Stanislaus & Tuolumne Rivers Groundwater Basin Association
Groundwater Sustainability Agency
1231 11th Street | Modesto, CA 95354
Phone: (209) 526-7564 | Fax: (209) 526-7352
Email: strgba@mid.org

SPECIAL TECHNICAL ADVISORY COMMITTEE AGENDA

June 23, 2021 (10:00 a.m. – 12:00 p.m.)
Webinar Digital Platform or Phone Meeting
https://us02web.zoom.us/j/84737425857
By phone: 1-669-900-9128
Webinar ID: 847 3742 5857

PUBLIC PARTICIPATION
The public may participate in this meeting in the two ways described below.

Instructions for Participating in STRGBA GSA & Technical Advisory Meeting via Zoom Webinar or Phone

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1. To join the webinar, click the link published in the Agenda for the current meeting about 5 minutes before webinar begins.
2. Follow the on-screen instructions to install and/or launch the Zoom application.
3. If prompted, enter the Webinar ID published in the Agenda.
4. All public attendees will enter the meeting muted.
5. If you wish to speak under Business from the Public, or after the Chairman calls for Public Comment, click on the “Raise Hand” button to request to speak.

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1. To join the meeting by phone, call the number published in the Agenda for the meeting.
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    a. Wait until the last four digits of your phone number is called by the Host.

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1. Call to Order/Welcome and Introductions
   (Four agencies needed for a quorum)

2. Business from the Public
   Who: Public
   Expected Outcome: Interested persons are welcome to introduce any topic within the Agency's jurisdiction. Matters presented under this heading may be discussed but no action will be taken by the Agency at this meeting.

3. Topic: Approve 6/9/21 Meeting Minutes [Action Items]
   Who: Eric Thorburn, Committee
   Expected Outcome: Approval

4. Topic: Sustainable Yield
   Who: Woodard & Curran, Committee
   Expected Outcome: Discussion

5. Topic: Sustainable Management Criteria – Interconnected Surface Waters and Chronic Lowering of Water Levels
   Who: Todd Groundwater, Committee
   Expected Outcome: Discussion

6. Next Meeting
   July 14, 2021 at 2 p.m. (following STRGBA GSA monthly meeting) via Zoom

7. Items too late for the agenda

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TECHNICAL ADVISORY COMMITTEE MEETING MINUTES

June 9, 2021 (2:00 p.m. – 3:00 p.m.)

The meeting was called to order at 1:50 p.m.

1. **Welcome and Introductions**

The following members of the Stanislaus and Tuolumne Rivers Groundwater Basin Association Groundwater Sustainability Agency (STRGBA GSA) attended via Zoom:

Modesto Irrigation District (MID):	Chad Tienken
City of Waterford:	Mike Pitcock
City of Modesto:	Miguel Alvarez
Stanislaus County:	Walt Ward
Oakdale Irrigation District:	Eric Thorburn
City of Oakdale:	Michael Renfrow
City of Riverbank:	Michael Riddell

Other Attendees:

Alexis Stevens, Somach, Simmons & Dunn
John Mauterer, MID
Stacy Henderson, Terpstra Henderson
Hilary Reinhard, Provost & Pritchard
Gordon Enas, MID
Tom Orvis
Steve Knell
Samantha Wookey, MID
Dennis Witchow
John Mensinger
Stu Gilman
David Orth
Emily Sheldon
Valerie Kincaid
Kirsten Pringle, Stantec
Bonnie Fogarty
Liz Elliott
Allison & Dave Boucher
Phyllis Stanin, Todd Groundwater
Kathryn Wilkins
John Davids
Matthew Toste
Louie Brichetto
Linda Santos
Amanda Peisch-Derby

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2. **Business from the Public**
   N/A

3. **Approve 5/12/21 Minutes [Action item]**
   Riddell moved, 2nd by Alvarez, to approve 5/12/21 meeting minutes. Motion carried.

4. **Designation of Management Areas**
   Stanin began with a presentation on preliminary management areas and sustainable management criteria for chronic lowering of water levels. The presentation can be accessed at the STRGBA GSA website, www.strgba.org .
   - Mensinger asked if all of those areas in the Oakdale Irrigation District shown on the Management Area map have the same right to water on a yearly basis? Thorburn responded that there's two tiers of water users, Tier 1 includes original constituents and Tier 2 includes some annexations that happened around 2012. Some of the lands on the east side are Tier 2 lands, including the ones on the northeast,for example, whereas the Paulsell is Tier 1. Mensinger stated that this is an anomaly because there is a big chunk of land in northeast OID that doesn't have a yearly right to water or a full allocation. In those years that OID is not able to supply water to their Tier 2 customers, those people are going to pump. Thorburn responded there's only been one year since that annexation that they've been short. They will be managed like OID constituents and included in the water budget.
   - Mensinger then asked if it's possible to get information from private well owners? Stanin stated some private well owners are beginning to offer some of that information. Mensinger asked if the GSA has the authority to require private well owners to provide information on the depth of the wells? Stanin stated she is not sure what information can be obtained from private wells. The GSA does have under SGMA the ability to get data for groundwater extractions. The GSA will have to report extractions on an annual basis. Mensinger said we need more information on what's happening in non-district East (NDE).
   - Mensinger also asked if it's correct that the MT for the NDE does not have enough observations for the historical period of 1991-2020? Stanin responded that is correct, however enough information was available to calibrate the model. Thorburn added that OID has good data from their wells in the area.
   - Stevens asked if the process for adopting minimum thresholds and undesirable results is included in GSP and will there be a resolution? Stanin responded that will be up to the Committee. Stevens followed up by asking when is the final monitoring network expected to be presented and will it be approved by the Committee? Stanin stated the expected date is in July along with a possible second TAC meeting.

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5. Monitoring Wells – Minimum Threshold's and Management Objective's

Stanin next gave a presentation on preliminary monitoring network wells with MT's and MO's.

- Thorburn stated the need to establish the complete monitoring network since the Undesirable Results pertain to the whole subbasin not just the Management Areas. Boucher added that we also need to better understand what's happening in the NDE and the ability of the water table to sustain native oaks. Stanin agreed and stated the need to establish aggressive MT's.
- Kincaid asked if the GSA has considered using different MT's for different Management Areas? Stanin replied that we can, but keeping MT's near historic lows will likely prevent future problems. Since the subbasin acts as a whole, we can't have too big of a difference between MT's for each of the Sustainability Indicators. Kincaid responded that you don't want to make the MT's so low that they are unsustainable and historic lows might violate our objectives immediately. Otherwise, you would need to motivate folks to begin projects immediately. Thorburn added that we need to discuss Interconnected Surface Water before setting MT's. Stanin also added that we need to proceed with baby steps, determining the overall approach first and then bring in the data from the monitoring network.

6. Application of Sustainable Management Criteria During Implementation Period

- Gilman asked if there is any technology available for the GSA to retrofit private wells to provide the necessary monitoring without installing new monitoring wells to get more data on the east side? Stanin stated absolutely, but it is best if they are inactive wells. Retrofitting is not needed if there's enough room in the well column to get around the pump and get a sounder or transducer down into the well. If the well can be sounded it can be used. Gilman followed up by asking how long does a well have to be static to get good readings? Stanin replied that it should be off for the same amount of time it is on.
- Gilman asked if there is any data from inactive wells in the area, which we can use to get more information? Stanin responded that we have not been able to identify those inactive wells. Gilman asked if there is any outreach plan to the growers on the east side to help determine what wells might be good candidates? Stanin said we don't have anything in place for the GSP development process, but after the GSP has been adopted the management actions can involve that outreach. Stanin also said there have been attempts to gather well data information in the past. Wookey added that a request for well data was also included in the last newsletter.
- Mensinger asked if we could use the well's electrical records as a proxy to determine the depth of the groundwater? Stanin responded that there could be complications because often the electrical records include a house or multiple houses on the same meter. Another factor is kilowatts hours are represented only by rates making it very difficult to determine pumping levels.

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7. **Next Meeting**
   July 14, 2021 at 2 p.m. (following STRGBA GSA monthly meeting) via Zoom

8. **Items too late for the agenda**
   N/A

SUSTAINABLE YIELD – MODESTO SUBBASIN

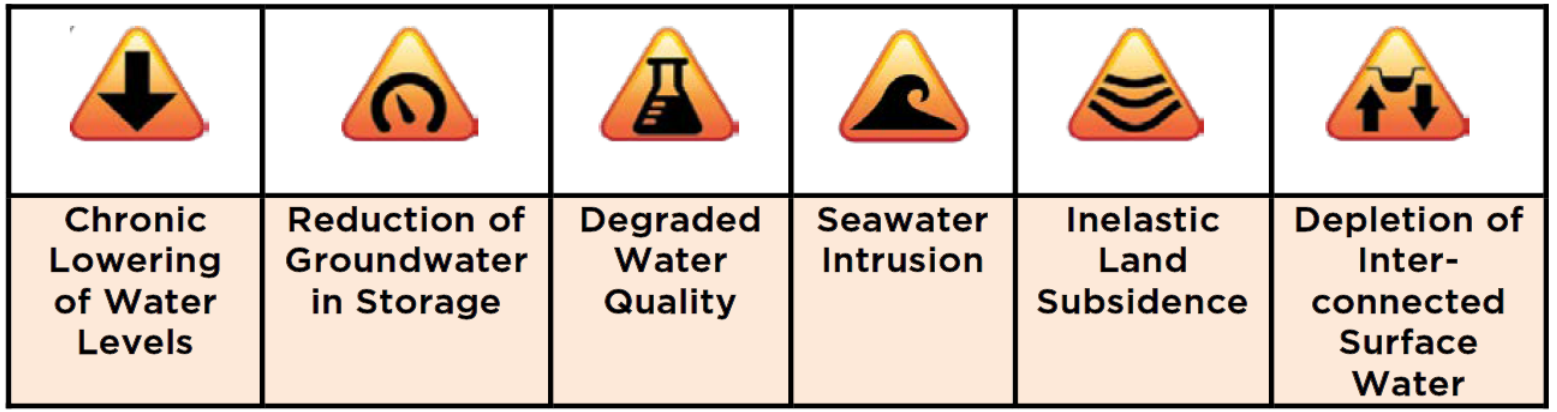
TECHNICAL ADVISORY COMMITTEE (TAC) SPECIAL MEETING

JUNE 23, 2021

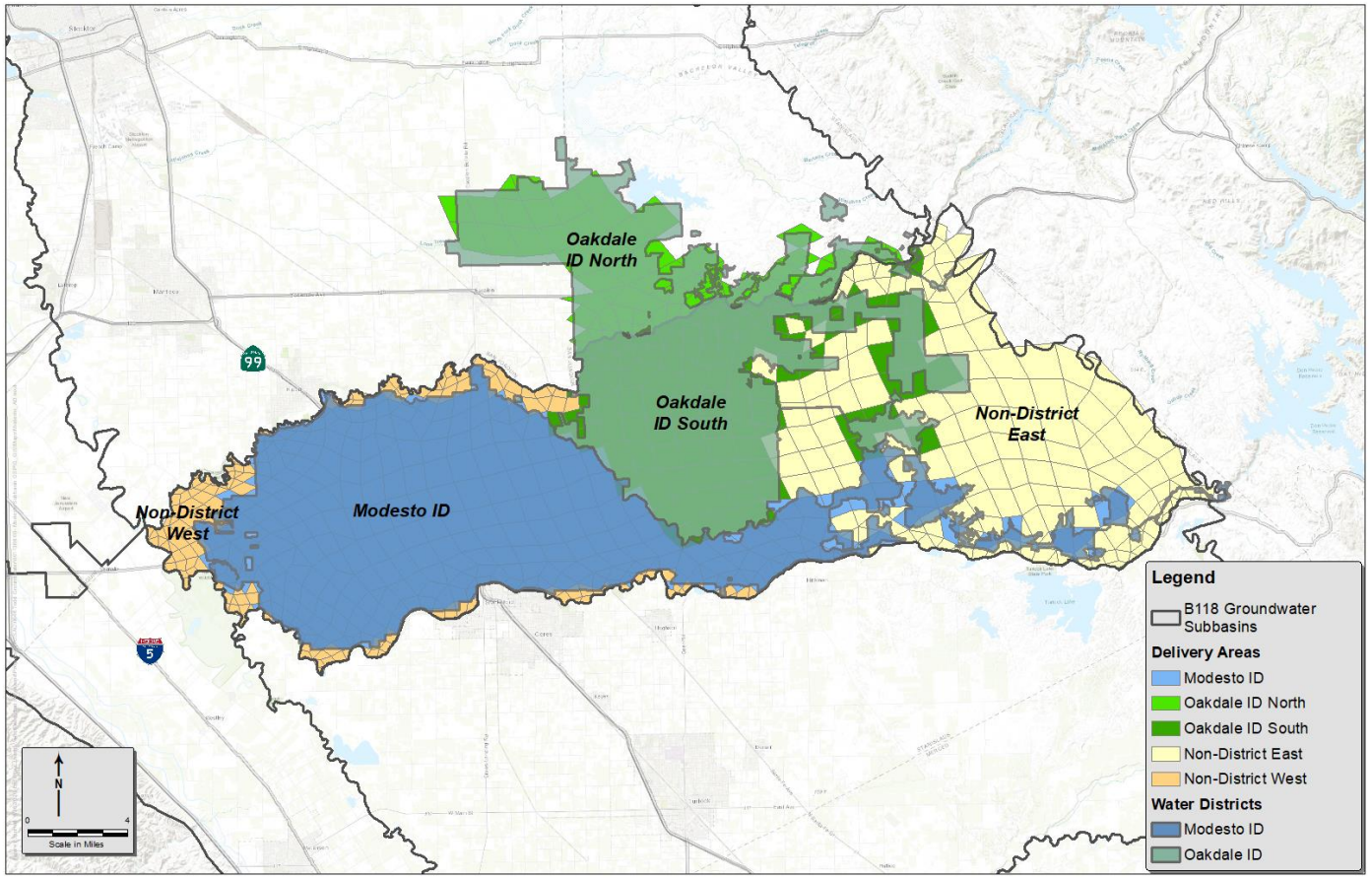
Sustainable Yield Analysis and Sustainability Indicators

- *Sustainable Yield* is the amount of groundwater that can be pumped annually without causing undesirable results
- A single value for the Subbasin's *Sustainable Yield* is required by the GSP regulations

Sustainability indicators require consideration of the *Sustainable Yield* for setting sustainable management criteria



Sustainable Yield Scenarios



Water User Groups

- **Management Group 1**
  - Modesto ID
  - Oakdale ID
  - Non-District West (riparian)
  - Cities of Modesto, Oakdale, Riverbank, & Waterford
- **Management Group 2**
  - Non-district East

DRAFT

Land & Water Use Budget

	Historical (WY 1991-2015)	Baseline (50-Yr Avg)	SY Scenario (50-Yr Avg)
Ag. Area (acres)	138,000	132,000	122,000
Ag. ETAW	288,000	321,000	292,000
Ag. SW Deliveries	289,000	266,000	266,000
Ag. Private Pumping	223,000	230,000	183,000
Ag. Agency Pumping	26,000	24,000	24,000
Urban Area (acres)	31,000	37,000	37,000
Urban Demand	88,000	116,000	116,000
Urban SW Deliveries	26,000	51,000	51,000
Urban Pumping	63,000	60,000	60,000
Total SY Pumping	311,000	314,000	267,000

- **Demand Reduction Areas:**
  - Ag. Consumptive Use
- **Reduction Factors:**
  - Management group #1 0%
  - M&I 0%
  - Management group #2 58%
- **Water Use Budget**
  - Total Basin-wide Demand Reduction (Ag & Urban): 7%
  - Basin-wide Ag Demand Reduction: 9%
  - Total Pumping Reduction: 15%

- Area in acres; all other units are in acre-feet

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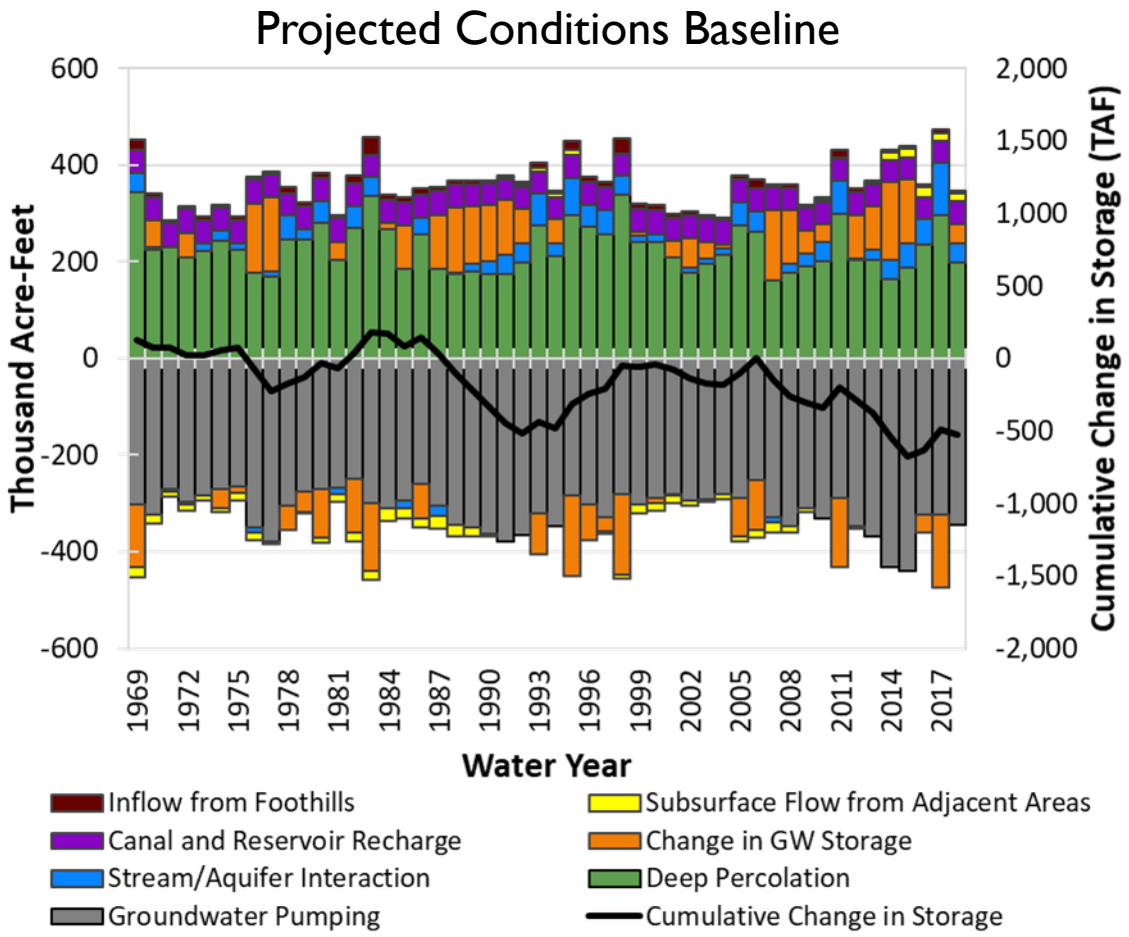
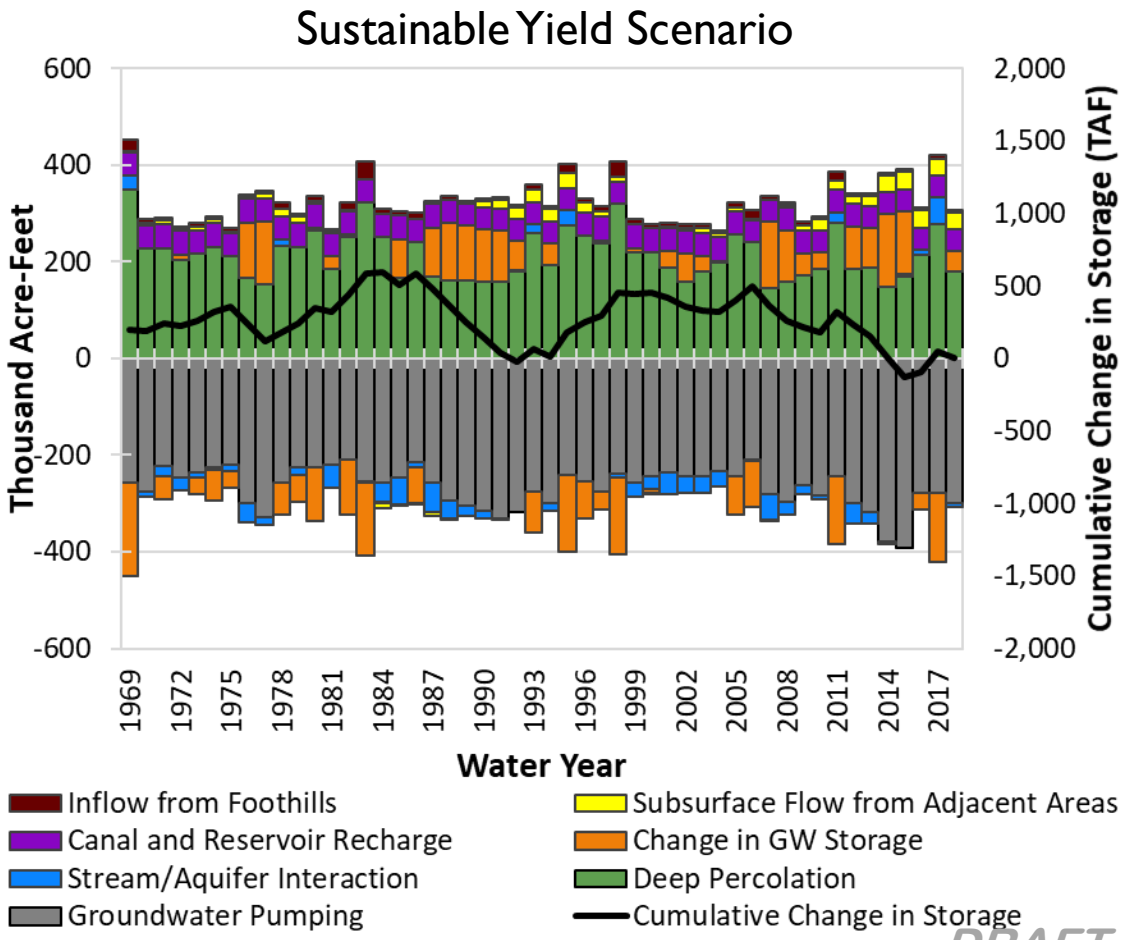
Groundwater Budget





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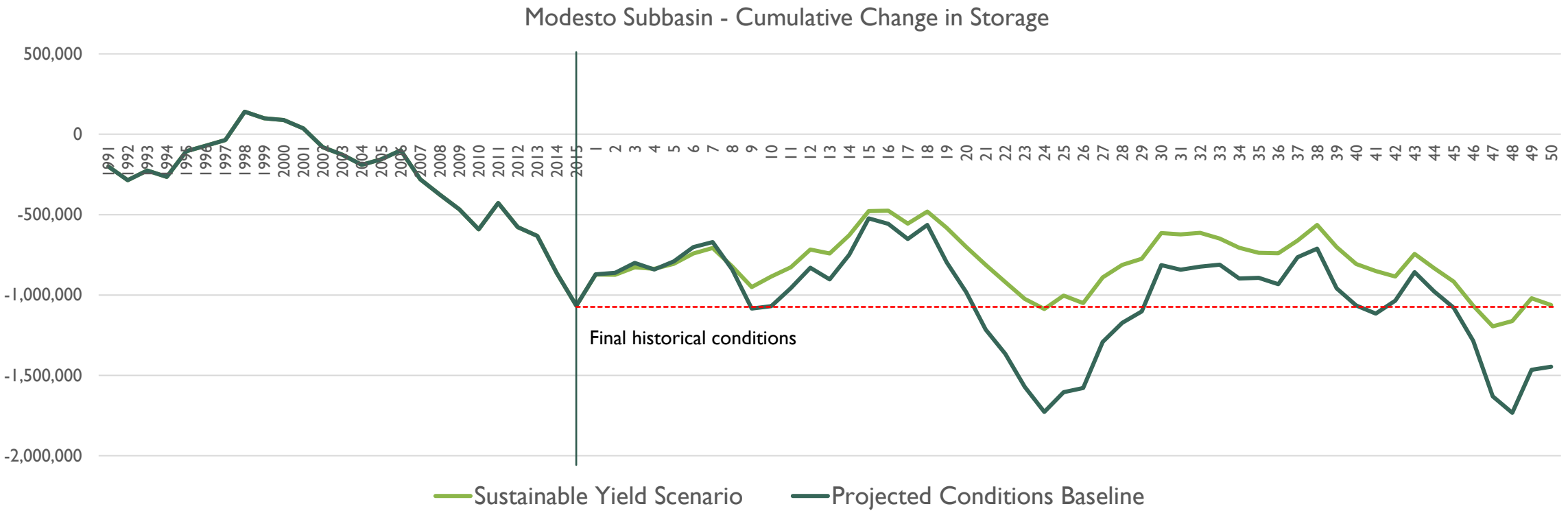
Groundwater Budget



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Groundwater Budget

	Historical (WY 1991-2015)	Baseline (50-Yr Avg)	SY Scenario (50-Yr Avg)
GW Storage Depletion	43,000	11,000	0
Total Streamflow Depletion	-60,000	26,000	-13,000
Tuolumne River	-30,000	11,000	-11,000
San Joaquin River	-14,000	-9,000	-12,000
Stanislaus River	-16,000	24,000	9,000
Deep Percolation	272,000	228,000	213,000
Inflow from Foothills	9,000	9,000	9,000
Canal and Reservoir Recharge	49,000	47,000	47,000
Groundwater Pumping	-311,000	-314,000	-267,000
Total Inter-Subbasin Flow	-2,000	-7,000	21,000
Inter-Subbasin Flows from Eastern San Joaquin	-2,000	-7,000	-1,000
Inter-Subbasin Flows from Turlock	-2,000	-1,000	7,000
Inter-Subbasin Flows from Delta-Mendota	2,000	2,000	5,000

Notes:

- Scenario targets zero change in aquifer storage
- Under sustainable yield, streamflow depletion is lower than the baseline but thresholds are based on GW levels rather than total volumes.
- Total groundwater production reduced by 47,000 AFY or 15% compared to the Baseline

- Positive values represent water moving into the groundwater system, negative values represent water leaving the aquifer.
- All units are in acre-feet

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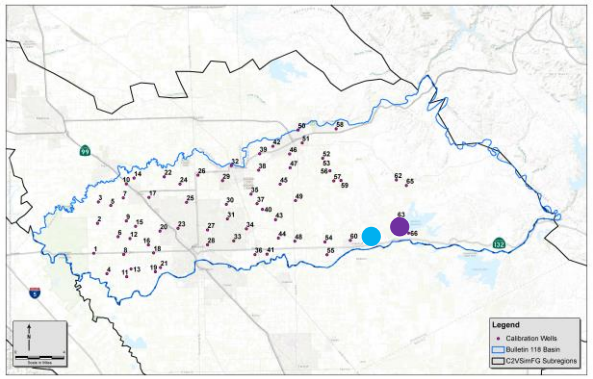
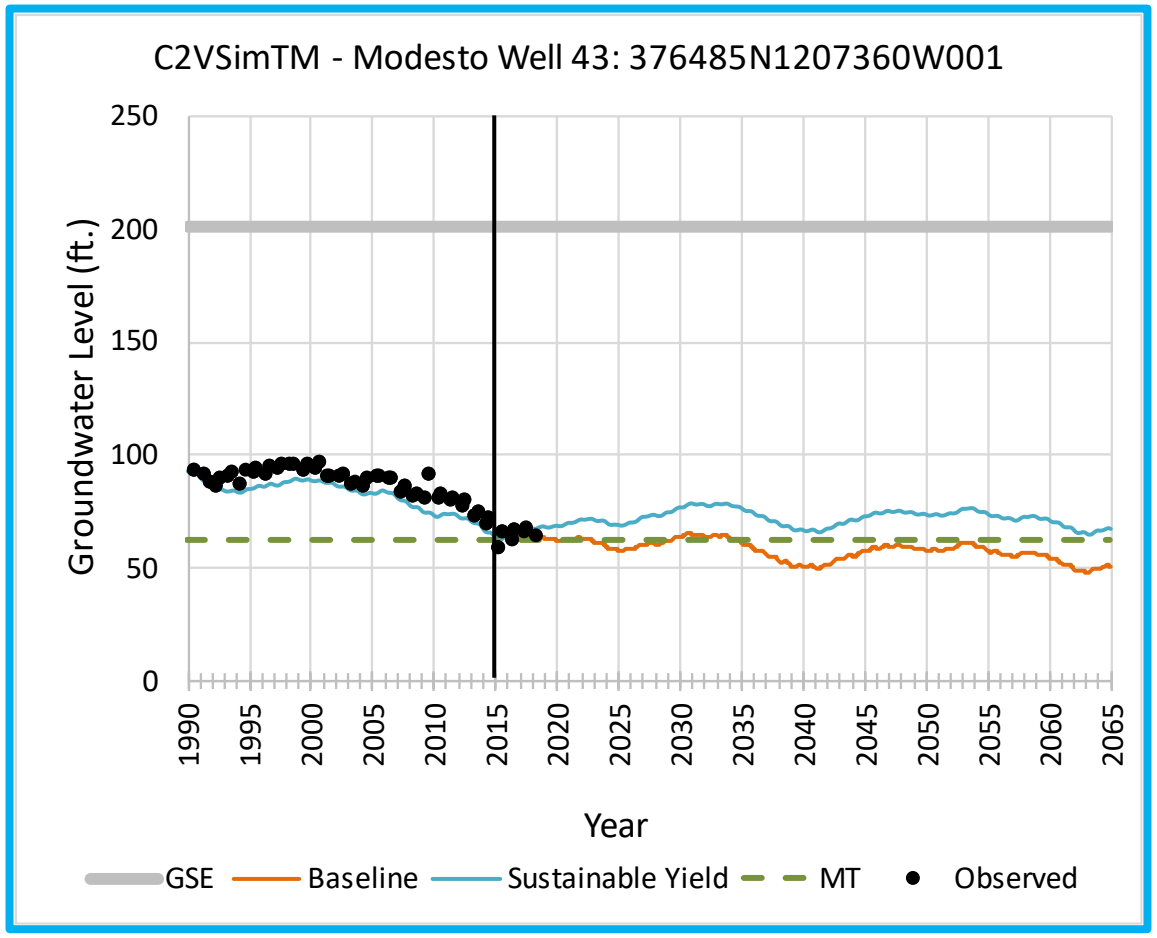
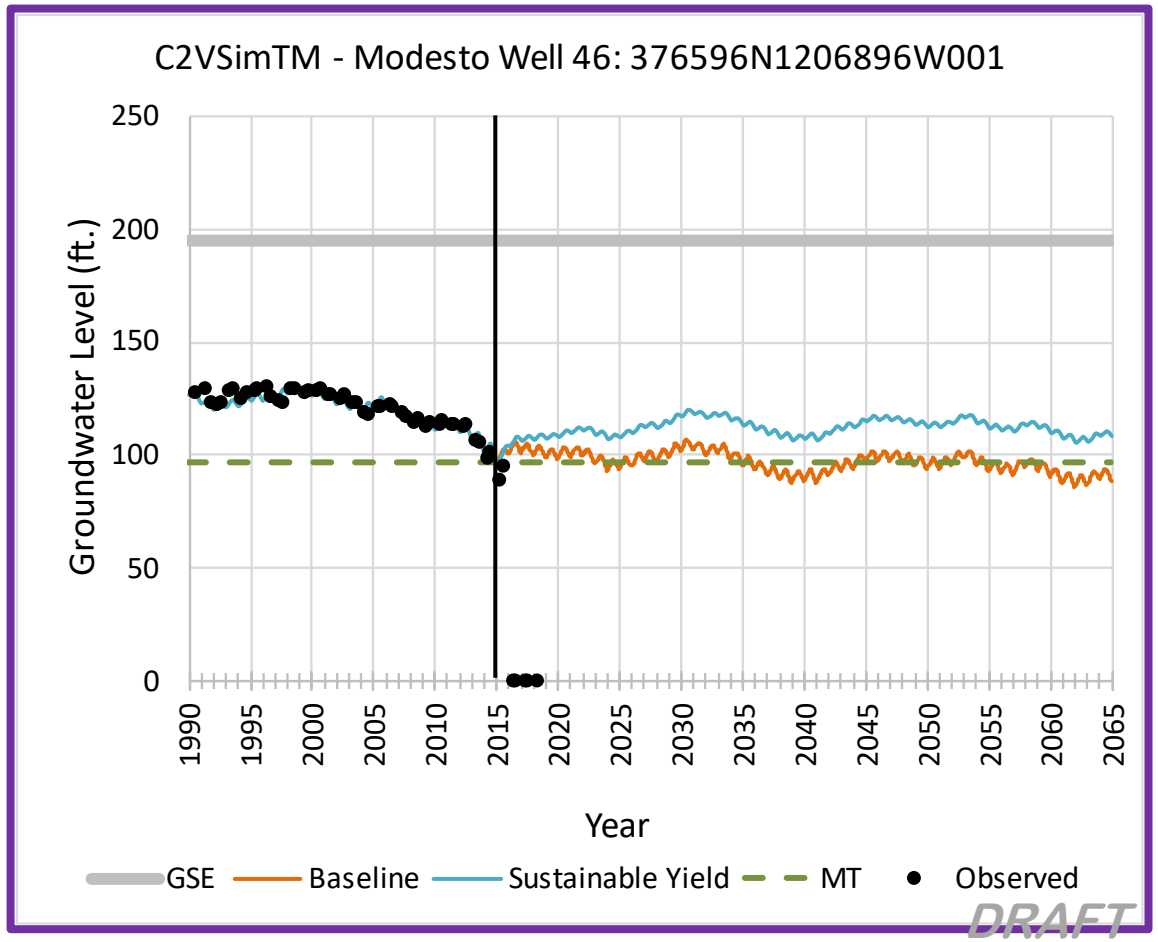
SUSTAINABLE YIELD HYDROGRAPHS







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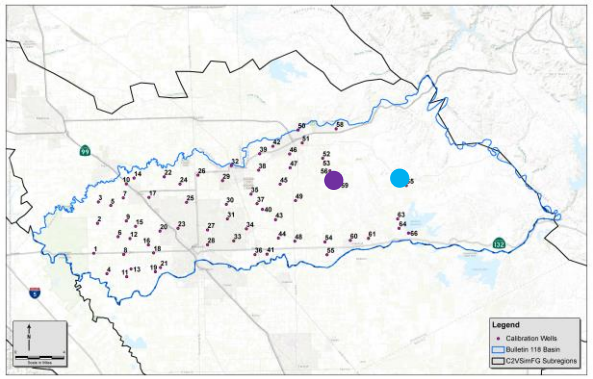
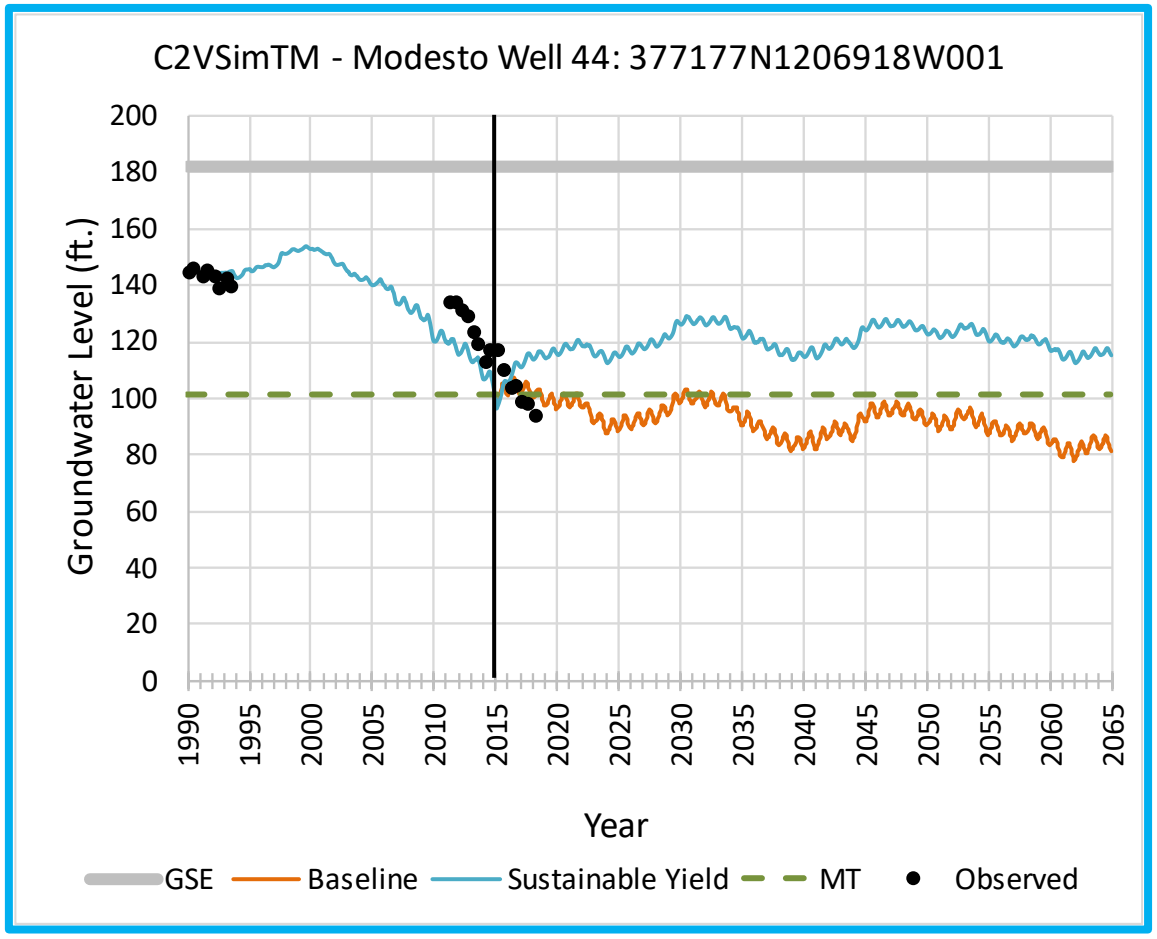
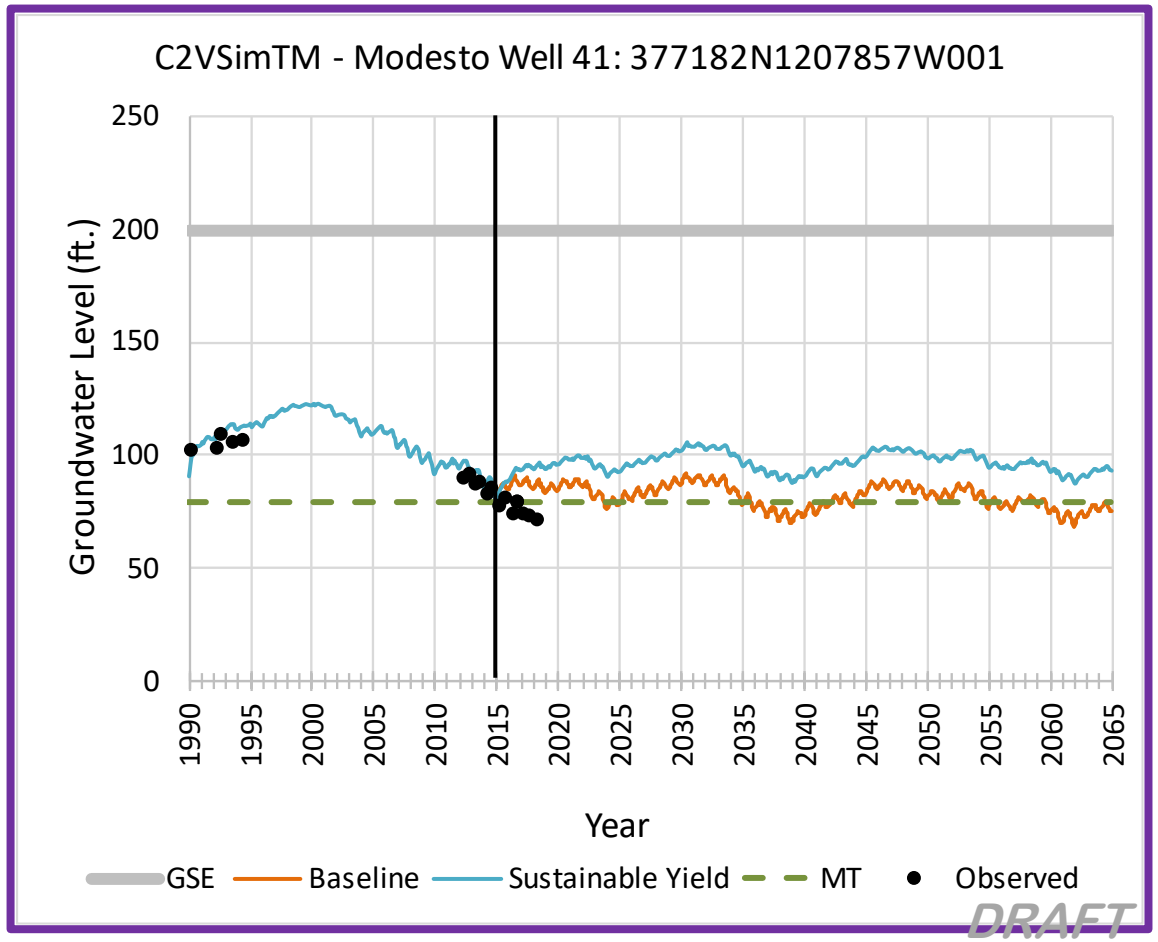
SUSTAINABLE YIELD HYDROGRAPHS







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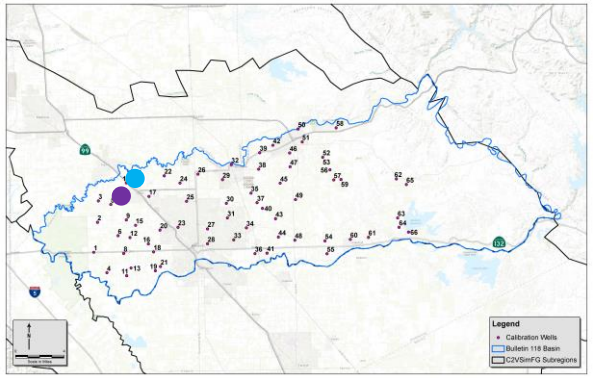
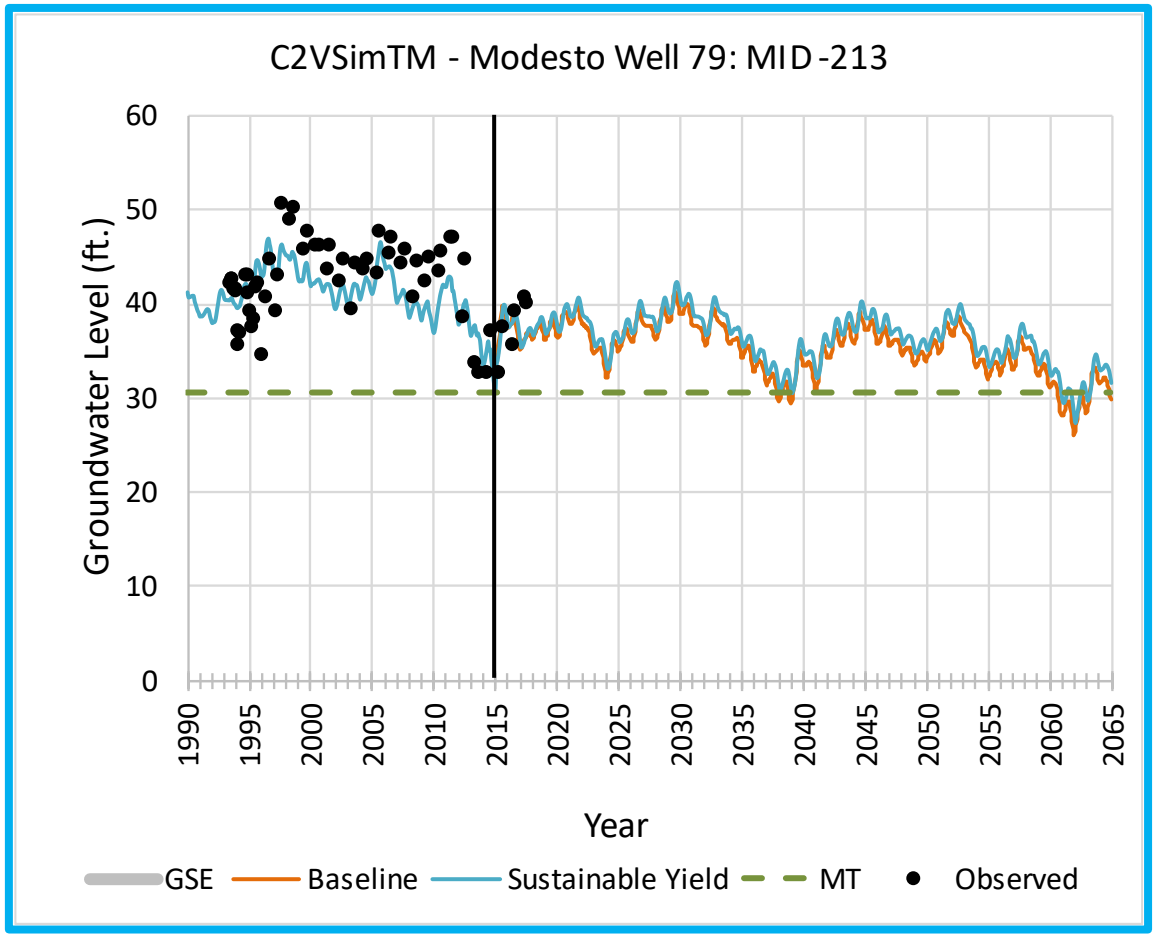
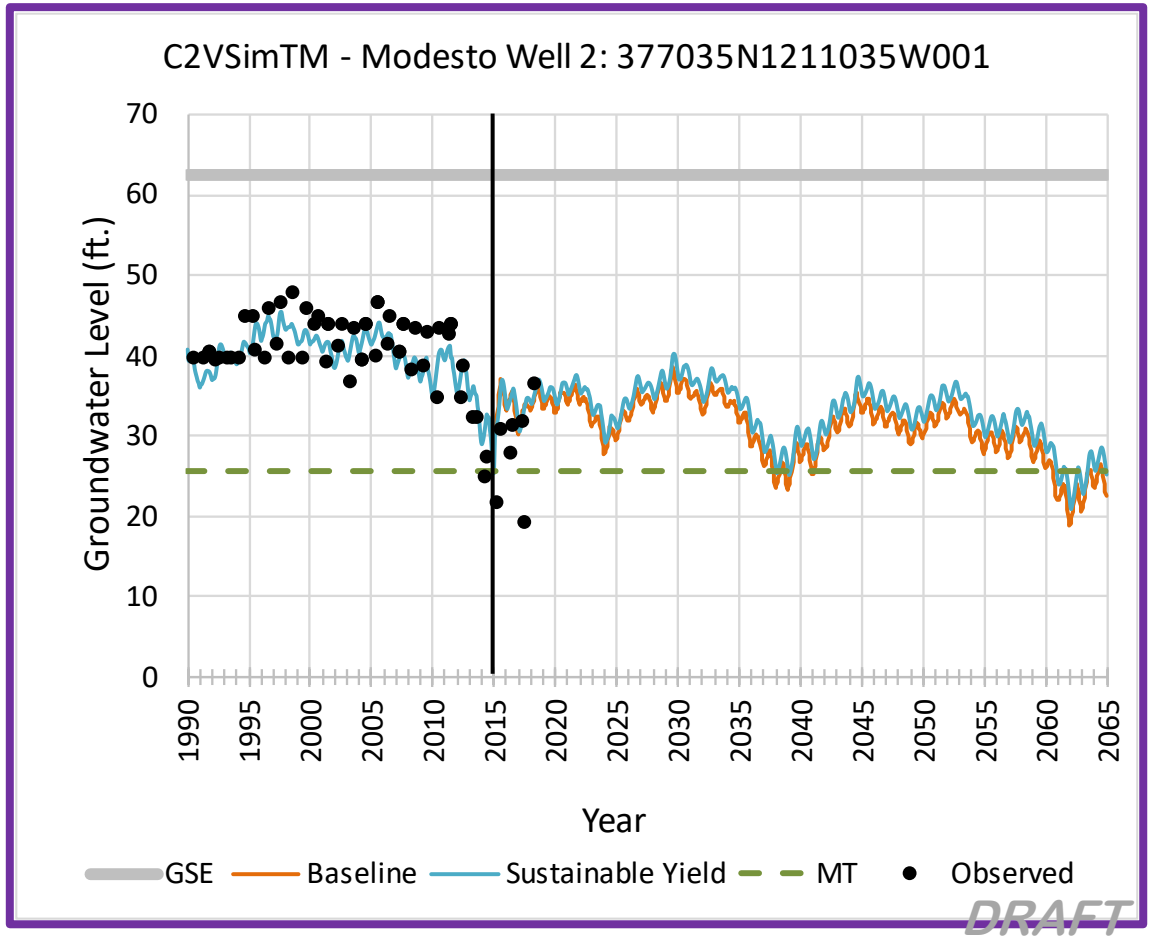
SUSTAINABLE YIELD HYDROGRAPHS







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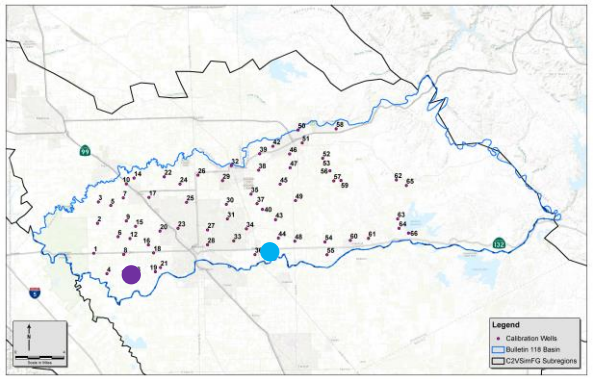

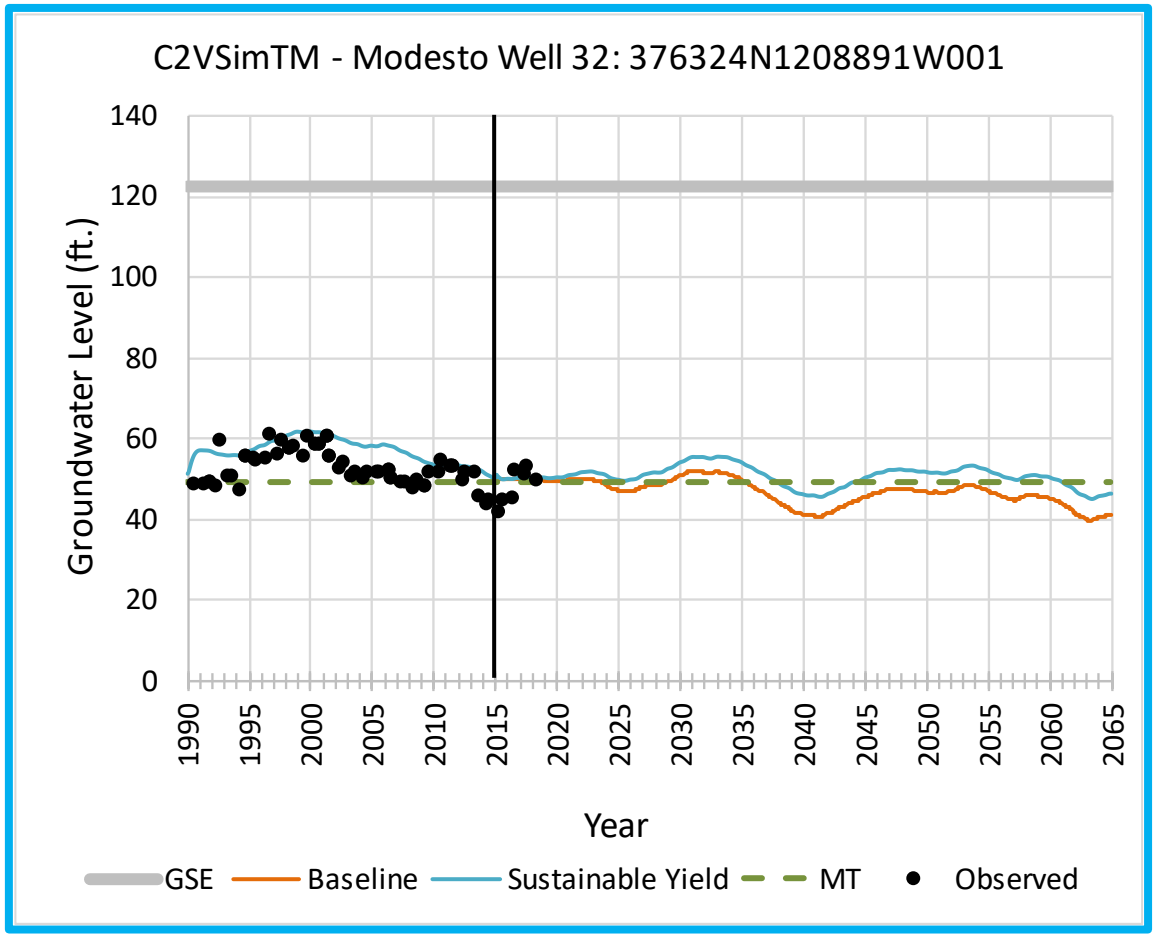

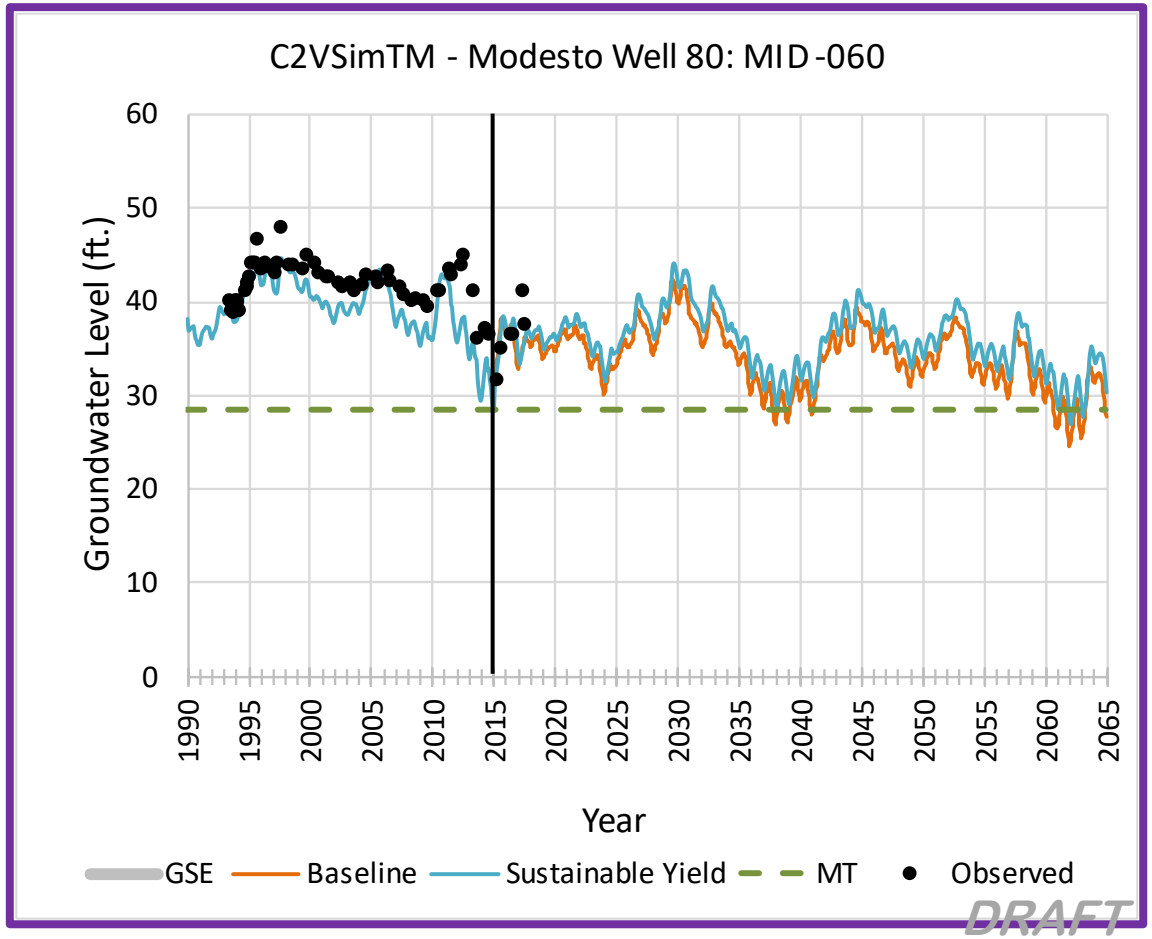

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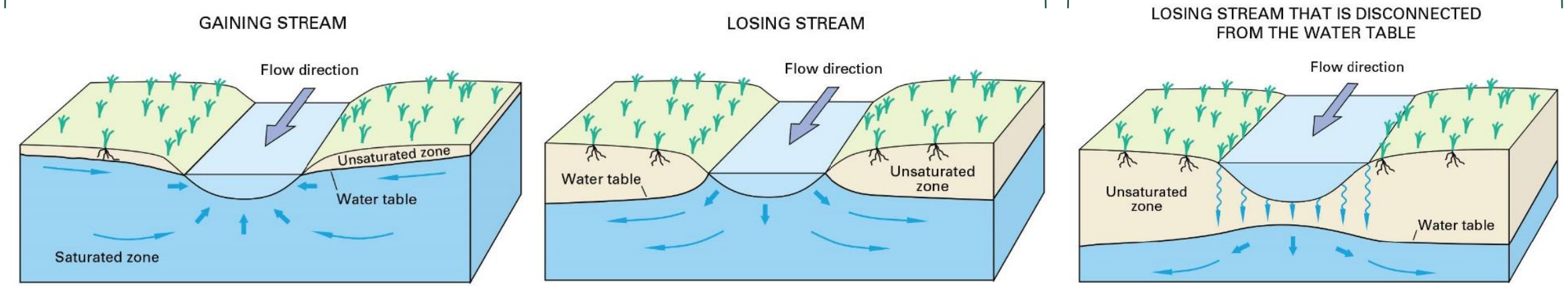
Stream-Aquifer Interactions

Connected Stream

Disconnected Stream

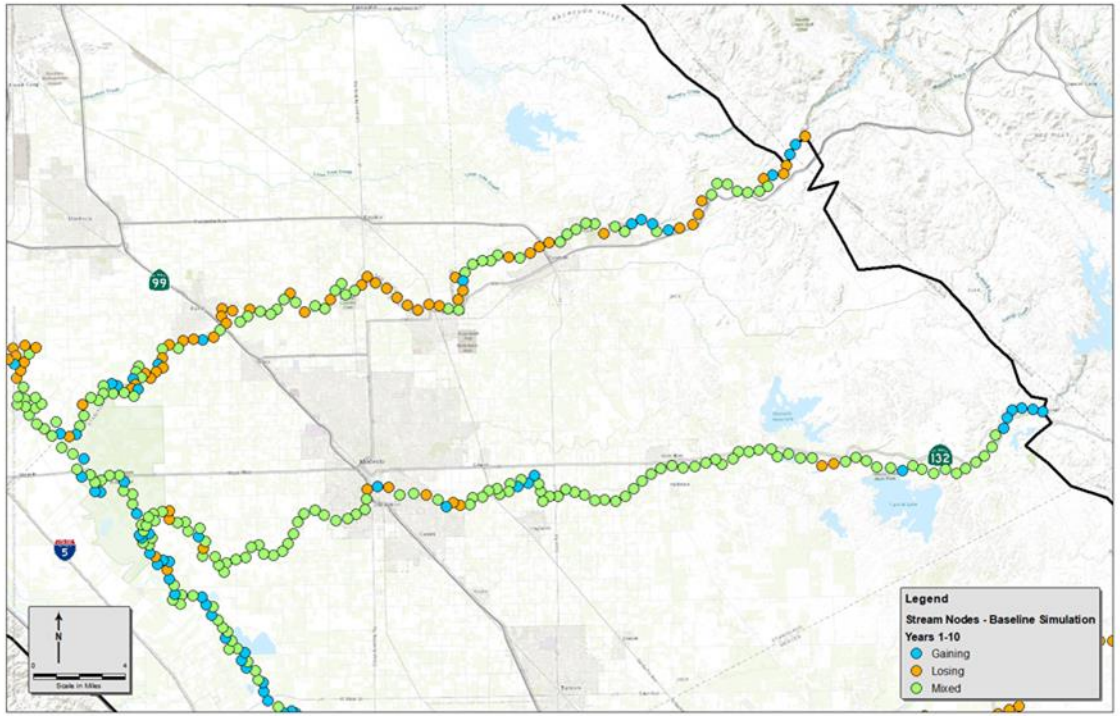


Gaining Stream

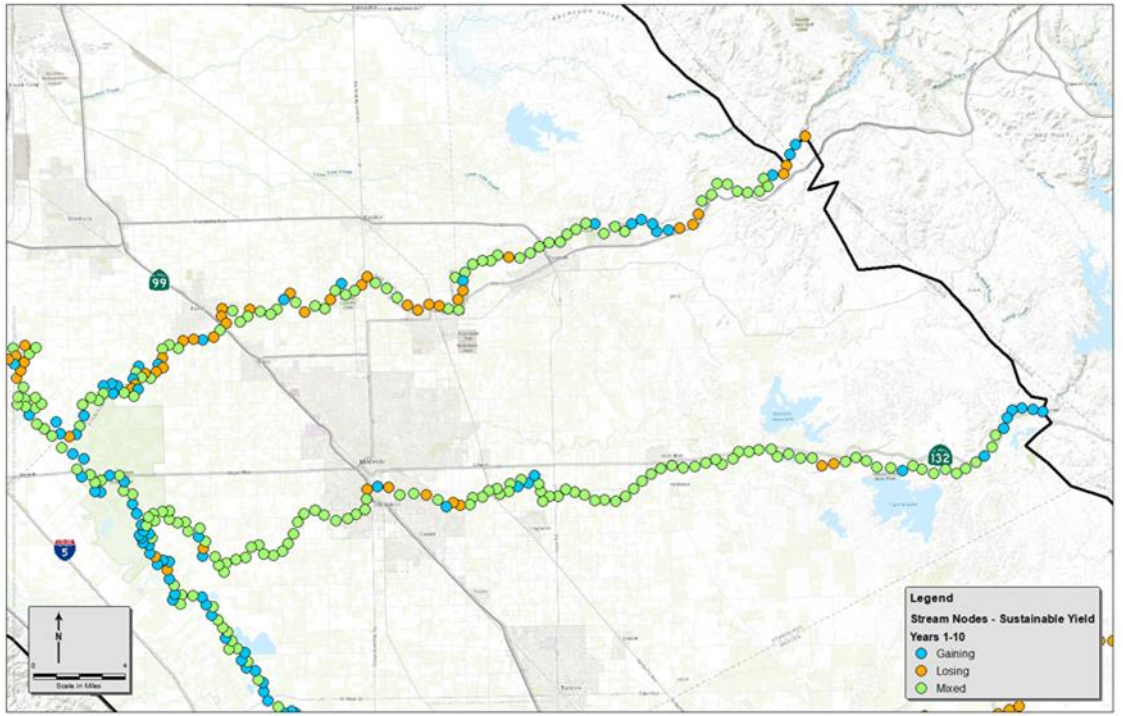
Losing Stream

Stream Connectivity

Projected Conditions Baseline
(Years 1-10)



Sustainable Yield Scenario
(Years 1-10)



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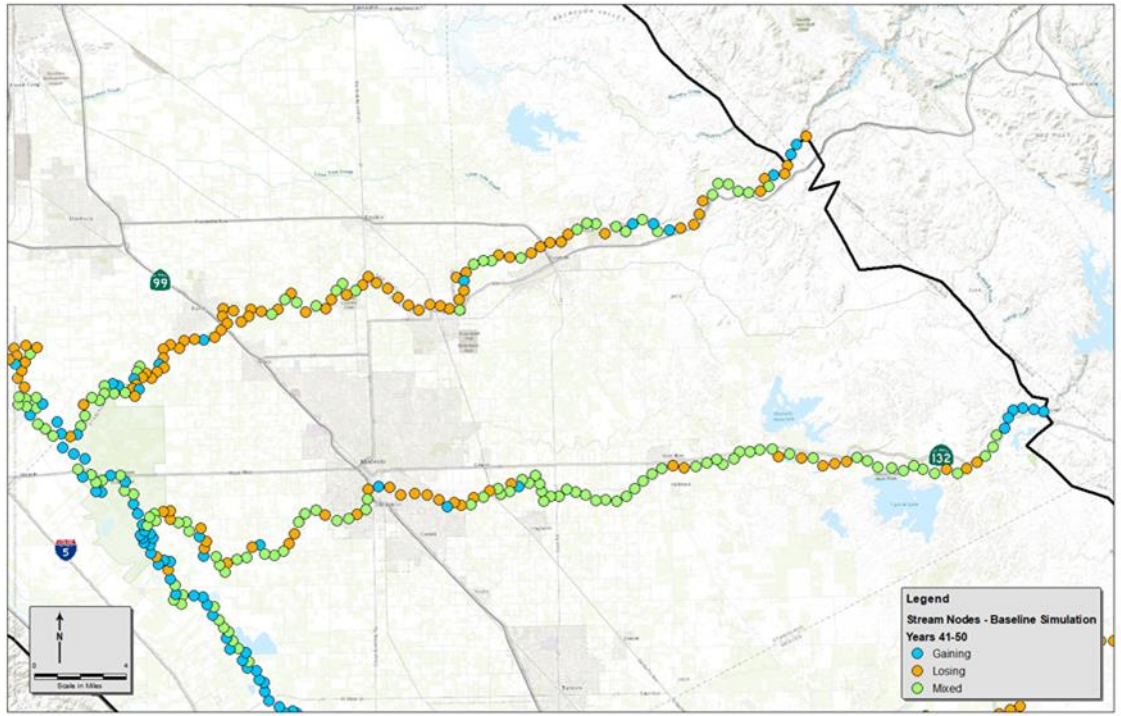
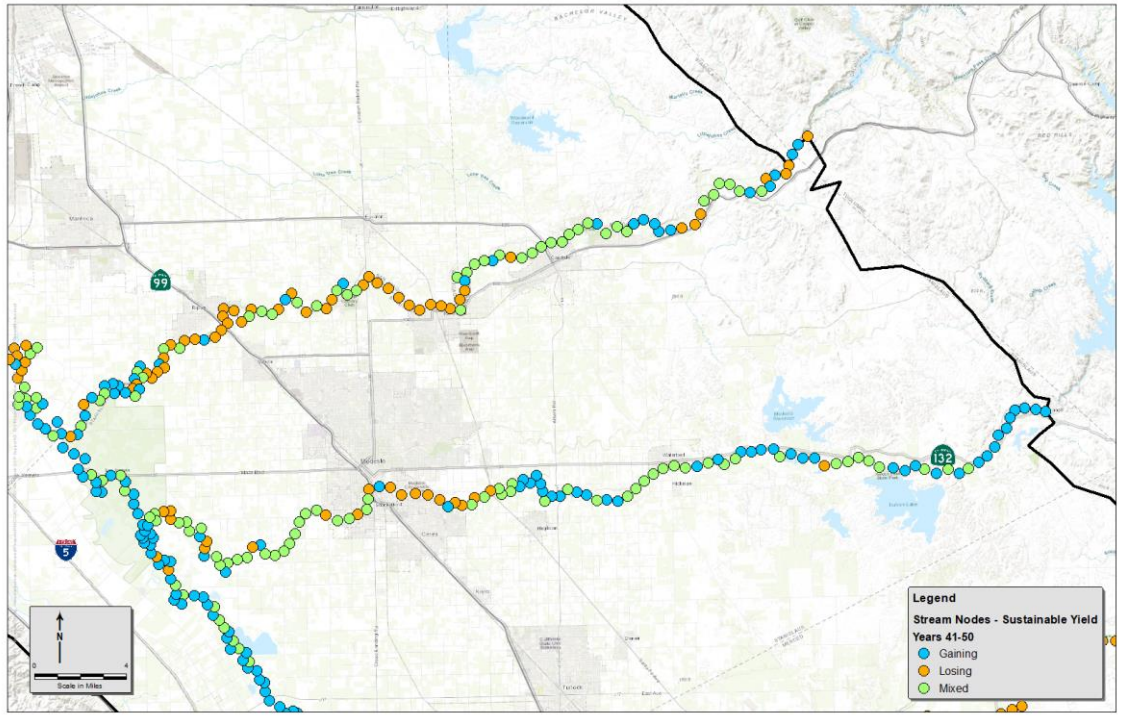
Stream Connectivity

Gaining
Losing
Mixed

Projected Conditions Baseline
(Years 41-50)



Sustainable Yield Scenario
(Years 41-50)



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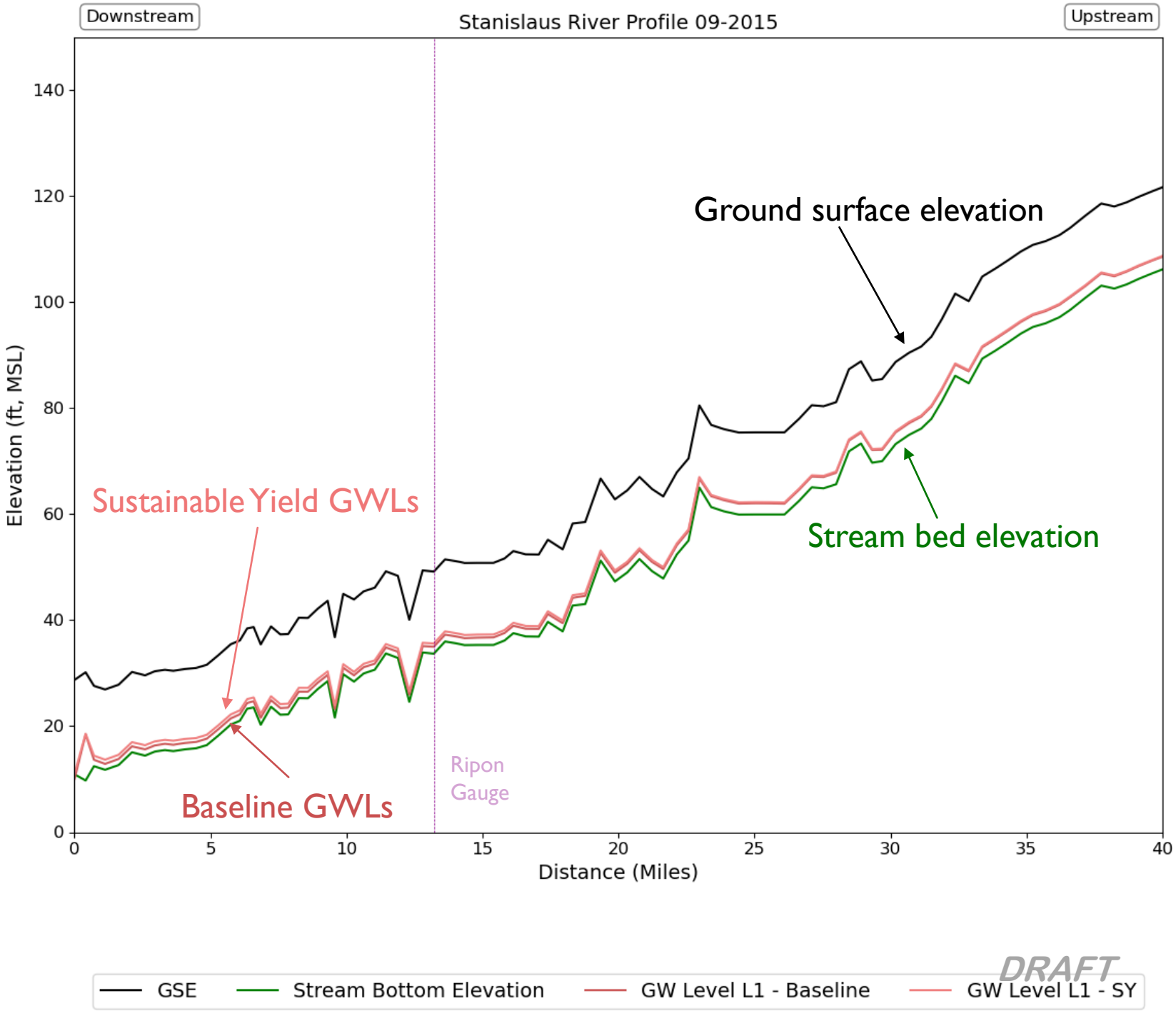
Stream Connectivity

- Groundwater level near or above stream bottom confirms interconnection of groundwater and surface water
- Stanislaus River maintains connection with groundwater system under both baseline and sustainable yield conditions
- Higher water levels with sustainable yield reduces streamflow depletion



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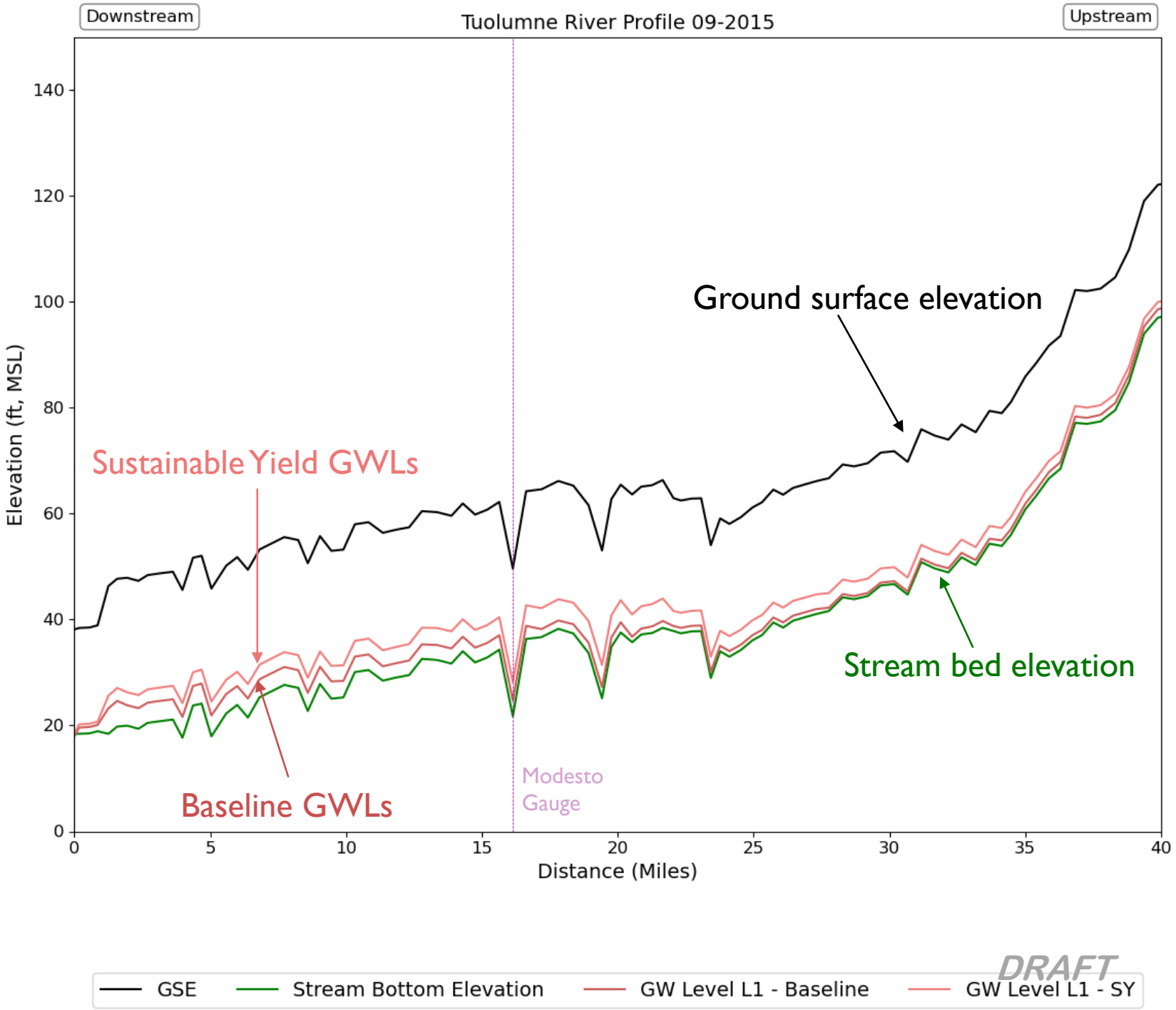
Stream Connectivity

- Tuolumne River maintains connection with groundwater system under both baseline and sustainable yield conditions
- Higher water levels with sustainable yield reduces streamflow depletion



Discussion & Next Steps

- Finalize demand-reduction sustainable yield scenario
  - Make any needed refinements
  - Inter-basin coordination with Turlock and Eastern San Joaquin subbasin
- Develop a comprehensive sustainability simulation
  - Develop and analyze Project and Management Actions

QUESTIONS?

Sustainable Management Criteria
Interconnected Surface Water
Chronic Lowering of Water Levels

Technical Advisory committee (TAC) Special Meeting

June 23, 2021

Interconnected Surface Water Undesirable Results

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

SGMA defines "undesirable results" for this indicator as:

Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water.

CWC Section §10721(x)(6).

TODD GROUNDWATER

DRAFT

SGMA Directive on Interconnected Surface Water

- SGMA singles out this indicator directly with regards to GSP implementation during the first five-year period.

State Water Board may designate the Basin as a probationary basin if the board finds…after January 31, 2025, both of the following have occurred:

- *(i) The department, in consultation with the board, determines that a GSP is inadequate or that the GSP is not being implemented in a manner that will likely achieve the sustainability goal.*
- *(ii) The board determines that the basin is in a condition where groundwater extractions result in significant depletions of interconnected surface waters.*

TODD GROUNDWATER

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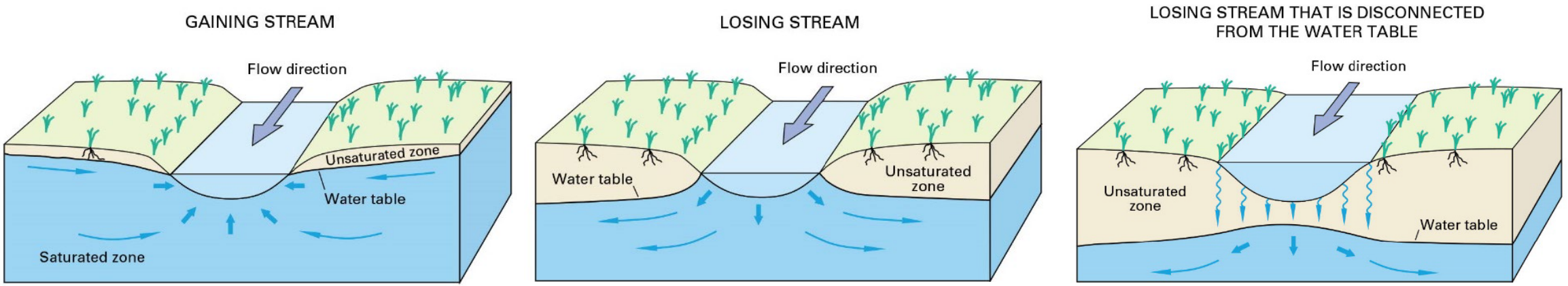
Interconnected Surface Water Concepts and Modesto Subbasin boundaries



- Historical water budget: All three river boundaries – Tuolumne, San Joaquin, and Stanislaus rivers – were net gaining streams
- Projected future baseline: Tuolumne and Stanislaus rivers transition to net losing streams although remain connected to groundwater; San Joaquin is less affected
- Net losing stream benefits groundwater but has potential to impact surface water rights and ecosystems unless mitigated by projects and operational measures

TODD GROUNDWATER

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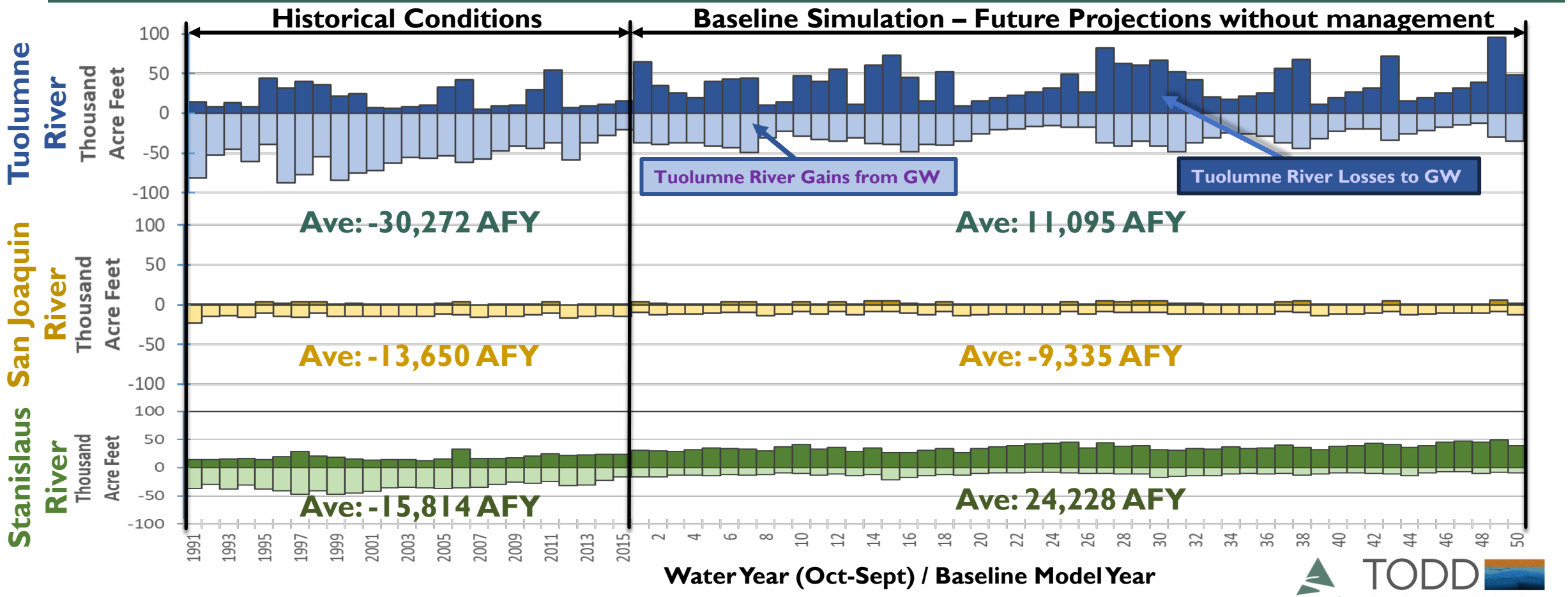
Streamflow Depletion – Historical and Projected Modesto Subbasin River Boundaries



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Interconnected Surface Water Modeling Water Budgets and Sustainable Yield

- Sustainable yield (SY) scenario suggests future streamflow depletions can be partially offset if water levels are managed at 2015 levels.

Interconnected Surface Water Modeling	Historical (WY 1991-2015)	Baseline (50-Yr Avg)	SY Scenario (50-Yr Avg)
Total Streamflow Depletion (GW recharge)	-60,000	26,000	-13,000
Tuolumne River	-30,000	11,000	-11,000
San Joaquin River	-14,000	-9,000	-12,000
Stanislaus River	-16,000	24,000	9,000

- SY scenario improves future conditions in each river compared to projected Baseline conditions

WOODARD & CURRAN TODD GROUNDWATER

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Interconnected Surface Water Sustainable Management Criteria

- Minimum Threshold (MT) shall be the rate or volume of surface water depletions caused by groundwater use that has adverse impacts on surface water beneficial uses and may lead to undesirable results.

CALIFORNIA CODE OF REGULATIONS
TITLE 23. WATERS
DIVISION 2. DEPARTMENT OF WATER RESOURCES
CHAPTER 1.5. GROUNDWATER MANAGEMENT
SUBCHAPTER 2. GROUNDWATER SUSTAINABILITY PLANS

ARTICLE 1. Introductory Provisions

<u>MT supported by</u>:

- Location, quantity, and timing of interconnected surface water depletions.
- Description of the groundwater and surface water model used to quantify surface water depletion... (§354.28 (c)(6)).

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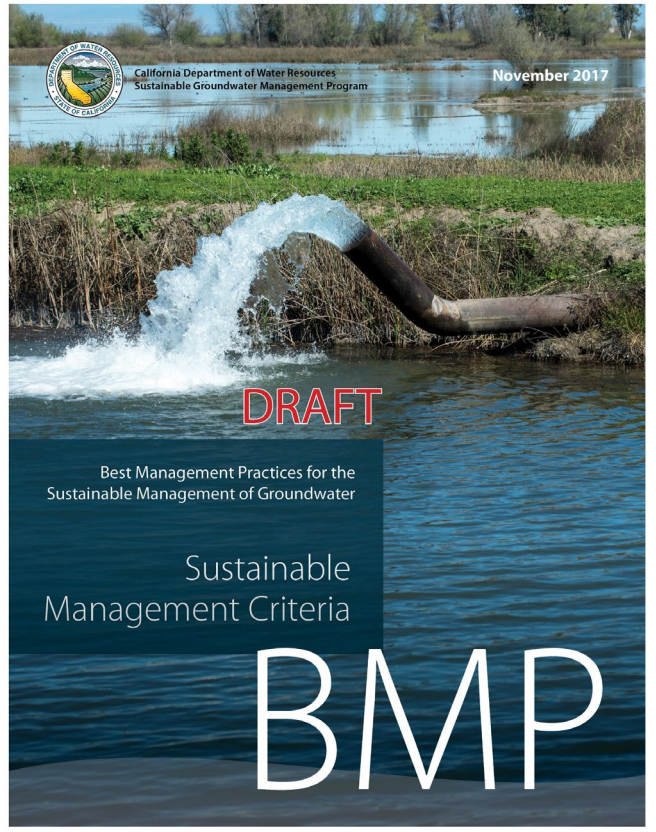
Interconnected Surface Water Sustainable Management Criteria – DWR BMP

DWR BMP provides a list of considerations when selecting a minimum threshold (MT) for this indicator:

- Historical rates of stream depletion for water year types
- Uncertainty in streamflow depletion estimates from model
- Proximity of pumping along rivers
- Impacts on GDEs (analysis pending)
- Agricultural and municipal surface water demand
- State or federally mandated flow requirements

Also consider MTs set in adjacent subbasins along shared river boundaries



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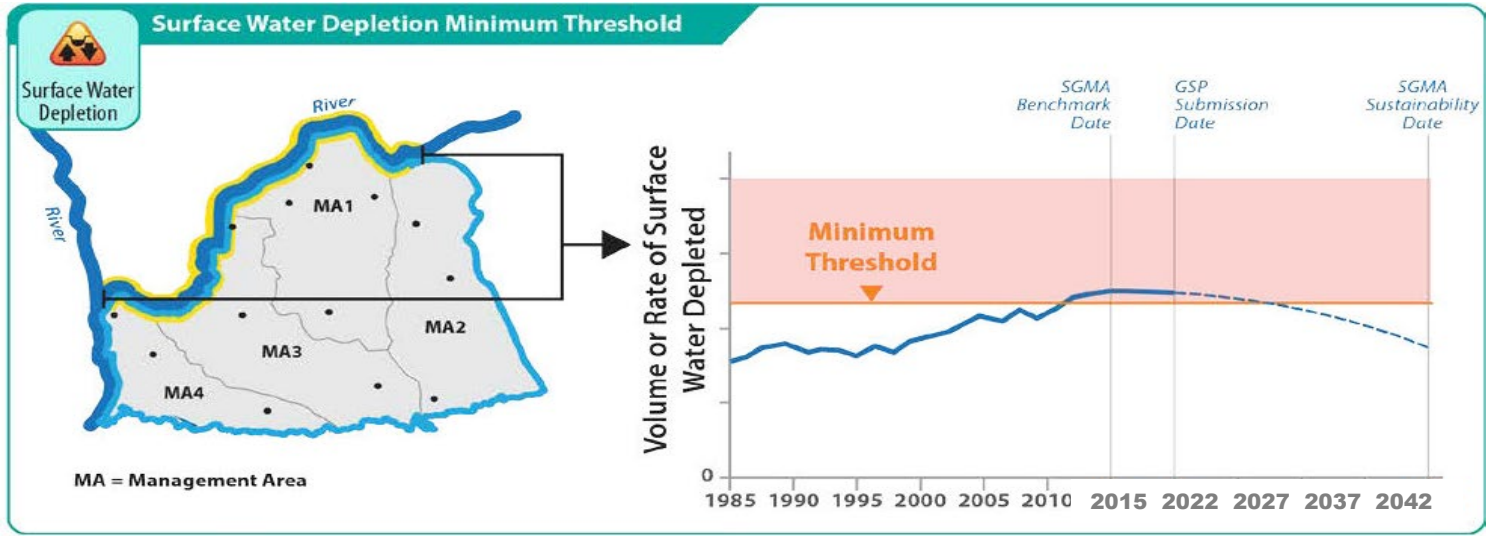
Interconnected Surface Water Metrics Sustainable Management Criteria



- DWR BMP: use volume or rate of streamflow depletion as the metric for MT
- Adjacent subbasins use groundwater levels as a proxy for interconnected SW

- Two approaches for using water levels as a proxy to the depletion volume or rate:
  - Identify groundwater elevation monitoring sites where a correlation between water level and volume/rate of depletion can be demonstrated.
  - Demonstrate that the groundwater elevation MT for another sustainability indicator is sufficiently protective of interconnected surface water.

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Turlock Subbasin Minimum Thresholds (MTs) for Interconnected Surface Water

Turlock Subbasin
Interconnected Surface Water Modeling

	Historical	Baseline	SY Scenario
Total Streamflow Depletion	-57,000	38,000	-9,000
Tuolumne River	-35,000	6,000	-16,000
San Joaquin River	-38,000	-28,000	-33,000
Merced River	17,000	60,000	41,000

- Positive values represent water moving into the groundwater system, negative values represent water leaving the aquifer.
- All units are in acre-feet
- SY = Sustainable Yield

- MTs set to mitigate future projected streamflow depletion and maintain interconnection.
- Use groundwater levels as a proxy.
- MTs set at Fall 2015 low water levels for Tuolumne and San Joaquin rivers.
- MTs along the Merced river set at Spring 2014 water levels to avoid disconnection.

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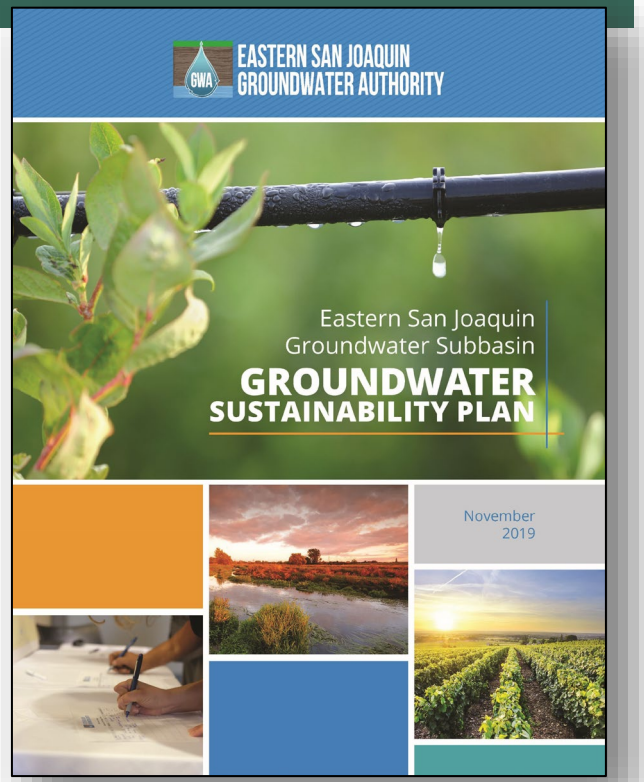
Eastern San Joaquin Minimum Thresholds (MTs) for Interconnected SW

- Use *Chronic Lowering of Groundwater* MTs as a proxy for *Interconnected Surface Water*
- Data for rivers addressed cumulatively in the GSP (Calaveras, Mokelumne, Dry Creek, San Joaquin, and Stanislaus rivers)
- Difference between historical and projected baseline about 50,000 AFY (approx. 1% of total stream outflows from ESJ Subbasin)
- Sustainable yield – water level MTs would not cause streamflow depletion greater than 50,000 AFY



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Recommendation for Interconnected Surface Water Undesirable Results and Minimum Thresholds

Undesirable Result (UR) Definition	Significant and unreasonable adverse impacts on the beneficial uses of surface water caused by groundwater extraction.
	For the Tuolumne, San Joaquin, and Stanislaus rivers, the MT will be expressed as the low groundwater elevations observed in Fall 2015 at representative monitoring wells along the river boundaries. The UR will be evidenced by an exceedance of a MT at a designated percentage of representative monitoring locations in a designated number of consecutive semi-annual monitoring events along each river. *Percentage of wells and number of events to be based on the final number of representative monitoring wells in each Management Area; monitoring network in progress.*

Recommendation for Chronic Lowering of Water Levels Undesirable Results (UR) and Minimum Thresholds (MT)

Undesirable Result (UR) Definition	Significant and unreasonable groundwater level declines such that water supply wells are adversely impacted during multi-year droughts in a manner that cannot be readily managed or mitigated.
	The MT will be expressed as the historic low groundwater elevation observed from WY 1991 through WY 2020 at each representative monitoring location, based on available data. The UR will be evidenced by an exceedance of a MT at a designated percentage of representative monitoring locations in a designated number of consecutive semi-annual monitoring events within each Management Area. *Percentage of wells and number of events to be based on the final number of representative monitoring wells in each Management Area; monitoring network in progress.*

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NEXT STEPS

- Approve Undesirable Results definition and MT approach for *Chronic Lowering of Water Levels* and *Interconnected Surface Water* at July 14 meeting
- Complete GDE assessment; adjust Interconnected Surface Water criteria, as necessary
- Finalize monitoring network
- Set MTs, Measurable Objectives (MOs), and Interim Milestones for representative wells
- Continued development and analysis of projects and Management Actions

QUESTIONS?