

Developing a groundwater model for a coastal area by integrating GemPy and FloPy

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Presenter: Hsin-Po Wang

Advisor: Prof. Chuen-Fa Ni

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Abstract (14pt, 1.5 spacing, 0.5pt before and after line spacing, align center, bolder font)

In coastal areas, groundwater resources will naturally encounter the problem of coexistence with seawater. Therefore, it needs to understand the boundary distribution of seawater and freshwater through observational data and numerical models. range, and how it is affected by tides. The hydrogeological numerical model simulation first focuses on that build a geological conceptual model. The construction of a geological model that can effectively reduce the uncertainty of the estimation results and improve the accuracy of water resources calculation and assessment. This research takes TaiCOAST workstation as the target to carry out hydrogeological work, including core drilling and identification of geological materials, underground water observation, hydrological characteristic parameters, etc. And builds a 3D geological model with GemPy open source suite, combined with FloPy to simulate the flow field in coastal areas. Final check the model through changes in the head of seawater and freshwater. GemPy is an open source geological modeling suite based on implicit interpolation methods, which can use data obtained from cores to set the stratigraphic distribution of the area through interpolation methods. This research can more efficiently build a 3D hydrogeological model with open source software, and connect the flow numerical model package of python language for groundwater flow field analysis. The accuracy of the estimation and the research results can also provide a reference basis for useful method for hydrogeological modeling. (12pt, 1.5 spacing, 0pt before line spacing, 0.5pt after line spacing, justify text, font Times New Roman)

Keywords: (14pt, 1.5 spacing, 0.5pt before line spacing, justify text, bolder font)

Hydrogeological modeling, Seawater and freshwater interface, Numerical simulation analysis, Flow field simulation. (12pt, 1.5 spacing, font Times New Roman)