



Contribution ID: 558

Type: **Poster (+) Presentation**

Use of DNA tracers for determining aquifer hydraulic properties in a 3-dimensional laboratory sand tank

Thursday, 3 June 2021 14:40 (1 hour)

DNA tracers have been applied in groundwater systems in order to track flow paths and travel times, and to identify hydraulic connections. In this study, we aim to develop a blueprint of the application of DNA tracers to determine hydraulic conductivity, effective porosity, and dispersion. Also, we aim to minimize the uncertainty in estimating the parameters. Two well-controlled laboratory built, ~130 x 70 x 40 cm and ~100 x 58 x 30 cm, respectively, Aquifer tanks were used under steady-state flow conditions. Under forced gradient condition, monodispersed, silica-coated double-stranded DNA tracer particles were injected and collected down-gradient. Different injection and sampling experiments were carried out: various well configurations, sampling depths, injection intervals and so forth. Water samples collected were analyzed on their DNA tracer concentration using a qPCR machine. Finally, the resulting breakthrough curves were analyzed to arrive at hydraulic properties, using groundwater flow and contaminant transport modeling (MT3DMS).

Time Block Preference

Time Block B (14:00-17:00 CET)

References

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Student Poster Award

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