



Contribution ID: 355

Type: Oral Presentation

Global sensitivity analysis on a groundwater flow model in a regional- scale with uncertain parameters: a case study in the Middle Magdalena Valley-Colombia.

Thursday, 2 June 2022 09:40 (15 minutes)

The characterization of aquifer systems on a regional scale is one of the main challenges in the study of groundwater today. This is addressed, usually, from the implementation of hydrogeological models. However, these have implicit uncertainties associated with the lack of hydrogeological information [1,2]. In this study, a numerical hydrogeological model was implemented at a regional scale in the Middle Magdalena Valley - Colombia, a region with high potential for the exploitation of gas/oil in unconventional reservoirs, where it is required to have a high degree of certainty in the hydrodynamic behavior of the system.

For this, a global sensitivity analysis (GSA) was performed to determine the impact of each parameter considered in the conceptual model on the calibration, performed with hydraulic heads. The relative influence of the uncertainties of each parameter, including boundary conditions, on the behavior of the hydraulic head in steady state will be determined from a GSA approach based on the evaluation of the Sobol index, concluding that the recharge is the parameter with higher incidence followed by the regional flow, that enters the model, through the Quaternary deposits in the northeast border.

Acknowledgments

The researcher thanks the MEGIA Research Project, Contingent Recovery Contract FP44842-157-2018 funded by Minciencias and the National Hydrocarbons Agency.

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Country

Colombia

References

- [1] Doherty, J., & Christensen, S. (2011). Use of paired simple and complex models to reduce predictive bias and quantify uncertainty. *Water Resources Research*, 47(12). doi:10.1029/2011wr010763
- [2] Guillaume, J. H. A., Hunt, R. J., Comunian, A., Blakers, R. S., & Fu, B. (2016). Methods for Exploring Uncertainty in Groundwater Management Predictions. *Integrated Groundwater Management*, 711–737. doi:10.1007/978-3-319-23576-9_28

Time Block Preference

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

Participation

In person

Primary author: Mr LORA ARIZA, Boris (Universidad Nacional de Colombia)

Co-authors: Mr SILVA VARGAS, Luis (Universidad Nacional de Colombia); Dr CASTRO ALCALÁ, Eduardo (Universidad nacional de Colombia); Dr DONADO GARZÓN, Leonardo (Universidad Nacional de Colombia)

Presenter: Mr LORA ARIZA, Boris (Universidad Nacional de Colombia)

Session Classification: MS23

Track Classification: (MS23) Special Session in honor of Brian Berkowitz