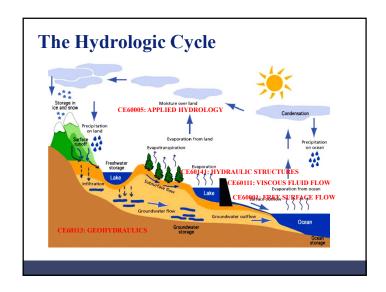
Overview Geohydraulics | CE60113 Lecture:00

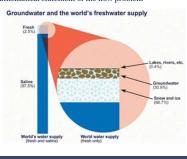


Learning Objective To understand the importance of groundwater

Basics		
• Geology:		
• Hydraulics & Hydrology:		

Geohydraulics

- Geohydraulics is the part of hydraulics that deals with the occurrence, movement and quality of water beneath the Earth's surface.
- Provide tools to deal with groundwater flow problems.
- · Provides mathematical statement of the flow problem



Differences between Geohydraulics and

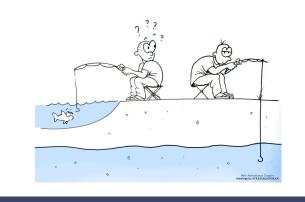
- Groundwater Hydraulics
- Groundwater Hydrology
- Hydrogeology
- Geohydrology
- · Geological Fluid Dynamics

Groundwater: the hidden resource





Groundwater: not a lake under the ground



Groundwater: a inexpensive source of reliable water

Questions

- Where can I find groundwater in sufficient quantity and quality? (groundwater exploration, groundwater development)
- How much groundwater can be extracted at a certain location or from a certain aquifer? (aquifer analysis, catchment delineation, well head protection, sustainability)
- How fast moves groundwater? (water protection areas well head protection)

Geohydraulics deals with

- Consumption (water for domestic and industrial use, irrigation)
- · Pollution Contamination Remediation
- · Geotechnical Applications
- · Energy: Hydro-Geothermal Applications
- Mining





Question (contd.)

- How old is it? (recharge, flow / seepage velocity, sustainabilty ...)
- Where does it go? (contaminated site ⇒ affected area)
- Where does it come from? (drinking water supply, water protection area)
- How is the quality of groundwater? (drinking water, irrigation ..)

Business of Geohydraulics

- · Groundwater supply
- Groundwater contamination

Evaluation Policy

- Assignments: 20%
- 2 Class Tests: 80%
- Marks: 30 + 50

Syllabus

- · Aquifer properties and subsurface flow
- · Mechanics of well-flow and aquifer tests
- · Modelling of two-dimensional flow in aquifers
- · One-dimensional flow in unsaturated zone
- · Pollution transport by advection and diffusion
- Sea-water intrusion
- Finite difference and finite element methods for solving subsurface flow and transport problems
- Applications of conformal mapping and Schwartz Christoffel transformation
- · Application of professional software for modelling
- Conjunctive surface- and subsurface water system for sustainable management of regional water
 recourses.

Submission of Assignments and Tests

- Institute Moodle Server
- URL: http://kgpmoodlenew.iitkgp.ac.in/

Groundwater SCIENCE CHARLES E HTD



