What is Environmental Engineering?

**Definition:** The application of science and engineering knowledge and concepts to care for and/or restore our natural environment and/or solve environmental problems.
Who does it affect?

Everyone & Everything!
- Plants
- Insects
- Animals
- Humans
- Ecosystems
- Our planet
What are environmental issues?

Three areas:

- Air quality
- Land quality
- Water quality
# Air Quality

**Why is air quality such a problem?**

Poor air quality can lead to:

<table>
<thead>
<tr>
<th>smog</th>
<th>acid rain</th>
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<tbody>
<tr>
<td>respiratory &amp; other illnesses</td>
<td>global warming</td>
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From where do air pollutants come?
Air Quality

**Air pollutant:** A known substance in the air that can cause harm to humans and the environment.

- nitrogen oxides (NO\(_x\))
- sulfur oxides (SO\(_x\))
- carbon monoxide (CO)
- carbon dioxide (CO\(_2\))

*effects of acid rain on plants*
**Global warming:** An increase in the average air temperature of the Earth.

**Greenhouse effect:** Heat from the sun gets trapped inside the glass of a greenhouse and heats up its air.

More carbon dioxide (CO2) being released in the atmosphere traps more heat.
How do we reduce air pollutants?

- carpool
- hybrid cars
- EPA government regulation
- NEW: geologic carbon sequestration
- alternative fuels
- walk, bike or use public transportation
Land Quality

- **Land pollution:** Destruction of the Earth’s surface caused by human activities and the misuse of natural resources.

- **Natural resources:** Land and raw materials that exist naturally in the environment undisturbed by humans.

- **Renewable resource:** A natural resource that can be replaced by a natural process.

- **Non-renewable resource:** A natural resource that cannot be produced or re-grown or reused.
Examples

Renewable Resources

Non-Renewable Resources
What problems arise from land pollutants?

- acid mine drainage
- pesticides and herbicides
- landfills
How do we reduce land pollution?