Are Environmental Problems Getting Worse or Better?
Environmental Policy

Pattern of Government decisions and actions intended to address environmental problems

- Defining environmental problems
- Devising programs and activities to manage them
Environmental Policy Making

- How the government determines what are/not environmental problems and which deserve government attention
  - Institutions
    - How public concerns are translated into government concerns
  - Procedures
Environmental Politics

Clash of interests, ideas, & values that occurs -- inside and outside of government -- in the course of defining environmental problems and deciding what government should (not) do about them

– Include public participation
  - Voting
  - Letter writing
  - Lobbying
Environmental Politics

- What are the real problems we face as a society and how do we characterize and prioritize them?
  - Environmental problems vs. other problems
- Should our government do anything about the environmental problem(s) we identify?
- If so, what are our choices for government action? What can government do and what should government do?
- Once we know what we want government to do, how do we make it happen?
Scientific & Engineering Data in Environmental Policy

Where does science and technology come into play?

- Defining the *some* of the characteristics of environmental problems
- Defining *some aspects* of the solutions for solving the problems
Scientific & Engineering Data in Environmental Policy

“Emerging” science & technology
- Tentative
- Uncertain
- Speculative

Looking for the truth vs. Looking for evidence
- Many ways to present data
Are Environmental Problems Getting Worse or Better?

What do the Data show?
Things Are Getting Worse
World Population

![Population Projection Graph]
World Population Growth
GDP per capita (2000)

GDP/pop

US
Japan
Germany
UK
Sweden
Mexico
China
India
Nigeria
CO$^2$ Emissions per Capita (1996)

- USA
- Japan
- Germany
- UK
- Sweden
- Mexico
- China
- India
- Nigeria
- World
Energy Consumption per capita (1997)
Municipal Trash

kg per capita

<table>
<thead>
<tr>
<th>Country</th>
<th>kg per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>750</td>
</tr>
<tr>
<td>Japan</td>
<td>350</td>
</tr>
<tr>
<td>Germany</td>
<td>300</td>
</tr>
<tr>
<td>UK</td>
<td>450</td>
</tr>
<tr>
<td>Sweden</td>
<td>500</td>
</tr>
<tr>
<td>Mexico</td>
<td>250</td>
</tr>
<tr>
<td>China</td>
<td>100</td>
</tr>
<tr>
<td>India</td>
<td>150</td>
</tr>
<tr>
<td>Nigeria</td>
<td>50</td>
</tr>
<tr>
<td>World</td>
<td>300</td>
</tr>
</tbody>
</table>
Ecological Footprint

The Ecological Footprint graph shows the comparison of ecological footprint and productive land per capita for various countries, including the US, Japan, Germany, UK, Mexico, China, India, Nigeria, and the world. The graph indicates the significant difference between the ecological footprint and productive land, highlighting the environmental impact of these countries.
Things Are Getting Better
Population Growth
1990-2000

% Annual Growth

US, Japan, Germany, UK, Sweden, Mexico, China, India, Nigeria, World
CO² Emissions per GDP (1996)
BTUs Consumed per GDP
(1996)

USA  Japan  Germany  UK  Sweden  Mexico  China  India  Nigeria
US Energy Use & GDP

BTUs / GDP

US SO$_2$ Pollution & GDP
U.S. NO$_x$ Emissions vs GDP/Pop

- **NO$_x$ Emissions**
  - 5000
  - 10000
  - 15000
  - 20000
  - 25000

- **GDP per Capita**
  - 5000
  - 10000
  - 15000
  - 20000
  - 25000

- Years:
  - 1930
  - 1935
  - 1940
  - 1945
  - 1950
  - 1955
  - 1960
  - 1965
  - 1970
  - 1975
  - 1980
  - 1985
  - 1990
  - 1995
  - 2000

- Data points for the years 1991 to 1998.
US CO2 Emissions

CO2 Emissions

1,250
1,300
1,350
1,400
1,450
1,500


17.32 Limited Earth?
US CO2 Emissions / GDP

CO2 Emissions/GDP

Simon & Kahn

- Life expectancy is rising globally
- Birth rates are falling
- Global food supply is increasing
- No statistical evidence of species loss
- Fish catch is increasing
- Agriculture not constrained by land availability
Simon & Kahn

- US farmland is not being lost to urbanization
- Water is not growing scarce
- No sign of serious climate change
- Mineral resources are becoming less scarce
- Nuclear power is safe and competitive
- Air and Water pollution threats are exaggerated
U.S. Population
Urban & Rural

Year
0 50 100 150 200 250
Population (millions)
0 50 100 150 200 250
Rural
Urban

1900 1920 1940 1960 1990
US Vehicles Miles per capita

Year

Vehicle Miles per Capita

1900 1920 1940 1960 1980 2000

0 2000 4000 6000 8000 10000 12000
Federal Environmental Laws Passed
(including amendments)

<table>
<thead>
<tr>
<th>Decade</th>
<th>Number Passed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1945-1950</td>
<td>1</td>
</tr>
<tr>
<td>1951-1955</td>
<td>1</td>
</tr>
<tr>
<td>1956-1960</td>
<td>1</td>
</tr>
<tr>
<td>1961-1965</td>
<td>1</td>
</tr>
<tr>
<td>1966-1970</td>
<td>8</td>
</tr>
<tr>
<td>1971-1975</td>
<td>7</td>
</tr>
<tr>
<td>1976-1980</td>
<td>6</td>
</tr>
<tr>
<td>1981-1985</td>
<td>9</td>
</tr>
<tr>
<td>1986-1990</td>
<td>5</td>
</tr>
<tr>
<td>1991-1995</td>
<td>6</td>
</tr>
<tr>
<td>1996-2000</td>
<td>2</td>
</tr>
</tbody>
</table>