

MODBRNCH

Model Uses	MODBRNCH is a finite-difference ground-water flow model that can be used to simulate steady and unsteady flows in irregularly shaped channel systems.	
Major Categories	Hydrology and Water Use; Geomorphology; Decision Support	<u>Subject Knowledge Level</u> Intermediate
Minor Categories	Surface Water; Ground Water; Sediment Sources; Flow; Time Series	<u>Technical Difficulty Level</u> Intermediate
Model Type	Physical Model	<u>Geographic in Nature?</u> No

Abstract

MODBRNCH combines the BRANCH and USGS modular, three-dimensional, finite-difference ground-water flow (MODFLOW-96) models to study ground-water interactions. MODFLOW-96 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. BRANCH simulates steady or unsteady flow in a single open-channel reach (branch) or throughout a system of branches (network) connected in a dendritic or looped pattern by solving the one-dimensional equations of continuity and momentum for the river flow. Channel-aquifer flows are leakage through a confining layer or riverbed. Computation of this leakage in the ground-water and surface-water systems allows these processes to be coupled for simulation purposes.

Future Developments

Unknown

Model Limitations

Unknown

Model Features

LISEM takes into account and models information for:

- 3-Dimensional modeling capabilities
- Model irregularly shaped channels with confined, unconfined or both types
- Model single or networks of reaches
- Simulate aquifer leakage

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. BRANCH input data consist of channel geometry and initial flow conditions defined at all cross-section locations and boundary conditions defined at channel extremities. Refer to input specifications instructions for the MODFLOW-96 and BRANCH models for specific details.

Model Outputs

Primary ground-water computational output is head, 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.

Time series of computed surface-water flow results can be directly output in tabular or graphical form at all, or selected, cross-section locations. Tabular output options include discrete flow results at every time step or iteration; daily summaries of minimum, maximum, and average flow conditions; monthly flow-volume summaries; or river-mile locations of injected particles. Digital or line-printer graphical options include hydrograph plots of computed water levels or discharges or comparative plots of computed results versus measured data. Output results can be either in metric or inch-pound units.

Hardware Requirements

None noted

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

Software Requirements

None noted

Windows	<input checked="" 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/software/modbrnch.html>