

What is an Environmental Toxicologist?

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Environmental toxicologists study the effects of toxic chemicals on organisms in their natural environments, as well as the ecosystems they belong to. For example, they may conduct laboratory experiments to determine the effects of a toxin at various concentrations. Since some pollutants bioaccumulate, or build up over time in the flesh of larger predators that eat smaller, contaminated prey, environmental toxicologists may study the effects of bioaccumulation on wild food webs, as well as our own food supply.

What Does an Environmental Toxicologist Do?

Environmental toxicologists are usually involved in studying how toxic chemicals are metabolized by organisms, how they move through food webs and ecosystems, and the lethal and non-lethal effects they have on species. This work is often done with advanced computer models, laboratory experiments, and fieldwork. Experiments are often carried out on laboratory animals and human cells to determine toxic effects. Fieldwork may involve monitoring and reporting on changes in populations at all levels of an ecosystem that have been exposed to contaminants.

Some environmental toxicologists conduct ecotoxicity testing and risk assessment on new chemicals before they're released to the market, to ensure they won't cause cancer, birth defects, neurological problems or other adverse effects. They may either do this testing for federal regulatory agencies like the U.S. Environmental Protection Agency or Food and Drug Administration, or for private companies.

Environmental toxicologists may also help local, state and federal regulatory agencies develop and enforce laws governing the production, use and disposal of chemicals. They may either be employed directly by the government, or by private consulting

firms. These firms also help communicate information about chemical risks and regulations to the public.

Where Does an Environmental Toxicologist Work?

Many environmental toxicologists are employed by private companies, where they help with product development, product safety testing, and navigating the regulatory landscape. They may either work for product developers, or for research organizations that contract their services and toxicological expertise.

Environmental toxicologists are also employed by federal and state regulatory agencies, where they test new chemicals for safety or help develop regulatory policies. More than half of toxicologists working for the government have doctoral degrees.

Toxicologists are increasingly employed by consulting firms that advise local public officials, industries and lawyers on issues related to toxic chemicals. Doctoral degrees are typically not required for these positions. Those with bachelor's and master's degrees may find jobs at consulting firms.

Many environmental toxicologists are employed as faculty or staff researchers at colleges and universities. Doctoral degrees are usually required for such positions. Some nonprofit organizations also hire toxicologists to conduct research on chemicals or issues of public concern.

While most government and industry positions are located in the eastern U.S., jobs are generally available nationwide.

Some environmental toxicologists conduct outdoor fieldwork to monitor the effects of chemicals on ecosystems. This may involve conducting surveys on foot or by boat. Toxicologists may need to wear protective gear when working with certain chemicals, species, or contaminated substances.

What Is the Average an Environmental Toxicologist Salary?

According to the Society of Toxicology, most graduates with bachelor's and associate's degrees start their careers as lab technicians and research assistants. While the U.S.

Bureau of Labor Statistics (BLS) doesn't collect data on toxicologists specifically, it reports that the 2012 median annual wages for chemical and biological technicians ranged from \$40,000 - 43,000. Those who work their way up to full environmental toxicologist positions may earn salaries close to those for biochemists and biophysicists, which BLS gives as \$84,320, or \$40.54 hourly. Jobs in private industry typically pay more than positions in government or academia.

| State | Median Salary |
|----------------------|----------------------|
| Arizona | \$47,080 |
| California | \$92,430 |
| Colorado | \$60,160 |
| Connecticut | \$101,100 |
| Delaware | \$87,710 |
| District of Columbia | \$45,850 |
| Florida | \$59,420 |
| Georgia | \$36,870 |
| Idaho | \$37,250 |
| Illinois | \$69,180 |
| Indiana | \$93,180 |
| Iowa | \$59,650 |
| Kentucky | \$46,530 |
| Louisiana | \$45,620 |
| Maine | \$79,020 |
| Maryland | \$72,160 |
| Massachusetts | \$100,980 |
| Michigan | \$42,290 |
| Minnesota | \$69,600 |
| Missouri | \$68,220 |
| Nebraska | \$52,140 |
| Nevada | \$59,020 |
| New Hampshire | \$73,650 |
| New Jersey | \$111,580 |

| State | Median Salary |
|----------------|---------------|
| New York | \$72,440 |
| North Carolina | \$80,940 |
| Ohio | \$63,960 |
| Oklahoma | \$53,530 |
| Oregon | \$66,430 |
| Pennsylvania | \$94,590 |
| Puerto Rico | \$52,660 |
| Rhode Island | \$56,950 |
| South Carolina | \$57,820 |
| Tennessee | \$80,200 |
| Texas | \$61,620 |
| Utah | \$44,440 |
| Virginia | \$64,890 |
| Washington | \$80,560 |
| West Virginia | \$85,600 |
| Wisconsin | \$64,550 |

Table data taken from BLS (<http://www.bls.gov/oes/current/oes191021.htm>)

Environmental Toxicology Jobs & Job Description

Environmental toxicologists work mainly in applied fields analyzing the harmful effects of newly created chemical compounds, and existing combinations of chemicals that have influenced the environment on a local, national, or global scale. While scientists seeking environmental toxicologist jobs may pursue teaching or some interdisciplinary research, the greater job demand is for these individuals to work in industrial settings or for regulatory agencies. While tasks do vary significantly from job to job, the scope of an environmental toxicologist job is found below:

- Develop research methods and systems that are best fit for the chemicals and environment that are being researched
- Use observations, samples, and specimens to collect data

- Review current scientific literature on an ongoing basis
- Manage observations, samples and specimens in the lab and via fieldwork
- Forecast and analyze toxicology impact using GIS and modelling technology
- Use literature, data, laboratory samples, and other sources of information to uncover primary, secondary, and tertiary chemical impacts
- Present research findings to internal and external stakeholders
- Communicate with project leader and administrators through reports and presentation of research findings
- Consult with policymakers on the impact and safety of chemicals in the environment

A lead environmental toxicologist or chief researcher may have the following or similar additional responsibilities, depending on the goals of the project. These additional tasks tend to be focused on project and budgetary management:

- Create project timelines and budgetary metrics
- Foster quality, integrity, organization, and appropriate tracking of field and lab data
- Oversee the integrity of a project site to control for chemical impact data
- Manage tasks like report and presentation preparation and submittal, as well as communicating with site stakeholders
- Supervise fieldwork and administrative support (survey, site recording, testing, monitoring, and data integrity) of one or more field crews
- Communicate with funding agencies for grant applications

What Is the Job Demand for an Environmental Toxicologist?

Environmental toxicologists should have excellent job prospects over the coming years. BLS predicts that employment of biochemists will grow 15-21%, adding 13,700 jobs by 2022. This rate is faster than the average projected for all occupations. Specialists in environmental toxicology will have advantages over biologists and other scientists without specialized training in toxicology.

What Are Environmental Toxicologist Education Requirements?

Most environmental toxicologists have advanced degrees in this specialization. Most professionals enter graduate school with bachelor's degrees in biology, chemistry, environmental chemistry, or ecology. Graduate programs build on those basics, providing additional education in molecular and developmental biology, neuroscience and risk assessment. They also teach students how environmental contaminants relate to other life and earth sciences such as microbiology, botany, entomology, soil science, hydrology, and atmospheric science.

Learn more about environmental toxicology degrees.

What kind of societies and professional organizations do Environmental Toxicologists have?

- The Society of Toxicology (SOT) <http://toxicology.org/> advances the profession of toxicology, career opportunities for toxicologists, and the protection of public health. It offers networking and involvement through special interest groups and regional chapters. These sub-groups offer developmental webinars on a variety of professional topics.
- The Society of Environmental Toxicology and Chemistry (SETAC) (<http://www.setac.org/>) is a global professional organization that actively balances its governance and activities among its academic, business, and government members. It focuses on developing and promoting multidisciplinary approaches to solving environmental problems, and provides a forum for sharing ideas. It holds annual meetings, offers short courses, supports regional branches and chapters, offers a job board, and maintains a directory of graduate programs.

<http://www.environmentalscience.org/career/environmental-toxicologist>