

APES Chapter 14 – Water Pollution

Intro: Chesapeake Bay – recall: what is an estuary?

What are the basic inputs to this system?

What are the consequences to this ecosystem?

I. Water Pollution

Definition:

A. Point Source pollution

B. Nonpoint Source pollution

II. Human Wastewater

Three reasons that scientists are concerned:

A. Biochemical Oxygen Demanding Waste

The Oxygen Sag Curve

B. Eutrophication (natural) and Cultural Eutrophication

Dead Zones

C. Water-related and Waterborne Diseases

Indicator species: Fecal Coliforms

III. Dealing with Human and Animal Wastes

A. Septic Tank Systems – basic structure and processes:

B. Sewage Treatment Plant – know basic physical, biological, chemical processes

1. Primary treatment
2. Secondary treatment
3. Tertiary or Advanced treatment

C. Manure Lagoons – primarily for animal wastes

IV. Heavy Metals and Other Hazards

- A. Lead
- B. Arsenic
- C. Mercury
- D. Acid Mine Drainage
- E. Synthetic Compounds (several categories...many are POP's)
 1. Pesticides
 2. Inert Ingredients
 3. Pharmaceuticals and Hormones
 4. Military Compounds
 5. Industrial (PCB's, PBDE's, etc)

V. Oil Pollution

- A. Why it is a major problem:
- B. 1969 – Santa Barbara, CA (offshore well blowout)
- C. 1989 – Exxon Valdez (oil tanker accident off Alaska)
- D. 2010 – BP Deep Water Horizon, Gulf of Mexico (offshore well blowout)
- E. Remediation of Oil Spills:

VI. Other Water Pollution Issues

- A. Solid Waste
- B. Sediments
- C. Thermal Pollution
- D. Noise

VII. Water Laws

- A. Clean Water Act (1972 and subsequent expansion and reauthorization)
- B. Safe Drinking Water Act (1974 and subsequent...)
- C. International Efforts to Prevent Water Pollution in the Oceans

Working Toward Sustainability – Green Solutions to Wastewater Treatment

The “Greenhouse”

The “Living Machine” at Oberlin College