

KANSAS, WATER SHORTAGES AND AGRICULTURE: CLIMATE CHANGE AND RISK MANAGEMENT

WATER AND AGRICULTURE

The availability of water is critical to agricultural production and the economy of the United States. Climate change and emerging weather patterns pose concerns for agricultural risk management. As is true of most science, debate will continue within climate science about specific pieces of data and what they mean. However, the overwhelming scientific evidence continues to point to the urgent need to reduce global greenhouse gas emissions; this evidence should concern farmers because of the significant new risks climate change poses to production.

Alterations in climate patterns are creating more extreme weather events, including droughts and downpours, increasing the need for new technologies and management strategies to maintain American agriculture's ability to produce food and energy for the world. Changes in the climate, precipitation and water availability could have implications for agricultural production¹ including:

- Changes in crop yield
- Variations in plant tolerance
- Prevalence of crop disease, weeds, and insect pests
- Effectiveness of herbicides and pesticides
- Shifts in areas where food is produced
- Decline in livestock feed and livestock productivity
- Increase in the level of weather-related risk to production
- Changes to crop insurance

In particular, extreme weather and water shortages, and the fact that the ability of farmers to adapt to them may lag behind the rate at which they occur, present an unpredictable and potentially costly situation for farmers. Changing water availability will make the challenge of meeting increased demand for water and food production to match economic and population growth more difficult. As water availability decreases, and demand increases, water shortages become even more likely.

ANALYSIS

Tetra Tech, a highly-respected consulting firm used by the electric and other industries, has conducted a new analysis which shows on a county-by-county basis the risk that water demand will outstrip supplies, if no other remedial actions are taken.² The analysis combines water



demand projections based on current trends in growth – particularly of population and energy demand – with renewable water supply projections.

To be clear, it is not intended as a prediction that water shortages will occur, but rather that they are more likely to occur. As a result, the pressure on public officials and water users like farmers to manage demand and supply will be greatest in these regions.

CLASSIFICATION

Counties are classified as ‘at-risk’ based on the following criteria: projected demand for water from rain and snowmelt; projected demand from groundwater; susceptibility to drought; increases in freshwater withdrawals; and increase in summer shortages. Counties meeting two of the criteria are classified as “moderately at-risk”; those meeting three or more are classified as “highly at-risk”; and those meeting four or more are classified as “extremely at-risk.” Counties meeting less than two criteria are considered to have low risk for water shortages.

IMPACTS IN KANSAS

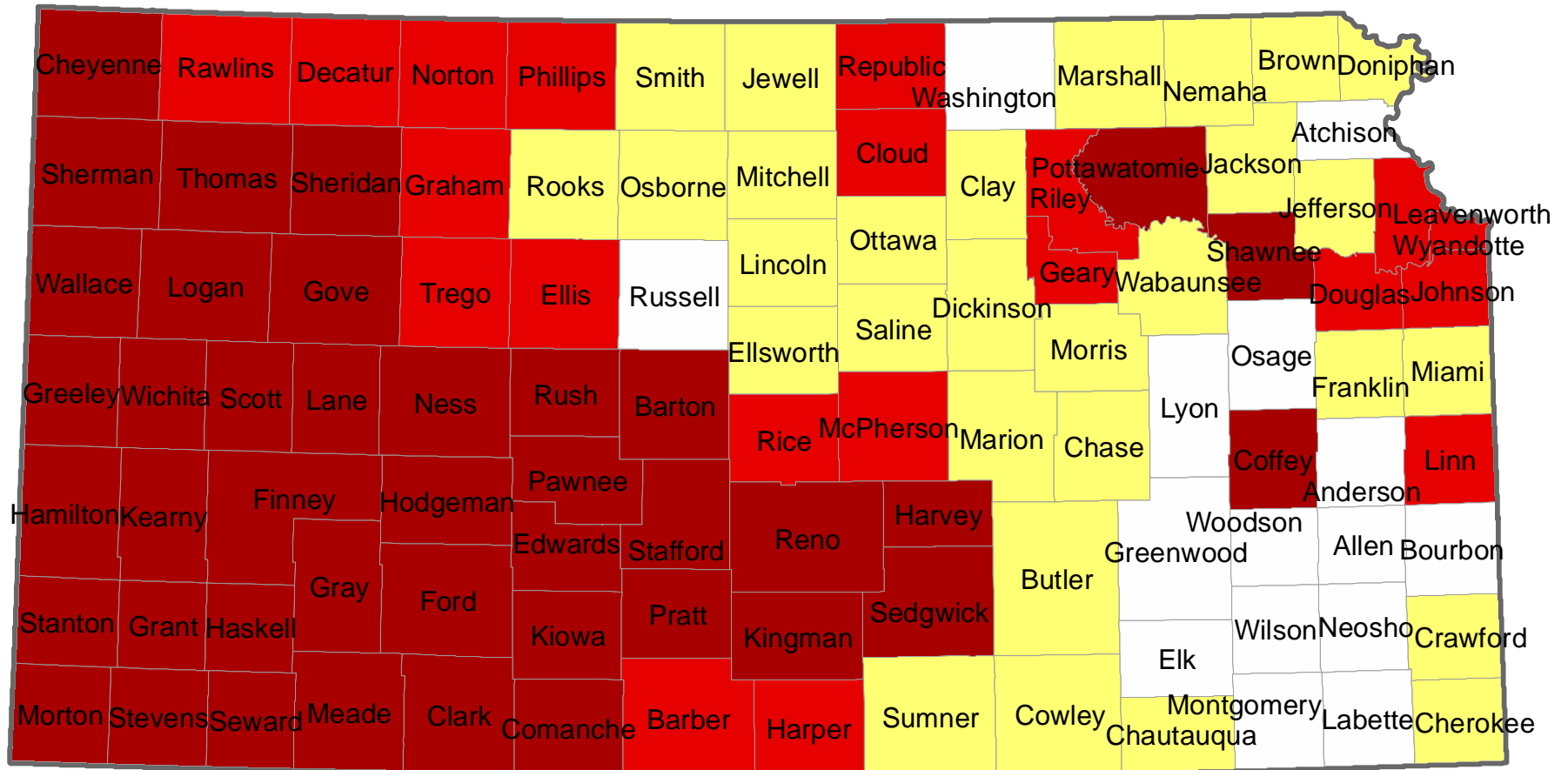
The potential for water shortages in these at-risk counties will clearly pose challenges for existing agricultural production and practices, as well as the local economy. For example, crop production³ in the state’s 90 at-risk counties was worth approximately \$4,200,000,000 in 2007. This includes about \$1,580,000,000 worth of corn, \$1,350,000,000 worth of wheat and \$556,000,000 worth of soybeans.

¹ Based on information from USDA and the US Global Change Research Program, Climate Change Impacts by Sector: Agriculture, 2009. Retrieved from <http://globalchange.gov/publications/reports/scientific-assessments/us-impacts/climate-change-impacts-by-sector/agriculture>.

² See full report “Evaluating Sustainability of Projected Water Demands Under Future Climate Change Scenarios,” Tetra Tech Inc. 2010” for detailed methodology and definition of terms (<http://www.tetrattech.com/>.)

³ US Department of Agriculture, 2007 Census of Agriculture (http://www.agcensus.usda.gov/Publications/2007/Full_Report/index.asp.)

Kansas: With Climate Change Impacts



Water Supply Sustainability Index (2050)
 Number of Counties for each Category in Parentheses

