

CEE 577: Surface Water Quality Modeling

Lecture #1

(laws, regulations and standards)

Water Pollution



More Pollution



Outline

- Laws and Regulations
 - USEPA
 - History
 - Wastewater
 - Natural Waters
 - Regulatory Methods
 - Environmental Quality Based
 - Effluent Based
- Water Quality Modeling Objectives
- Loading Rates

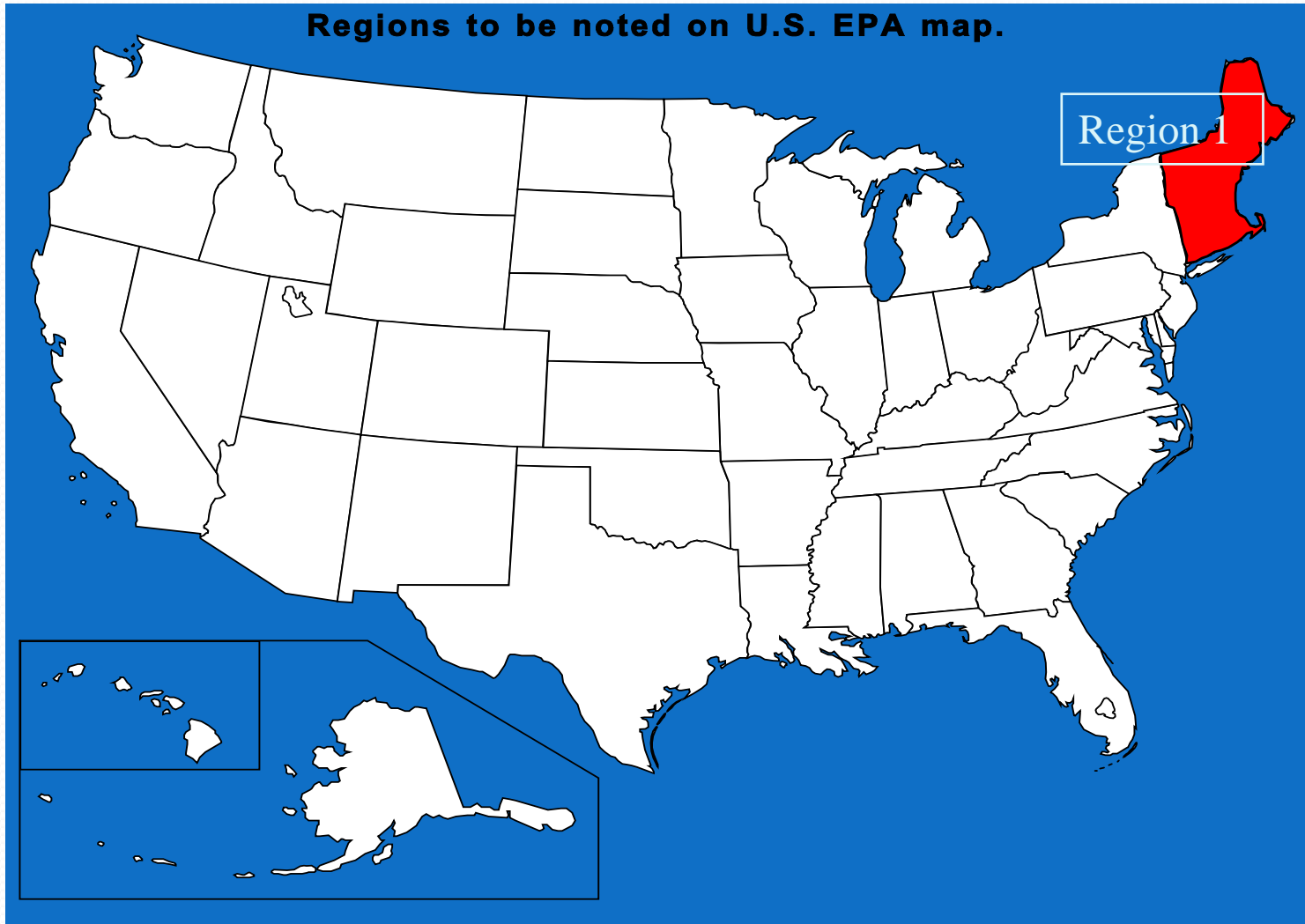
Laws and Regulations

- Laws: passed by a majority of both *legislative* houses and signed by the President
- Regulations: established by *executive* branch (USEPA) in response to laws
 - propose in Federal Register
 - public comment and modification
 - promulgation: into Code of Federal Regulations (CFR Part 40)

USEPA Regional Addresses

U.S. EPA Region 1 JFK Building Boston, MA 02203	U.S. EPA Region 2 26 Federal Plaza New York, NY 10278
U.S. EPA Region 3 841 Chestnut Street Philadelphia, PA 19107	U.S. EPA Region 4 345 Courtland Street, NE Atlanta, GA 30365
U.S. EPA Region 5 77 West Jackson Blvd. Chicago, IL 60604	U.S. EPA Region 6 First Interstate Bank Tower 1445 Ross Avenue, Suite 1200 Dallas, TX 75202
U.S. EPA Region 7 726 Minnesota Avenue Kansas City, KS 66101	U.S. EPA Region 8 999 18th Street, Suite 1500 Denver, CO 80202
U.S. EPA Region 9 75 Hawthorne Street San Francisco, CA 94105	U.S. EPA Region 10 1200 Sixth Avenue Seattle, WA 98101

USEPA Region #1



Legislative History

- 1899: Rivers and Harbors Act
 - Prohibited disposal of solid objects in navigable waters
- 1948: Water Pollution Control Act
 - first national water quality legislation
- 1966: Clean Rivers Restoration Act
- 1970: National Environmental Policy Act (NEPA)
 - required an Environmental Impact Statement (EIS) for all federally-funded projects

Legislative History (cont.)

- 1970: USEPA formed
- 1972: Federal Water Pollution Control Act
 - PL 92-500 subsequently amended and now called the **Clean Water Act**
 - established water quality goals “fishable & swimmable” and timetable
 - established National Pollution Discharge Elimination System (NPDES)
 - construction grants for WW treatment

PL 92-500 policies (cont.)

- **Comprehensive Pollution Control Planning Programs**
 - *106 - State Work Plans or Program Summaries*
 - *201 - POTW Facilities Planning*
 - *205 - Statewide Planning*
 - *208 - Areawide Planning*
 - *209 - Interstate River Basin Planning*
 - *305 - Inventory of Point Sources & Water Quality*
 - *303c - Water Quality Implementation Plans*
 - *Basis for current WQ standards program*
 - *303d - List of waters needing TMDL*
 - *Impaired & threatened waters, Impaired by pollutants*
 - *303e - develop plans for TMDLs*
 - *319 - Nonpoint Source Control Planning*

Legislative History (cont.)

- **1977: Clean Water Act Amendments**
 - **Best Available Technology (BAT) for 21 Industrial Categories for removal of 65 (later 126) "priority pollutants".**
- **1987: Water Quality Act**
 - **Forced States to adopt numerical criteria for priority pollutants**
 - **Addressed non-point sources**
 - **Great Lakes Program (1990)**
- **1988: Federal Clean Water Act Revisions**
 - **waterbodies that are listed on the 303d list must be brought into compliance using a "Total Maximum Daily Load or other watershed approach."**
- **for more information, see:**
 - [*EPA's CWA History page*](#)
 - *The Clean Water Act with Amendments, WPCF 1982*
 - *The Clean Water Act 20 Years Later, Adler et al., 1993*

Historical Regulatory Methods

- Environmental Quality-Based Standards
 - cannot degrade environment beyond a certain level
 - dependent on immediate environment
 - more flexible
- Effluent-Based Standards
 - cannot discharge above a certain level of pollutant
 - independent of immediate environment
 - easier to establish and monitor

Gold King Mine Spill



Endangered Species Critical Habitat for Colorado Pikeminnow, Razorback Sucker, Southwest Willow Flycatcher and Yellow-billed Cuckoo





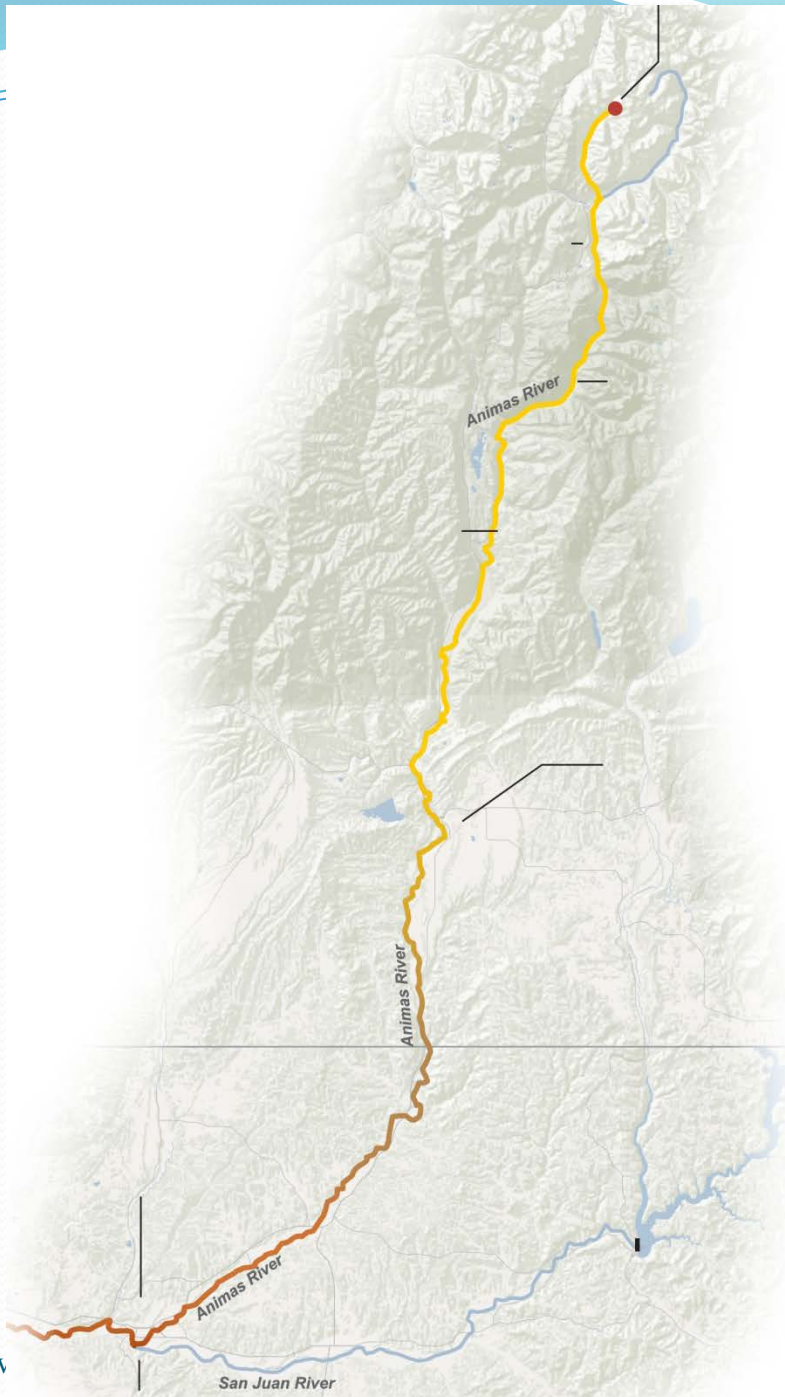
https://en.wikipedia.org/wiki/2015_Gold_King_Mine_waste_water_spill

Gold King Mine Spill





Water samples (■) collected prior to the plume's arrival.



- To next lecture