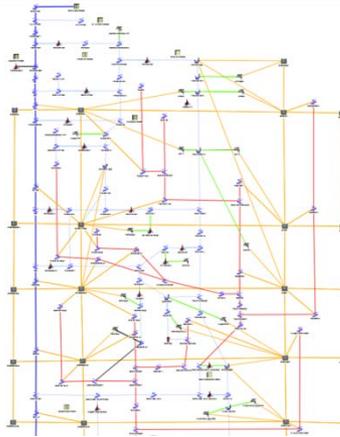
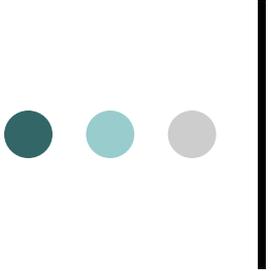


Update on the USDA project

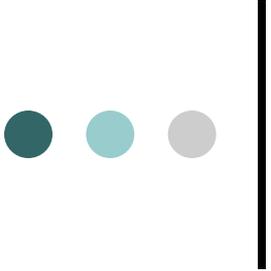


Zhuping Sheng, Ari Michelsen, Girisha Gunjunte, Co-PI, TAMU
William Hargrove, PI, UTEP



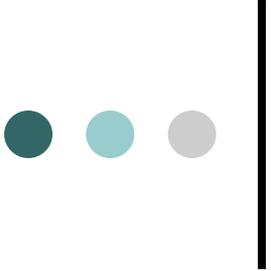
USDA Project - Summary

- **Title: Sustainable water resources for irrigated agriculture in a desert river basin facing climate change and competing demands: From characterization to solutions**
- UTEP, TAMU, NMSU, UNM, MT, UACJ
- Five Year (2014-2019)
- \$4.9 million



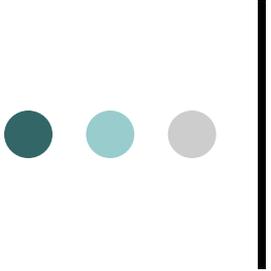
USDA Project – Key Question

- How can water be managed so that the three competing sectors—agricultural, urban, and environmental—can simultaneously thrive in a shared water system challenged by climate change, dwindling supply, and competing demands?



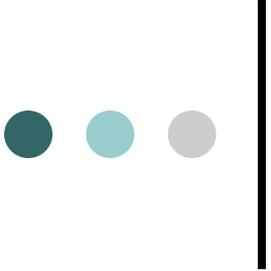
USDA Project - Hypothesis

- In spite of dwindling supplies, competing demands, and changing climate, sufficient water supplies can be achieved and managed to sustain irrigated agriculture in the desert Southwest through innovative technologies, collaborative decision making, and improved policies.



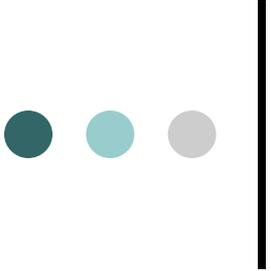
USDA Project - Goals

- Characterize key components of this complex system
 - Changing climate as a key driver of water supply and demand
 - The hydrological connections between surface and groundwater; and
 - The dynamic competing demands for water in a bi-national setting with a large metropolitan area sandwiched between irrigated agriculture both upstream and downstream, and surrounded by the Chihuahuan desert



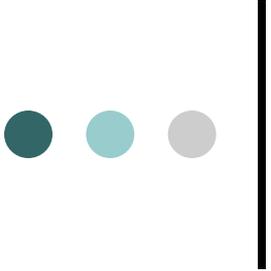
USDA Project - Goals

- Use our improved characterization and understanding of the system to develop and test technologies and policies
 - Augment useable water supplies
 - Optimize allocation of water to competing demands
 - Improve water use efficiency, conservation, and environmental impacts



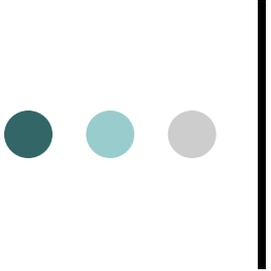
USDA Project - Objectives

- Model medium to long-term climate change, and short-term climate variability for the region
- Improve and integrate existing hydrology models, including upstream demands and flows, groundwater supplies and demands, surface-subsurface interactions, and water quality dynamics



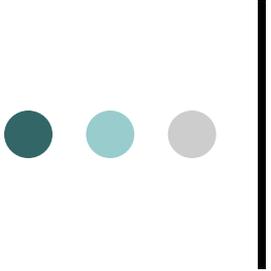
USDA Project - Objectives

- Stakeholders participation: representing the range of interests, & effective participation in modeling activities and meetings
- Develop a spatially explicit, dynamic systems model with a front interface of variables and outputs that can be used in participatory stakeholder meetings



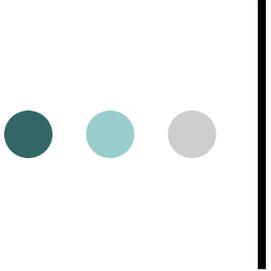
USDA Project - Objectives

- Identify and formulate technologies and policies
 - augment water supplies available to agriculture
 - optimize water allocations among competing demands; and
 - improve water use efficiency, conservation, and environmental impacts



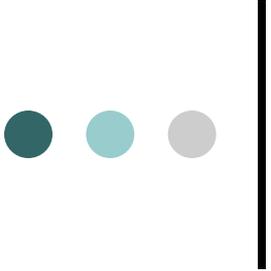
USDA Project - Objectives

- Disseminate selected agricultural technologies through traditional extension methods and outreach campaigns
- Capacity building:
 - Training water professionals
 - Engaging graduate student
 - Developing learning component in environmental sci.



USDA Project - Outcomes

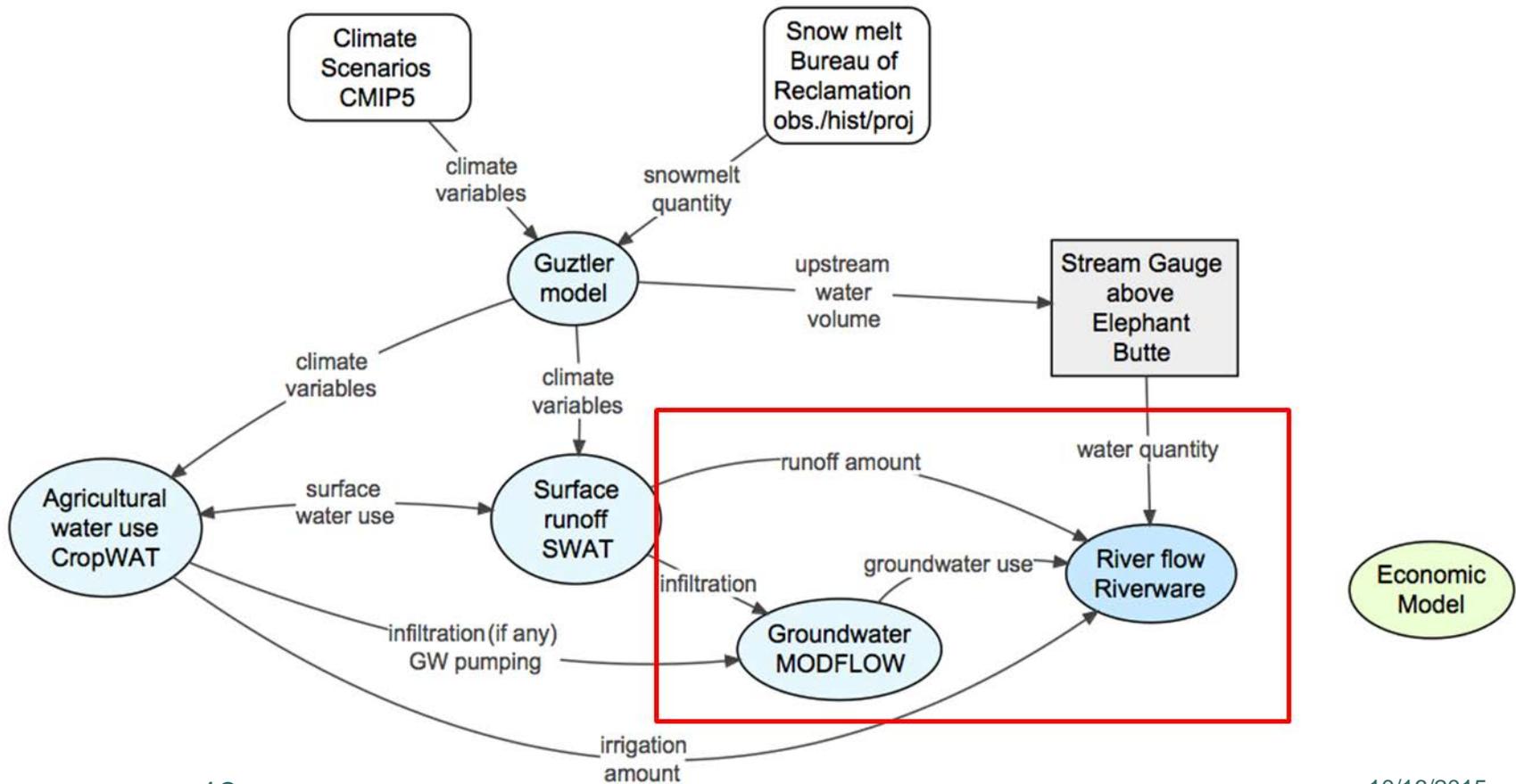
- Improve understanding for both stakeholders and researchers of the drivers of water supply and demand and solutions that are acceptable and workable at a local and regional level
- An enduring systems dynamic model that can be consulted, improved, and recalibrated

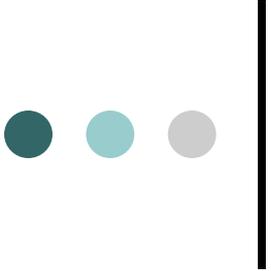


USDA Project - Outcomes

- Transferrable approaches and solutions aimed at alternative futures for arid/semi-arid basins
- A cadre of well-trained water professionals, the majority of whom will be Hispanic
- Strengthening institutions to train and develop water professionals.

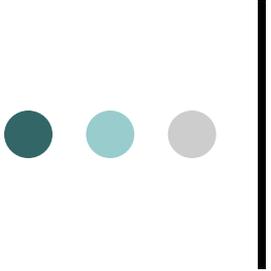
Integrated Models





Work related to RiverWare model

- Identify linkage with other models & associated data sets
- Modify the existing model as needed to meet requirements of integration of models
- Run different scenarios based on stakeholders inputs
- Update and consult with URGWOM



Benefits to URGWOM

- Promote RiverWare model to regional stakeholders
- Understand needs of other stakeholders as participatory stakeholder meetings
- Expand and upgrade the RiverWare model