
Local vs regionalised deep learning models for groundwater level simulations in the Seine basin.

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Résumé

This study aims to investigate the use of deep learning techniques, with or without data pre-processing for simulating groundwater levels. Two approaches are compared: (1) a single (local) station approach, where a separate model is trained for each station, and (2) a multi-station approach, where a single model is trained using data from multiple stations in the study area. In the latter approach, static catchment attributes and dynamic meteorological (precipitation and temperature) and climate (sea level pressure, etc) inputs are used to model groundwater levels in the Seine basin. By including static variables corresponding to (hydro)geological or geomorphologic watershed characteristics in the deep learning model, we aim to improve the accuracy of simulations and better understand the factors that influence groundwater levels in the Seine basin. Additionally, we are assessing the potential of using MODWT as a pre-processing method in both approaches. For both single-station and multi-station approaches, without including static variables, results show that MODWT pre-processing helps the models in extracting the relevant information which in turn improves the simulations. Additional ongoing works are being conducted including static/watershed characteristics to assess whether these could help improving the modeling results.

Mots-Clés: Groundwater, LSTM, MODWT, Regional

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