Date of the exam: Thursday June 11th, 2015 Location: Veihmeyer 212. 6:00-8:00 pm

What would you expect in the Final exam?

Two questions and four problems. For the problem section, only four are obligatory, you can chose the 4 problems that you feel more comfortable. If you do the remaining problem, it will count as extra points.

What about the "Questions"?

The two questions are based on the readings and the presentation for the guest speakers.

For the reading assignments, these are the topics that you should focus on:

- Groundwater pollution and management. Make a good summary of issues related to groundwater pollution (reading 7) and some of the proposed policy for groundwater management (reading 6)
- Rivers for life. Make a good summary of the topics explained in these readings, mostly in ecosystem services, human activities on freshwater ecosystems, ecological functions performed by different types of flows, and the consequences of the absence of these ecological flows (Reading 4 and 5).

For the Guest Speaker's presentations, focus on the presentation of Nicholas Depsky, Eleanor Bartolomeo and Randy Dahlgren:

- What is the problem/techniques that they talked about?
- What were their main "Key point" that each of them talked about?
- What are their main concerns/challenges/problems?
- What actions/strategies they are taken to improve their water management and to solve their problems?

What about the "Problems"?

The four problems are based on Exercises 5 (Optimization Modeling), Exercise 7 (Incremental Benefit-Cost Method), and exercise 8 (Expected Monetary Value). The main topics of these exercises are:

- *Optimization model*. Make sure you know how to define an Objective function and the constraints of a linear optimization program, how to draw a feasible region, be able to evaluate the vertices (corners) of the feasible region, and to determine the optimal values

- *Net Benefits* – make sure you know the 6 formulas to estimate cost or benefits at present time, future time, or annualized, according to what is asked on the exam. Take a look at the exercise related to this topic (Exercise 7 - Page 10).

- *Incremental Benefit* – Cost Method. Make sure that you know how to obtain the annual values for present value costs. Also make sure you know how to perform all the step necessary to use this method

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- *Expected Monetary Value and Decision Trees*.- Make sure you know how to use joint probabilities to estimate: (a) Marginal Probabilities, (b) Conditional probabilities, (c) Expected Monetary Value and (d) decision trees. Also, make sure you know how to use all these probabilities to build decision trees.

- *Mass Balance*. - Make sure you know how to use the Mass Balance equation ($\Delta S=I-O$ or $S_{t+1}-S_t=I_t-O_t$) to estimate aquifer/reservoir storages. I just uploaded an extra exercise with the solution so you know how to apply the mass balance equation.

What should I bring to the exam?

The exam is a closed book and closed notes exam. It is prohibited the use of cellphones, smartphones, tablets, computers, laptops, any music player, or any electronic device except for calculators. No exchange of calculator is allowed.

You can bring:
Your own calculator
One sheet of paper with notes for the exam (both sides) is allowed. You can also bring your Mid-term exam cheat sheet.
Some water.

If I have any question about a topic, what should I do?
Please come to my last office hours. Wednesday June 10 12-1:30 pm.

Something very important, make sure you know how to use your calculator!!!