

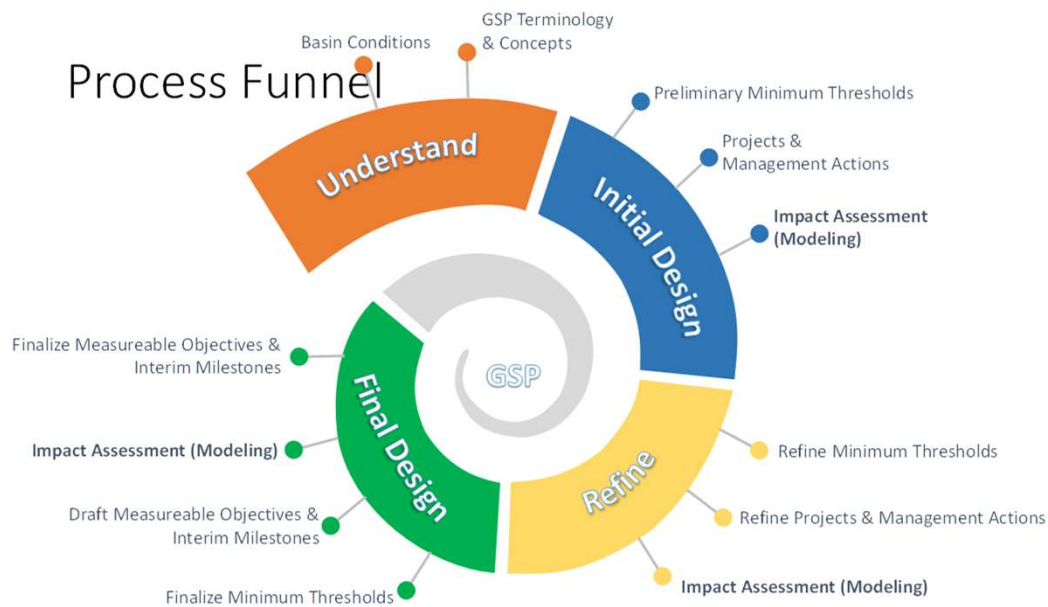


Sustainable Management Criteria Discussion

**SVBGSA Langley Subbasin
Committee Meeting
September 2, 2020**



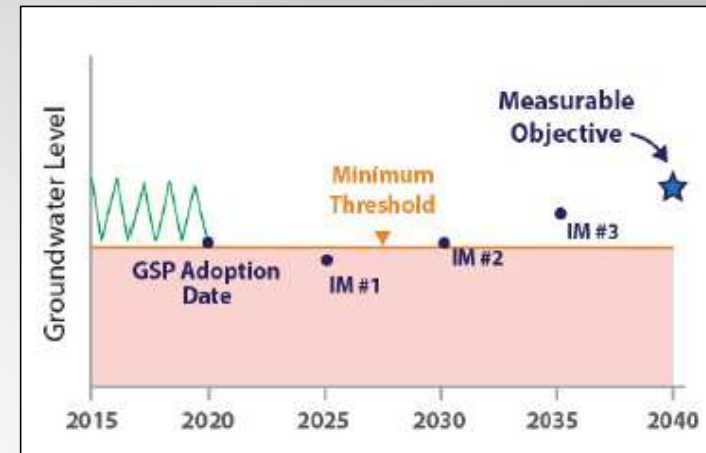
Process



- July 10 Subbasin Committee Meeting – received overview of SMCs in the Langley Area 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 Langley Area GSP
- Jan 2021 – receive SMC chapter

Opinions/guidance will be included in boxes

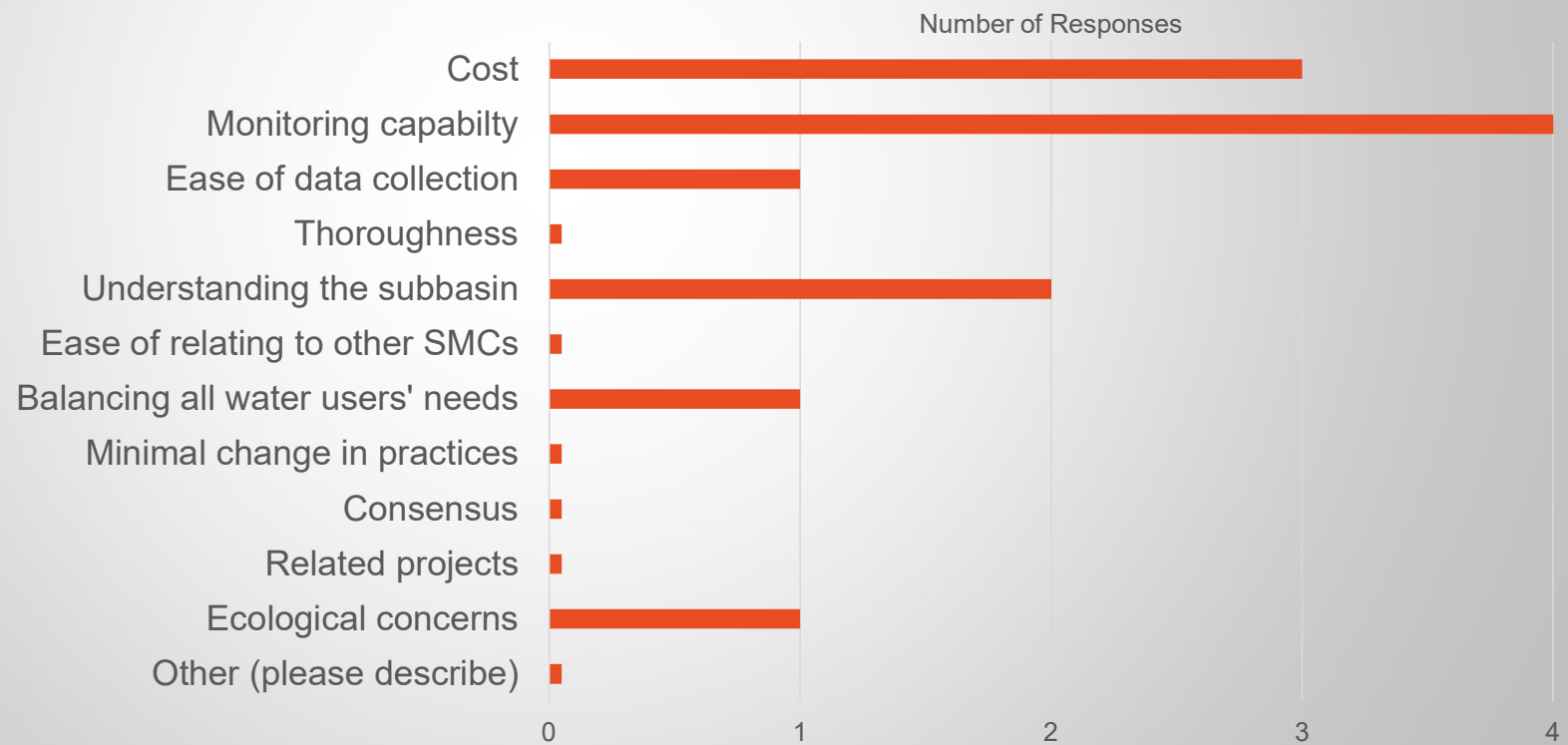
Each of the Six Sustainability Indicators has:



- 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 setting and implementing SMCs





Groundwater Storage

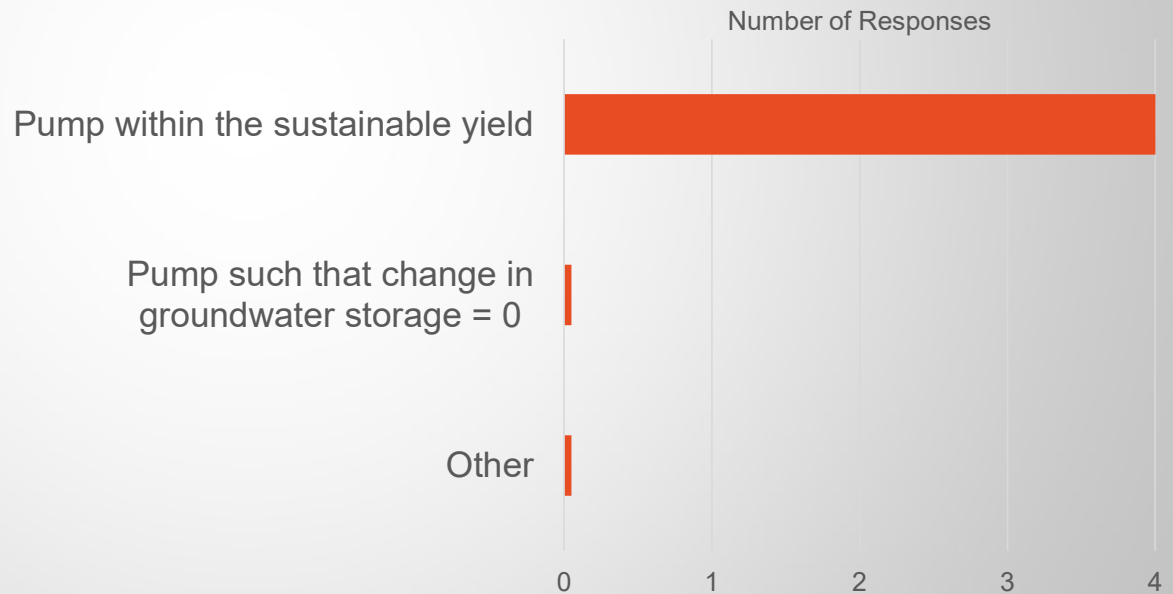
Question 10

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?





Groundwater Storage Minimum Threshold 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



Groundwater Storage Direction

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.





Land Subsidence - Metric

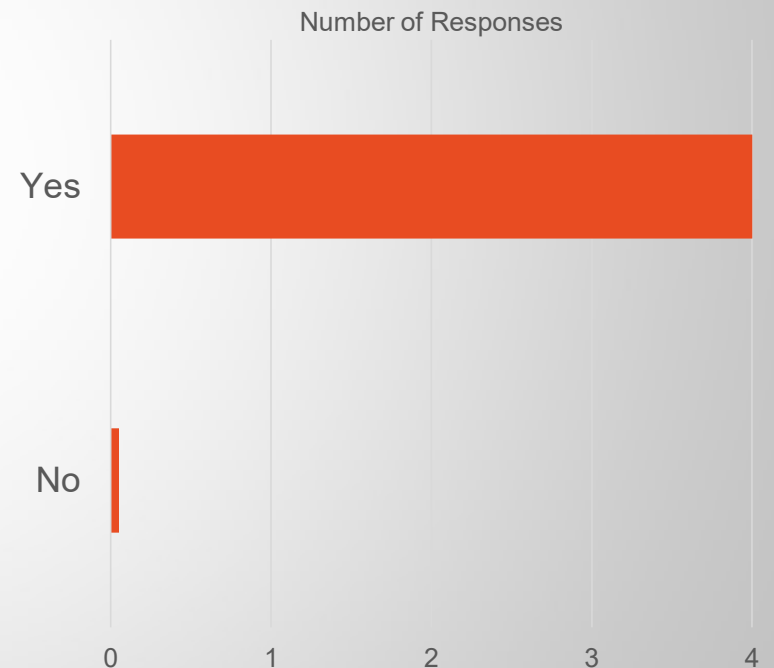
Question 4

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

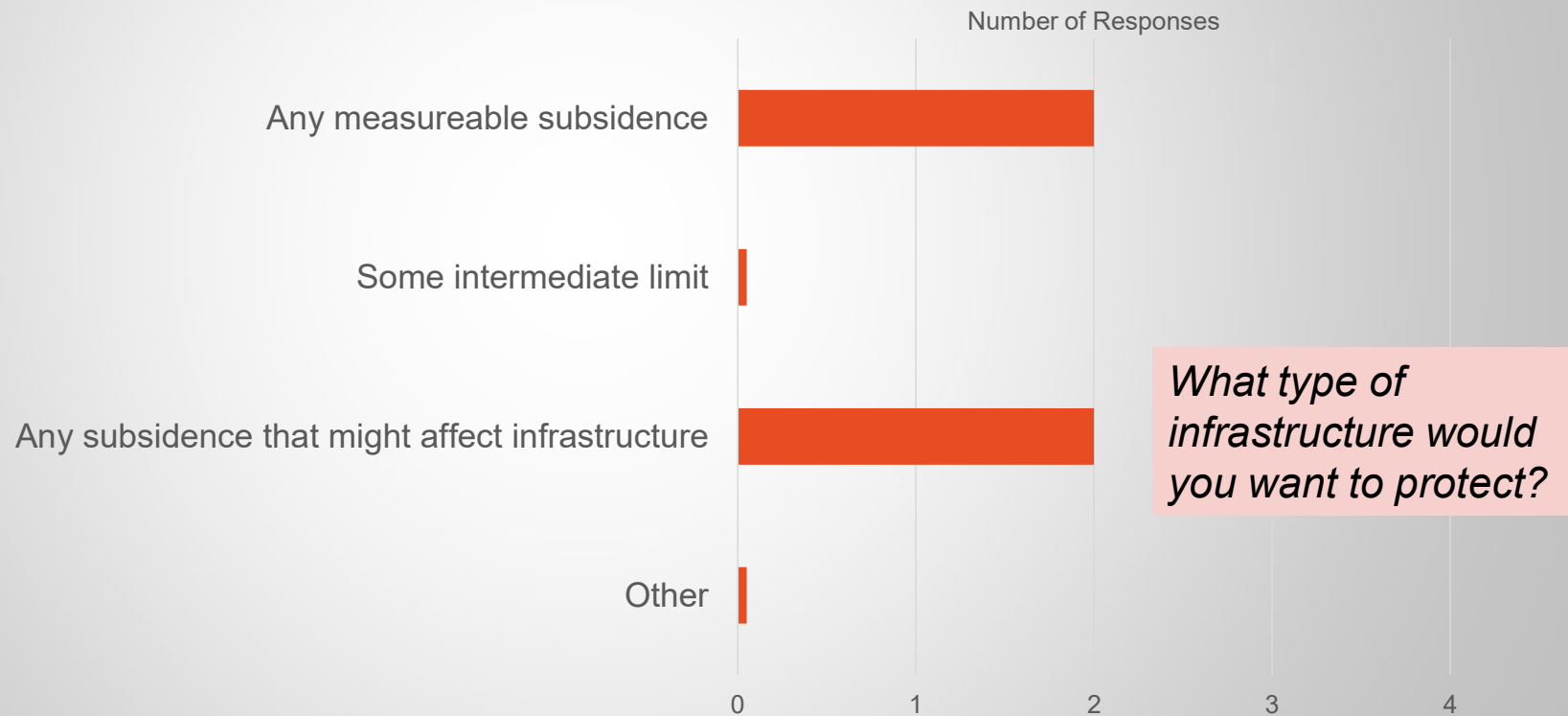
Are InSAR data sufficient?





Land Subsidence Question 5

How much subsidence is too much?





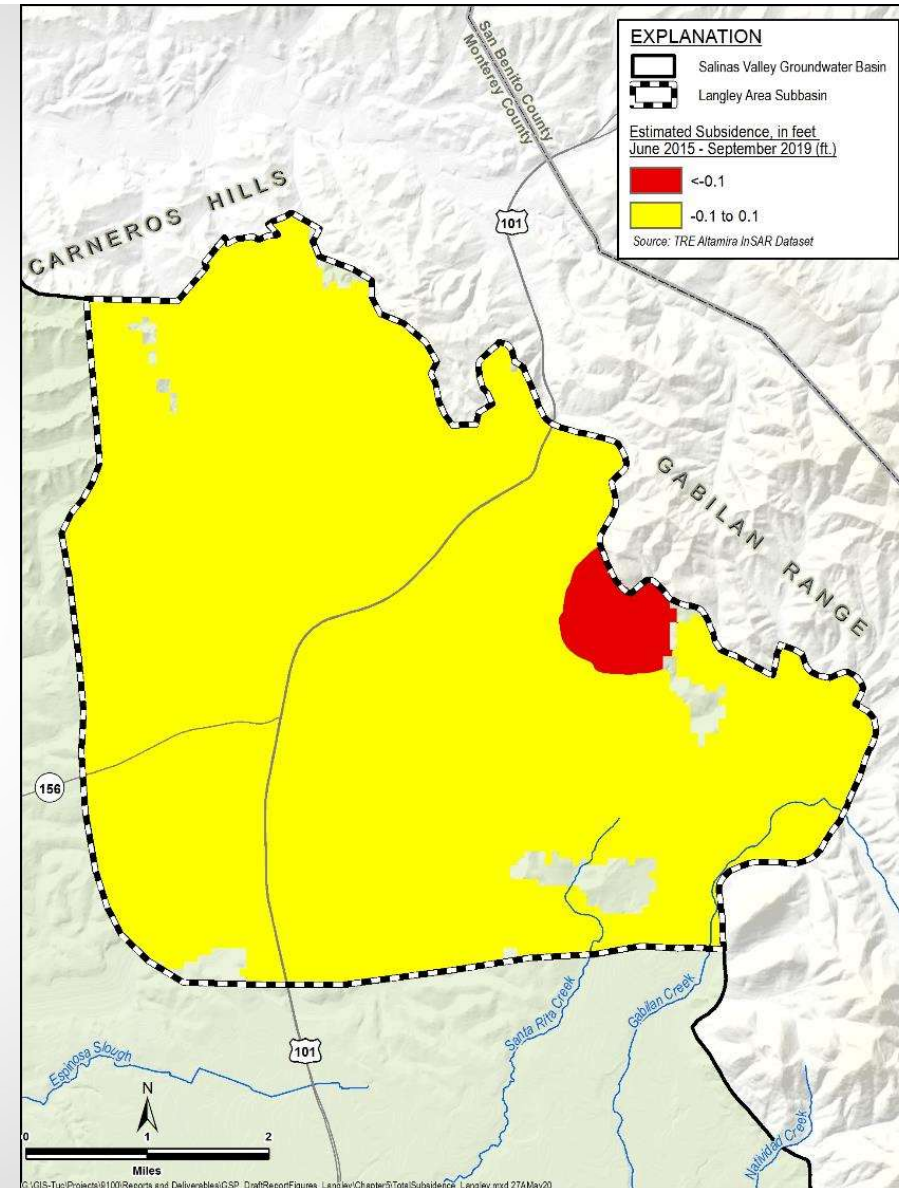
Example Subsidence Data – InSAR (From DWR)

Subsidence is not a significant problem in this subbasin.

This map shows four years of subsidence, not annual subsidence

Location of subsidence is at interface with Gabilan Range where there is limited aquifer space and limited water resources.

Subsidence may not be related to groundwater management, and undesirable results occur only when caused by groundwater conditions





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. – *Not selected*
 - Minimum threshold = ? subsidence everywhere
 - Measurable Objective = 0 subsidence everywhere

180/400
GSP

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



Subsidence Direction

Metric - INSAR

Option 1 (any subsidence), or

Option 2 (any subsidence that might affect infrastructure)

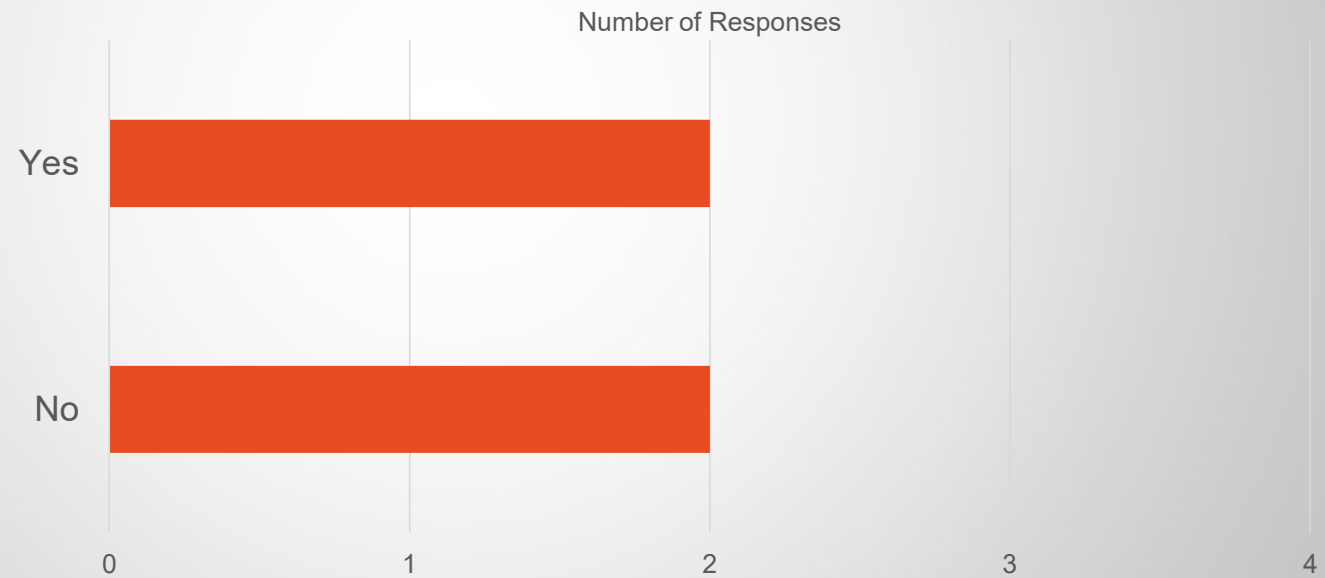
If option 2, what infrastructure?





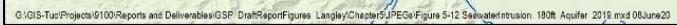
Seawater Intrusion Question 13

Is seawater intrusion a concern that should be addressed?





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- 14





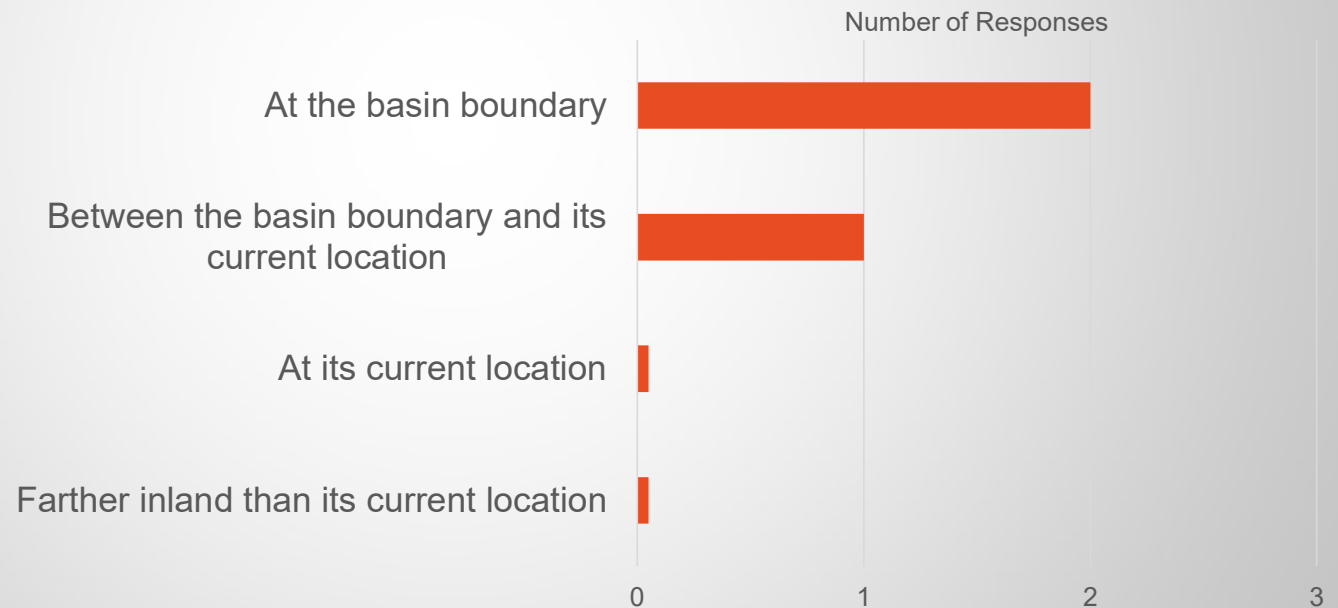
Seawater Intrusion SMC Options

1. Any seawater intrusion in the Subbasin is significant and unreasonable
 - Minimum threshold = a chloride isocontour at the Subbasin boundary
 - Measurable objective = same as minimum threshold
2. Additional SWI is neither significant nor unreasonable. Seawater intrusion can advance farther inland.
 - Minimum threshold = a chloride isocontour inland of the Subbasin boundary
 - Measurable objective = same as minimum threshold



Seawater Intrusion Question 14

Where should the chloride isocontour be set for the seawater intrusion minimum threshold?



Seawater Intrusion Direction

- Not likely to occur; do not address
- 1. Any seawater intrusion in the Subbasin is significant and unreasonable. Set at subbasin boundary.
- 2. Additional SWI is neither significant nor unreasonable. Seawater intrusion can advance farther inland.





Water Quality - Metric

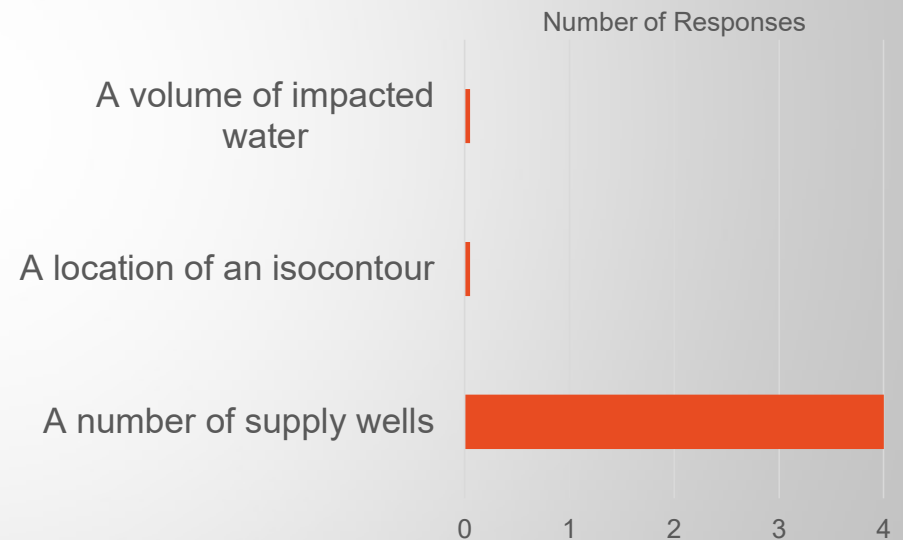
Question 11

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

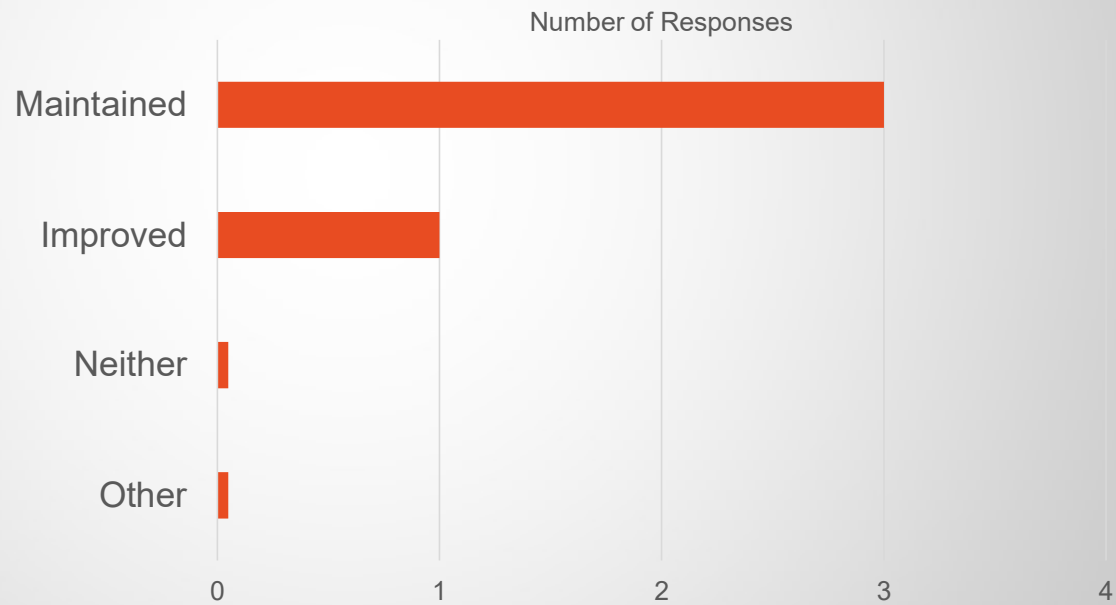
To monitor and measure water quality, it would be best to use:





Water Quality SMC Question 12

Current groundwater quality should be:





Groundwater Quality Minimum SMC Options - Selected

1. Degraded groundwater quality resulting from direct GSA actions is significant and unreasonable
 - Minimum threshold = **maintain** current groundwater quality impacts
 - Measurable objective = same as minimum threshold
3. Existing groundwater quality conditions are significant and unreasonable, 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



Groundwater Quality Minimum SMC Options – Not Selected

2. *Existing groundwater quality conditions are significant and unreasonable, 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 with this option*



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



Water Quality Direction

Metric: A number of supply wells.

SMC Option:

- Option 1 - Maintain
- Option 3 - Improve
- (Option 2 – current levels are sig & undesirable, set MT to improve quality, but are not held to it)





Groundwater Levels

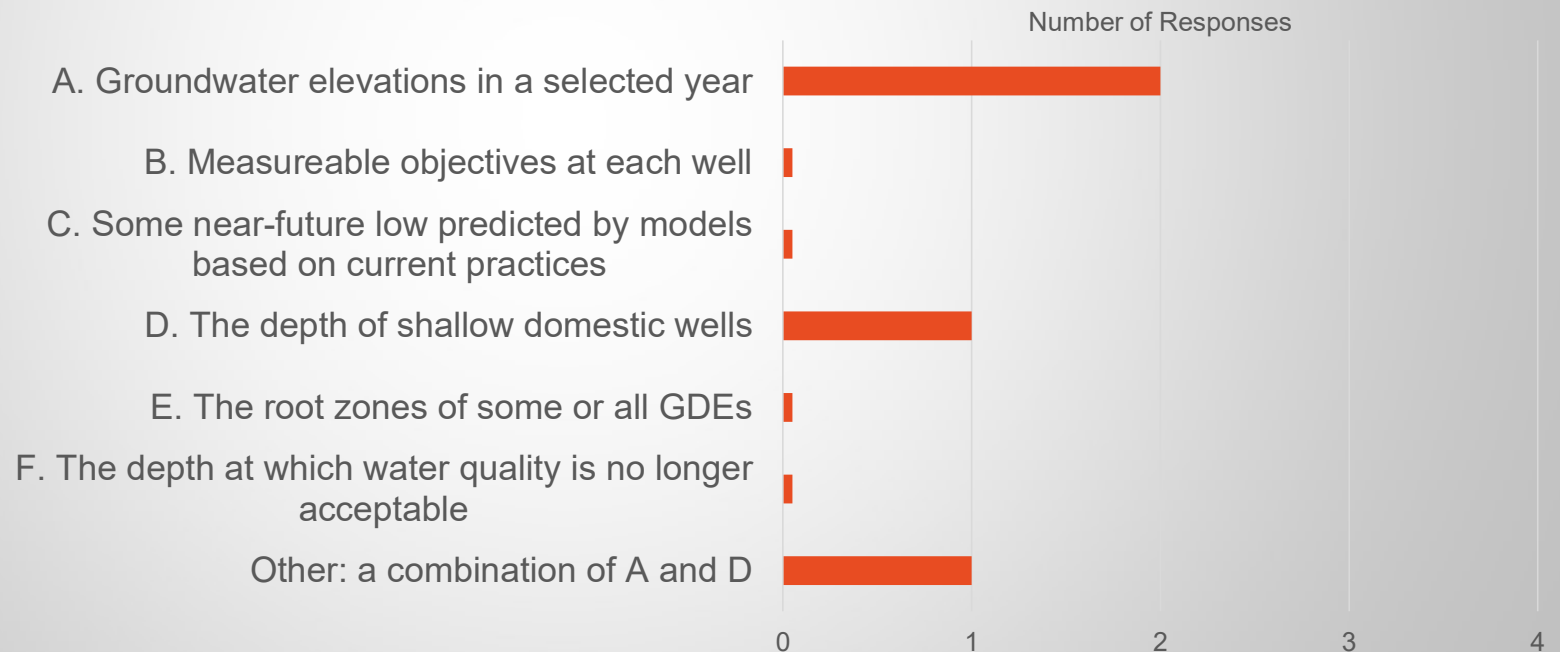
Question 9

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 Elevation SMC Options - Selected

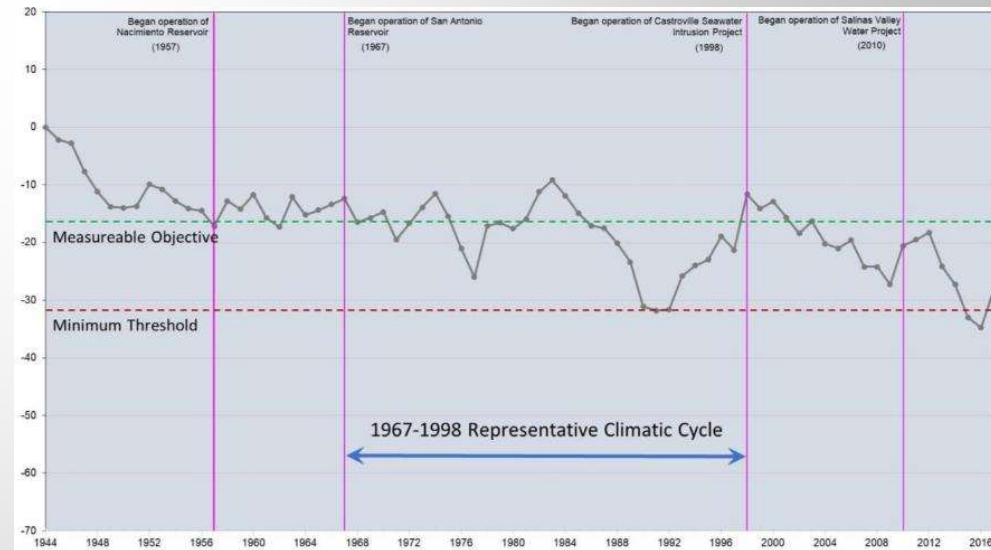
1. Groundwater elevations in a certain year were significant and unreasonable
 - Set minimum thresholds above whatever was recorded in the year in question
4. Impacting shallow, domestic wells is significant and unreasonable
 - Minimum thresholds are set to ensure **most** shallow domestic wells have adequate water for operation (what percentage?)
 - Option: set minimum thresholds excluding the very shallowest domestic wells
 - Option: use this as a check on the reasonableness of minimum thresholds

Or some combination of the two

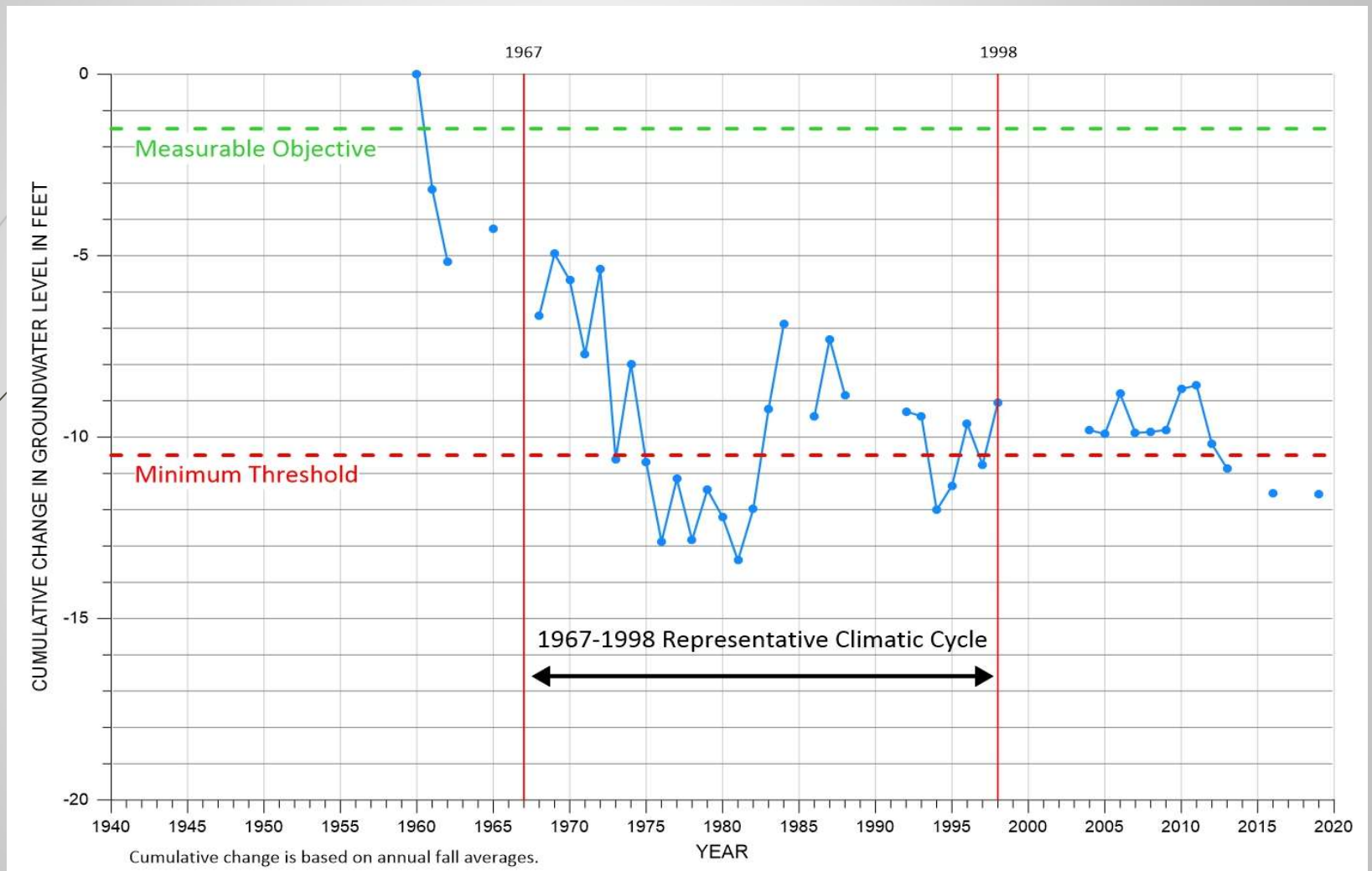
180/400-Foot Subbasin Example – Groundwater Elevation Minimum Threshold

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 Langley Area Subbasin





Groundwater Elevation SMC Options – Not Selected

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



Groundwater Elevation SMC Options – Not Selected

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.



Groundwater Levels Direction

Option 1 – Groundwater elevations in a selected year

Option 4 – Depth of shallow domestic wells

Other – Combination of 1 and 4, like in the 180/400 GSP





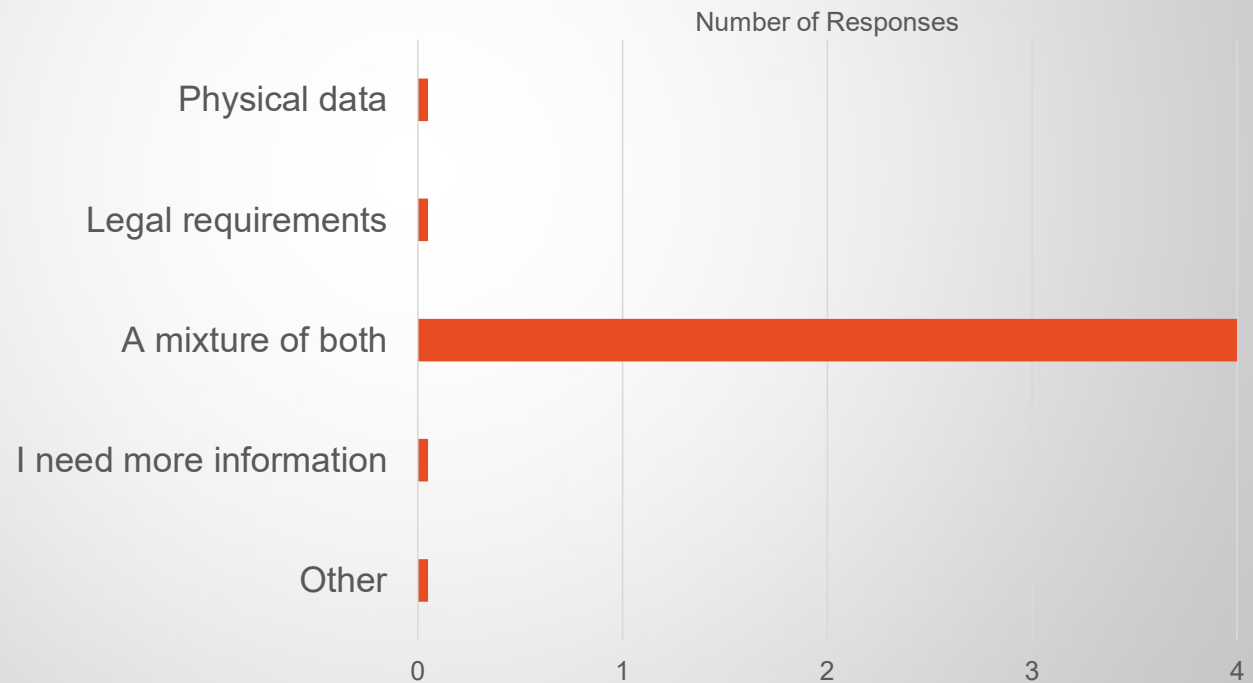
Measuring Thresholds & Objectives (354.28(c))

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



Interconnected Surface Water Question 6

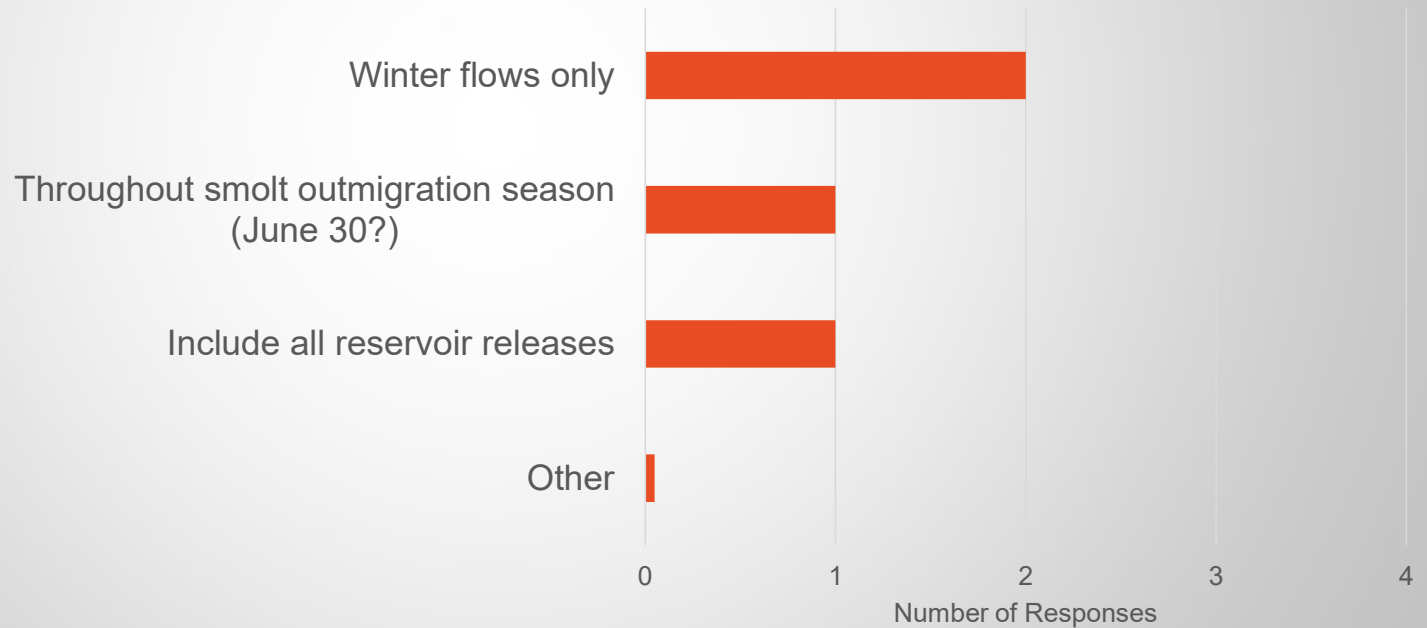
The SMC approach should focus on:





Interconnected Surface Water Question 7

What flows should the SMC approach be concerned about?

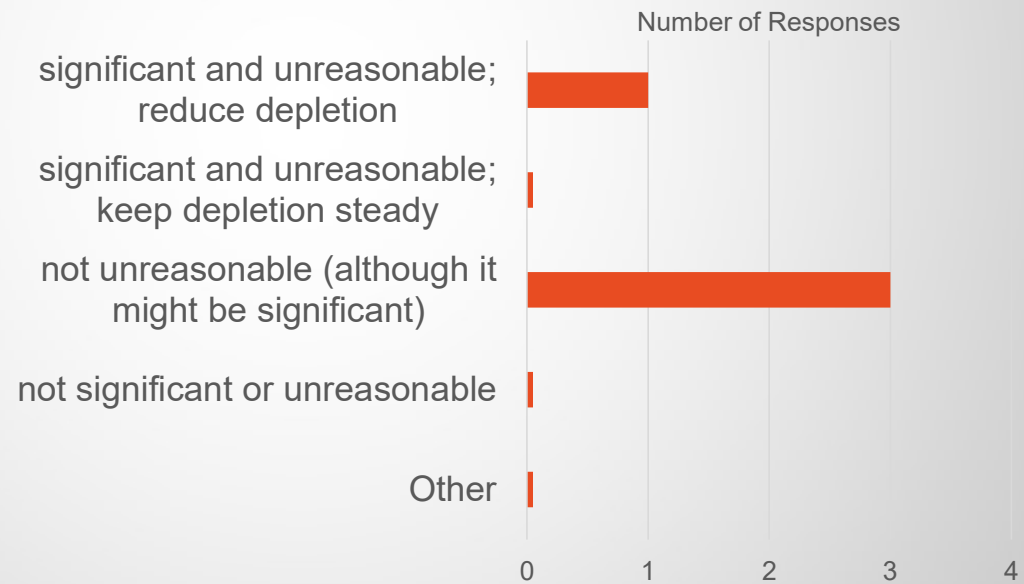




Interconnected Surface Water

Question 8

The current rate of surface water depletion is:





Interconnected Surface Water SMC Options - *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
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

180/400
GSP



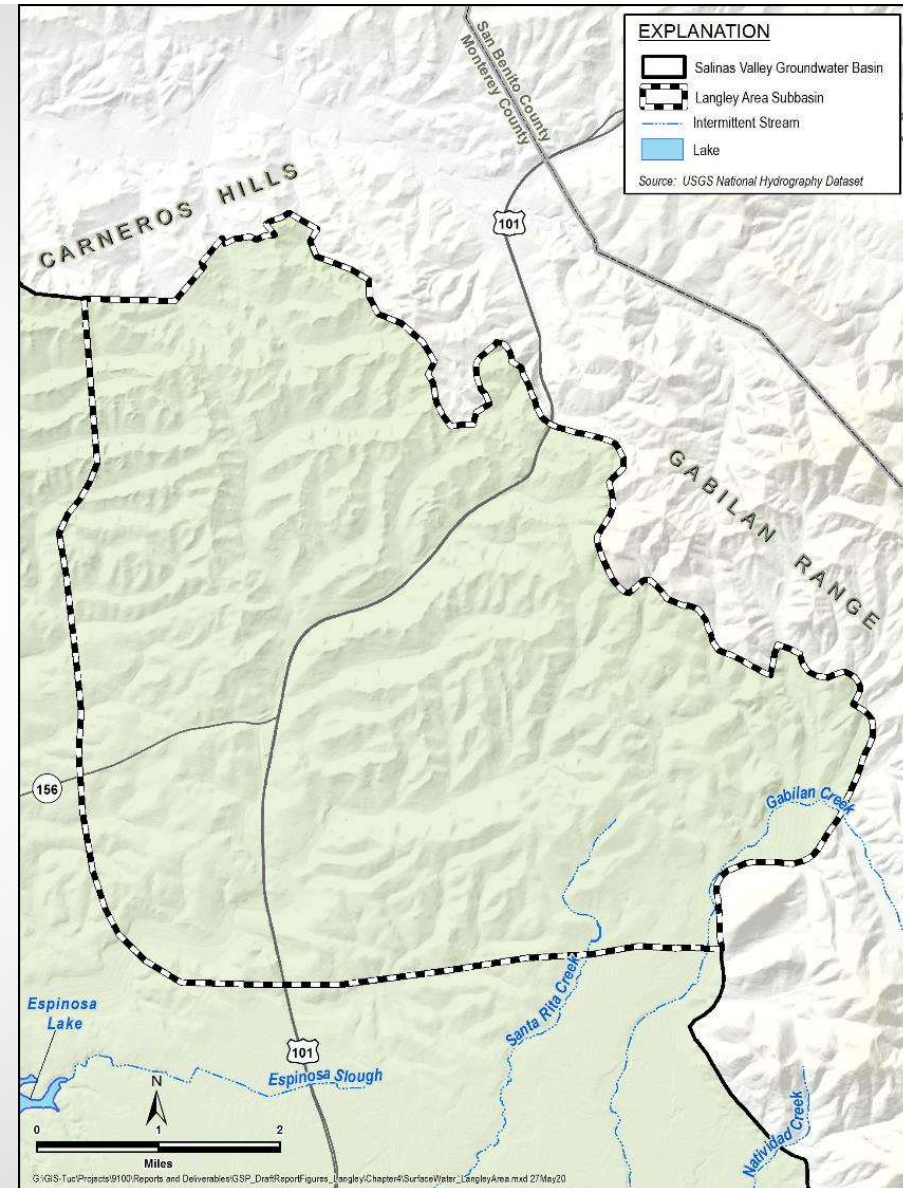
Interconnected Surface Water SMC Options – *Not Selected*

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
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



Potential Interconnected Surface Waters

- ▶ Not many, and ephemeral surface water bodies
 - ▶ Santa Rita Creek
 - ▶ Gabilan Creek
- ▶ Currently unsure of level of interconnection
- ▶ Is this a driving concern/issue in the Langlely Subbasin?





ISW Direction

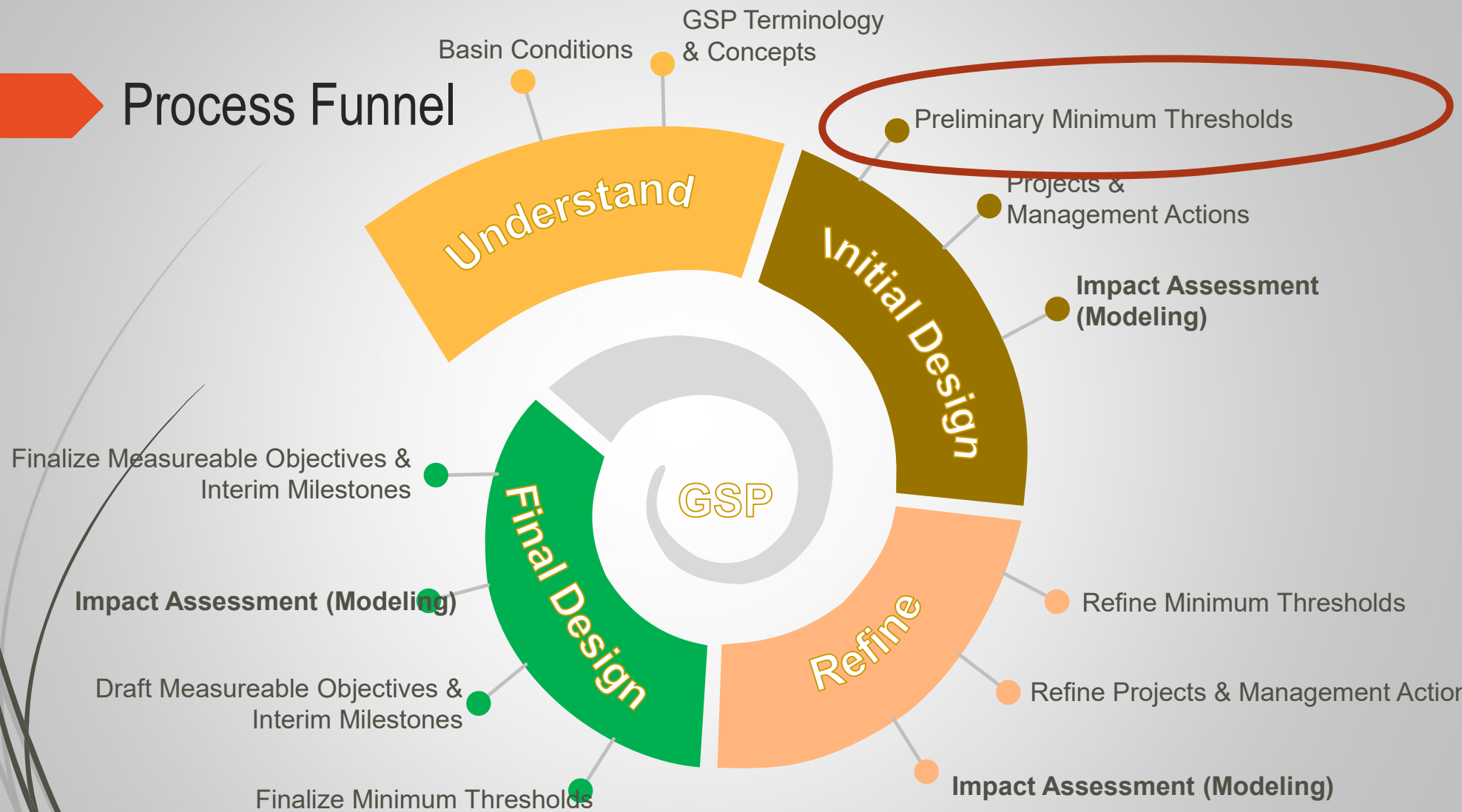
Metrics – modeling vs shallow groundwater levels

Option 1 – sig and unreasonable; reduce depletion

Option 4 – not unreasonable (although it might be significant); equal to today's depletion



Process Funnel





Questions

