

Python Workshop

How we use python

Christian D. Langevin

U.S. Geological Survey
Reston, Virginia USA

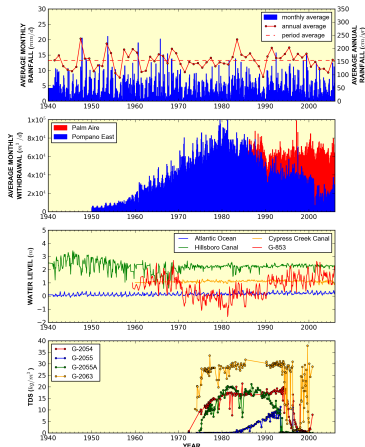
USGS National Groundwater Workshop, August 2012



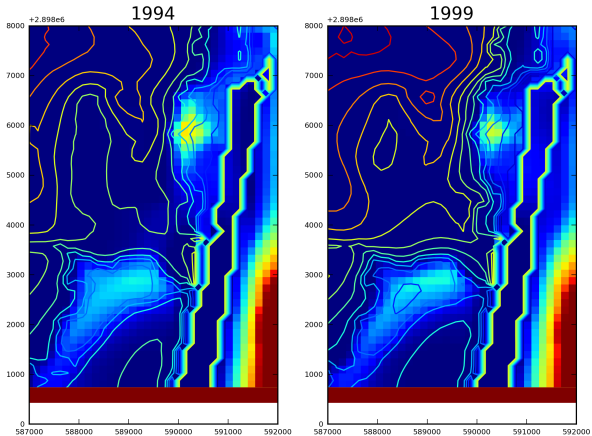
How we use python

- 1 Automate Everything!
 - Data Processing
 - Figure Generation
- 2 Design Models
 - Process Input Data
 - Post Process Results
- 3 Prototype Groundwater Software
 - PYFLOW

Hydro Time Series

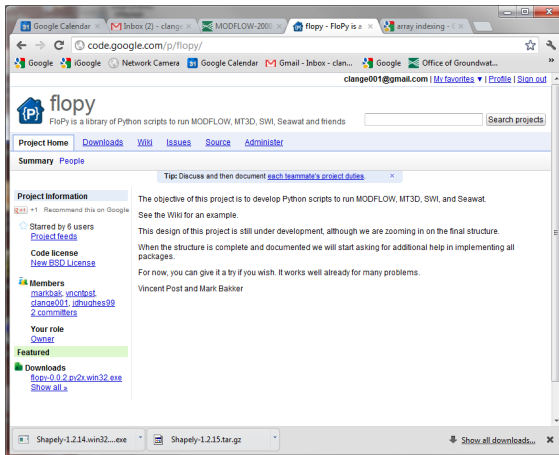


Quickly Plot 2D Information



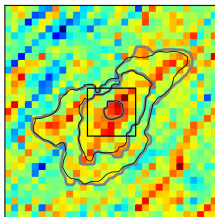
Create Input Files

`http://code.google.com/p/flopy/`

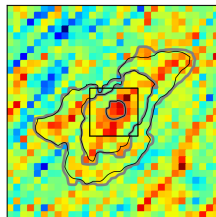


Post Processing

MODFLOW-USG



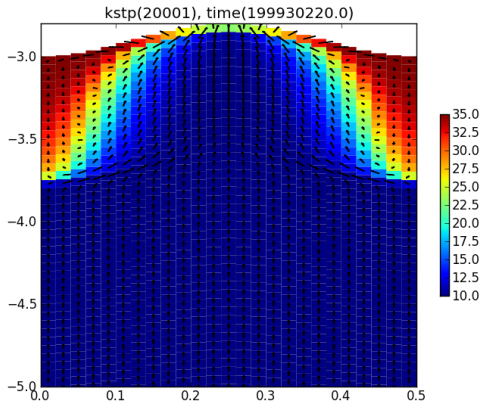
MODFLOW-LGR



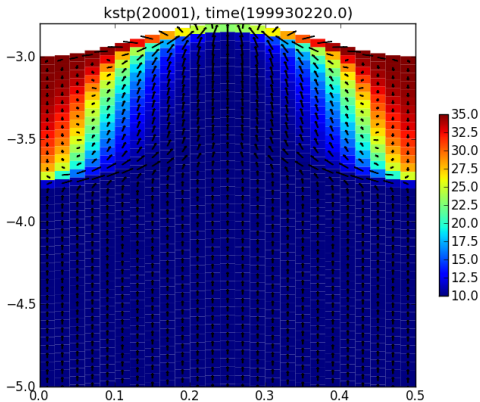
PYFLOW

- Simple flow and transport code written in Python using object-oriented design concepts and an unstructured formulation
- Flow
 - ▶ Density dependent
 - ▶ Ghost node corrections
 - ▶ Common boundary conditions (general head, constant head, specified flow, etc.)
- Transport
 - ▶ Advection, dispersion, source/sink
 - ▶ 2nd order TVD
- Solver
 - ▶ Use `scipy.sparse.linalg` solvers

Variable-Density Flow



Variable-Density Flow



Variable-Density Flow

