Modesto Subbasin GSP

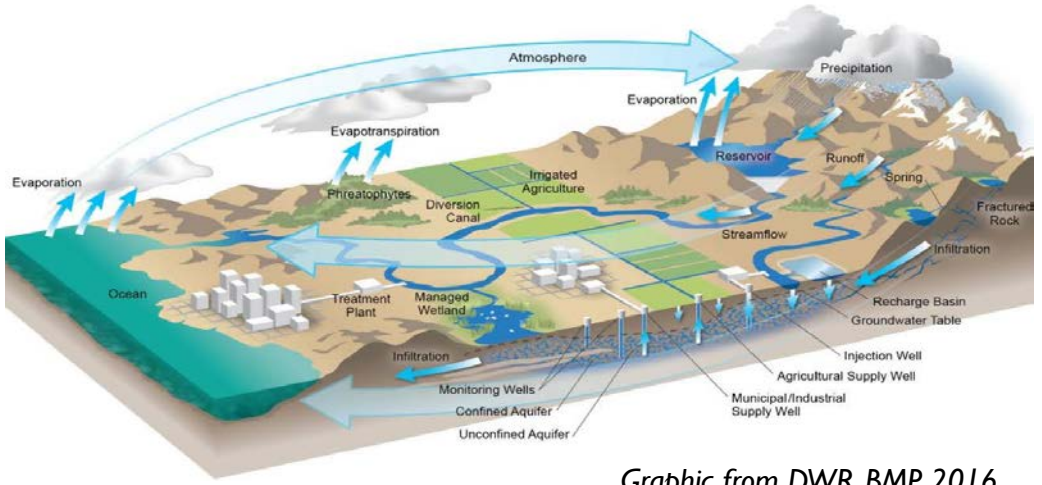
Report on Ongoing Analyses and Next Steps

Technical Advisory committee (TAC) meeting

August 12, 2020

GSP Analyses

- Zone Water Budgets - ongoing
- Projected Future Water Budgets
  - Purpose and Requirements
  - Approach and Development
  - Data Requests



Graphic from DWR, BMP, 2016

- Sustainable Management Criteria
  - Review of concepts
  - Prepare for upcoming discussions

Chronic Lowering of Water Levels	Reduction of Groundwater in Storage	Degraded Water Quality	Seawater Intrusion	Inelastic Land Subsidence	Depletion of Inter-connected Surface Water

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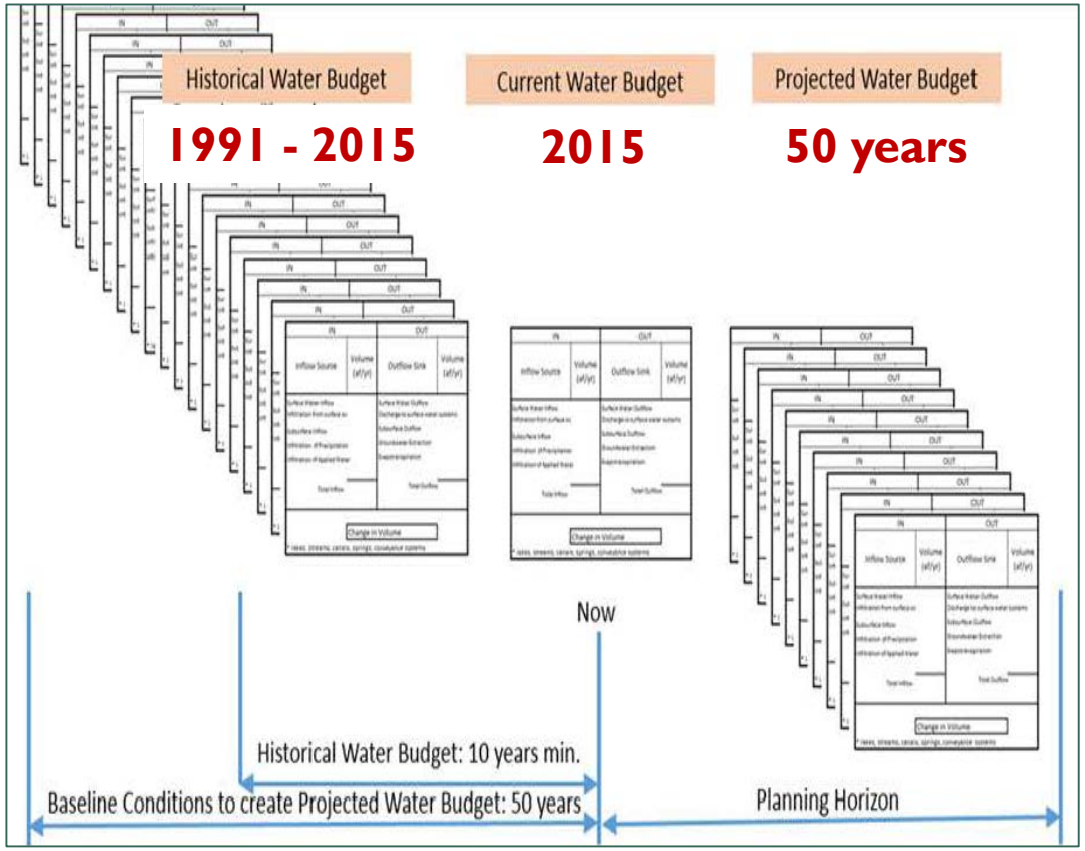
PROJECTED (FUTURE) WATER BUDGETS



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DWR, BMP, 2016

- Historical/current water budgets analyze past supply and demand with respect to water year type
- Projected water budgets provide a baseline of future supply and demand
- Analyze how aquifer responds to GSP implementation (compare to baseline)
- Calibrated Model used to support the analysis

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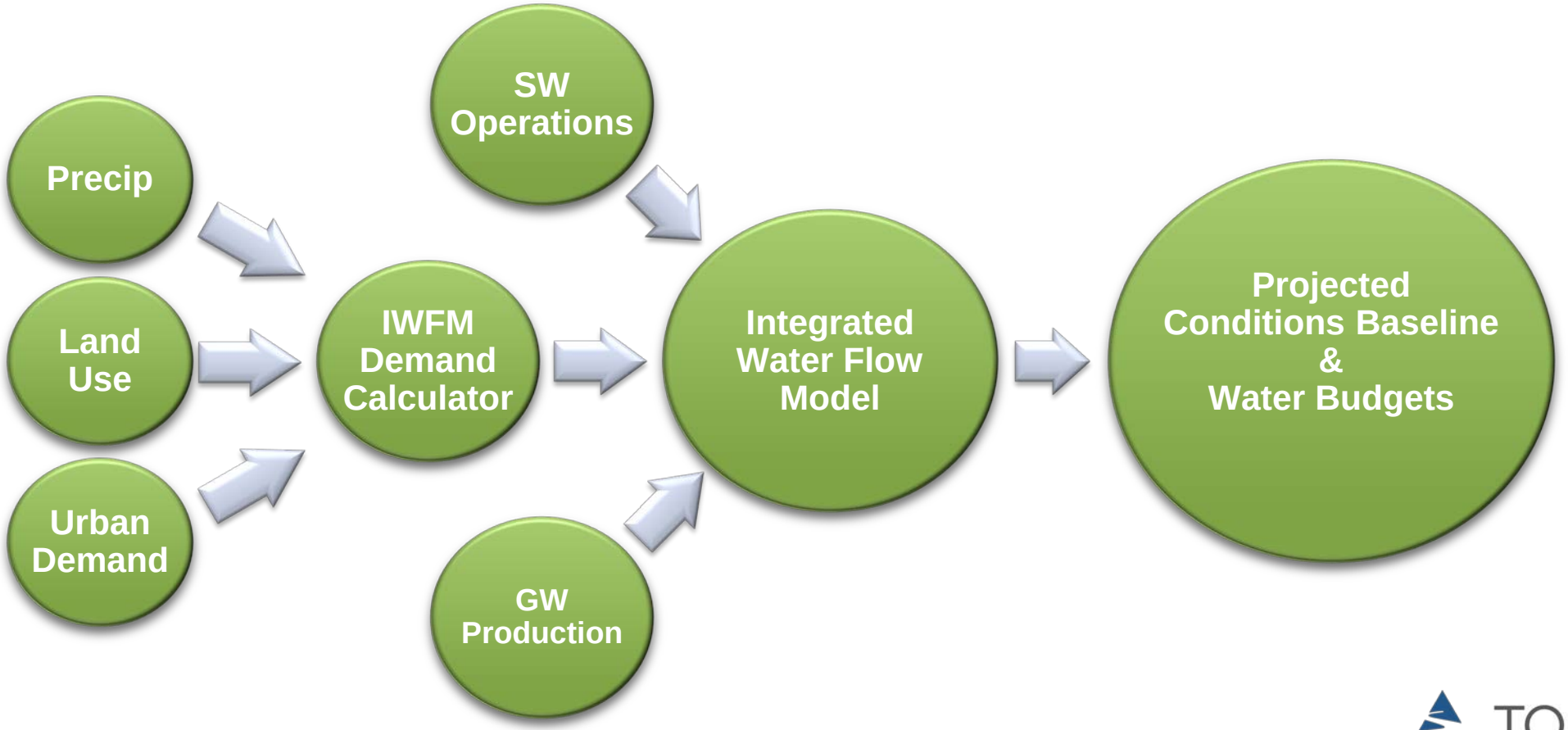
GSP Regulations for Projected Water Budgets

- 50 years of historical precipitation, ET, and streamflow information.
- Projections of climate change conditions using DWR guidance.
- Baseline must be based on most recent land use, ET, and crop coefficients for future demand estimates.
- Incorporate projected future changes in land use over the baseline period (e.g., in UWMPs or General Plans), population growth, and climate.
- Baseline must use most recent water supply information for estimating future surface water supply.

Baseline Modeling Approach

- Hydrology
  - Precipitation
  - Tuolumne, San Joaquin, & Stanislaus Streamflow
  - Reservoir operations
- Agricultural Operations
  - Surface water deliveries
  - Land use and cropping patterns
  - Irrigation management
  - Groundwater production (agency)
- Urban Operations
  - Urban land expansion
  - Municipal population growth
  - Unincorporated population growth
  - Per-capita-water-use
- Projects and Management Plans

C2VSim Baseline Development



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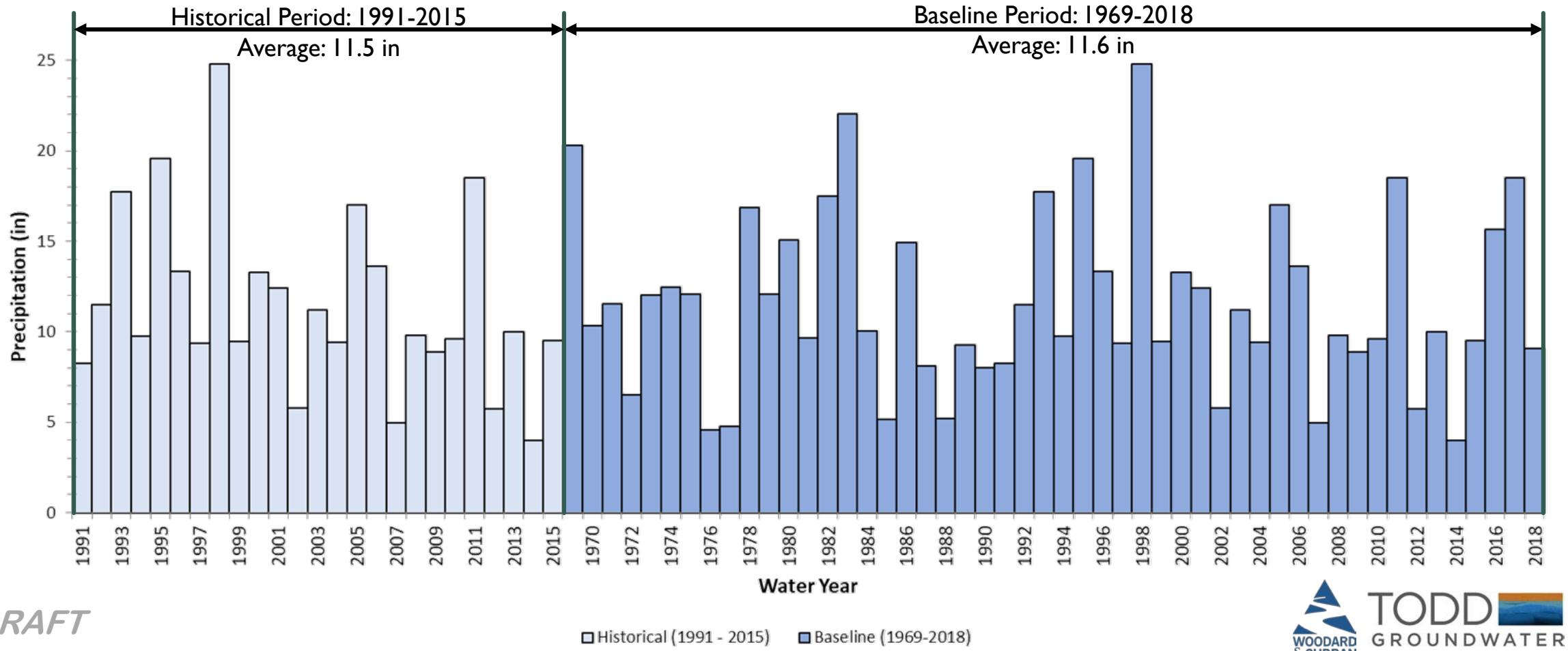
Hydrologic Period for Baseline - Precipitation



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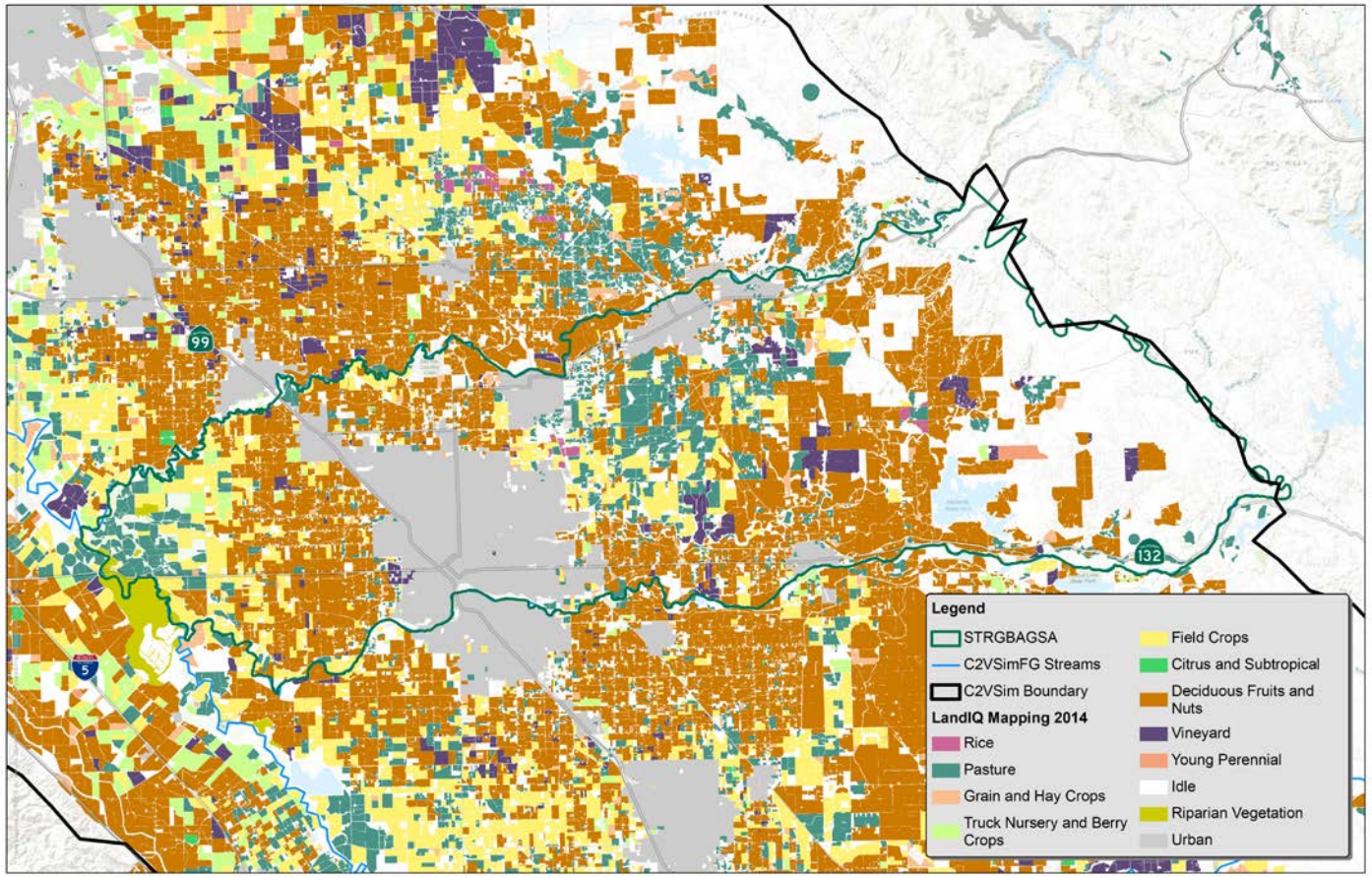
Surface Water Operations and Deliveries for Projected Water Budget Baseline

- Tuolumne River Operations
  - MID and TID working cooperatively on modeling
- LaGrange Diversion Dam Releases
  - Modesto Reservoir Seepage
  - MID Deliveries
  - Modeling team to work with MID
- San Joaquin River Operations
  - Already incorporated into C2vSim
- Stanislaus River Operations
  - Streamflow
  - Reservoir Releases
  - OID Deliveries
  - Based on Eastern San Joaquin Subbasin GSP Data?
  - Modeling team to work with OID

Land Use and Cropping Pattern Projections



- Current Model Land Use Base: 2016 Land IQ
- Additional local data, as needed:
  - Projected cropping changes (if known)
  - Urban growth areas
  - Agricultural growth areas

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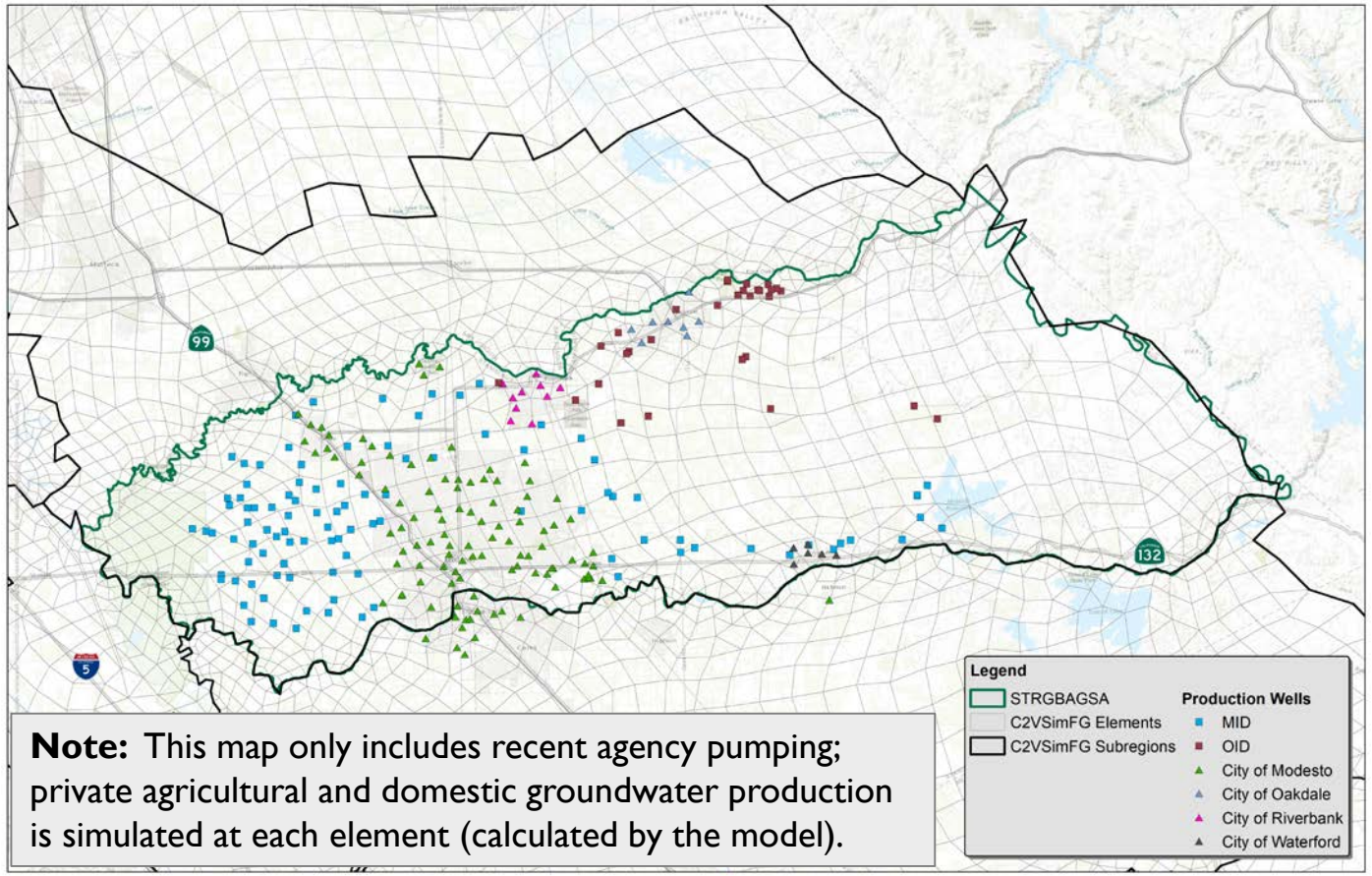
Groundwater Production by Agency Considerations for Baseline



Note: This map only includes recent agency pumping; private agricultural and domestic groundwater production is simulated at each element (calculated by the model).

- Consider water year type for pumping during the 50-year baseline
- Additional wells?
- Additional estimated pumping?

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Agricultural Data Request
Projected Water Budget Baseline

- Projected surface water diversions
  - Deliveries by geographic area
  - Modesto Reservoir seepage
  - Additional Agency pumping
- As needed:
  - Land use and cropping patterns
  - Groundwater wells and extractions

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Urban Data Requests
Projected Water Budget Baseline

Municipal Agencies

- Sphere of influence
- Water use and supply based on UWMP, otherwise need following:
  - Population growth trend
  - Per-capita-water-use
  - Groundwater wells and extractions
  - Whether growth will impact current land use (e.g., potential urbanization of some agricultural lands?)

Unincorporated / Rural Areas

- As needed:
  - Areas of growth
  - Population growth trend
  - Per-capita-water-use

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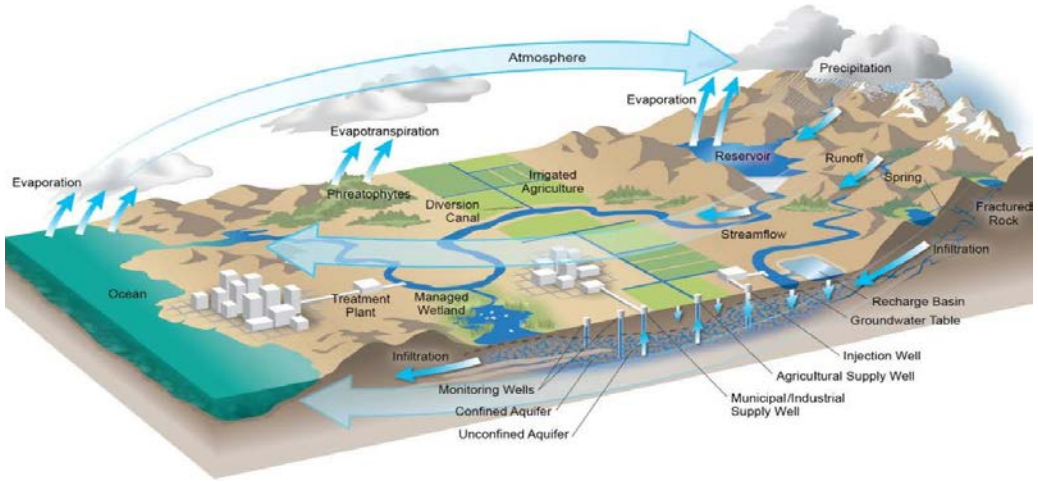
Agenda Items

- Projected Future Water Budgets
  - Use and Requirements
  - Approach and Assumptions
  - Data Requests



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Chronic Lowering of Water Levels	Reduction of Groundwater in Storage	Degraded Water Quality	Seawater Intrusion	Inelastic Land Subsidence	Depletion of Inter-connected Surface Water

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Sustainability Indicators


Chronic Lowering of Water Levels


Reduction of Groundwater in Storage


Degradation of Water Quality caused by management actions


Land subsidence affecting land use


Depletion of Interconnected Surface Water affecting beneficial use

If a sustainability indicator is determined to be significant and unreasonable , then it is an Undesirable Result

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Sustainability Indicators


Chronic Lowering of Water Levels


Reduction of Groundwater in Storage

Consider the first two sustainability indicators together


Degradation of Water Quality caused by management actions


Land subsidence affecting land use


Depletion of Interconnected Surface Water affecting beneficial use

If a sustainability indicator is determined to be significant and unreasonable , then it is an Undesirable Result

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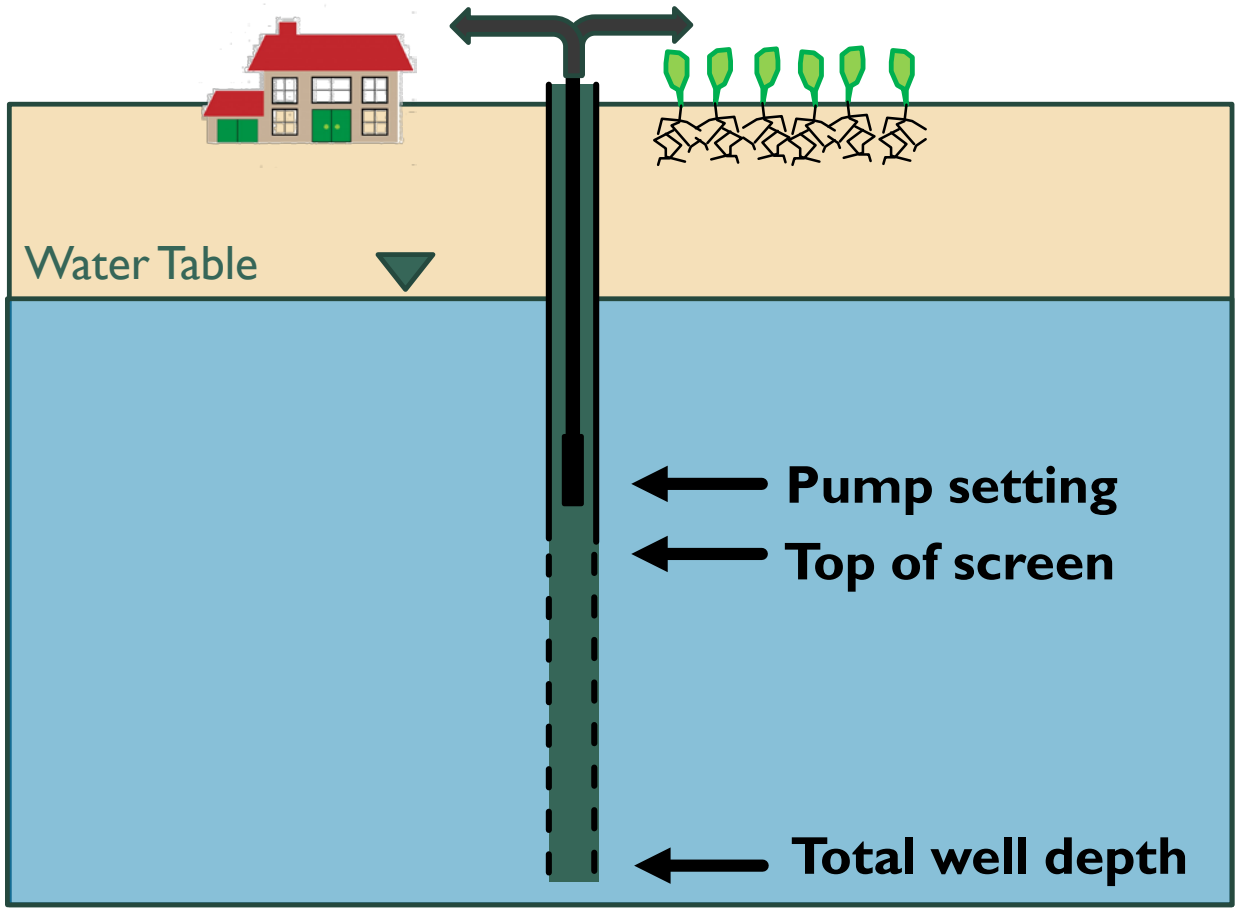
Chronic Lowering of Water Levels



- Have water level declines affected beneficial uses of wells?
- During the recent drought of record, did we have:
  - Dry wells?
  - Operational issues?
  - Water quality concerns?
- Are these undesirable results?

Sustainable Management Criteria
Steps for Analysis

1. Analyze the **Sustainability Indicators** for the Modesto Subbasin (applying conditions from the Basin Setting).
2. Define **Undesirable Results** (conditions we want to avoid).
3. Select a **Minimum Threshold (MT)** for each indicator – i.e., a ***metric*** that can be used to define undesirable results.
4. Select a **Measurable Objective** for each indicator – i.e., a target metric to avoid MTs and undesirable results.
5. Select **Interim Milestones** that show progress toward each **Measurable Objective** over the 20-year planning horizon.

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Next Steps in the GSP Analyses

- Water Budgets by Zone – in progress
- Projected Future Water Budgets – Baseline Analysis
- Discussions on Sustainable Management Criteria including a Sustainability Goal for the Subbasin

Questions?