## New program of Japanese geothermal resources assessment using GIS

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'Study on Assessment of Geothermal Resources using Geographic Information System (GIS)' has been conducted in the Geological Survey of Japan, AIST since 2001. The purpose of this study program is contributing to long-term comprehensive optimization of exploration, exploitation and conservation of various kinds of geothermal resources (regional thermal-conduction type, hydrothermal convection type, Hot Dry Rock type and magma type among others) distributed abundantly in Japan.

For assessment of geothermal resources, it is necessary to conduct very complicated processes: editing, managing, analyzing and visualizing various kinds of spatial 2-D and 3-D data for understanding thermal structures and fluid reservoir structures from shallow to deep levels. It is also necessary to delineate the relations between distributions of geothermal resources and surface environments (topography, National Parks, hot spring areas and others), and evaluate the economy of geothermal exploitation depending on various conditions. Furthermore, it will be very important to discuss the methods of optimal utilization of volcano-hot spring-geothermal areas for comprehensive progress of resource development, environmental protection and hazard mitigation, as long-term and ultimate objectives.

In this paper, an overview of this study is explained, especially for an assessment support system using GIS (Fig. 1), and expected major problems and their solutions. Importance of regulating and standardizing data file formats, especially adapting such a hierarchical mesh system as DEM for elevation by Geographical Survey Institute using multi-layers, is emphasized, because the standardized formats will progressively enhance not only visualization but also numerical operation and simulation analysis using many kinds of 2-D and 3-D data being increasingly provided from various branches of earth sciences and engineering.



第1図 GISを利用した地熱資源の評価(支援)システムの概念図