



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2003NJ39B

Title: Validation of the PMF (Preprocessor to MODFLOW for Fractured Media) Package

Project Type: Research

Focus Categories: Groundwater, Models, Hydrology

Keywords: groundwater, modelling, non-Coastal Plain aquifer, Coastal Plain aquifer, fracture, equivalent porous media, EPM, fractured media, eutrophication, nonpoint

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Matching Funds: \$8560.00

Congressional District: 6

Principal Investigators: Mun, Yuri; Uchrin, Chris

Abstract: The objective of this proposal is to perform the validation of our PMF (Preprocessor to MODFLOW for Fractured media) package developed to simulate ground water flow in fractured media.

Ground water is the largest accessible freshwater source in the world. In New Jersey, 50 percent of the population depends on ground water as their water source, and public health concerns arise over drinking water being contaminated. Predicting ground water movement and quality, an essential task, is can be accomplished with a ground water model.

In NJ, a non-Coastal Plain aquifer is generally of the fractured media which has a multitude of fractures acting as conduits for subsurface fluid flow. Its flow properties are highly heterogeneous and localized, as the distribution of

fractures changes discretely even within a single geological unit. There are preferred fluid pathways in fractured media so that some parts play a role as highways of ground water flow and others do not involve ground water flow. Therefore different modeling approaches to simulate ground water flow in fractured media are required from those of granular porous media.

Unfortunately, a comprehensive study of ground water flow in fractured media has not been performed up to date, because rock systems are complicated and inaccessible. If the specific information about fractures is not known, an 'equivalent porous media (EPM) approach' has been considered an acceptable method for flow modeling of fractured media.

Ground water flow modeling applying the PMF package will be performed for a selected site in northern New Jersey. This modeling study will be followed by the modification of PMF package if necessary. PMF package and modeling study will be presented in public to get feedback.

[U.S. Department of the Interior, U.S. Geological Survey](#)

Maintain: Schefter@usgs.gov

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