Fillmore and Piru Basins
Groundwater Sustainability Agency

# Special Board Meeting

Nov 4, 2020

## Sustainable Management Criteria

# Sustainable Groundwater Management Act (SGMA)

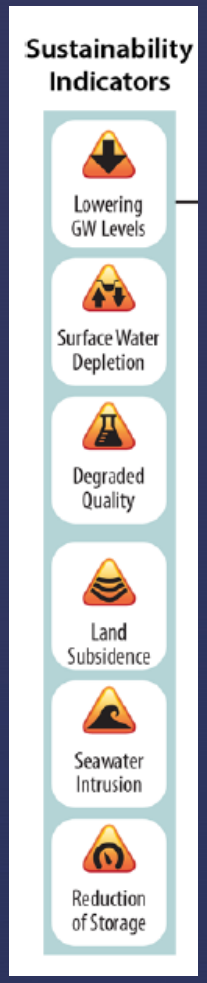
## Background

## What is SGMA?

## Sustainable Groundwater Management Act

**SGMA is a State law that requires the management of *high and medium priority* groundwater basins to ensure their sustainability**

# Six Sustainability Indicators
## (aka *6 Deadly Sins of SGMA*)




- Chronic lowering of GW levels indicating S&U depletion of supply
- Depletions of interconnected SW that have S&U impacts on beneficial uses of SW
- S&U degraded water quality
- S&U land subsidence that interferes with surface land uses
- S&U seawater intrusion
- S&U reduction of GW storage

S&U = significant and unreasonable

*undesirable results have these effects*

# Sustainable Groundwater Management Act (SGMA)
## Definitions

**Significant and Unreasonable** – defined by GSA. Basic element of "local control" inherent to SGMA.

**Minumum Threshold** – a numeric value for each sustainability indicator used to define undesirable results. A quantitative value that if exceeded may cause an "undesirable result" - cannot be an arbitrary number.

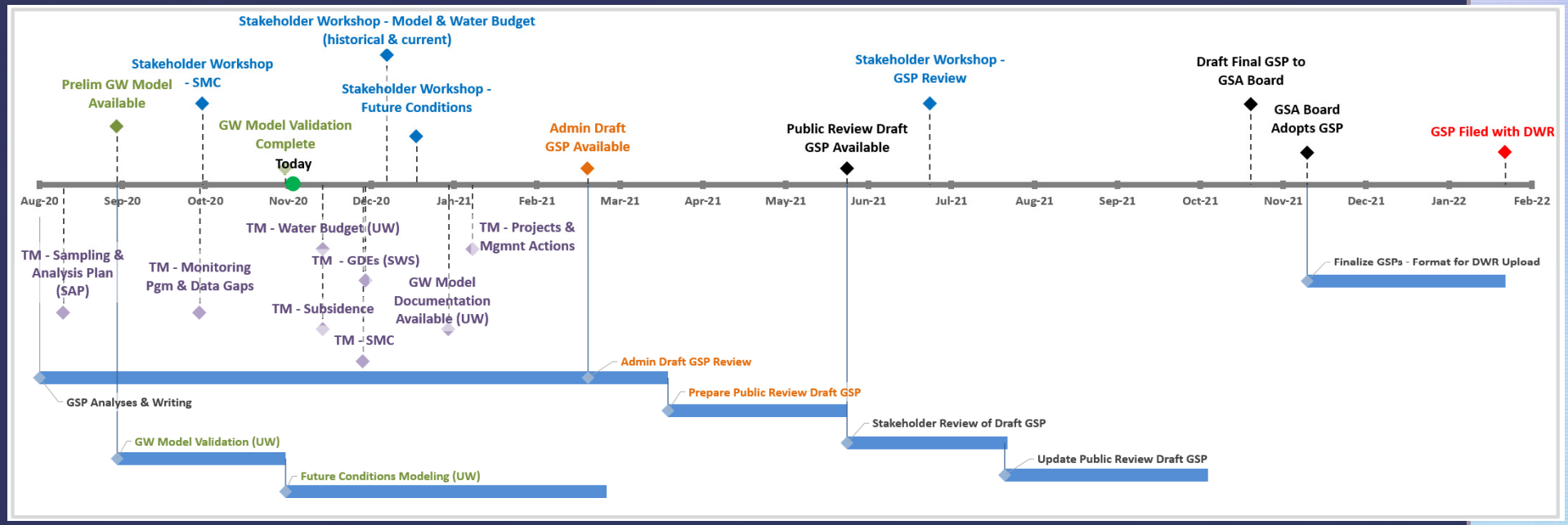
**Measurable Objective** – specific, quantifiable goals for the maintenance or improvement of specified groundwater conditions. Included in an adopted Plan to document progress towards achieving the sustainability goal for the basin.

# How did we get to this point?

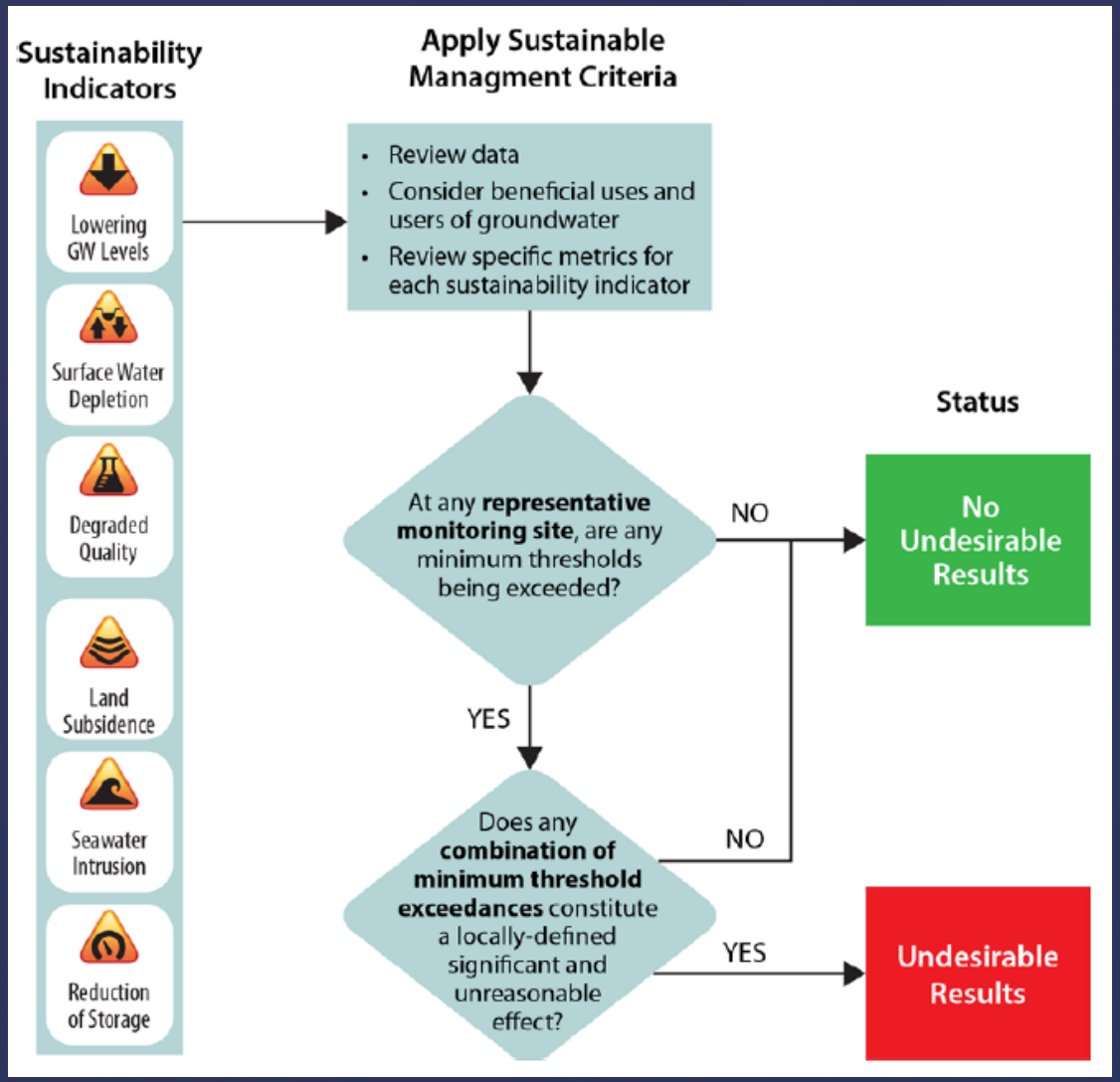
- SMC ad hoc committee sessions
- Presentations to Board of Directors
- Stakeholder Workshops
- Technical consultant to craft draft SMC for stakeholder and Board of Directors consideration
  - Simple “fact sheet” for each SM indicator to provide context and summarize the proposed language

Preliminary Draft - For Discussion Purposes Only

# GSP timeline



# DWR Flowchart for Application of SMC



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## Potential Sustainable Management Criteria

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# Draft SMC Matrix

| SM Indicator | Example Possible Undesirable Results | Metric / Measurement Method | MT | MO |
|---|---|---|---|---|
| GW Elevation | *Option A* - Static GW levels decline below the top of the well screen | GW level measurements / Depth to water / Future simulated GW levels | Static GW levels equal to the top of the well screen | Static water levels at or near 2011 water levels |
| GW Elevation | *Option B* - Static GW levels decline below the bottom of the well | GW level measurements / Depth to water / Future simulated GW levels | Static GW levels at or below the bottom of the well screen | Static water levels at least 70 feet above the bottom of the well screen |
| GW Storage Reduction | inadequate GW storage to last through multi-year drought without GW extraction limitations | GW level measurements / Depth to water / Future simulated GW levels | Static water levels equal to the top of the well screen. | Static water levels equivalent to 2011-2016 water level decline above the top of the well screen. |
| SW Depletion | Surface water flows are depleted by groundwater extractions or GSA projects and management actions that impairs the beneficial use of the resource | GW level measurements / Depth to water / Future simulated GW levels | ? | ? |
| Land Subsidence | land subsidence amounts that interfere with critical infrastructure operations / >1 ft of subsidence in a single year OR 1 ft of cumulative net subsidence over 5 years | InSAR data for recent historical monitoring / Potential Subsidence Screening Tool for potential future subsidence | Water levels twenty (20) feet below the historic low water levels | Water levels at (or above) historical low levels |
| Degraded WQ | water quality degradation that occurs due to GSA projects or management actions that impairs the beneficial use of the resource | Groundwater and surface water sampling and laboratory analyses | Option A - Water quality values included in existing or future regulations. | Option A - The authority to regulate water quality is afforded to State and Federal agencies other than the FPBGSA. FPBGSA is not a water purveyor and does not have the authority for water quality compliance but will cooperate with appropriately empowered entities. |
| Degraded WQ | water quality degradation that occurs due to GSA projects or management actions that impairs the beneficial use of the resource | Groundwater and surface water sampling and laboratory analyses | Option B - Maximum Contaminant Level (MCL), Health Goal, or other value specific to beneficial use (e.g., agriculture, vegetation, industrial), as appropriate. | Option B - FPBGSA is not a groundwater producer, and as such, does not function as a potable or irrigation water purveyor. FPBGSA does not have the authority for water quality compliance but will cooperate with appropriately empowered entities. |
| Seawater Intrusion | Not Applicable | Not Applicable | Not Applicable | Not Applicable |

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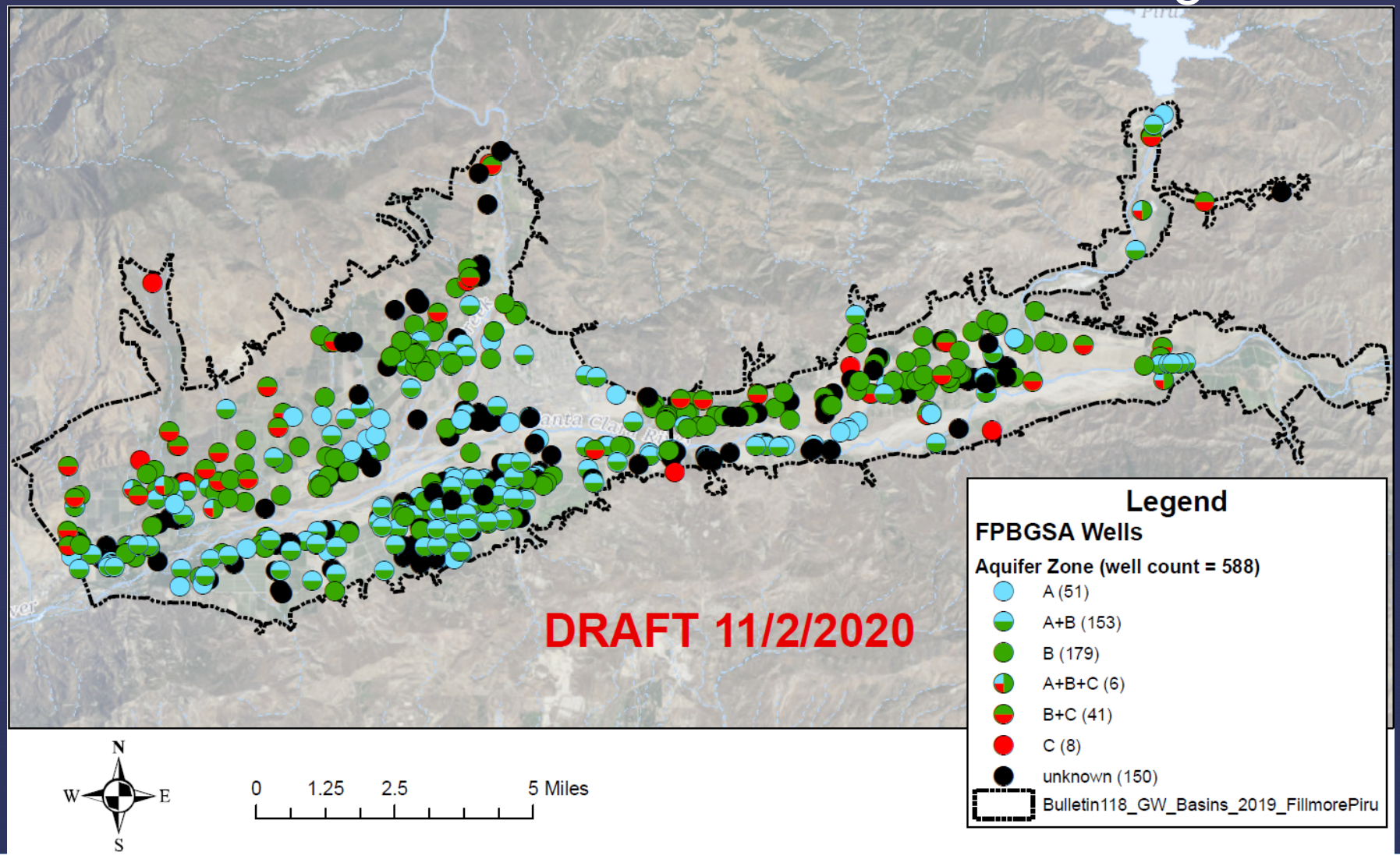
# Active/Monitoring Wells



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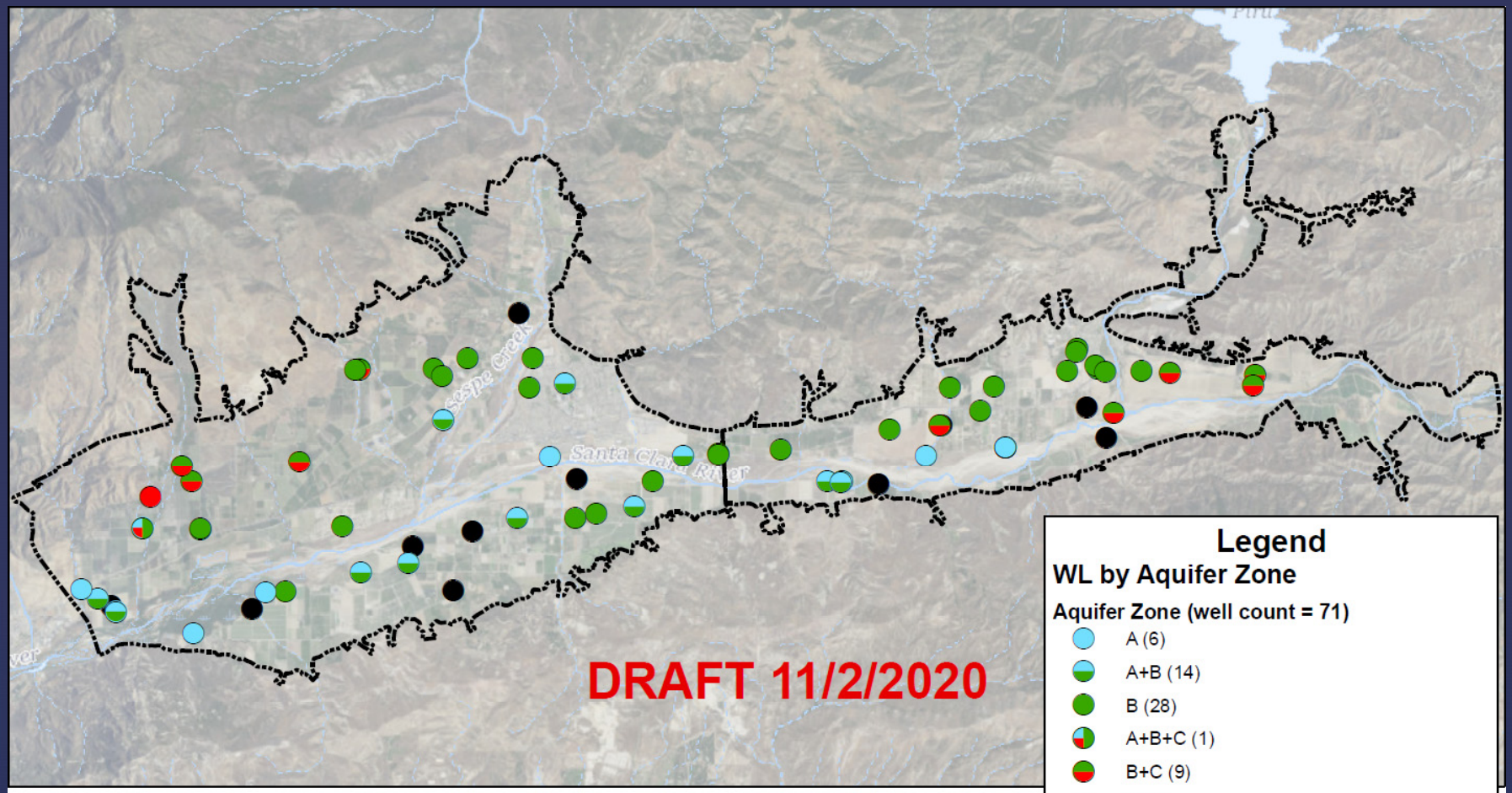
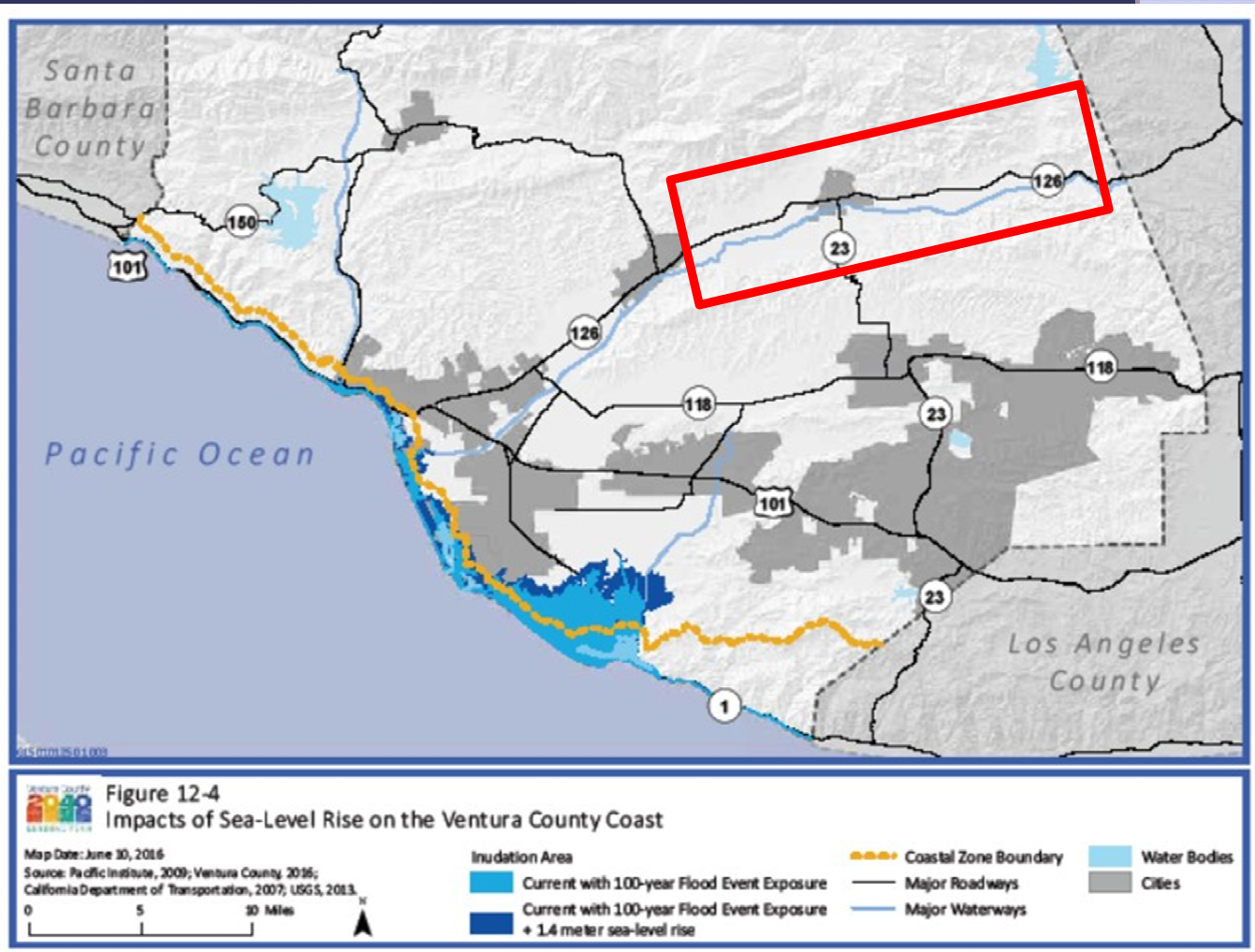
# Possible Water Level Indicator Wells



# Sea-Water Intrusion

- Too far inland (~15 mi from coastline)
- Several hundred feet above sea level (~300 ft western end of Fillmore basin, ~480 ft western end of Piru basin)
- Not a realistic issue for these basins



# Water Quality Degradation

- ✓ **DWR has not prepared BMP or Guidance Document**
- ✓ **Regulations focused on contaminated sites - do not address naturally occurring compounds (e.g., TDS, arsenic)**
- ✓ **GSAs generally do not have authority over water quality (RWQCB, DTSC, EPA) or some of the aspects that can impact water quality (e.g., land use)**
  - **Not responsible for enforcing water quality standards or collecting data to support existing water quality programs**
- ✓ **GSA not required to "fix" issues existing prior to 01 Jan 2015 (when SGMA became effective)**
  - **...but GSP should not make conditions worse**

# Water Quality Degradation

- ✓ **GSAs have broad powers "*...perform any act necessary or proper to carry out the purposes of SGMA...*"**

**Gray Zone:**

- **Are GSAs responsible to address WQ problems that were present prior to 01Jan15 and have gotten worse?**
- **Are GSAs responsible for WQ problems not being addressed by other regulatory agencies?**

# Water Quality Degradation - draft SMC language

| SM Indicator | Example Possible Undesirable Results | Metric / Measurement Method | MT | MO |
|---|---|---|---|---|
| Degraded WQ | water quality degradation that occurs due to GSA projects or management actions that impairs the beneficial use of the resource | Groundwater and surface water sampling and laboratory analyses | Option A - Water quality values included in existing or future regulations. | Option A - The authority to regulate water quality is afforded to State and Federal agencies other than the FPBGSA. FPBGSA is not a water purveyor and does not have the authority for water quality compliance but will cooperate with appropriately empowered entities. |
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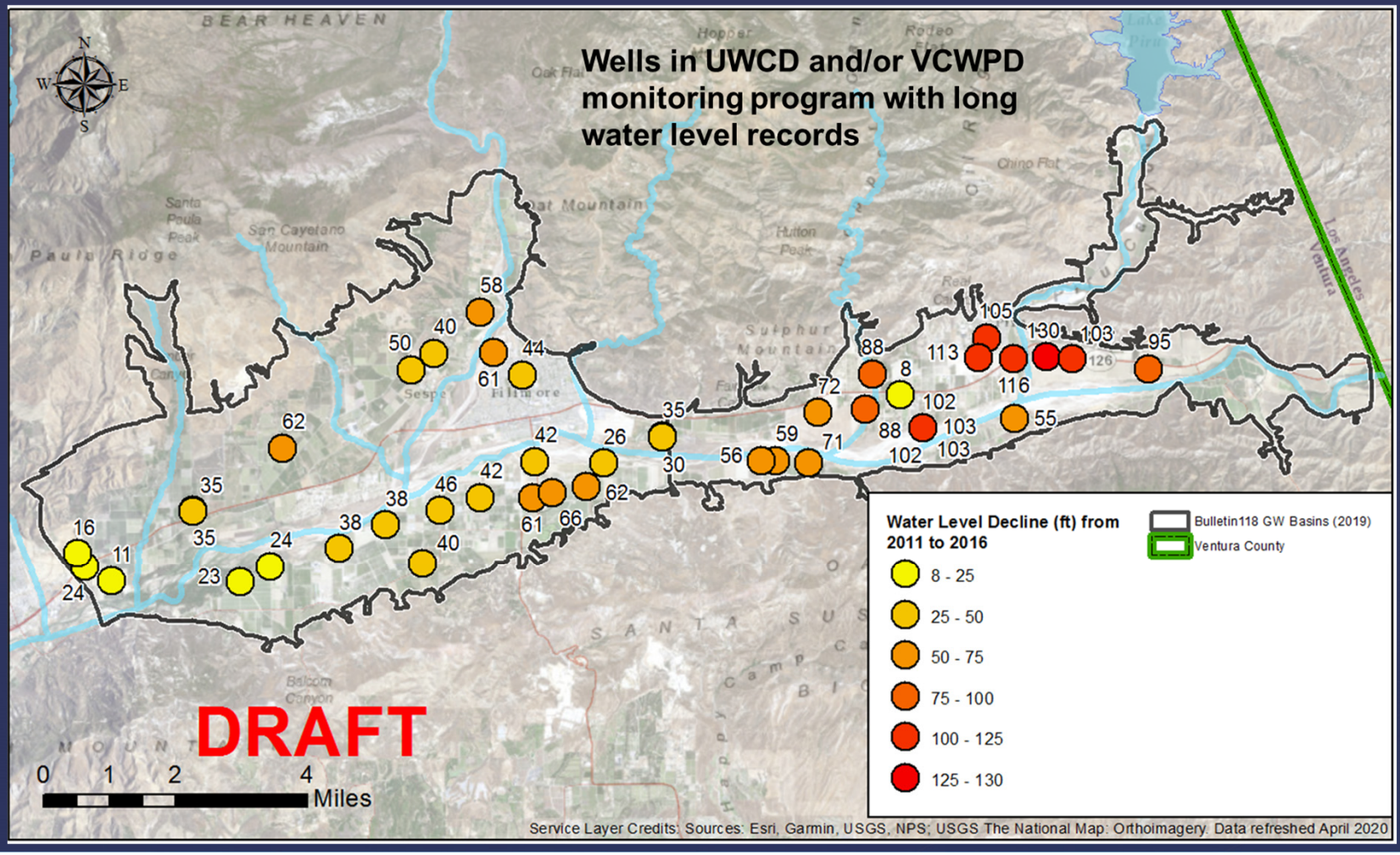
# Groundwater Levels



# Groundwater Levels - draft SMC language

| SM Indicator | Example Possible Undesirable Results | Metric / Measurement Method | MT | MO |
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| GW Elevation | *Option A* - Static GW levels decline below the top of the well screen | GW level measurements / Depth to water / Future simulated GW levels | Static GW levels equal to the top of the well screen | Static water levels at or near 2011 water levels |
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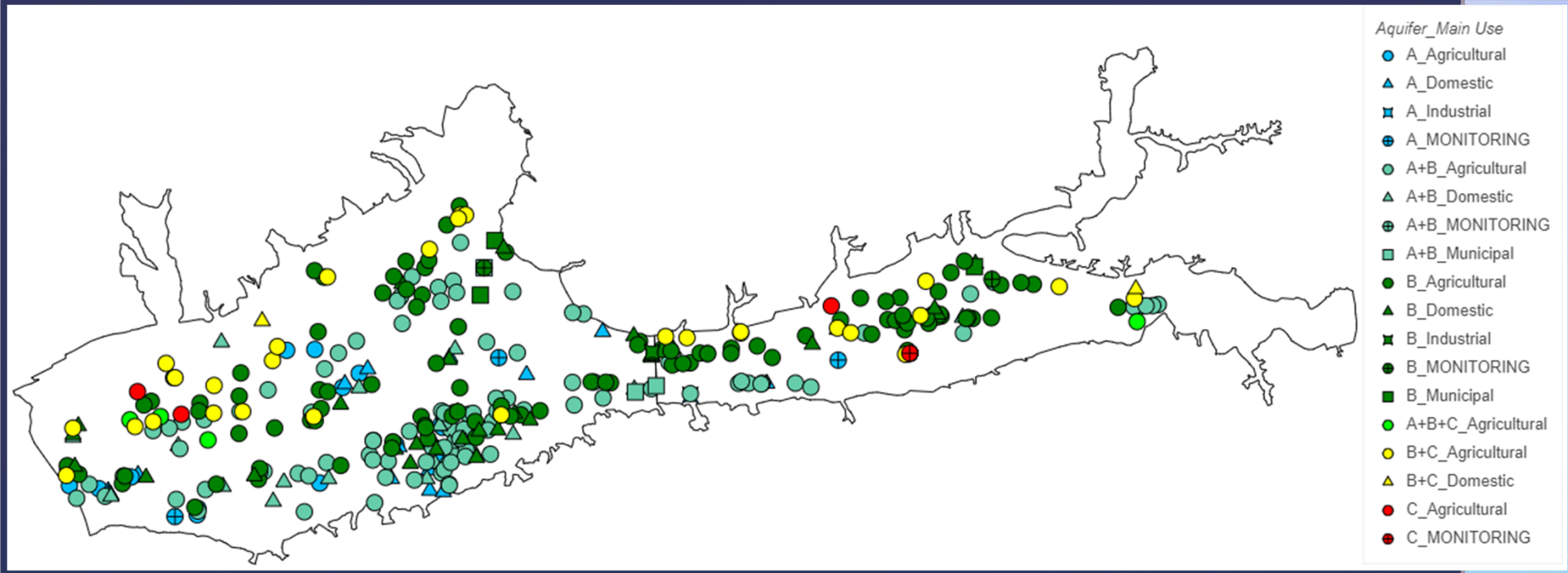
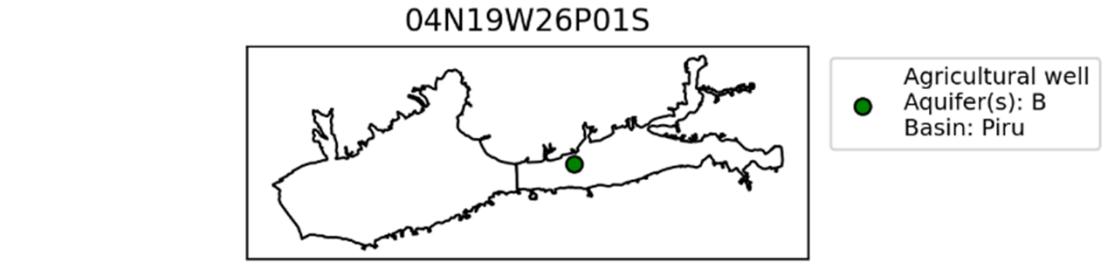
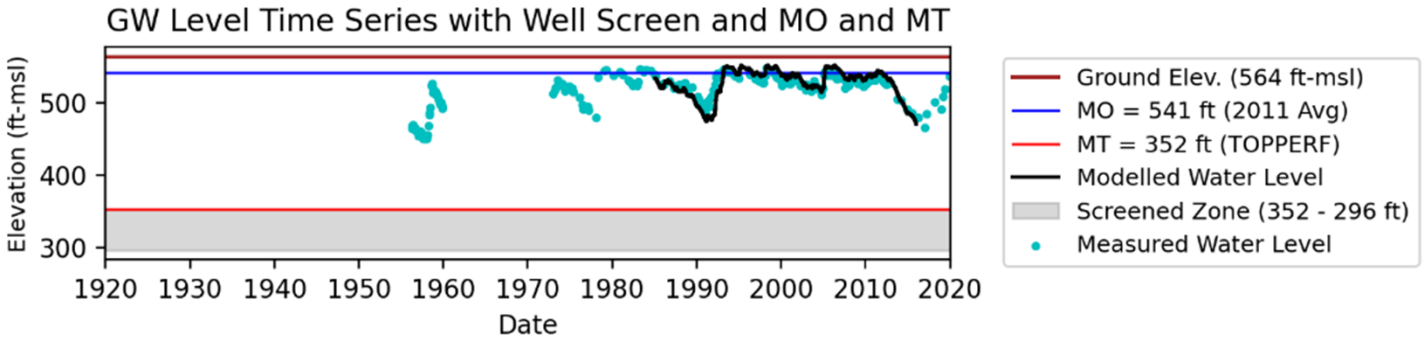
# Active/Monitoring Wells (with Screen Info) in GW Model

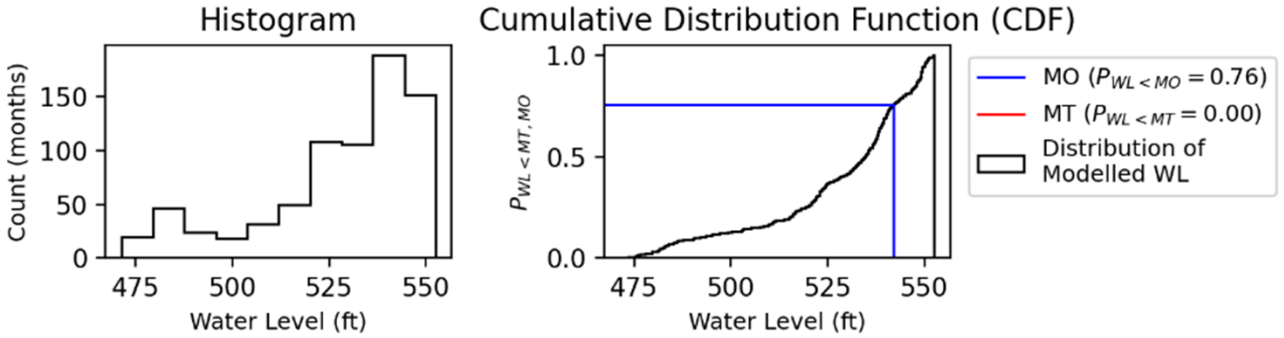


# Groundwater Levels – Historical Water Levels

- WLs always above well screen

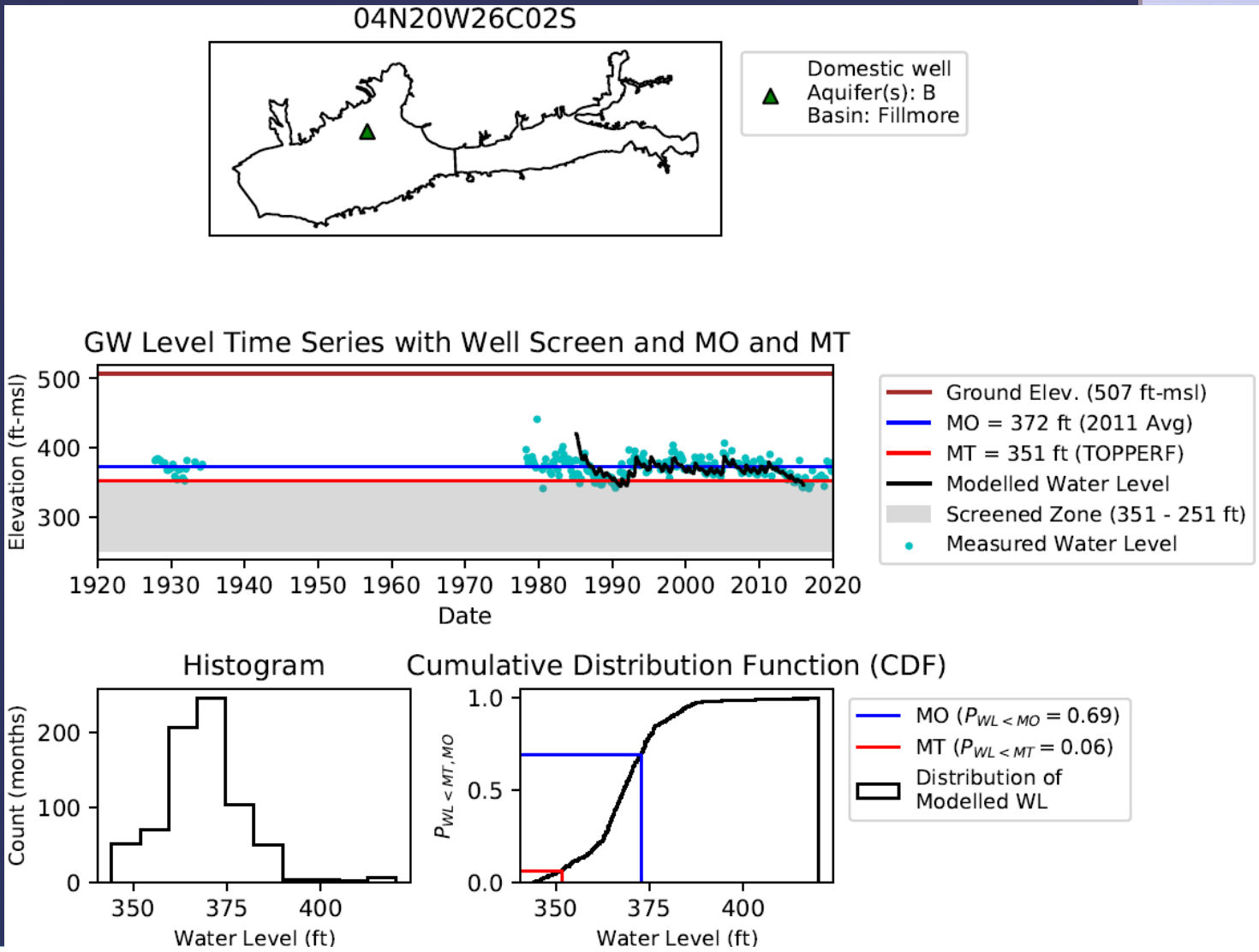


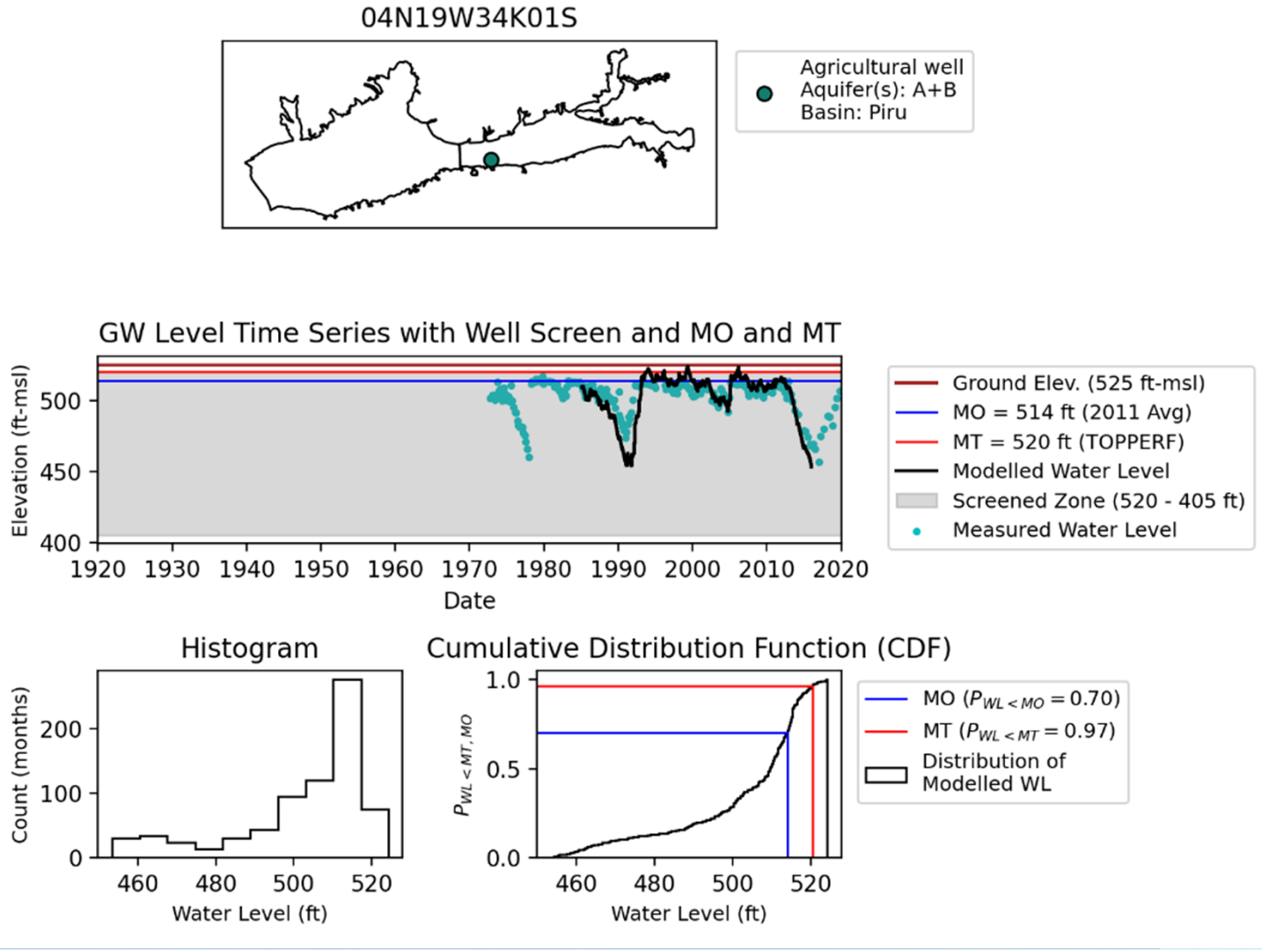
# Groundwater Levels – Historical Water Levels

- WLs usually above well screen



# Groundwater Levels – Historical Water Levels

- WLs always below well screen



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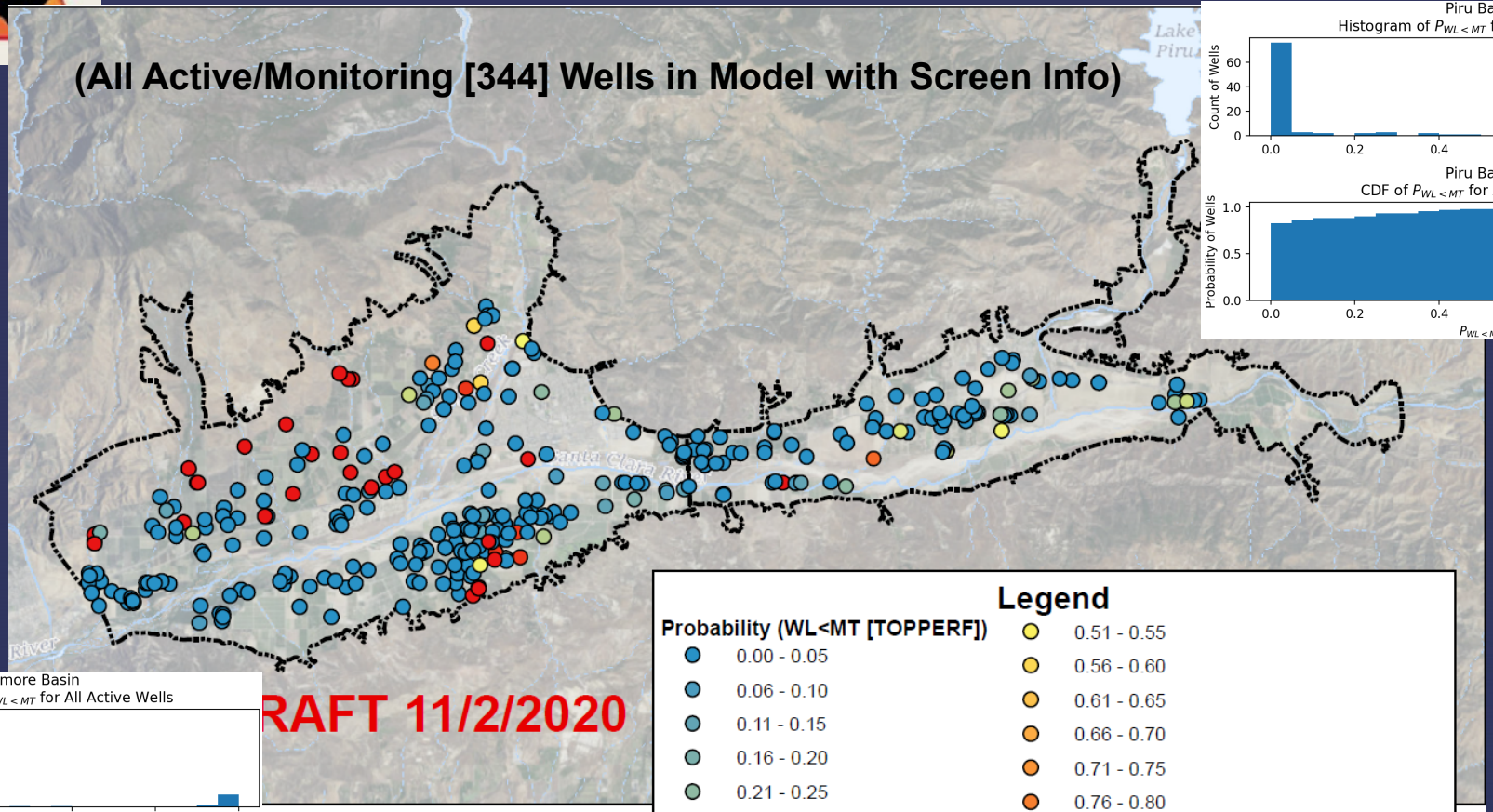
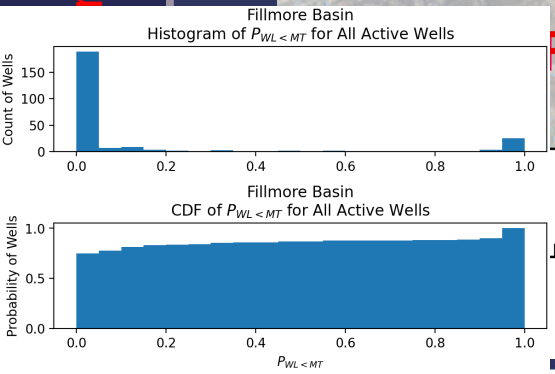
# Groundwater Levels – Probability Water Level < MT







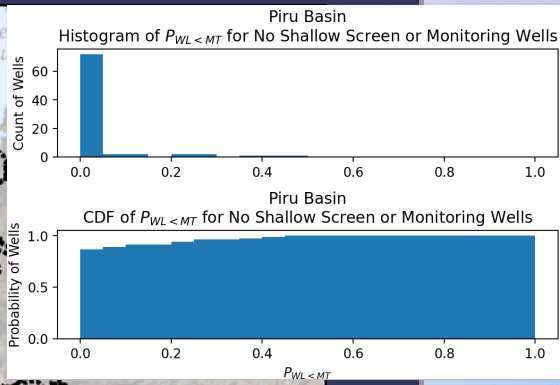


# Groundwater Levels – Probability Water Level < MT

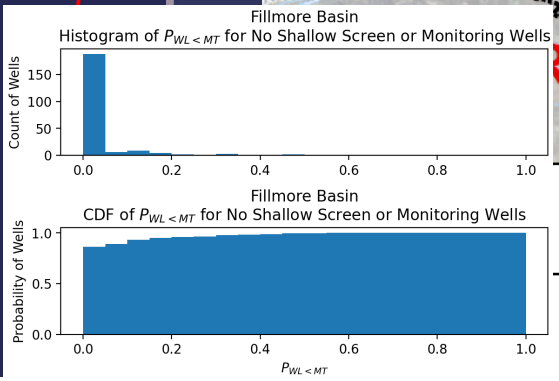


- **Removed 43 of the following wells:**
  - **Monitoring wells,**
  - **Shallow well screens, or**
  - **Less robust calibration**

**(Active Production [301] Wells with Screen Info)**






1.5 3 6 Miles

**Legend**

**SMC_WL_Wells**

**Probability (WL<MT [TOPPERF])**

| | |
|---|---|
| 0.00 - 0.05 | 0.46 - 0.50 |
| 0.06 - 0.10 | 0.51 - 0.55 |
| 0.11 - 0.15 | 0.56 - 0.60 |
| 0.16 - 0.20 | 0.61 - 0.65 |
| 0.21 - 0.25 | 0.66 - 0.70 |
| 0.26 - 0.30 | 0.71 - 0.75 |
| 0.31 - 0.35 | 0.76 - 0.80 |
| 0.36 - 0.40 | 0.81 - 0.85 |
| 0.41 - 0.45 | 0.86 - 0.90 |
| | 0.91 - 0.95 |
| | 0.96 - 1.00 |

Bulletin118_GW_Basins_2019_FillmorePiru

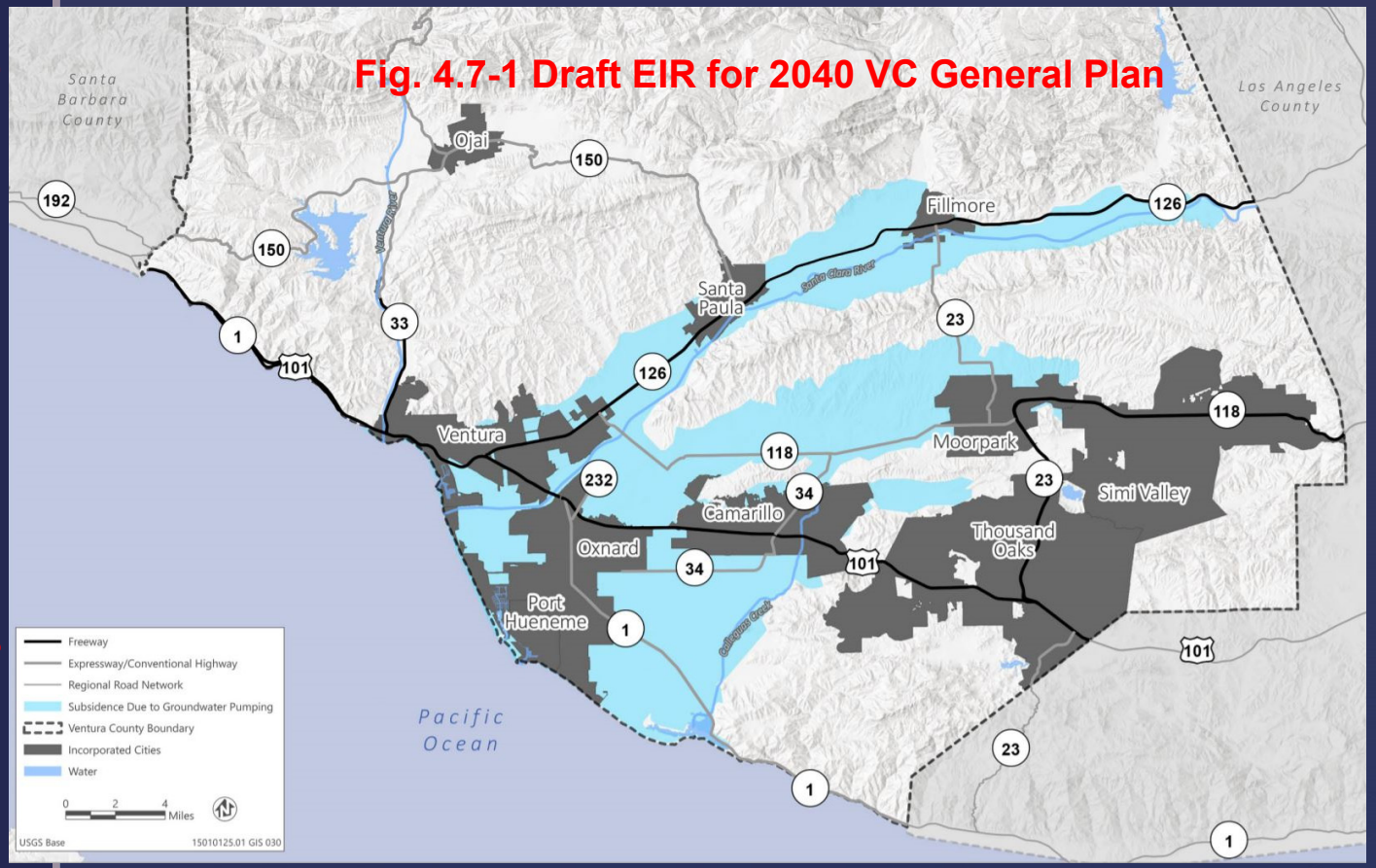
# Groundwater Storage

- adequate groundwater reserves to last through a typical drought
- in 2011-2016 drought, Fillmore extracted ~46,829 acft/year (not much more than the long-term average of ~46,150 acft/year)
- in 2011-2016 drought, Piru extracted ~12,066 acft/year (not much more than the long-term average of ~11,079 acft/year)
- “adequate groundwater reserves” defined (for the GSP) that correspond to the water level decline experienced in 2011-2016 drought

# Groundwater Storage - draft SMC language

| SM Indicator | Example Possible Undesirable Results | Metric / Measurement Method | MT | MO |
|---|---|---|---|---|
| GW Storage Reduction | inadequate GW storage to last through multi-year drought without GW extraction limitations | GW level measurements / Depth to water / Future simulated GW levels | Static water levels equal to the top of the well screen. | Static water levels equivalent to 2011-2016 water level decline above the top of the well screen. |

# Subsidence




- **Subsidence due to GW pumping in both Fillmore & Piru basins**
- **No data or report to substantiate**

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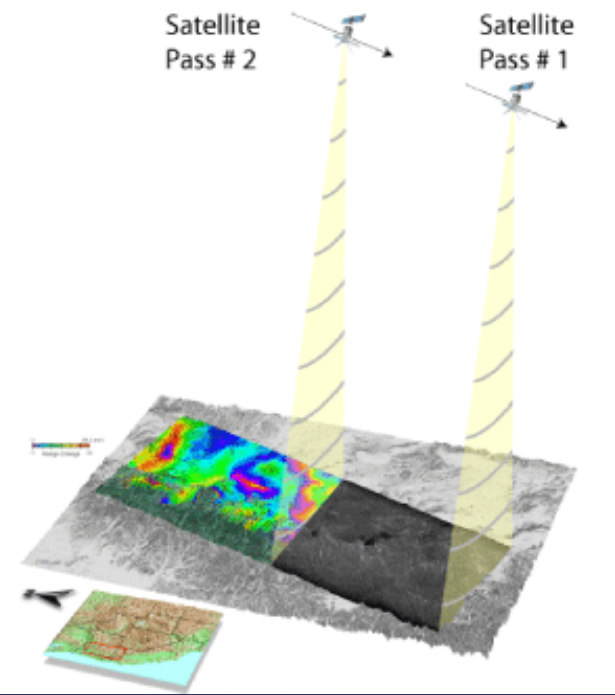
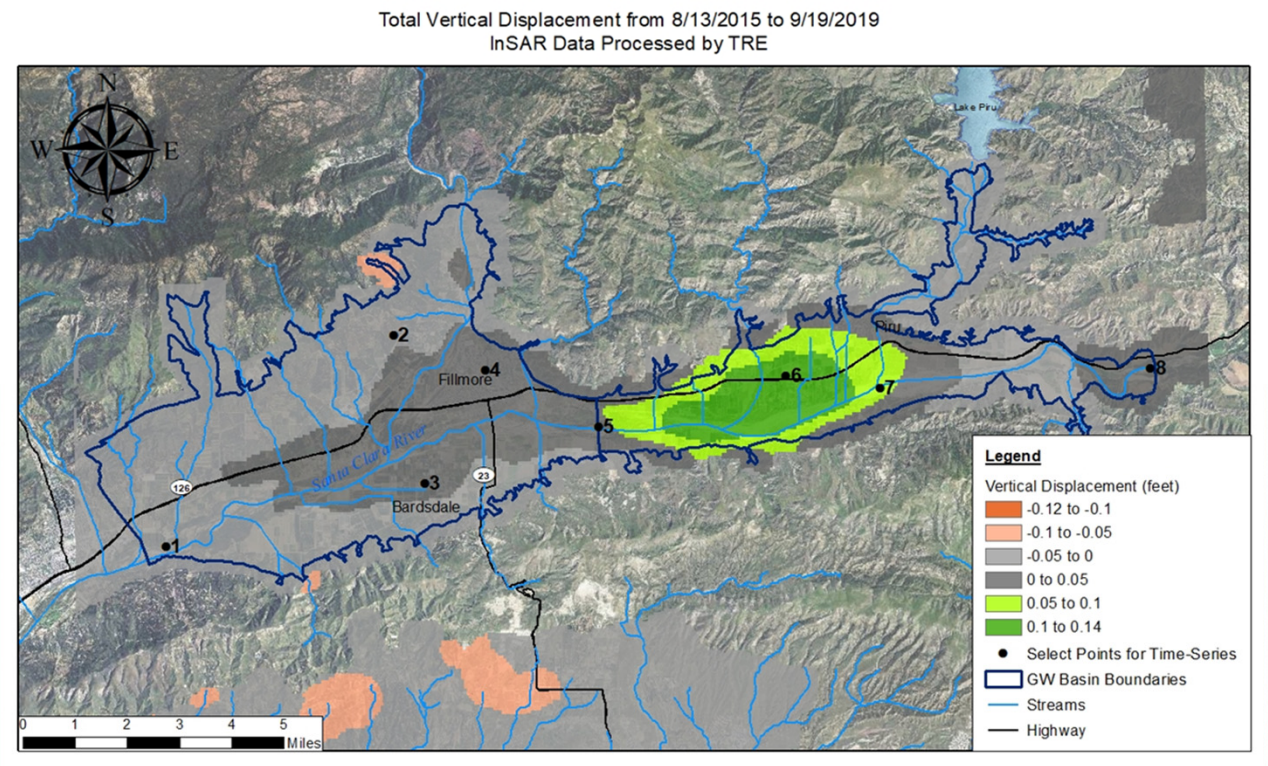
# Subsidence Metrics

## recent historical estimates of subsidence



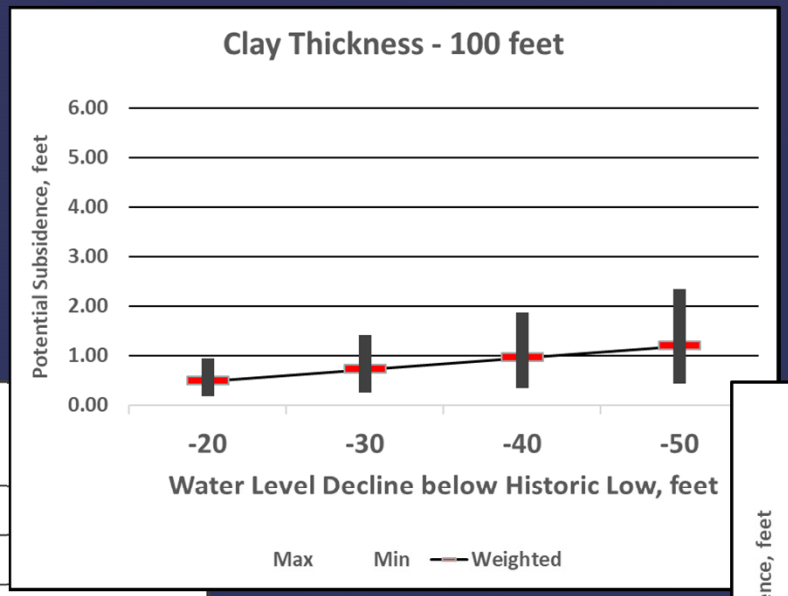

**InSAR - Interferometric Synthetic Aperature Radar**

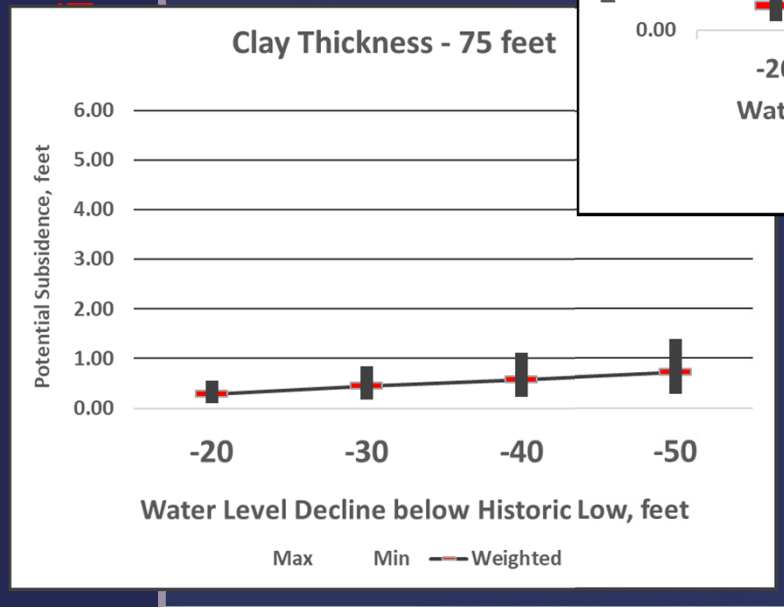


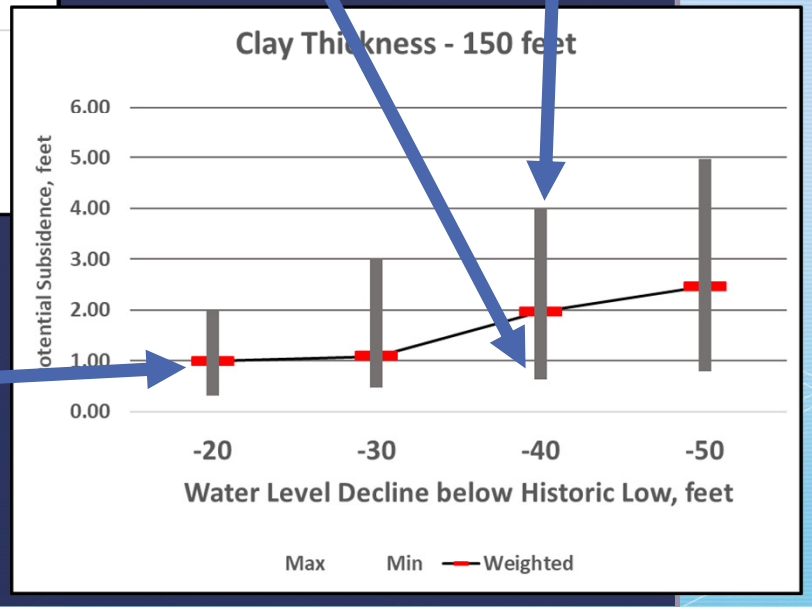
# Influence of Clay Thickness & Water Level on Potential Subsidence

iscussion

## Subsidence Metrics
future estimates of subsidence




**Max estimated subsidence**

**Min estimated subsidence**

**Weighted estimated subsidence**

# Subsidence MT

- WL data from wells with long records often suggest that water levels in 1940 - 1970 were lower than 2016 drought low
- Data from 1940 - 1970 sparse, but useful

- **Subsidence MT**
  - 2016 low WL
  - minus 20 ft to estimate historical WLs
  - minus 20 ft to approximate a maximum of 1 ft of allowable subsidence
  - So, MT = 2016 low WL - 40 ft

# Subsidence - draft SMC language

| SM Indicator | Example Possible Undesirable Results | Metric / Measurement Method | MT | MO |
|---|---|---|---|---|
| Land Subsidence | land subsidence amounts that interfere with critical infrastructure operations / >1 ft of subsidence in a single year OR 1 ft of cumulative net subsidence over 5 years | InSAR data for recent historical monitoring / Potential Subsidence Screening Tool for potential future subsidence | Water levels twenty (20) feet below the historic low water levels | Water levels at (or above) historical low levels |

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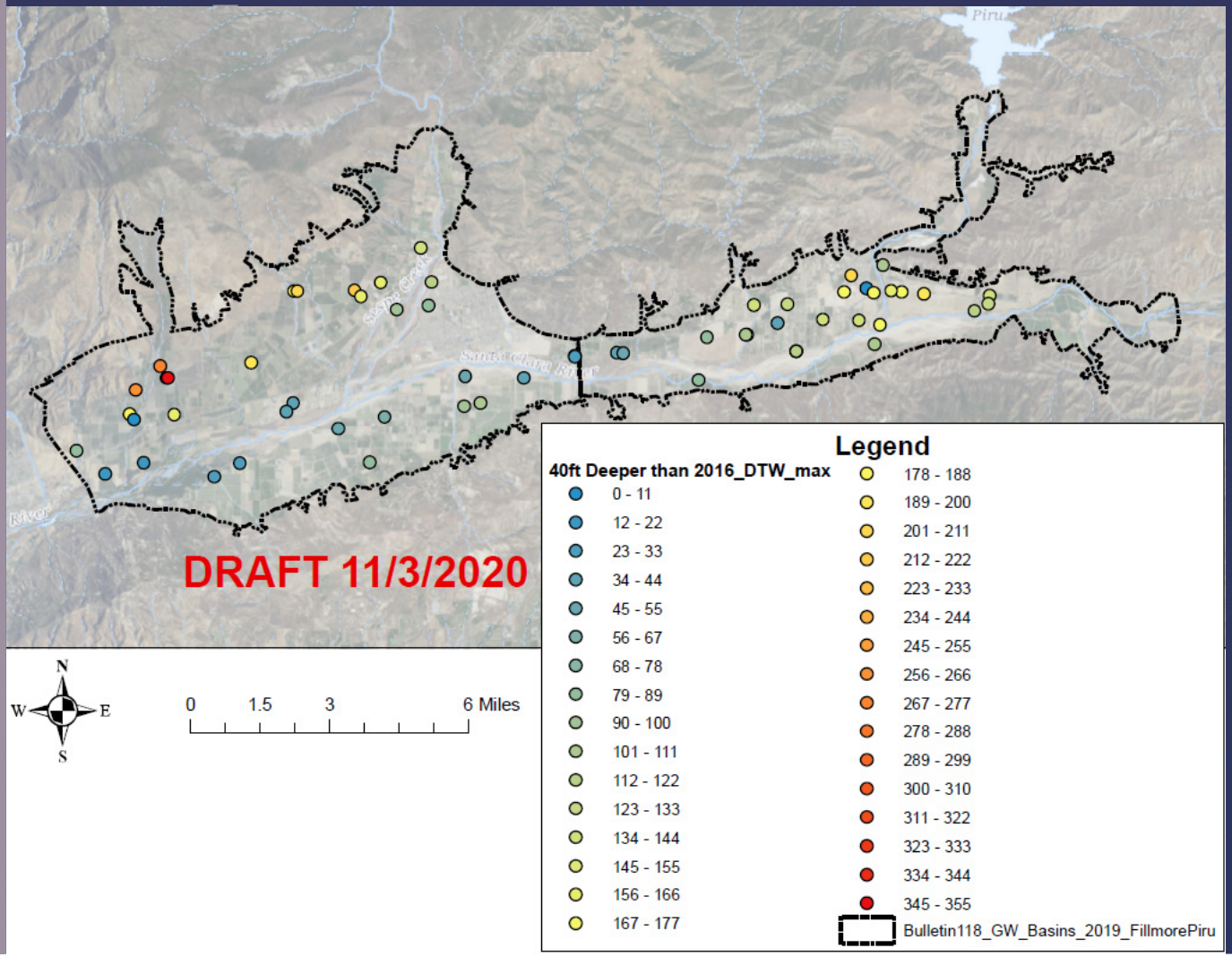
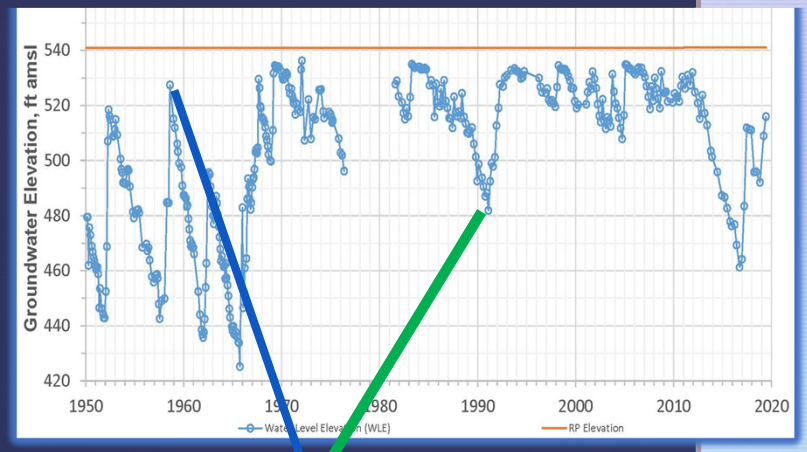
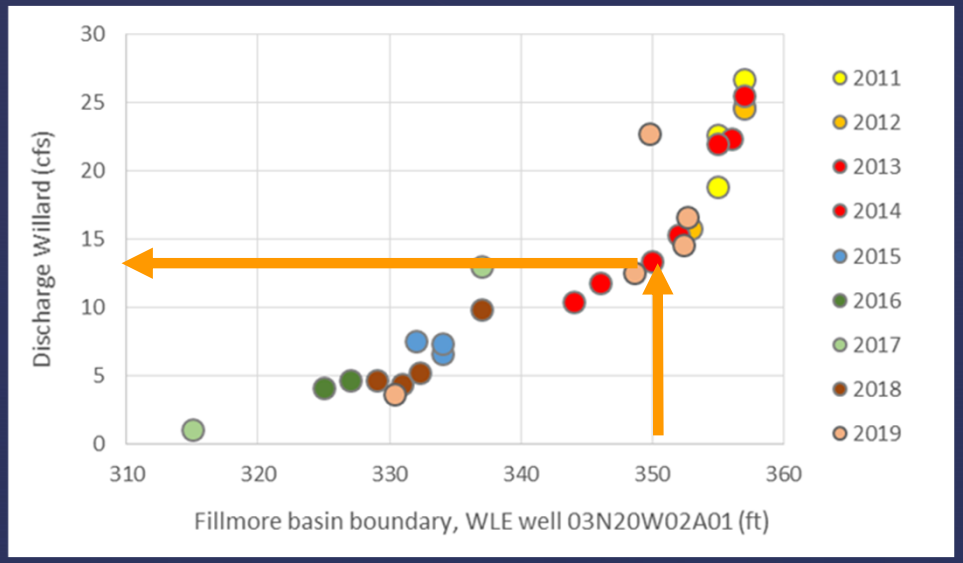
# Proposed Subsidence MT

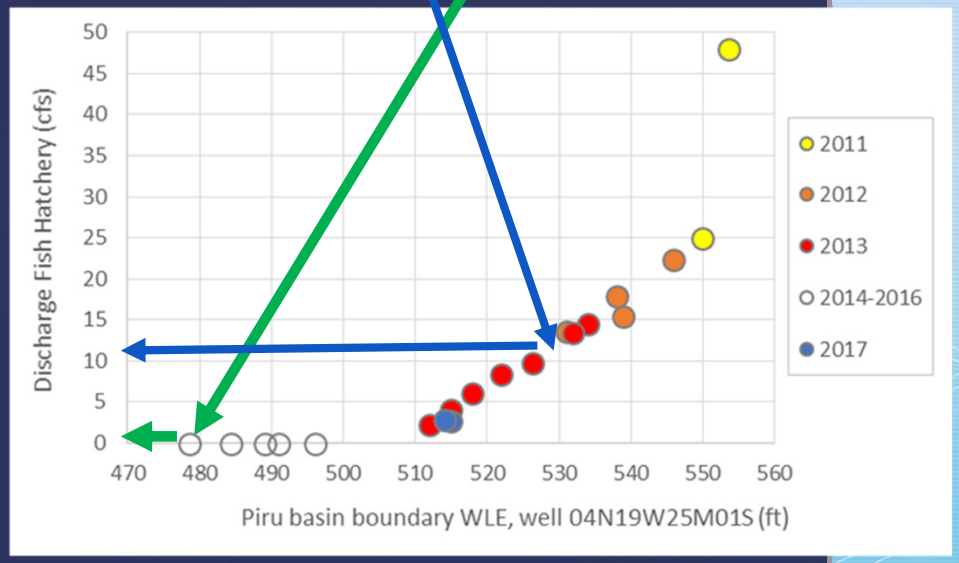


# Depletion of Interconnected Surface Waters

Use SW flow rate v. WLE relationship to predict historic SW flows & future flows



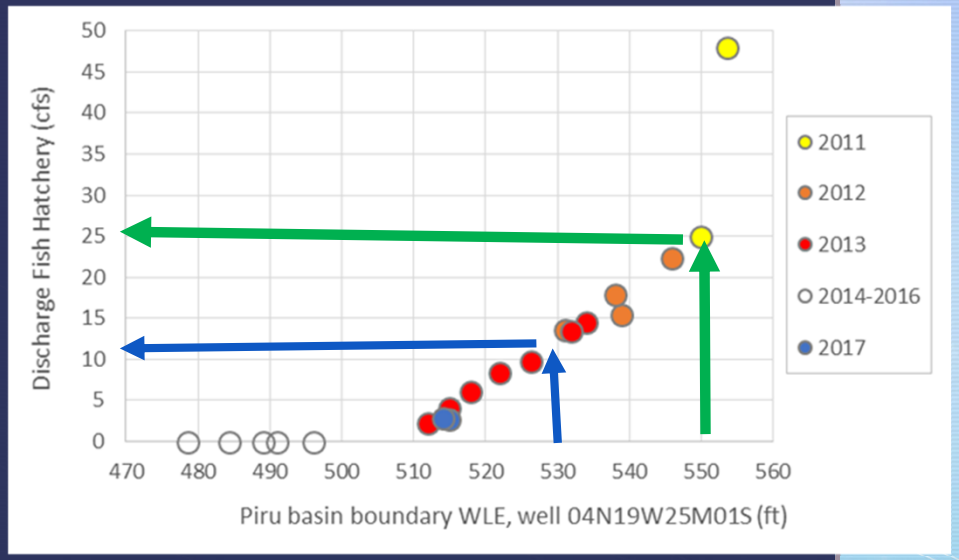



# Depletion of Interconnected Surface Waters

Use SW flow rate v. WLE relationship with GW pumping = 0 to estimate impact of pumping on SW flow

If WLE =530 ft with pumping, but 550 ft w/o pumping

550 ft = 25 cfs
530 ft = 12 cfs
Estimated pumping impact is 13 cfs



# Depletion of Interconnected Surface Waters - draft SMC language

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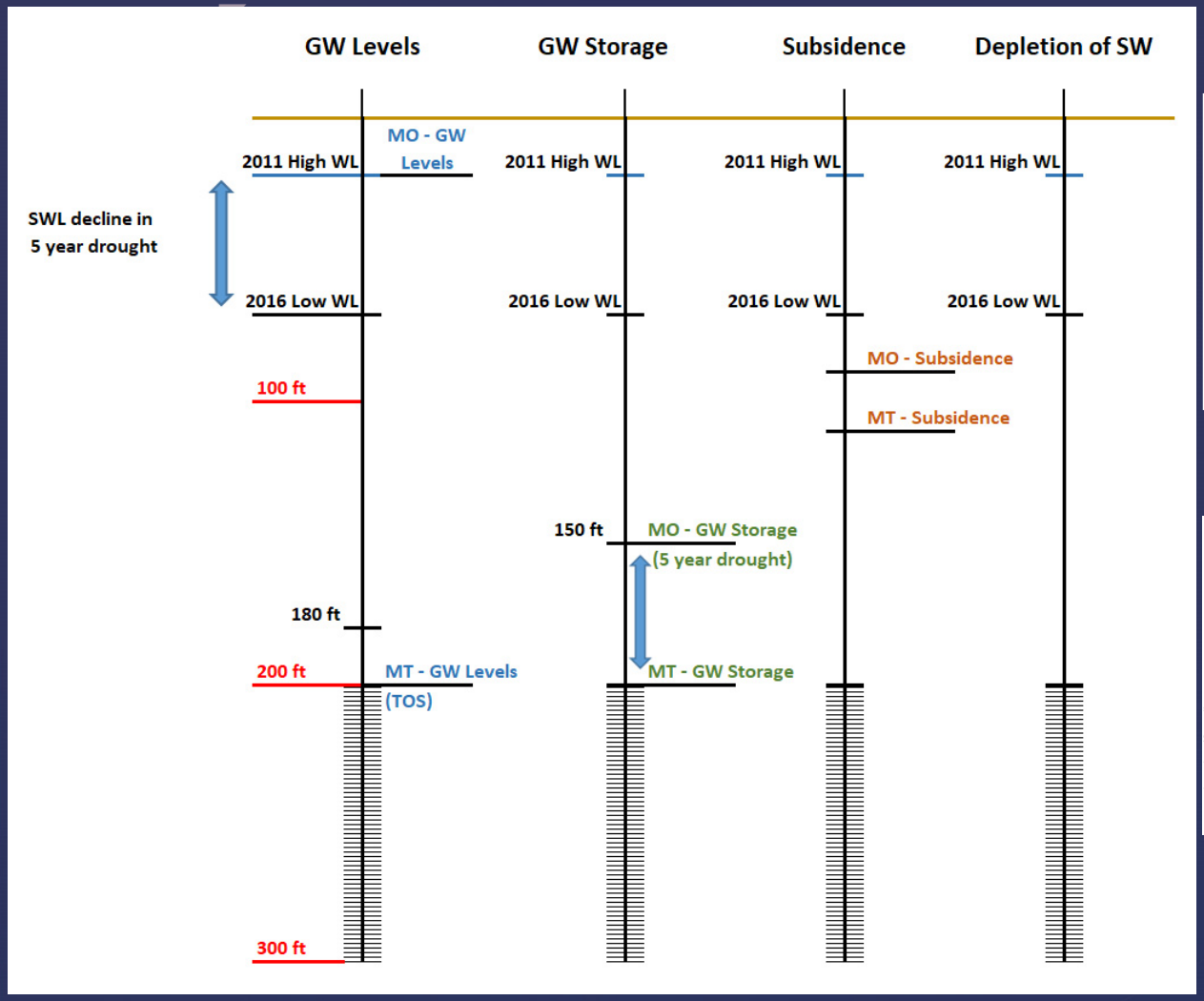
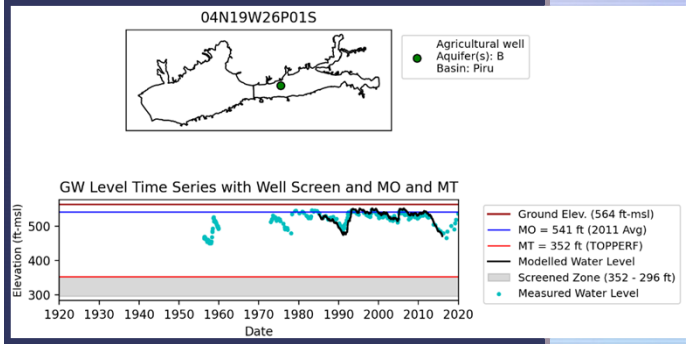
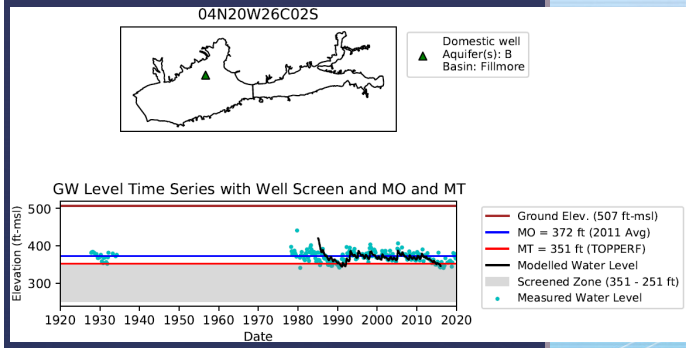
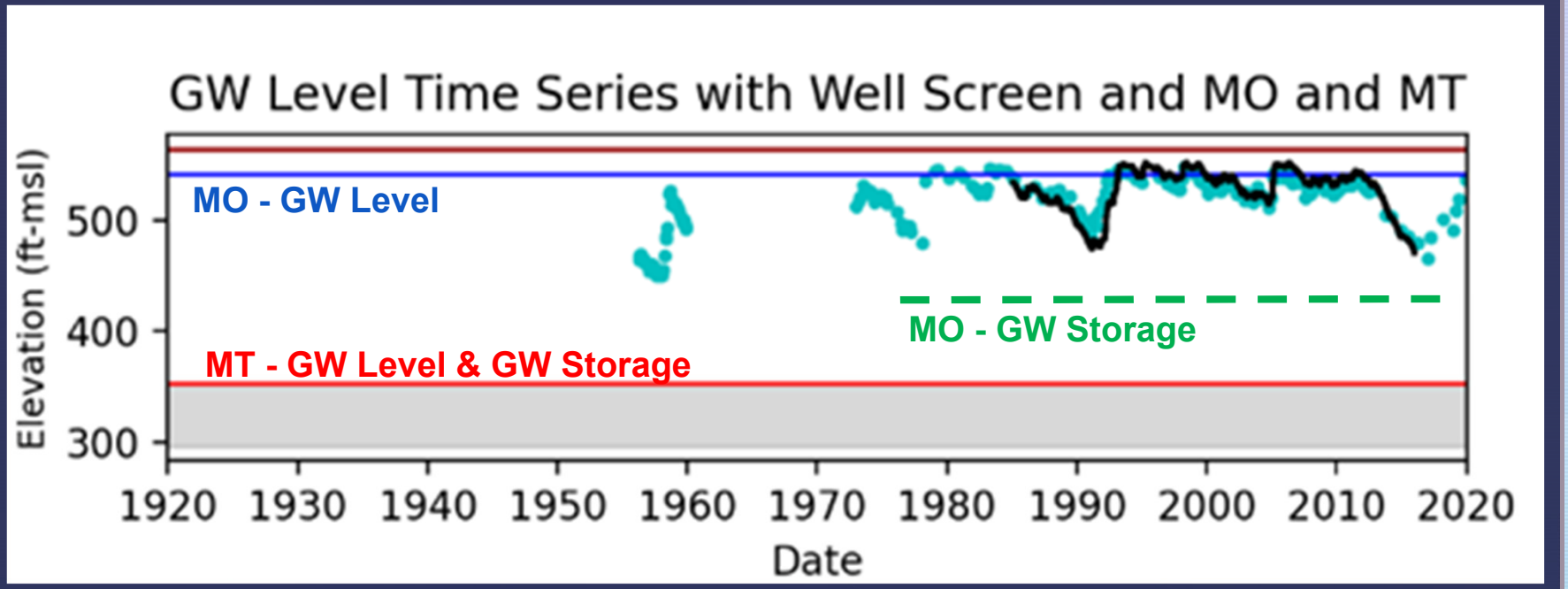
# MT - MO Summary



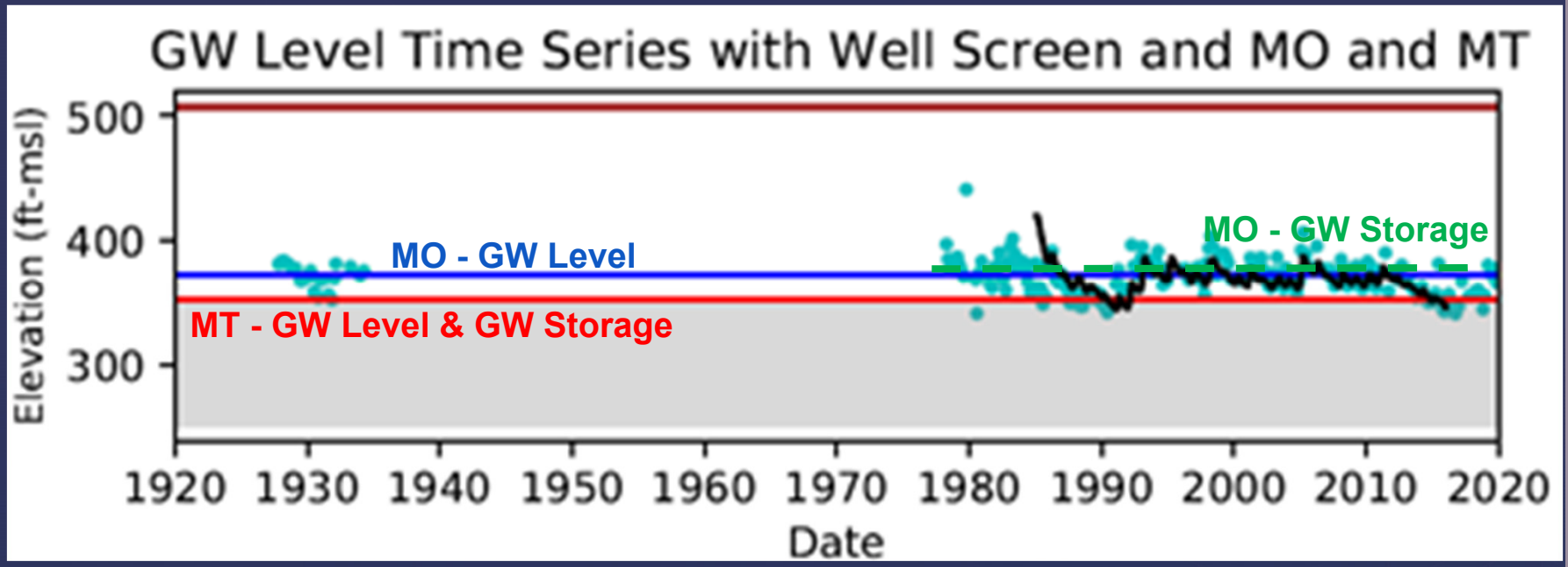



# MT - MO Summary



# MT - MO Summary

**for this specific well, MO for GW level ≃ MO for GW Storage**




**Fillmore and Piru Basins**
**Groundwater Sustainability Agency**

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