WATER FOR ALL

Water means different things to different people. Water is essential for human health and hygiene, agriculture, energy production, recreation, cultural practices, environmental health, and more.

Today, water is under extreme threat from a growing population, increasing demand, pollution, and the impacts of climate change.

Researchers at land-grant universities across the U.S. are working together with partners to protect this vital resource.

Data, models, and guidance have helped farmers, industries, government agencies, nonprofit organizations, and landowners weigh the costs and benefits of complex water management decisions and develop programs and policies that conserve and protect water for all uses.

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IMPACTS
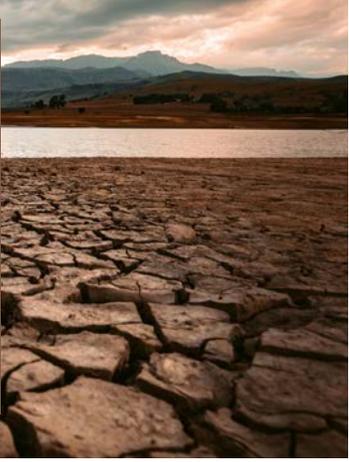
Researchers developed **accurate models** of water quality and water use to help target prevention and mitigation strategies and predict demand and potential shortages. Scientists also created weather and **climate change** models that help predict **water availability** and potential extremes like drought or flooding.

Insights on human behavior, new survey tools, and trainings are helping government agencies and non-profits develop **water policies and programs** that are cost-effective. Researchers also analyzed strategies for **resolving water conflicts** and proposed ways to use **water banking and trading** to balance supply and demand and alleviate the cost burden of implementing water protection measures.

Researchers identified ways to safely **reuse wastewater** in lieu of freshwater extractions.
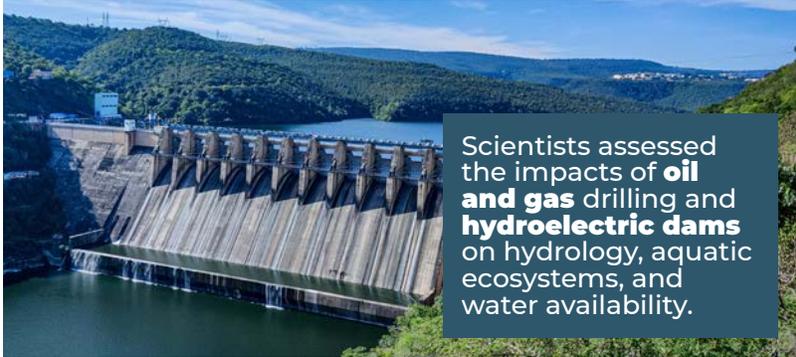
Scientists assessed the impacts of **oil and gas** drilling and **hydroelectric dams** on hydrology, aquatic ecosystems, and water availability.
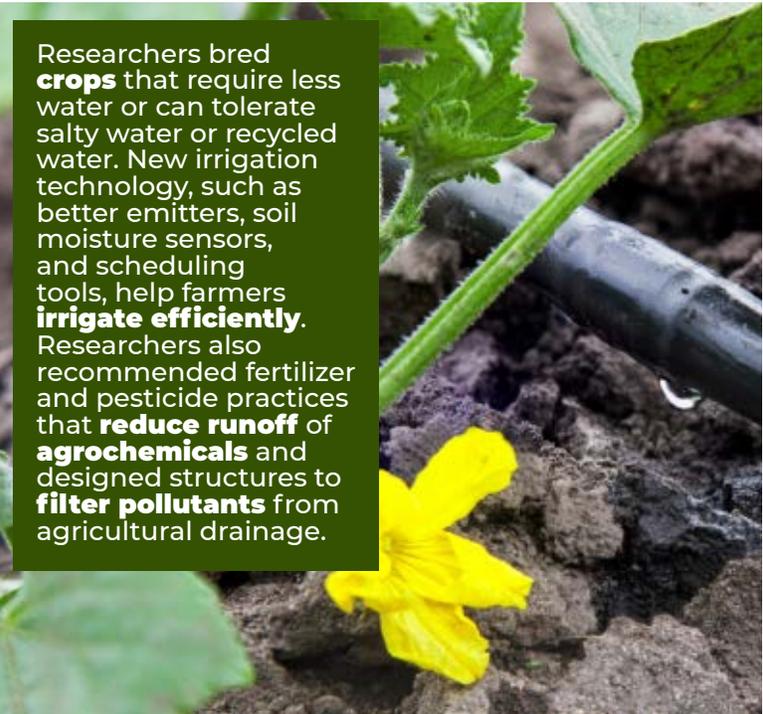
Researchers bred **crops** that require less water or can tolerate salty water or recycled water. New irrigation technology, such as better emitters, soil moisture sensors, and scheduling tools, help farmers **irrigate efficiently**. Researchers also recommended fertilizer and pesticide practices that **reduce runoff** of **agrochemicals** and designed structures to **filter pollutants** from agricultural drainage.
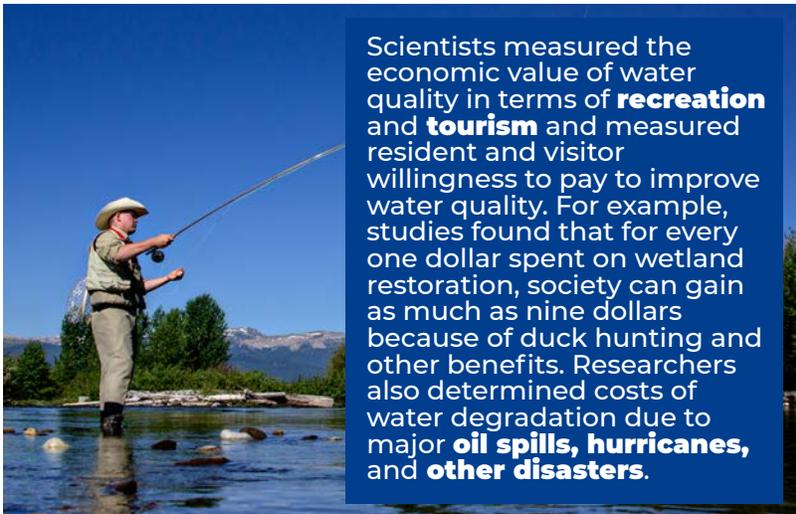
Scientists measured the economic value of water quality in terms of **recreation** and **tourism** and measured resident and visitor willingness to pay to improve water quality. For example, studies found that for every one dollar spent on wetland restoration, society can gain as much as nine dollars because of duck hunting and other benefits. Researchers also determined costs of water degradation due to major **oil spills, hurricanes,** and **other disasters**.

Scientists bred **turfgrass and ornamental plants** varieties that use less water and tolerate recycled water and developed growing media and containers that help **greenhouse and nursery plants** use water more efficiently.
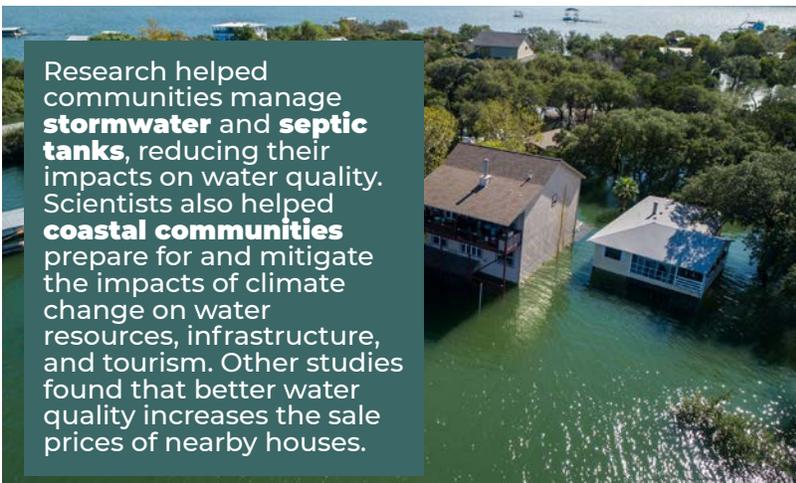
Research helped communities manage **stormwater** and **septic tanks**, reducing their impacts on water quality. Scientists also helped **coastal communities** prepare for and mitigate the impacts of climate change on water resources, infrastructure, and tourism. Other studies found that better water quality increases the sale prices of nearby houses.

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