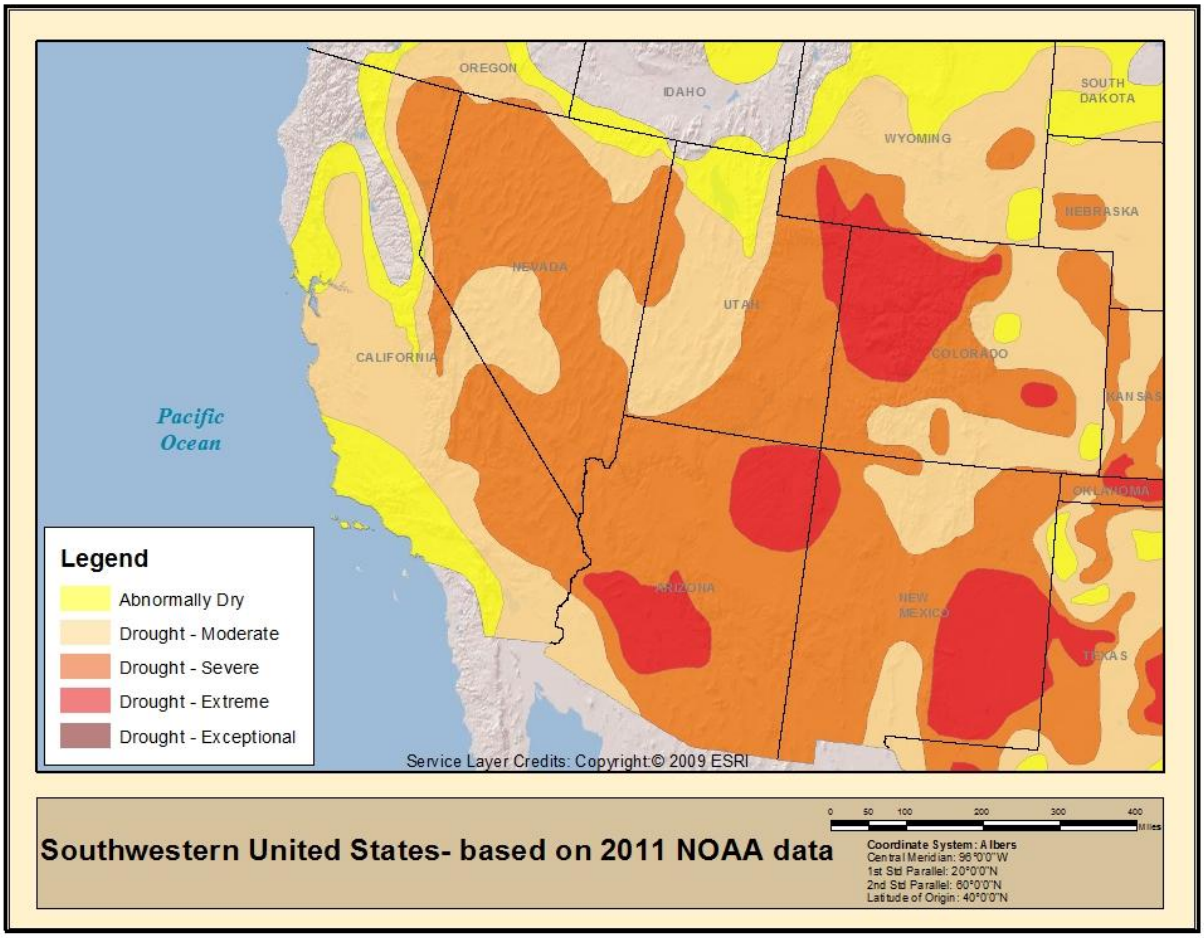
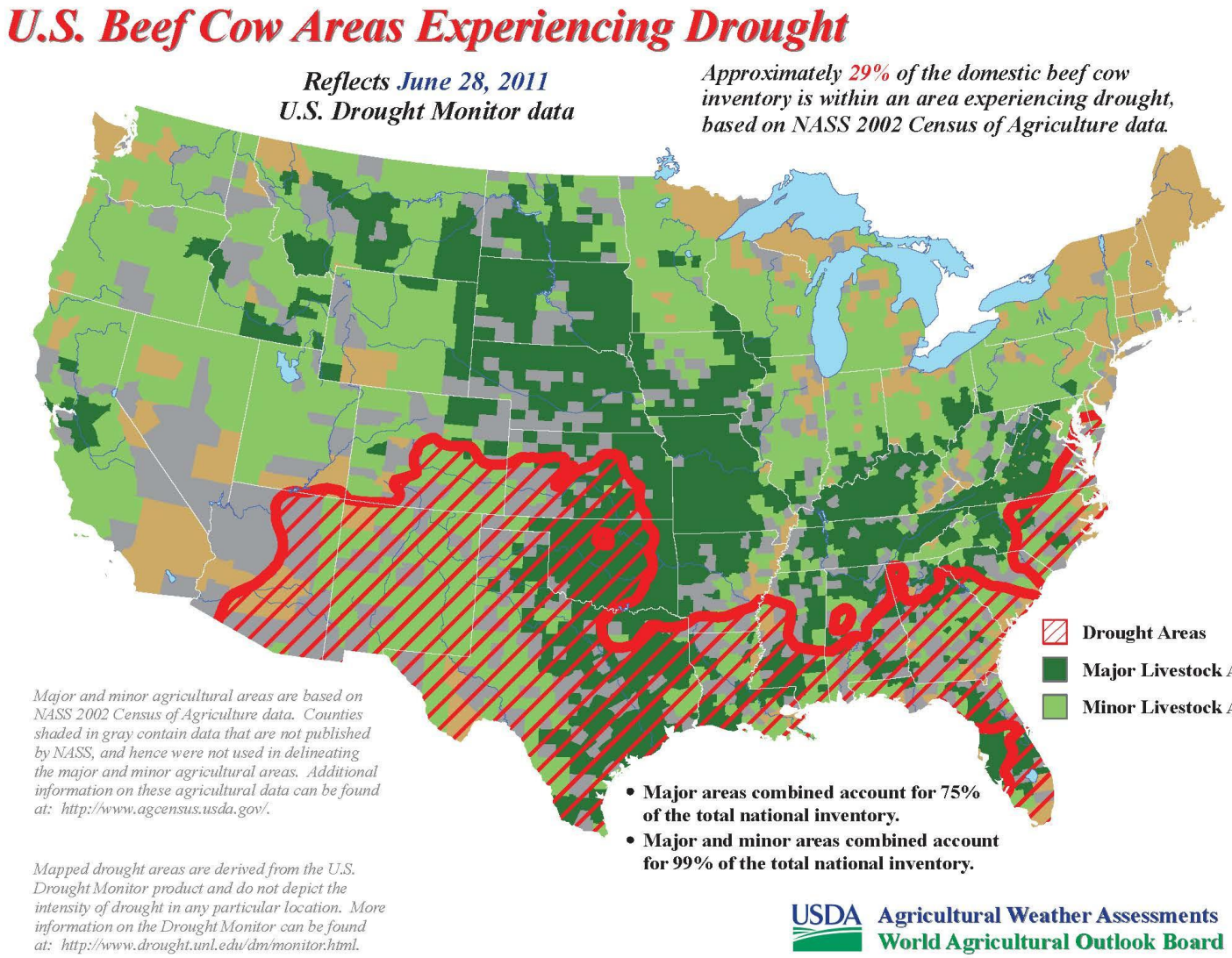
Utton Research Notes: Climate and Agriculture in the Southwest – September 2012

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

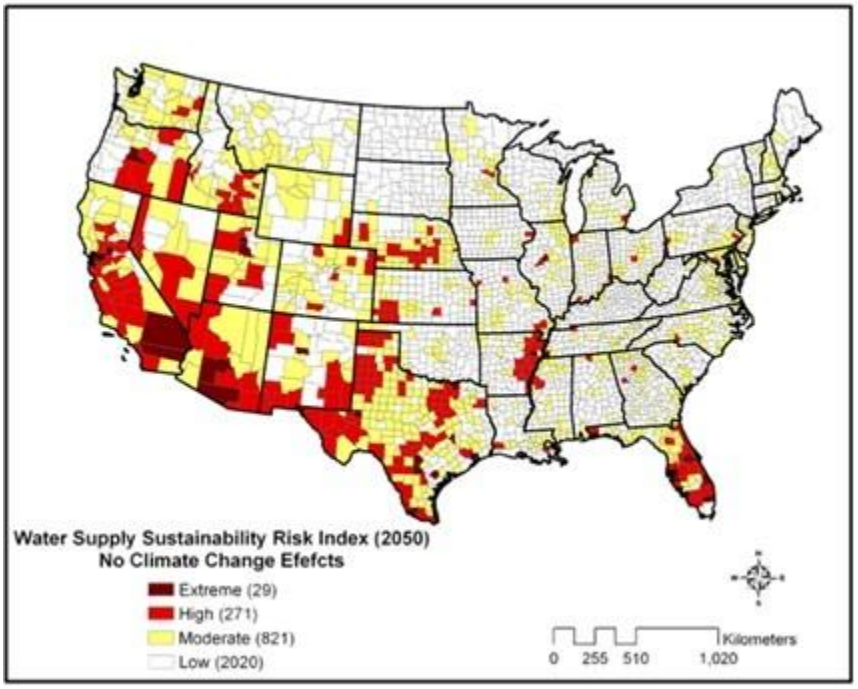
currently popular crops and livestock, such as wheat beef and corn, are very water intensive.



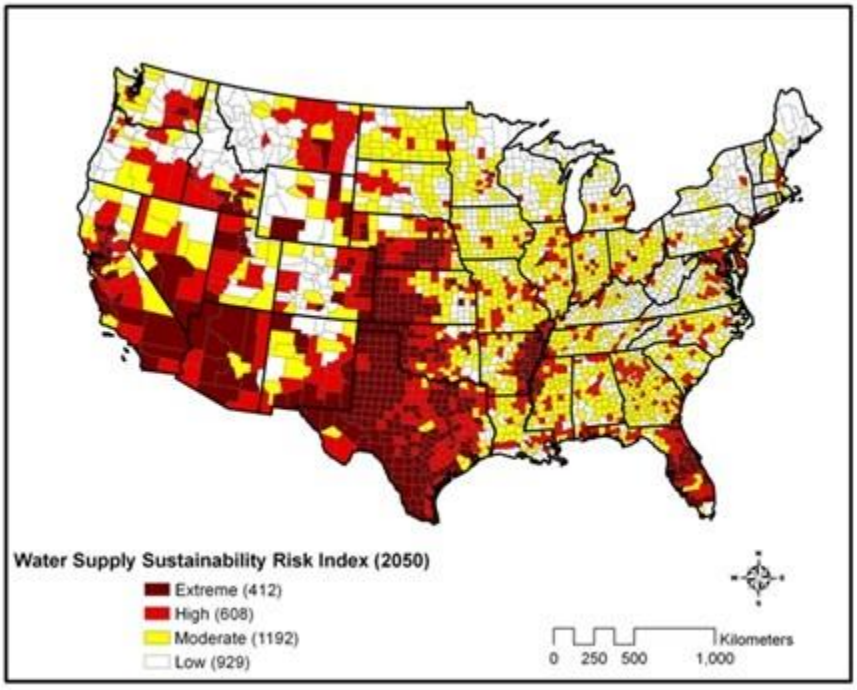
All areas of society will likely be affected by the changing climate. However, the agricultural field will be one of the most harmed sectors of society. Although some geographic areas may see initial benefits, these will most likely quickly dwindle. In the Southwest's agricultural sector, small farmers 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

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