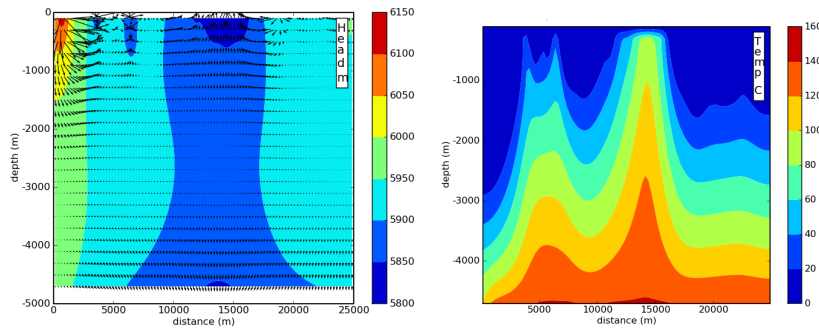


Introduction to Groundwater Modeling



Regional groundwater and heat flow for a coupled heat and fluid transport model of the Norris Geyser Basin, Yellowstone National Park

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Course Objective: This course is a first taste and introduction to groundwater modeling. It stresses the basics of designing and creating numerical models to solve boundary value problems. This course will give a quick glimpse into the numerical machinations behind groundwater modeling, and then an introduction to the sophisticated software programs which are used to interface with some of the most common groundwater modeling packages. By the end of the course you should know how a finite difference code works, and be able to use GMS to build simple 3D groundwater models which can be run on some of the most commonly used finite difference groundwater and solute transport codes. Finally, you will build a groundwater and solute transport model which you will use for the Solute Transport and Environmental Remediation course's final project.

Schedule: This is a mini course which will meet every Tuesday for five weeks. *It really* helps to come to the lab on time as I will be there to answer questions and help out. The labs are designed to be finished in the allotted lab time, so if you show up, you will get done faster and have an easier time.

- Week 1 - 1/10/23 – Introduction to the finite difference method.
- Week 2 - 1/17/23 – The grid based approach – Manual grid creation in GMS.
 - Assignment 1 due
- Week 3 – 1/24/23 – The conceptual model approach – Building grids from a conceptual model.
 - Assignment 2 due
- Week 4 – 1/31/23 – Solute transport 1 – advection only with MODPATH particle tracking model.
 - Assignment 3 due
- Week 5 – 2/7/23 - Last class - Solute transport 2 – Advection dispersion modeling with MT3D.
 - Assignment 4 due

- 2/14/23 – Assignment 5 due.

Grading: This is fairly simple, follow instructions, point and click, and answer some questions class. Classes will feature a little lecture to start off with, and then you will spend the rest of the time working on the lab assignment. Assignments can generally be finished by the end of each lab period, and there will be little to no homework. Class participation is a good idea, as I expect a high quality product for each assignment, and I expect them on time. As a matter of principal, late homework will not be accepted, but I will work with anyone for extenuating circumstances.