

# EDITOR'S CHOICE

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## Potential Climate Change Impacts on Four Biophysical Indicators of Cattle Production From Western US Rangelands

Matthew C. Reeves, Karen E. Bagne, and John Tanaka

Rarely has any scientific presentation created more discussion than the hockey stick graph in 1998 showing the temperature anomaly of the Northern Hemisphere from the year 1000 to 2000. Since that time, a continuous discussion has taken place about global warming and the possibility that the most rapid and extended period of warming has occurred in the past 100 years. Clearly, carbon dioxide is increasing in the Earth's atmosphere. Some assert that this indicates a long-term trend that will end in devastation; some refute it. Global warming may be one of the most widely studied and discussed topics in the history of science. The literature is full of point-counterpoint research (and in my assessment, the passionate and heated discussions are often so intense they could be the cause of the warming!). Mother Nature has fueled even more debate because the Earth apparently has been experiencing a cooling period over the past 10 years, which may be ending now. The fact is that climate change has occurred in the past, is occurring now, and will occur into the future. It is only prudent to try to understand potential impacts associated with climate change to manage them for the benefit of all that is good.

Fortunately, we are lucky to have the work of Drs. Reeves, Bagne, and Tanaka, whose paper in volume 70, issue 5 of *Rangeland Ecology & Management* was selected as an Editor's Choice. They have advanced our understanding of the impact of climate change on cattle production in the western United States, which is among the major beef-producing regions of the world. These researchers used the best available spatial

climate change models to determine how livestock production might be affected by year 2100 based on four indicators: forage quantity, change in the type of vegetation, variability of forage within the year, and the stress heat may cause animals during production. Their analysis forecasted 1) increased forage quantity in the northern regions, 2) a change from woody plant dominance to more grassy types with more variety across the landscape, 3) substantial variation in forage quantity within a growing season for most regions of the West, and 4) an increase in the number of days cattle may be stressed by heat. Collectively, the authors believe there will be declining cattle production in the southern and western portions of the region, and the increase in forage production in the other areas will likely be offset by increases in heat stress days. If the western United States warms as suggested by these models, the need for intensive, flexible, and creative cattle management will continue to grow. History has proven that livestock managers are some of the most innovative and forward-thinking businesspeople in the world. They are used to tackling environmental challenges and overcoming barriers that threaten their livelihoods and families. Thanks to Drs. Reeves, Bagne, and Tanaka for giving us some idea about what to expect in the future. We will be ready.

Roger L. Sheley  
*Editor-in-Chief, Rangeland Ecology & Management*

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