

Making of 3D Geological Structure Model in Multilayered Ground

Takuya Yamamoto, Takahumi Kitaoka, and Harushige Kusumi
Graduate school of Science and Engineering, Kansai University
3-3-35 Yamate-cho, Suita-shi, Osaka
JAPAN
E-mail: k071598@kansai-u.ac.jp

Abstract

In this research, we make the three-dimensional geological structure model for groundwater simulation. The model can consider the influence that pumping gives the groundwater flow in groundwater simulation. The model represents the topography of the area exactly. It was proved by comparing the topographical map with the model.

1. INTRODUCTION

In the management and usage of groundwater resource, we need to work on an accurate grasp of the current situation and make a future vision for the region where the groundwater exploitation is active. The groundwater flow almost depends on the geological structure. Therefore, reproduction of correct geological structure model is necessary to reproduce the groundwater flow exactly. In addition, the model must be able to consider the influence that groundwater pumping gives to the groundwater flow. Because, the influence that groundwater pumping gives to the groundwater flow is greatly, we cannot ignore the influence in the simulating. Then, based on geological data, we grasp geology of the area and try to model the area exactly for groundwater simulation.

2. EXPERIMENTAL PROCEDURE

Firstly, based on the boring log and an altitude distribution map, we grasped the topography and the geological structure of a target area. Secondly, In consideration of boundary condition, we decide a range that model the area. Thirdly, based on the boring log, we interpolated the layer thickness of every layer in a model by using the Kriging method. The outline of the three-dimensional geological structure is completed by piling them up. Finally, by considering the position of the pumping wells and the layer thickness distribution, we divided mesh.

3. RESULTS AND DISCUSSION

The model represents the topography of the area exactly. It was proved by comparing the topographical map with the model. The altitude of the hill country, bedrock depth and the position of the pumping well accord with topography data.

4. CONCLUSIONS

The three-dimensional geological structure model that we made in this research represents the topography of the area for exactly. In addition, we model the area to the depth that can consider influence of the pumping. As a future subject, we must perform groundwater simulation in this model, and try for elucidation of the groundwater flow.