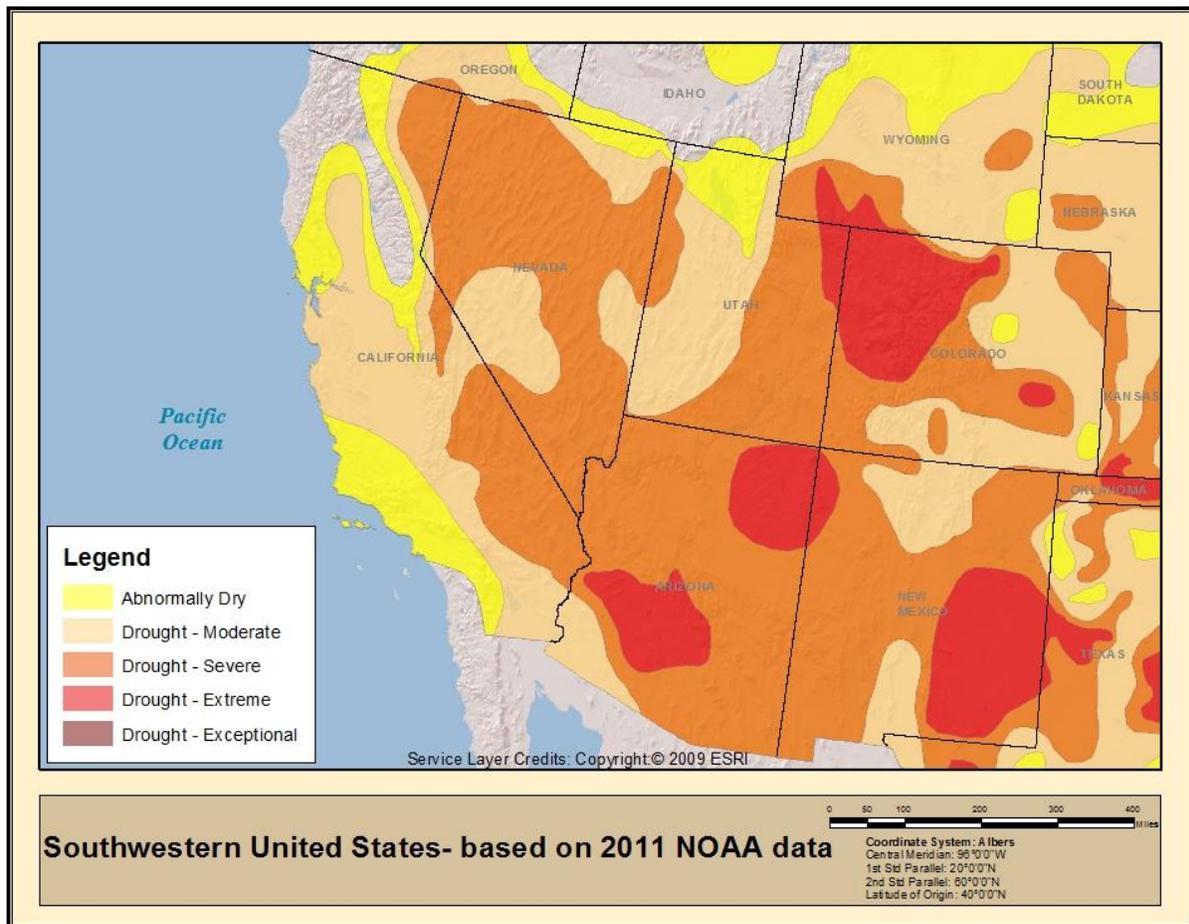


## Utton Research Notes: Climate and Agriculture in the Southwest – September 2012

Climate change will alter almost all-important aspects of Southwestern agriculture. Drought, reducing both soil moisture and availability of water for irrigation, is already harming much of the Southwest. Climate change is predicted to both generally decrease western water availability, and increase the length and occurrence of droughts.



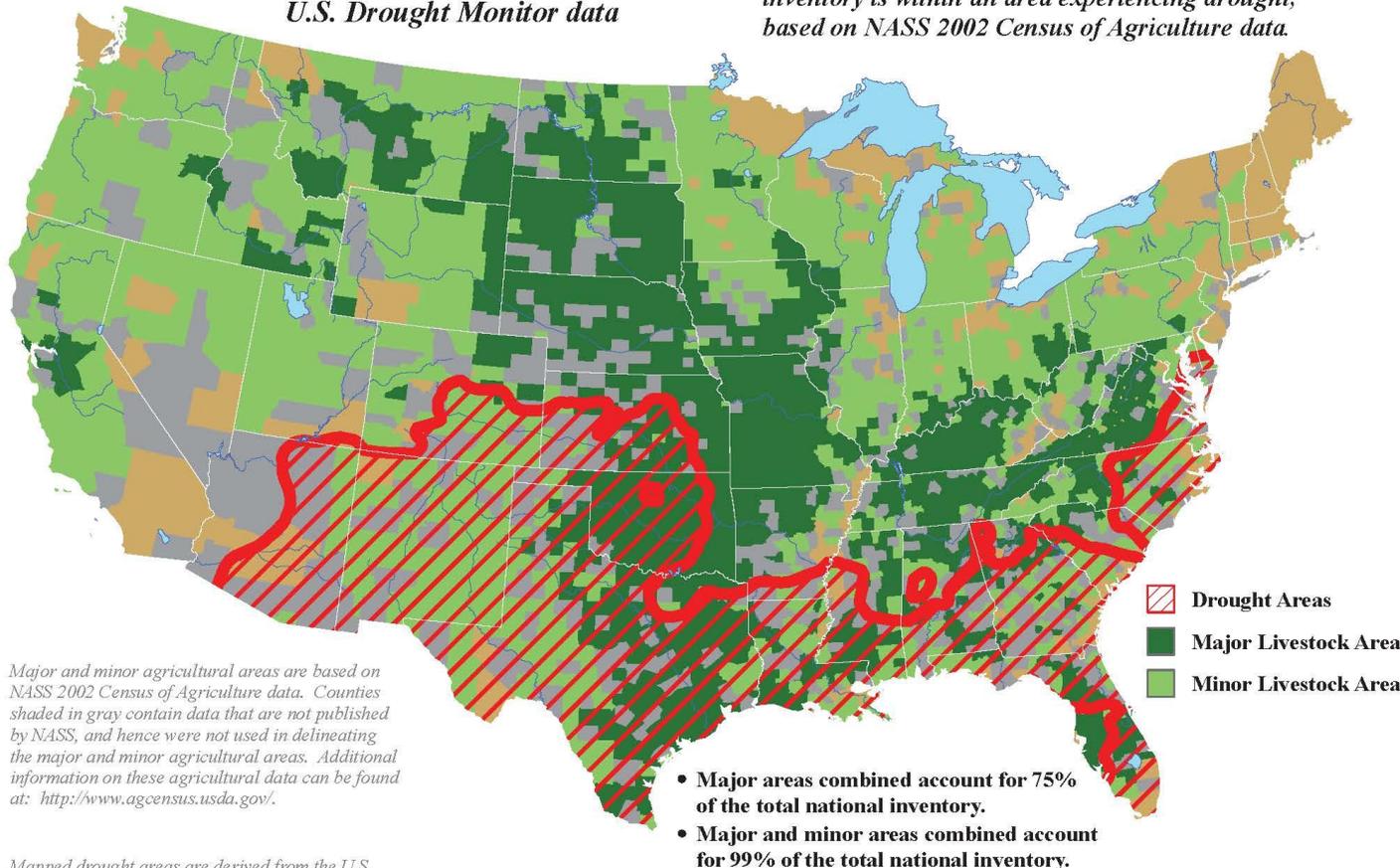
Failure to thrive in the new climate applies to agricultural crop and livestock species as well, driving the need for adaptation, through utilization of new species, and modification of current crop types. Modification techniques include genetic modification and traditional breeding of more tolerant strains. Techniques focus on improving tolerance to drought, heat stress, and the potential pests, which may come with climate change. Pests stand to be extremely damaging, as increasing temperatures allow insects to survive through the winter. Ideally, this research will continue current levels of agricultural output, despite worsening conditions. However, concerns over genetic modification, water overuse and agricultural runoff suggest the results may not be able to overcome the environmental changes. Many

currently popular crops and livestock, such as wheat, beef and corn, are very water intensive.

## U.S. Beef Cow Areas Experiencing Drought

Reflects June 28, 2011  
U.S. Drought Monitor data

Approximately 29% of the domestic beef cow inventory is within an area experiencing drought, based on NASS 2002 Census of Agriculture data.



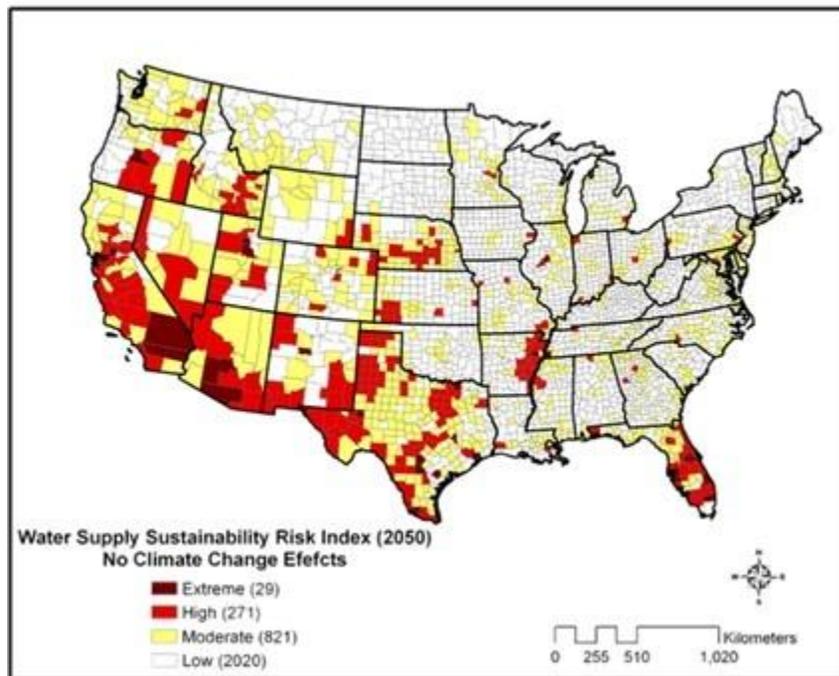
Major and minor agricultural areas are based on NASS 2002 Census of Agriculture data. Counties shaded in gray contain data that are not published by NASS, and hence were not used in delineating the major and minor agricultural areas. Additional information on these agricultural data can be found at: <http://www.agcensus.usda.gov/>.

Mapped drought areas are derived from the U.S. Drought Monitor product and do not depict the intensity of drought in any particular location. More information on the Drought Monitor can be found at: <http://www.drought.unl.edu/dm/monitor.html>.

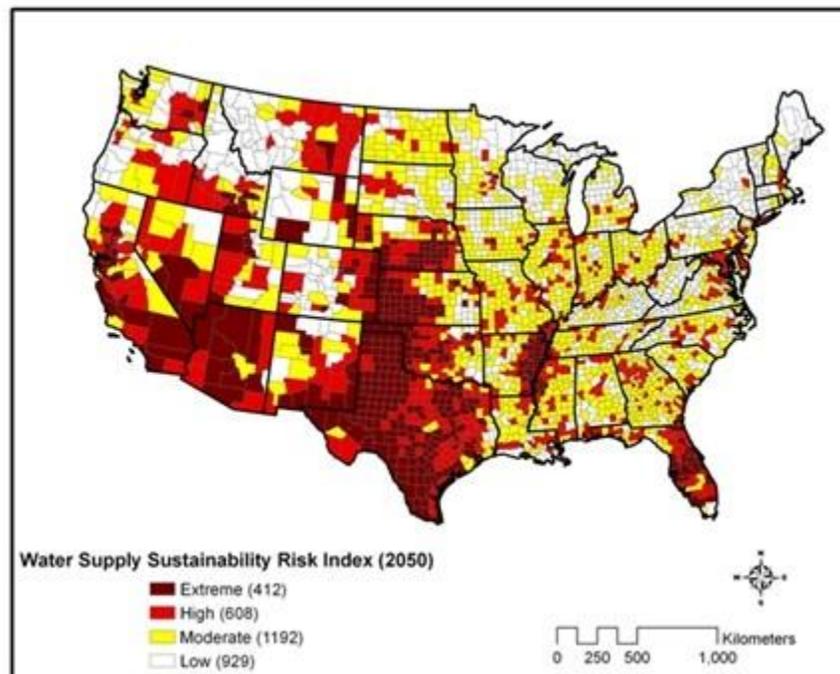
USDA Agricultural Weather Assessments  
World Agricultural Outlook Board

All areas of society will likely be affected by the changing climate. However, the agricultural field will be one of the most harmed sectors of society. Although some geographic areas may see initial benefits, these will most likely quickly dwindle. In the Southwest's agricultural sector, small farmers and ranchers, along with Native American tribes will most likely be the hardest hit. These groups generally, though not always, already have lower quality lands. Small scale farmers and ranchers also may have difficulty acquiring water. Climate change will stress the crops and livestock grown, which will increase the amount of water need to maintain production levels, increasing the difficulty of agricultural work. Sustainability of water use will be threatened for many individuals and families.

# Effects of Climate Change Water Sustainability, Compared to a Hypothetical "No Change" Scenario: No Climate Change



## Climate Change in 2050 (A1b Emissions)



**Water supply sustainability index, based on 2000-2011 data, extrapolated to 2050 (NOAA, 2011)**

**Available at:**

[http://faculty.washington.edu/girvetz/US\\_Water\\_Sustainability\\_Climate\\_Change\\_A1b\\_2050.pn](http://faculty.washington.edu/girvetz/US_Water_Sustainability_Climate_Change_A1b_2050.pn)

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