



Hydrogeophysics applied to contrasting land cover

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Study author Qinbo Cheng carries an electromagnetic induction (EMI) explorer, which the team used to obtain soil bulk electrical conductivity data. Photo by Jiao Wang.

Changes in land cover have impacted ecosystems and water resources worldwide. Sustainable management requires regular monitoring over large areas, which can be costly. Geophysical methods may offer a cost-effective tool to help gain useful information on properties and states of soils, over large areas, thus providing valuable information for land management.

In a recent *Vadose Zone Journal* article, researchers report their results using the electromagnetic induction (EMI) method to measure the soil bulk electrical conductivity (ECa) over four typical land covers in the Loess Plateau of China. The soil water contents (SWC) in the vadose zone under the different land covers were measured to 4 m deep.

The researchers found an increasing trend of the ECa from shrub < pasture < fallow < crop, which was similar to the SWC trend, establishing a linear relationship between EMI and SWC. This relationship was shown to be affected by salt accumulation under the shrub cover.

The study highlights the potential for the implementation of the EMI method for investigations of water distribution in the vadose zone. It may also offer a means for qualitative mapping of the vulnerability to excessive vegetation demands and hence, unsustainable land cover.

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Turkeltaub, T., Wang, J., Cheng, Q., Jia, X., Zhu, Y., Shao, M.-A., & Binley, A. (2022). Soil moisture and electrical conductivity relationships under typical Loess Plateau land covers. *Vadose Zone Journal*, 21, e20174. <https://doi.org/10.1002/vzj2.20174>

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