Defining “The Environment”

• **Biophysical Environment:**
  • *the biotic & abiotic setting of an organism or population, and consequently, the factors that have an influence in their survival, development, and evolution.* (G. Tyler Miller)

• **Biodiversity**

• **Biocomplexity**
  • *the interdependence of elements within specific environmental systems, and the interactions between different types of systems.* (J. Artiola, et al)

• **Natural Resources:** Renewable vs. Non-renewable?
Environmental Monitoring

- **Environmental Monitoring:**
  Systematic processes used to characterize, monitor, maintain, and/or rehabilitate the quality of an environment.

- Researchers, Decision-makers, and the Community

- Continuum of biosystems & physio-chemical processes
Environmental Monitoring

• Rooted in the **Scientific Method**

• Data generated can be used in a myriad of ways:
  • Short-term fates
  • Long-term preservation strategies
  • Regulation of deleterious actions

• Other factors influencing decision-making? (...in addition to Monitoring Data)
Benefits of Environmental Monitoring?
Monitoring Agencies

Who is responsible for Environmental Monitoring?
A Need for Regulation

Evolution of Our Environmental Policy

- **1962:**
  - *Silent Spring*, Rachel Carson
  - *The Closing Circle*, Barry Commoner
- **1969:** Oil spill in Santa Barbara, CA
- **1970:**
  - National Environmental Policy Act (NEPA), President Nixon
  - First Earth Day Celebrated, April 22\(^{nd}\)
  - US Environmental Protection Agency created
- **1969-79:**
  - 27 environmental protection laws passed, including the CAA, CWA, & SDWA
  - Hundreds of administrative regulations enacted
- **1980s:**
  - Reduction in funding for federal environmental programs
  - Relaxation in federal environmental policy enforcement
  - Cutbacks in budgets for federal agencies
  - Shift of environmental legislation from the federal government to the states
- **1990s:**
  - Renewed public and governmental interest in environmental policy
  - Pollution Prevention Act passed
  - Amendments to strengthen CAA & SDWA passed
  - “Green” products became the fad for industry and major businesses
  - Increase in policy enforcement

August 2015 CFCC MSC-210
## Major U.S. Environmental Legislation

<table>
<thead>
<tr>
<th>Year</th>
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<tr>
<td>1955</td>
<td>Air Pollution Control Act</td>
<td>1972</td>
<td>Noise Control Act</td>
<td>1986</td>
<td>Safe Drinking Water Act Amendments</td>
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Major U.S. Federal Departments with Ties to Environmental Monitoring

- **U.S. Department of Commerce:**
  - NOAA – National Oceanic and Atmospheric Administration
  - NWS – Nation Weather Service
  - NESDIS – National Environmental Satellite, Data, & Information Service
  - NODC – National Oceanic Data Center
- **U.S. Census Bureau (USCB):**
- **Economics & Statistics Administration (ESA):**

- **U.S. Dept. of Health & Human Services:**
  - USFDA – U.S. Food & Drug Administration
  - CDC – Center for Disease Control

- **Dept. of Defense (DOD):**
  - USACE – U.S. Army Corp of Engineers

- **NASA – National Aeronautics & Space Administration**

- **U.S. Environmental Protection Agency (EPA):**
  - Office of Solid Waste & Emergency Response
  - Office of Air & Radiation
  - Office of Water

- **Department of Interior (DOI):**
  - USGS – U.S. Geological Survey
  - BOEM – Bureau of Ocean Energy Management
  - USFWS – U.S. Fish & Wildlife Service

- **Department of Energy (DOE):**
  - FERC – Federal Energy Regulatory Commission

- **U.S. Department of Agriculture (DOA):**

- And more...
Other Entities with Ties to Environmental Monitoring

• **State Agencies & Departments:**
  - Environmental Protection Agencies
  - Departments of Marine Fisheries
  - Departments of Natural Resources
  - Departments of Water Resources
  - And more..

• **Private Companies & Non-Profits:**
  - [CSA Ocean Sciences, Inc.](#)
  - [Dial Cordy & Assoc., Inc.](#)
  - [CZR, Inc.](#)
  - [Eco Analysts, Inc.](#)
  - [Ecology & Environment, Inc.](#)
  - [Gulf of Mexico Foundation](#)
  - [Clean Gulf](#)
  - [Cape Fear River Watch](#)
  - And many, many more...

• **World Organizations:**
  - The United Nations (U.N.)
  - Food & Agricultural Organization (FAO)
  - USDA’s Foreign Agricultural Service (FAS)
  - World Meteorological Organization (WMO)
  - World Health Organization (WHO)
  - World Weather Watch (WWW)
  - World Health Organization (WHO)
  - Global Environment Monitoring System (GEMS)
  - International Atomic Energy Agency (IAEA)
  - Global Atmosphere Watch (GAW)
  - U.N. Statistical Office (UNSO)
  - International Energy Administration (IEA)
  - World Conservation Monitoring Center (WCMS)
  - And more...
“Marine environmental monitoring has been successfully employed to protect public health through systematic measurement of microbial indicators of fecal pathogens in swimming and shellfish growing areas, to validate water quality models, and to assess the effectiveness of pollution abatement.

Nevertheless, despite these considerable efforts and expenditures, most environmental monitoring programs fail to provide the information needed to understand the condition of the marine environment or to assess the effects of human activity...”
References

Lecture Content


Images

• Slide 7: Silent Spring
  [http://www.amazon.com](http://www.amazon.com)

• Slide 11: Managing Troubled Waters