



## Understanding the Impacts of Solar Arrays on Arid Soil Hydrology

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Nevada enjoys abundance of sunshine days and could potentially produce a huge amount of electricity power by photovoltaic facilities to meet the nation's energy needs and diversify the local economy. Yet, the developing of solar energy must be tempered by concerns about required water use and environmental impact. Due to the fragile ecosystem in Nevada, environmental impact researches and evaluations are needed before constructing the photovoltaic facilities. Every living thing is dependent on water, so hydrologic cycle is important to the ecosystem.

As we know, rain drops fall on the ground directly in natural environment, especially in the desert because of the very limited vegetation. However, the solar arrays change the way that rain reaches the soil. By this, the rainwater could concentrate along drip lines, which could potentially lead to deeper infiltration. If the water infiltrates deeper down the surface, more water would be stored in the soil and less water evaporates happens. This will probably change the water balance inside the soil and further having an influence on the local ecosystem.

We are developing a soil hydrology model using HYDRUS and calibrating the model based on soil moisture data from the NSF-EPSCoR-funded SEPHAS lysimeters. Then we will use this HYDRUS model to simulate concentrated infiltration by solar panels and their impacts on the hydrology of arid soil.



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