

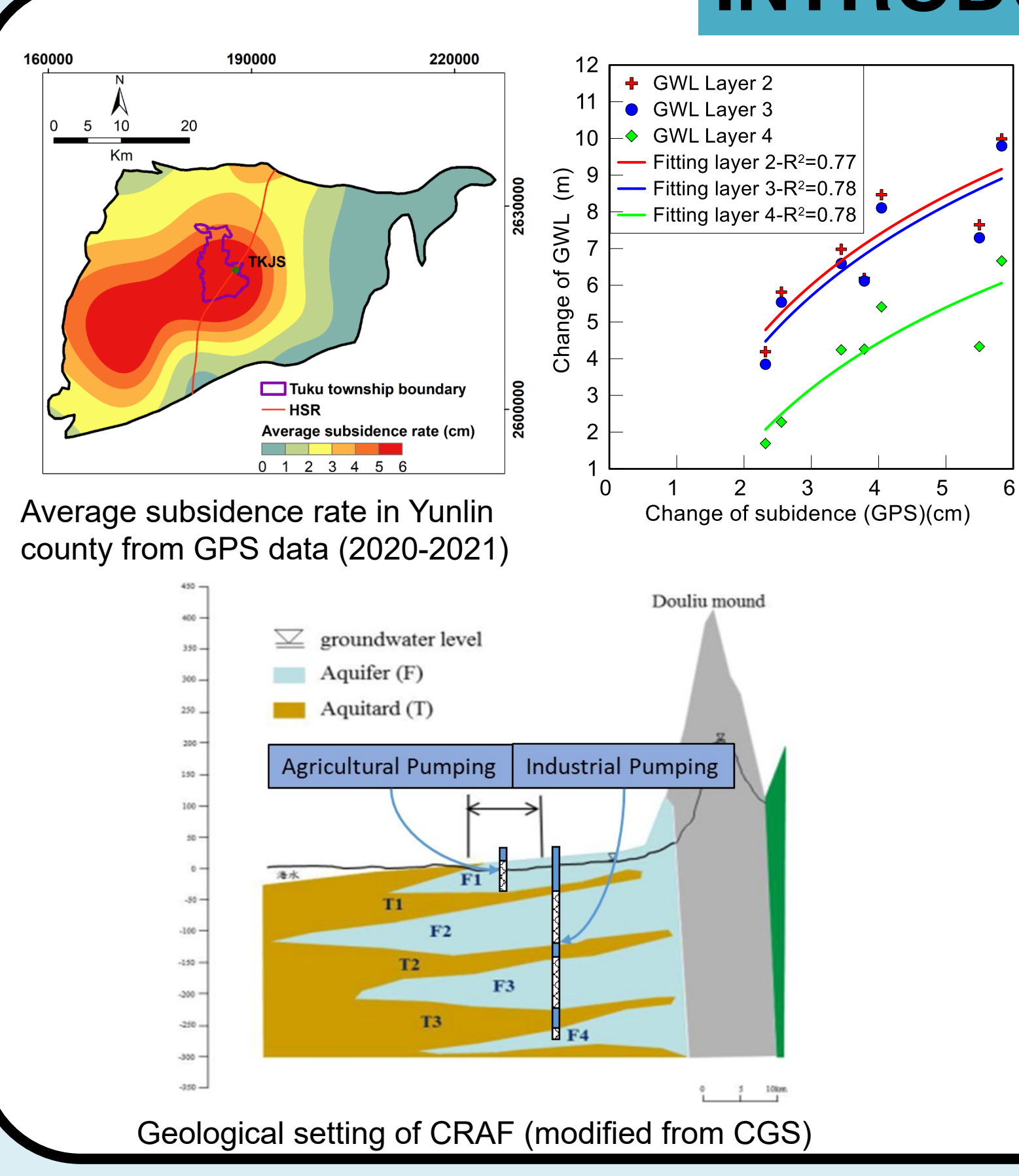


NUMERICAL SIMULATION OF SUBSIDENCE INDUCED BY GROUNDWATER PUMPING AT DIFFERENT AQUIFERS IN THE CENTRAL YUNLIN COUNTY

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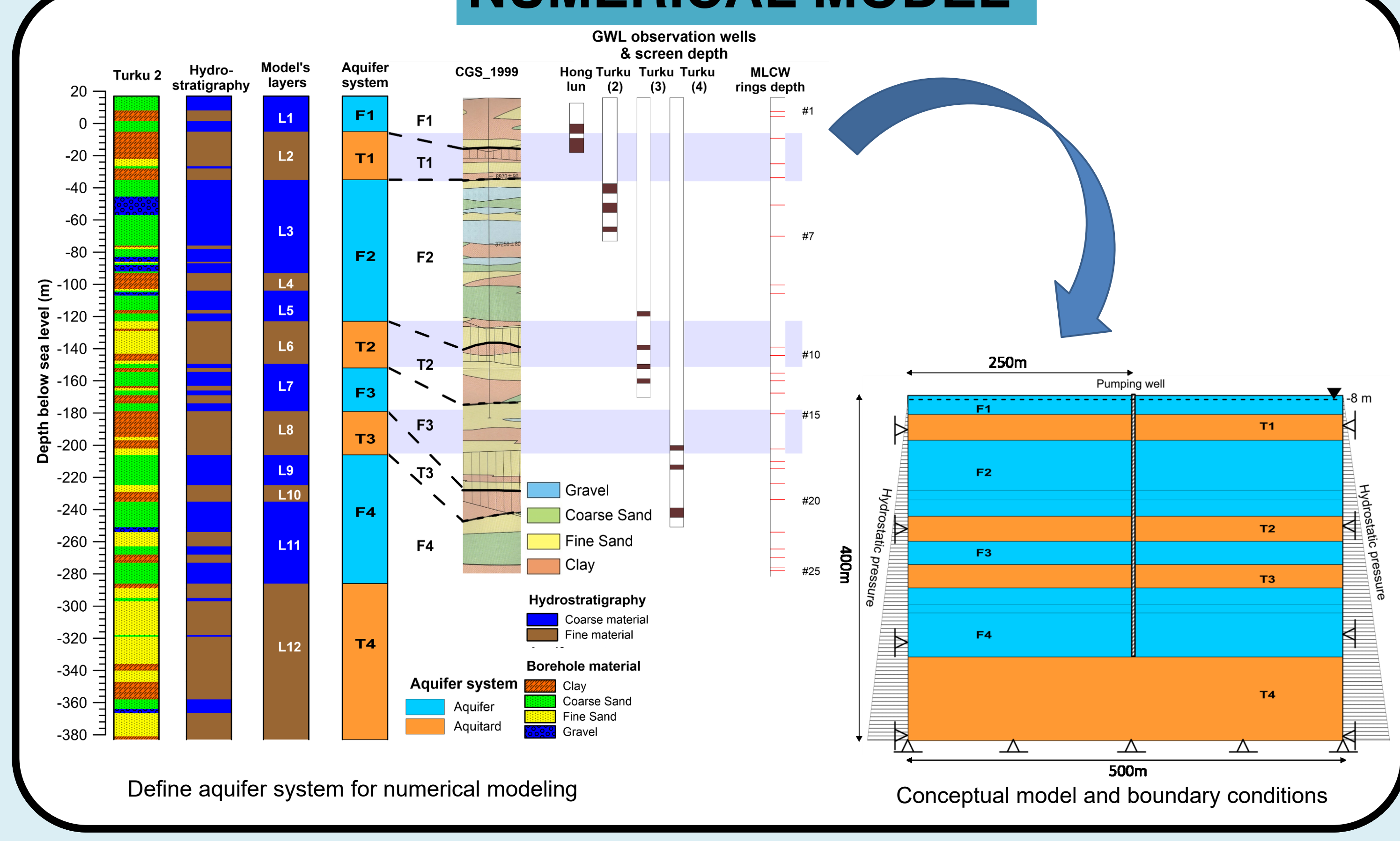
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INTRODUCTION



Yunlin (Taiwan) subsidence has been occurring due to pumping groundwater for agriculture, industry, cosmetics with different depths of pumping wells. It is essential to determine whether pumping in shallow or deep aquifers will cause more subsidence.

NUMERICAL MODEL



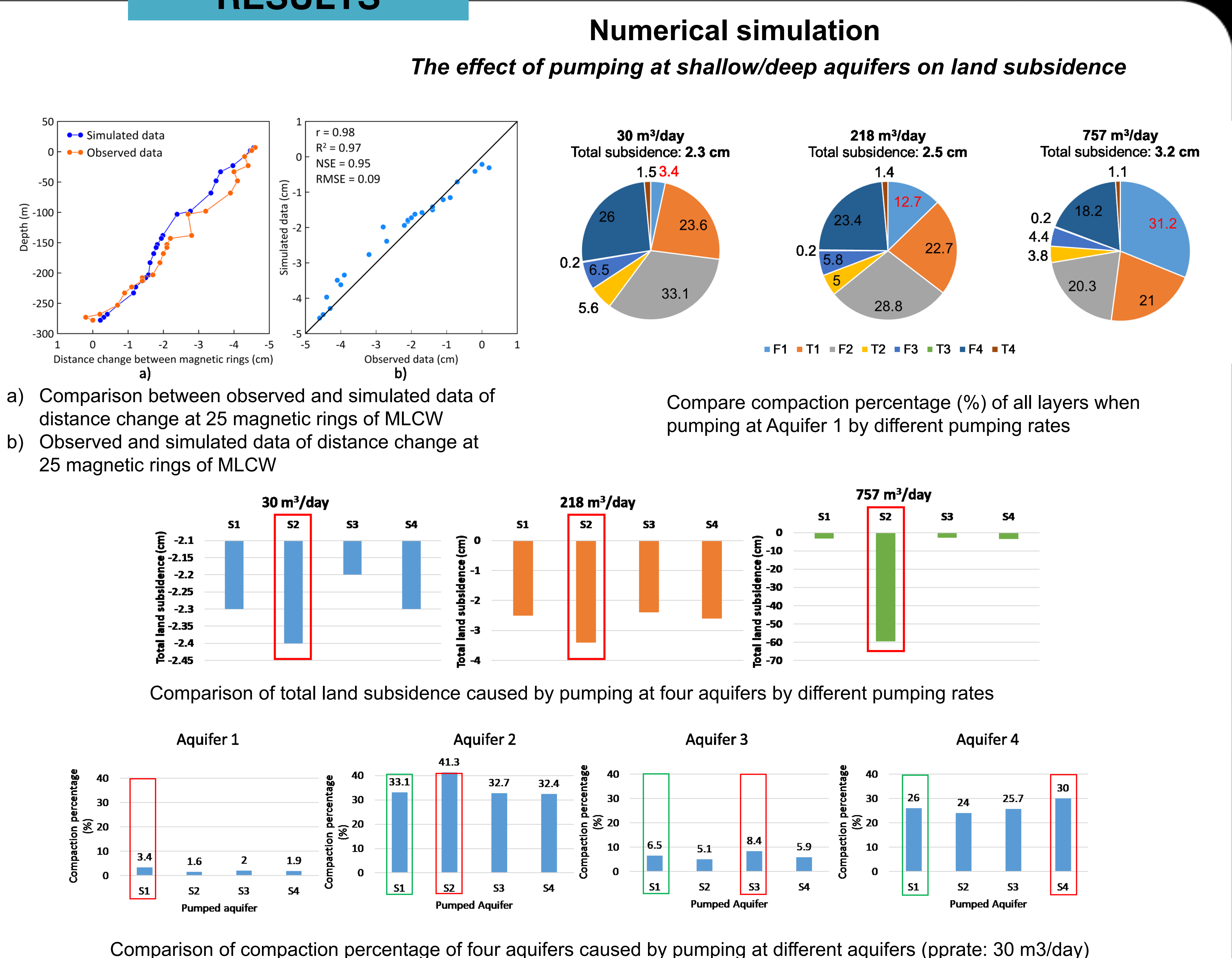
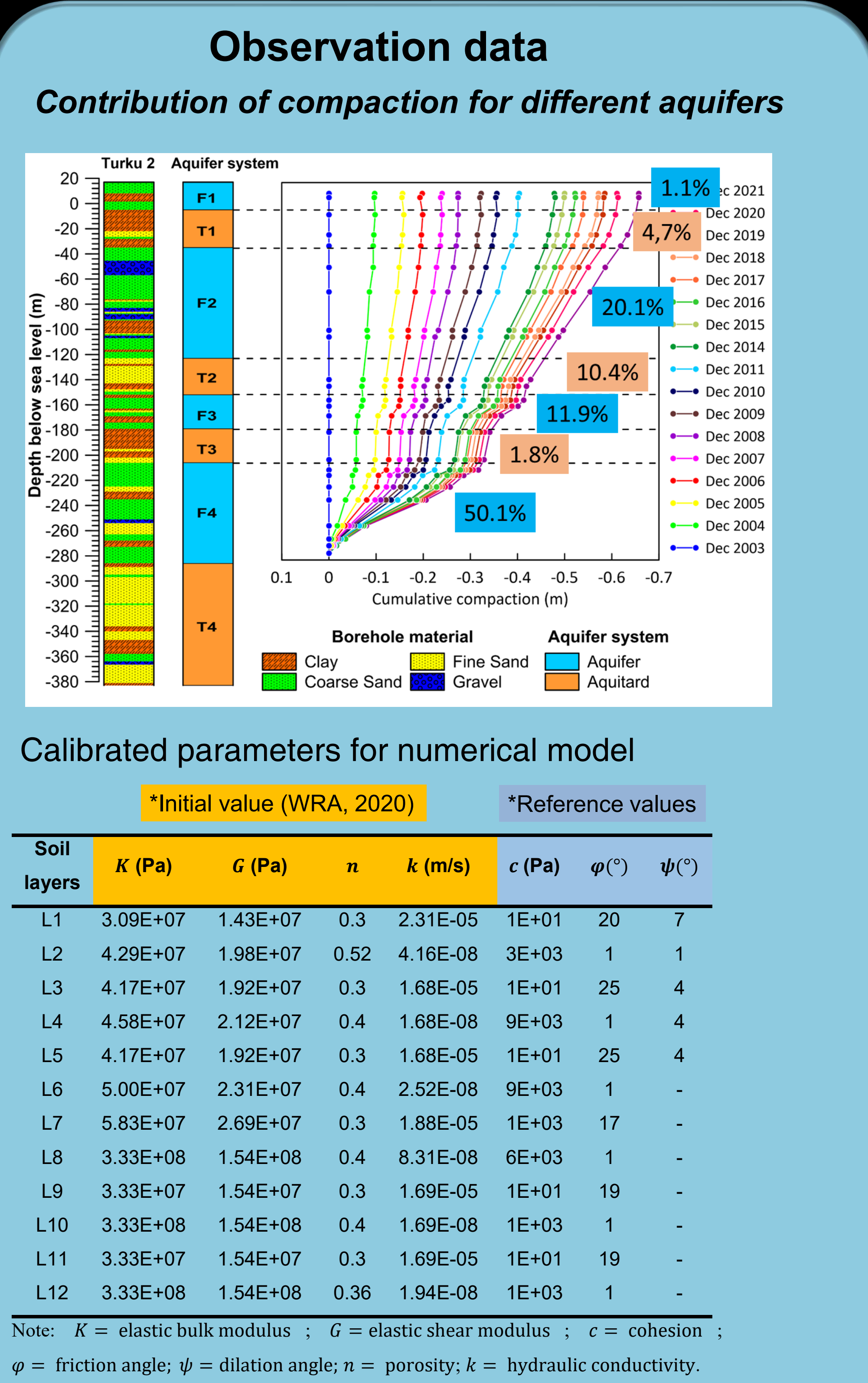
OBJECTIVES

- Determine the contribution of each layer compaction to the total land subsidence.
- Determine pumping in shallow/deep aquifers leading to more subsidence when applying the same pumping rate.

METHODOLOGY

A coupled fluid-mechanical model with Mohr-Coulomb criteria, using the finite difference method in FLAC3D software is employed to assess the effect of pumping shallow/deep aquifer to total land subsidence.

RESULTS



CONCLUSIONS

- Aquifers 2 & 4 contribute > 70% to the total land subsidence due to clay-interbedded layers & thicker thickness
- Fluid-mechanical model captured the compaction behavior due to GW pumping
- The higher pumping rate, the more compaction in the pumped aquifer and more land subsidence
- Pumping at aquifer 2 (depth interval 40 – 120m) caused the most land subsidence.
- Pumping at shallow aquifer caused more compaction on other aquifers, pumping at deep aquifers mainly affected themselves a lot.