United States Department of Agriculture
Agricultural Research Service

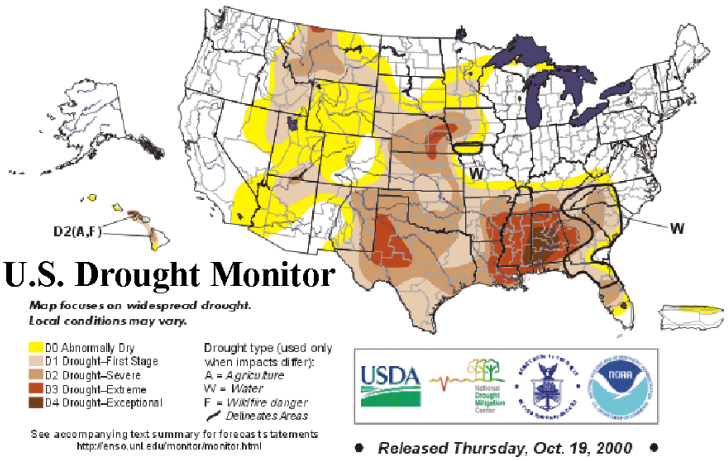
WATERSHED SCIENCE **FACT SHEET**

Drought and Water Scarcity: An Increasing Threat to a Growing Society

US drought losses are in the billions of dollars. Widespread drought conditions in south central states in 1996, 1998, 1999, and again in 2000 have raised serious concerns about our nation's vulnerability to extended periods of drought-induced water shortages. Primary concerns are food security, environmental degradation, and impeded socioeconomic growth. A coordinated and comprehensive approach to drought emergencies and water scarcity is needed to mitigate agricultural production losses and meet the increasing demand for food and water by a growing population and economy.

The need for action to prepare for drought emergencies was recognized by the 105th Congress when it enacted Public Law 105-199, the National Drought Policy Act. This Act makes the USDA responsible for developing cost-effective strategies to mitigate the effects of drought on producers, rural communities and ecosystems. Preparedness is the cornerstone of the national drought policy. The Agricultural Research Service (ARS) can provide technical and research assistance to improve drought monitoring and impact assessment.

Early warning, preparedness, and monitoring provide the first defense against drought impacts and shift the emphasis of drought response from crisis management to risk management. The US Drought Monitor is a management tool produced by a partnership between the U.S. Departments of Agriculture and Commerce and the National Drought Mitigation Center at the University of Nebraska-Lincoln.



Drought mitigation strategies and cost-effective solutions to drought and water scarcity-related social, economic, and environmental problems are being developed through research efforts by ARS. These research efforts are greatly enhanced by the availability of an ARS network of instrumented watersheds located in different climatic regions of the continental United States. Unique features of the ARS network and related water management research programs include:

- Availability of decades of intensive precipitation and runoff data to assess the vulnerability of surface water resources to drought and other climate extremes.
- Existence of expertise, data, and models to evaluate the effectiveness of alternative water conservation, water reuse, and water management efforts, and their integrated impact on water supplies and related downstream flow and water quality requirements.
- Ready use of instrumented watersheds as test beds for the development and evaluation of remote sensing, models and other new technologies to monitor drought and impacts on water resources and ecosystems.

The USDA watershed network has been a valuable resource for investigations and solutions of problems with regional water resources. Real life applications of drought monitoring and impact assessment provide another opportunity for the data from this network to contribute to the nation's economy through efficient use of scarce water resources and sustainable food production.

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Drought conditions increase the threat of wildfires across millions of acres of prairie, range and forestland. Research by ARS provides recommendations on re-vegetation options after wildfires in rangeland watersheds to re-establish native species and keep weed invasion under control. Annual weeds often proliferate after wildfires, and certain weeds can increase the susceptibility to wildfires.

Droughts cost the U.S. economy billions of dollars annually. Research conducted by ARS on its watershed network contributes to improve drought monitoring capabilities and impact assessments and to develop information for risk-based management that reduce losses by anticipation of and preparation for drought conditions. The ARS network of watersheds is also used to develop new remote sensing technologies for soil moisture measurement and to verify the performance of these technologies.

THE DAILY OKLAHOMAN
July 1998

Ag Official Puts Drought Losses At $2 Billion

Grasshopper Plague Invades State

In arid regions, water cost and availability limit the amount of land that is in production. The patchwork of cropped agricultural land in Central Arizona results from changes in cost and availability of water, and threatens agriculture's sustainability. ARS scientists are conducting research to improve the environmental sustainability and economic viability of irrigated agriculture where water supplies are limited.

Drought conditions increase the exposure of cropland to wind erosion. Research conducted by ARS helps sustaining agriculture through drought years by identifying conservation tillage practices that protect the soil from wind erosion.

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