



SANTA CRUZ MID-COUNTY GROUNDWATER SUSTAINABILITY PLANNING

Advisory Committee Meeting #15

Wednesday, January 23, 2018, 5:00 – 8:30 p.m.
Simpkins Family Swim Center, Santa Cruz

Welcome and Introductions

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- ▣ Groundwater Sustainability Plan (GSP)
Advisory Committee
- ▣ Staff
- ▣ Public

Meeting Objectives

3

- Continue reviewing groundwater modeling results from pumping impact scenarios
- Discuss challenges in the Aromas Aquifer and options for moving forward
- Discuss proposed refinements to minimum thresholds for the Chronic Lowering of Groundwater Levels Sustainability Indicator

Agenda

4

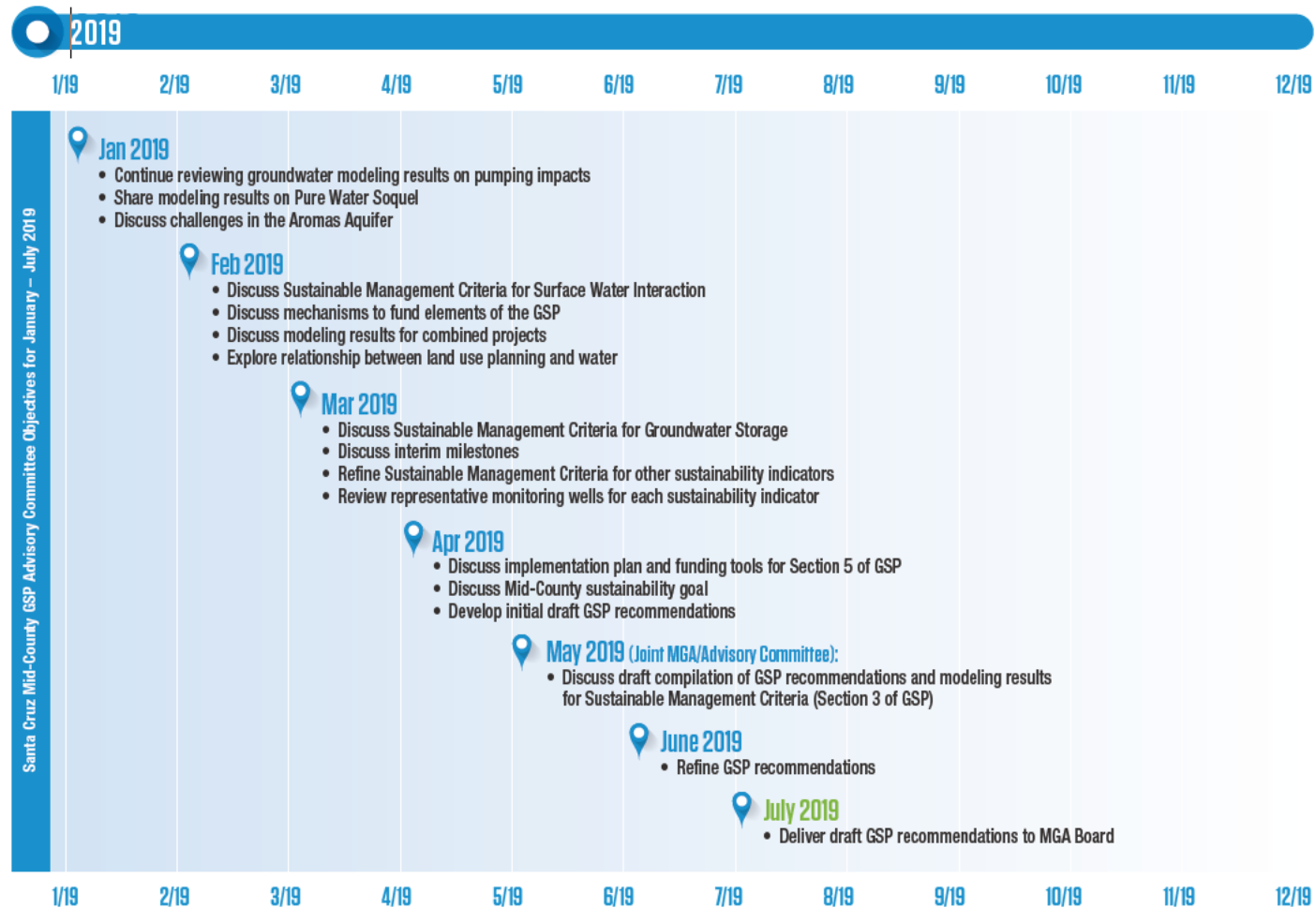
- 5:00 Welcome, Introductions, Objectives, Agenda, and
GSP Project Timeline
- 5:10 Oral Communications
- 5:20 Project Updates
- 5:35 Groundwater Modeling Results for Sustainability Strategies
- 6:25 Public Comment
- 6:35 *Break*
- 6:50 Groundwater Modeling Results for Non-municipal Pumping Effects
- 7:10 Approaches for Addressing Challenges in Aromas Aquifer
- 7:40 Update on Minimum Thresholds for Chronic Lowering of Groundwater
Levels
- 8:10 Public Comment
- 8:20 Confirm December 12, 2018 Advisory Committee Meeting Summary
- 8:25 Recap and Next Steps
- 8:30 *Adjourn*

GSP Project Timeline

GSP 2019 Project Timeline

6

Santa Cruz Mid-County GSP Advisory Committee Objectives for January – July 2019



Oral Communications

Project Updates

8

- Surface Water Interaction Working Group
- Anticipated groundwater modeling enrichment session in February
- Santa Margarita Basin informational meetings
- DWR update
- Water exchanges, Pure Water Soquel & other

Item 4: Groundwater Modeling Results for Sustainability Strategies

- Introduction of Additional Evaluations of Model Results
- 10 Year Averages of Groundwater Levels
- Areas Affected by Projects

Projects and Management Actions Previously Presented

10

- Pumping Redistribution and Municipal Pumping Curtailment
 - ▣ May need additional reduction in pumping below 3,450 AFY even with pumping redistribution from Tu and Aromas to Purisima
- City of Santa Cruz Aquifer Storage and Recovery
 - ▣ Not Designed to Achieve Basin Sustainability but Shows Benefit

Sustainability Management Criteria Based on 10 Year Average

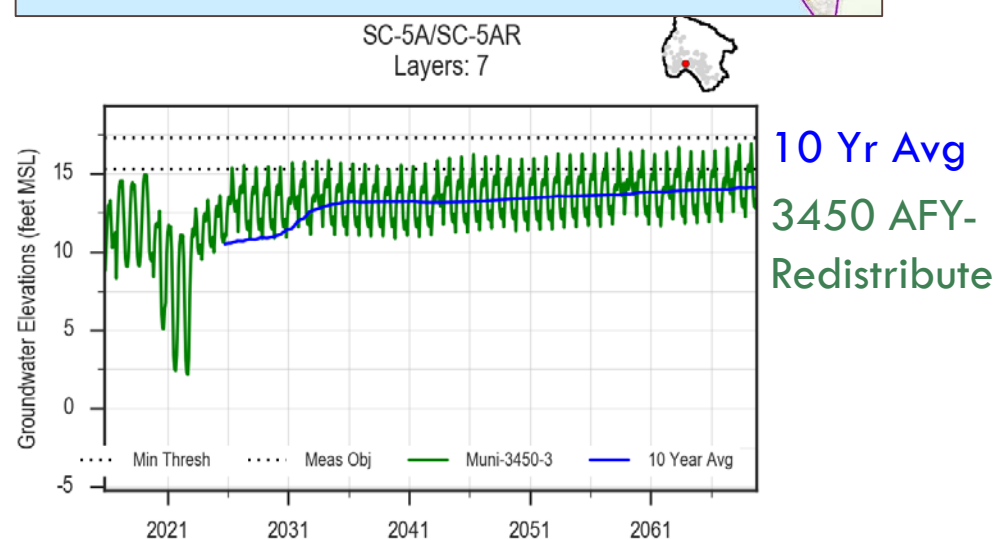
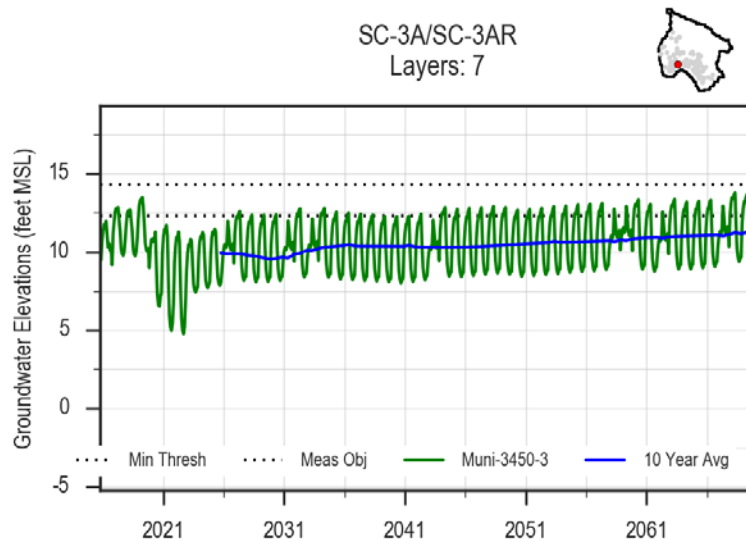
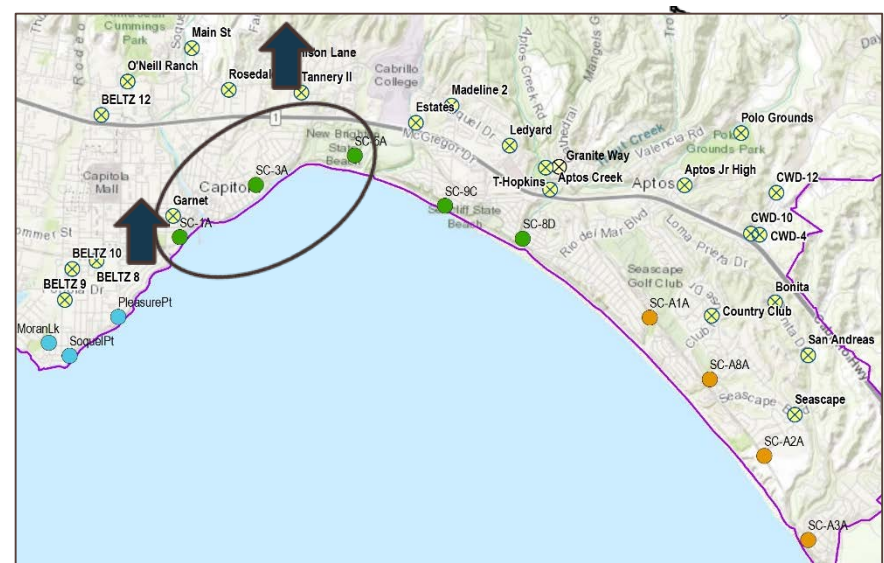
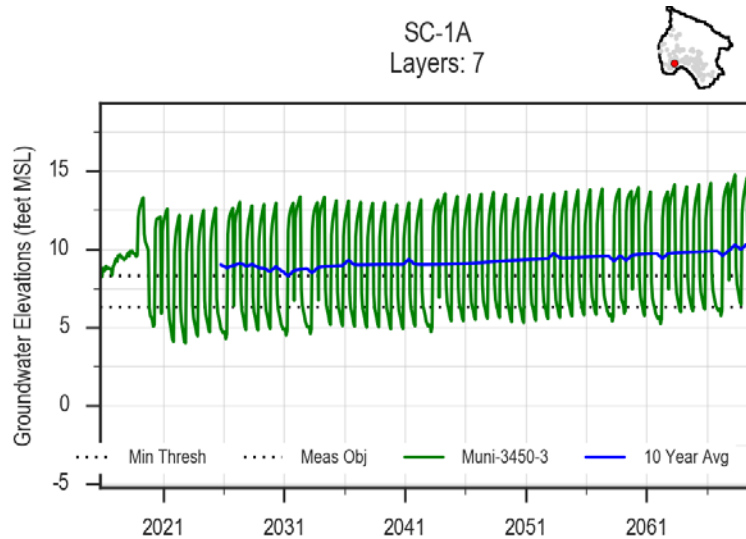
11

- Minimum thresholds and measurable objectives for preventing seawater intrusion based on 10 year average
- Calculate trailing average from model results similar to how **undesirable results** will be monitored
 - ▣ Can combine with historical simulation for first 10 years
- Adjust criteria for simulated sea level rise (+2.3 feet)

Redistribution and Curtailment

Purisima A Unit

12

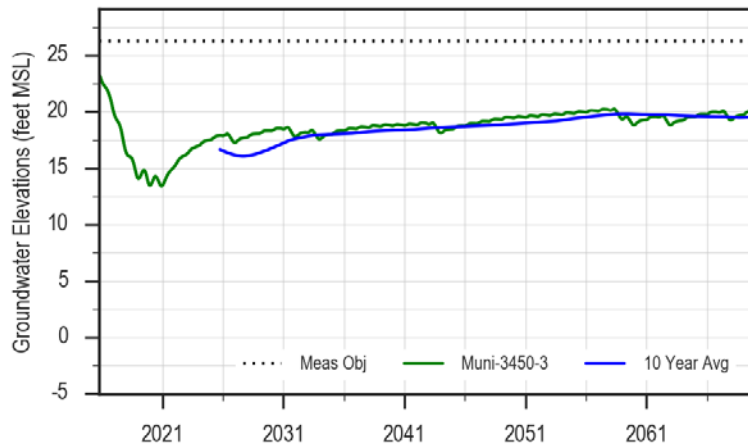


Redistribution and Curtailment

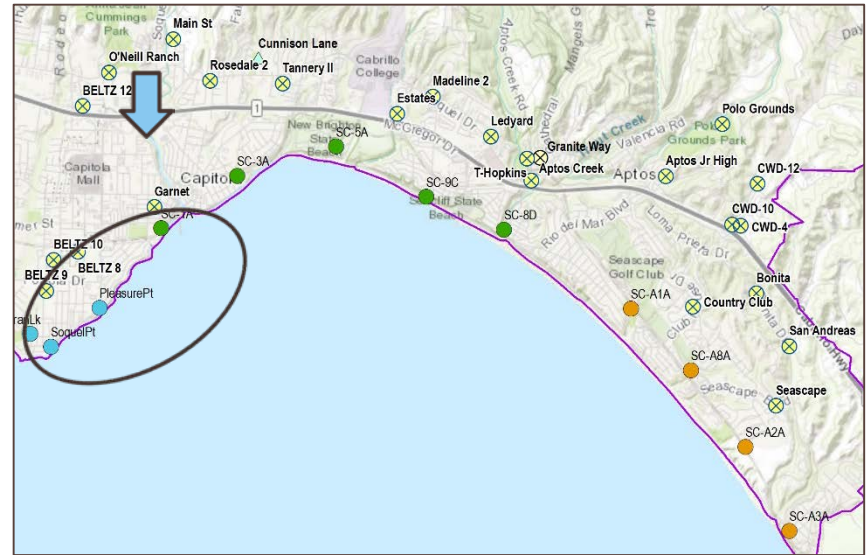
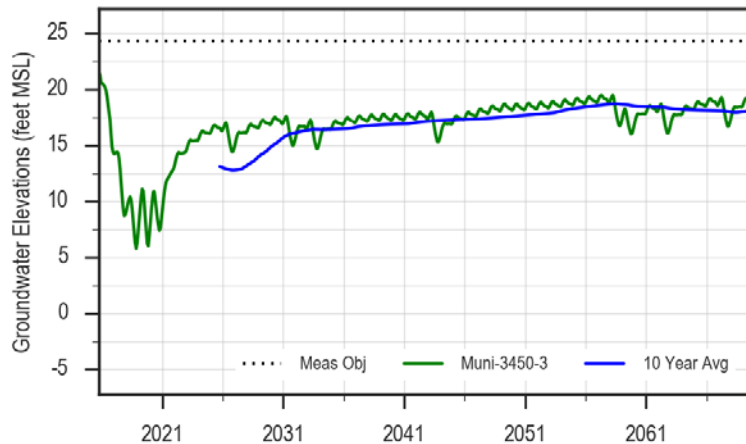
Tu Unit

13

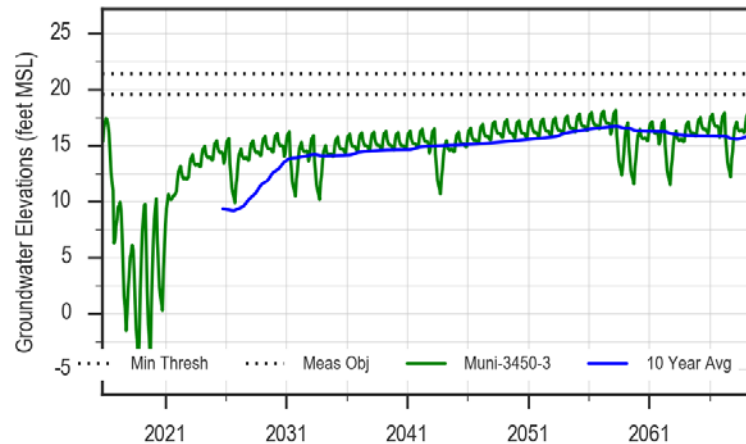
Soquel Point TU
Layers: 9



Pleasure Point TU
Layers: 9



SC-13A
Layers: 9

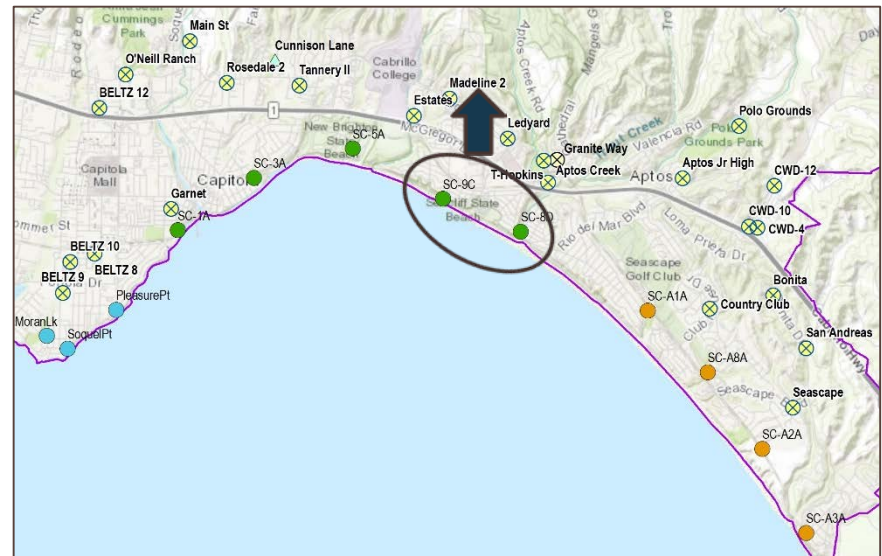


10 Yr Avg
3450 AFY-
Redistribute

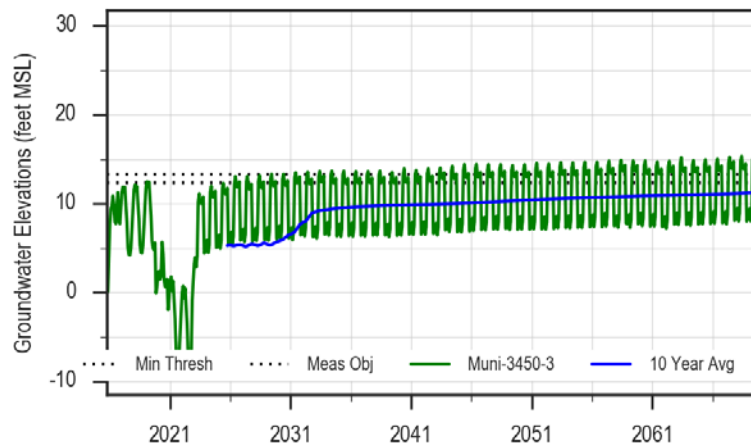
Redistribute and Curtailment

Purisima BC Unit

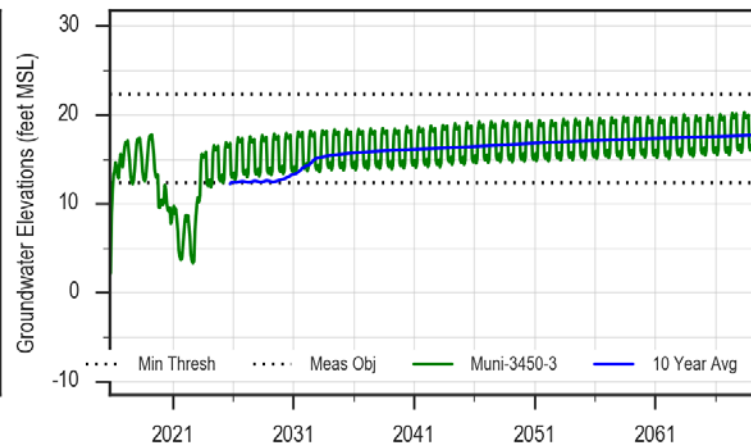
14



SC-9C/SC-9CR
Layers: 5



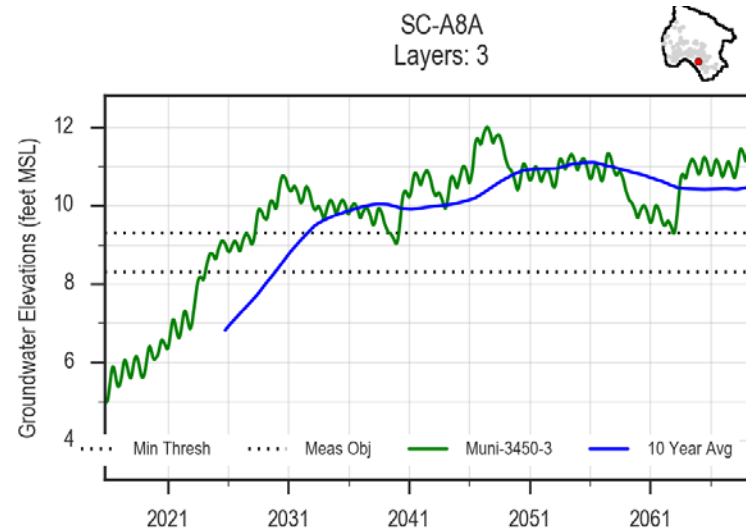
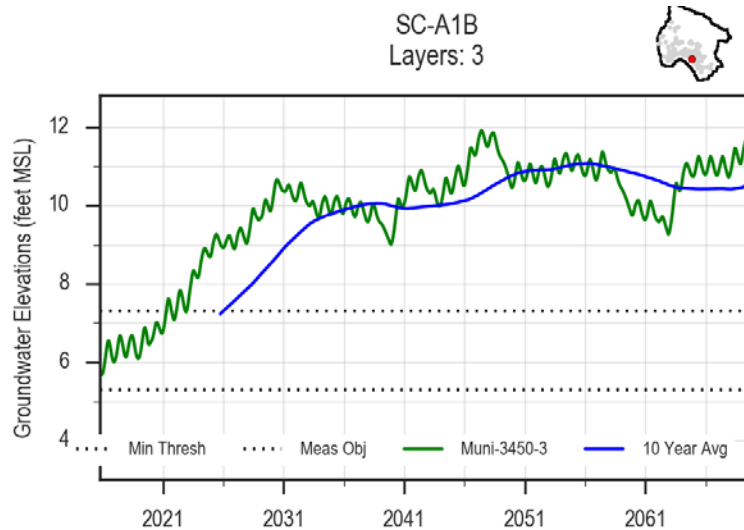
SC-8RC
Layers: 5



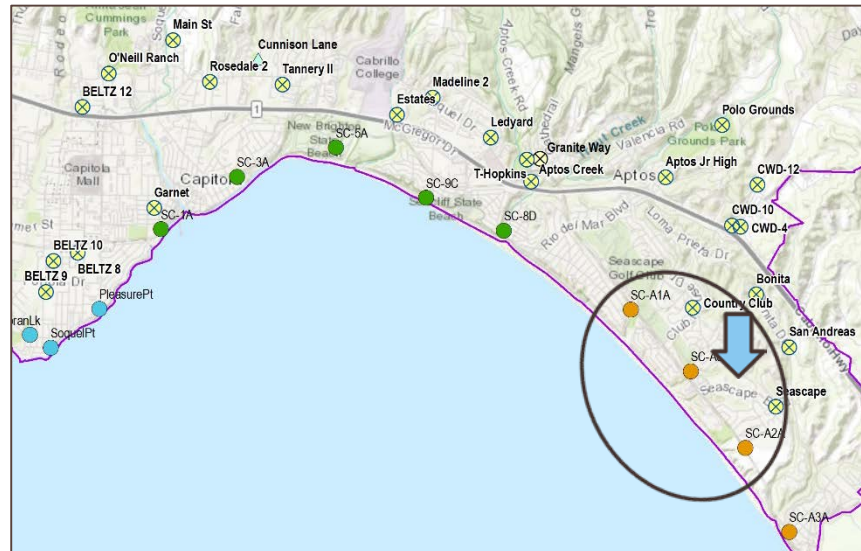
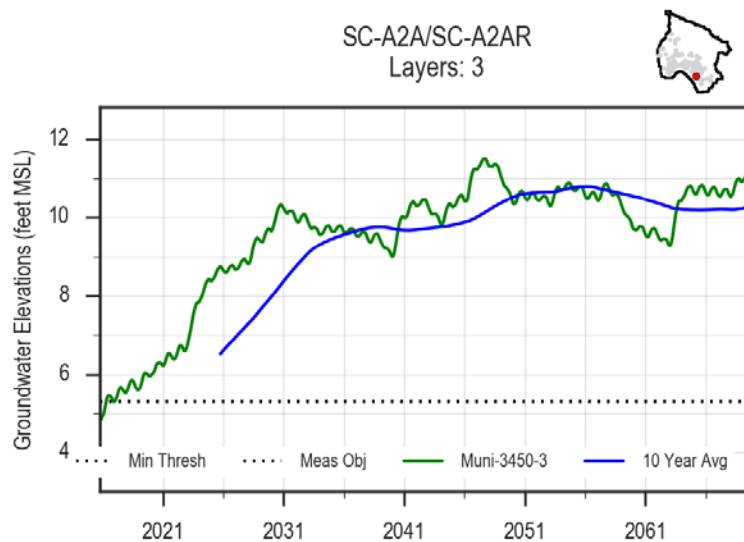
10 Yr Avg
3450 AFY-
Redistribute

Redistribute and Curtailment Aromas Area (Purisima F Unit)

15

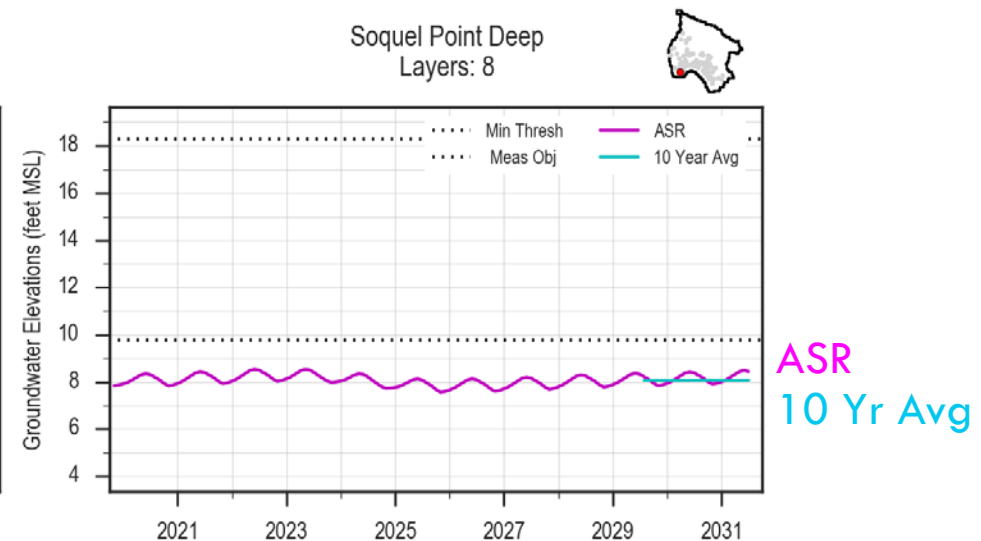
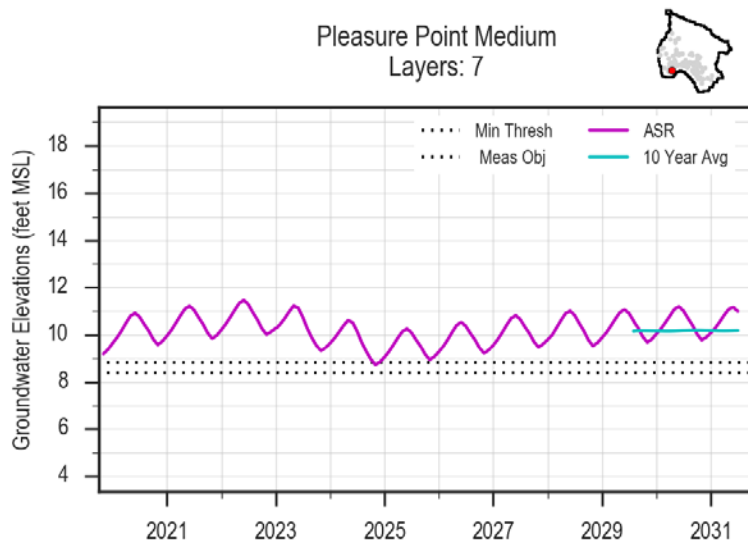
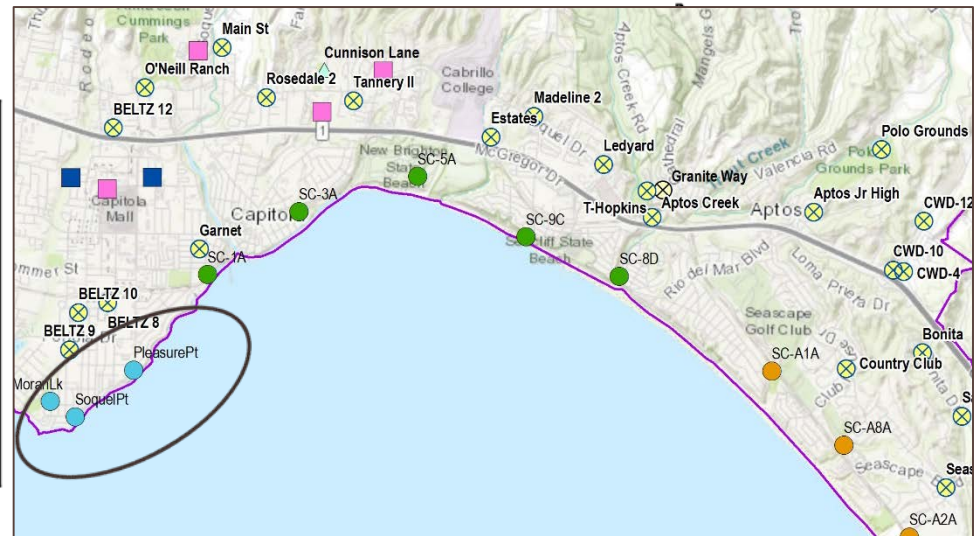
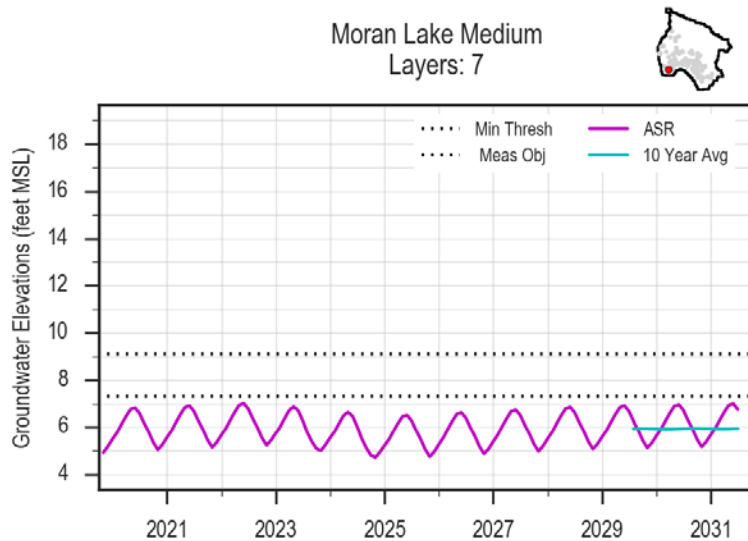


3450 AFY-
Redistribute
10 Yr Avg



City of Santa Cruz ASR Only Purissima A Unit (City Wells)

16

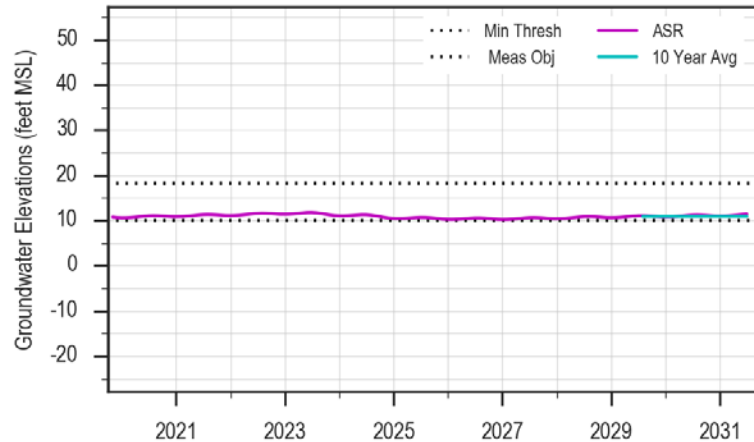


City of Santa Cruz ASR Only

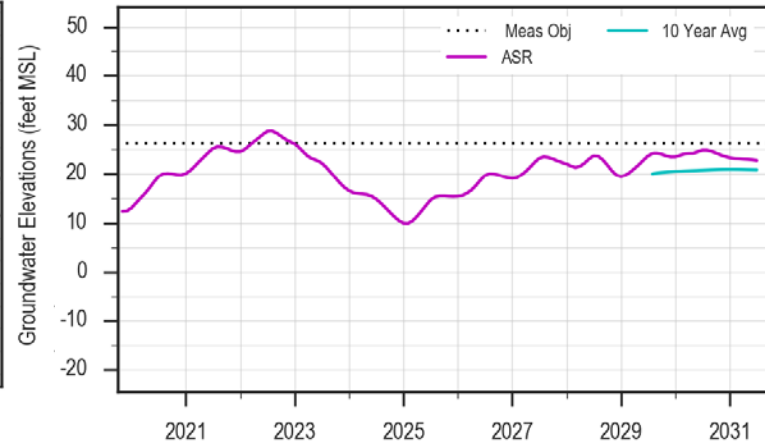
Tu Unit

17

Pleasure Point Deep
Layers: 8

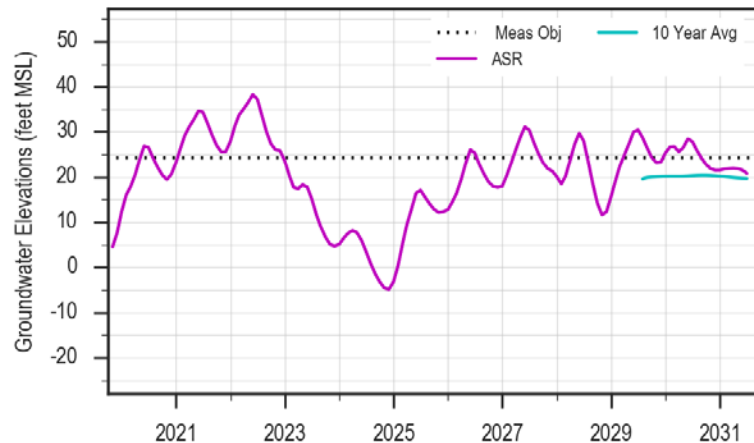


Soquel Point TU
Layers: 9

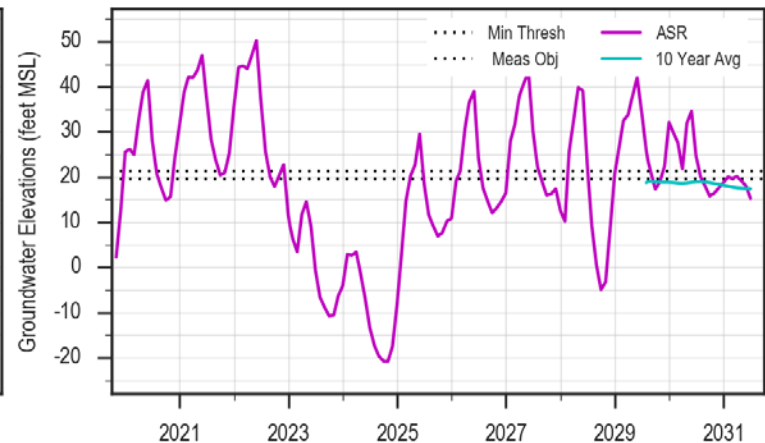


ASR
10 Yr Avg

Pleasure Point TU
Layers: 9



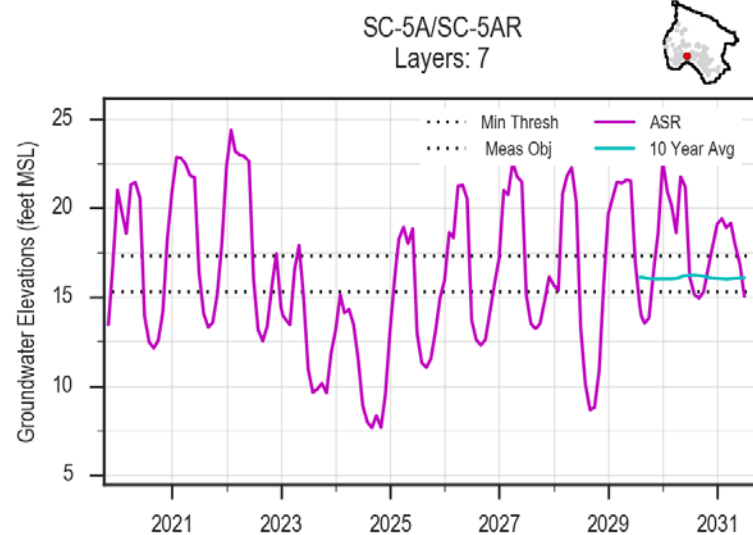
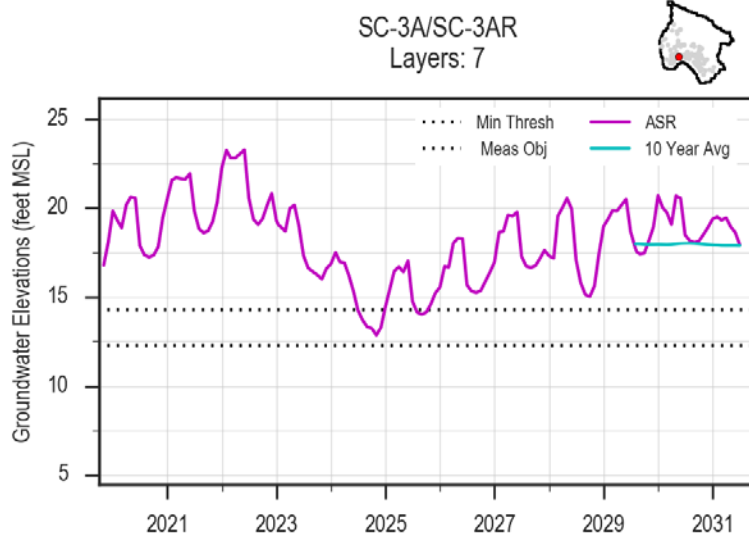
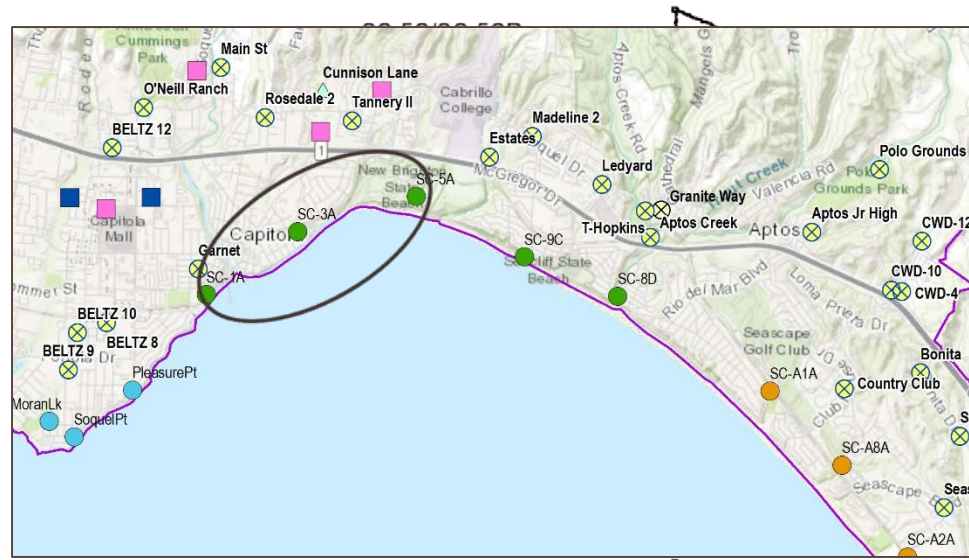
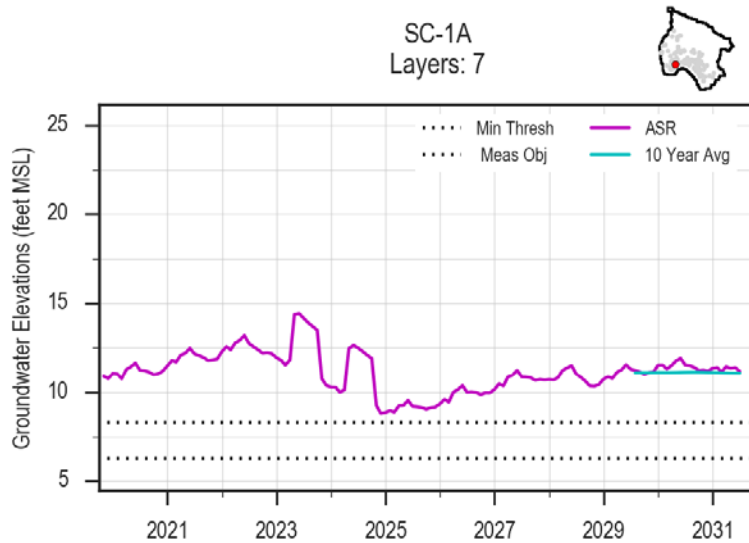
SC-13A
Layers: 9



ASR
10 Yr Avg

City of Santa Cruz ASR Only Purissima A Unit (SqCWD Wells)

18

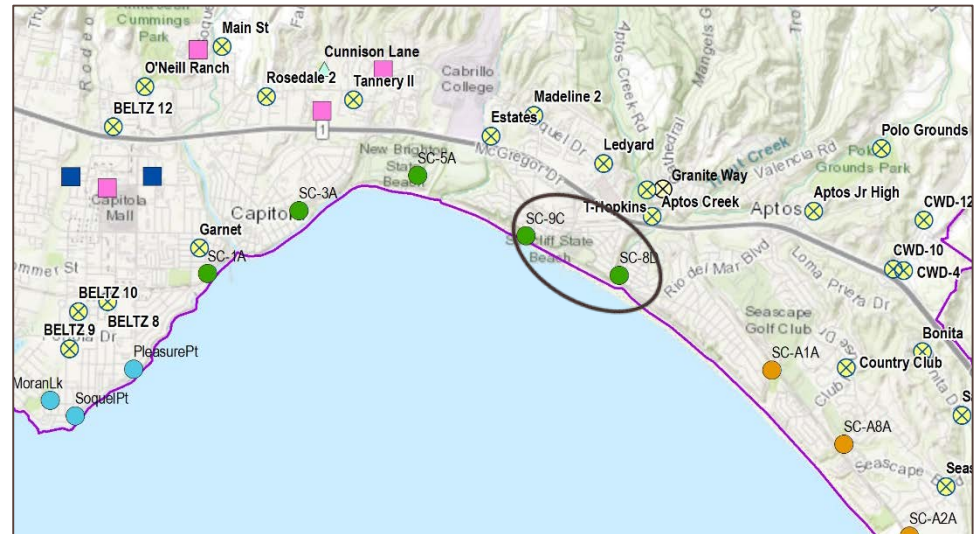


ASR
10 Yr Avg

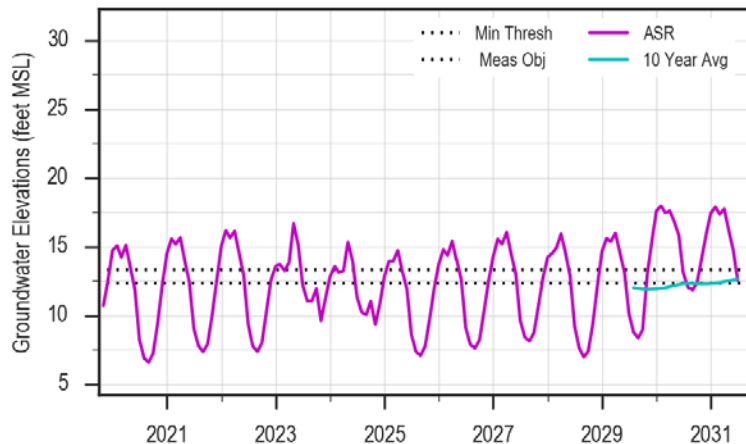
City of Santa Cruz ASR Only

Purisima BC Unit

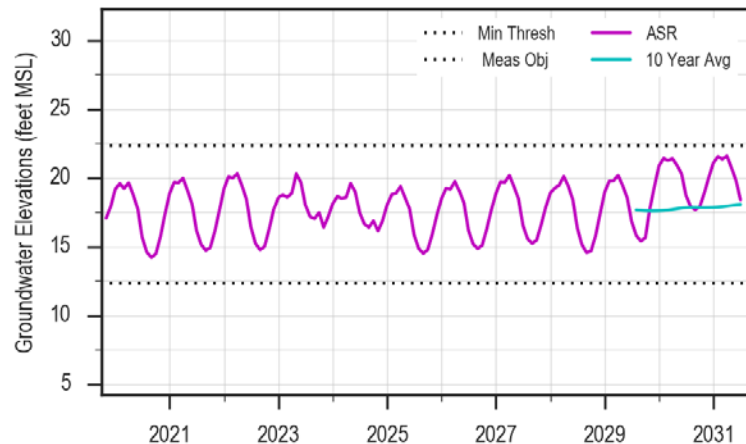
19



SC-9C/SC-9CR
Layers: 5



SC-8RC
Layers: 5

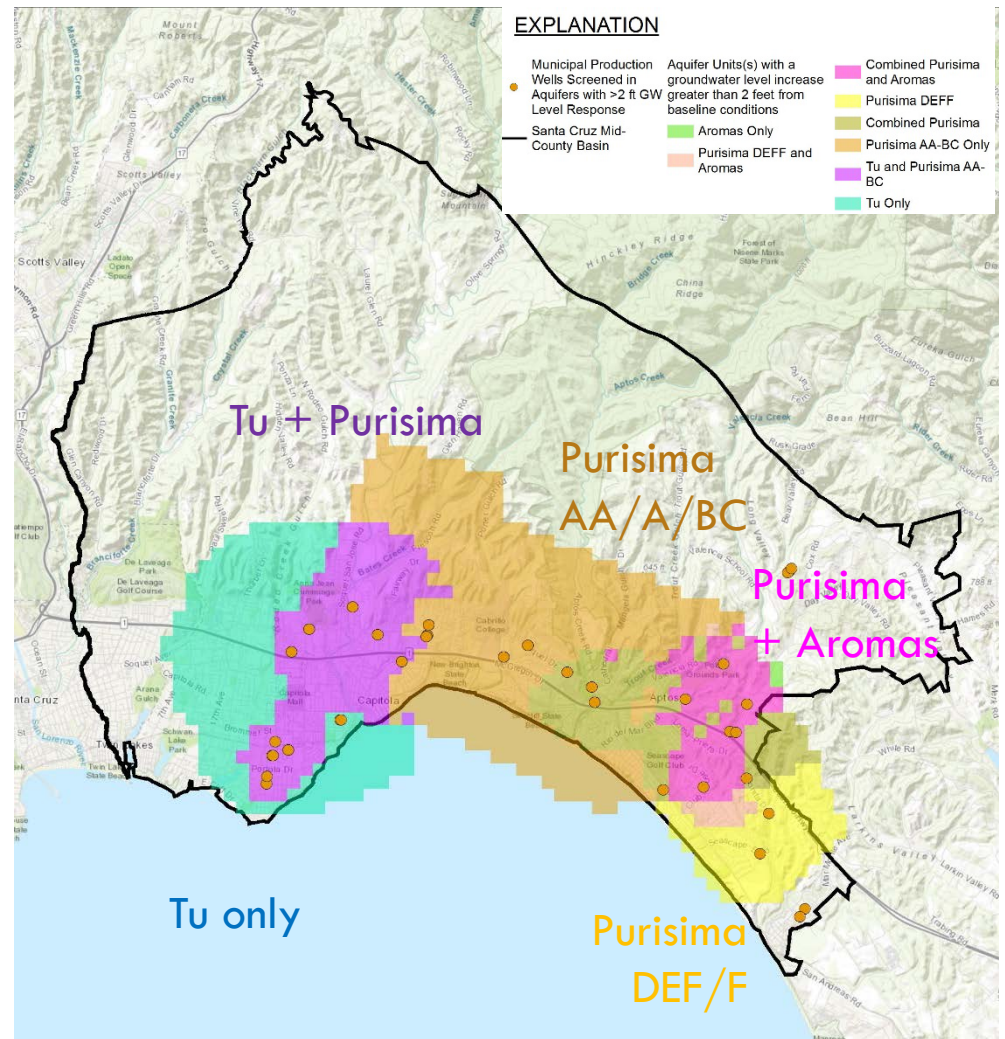


ASR
10 Yr Avg

Areas/Aquifers Affected by Curtailment

20

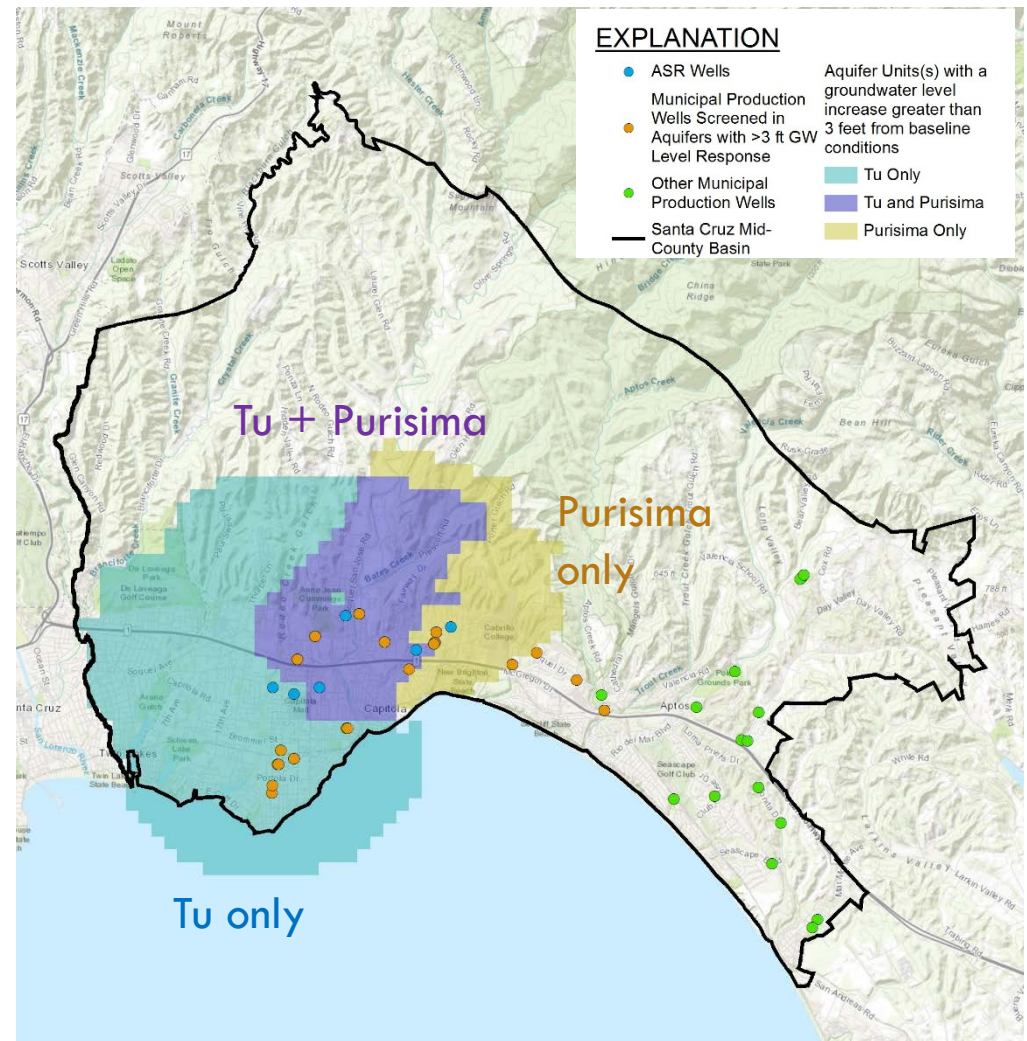
- Based on simulated groundwater level difference between curtailment and redistribution baseline
- In-lieu recharge at all municipal wells



Areas/Aquifers Affected by City ASR only

21

- Based on simulated groundwater level difference between ASR only project and baseline
- ASR wells in Tu and Purisima



Questions and Discussion

- What is your feedback on using 10 year average for seawater intrusion sustainable management criteria?
- Is the level of information provided on the affected areas maps appropriate? If not, how could the maps be improved

Public Comment

Break

Item 7: Groundwater Modeling Results for Non-Municipal Pumping Effects

Non-municipal pumping just inland of municipal pumping area has greater effect at coastal Purisima wells than non-municipal pumping in municipal pumping area due to larger volumes extracted.

Review: Sensitivity of Inland Pumping

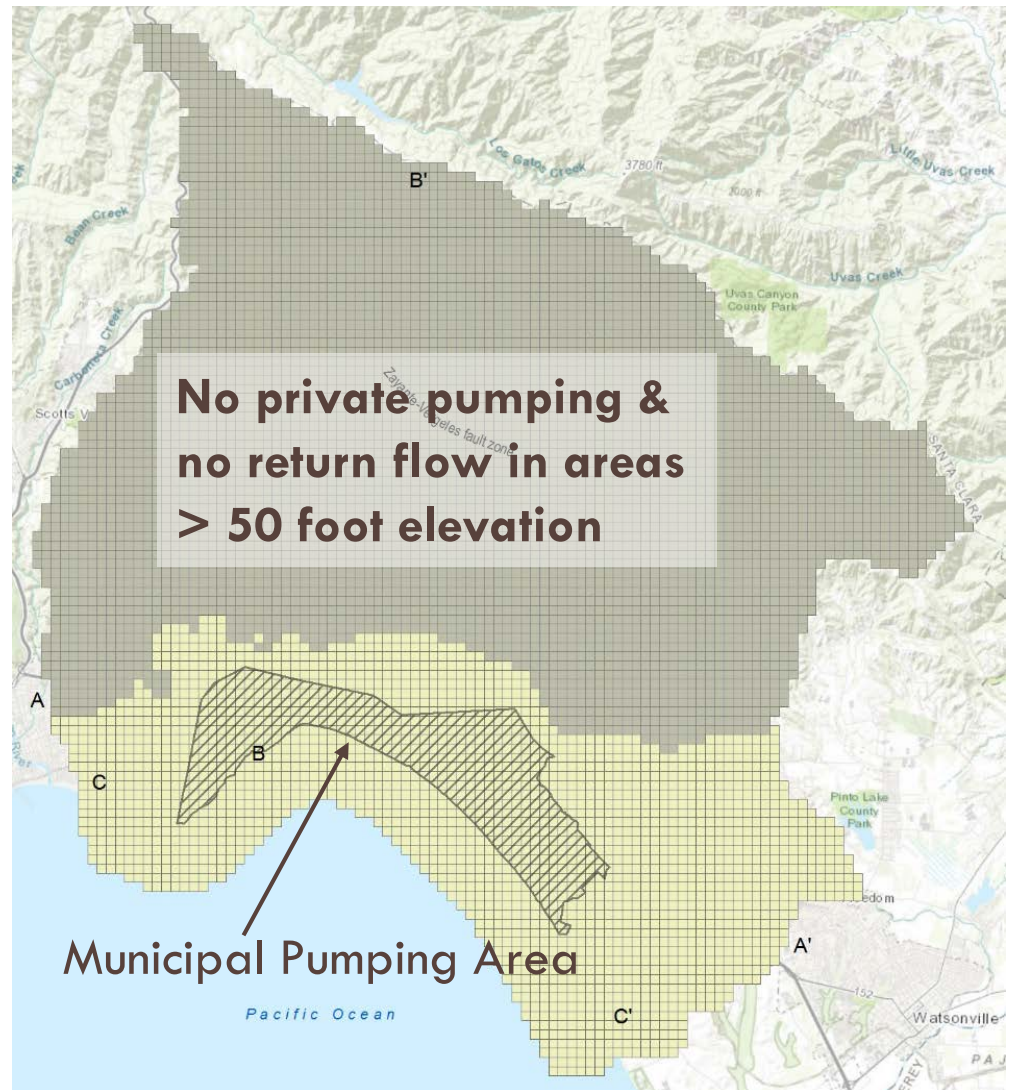
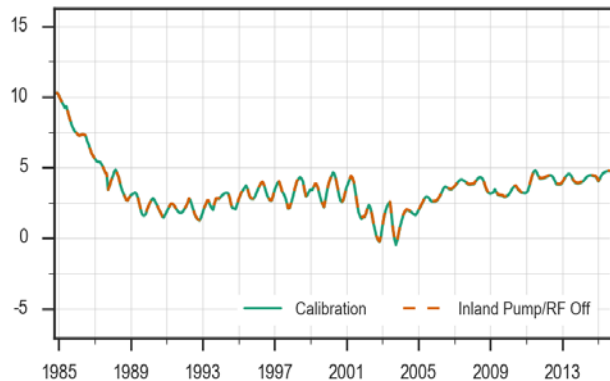
26

Inland pumping has small effect at coast

Purisima A

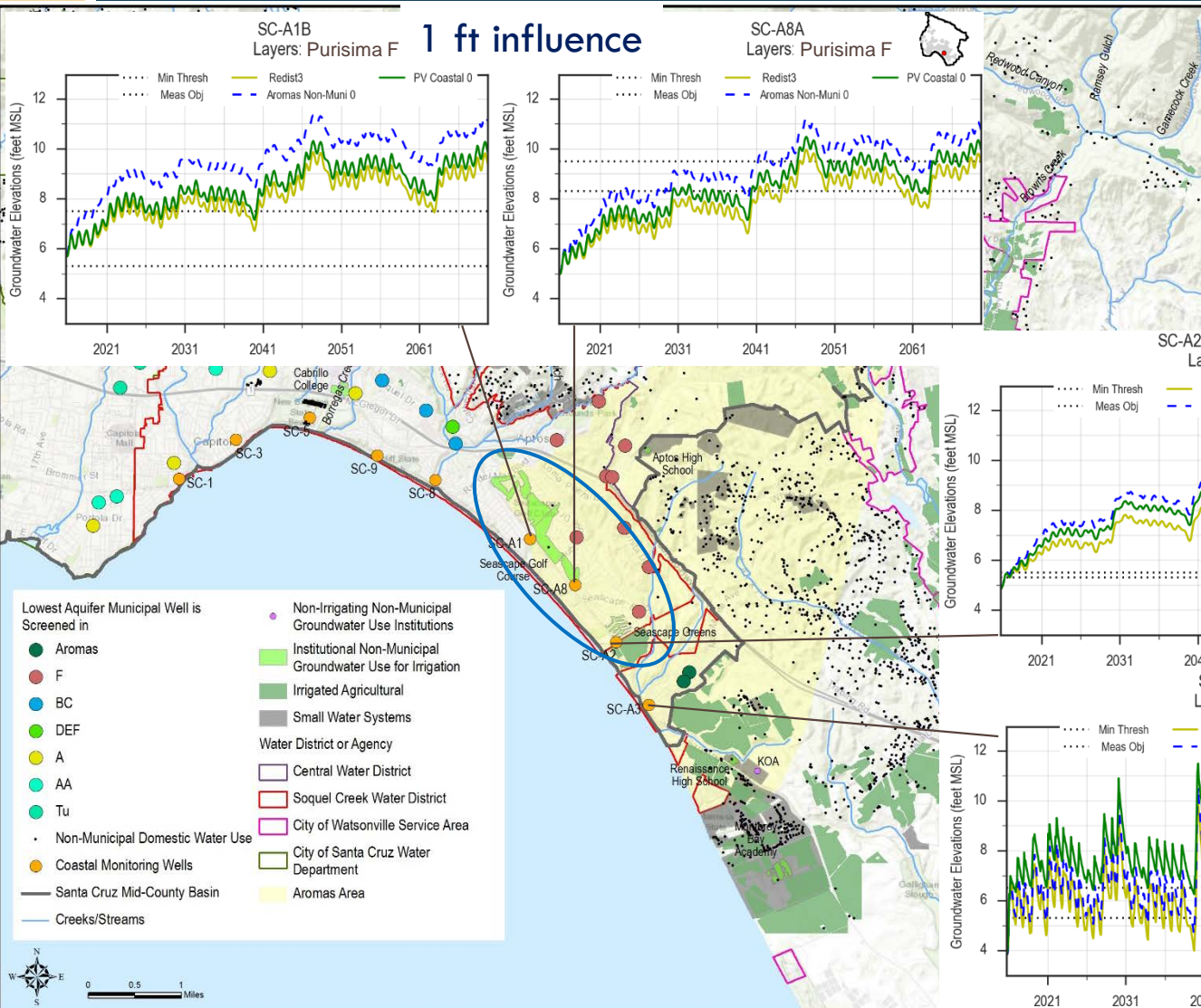
Purisima F

SC-A2A/SC-A2AR
Layers: 3



Review: Sensitivity of Non-municipal pumping in coastal Aromas area

27



Pumping of 263 AFY eliminated

- 122 AF ag use
- 136 AF institutional use
- 5 AF domestic use

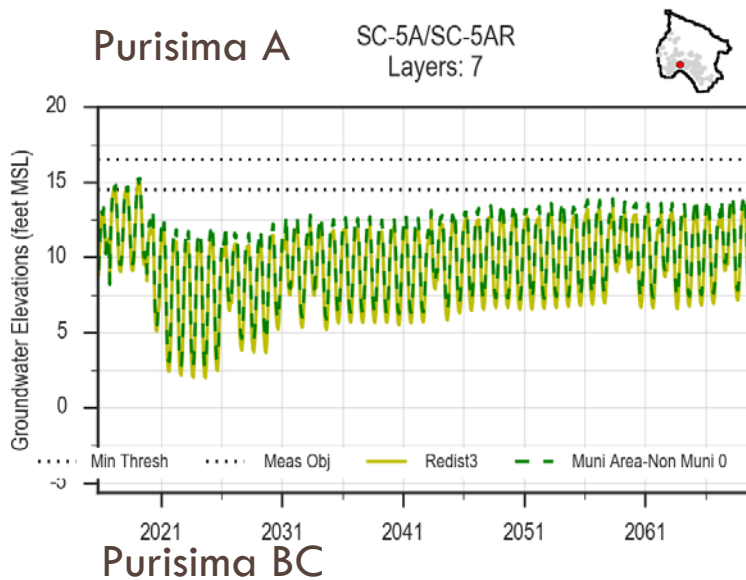
No Aromas/PurF non-muni Basin pumping
No Aromas/PurF PV non-muni pumping
Redistribute muni pumping

Little influence but greater than municipal

Sensitivity: Non-Municipal Pumping in Municipal Pumping Area

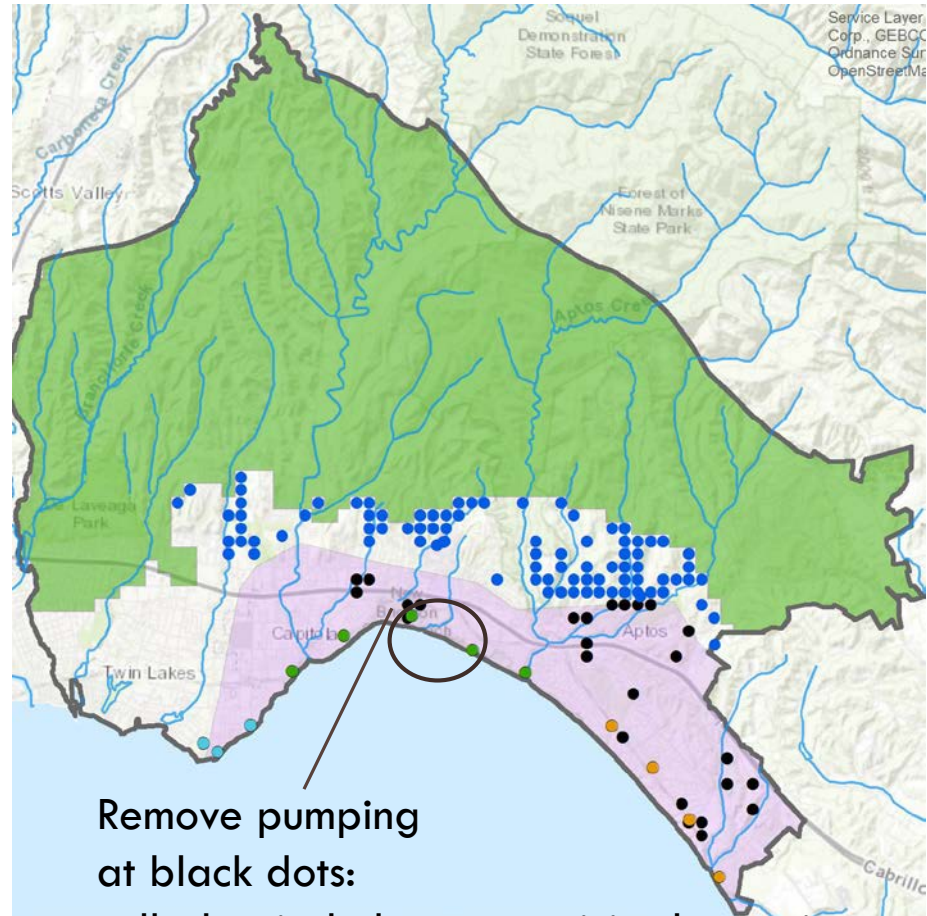
28

Purisima pumping has small effect at coast



No non-muni pumping in muni pumping area

Redistribute muni pumping

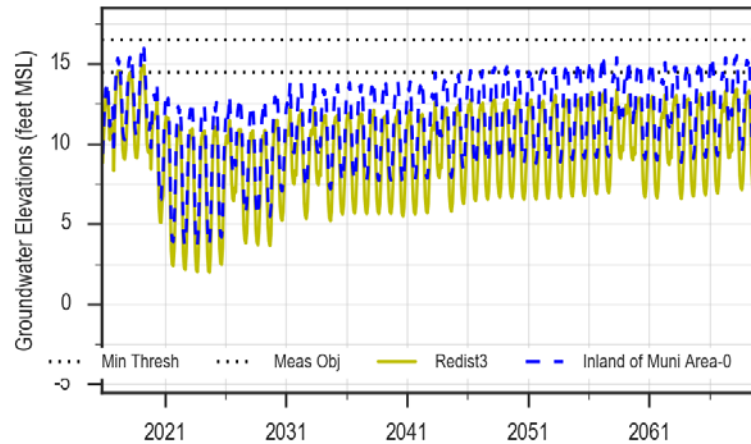


Sensitivity: Non-Municipal Pumping Inland of Municipal Pumping Area

29

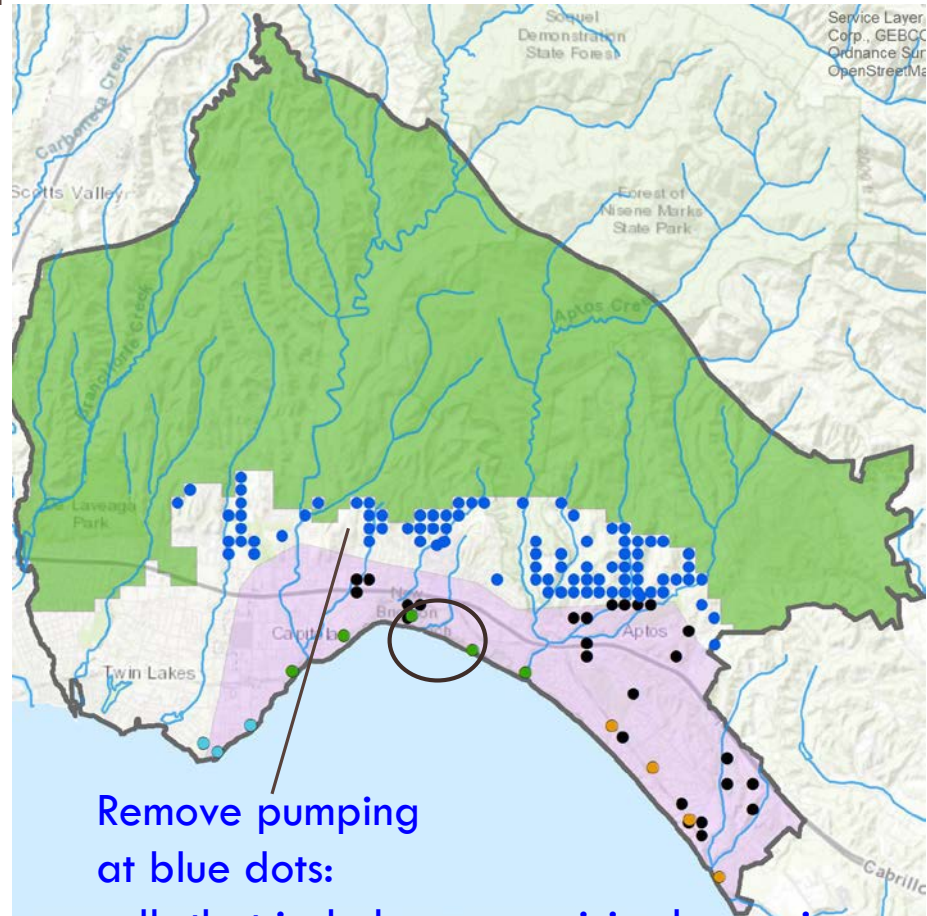
Purisima pumping has larger effect at coast

SC-5A/SC-5AR
Layers: 7



No pumping inland of
municipal pumping area

Redistribute muni pumping



Remove pumping
at blue dots:
cells that include non-municipal pumping
Purisima A/BC ~ 80 AFY

Questions and Discussion

What is your feedback on how non-municipal pumping should be addressed in the GSP?

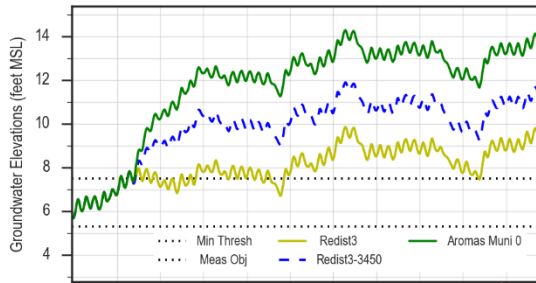
Item 8: Groundwater Modeling Results for Theoretical Managed Recharge in Coastal Aromas Area

Site location important for which coastal wells show benefit

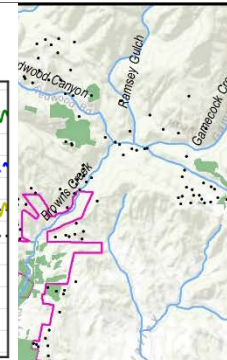
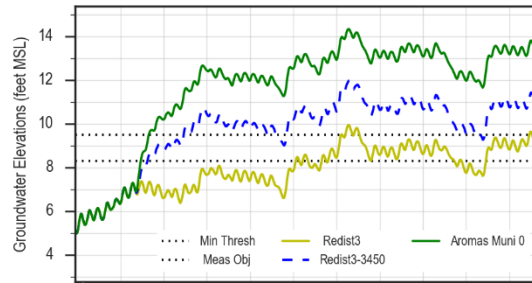
Review: Municipal pumping effects in Coastal Aromas Area

32

SC-A1B
Layers: Purisima F **2 – 4 ft influence**



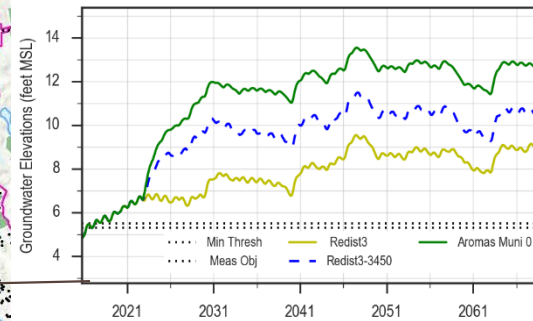
SC-A8A
Layers: Purisima F



- Pumping of 380-830 AFY eliminated
- 4 SqCWD wells
- 2 CWD wells

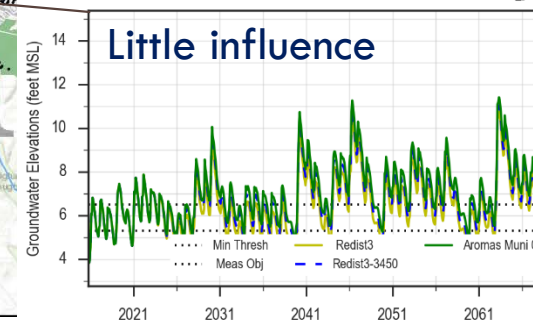
SC-A2A/SC-A2AR

Layers: Purisima F



No Aromas/PurF muni pumping
Redistribute & reduce muni pumping
Redistribute muni pumping

SC-A3A
Layers: Aromas

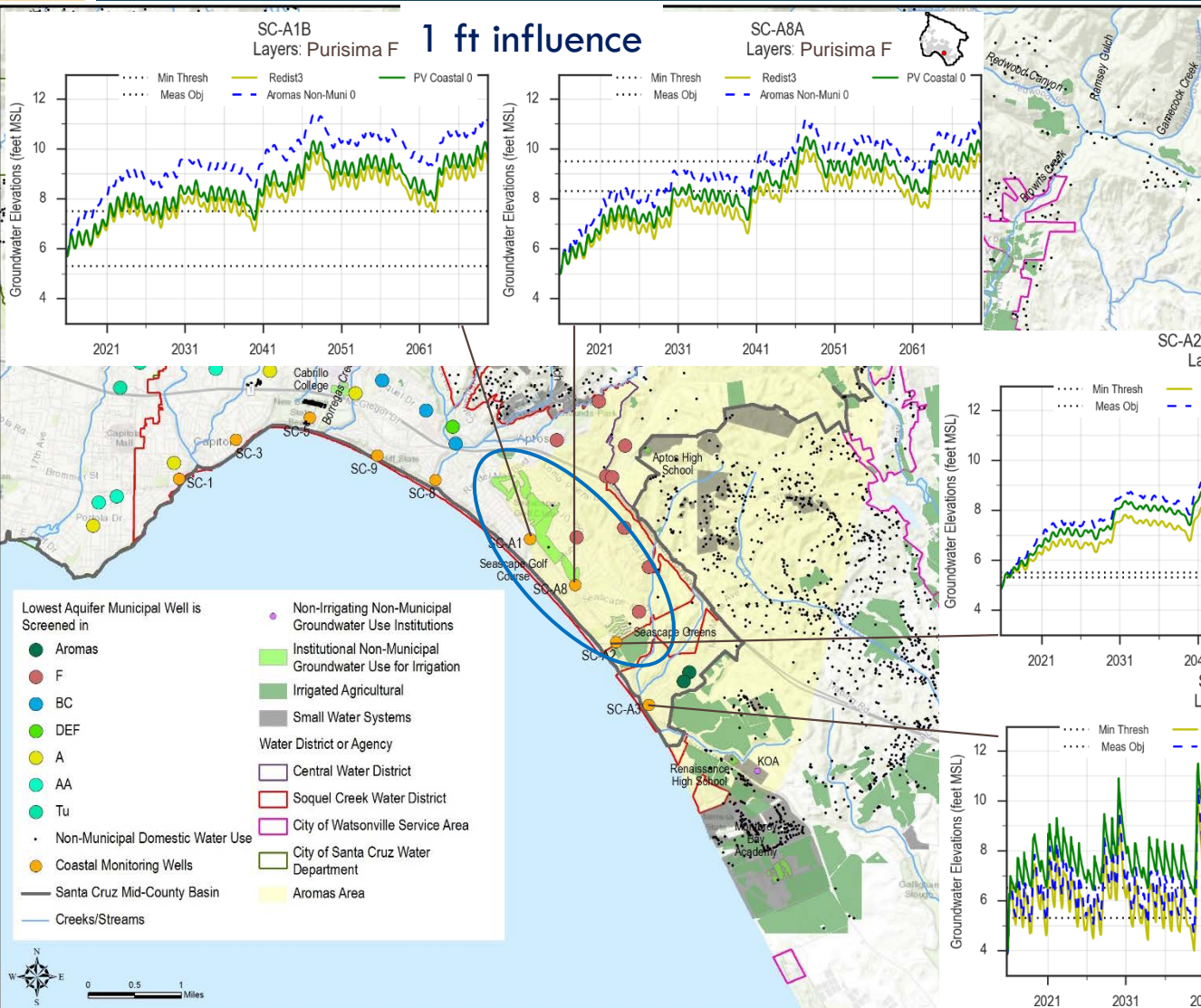


Little influence



Review: Non-Municipal pumping effects in Coastal Aromas Area

33



Pumping of 263 AFY eliminated

- 122 AF ag use
- 136 AF institutional use
- 5 AF domestic use

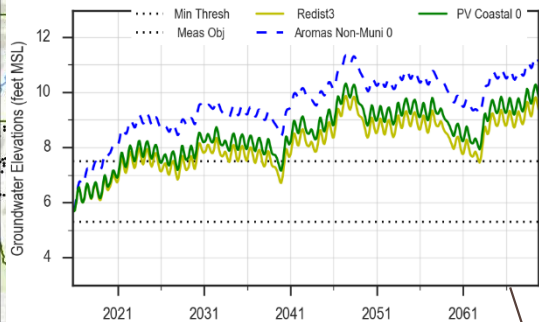
No Aromas/PurF non-muni Basin pumping
No Aromas/PurF PV non-muni pumping
Redistribute muni pumping

Little influence but greater than municipal

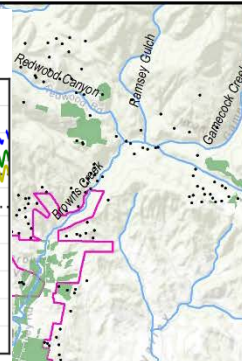
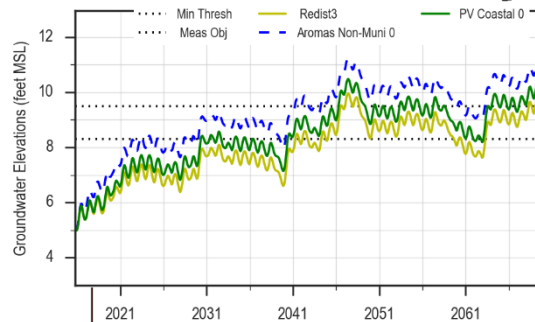
Review: Pajaro Valley non-municipal pumping effects in coastal Aromas area

34

SC-A1B
Layers: Purisima F **little influence**



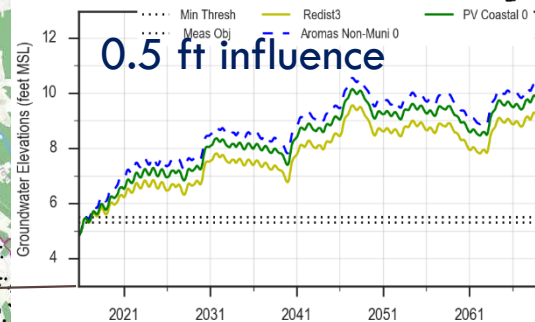
SC-A8A
Layers: Purisima F



Pumping of 2,533 AFY eliminated

- 1,774 AF ag use
- 611 AF institutional use
- 148 AF domestic use

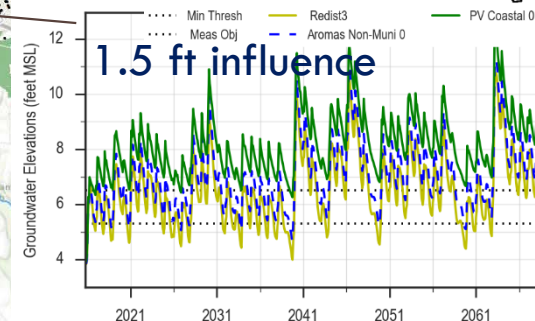
SC-A2A/SC-A2AR
Layer Purisima F



0.5 ft influence

No Aromas/PurF non-muni Basin pumping
No Aromas/PurF PV non-muni pumping
Redistribute muni pumping

SC-A3A
Layers: Aromas



1.5 ft influence



Review: Coastal Aromas Area Pumping

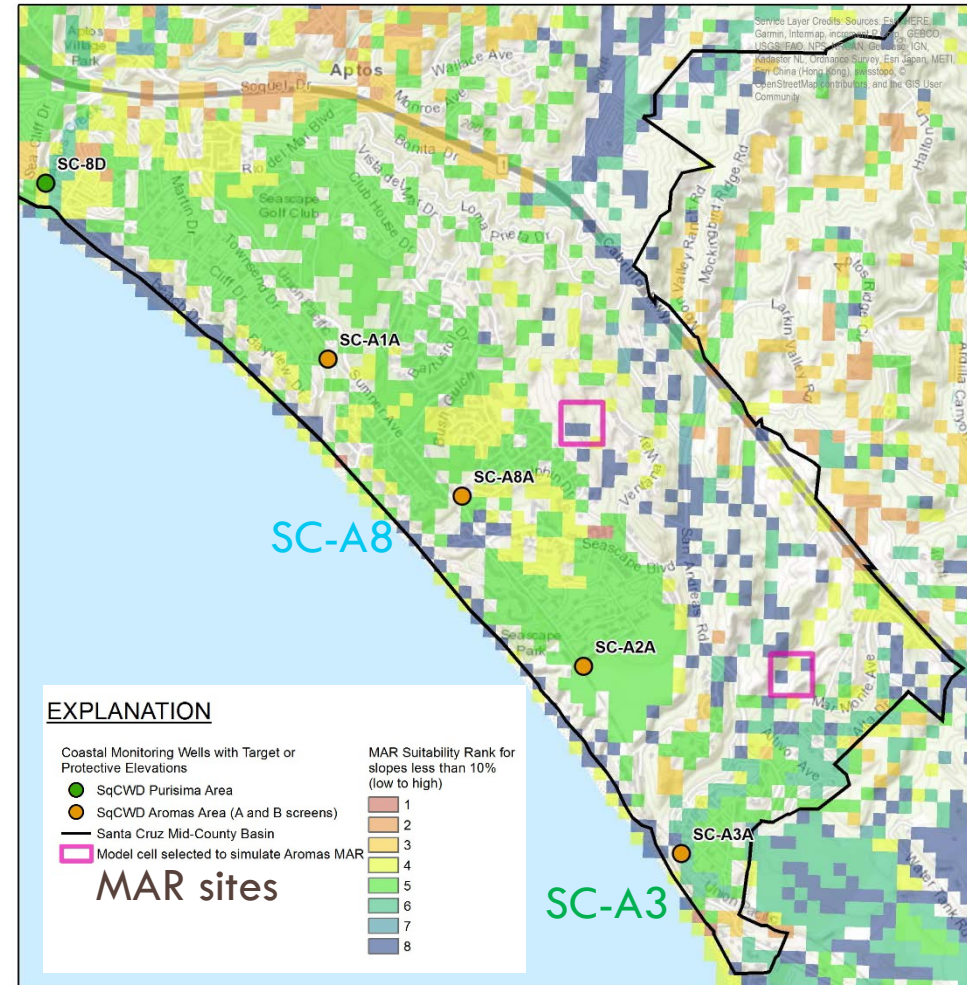
35

- Coastal municipal pumping in the Aromas/Purisima F impacts protective elevations in Purisima F and not much in the Aromas (southernmost well)
- Coastal non-municipal pumping in the Aromas/Purisima F impacts protective elevations in Purisima F and not much in the Aromas (southernmost well)
- Coastal Pajaro Valley Aromas pumping impacts protective elevations mostly in the southernmost coastal well (SC-A3A) and has lesser impacts with distance in the Mid-County Basin's Purisima F wells

Theoretical Aromas Managed Recharge Location

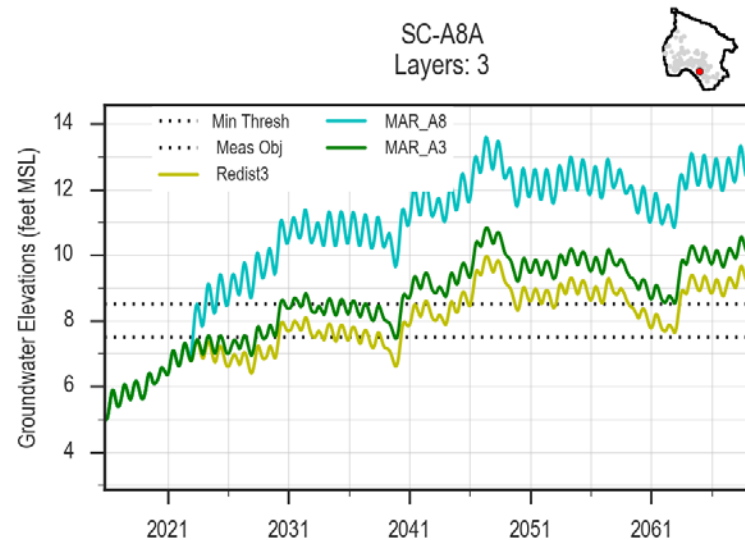
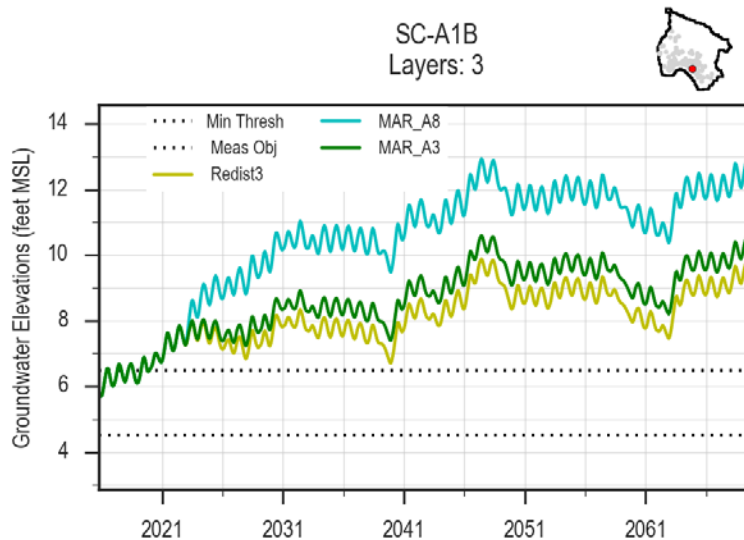
36

- Sites based on Managed Aquifer Suitability ranks by UC Santa Cruz/RCD
- Undeveloped Areas
- Recharge 500 AFY at one site
 - ▣ Near SC-A8
 - ▣ Near SC-A3



Hydrographs for Both Sites

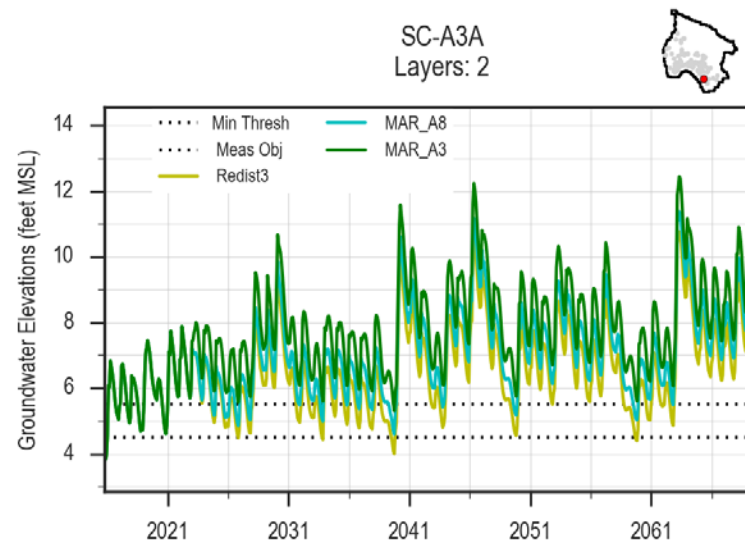
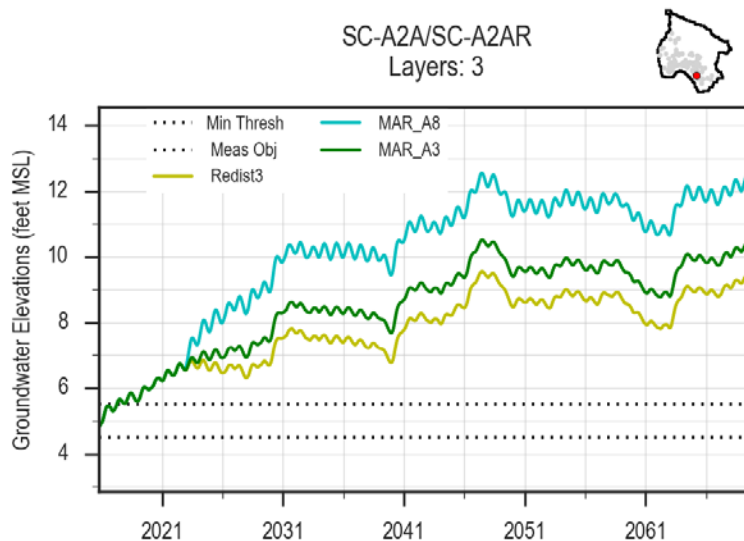
37



MAR nr SC-A8

MAR nr SC-A3

No MAR



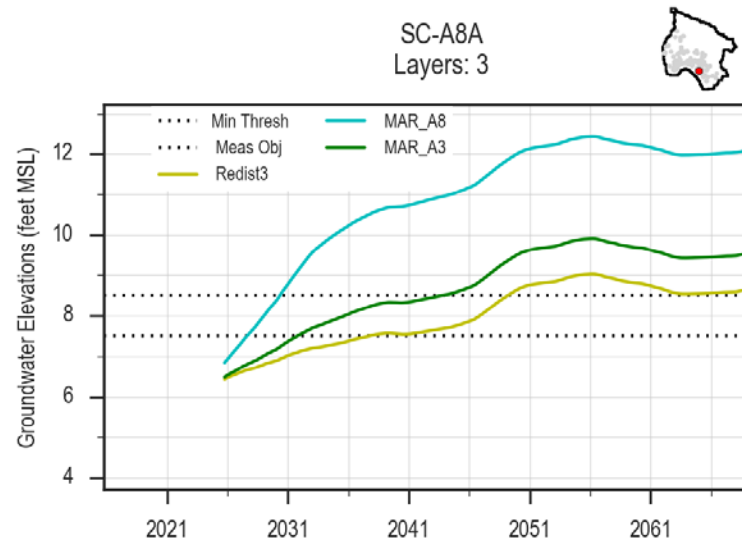
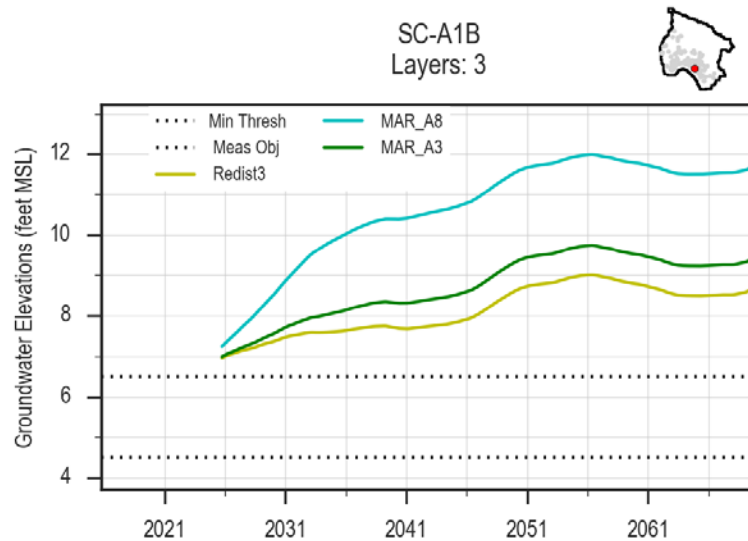
MAR nr SC-A3

MAR nr SC-A8

No MAR

10 Year Averages for Both Sites

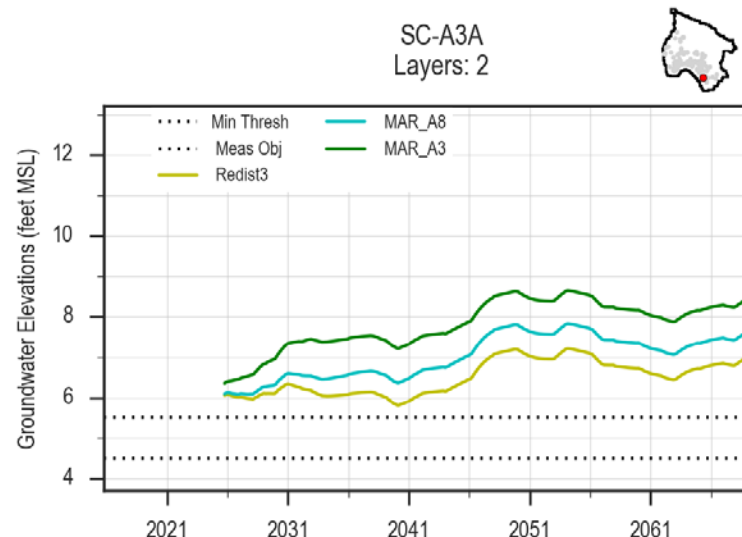
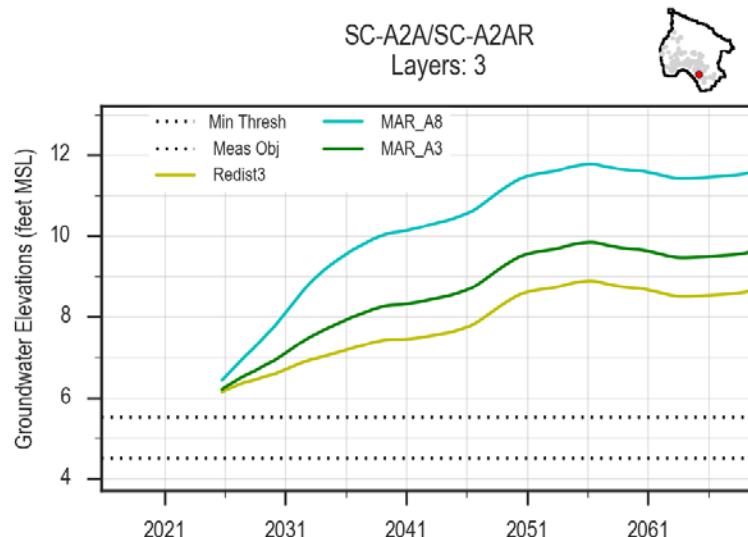
38



MAR nr SC-A8

MAR nr SC-A3

No MAR



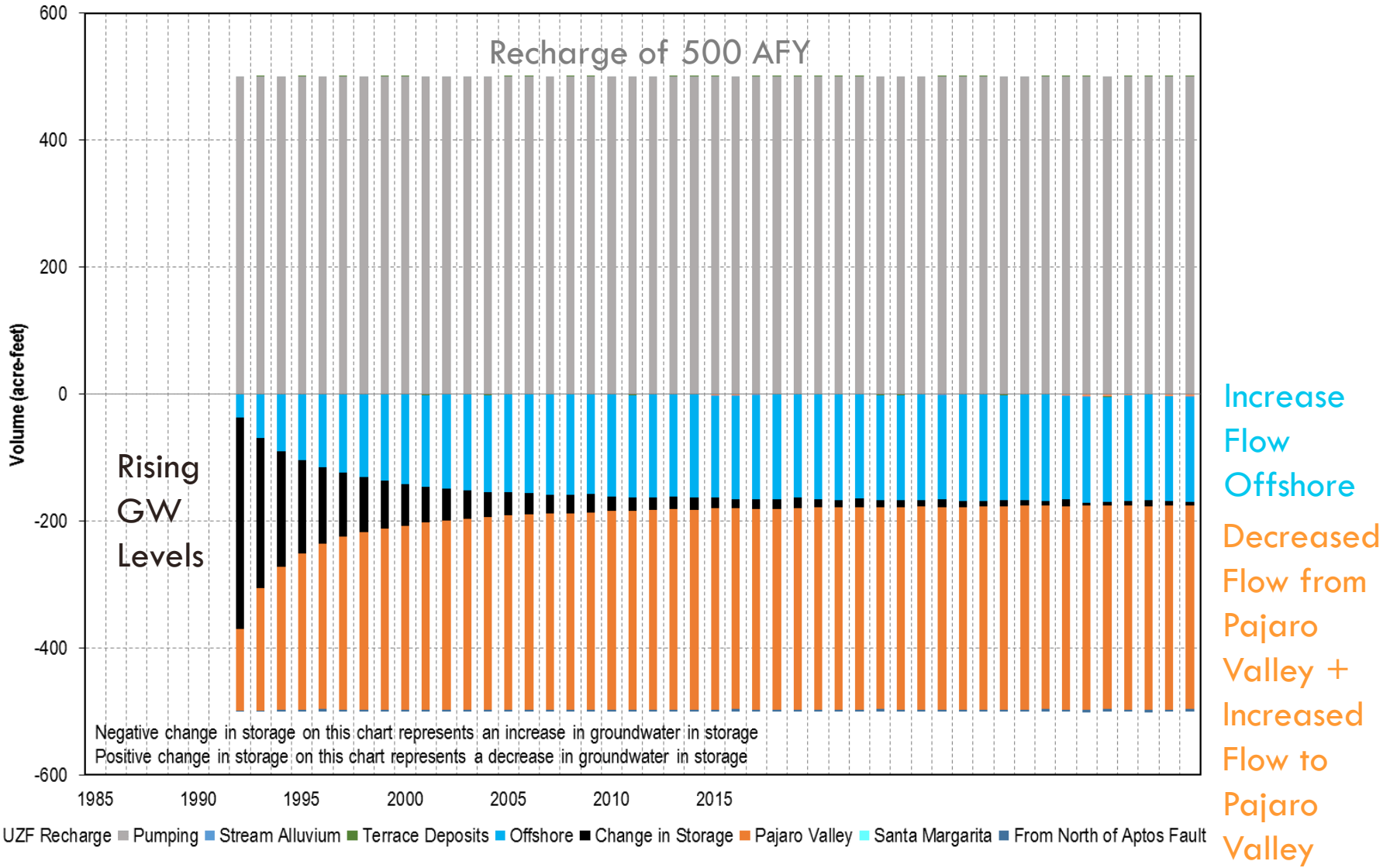
MAR nr SC-A3

MAR nr SC-A8

No MAR

Water Budget Change for SC-A8 Site

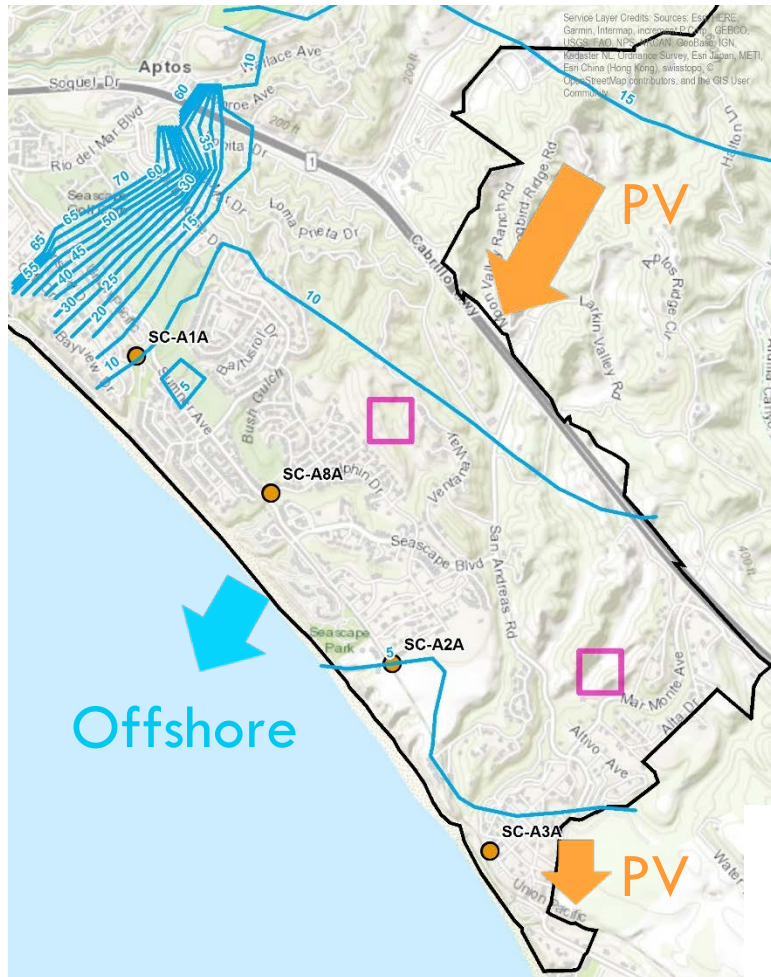
39



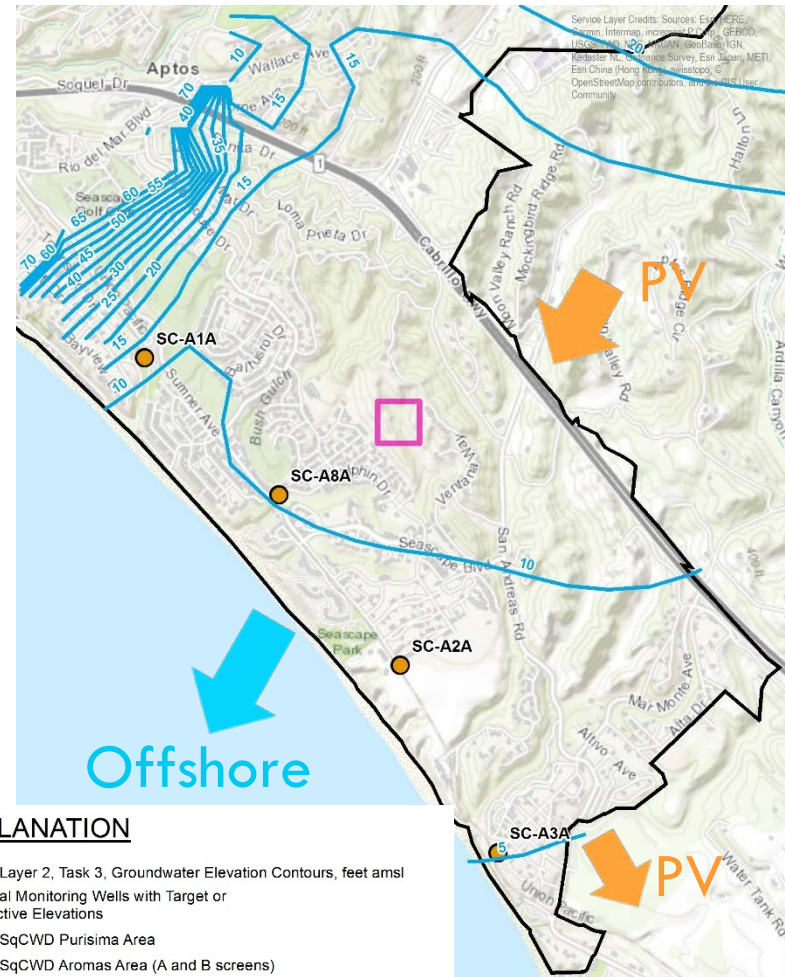
Groundwater Level Contours

40

No MAR



MAR near SC-A8



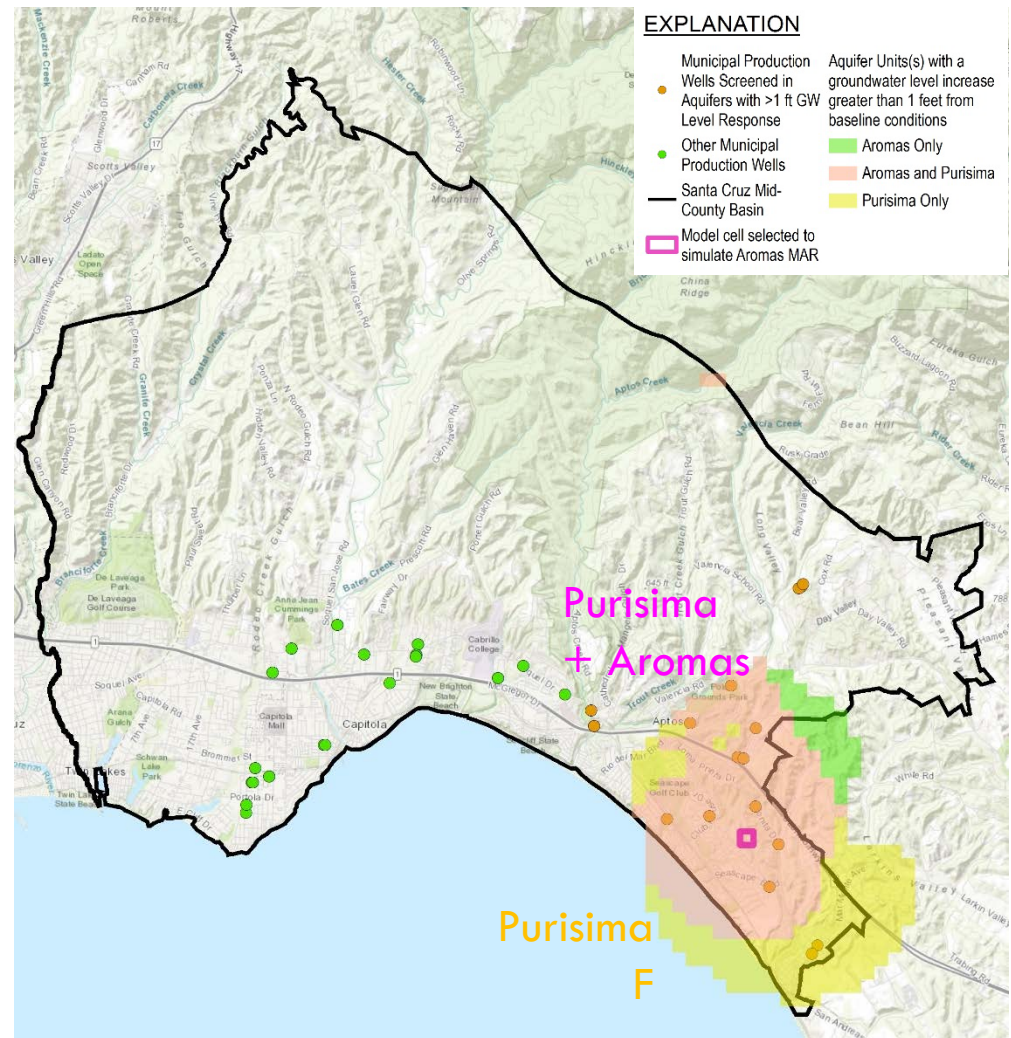
EXPLANATION

- Layer 2, Task 3, Groundwater Elevation Contours, feet amsl
- Coastal Monitoring Wells with Target or Protective Elevations
- SqCWD Purisima Area
- SqCWD Aromas Area (A and B screens)
- Santa Cruz Mid-County Basin
- Model cell selected to simulate Aromas MAR

Area of Effect for Site Near SC-A8

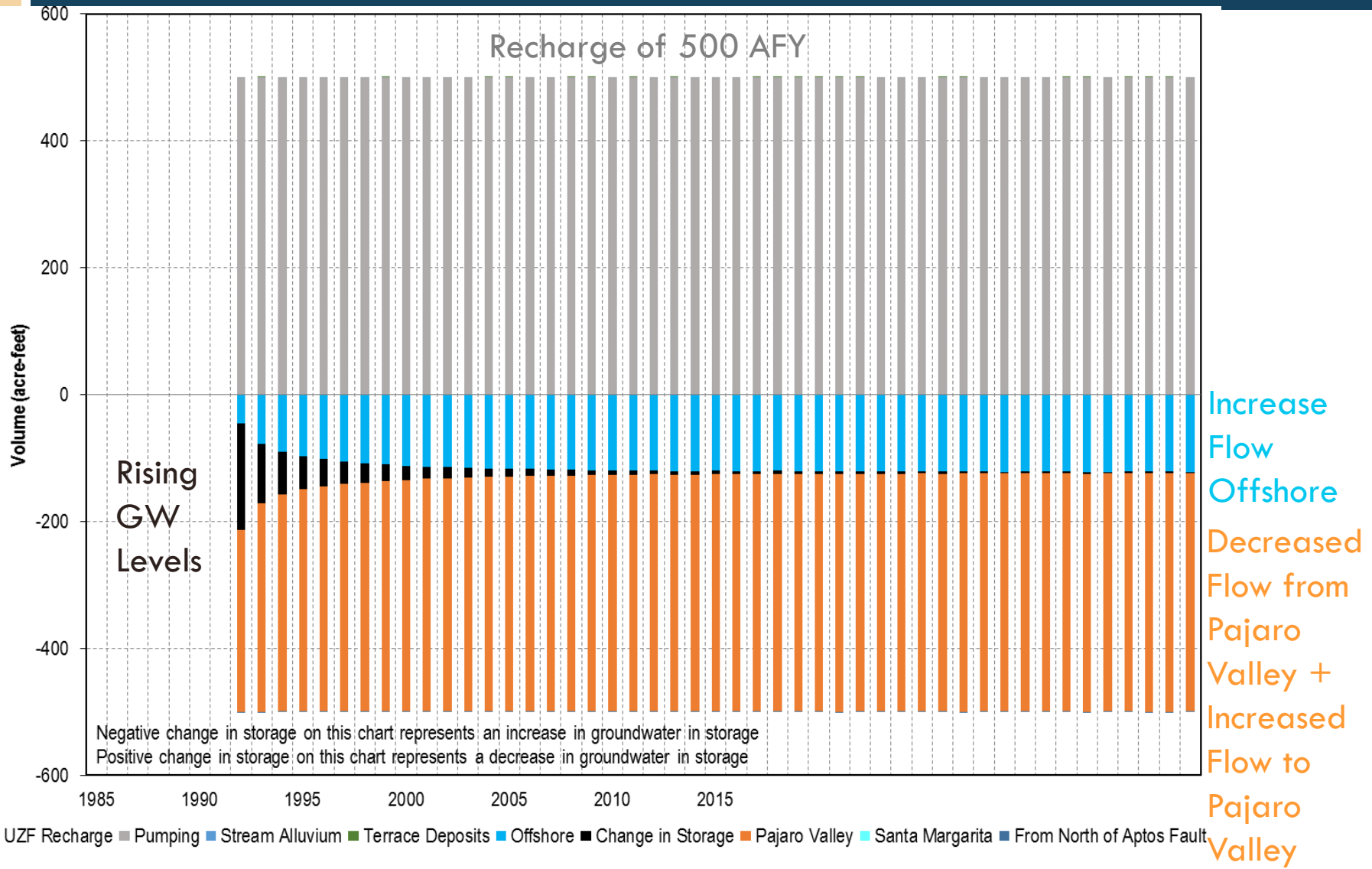
41

- Based on simulated groundwater level difference between managed recharge and redistribution baseline
- Only Aromas and Purisima F affected



Water Budget Change for SC-A3 Site

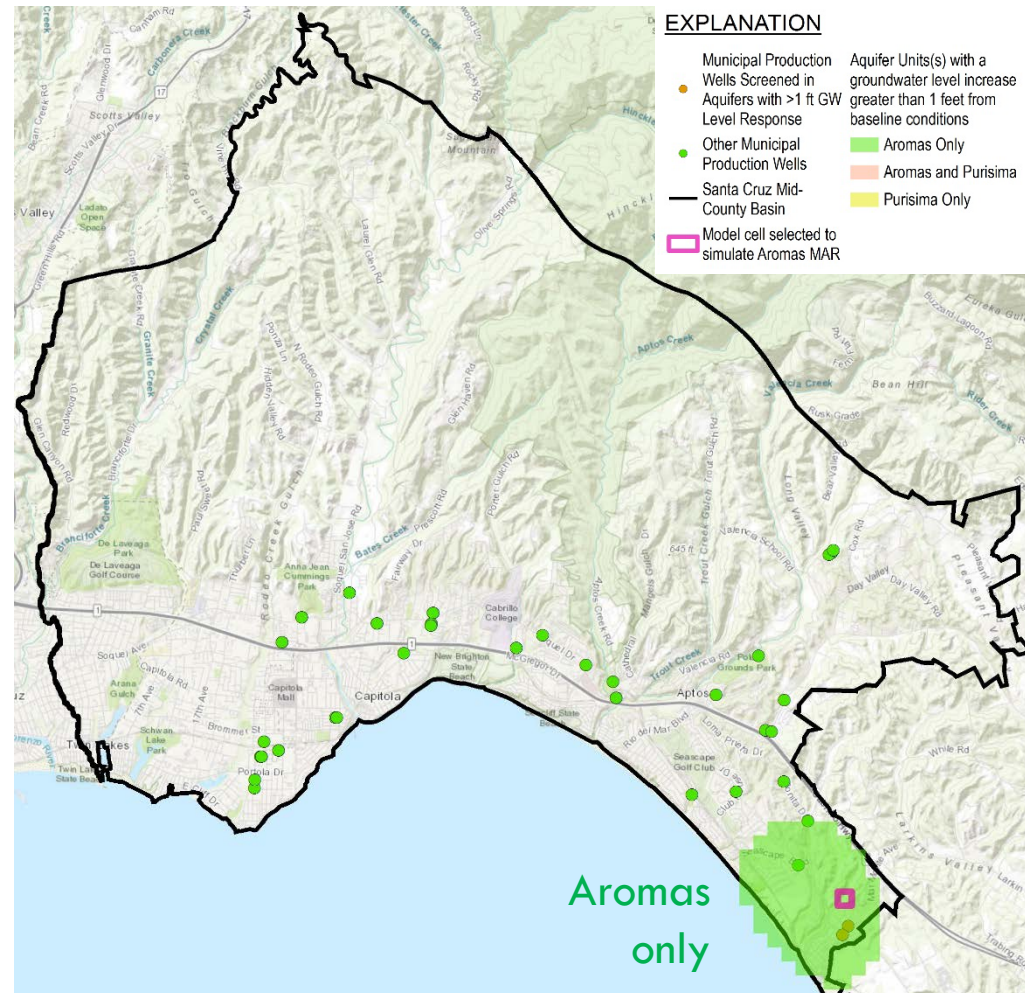
42



Area of Effect for Site Near SC-A3

43

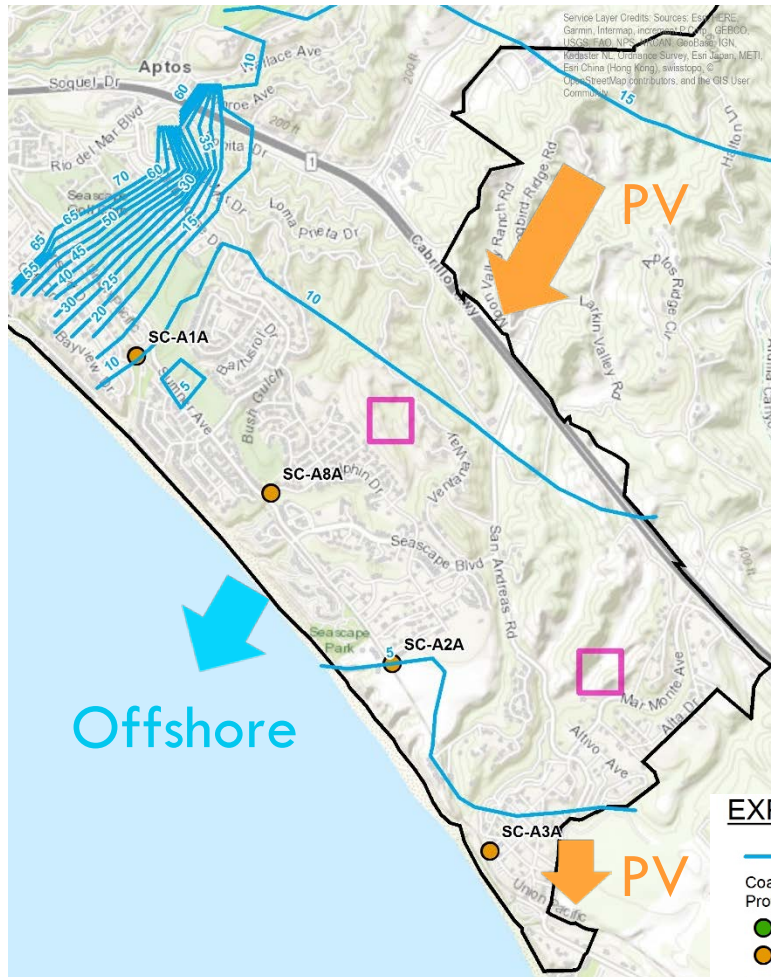
- Based on simulated groundwater level difference between managed recharge and redistribution baseline
- Only Aromas Red Sands affected



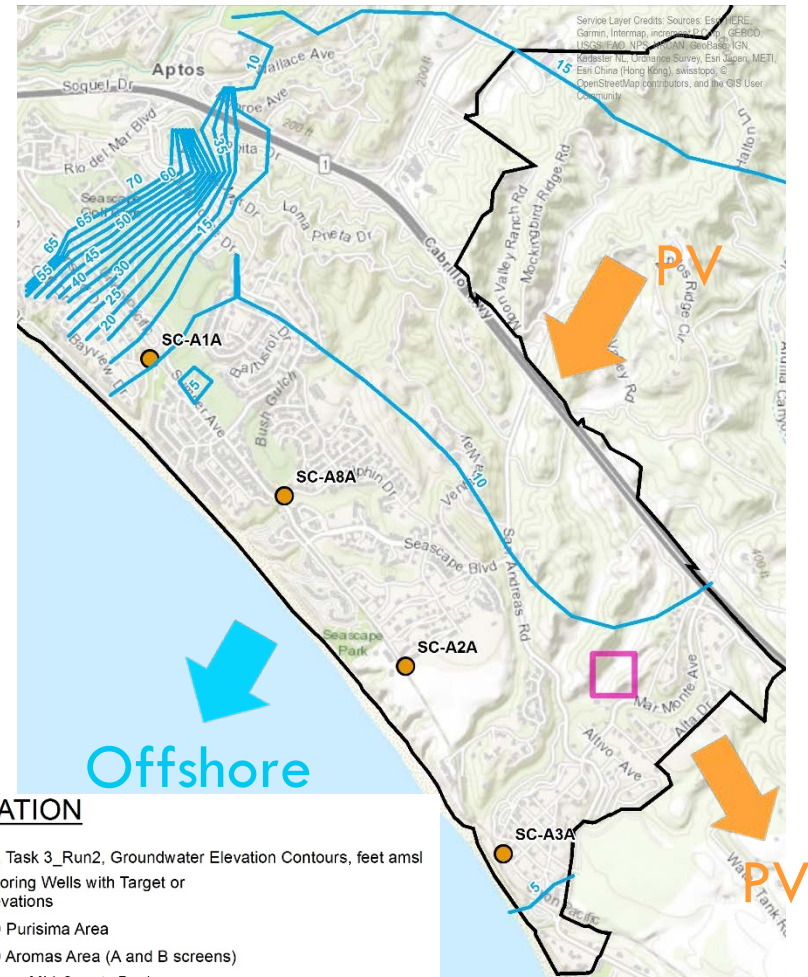
Groundwater Level Contours

44

No MAR



MAR near SC-A3



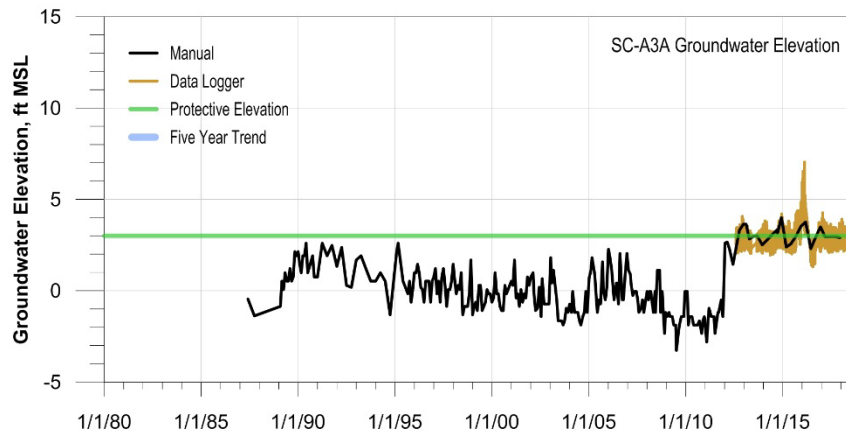
EXPLANATION

- Layer 2, Task 3_Run2, Groundwater Elevation Contours, feet amsl
- Coastal Monitoring Wells with Target or Protective Elevations
- SqCWD Purisima Area
- SqCWD Aromas Area (A and B screens)
- Santa Cruz Mid-County Basin
- Model cell selected to simulate Aromas MAR

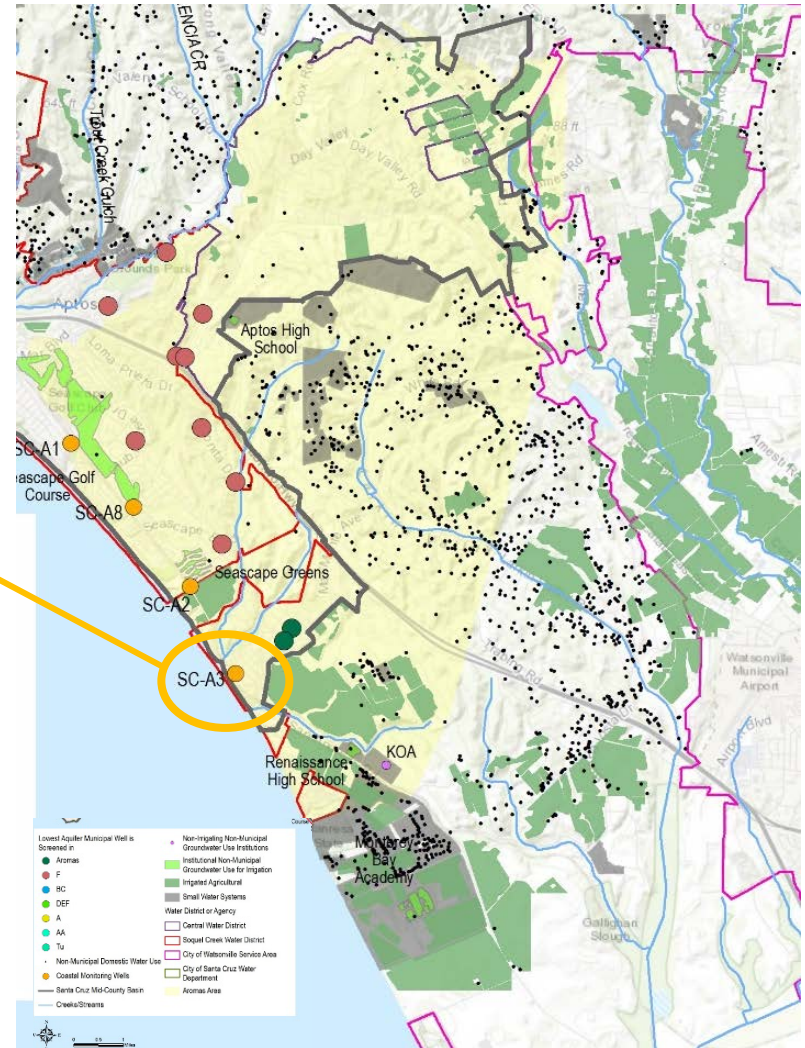
Recent Conditions at SC-A3A

45

Historical seawater
intrusion



Recent groundwater levels
at minimum thresholds



Questions and Discussion

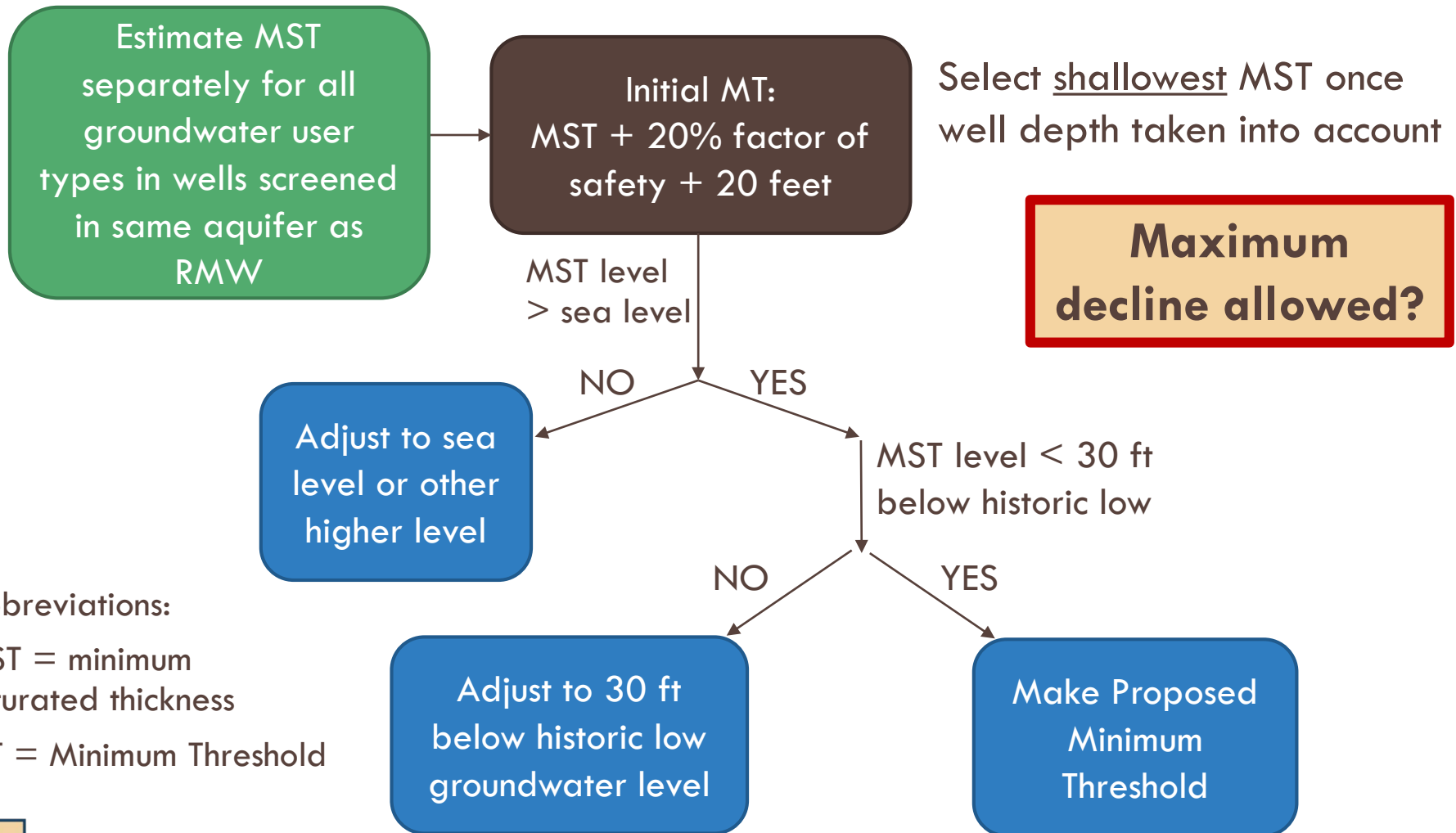
What is your feedback on how management of groundwater levels and seawater intrusion in the SC-A3 area should be addressed?

Item 9: Minimum Thresholds for Chronic Lowering of Groundwater Levels

- Update to draft presented in Sept 2018
- Based on comments received from GSP Advisory Committee members and other agency staff

Process for Assigning Minimum Thresholds

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Abbreviations:

MST = minimum saturated thickness

MT = Minimum Threshold

Changes to Approach

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- Did not include all wells in set radius
 - ▣ Eliminated some based on elevation of screened interval
- Used depth of shallowest well screened in same aquifer as RMW as base level to estimate Minimum Thresholds
 - ▣ Previously used shallowest or up to 15th percentile

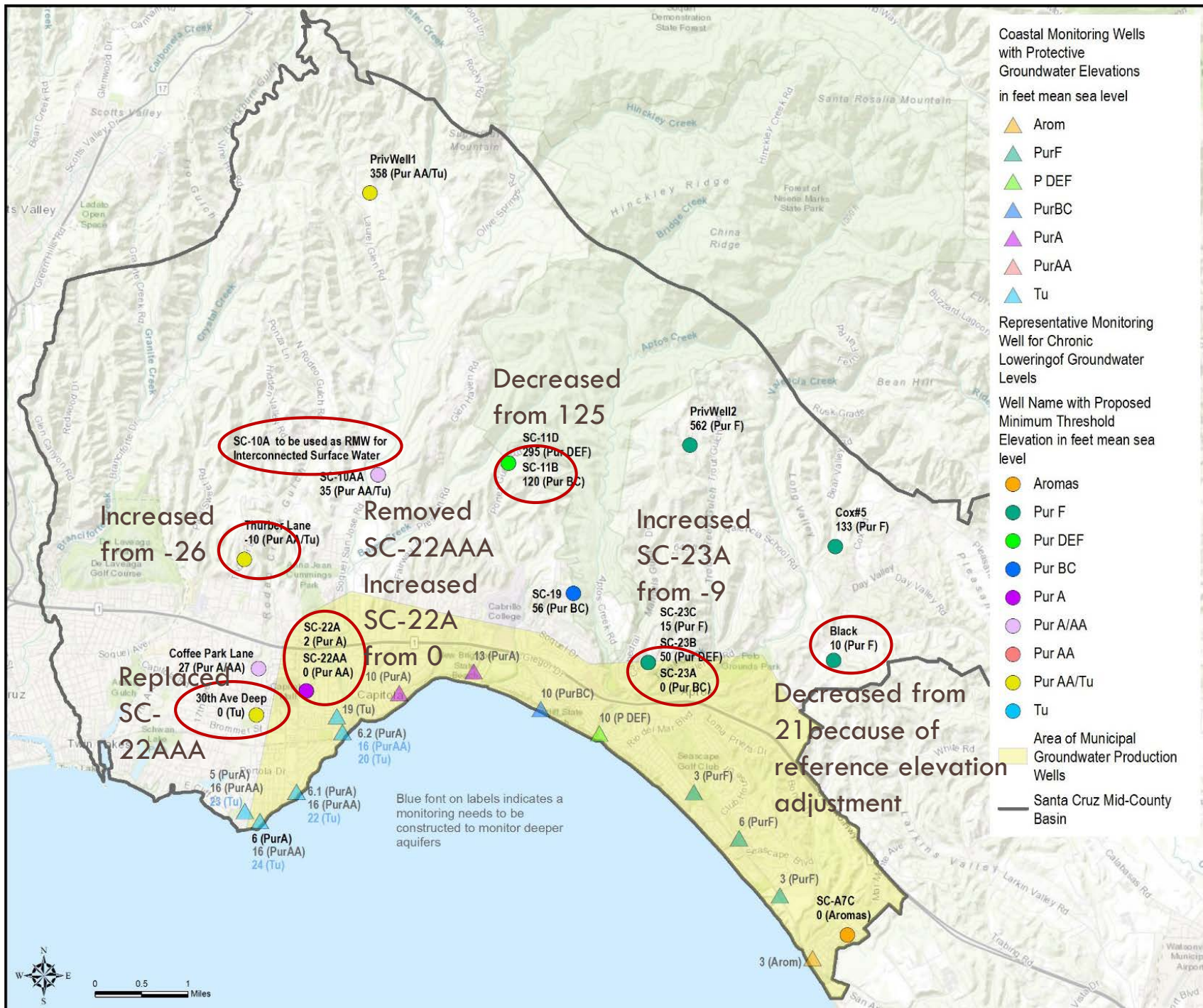


Table 1: Summary of Representative Monitoring Wells with Proposed Minimum Thresholds

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RMW Name	Overlying Demand Type	Aquifer	Proposed Minimum Threshold Elevation (feet amsl)	Minimum Saturated Thickness (MST) Assumptions and Adjustments made to Minimum Thresholds (MT)
30th Ave Deep (replaces SC-22AAA in previous draft)	Municipal	Tu	0	No private wells screened in this very deep aquifer. There are some municipal wells screened in this aquifer > 0.8 mile to the north. Shallowest municipal well depth results in a minimum elevation of -324 ft amsl based on the MST. However, well screens are typically at 200 ft below ground so the MT is adjusted upwards to sea level which is typically above well screens.
SC-22AAA	Municipal	Tu	-39	Shallowest municipal well depth, adjusted MST at -326 ft amsl, MT set to 30 ft below historic low 30 th AVE DEEP REPLACES THIS RMW
Thurber Lane Deep	Private Domestic	Pur AA/Tu	-10	Shallowest domestic well depth results in a minimum elevation of -33 ft amsl that still meets demands. Increase the elevation to -10 ft amsl so that there is not such a steep gradient between this RMW and the coast where there are higher protective groundwater elevations.
SC-10RAA	Private Domestic	Pur AA/Tu	35	There are no deep domestic wells in the area of this RMW that are screened in the Pur AA/Tu similar to the RMW. They are screened shallower in Pur A/AA and in the alluvium. Even using the shallowest domestic well depth (not screened in the same aquifer), adjusted MST is at -275 ft amsl, MT is therefore set to 30 ft below historic low levels.

Questions and Discussion

Public Comment

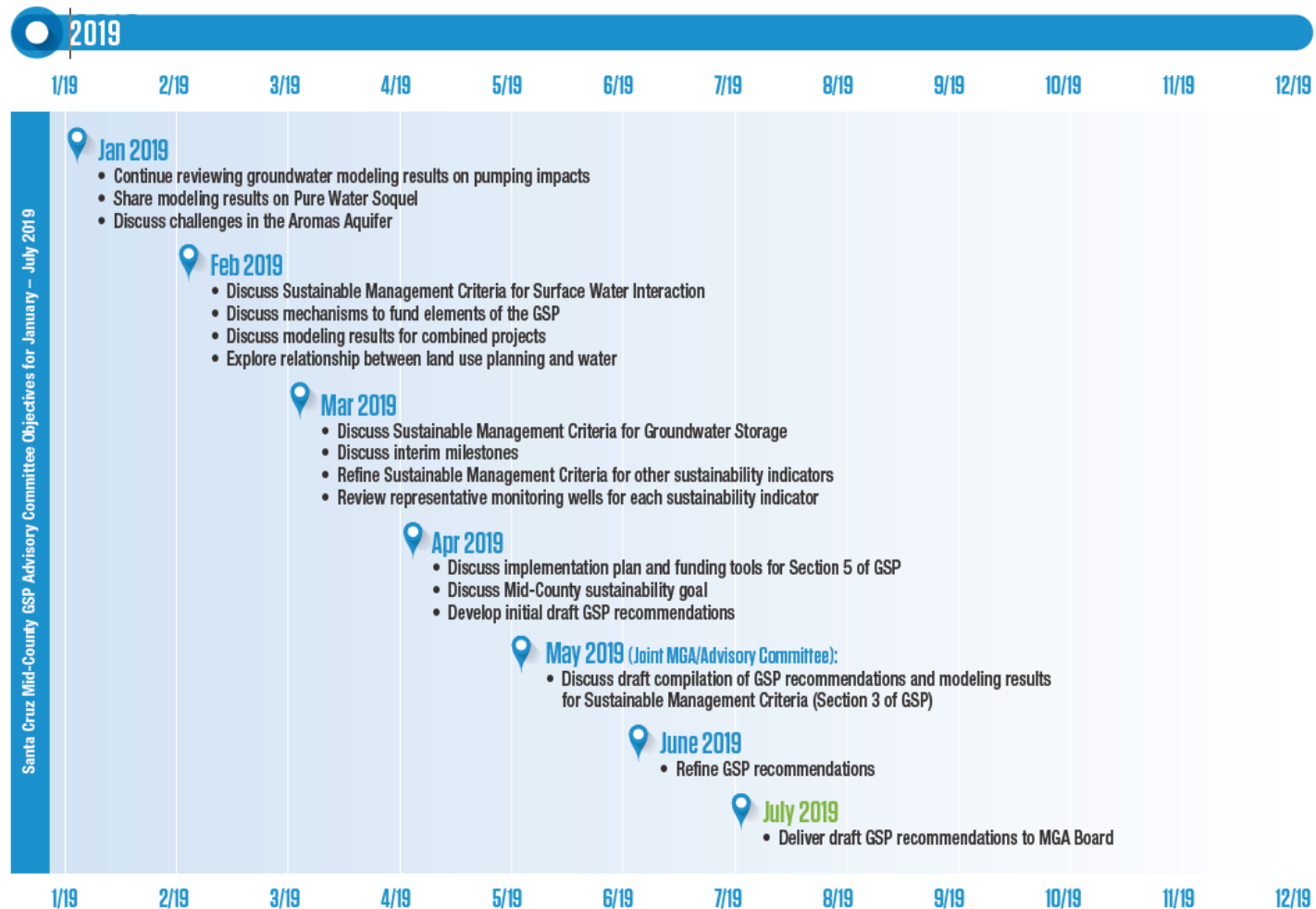
December 12, 2018 GSP Advisory Committee Meeting Summary

Recap and Next Steps

GSP 2019 Project Timeline

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Santa Cruz Mid-County GSP Advisory Committee Objectives for January – July 2019



Next Steps:

Meetings 16 and 17

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❑ **February 27, 2019 Meeting (#16)**

- ❑ Discuss Sustainable Management Criteria for Surface Water Interaction
- ❑ Discuss mechanisms to fund elements of the GSP
- ❑ Discuss modeling results for combined projects
- ❑ Explore relationship between land use planning and water

❑ **March 27, 2019 Meeting (#17)**

- ❑ Discuss Sustainable Management Criteria for Groundwater Storage
- ❑ Discuss interim milestones
- ❑ Refine Sustainable Management Criteria for other sustainability indicators
- ❑ Review representative monitoring wells for each sustainability indicator



THANK YOU!

FOR ANY QUESTIONS, PLEASE CONTACT:

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