

Review of GFLOW 2000

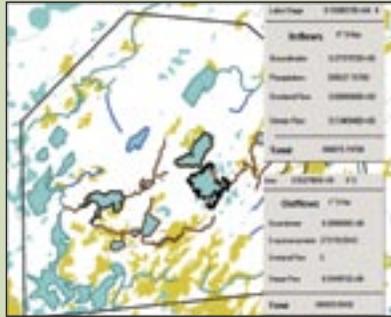
Daniel Feinstein – U.S. Geological Survey
(This review does not imply endorsement of GFLOW 2000 by the U.S. Geological Survey.)

GFLOW 2000® is an analytic element code that belongs in the arsenal of commonly used groundwater modeling tools. It solves groundwater flow problems by superimposing analytic solutions under Dupuit-Forchheimer assumptions.

In its simplest form, the code facilitates rapid construction and solution of a steady-state, single-layer groundwater model containing multiple recharge and transmissivity zones with complicated internal boundary conditions. However, one of its most innovative aspects is its ability to perform conjunctive surface water/groundwater modeling. GFLOW 2000 uses stream networks to route baseflow so that available streamflow responds to stresses such as pumping, an option that is particularly useful in determining the effect of wells on the headwaters of streams. It can simulate the interaction of groundwater with lakes in several ways, including performing detailed water balances in the presence of through-flowing streams, a capacity not yet available in other analytic element codes or MODFLOW2000. Together these options make it particularly useful in modeling unconfined flow in terrains with closely spaced surface-water bodies.

GFLOW 2000 Software Review

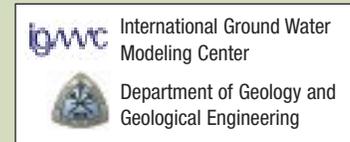
Reviewer: Daniel Feinstein – USGS



Ease of Use:		Best Feature:	GW/SW interactions
GUI:		Worst Feature:	Editing linesinks
Application:		OVERALL RATING:	
Output/Plotting:			
Documentation:			
Speed:			

Rating System for graphics:

	Excellent		Satisfactory
	Very Good		Poor
	Good		



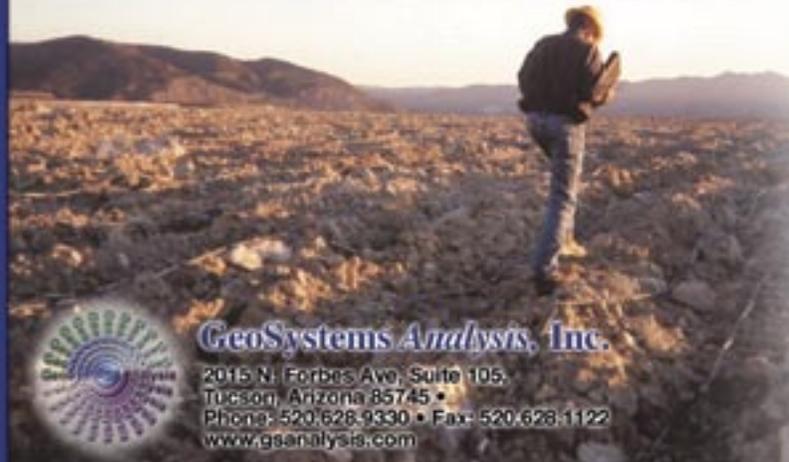
A second innovation of the code facilitates use of the “stepwise” modeling approach. Dupuit-Forchheimer assumptions are often more valid for regional flow problems than for site-specific problems where vertical head gradients are important. By matching the speed of analytic elements with the flexibility of finite differences, GFLOW 2000 supports automatic conversion of part of its domain to a local MODFLOW model with flux or constant head boundary conditions around the inset grid. Once the conversion is made, the user can add more complexity to geometry and properties inside the MODFLOW model. Another advanced feature of the code is particle tracking, which takes advantage of mass

balance considerations to simulate flow lines from the water table below a stream to a well.

Ample help material introduces the user to the technique’s special vocabulary and also provides a general guide to modeling, which makes the code a first-rate teaching tool. The graphical user interface, compatible with all versions of Windows, is workmanlike, with excellent visualization tools related to surface water and calibration. Much thought has gone into converting readily available maps such as USGS coverages into base maps.

GFLOW 2000 is available for \$450 from www.haitjema.com.

Innovative Solutions in Hydrology



- Vadose Zone Characterization and Modeling
- Groundwater Recharge Investigations
- Water Resources Management
- Mine Reclamation Studies
- Copper and Gold Heap Leach Optimization
- Hydrologic Testing Laboratory
- Saturated and Unsaturated Flow Properties
- Calibration of Monitoring Instruments
- Large Core Testing
- Custom Testing and Reserch

GeoSystems Analysis, Inc.
2015 N. Forbes Ave, Suite 105,
Tucson, Arizona 85745 •
Phone: 520.628.9330 • Fax: 520.628.1122
www.gsanalysis.com