



2019 FLOOD-MAR PUBLIC FORUM

*Exploring Science, Socio-economic,
and Policy Considerations for
Using Floodwaters for Managed
Aquifer Recharge*

Participant Workbook

2019 FLOOD-MAR PUBLIC FORUM

Day 1 Agenda Flood-MAR Policy and Socio-Economics Forum

<u>Time</u>	<u>Agenda Item</u>	<u>Speaker(s)</u>
8:30	Registration	
9:00	Welcome and Introductions	Kamyar Guivetchi, Department of Water Resources (DWR) Ashley Boren, State Board of Food and Agriculture Genevieve Taylor, Ag Innovations
9:30	What is Flood-MAR?	Kamyar Guivetchi, DWR
9:50	Flood-MAR Research & Data Development Plan	Daniel Mountjoy, Sustainable Conservation
10:10	Promoting Innovation, Integration, and Collaboration for Water Resilience	Secretary Karen Ross, Department of Food and Agriculture
10:30	Topic I: Formulating Flood-MAR Projects with Multiple Benefits Panel (50 minutes) Q&A (10 minutes) Small Group Discussion (25 minutes)	Moderator: Kris Tjernell, DWR Panelists: Ann Hayden, Environmental Defense Fund David Guy, Northern California Water Association Laurel Firestone, State Water Resources Control Board Tim Washburn, Sacramento Area Flood Control Agency
11:55	Lunch/Keynote Speaker – Bringing Partners to the Table	Cannon Michael, Bowles Farming Co.
1:05	Topic II: Building Networks and Collaboration Opportunities to Advance Flood-MAR Implementation Speaker (15 minutes) Small Group Discussion (20 minutes)	Mike Antos, Stantec
1:40	Topic III: Incentivizing Aquifer Recharge Panel (50 minutes) Q&A (10 minutes) Small Group Discussion (20 minutes)	Moderator: Josue Medellin-Azuara, University of California (UC) Merced Panelists: Ellen Bruno, UC Berkeley HB Zeff, University of North Carolina Marco Bell, Merced Irrigation District Michael Kiparsky, UC Berkeley Law

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<u>Time</u>	<u>Agenda Item</u>	<u>Speaker(s)</u>
3:00	Break	
3:15	Ties to Sustainable Groundwater Management	Taryn Ravazzini, DWR
3:25	Topic IV: Improving Policy and Regulatory Landscape to Support Multiple Benefit Flood-MAR Projects Panel (50 minutes) Q&A (10 minutes) Small Group Discussion (20 minutes)	Moderator: Don Cameron, State Board of Food and Agriculture Panelists: Armando Quintero, California Water Commission Bill Edgar, Central Valley Flood Protection Board Joaquin Esquivel, State Water Resources Control Board Mary Creasman, Wildlife Conservation Board
4:45	Day 1 Wrap Up Moderator's Report Out (30 mins) Small Group Discussion (10 mins)	Moderator: Kamyar Guivetchi, DWR Panelists: Daniel Mountjoy, Sustainable Conservation Don Cameron, State Board of Food and Agriculture Josue Medellin-Azuara, UC Merced Kris Tjernell, DWR Mike Antos, Stantec
5:25	Looking Forward to Day 2	Daniel Mountjoy, Sustainable Conservation
5:30	Adjourn/Poster Session/Reception	

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Day 2 Agenda Flood-MAR Science and Technical Forum

<u>Time</u>	<u>Agenda Item</u>	<u>Speaker(s)</u>
8:30	Registration	
9:00	Welcome and Introductions	Daniel Mountjoy, Sustainable Conservation Genevieve Taylor, Ag Innovations
9:30	Complex Issues Require Significant Changes	Alvar Escriva-Bou, Public Policy Institute of California
9:50	Topic V: Quantifying Water Available for Recharge Panel (50 minutes) Q&A (10 minutes) Small Group Discussion (20 minutes)	Moderator: Stacey Sullivan, Sustainable Conservation Panelists: Amanda Montgomery, State Water Resources Control Board Pablo Garza, Environmental Defense Fund Paul Peschel, Kings River Conservation District Romain Maendly, DWR
11:10	Break	
11:25	Topic VI: Determining Suitable Recharge Locations Panel (50 minutes) Q&A (10 minutes)	Moderator: Graham Fogg, UC Davis Panelists: Meredith Goebel, Stanford University Thomas Harter, UC Davis Toby O'Geen, UC Davis
12:25	Networking Lunch	
1:25	Topic VI: Determining Suitable Recharge Locations (continued) Small Group Discussion (20 minutes)	
1:45	Topic VII: Understanding Water Accounting Methods Panel (50 minutes) Q&A (10 minutes) Small Group Discussion (20 minutes)	Moderator: Doug Parker, California Institute for Water Resources Panelists: Christina Babbitt, Environmental Defense Fund Eric Averett, Rosedale-Rio Bravo Water Storage District Joe Choperena, Sustainable Conservation
3:05	Break	

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<u>Time</u>	<u>Agenda Item</u>	<u>Speaker(s)</u>
3:20	Recharge on Floodplains or Upland Habitat	Aysha Massel, American Rivers Ryan Luster, The Nature Conservancy
3:50	Day 2 Wrap Up Moderator's Report Out (30 mins) Small Group Discussion (20 mins)	Moderator: Daniel Mountjoy, Sustainable Conservation Panelists: Doug Parker, California Institute for Water Resources Graham Fogg, UC Davis Stacey Sullivan, Sustainable Conservation
4:40	Closing Remarks	Armando Quintero, California Water Commission
4:55	Thank you	Daniel Mountjoy, Sustainable Conservation Genevieve Taylor, Ag Innovations
5:00	Adjourn	

DWR would like to thank:

Our State agency partners



And event sponsors



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Small Group Discussions

Thank you for joining us today. Following each panel discussion, we have allocated time for conversation at your table to share your thoughts about the panel and the related priority actions that were identified in the Flood-MAR Research and Data Development (R&DD) Plan. The intent is to allow time for participants to reflect on the presentations, learn from each other, and make connections between your work and the identified actions to promote Flood-MAR project implementation.

Flood-MAR Research and Data Development Plan

The Flood-MAR Research and Data Development Plan (R&DD Plan) presents the work of the Flood-MAR Research Advisory Committee (RAC) and its subcommittees, multidisciplinary groups of subject matter experts across 13 research themes. The RAC was tasked to identify the research, data, guidance, and tools necessary to support and expand the implementation of Flood-MAR projects. Well-formulated Flood-MAR projects can benefit Californians and the environment through improved water supply reliability, flood-risk reduction, drought preparedness, aquifer replenishment, ecosystem enhancement, subsidence mitigation, water quality improvement, working landscape preservation and stewardship, climate change adaptation, recreation, and aesthetics.

The R&DD Plan highlights 39 priority actions that can be implemented in the near-term (with appropriate funding most can be completed within two years). Actions range from those that are relatively simple, such as convening experts and compiling existing information and making it readily available, to more complex, such as new research studies. ***The needs of end users, such as project planners, implementers and beneficiaries, must drive the implementation of the recommendations of the R&DD plan and ultimately the implementation of Flood-MAR projects.***



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Instructions:

1. Please identify a note taker for the group to help track key themes from your discussion and to report out on behalf of the group. A **separate Group Report Workbook** is provided for tracking the group's discussion. This workbook is for your personal use.
2. Review the topic's recommended priority actions and go around the table, giving each participant an opportunity to provide input. Make sure that all participants have an opportunity to share their thoughts.
3. Be additive and highlight areas of agreement.
4. At the end of each small group discussion, you will be prompted to vote on the related action that you believe should be a state priority to advance Flood-MAR projects implementation.

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TOPIC I: FORMULATING FLOOD-MAR PROJECTS WITH MULTIPLE BENEFITS

Moderator: Kris Tjernell, California Department of Water Resources

Panelists: Ann Hayden, Environmental Defense Fund
David Guy, Northern California Water Association
Laurel Firestone, State Water Resources Control Board
Tim Washburn, Sacramento Area Flood Control Agency

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Panel notes and reflections:

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Related R&DD Plan Priority Actions:

- A. **Develop a map** that prioritizes Flood-MAR based on the additional **habitat benefits** that can be achieved at those sites. (Environment)
- B. **Map subsurface geology of floodplains** to identify areas with the greatest potential for deep aquifer recharge. (Environment)
- C. Establish **methods and considerations by which floodplains can be used as direct recharge sites** and in conjunction with other recharge methods. (Recharge and Extraction Methods and Measurement)
- D. **Develop a tool to calculate groundwater recharge** that occurs when floodplains are inundated. (Environment)
- E. **Provide guidance related to beneficial use designations** associated with recharge. (Local, State, and Federal Policies and Legal Considerations)
- F. **Provide environmental permitting refinements and guidance** for potential project applicants of Flood-MAR Projects. (Local, State, and Federal Policies and Legal Considerations)
- A. **Conduct cost/benefit analysis**, including multi-benefit. (Tool and Application Development)
- G. **Create decision support tools to integrate Flood-MAR disciplines.** (Tool and Application Development)

Potential additional actions?

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TOPIC II: BUILDING NETWORKS AND COLLABORATION OPPORTUNITIES TO ADVANCE FLOOD-MAR IMPLEMENTATION

Speaker: Mike Antos, Stantec

Speaker notes and reflections:

Flood-MAR Network

RAC members identified a need for an ongoing multi-stakeholder involvement process for coordinating, communicating, and carrying out the R&DD Plan actions. In particular, many RAC members recommend the establishment of a Flood-MAR Network that may provide the following benefits:

- A collaborative that orchestrates the compilation of technical and financial assistance information to support Flood-MAR project research and implementation.
- Serve as a clearinghouse and one-stop shop for interested parties seeking information and support for developing projects.
- Ensure that data collected through the priority actions is stored and archived centrally.
- Central platform to host developing support tools.

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Questions for Group Discussion:

What should be the primary purpose of a Flood-MAR network?

Of the priority actions below, which do you think would be best supported by a Flood-MAR network?

Notes:

Related R&DD Plan Priority Actions:

- A. Document coordination and communication methods** occurring between groundwater sustainability agencies (GSAs) and land use planning agencies to develop best practices. (Land Use Planning and Management)
- B. Develop protocols for data consistency** for all planning documents. (Land Use Planning and Management)
- C. Develop a web-based platform** to allow public access to a compilation of all existing knowledge identified by the Water Quality Subcommittee. (Water Quality)
- D. Develop guidance and multi-criteria decision-making tools** to address water quality issues in Flood-MAR projects. (Water Quality)
- E. Develop an engagement practices document** for Flood-MAR. (People and Water)
- F. Develop an ethical and just framework project checklist** specifically focused on the Flood-MAR program. (People and Water)
- G. Compile existing managed aquifer recharge projects and associated data.** (Recharge and Extraction Methods and Measurement)
- H. Compile pertinent information to determine the efficiency of managed aquifer recharge projects.** (Recharge and Extraction Methods and Measurement)

Potential additional actions?

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TOPIC III: INCENTIVIZING AQUIFER RECHARGE

Moderator: Josue Medellin-Azuara, University of California (UC) Merced

Panelists: Ellen Bruno, UC Berkeley
HB Zeff, University of North Carolina
Marco Bell, Merced Irrigation District
Michael Kiparsky, UC Berkeley Law

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Proposed R&D Plan Priority Actions:

- B. Identify sources of funding** for integrated planning efforts and groundwater management. (Land Use Planning and Management)
- C. Assess groundwater ownership rights** and market issues associated with Flood-MAR. (Economic Analysis)
- D. Evaluate economic and other incentives** for Flood-MAR implementation (Economic Analysis)
- E. Develop an economic analysis guidance** document for groundwater recharge projects. (Economic Analysis)
- F. Conduct cost/benefit analysis**, including multi-benefit. (Tool and Application Development)
- G. Create decision support tools** to integrate Flood-MAR disciplines. (Tool and Application Development)

Potential additional actions?

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Proposed R&D Plan Priority Actions:

- A. Analyze reservoir and broader water resources system** to assess potential for shifting drought storage from surface water reservoirs to aquifers. (Reservoir Operations)
- B. Refine guidance and provide applicant assistance for beneficial use designations** associated with recharge. (Local, State, and Federal Policies and Legal Considerations)
- C. Provide guidance and support** for water availability analyses and associated determinations **for processing of water rights applications.** (Local, State, and Federal Policies and Legal Considerations)
- D. Develop recommendations for environmental permitting refinements** and permitting guidance for Flood-MAR project proponents and establish an interagency group (part of the Flood-MAR network) to coordinate refined permit processes with entities seeking permits. (Local, State, and Federal Policies and Legal Considerations)
- E. Identify policy linkages and governance structures.** (Tool and Application Development)

Potential additional actions?

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TOPIC V: QUANTIFYING WATER AVAILABLE FOR RECHARGE

Moderator: Stacey Sullivan, Sustainable Conservation

Panelists: Amanda Montgomery, State Water Resources Control Board
Pablo Garza, Environmental Defense Fund
Paul Peschel, Kings River Conservation District
Romain Maendly, California Department of Water Resources

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Moderator: Stacey Sullivan, Sustainable Conservation

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Panel notes and reflections:

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Proposed R&D Plan Priority Actions:

- A. **Provide guidance and support for water availability analyses** and associated determinations for processing water rights applications. (Local, State, and Federal Policies and Legal Considerations)
- B. **Improve comprehensive snowpack monitoring** (Airborne Snow Observatory and in-situ) (Hydrology Observation and Prediction)
- C. Conduct inter-model **comparison of surface hydrologic models with available historical precipitation products**. (Hydrology Observation and Prediction)
- D. **Develop a spatially distributed soil moisture network** for upper watersheds. (Hydrology Observation and Prediction)
- E. **Extend forecast-informed reservoir operation (FIRO)** to include operations for groundwater recharge, particularly for local and regional agricultural field and basin recharge opportunities. (Reservoir Operations)
- F. Build a standardized statewide geographic information system (GIS) conveyance **database of conveyance networks** that could be used for Flood-MAR projects. (Infrastructure Conveyance and Hydraulics)
- G. **Research sediment transport impacts** on conveyance networks and streams resulting from increased usage from Flood-MAR operations. (Infrastructure Conveyance and Hydraulics)
- H. **Develop light detection and ranging (LiDAR)**, topography, and bathymetry data around potential Flood-MAR project areas that are lacking this data in order to augment the GIS conveyance database. (Infrastructure Conveyance and Hydraulics)

Potential additional actions?

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TOPIC VI: DETERMINING SUITABLE RECHARGE LOCATIONS AND METHODS

Moderator: Graham Fogg, UC Davis

Panelists: Meredith Goebel, Stanford University
Thomas Harter, UC Davis
Toby O’Geen, UC Davis

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Moderator: Graham Fogg, UC Davis

Panelists: Meredith Goebel, Stanford University
Thomas Harter, UC Davis
Toby O'Geen, UC Davis

Panel notes and reflections:

[illegible]

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Proposed R&D Plan Priority Actions:

- A. Perform case studies on agricultural land-based Flood-MAR projects** completed to date. (Crop Suitability)
- B. Initiate and complete research on knowledge gaps of crop systems suitability** for MAR in California. (Crop Suitability)
- C. Develop decision support tool to determine crop suitability** for Flood-MAR. (Crop Suitability)
- D. Improve subsurface geologic data** and provide **greater accessibility** to useable and better quality data. (Soils, Geology, and Aquifer Characterization)
- E. Synthesize hydrogeologic data to identify the best locations for recharge.** (Soils, Geology, and Aquifer Characterization)
- F. Establish methods and considerations by which floodplains can be used as direct recharge sites** and in conjunction with other recharge methods. (Recharge and Extraction Methods and Measurement)
- G. Map subsurface geology of floodplains** to identify areas with the greatest potential for deep aquifer recharge. (Environment)
- H. Document areas most feasible for recharge with disadvantaged communities** that are groundwater dependent and would greatly benefit from Flood-MAR actions.

Potential additional actions?

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Panelists: Christina Babbitt, EDF
Eric Averett, Rosedale-Rio Bravo Water Storage District
Joe Choperena, Sustainable Conservation

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Proposed R&D Plan Priority Actions:

- A. Develop improved statewide water accounting to support the kinds of agreements and incentives needed for Flood-MAR, SGMA-related water plans, water markets, and enforcement of surface water rights. (Reservoir Operation)**
- B. Analyze reservoir and broader water resources system to assess potential for **shifting drought storage from surface water reservoirs to aquifers.** (Reservoir Operations)**
- C. Compile existing managed aquifer recharge projects and associated data. (Recharge and Extraction Methods and Measurement)**
- D. Compile pertinent information to **determine the efficiency of managed aquifer recharge projects.** (Recharge and Extraction Methods and Measurement)**
- E. Develop a tool to **calculate groundwater recharge that occurs when floodplains are inundated.** (Environment)**
- F. Refine guidance and provide applicant assistance for beneficial use designations associated with recharge. (Local, State, and Federal Policies and Legal Considerations)**

Potential additional actions?

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