

Project Details...

- Funding
 - USDA - NIFA
- Collaborators
 - Stockholm Environment Institute
 - Chuck Young, Vishal Mehta, Laura Forni
 - University of Vermont
 - Meredith Niles
 - ERA Economics
 - Richard Howitt, Duncan MacEwan



Outline

- Background
- Approach
 - Farmer Survey
 - Hydro-economic modeling
 - Participatory stakeholder process



Background

- Sustainable Groundwater Management Act (SGMA) – effective January 1, 2015
- SGMA requires the development of
 - Groundwater sustainability agency (GSA)
 - Groundwater sustainability plan (GSP)
- Yolo County is a "high" priority basin
 - Formation of GSA is ongoing
 - GSP must be developed by 1/31/2020



Background

- Earlier research (California Energy Commission and NASA)
 - Assessed farmer perceptions of climate change and adaptation strategies
 - Developed a hydrological model of Yolo County
 - Assessed management strategies for a Yolo County irrigation district

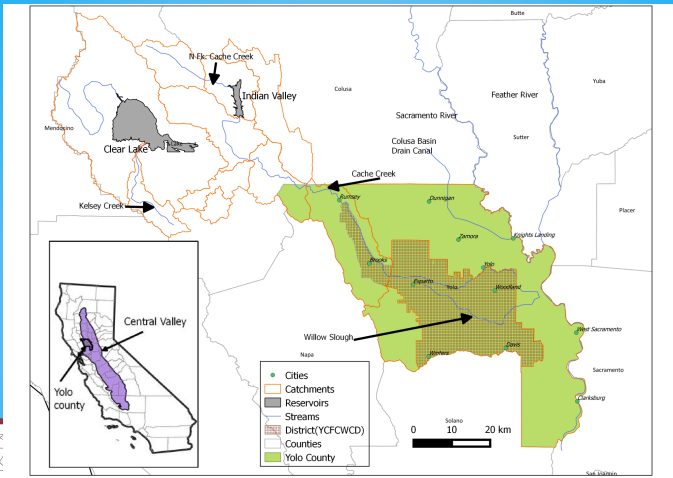


Project Objectives

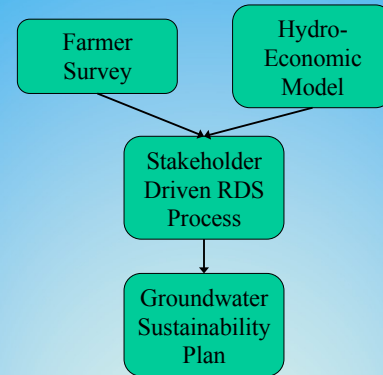
- Understand farmer concerns and attitudes related to SGMA
- Develop a hydro-economic modeling framework of Yolo County
- Work with local stakeholders to develop a shared mental model of the water resources system and develop a groundwater sustainability plan
- Share lessons learned with the broader community of water managers



Yolo County Study Region



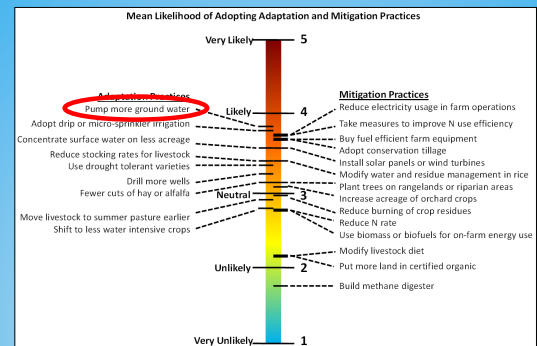
Project Work Flow



Farmer Survey

- Purpose
 - Assess farmer attitudes towards
 - Groundwater conditions
 - Undesired "results"
 - Definition of sustainability
 - Potential management approaches
- Approach
 - In-person focus groups
 - County-wide mail survey

Farmers' Likely Practice Adoption



Haden, Niles et al. 2012.

Hydro-Economic Modeling

- Purpose
 - Provide a test-bed for analysis of management strategies identified during stakeholder process
- Approach
 - Further refine hydrological model developed in earlier work
 - Link hydrological model to economic model

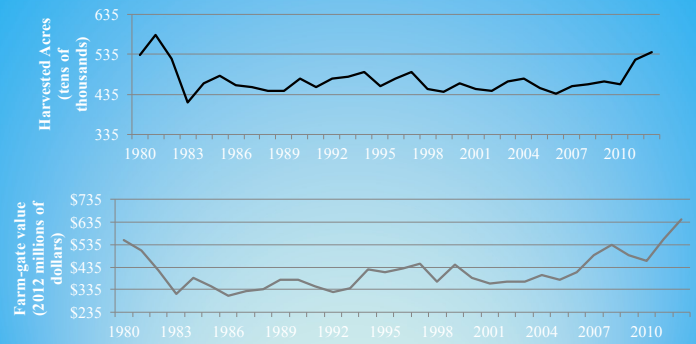
Hydro-Economic Modeling

- Hydrological Model
 - Monthly time step
 - Represents:
 - source watersheds and storage including Clear Lake and Indian Valley Reservoir
 - reservoir operations including Solano Decree
 - irrigation diversions and crop water use
 - groundwater

Hydro-Economic Modeling

- Agricultural Economics Model
 - Annual time step
 - Represents:
 - 20 crops
 - Predicts crop distribution based on
 - inputs costs,
 - crop values,
 - surface water availability and groundwater depth

Yolo County Harvested Acreage and Farm Gate Value



Participatory (RDS) Process

- Stakeholder group including representatives of irrigation districts, farmers, and municipalities
- Conduct a structured exercise to identify:
 - Uncertainties
 - Strategies (account for information gained in farmer survey)
 - Metrics
- Utilize models to test strategies over range of uncertainties and compare to metrics

Participatory Process Outcomes

- Learn of challenges faced by each sector
- Develop a common understanding of water resources system, its challenges, and solutions
- Develop a widely supported, effective groundwater sustainability plan

Summary

- Conduct a farmer survey
- Refine and develop hydro-economic models
- Conduct a stakeholder driven participatory process to identify uncertainties, management strategies, and metrics. Study, refine and select promising management strategies for implementation of the SGMA.

Thank You!