Geophysical Research Abstracts
Vol. 20, EGU2018-6075, 2018
EGU General Assembly 2018

The role of atmospheric conditions in driving air movement along a deep borehole using radon and CO_2 mutual relation

Elad Levintal (1), Hovav Zafrir (2), Maria I Dragila (3), and Noam Weisbrod (1)

(1) Environmental Hydrology and Microbiology, The Zuckerberg Institute for Water Research, The Jacob Blaustein Institutes for Desert Research, Ben-Gurion University of the Negev, Israel, (2) Geological Survey of Israel, (3) Department of Crop and Soil Science, Oregon State University, USA

Understanding and quantifying the air exchange rate at boreholes and wells and subsequently their potential role as a source for greenhouse gases (GHGs) or volatile organic contaminant (VOCs) emissions to the atmosphere is important. Here, we investigate the effect of atmospheric conditions (atmospheric pressure and temperature) on air transport inside a deep dry borehole (88-m deep and 0.9-m wide) using radon, CO_2 and absolute humidity measurements. Temperature, relative humidity, CO_2 and radon (alpha detector) sensors were placed along the cased borehole, and a standard meteorological station was located a few km from the borehole. All borehole data were logged at high 1-min resolution. Current results show that climatic driving forces have a similar effect on the CO_2 and radon trends within the borehole. In addition, we can distinguish between the diurnal and semi-diurnal periodical effect of the ambient temperature and pressure on both CO_2 and radon concentrations.