HYDROGEOLOGY OF SPRINGS IN THE NORTHERN GREAT BASIN IN OREGON

Henry M. Johnson[1]

Author Affiliation:

[1] U.S. Geological Survey Oregon Water Science Center

Drought, climate change, and multiuse management of water resources in southeastern Oregon are driving a new, regional investigation of springs in the area. Springs are often the only available surface-water source for tens of kilometers in the Northern Great Basin, and are important water resources for livestock and habitat for the native flora and fauna. In recent years, the US Forest Service and Bureau of Land Management (BLM) have inventoried many of the larger springs on lands they manage in the region. However, most of the springs across the Northern Great Basin in Oregon are known only as a point on decades-old maps; their existence, current condition, current use, and short- and long-term viability as water resources are unknown.

In 2016, in cooperation with the BLM, the USGS Oregon Water Science Center began an evaluation of springs across 50,000 square kilometers of the Northern Great Basin in Oregon with the goal of providing a regional understanding of the hydrology of these poorly documented, but important features. Our work focuses on understanding the physical hydrology of the spring systems, including geologic and topographic controls on the spring location, discharge volume, and to the extent possible, an understanding of the short- and long-term discharge variability. Field assessments include an on-site evaluation of the geology, documentation of the spring morphology and its geographic setting, measurement of basic field chemistry (temperature, specific conductivity, pH), a discharge measurement, a sample for the analysis of stable isotopes of water, and at selected sites, collection of samples to estimate the residence time. This talk provides an overview of our work to date and a preliminary evaluation of the data we have collected.