

MANAGEMENT AND DEVELOPMENT OF WATER SYSTEMS
ECIA W4100.001
MW 10:35A-11:50A
SEELEY W. MUDD 1127

Session 1: January 19 (Block)

Class logistics

World water resources

- global hydrology primer
- water supply and demand
 - historical to present
 - megaprojects/development
 - agriculture

Gleick: World's Water

Session 2-3: January 24/26 (Puma)

Conservation of mass

Hydrology primer

Session 4-5: January 31 / February 2 (Puma)

Human interventions in the water cycle and sustainability

- developing vs developed countries
- economic & ecological views
- unsustainability examples
- demand, drivers and projections

Jan 31: Assign HW1 (through reliability topics)

Lester Brown: Outgrowing the Earth

Session 6-8: February 7/9/14 (Block)

Water sources and options

- streamflow characterization
- storage and design
- reliability
- probability & sampling
- benefit-cost analysis & optimization

Session 9-10: February 16/21 (Block)

Risk and decision-theory

- decision analysis, decision trees
- optimization & trade-offs
- allocation

Feb 21: HW1 due

Session 11-15: February 23/28/March 2; March 7/9 (Puma/Block)

Climate connection: variability and change

- time scales (*Puma*)
- large-scale climate (*Puma*)
- extremes: droughts and floods (*Puma*)
- forecast methods: regression, nonparametric, CPT (*Block*)
- data library (*Block*)
- application of forecasts (*Block*)

Feb 23: Introduction to Term Project. Start working on research question.

Feb 23: Assign HW2 (sampling through allocation topics)

Mar 9: HW2 due.

Mar 9: Term project research question/concept paragraph due.

Paul training, Andy ppts, IRI manual, Mays chp 8-9, HW-to make

Spring Break: March 14/16

Session 16: March 21

IRI Data Library

Session 17-18: March 23/28 (*Puma*)

Water stress, scarcity, and hotspots

- blue and green water
- drivers: demand, population, economies, preferences
- virtual water trade and transfer
- water footprints: nations and companies

April 4: Take-home Exam DUE

Session 19-21: March 28; April 4/6 (*Block/Troy*)

Models

- Reservoir simulation – Excel
- Simple R/R models (Sac, ABCD)
- HEC-HMS, RAS, SWMM, EPANET, GIS, CROPWAT
- VIC

Mar 23: Assign HW3 (climate through water footprints topics)

Mar 30: Take-home Exam ASSIGN.

Mar 30: Term project outline of work due.

Manu files, Paul files, Tara Troy for VIC

Session 22-23: April 11/13 (*Block/Puma*)

Case studies

Own work (Ethiopia, Brazil, Chile)

Session 24-28: April 18/20/25/27, May 2

Term projects

April 20: HW3 due

Textbooks online:

Mays book

Loucks book

Reading list/options

The world's water (Gleick, Pac Institute)

Plan B (Brown)

When the rivers run dry (Pearce)

Water: the fate of our most precious resource (DeVillers)

Water for food, water for life (Molden, IWMI)