

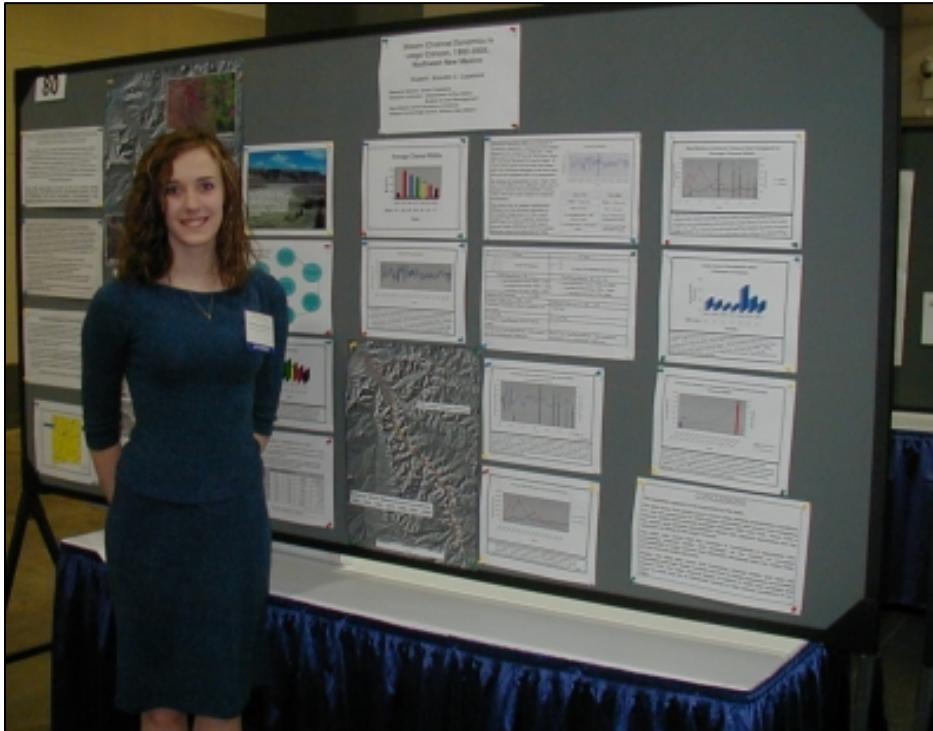
## 2007 State NMJAS Paper Competition Winner

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**Shandiin C. Copeland**

*Stream Channel Dynamics in Largo Canyon, 1882-2005, Northwest New Mexico*

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**Abstract:** In the 1880s, arroyo channels began to intensely erode, widen, and deepen in much of the American Southwest. Different theories about what may have caused this erosion cycle include changes in precipitation, overgrazing, or a combination of both. The Byran-Antevs model argues that arroyo cutting is associated with drought and poor vegetation and arroyo filling with higher rainfall and improved vegetation cover. The Martin-Schoenwatter model states that arroyo cutting is associated with increased summer rainfall when there may actually be greater annual rainfall and increased vegetation cover. Nearly 125 years of Largo Canyon channel size data, precipitation, homesteading, and livestock data are available to examine this question. Using 1882 survey data, 70 years of 20th-21st century aerial photography, GIS, historical records, and statistical analysis, can it be determined what effect precipitation, homesteading, and livestock usage had on the arroyo channel of Largo Canyon? The hypothesis is that there will be an association between channel size and acreage, and the variables of precipitation, homesteading, and livestock numbers in Largo Canyon. As a result of the analysis, the hypothesis is not rejected. There appears to be strong association between livestock numbers, homesteading, and erratic precipitation, including very dry years, with a measurable increase in the channel of Largo Canyon between 1882 and 1935, and as livestock, principally sheep, declined in numbers, a filling in of the channel after 1935.