

MAY ADVISORY COMMITTEE MEETINGS

Butte Valley Groundwater Advisory Committee Meeting



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ASSOCIATES
science | policy | solutions



GSP Determination and Next Steps

- **Corrective Action 1** - Reconduct the assessment of overdraft conditions and describe management actions to mitigate overdraft.
 - Refine the water budget, and better understand overdraft/no overdraft
 - Provide “reasonable means” to mitigate overdraft (describe feasible management actions)
- **Corrective Action 2** - Further justify the SMCs set for water levels, and quantitatively describe the effects of the criteria on users of groundwater.
 - Describe the specific, quantitative undesirable results that are planned to be avoided
 - MTs should be set at a level where depletion of supply across the Basin may lead to undesirable results

GSP Determination and Next Steps

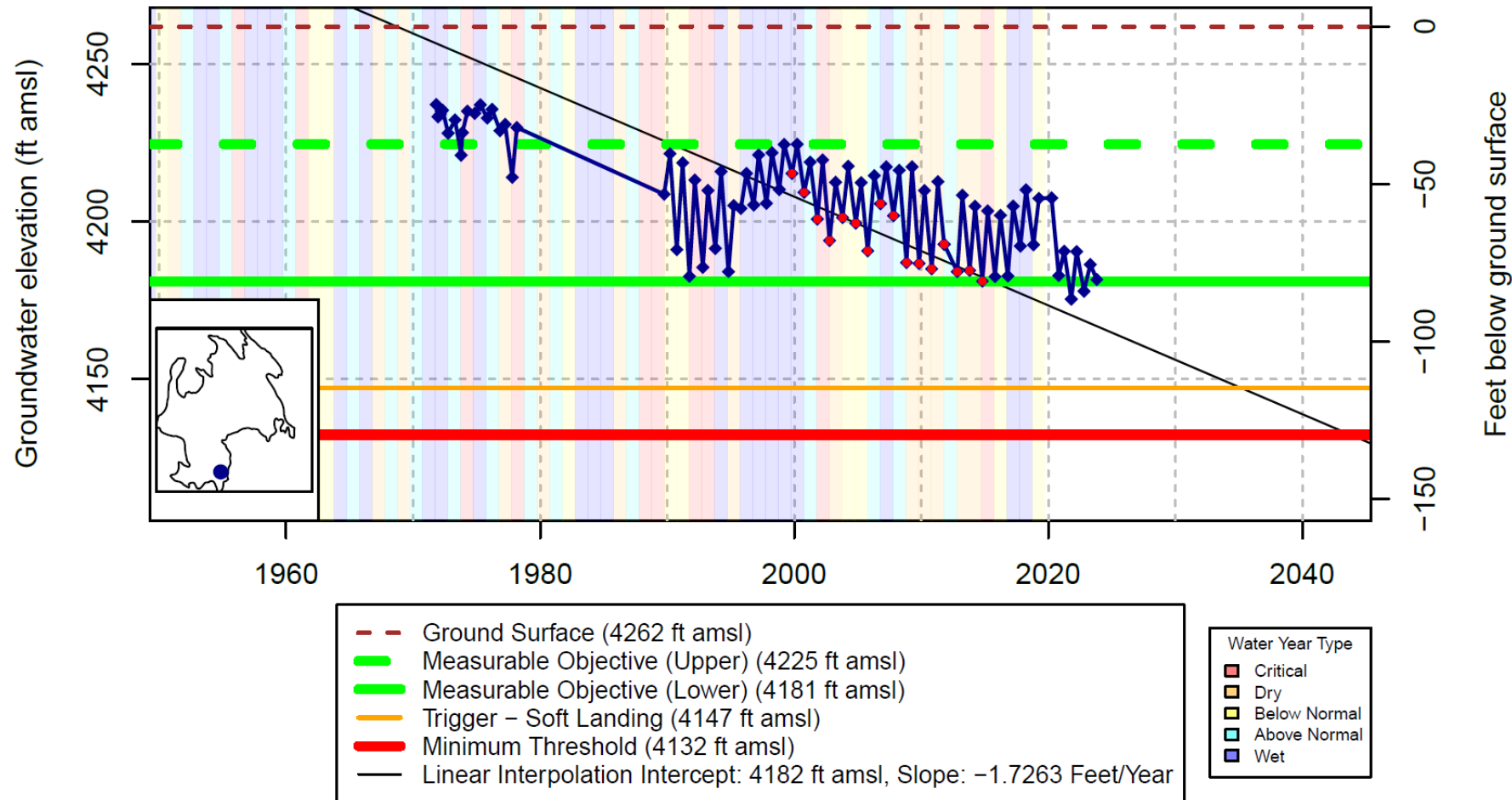
- Monthly meetings with DWR
- Refinement of water budget
- Review of model results and boundary conditions
- Quantitative description of undesirable results for users of groundwater

Finding 1: There is no immediate threat of water levels reaching Minimum Thresholds, but further long-term steady decline is not desirable nor acceptable.

Evidence: Representative Monitoring Network Hydrographs

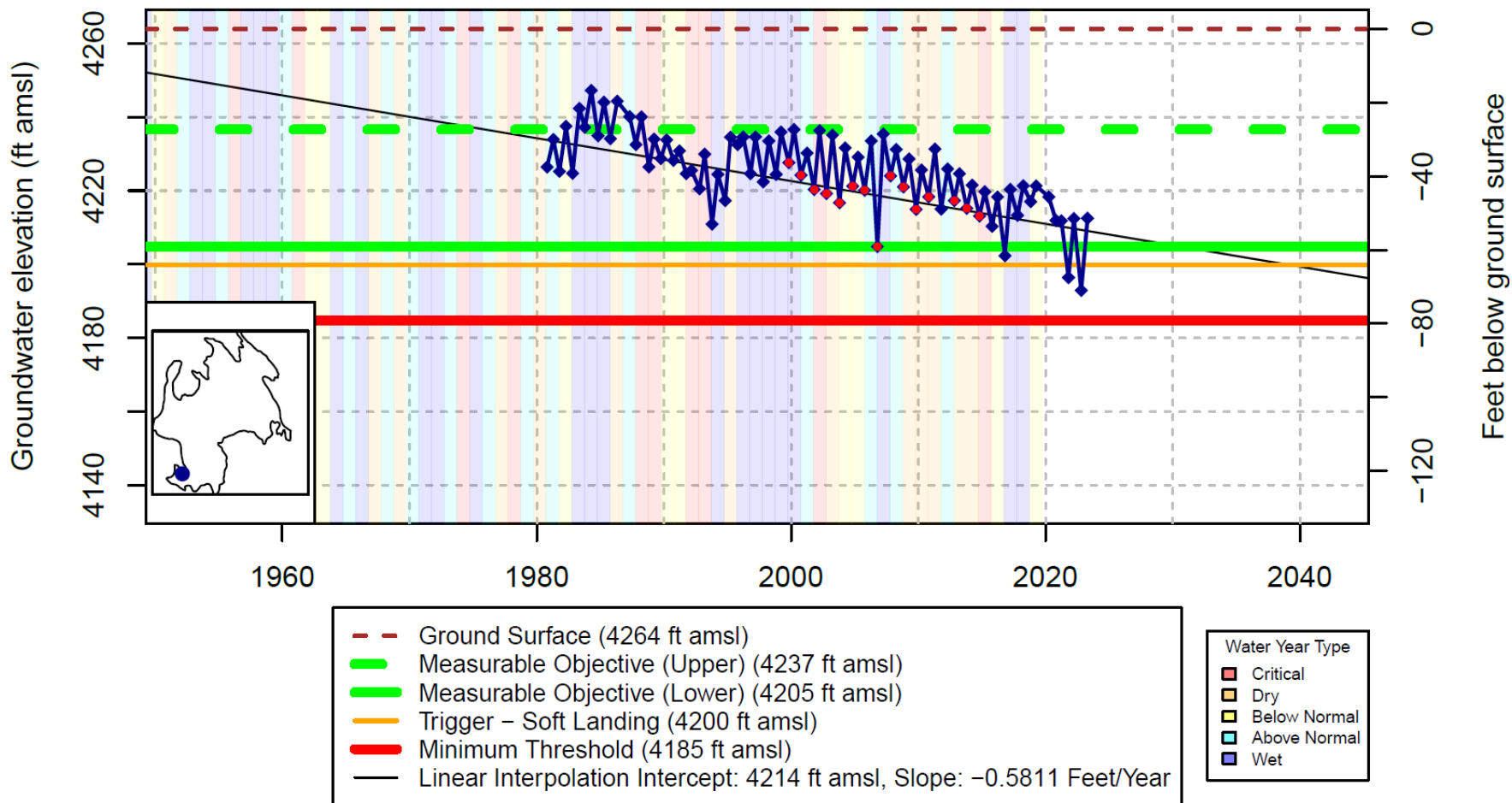
Monitoring Network

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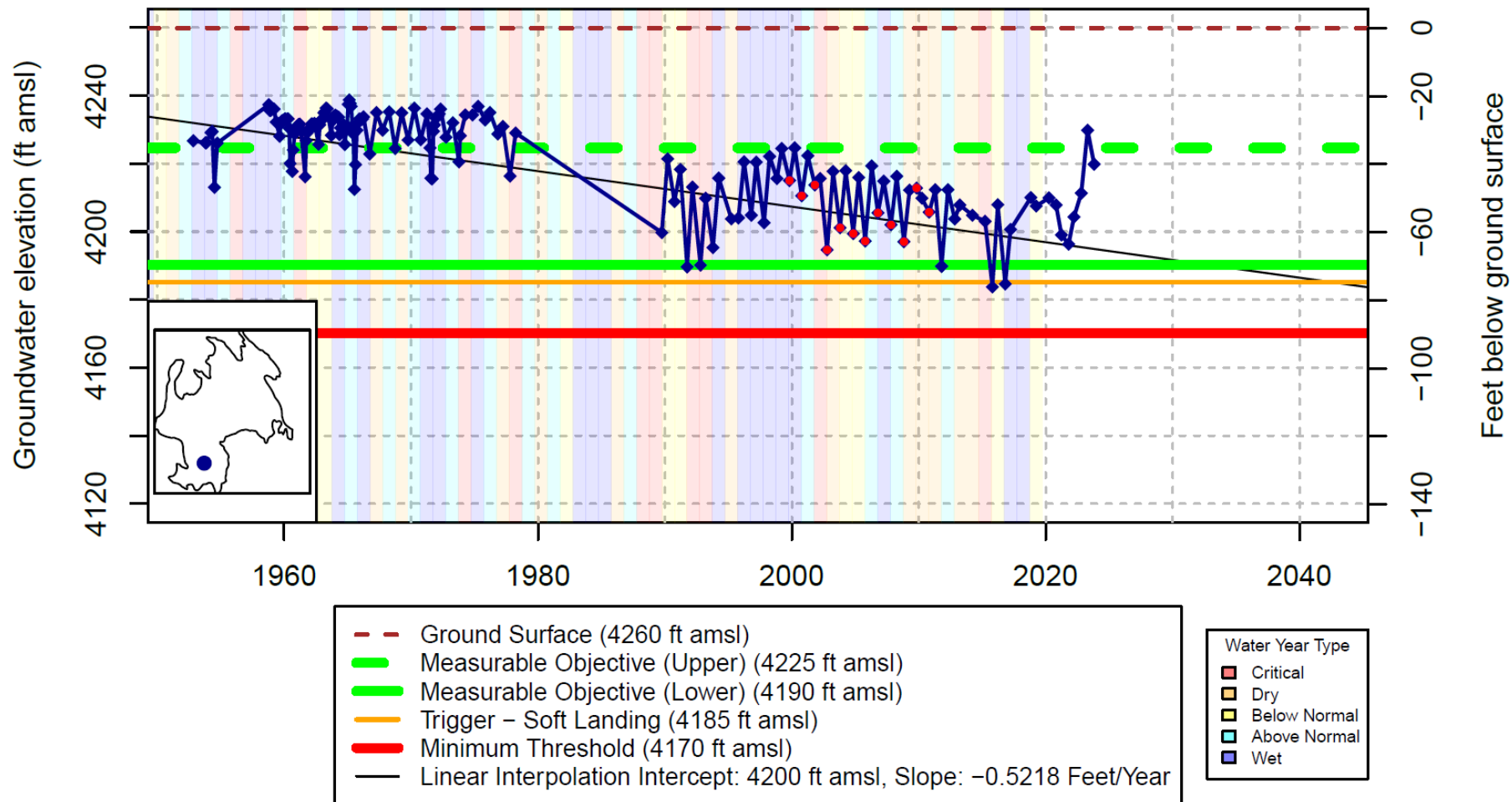
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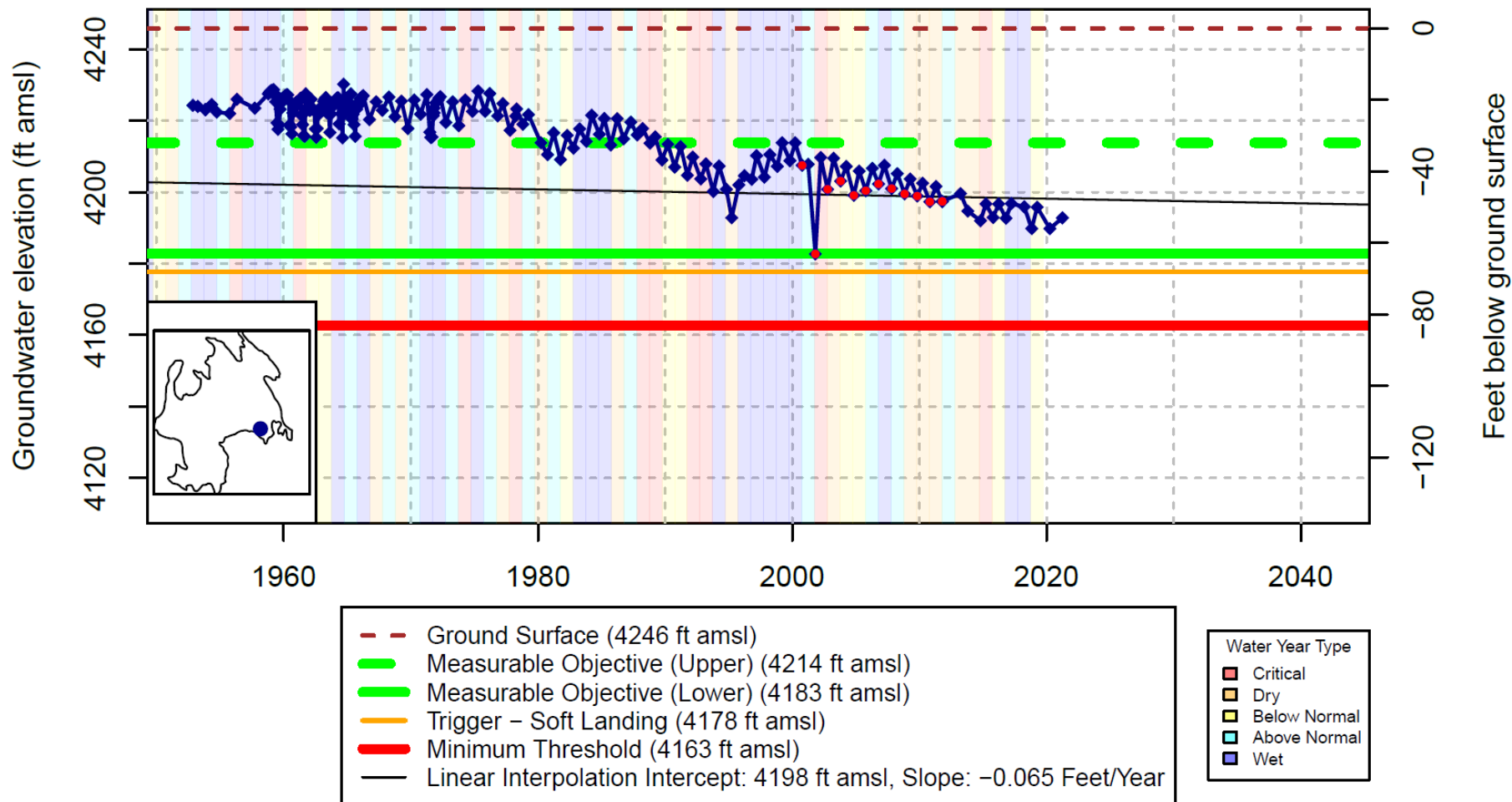
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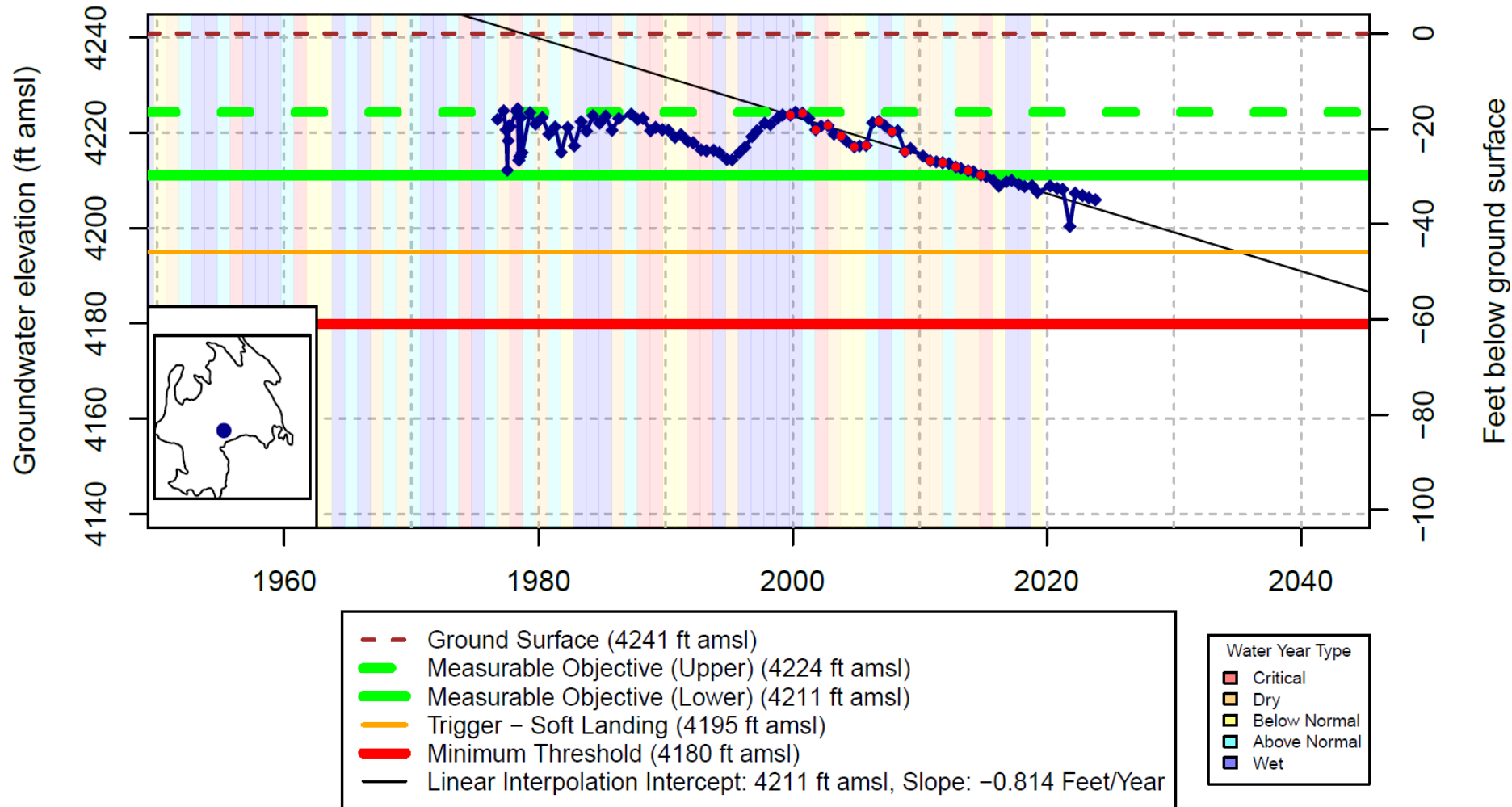
Monitoring Network

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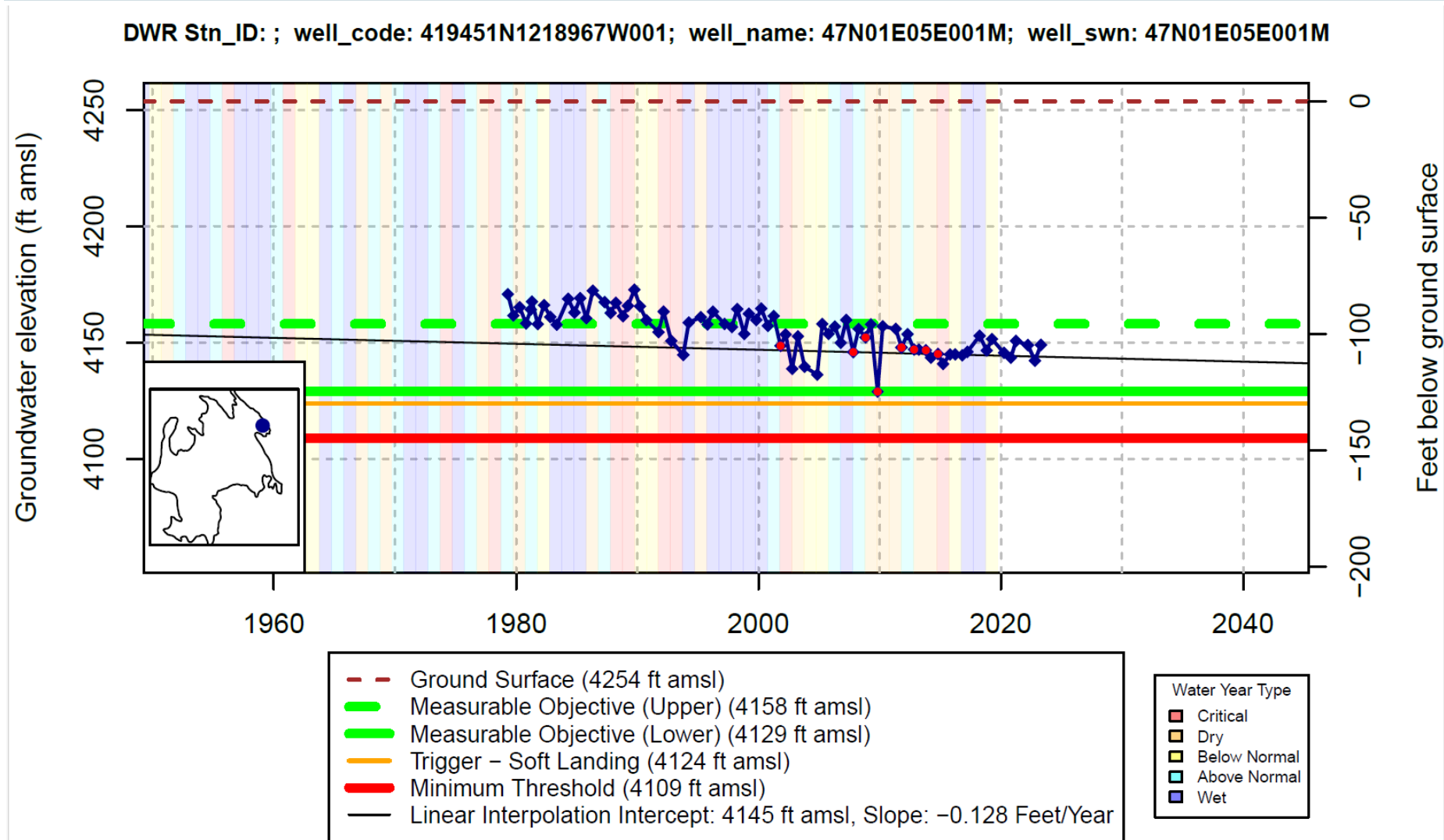


Monitoring Network

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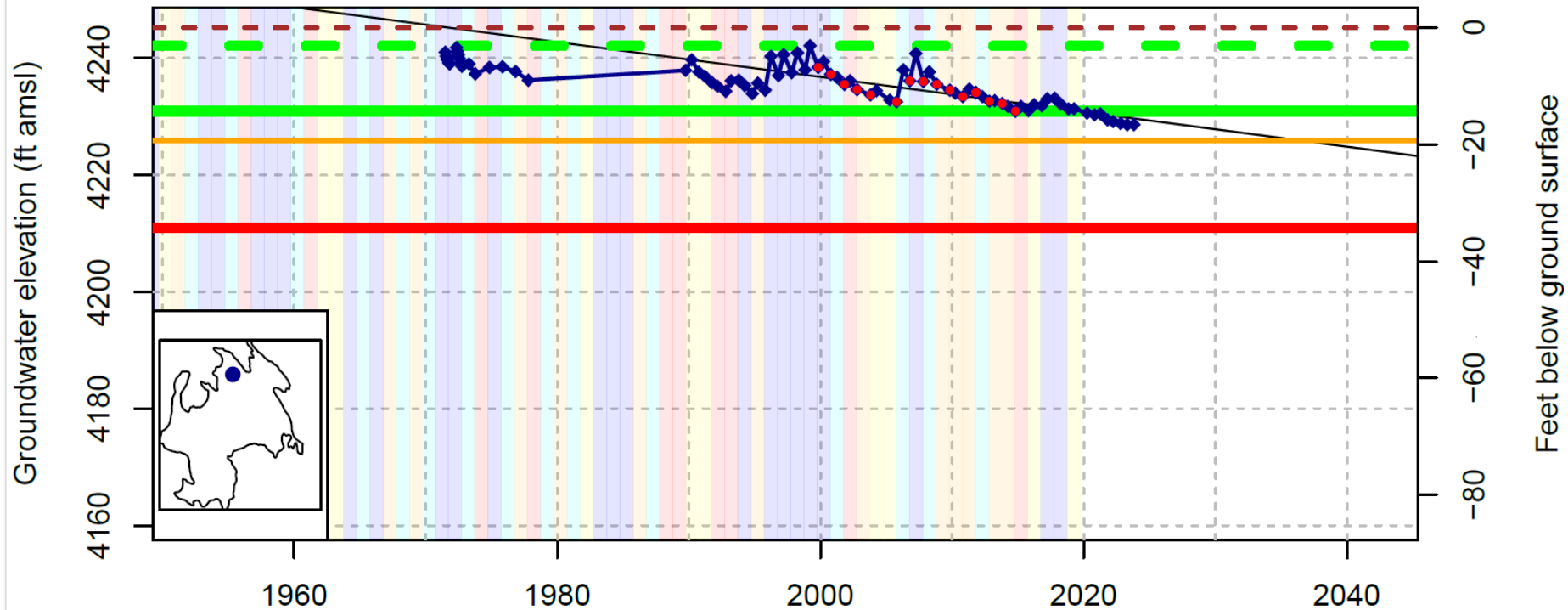


Monitoring Network



Monitoring Network

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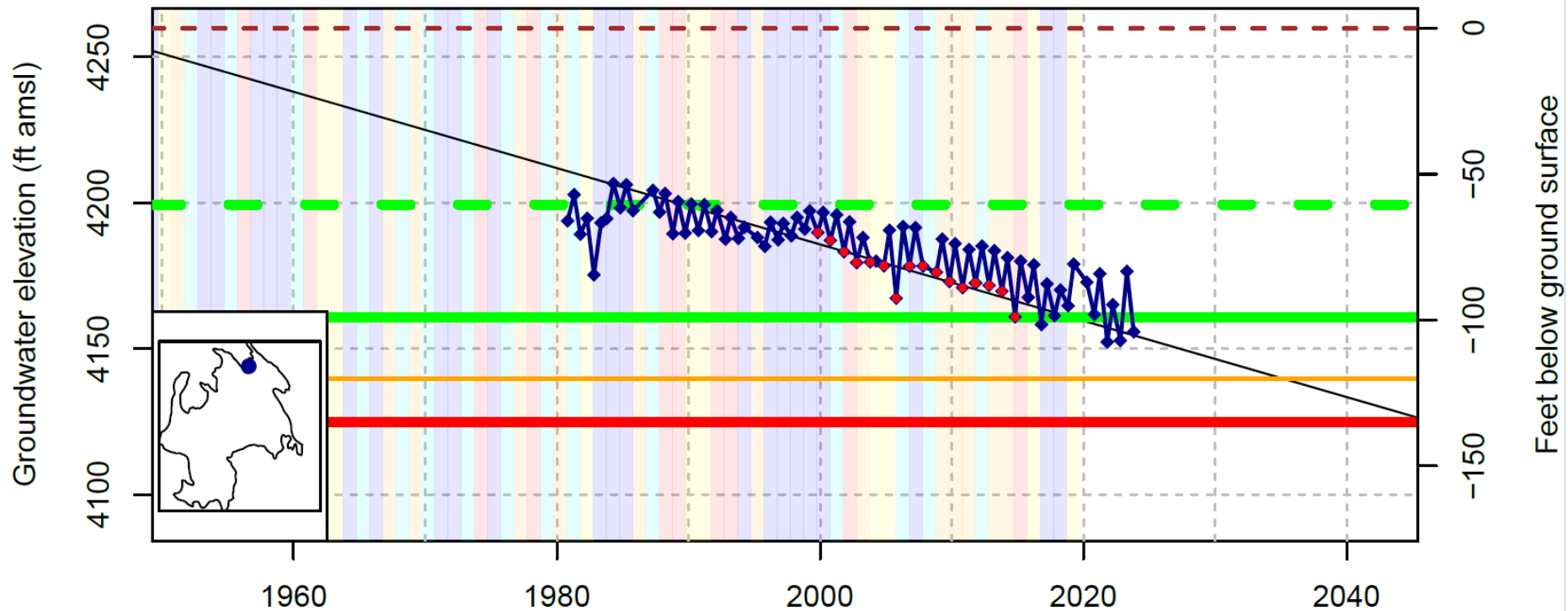


- - - Ground Surface (4245 ft amsl)
- Measurable Objective (Upper) (4242 ft amsl)
- Measurable Objective (Lower) (4231 ft amsl)
- Trigger - Soft Landing (4226 ft amsl)
- Minimum Threshold (4211 ft amsl)
- Linear Interpolation Intercept: 4232 ft amsl, Slope: -0.2984 Feet/Year

- Water Year Type
- Critical
 - Dry
 - Below Normal
 - Above Normal
 - Wet

Monitoring Network

DWR Stn_ID: ; well_code: 419662N1219633W001; well_name: 48N01W34B001M; well_swn: 48N01W34B001M



- - - Ground Surface (4260 ft amsl)
- Measurable Objective (Upper) (4199 ft amsl)
- Measurable Objective (Lower) (4161 ft amsl)
- Trigger - Soft Landing (4140 ft amsl)
- Minimum Threshold (4125 ft amsl)
- Linear Interpolation Intercept: 4166 ft amsl, Slope: -1.3072 Feet/Year

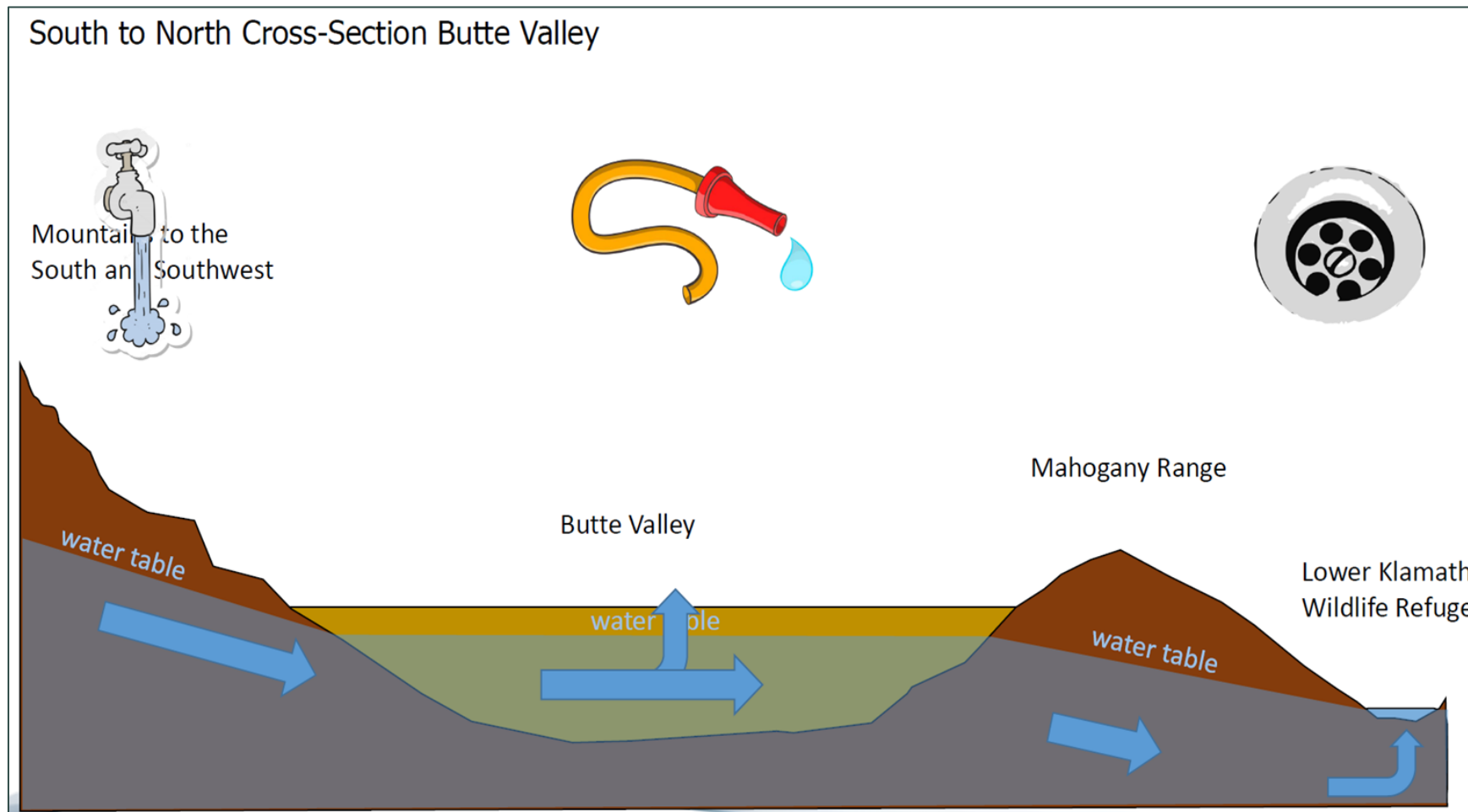
- Water Year Type
- Critical
 - Dry
 - Below Normal
 - Above Normal
 - Wet

Finding 2: To support water levels in Butte Valley above the Minimum Thresholds (in the 4100s' range), sufficient subsurface outflow toward Tulelake/Lost River is needed (water levels in the low 4000s' range) => affects sustainable yield in Butte Valley.

Evidence: Conceptual Model, BVIHM

Simplified Conceptual Model

sustainable yield = recharge - necessary outflow to NE (Lower Klamath Wildlife/Tulelake/Lost River)



Groundwater Model Update

Butte Valley Integrated Hydrologic Model (BVIHM)

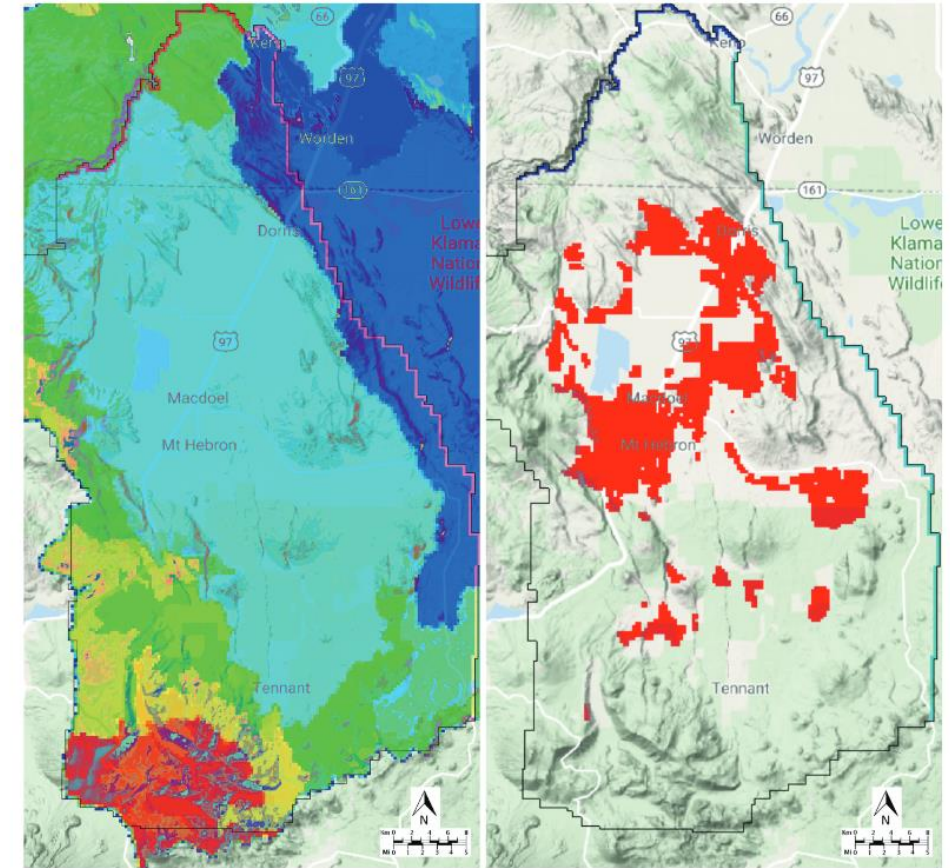
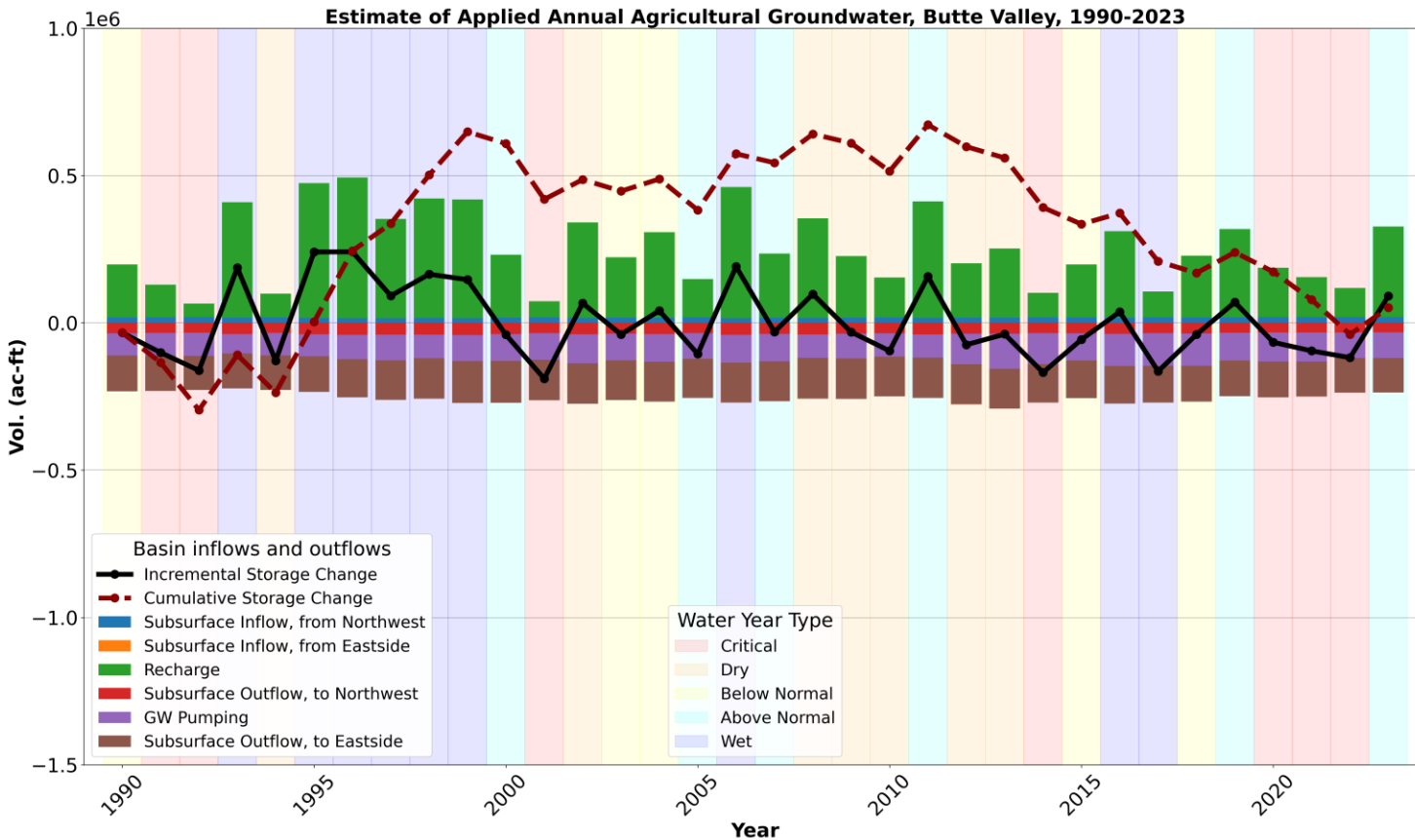
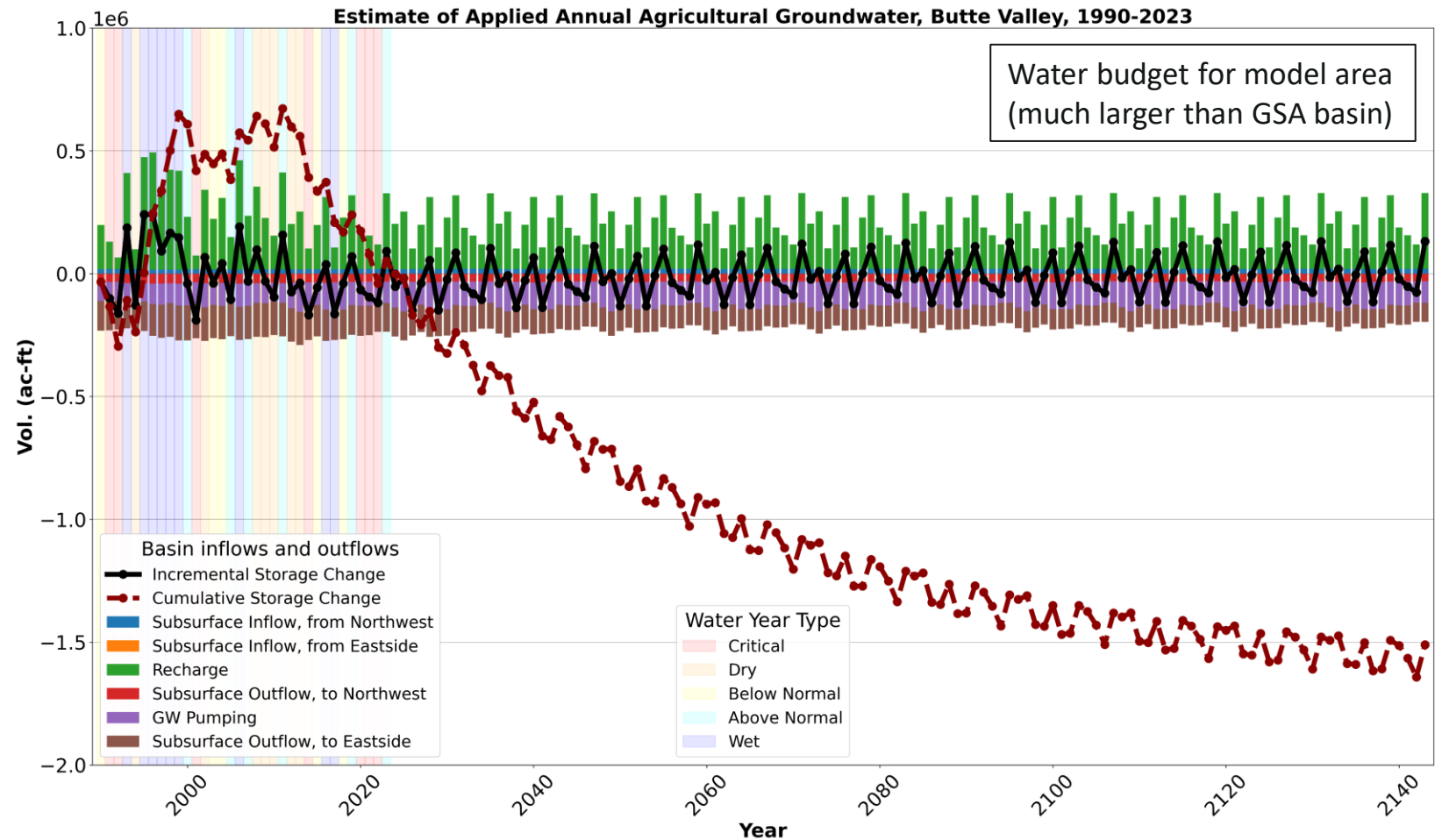


Figure 1.39: Spatial distribution of long-term average recharge (left, red: highest amounts of recharge, dark blue: lowest amounts of recharge) and location of areas with groundwater pumping (right). Black outline: BVIHM simulation domain boundary.

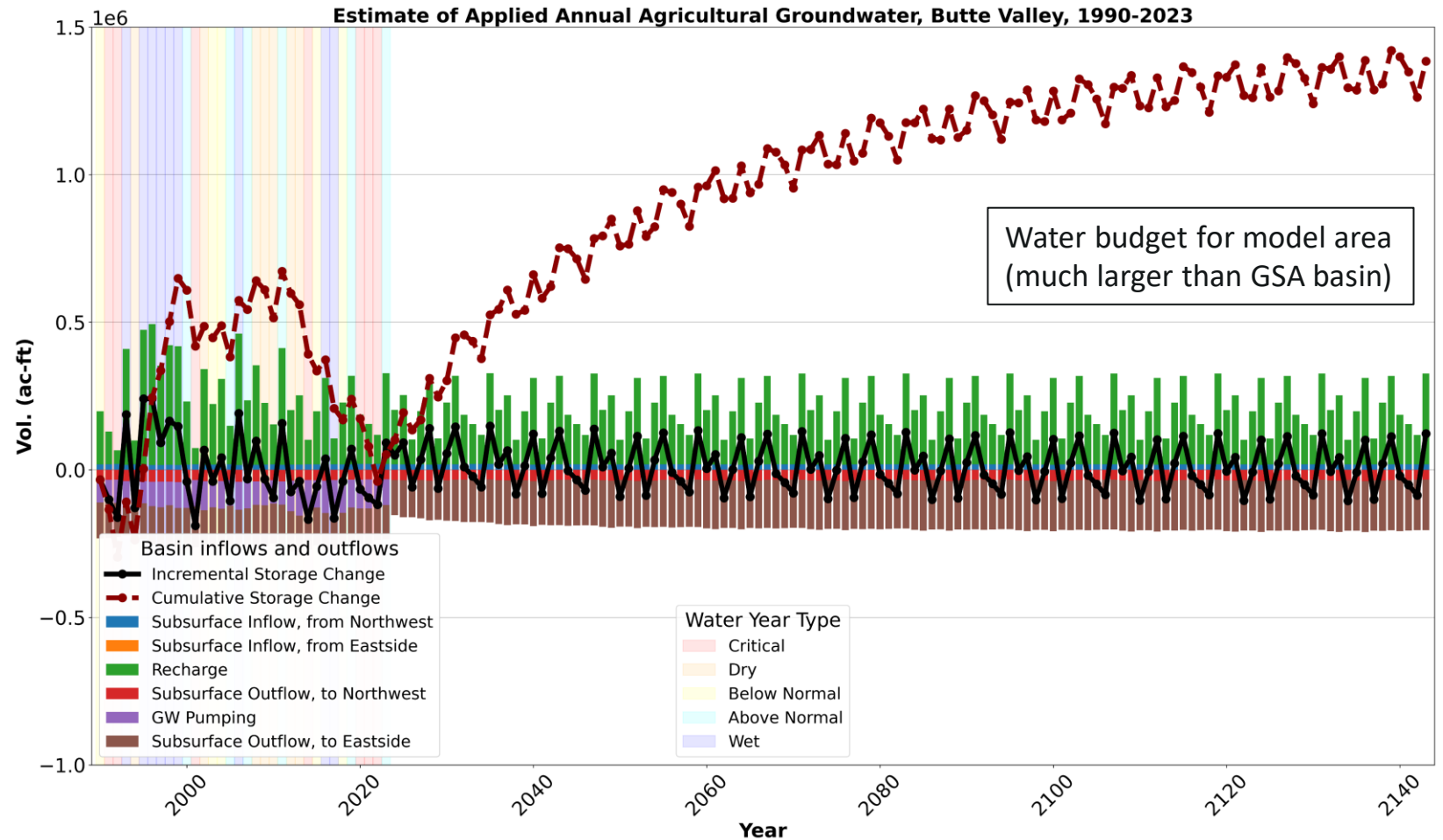
BVIHM: Where are we heading, worst case?

- 2011-2023 driest megadrought climate, repeated through mid-21st century
- 2011-2023 pumping, repeated



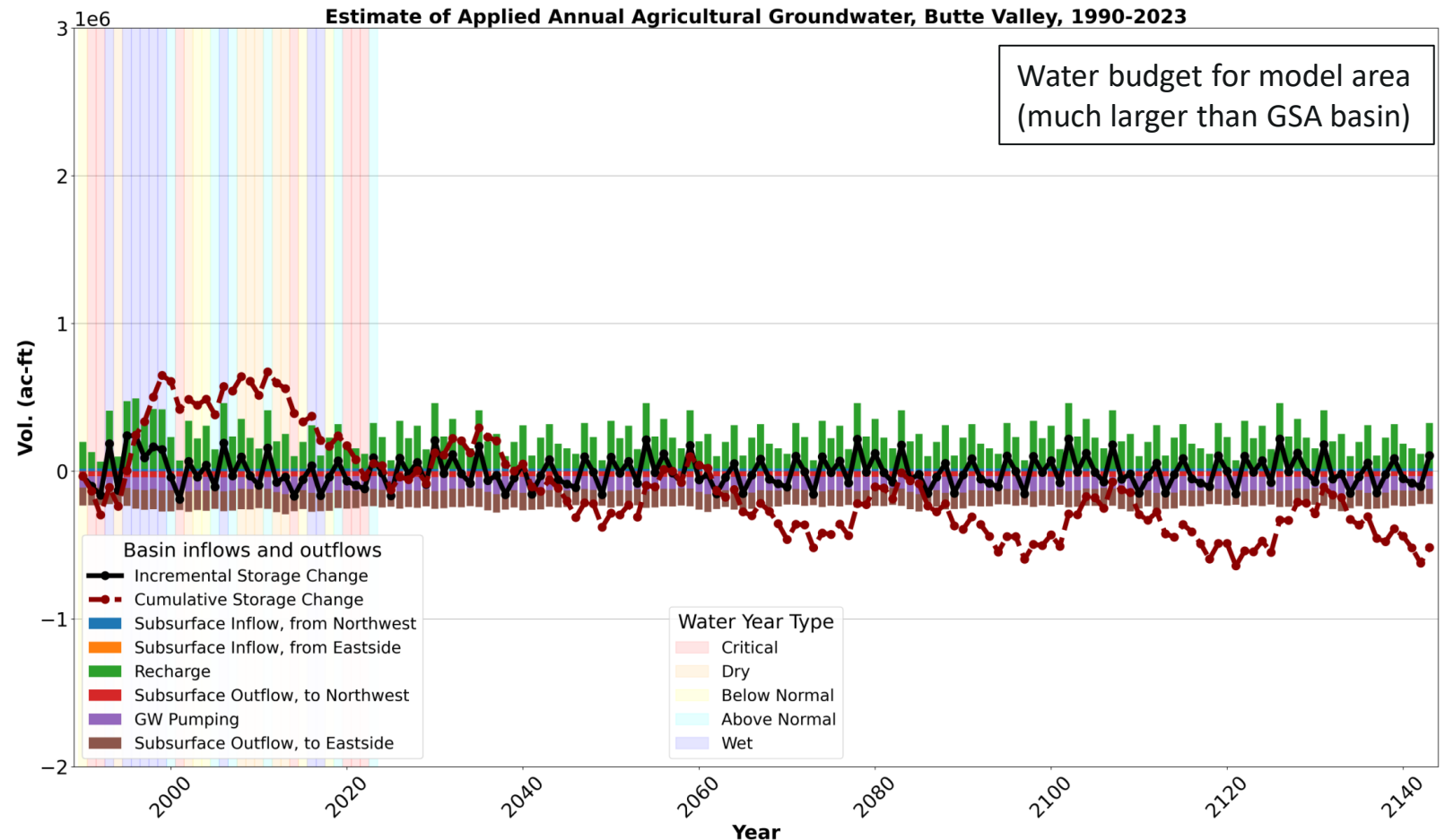
BVIHM: Unimpaired scenario (super-drought)

- 2011-2023 driest megadrought climate, repeated through mid-21st century
- no pumping after 2023



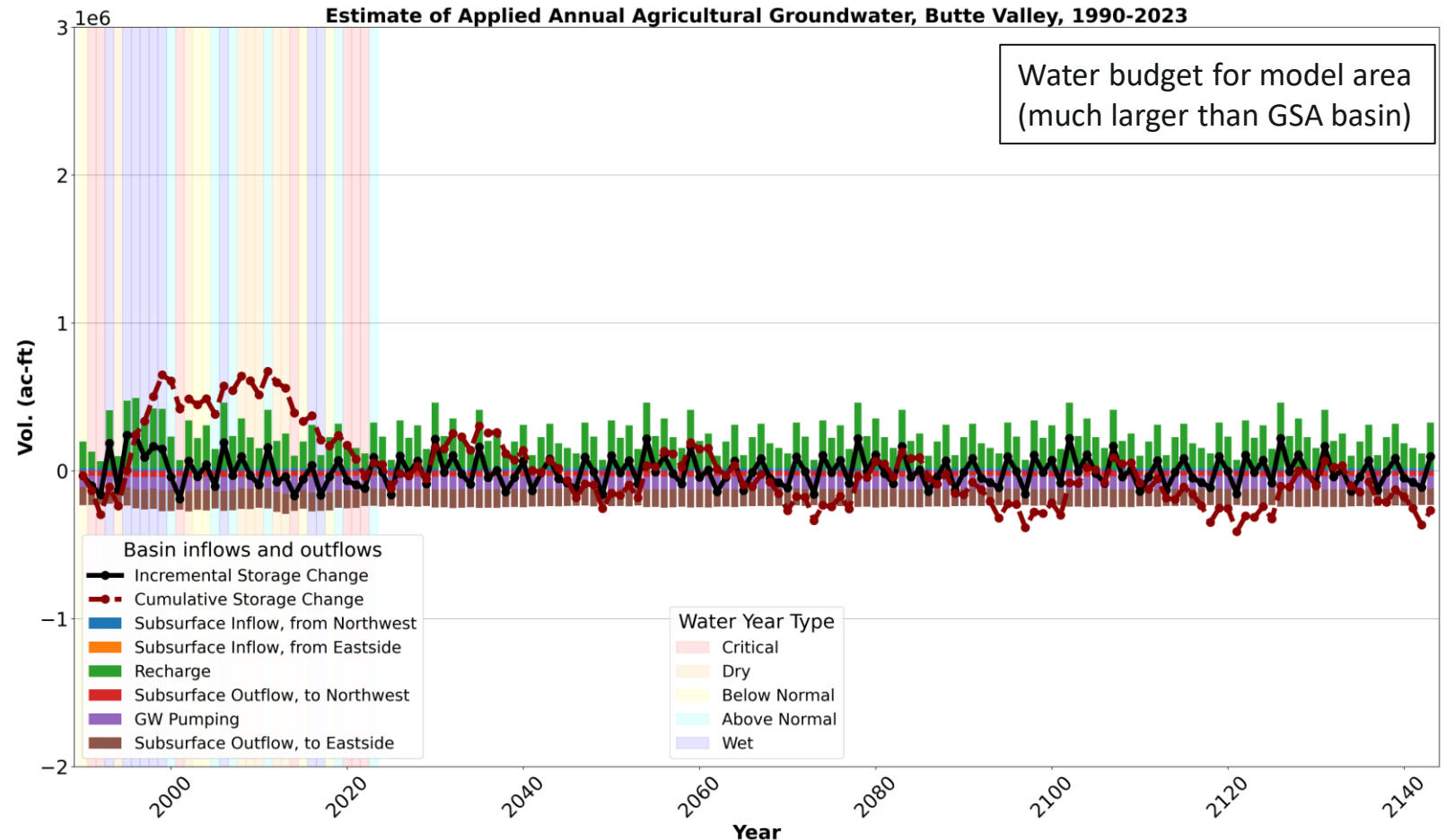
BVIHM: Where are we heading, not so worst case?

- 2000-2023 megadrought climate, repeated through mid-21st century
- 2000-2023 pumping repeated



BVIHM: Sustainable Yield (mega-drought)

- 2000-2023 megadrought climate, repeated through mid-21st century
- 2023 pumping fixed all years thereafter (65,000 acft, which is the average for 1990-2014)

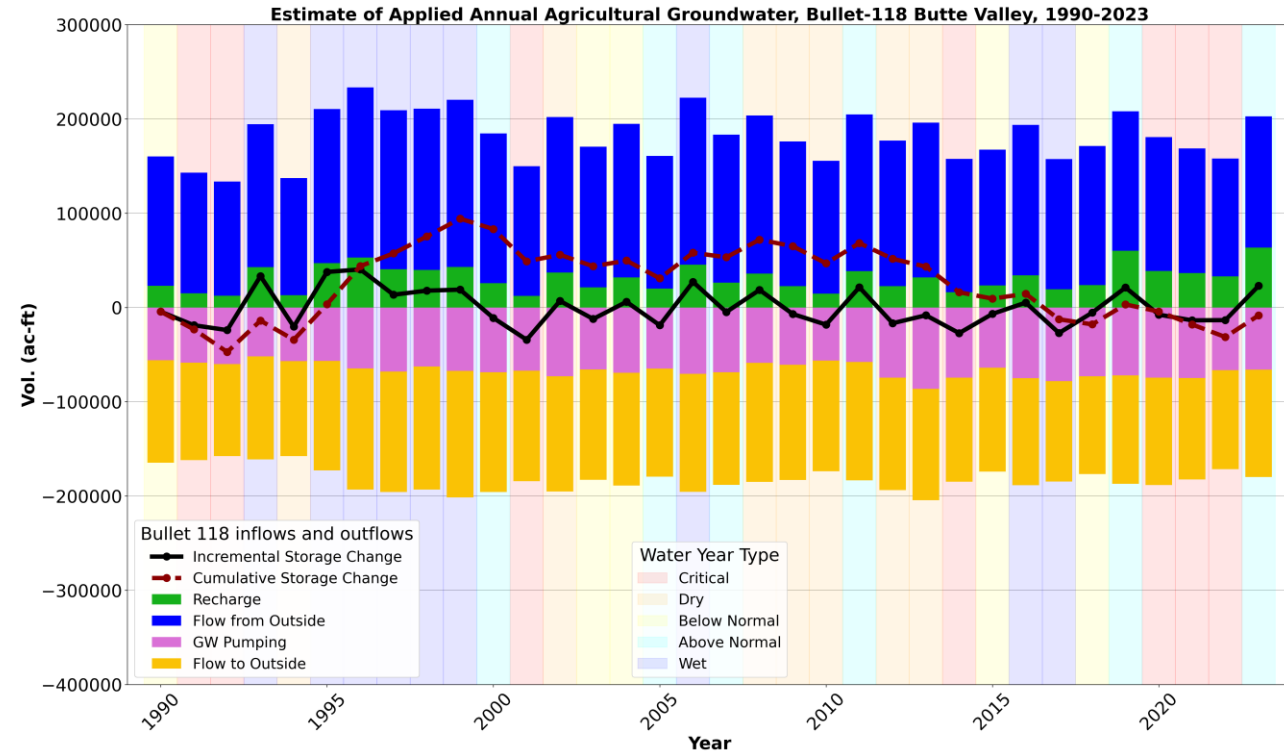


Finding 3: Revise If we revise sustainable yield to 10% less than the average 2011-2023 about 65,000-67,000 acft (same as 1990-2014 average, similar to reported pumping of the 1970s), check if levels are stabilizing in the 5 years

Evidence: BVIHM

Model Update: Simulate Applied Groundwater in Bullet-118 Butte Valley, CA, 1990-2023

Simulate Applied Groundwater in the Bullet-118 Butte Valley, CA, 1990-2023					
Water Year	Pumping (ac-ft)	Water Year	Pumping (ac-ft)	Water Year	Pumping (ac-ft)
1990	55,990	2001	67,059	2012	74,464
1991	58,563	2002	72,904	2013	86,338
1992	60,079	2003	65,689	2014	74,332
1993	51,851	2004	69,236	2015	63,969
1994	56,836	2005	64,810	2016	74,991
1995	56,676	2006	70,371	2017	78,074
1996	64,641	2007	68,753	2018	73,007
1997	67,982	2008	58,657	2019	71,977
1998	62,548	2009	60,781	2020	74,496
1999	67,218	2010	56,341	2021	74,729
2000	68,704	2011	57,689	2022	
		2023		2023	



Options

1. More restrictive:
 - Revise minimum thresholds to be at lowest historic levels
 - Stepwise lowering of everyone's pumping output
 - Low likelihood of approval by advisory committee, GSA board due to impact on economic livelihood of the basin
2. Tech Team suggested (discussed later)
3. Less restrictive:
 - No or very limited well mitigation program
 - No or very limited monitoring and management of groundwater use
 - Fail GSP revision
 - Proceed into Chapter 11
 - Management under SWRCB

Core Action Option 2

- Keep minimum thresholds and extended minimum thresholds as defined in 2022 GSP
- Requires a **strong well mitigation program** to avoid significant undesirable results
- Sustainable yield of about 65,000-67,000 acft (about 10% less than 2012-2023 average → exact number to be finalized after reviewing recent landuse data)

Tech-Team Assessment of Most Likely to Succeed: Core Action 2

- Follows the intent of the original GSP
- Keeps basin in no-overdraft conditions
- Avoids significant undesirable results through strengthened well mitigation program
- Provides GSA operational flexibility for managing groundwater pumping, adjusting sustainable yield in response to climate variation, at 5 year-increments
- Will likely allow groundwater use at about 65,000-67,000 acft (similar to 1990-2014; 10% less than the average 2011-2023)
 - Can be achieved through irrigation efficiency improvements at reasonable economic cost to agricultural sector
 - Improve metering of groundwater pumping, implement assessment of ET, update BVIHM and evaluation of sustainable yield
- Cost of providing well mitigation program is fraction of economic impact if agricultural production were reduced by one-quarter, one-third, one-half, or more

Five-Year Action Plan under Option 2

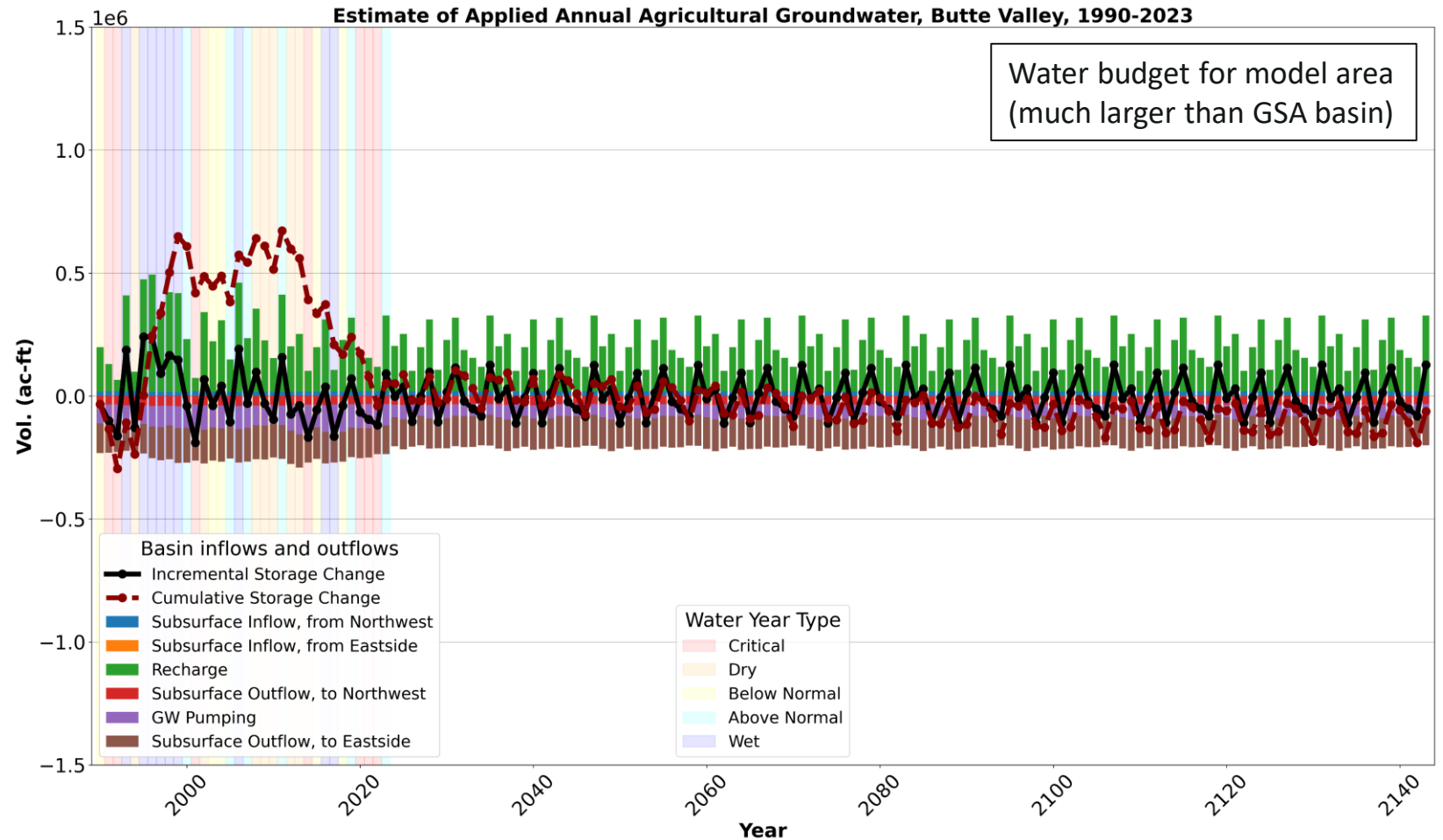
- Plan for public supply systems to replace most shallow domestic wells (well depth at least 400 ft bgs, top of screen) => build future resiliency
- Plan for well deepening outside public supply systems to depths of at least 200 ft bgs (top of screen) => build future resiliency
- Set sustainable yield at 65,000-67,000 acft for the next 5 years:
 - Monitor baseline and improvements
 - should lead to some foreseeable stabilization of water levels, soft landing prior to 2042
- Plan for
 - 10% reduction of pumping



Thank You

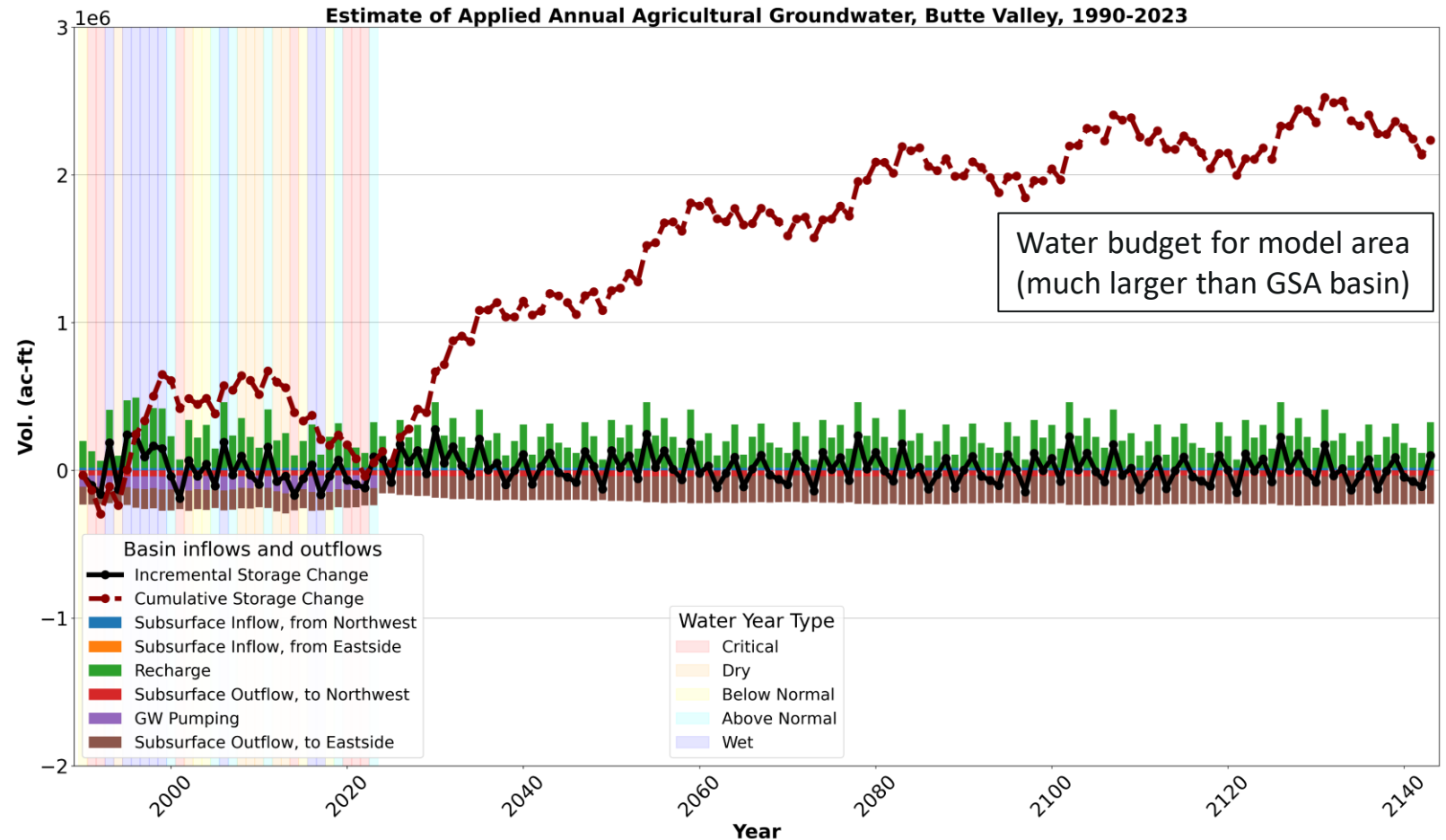
BVIHM: Sustainable Yield Future Scenario

- 2011-2023 driest megadrought climate, repeated through mid-21st century
- 50% of 2011-2023 pumping, repeated



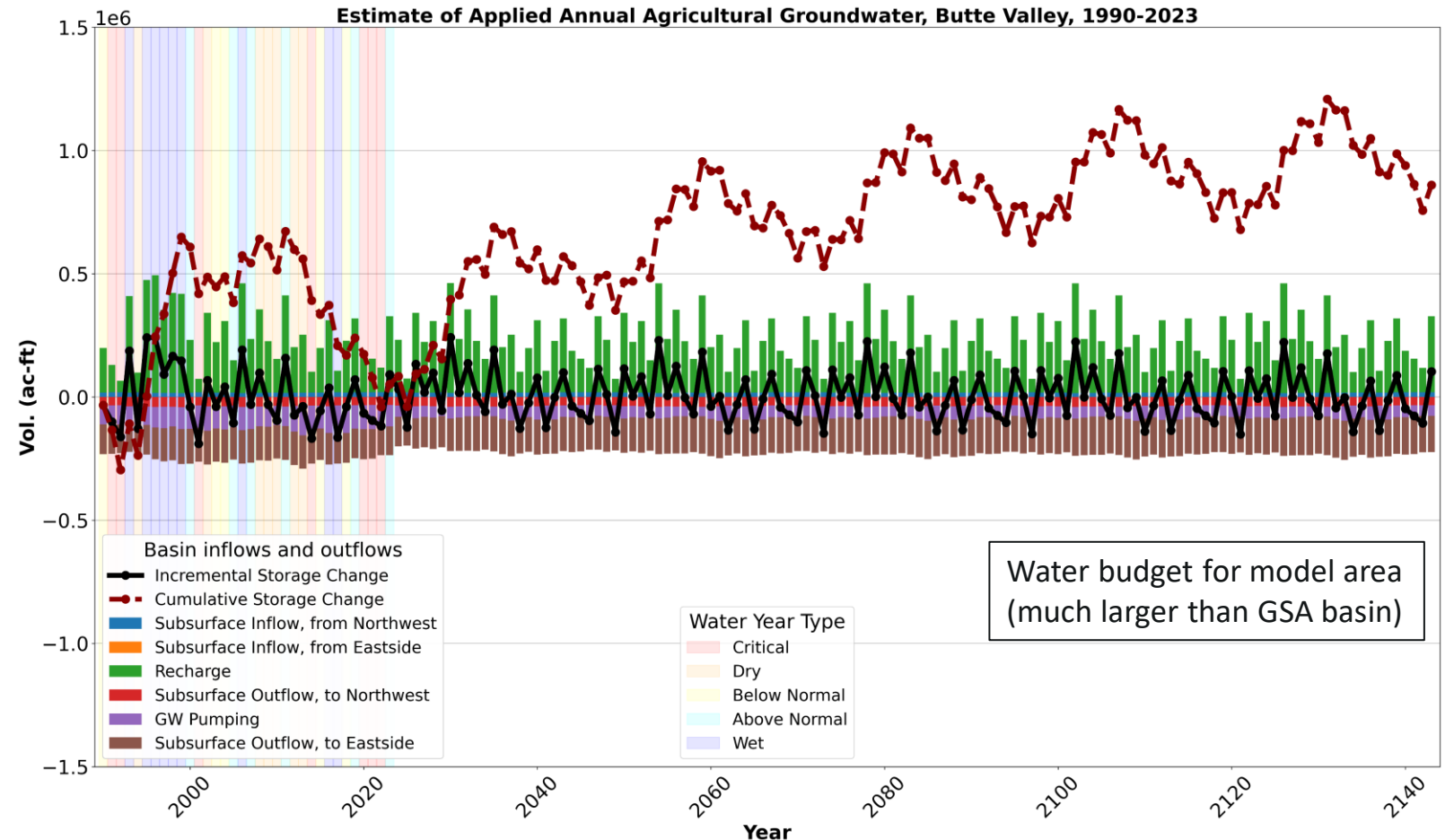
BVIHM: Unimpaired scenario (mega-drought)

- 2000-2023 megadrought climate, repeated through mid-21st century
- No pumping after 2023



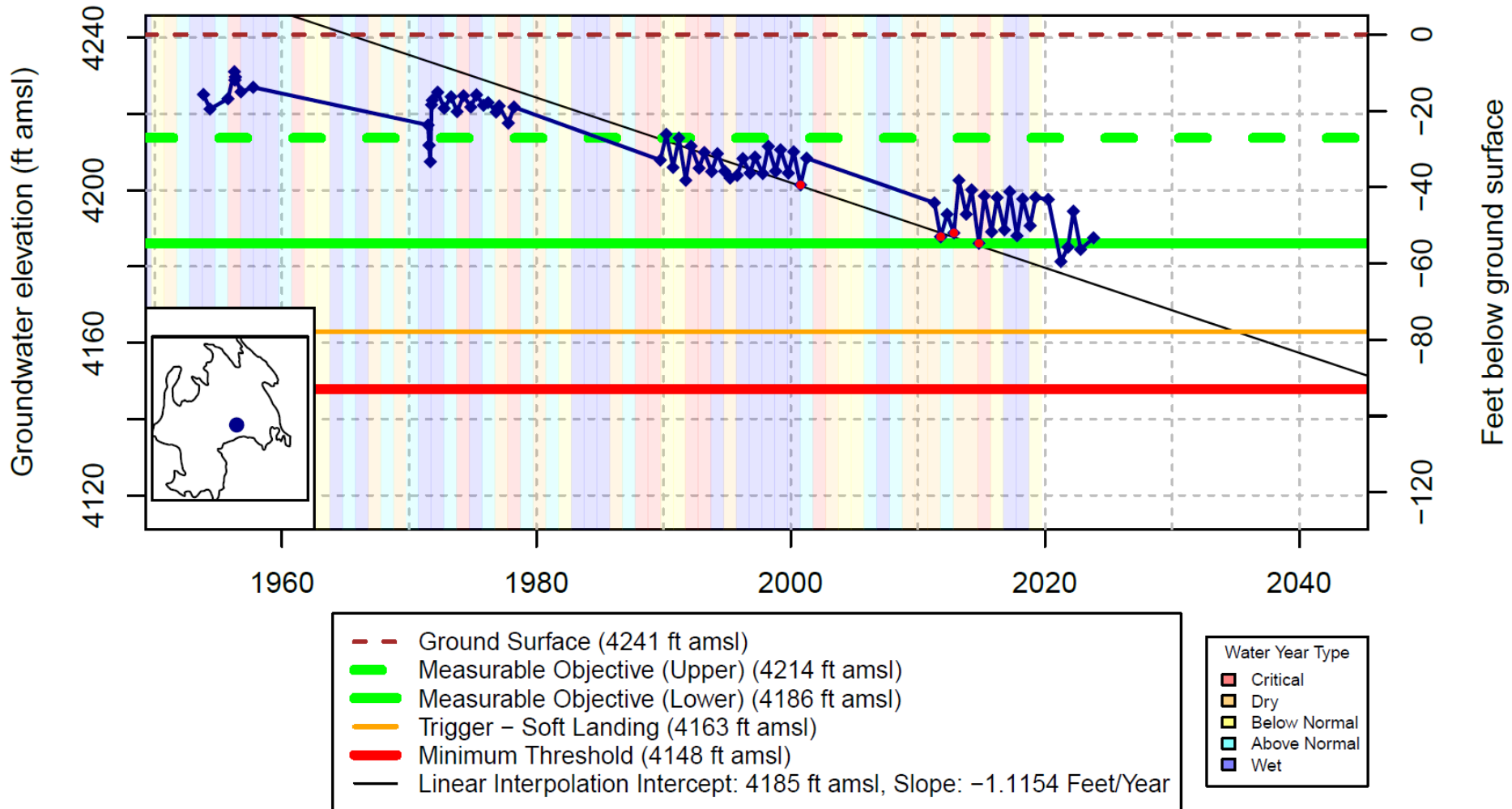
BVIHM: 50% pump reduction (mega-drought)

- 2000-2023 megadrought climate, repeated through mid-21st century
- 50% of 2000-2023 pumping, repeated



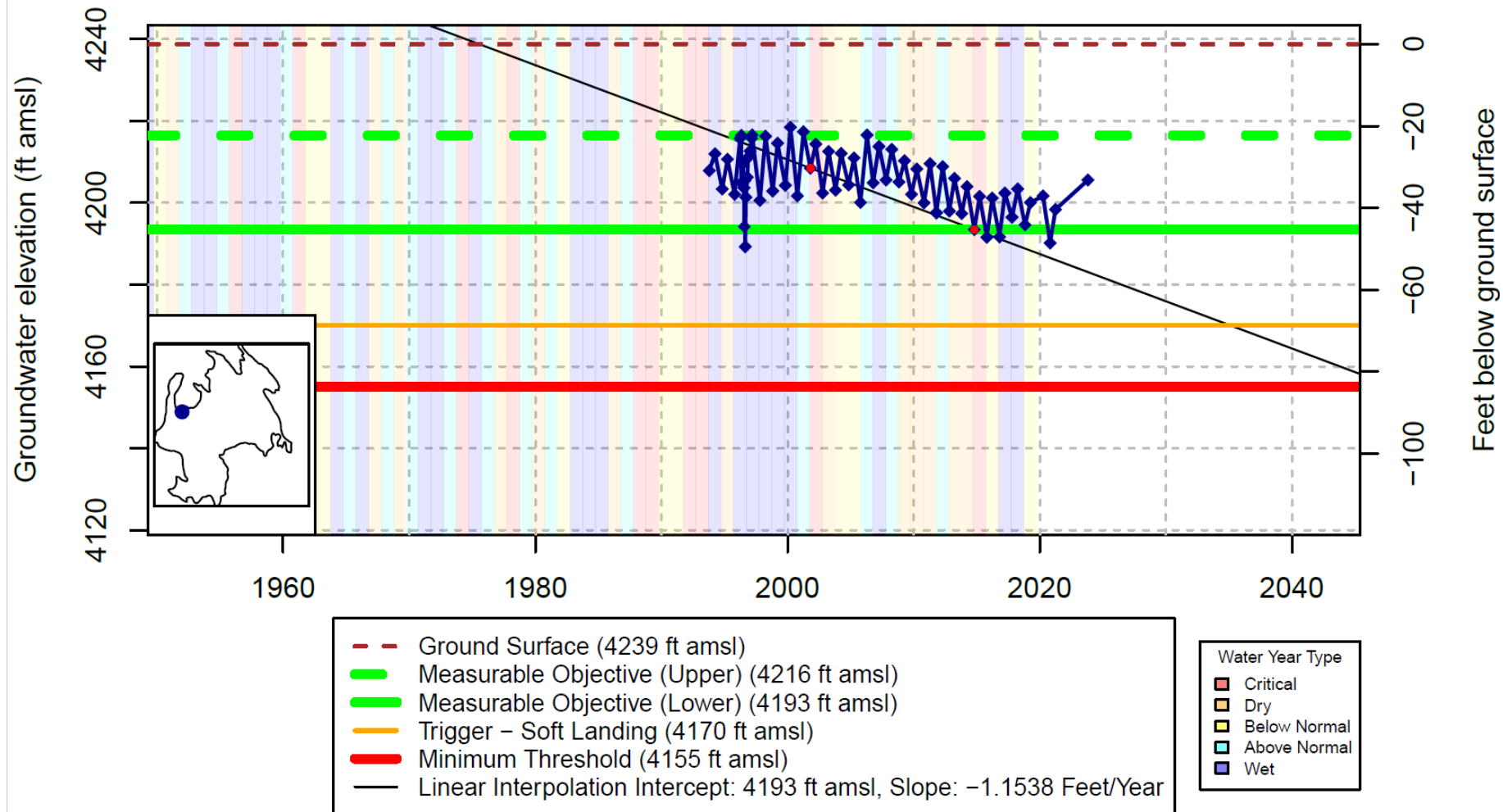
Monitoring Network

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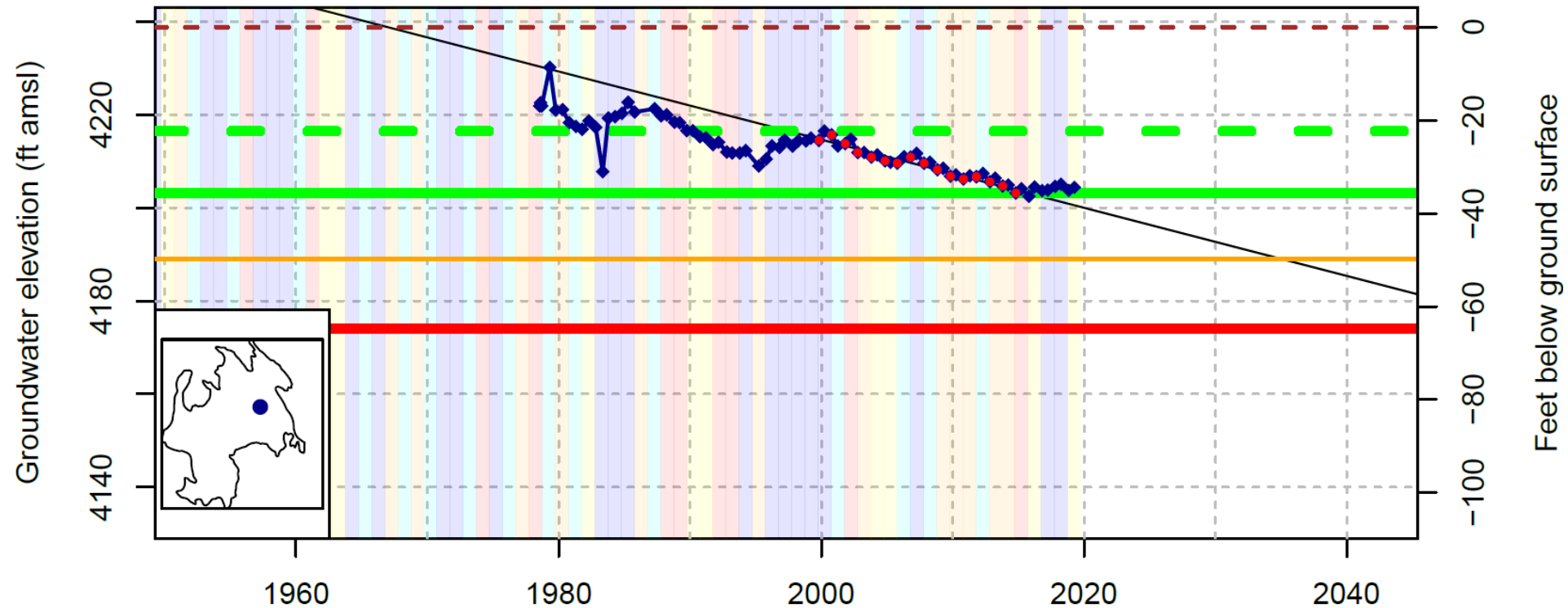
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Monitoring Network

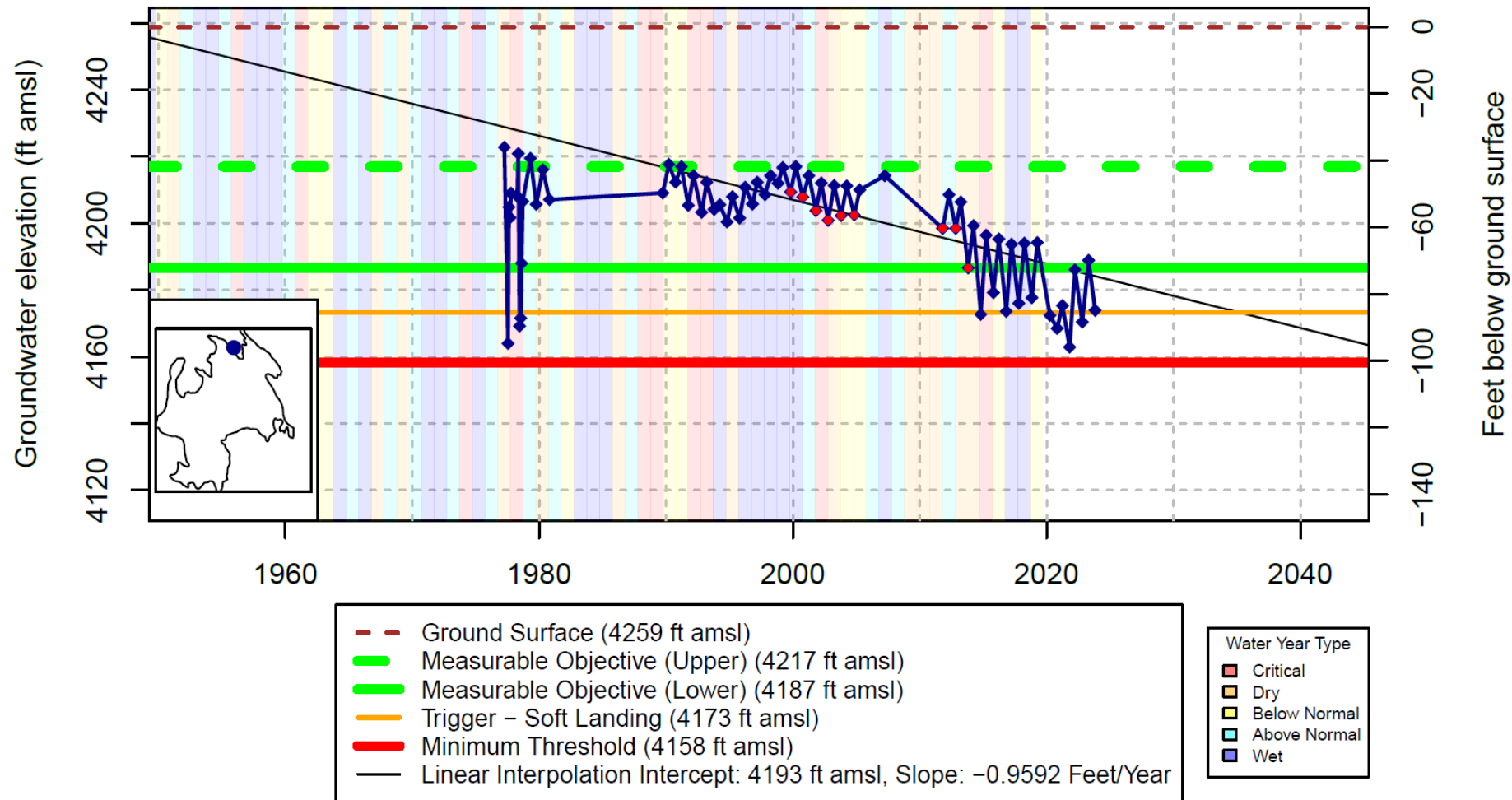
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- - Ground Surface (4239 ft amsl)
 - - Measurable Objective (Upper) (4216 ft amsl)
 - - Measurable Objective (Lower) (4203 ft amsl)
 - - Trigger - Soft Landing (4189 ft amsl)
 - - Minimum Threshold (4174 ft amsl)
 - - Linear Interpolation Intercept: 4204 ft amsl, Slope: -0.7318 Feet/Year
- Water Year Type
- Critical
 - Dry
 - Below Normal
 - Above Normal
 - Wet

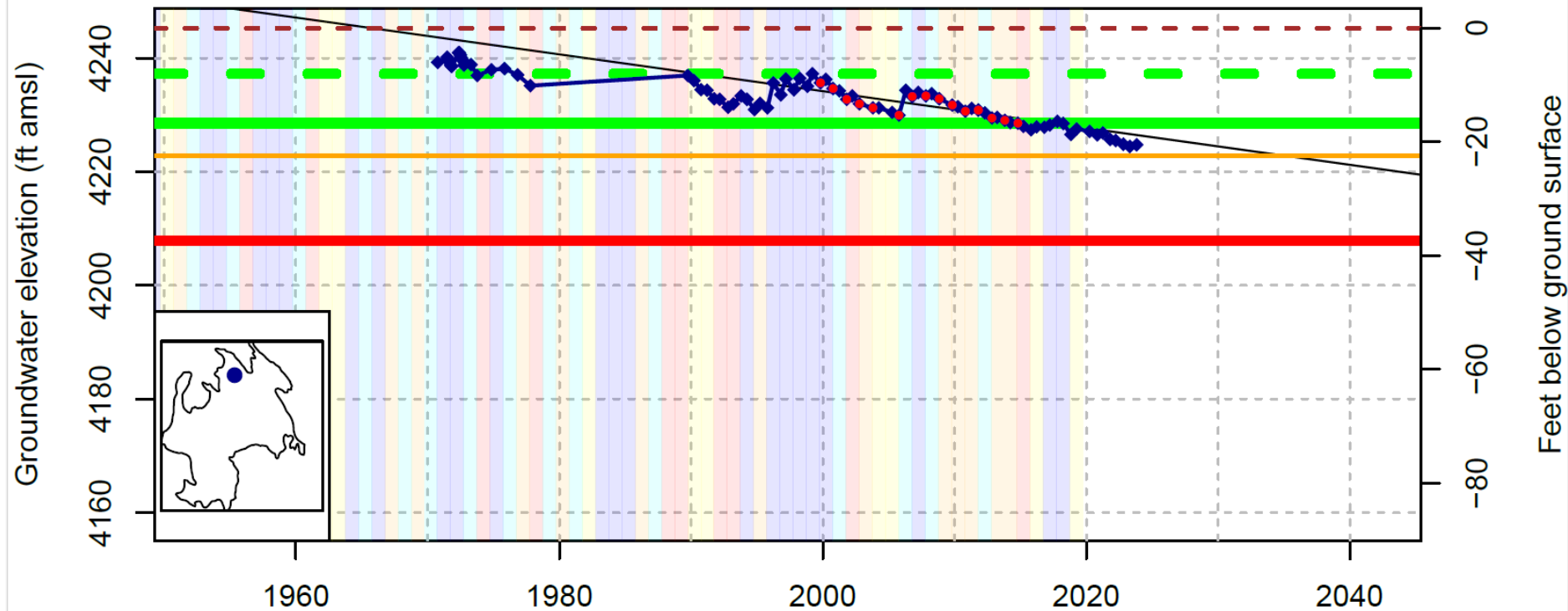
Monitoring Network

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Monitoring Network

DWR Stn_ID: ; well_code: 419519N1219958W001; well_name: 47N01W04D002M; well_swn: 47N01W04D002M



- - Ground Surface (4245 ft amsl)
- Measurable Objective (Upper) (4237 ft amsl)
- Measurable Objective (Lower) (4229 ft amsl)
- Trigger - Soft Landing (4223 ft amsl)
- Minimum Threshold (4208 ft amsl)
- Linear Interpolation Intercept: 4229 ft amsl, Slope: -0.3238 Feet/Year

- Water Year Type
- Critical
 - Dry
 - Below Normal
 - Above Normal
 - Wet