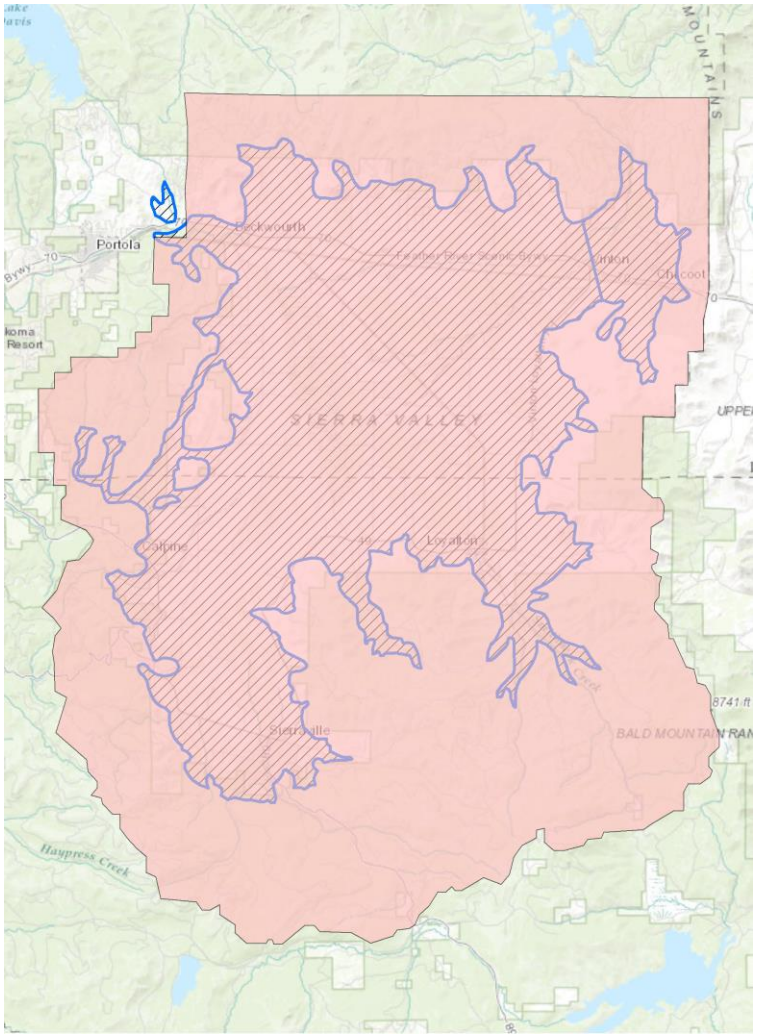
Sierra Valley Groundwater Basin Public Meeting

Sustainable Groundwater Management Act (SGMA) Implementation

December 3, 2019

Sierra Christian Church, Beckwourth



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Meeting Overview

- Welcome
- Agenda Review
- Sustainable Groundwater Management Act Background
- Sierra Valley Groundwater Conditions Presentation & Discussion
- Groundwater Sustainability Planning Grant Submission
- Stakeholder Participation Opportunities
- Closing

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Sustainable Groundwater Management Act Background

Introduction

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Presentation Overview

Goal:

- Provide the necessary conceptual background that establishes a foundation for participant input in the GSP development process and other SGMA activities

  Local control is a hallmark of SGMA and public input is critical!

Outline:

- SGMA Basics
- Basin Prioritization Process and Results Summary
- Sustainability Indicators Introduction
- Sustainable Management Criteria Introduction
- Q&A

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Sustainable Groundwater Management Act Background

Introduction to SGMA – SGMA Basics

- The Sustainable Groundwater Management Act (SGMA) is a package of three bills (AB 1739, SB 1168, SB 1319) signed into law in 2014
- SGMA requires:
  - groundwater basin prioritization by the Dept of Water Resources (DWR)
  - medium- and high-priority basins to be managed by a Groundwater Sustainability Agency (GSA) under a Groundwater Sustainability Plan (GSP) by January 31, 2022 or by January 31, 2020 if critically overdrafted and to achieve sustainable groundwater management within 20 years of GSP implementation
  - GSAs to encourage the active involvement of the basin's population
  - the State Water Resources Control Board to intervene if local agencies do not achieve sustainable groundwater management

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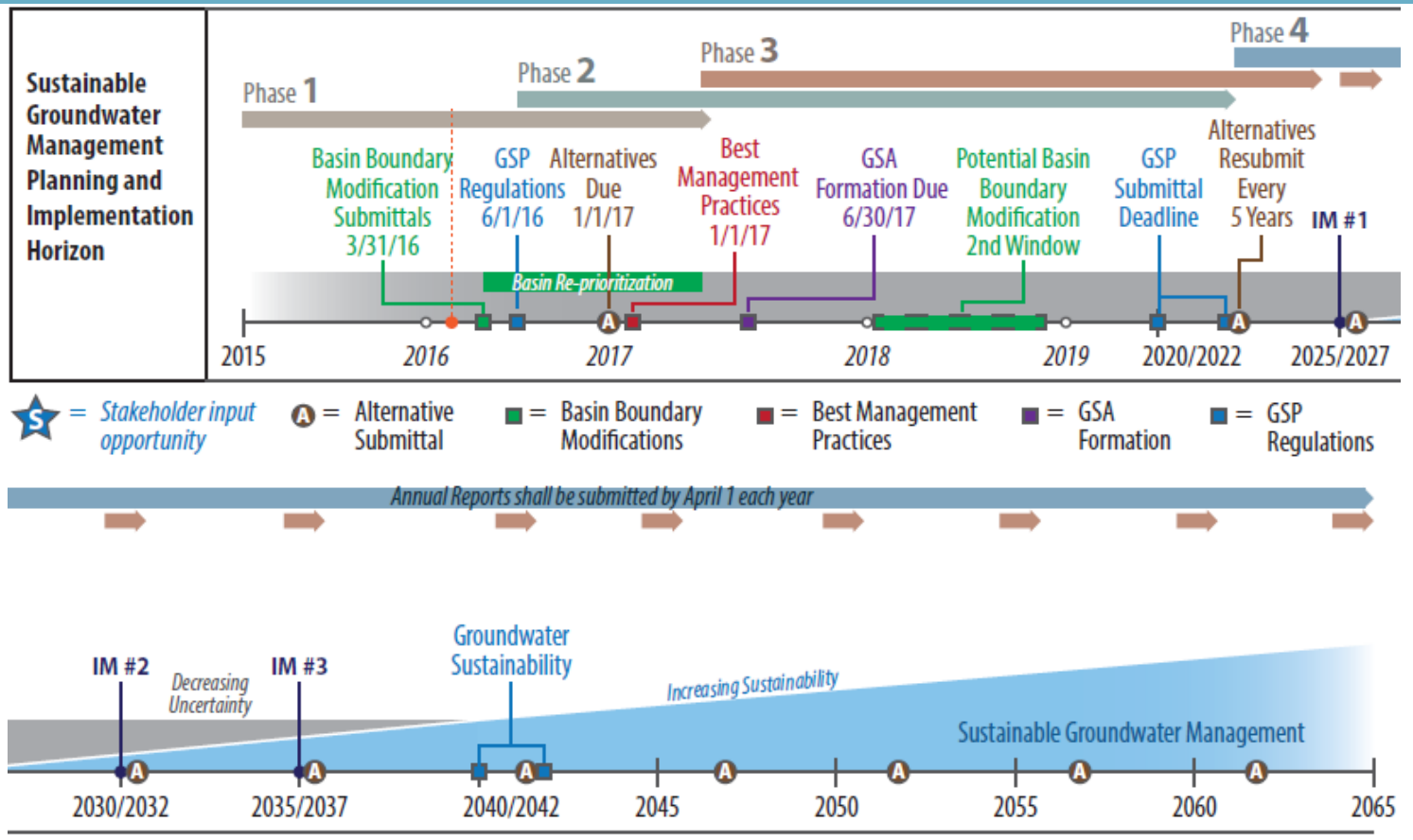
Introduction to SGMA – Timeline



IM = Interim Milestone

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Basin Prioritization – Considerations

Required Basin Prioritization Considerations:

(1) Population

(2) Population growth rate

(3) # of public supply wells

(4) Total # of wells

(5) Irrigated acreage

(6) Groundwater reliance

(7) Documented impacts including overdraft, subsidence, and other water quality degradation

(8) Other info determined to be relevant by DWR, including adverse impacts on local habitat and local streamflows

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Basin Prioritization – Process Summary

Basin Prioritization Process Summary:

- Eight separate scoring components
- Up to five "priority points" possible per scoring component
- Possible total scores ranging from 0 to 40 priority points
- Scoring components 6 , 7, and 8 have sub-components
- Basin Priority Designations:
    - Very Low: 0 – 7 priority points
    - Low: 8 – 14 priority points
    - Medium: 15 – 21 priority points
    - High: > 24 priority points

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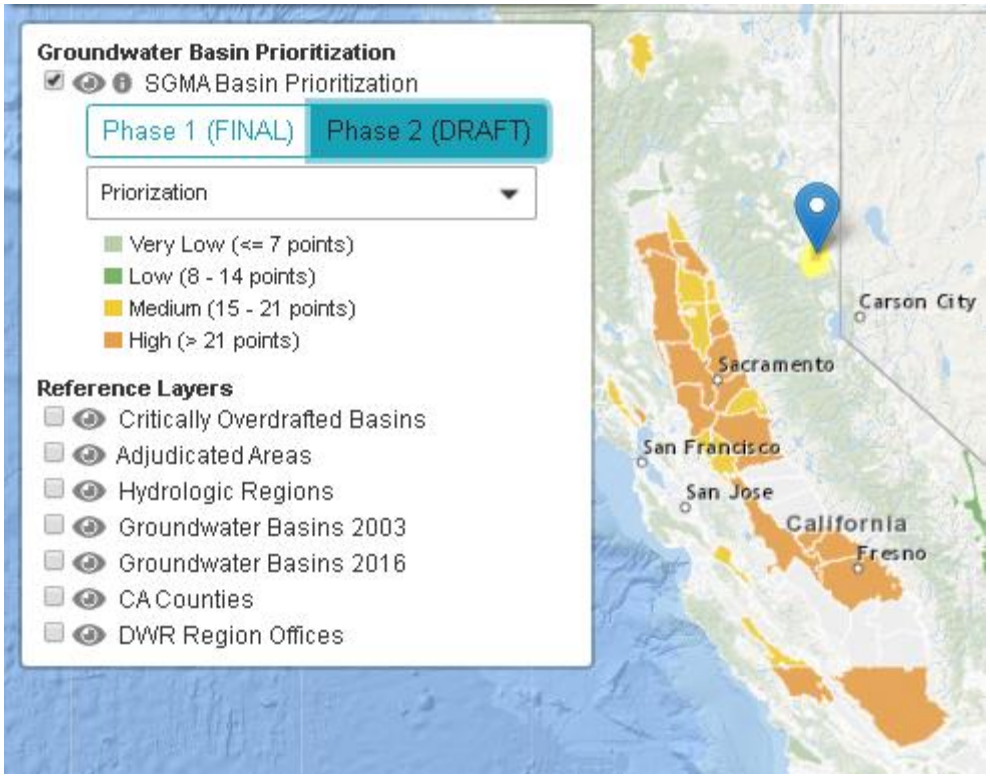
Basin Prioritization – Sierra Valley Subbasin Results Summary



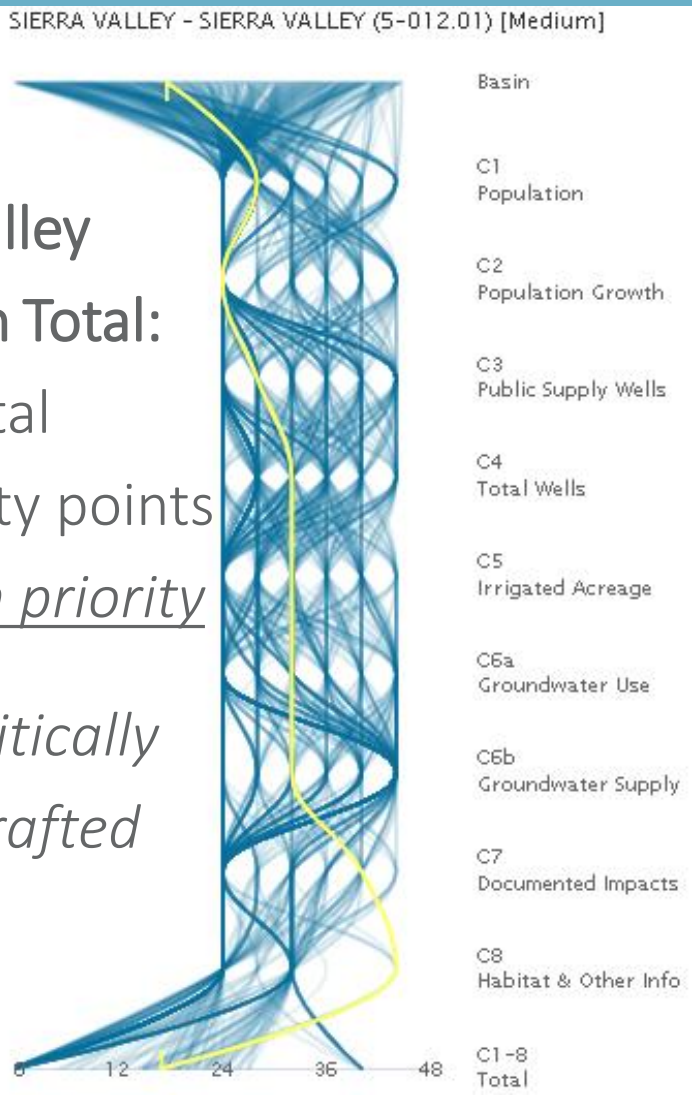
Web link: https://gis.water.ca.gov/app/bp-dashboard/p2/#

Sierra Valley Subbasin Total:

- 17 total priority points

medium priority

Not Critically Overdrafted



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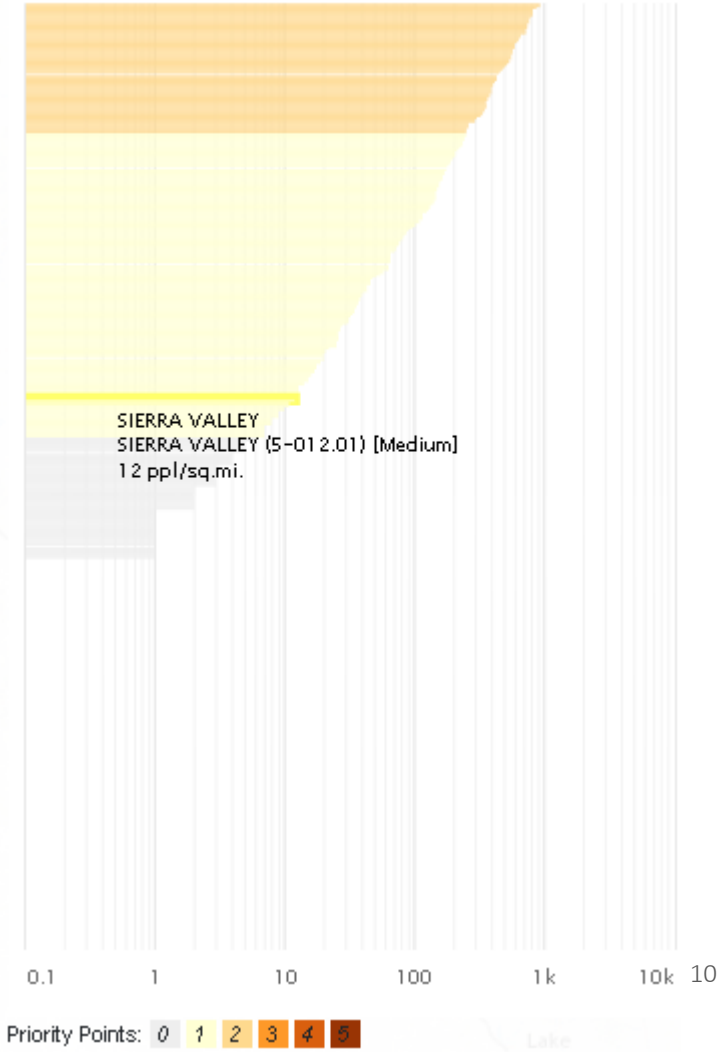
Basin Prioritization – Scoring Component 1

Component 1 - Population	
Population (2010)	2,192
Pop / mi^2	12
C1 Priority Points	1

Priority Points	2010 Population Density (persons/square mile) 'x' = population density
0	x < 7
1	7 ≤ x < 250
2	250 ≤ x < 1,000
3	1,000 ≤ x < 2,500
4	2,500 ≤ x < 4,000
5	x ≥ 4,000



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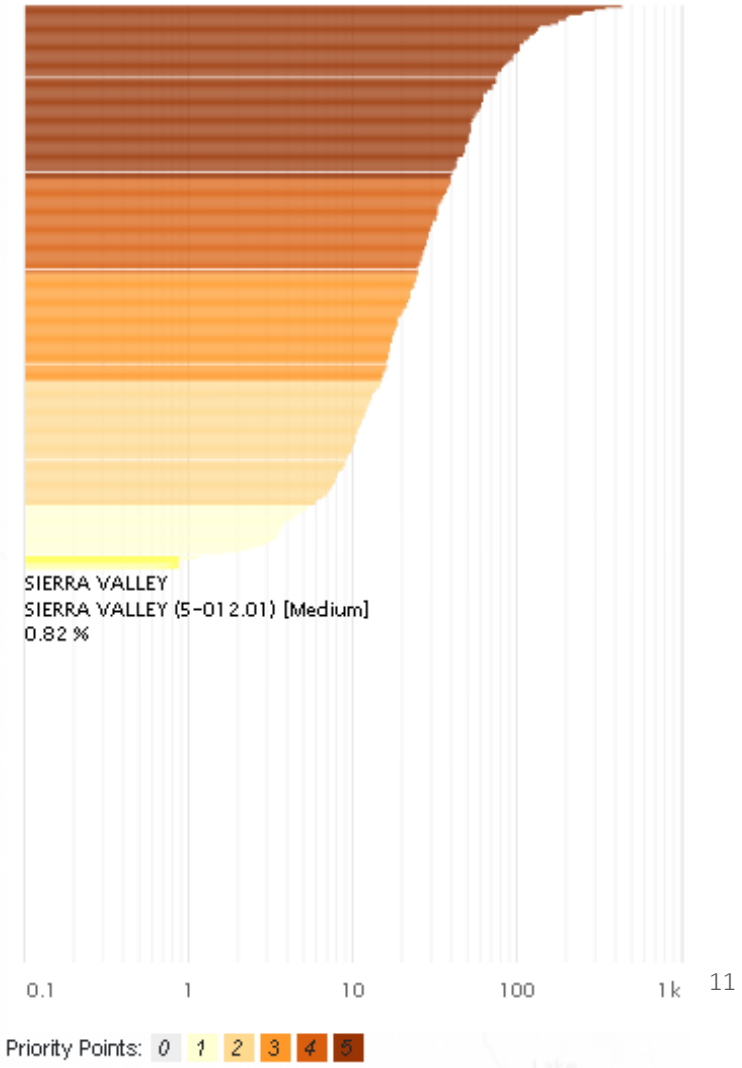
Basin Prioritization – Scoring Component 2

Component 2 - Population Growth	
Population (2030)	2,210
Pop Growth	1%
C2 Priority Points Population Density < 50 ppl/sq.mi. and 2010 Population <= 25,000	0

Priority Points	Population Growth (percent) 'x' = Population growth percentage
0	x ≤ 0
1	0 < x < 6
2	6 ≤ x < 15
3	15 ≤ x < 25
4	25 ≤ x < 40
5	x ≥ 40



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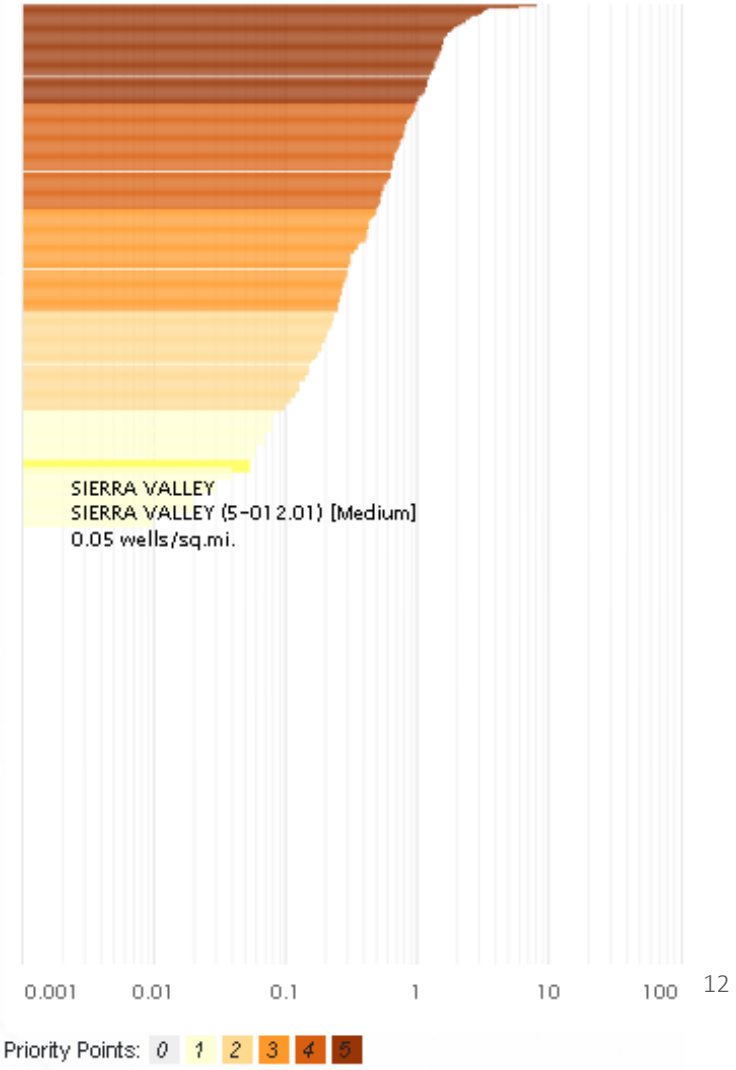
Basin Prioritization – Scoring Component 3

Component 3 - Public Supply Wells	
Public Supply Wells	10
PSW / mi^2	0.05
C3 Priority Points	1

Priority Points	Public Supply Well Density (x = wells per square mile)
0	x = 0
1	0 < x < 0.1
2	0.1 ≤ x < 0.25
3	0.25 ≤ x < 0.5
4	0.5 ≤ x < 1.0
5	x ≥ 1.0



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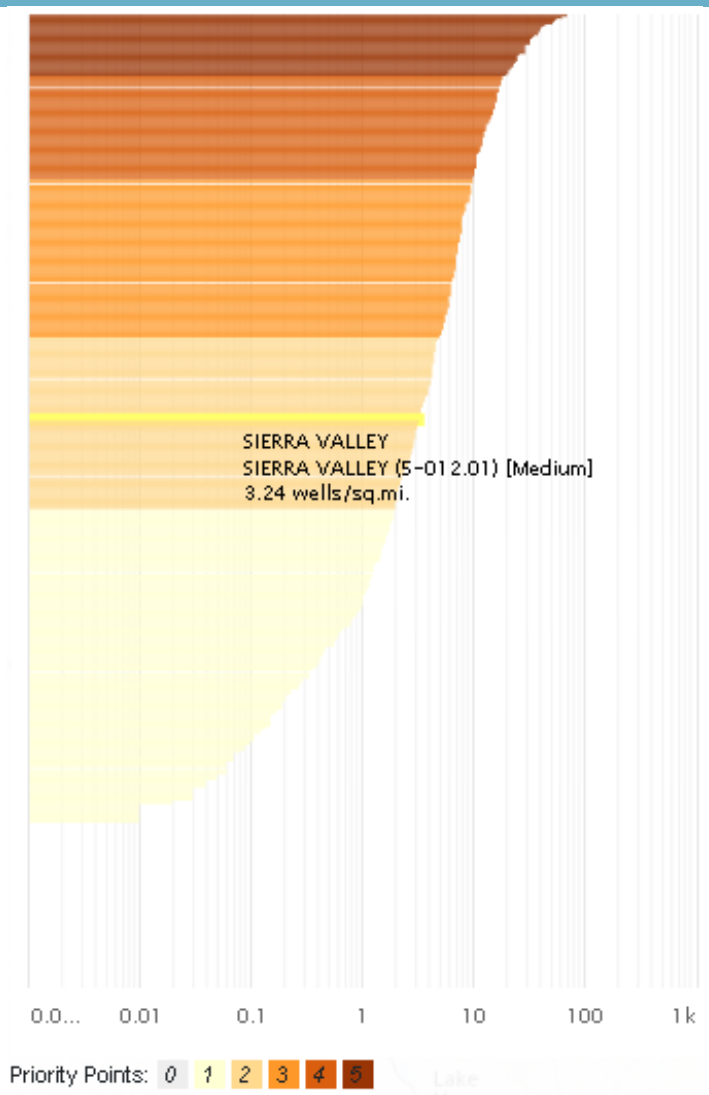
Basin Prioritization – Scoring Component 4

Component 4 - Total Wells	
Total Wells	594
Wells / mi^2	3.24
C4 Priority Points	2

Priority Points	Production Well Density (x = wells per square mile)
0	x = 0
1	0 < x < 2
2	2 ≤ x < 5
3	5 ≤ x < 10
4	10 ≤ x < 20
5	x ≥ 20



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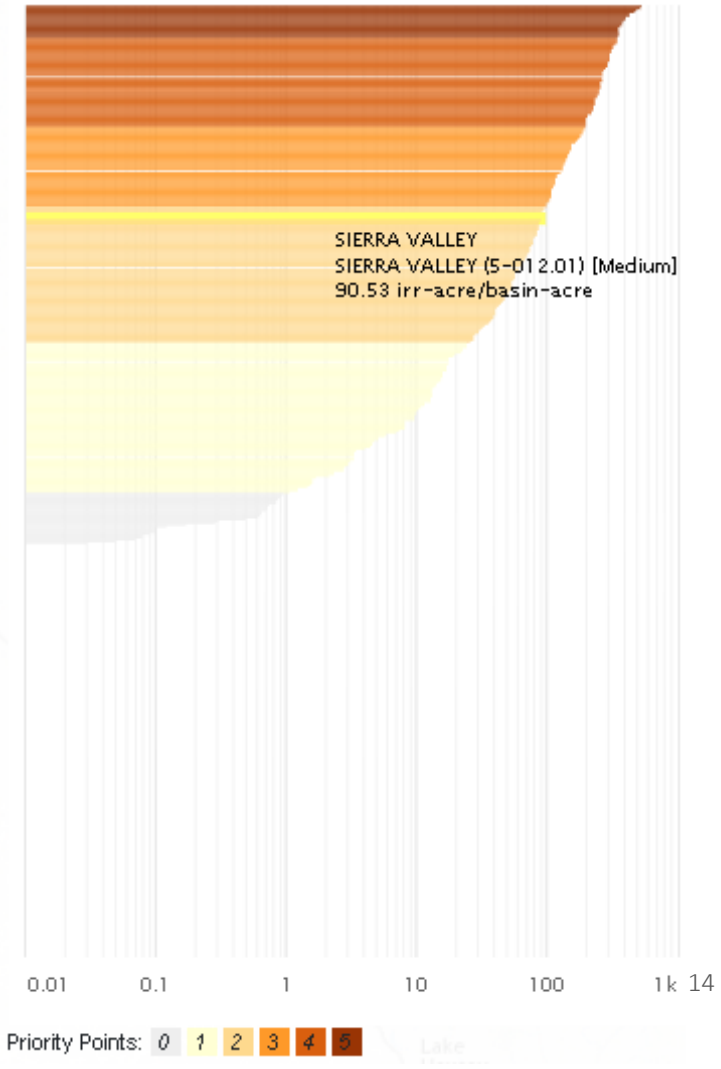
Basin Prioritization – Scoring Component 5

Component 5 - Irrigated Acres	
Irrigated Acres	16,592
Irr. Acres / mi^2	90.53
C5 Priority Points	2

Priority Points	Density of Irrigated Acres (x = acres per square mile)
0	$x < 1$
1	$1 \leq x < 25$
2	$25 \leq x < 100$
3	$100 \leq x < 200$
4	$200 \leq x < 350$
5	$x \geq 350$



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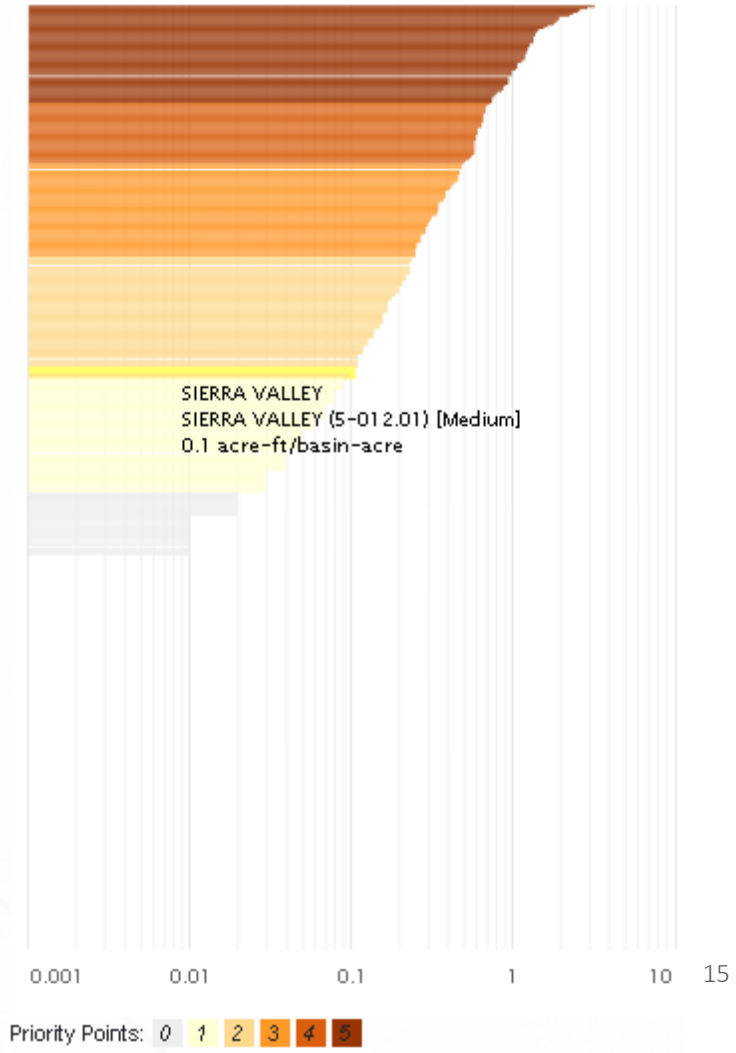
Basin Prioritization – Scoring Component 6a

Component 6 - Groundwater Reliance	
Component 6a - Groundwater Use	
GW Use Acre-Ft	12,480
GW Acre-Ft / Basin-Acre	0.1
C6a Points	2

Points	Groundwater Volume Density (x = acre-feet per acre)
0	$x < 0.03$
1	$0.03 \leq x < 0.1$
2	$0.1 \leq x < 0.25$
3	$0.25 \leq x < 0.5$
4	$0.5 \leq x < 0.75$
5	$x \geq 0.75$



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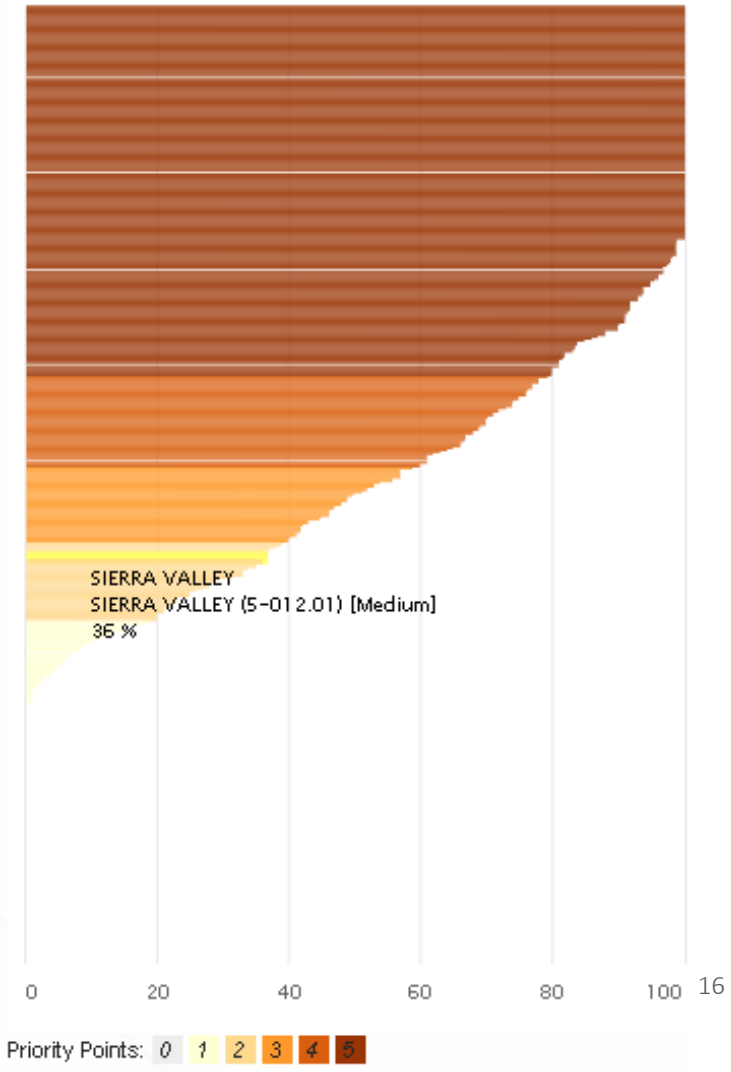
Basin Prioritization – Scoring Component 6b

Component 6 - Groundwater Reliance	
Component 6b - Groundwater Supply	
GW Percent of Supply	36%
C6b Points	2
C6 Priority Points	**2**

Points	Total Supply Met by Groundwater (x = Groundwater Percent)
0	x = 0
1	0 < x < 20
2	20 ≤ x < 40
3	40 ≤ x < 60
4	60 ≤ x < 80
5	x ≥ 80



Component 6 Priority Points = Avg. 6a & 6b

= (2+2)/2 = 2

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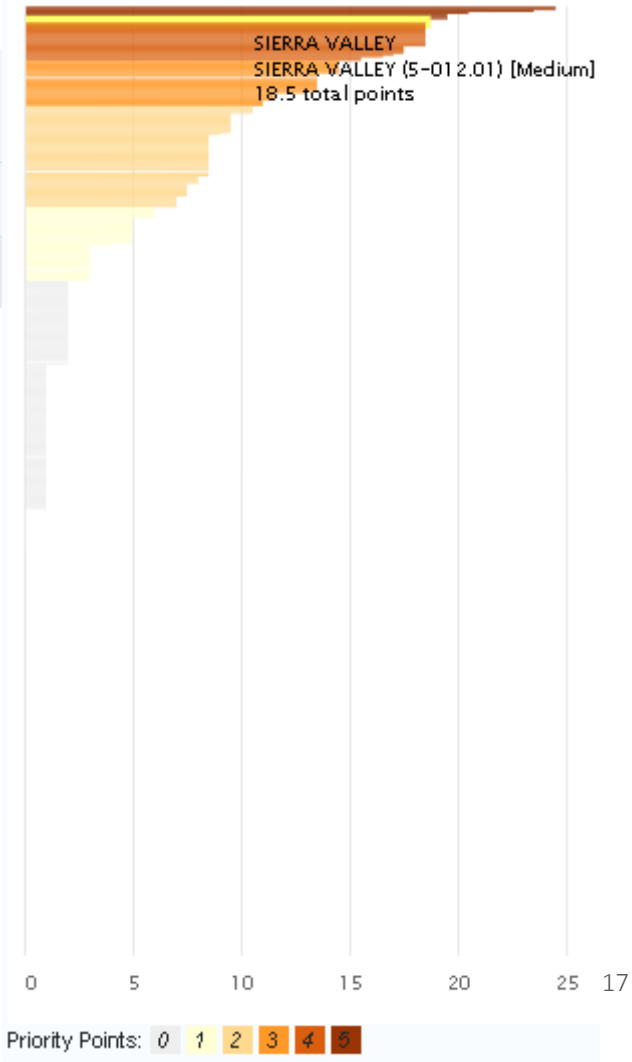
Basin Prioritization – Scoring Component 7

Component 7 - Impacts			
Declining GW Levels Points	7.5	Water Quality Points	1
Salt Intrusion Points	0	Impacts Total Points	18.5
Subsidence Points	10	C7 Priority Points	4

Past = 3.75 points
Current = 10 points

Any decline = 7.5 points

Priority Points	Cumulative Total – Documented Impacts
0	x < 3
1	3 ≤ x < 7
2	7 ≤ x < 11
3	11 ≤ x < 15
4	15 ≤ x < 19
5	x ≥ 19



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Basin Prioritization – Scoring Component 7 Comments

Declining GW Comment Summary:

- Hydrographs show groundwater level decline
- Majority of long-term hydrographs are relatively stable, a few with declining groundwater levels

Subsidence Comment Summary:

- Reports approximately 6” of subsidence between 5/’15 and 6/’16
- Reports subsidence in various locations in the basins ranging from 1.5-2.2’

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Basin Prioritization – Scoring Component 8

Component 8 - Habitat and Other Information	
Component 8a - Habitat and Streamflow	
Streamflow Points	1
Habitat Points	1
C8a Priority Points	2
Component 8b - Other Information	
C8b Priority Points	3
Component 8c&d - Statewide Other Information	
None	
C8c&d Priority Points	0

Groundwater Levels Monitored

GW Use < 0.16 AF/Basin-Acre

Declining GW Levels

Adverse Impacts Identified

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Basin Prioritization – Scoring Component 8 Comments

Component 8a Comment Summary:

- largest fresh water marsh in Sierra Nevada Mountains
- MF Feather River is designated as a National Wild and Scenic River
- Monitoring data showing significant declines that *could* be impacting

Component 8b Comment Summary:

- Complicated water management scenario including:
  - reservoir operations out of the control local water managers,
  - surface water deliveries driven by highly variable precipitation
- Results in increase of groundwater pumping during years of limited surface water, made more challenging by the lack of available surface water for conjunctive management to manage groundwater conditions

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Sustainability Indicators – Introduction

- "Sustainable Groundwater Management" – The management and use of groundwater in a manner that can be maintained during the planning and implementation horizon (50 years) without causing undesirable results
- "Sustainability Indicator" – Any of the effects caused by groundwater conditions occurring throughout the basin that, when significant and unreasonable, cause undesirable results

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Sustainability Indicators – Undesirable Results

- "Undesirable Results" – One or more of the following effects:
  -  Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply if continued
  -  Significant and unreasonable reduction of groundwater storage
  -  Significant and unreasonable seawater intrusion
  -  Significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies
  -  Significant and unreasonable land subsidence that substantially interferes with surface land uses
  -  Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water

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Sustainability Indicators – Significant and Unreasonable

- "Significant and Unreasonable" – definitions are up to us!
  - What effects/impacts would be unacceptable to you for each indicator?
  - Examples – Groundwater levels:
    - decline which causes pumping costs to increase by *X % ?*
    - decline which reduces production rate by *X* % ?
    - decline that requires abandonment and re-drilling of wells?
    - decline that is below historic low (i.e. impacts exceeding those of past)?
  - Storage: long-term reduction affecting sustainable yield?
  - Subsidence: subsidence of sufficient magnitude to damage infrastructure?
  - Water quality: Changes in water quality which would require treatment (exceeding drinking water standards; exceeding crop tolerability)?
  - Surface depletion: reduced mapped groundwater dependent ecosystems?

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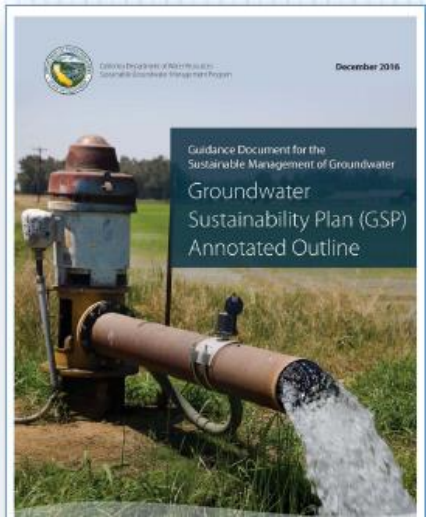
Sustainable Management Criteria – Introduction

- Sustainable Management Criteria – criteria that constitute sustainable groundwater management
- Sustainable Management Criteria in the context of the GSP
  - Part 1: Describes who you are
  - Part 2: Describes the basin and GW conditions
  - Part 3: Define how you will measure sustainability
  - Part 4: Identify projects and management actions to achieve sustainability
  - Part 5: Implementation information
- Key Terms:
  - Minimum Thresholds, Interim Milestones, Measurable Objectives SGMA Benchmark Date, Operational Flexibility, Sustainability Goal



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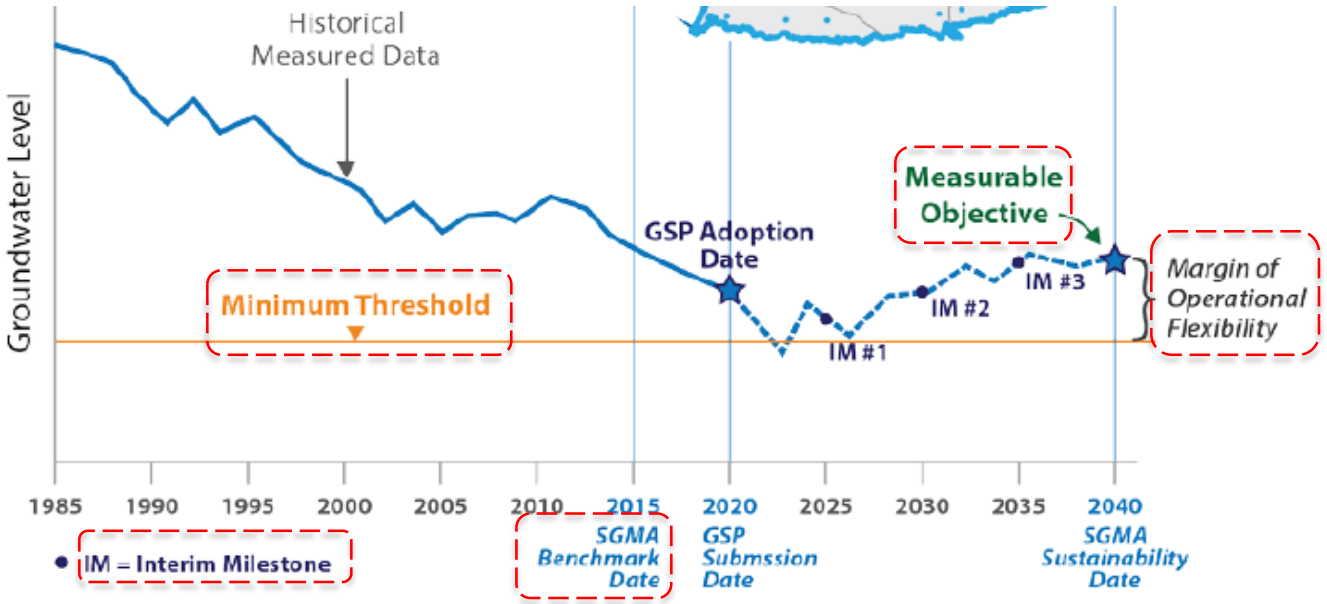
Sustainable Management Criteria – Development Process and Intro to Terms

1) Describe "significant and unreasonable" effects for each indicator
2) Set minimum thresholds based on relationship between conditions & effects
3) Set measurable objectives and interim milestones allowing operation flexibility
4) Establish sustainability goal and develop projects and management actions to meet milestones, objectives, and achieve sustainability!



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Sustainable Management Criteria – Review: Achieving Sustainability

- Achieving sustainability means meeting a locally-defined "sustainability goal" within 20 years of GSP implementation
  - "Sustainability goal" describes intended outcome and how to get there
  - typically the last piece of GSP development
  - essentially means elimination of undesirable results, or in other words, sustained groundwater conditions above minimum thresholds
- Many paths to sustainable groundwater management – depends on groundwater conditions and locally-defined values

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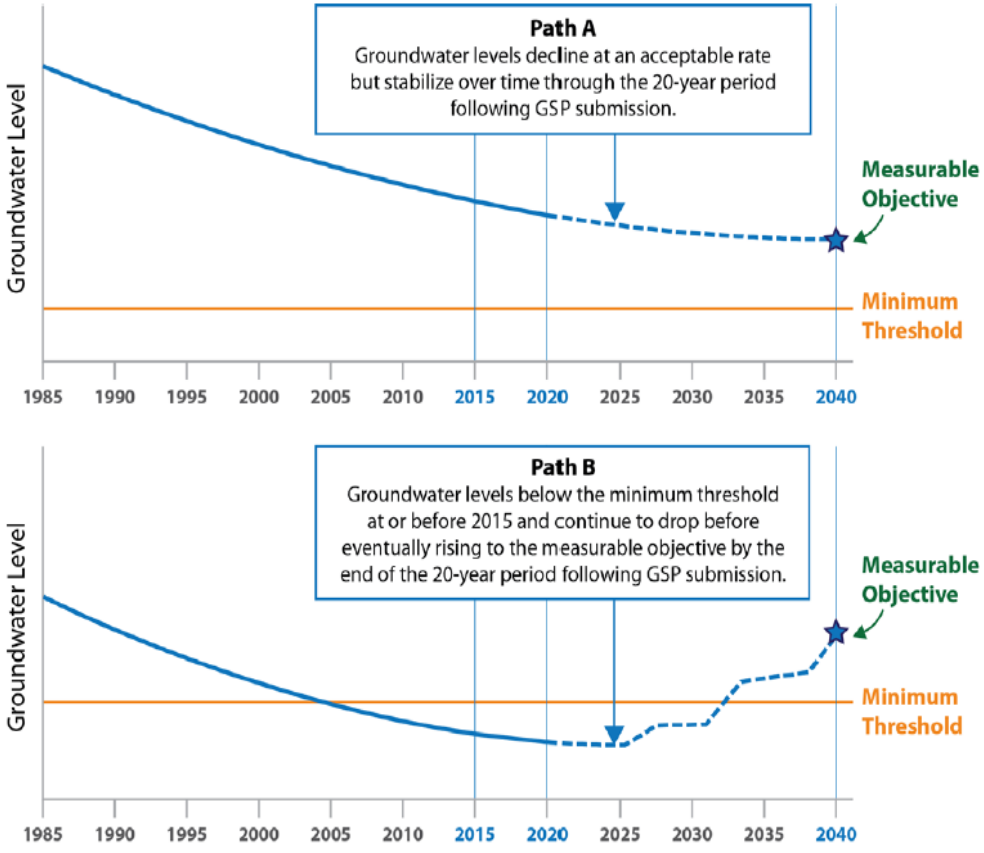
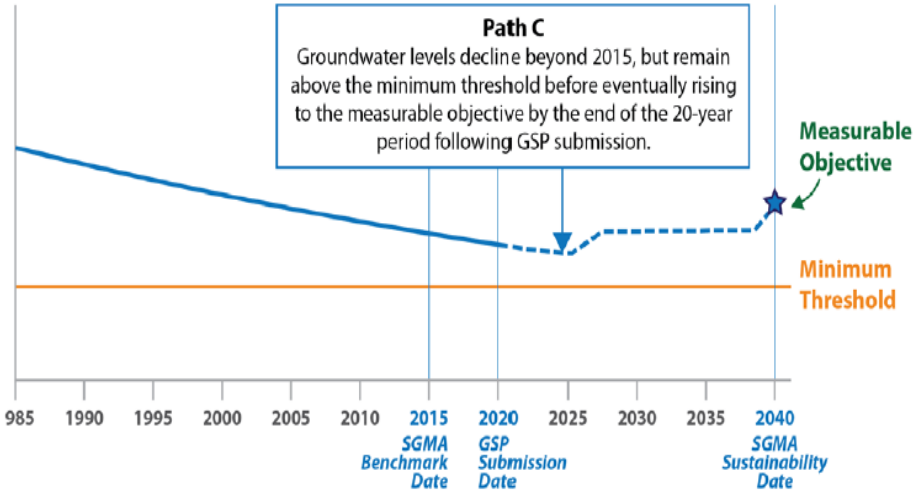
Sustainable Management Criteria – Example Paths to Sustainability





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Sustainable Management Criteria – What's Next?

- Public meetings…
  - Review basin data/conditions
  - Discussions, surveys, questionnaires to define what is unacceptable - descriptions of significant and unreasonable impacts for each sustainability indicator
  - Compare results to basin data – translated into justifiable minimum thresholds and measurable objectives
  - Present proposed values, representative monitoring locations, and monitoring protocols
  - Discuss, revise, and iterate until finalized
  - Then: Develop sustainability goal via iterative process!

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Questions?

Coming up after the break…

Sierra Valley Basin Conditions Presentation & Discussion

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Sustainable Management Criteria – Supplemental Slides

- "Minimum Thresholds" – the quantitative value at a representative monitoring site that, when exceeded, may cause undesirable results (significant and unreasonable effects)
  - At what values would unacceptable effects/impacts occur?
  - Requires that we understand relationship between groundwater data and associated impacts
- Minimum thresholds are established at representative monitoring sites for each indicator, represents general conditions
- Proxy monitoring is allowable if relationship between indicators is well-documented (i.e. using groundwater level data to monitor for storage and/or subsidence)

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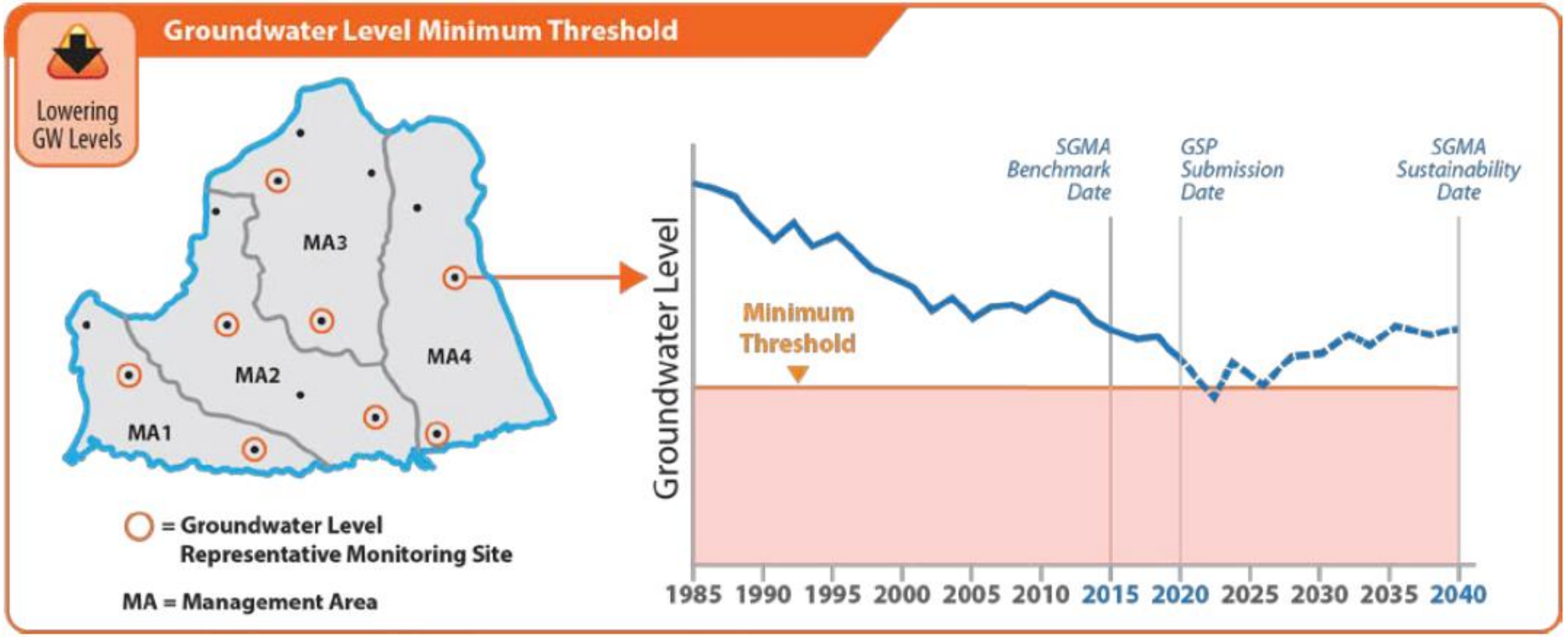
Sustainable Management Criteria – Minimum Threshold Examples



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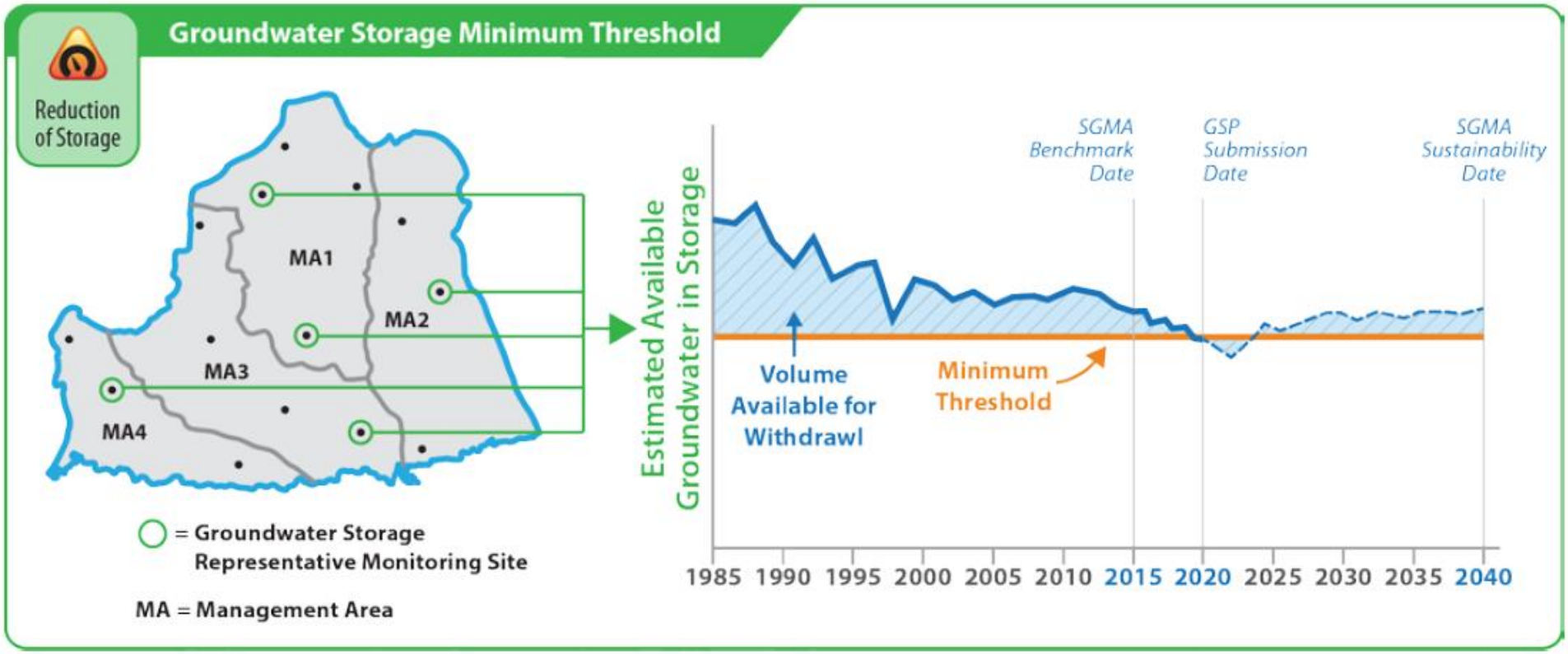
Sustainable Management Criteria – Minimum Threshold Examples (Continued)



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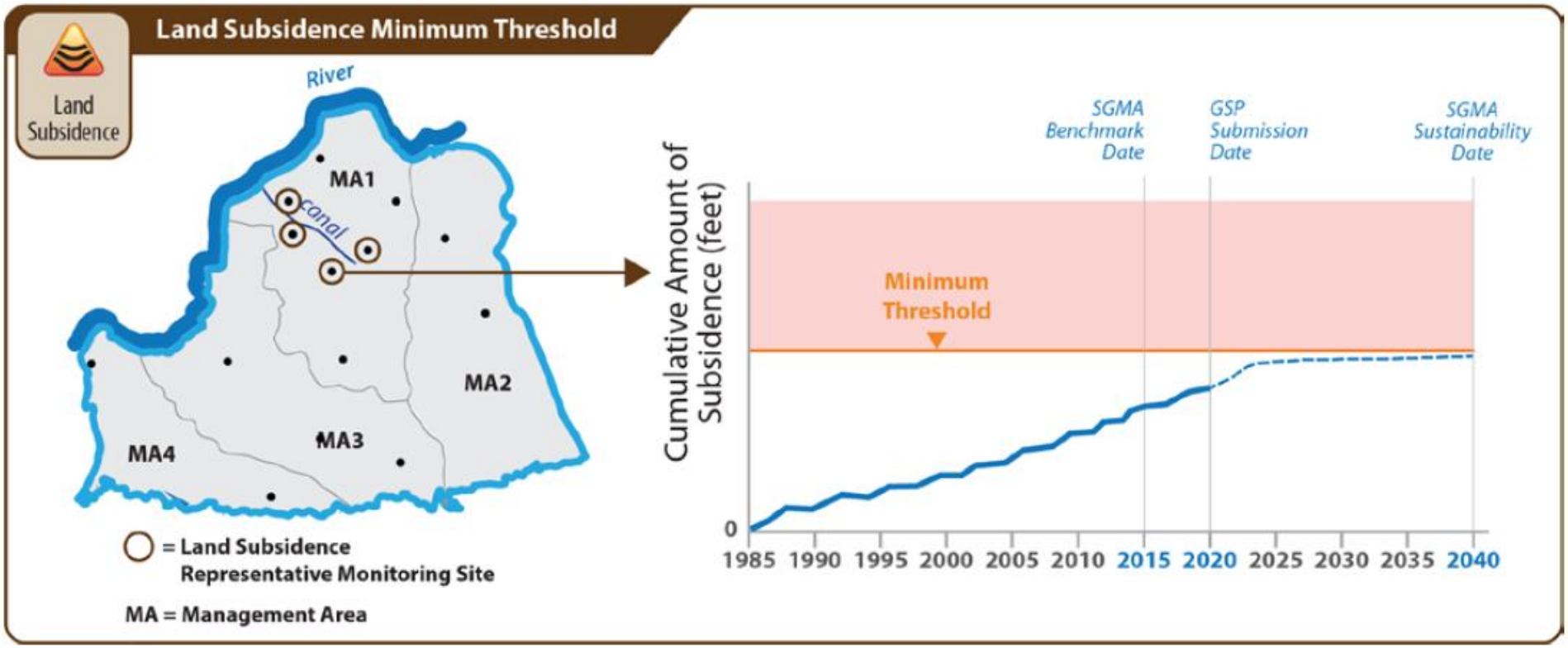
Sustainable Management Criteria – Minimum Threshold Examples (Continued)



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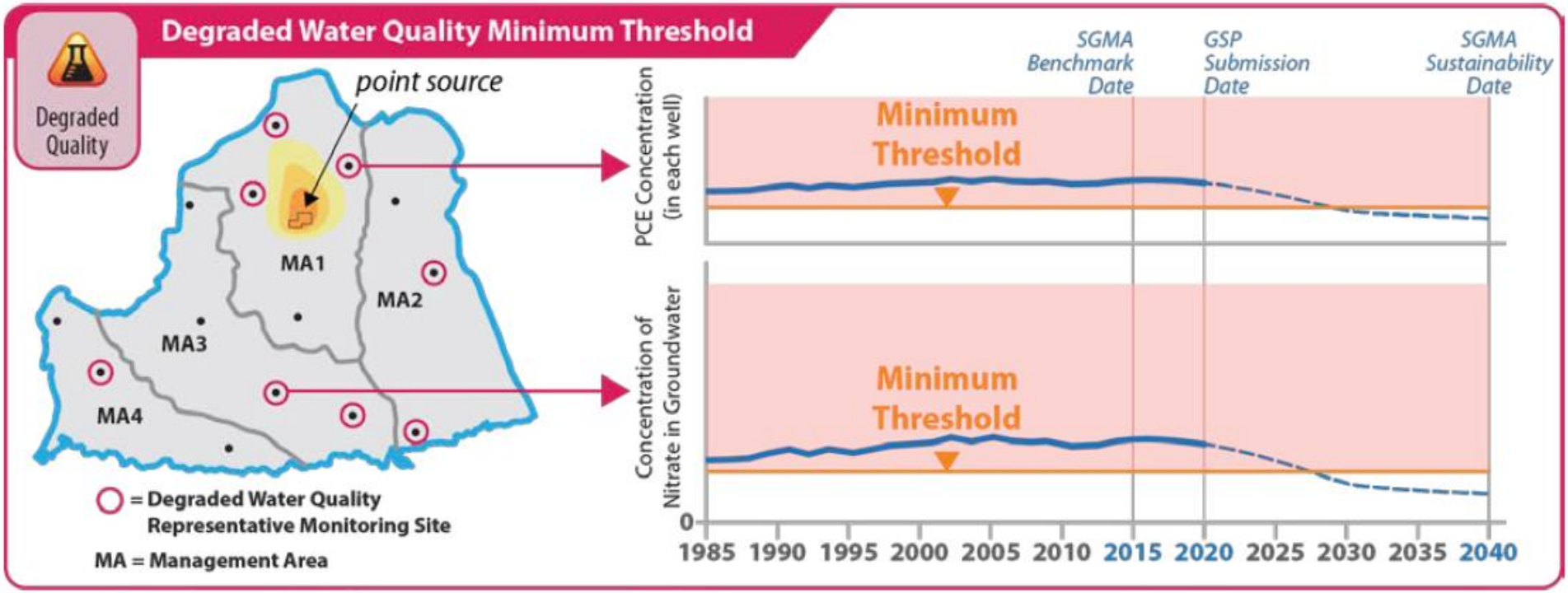
Sustainable Management Criteria – Minimum Threshold Examples (Continued)



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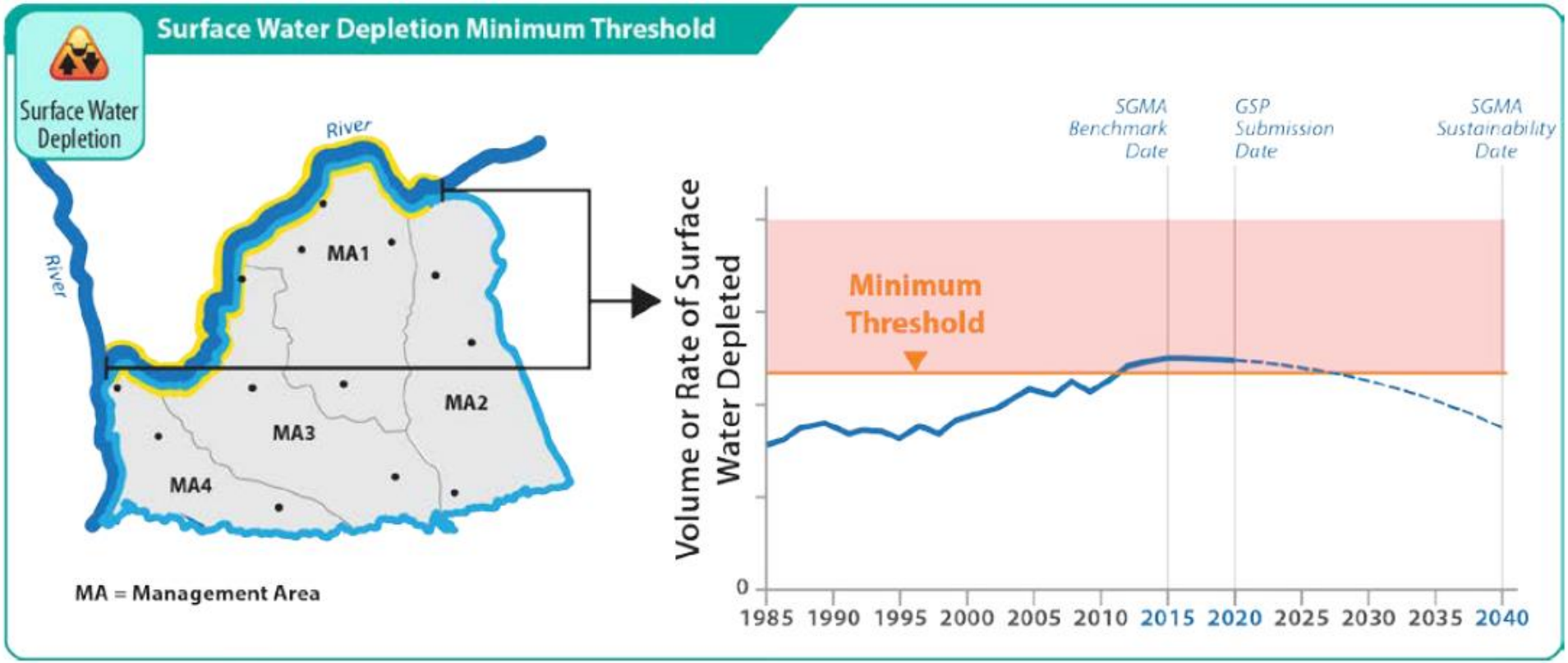
Sustainable Management Criteria – Minimum Threshold Examples (Continued)



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Sustainable Management Criteria – Supplemental Slides

- "Measurable Objectives" – quantitative goals that reflect the basin's desired groundwater conditions at year 20
  - What improvements would you like to see relative to current conditions?
  - What effects/impacts would you like to see eliminated in 20 years?
- "Interim Milestones" – measurable objectives defined in five-year increments
  - Used by GSAs and DWR to track progress toward achieving sustainability
- Same monitoring sites and metrics as minimum thresholds
- Important to allow for "operational flexibility"

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Sustainable Management Criteria – Supplemental Slides

- "SGMA Benchmark Date" – January 1, 2015 (*baseline conditions*)
  - Minimum thresholds are not simply January 1, 2015 conditions…
  - The process should be:
    1. describe significant and unreasonable effects
    2. set minimum thresholds
    3. compare minimum thresholds to 2015 conditions

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Sustainable Management Criteria – Supplemental Slides

- Considerations for developing Minimum Threshold for Groundwater Level Declines:
  - What are the historical groundwater conditions in the basin?
  - What are the average, minimum, and maximum depths of municipal, agricultural, and domestic wells?
  - What are the screen intervals of the wells?
  - What impacts do water levels have on pumping costs (e.g., energy cost to lift water)?
  - What are the adjacent basin's minimum thresholds for groundwater elevations?
  - What are the potential impacts of changing groundwater levels on groundwater dependent ecosystems?
  - Which principal aquifer, or aquifers, is the representative monitoring site evaluating?

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Sustainable Management Criteria – Supplemental Slides

- Considerations for developing Minimum Threshold for Groundwater Storage:
  - What are the historical trends, water year types, and projected water use in the basin?
  - What groundwater reserves are needed to withstand future droughts?
  - Have production wells ever gone dry?
  - What is the effective storage of the basin? This may include understanding of the:
    - o Average, minimum, and maximum depth of municipal, agricultural, and domestic wells.
    - o Impacts on pumping costs (i.e., energy cost to lift water).
  - What are the nearby basin's minimum thresholds?

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Sustainable Management Criteria – Supplemental Slides

- Considerations for developing Minimum Threshold for Land Subsidence:
  - Do principle aquifers in the basin contain aquifer material susceptible to subsidence?
  - What are the historical, current, and projected groundwater levels, particularly the historical lows?
  - What is the historical rate and extent of subsidence?
  - What are the land uses and property interests in areas susceptible to subsidence?
  - What is the location of infrastructure and facilities susceptible to subsidence (e.g., canals, levees, pipelines, major transportation corridors)?
  - What are the nearby basin's minimum thresholds?

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Sustainable Management Criteria – Supplemental Slides

- Considerations for developing Minimum Threshold for Water Quality:
  - What are the historical and spatial water quality trends in the basin?
  - What is the number of impacted supply wells?
  - What aquifers are primarily used for providing water supply?
  - What is the estimated volume of contaminated water in the basin?
  - What are the spatial and vertical extents of major contaminant plumes in the basin, and how could plume migration be affected by regional pumping patterns?
  - What are the applicable local, State, and federal water quality standards?
  - What are the major sources of point and nonpoint source pollution in the basin, and what are their chemical constituents?
  - What regulatory projects and actions are currently established to address water quality degradation in the basin (e.g., an existing groundwater pump and treat system), and how could they be impacted by future groundwater management actions?

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Sustainable Management Criteria – Supplemental Slides

- Considerations for developing Minimum Threshold for Surface Water Depletion:
  - What are the historical rates of stream depletion for different water year types?
  - What is the uncertainty in streamflow depletion estimates from analytical and numerical tools?
  - What is the proximity of pumping to streams?
  - Where are groundwater dependent ecosystems in the basin?
  - What are the agricultural and municipal surface water needs in the basin?
  - What are the applicable State or federally mandated flow requirements?

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Sustainable Management Criteria – Supplemental Slides

- Sustainability Goal must include:
  - Goal description. The goal description should summarize the overall purpose for sustainably managing groundwater resources and reflect local economic, social, and environmental values within the basin.
  - Discussion of measures. The goal should summarize the measures that will be implemented and how these measures will lead to operation of the basin within its sustainable yield.
  - Explanation of how the goal will be achieved in 20 years.

Likely to be one of the final components of GSP development…

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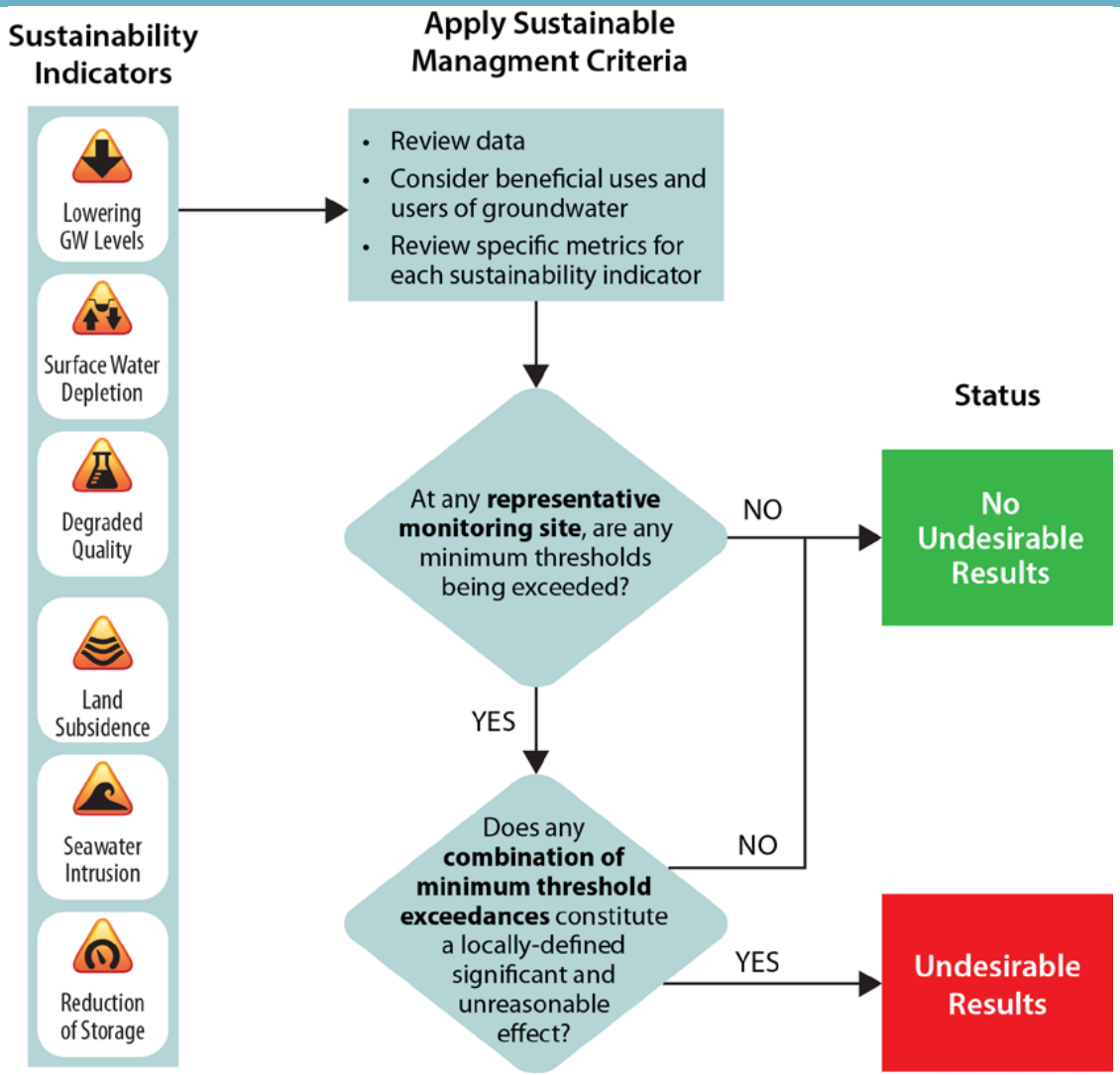
Sustainable Groundwater Management Act Background

Sustainable Management Criteria – Example of Evaluating Sustainability



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