NGO GROUNDWAIER

COLLABORATIVE







2020 (Virtual) Convening

Day 1: Skills Training
Tuesday, March 31, 3:00 PM - 5:30 PM, PDT

Day 2: Reflecting & Looking Ahead Wednesday, April 1, 9:00 AM - 2:00 PM, PDT





NGO GROUNDWAIER

COLLABORATIVE







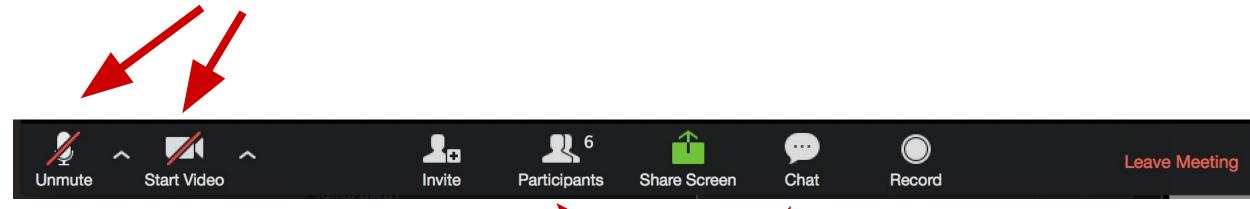
Zoom Meeting Technical Orientation







Click Unmute and Start Video





Click Participants

and Chat menu buttons







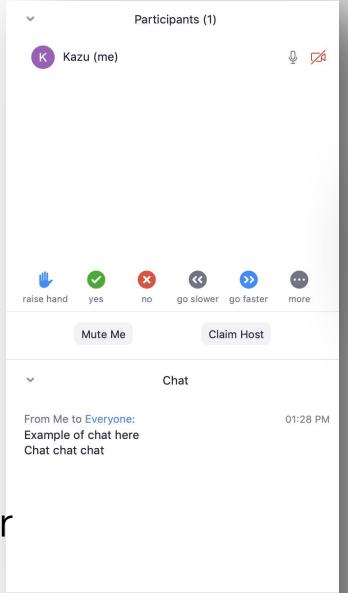


Raise hand button



Write to everyone or another





To: Everyone

Type message here...

File

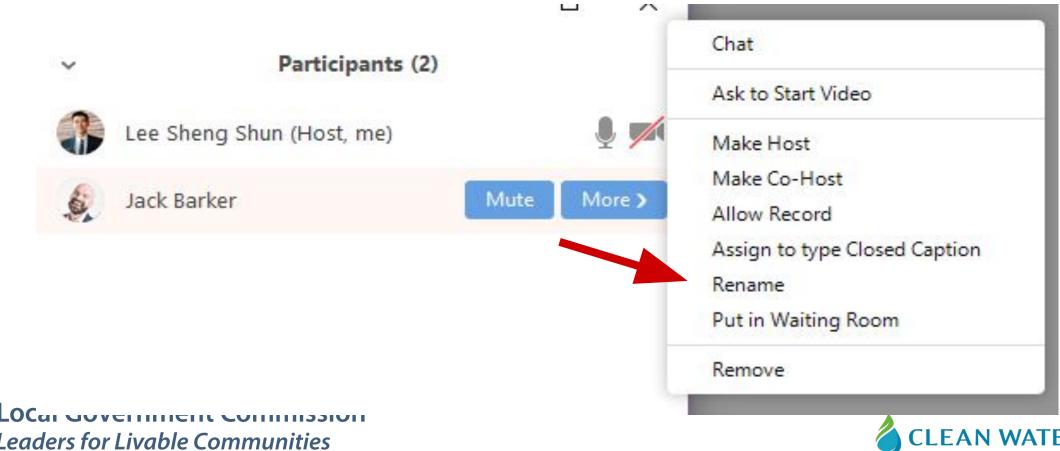
Stepped away



Need a break



Rename your self by hovering on your name and clicking "Rename".









Additional Guidance

NGO Groundwater Collaborative Virtual Convening Attendee Packet

March 31 - April 1, 2020

Table of Contents

- 1. Zoom Instructions
- 2. Day 1 Agenda
- Day 2 Agenda
- Speaker Bios
- Conference Call Bingo Board

Zoom Instructions

Additional support can be found at: https://support.zoom.us/

If you have never used Zoom before, you can join a test meeting to familiarize yourself.

Emily will begin the Zoom meeting 20 minutes prior to the start time each day (2:40 pm on Day 1; 8:40 am on Day 2). We highly recommend logging on to the call 15 - 20 minutes before it starts, as heavy user traffic on the hour causes Zoom to slow down. This will also allow time to figure out your audio/video logistics and settle in.







Welcome & Introductions





Getting to Know You

- 1) ID someone you don't know (or have only spoken to, never met)
- 2) Private Chat them:
 - a) Biggest personal annoyance of COVID-19 situation;
 - b) Best personal silver lining of COVID-19 situation





Getting to Know You

What do you consider your "home" water body?







Rules of Engagement

- Mute when not speaking.
- Remain actively engaged.
- Mutual respect suspend judgement/ assume best intentions
- Use the Chat box & Participant Features.
- Step up/Step back.
- Be gracious to the facilitator(s).











Day 1: Skills Training

March 31, 3:00 PM - 5:30 PM, PDT

3:00	Welcome & Introductions
3:20	Choosing the Right Management Action: The Role of Monitoring Networks and Economics
4:10	Stretch Break
4:20	Breakout: EJ & Enviros: What are Our Shared Priorities?
5:30	Transition Break
5:45	Virtual Happy Hour: Local Challenges & Resources





Objectives for the Convening

- Gain new skills and resources to aid in SGMA engagement moving forward
- Share primary lessons learned from the first round of GSP development
- Strategize plan review & collaborative engagement for the next 1-2 years







Choosing the Right Management Action

The Role of Monitoring Networks & Economics





Speakers

Coreen Weintraub

Western States Senior
Outreach & Campaign
Coordinator

Union of Concerned Scientists

Concerned Scientists

Ellen Bruno

Assistant Cooperative
Extension Specialist,
Agricultural and
Resources Economics

UC Berkeley



Darcy Bostic

Hydrology Masters
Student, Hydrology with
a focus on Groundwater
Management

UC Davis



Choosing the Right Management Action: The Role of Monitoring Networks and Economics

Coreen Weintraub
Sr. Outreach and Campaign Coordinator
Union of Concerned Scientists





Groundwater Technical Assistance Network



An Economist's Perspective on Timing of Management Actions Under SGMA

Ellen Bruno, PhD ebruno@berkeley.edu

Assistant CE Specialist
Dept. of Agricultural & Resource Economics
University of California, Berkeley

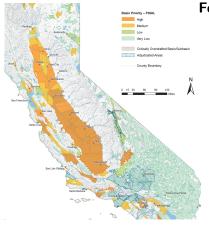
March 31, 2020

Prepared for NGO Groundwater Collaborative 2020 Virtual Workshop





SGMA Groundwater Sustainability Plans (GSP)



Four main components of a GSP:

- 1. Description of groundwater conditions
- Minimum thresholds and measurable objectives for six sustainability indicators
- Monitoring network and plan for tracking indicators
- Management actions and projects to achieve sustainability objectives

From DWR's GSP Guidance Document

For each project and/or management action, GSP must detail:

- Expected benefits and how they will be evaluated
- Estimated costs and plans to meet these costs
- Time-table for initiation and completion, and the accrual of expected benefits



Economics Framework to meet SGMA Goals

Find strategies that maximize well-being to all of society

► Choose strategy to maximize net benefits:

$$\sum_{t=0}^{t=20} Benefits_t - \sum_{t=0}^{t=20} Costs_t$$
 (1)

- Can be used to evaluate actions themselves and timing.
- Need to include everyone in calculation who stands to gain or lose.

Valuation & Tradeoffs

Weighing costs and benefits requires putting a value on everything.

- Moral argument against putting a dollar value on water security or the environment.
- Not valuing it may lead to it being left out of calculation entirely (implicit value of 0).



Weighing Early vs. Delayed Action

For simplicity, let's assume demand-side action will be taken:

Goal: Meet groundwater elevation requirement by 2040.

Method: Setting annual allowances for groundwater pumping.

<u>Question:</u> When should GSA start limiting pumping in order to reach target?

Reasons to Take Early Action

The more quickly the basin converges to sustainability, the faster you stabilize the height of the aquifer.

- 1. Avoid irreversible land subsidence
- 2. Avoid energy costs of pumping from lower water table
- 3. Avoid loss of domestic well supplies
- 4. Value to environment and ecosystems

Reasons for Delayed Action

Waiting pushes costly adjustments into the future.

- 1. Give people an adjustment period to prepare for individual restrictions/allowances.
- 2. Push costs associated with limiting pumping into the future.
 - Groundwater pumping restrictions are costly.
 - It could make sense to wait because profit losses today hurt more than losses in the future.

Illustration of Value in Delaying Action

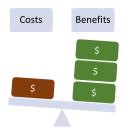
Suppose costs to agriculture of a 10% cut back in groundwater this year were equal to \$100 million.

- ► Interest rate = 2%
- ▶ \$100 million this year = \$119.5 million in 10 years
- ► Value of waiting 10 years = \$19.5 million

Making Economic Argument for Early Action

Show that benefits of early action outweigh that of delayed action.

- Uncertainty on both sides of equation.
- ▶ Do damages to domestic wells and environment of waiting far exceed the benefits to agriculture of pushing costs further into the future?



What I would want to know

If the 10% reduction in groundwater pumping were to happen in 10 yrs instead of this year:

- ► How many domestic wells would go dry?
- ▶ When wells go dry, what is the alternative?
- How would it hurt ecosystems & environment?
- ► How would it affect permanent land subsidence and groundwater storage?
- Other costs of waiting?

Take-aways and Considerations for GSPs

In order to weigh tradeoffs of early vs. delayed action, we need to know the costs and benefits.

- Fundamental part of this is the monitoring network and data on how pumping affects domestic well supply.
- ▶ GSP should contain timeline, benefits and costs.
- Tradeoffs are being made. Better to be a part of calculation than not.

Contact Me

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Assistant Specialist in Cooperative Extension Department of Agricultural and Resource Economics, UC Berkeley

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Link to evaluation survey:

https://forms.gle/CA8qFtTNoThCvFB56

GTAN Network

https://forms.ucsusa.org/groundwater-technical-assistance-tool/

Darcy Bostic
@darcybostic
Hydrologic Sciences
UC Davis

MONITORING NETWORKS

ROAD MAP

I. Definitions

- a. Sustainability Indicators
 - i. Measurable Objectives
 - ii. Minimum Thresholds
- b. Monitoring Networks
 - i. Representative Monitoring Networks

2. Assessing RMPs

ACRONYMS

- 1. SI Sustainability Indicator
- 2. MO Measurable Objective
- 3. MT Minimum Threshold
- 4. MN Monitoring Network
- 5. RMN Representative MN

ROAD MAP

I. Definitions

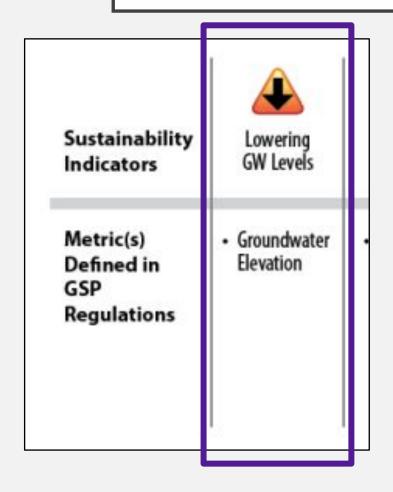
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 - ii. Minimum Thresholds
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 - i. Representative Monitoring Networks

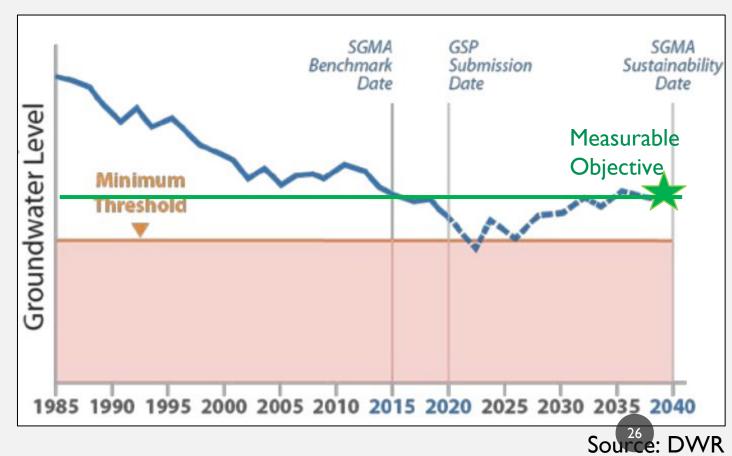
2. Assessing RMPs

INSIDE A GSP

Sustainability	Lowering	Reduction of Storage	Seawater	Degraded	Land	Surface Water
Indicators	GW Levels		Intrusion	Quality	Subsidence	Depletion
Metric(s) Defined in GSP Regulations	Groundwater Elevation	• Total Volume	Chloride concentration isocontour	Migration of Plumes Number of supply wells Volume Location of isocontour	Rate and Extent of Land Subsidence	Volume or rate of surface water depletion

INSIDE A GSP





MEASURABLE OBJECTIVES AND MINIMUM THRESHOLDS

Measurable objectives are the ideals.

Minimum thresholds are the lowest allowable.

ROAD MAP

I. Definitions

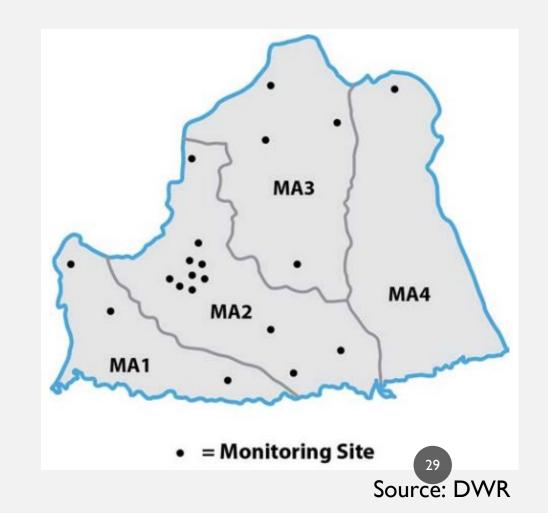
- a. Sustainability Indicators
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2. Assessing RMPs

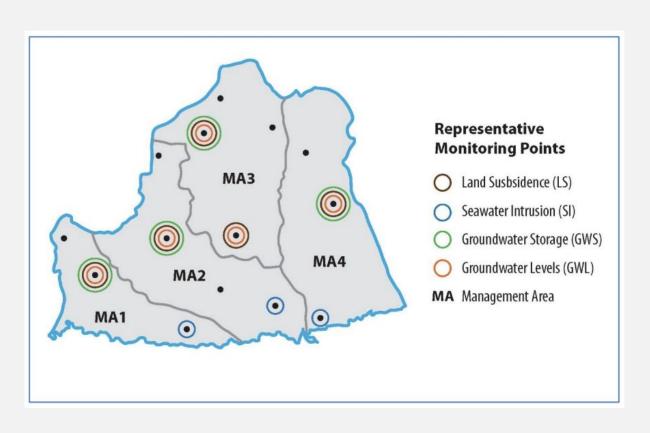
MONITORING NETWORKS CAPTURE BASIN TRENDS

A monitoring network is a collection of wells that, together, capture basin trends for each of the relevant sustainability indicators.

Depending on where you are, the importance of each SI varies.



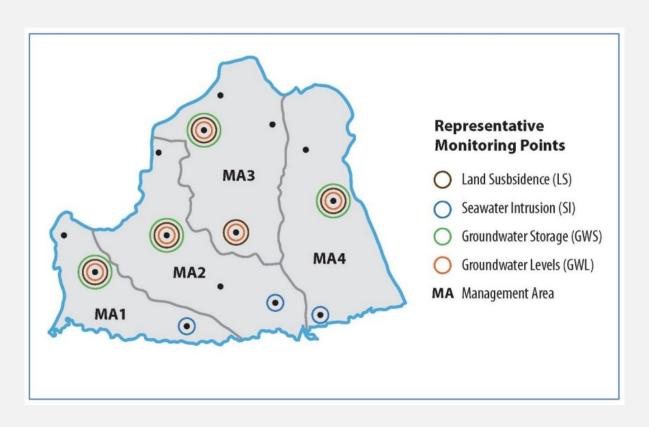
REPRESENTATIVE MONITORING NETWORKS



A **subset** of the monitoring network where **MOs** and **MTs** are set.



REPRESENTATIVE MONITORING NETWORKS

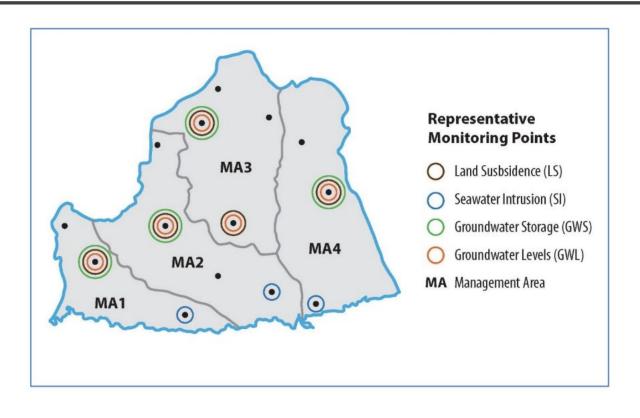


In order to set MOs and MTs you need:

- I. A historical record
- 2. To demonstrate RMN has similar trends to wells nearby

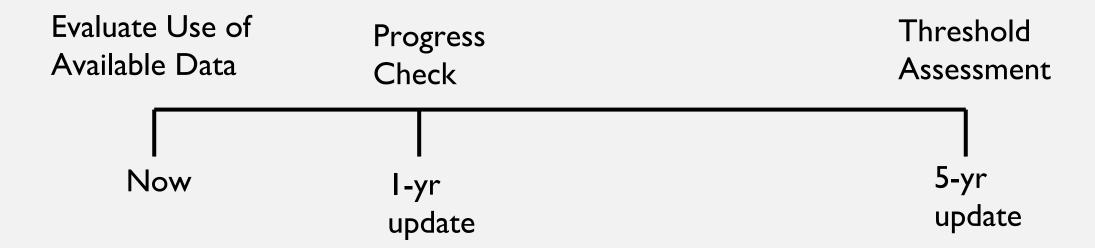


REPRESENTATIVE MN ALL WELLS



WHAT QUESTIONS SHOULD YOU BE ASKING?

TIMELINE



Does the GSP have a plan to monitor all relevant SIs?

Does the GSP have a plan to monitor all relevant SIs?

I. Inclusion of SIs

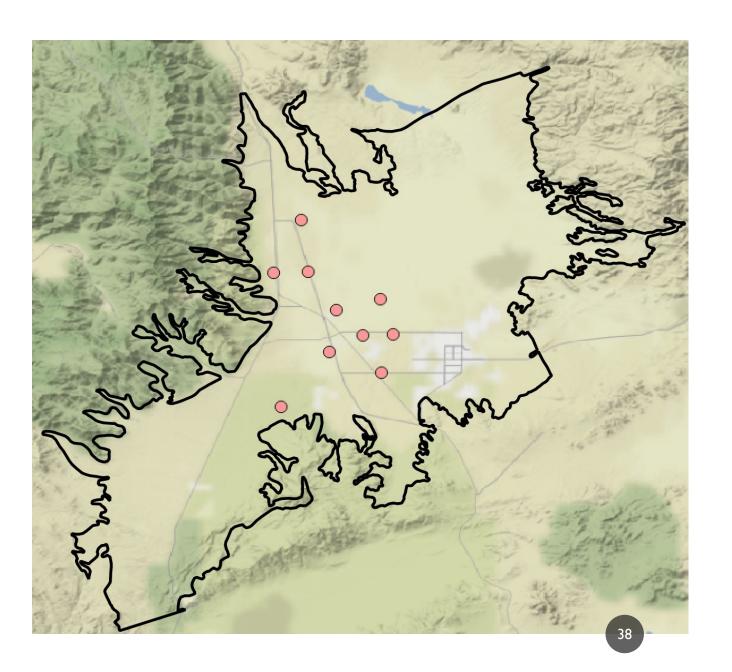
I. Are they including surface-groundwater interactions to monitor GDEs?

Does the GSP have a plan to monitor all relevant SIs?

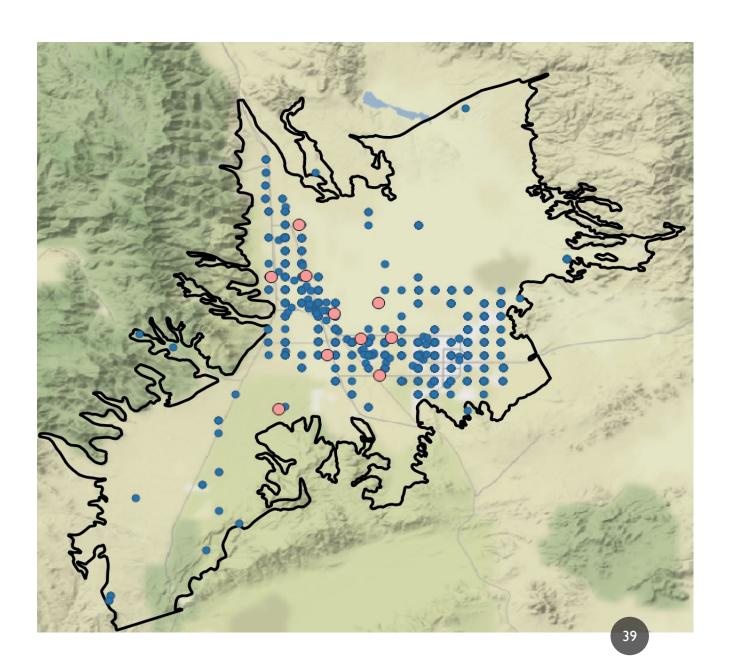
- I. Inclusion
- 2. Coverage

2. Do they have enough representative monitoring wells to monitor impacts to shallow domestic wells?

AN EXAMPLE SPACE



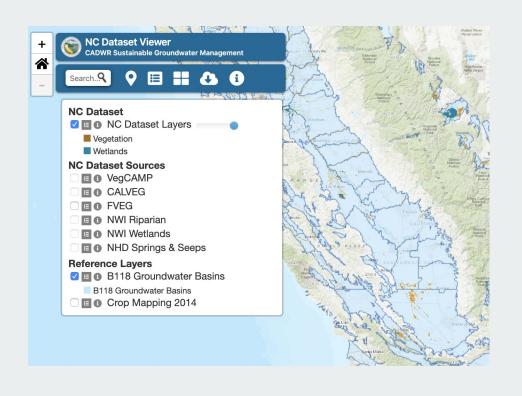
AN EXAMPLE SPACE

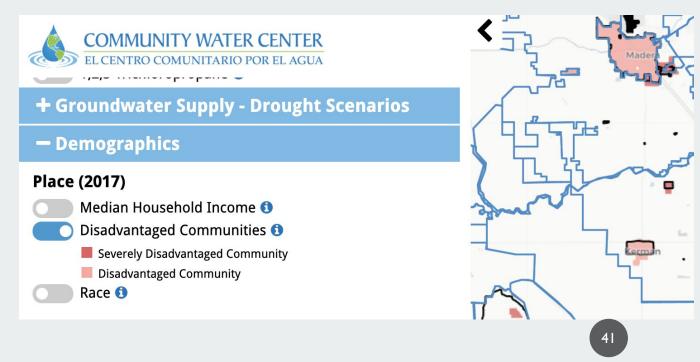


Does the GSP have a plan to monitor all relevant SIs?

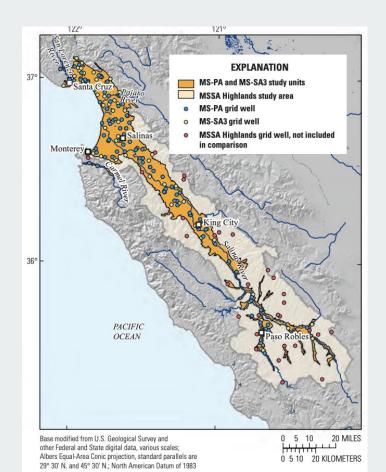
Is the GSP using all available data?

Do they list disadvantaged communities or GDEs in their list of beneficial uses and users?





Are they using pre-existing monitoring networks?





Does the GSP have a plan to monitor all relevant SIs?

Is the GSP using all available data?

If there are data gaps, are there concrete plans to improve the monitoring network?

If there are data gaps, are there concrete plans to improve the monitoring network?

Have they applied for DWR TSS help and funding?

I-YR: PROGRESS CHECK

Has the GSP done what they planned?

Are the new monitoring wells installed?

I-YR: PROGRESS CHECK

Has the GSP done what they planned?

Is the RMN actually representative?

Are farmers or shallow well users noticing changes in the water table that contradict the RMN?

5-YR: THRESHOLD ASSESSMENT

Is the new RMN actually representative?

Are representative wells showing similar data to other wells in their proximity?

5-YR: THRESHOLD ASSESSMENT

Is the new RMN actually representative?

Are representative wells showing similar data to other wells in their proximity?

Should MTs and MOs be assigned at other monitoring wells?

THE PUNCHLINE

Monitoring networks provide the information to assess current conditions and adjust actions.

A PLUG

The Groundwater Technical Assistance Network (GTAN) can assist you with answering these questions or with writing comments on GSPs / commenting before GSPs are finalized.

THANK YOU FOR ALL OF YOUR WORK!

EXTRA SLIDES

EXTRA SLIDES

WHERE ARE THE GAPS?

Space

Time

WHERE ARE THE GAPS?

Space Availability of Wells

Time
Historical Data (Time series)
Frequency of collection

AN EXAMPLE SPACE

From the GSP:

"Depth to water is measured biannually at 198 wells to observe changes in groundwater levels." – IWVGSP, page 4-36

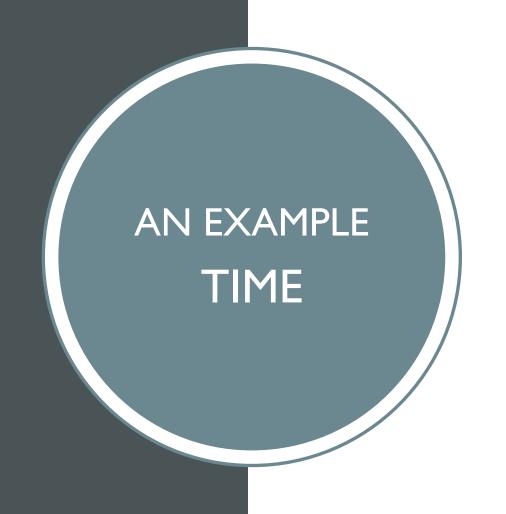
"Data gaps in the groundwater level monitoring program exist outside of the pumping areas, mostly open space managed by BLM. Groundwater resources in this area have not been fully characterized or quantified."

- Indian Wells Valley GSP, page 3-51

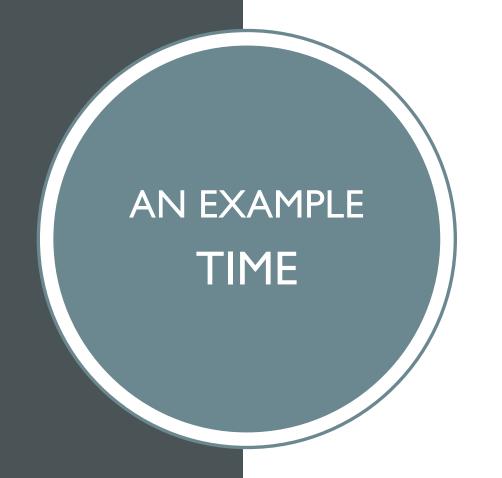
AN EXAMPLE SPACE

Comments on the Monitoring Network:

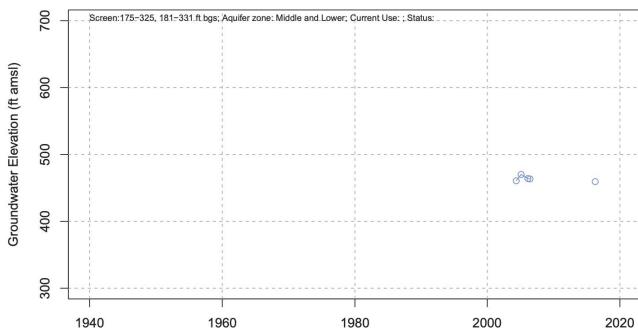
"The representative wells are predominantly deep wells which will not adequately monitor impacts to GDEs."

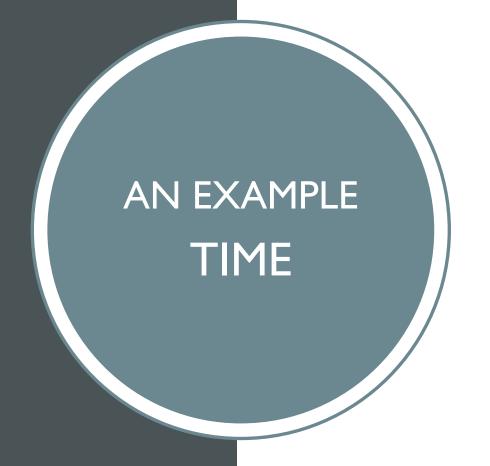


Wells without data can't show meaningful trends

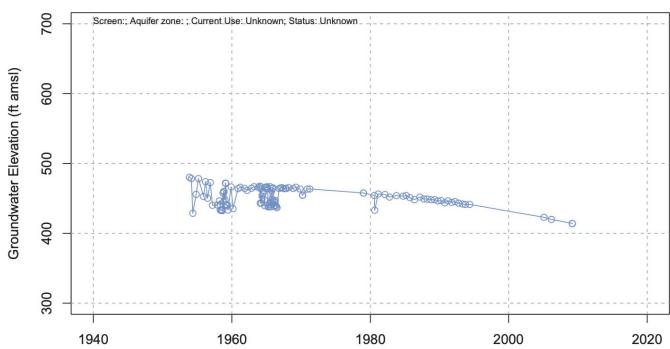


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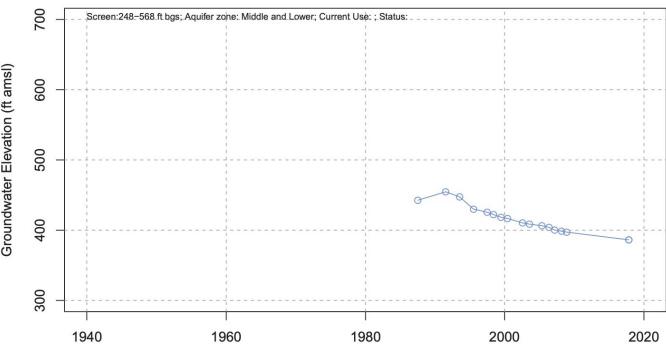


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Groundwater Elevation (ft amsl) AN EXAMPLE TIME

011S006E16A002S



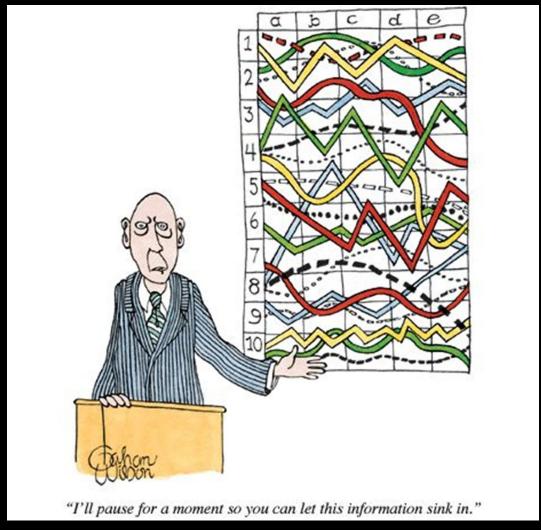
Key Takeaways



Key Takeaways



Key Takeaways



Coreen Weintraub

Email: cweintraub@ucsusa.org

www.ucsusa.org/groundwater-technical-assistance-tool





10-min Stretch Break







EJ & Enviros:

What are Our Shared Priorities?





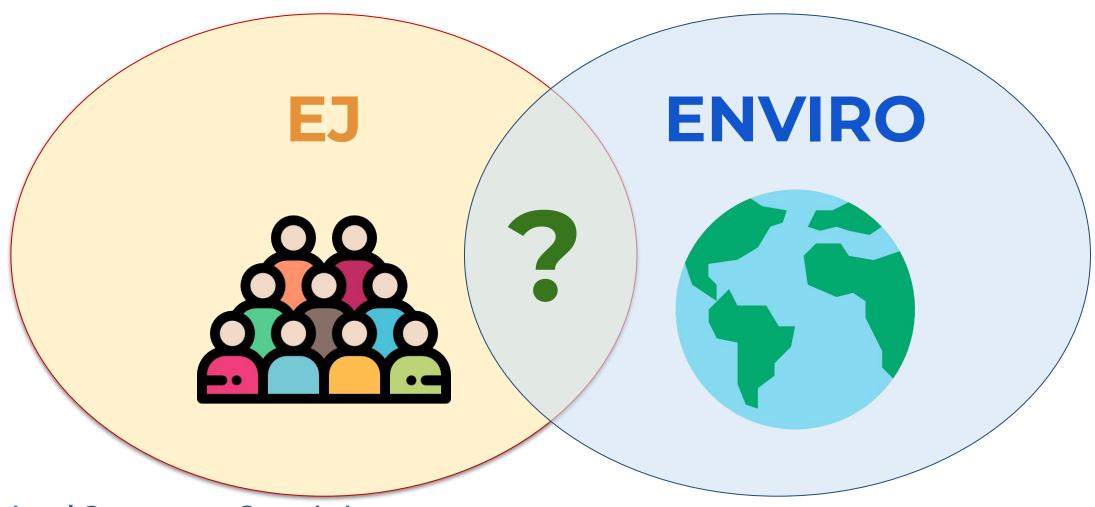
EJs & Enviros







Shared Priorities









When survey is active, respond at PollEv.com/atleykeller192



0 surveys done



Enviro

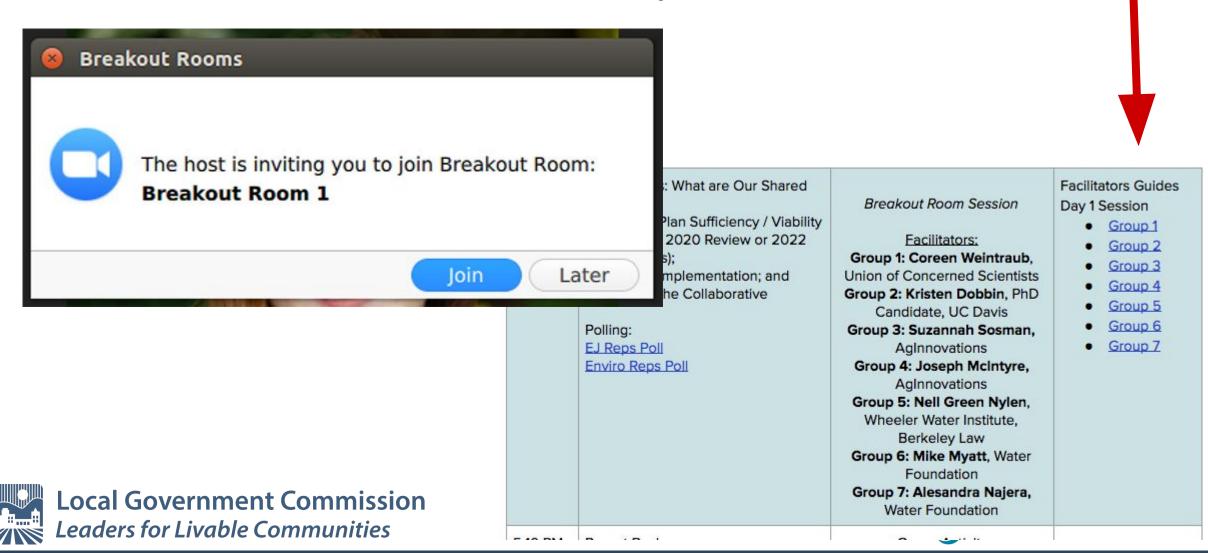
When survey is active, respond at PollEv.com/atleykeller192







Breakout Group Guidance



Breakout Groups

1) Coreen Weintraub	5) Nell Green Nylen
2) Kristen Dobbin	6) Mike Myatt
3) Suzannah Sosman	7) Alesandra Najera
4) Joseph McIntyre	







Break-Out Groups Report Back





Report Out

EJ Priority

Environmental Priority

One mutually beneficial connection

One unintended consequence

Idea(s) for collaboration

Idea(s) for Groundwater Collaborative support







Transition to Virtual Happy Hour

















Virtual Happy Hour Local Challenges & Resources



Local Challenges & Resources



Diagram of Zoom Meeting Attention Span

