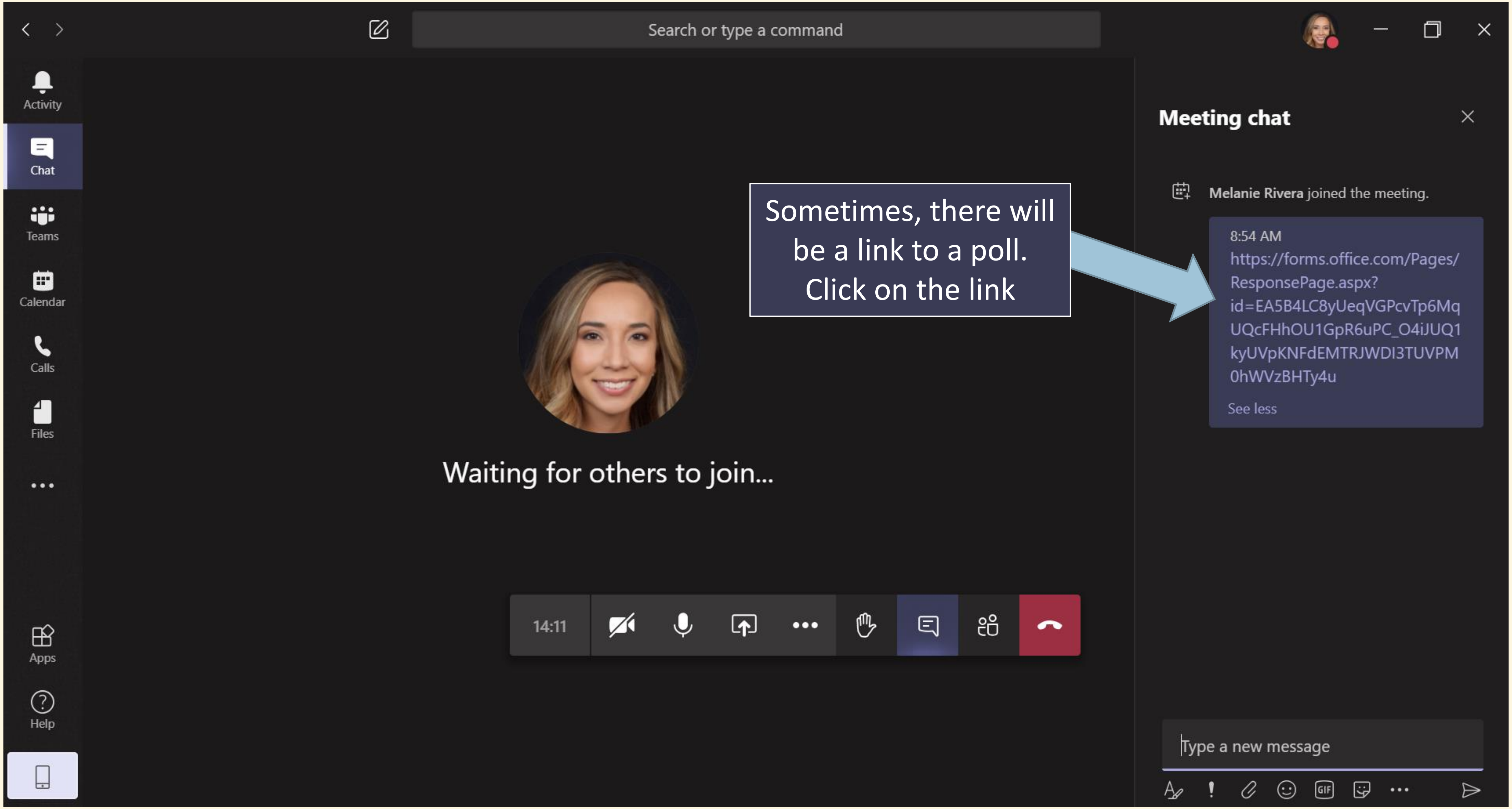

The Virtual Experience: **Polls**

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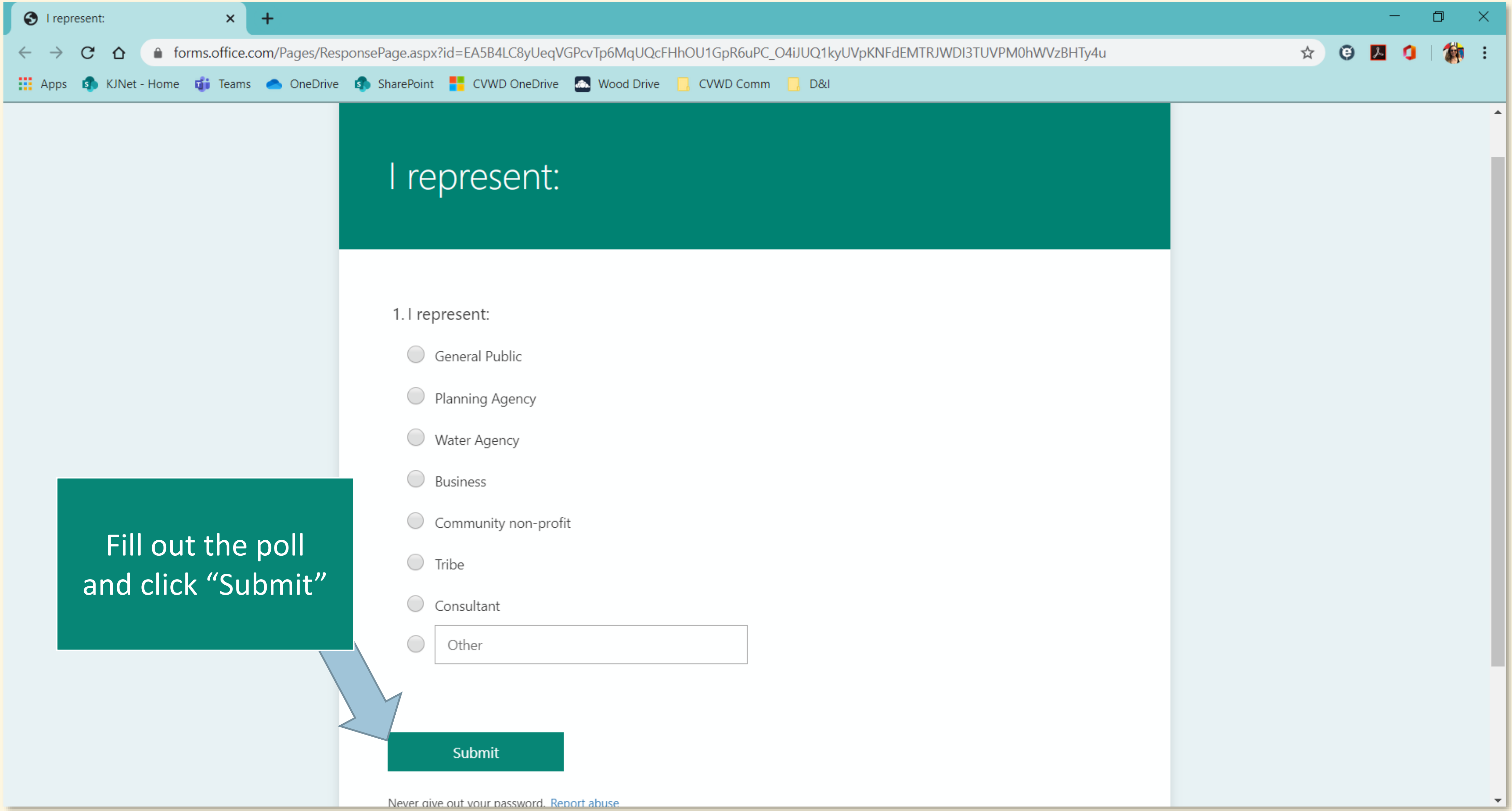


Fill out the poll and click “Submit”

POLL 1

Go to “Comments” Box for Poll Link

I represent:

1. General public
2. Planning agency
3. Water agency
4. Business
5. Community non-profit
6. Tribe
7. Consultant
8. Other

POLL 2

Did you attend Public Workshop #1?

- ❑ Yes
- ❑ No

Alternative Plan Overview

What is SGMA?

SGMA: Sustainable Groundwater Management Act

- Signed into law in September 2014
- Provides framework for sustainable groundwater management over 20 years
- Supports local management via Groundwater Sustainability Agencies (GSAs)

SGMA Requirements

- GSAs must submit plans (Groundwater Sustainability Plan (GSP) or Alternative Plan) and annual reports to the California Department of Water Resources (DWR), and demonstrate progress towards achieving sustainable management
- GSP or Alternative Plan updates due every 5 years
- First Mission Creek Subbasin (MCSB) Alternative Plan update due by January 1, 2022

What is a GSA?

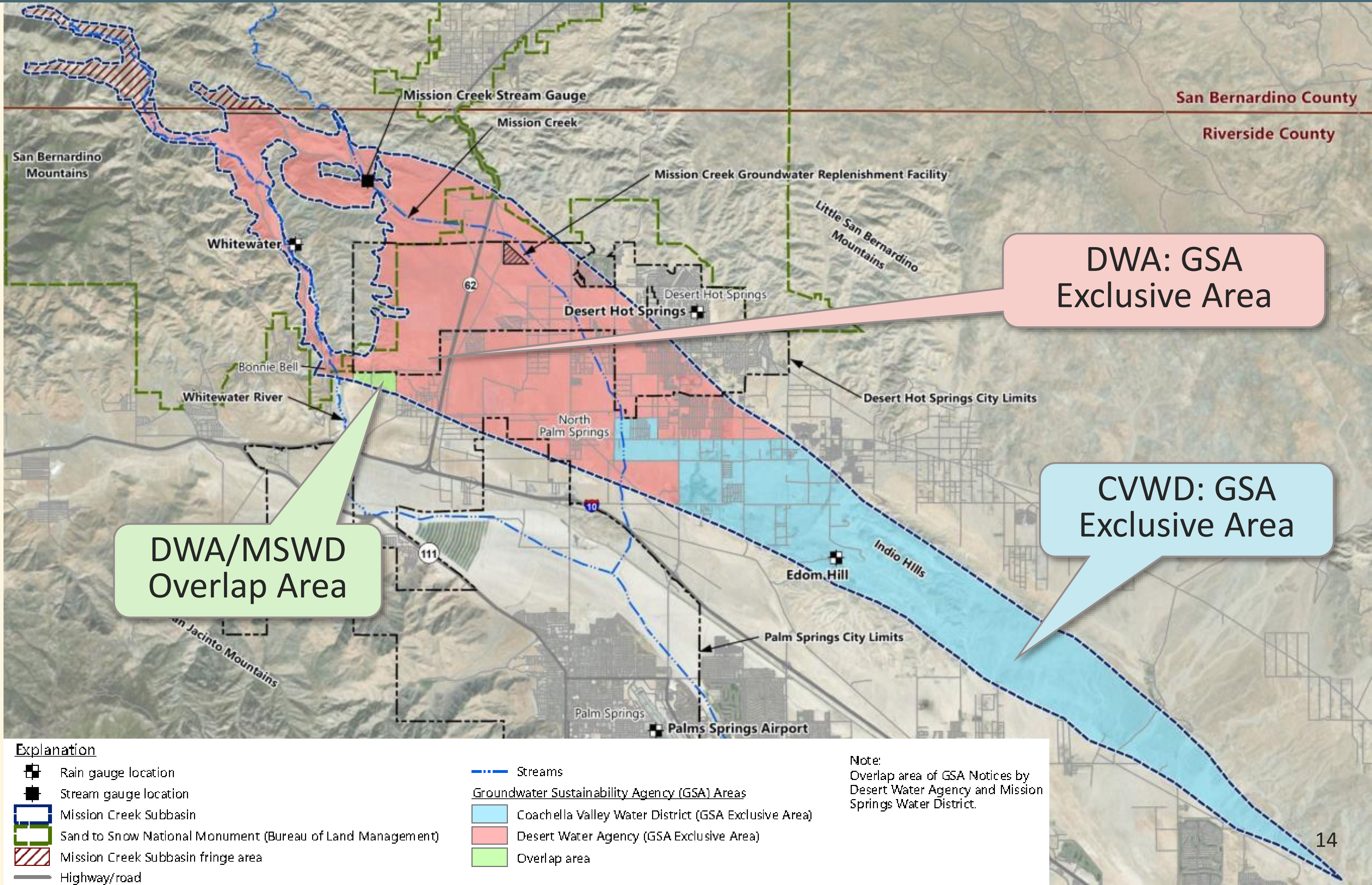
- **GSA:** Groundwater Sustainability Agency
- Consists of one or more local governmental agencies that implement the provisions of SGMA
- Formation of a GSA is required in high- and medium-priority basins
- MCSB has been designated a medium-priority basin

- **Basin Priority is Based On:**

Total Population | **Population Growth** | **# of Public Wells** | **# of Total Wells** | **Irrigated Acreage** | **Groundwater Reliance** | **Groundwater Impacts** | **Other Adverse Impacts**

GSAs in the Mission Creek Subbasin (MCSB)

- GSAs include CVWD and DWA
- Management Committee includes CVWD, DWA, and MSWD

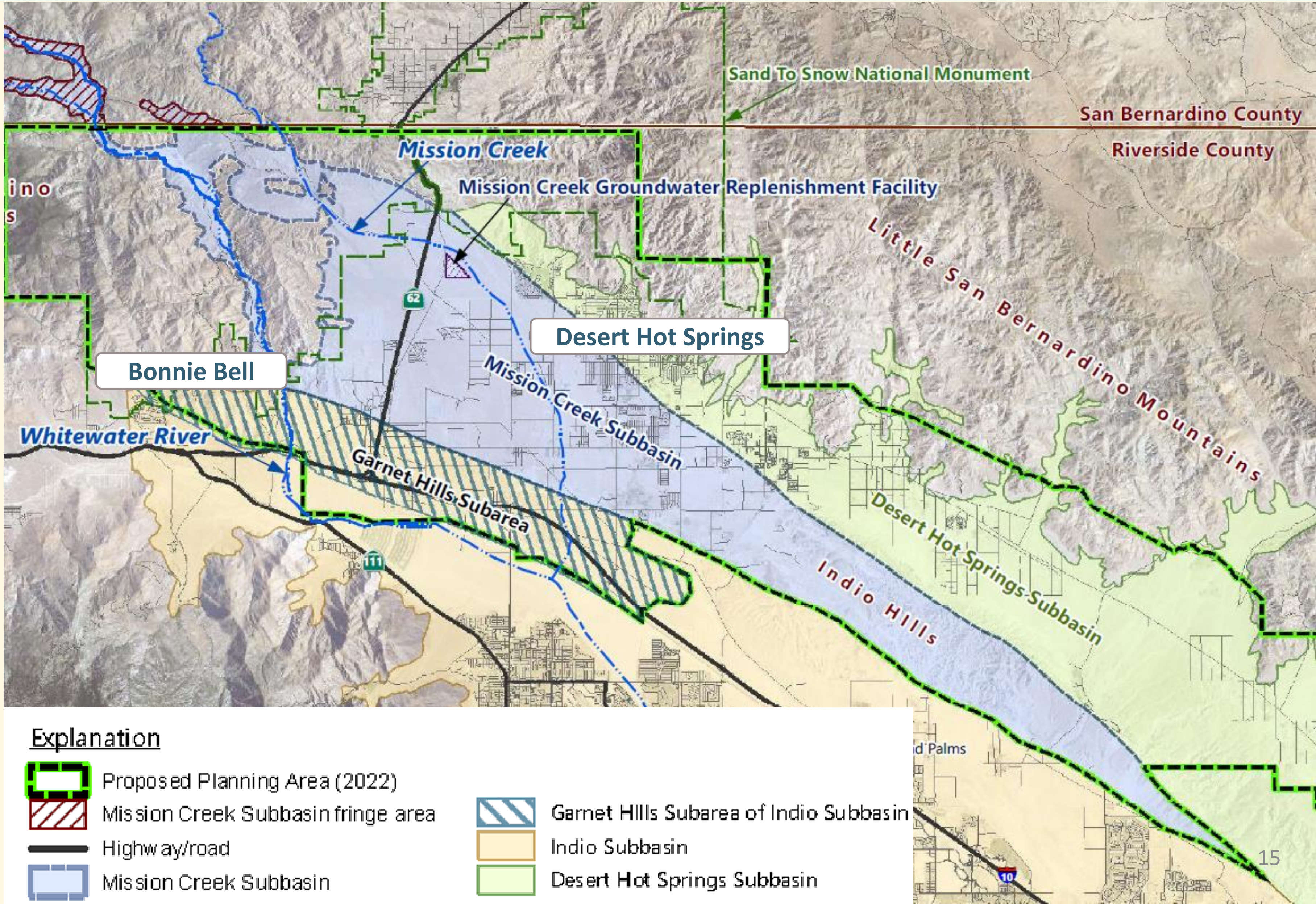


Source: https://cvwd.org/504/Mission-Creek-Subbasin-SGMA-Compliance

MCSB and SGMA

MISSION CREEK SUBBASIN SGMA

- MCSB Water Management Plan completed in 2013
- The Water Management Plan in addition to a Bridge Document was approved by DWR as an Alternative Plan for the MCSB in June 2019
- Management Committee utilizes several management tools to achieve sustainability goals
- Garnet Hill Subarea included in both MCSB and Indio Subbasin planning efforts. Annual reporting is done as part of Indio Subbasin Annual Report



Public Workshop #1 Summary

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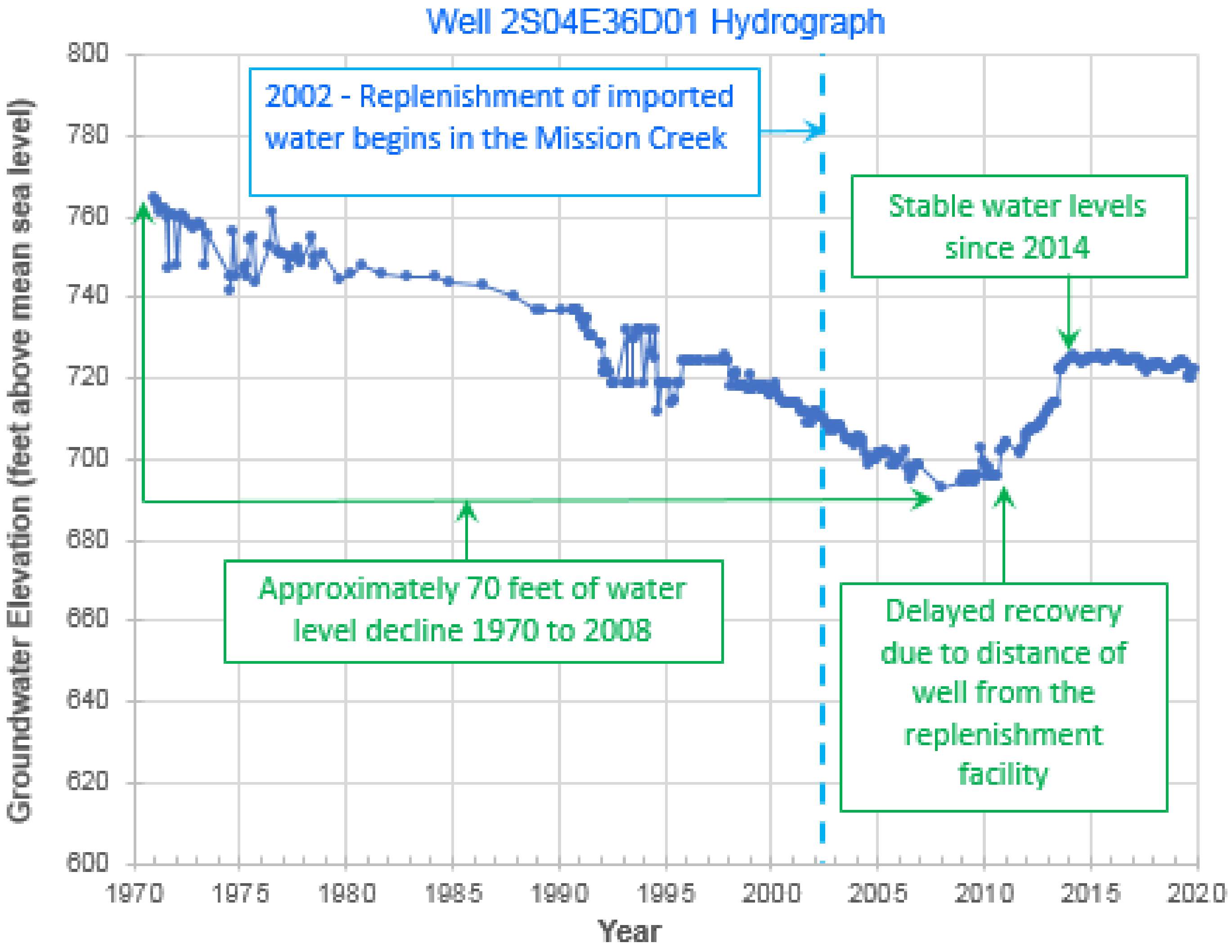
- Groundwater levels steadily declined in the MCSB as water use increased with population
- Recharge of imported water and reduced demand through conservation has reversed this trend
- Existing Management Plan + Bridge Document for SGMA Compliance = Alternative Plan



Hydrogeologic Conceptual Model

Hydrogeologic Conceptual Model

- A hydrogeologic conceptual model (HCM) is a simplified representation of the surface water / groundwater flow systems, frequently in the form of a block diagram or cross section (Anderson & Woessner, 1992).
- The purpose of the HCM is to establish an initial understanding of the surface water / groundwater systems and organize the associated field data so that the system can be analyzed more effectively.
- The nature of the HCM determines the dimensions of the numerical model, the design of the grid, the simulation period, and the number of stress periods utilized.
- The HCM also provides estimates of the various inflows and outflows to the numerical model for each stress period of the simulation.

Hydrogeologic Conceptual Model – **Upper Coachella Valley Study Area**

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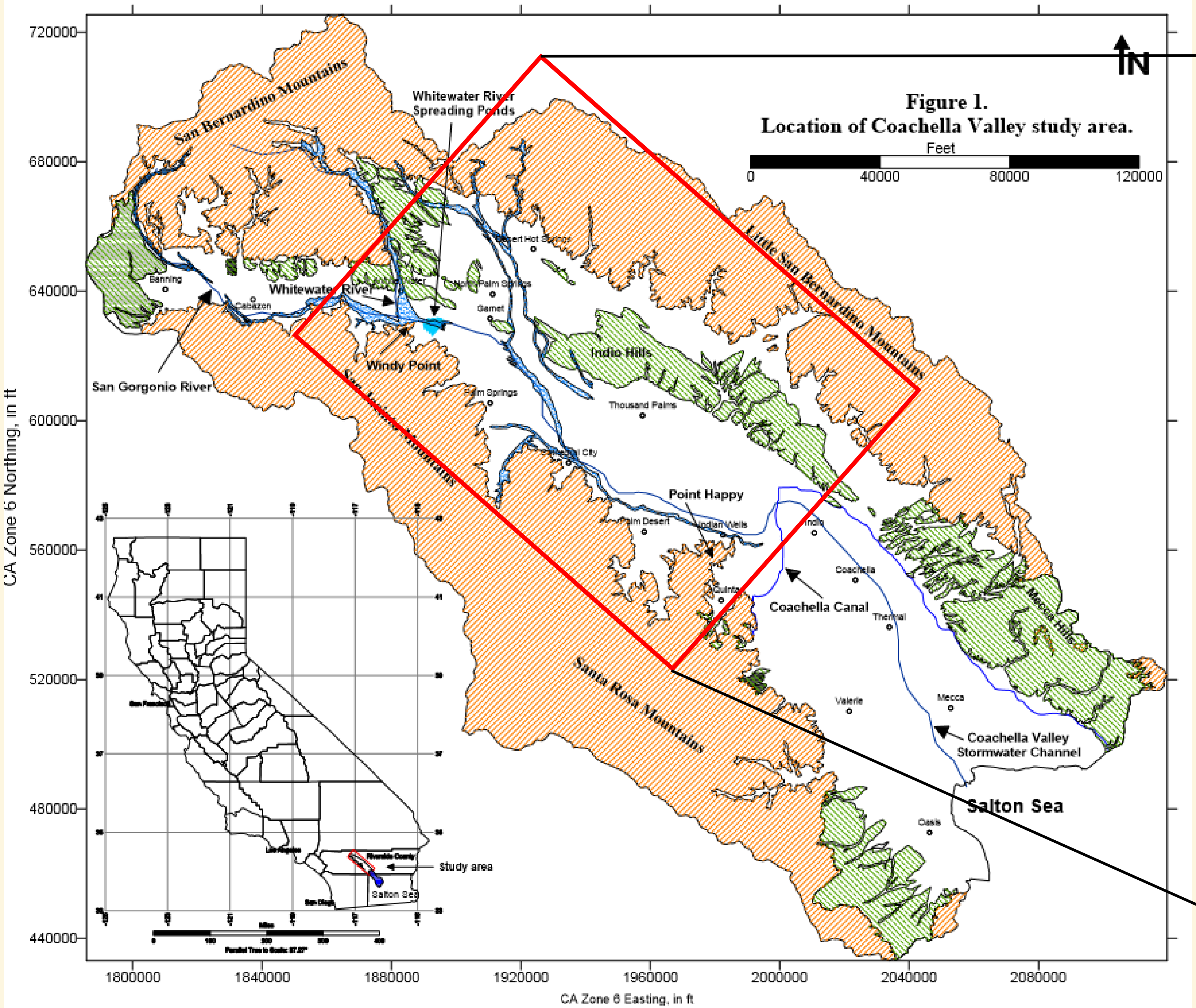

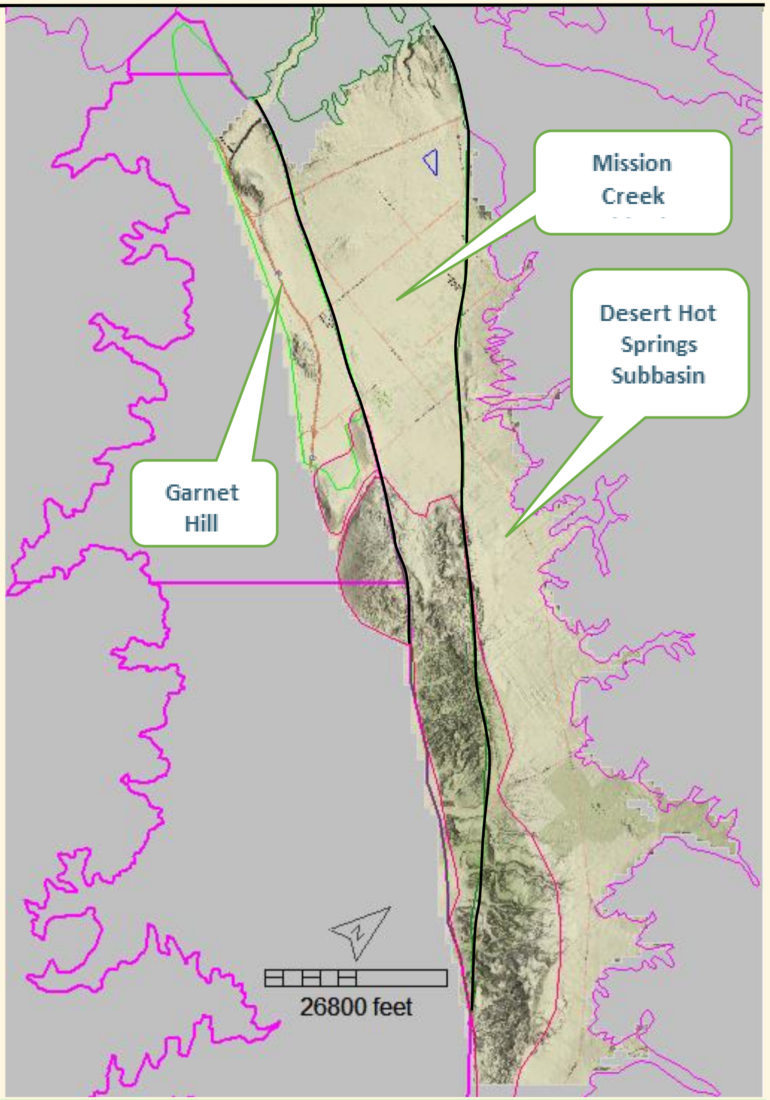

Approximate Area of Interest

Hydrogeologic Conceptual Model – **Geology**

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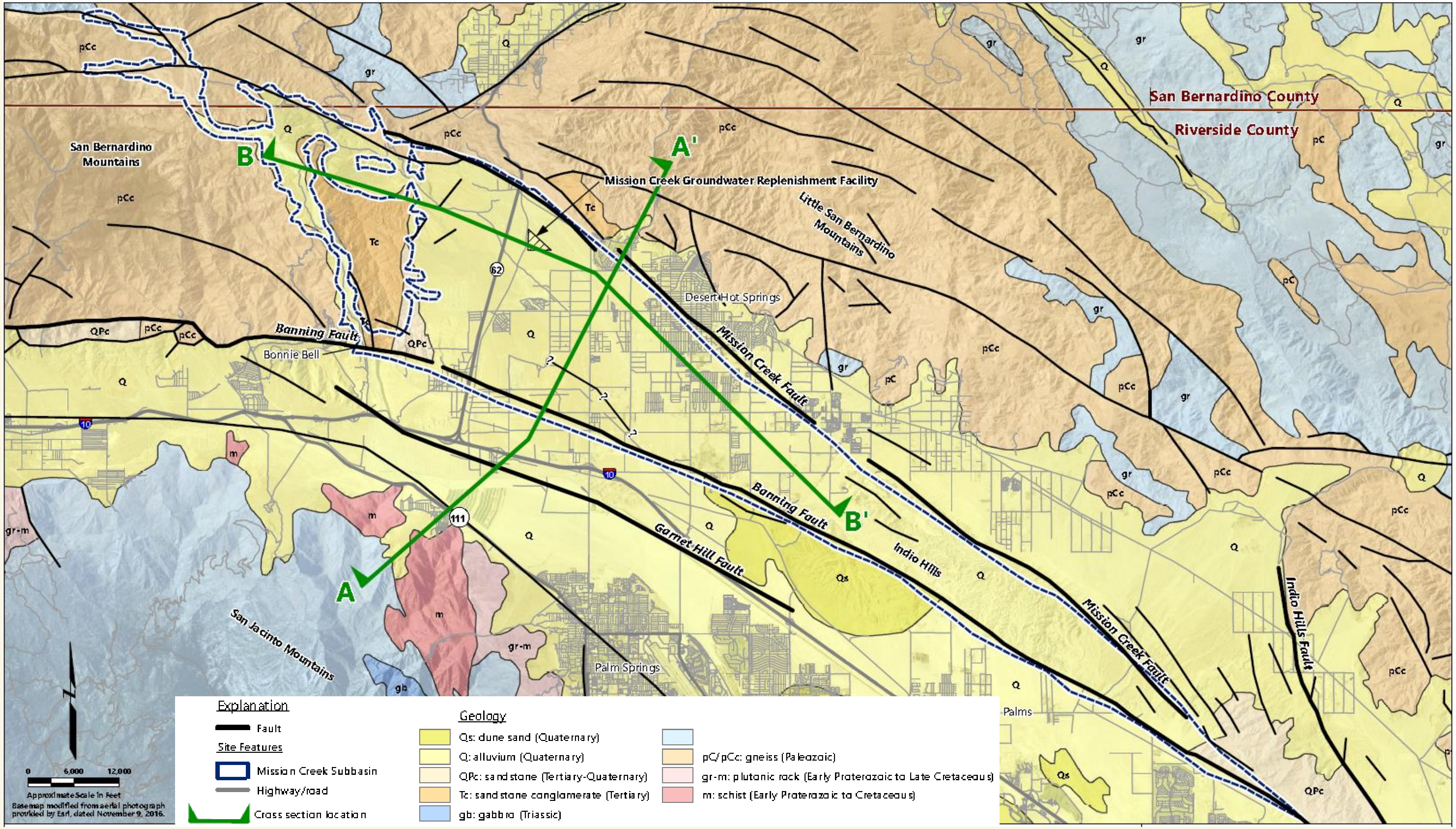

Hydrogeologic Conceptual Model – **Cross Section A-A’**

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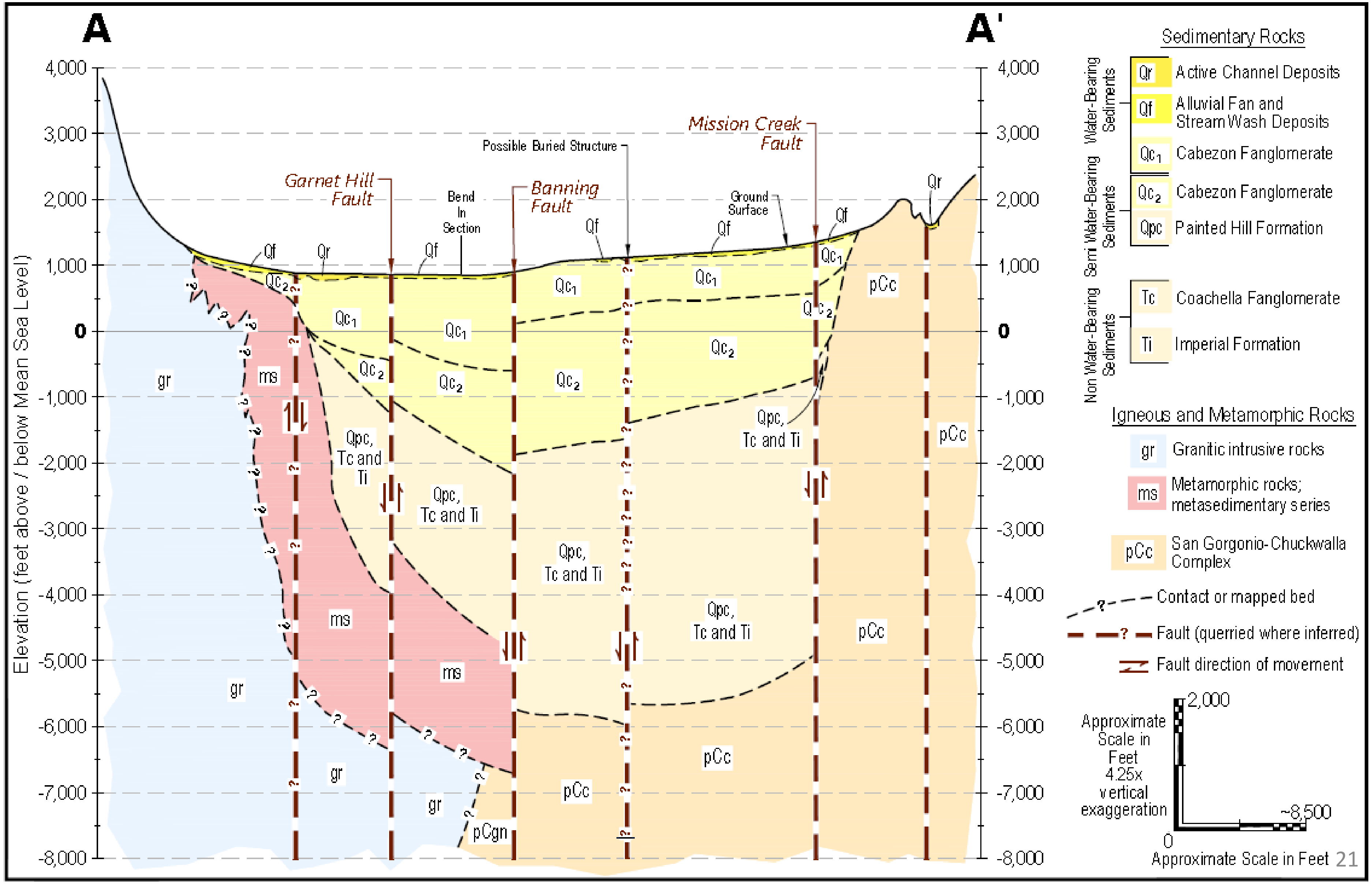
- South-southeast – north-northwest cross section (note vertical exaggeration) shows fault relationships that form the subbasins and subarea
- A possible buried structure (fault) does not appear to be a groundwater barrier in the MCSB
- Alluvium and fanglomerate are the primary aquifer materials extending several thousand feet below ground surface



Adopted from Geotechnical Consultants, Inc., 1979

Hydrogeologic Conceptual Model – **Cross Section C-C’**

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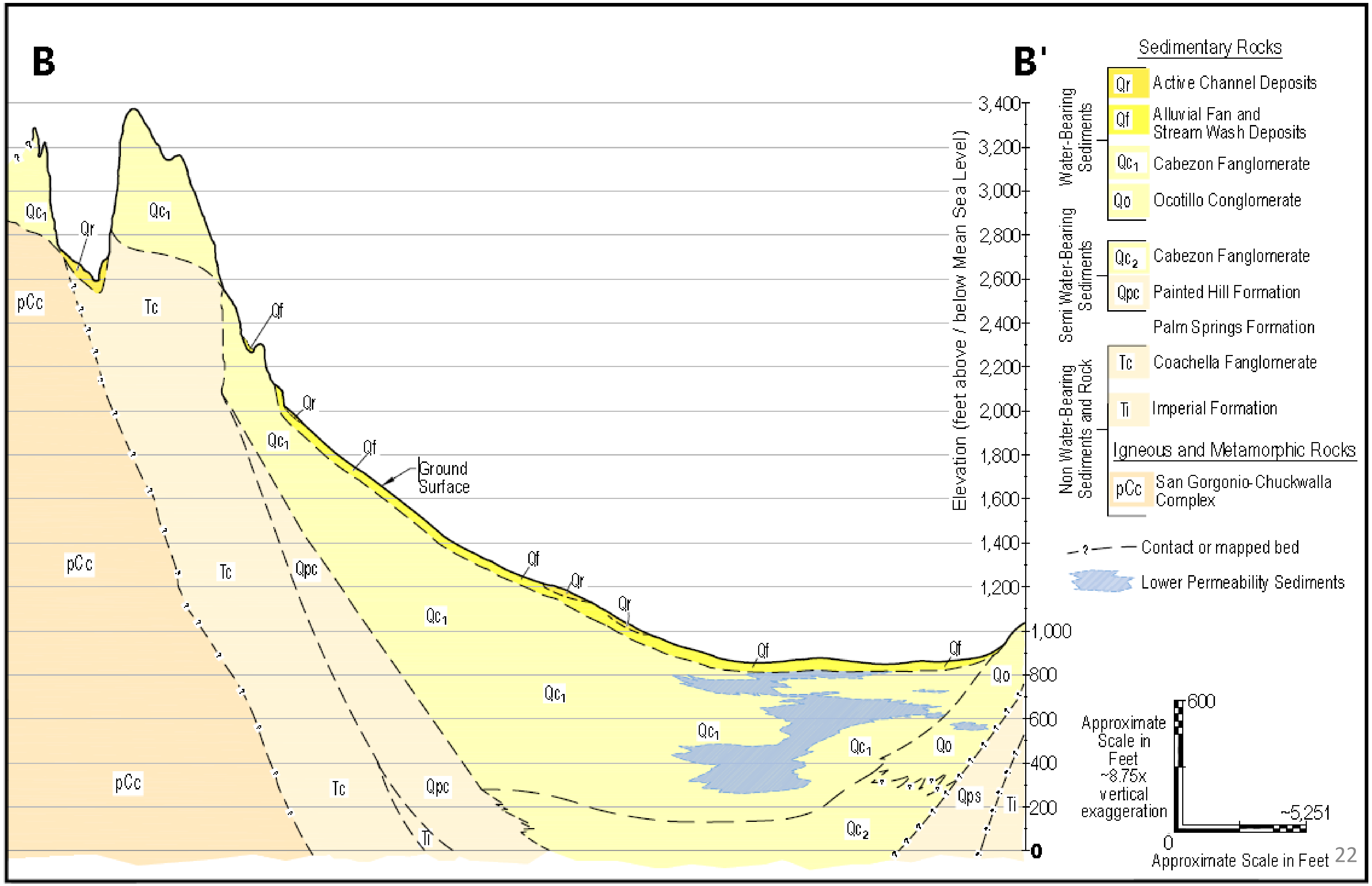
- Northwest – southeast section shows topography on this alignment (note the difference in scale and vertical exaggeration)
- Indio Hills are underlain by older sediments that are considered semi water bearing
- Lower permeability sediments occur in the southern part of the MCSB but do not appear to result in a separate confined aquifer zone



Adopted from Geotechnical Consultants, Inc., 1979

Hydrogeologic Conceptual Model – **Groundwater Levels**

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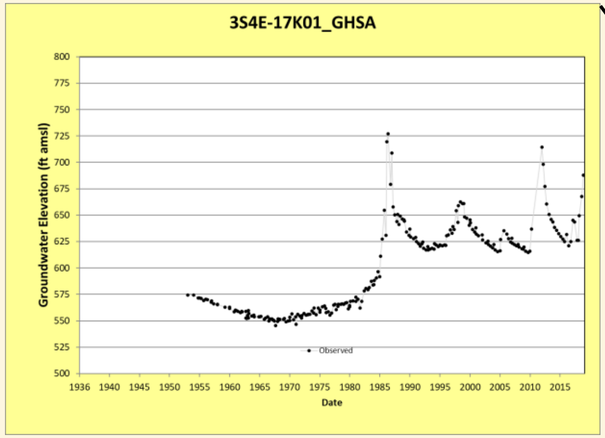

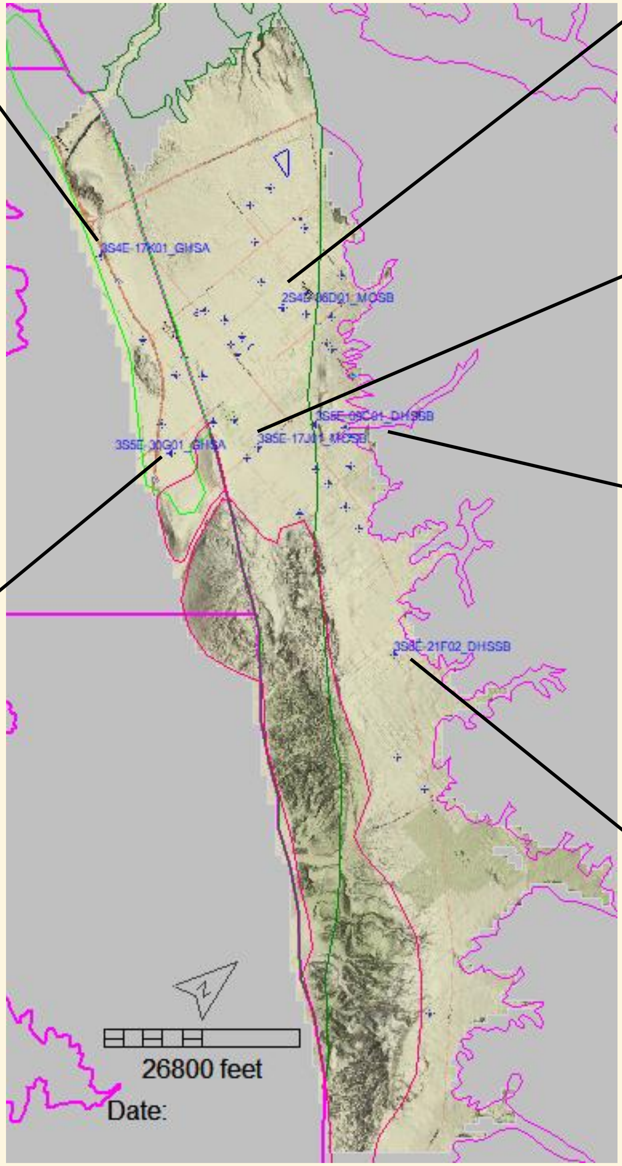

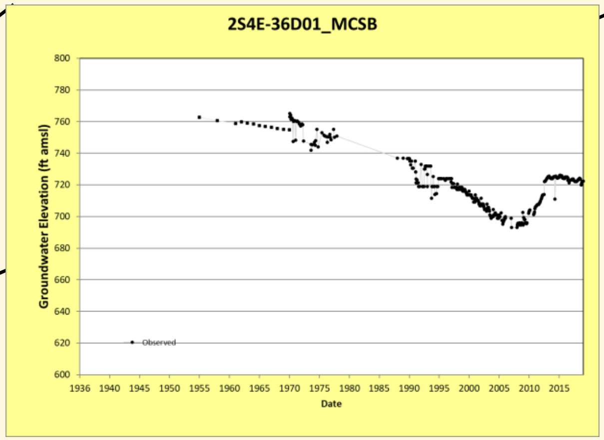

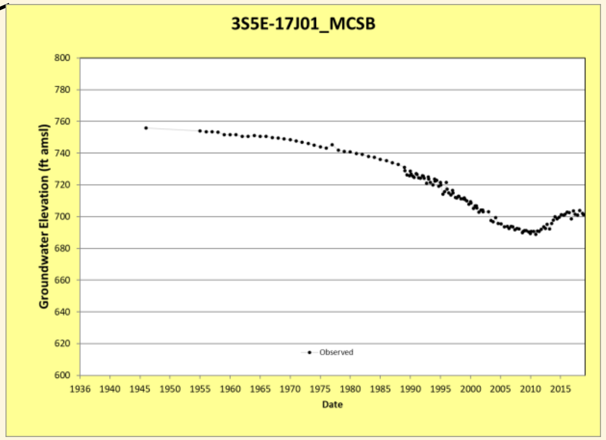

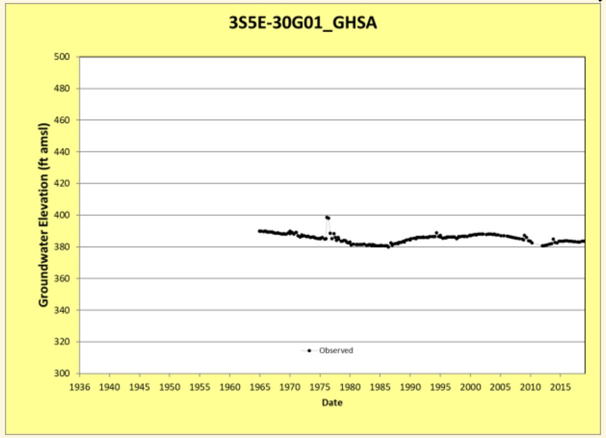

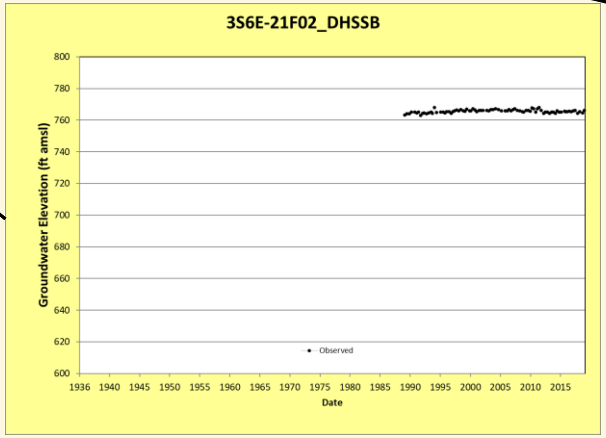

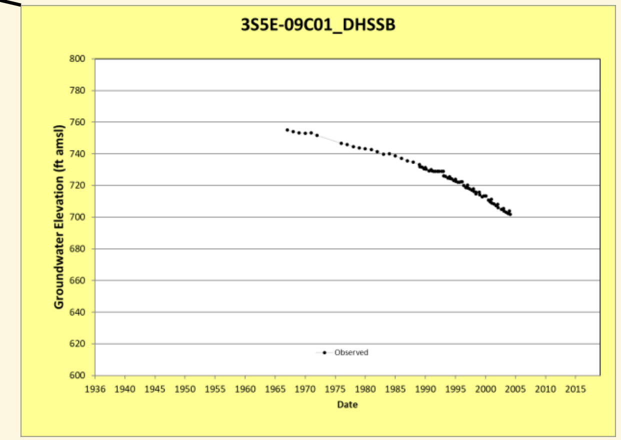

Hydrogeologic Conceptual Model – Groundwater Pumping

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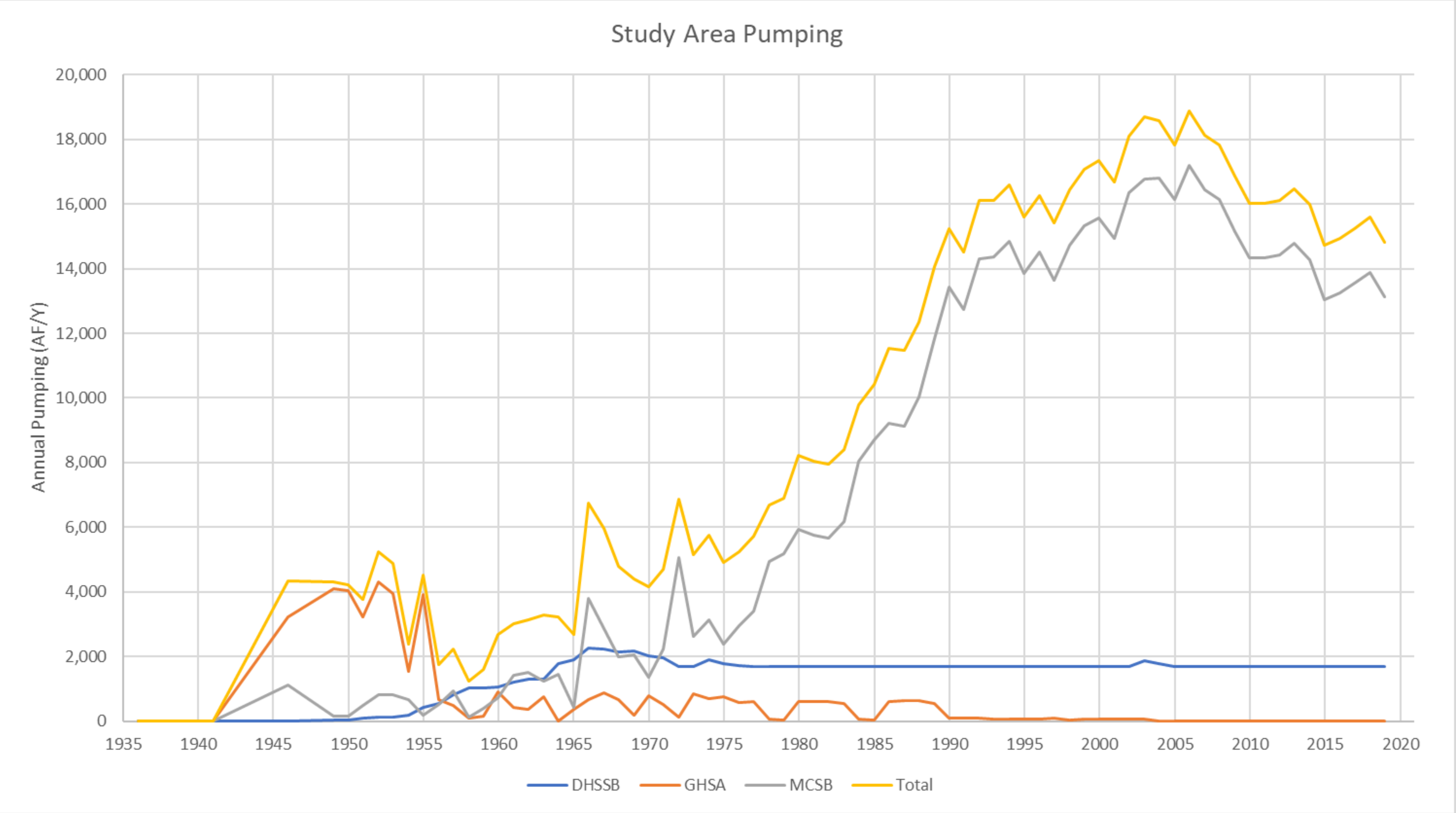
- Most of the pumping occurs in MCSB
- Pumping in GHSA has declined and currently in the range of 100 AF per year
- DHSSB is private pumping and is estimated



Pumping estimates prior to 1978 from PSOMAS model estimates
Pumping estimates from 1978 to present based on Agency records
Pumping from DHSSB is private pumping and is estimated from Mayer et al., 2007

Hydrogeologic Conceptual Model – **Recharge Sources**

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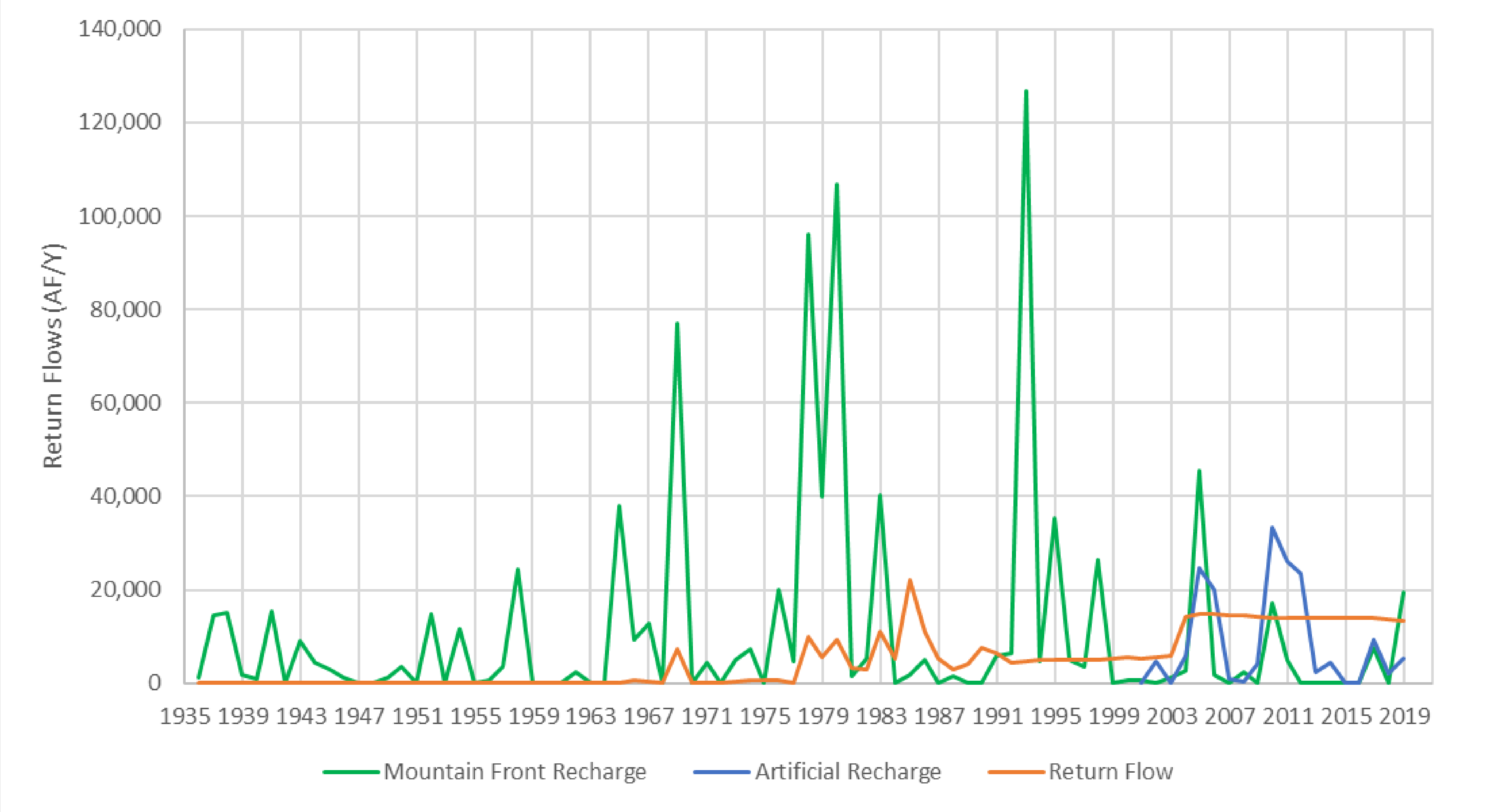

Mountain Front Recharge estimated from USGS Basin Characterization Model (BCM)
Artificial recharge as summarized in Engineer’s Reports on Water Supply and Replenishment Assessment and Mission Creek Subbasin Annual Reports
Return flow based on water use and return flow factors provided in CVWD Engineer’s Reports on Water Supply and Replenishment Assessment 2018-2019 and Mission Creek Subbasin Annual Reports for Water Years 2016-2017, 2017-2018, and 2018-2019

Hydrogeologic Conceptual Model – **Water Balance**

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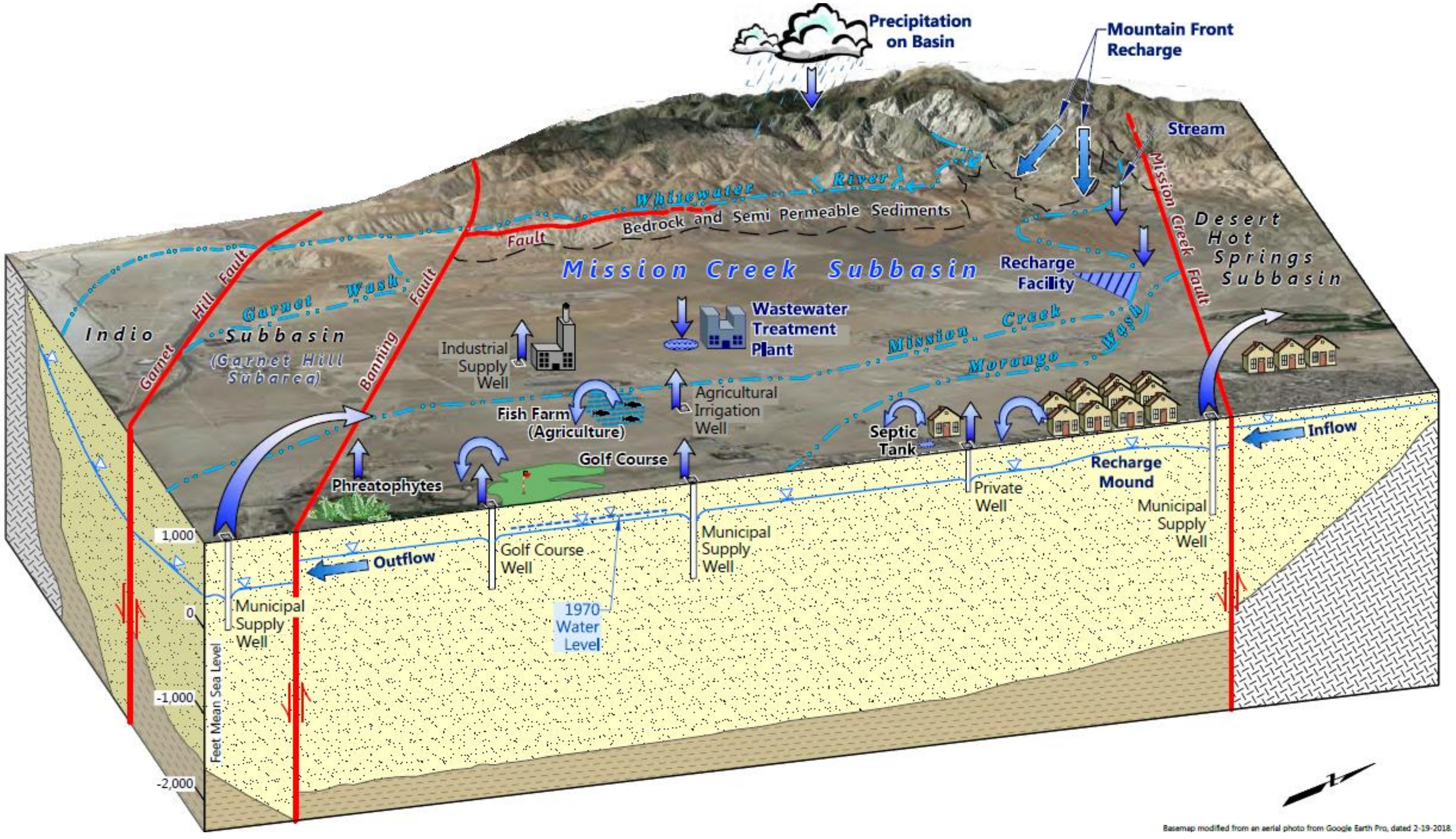
Inflows

- Precipitation
- Mountain Front Recharge
- Agricultural Return Flows
- WWTP Percolation
- Septic Percolation
- Artificial Recharge
- Inter-basin Underflow

Outflows

- Evapotranspiration
- Bare Soil Evaporation
- Groundwater Pumping
- Inter-basin Underflow



Hydrogeologic Conceptual Model – **Water Balance**

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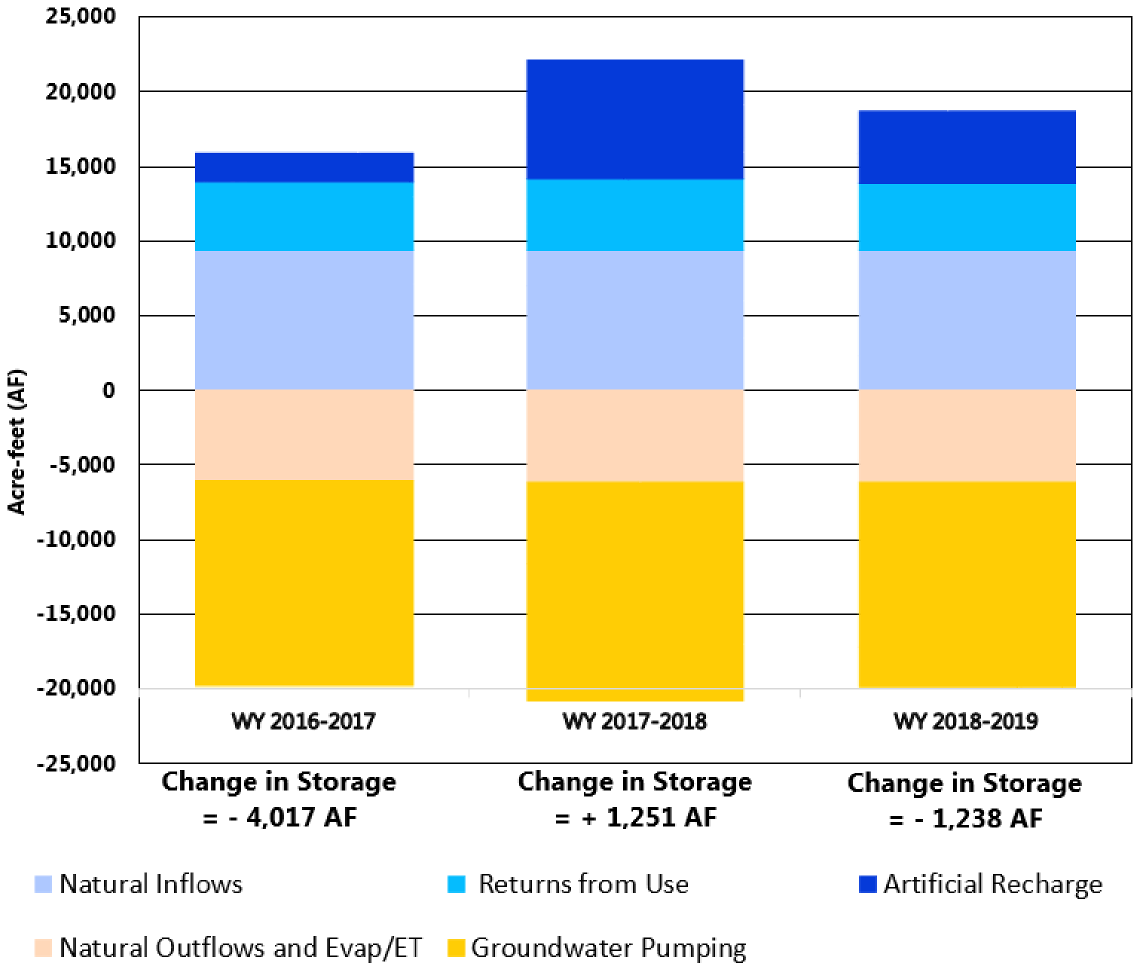
- Inflows – Outflows = Change in Storage. Water levels rise with increases in storage and fall with decreases in storage
- Inflow components include natural inflows (surface and subsurface), return flow from use, and artificial recharge
- Outflow components include natural outflows, evaporation/ evapotranspiration and groundwater pumping
- Change in storage varies over time, for example, ranging between – 4,017 AF decrease to 1,251 AF increase over the past 3 years

Groundwater Balance Water Year (WY) 2016-2017, WY 2017-2018, and WY 2018-2019



Notes:
AF = Acre-Feet
Evap/ET = Evaporation losses and evapotranspiration

10- and 20-Year Average Change in Storage

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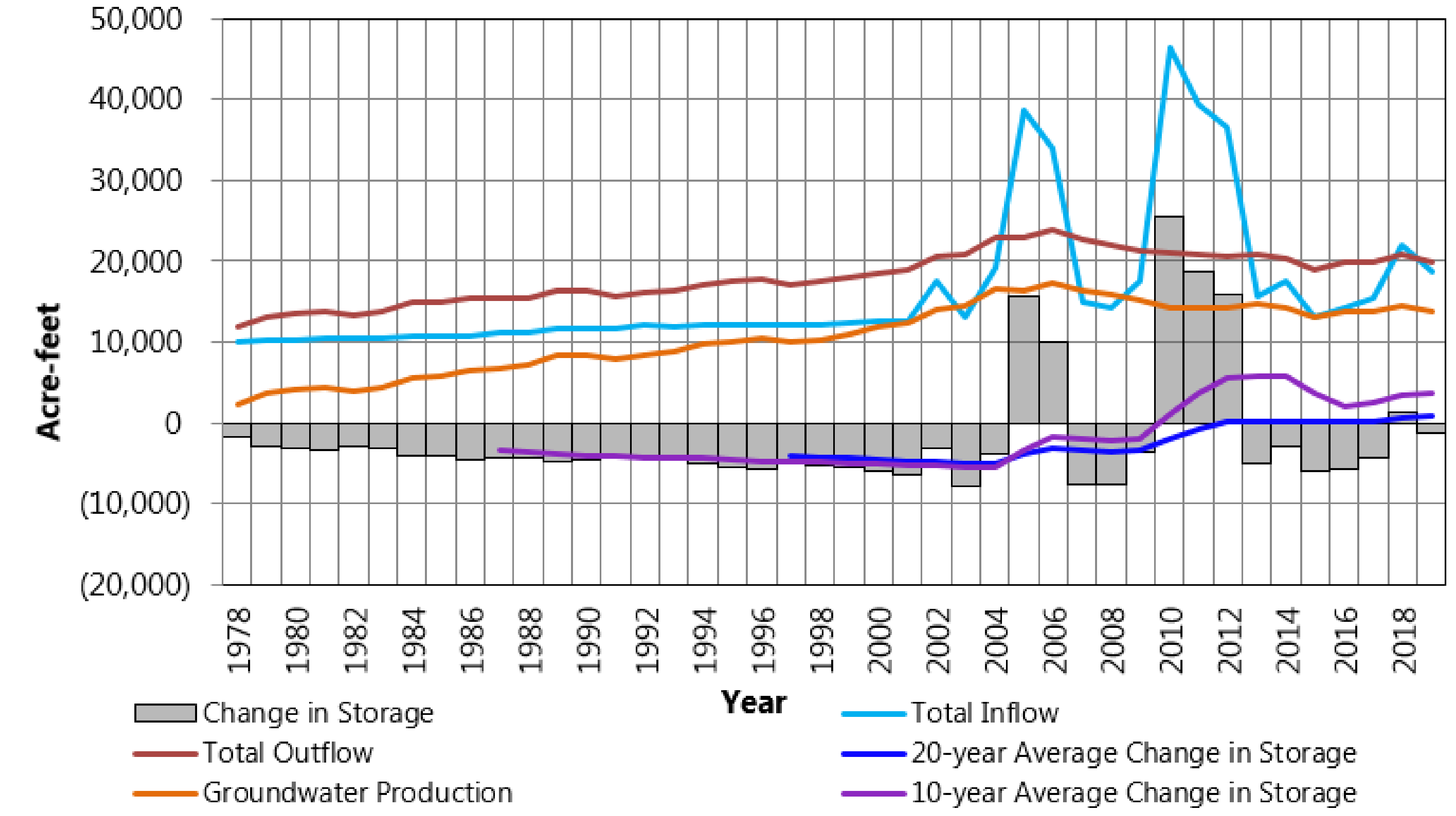
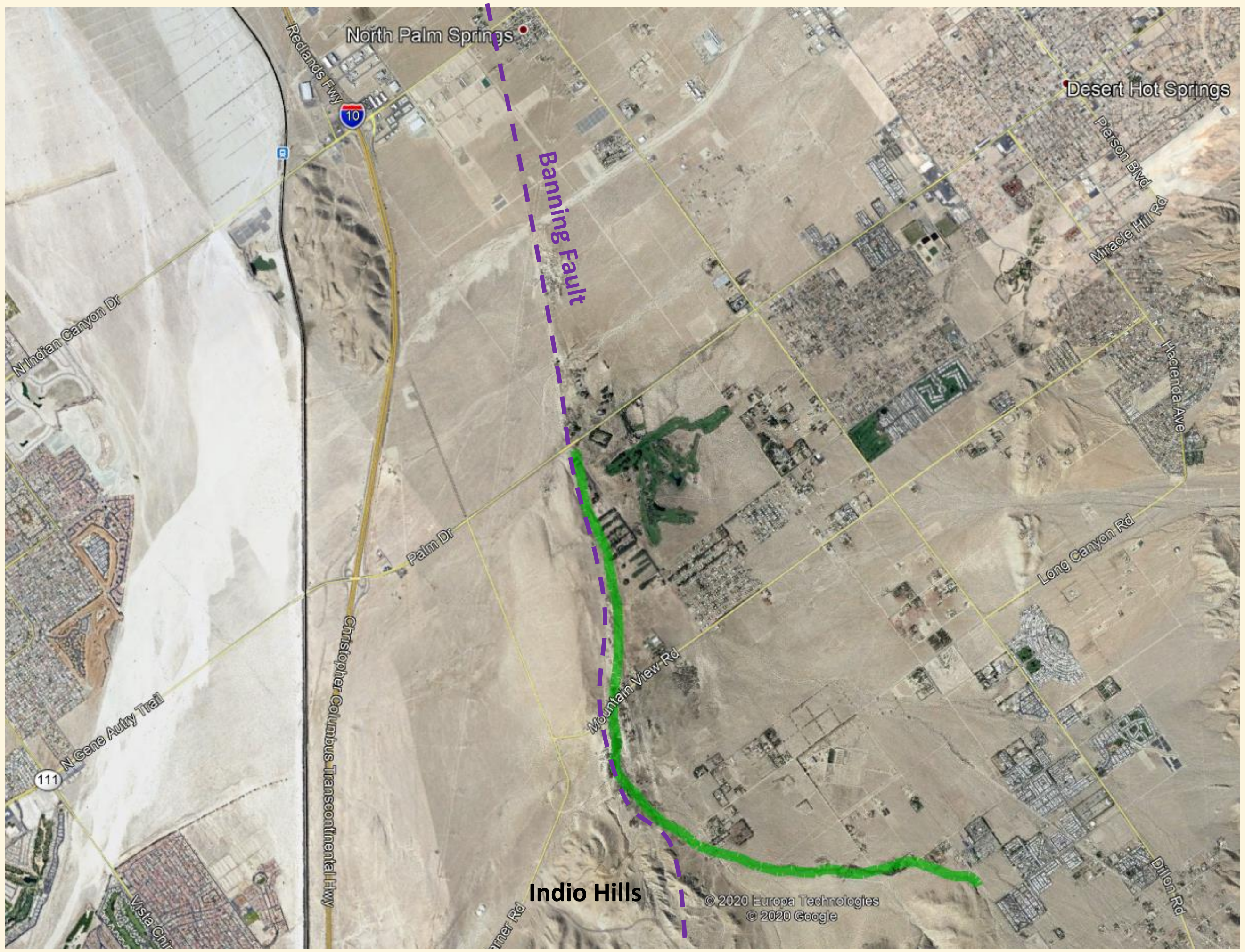
- 1978 to 2004 outflows exceeded inflows
- Recharge of imported water resulted in several years of net positive inflow
- 10-year average change in storage has been positive since 2013
- 20-year average has been positive since 2010



Note: Water balance accounting based on Calendar Year prior to October 1, 2016 and Water Year (October 1 to September 30) since October 1, 2016.

Groundwater Dependent Ecosystems



- Groundwater dependent ecosystems (phreatophytes) have been identified in the MCSB.
- Approximately 1,120 acres of phreatophytes (mostly mesquite) have been identified along the Banning Fault and Indio Hills, (Mayer, 1998).
- These phreatophytes consume an estimated 1,450 AF/Y of shallow groundwater upwelling along the fault.

POLL 3

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- Are you familiar with the areas with groundwater dependent ecosystems?
  - ❑ Yes
  - ❑ No
- If yes, can you share any observations (e.g. differences between dry years vs wet years)?

Groundwater Model Overview

Mission Creek Subbasin Model Domain and Planning Area

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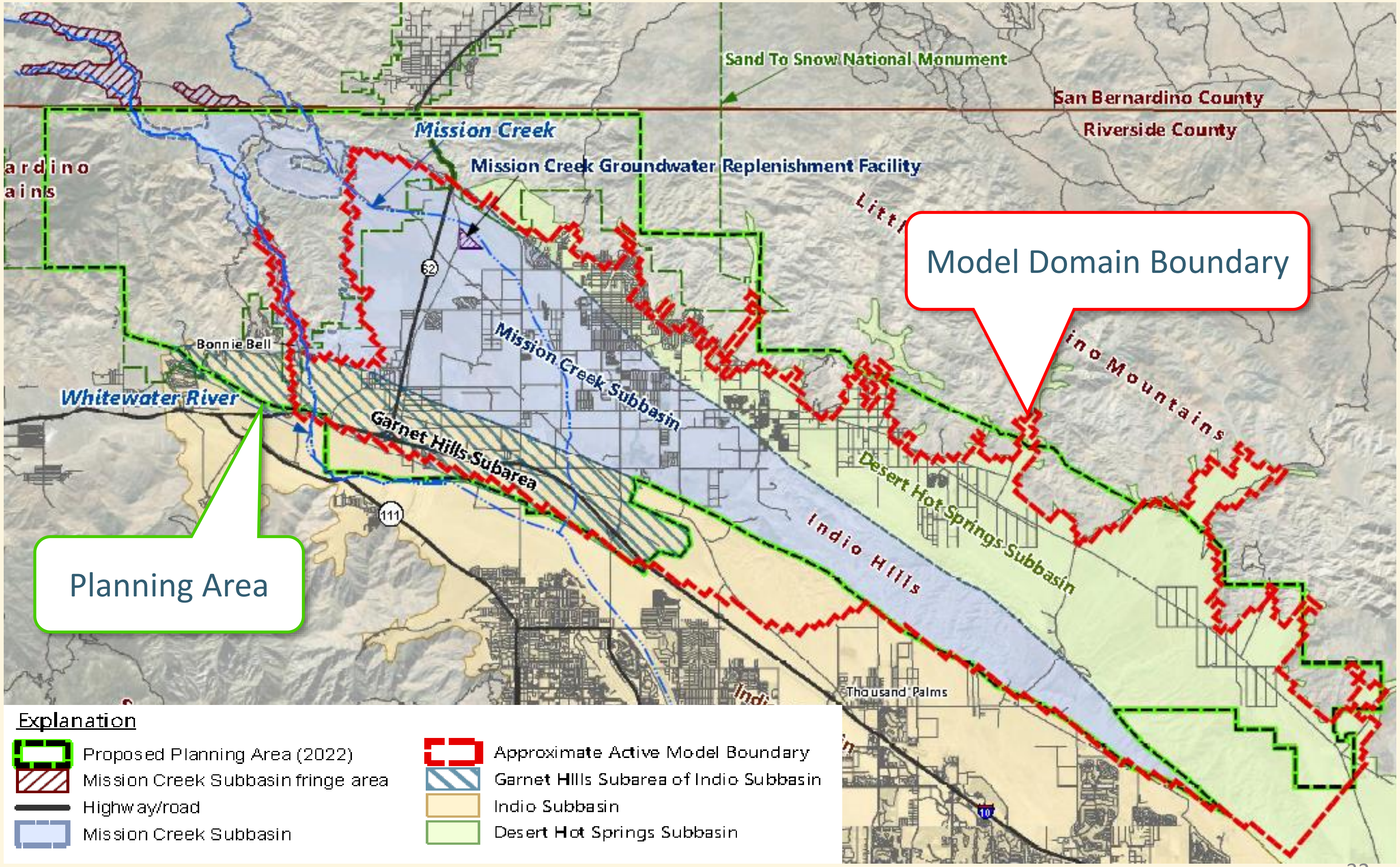
- Planning Area is focused on current and potential future water use
- Model Domain is focused on groundwater flow and occurrence, pumping, return flows, natural recharge, and artificial recharge in the Planning Area
- Groundwater flow between adjacent subbasins/subareas are simulated with faults and/or flux boundary conditions



MCSB Groundwater Model — **Objectives**

- Utilize and update existing groundwater model of Upper Coachella Valley (PSOMAS 2013)
- Modeling efforts focused on Mission Creek and Desert Hot Springs Subbasins (SB), and the Garnet Hill Subarea (SA) of the Indio SB
- Exclude Indio SB except for Garnet Hill SA. Represent inter-basin flow across Garnet Hill Fault boundary with a flux term – reduces effort in Indio SB that will be applied to Desert Hot Springs SB
- Maintain compatibility (Grid size, layers, stress periods, etc.) with Coachella Valley Groundwater Model as much as possible
- Extend model domain to south and east to include Desert Hot Springs and Indio Hills to address specific requests by DWR
- Update estimated recharge and production values through 2019 based on available records

MCSB Groundwater Model - Domain

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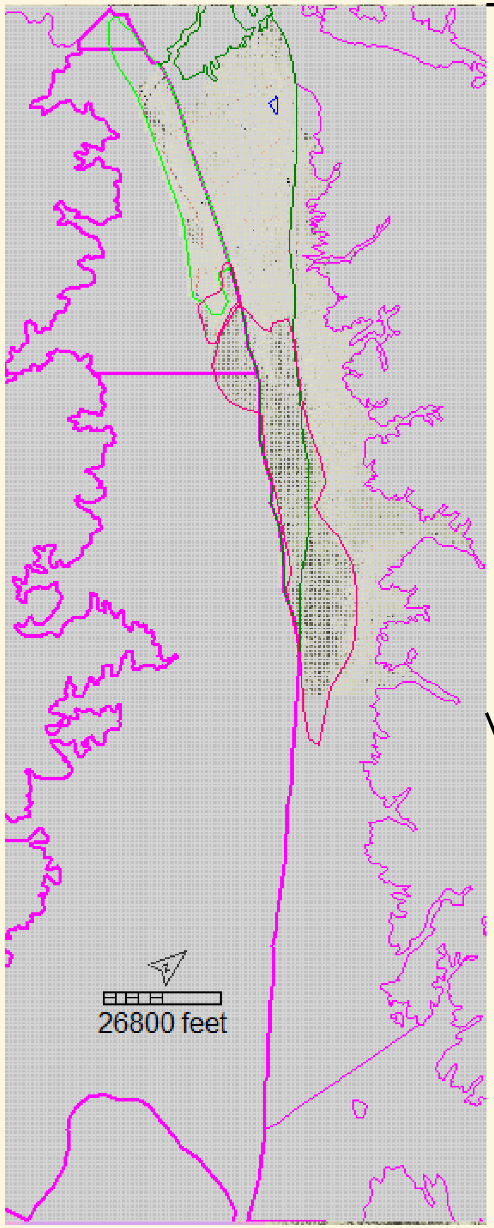

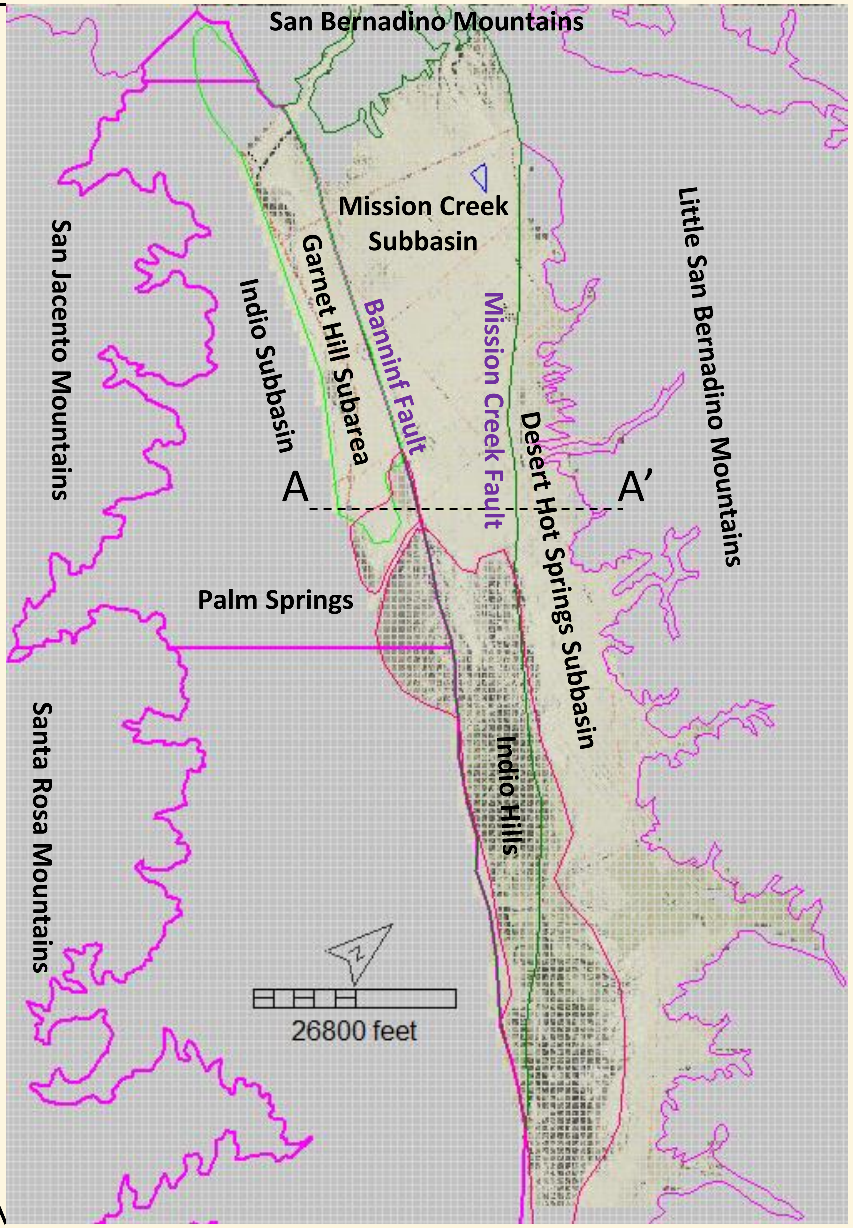

- MCSB model domain is a subset of the larger Coachella Valley Groundwater model develop in 2000 (Fogg, 2000)
- MCSB Model Grid consists of:
  - 159 Rows/113 Columns
  - 1000 x 1000 feet
  - 4 Layers
  - 126,560 Total Cells
  - 18,172 Active cells
  - 14.3% of Total
  - 104,293 acres
  - 162.96 sq. miles
- Simulates the years:
  - 1936-1945 using 5-year SPs
  - 1946-1948 using 3-year SP
  - 1949-1989 using Annual SPs
  - 1990-2019 using Quarterly SPs
  - 164 Total Stress Periods

MCSB Groundwater Model — **Cross-Section**

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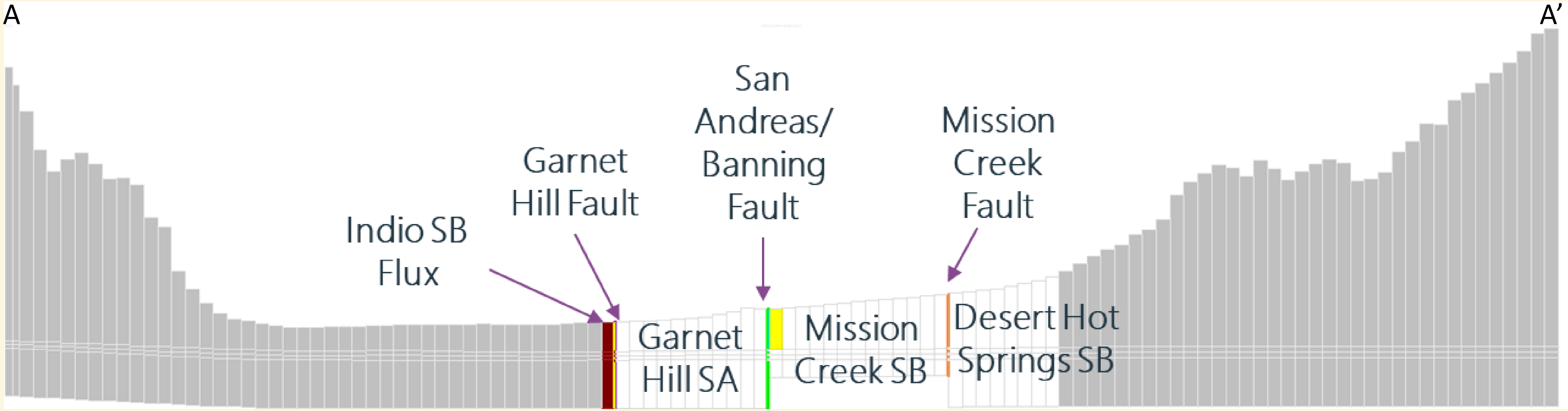

MCSB Groundwater Model — **Mountain Front Recharge**

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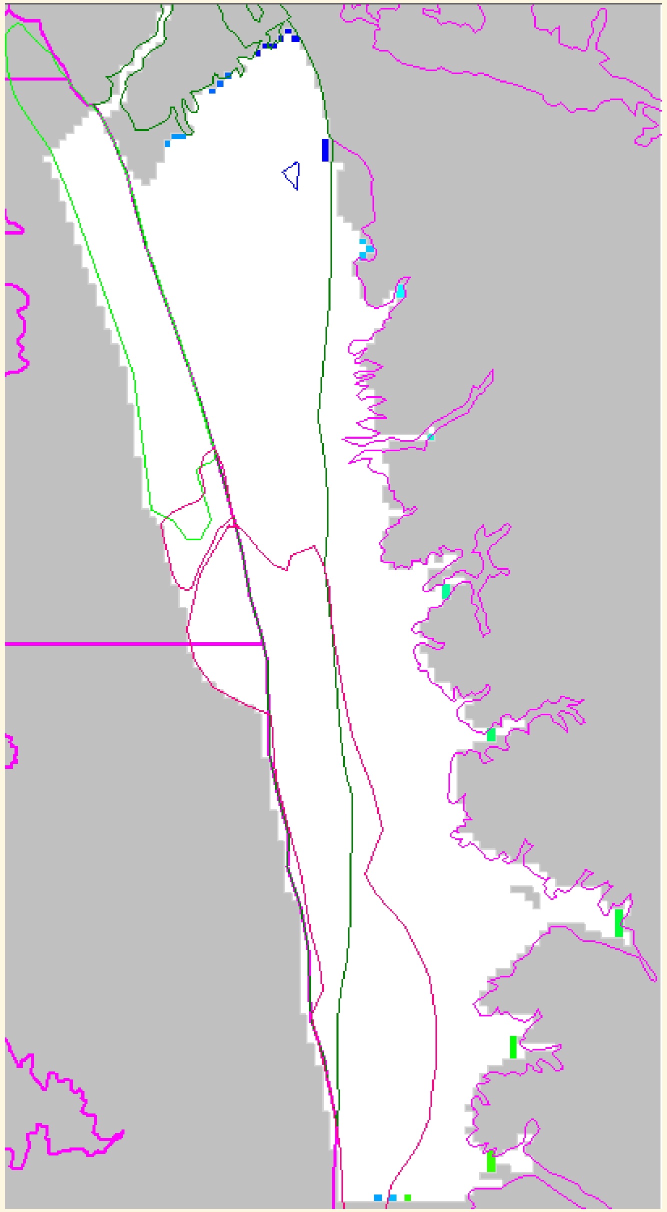
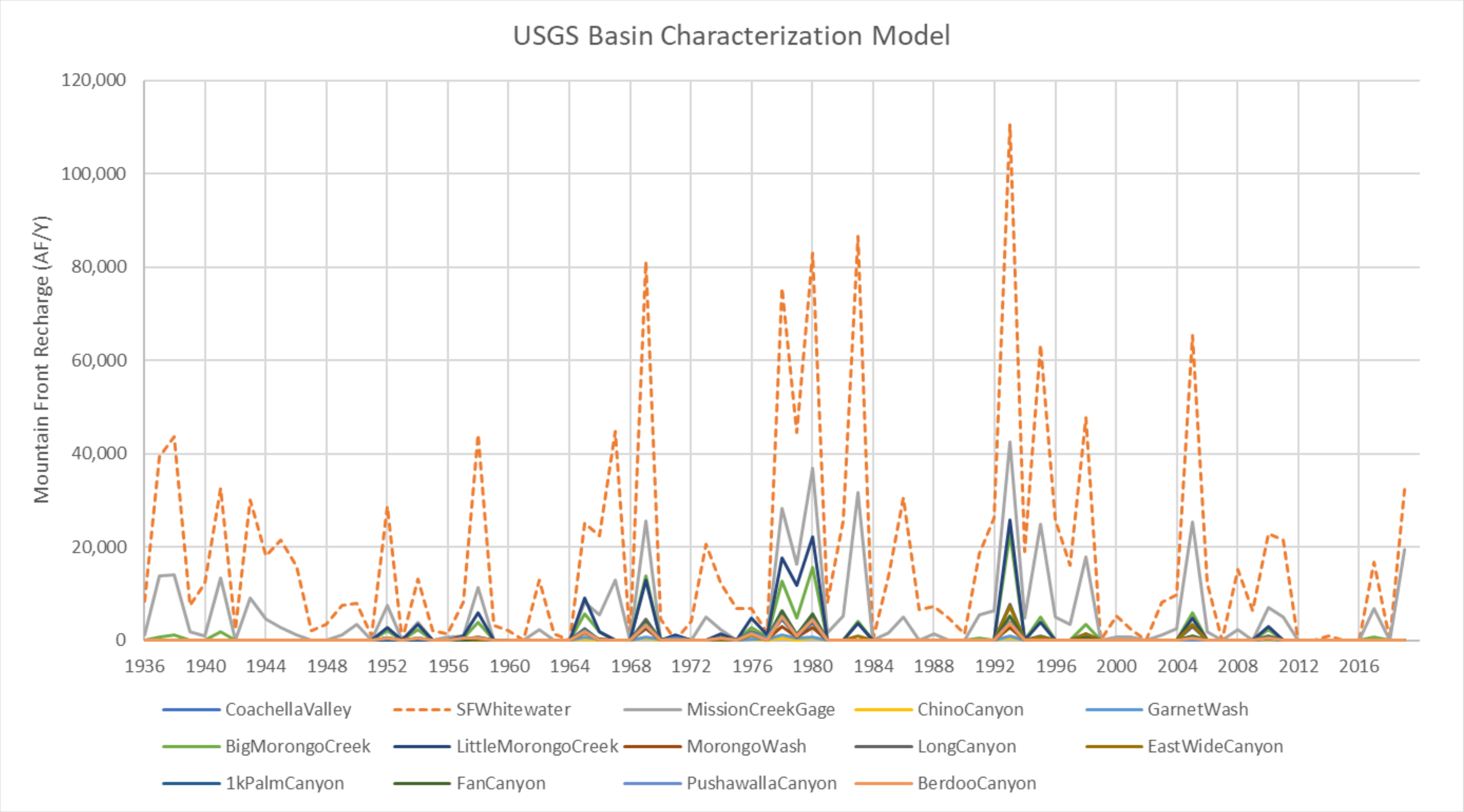
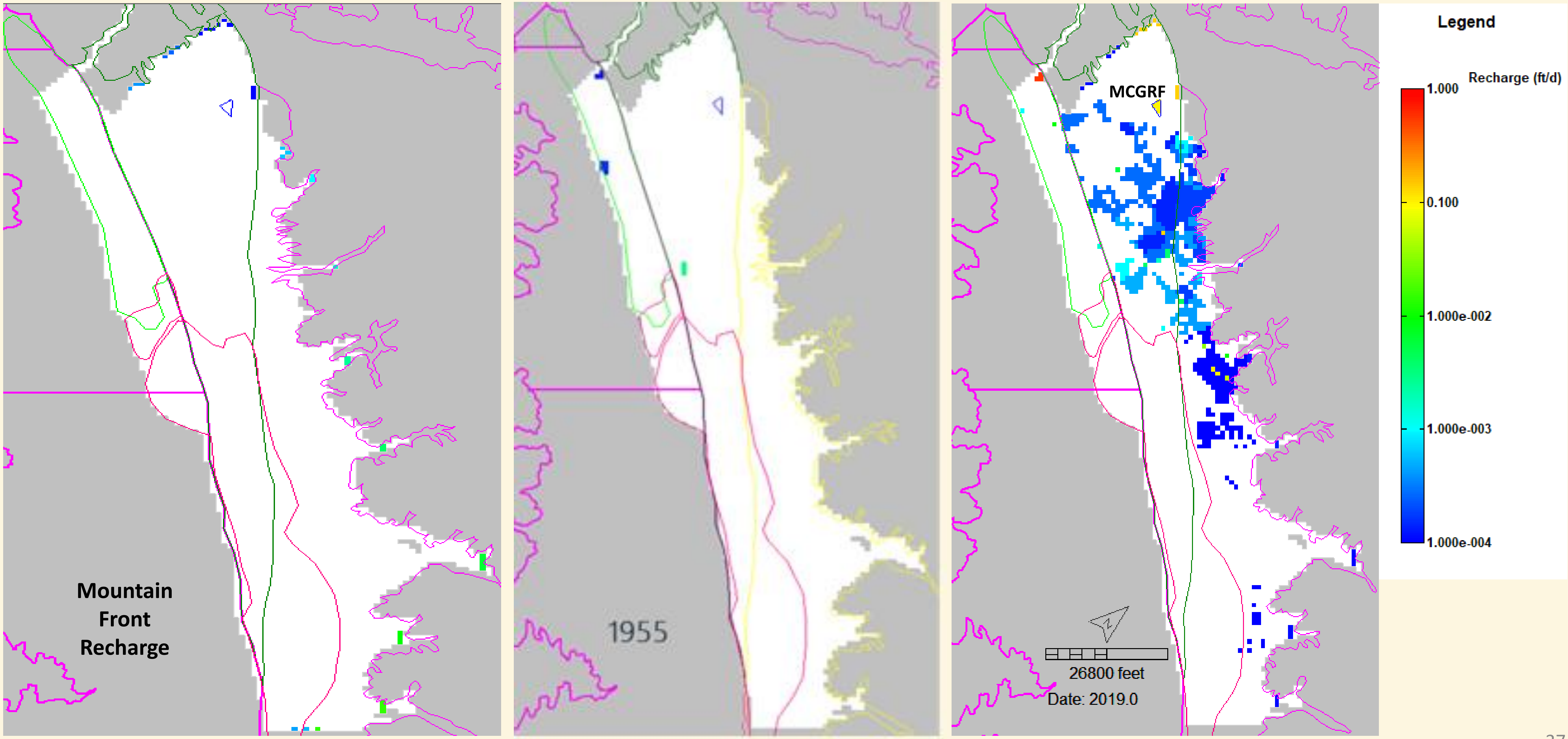
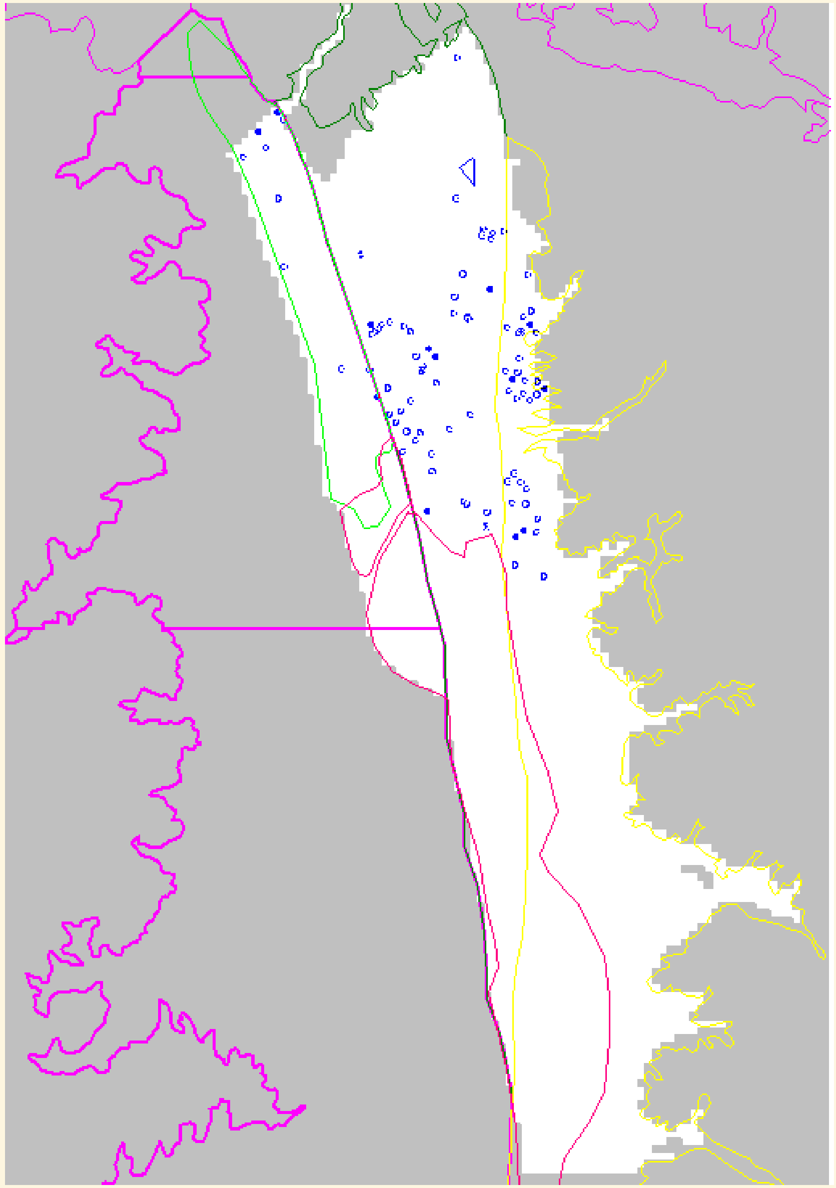


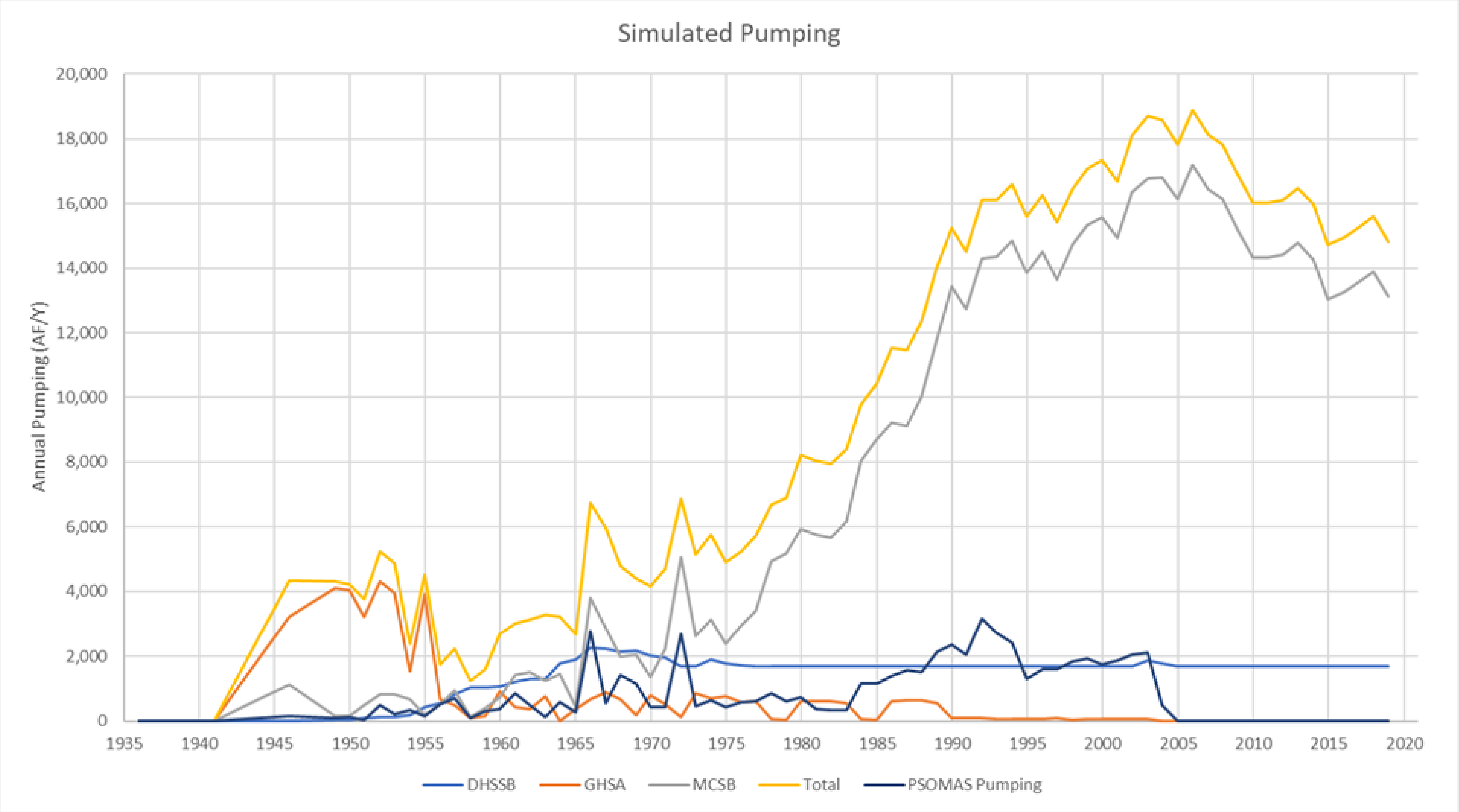


MCSB Groundwater Model – **Recharge Areas**



MCSB Groundwater Model – **Groundwater Pumping**





Model simulates pumping from 94 wells, most in Mission Creek SB

Pumping estimates prior to 1978 from PSOMAS model estimates
Pumping estimates from 1978 to present based on Agency records
Pumping from DHSSB is private pumping and is estimated from Mayer et al., 2007

MCSB Groundwater Model – **Preliminary Calibration**

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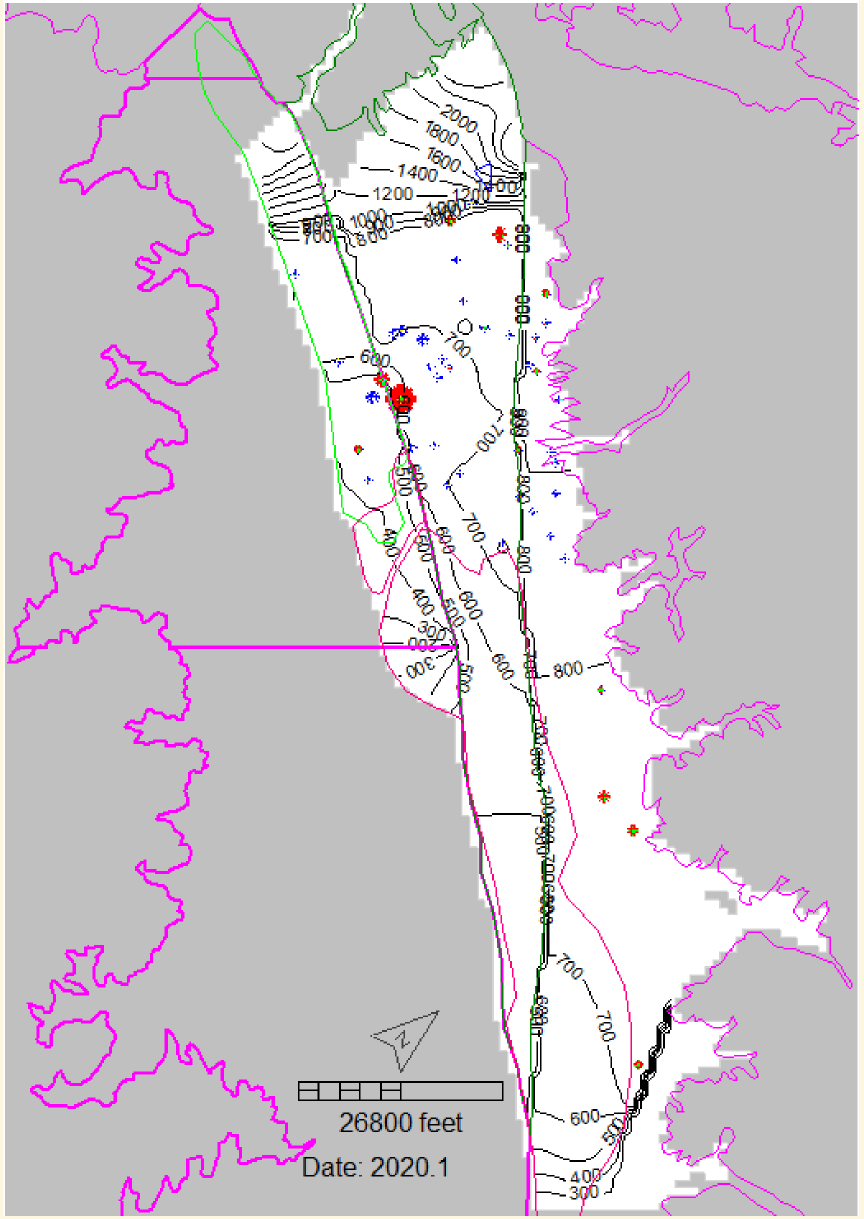
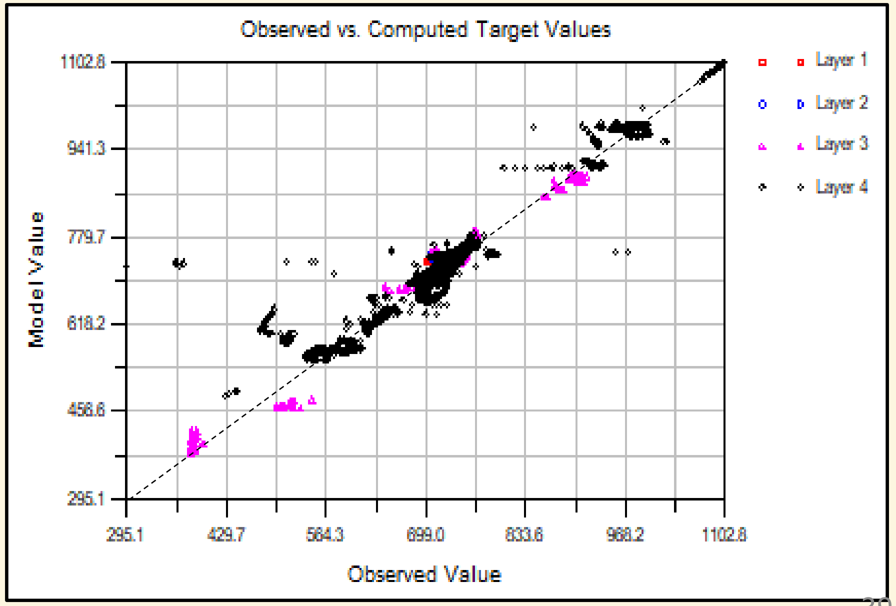
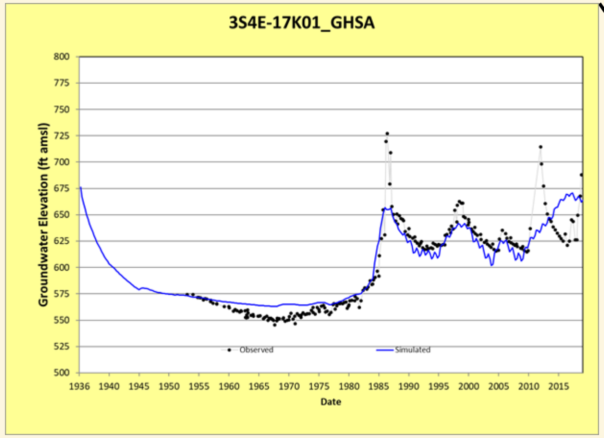


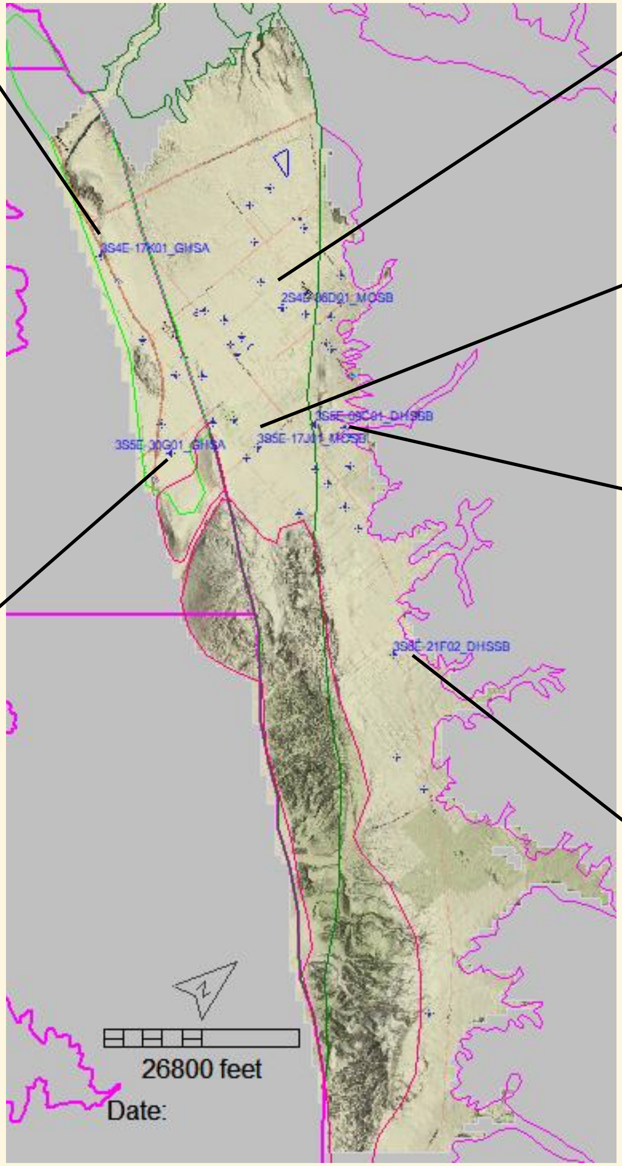
- Model Calibrated by trial and error and with PEST
- Model calibrated to 4,340 WLE observations in 52 wells
- Scaled RMS error is 4.0 % (<10% is considered well calibrated)
- Scattergram of Observed vs Simulated values show most targets fall along the 45º line of equivalency
- Some observation appear as outliers, difficult to simulate

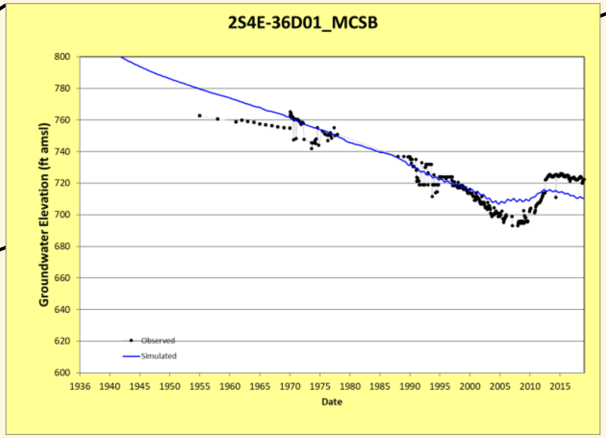
Residual Mean	= -4.26
Residual Standard Dev.	= 31.68
Absolute Residual Mean	= 17.44
Residual Sum of Squares	=4.43e+006
RMS Error	=31.96
Minimum Residual	= -430.67
Maximum Residual	= 220.84
Range of Observations	= 807.70
Scaled Res. Std. Dev.	= 0.039
Scaled Abs. Mean	= 0.022
Scaled RMS	= 0.040
Number of Observations	= 4340

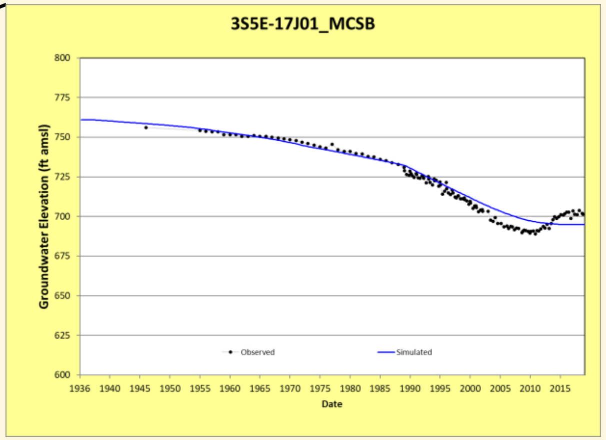


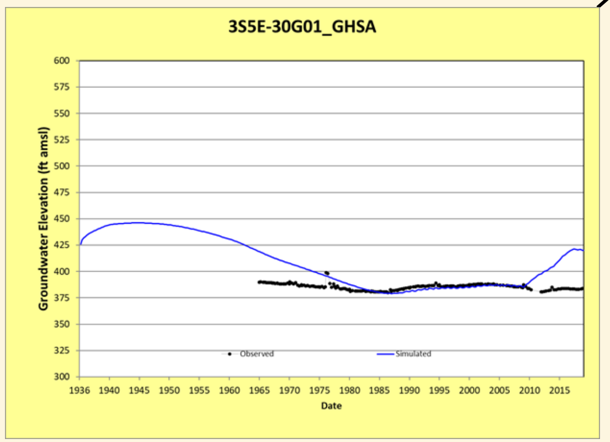
MCSB Groundwater Model – **Preliminary Simulation Results**

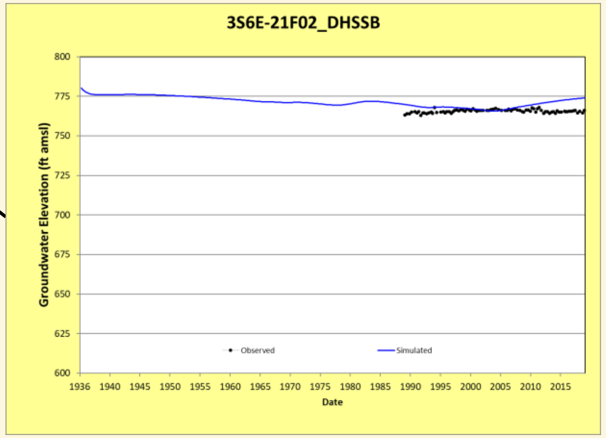


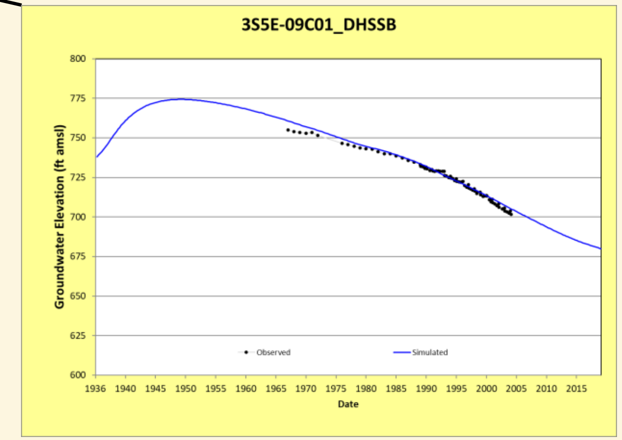








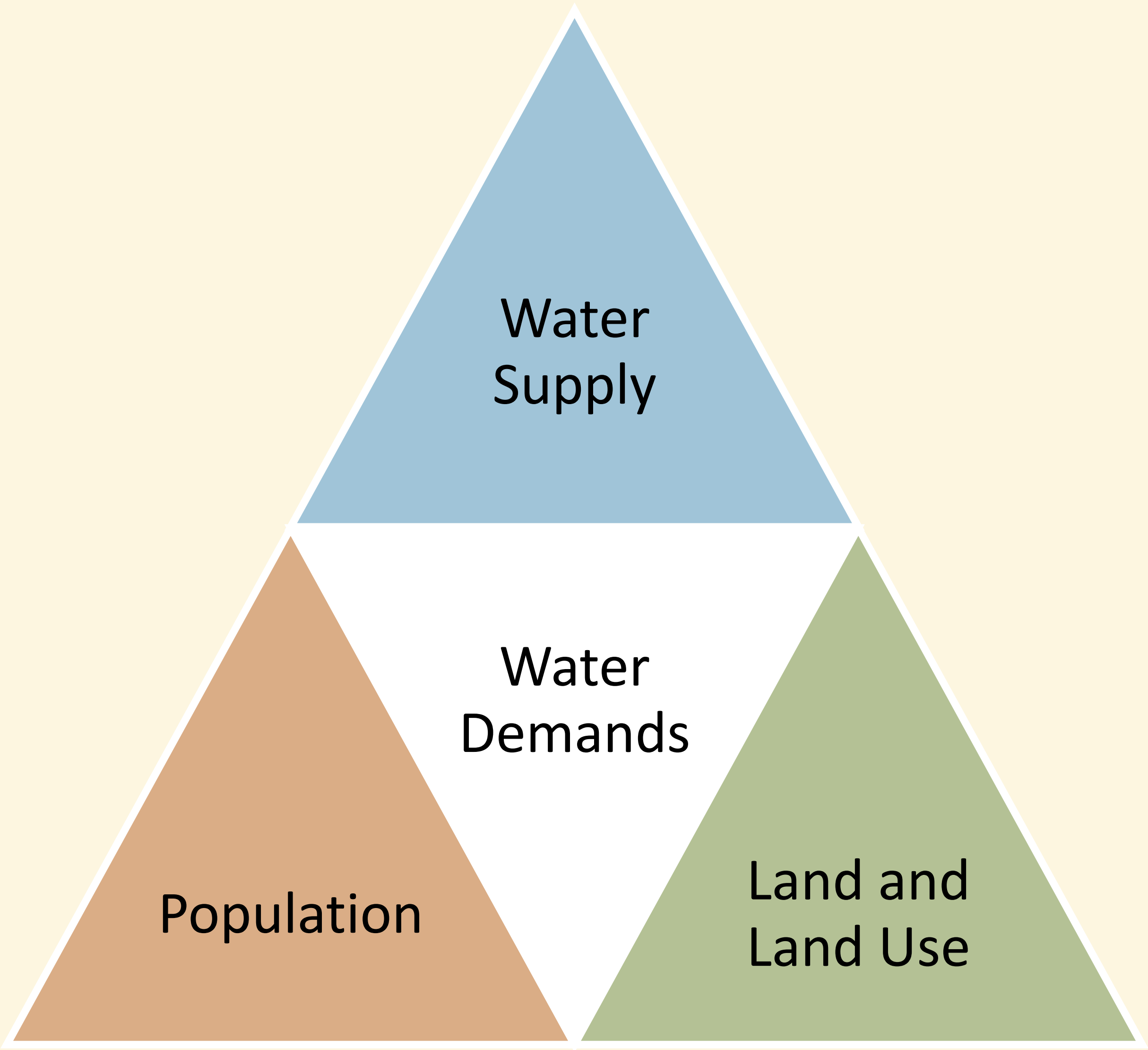




Questions?

Overview of the Future

Future Groundwater Conditions Are Built On:



Planning Area

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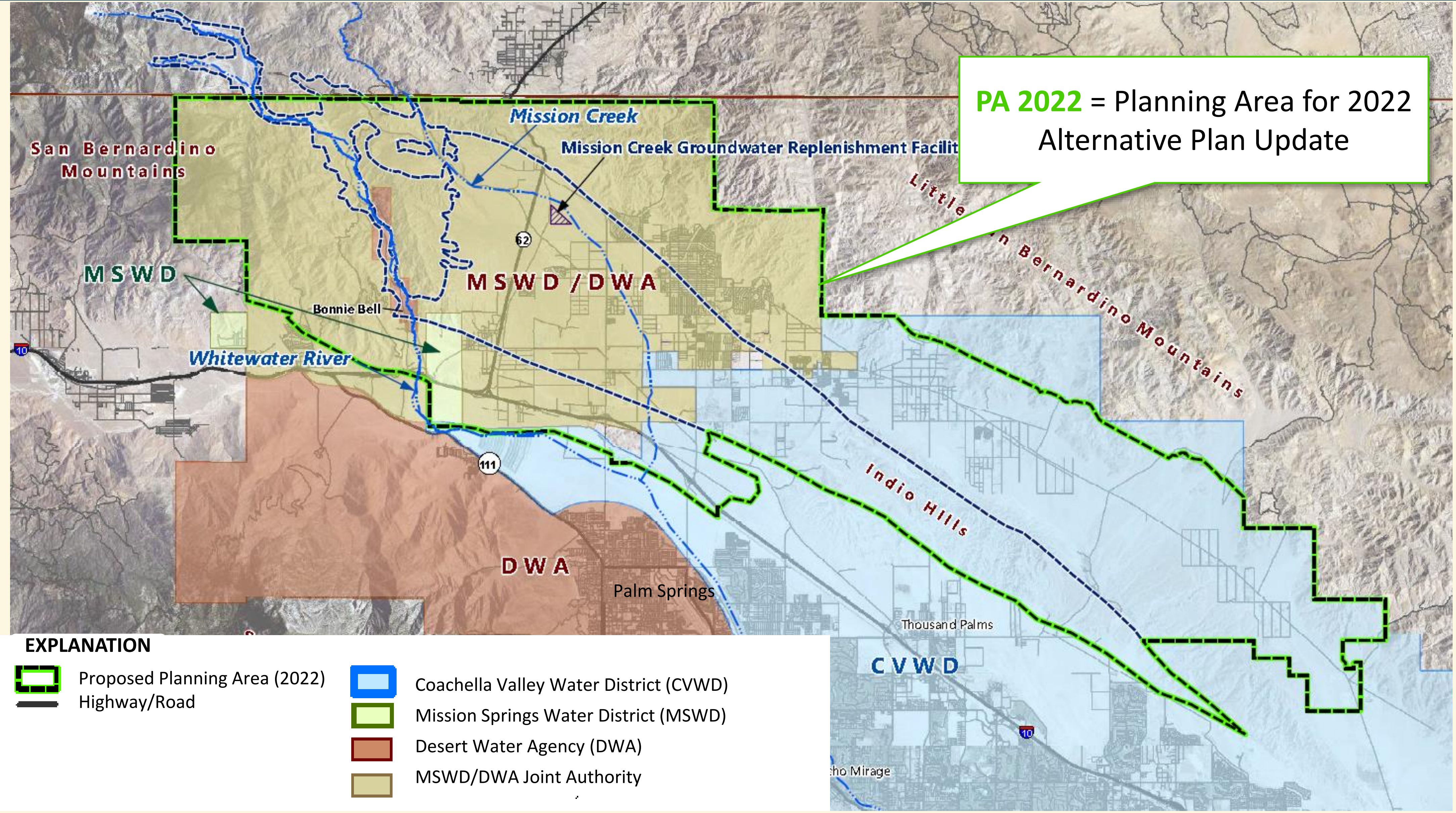

Population Growth Estimates

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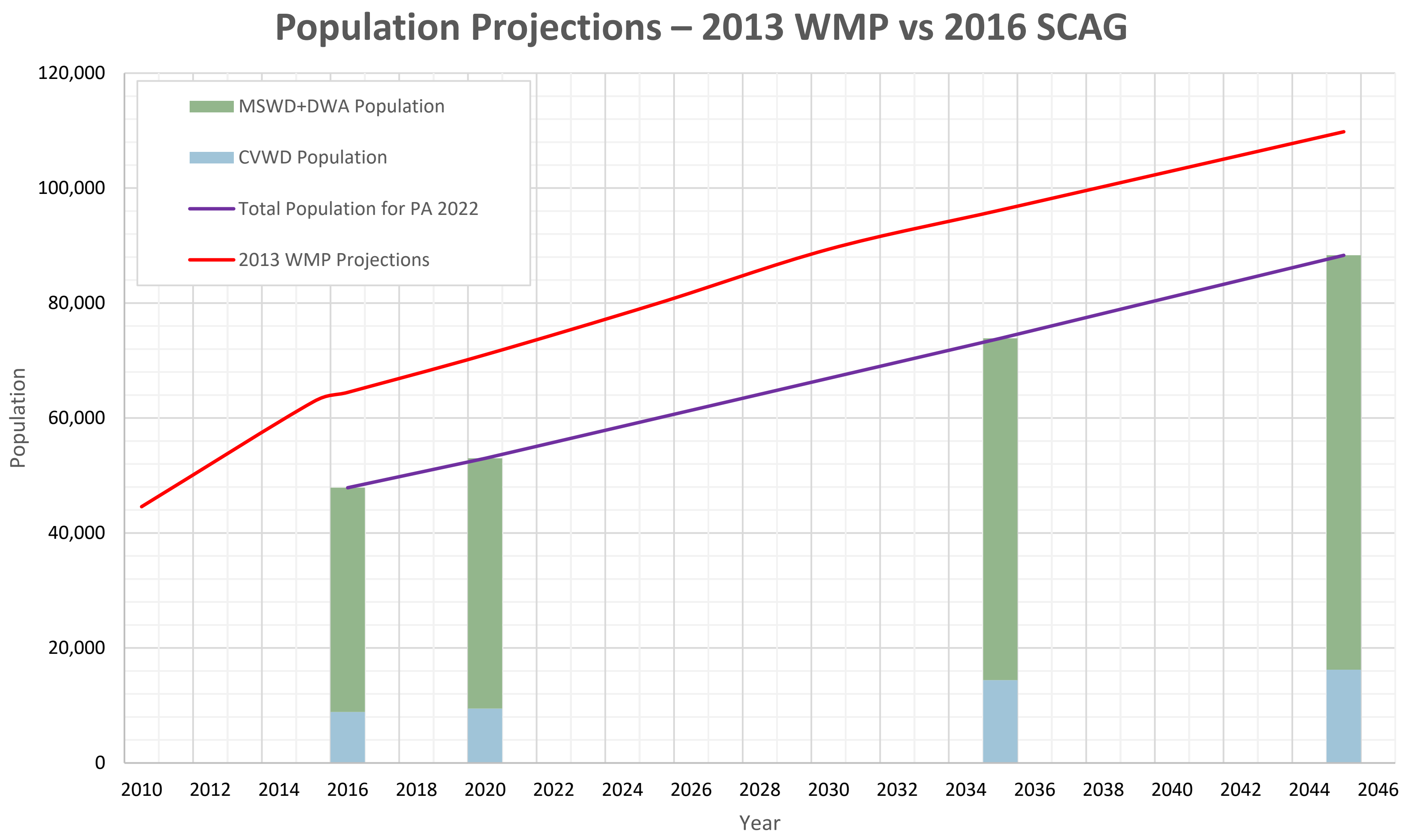
- 2013 WMP Projections Anticipated Higher Short-term Growth Than What Occurred
- Resulting Long-term Population Growth as Estimated in 2016 by Southern California Area of Governments is Almost 20% Lower Than in 2013



PA 2022 = Planning Area for 2022 Alternative Plan Update

POLL 4

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- Are you aware of any developments planned in your area?

  If so, please provide the following information:

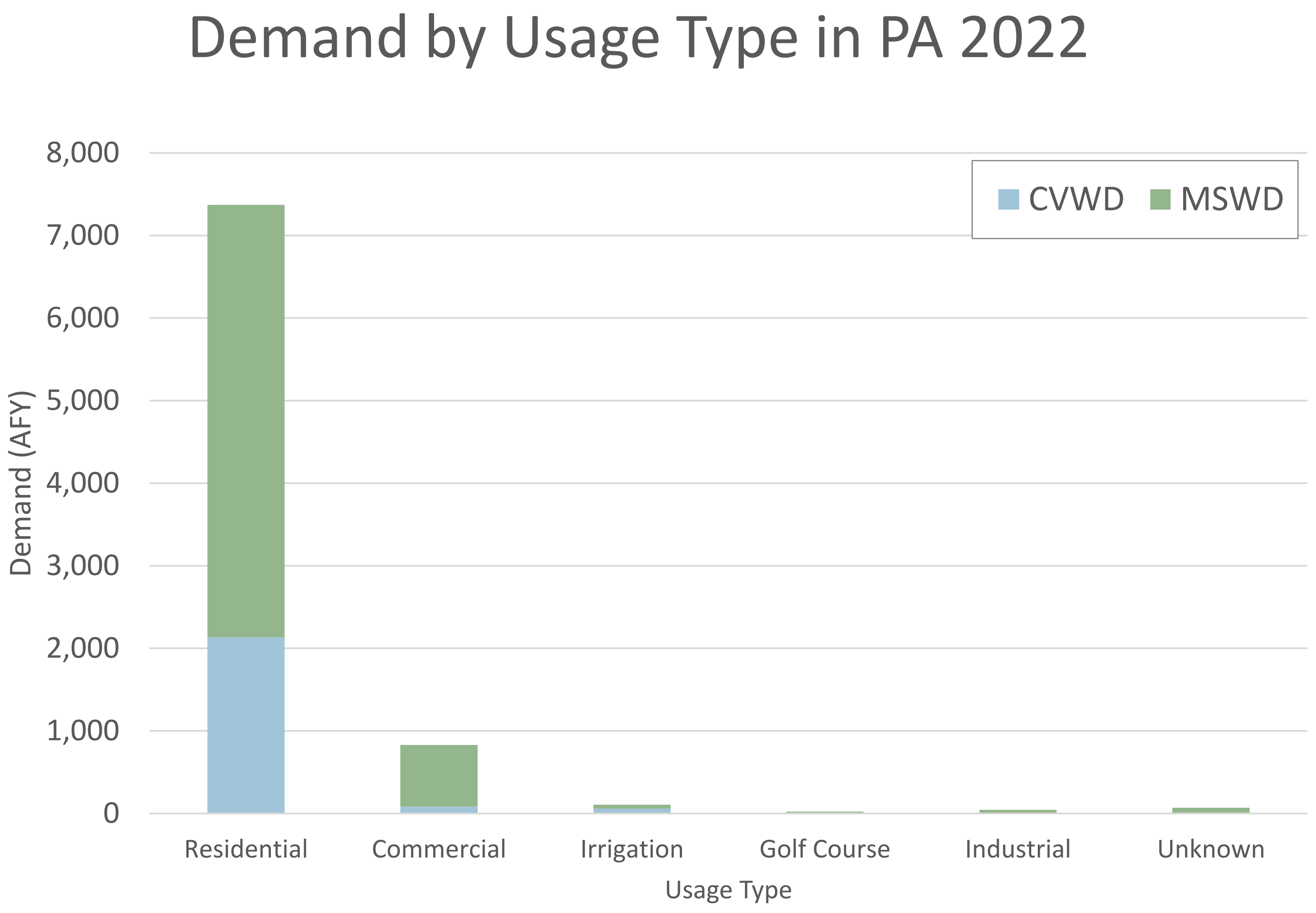
  - Location (eg cross streets) and name

Demand Estimation Approach

Historic Water Usage by Land Use

Usage Type by Land Use**	2014-2019 Average Demand (AFY)*	
	CVWD	MSWD
Residential	2,134	5,238
Commercial	83	748
Irrigation	60	46
Golf Course	3	21
Industrial	1	42
Unknown	0	69
Grand Total	**2,280**	**6,164**

*Does Not Include Private Pumping
** Riverside County Land Use



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Historic Metered Demand Is Used to Estimate Typical Usage by Land Use Type

Demand by Land Use* (AFY/Acre)	X	Acres of Land of Same Land Use (Acres)	=	Total Demand by Land Use (AFY)

* Adjustments Made to Reflect Water Conservation

Parcel Categorization

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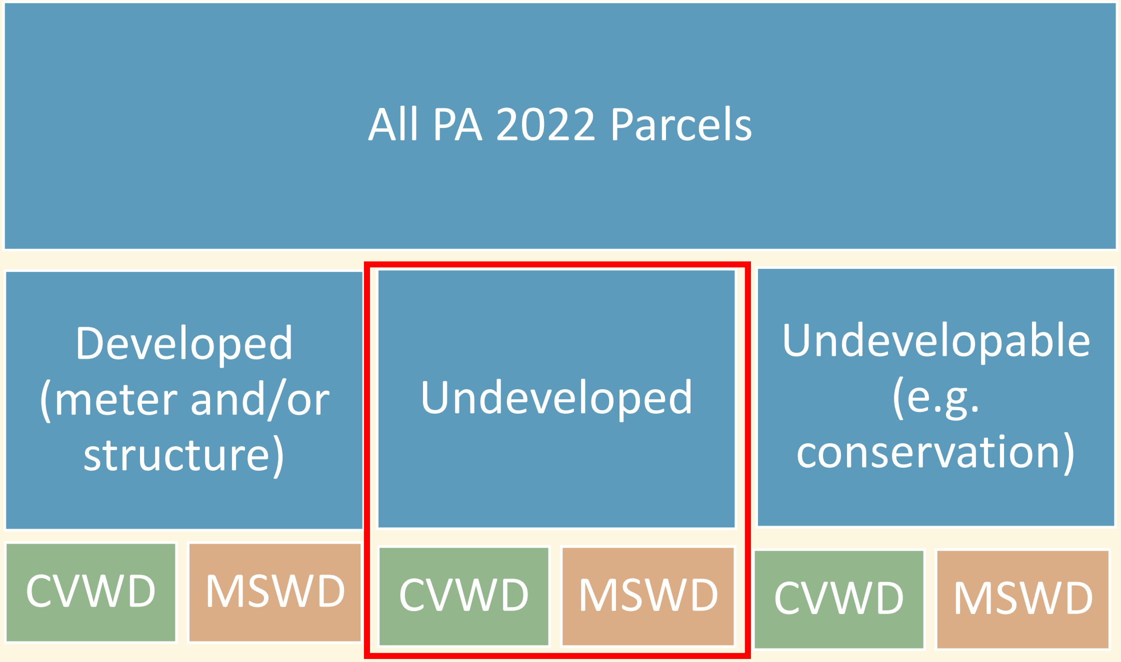
- All Parcels in 2022 Planning Area Separated by District
- Developed Parcels Are Those with Existing Metered Demand and/or Structures per Riverside County Parcel Tax
- Undevelopable Parcels are Those Owned by "Conservancy" and Public Ownership
- Undeveloped Parcels Are Those That Are Not Developed or Undevelopable: **Used for Estimating Future Demands**



Undeveloped Parcels by Land Use

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- The Remaining 9,959 Undeveloped Parcels in CVWD and MSWD Account for 116,007 Acres in PA 2022 as Categorized by Riverside Co Land Use Usage Type

	CVWD		MSWD	
Usage Type	**Acreage**	**# Parcels**	**Acreage**	**# Parcels**
Commercial	2,030	87	3,146	650
Industrial	453	7	803	16
Irrigation	19,297	348	8,212	240
Residential	32,783	2,350	48,312	6,247
Unknown	960	11	11	3
Total	**55,522**	**2,803**	**60,485**	**7,156**

Remaining Undeveloped Parcels by Classification

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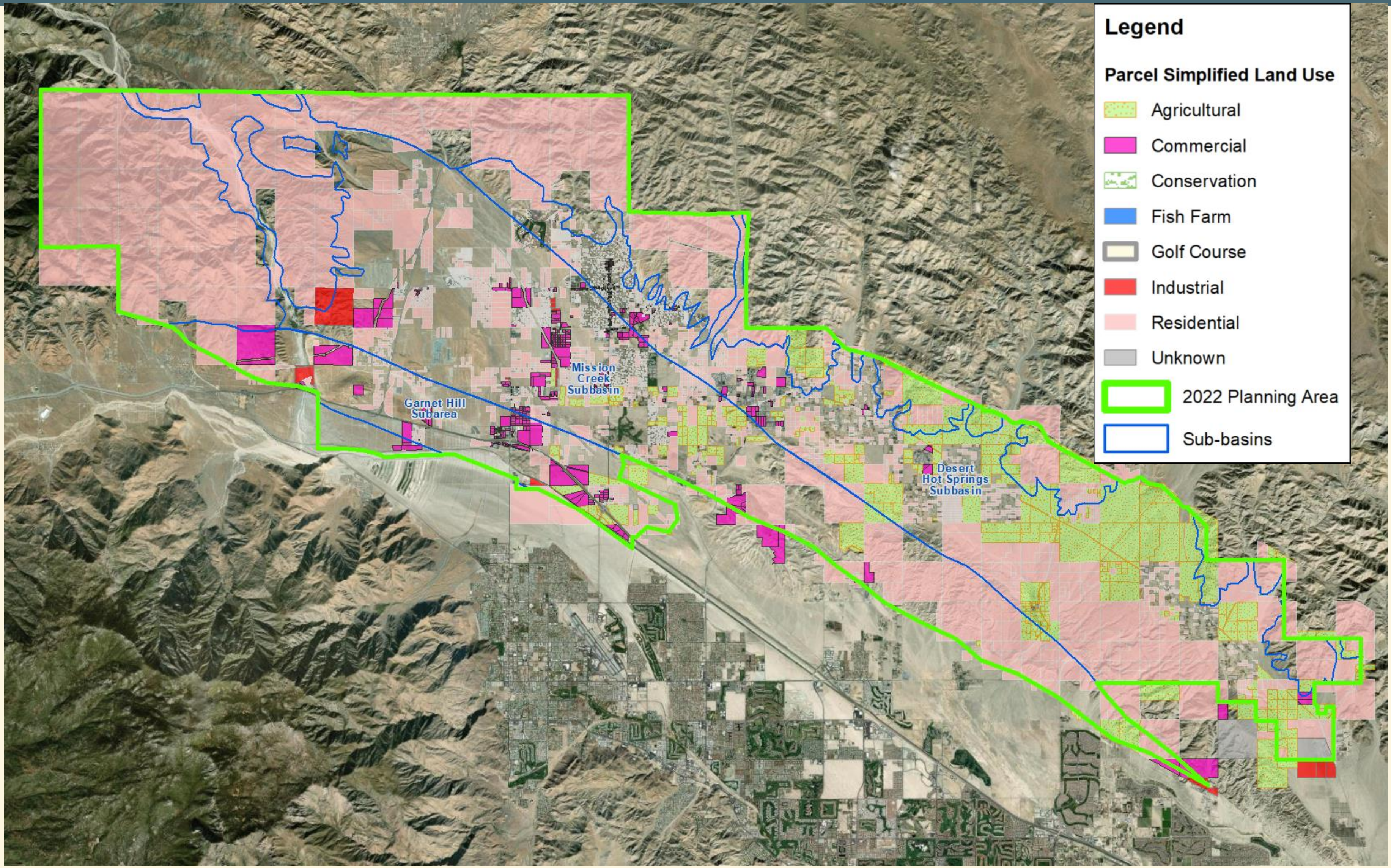
- Refinement of Undeveloped Parcel Classification to include
  - Multi Species Habitat Conservation Plan Area and
  - Relevant General/ Specific Plans



Supply Estimation Considerations

Water Supply Sources

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- Water Conservation
- Groundwater
- Local Runoff
- Imported Water for Groundwater Replenishment
- Future Recycled Water

- Imported Water Derives From State Water Project (SWP)
- SWP Water Exchanged with MWD for Colorado River Water
- CVWD/DWA SWP Table A Contract is up to 194,100 AFY for both Mission Creek and Indio Subbasins based on pumping
- Delivered for Recharge at Mission Creek GRF and Whitewater GRF in Indio Subbasin

State Water Project Reliability Is Critical for Imported Water Delivery

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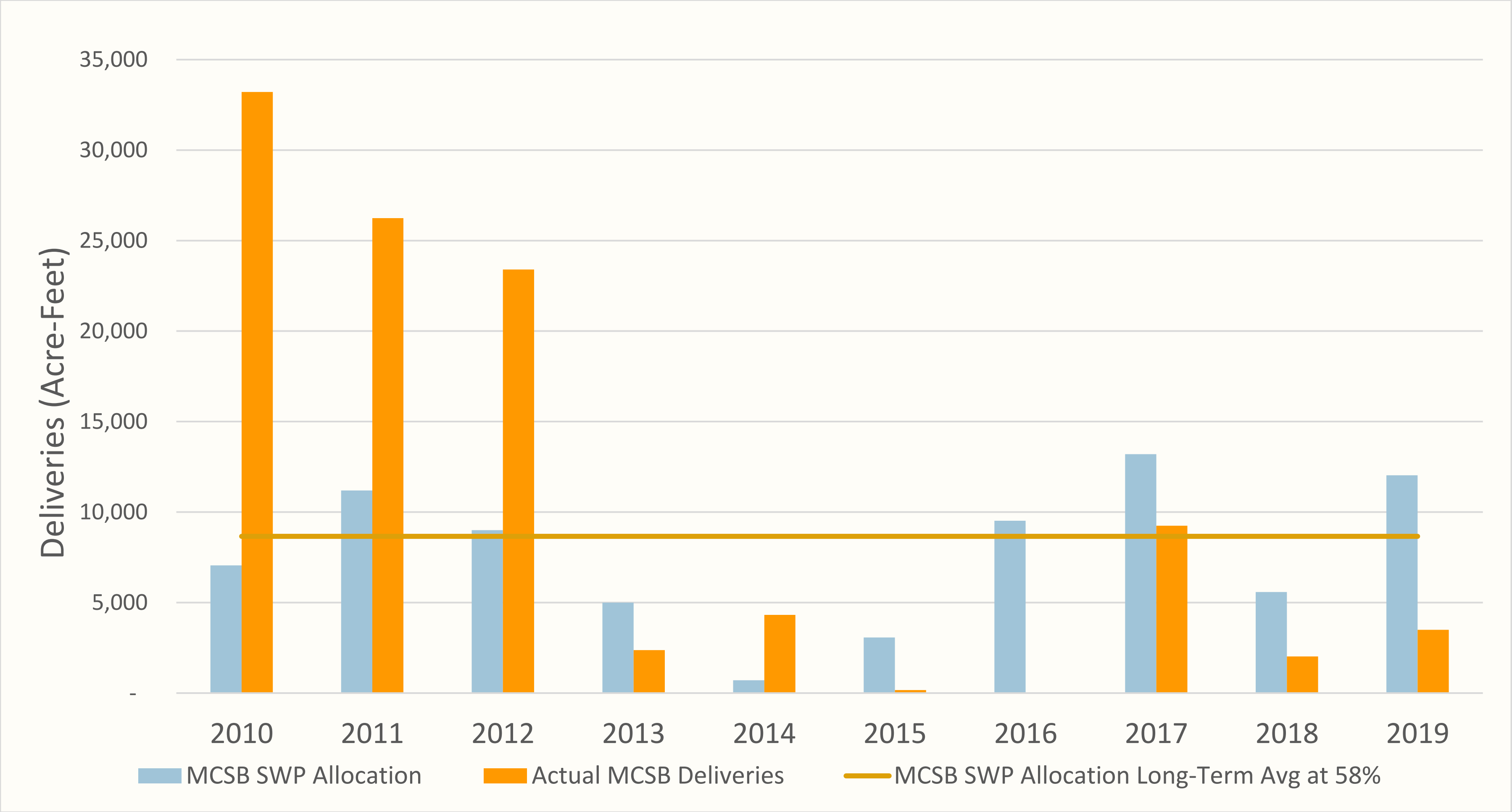
- MCSB SWP Allocation is for Table A
- Actual MCSB Deliveries include:
    - Table A Allocation and Supplemental Water
    - Can Include Advanced Delivery, Which is Accounted for in the Region's SWP Delivery Balance



* The long-term trend is for the 58% delivery to further reduce to 52% delivery

POLL 5

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- What would you estimate the average annual imported water delivery since 2002 to the MCSB to be?
  - ❑ 0-2,500 AFY
  - ❑ 2,500-5,000 AFY
  - ❑ 5,000-7,500 AFY
  - ❑ >7,500 AFY

Next Steps for Alternative Plan Update

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- Refine Calibration of the Groundwater Model
- Completion of the Future Water Demand Estimates
  - Refinement of Unit Water Production (AFY/Ac)
  - More Detailed Evaluation of Undeveloped Parcels
- Initiation of Future Scenarios for Groundwater Model
- Drafting of Alternative Plan Update Sections

Public Outreach

Your Participation is Crucial

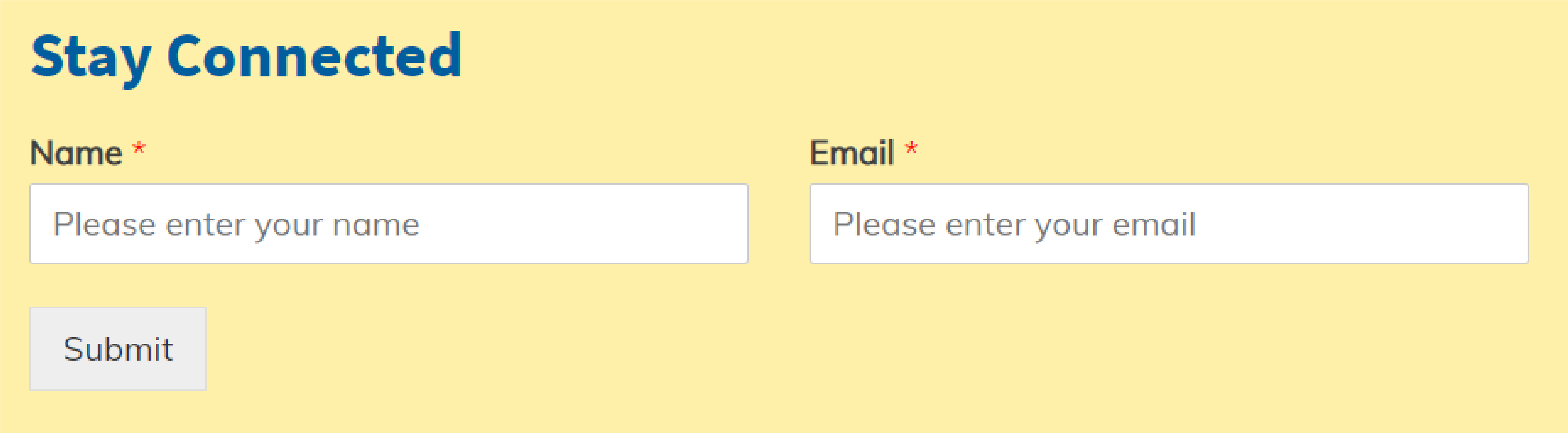
- **Goals for Outreach:**
  - Enhance public understanding
  - Inform public of Plan Update process
  - Engage all parties within planning area
  - Respond to public concerns
- **Communication and Engagement Plan:**
  - Outlines public outreach goals in more detail
  - Available at www.MissionCreekSubbasinSGMA.org

Next Steps

- **Next Meeting:** 1st Quarter 2021
- **For additional information, please contact:**
  - Melanie Rivera at (626) 568-4304
  - Sachi Itagaki at (650) 852-2817
  - MissionCreekSubbasinSGMA@KennedyJenks.com

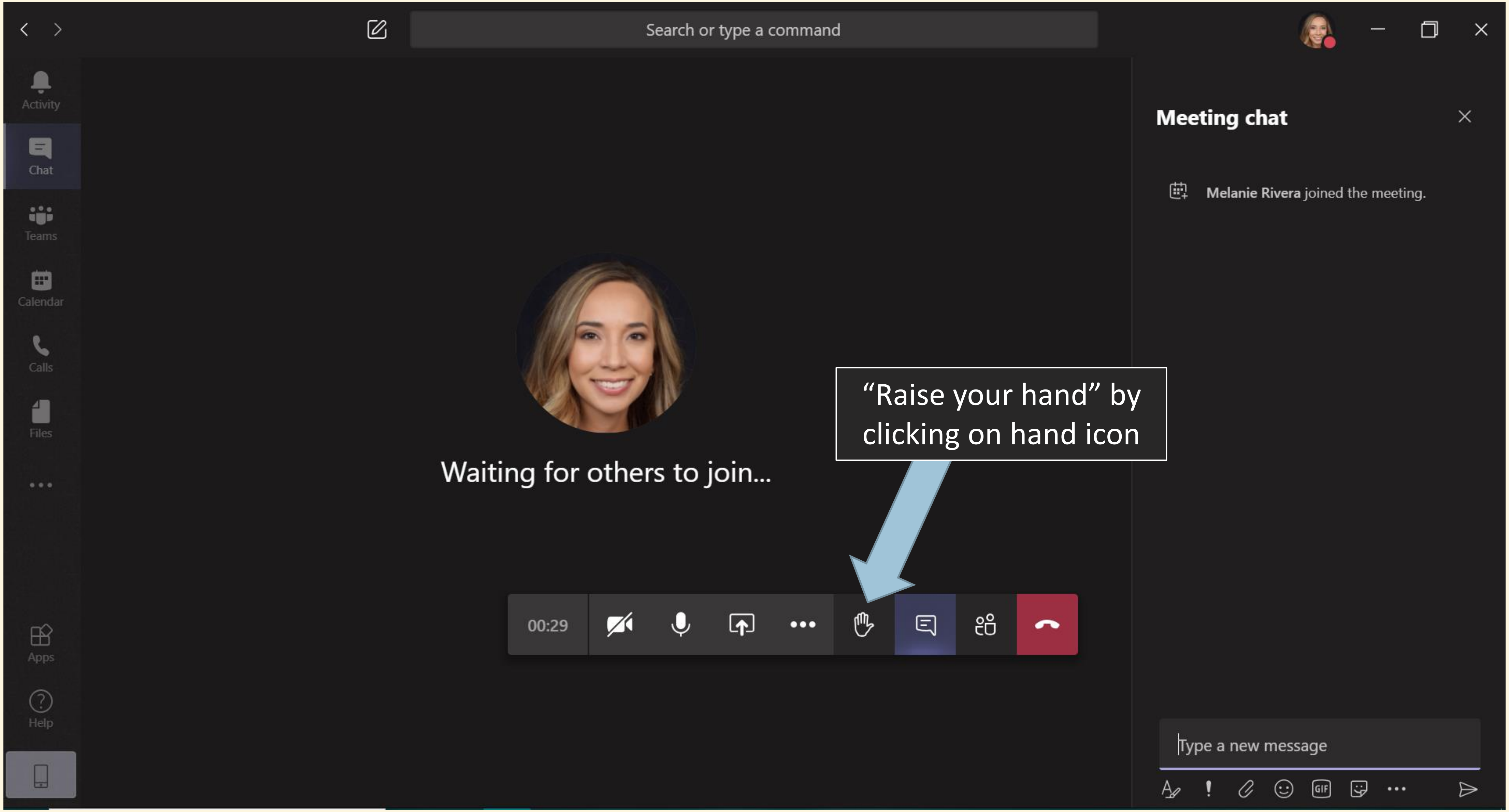
Get Involved

- **Website:** www.missioncreeksubbasinsgma.org/get-involved-faq
- **Email address**: MissionCreekSubbasinSGMA@KennedyJenks.com



Public Comment

The Virtual Experience: Raising Hand



“Raise your hand” by clicking on hand icon

Open Discussion

- Questions?
- Possible Topics:
    - Groundwater model
    - Current/future population
    - Water demand analysis

Thanks for joining us!