

Lecture 1—Introduction to Hydrology

Welcome to *the most* important class you'll take as a geologist. Seriously. Wow, I feel like Quincy. It's really true, though. Water is the one geologic substance we can't do without. We managed for millions of years without oil, and hundreds of thousands without metals, but we won't last a month without water. More importantly, as global population rises, *the* limiting factor on continued growth is the availability of fresh water. Conversely, as more and more people get squeezed into the flat places of our planet, the possibility for people to be displaced or killed by floods rises. This class will be the study of how water moves through the water cycle, and how its abundance in each part varies both spatially and temporally. Because we need to know how much water there *will* be, emphasis in hydrology is placed on quantitative skills.

--Who am I?

- Assistant professor in Hydrology here at Kent
- MS and PhD from UW in hydraulics of tsunami sediment transport
- BA from Carleton College in Minnesota (in geology)
- Post-doc for 3 years at Tohoku University Civil Engineering department in Sendai, Japan

--Why do you need to know this?

- I have spent a lot of time among the engineers. As a result, you should expect to do some math in this class. HOWEVER, I come from a liberal arts school background, and started with little to no math coming out of undergrad. Concepts are stressed over formulae, and I do still recall my bewilderment about math. That said, you still have to do it.
- My own specialization is in the hydraulics of sediment transport. As a result, this will be a class primarily in PHYSICAL hydrology, as opposed to chemical.

--What is hydrology?

- Hydrology is the study of water, its physical properties and distribution on and beneath the surface of the earth. Basically, we're going to be concerned with how much water

ends up in the various parts of the water cycle both spatially and temporally.

- Take a look at the syllabus to see how we'll approach this:
 - Physical properties of water
 - The hydrologic cycle
 - Hydraulics
 - Measurement of hydrologic properties
 - Flood routing

--What *isn't* hydrology?

- No oscillatory flows (Coastal Processes, every other year in the fall)
- No sediment transport (Fluvial Sediment Transport, every other year in the fall)
- Not much chemical hydrology (GEOL 5/72069, Hydrogeochemistry)
- No subterranean flows (GEOL 52067, Introductory Hydrogeology)
- Not much about the morphology of basins (GEOL 6/72066, Quantitative Geomorphology)

--Why study this at all?

- "The next world war will be over water" --Ismail Serageldin, former World Bank vice president.
 - Bolivia
 - Kashmir
 - US-Mexico
 - Oregon
- Flooding is a huge natural hazard.
 - South Asia
 - Europe
- Crop production depends on water, and waterborne residue from food production is one of the primary pollutants in our environment.

--How will this class be run?

- This class is a combination of lecture and lab based. Labs will be run in place of lecture every other week for the first 10 weeks of the quarter.
- Please don't be afraid to ask questions. The class becomes more accessible to you if I have feedback on what's not clear, or what you want to know more about.

- See the syllabus for information on grading and extra help.