CEE 577: Surface Water Quality Modeling
Lecture #1
(laws, regulations and standards)

Water 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

USEPA Regional Addresses

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

  - 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*

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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

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

David A. Reckhow
To next lecture