Tehama County
Demand Management Concepts

Demand Management Working Group Meeting

DAVIDS ENGINEERING, INC

ERA Economics
Environment • Resources • Agriculture

Topics

- Introductions
- GSP implementation and background
- Demand management program concepts and examples
  - Napa Valley Subbasin
  - Madera Subbasin, Madera County GSA
  - Semitropic Water Storage District
  - Madera County Subbasins
  - Salinas Valley Subbasin
- Economic analysis and GSP implementation
- Discussion: demand management program concept

INTRODUCTIONS

Who are we?

ERA Economics
Environment • Resources • Agriculture

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Brooks Ronspies

DAVIDS ENGINEERING, INC

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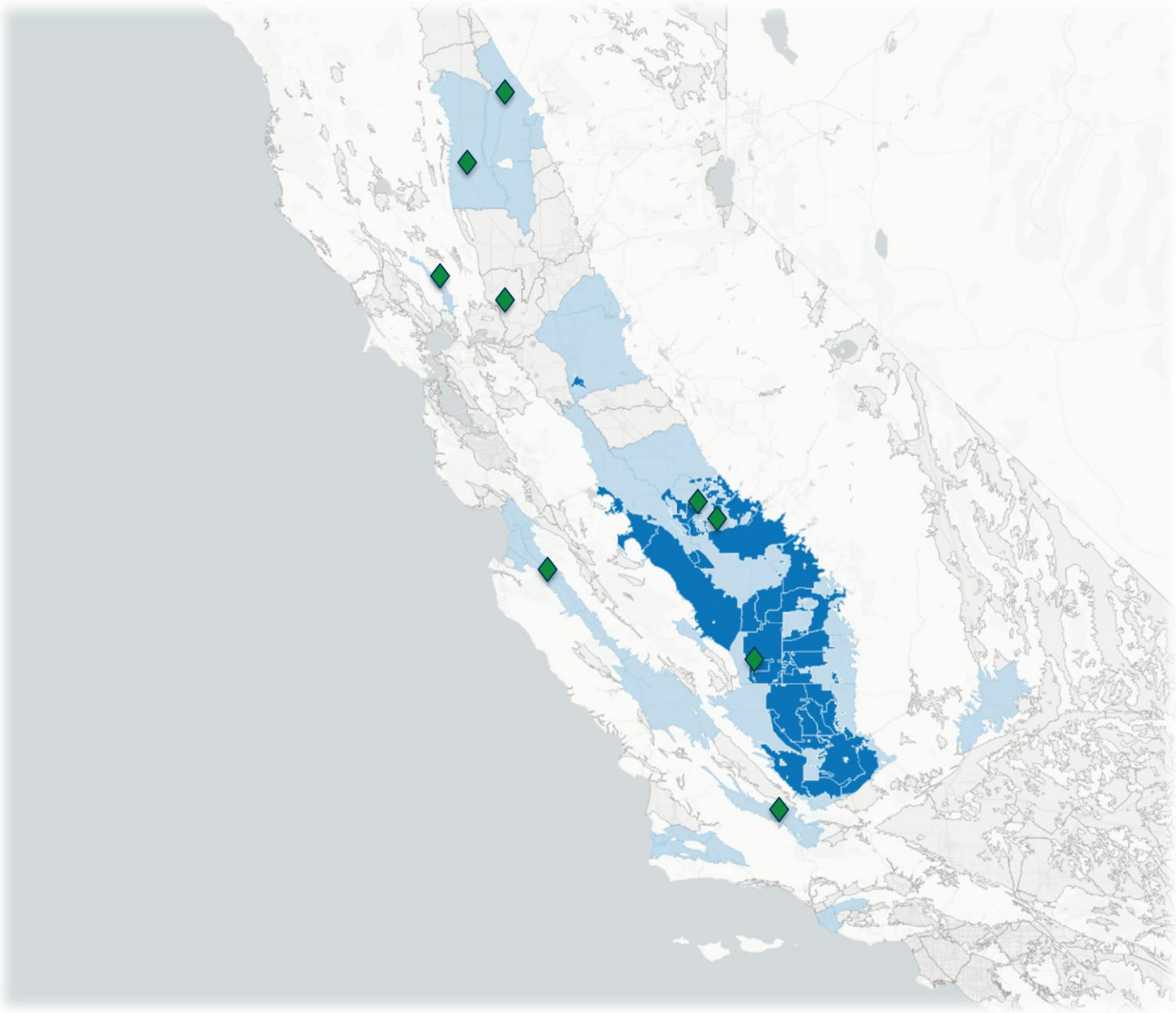


What will we be assisting with?

- What is a demand management program?
- What are different options for a demand management program and what could work in Tehama County?
- How do we identify cost-effective approaches (evaluate economic impacts) for demand management and other projects?
- **Outcome**: contribution to a technical memorandum summarizing a demand management program concepts for Tehama County

GSP IMPLEMENTATION AND BACKGROUND

Why evaluate demand management?

- GSP approval and SGMA compliance
- GSP projects and management actions

Subbasin	GSP Overdraft* Estimate to be Addressed by Projects and Management Actions
Bowman	~
Red Bluff	(31,800) AFY (~25%)
Antelope	~
Los Molinos	(2,300) AFY (~10%)
Corning	(31,200) AFY (~20%)

*information from revised GSPs

Tehama County Subbasin PMAs Overview

PMA Type*	Bowman	Red Bluff	Antelope	Los Molinos	Corning
Data Improvement	Well registration	Well registration	Well registration	Well registration	Well registration
Recharge	Various recharge projects	6 sites targeted 535 AFY yield	Various recharge projects	Various recharge projects	12 sites targeted 1,749 AFY yield
In-Lieu Projects			Utilize SW supplies		CA Olive Ranch Utilize SW supplies
Education	Workshops and materials	Workshops and materials	Workshops and materials	Workshops and materials	Workshops and materials
Non-Beneficial ET		Invasive plant removal			Invasive plant removal
Demand Management	Best practices, conservation, incentive programs	Fees, land use restrictions, fallowing incentives	Best practices, conservation, incentive programs	Best practices, conservation, incentive programs	Fees, land use restrictions, fallowing incentives

*information from 2023 GSP Annual Reports

DEMAND MANAGEMENT PROGRAM PLANNING

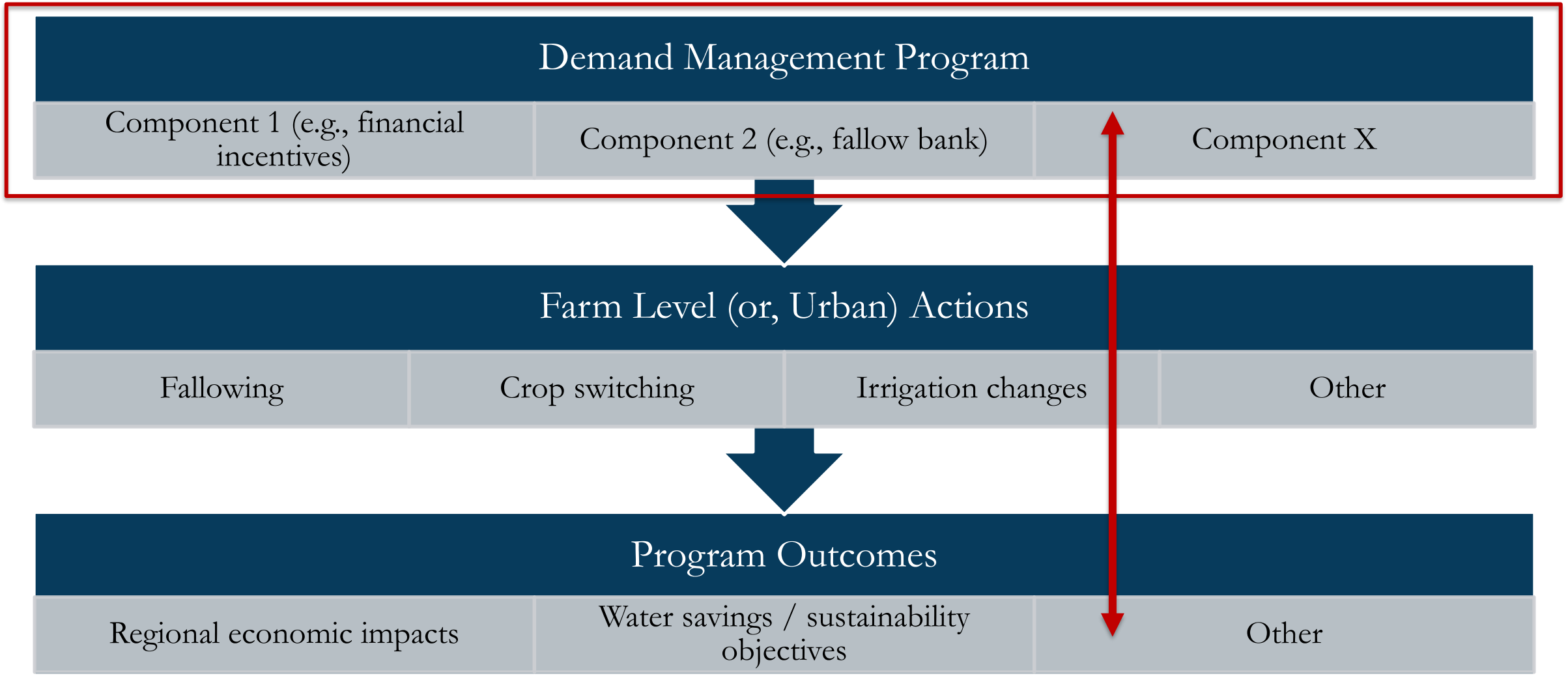
Demand Management Approaches

Allocations

Voluntary Incentive-Driven Programs

Hybrid

Demand Management Program Framework

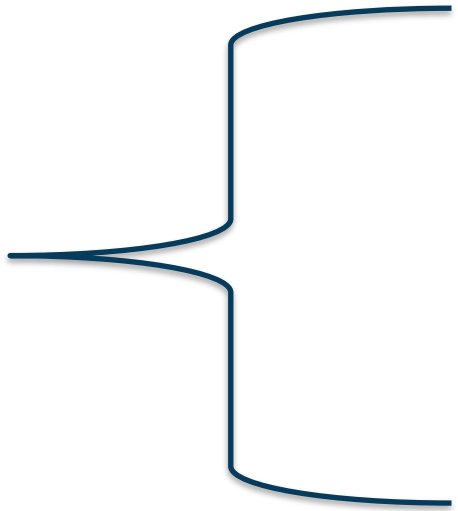


Program Development in Practice

- Some considerations
  - What program components and actions are technically feasible?
  - What are the costs of different actions (e.g., to a grower) and components (e.g., to the GSA)?
  - What are the regional economic implications?
  - Is the program the same for the entire county?
  - When are program components implemented?
  - How will (components of) the program be funded, who pays, and how much?
  - How do we measure water savings?
  - How to incentivize voluntary adoption / participation?
  - Does an action save gross pumping or net use?
- Today: case studies of other areas as examples for discussion
  - Outcome: frame county demand management program

Demand Management Overview and Prior Meetings

Example Components / Actions
Land repurposing
Reduced pumping (incentives/voluntary)
Irrigation and production practices
Conservation (e.g., urban)
Rotational fallowing (incentives/voluntary)
Fallow bank (incentives/voluntary)
Alternative crops
Land retirement (incentives/voluntary)
Recycled water
Water fees / financial incentives
Education / water use data
Others

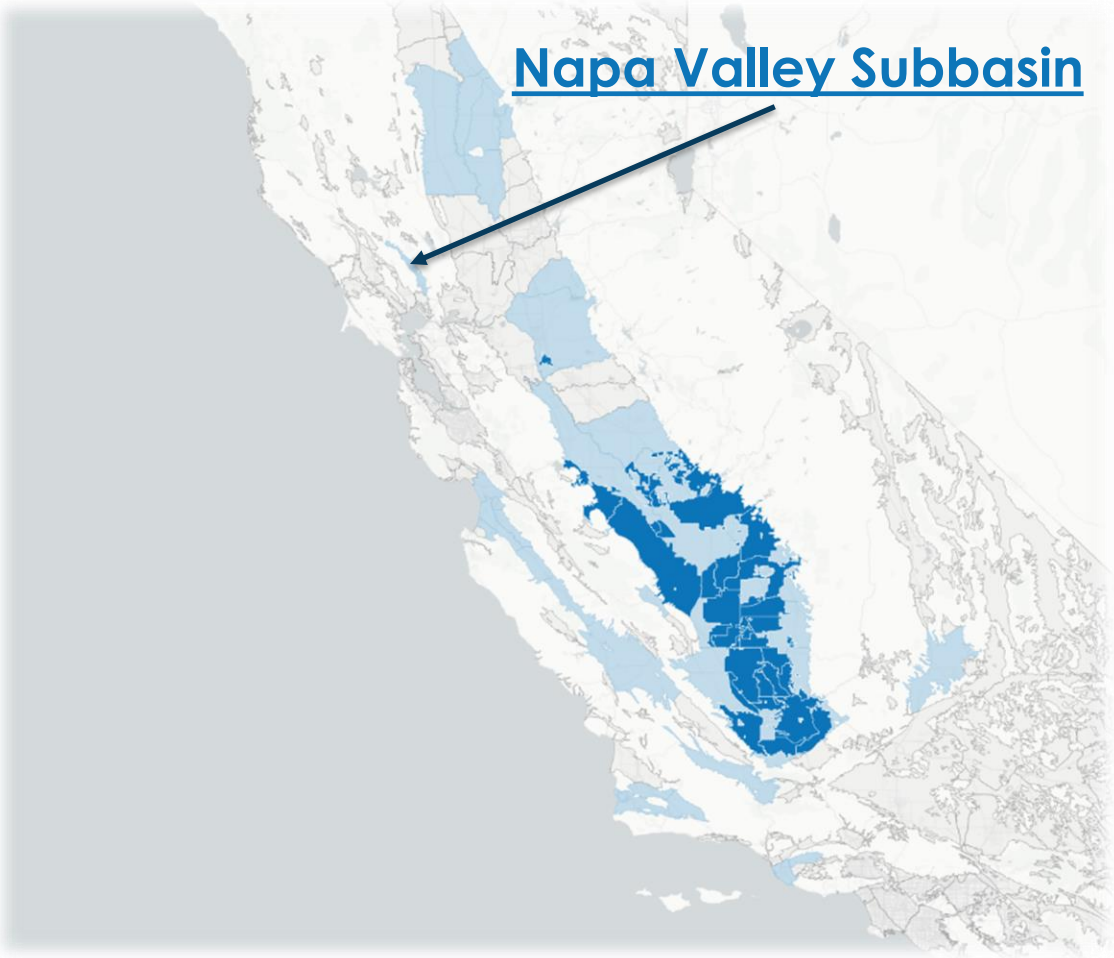


Flagged by Committee (Jan 2025 Meeting)
Allocations
Pumping restrictions
Water fees / financial incentives
Fallowing program
Recharge

CASE STUDY: NAPA VALLEY SUBBASIN

Groundwater Pumping Reduction (GPR) Program

Example Components / Actions
Land repurposing
Reduced pumping (incentives/voluntary)
Irrigation and production practices
Conservation (e.g., urban)
Rotational fallowing (incentives/voluntary)
Fallow bank (incentives/voluntary)
Alternative crops
Land retirement (incentives/voluntary)
Recycled water
Water fees / financial incentives
Education / water use data
Others



Background

- What triggered implementation?
  - GSP Advisory Committee approved pumping reduction starting with GSP adoption
  - 10% reduction applied to the Subbasin as a whole, not individual parcels
  - MT during recent drought

Program Overview

- Water Conservation Workplan
  - What actions can water users take to conserve water?
- Groundwater Pumping Reduction Workplan
  - What are program components, how are they implemented, and how is water savings measured?
- When were Workplans developed?
  - 2022 – 2023; adopted in 2024
- Implementation commenced in 2024 after Workplans were adopted

What Would Actions Cost?

- Actions analyzed
  - Water savings potential
    - Gross or net
  - Scalability
  - Historical investments
- Water conservation actions
  - All water users
  - Tailored to program implementation

Practice	Estimated Annualized Cost per AF Conserved $/AF	Estimated Potential Subbasin-wide Water Savings AFY	Adoption Timeline* Years	Overall Feasibility Ranking
Water Practices for All Users				
Water Metering	$150 - $2,500	350 - 550	Medium-Term	High
Recycled Water	$362 - $720	200 - 300	Medium-Term	High
Benchmarking	$100 - $350	300 - 1,100	Medium-Term	High
Water Practices for Vineyards (Established)				
Drip Irrigation	$2,800 - $9,200	75 - 250	Near-Term	Medium
Distribution Uniformity	$175 - $450	500 - 2,100	Near-Term	High
Plant Water and Soil Moisture Monitoring	$155 - $3,340	1,000 – 2,000	Near-Term	High
High Tech, Low Labor	$350 - $1,450			
Medium Tech, Medium Labor	$740 - $3,340			
Low Tech, High Labor	$155 - $1,170			
Cover Cropping	$5,000 - $18,000	50 - 550	Medium-Term	Low
Canopy Management	$3,500 - $5,000	200 - 300	Near-Term	Medium
Water Practices for Vineyards (New Plantings)				
Row Orientation	No additional cost	200 - 325	Long-Term	High
Rootstock Selection	No additional cost	Data Gaps	Long-Term	Data Gaps
Water Practices for Wineries				
Waterless Barrel Sanitation	$1,900 - $2,800	100 - 165	Near-Term	Low
Process Water Treatment and Reuse	Data Gaps	275 - 450	Long-Term	Medium
Water Practices for Residential, Commercial, and Hospitality				
WaterSense Devices	$775 - $1,200	500 - 575	Near-Term	High

How is the Program Implemented?

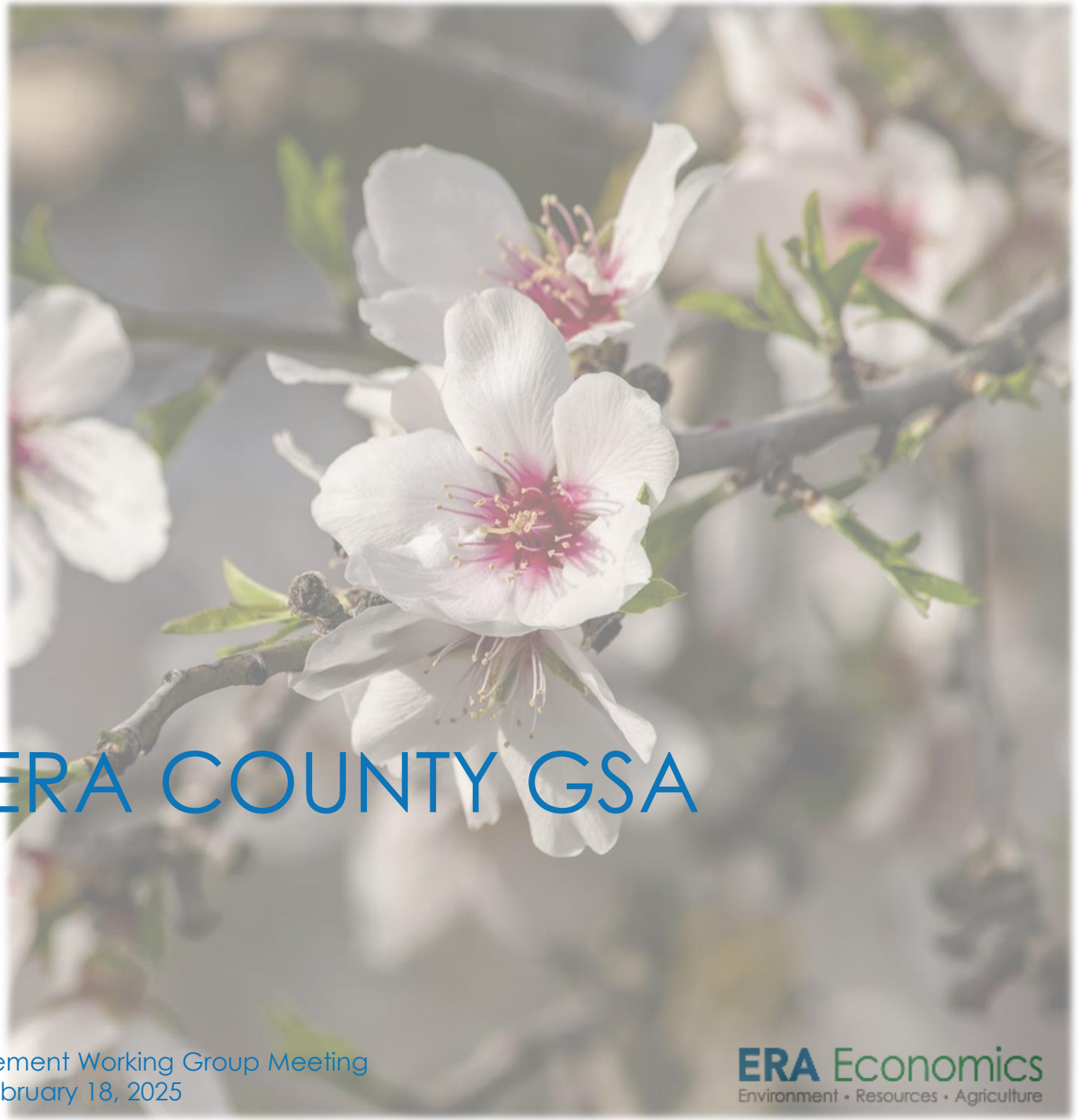
- Phased implementation
  - Concurrent components
  - Behavioral programs
- Other Considerations
  - Includes several behavioral programs
  - Options for incentives

Component 1: Education & Outreach	Component 2: Voluntary Adoption	Component 3: Voluntary Certification
• Develop educational materials • Build partnerships with local organizations • Develop notification/messaging system	• Develop incentive program for adoption of High-Priority Water Conservation Practices • Pilot a benchmarking program • Develop a voluntary meter data and reporting program	• Define minimum criteria (practices) for a certification program's members to receive a financial incentive • Develop incentives for certification

Key Discussion Points

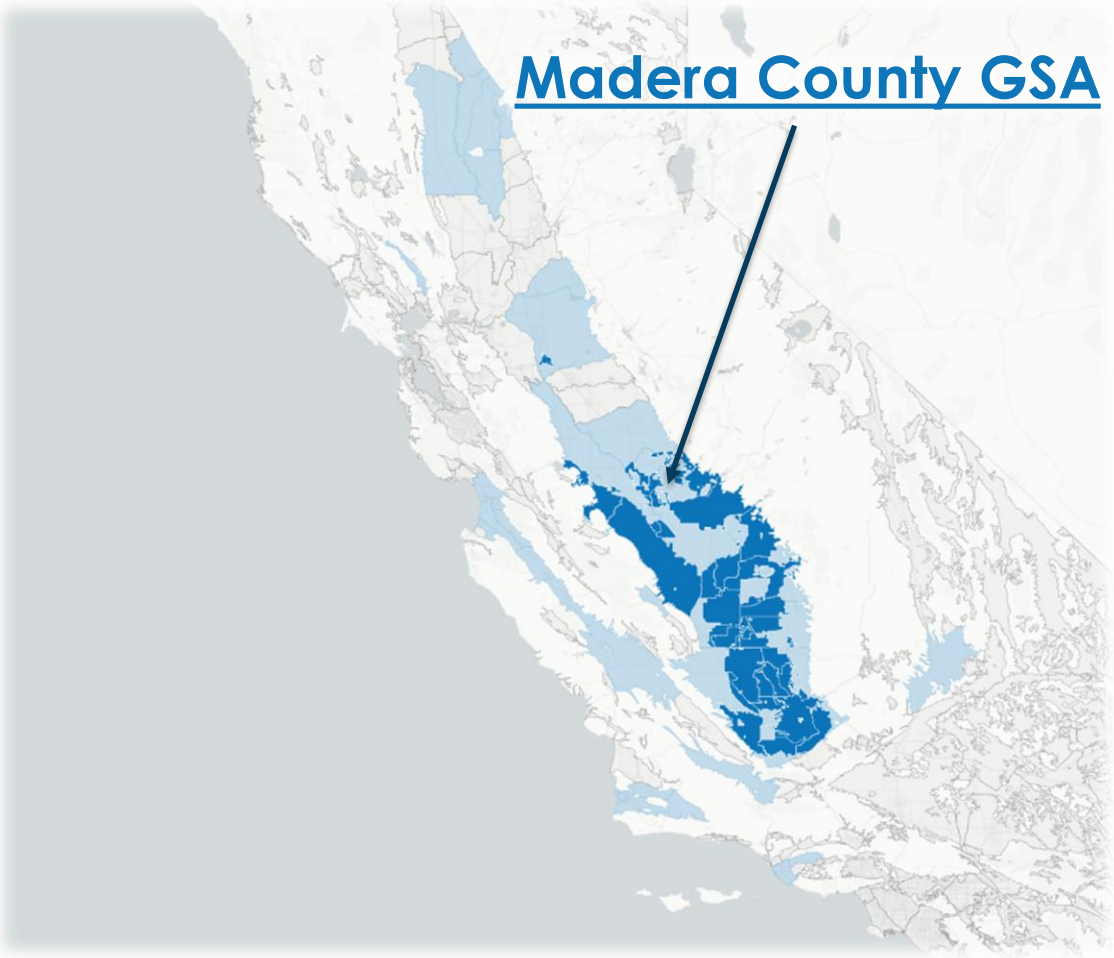
- Example of:
  - Voluntary program with different components
  - Careful cost analysis of actions
  - Evaluation of water savings (gross and net) potential
- Application across water users
  - M&I, rural, ag
- Phased implementation plan with mandatory options

CASE STUDY: MADERA COUNTY GSA



Voluntary Land Repurposing Program (VLRP)

Example Components / Actions
Land repurposing
Reduced pumping (incentives/voluntary)
Irrigation and production practices
Conservation (e.g., urban)
Rotational fallowing (incentives/voluntary)
Fallow bank (incentives/voluntary)
Alternative crops
Land retirement (incentives/voluntary)
Recycled water
Water fees / financial incentives
Education / water use data
Others -- Allocations



Background

- What triggered implementation?
  - Demand management is part of core GSP implementation for Madera County GSA (MCGSA)
  - This is one of several demand management programs

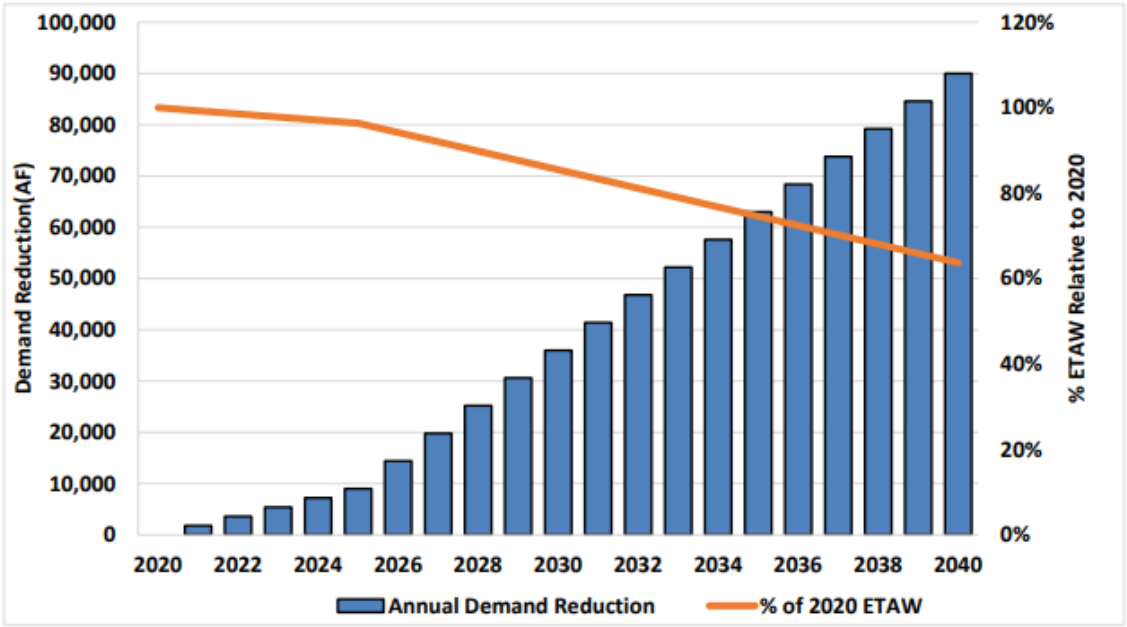


Figure 4-4. Madera County Demand Management Program

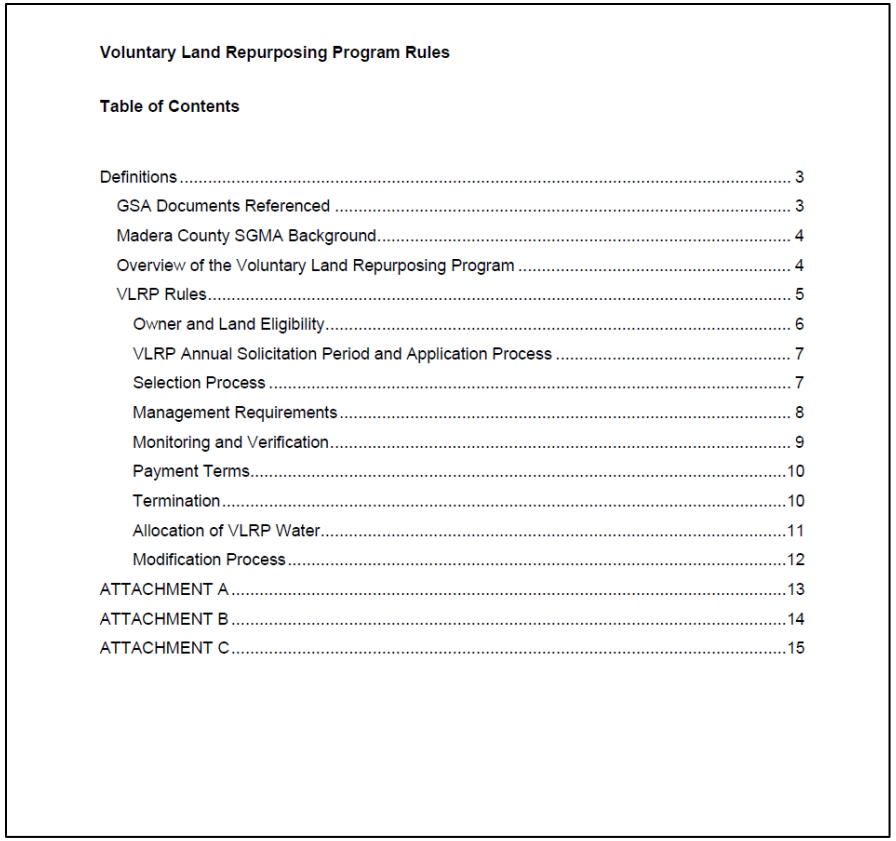
2020 Madera Subbasin Joint GSP. Chapter 4. PMAs

MCGSA Allocation

- Economic analysis for GSP
  - Glide path
  - Transitional Water
- Components
  - Transitional Water (TW)
  - Sustainable Yield
  - Surface Water Recharge
- Key rules
  - 2%/year increasing to 5%/year reduction in TW
  - Management within a Farm Unit
  - Penalties
  - Recharge accounting system

Program Overview

- What is the VLRP?
  - Temporary fallowing program
  - Operates as a fallow bank
- When was it developed?
  - Concept included in GSP
  - Development in 2020/2021
  - Adopted in 2022
- How was it funded?
  - SALC planning grant
  - Landowner funding (rates on hold)
  - Other potential grant funding



Voluntary Land Repurposing Program Rules

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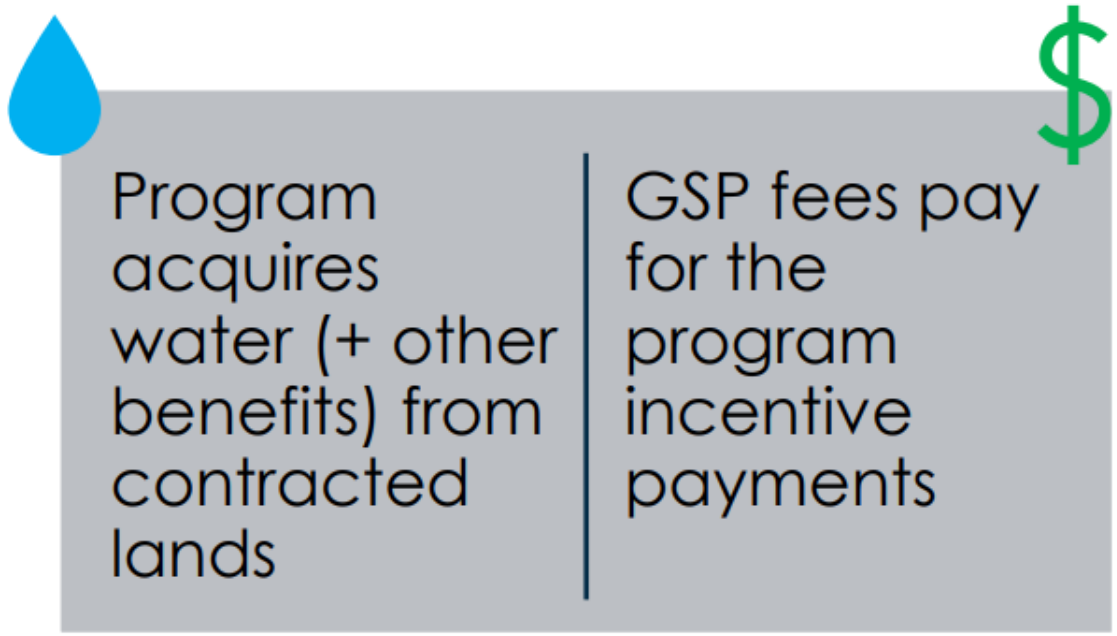
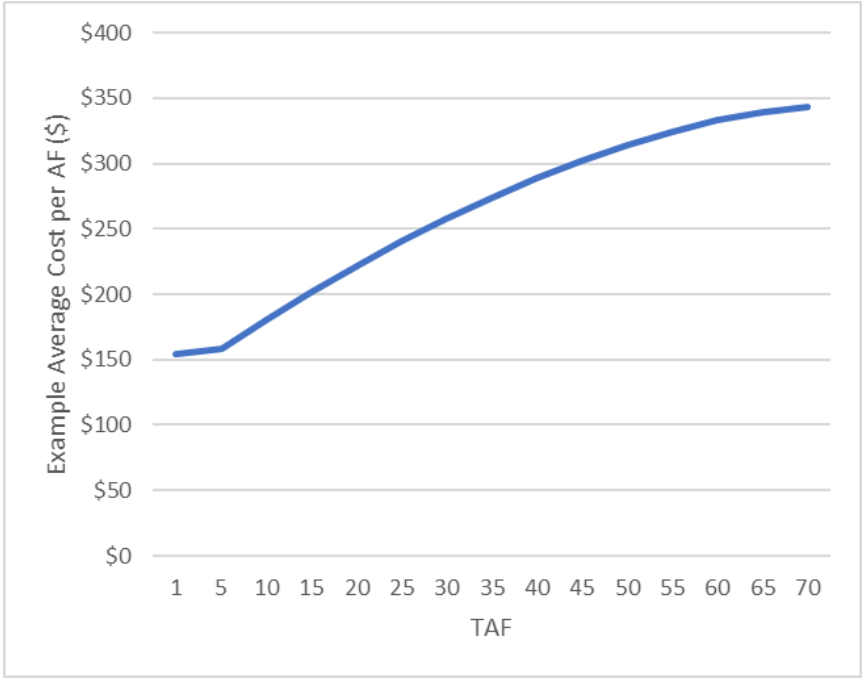
Fallow Bank Concept

- Voluntary
- Enrollment approach
  - GSA accepts bids for payment and enrollment term
  - Ranked/selected using a reverse auction
  - Water saved available for lands that fund the program



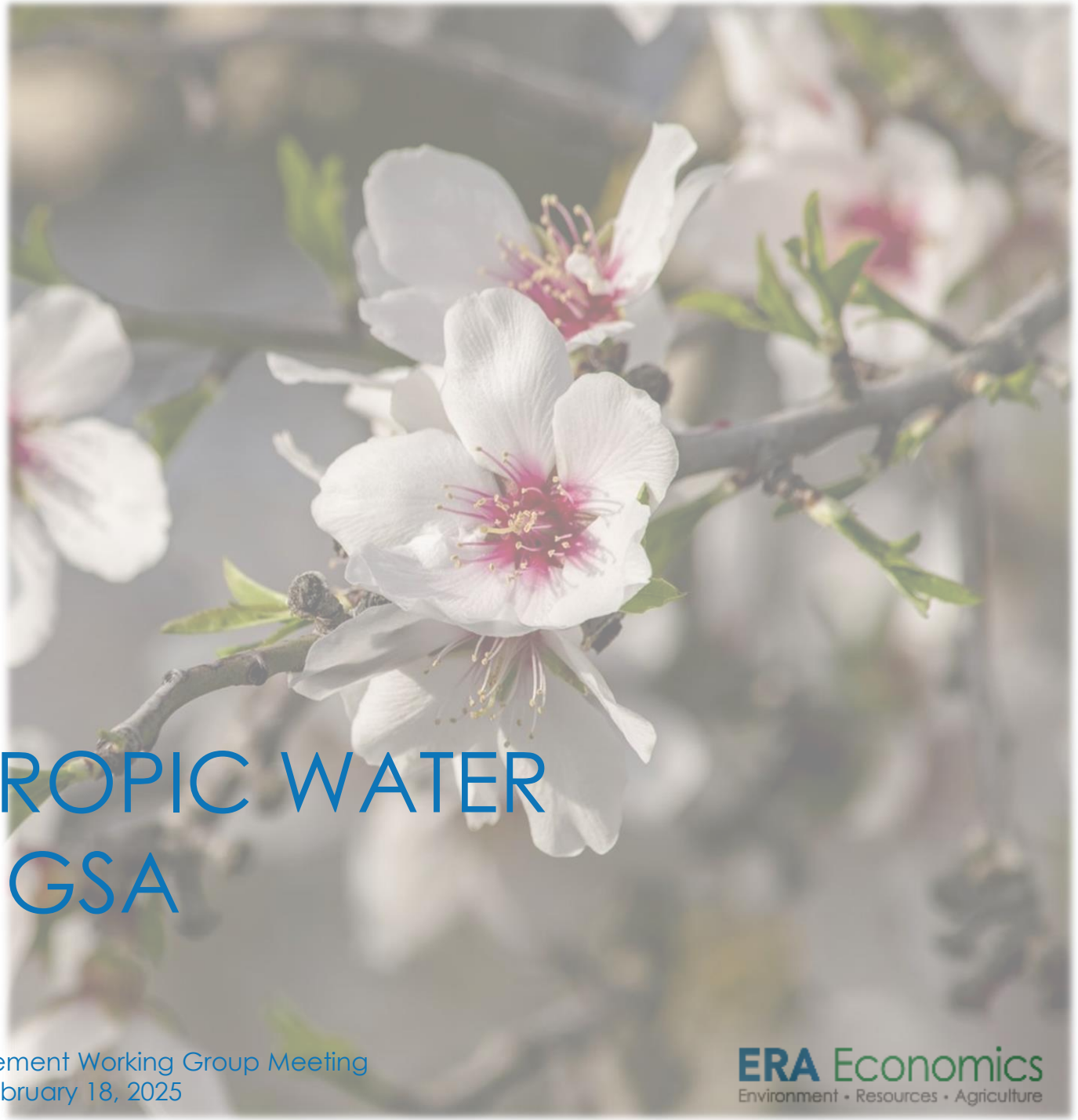
What would the program cost?

- Depends on size of the fallow bank
  - Bid approach
  - What might the program pay? $200 - $400 per AF
  - What would the program cost? $25 - $95 per acre per year, for all acres
- Other Considerations
  - Landowner input for program rules and incentives



Some Discussion Points

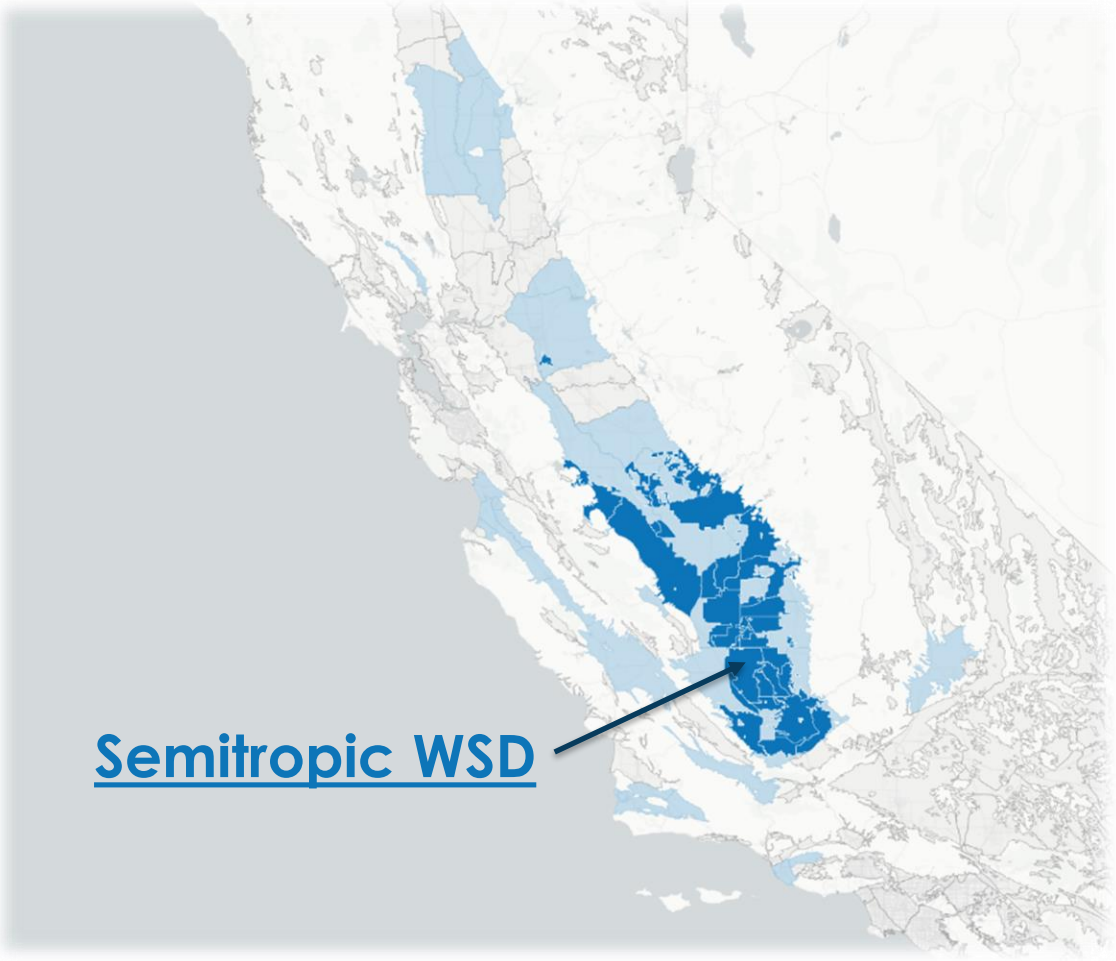
- MCGSA allocation system
- Example of a voluntary fallowing bank
- Scalability and cost
- Tailoring to other funding opportunities



CASE STUDY: SEMITROPIC WATER STORAGE DISTRICT GSA

Landowner Water Budgets (Allocations)

Example Components / Actions
Land repurposing
Reduced pumping (incentives/voluntary)
Irrigation and production practices
Conservation (e.g., urban)
Rotational fallowing (incentives/voluntary)
Fallow bank (incentives/voluntary)
Alternative crops
Land retirement (incentives/voluntary)
Recycled water
Water fees / financial incentives
Education / water use data
Others -- Allocation



Background

- What triggered implementation?
  - Demand management is part of core GSP implementation
  - This is one of several demand management programs
  - SWSD overdraft ~136,000 AFY (about 40%)

SWSD PMAs	Quantity
Allocation	**136,000 AF**
Other Demand Management	**~30,000 AF**
Projects	**~50,000 AF**
Total	**~225,000 AF**

Allocation Overview

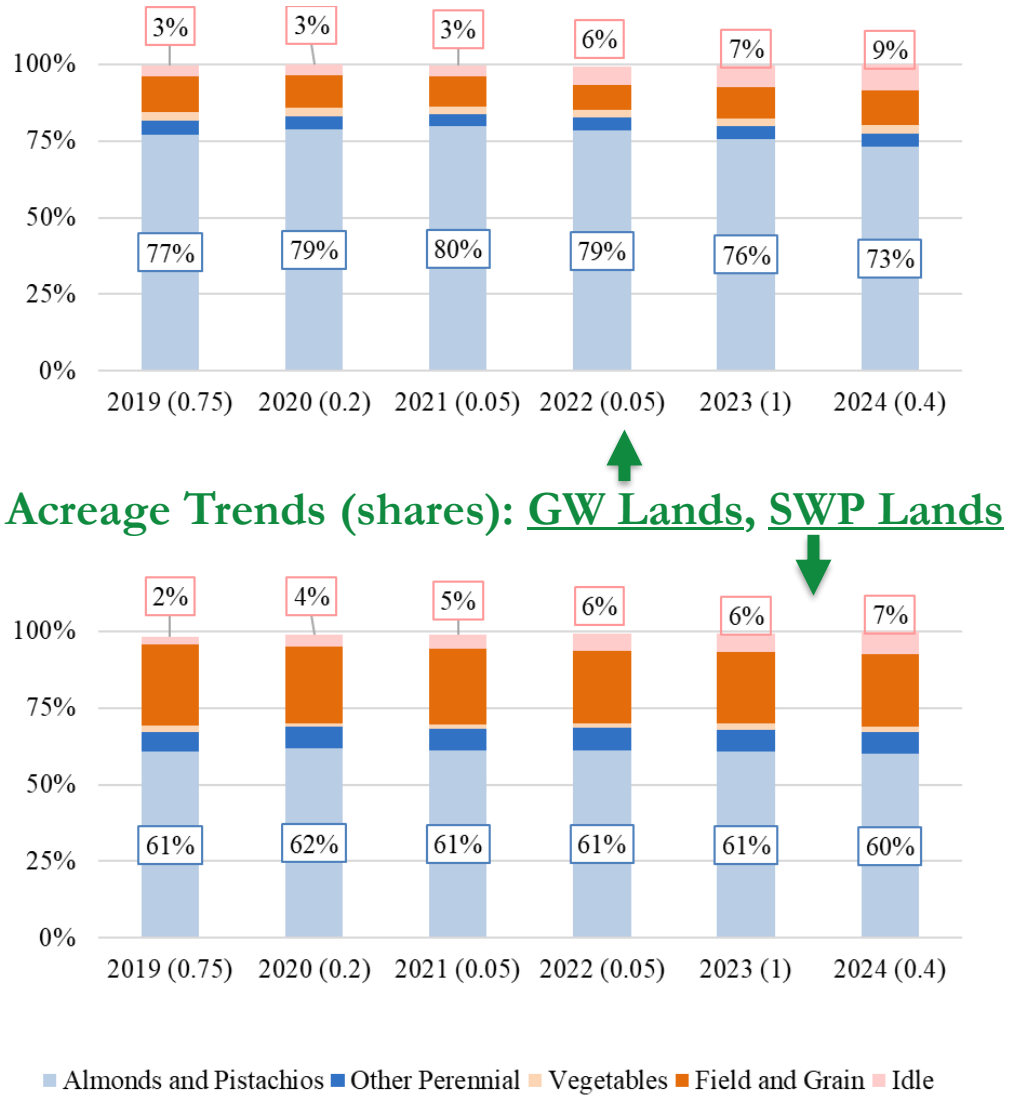
- What is the Landowner Water Budget?
  - SWP
  - Native yield
  - Supplemental purchases
  - Temporary consumptive use allowance (TCA)
- When was it developed?
  - Concept included in GSP
  - Development in 2020/2021
  - Adopted in 2022
- How does it work?
  - Penalties for over pumping
  - Flexibility within a landowner unit

Demand Reduction P/MA's Implemented After Adoption of GSP (2020)

SWSD-16 Landowner Water Budgets – An important aspect of managing the SWSD GSA's local groundwater resources is understanding the quantities of surface water and groundwater available to individual landowners in the SWSD GSA and how managing those resources over time will lead to sustainable groundwater management. The SWSD GSA adopted SWSD-16 – Landowner Water Budgets as the principal

Implementation

- Ramp-down period
  - TCA reduced by ~34,000 AF every 5 years
  - SWP and other supplies periodically updated
- Penalties
  - $500 per AF plus $1,000/day
- Tiered pricing (2025)
  - Tier 0: $5 per AF of TCA
  - Tier 1: $321 per AF if GW levels below MOs
  - Tier 2: $595 per AF if exceed budget by <5%
  - Tier 3: $1,678 per AF if exceed budget by >5%



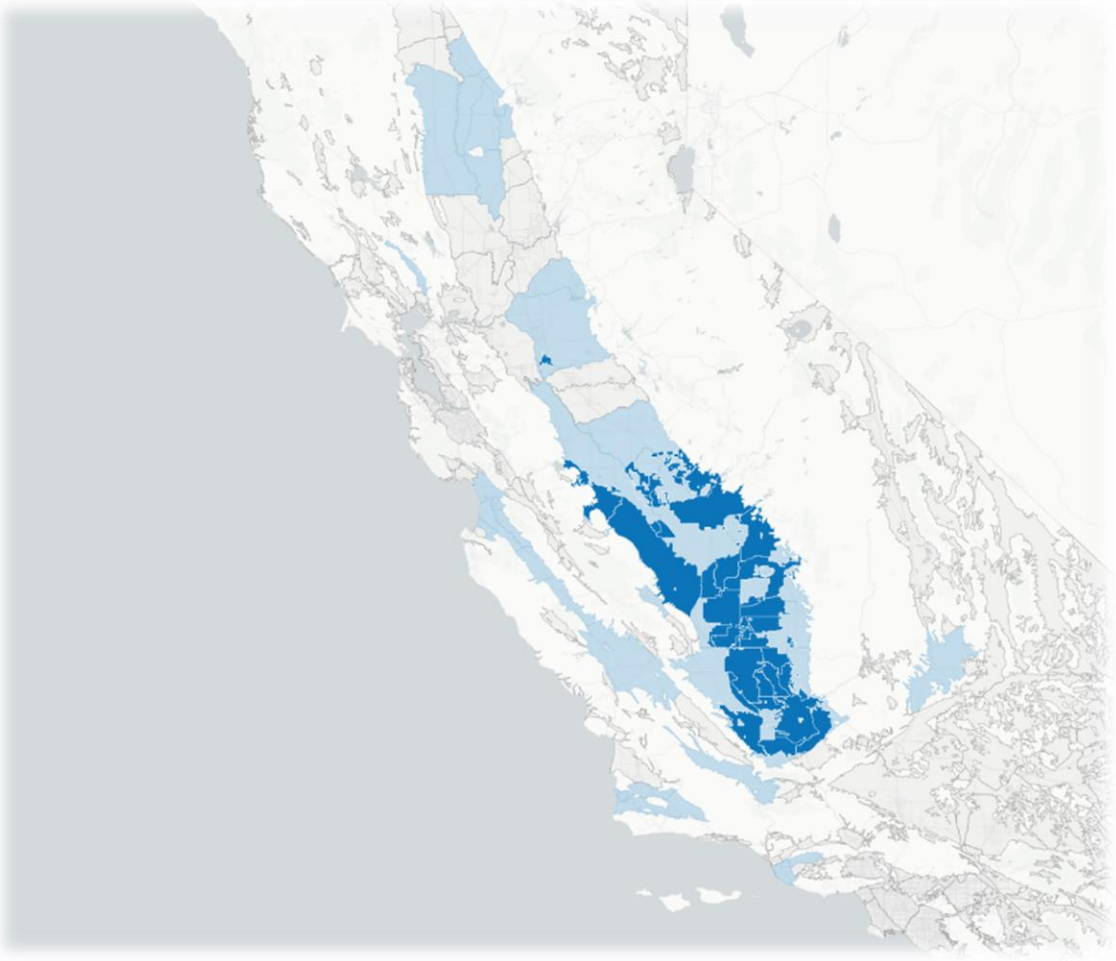
Some Discussion Points

- Allocation system
  - Fees and penalties
  - Management areas
- Different types of lands and components to the water allocation (SWP, GW, TCA, transfers, etc.)
- Flexibility within individual landowner water budgets
- Phased ramp-down of TCA

CASE STUDY: MADERA COUNTY

Multibenefit Land Repurposing Program (MLRP)

Example Components / Actions
Land repurposing
Reduced pumping (incentives/voluntary)
Irrigation and production practices
Conservation (e.g., urban)
Rotational fallowing (incentives/voluntary)
Fallow bank (incentives/voluntary)
Alternative crops
Land retirement (incentives/voluntary)
Recycled water
Water fees / financial incentives
Education / water use data
Others



Background

- What triggered implementation?
  - Demand management is part of core GSP implementation for many GSAs
  - This is one of several demand management programs
  - Grant funding

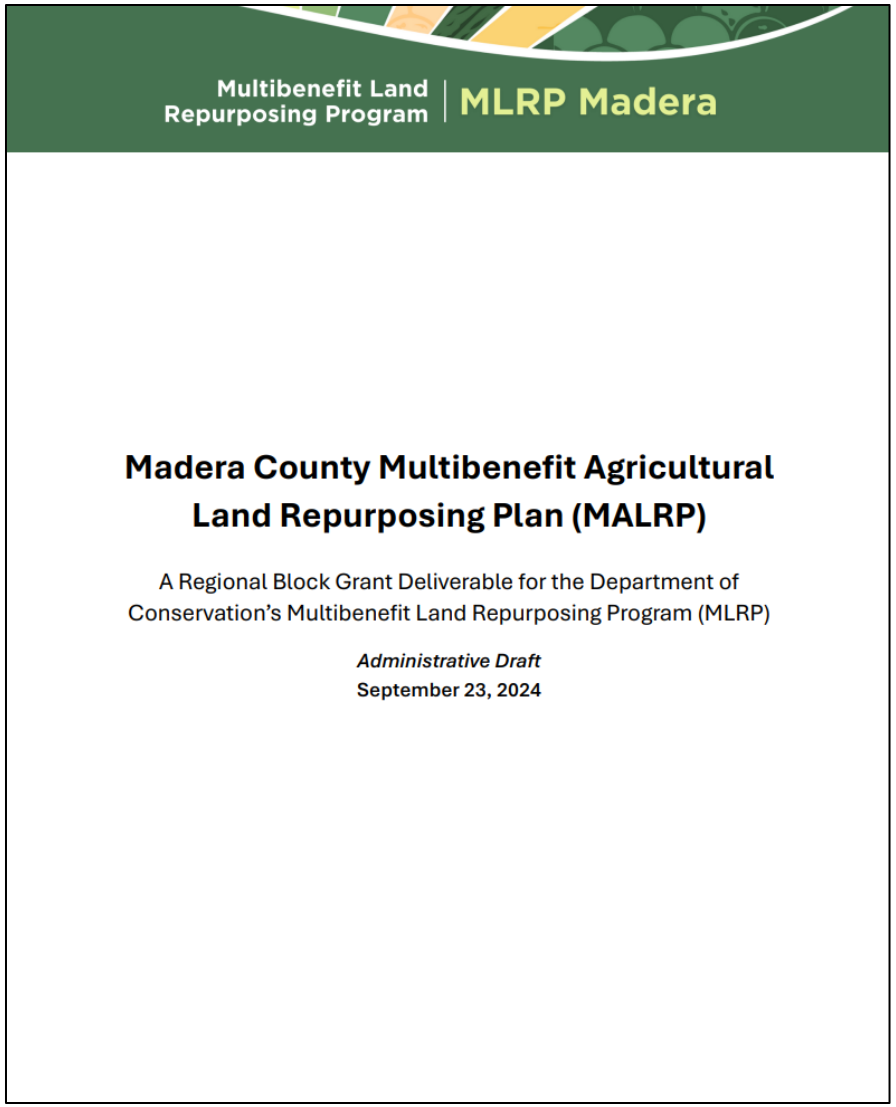
Multibenefit Land Repurposing Program (MLRP)

Multibenefit Land Repurposing Program | MLRP Madera

Support for voluntarily ag land transitions that save water and create co-benefits

Program Overview

- What is the MLRP?
  - Department of Conservation
  - Defined by local partner groups
- When was it developed?
  - Development in 2023/2024
  - Adopted in 2024
- How is it funded?
  - DOC block grant



MLRP Concept

- Voluntary
  - Must save water and provide co-benefits
- Enrollment approach
  - Open enrollment
  - Scoring process
  - Rank and select project proposals

C. Multibenefit Outcomes (Co-Benefits) and Definitions

Co-Benefit	Description
Air quality improvement	Reduces dust, chemicals or other sources of particulate matter that impact the air quality within and around the project location.
Employment opportunities	Creates new jobs or supports job security.
Tribal or cultural benefit	Provides space dedicated to traditional land uses, cultural traditions, or the arts.
Soil quality enhancement	Includes land maintenance and management practices to promote soil health or prevent erosion.
Water quality enhancement	Supports improved water quality of community or domestic wells.
Renewable energy	Creates a clean energy source that helps California reduce its climate impacts.
Habitat creation	Improves regional biodiversity supports the recovery of plants and animals that are at risk of extinction.
Recreation or community space	Offers opportunities for recreational, educational or other space to enhance community well-being.
Flood risk mitigation	Provides a diversion point or dedicated area for flood flows to reduce downstream flood risks to communities and farmland.

What will the program cost?

- Grant funded
  - Incentive payments
  - Co-benefit (public benefit) payments
  - Direct cost reimbursement
- Other Considerations
  - Scalable
  - Landowner options for project

Project Type
Community recreational area or cultural space
Dryland farming
Floodplain habitat
Less water-intensive crop
Rangeland (Managed Grazing Land)
Pollinator habitat
Recharge basin or facilities
Rotational strip cropping
Solar energy production, storage, transmission
Wildlife habitat

Category	Description
1. Direct Project Costs	Compensation for project development, implementation, operating, and maintenance costs
2. Forgone Returns	Payment to cover returns that would have been realized under the existing land use, adjusted to reflect water use and/or any income from the repurposed land use
3. MLRP Benefits	Additional bonus payment(s) for public "multi" benefits created by the project

Some Discussion Points

- Example of a voluntary program with co-benefits
  - Scalability and cost
  - Comparable opportunities?
- Fixed incentive payments with scoring for project selection
- Grant funding opportunity

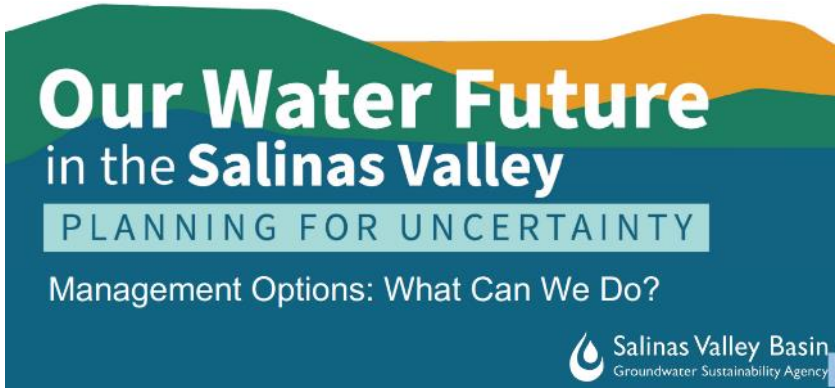
CASE STUDY: SALINAS VALLEY BASIN

Building on Existing Programs

Example Components / Actions
Land repurposing
Reduced pumping (incentives/voluntary)
Irrigation and production practices
Conservation (e.g., urban)
Rotational fallowing (incentives/voluntary)
Fallow bank (incentives/voluntary)
Alternative crops
Land retirement (incentives/voluntary)
Recycled water
Water fees / financial incentives
Education / water use data
Others

Background

- Groundwater management issues predate SGMA
  - Seawater intrusion mitigation project
  - Land conversion
  - Land retirement
- Trends
  - Robust agricultural industry
  - Population growth in the region
- GSPs
  - Management for levels, seawater intrusion, quality, storage



Demand Management Issues

- Historical investments
- Who pays for projects and any management actions?
- Fairness across subbasin boundaries
  - Markets and contracts
- Urban and agricultural water users

Some Discussion Points

- Differences in lower and upper valley areas
- Concerns about fairness
  - Allocation of water supply
  - Allocation of costs
- Substantial investment in potential projects
  - Seawater intrusion

ECONOMIC ANALYSIS AND GSP IMPLEMENTATION

Evaluating Economic Outcomes

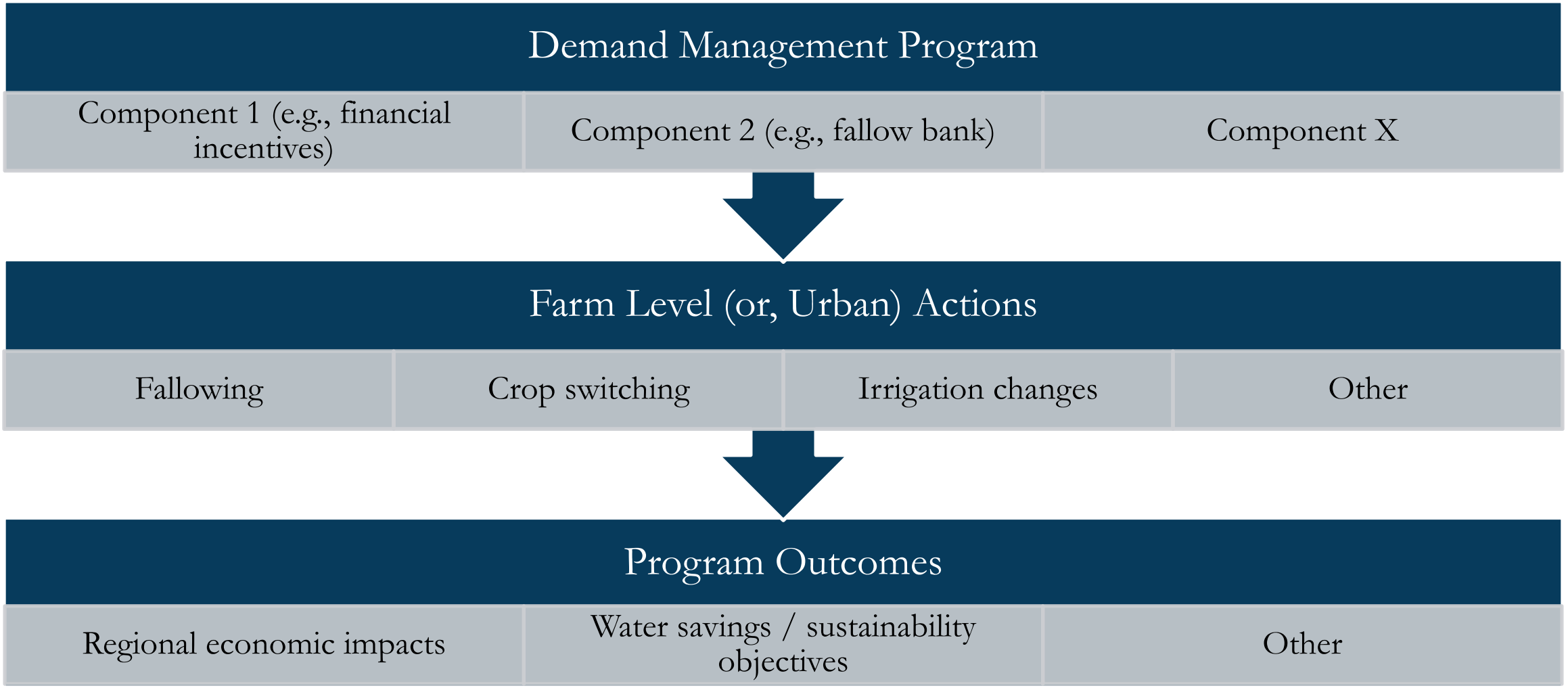
- Considerations for evaluating demand management program components
  - Grower and landowner costs
  - Regional economic impacts
  - County tax base and community impacts
  - Consideration of small and large farms
  - Allocation design
  - Well mitigation programs

Program Considerations

- Minimizing economic costs
  - Adjustment period
  - Program components
- Small farming operations
  - Funding mechanisms for programs
  - Access to capital
- Mitigation programs
  - Costs and benefits of expanding implementation and mitigating for any impacts
  - What is "significant and unreasonable"?

DISCUSSION: DEMAND MANAGEMENT PROGRAM CONCEPT

Demand Management Program Framework



Discussion / Next steps

- Frame potential components for a Tehama County demand management program
  - **Outcome (under this project as currently defined)**: contribution to a technical memorandum summarizing a demand management program concept for Tehama County

- Other questions and discussion?