Environmental Engineering Careers

- What are some of the job opportunities in the Environmental Engineering field?
Prospects for employment are good!

**Fortune (2005)**

Environmental Engineers were at the top of prospective job growth by 2012.

2012 mean salary for Env. E. is listed as $85,140.
According to the Bureau of Labor Statistics, U.S. Department of Labor


- Employment of environmental engineers is projected to grow 15 percent from 2012 to 2022, faster than the average for all occupations.
- More environmental engineers will be needed to help companies comply with environmental regulations and to develop methods of cleaning up environmental hazards.
- State and local government concerns regarding water should lead to efforts to increase the efficiency of water use.
Annual mean wage of environmental engineers, by state, May 2012

Annual mean wage
- $70,220 - $77,780
- $77,900 - $81,150
- $81,330 - $85,890
- $86,630 - $108,730

Blank areas indicate data not available.
What you will do will depend a bit on how far you go with your education.

- **Graduate training** is considered by some to be the *entry level degree* for a career in Environmental Engineering.
  - In part, because Env. E. was formally a focus area of another field such as Civil or Chemical Engr. So, undergrads took environmental courses along with many courses related to other topics in the field.

- None-the-less, many job openings are available to individuals with a bachelor’s degree.
There are many interesting employment options. Including . . .

- Private consulting firms.
  - Consulting firms handle many different environmental problems for their clients. The jobs may be in the office or field work. Examples include.
    - hazardous waste site clean up (rapid growth of work in this area in the last 2 decades)
      - site surveys (before, during and after remediation)
      - remediation design and implementation
      - sample analysis, data interpretation
    - wastewater treatment plant design & upgrade
      - for industry (petrochemical, textile, pulp and paper, etc.)
      - for municipalities (ex. upgrades for P removal)
      - international (growth potential in this area is high)
    - municipal water treatment plant design
      - International (growth potential in this area is high)
More on what private consulting firms do . . .

- designs for recycling and/or disposal of solid wastes
- designs for treatment of gaseous emissions
  - designs for CO$_2$ removal are a likely growth area
- designs for advanced wastewater treatment for reuse of water or watershed protection.
- environmental assessments (risk estimation) for discharges, emissions and waste residuals.
Many **industries** have their own *in-house* environmental engineering teams.

- handle designs for treatment of industry-specific waste streams:
  - designs for optimal cost-effective compliance with government regulations.
    - wastewater treatment system design
    - design and operation of pretreatment systems for discharge to sanitary sewers.
  - recovery & recycle of valuable materials from waste streams.
    - process design / management of industrial solid wastes.
  - design / operation of gaseous emission control.
OR work for a government agency

Municipal governments
- operate water & wastewater treatment plants
- collect / dispose of solid wastes
- design / build water distribution, sanitary sewer systems & storm drains

State and Federal governments
- set / enforce environmental laws
  » i.e., New York State Dept. of Environmental Conservation, U.S. Environmental Protection Agency
- manage / monitor environmental resources
  » i.e., Corps of Engineers (flood risk), U.S. Forest Service (forests/parks), U.S. Geological Survey
- assess environmental impacts at a regional scale (dams, hydropower projects, wetlands, etc.)
There are also a significant number of openings for individuals to carry out environmental research.

- **At nonprofit institutions such as:**
  - Battelle Memorial Institute
  - Stanford Research Institute

- **At government laboratories such as:**
  - those associated with the Departments of Defense (DOD), Energy (DOE), and the EPA.

- **At Universities**
Environmental Research at Cornell

- Biological and Environmental Engineering
- Boyce Thompson Institute
- Chemical and Biomolecular Engineering
- Chemistry and Chemical Biology
- Civil and Environmental Engineering
- Crop and Soil Science
- Earth and Atmospheric Sciences
- Ecology and Evolutionary Biology
- Environmental Toxicology
- Human Ecology
- Mechanical Engineering
- Microbiology
- Natural Resources
An education in Environmental Engineering can also serve as a stepping stone for a career in:

- **Law** (particularly environmental law)
- **Business** (management).
  - Engineers are in high demand because of their problem solving skills.
- **Medicine**
  - The combination of math physics, chemistry and biology that environmental engineering students study is excellent preparation for medical school.
Ithaca as a microcosm for Environmental Engr. in the U.S.

- **Chemical waste site** *(near airport)*, & **coal tar** and **cleaning solvent waste sites** *(downtown & South Hill)*
  - Containment, treatment and remediation

- **Radioactive waste disposal site** *(near airport)*

- **Wastewater discharges** to Cayuga lake
  - Currently two treatment plants operating
    » Plant modification for improved phosphorus removal

- **Water supply**
  - Currently three water treatment plants operating
    » Ithaca plant upgrade will occur in the near future

- **Municipal refuse** collection, disposal and recycle

- **Management of lake level and flooding**

- **Lake source cooling**
  - Assessment of environmental impact

- **Invasive species** *(zebra mussels, hydrilla)*
An education in Environmental Engineering can also serve as an entry into government, or non-governmental organizations working to help people abroad and in the U.S., such as:

- The Peace Corps
- Teach for America