

## Groundwater Level and Spring Discharge Declines in the Mid-Snake Area of South-Central Idaho

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The U.S. Geological Survey's (USGS) National Water Quality Assessment (NAWQA) in the upper Snake River Basin (USNK) recently entered its third decadal cycle. During the previous two NAWQA cycles, groundwater levels in wells were measured at various time intervals in parts of the eastern Snake River Plain (ESRP) aquifer in southern Idaho. Two USNK well networks have long-running measurements of water levels: a 31-well network near Paul and Rupert (referred to as the A&B network) and a 30-well network near Jerome and Gooding (referred to as the Jerome/Gooding network). These two well networks are the only Idaho wells to be measured during NAWQA's third decadal cycle. Groundwater levels were measured in the entire A&B network during June 2014, the first year of the third decadal cycle and the Jerome/Gooding network is scheduled for June 2015. Water levels in the A&B network (some dating back to 1993) were evaluated for trends. A regional Kendall's tau for the entire network had a correlation coefficient of 0.72 and a median slope of -0.77 indicating a groundwater level decline of 0.77 ft/year for the network. Individual wells showed significant (p-values < 0.05) rates of groundwater decline ranging from 0.51 to 1.38 ft/year. Some wells did not have enough values to be evaluated independently. The USGS has continuous discharge data for four springs that discharge groundwater to the Snake River down gradient of the A&B network. A seasonal Kendall's tau was used to evaluate trends in discharge for each of the four springs. From upstream to downstream along the Snake River, the springs' tau correlation coefficients varied from 0.59 to 0.74 and the slope for spring discharge varied from -0.25 to -2.06 cubic feet per second per year. The decrease in spring discharge corresponds with the decline in groundwater levels in the A&B network. These data indicate that groundwater is declining in at least part of the ESRP. Additional research would be valuable to determine whether the declines seen in the A&B network are occurring throughout the ESRP. The research should include 1) identification of how groundwater levels vary across the aquifer, 2) determine how groundwater declines affect spring discharge to the Snake River, and 3) identify the lag time between groundwater declines and a reduction in spring discharge.