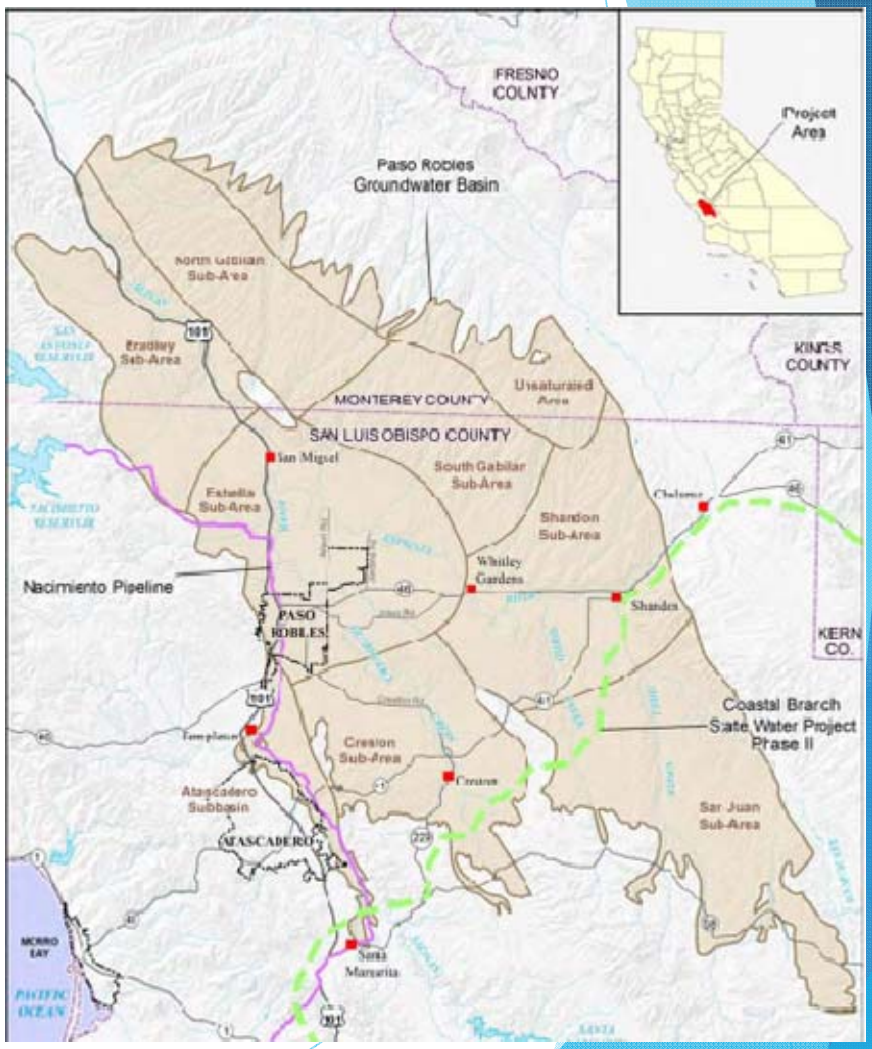
Paso Robles Groundwater Basin Computer Model Update Final Report

San Luis Obispo County Board of Supervisors

January 13, 2015

Presentation Overview

- Computer Model Update Process
- Perennial Yield Estimate
- Results of Predictive Scenarios
- Recommended Action



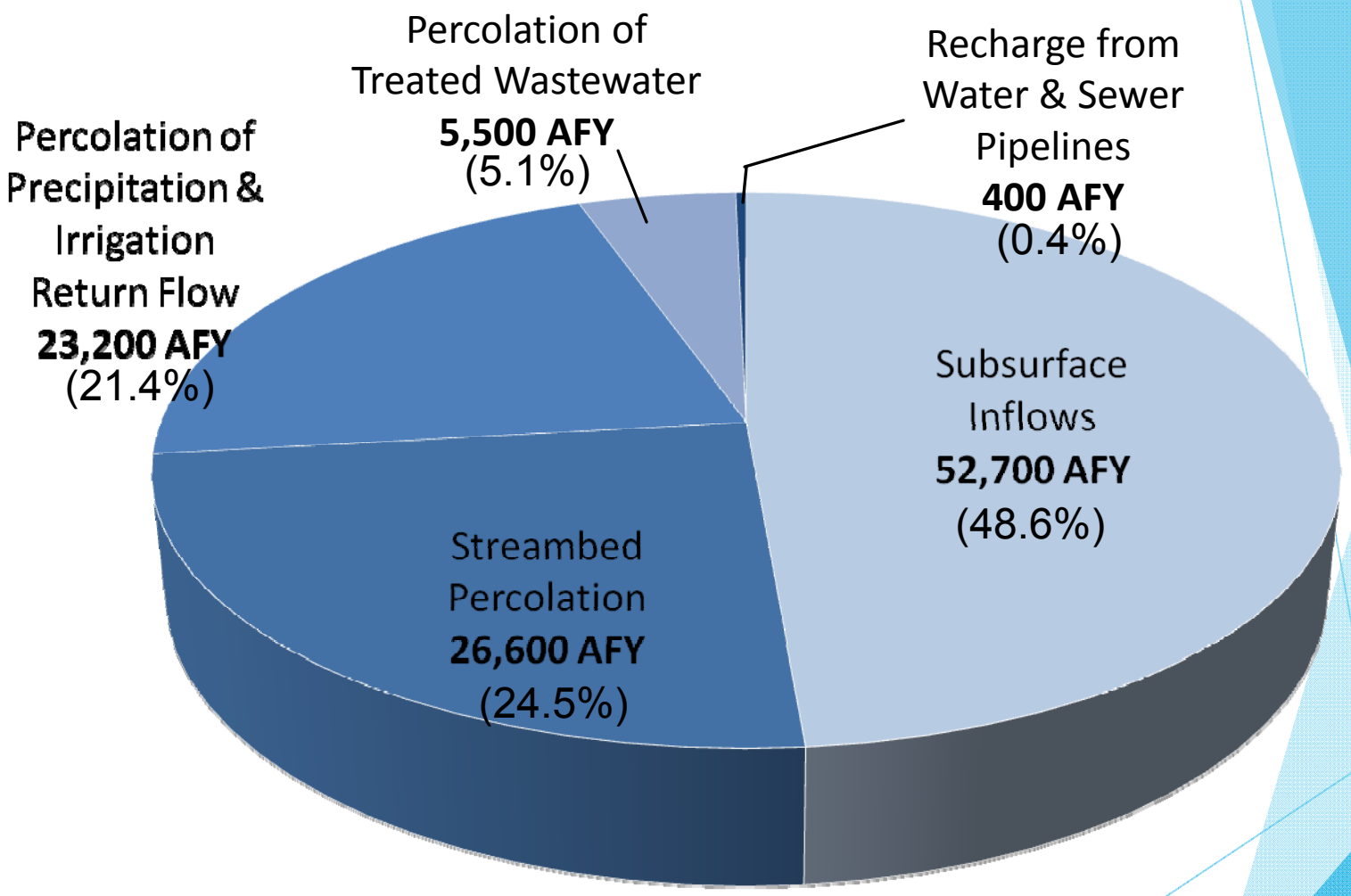
Computer Model Update Process

- **The primary objective of the Basin Model update is to provide an updated, accepted tool for simulating Basin response under current and projected future conditions.**

Computer Model Update Process

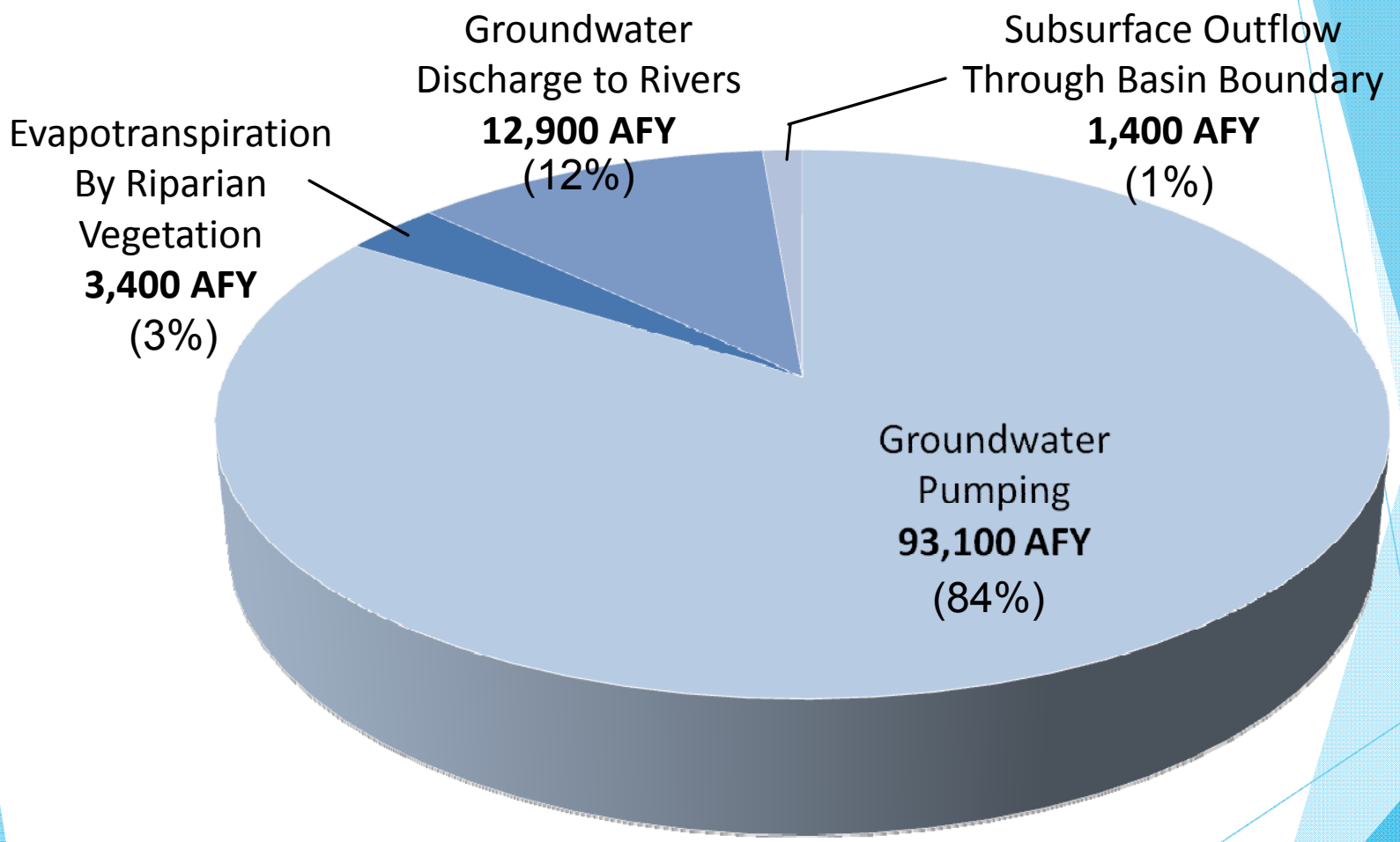
- ✓ Data Collection and Integrity Analysis
- ✓ Hydrogeology Analysis
- ✓ Watershed Model (Inflow/Outflow Preliminary Analysis)
- ✓ Water Balance Preliminary Estimates
- ✓ Post Model Input Audit
- ✓ Model Calibration/Estimate Refinement
- ✓ Sensitivity Analysis
- ✓ Predictive Scenarios
- ✓ Reporting and Presentation – Public Draft
- ✓ Final Report

Average Annual Inflows (1981-2011)



TOTAL AVERAGE ANNUAL INFLOW = 108,400 AFY

Average Annual Outflows (1981-2011)



TOTAL AVERAGE ANNUAL OUTFLOW = 110,800 AFY

Water Balance for Recalibrated Basin Model

Total Inflow – Total Outflow = Change in Groundwater Storage

Water Balance of Paso Robles Groundwater Basin
Average of 1981 – 2011 [AFY]

Total Inflow	Total Outflow	Change in Storage
108,400	110,800	-2,400

Analysis Included in Scope

- Updated Perennial Yield Estimate
  - Perennial Yield = Total Groundwater Pumping + Change in Groundwater Storage
- Two Predictive Baseline Simulations
  - No Growth Scenario
  - Growth Scenario

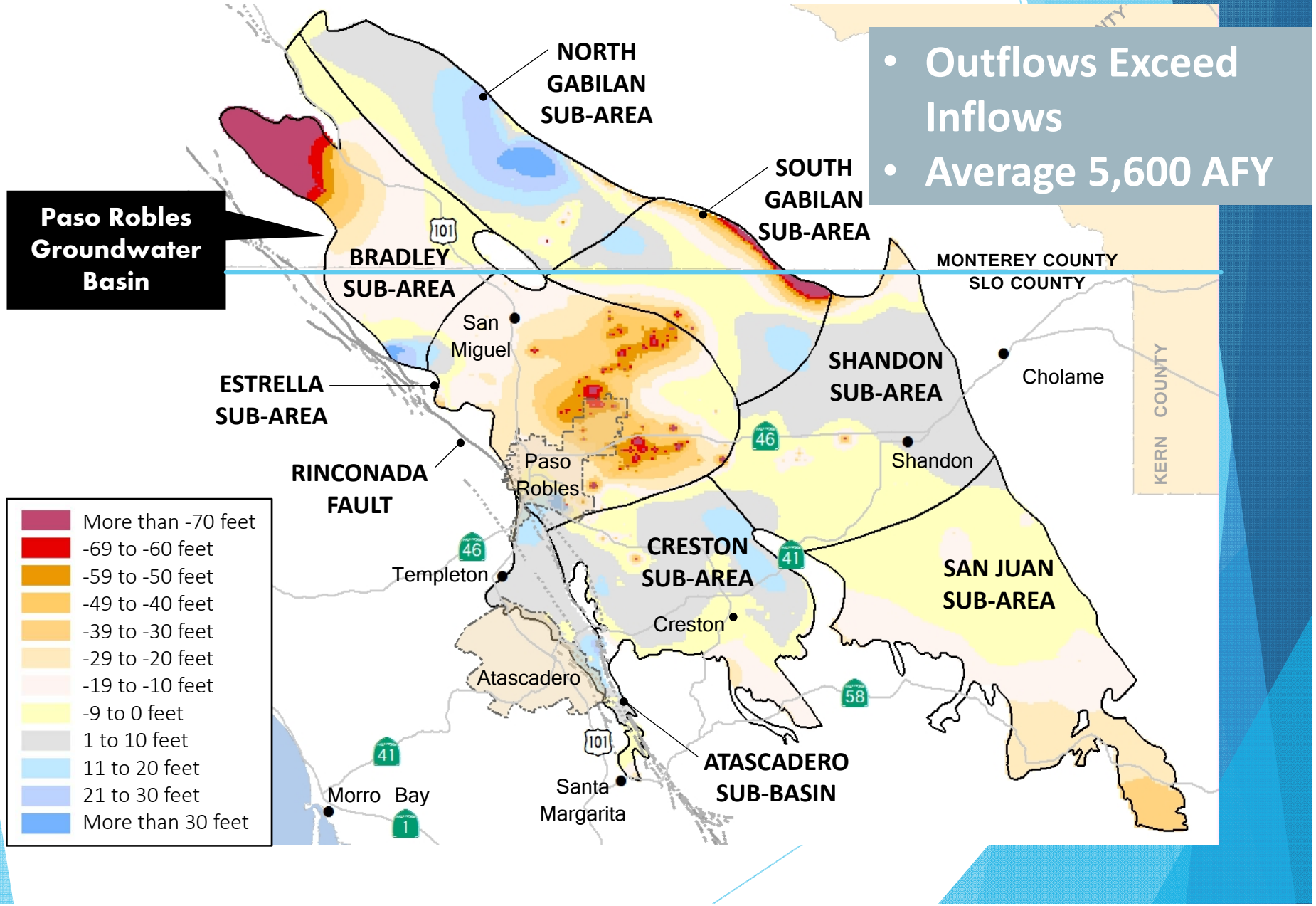
Perennial Yield Estimate

- Hydrologic Base Period = Covers Wet, Dry and Average Hydrologic Cycles

- Average of Base Period 1982 – 2010 [AFY]

Total Pumping	Change in Storage	Perennial Yield
92,600	-2,900	89,700

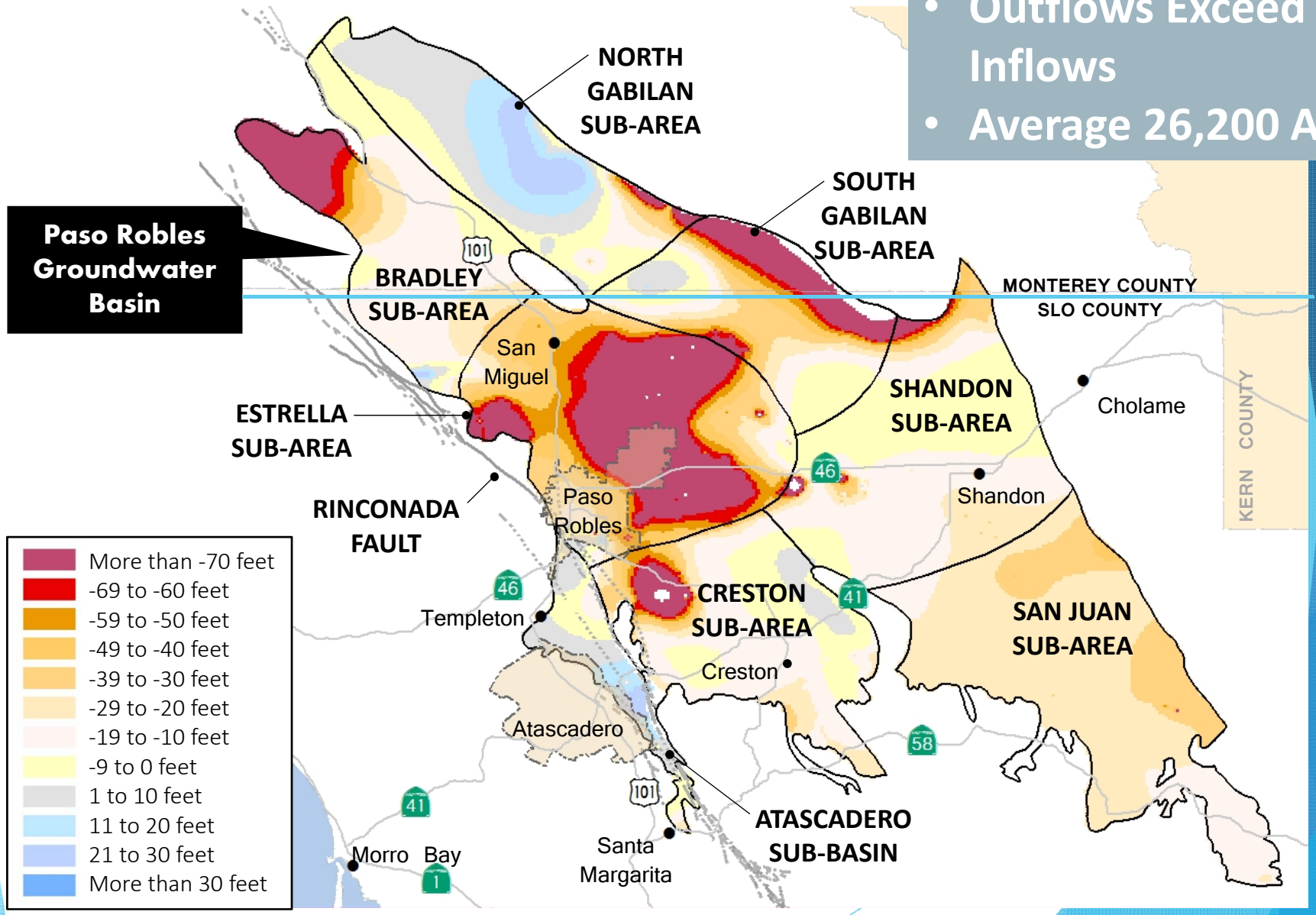
Change in Layer 4 Groundwater Elevations (2012-2040)
Model Run 1 – Baseline with No Growth



- Outflows Exceed Inflows
- Average 5,600 AFY

Change in Layer 4 Groundwater Elevations (2012-2040)
Model Run 2 – Baseline with Growth

- Outflows Exceed Inflows
- Average 26,200 AFY

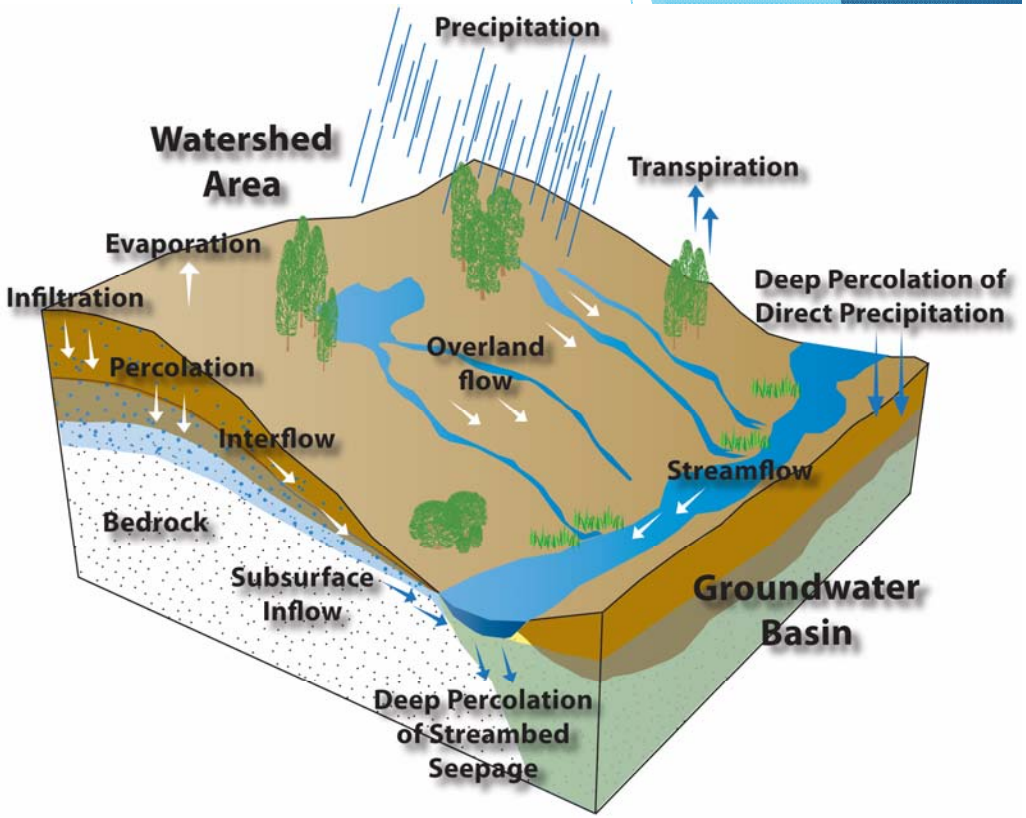


Next Steps

- Prepare additional refinements to the model
- Conduct nine analyses (additional model runs)

Refinements

- Refining the evaluation of inflow from the watershed to the Basin
- Using a different software module for streamflow/basin interaction
- Refining the evaluation of rainfall percolation and return flows in the Basin
- Refining the range of hydraulic conductivity values for recalibration



Additional Model Runs

- Updated Baseline with Growth
- Analysis 1 – Demand Reduction Scenario
- Analysis 2 – Salinas River Recharge
- Analysis 3 – Offset Basin Pumping with Recycled Water
- Analysis 4 – Offset Water Demand in Estrella Sub-Area
- Analysis 5 – Additional Releases to Huer Huero Creek
- Analysis 6 – Additional Releases to Estrella River
- Analysis 7 – Offset Pumping in Creston Sub-Area
- Analysis 8 – Offset Pumping in Shandon Sub-Area

Recommended Action

- Agreement Amendment ($155K)
  - Prepare additional refinements to the model
  - Conduct nine analyses

Questions?