

MODFLOW (2000)

Model Uses	MODFLOW is used to simulate steady and unsteady flow in irregularly shaped flow and channel systems.	
Major Categories	Hydrology and Water Use; Water Quality	<u>Subject Knowledge Level</u> Intermediate
Minor Categories	Ground Water; Flow; Transport	<u>Technical Difficulty Level</u> Intermediate
Model Type	Physical Model	<u>Geographic in Nature?</u> No

Abstract

MODFLOW is a three-dimensional finite-difference ground-water model that was first published in 1984. It has a modular structure that allows it to be easily modified to adapt the code for a particular application. Many new capabilities have been added to the original model.

MODFLOW-2000 simulates steady and non-steady flow in an irregularly shaped flow system in which aquifer layers can be confined, unconfined, or a combination of confined and unconfined. Flow from external stresses, such as flow to wells, a-real recharge, evapotranspiration, flow to drains, and flow through river beds, can be simulated. Hydraulic conductivities or transmissivities for any layer may differ spatially and be anisotropic (restricted to having the principal directions aligned with the grid axes), and the storage coefficient may be heterogeneous. Specified head and specified flux boundaries can be simulated as can a head dependent flux across the model's outer boundary that allows water to be supplied to a boundary block in the modeled area at a rate proportional to the current head difference between a "source" of water outside the modeled area and the boundary block. MODFLOW is currently the most used numerical model in the U.S. Geological Survey for ground-water flow problems.

In addition to simulating ground-water flow, the scope of MODFLOW-2000 has been expanded to incorporate related capabilities such as solute transport and parameter estimation.

Future Developments

Unknown

Model Limitations

Unknown

Model Features

- Steady & Unsteady flow simulation
- Support of confined or unconfined shapes or combination of both
- Stress models including wells, recharge, evapotranspiration, drains and river beds

Required Data Types

In order to use MODFLOW, initial conditions, hydraulic properties, and stresses must be specified for every model cell in the finite-difference grid.

Model Outputs

Primary output data are head values, which can be written to the listing file or into a separate file. Other output includes the complete listing of all input data, drawdown, and budget data. Budget data are printed as a summary in the listing file, and detailed budget data for all model cells can be written into a separate file.

Hardware Requirements

None noted

Supported Platforms			
DOS	<input checked="" type="checkbox"/>	UNIX	<input checked="" type="checkbox"/>

Software Requirements

None noted

Windows	<input type="checkbox"/>	Macintosh	<input type="checkbox"/>
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Cost, Licensing and Availability

Free - available from link below.

Source

US Geological Survey

Source URL

<http://water.usgs.gov/nrp/gwsoftware/modflow2000/modflow2000.html>