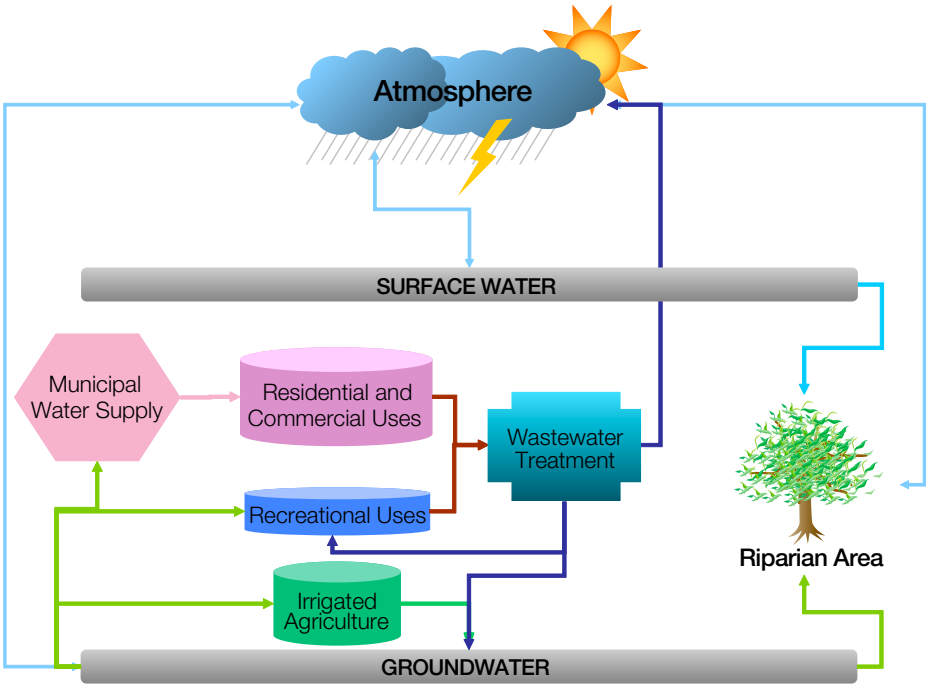
Upper SanPedro Partnership

21st Century Decision Making

Decisions, decisions. . .

The Upper San Pedro Partnership sponsored the development of an interactive, computer-based tool that can help water managers and the public use real water information to make future decisions. This **decision-support system (DSS)** was developed by researchers at the University of Arizona. It allows users to experiment with a variety of "water scenarios" in an attempt to reach sustainable yield in the Sierra Vista sub-watershed. The DSS provides feedback to the user on the impacts that those particular scenarios or decisions have on the water system as a whole. The DSS is intended to play a major role in the future of water management in the region because it integrates current data from a variety of sources.



Combining layers of ideas & information

Like a SimCity interactive game, the DSS provides the user with multiple water management choices and multiple outcomes based on the decisions the user makes. Unlike a game, the information comes from real data and monitoring stations along the San Pedro River and views the watershed as a whole. Users can explore changes in water use at the household (**micro**) level or the regional (**macro**) level. Data from the **SPRNCA** groundwater models, natural evapotranspiration rates, and human uses are integrated, allowing the user to measure what goes in and what goes out. Consumptive and non-consumptive water use can be varied, so the user can see how these factors affect water used and returned to the system. The model also addresses the influences of population growth and changing water demands. The DSS model provides a basis for understanding the impacts of a variety of decisions that can be made about regional water use and management.

Putting all ideas on the table

The DSS considers both water supply and water demands on the overall system in the sub-watershed. The **supply side** includes both surface water supply (in the river) and groundwater storage. The **demand side** looks at water use such as residential uses in each city of the Sierra Vista sub-watershed, commercial and industrial uses, irrigated agriculture uses, recreational uses (golf course, pools), and SPRNCA water use. The user can then select from approximately 60 different water use, recharge, augmentation, and conservation options and create "what if" scenarios for a variety of options. Each scenario can then be examined within a 20-year simulation period, and once the scenario is created, the model predicts how groundwater levels will respond at key locations, their relative costs, and other relevant information. This allows the public and water managers to identify cost-effective and alternative water conservation measures in an easy-to-use format.

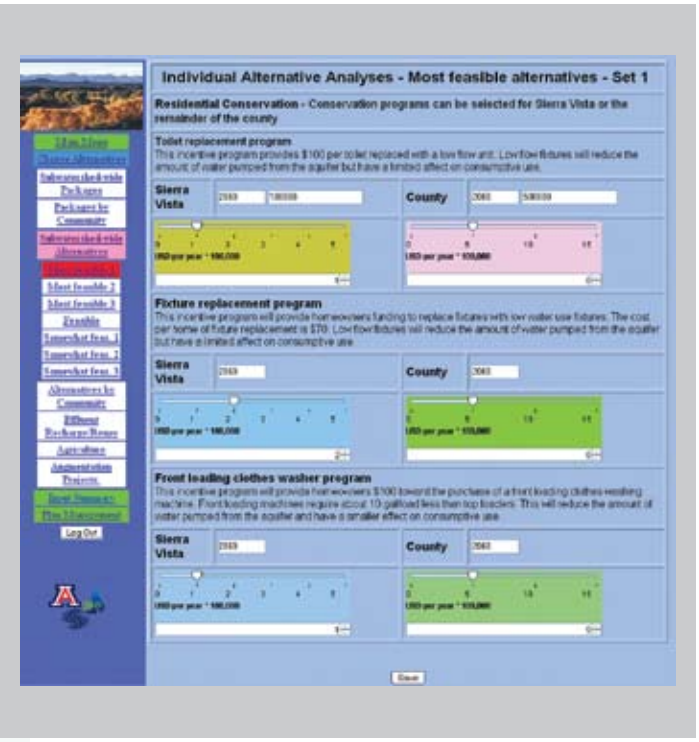
SAHRA www.sahra.arizona.edu

This fact sheet was produced in collaboration with SAHRA, the NSF Center for Sustainability of semi-Arid Region Hydrology and Riparian Areas, at the University of Arizona (www.sahra.arizona.edu). It is part of a series connecting science findings with decision-making in the Upper San Pedro Basin.

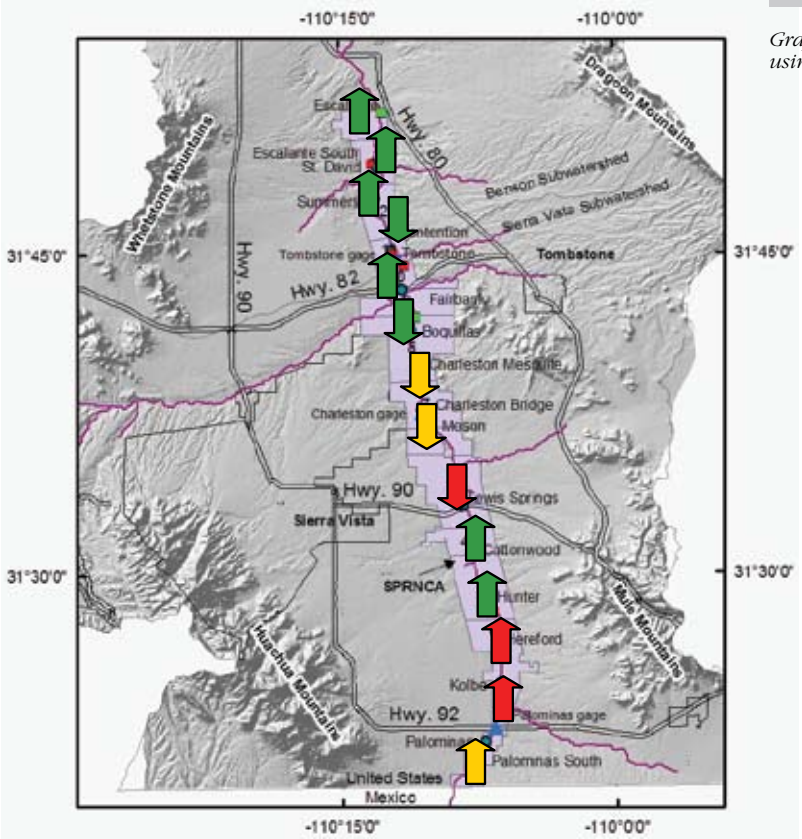
From car wash to cottonwood: The future DSS

Whether a user wants to see how much impact low flow toilets will have, or examine impacts of a farm's water use, the model can provide a way to do this accurately and quickly, and illustrate the impacts of these scenarios at 14 different points along the river. Now we can ask questions such as where to pump (or where to recharge) at locations along the San Pedro and assess the impact of those decisions.

The choices available within the DSS model will continue to grow, as new ideas emerge and provide more options for examining water management options in the region. This will allow users to begin making progress now, while refining strategies for the future, as our understanding of this complex issue continues to grow. Throughout this learning process we will improve our ability to understand the impacts that our water decisions have on our lives and our environment.



Graphical interface allows the user to select water management options using a set of slider bars.



Illustrated results show changes in riparian groundwater level. Arrows indicate the direction of change and their color shows the magnitude of change.

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