Political Science 12: IR -- Ninth Lecture, Part 1
The Global Environment

1. Resolving environmental problems
2. Interests and interactions
3. Severity of problems and outcomes
4. International institutions and cooperation
5. The science of ozone depletion and climate change
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Resolving Environmental Problems

• On some issues, states fail to take action
• Other important issues have been successfully resolved
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Interests and Interactions
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Figure 13.1: National Interests and Carbon Dioxide Emissions

- United States: 17.3%
- Korea, South Africa, Mexico, Taiwan: 5.1%
- Brazil: 5.1%
- China: 20.5%
- Japan: 3.9%
- India: 5.4%
- Indonesia: 1.7%
- European Union: 14.2%
- Russia: 6.1%
- Other carbon exporters: 8.1%
- Other enthusiastic nations: 0.6%
- Small islands: 0.9%
- Other vulnerable small emitters: 7.3%
Interests and Interactions

Two different types of goods pose different kinds of cooperation problems

1. Public goods
2. Common pool goods
Interests and Interactions

At times, public and common goods can be privatized

Privatizing public goods
Interests and Interactions

Map 13.1: Environmental Performance Index, 2012
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Interests and Interactions

Figure A: EPI and Income, 2010
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Severity of Problems and Outcomes
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Privileged groups tend to be more effective
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International Institutions and Cooperation

• Setting standards
• Verifying compliance
International Institutions and Cooperation
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- Facilitating decision-making
- Resolving disputes
International Institutions and Cooperation
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The Science of Ozone Depletion and Climate Change

Figure 13A.1: The Chemistry of Ozone Depletion

Ultraviolet radiation strikes a CFC molecule...

... and causes a chlorine atom to break away.

The chlorine atom collides with an ozone molecule...

... and steals an oxygen atom to form chlorine monoxide and leave a molecule of ordinary oxygen.

When a free atom of oxygen collides with the chlorine monoxide...

... the two oxygen atoms form a molecule of oxygen. The chlorine atom is released and free to destroy more ozone.
The Science of Ozone Depletion and Climate Change

Figure 13A.2: Ozone Hole
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Figure 13A.3: Atmospheric Chlorine and Ozone Levels

- **Chlorine**
  - Initial decline of stratospheric chlorine due to Montreal Protocol

- **Ozone (%)**
  - Temporary reduction following Mt. Pinatubo
  - First stage of ozone recovery (starting in 1997)
Figure 13A.4: The Greenhouse Effect

- Solar radiation passes through the clear atmosphere.
- Some solar radiation is reflected by the earth and the atmosphere.
- Some of the infrared radiation passes through the atmosphere, and some is absorbed and reemitted in all directions by greenhouse gas molecules. The effect of this is to warm the earth’s surface and the lower atmosphere.
- Most radiation is absorbed by the earth’s surface and warms it.
- Infrared radiation is emitted from the earth’s surface.
Figure 13A.5: Earth’s Surface Temperature, 1000-2100
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Figure 13A.6: CO$_2$ Concentrations in the Atmosphere
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Figure 13A.7: World Greenhouse Gas Emissions, 2000
Political Science 12: International Relations