Sustainability Indicator #4
Reduction of Groundwater in Storage

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Santa Margarita Groundwater Agency
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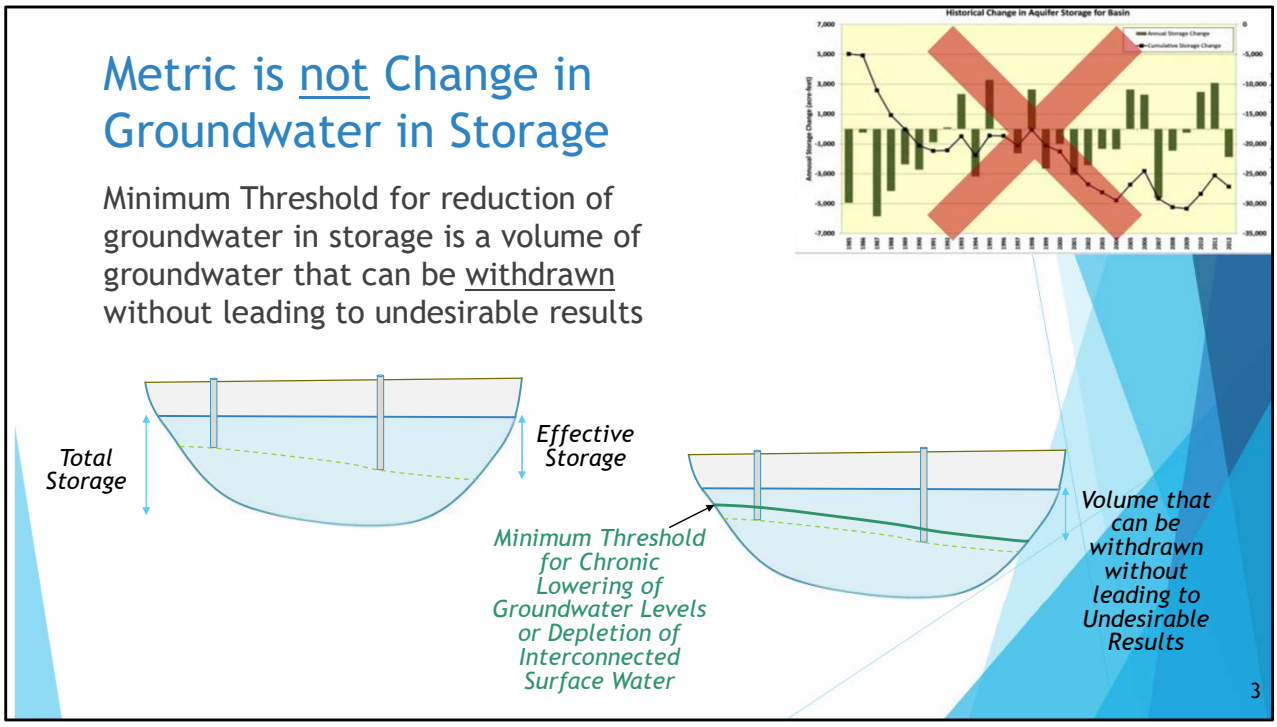
Objectives

- Understand the Sustainability Indictor of Reduction of Groundwater in Storage
- Understand approach for developing Sustainable Management Criteria for Reduction of Groundwater in Storage



Groundwater in storage is directly related to groundwater levels. However, the metric for this indicator is a volume of water pumped and not groundwater levels.
The graphics on this slide show that if you meet all other criteria then you can go back and look at the range of storage you can maintain at those thresholds. This illustrates how interrelated the storage indicator is with the other groundwater level measured indicators

What to Consider for Significant and Unreasonable Reduction of Groundwater in Storage?

- What in historical record was Significant and Unreasonable, and why?
- Is there groundwater in storage to rely on during drought?
- Have production wells ever gone dry?
- What is the effective storage of the basin? This may include understanding of the:
  - Average, minimum, and maximum depth of municipal, agricultural, and domestic wells
  - Impacts on pumping costs (i.e., energy cost to lift water)

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These are very similar questions we asked about past groundwater level conditions

Approach for Developing Significant and Unreasonable Reduction of Groundwater in Storage Conditions

- This is a difficult Sustainability Indicator to define what is Significant and Unreasonable because other Indicators influence it
- Most other basins base this indicator on groundwater levels and not a volume of groundwater pumped
- Recommendation:
  - *A significant and unreasonable reduction of groundwater in storage occurs when there is a long-term decline in groundwater in storage, or the volume of groundwater extracted causes undesirable results for any other sustainability indicator*

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Recommendation is generic but covers the intent of this indicator

Approach for Developing Minimum Threshold

- Minimum Threshold for reduction of groundwater in storage is a volume of groundwater that can be withdrawn without leading to Undesirable Results
- By pumping an amount that results in meeting or improving on Minimum Thresholds for the other Sustainability Indicators, the Reduction of Groundwater in Storage Minimum Threshold does not cause Undesirable Results
- GSP regulations only require one volume amount for the Basin, although the SMGWA can provide separate volumes by aquifer and management areas, if needed

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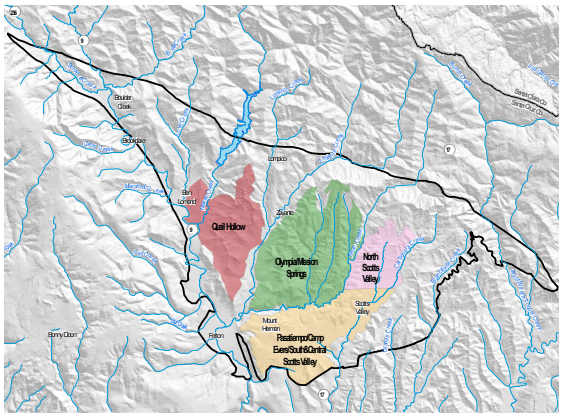
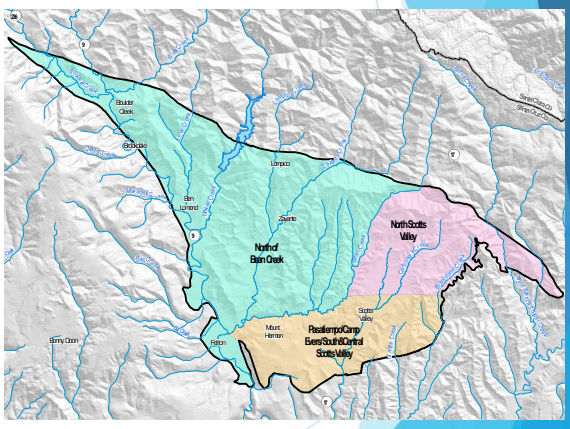
Propose to Develop Reduction of Groundwater in Storage SMC for Subareas



Santa Margarita Aquifer



All other Aquifers

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Managing the Basin to one Reduction of Groundwater in Storage Minimum Threshold does not work in the case where pumping your entire SY from one aquifer this would clearly be undesirable

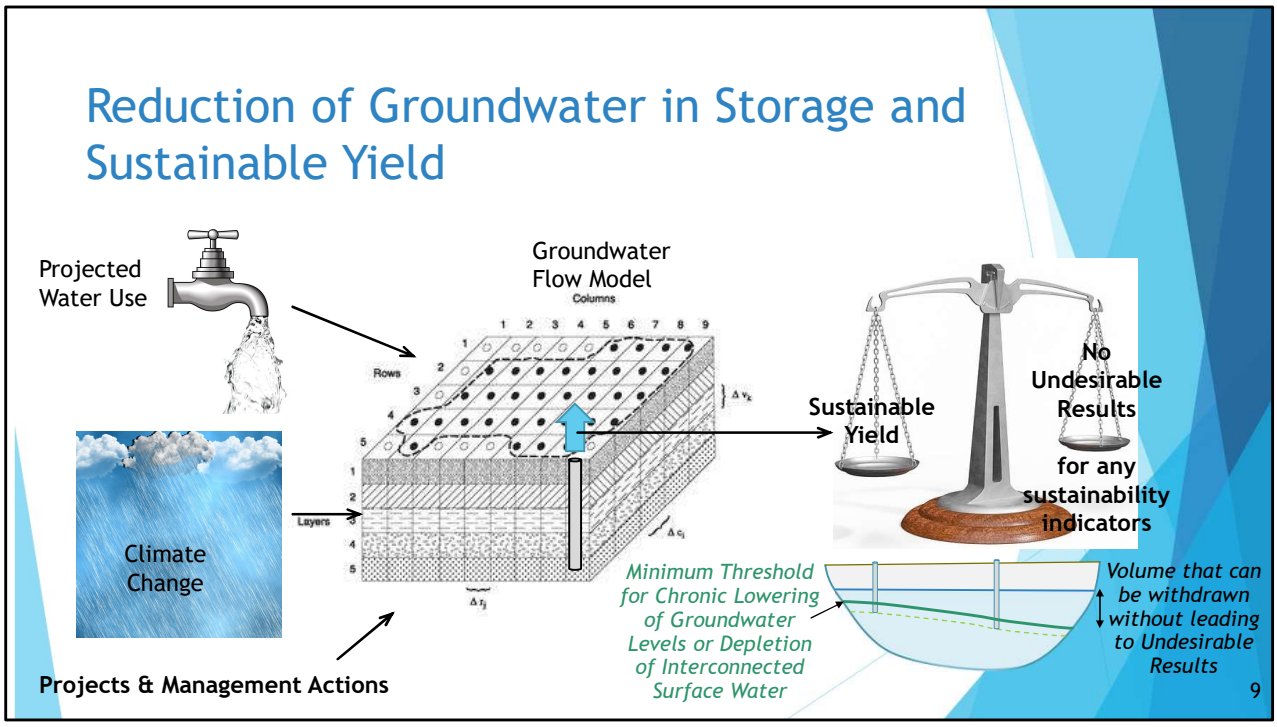
Better to manage each aquifer if there are SMC for each aquifer

Subareas are proposed based on where the Santa Margarita aquifer is isolated in certain locations. The Pasatiempo/Camp Evers/South & Central Scotts Valley subarea is delineated from the North Scotts Valley subarea based on where the Santa Margarita aquifer is dewatered and where an approximate groundwater divide occurs at this location.

Reduction of Groundwater in Storage and Sustainable Yield

- Per GSP Regulations: Minimum thresholds for reduction of groundwater in storage are supported by the ***sustainable yield*** of the basin, calculated based on historical trends, water year type, and projected water use in the basin

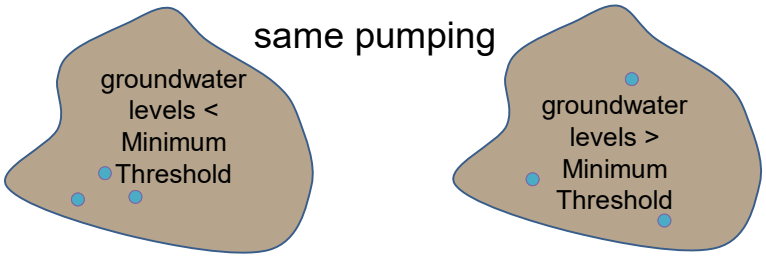
- The sustainable yield is the amount of groundwater that can be pumped from the Basin without causing undesirable results



We estimate sustainable yield using projected water use, climate change, and projects and management actions in the model to simulate future groundwater levels for the next 50 years. Pumping is adjusted in the model until no undesirable results occur in the Representative Monitoring Wells with groundwater level criteria. The resulting volume of groundwater extracted is the projected long-term Sustainable Yield.

Reduction of Groundwater in Storage and Sustainable Yield

- Sustainable yield is dependent on the locations of wells and how much they pump



Greater impact on local groundwater levels

Lesser impact on local groundwater levels

- The estimate of sustainable yield can only be done once projects and management actions have been finalized

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Proposed Minimum Threshold Approach for Reduction of Groundwater in Storage

Minimum Threshold = Sustainable Yield

- Minimum Threshold for reduction of groundwater in storage is a volume of groundwater that can be withdrawn without leading to undesirable results
- Pumping more than the Sustainable Yield will cause other Sustainability Indicators to have undesirable results

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Next Steps for Reduction of Groundwater in Storage Sustainability Indicator

Once Minimum Thresholds for chronic lowering of groundwater levels and depletion of interconnected surface water are determined:

1. Board defines Significant and Unreasonable Conditions related to reduction of groundwater in storage
2. Develop predictive model run with climate change, projected water demands, and projects & management actions
3. Use model to estimate Sustainable Yield for each subarea by aquifer
4. Define Minimum Threshold for each subarea by aquifer
5. Use predictive model to determine Measurable Objectives for each subarea by aquifer

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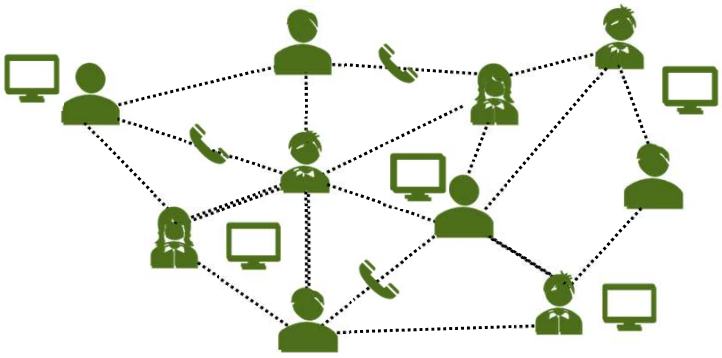
Thank you for your participation!



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