Announcements

- Midterms
  Returned at
  End of Class

- Class here
  this
  Saturday

- Student
  Papers Due
  in 3 Weeks

Water Quality Law/Regulation

Water Quality Law Definitions

1) Point sources

2) Publicly Owned
   Treatment Works

3) Nonpoint sources

Major Surface Water Pollutants

1) Pathogens

2) Conventional
   Organics

3) Toxic Trace
   Organics

4) Nutrients

5) Heavy Metals

Pathogens

1. Includes bacteria, viruses, protozoans,
   and parasitic worms

2. Some of the pathogens can cause health
   problems, including:
   ✓ Cryptosporidium
   ✓ Typhoid fever
   ✓ Hepatitis
   ✓ Cholera
   ✓ Dysentery
   ✓ Giardia
Conventional Organics

- Conventional organics include gasoline, oil, grease, and diesel fuel.

Toxic Trace Organics

1. These are compounds that are toxic at low concentrations.
2. Many TTOs are slow to degrade and can be carcinogenic, cause birth defects, cellular damage, nervous system damage, organ damage, etc.
3. TTOs include PCBs, dioxins, solvents, pesticides, and pharmaceuticals.

Nutrients

1. Excess nitrogen, phosphates, and potassium can cause water quality problems by promoting plant and algal blooms in lakes, rivers, and streams.
2. When the plants and algae die, aerobic bacteria break it down causing anoxic (oxygen depleted) conditions.
3. This is called cultural eutrophication, and it kills fish and other aerobic organisms in aquatic systems.

Heavy Metals

1. Some heavy metals, such as mercury, lead, and chromium can be highly toxic.
2. These metals are naturally occurring in the environment at low concentrations.
3. When we mine and refine them, they can create problems in human and aquatic systems.
4. Metals such as copper and lead can also leach out of plumbing systems into tap water.

The Federal Water Pollution Control Act of 1972

1. Purpose: Restore and maintain the chemical, physical, and biological integrity of the Nation’s waters. The primary tools include:

   - Technology-based discharge limitations
   - Nationwide permit system (NPDES)
   - Construction of Publicly Owned Treatment Works (POTWs)
The Clean Water Act

1. In 1977, the FWPCA was amended and renamed the Clean Water Act (CWA) to control point source discharges
   - Point source discharges come from a known, identifiable source
   - For example, a pipe from an industrial facility or a POTW into a “navigable water” is a point source

2. The CWA remains the principle federal statute regulating water pollution in the U.S. today

The Clean Water Act

1. The CWA was further amended in 1981, and 1987
   - It now regulates nonpoint source discharges including urban and agricultural runoff, animal wastes, storm sewer discharges, and mining and logging operations

Effluent Limitations - Point Sources

1. The CWA prohibits all pollutant discharges without a permit

2. The National Pollutant Discharge Elimination System (NPDES) permit must provide for effluent limitations on the discharger

3. Effluent limitations are technology based and are dependent on the type of pollutant, the type of discharger, and the characteristics of the watershed

Publicly Owned Treatment Works

1. In the 1972 FWPCA, Congress required POTWs to achieve secondary treatment by 1977

2. In the 1981 CWA Amendments, they extended this deadline to 1988

3. Congress also provided financing for the construction and maintenance of POTWs

4. POTWs are required to maintain a pretreatment program to monitor industrial sources that discharge into sanitary sewers

Nonpoint Source Control

1. The bulk of the remaining surface water pollution comes from nonpoint sources

2. Nonpoint sources include urban and cropland runoff, animal wastes, storm sewer discharges, and mining and logging operations

3. Much more difficult to control than point sources since nonpoint sources are more numerous, widespread geographically, and they don’t lend themselves to command and control type regulations

4. Section 319 of the CWA provides funding for implementing nonpoint source management programs
Safe Drinking Water Act of 1974

1. The purpose of the SDWA is to protect public water supply systems and to ensure that they supply potable water free from biological, chemical, and physical contamination.

2. The SDWA required the EPA to develop Maximum Contaminant Level Goals (MCLGs) for many hazardous constituents.
   - MCLGs are unenforceable standards where no adverse health effects should occur.

SDWA

1. Required EPA to develop primary Maximum Contaminant Levels (MCLs)
   - These are enforceable drinking water standards designed to protect human health.

2. Required EPA to develop secondary MCLs
   - These are enforceable drinking water standards designed to protect aesthetic water quality like taste and odor.

SDWA Compliance and Enforcement

1. Monthly monitoring requirements based on size of system.
2. EPA may issue administrative orders and collect fines.
3. Water purveyors must provide annual water quality reports.
4. Water purveyors required to notify customers when MCL violations occur.

Annual Water Quality Report