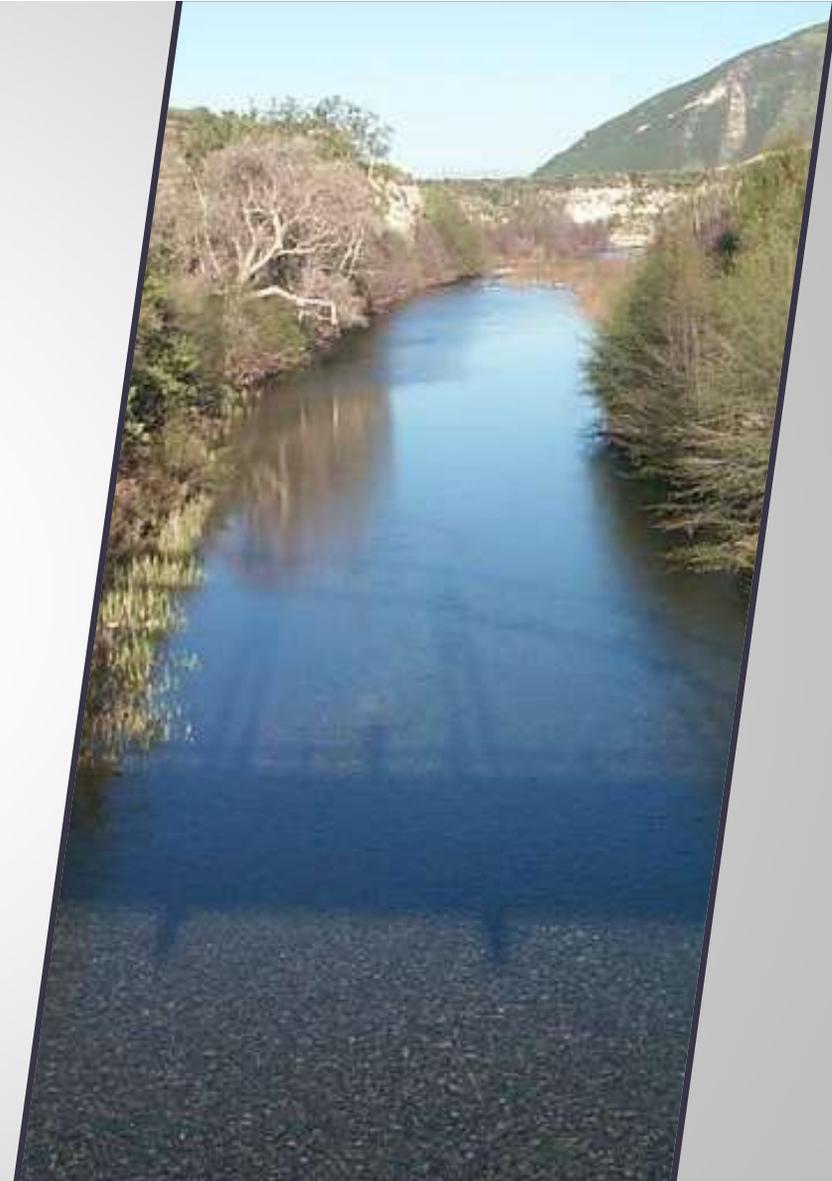


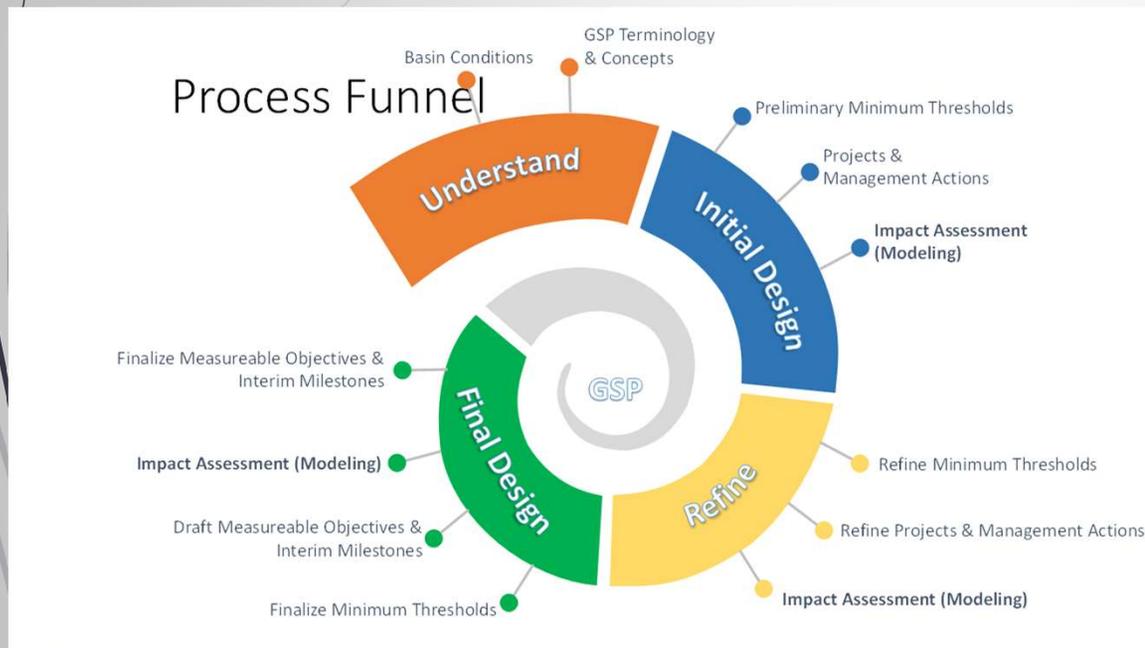
Sustainable Management Criteria Discussion

SVBGSA Forebay Subbasin
Committee Meeting

September 2, 2020



Process

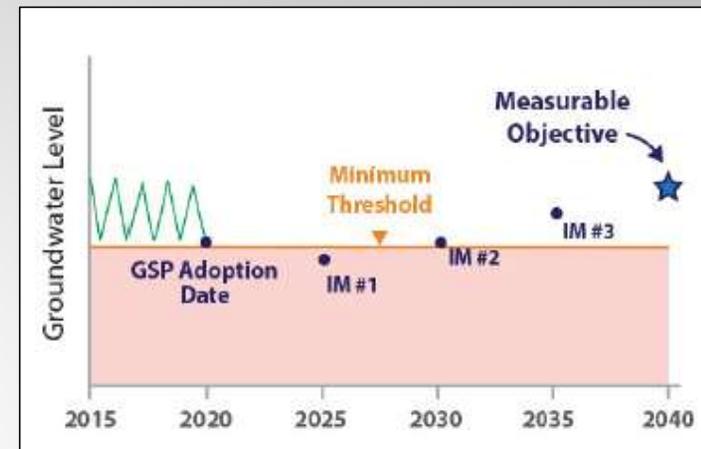


- July 1st Subbasin Committee Meeting – received overview of SMCs in the Forebay Subbasin
- July 28 workshop – provided greater detail on SMC terminology and concepts
- Sept 2 Subbasin Committee Meeting – discuss and give direction on SMCs in the Forebay GSP
- SVBGSA will work with ASGSA
- Jan 2021 – receive SMC chapter

Opinions/guidance will be included in boxes

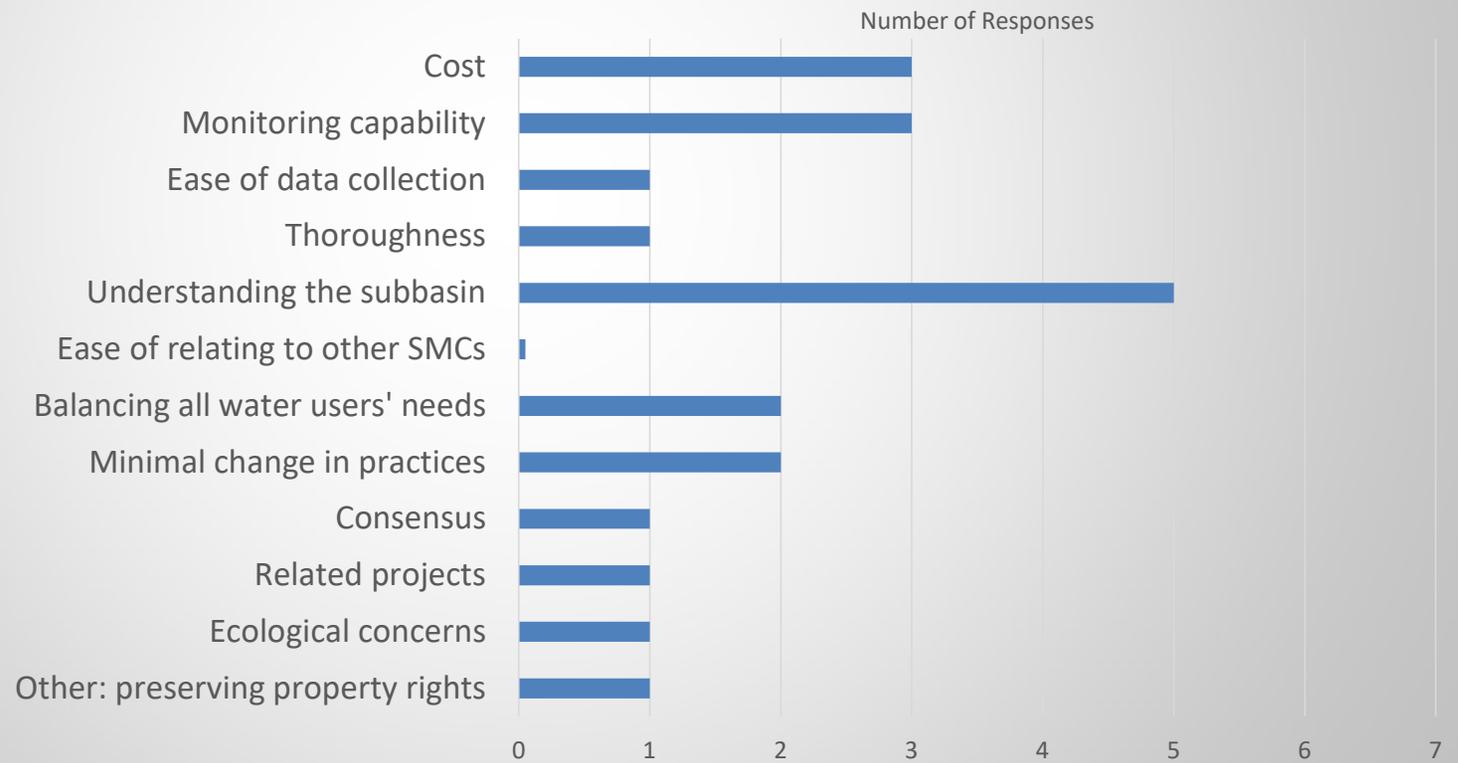
Each of the Six Sustainability Indicators has:

- A statement of what is **significant and unreasonable** for the GSP
- **Minimum thresholds** - quantitative value that define what is significant and unreasonable at every measuring point
- **Undesirable results** - combination of minimum thresholds exceedances for the whole subbasin
- **Measurable objectives** are quantitative goals
- *GSPs must clearly define a planned pathway to reach sustainability in the form of interim milestones towards measurable objectives, and show actual progress in annual reporting*



Question 3

Select up to three priorities for selecting and implementing SMCs





Land Subsidence

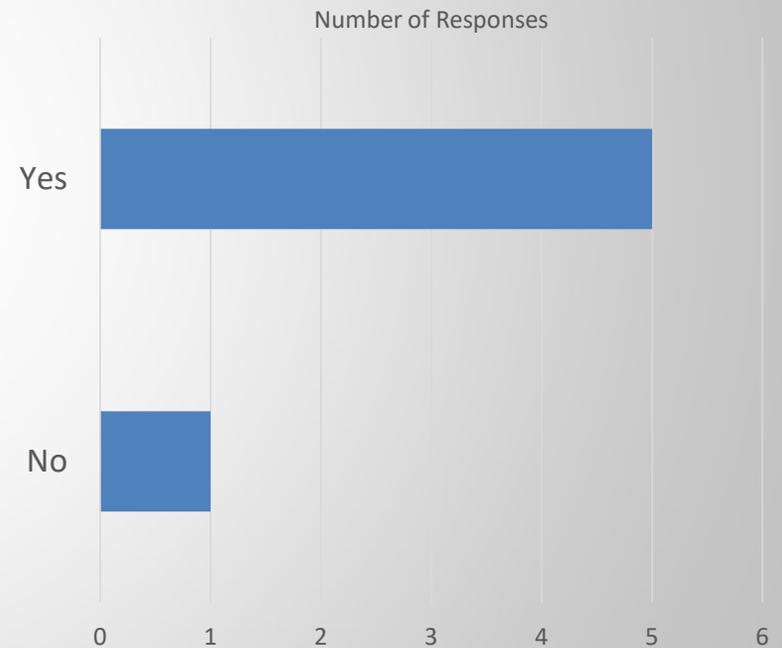
Question 4

Metric Options

Change in land surface elevation at each measuring point

- One minimum threshold and one measurable objective per measuring point
- Option to use groundwater level as a proxy for ground surface elevation

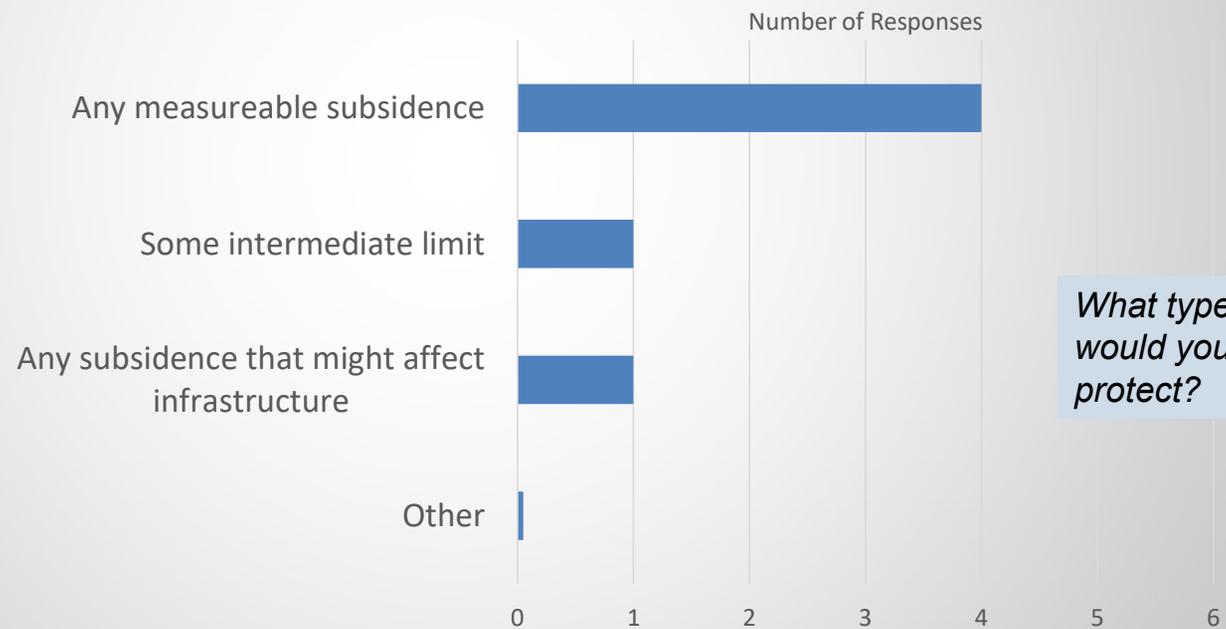
Are InSAR data sufficient?



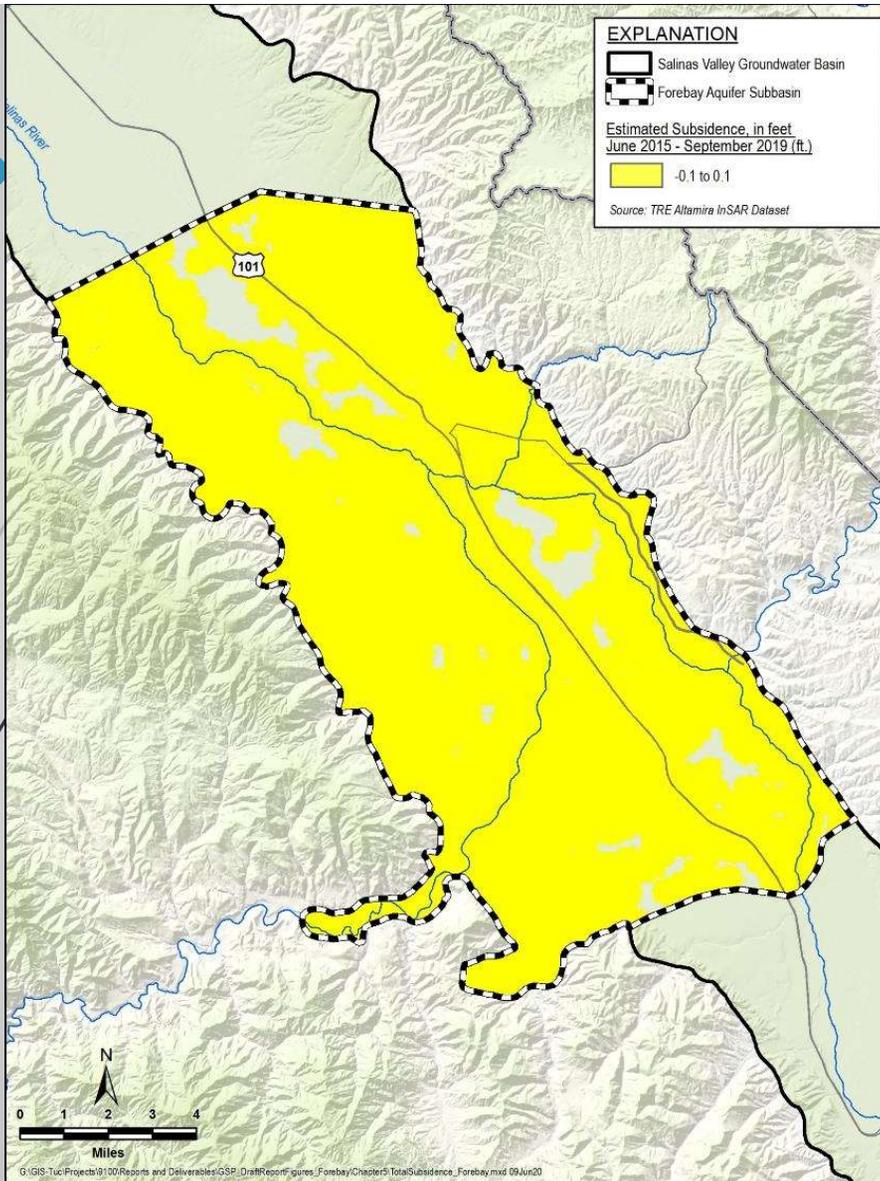


Land Subsidence Question 5

How much subsidence is too much?



*What type of infrastructure
would you want to
protect?*



Example Subsidence Data – InSAR (From DWR)

Subsidence is not a significant problem
in this subbasin

This map shows four years of
subsidence, not annual subsidence



Top pick

Subsidence SMC Options

1. **Any subsidence** anywhere in the Subbasin is significant and unreasonable
 - Minimum threshold = 0 subsidence
 - Measurable Objective = 0 subsidence
2. **Any subsidence may impact infrastructure** in the Subbasin is significant and unreasonable
 - Map infrastructure locations
 - Minimum threshold = 0 in mapped locations
 - Minimum threshold = ? outside of mapped locations
 - Measurable objective = 0 everywhere
3. **Some** level of subsidence is acceptable.
 - Minimum threshold = ? subsidence everywhere
 - Measurable Objective = 0 subsidence everywhere

180/400
GSP

Subsidence Direction



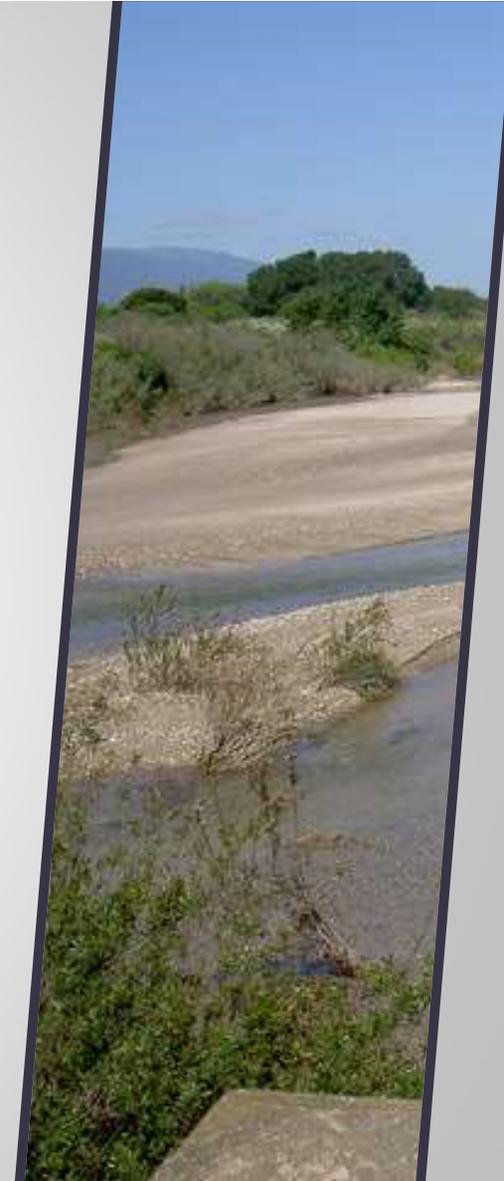
Metric - InSAR

Option 1 (any subsidence), or

Option 2 (any subsidence that might affect infrastructure)

If option 2, what infrastructure?

Option 3 (some subsidence is acceptable)





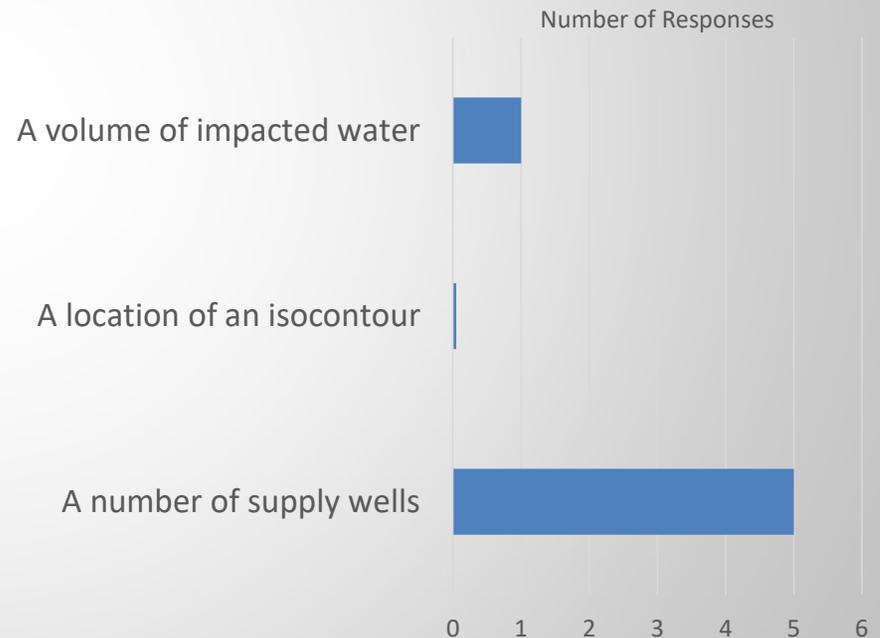
Quality Metric - Measuring Thresholds & Objectives (354.28(c))

Metric

Three options in the regulations.

1. A volume of impacted groundwater. Annually contour and calculate the volume of impacted groundwater
2. The location of an isocontour. Annually contour concentrations
3. A number of supply wells. Review drinking water and irrigation water quality data

To monitor and measure water quality,
it would be best to use:

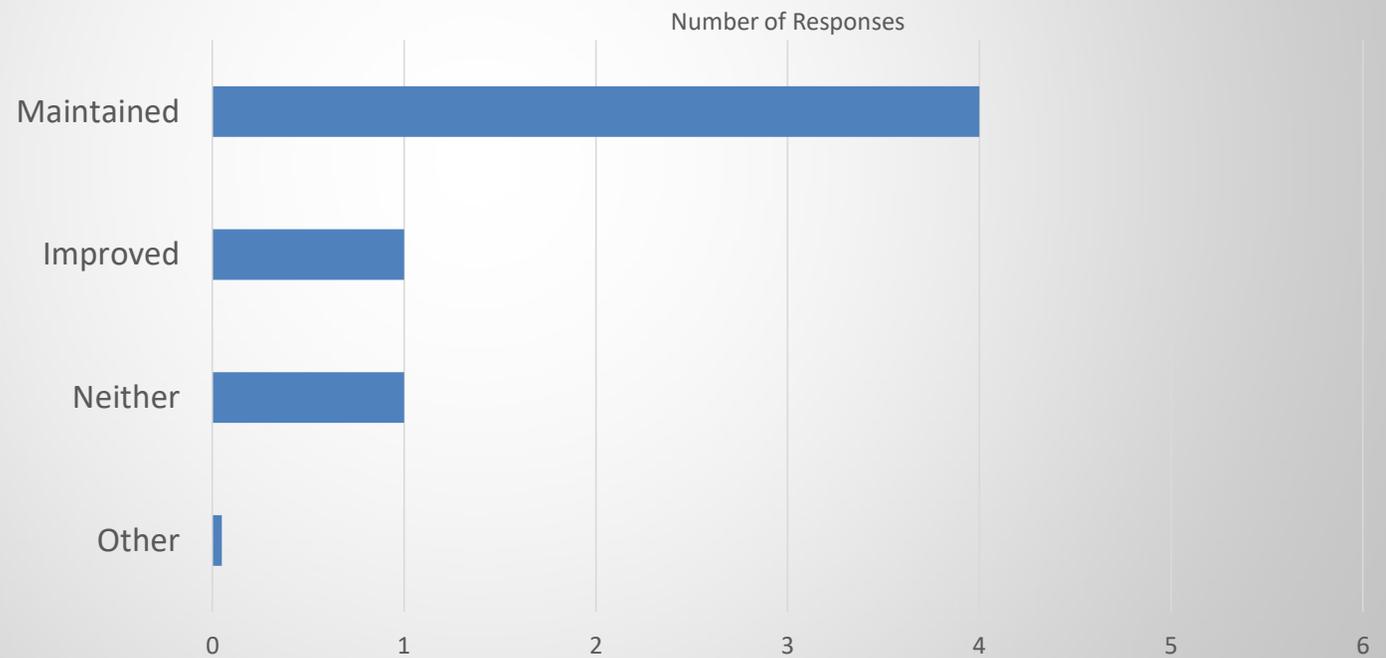




Groundwater Quality SMC

Question 12

Current groundwater quality should be:





Top pick

Groundwater Quality Minimum SMC Options

1. Degraded groundwater quality resulting from direct GSA actions is significant and undesirable
 - Minimum threshold = **maintain** current groundwater quality impacts
 - Measurable objective = same as minimum threshold
2. Existing groundwater quality conditions are significant and undesirable, but SVBGSA **chooses not to improve** existing groundwater quality
 - Minimum threshold = improve groundwater quality impacts
 - Measurable objective = same as minimum threshold

****We are not required to meet the minimum thresholds in this example**
3. Existing groundwater quality conditions are significant and undesirable, and SVBGSA **chooses to improve** existing groundwater quality
 - Minimum threshold = improve groundwater quality impacts
 - Measurable objective = same as minimum threshold

180/400
GSP

Be cautious adopting responsibilities and authorities already held by other agencies such as CCRWQB, or County of Monterey



180/400-Foot Subbasin Example – Groundwater Quality Minimum Threshold

Minimum threshold is zero additional exceedances of groundwater quality constituents of concern known to exist in the Subbasin **[option 1]**

- Based on the idea that it is significant and unreasonable for the GSA to take an action that financially impacts a well owner.
 - Well owner has to treat water
 - Well owner has to abandon a well
 - Reduced crop production due to water quality



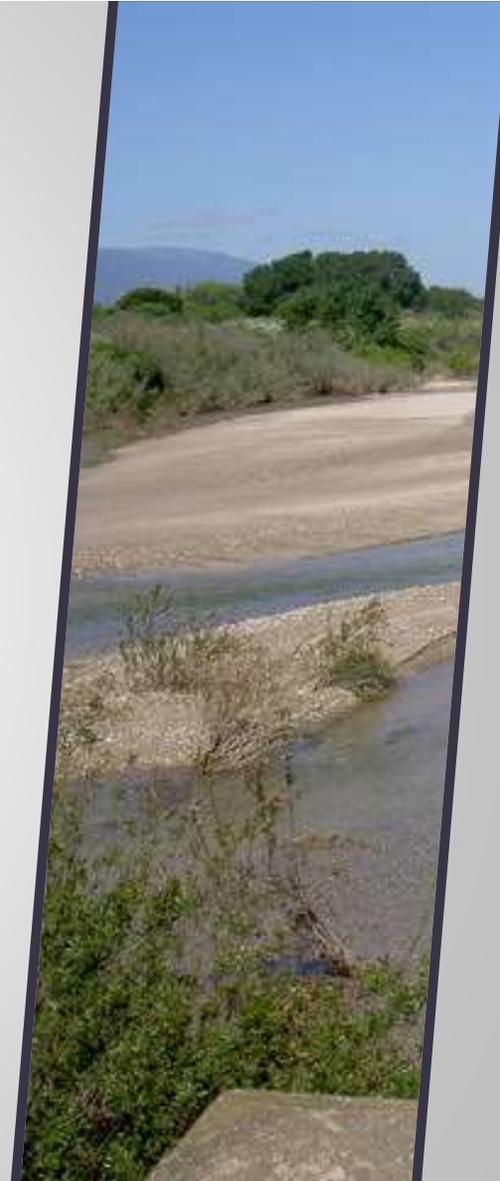
Groundwater Quality Direction

Metric – A number of supply wells

Option 1 – Maintain

Option 2 – Choose not to improve

Option 3 – Choose to improve





Groundwater Storage

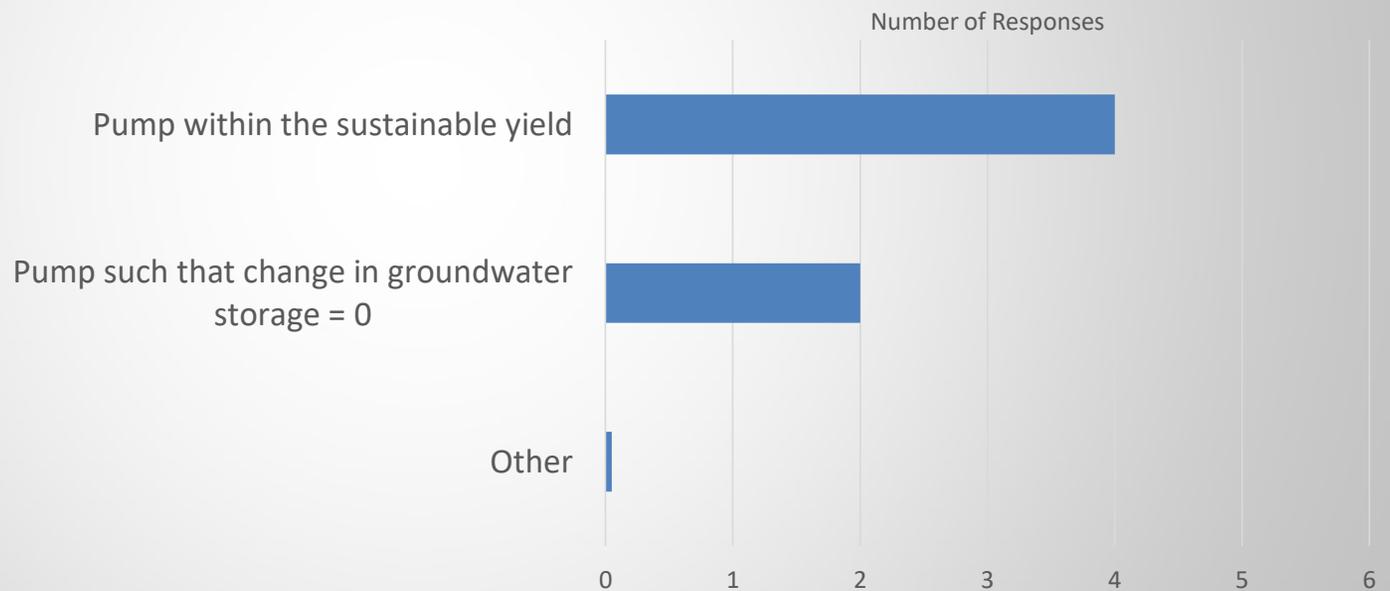
Question 10

Metric

Total extractions (pumping)

- One minimum threshold and one measurable objective for the entire subbasin
- *Many GSPs have opted to calculate storage from groundwater levels as a proxy for extractions*

How should groundwater pumping be limited?





Top pick

Groundwater Storage SMC Options

1. Pumping in excess of the sustainable yield leads to significant and unreasonable impacts
 - Minimum threshold = pump within the sustainable yield. Provide an estimate of the sustainable yield, acknowledging it will be refined with better data
 - Measurable objective = pump at, or less than the sustainable yield.
2. Net change in groundwater storage, based on groundwater elevations is zero
 - Minimum threshold = no long-term change in storage based on calculations using groundwater elevation data
 - Measurable objective = long-term stability, or increase in storage based on calculations using groundwater elevation data

180/400
GSP

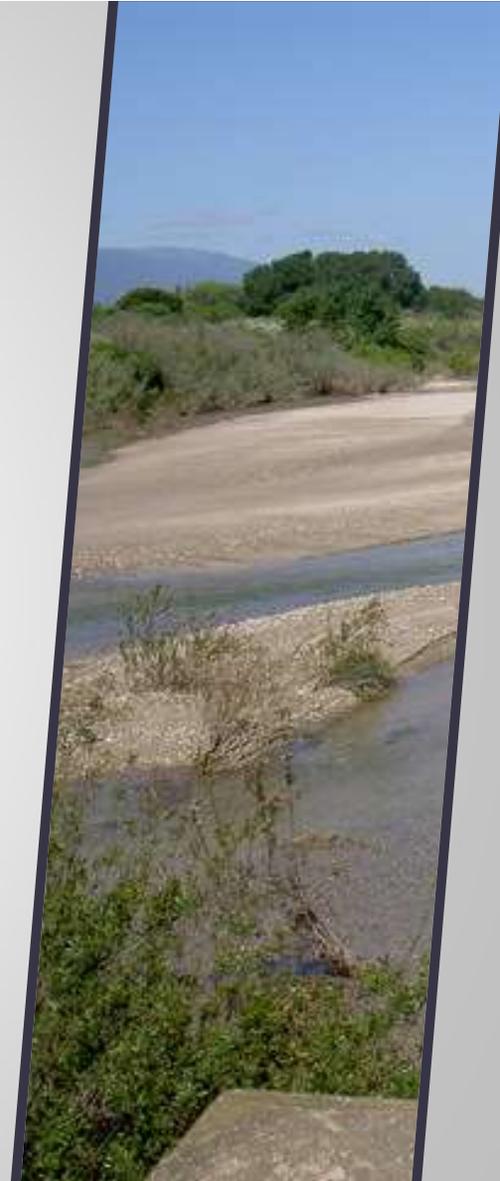
It is unclear how using groundwater levels as a proxy strictly meet SGMA regulations



Groundwater Storage Direction

Option 1 – Pump within sustainable yield

Option 2 – Pump such that change in groundwater storage is 0, based on groundwater elevations





Groundwater Levels

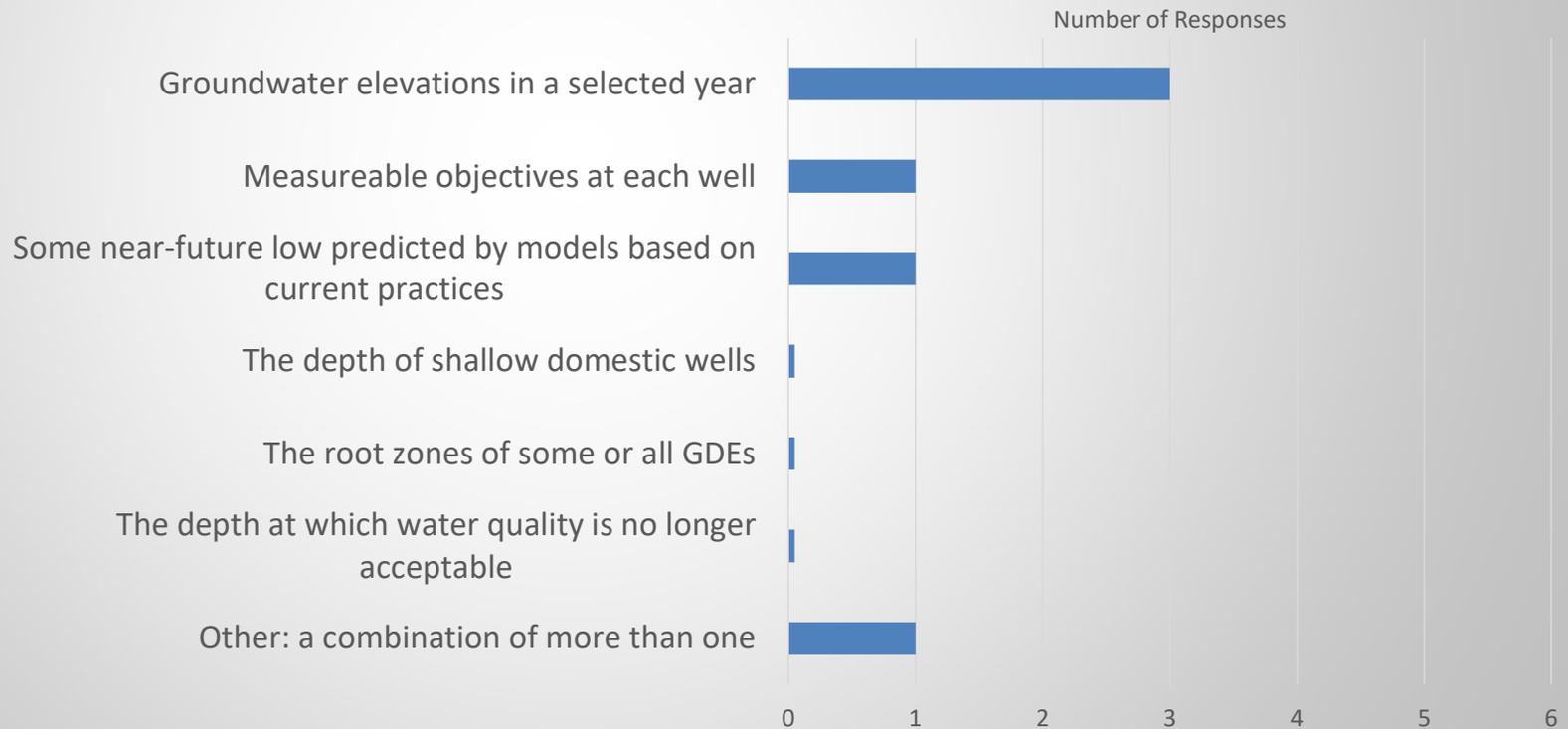
Question 9

Metric

Groundwater levels measured in representative monitoring wells

- One minimum threshold and one measurable objective per well

What should determine groundwater elevation minimum thresholds?



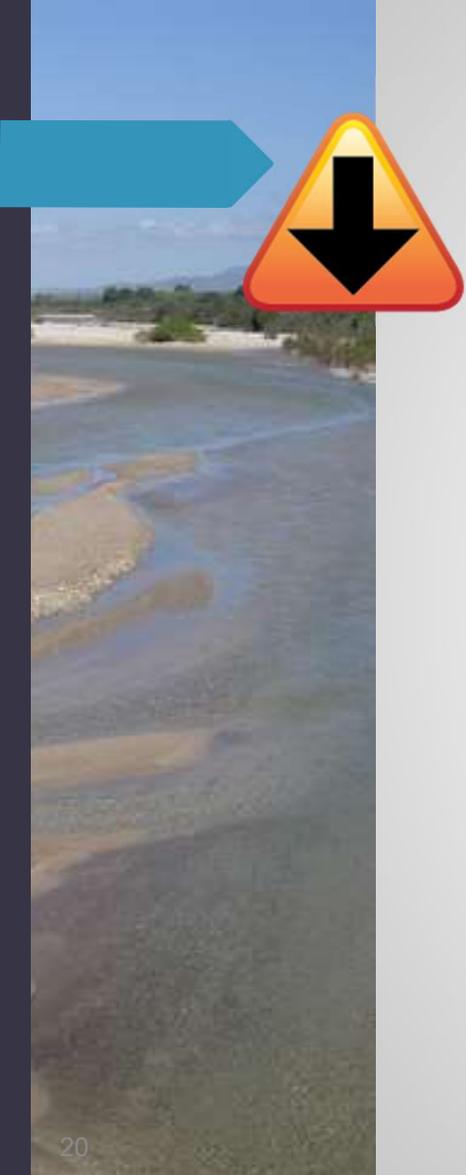
Groundwater Levels SMC Options



Top pick

1. Groundwater elevations in a certain year were significant and unreasonable
 - Set minimum thresholds above whatever was recorded in the year in question
2. Groundwater elevation Minimum Thresholds will be set a depth below the measurable objective at each well
 - Set the groundwater level goal you would like to achieve, then set a minimum threshold that allows groundwater levels to drop during a drought.
 - Need a way to set your groundwater level goal. Maybe current conditions?
3. Groundwater elevations Minimum Thresholds are set at the lowest point predicted by models if current practices continue
 - Extend the current rate of groundwater decline out 20 years. Set the minimum thresholds there.
 - Option is to set minimum thresholds after 5,10, or 15 years of declines at current rates

180/400
GSP

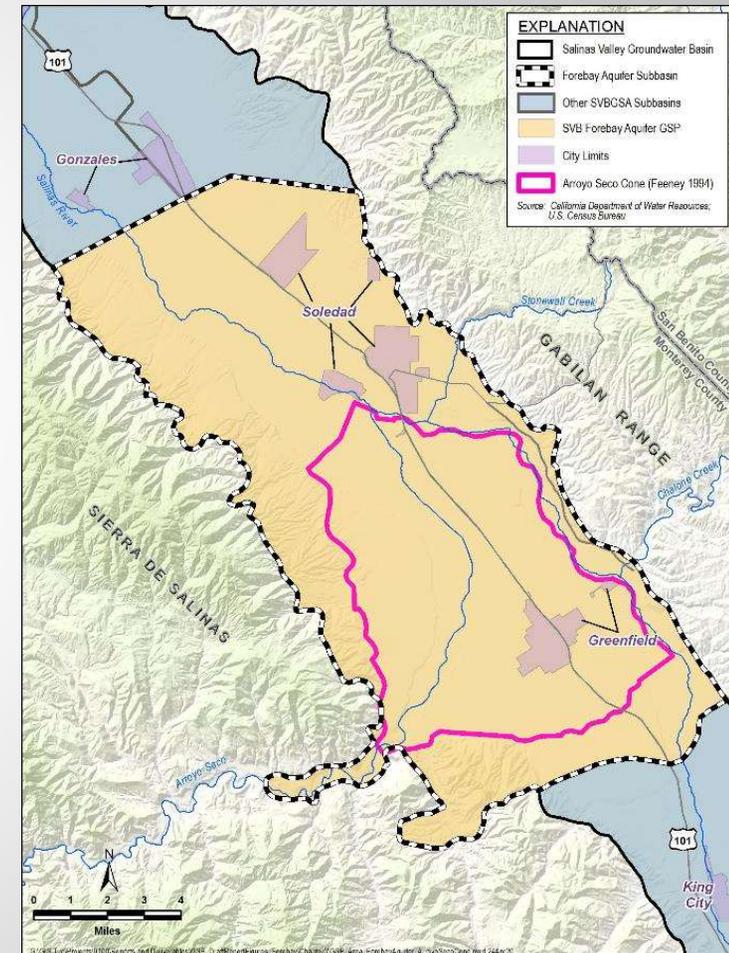


Groundwater Levels SMC Options – *Not selected*

4. *Impacting shallow, domestic wells is significant and unreasonable*
 - ▶ *Minimum thresholds are set to ensure **most** shallow domestic wells have adequate water for operation*
 - ▶ *Option: set minimum thresholds excluding the very shallowest domestic wells*
 - ▶ *Option: use this as a check on the reasonableness of minimum thresholds*
5. *Lowering groundwater elevations below the root zone of all (or selected) GDEs is significant and unreasonable*
 - ▶ *Minimum thresholds based on an assumed rooting depth of plants in a GDE*
 - ▶ *Measurable Objectives are above this depth to account for droughts*
6. *Lowering groundwater levels to where wells pump poor quality groundwater is significant and unreasonable*
 - ▶ *Requires data on groundwater quality with depth.*
 - ▶ *Used for naturally occurring constituents such as Arsenic etc.*

Variability Across the Subbasin

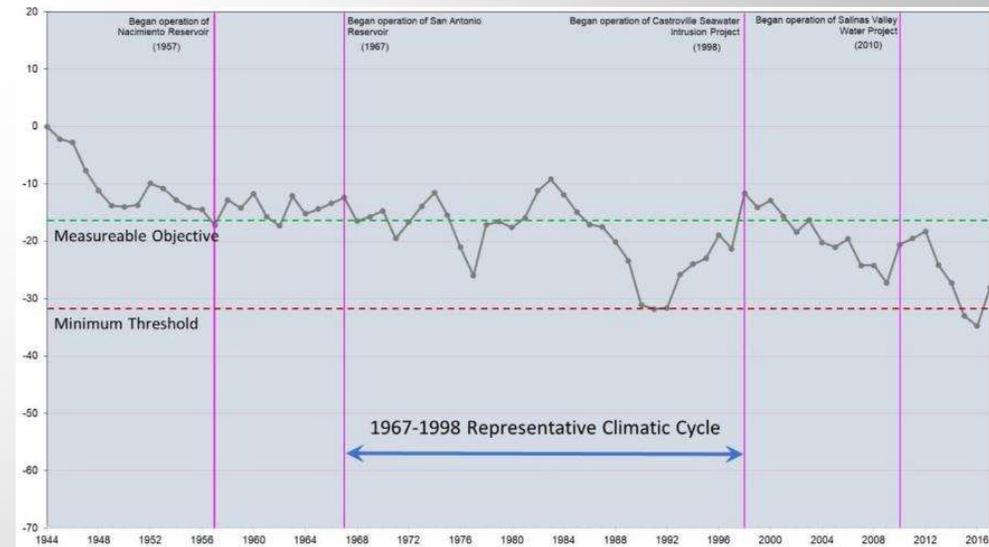
- ➔ SMC in different management areas can be based on different definitions of significant and unreasonable.
- ➔ However, minimum thresholds in one area cannot prevent another area from achieving its own sustainability



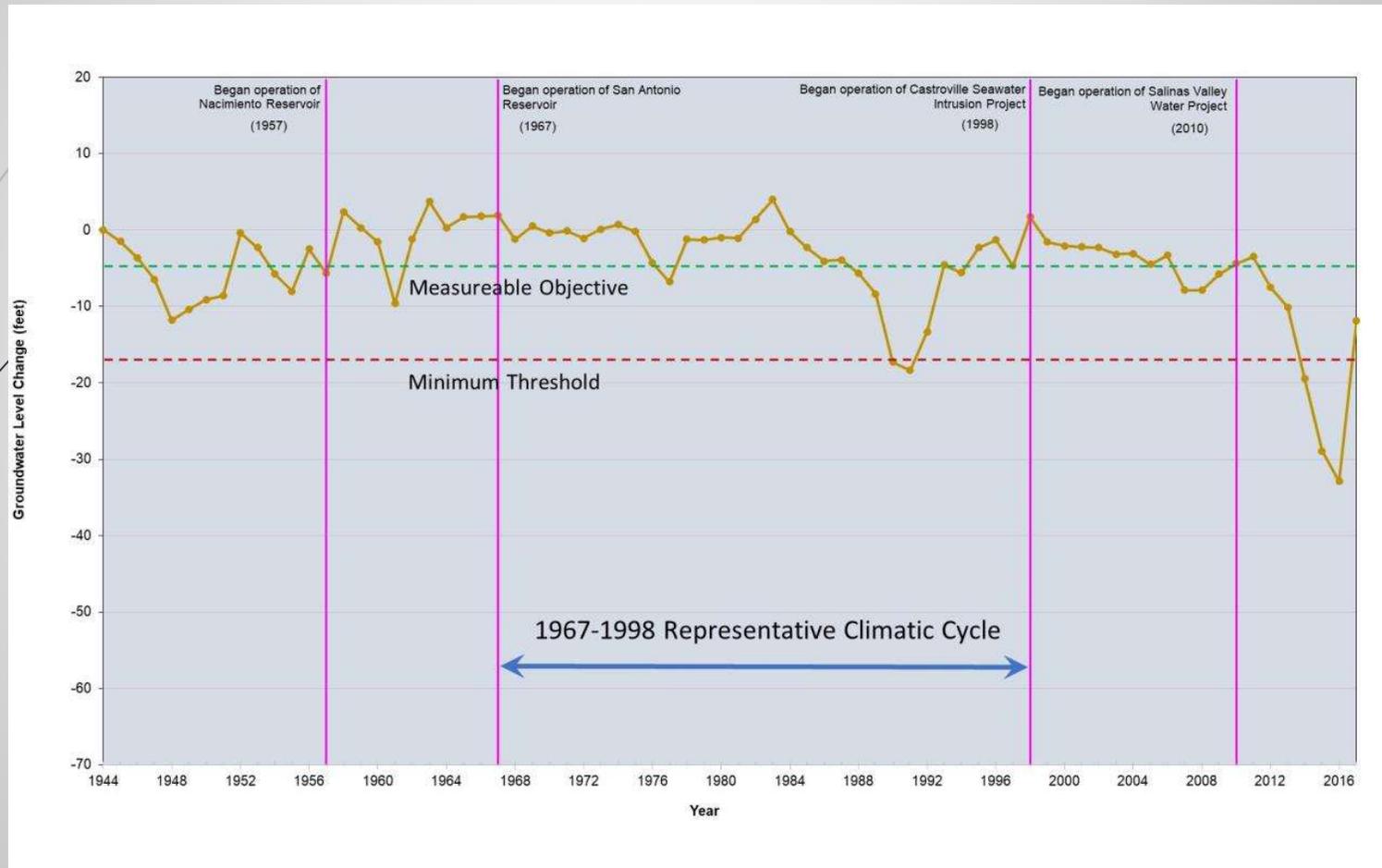
180/400-Foot Subbasin Example - Groundwater Levels Minimum Threshold

Groundwater elevations will be maintained 1 foot above measured 2015 elevations. [option 1]

- ▶ The GSP statistically assessed impacts on domestic wells [option 4]



Cumulative Groundwater Level Change Hydrograph with Selected Measurable Objective and Minimum for the Forebay



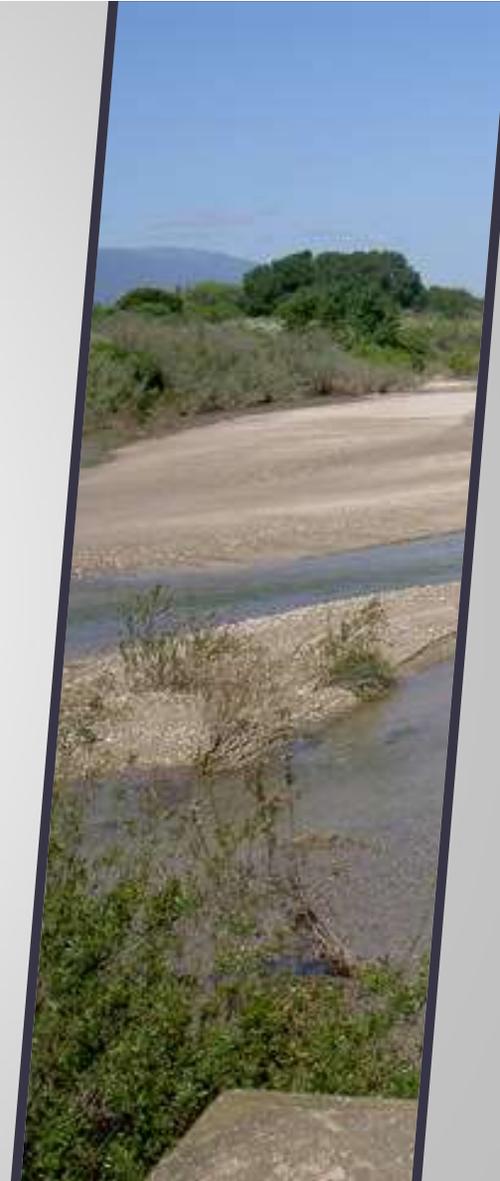


Groundwater Levels Direction

Option 1 – GW elevations in a selected year

Option 2 – MO at each well

Option 3 – Some near-future low predicted by models based on current practices





Interconnected Surface Water – Measuring Thresholds & Objectives (354.28(c))

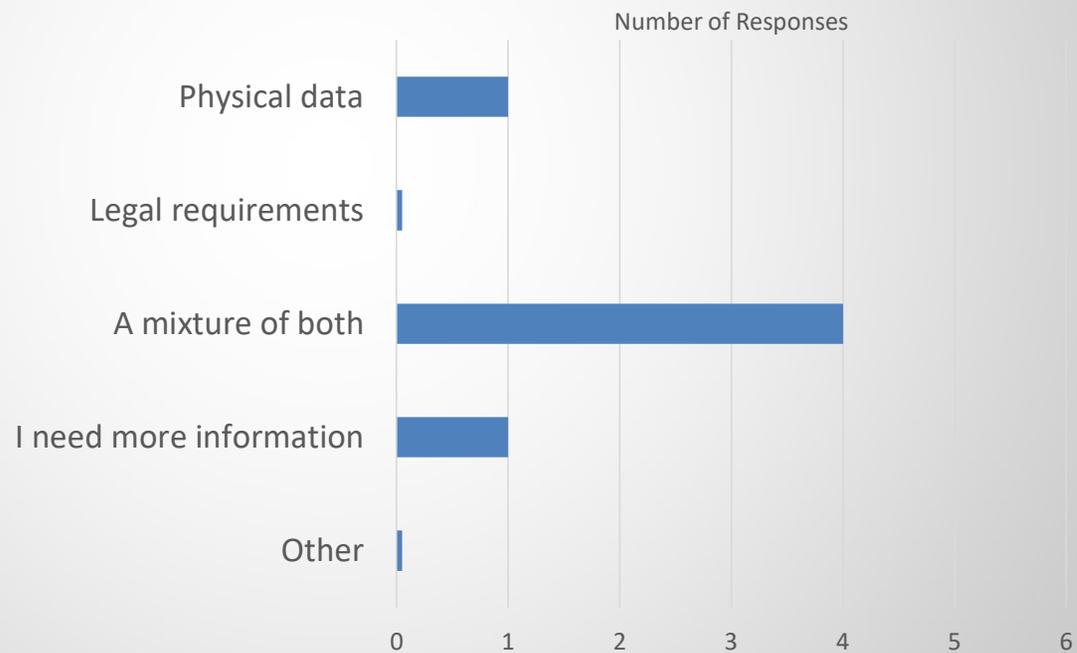
Sustainability Indicator	Metric
Depletion of Interconnected surface water	A rate or volume of surface water depletion. Set one minimum threshold and one measurable objective per surface water body. <ul style="list-style-type: none">• Option 1. Estimate depletions with a model• Option 2. Use groundwater elevations as a proxy



Interconnected Surface Waters

Question 6

The SMC approach should focus on:

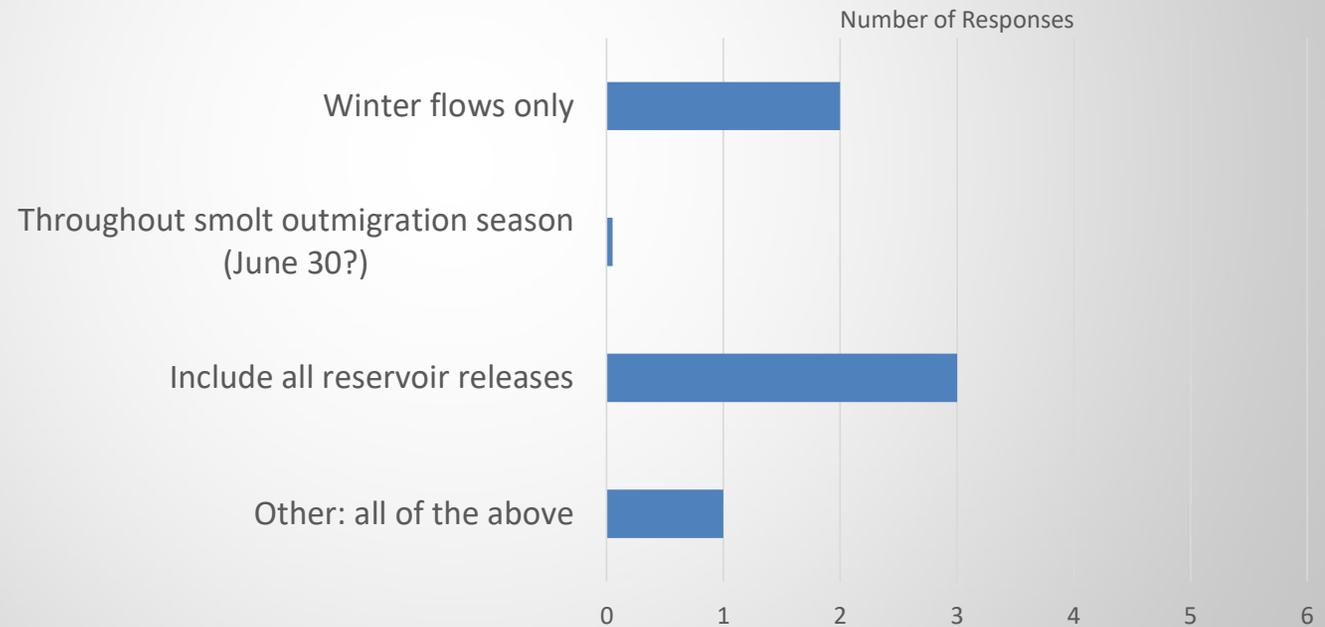




Interconnected Surface Waters

Question 7

What flows should the SMC approach be concerned about?

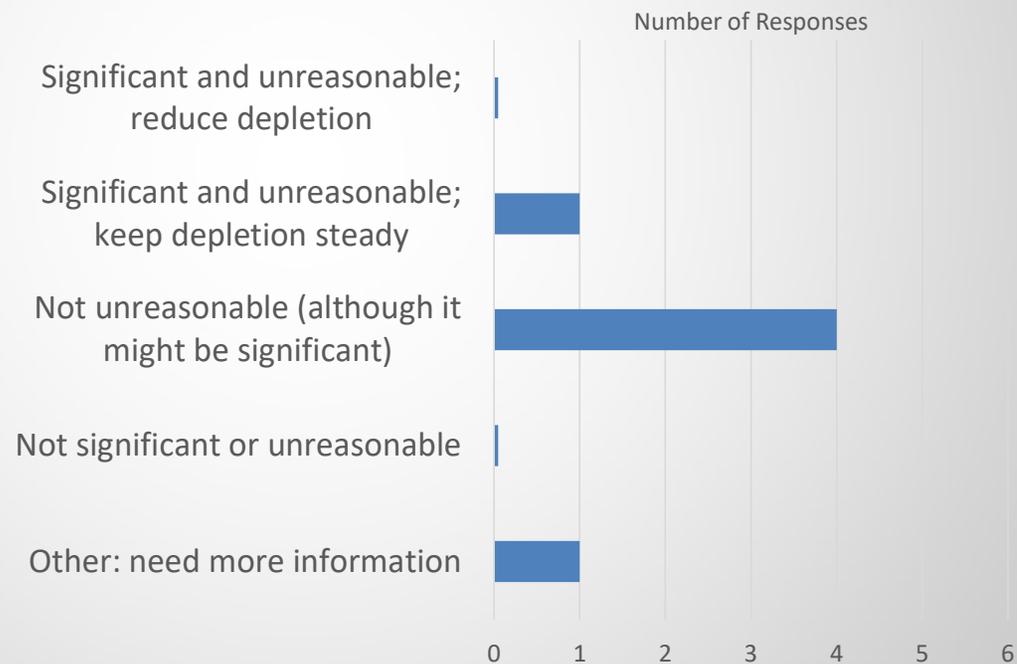




Interconnected Surface Waters

Question 8

The current rate of surface water depletion is:





Interconnected Surface Water SMC Options

2. The current rate of surface water depletion is significant and unreasonable, but SVBGSA **chooses not to reduce the rate of depletion**
 - Minimum threshold
 - Less than today's simulated depletion, or
 - Higher shallow groundwater levels
 - Measurable objectives
 - Less simulated depletion, or
 - Higher shallow groundwater levels
 - *We are not required to meet the minimum thresholds in this example*
3. The **current rate of surface water depletion is not unreasonable** (although it may be significant)
 - Minimum threshold
 - Equal to today's simulated depletion, or
 - Equal to today's shallow groundwater levels
 - Measurable objectives
 - Equal to today's simulated depletion, or
 - Equal to today's shallow groundwater levels

Top pick

180/400
GSP



Interconnected Surface Water SMC Options – *Not selected*

1. *The current rate of surface water depletion is significant and unreasonable, and we choose to reduce the rate of depletion (leave more water in surface water bodies)*
 - *Minimum threshold*
 - *Less simulated depletion, or*
 - *Higher shallow groundwater levels*
 - *Measurable objectives*
 - *Less simulated depletion, or*
 - *higher shallow groundwater levels*

4. *Additional surface water depletion is neither significant nor unreasonable (take more water out of surface water bodies)*
 - *Minimum threshold*
 - *More than today's simulated depletion, or*
 - *Lower shallow groundwater levels*
 - *Measurable objectives*
 - *More than today's simulated depletion, or*
 - *Lower shallow groundwater levels*

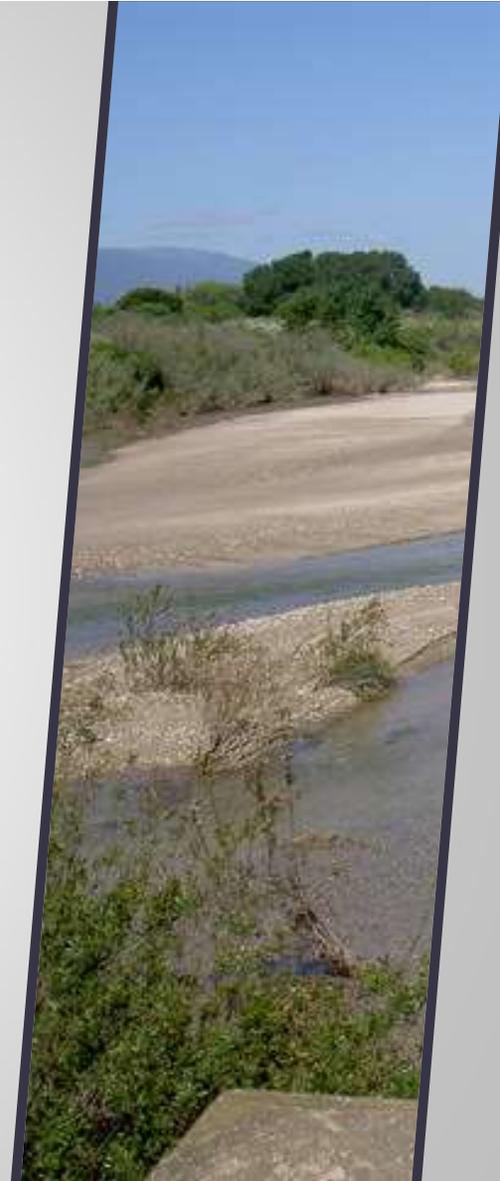
ISW Direction



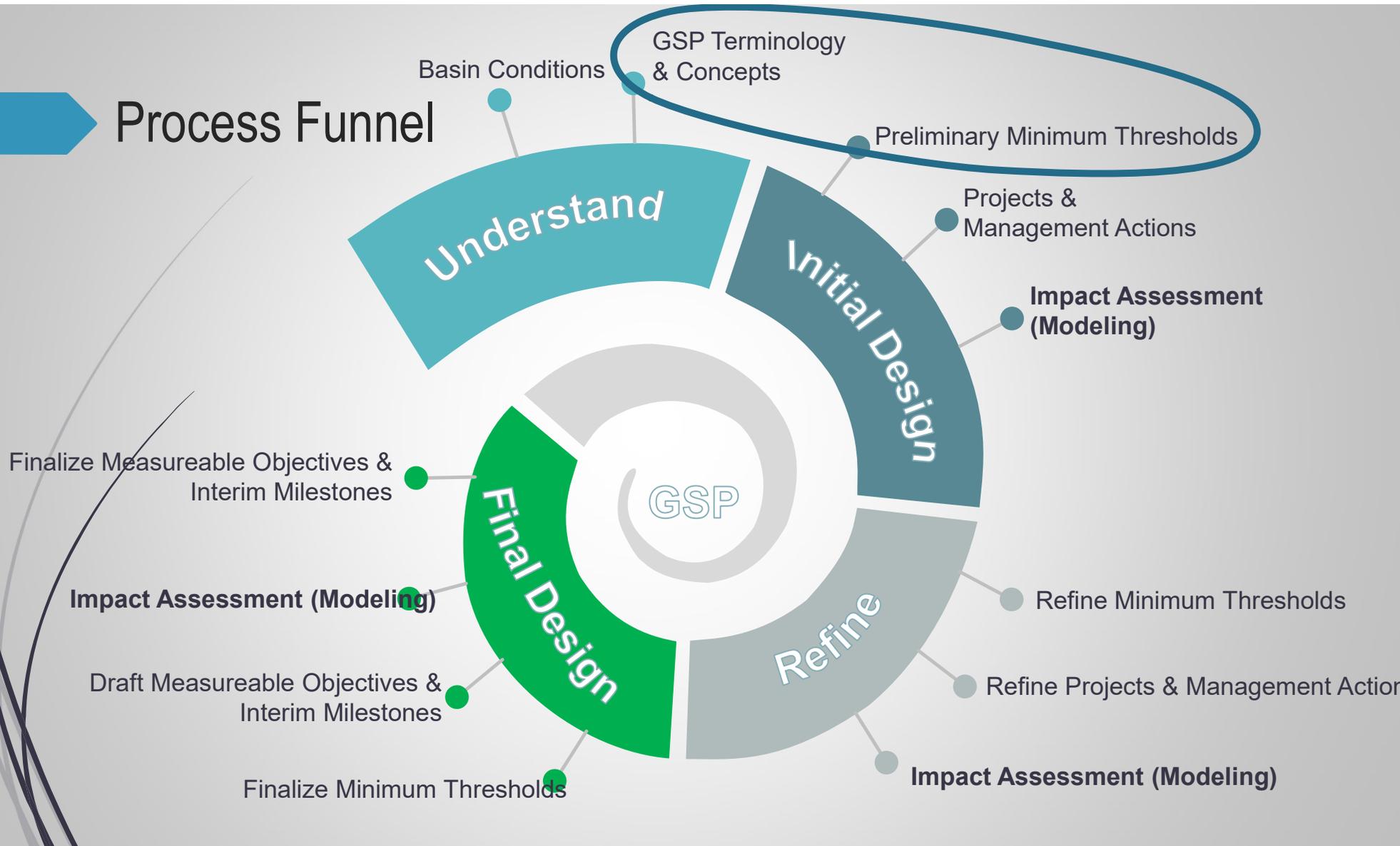
Metrics – model or shallow groundwater levels

Option 2 – Significant and unreasonable, keep depletions steady

Option 3 – Not unreasonable (even if may be significant)



Process Funnel





Questions

