MAY ADVISORY COMMITTEE MEETINGS

Butte Valley Groundwater Advisory Committee Meeting

LARRY WALKER ASSOCIATES
science | policy | solutions

Stantec

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

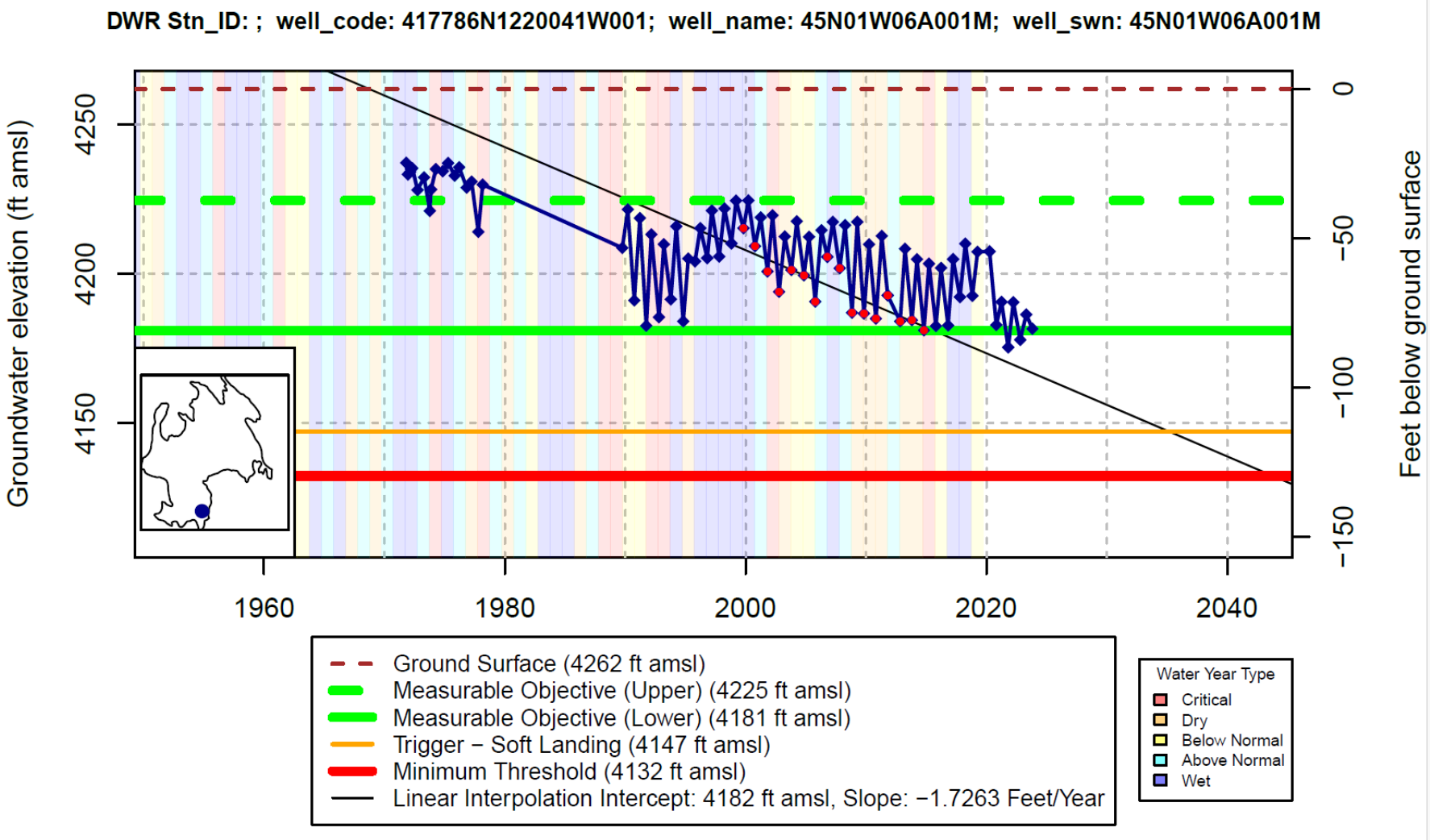
GSP Determination and Next Steps

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

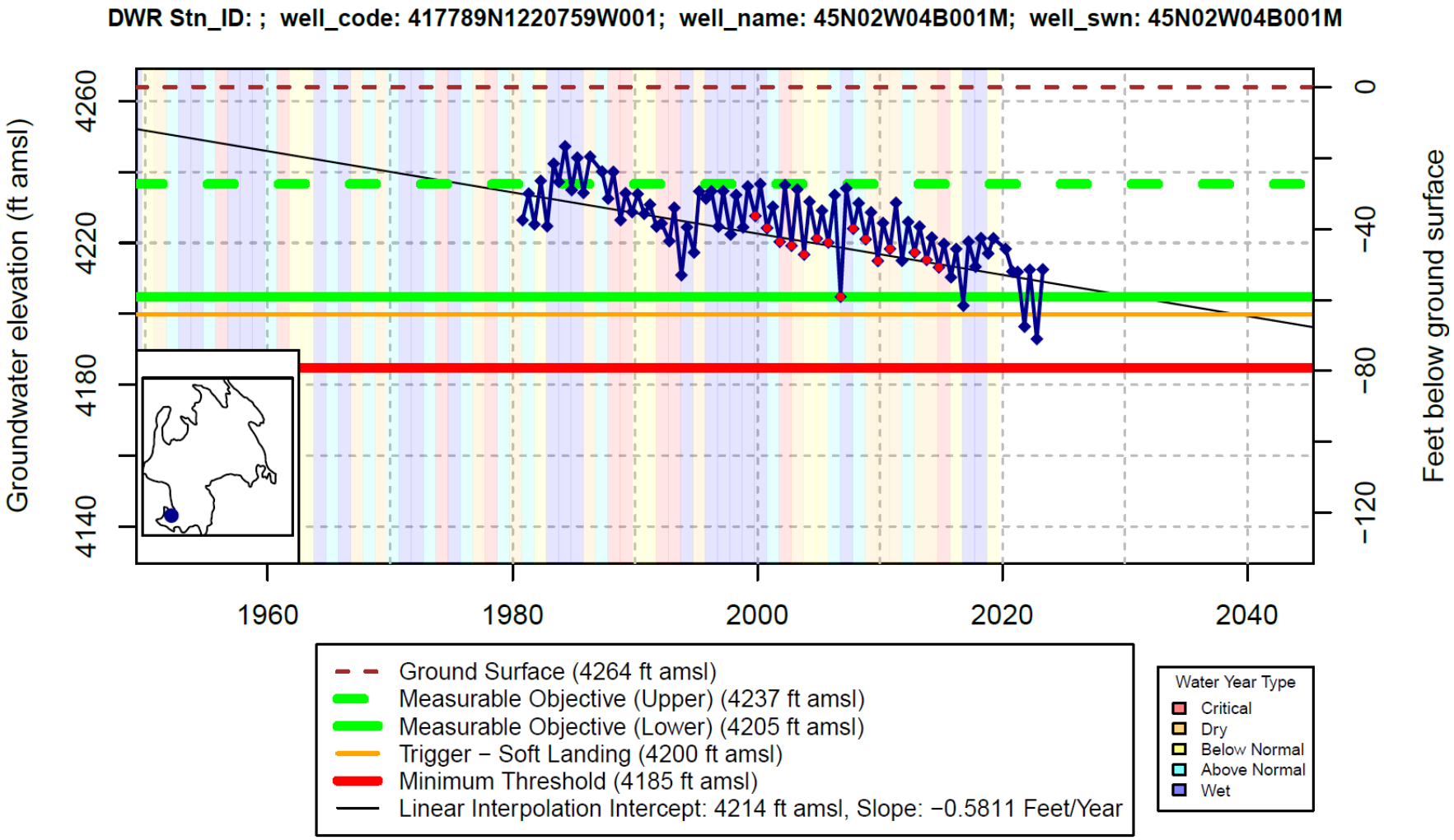
Finding 1: There is no immediate threat of water levels reaching Minimum Thresholds, but further long-term steady decline is not desirable nor acceptable.

Evidence: Representative Monitoring Network Hydrographs

Monitoring Network



Monitoring Network



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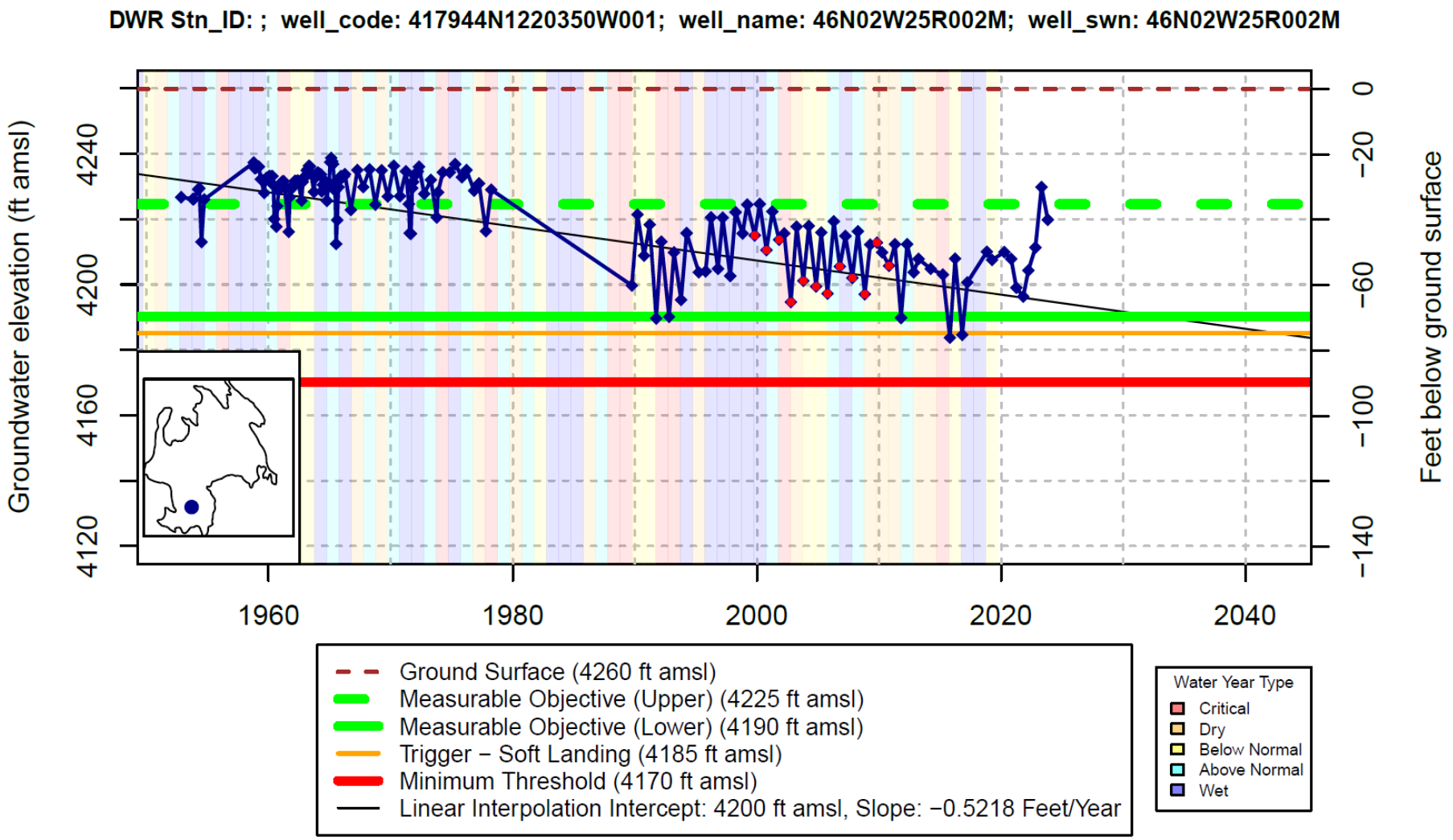

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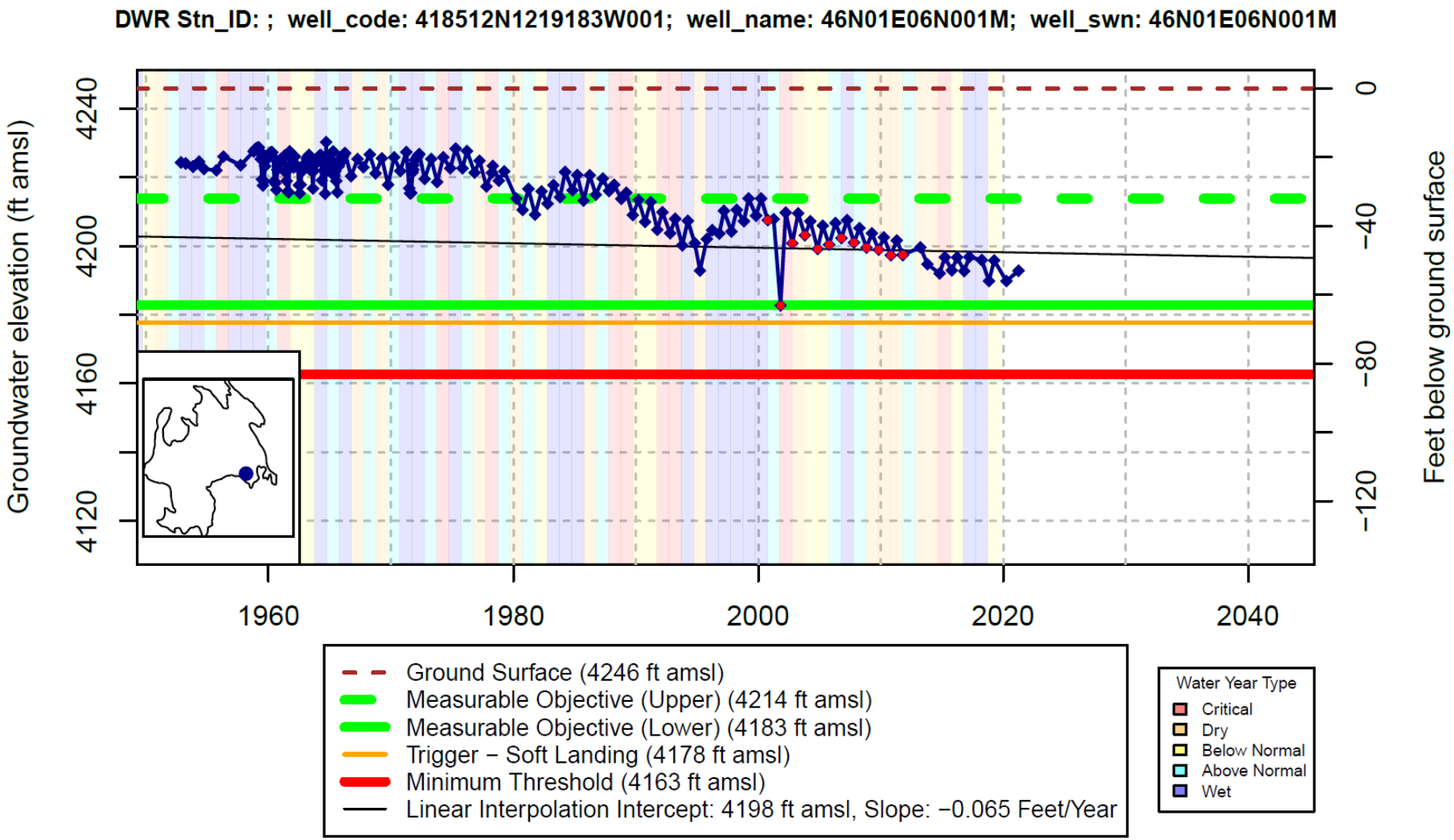

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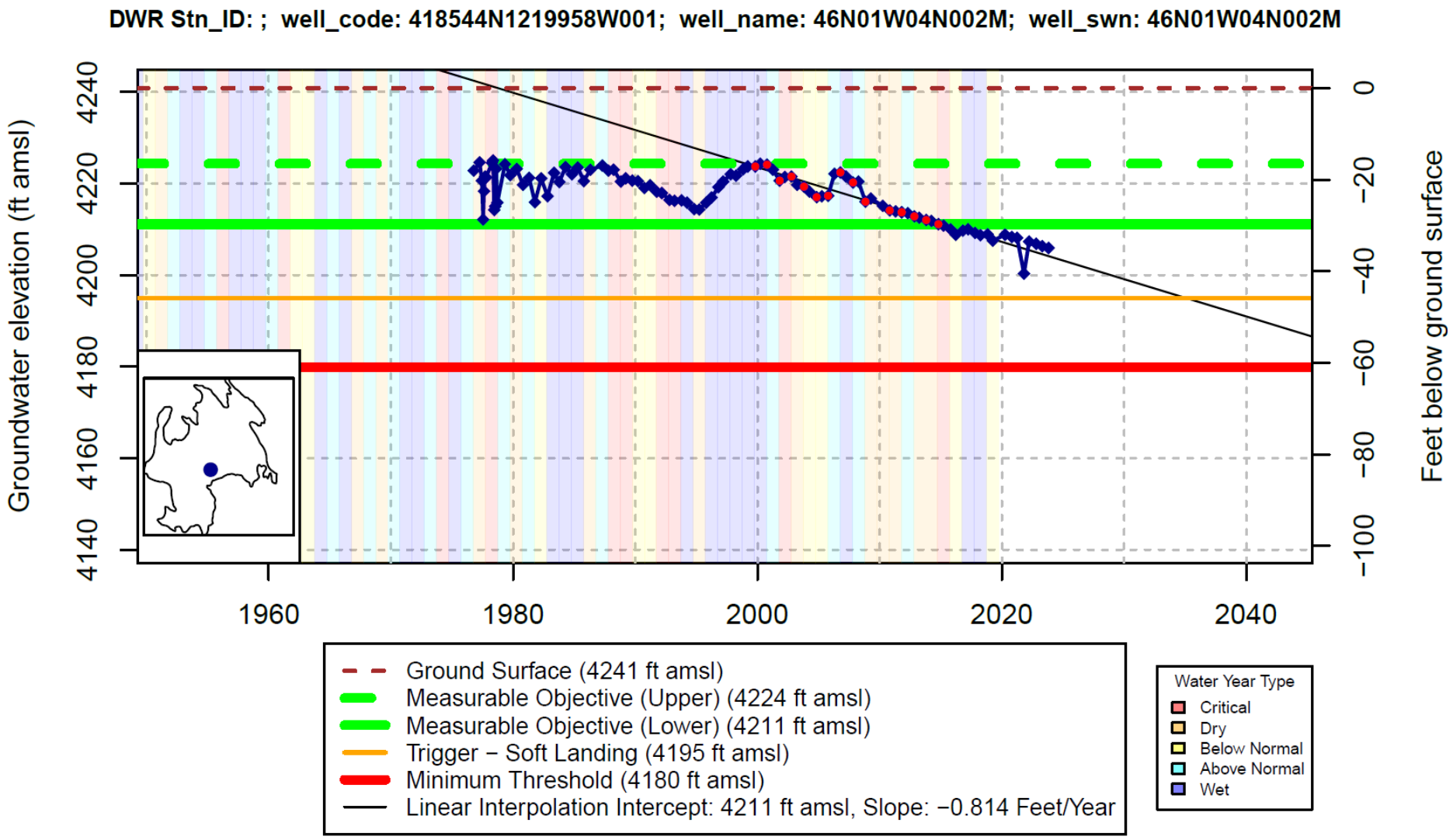

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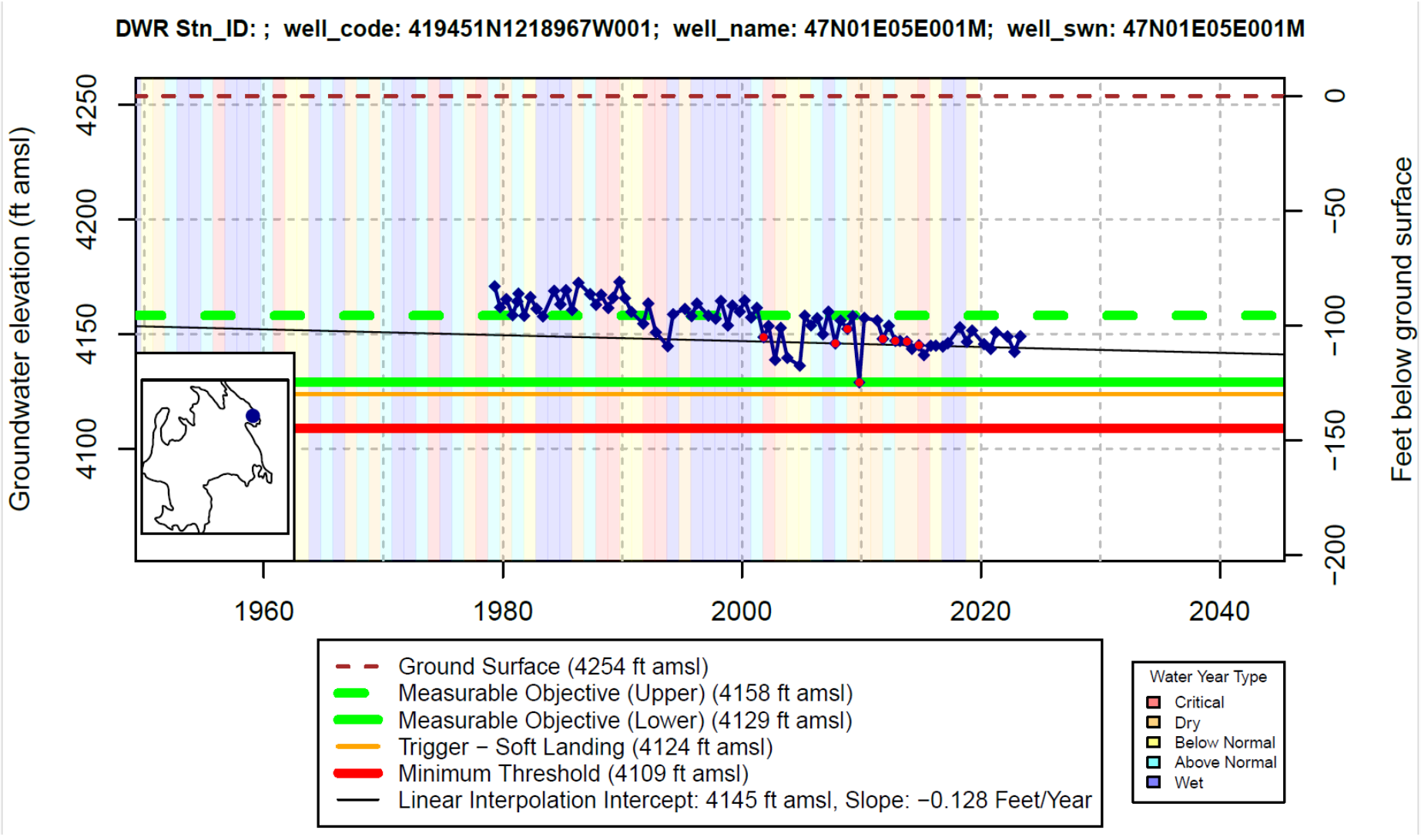

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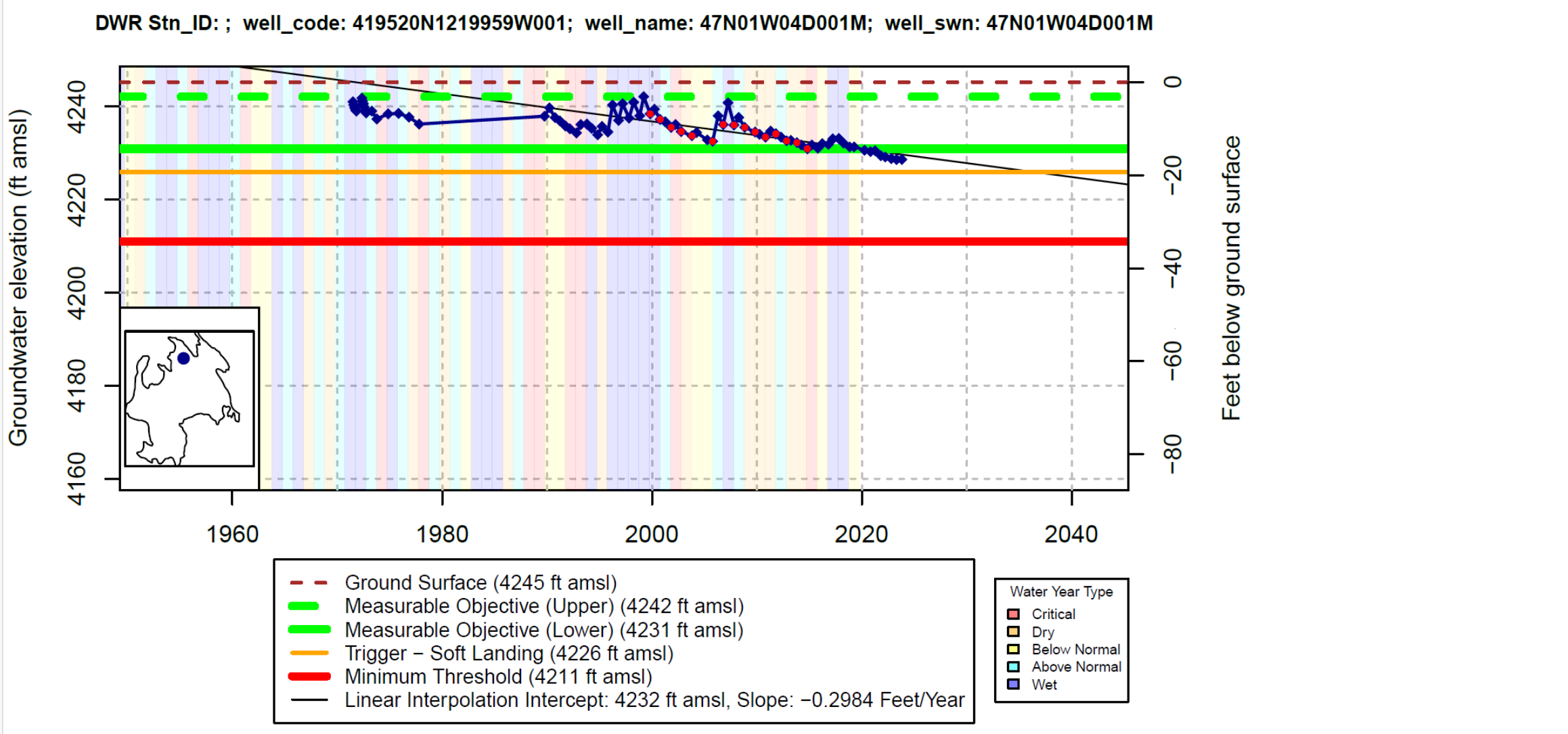

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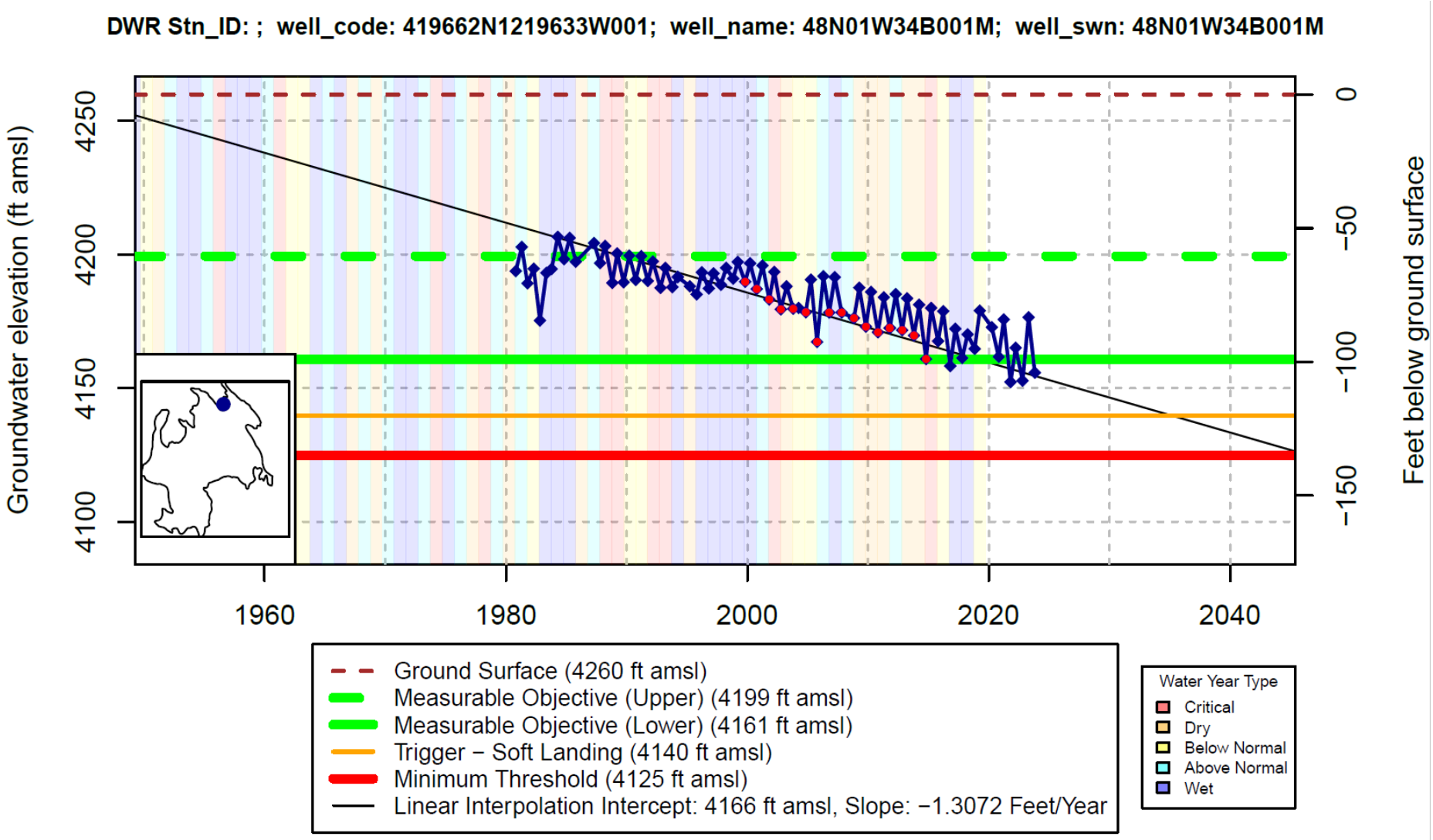
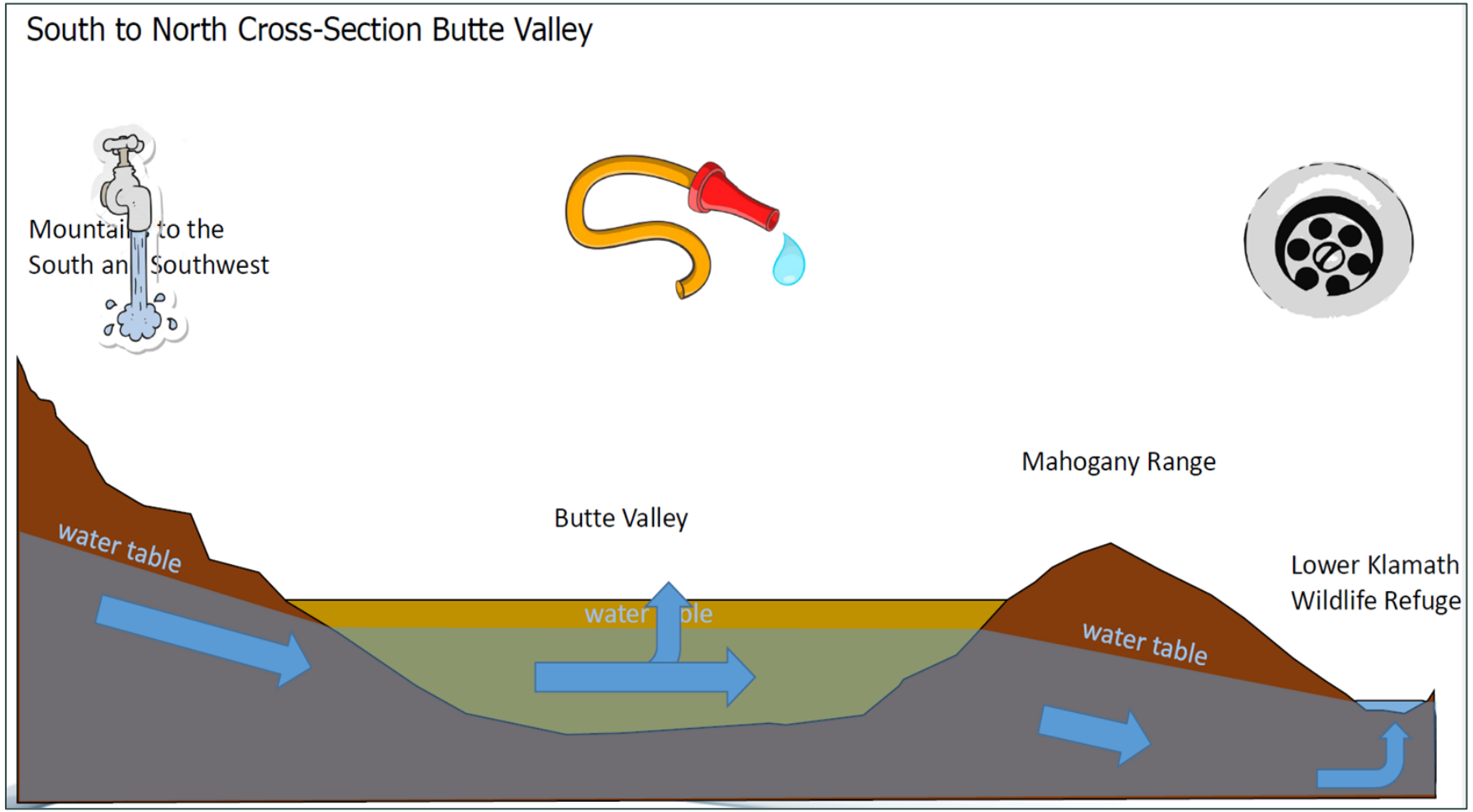


Finding 2: To support water levels in Butte Valley above the Minimum Thresholds (in the 4100s' range), sufficient subsurface outflow toward Tulelake/Lost River is needed (water levels in the low 4000s' range) => affects sustainable yield in Butte Valley.

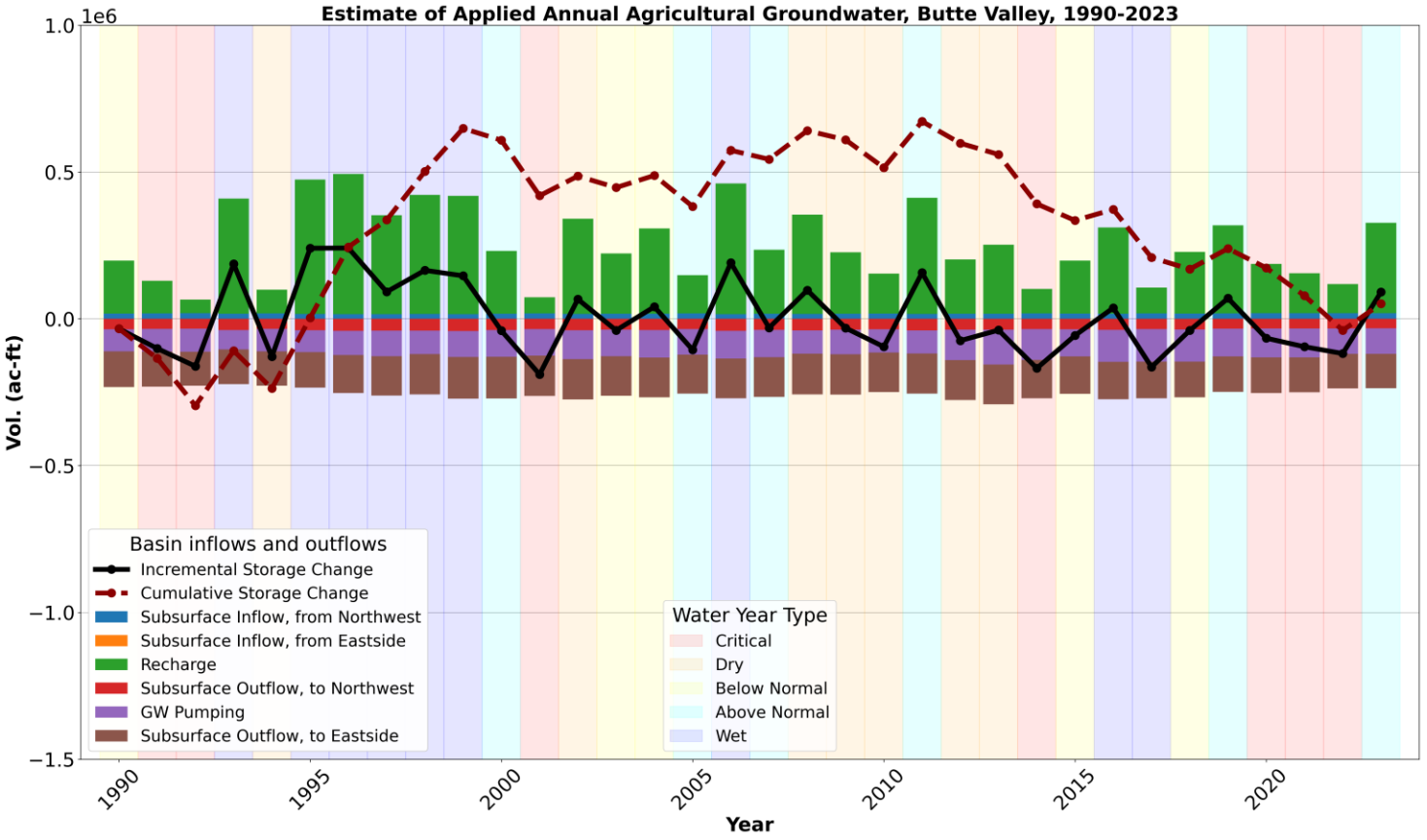
Evidence: Conceptual Model, BVIHM

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)



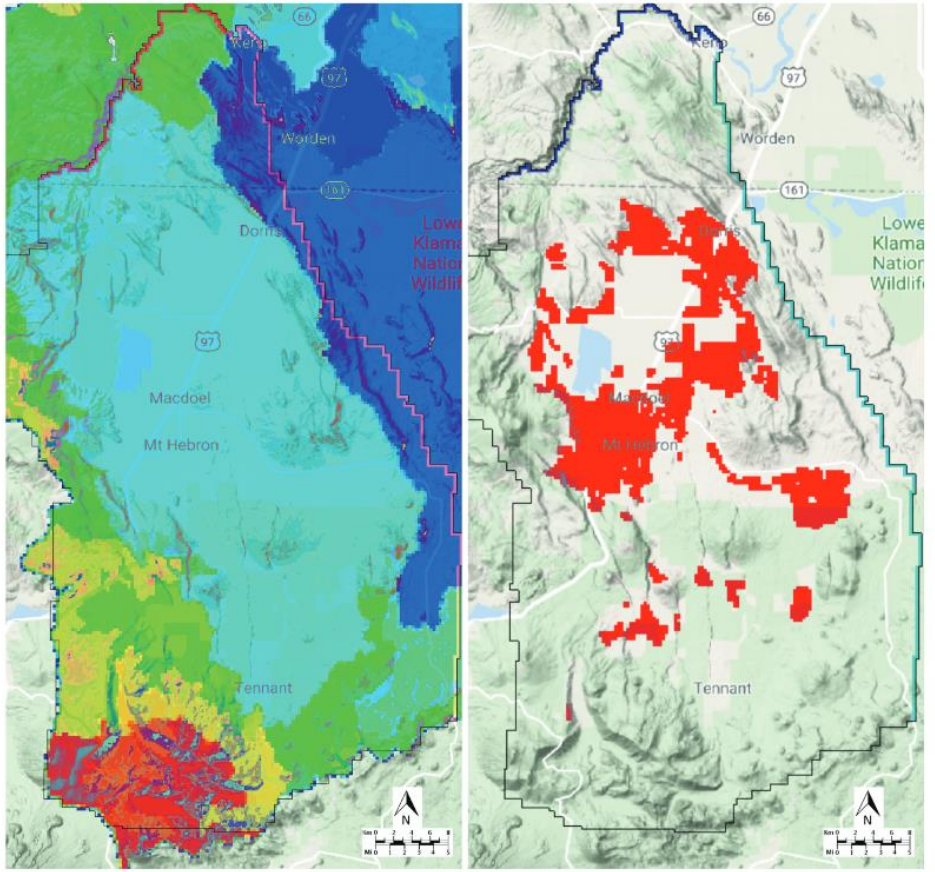
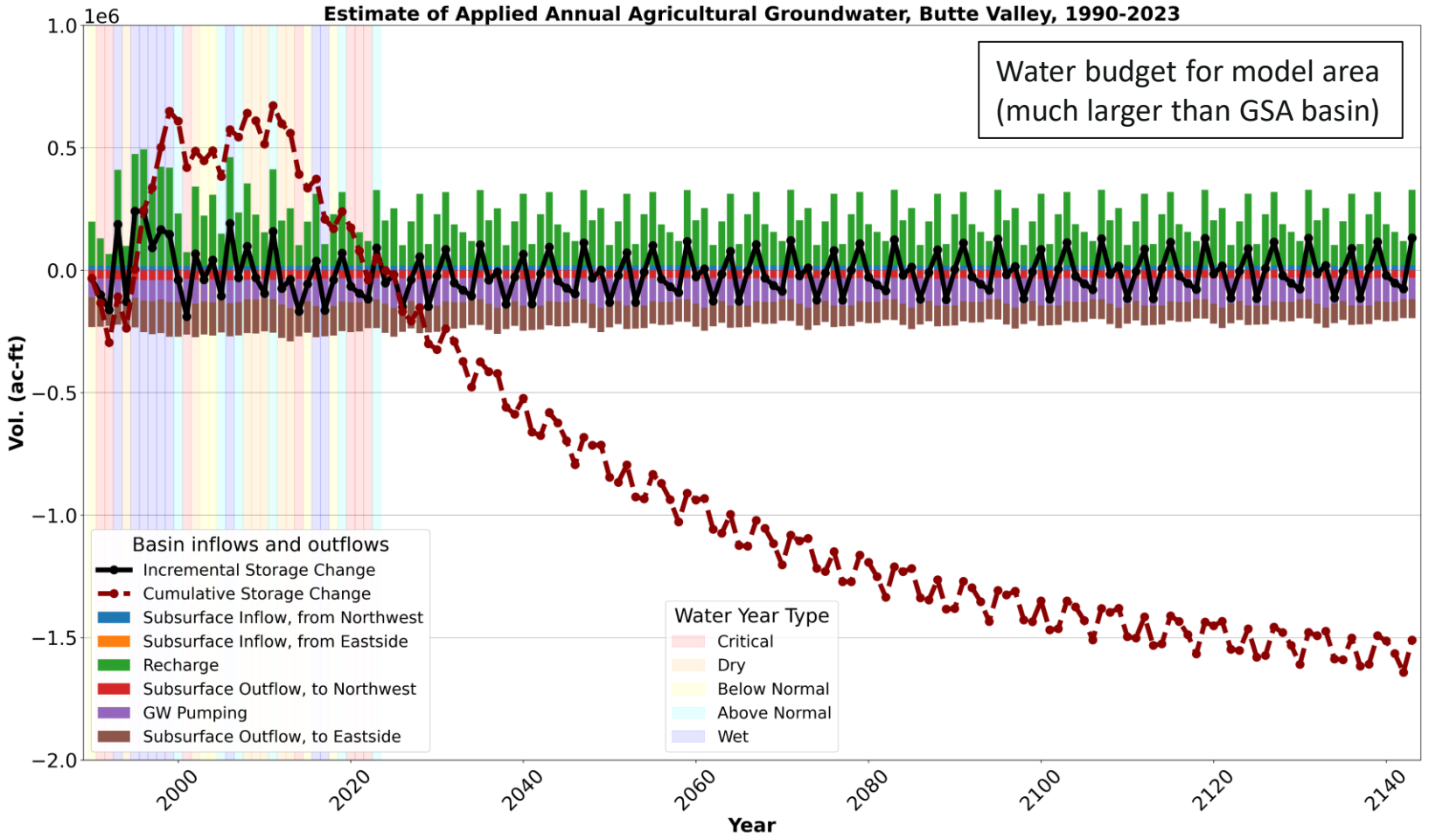


Figure 1.39: Spatial distribution of long-term average recharge (left, red: highest amounts of recharge, dark blue: lowest amounts of recharge) and location of areas with groundwater pumping (right). Black outline: BVIHM simulation domain boundary.

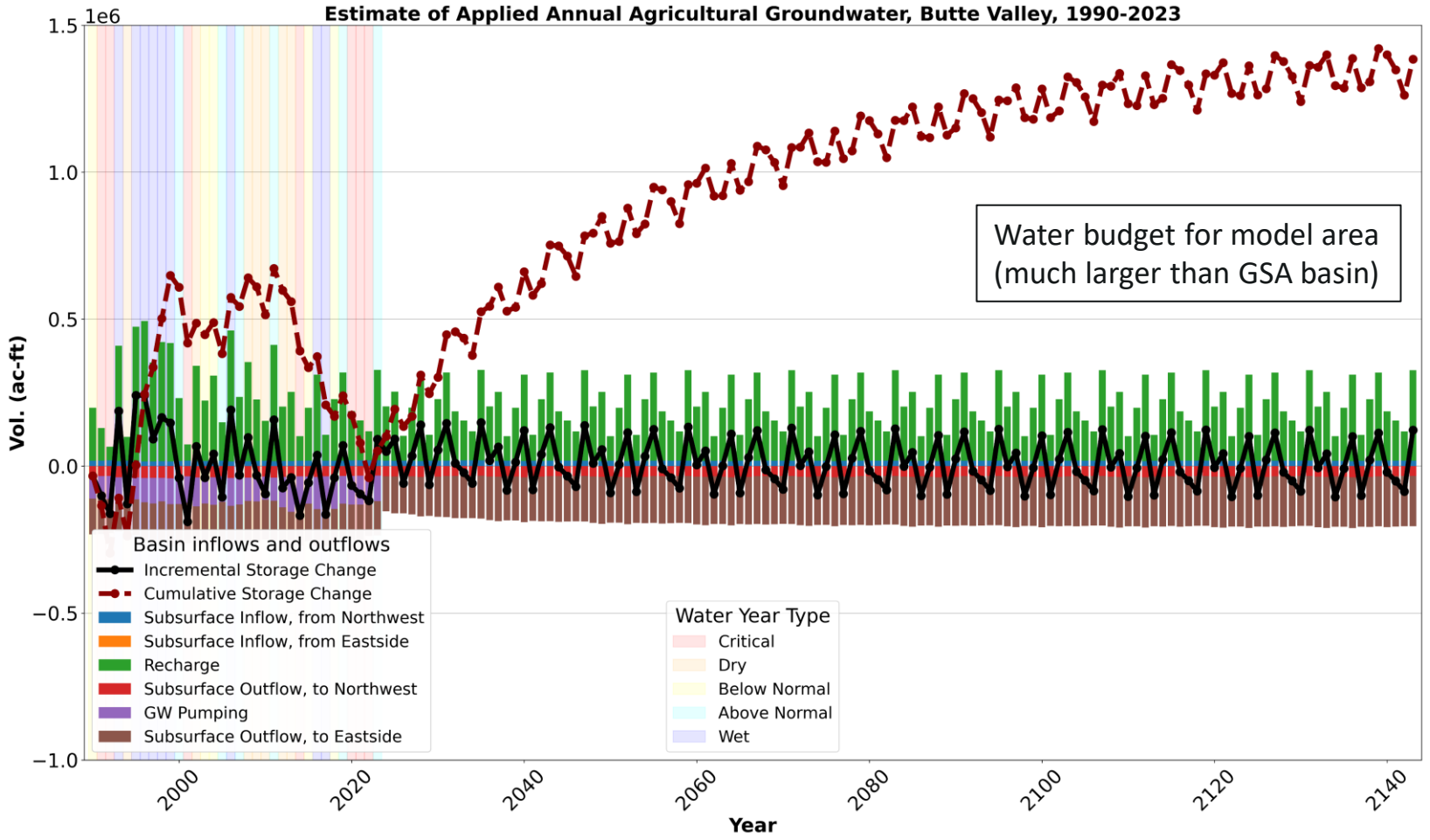
BVIHM: Where are we heading, worst case?

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



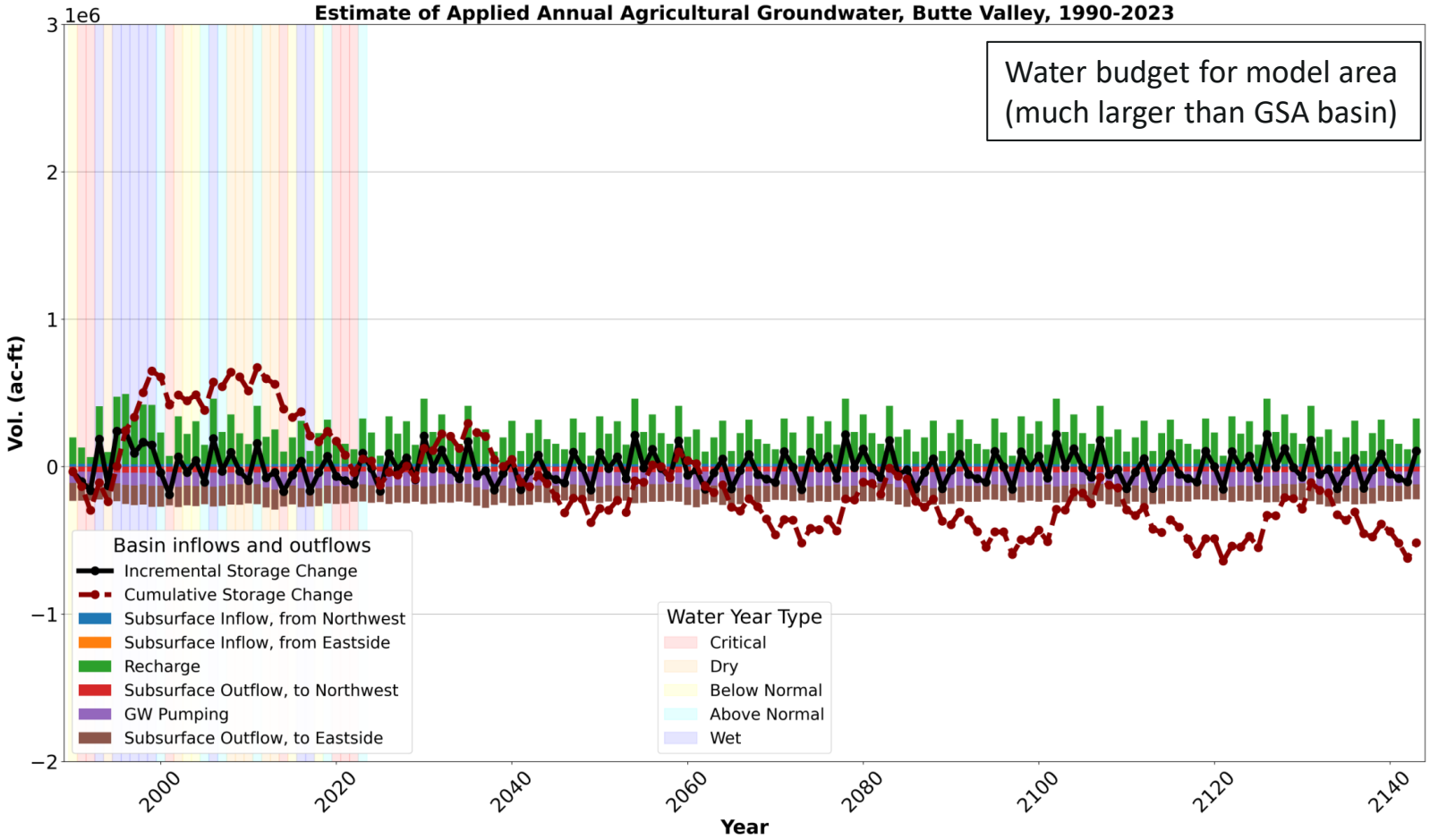
BVIHM: Unimpaired scenario (super-drought)

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



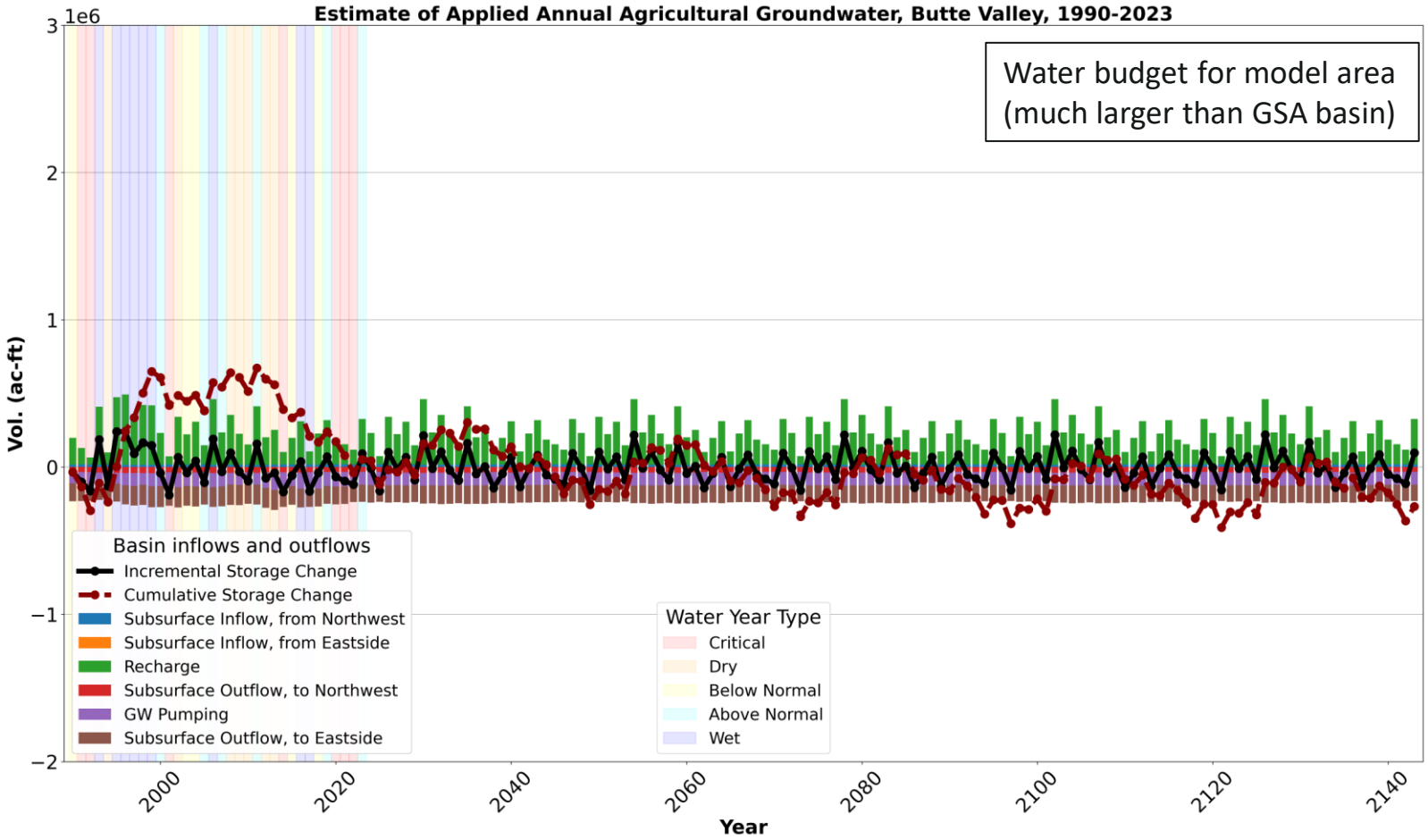
BVIHM: Where are we heading, not so worst case?

- **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)

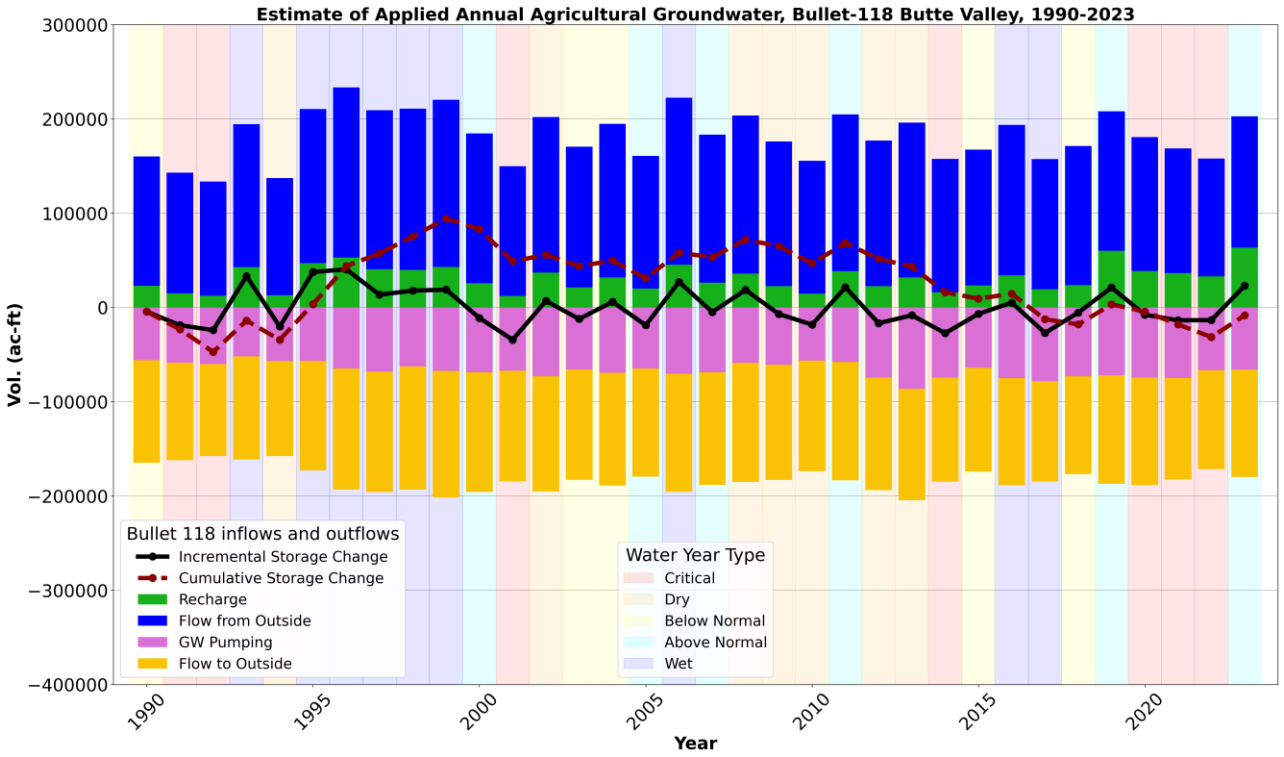


Finding 3: Revise If we revise sustainable yield to 10% less than the average 2011-2023 about 65,000-67,000 acft (same as 1990-2014 average, similar to reported pumping of the 1970s), check if levels are stabilizing in the 5 years

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	



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

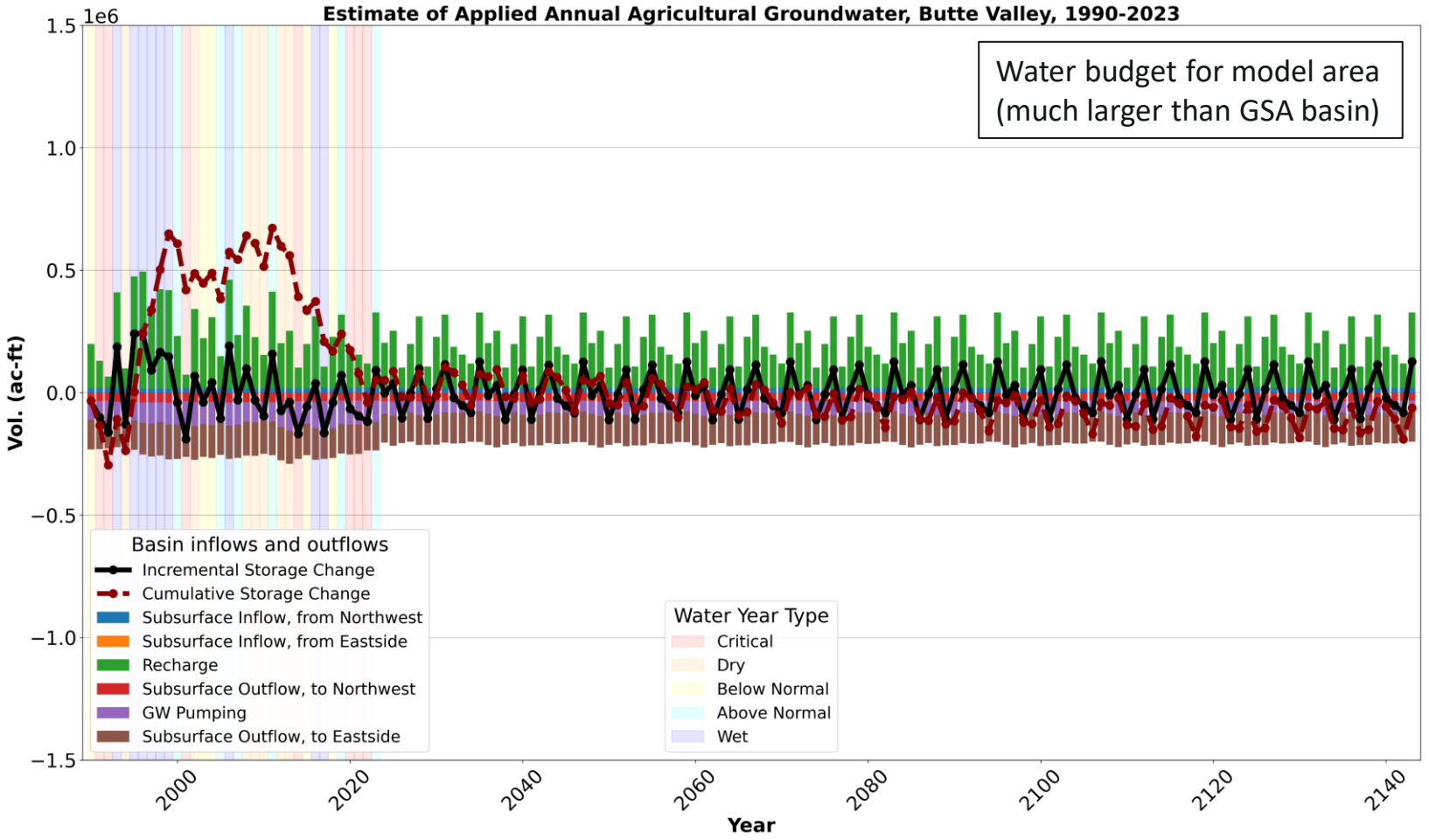
- Plan for public supply systems to replace most shallow domestic wells (well depth at least 400 ft bgs, top of screen) => build future resiliency
- Plan for well deepening outside public supply systems to depths of at least 200 ft bgs (top of screen) => build future resiliency
- Set sustainable yield 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


LWA
Thank You

BVIHM: Sustainable Yield Future Scenario

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



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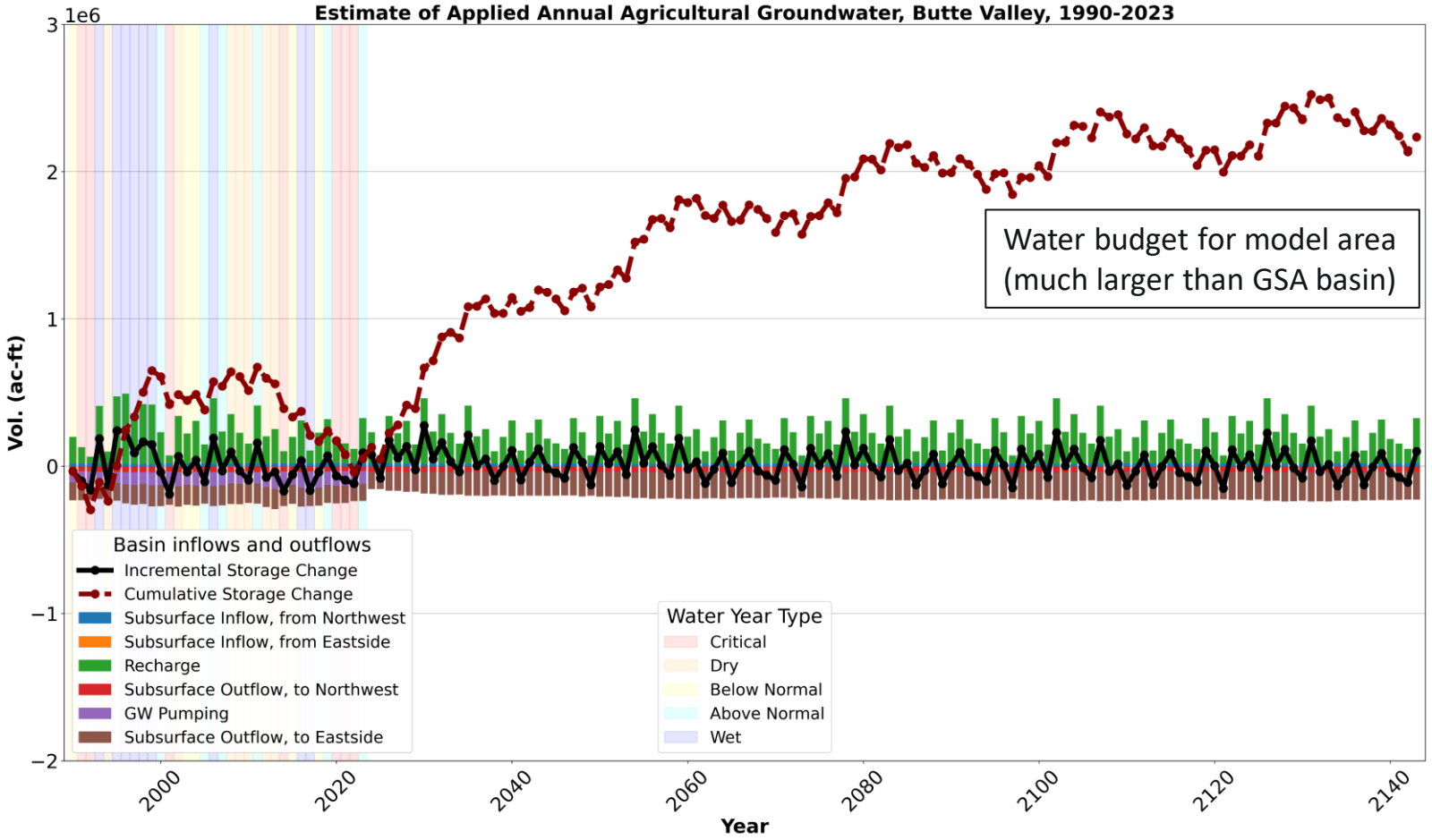

BVIHM: 50% pump reduction (mega-drought)

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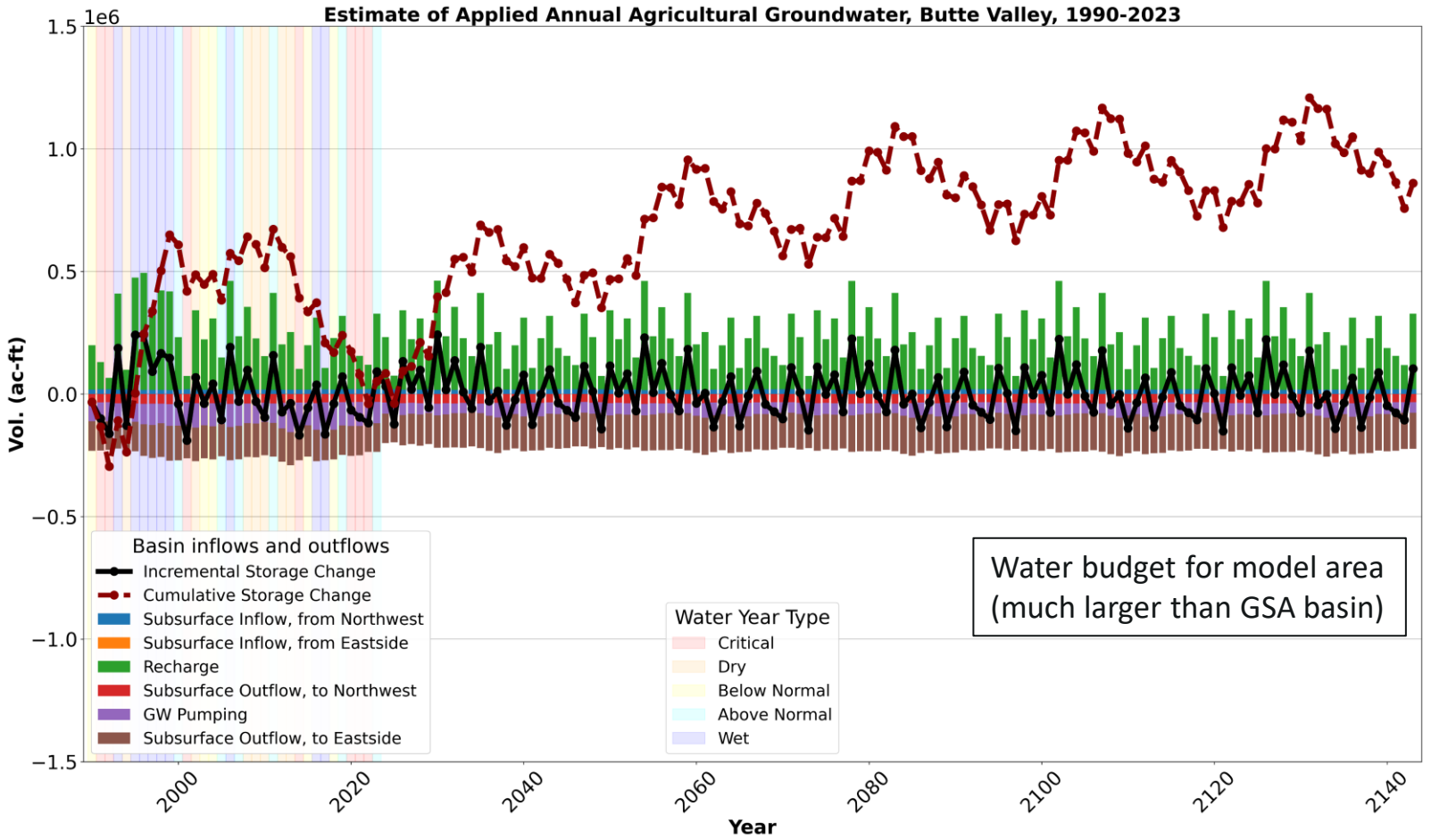
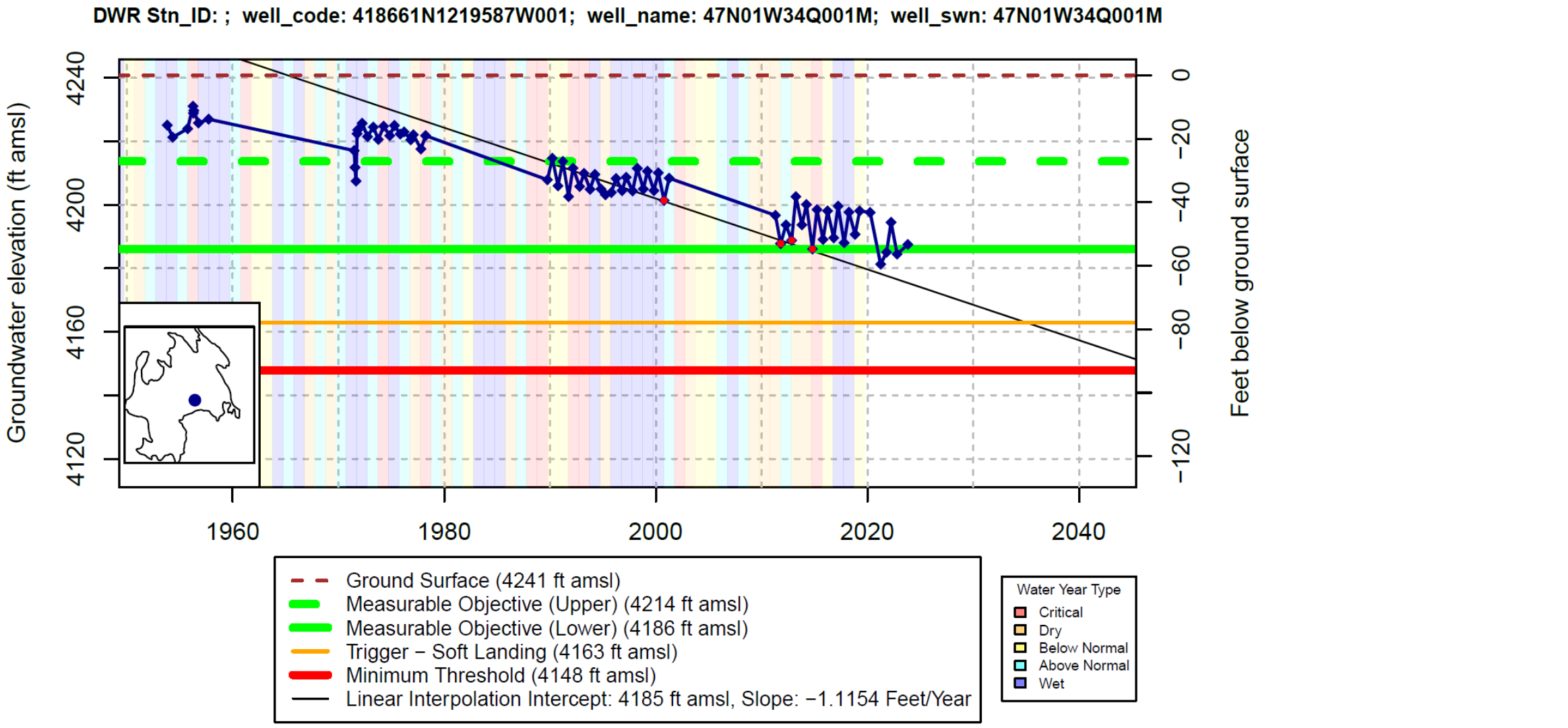


Monitoring Network



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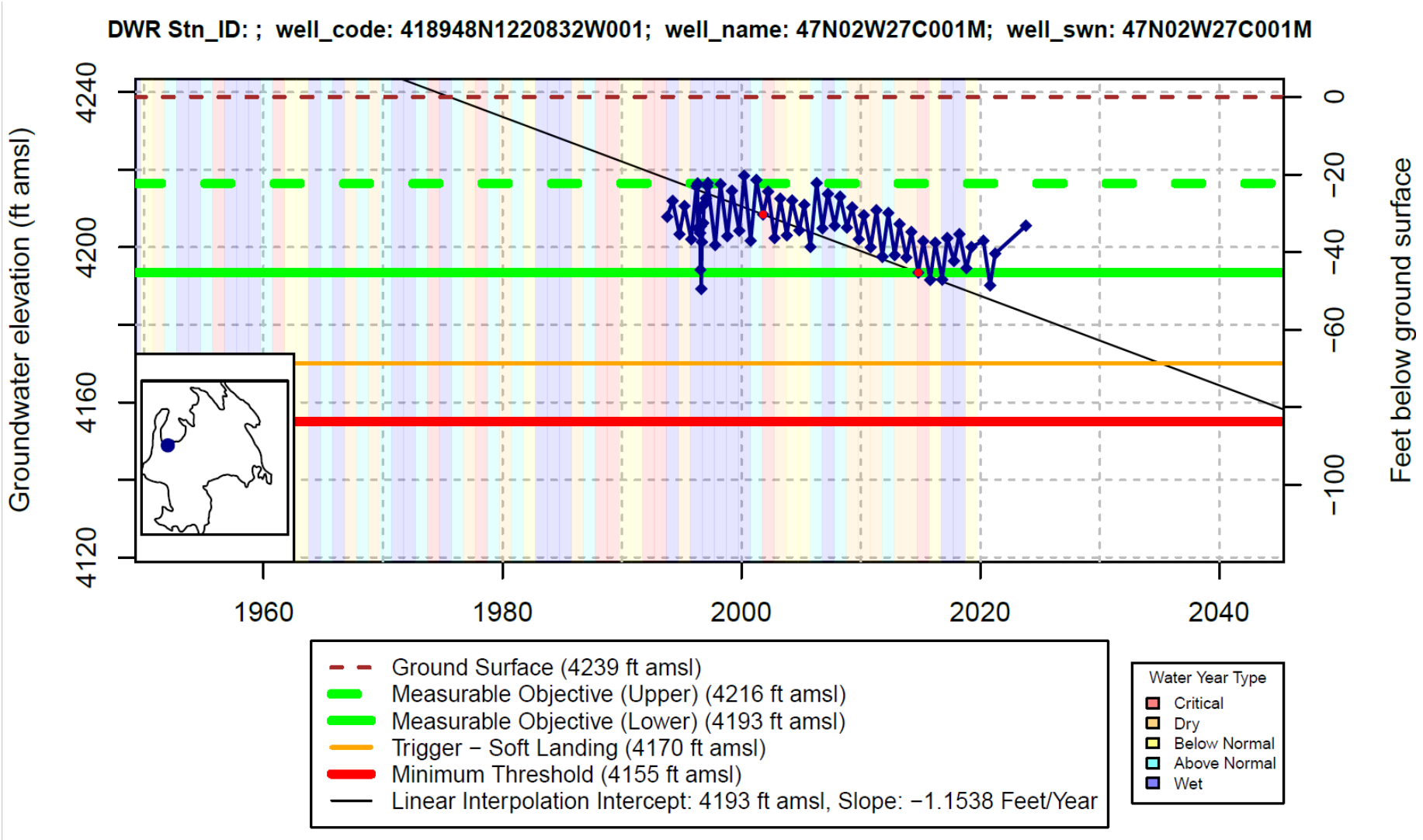

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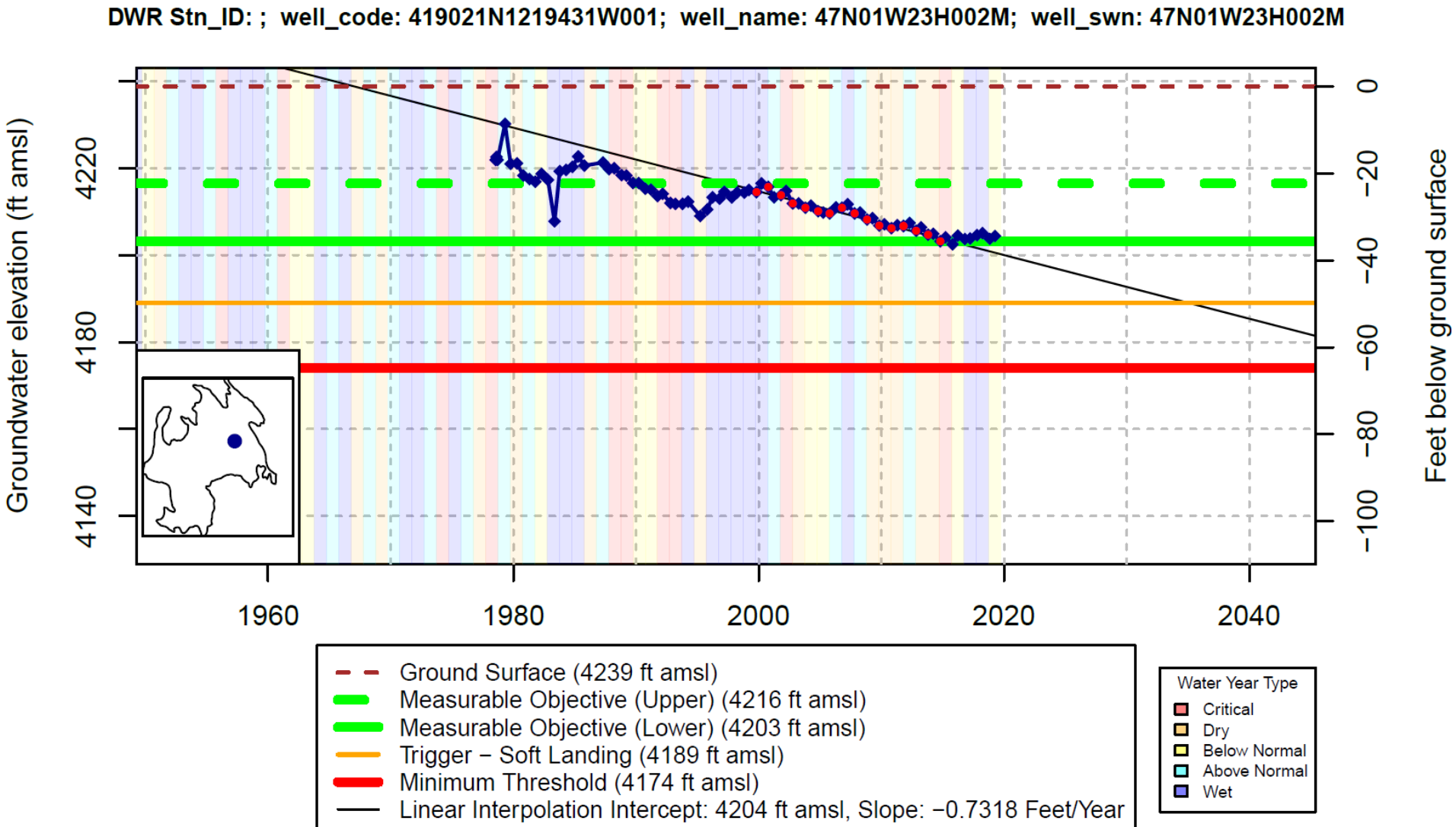

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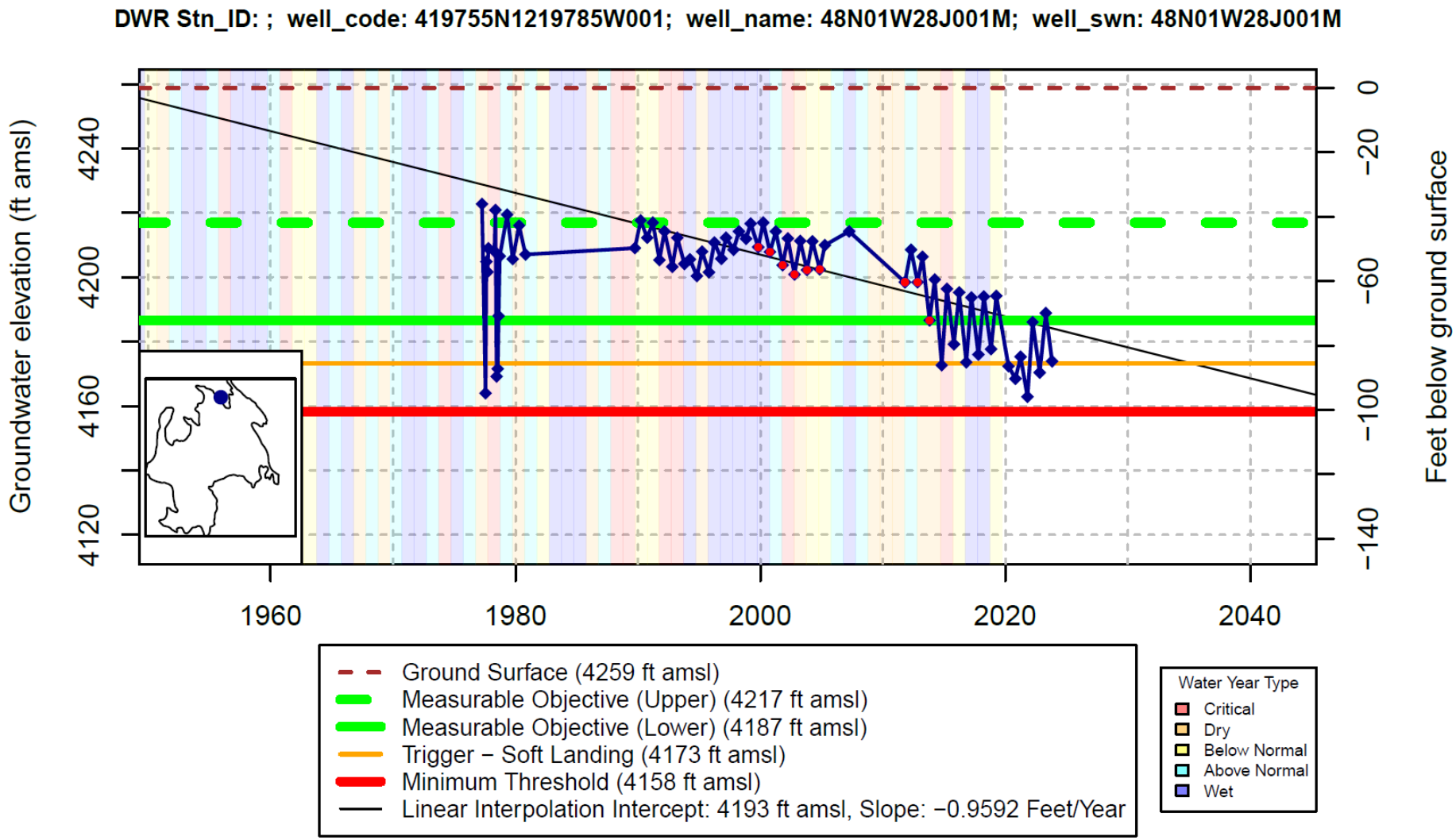

Monitoring Network