

Title: Status & Design of the NV-EPSCoR Remote Environmental Monitoring Transect Stations, Snake and Sheep Ranges, Nevada

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Abstract:

Over the past three years, a team of specialists from the Desert Research Institute, University of Nevada, Las Vegas, and University of Nevada, Reno, has been architecting a system of remote monitoring stations designed to assess baseline climatic, ecologic, and hydrologic conditions in two critical regions of Nevada. These stations have been engineered to not only produce data of immediate use to a wide range of environmental sciences, but also to provide a sustainable platform of experimental and observational expandability. In order to minimize costly downtime, field inspection, servicing, and maintenance events, key support infrastructure such as real-time communications, system health monitoring, and on-site power generation are being implemented in ways that attenuate up-front costs but provide long-term efficiency and redundancy. Best-practices design in electrical systems with a focus on simplicity and fault-protection increases system reliability at high elevations where site access is limited to 4 months per year. Leveraging modern technologies in the form of IP (Internet Protocol) networking allows for real-time high-speed data transfer to project servers, remote device control and configuration, on-site internet access, and remote troubleshooting. Scientific sensory deployments are held to uniform, established protocols to ensure comparability and compatibility with legacy datasets. Out of 12 stations planned, 11 have been constructed and are currently experiencing their first full winter season. Data on system performance is being gathered which will allow adjustment of hardware configurations to increase future reliability. Successful operation of complex, remote, and limited-budget stations will provide environmental scientists with a valuable resource to advance critical climate, water supply, and ecological research in Nevada.