Flood-Managed Aquifer Recharge (MAR)
Listening Session

January 14, 2019, 12:30pm – 4:00 pm
University of California Cooperative Extension
2145 Wardrobe Ave, Merced, CA 95341

Meeting Summary

LISTENING SESSION OBJECTIVE

The purpose of the Flood-MAR Agricultural Community Listening Session was to gather input from local farmers and landowners to better understand issues related to recharge project implementation. This input will inform the needs and priorities of the Flood-MAR Research Advisory Committee and associated subcommittees.

WELCOME AND OPENING REMARKS

To open the meeting, Hicham ElTal, Deputy General Manager, Merced Irrigation District (MID) offered a welcome and presented on MID's current efforts underway to optimize agricultural access to water. He described an increasing need for water storage around the state, and great potential for implementation of Flood-MAR projects in his Irrigation District, particularly around the confluence of the Merced and San Joaquin Rivers. Mr. ElTal introduced some of the resources that MID is utilizing, including MID H20 and the Groundwater Recharge Assessment Tool (GRAT) software being used to optimize recharge locations in the district and integrated with other software tools to look at water levels and access at all stages of the water cycle, from precipitation to groundwater extraction.

Orit Kalman, Lead Facilitator, Sacramento State Consensus and Collaboration Program (Facilitator) reviewed the purpose for the meeting and the agenda for the day. She explained that this Listening Session is part of a greater effort in the beginning stages of Flood-MAR research and planning, and that the information collected in this meeting will inform the Flood-MAR Research Advisory Committee (RAC).

Ajay Goyal, Principal Engineer in the Statewide Infrastructure Investigations Branch of DWR, and Flood-MAR Project Manager, gave a brief overview of Flood-MAR as an innovative climate change adaptation strategy to help California water managers as climate change causes higher precipitation levels in the winter and lower snowmelt run off in the spring and summer. He said that Flood-MAR can be implemented at a farm level, Groundwater Sustainability Agency level, a groundwater basin level, or watershed level, and will integrate Flood Management with groundwater recharge. He described Flood-MAR implementation factors and explained that the Flood-MAR team still needs to determine an incentive structure to encourage voluntary participation in recharge projects.

A participant asked if DWR has considered measure to slow the flow of rivers within their watershed, in contrast to current practices that clear rivers of debris and hasten their flow. Mr. Goyal replied that Flood-MAR ideas are in their early stages, but that being able to lower reservoir levels in advance of flood events by releasing water for MAR, will potentially help keep water in the watershed longer.

ON THE GROUND EXPERIENCES WITH FLOOD-MAR

The facilitator shared themes that arose from questions collected online from Listening Session registrants (Attachment D). These question themes included water rights and water supply issues, numerous how-to questions about implementation, the current state of research, regulatory issues, and linkages to the Sustainable Groundwater Management Act (SGMA). She then introduced Don Cameron and Nick Blom to share their experiences implementing large-scale Flood-MAR projects on their farms.

Don Cameron described his and his neighbors' experiences inundating crops with flood water since 1983 in Eastern Fresno County near the north fork of the Kings River. Over the years he has flooded pistachios, oil olives, walnuts, almonds, and grapes. Mr. Cameron reported no notable adverse effects on these crops, including no trees uprooting. In 2010, he received a $75,000 Natural Resources Conservation Service (NRCS) grant that was matched with $100,000 from elsewhere and partnered with Sustainable Conservation and UC Davis to put in place monitoring instruments. In 2012, he received a grant from DWR to take floodwater off the Kings River to mitigate flood damage downstream. He and his project partners have been planning for six years and are now constructing a canal to divert flood water to crops. The project was estimated to cost $7 million but now costs approximately $11.5 million.

Nick Blom inundated his dormant almond orchards in Modesto near the river for three years in a row. Once per week he would flood a five-acre block of trees with two feet of water, added in six- inch increments. He reported no notable change to the trees, except perhaps added root growth. During those three years the groundwater level rose from 40 feet to 35 feet below ground. He added that farms must adapt their water uses for climate change, that for SGMA every county must come up with solutions to their unique groundwater challenges, and that Flood-MAR could be part of that solution.

QUESTIONS & RESPONSES

- Don, when you put water on your 300 acres, was it flooded completely all the time, or did you alternate fields?

  Response: We tried to keep it on continuously and kept our old flood pipelines on, but with the infiltration rate we couldn't keep it flooded 100% of the time.

- Did you put pre-emergent water on before or after your spray control for your weed program?

  Response: We did not put herbicide down when we knew we would have a flood event. We did have powdered mildew on the grapes, but far less than expected. We ended up dusting Sulphur on a regular basis to prevent this. We had to be vigilant. It would make sense to take a break from flooding during blooms and put on some fungicide. At the time we felt the water was more valuable than the grapes though we did want the grapes.

- Did you have to get a special permit to get the water?

  Response: Originally, we didn't have a permit, but we ended up with an agreement with Kings River Water Association (KRWA), and they would charge us a minimal amount. We now have a 50-year agreement and pre-1914 water rights on the Kings River. Right now there is a fight over flood water on the Kings River. Temporary permits are an option, but things need to be simplified and cost less money. I understand the reasons behind water laws, but we need some help.

- If you take a lot of flood water out of the Kings River before it floods into the San Joaquin River and then reaches the bypass, does that mean we won't have water in the bypass?

Response: No, our canal is 500 cubic feet per second (cfs) while the capacity before it is diverted to the lake bottom is 4500 cfs. It's a massive amount of water, and I think there will be water still coming down since there aren't enough projects to divert too much.

- Did you have to mitigate for environmental concerns related to groundwater contamination?

  Response: No, the water quality we are putting on is of better quality than the water being pumped out. We have a salt bloom from an oil field in our part of Fresno County, so we have watched salt and nitrate movement but have seen no issues from nitrates. We put on snow water and rain water which dilute rather than increase salts concentrations.

- We have been hesitant to flood almonds and pistachios.

  Response: We were closely watching for damage, counting kernels basically, and there was absolutely no measurable difference in the orchards. Realistically, if you implement Flood-MAR projects you probably won't reach the extreme flooding we both did.

- A well driller was telling me that they use wells to put water back in the ground.

  Response: Injection wells are expensive so it's not your first choice unless that's your only alternative. It might be worthwhile if your neighbors join in. Water moves underground, and you may not gain the benefit. It's hard to spend the money if it won't benefit you.

STATE AGENCY ROLES – PANEL PRESENTATION

Jim Wieking, Supervising Engineer in the Statewide Infrastructure Investigations Branch of DWR; Amanda Montgomery, Manager in the Division of Water Rights, Permitting Section, State Water Resources Control Board (SWRCB); and Amrith Gunasekara, Science Advisor to the Secretary at the California Department of Food and Agriculture (CDFA) shared how each of their three agencies defines their role in research and eventual implementation of Flood-MAR.

Jim Wieking explained that DWR is investigating how to implement Flood-MAR projects on a large scale in California; they are trying to figure out what it would take to significantly grow and expand MAR in coordination with flood operations, water supply operations, and other work around the state. DWR currently has funding to do reconnaissance studies and provide some technical assistance with pilot projects, and is working to make more funding available. At this stage DWR is trying to frame their research and data needs through the Research Advisory Committee (RAC) and its 13 research themes subcommittees. This listening session is the start of a process of looking into a system of incentives for landowners to implement projects. He shared that DWR is working with MID to demonstrate some of the flood MAR concepts, and that there is a study in the Tuolumne river basin to study climate change and adaptive management practices, perhaps including Flood-MAR.

Amanda Montgomery reviewed the difference between temporary permits and standard permits for water use from natural bodies of water or an artificial water body serving as a natural water body. Temporary permits last for 180 days and take 6-8 weeks to process, so they would be ideal for a seasonal or short term trial project. Standard permits provide for permanent water rights and last for as long as the user is diverting water and showing beneficial use. SWRCB is currently trying to streamline the standard permitting process. They are looking at determining a peak flow level for diversion, though the diversion season will be December 1 through March 31. This streamlined process is expected to be

made public in the next 3-4 months. She also warned that riparian rights for surface water cannot be used for storage.

Amrith Gunasekara shared that a priority of CDFA is for California to remain the number one food-producing state in the nation. CDFA is pursuing a simplified process for getting permits for water flows, including umbrella permitting for multiple points of diversion. They are also researching crop resilience and 21-day weather forecasting in collaboration with University of California (UC) and California State University (CSU)researchers. These efforts support and align with the statewide implementation of Flood-MAR.

QUESTIONS & RESPONSES

- We need to be able to take advantage of flood events before they are over. The permitting process is involved. Is there any way that DWR can say that certain flood areas are such a priority that we can allow pumping? Can we say this is an emergency event or say we'll use a different standard and let the farmers buy the water instead of getting it for free?

  Response: Under the umbrella permitting that was mentioned, a district or GSA could get a permit that might list dozens or hundreds of users. That's a system that's not contrary to water rights at all. The Russian River has some permits like this, not for storage, but it allows a water right that you could turn on or off at certain times. It is unlikely water will just be available because of a flood event.

- We hear DWR saying we need to think outside the box and SWRCB saying we need to stay in the box. Where's the collaboration?

  Response: There's not a happily ever after answer to the question. Water Resources planning in California can be very slow and frustrating. We want to encourage you to start thinking in a longer time horizon in terms of what you are planning for. Remember, Flood-MAR is scalable. There are things you can do as an individual farmer that a larger Irrigation District would have a harder time doing. If you have a water right where you can get water off the river right now, then you would still need to work with the board about how you are using the water, but they have a process that allows for that. Longer term, if a lot of farmers diverted water for recharge and worked with SWRCB, then things would get better in groundwater basins. If you want to have a big effect then we will need to work together. If we can work with flood managers to exercise the reservoir in a slightly different way then you could make more water available, provide flood protection, and have more water available. It's a multi-pronged approach.

- Could you adapt the standard permit time period to the needs of individual basins? As farmers we are looking at flood flows when they are available, and December 1-March 31 might not be a time of peak flows. The cost for putting in a system for water diversion and MAR is high and we want to have flexibility. Last summer I was told it was two years to get a streamline permit and the time period was very strict.

  Response: The proposed streamlining guidance approach I discussed is being developed for statewide use. In the Spring as more water is diverted for irrigation and other uses, and fish migration occurs, it becomes much more complicated to extend out the diversion season, and it would also be complicated to customize it to basins. This voluntary streamlined pathway in no way restricts a party from filing an application with a longer season of diversion, the party will just need

to work through the normal permitting process to evaluate the impacts of their longer proposed season. Temporary permit processing has taken as short as 4 days but more commonly a few months, with none to my knowledge taking more than, say, six months. Perhaps there was confusion with standard permitting, which has more required steps, that takes at least a few years to process.

SMALL GROUP DISCUSSION

Participants had an opportunity to join small group discussions let by a facilitator and a DWR staff member taking notes. The facilitators and DWR notetakers rotated from one group of participants to the next so that all participants had the opportunity to weigh in on the three topics. At the end of the rounds, the facilitators reported to the larger group on the top issues that were identified in the discussions.

The questions were the following:

1. What **barriers or challenges** have you experienced when implementing or planning managed aquifer recharge projects?
2. What **data, information, tools, training, or processes** would facilitate implementation of managed aquifer recharge projects?
3. What types of **incentives** would encourage you to allow your land to be used for managed aquifer recharge projects?

The major themes highlighted by the breakout groups are outlined below. The full list of responses to these questions is provided in Attachment E.

BARRIERS & CHALLENGES

- Permitting challenges both in working with the SWRCB to secure the right to flood water and from the many other regulatory entities that must approve elements of a Flood MAR project.
- Conveyance infrastructure challenges ranging from a complete lack of infrastructure to antiquated or low capacity infrastructure and the costs for addressing these infrastructure gaps.
- Uncertainty and complexity of the water rights system for both accessing flood flows and later getting credit for recharge.
- Conflicting models about the balance among access to water for agriculture, protection of fish and environmental flows, and water for municipal and industrial uses that leads to lack of trust, polarization, and conflict between agriculture and other stakeholders.

DATA, INFORMATION, TOOLS, TRAINING & PROCESSES

- A guideline document that describes the process to implement Flood-MAR. Farmers have identified the need to have a guideline document that helps them to implement Flood-MAR projects starting from getting permits for using water flows to flood their fields, based on technical/scientific information, so that their crops aren't damaged.
- Funding to implement Flood-MAR. Farmers need access to funding or grants that will allow them to implement Flood-MAR projects.
- All types of information out there so farmers can take advantage of it to more easily implement Flood-MAR. Sharing the knowledge and experience that people or institutions have related to Flood-MAR projects implementation is crucial in order to facilitate the process and be more effective and efficient.

INCENTIVES

- Financial incentives
  - Tax incentives
  - Direct financial compensation
- Support for Flood-MAR implementation
  - NRCS funding for Flood-MAR infrastructure
  - Financial support to monitor water levels and quality
  - Financial support to study soil suitability
- Water access security incentives
  - Quick and easy to obtain permits
  - Priority water access
  - Guaranteed water access
- Also removing barriers to implementation would provide an incentive
  - A more flexible definition of beneficial use
  - How to account for this water under the SGMA Water Budget

ADJOURNMENT

The facilitator closed the meeting, telling participants that they can send further comments and questions to the Flood-MAR email address (FloodMAR@water.ca.gov), a summary document of key issues and themes from the meeting will be shared to the Flood-MAR website, and all of the information gathered here will inform the FMAR RAC and their subcommittees, and will be integrated into the research and development plan which will be out in June. Ajay Goyal thanked everyone for attending and reiterated the crucial role of input from potential implementers in the planning for Flood-MAR.

ATTACHMENTS

Meeting Agenda ..... Attachment A

MID PowerPoint Presentation ..... Attachment B

Workshop PowerPoint Presentation ..... Attachment C

Registrant Questions about Flood-MAR ..... Attachment D

Breakout Discussion Recorded Responses ..... Attachment E

Flood-MAR Listening Session
Meeting Summary

Attachment A

Meeting Agenda

FLOOD-MAR LISTENING SESSION

Monday, January 14, 2019

12:30 pm – 4:00 pm

University of California Cooperative Extension

2145 Wardrobe Ave, Merced, CA 95341

MEETING OBJECTIVES

Assemble members from the agricultural and rural communities to gather input from local farmers to better understand issues related to recharge project implementation. This input will inform the needs and priorities of the Flood-MAR Research Advisory Committee and associated subcommittees.

MEETING AGENDA

12:30 REGISTRATION AND NETWORKING

1:00 WELCOME AND OPENING REMARKS
Hicham ElTal, Deputy General Manager
Merced Irrigation District

1:10 AGENDA AND MEETING FORMAT
Orit Kalman, Lead Facilitator
CSUS|CCE – Collaboration and Consensus Programs

1:20 FLOOD-MAR OVERVIEW
Ajay Goyal, Principal Engineer
Statewide Infrastructure Investigations Branch, DWR

1:30 ON-THE-GROUND EXPERIENCES WITH FLOOD-MAR
Don Cameron, Terranova Ranch
Nick Blom, Blom Family Farms

2:00 STATE AGENCY ROLES - PANEL PRESENTATION
Jim Wieking, Supervising Engineer
Statewide Infrastructure Investigations Branch, DWR

Amanda Montgomery, Manager
Division of Water Rights, Permitting Section, SWRCB

Amrith Gunasekara, Science Advisor to the Secretary
CA Department of Food and Agriculture

2:35 BREAK

2:45 FACILITATED SMALL GROUP DISCUSSIONS- MANAGED AQUIFER RECHARGE PROJECT IMPLEMENTATION

- Barriers or challenges
- Data, information, tools, training, or processes needs for implementation
- Incentives

3:30 REPORT OUT

3:55 WRAP UP AND CLOSING

4:00 ADJOURN

Flood-MAR Listening Session
Meeting Summary

Attachment B

MID PowerPoint Presentation

Flood Management Aquifer Recharge
Flood-MAR

Listening Session

January 14, 2018

What is Flood-MAR?

Flood-MAR - Why Flood-MAR?

- More Competition over Surface Water Storage
- Potential Surface Water Reduction in Storage Due to Climate Change – More Rain than Snow
- Overall Concerns Regarding Sustainability – SGMA

Flood-MAR - Why Flood-MAR Crucial for Merced?

SWRCB- > 50% Reduction in Surface Water Diversion

SGMA - > 50% Reduction in Groundwater Extraction by 2040

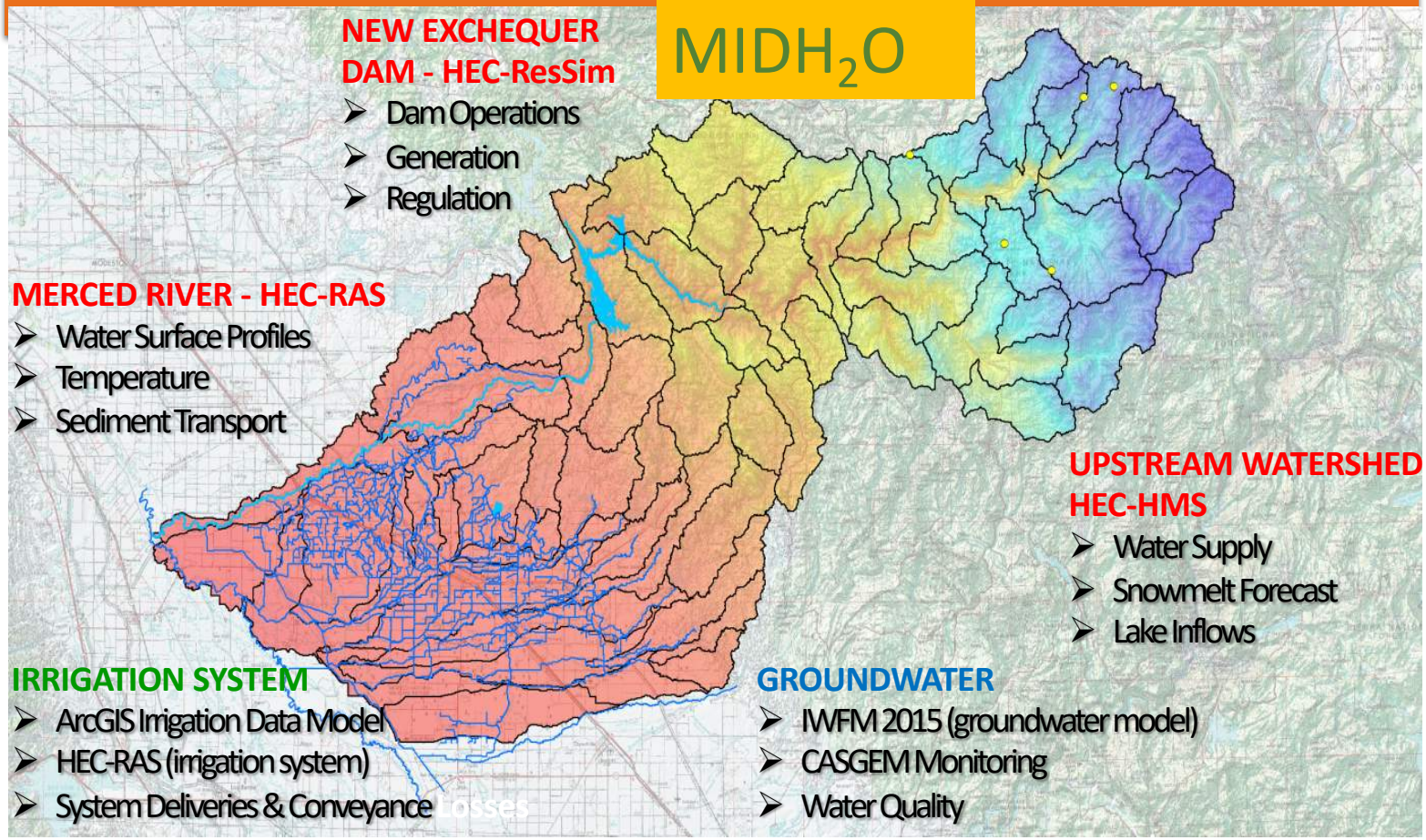
Components Under Construction to Optimize Flood-MAR in Merced

- Partnership with DWR – 3 Studies: 1- Reservoir Reoperation
  2- Potential Diversions
  3- Expected Recharge

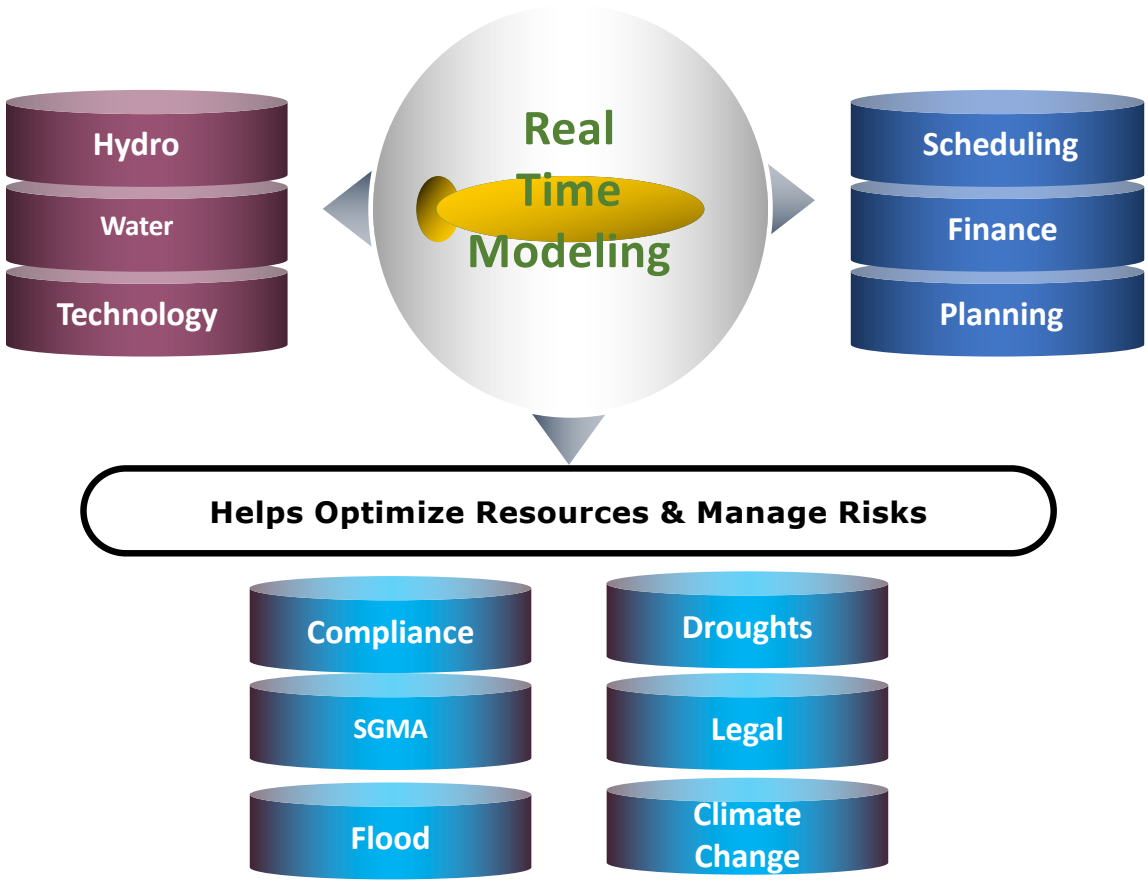
- MIDH_2O – MID Hydrology and Hydraulics Optimization Program
- GRAT – Groundwater Assessment Tool
- Overcoming Barriers:
  - Work with the State Water Resources Control Board to Overcome Inherent Restrictions
  - Further Modernize Facility to act for Water Supply and Flood Control Simultaneously
  - Partnerships: SGMA, etc.

Components Under Construction to Optimize Flood-MAR in Merced

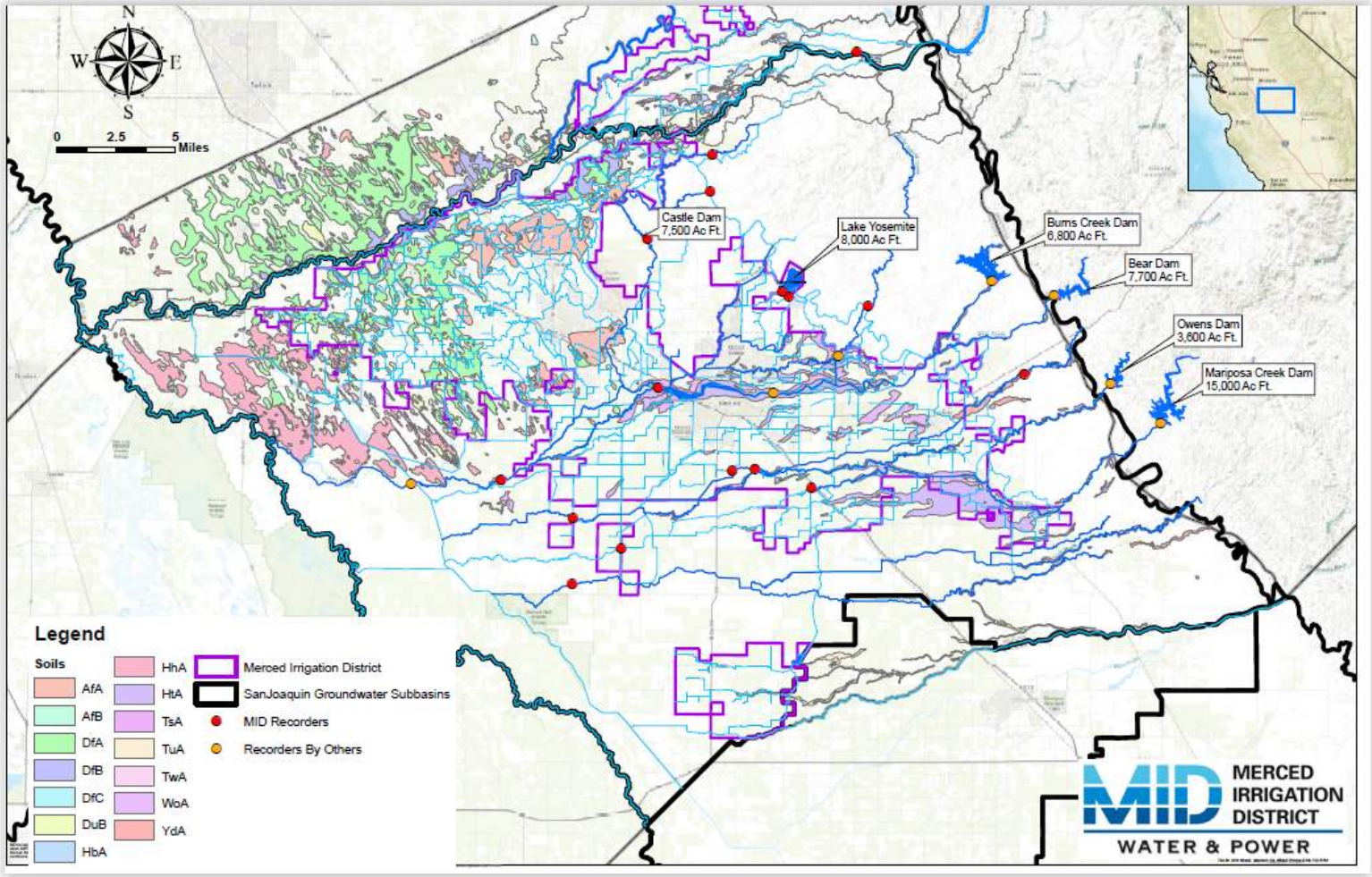
MERCED IRRIGATION DISTRICT
WATER & POWER



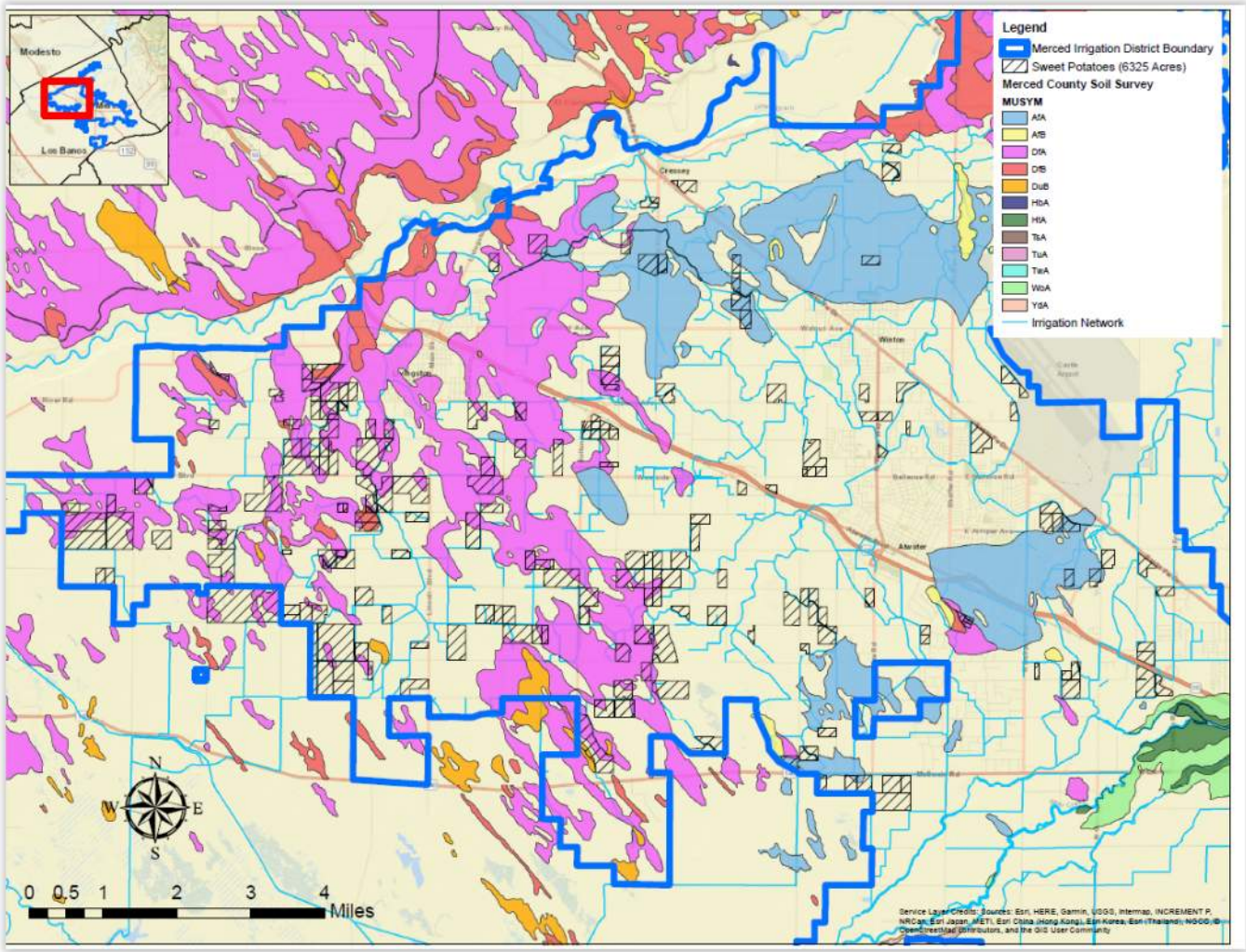
Merced Irrigation District Hydrology and Hydraulic Optimization MIDH$_2$O



Favored Recharge Soils

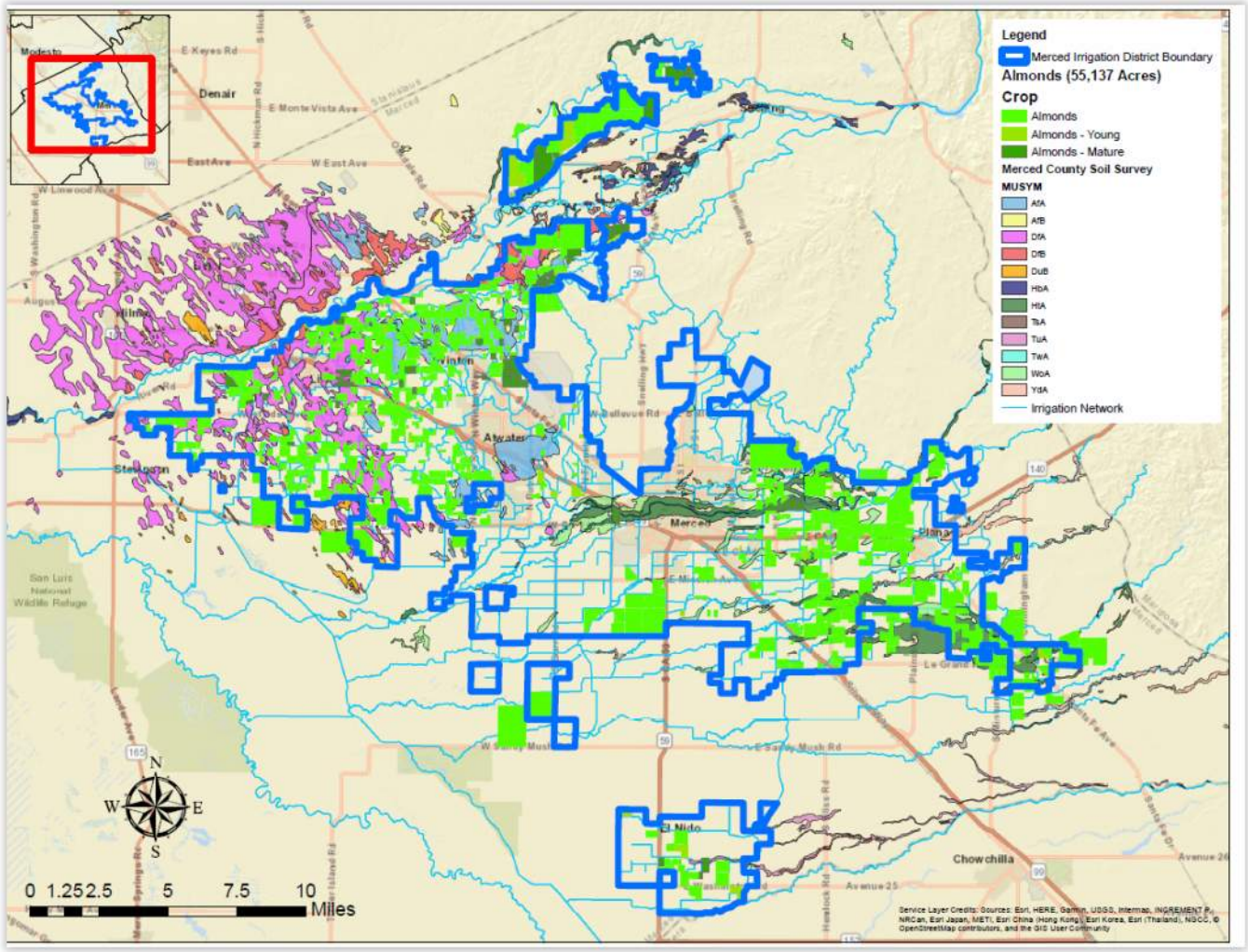


Flood-MAR in MID - Sweet Potato



Sweet Potato Acreage: 6,235 Acres

Flood-MAR in MID - Almond



Almond Acreage: 55,137 Acres

SGMA Planning Needs

1. **Where** is **recharge** best done? **When**?
2. **How much surface water** can we capture?
3. **What** would it **cost**?
4. **How much** of our **groundwater overdraft** can be addressed by increasing recharge?

Groundwater Recharge Assessment Tool

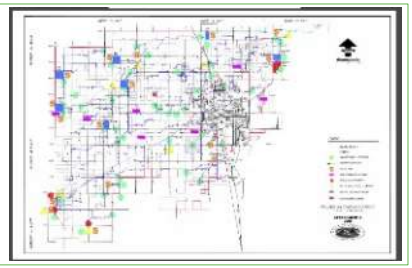
MERCED IRRIGATION DISTRICT
WATER & POWER

Water Available for Recharge

- Surface water availability
- Excess flood flows
- Water rights

Conveyance

- Conveyance infrastructure
- Delivery capacity to fields



Site Suitability

- Recharge suitability: slope, soil type, clay layers, underlying geology, depth to groundwater
- Crop and land use suitability

On-Farm and Fallow Recharge

- Infiltration-percolation potential potential (crop compatibility calendar)

Dedicated Basins

- Percolation rate of existing dedicated recharge basins

Recharge Benefit/Cost Analysis

- Relative cost per acre foot ($/acre foot)
- Increased groundwater recharge

Flood-MAR Listening Session
Meeting Summary

Attachment C

Workshop PowerPoint Presentation

Flood-MAR

Using Floodwater for Managed Aquifer Recharge

LISTENING SESSION

CALIFORNIA DEPARTMENT OF
water resources

Welcome and Opening Remarks

Hicham ElTal, Deputy General Manager of Water Supply/Rights

Merced Irrigation District

Meeting Agenda

1:00	**Welcome and Opening Remarks**
	Hicham ElTal, Merced Irrigation District
1:10	**Agenda and Meeting Format**
	Orit Kalman, CSUS|CCE – Collaboration and Consensus Programs
1:20	**Flood-MAR Overview**
	Ajay Goyal, Statewide Infrastructure Investigations Branch, DWR
1:30	**On-the-Ground Experiences with Flood-MAR**
	Don Cameron, Terranova Ranch
	Nick Blom, Blom family farms
2:00	**State Agency Roles - Panel Presentation**
	Jim Wieking, DWR
	Amanda Montgomery, State Water Resources Control Board
	Amrith Gunasekara, CA Department of Food and Agriculture
2:35	**Break**
2:45	**Facilitated Discussion**
	Barriers or challenges
	Data, information, tools, training, or processes needs for implementation
	Incentives to promote managed aquifer recharge projects
3:30	**Report out**
3:55	**Wrap up and Closing**
4:00	**Adjourn**

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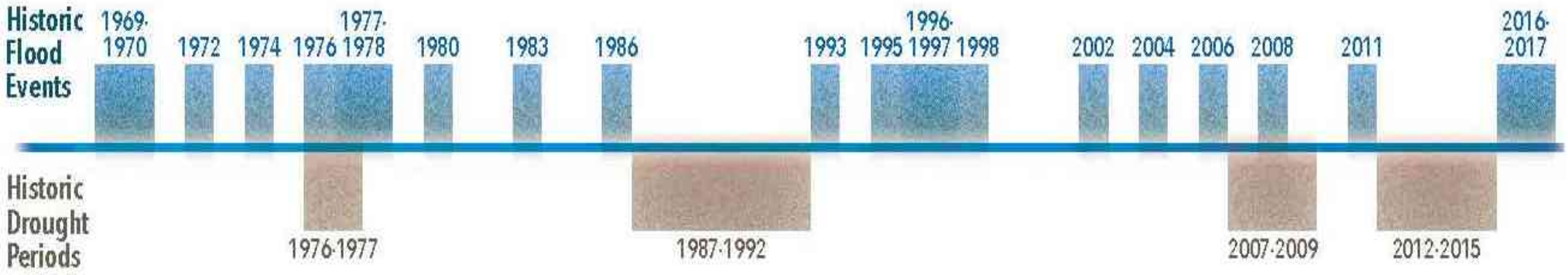
Guidelines for Conversation

- ✓ Use common conversational courtesy
- ✓ All ideas and points of view have value
- ✓ Avoid assuming and analyzing the motivation of others
- ✓ Be honest, fair, and as candid as possible
- ✓ Honor time
- ✓ Share the airtime
- ✓ Invite humor and good will
- ✓ Be comfortable
- ✓ Think innovatively and welcome new ideas
- ✓ Cell phone and computer courtesy

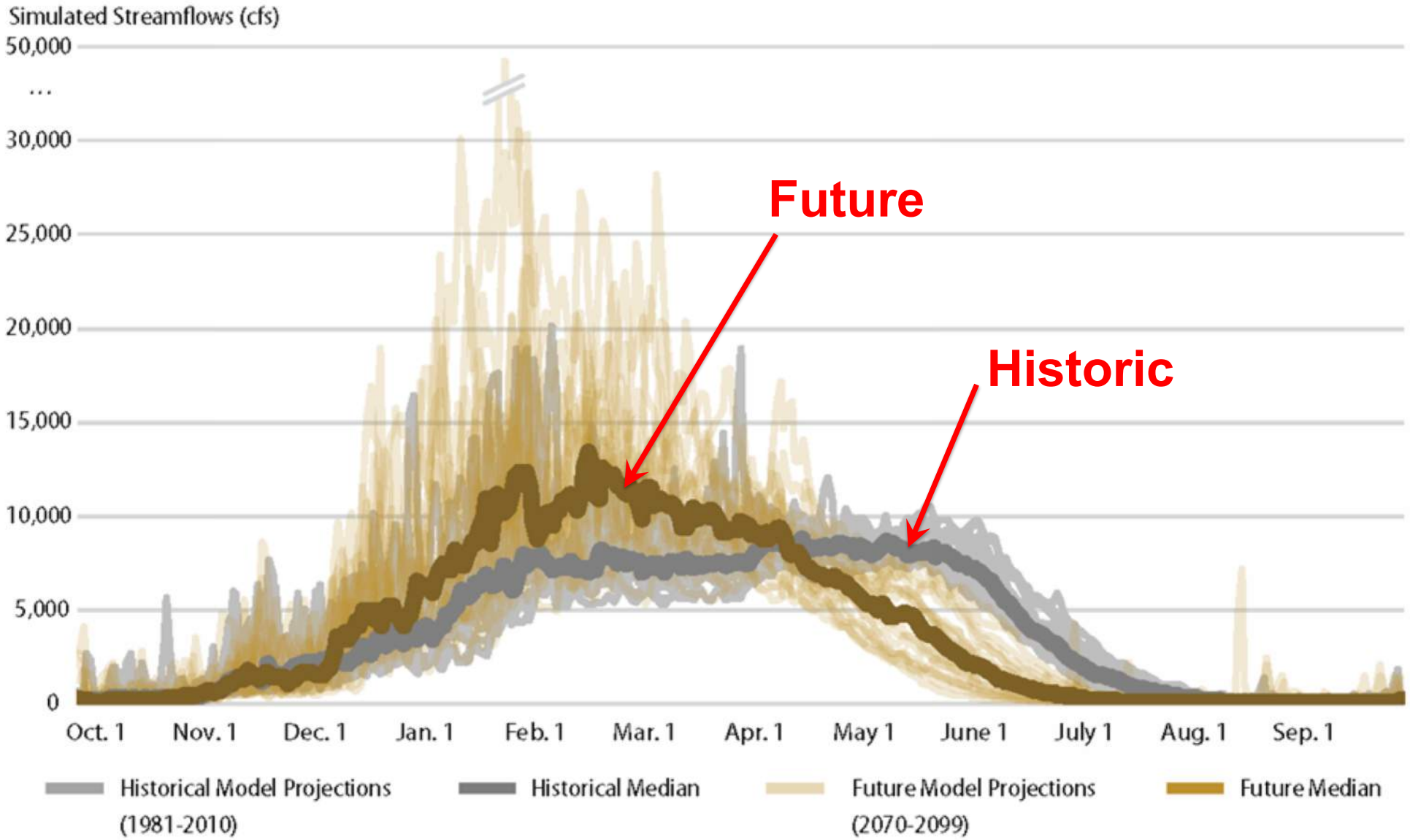
Flood-Mar Overview

Ajay Goyal, Principal Engineer
Statewide Infrastructure Investigations Branch
DWR

California's Water Management
A Tale of Two Extremes



Effects of Climate Change Necessitate Wholesale System Changes



What is Flood-MAR?

Using high flows from, or in anticipation of, rainfall or snowmelt, for managed aquifer recharge on agricultural lands, working landscapes, and natural managed lands.

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Flood-MAR is also…

- … an integrated & voluntary management strategy to improve water resources sustainability & climate resiliency
- … multi-sector (flood, surface & groundwater, ecosystem, quality)
- … scalable (farm, GSA, basin, region, watershed)
- … multi-faceted (reoperation, conveyance, storage, recharge, banking, transfers, cultivation, restoration, etc.)
- … an untapped part of California's water portfolio

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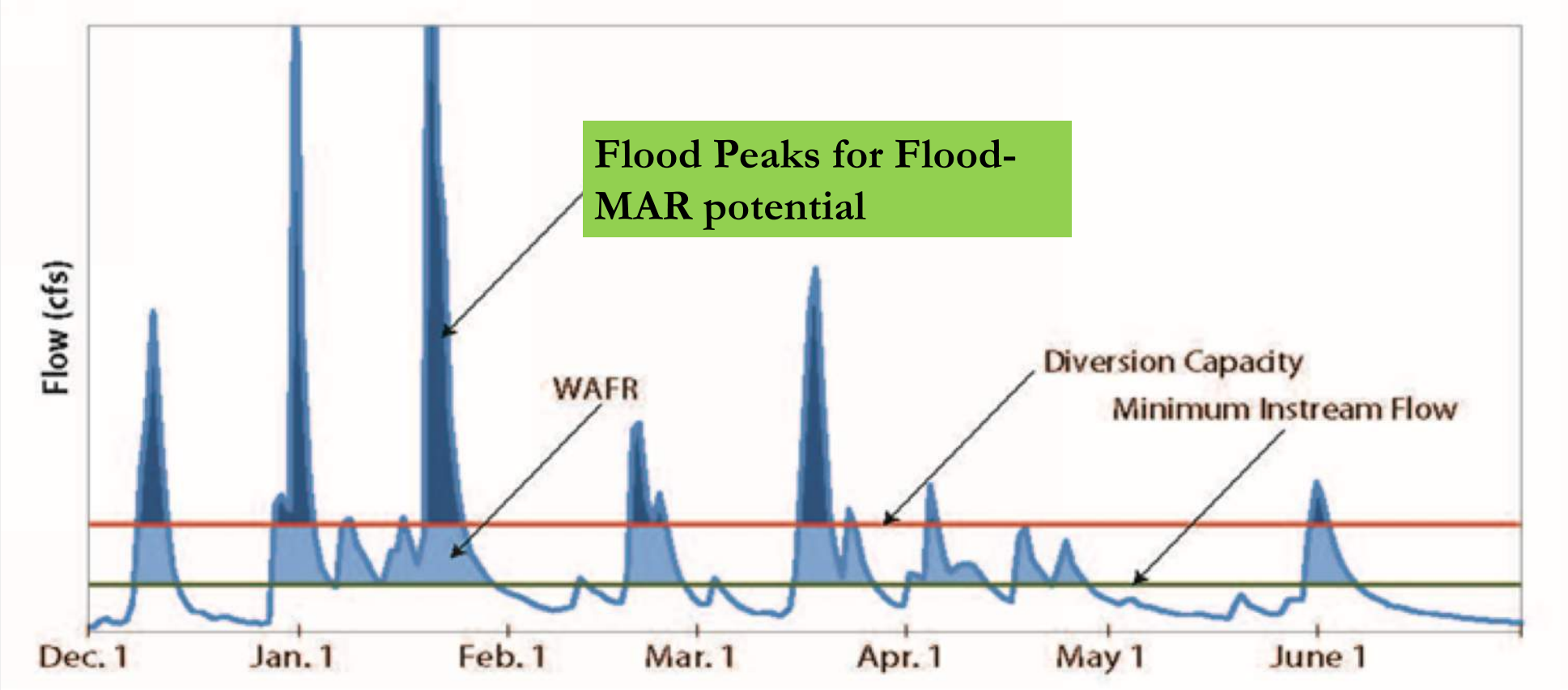
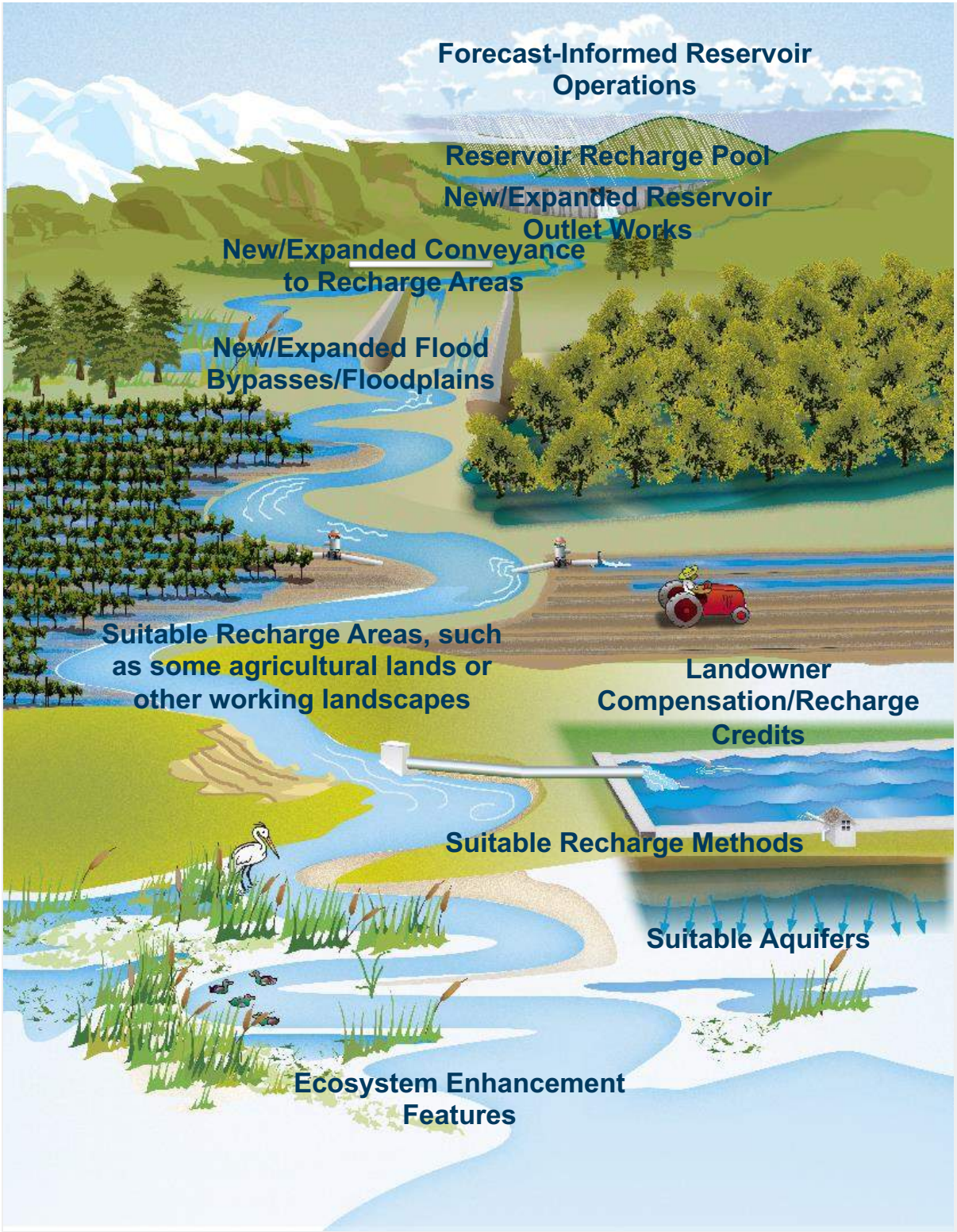
Flood Peaks


Flood Peaks for Flood-MAR potential
Flow (cfs)
WAFR
Diversion Capacity
Minimum Instream Flow
Dec. 1
Jan. 1
Feb. 1
Mar. 1
Apr. 1
May 1
June 1



Example Components of Flood-MAR Projects

Benefits of Flood-MAR

Private: Water supply reliability

Public:

- Flood risk reduction ★
- Drought preparedness ★
- Aquifer replenishment ← **Green Infrastructure**
- Ecosystem enhancement ★
- Groundwater remediation/water quality ★
- Working landscape preservation and stewardship
- Climate change adaptation
- Recreation and aesthetics ★

★ Public benefit as defined by Proposition 1

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Flood-MAR Implementation Factors

Governance and Coordination: How will project needs be coordinated?
- Landowner willingness
- Local or system needs and opportunities
- Partnerships and agreements
- Coordination and operations decisions
- Legal/ regulatory framework

Funding and Incentives: How will project be funded and landowners compensated?
- Available funding sources
- Landowner incentive or compensation programs
- Recharge quantification

Source Water: Where will the surface water come from?
- High flows
- Reservoir reoperation
- Timing and quantity of flows
- How are flows expected to change in the future?

Conveyance: How will surface water get to the site?
- Existing infrastructure
- New infrastructure

Site Suitability: Where are good candidate sites for recharge?
- Soil suitability
- Crop suitability
- Aquifer suitability
- Aquifer capacity
- Aquifer water quality
- Vadose zone water quality

Recharge Method: How will the water get into the ground?
- On-farm
- Fallowed land
- Dedicated basin
- In-lieu
- Direct injection

Groundwater Use: How will groundwater be recovered or otherwise used?
- Groundwater extraction wells
- Beneficial Uses
- Augmentation of groundwater for replenishment/ restoration

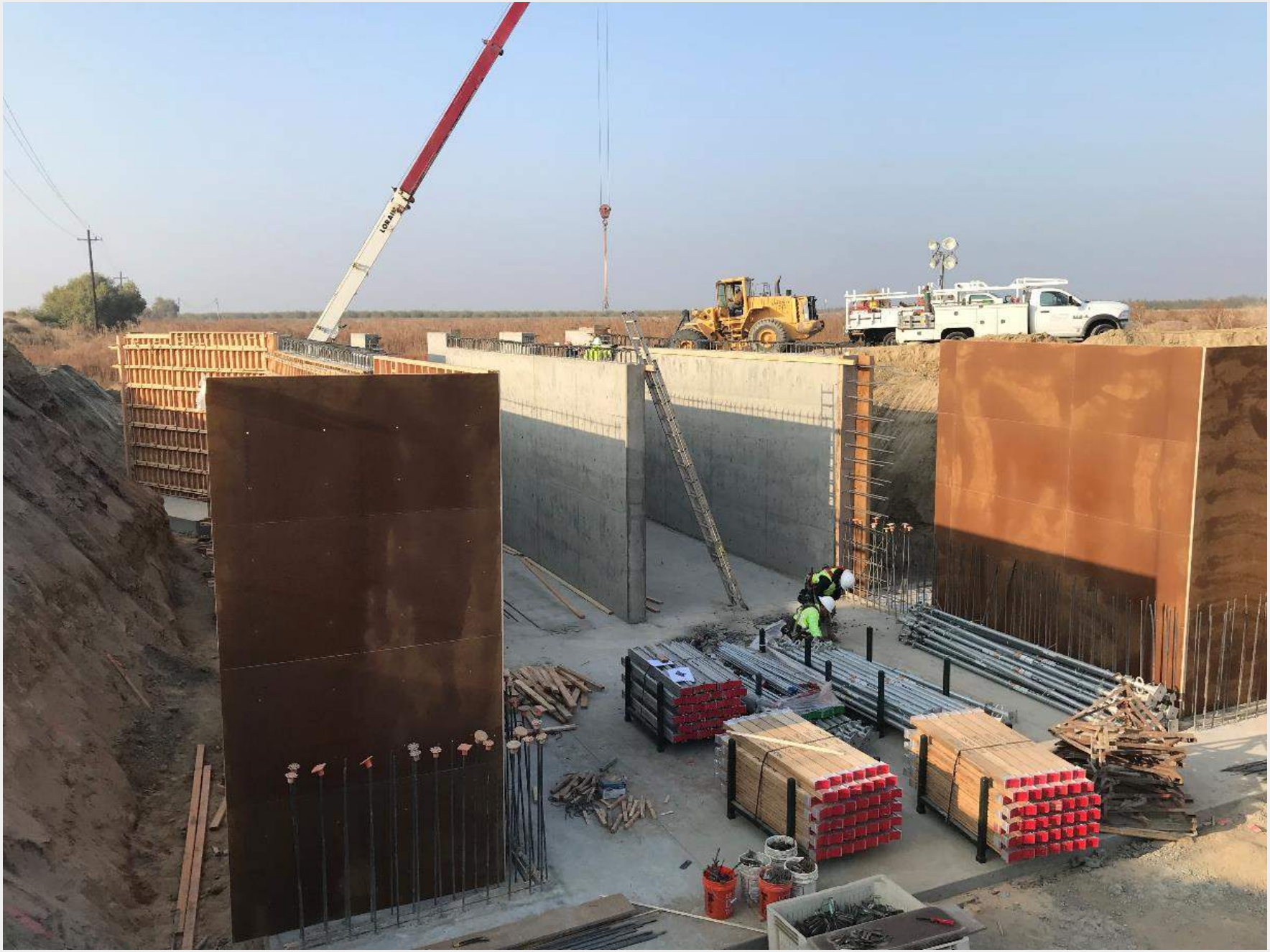
Feasibility Analysis: Is the project feasible?
- Benefits and beneficiaries
- Costs and impacts
- Agreements and assurances

On-the-Ground Experiences with Flood-MAR

Don Cameron, Terranova Ranch

Nick Blom, Blom family farms

Coalinga Canal Crossing



Headworks Construction

Pistachio Recharge

Recharge North Fork of King River

State Agency Roles Panel Presentation

Jim Wieking
DWR

Amanda Montgomery
State Water Resources Control Board

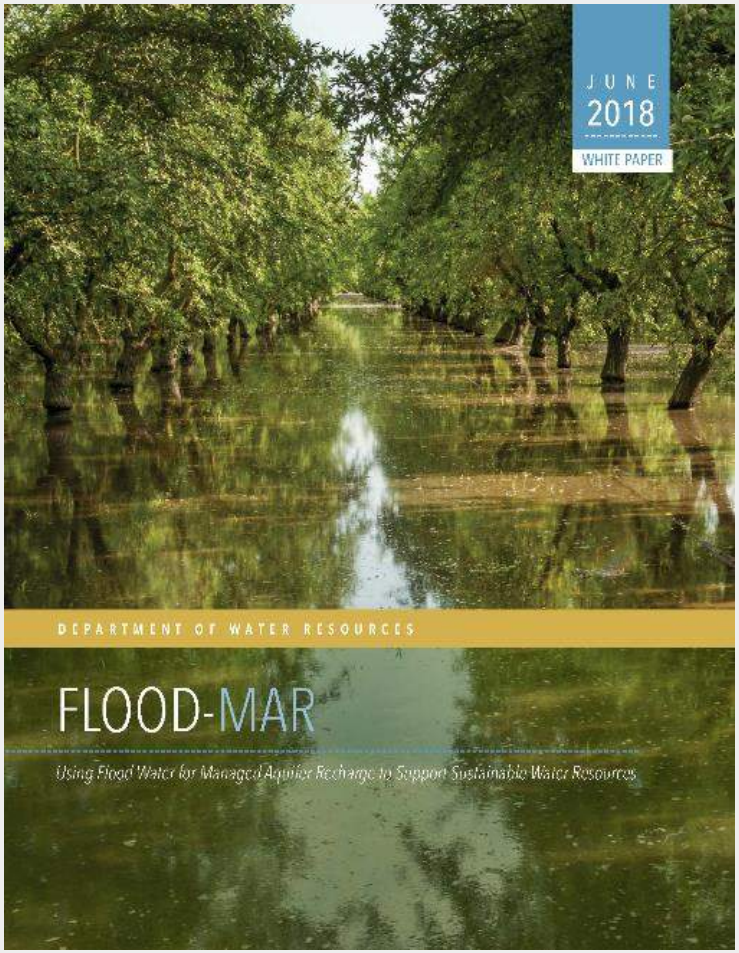
Amrith Gunasekara
CA Department of Food and Agriculture

DWR Program Funding

- DWR has early funding for:
  - Conducting reconnaissance and pilot studies
  - Providing local technical assistance
  - Convening potential partners and stakeholders
  - Framing research and data needs
  - Coordinating across State programs

DWR Documents and Activities

- Fact Sheet
- White Paper
- Research & Data Development
- Research Advisory Committee
- **Merced River Basin Reconnaissance Study**
- Tuolumne River Climate Vulnerability and Adaptive Project



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Research Themes:

1. Hydrology Observation and Prediction
2. Reservoir Operations
3. Infrastructure Conveyance and Hydraulics
4. Crop Suitability
5. Soil Suitability, Geology, and Aquifer Characterization
6. Land Use Management
7. Water Quality
8. Recharge and Extraction Methods and Measurements
9. Environment (Aquatic, Riparian and Terrestrial)
10. People and Water
11. Economic Analysis
12. Local, State, Federal Policies and Legal
13. Tool and Application Development

Next Steps for DWR

- Convene a Flood-MAR Research Advisory Committee (RAC) along with 13 sub-committees
- Develop a Research & Data Development Plan
- Continue investigation of concepts identified in the White Paper
- Evaluate Flood-MAR opportunities in other river basins, coastal, mountain, desert, etc.
- Provide planning and implementation guidance
- Support implementation of Flood-MAR
- Continue stakeholder outreach

DWR Financial Assistance Programs

- Flood-MAR Pilot Project Implementation Funding – Program under development
- Central Valley Tributaries Program – Applications due February 12
- Flood Corridor Program
- SGMA Implementation Grants
- IRWM Implementation Grants

Water rights permitting

	Temporary Permit	"Standard" Permit
Time	Short term. Diversion authorized for up to 180 days. Can be renewed.	Permanent. 2 stages: Permit authorizes quantity, rate & season. Actual diversion & use basis for license.

- Capturing and storing surface water in a groundwater basin for beneficial use(in-situ or extractive) requires coverage by an appropriative water right.
- Standard permit. Steps: Acceptance. Noticing & Protest Resolution. Water Availability. CEQA. Public Trust. Use Accounting. Other conditions.
- Unappropriated water must be available to supply a new project. Determine parties who already have rights in watershed and downstream flow path & determine instream needs.
- **Coming Soon** (by mid-2019): Guidance on streamlined approach to water availability for local agency(e.g. GSA) aquifer projects proposing to divert a portion of high flow events in wet season.
- Interested? Visit the Water Board's Groundwater Recharge page: **http://www.waterboards.ca.gov/waterrights/water_issues/programs/applications/groundwater recharge/**

Stretch Break

Facilitated Discussion

1. **What barriers or challenges** have you experienced when implementing or planning managed aquifer recharge projects?
2. **What data, information, tools, training, or processes** would facilitate implementation of managed aquifer recharge projects?
3. What types of **incentives** would encourage you to allow your land to be used for managed aquifer recharge projects?

Discussion Instructions

1. **Three rounds** – everyone will have an opportunity to address the three key areas of questions.
2. **Facilitated discussion** – each group has a facilitator who will review the questions, track your responses, share emerging ideas, and report back to the larger group.
3. **Share your thoughts and learn from others** - each round of conversation is 10-15 minutes.

Report Out

1. **What barriers or challenges** have you experienced when implementing or planning managed aquifer recharge projects?
2. **What data, information, tools, training, or processes** would facilitate implementation of managed aquifer recharge projects?
3. What types of **incentives** would encourage you to allow your land to be used for managed aquifer recharge projects?

Wrap up and Closing

Thank you for joining us today!

Program Contact Information

Email: FloodMAR@water.ca.gov

Website: https://www.water.ca.gov/Programs/All-Programs/Flood-MAR

Flood MAR Listserv: https://listservice.cnra.ca.gov/scripts/wa.exe?SUBED1=DWR_FLOODMAR&A=1

Flood-MAR Listening Session
Meeting Summary

Attachment D

Registrant Questions about Flood-MAR

Flood-Managed Aquifer Recharge (MAR)
Listening Session

Questions from Registrants

To better prepare for our meeting, please let us know what specific information about Flood-MAR you are interested in & is there anything else you would like to share with, or ask, the State agencies hosting this event?

1. Will there be some reduction of water costs if the project is implemented? How will UCD's recharge map be used?

2. What is the magnitude of floodwater that maybe available for groundwater recharge? What will the state water board allow? How will impacts of floodwater diversion to fish and wildlife resources be mitigated and tracked?

3. Regulatory requirements

4. Hearing about their experiences from landowners that have tried it and hearing from other landowners that the reasons for hesitating in following suit.

5. Legislative needs to implement a plan of action for capturing flood MAR events.

6. Incentives for local landowners to participate and regulatory programmatic permits to improve partnerships.

7. Challenges of distribution system capacity and cost to improve.

8. Opportunities and challenges for recharge in remaining river flood plain area within the levee system.

9. Enabling landowners and water districts to create banking areas with minimal permitting or bureaucratic restrictions.

10. multi-benefit approaches that incorporate wildlife and bird conservation goals

11. Program set up and update. Landowner experiences.

12. Permit streamlining with water rights and flood agencies and wildlife agencies

13. We hold ag conservation easements on farmland throughout the Central Valley. We want to make sure our easements allow for farmers to design and implement groundwater recharge projects.

14. What we should know about SGMA and recharge projects?

15. How can recharge projects be design so that they can increase groundwater baseflow while at the same time address drinking supply needs, including groundwater quantity and quality?

16. Current status in state. Study Results.

17. State involvement, plans, and assistance available.

18. Am authoring our districts Groundwater Sustainability Plan (GSP) for the Vina Sub-basin. Would like to know which metrics this impacts and how to estimate the magnitude in my district.

19. Tunneling water from North to Central Valley

20. Would like to know how everyday farmers can take advantage of MAR, accessibility, where is suitable, crops suitable, where to begin.

21. grant funding opportunities to landowners not within a water district. If we put in a MAR, can we also add several shallow wells to access that water above corcoran clay instead of pumping from below clay layer?

22. What are agency sources for cost sharing for water districts and private landowners.

23. Can diversion of flood waters be exempted from water rights permits. Can flood water temporary uses include irrigation if flood waters occur during growing season.

24. There needs to be a streamlined and cost effective approach to allow users to implement aquifer recharge projects. Could this session address what steps can be taken to ensure projects are not caught in a multi year red tape situation where we lose time to recharge groundwater basins in wet winters, or even through other water sources (recycled).

25. Would like to relay in an Ag Alert story, how growers can take advantage of MAR, where to begin, how to overcome barriers, challenges, improve communications...

26. Attempts to reduce overdraft of ground water

27. Can riparian water rights be used for recharge? What does it take to make that happen?

28. What specific plans will DWR imply to open up opportunities for landowners and districts to obtain flood waters in a fair manner?

29. How can we make grants available to individual landowners instead of mostly just districts or public agencies? There are plenty of us out there willing to be part of the solution, but white area ground is the most heavily regulated through SGMA, yet not eligible for much of the grant funding available. Those that need the recharge the most are left on the outside looking in it seems.

30. Potential programs regarding the San Joaquin River and Eastside Bypass.

31. Wetland recharge

32. If a groundwater market / credit system were to be developed in our area, would we receive credits for our recharge efforts?

Flood-MAR Listening Session
Meeting Summary

Attachment E

Breakout Discussion Recorded Responses

Flood-Managed Aquifer Recharge (MAR)
Listening Session

Breakout Discussion Recorded Responses

Question 1: What **barriers or challenges** have you experienced when implementing or planning managed aquifer recharge projects?

Part 1

- Permit from SWQCB
    - Time
- Other regulations F&W –CA (*Checkmark)*
    - -1450 Water code high hurdle
- Funding from CA to Agencies & Districts, Land Managers
- Incentive Payments Lacking
- What is in the mind of farmer & bureaucrat (urban folk).
    - Farmer— SWQRB needs to prioritize. No surface H_20. H_20 is for Food (cities>Fish)
    - Urban— Utopian view of Farming. Don't see dependency

Part 2

- Appropriative Vs. Riparian is confusing/opaque *[check mark]* Beneficial Use
- Lack of Trust between AG & State H_20 Board
- Guarantee of Water Right/Credit to Recharged H_20 *[check mark]*
- Balanced idea of public benefit.
    - Fish given more weight than public health
- Challenge of Navigating Public Processes

Part 3

- Risk of Abandonment if not used
- Lack of Infrastructure for flooding fields *[Point circled, 2 check marks]*
- <u>Conveyance</u>
- Antiquated (small capacity of infrastructure) *[Point circled, check mark]*
- Cost of new infrastructure *[Point circled]*
- Cost of improving infrastructure
    - Widening
    - Rights of way
- Lack of expertise on impacts at specific sites
- Impacts of flooding on H_20 quality
- Lack of knowledge about recharge

Part 4

- Lack dedicated demo site
- Interaction with SGMA
- Water districts hesitant to credit/ Accounting for H_20
- No infrastructure in white areas
- Cost vs. return on MAR projects *[point circled]*
    - Hard to calculate
- Role of public grounds that could recharge
- Need to understand permitting process

Question 2 ***"What data, information, tools, training or process would facilitate implementation of managed aquifer recharge projects?"***

Part 1

- People who can guide landowners step by step. Agency (Local GSA) <u>Process</u>
    - Who can define how much water to use?
    - Legal framework
    - Identify best places to recharge
- <u>Data available</u> (who owns the data?)
- What is above and below?
- Case studies or what has been done
    - Data, projects, etc.
    - Training/tool box
- $ (Money/Funding)
- Easy access to information on funding

Part 2

- Guidance
    - When we should start?
- Data: What effects recharge has on crops?
- Connecting with stakeholders/agencies
- Type of crop insurance
- Learn from cities
- Information-Benefits
- Standard plans/designs →Best result
- SAGBI (Soil Agricultural Groundwater Banking Index) but more accurate/easy information

Part 3

- Water
    - Made available to use by farmers
- Guidance document
    - Dedicated L Recharge basins
- Water availability off-stream. Stream by stream

Question 3 ***"What types of incentives would encourage you to allow your land to be used for managed aquifer recharge projects?"***

Part 1

- $$
- High % pumping credits *[check mark]*
- Tax incentives
- NRCS (Natural Resources Conservation Service) Funding-Infrastructure
- $ Support to
    - Monitor water
    - Study soil suitability
- Local credit trading system
- More secure access to flood water
    - Permits
    - Quick + easy
    - Priority water access
- Concerns: How to work within GSAs?

Part 2

- Allow accounting without needing permit
    - Permits account For H_20 longer time out (GSA).
- Recharge must be defined as beneficial use
    - Flexibility of definition
    - Different in North vs. South of state
- Guaranteed Access *[check mark]*
    - Now- Immediate
    - Streamlined Process
- Land on Bypass needs flow time later in the year for a standard permit
- Concerns: Beneficial Use— H_20 must be used within 12 months
    - Existing regulations
- Possible solution: Aquifers seen as "Green" infrastructure = beneficial use

Part 3

- Mitigate jeopardized H_20 rights – resolve waste + unreasonable use
- Need credit for growers within GSA
    - Priority Pumping and/or
    - Water credits to trade
- Standardized percent distribution among GSAs
- Template shared among GSAs for how to implement FMAR
- Concern: Will/how will FMAR increase GW levels in South Valley?