Salinas Valley Basin GSA

Water Budgets

Presented to Eastside Aquifer Subbasin Committee
April 7, 2021

Prepared by

MONTGOMERY & ASSOCIATES

Goals

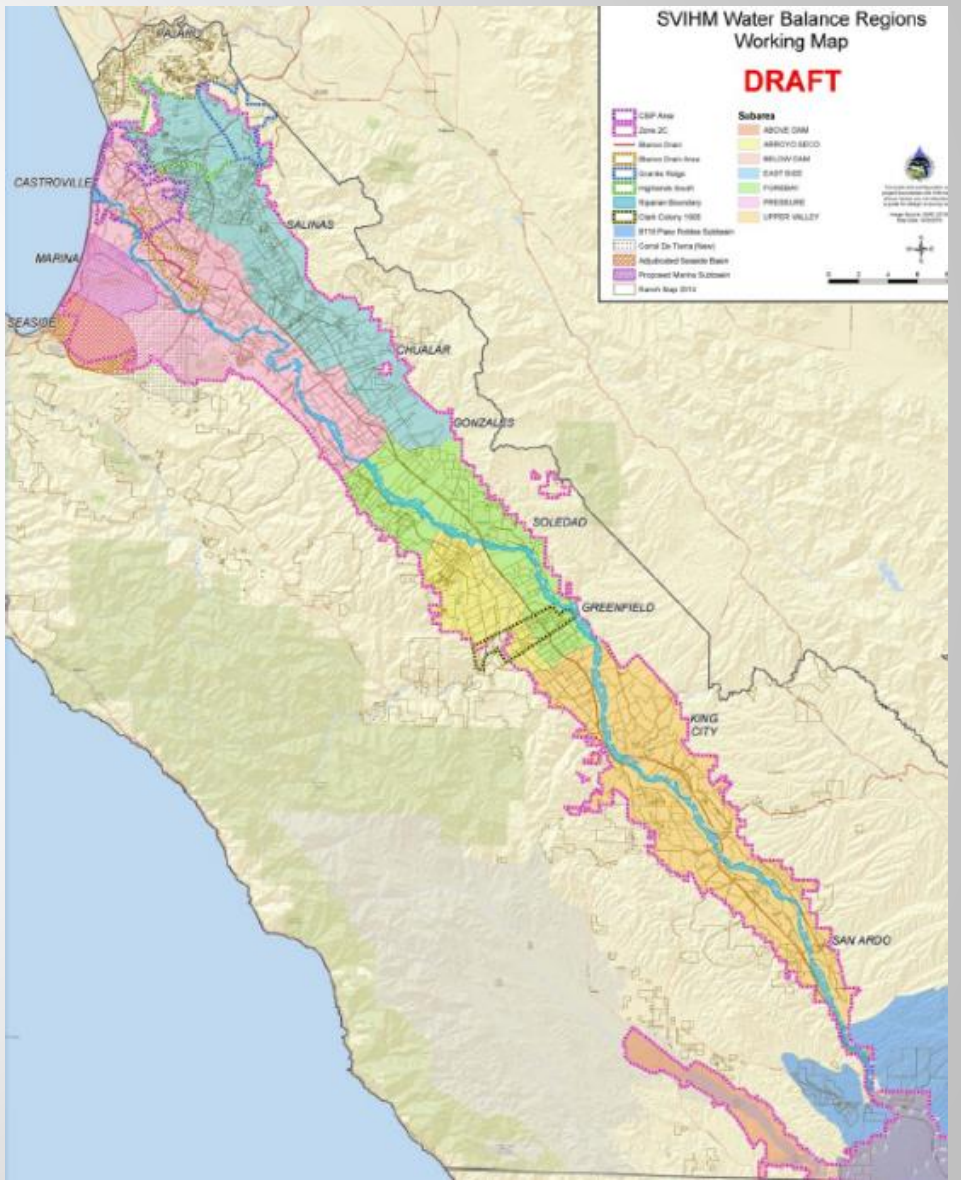
- Share preliminary findings from water budget analysis
- Establish initial estimates of the range of the Eastside Subbasin's sustainable yield

Background

- A general water budgets overview was given at a valley-wide workshop on February 24, 2021.
- Each Subbasin must pump within its sustainable yield (CCR §1071(t))
  - Sustainable yield can change as projects or management actions are initiated

Water Budget Tools

- Two models developed by USGS
  - Salinas Valley Integrated Hydrologic Model (SVIHM) – historical conditions
  - Salinas Valley Operational Model (SVOM) – future conditions
- Both models will also be used by MCWRA and USBR for other studies in the Valley
- Both models are preliminary. MODELS CONTINUE TO BE UPDATED.

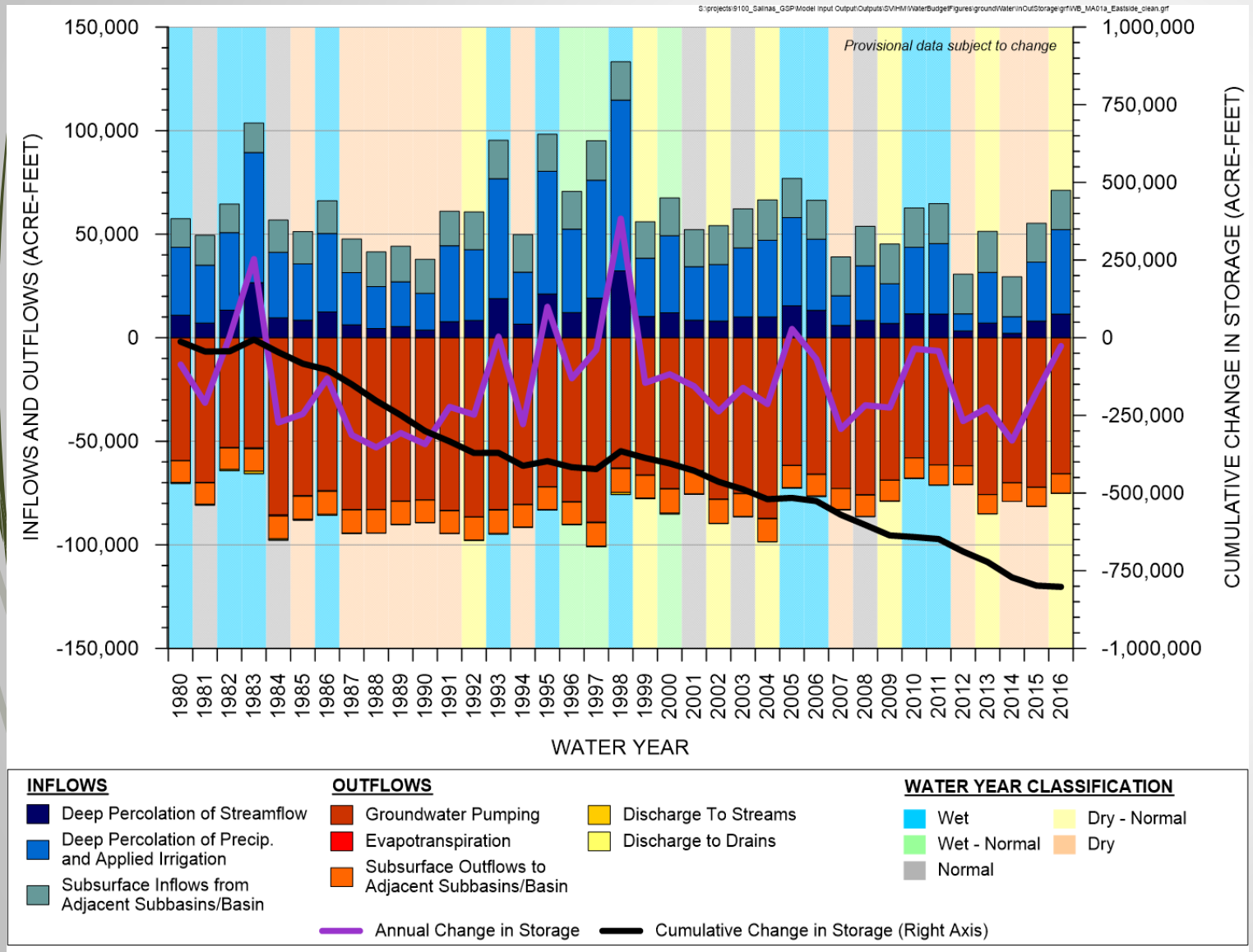


This data (model and/or model results) are preliminary or provisional and are subject to revision. This model and model results are being provided to meet the need for timely best science. The model has not received final approval by the U.S. Geological Survey (USGS). No warranty, expressed or implied, is made by the USGS or the U.S. Government as to the functionality of the model and related material nor shall the fact of release constitute any such warranty. The model is provided on the condition that neither the USGS nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the model.

Important Note

- *This data (model and/or model results) are preliminary or provisional and are subject to revision. This model and model results are being provided to meet the need for timely best science. The model has not received final approval by the U.S. Geological Survey (USGS). No warranty, expressed or implied, is made by the USGS or the U.S. Government as to the functionality of the model and related material nor shall the fact of release constitute any such warranty. The model is provided on the condition that neither the USGS nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the model.*

Preliminary Historical Water Budget Results*



- Modeled storage loss from 1980-2016 is 21,700 AF/yr.

Higher than previous estimates

**All model results are preliminary and subject to revision.*

Average Annual Simulated Historical Water Budget

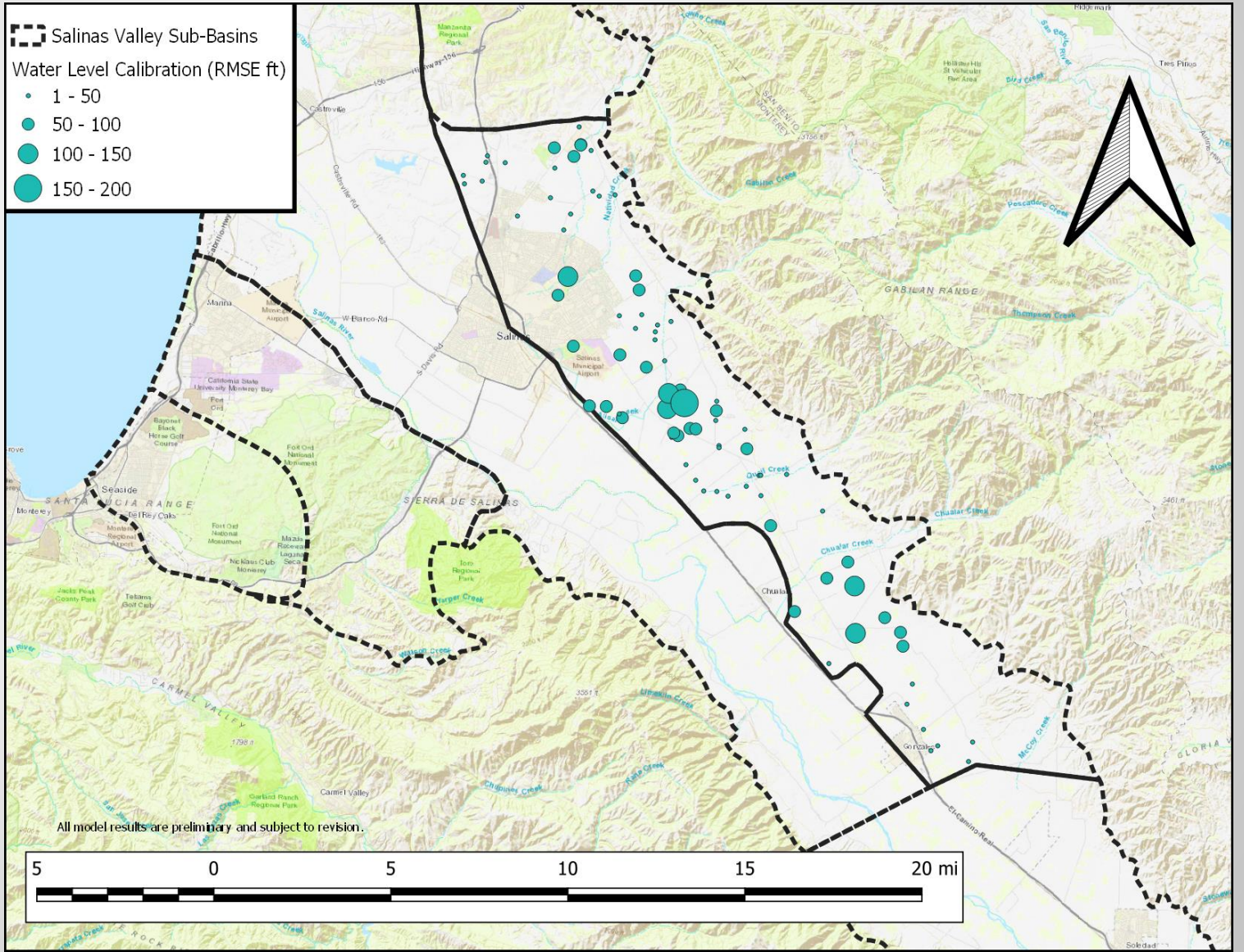
**All model results are preliminary and subject to revision.*	**Simulated (AF/yr.)**
Groundwater Pumping	-72,558
Flow to Drains	-34
Net Stream Exchange (gain from streams)	10,515
Net Deep Percolation of Precipitation and Irrigation	33,436
Net Flow from Langley Area Subbasin	1,130
Net Flow from 180/400-Foot Aquifer Subbasin	3,554
Net Flow from Forebay Aquifer Subbasin	760
Net Flow from Other Areas	1,686
Groundwater Evapotranspiration	-168
Net Storage Change	-21,675

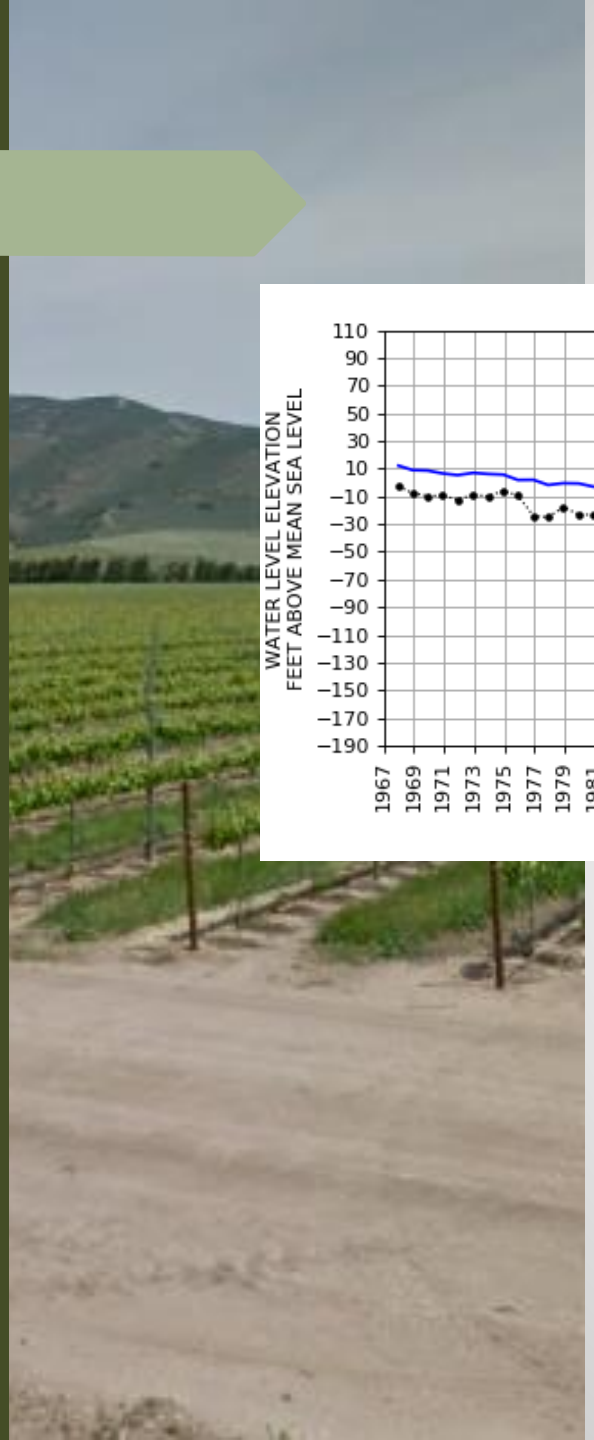
Preliminary Future Water Budget Results

**All model results are preliminary and subject to revision.*	**2030 (AF/yr.)**	**2070 (AF/yr.)**	**Significant Changes (Historical to 2070)**
Groundwater Pumping	-75,100	-78,400	5,800 more pumping
Flow to Drains	-100	-100	
Net Stream Exchange (gain from streams)	13,900	14,500	4,000 more from streams
Net Deep Percolation of Precipitation and Irrigation	35,800	38,700	5,300 more from precipitation and irrigation
Net Flow from Langley Area Subbasin	1,500	1,600	
Net Flow from 180/400-Foot Aquifer Subbasin	900	1,000	
Net Flow from Forebay Aquifer Subbasin	-700	-800	
Net Flow from Other Areas	700	500	
Groundwater Evapotranspiration	2,700	2,500	
Net Storage Change	-20,400	-20,500	

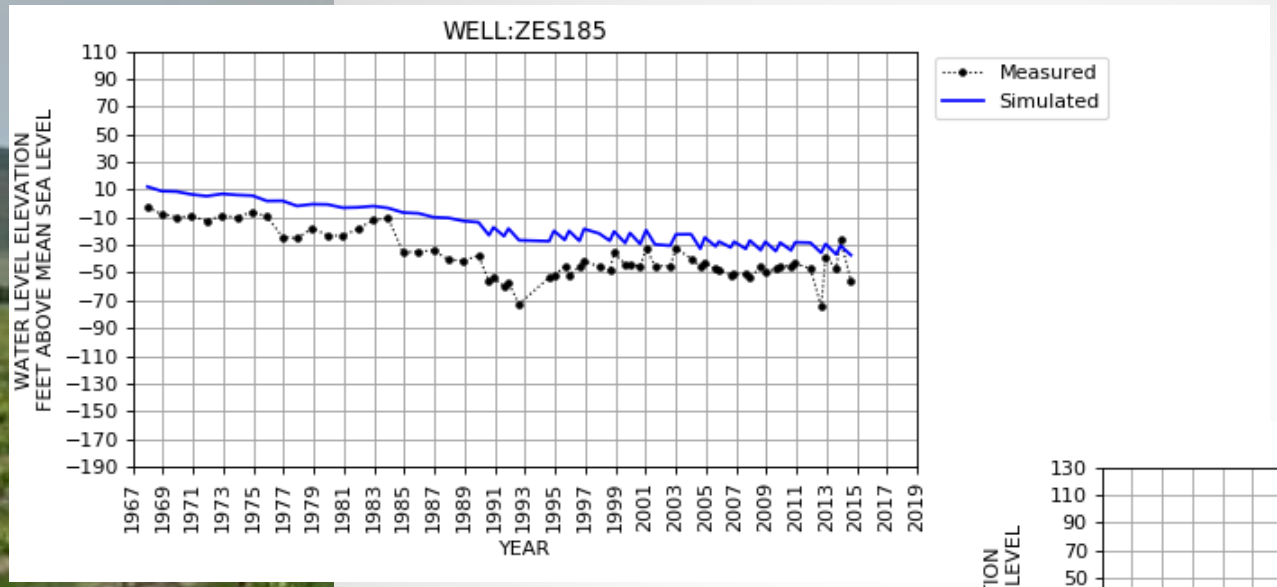
Potential Model Inaccuracies*

**All model results are preliminary and subject to revision.*

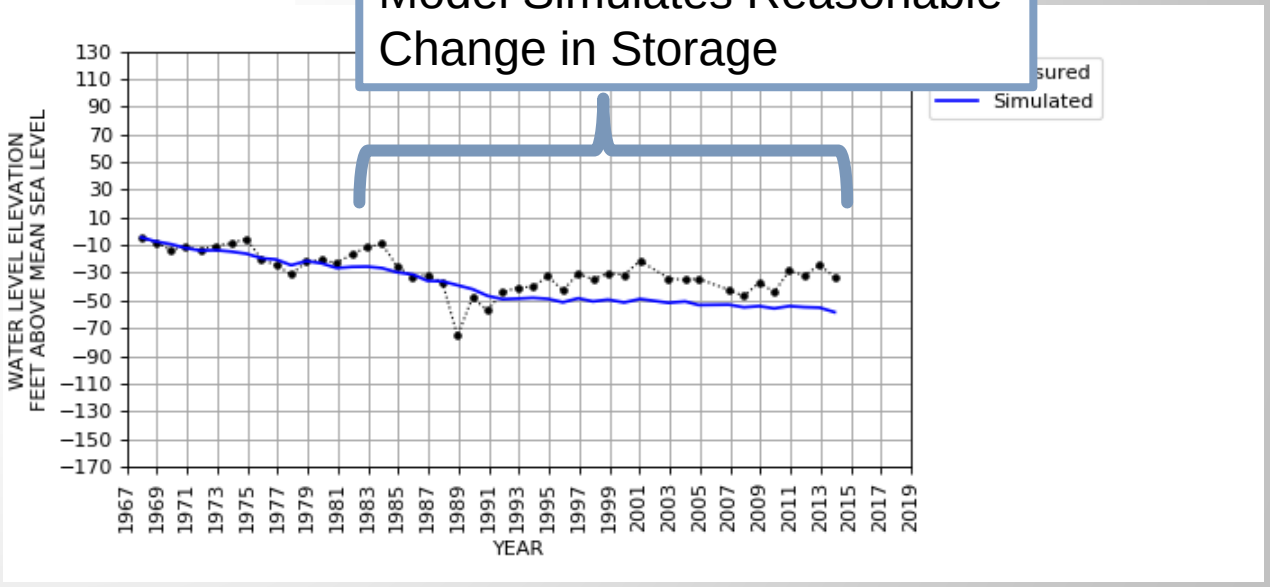




North of Salinas

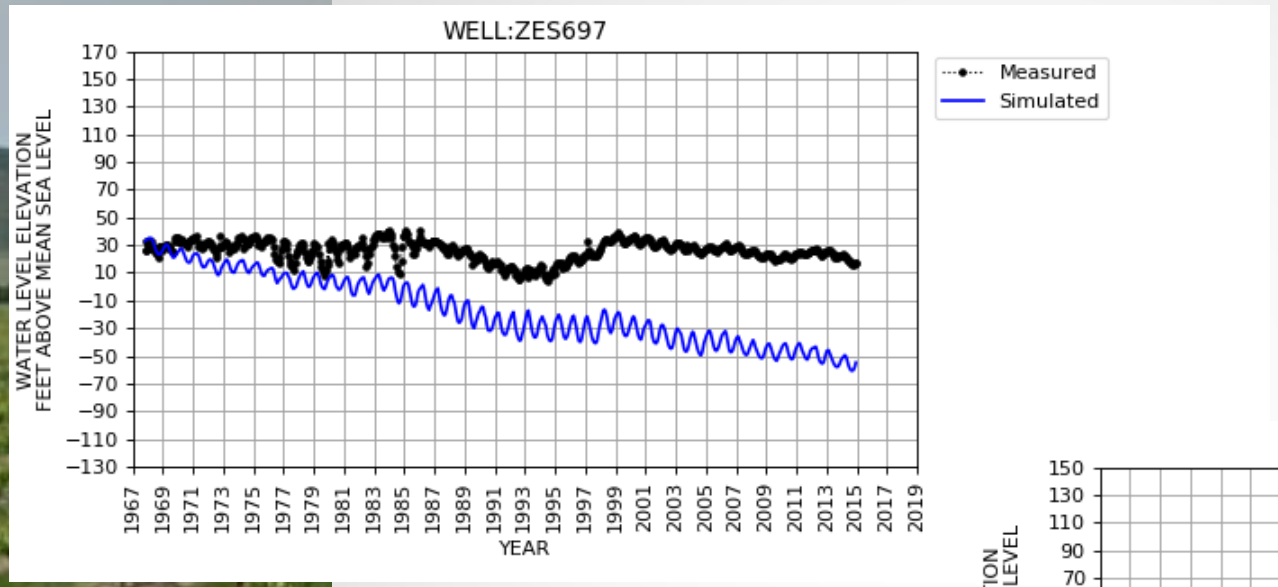


Model Simulates Reasonable Change in Storage

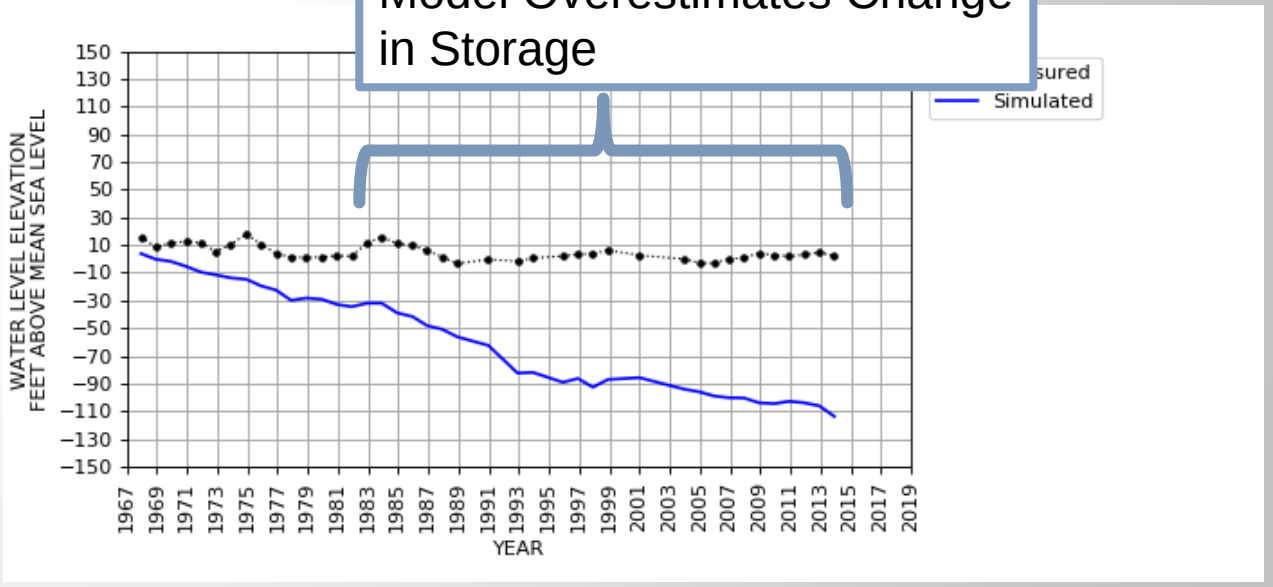


**All model results are preliminary and subject to revision.*

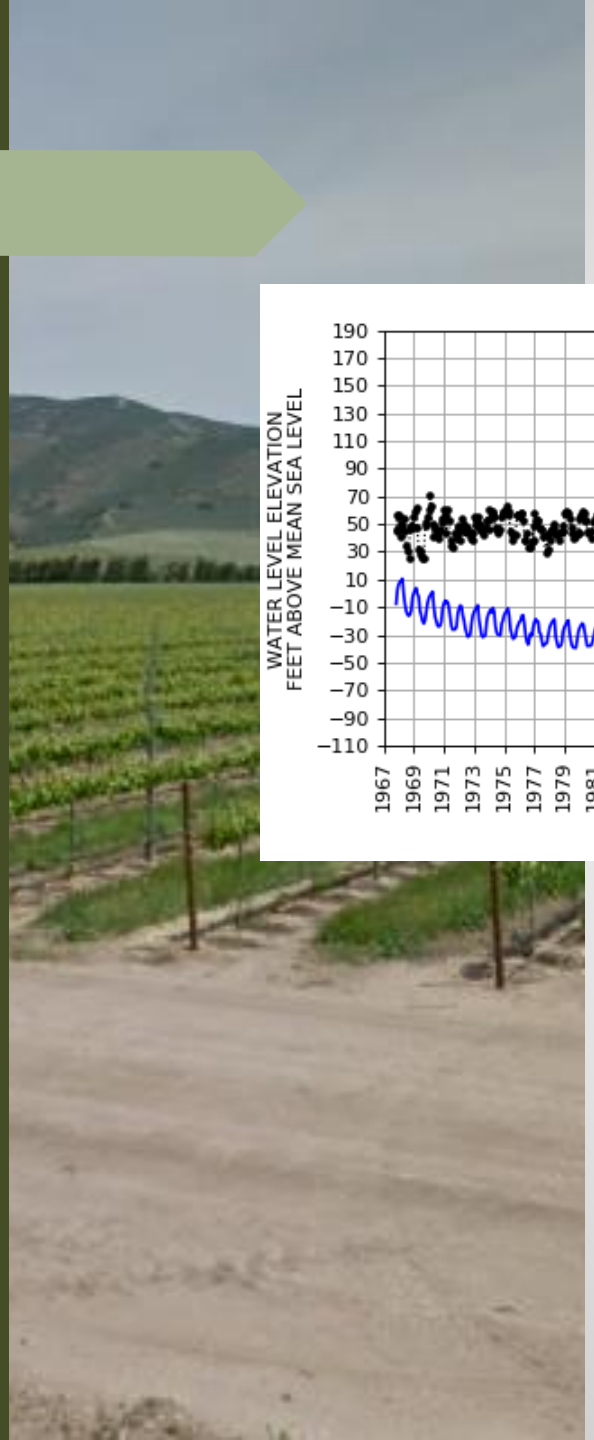
East-Southeast of Salinas



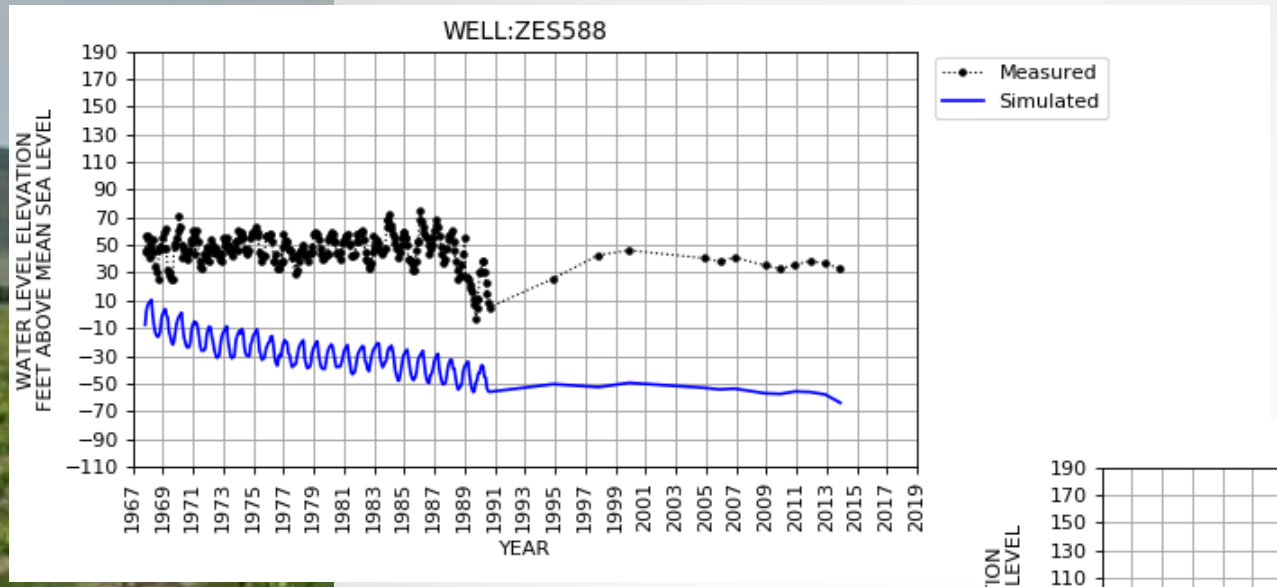
Model Overestimates Change in Storage



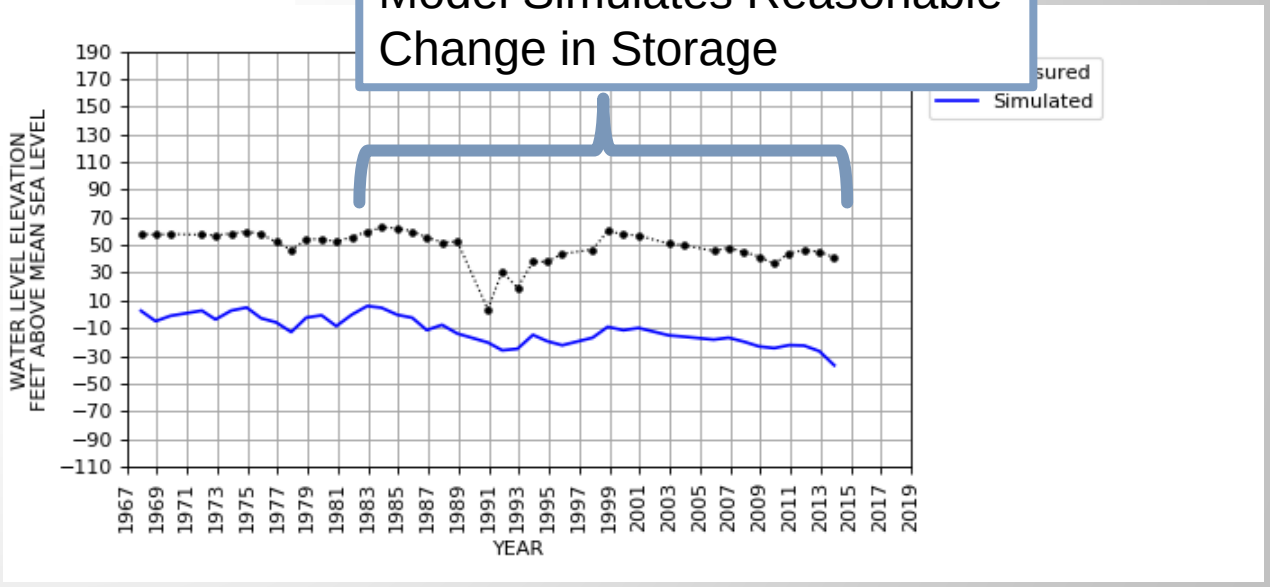
**All model results are preliminary and subject to revision.*



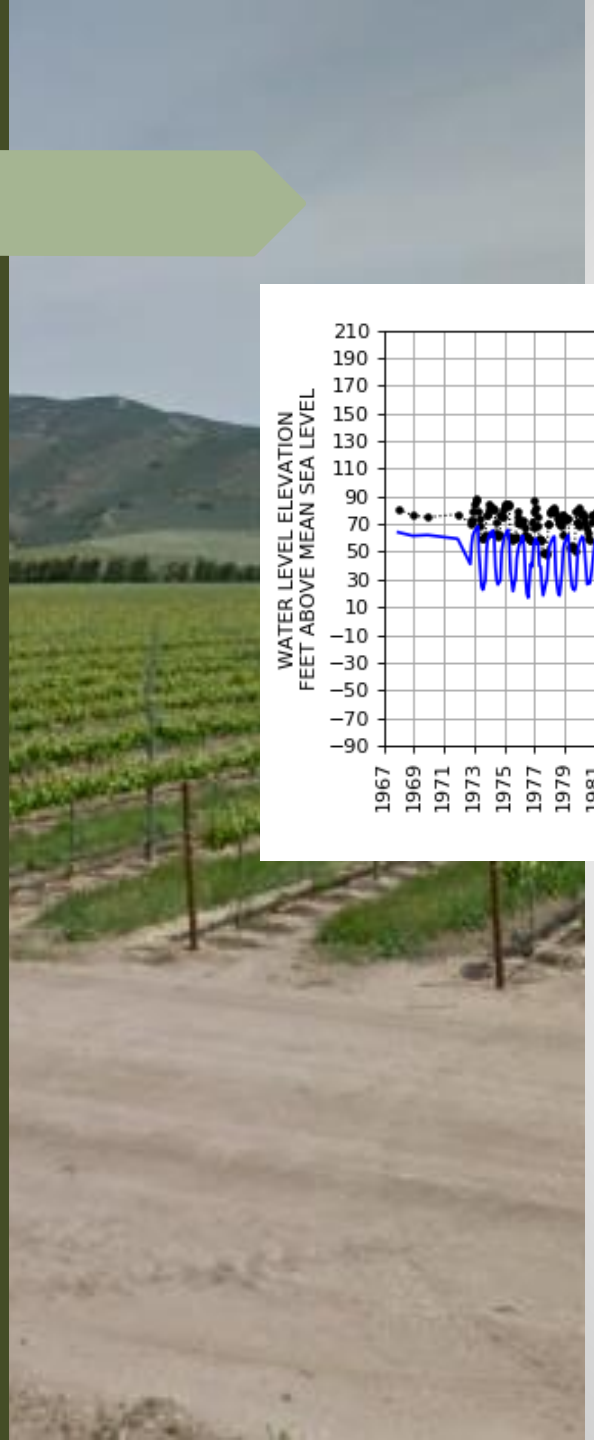
Near Chualar



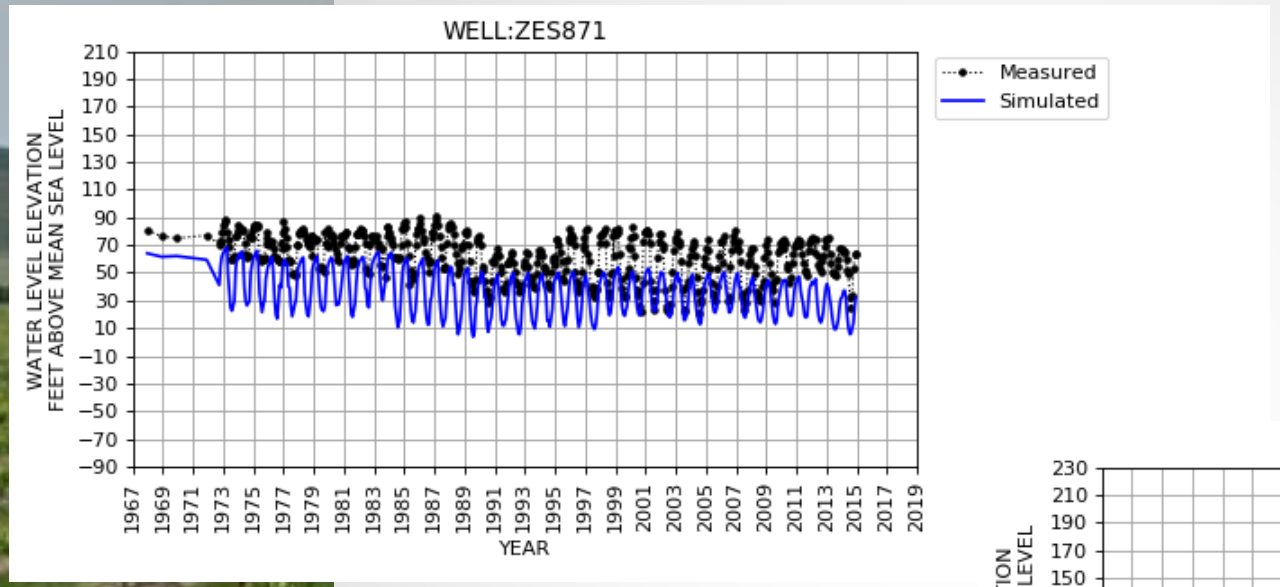
Model Simulates Reasonable Change in Storage

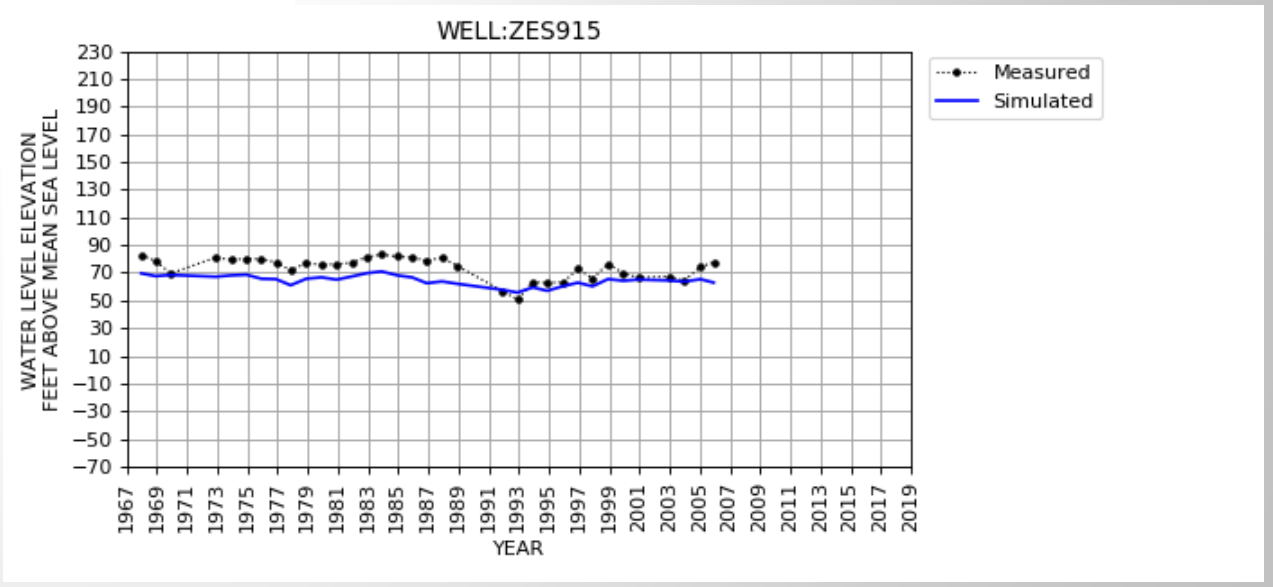


**All model results are preliminary and subject to revision.*



Near Gonzalez





**All model results are preliminary and subject to revision.*

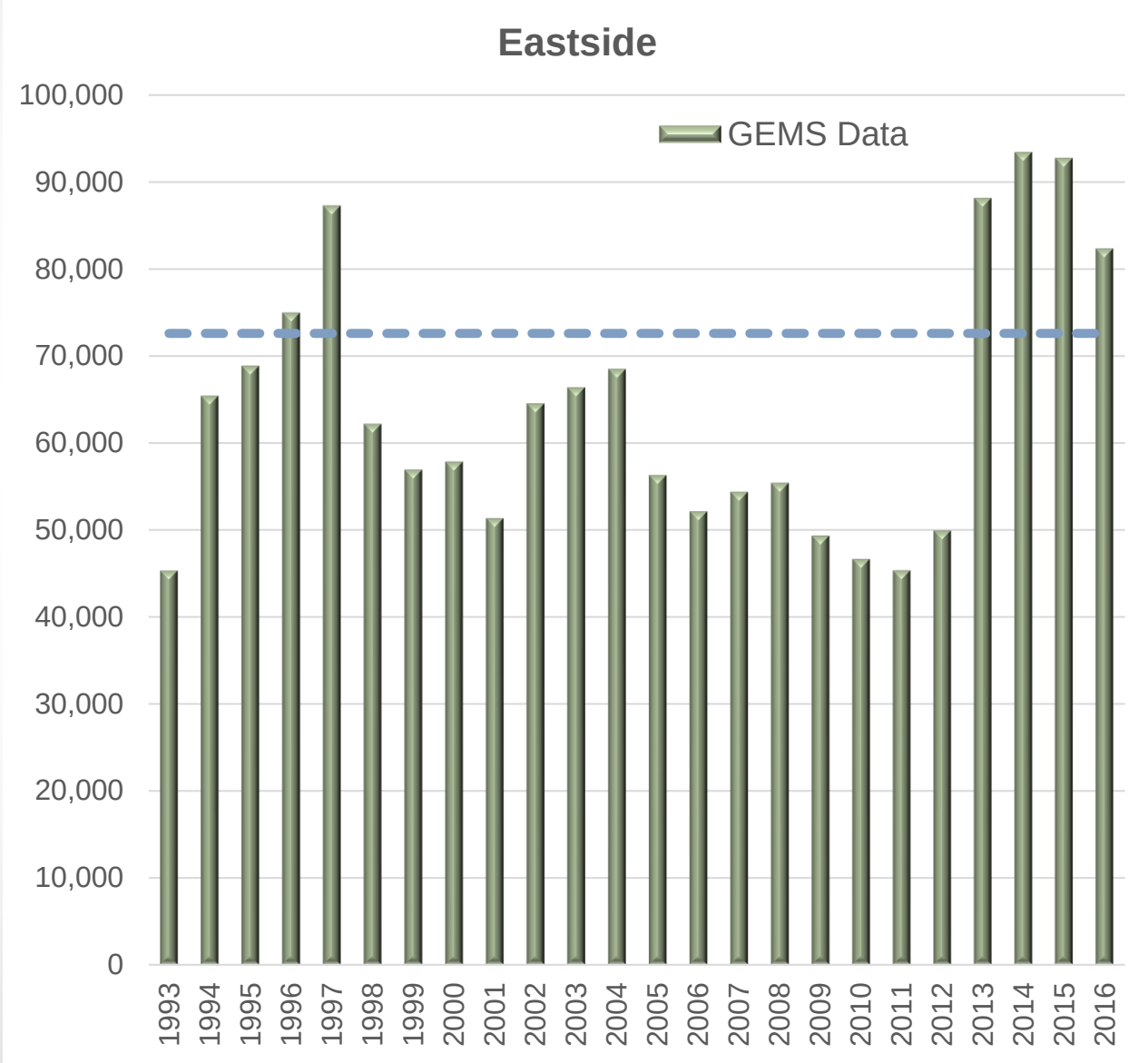
Model Uncertainties

- Previous overdraft estimates from State of the Basin (Brown and Caldwell, 2015)
  - 4,800 acre-feet per year between 1944 and 2013
  - 5,600 acre-feet per year between 1984 and 2013
  - 32,000 acre-feet per year between 1984 and 1991 (drought conditions)

Sustainable Yield

**All model results are preliminary and subject to revision.*

- Based on difference between pumping and overdraft
- Historical pumping is estimated by the model at 72,600 acre-feet per year.



Sustainable Yield

**All model results are preliminary and subject to revision.*

- The model estimates an historical overdraft of 21,700, yielding a sustainable yield of approximately 50,900 acre-feet per year.
  - This is heavily influenced by the overdraft numbers. M&A continues to investigate this.
- The sustainable yield is an average value for the whole Subbasin; hydrogeologic conditions vary across the Subbasin

Overall Water Budget Themes

**All model results are preliminary and subject to revision.*

- Pumping in the Eastside Subbasin has historically exceeded the sustainable yield
- The sustainable yield of the Eastside Subbasin is likely in a range between 50,800 acre-feet to 67,800 acre-feet per year **without climate change**
  - SVBGSA is working on establishing a single, refined sustainable yield number

Questions