



# Historical Benefits Analysis Update



# Purpose

- Develop an updated analysis that evaluated construction and operation of existing projects
  - Nacimiento and San Antonio Reservoirs/Dams
  - Monterey County Water Recycling Projects
    - Castroville Seawater Intrusion Project
    - Salinas Valley Reclamation Plant
  - Salinas Valley Water Project



# Purpose

- Evaluate three categories of benefits associated with the Projects
  - **Hydrologic:** groundwater levels and pumping
  - **Flood control:** frequency and severity of flood events
  - **Economic:** monetary benefit to stakeholders stemming from infrastructure or hydrologic and flood control benefits



# Some history...

- **April 1998** – Salinas Valley Historical Benefits Analysis (HBA) Final Report was prepared by Montgomery Watson
  - Purpose was to identify and quantify benefits to the Salinas Valley from construction and operation of Nacimiento and San Antonio Reservoirs



# Some history...

- **2021** – Public comments received during Agency consideration of an Engineer's Report for Zone 2D included concerns about reliance on the 1998 HBA because it did not include all present-day projects.
- **April 2023** – Agency initiated an HBA Update, partnering with consultants West Yost and One Water Econ.



# Study Background

- Hydrologic and flood control benefits modeling utilized the Salinas Valley Integrated Hydrologic Model (SVIHM)
- Economic benefits analysis relied, in part, on results from the SVIHM
- Study period of October 1967 - September 2018 (Water Year 1967-2018)
- Study area is Agency Zone 2C



# Study Background

- Benefits of the Projects are assessed as a comparison between modeling scenarios with the Projects (Historical Scenario) and without the Projects (No Projects).
  - Differences between scenarios are the effect of the Projects.
- Technical approach followed that of the 1998 HBA wherever possible.

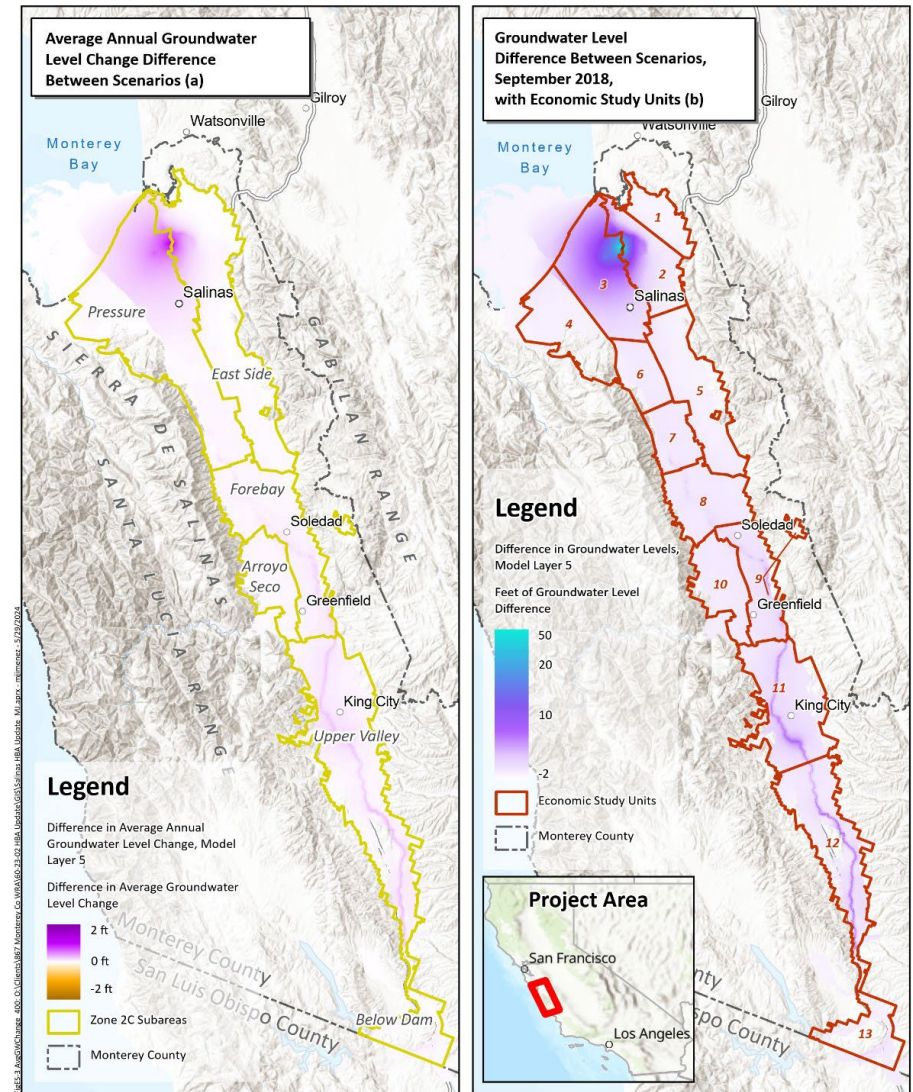


# Hydrologic Benefits – Groundwater Levels

- Pressure, East Side, and Arroyo Seco Subareas
  - Groundwater levels declined over the study period
- Forebay and Upper Valley Subareas
  - Groundwater levels largely unchanged or have risen
- Without the Projects, the decline would have been more severe and widespread.



Groundwater levels were higher with the Projects across most of the study area.



Prepared by:



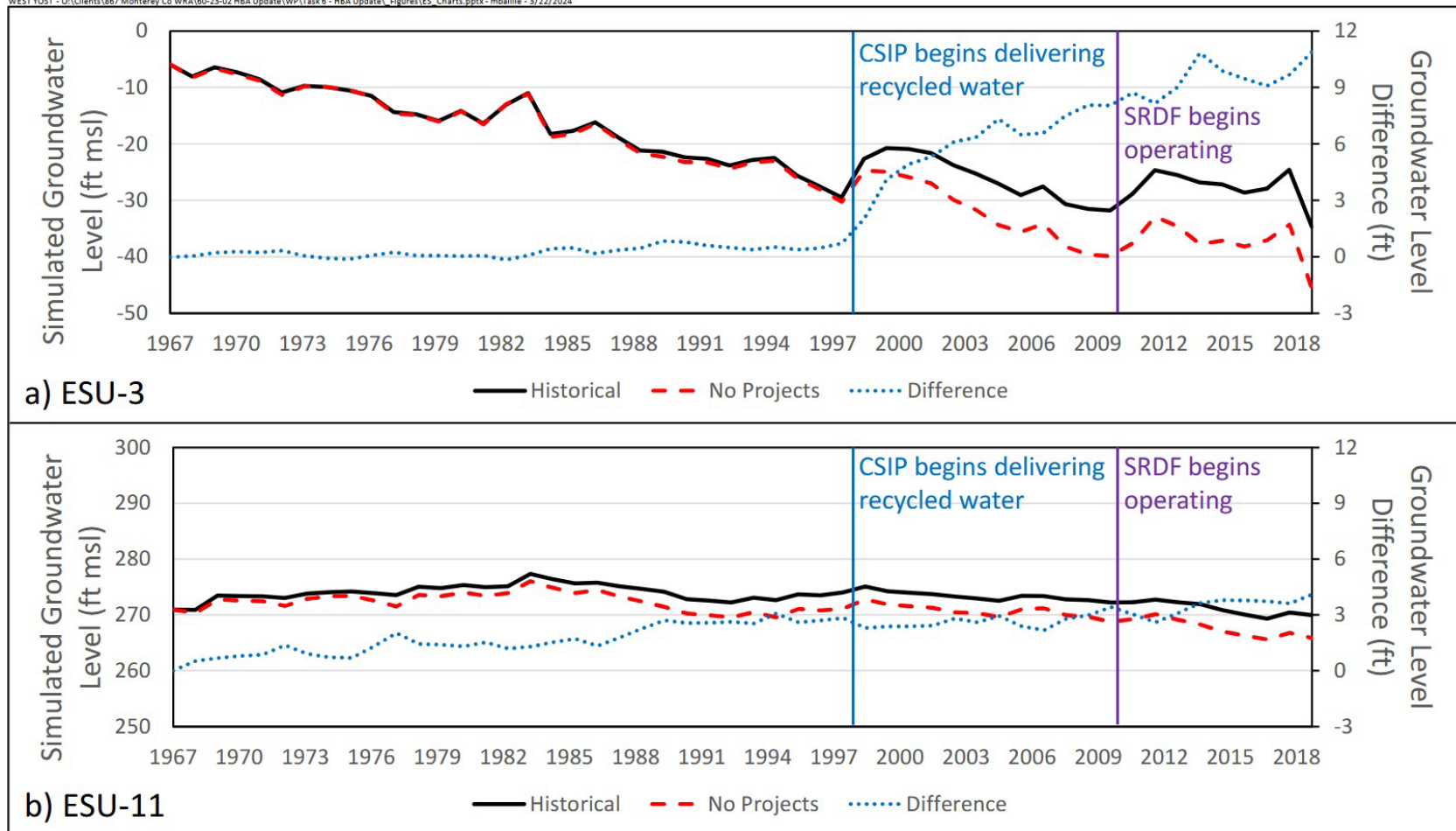
Prepared for:  
**Monterey County  
Water Resources Agency**  
Historical Benefits  
Analysis Update



**Groundwater Level Change (a) and  
Groundwater Level (b)  
Differences Between Scenarios  
400-Foot Aquifer & Equivalent**

Figure ES-3





**Benefits of the Projects  
manifest differently across the  
study area over time.**

**Figure ES-4**

**Average End-of-Year Groundwater Level in  
ESUs 3 and 11, Historical and No Projects  
Scenarios**



Monterey County Water Resources Agency  
Historical Benefits Analysis Update





# Other Hydrologic Benefits

- HBA Update evaluates groundwater and surface water budgets which include:
  - Groundwater recharge from the surface water system
  - Change in groundwater storage
  - Seawater intrusion
- Also looked at impacts to wells from changing groundwater levels.



# Flood Control Benefits

- Streamflow data were used to develop a statistical distribution of peak annual streamflow at the Salinas River at Bradley.
- A HEC-RAS model was used to simulate the effects of selected peak flows.
  - 10-year, 25-year, and 100-year events
- Analyzed changes to flood frequency, peak flow inundation, velocity, and depth across the study area.





# Flood Control Benefits

- Reservoirs have reduced the:
  - magnitude of peak flows
  - extent of inundation
  - depth of flooding
  - velocity of flows within the inundated area
- Reservoirs have the largest impact during flood events that occur more frequently, such as 10-year or 25-year events



# Economic Benefits – Key Findings

- Higher groundwater levels have reduced the need to replace groundwater wells.
  - Avoided \$107.4M in well replacement costs over the study period.
- Higher groundwater levels have reduced the energy required to pump groundwater in many areas.
  - Saved \$67.9M over the study period.



# Economic Benefits – Key Findings

- Increase in groundwater storage has decreased seawater intrusion and the acreage of farmland that has been impacted.
  - Benefit has largely accrued since operation of the Castroville Seawater Intrusion Project (CSIP) began.
  - Avoided impacts to crops of \$21.7M - \$86.9M



# Economic Benefits – Key Findings

- Reservoirs have reduced flooding along the Salinas River
  - Avoided damages to buildings of \$210.5M over the study period
  - Avoided damages to agricultural crops of \$211M over the study period





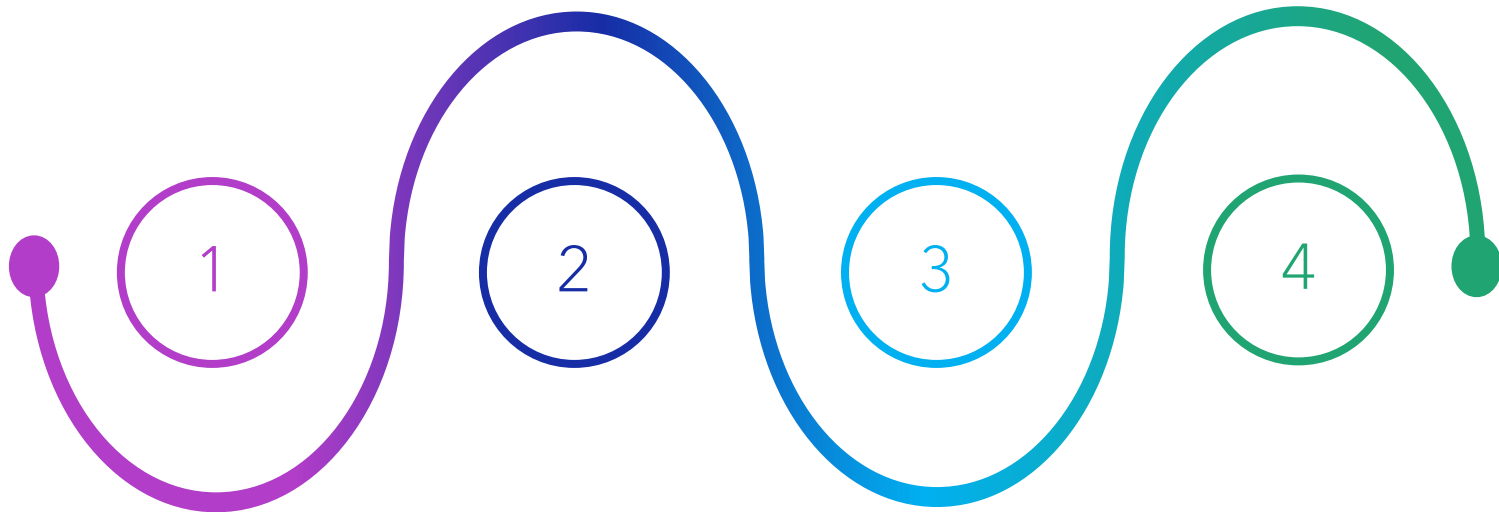
# Economic Benefits – Key Findings

- Reservoirs have resulted in recreational benefits
  - Close to \$800M from 1985-2018
- Generation of hydropower at Nacimiento Dam from 1987-2018
  - Generated power valued at \$59.1M
  - Avoided health-related costs resulting from clean hydropower valued at \$16M



# **Draft Interlake Tunnel and San Antonio Spillway Modification Project Assessment Engineer's Report**

# Getting to the draft engineer's report



## 1998 HISTORICAL BENEFITS ANALYSIS

This analysis didn't include all currently constructed and operating Agency projects.

## 2025 HBA UPDATE

Partnering with two consultants, the Agency developed an updated analysis of historical hydrologic, flood control, and economic benefits of current projects.

## MODELING

Modeling results from the Project and HBA Update provided data for the draft Project Assessment Engineer's Report

## DRAFT REPORT

Draft Assessment Engineer's Report for the Project available for submittal to DWR



# Cost Allocation Options

- The draft Assessment Engineer's Report for the Project presents three methodologies for reasonable ways to allocate Project benefits.
- There may be others to consider also in future discussions about this Project or other Agency projects.



# **Publication of the Salinas Valley Hydrologic Models**



# Hydrologic Modeling Tools

- The HBA Update utilized modeling tools developed by the U.S. Geological Survey (USGS) to provide data about groundwater and surface water conditions.
  - The Agency, County of Monterey, and Salinas Valley Basin GSA partnered on development of the models.
- Model data also informed the Draft Engineer's Report for the Interlake Tunnel Project.



# Hydrologic Modeling Tools

- The full suite of modeling tools and documentation have been published by the USGS and are available to the public.
- Model data and files:
  - <https://www.usgs.gov/centers/california-water-science-center/news/new-data-salinas-valley-hydrology>
- Model report:
  - <https://eartharxiv.org/repository/view/8900/>