

Grazing Impacts Subalpine Hydrology

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HIGH plateaus in the western U.S. provide perhaps the most important commodity for local communities-water for drinking, irrigation, and industry. As the ecologist Lincoln Ellison once wrote, "As surely as canyon from the plateau opens upon the valley floor, so surely will one find a farm, a village, or a town. Each of these small islands of civilization is nourished, as by a silver umbilical thread, from snows that accumulate in the nearby highlands."

In the early 20th century westerners were beginning to realize that activities on these high plateaus, particularly intensive livestock grazing, had the potential to dramatically alter the timing and quality of water supplied to the valleys.

In 1913 Dr. Arthur Sampson built fences to exclude livestock from parts of the Wasatch Plateau to see what impacts grazing had on ecology and hydrology of this region. Now, 90 years later we have returned to Dr. Sampson's enclosures to see whether long-term livestock

grazing has altered ecological and hydrological processes. In 2002 we placed Decagon's soil moisture probes at several locations in the subalpine region of the Wasatch Plateau, both inside and outside of grazing exclosures, all above 10,000 foot elevation. Volumetric soil water content was continuously monitored by logging data using Em5 dataloggers. After successfully characterizing soil moisture through a growing season and winter, we returned in 2003 and expanded our research to include an analysis of how global warming and increased nitrogen deposition could impact the infiltration and retention of water in subalpine soils. Data are currently being analyzed, but it is clear that ungrazed areas had higher infiltration rates and soil water content than soils from grazed areas. By continuously monitoring soil moisture from winter through the growing season we hope to be able to better understand soil water dynamics as snows melt and release water into the streams that vital to the communities of the Wasatch Front of Utah.