

Green Careers Resource Guide



by Jim Cassio

November 2007

www.work-info.com

Copyright © 2007 Jim Cassio | Workforce Information Group, Inc.

Table of Contents

Page	
3	Introduction
3	A Green Birth
3	Defining Green Careers
4	Identifying Green Occupations
5	Initial Assessment of the List of Occupations
5	Occupation vs. Job
5	Wages Comparison
6	Education and Training Levels
7	Career Clusters/Pathways
8	Green Occupations by Career Cluster
9	Career Interest Areas
10	Green Occupations by Career Interest Area
11-13	Employment Statistics for Green Occupations
14	Occupational Information Sources
15	New and Emerging Occupations
16-32	Occupation Definitions and Major Employment Sectors
33-35	Resources: Articles and Publications
36-39	Resources: Websites and Job Boards
40	About Mainstream Job Boards
41	About Our Sponsor: CareerDNA
41	About Jim Cassio

Green Careers Resource Guide

Introduction

You don't have to be an environmental activist to be interested in a Green Career. You just need to be interested in work that involves preserving and protecting the environment. Certainly many people who consider themselves to be environmentalists or environmental activists look to green careers as an important part of their lifestyle. But others, too, are likely to be interested in green careers simply because of their strong affinity for nature.

A Green Birth

The modern environmental movement in the United States began to appear following the publication of *Silent Spring* in 1962 by Rachel Carson. She was a biologist and a former researcher for the Fish and Wildlife Service. Carson had that rare ability to communicate complex issues in a way that most people could understand. Her book, *Silent Spring*, made people aware of how the indiscriminate use of the insecticide DDT spread throughout the food chain. Its title, "silent spring," refers to the death of robins from DDT toxicity. Carson effectively presented the widespread harm that pesticides cause to wildlife, as well as the damage that agricultural runoff did to waterways. The realization that new synthetic chemicals widely used in agriculture and industry had potentially disastrous consequences captured the attention of many.

Environmentalism was a major part of the social protest movements of the 1960s, and by the beginning of the 1970s, the foundations of the environmental movement were well laid for what would be called the **Green Decade**. Numerous public and private organizations formed to promote pro-environmental causes. The result was a collection of environmental laws and agencies intended to incorporate environmentalism into government. Public support for environmentalism blossomed; however, the early success of the environmental movement also created a significant backlash based on economic concerns and a growing criticism that environmentalists were too radical.

The 1980s would be a challenging time of transition for environmentalists as they struggled to maintain their gains while their opposition went on the offense. By the end of the '80s, the environmental movement had survived the backlash of the Reagan-Bush era. Despite efforts to deregulate and dismantle environmental protection agencies, a strong legal foundation to promote environmental issues remained.

The environmental movement was largely an American cultural phenomenon until the late 1980s when environmentalism became a global movement that culminated in the Earth Summit of 1992. Green political parties began to appear in Germany and other countries and began to gain some political power. But in America during the '90s, opponents of the environmental movement continued to proliferate and attempted to counter the movement's influence. The backlash against environmental activism continued. Critics referred to most environmentalists as **Lite Greens** – those who like the idea of protecting the environment but are not willing to make any real sacrifices. But by the end of the decade, the environmental movement had become an institution, both in the United States and globally. The movement clearly had made Americans more aware of their environment than at anytime in their history. Nevertheless, inertia due to the complex and sometimes apocalyptic nature of the environmental debate often left people confused, skeptical, and apathetic.

More recently, environmental awareness does seem to have made Americans sensitive to the long-term connections between our living standards and the preservation of nature. Faced by such real catastrophic disasters as global warming and extinction of species, many Americans are now moving from that state of hopelessness or indifference to a state of wanting to do something meaningful. For many, a green career is one way of doing something meaningful.

Defining Green Careers

A *green career* is a job or series of jobs for which the common thread is environmental protection and preservation. It doesn't matter what sector one works in, or who they work for. It also doesn't matter whether it's a hands-on field job, or a lab or office job, or something else. What matters is whether the job is *about* preserving and protecting the environment, and you can't necessarily determine that by the job or occupation title. Many green jobs have the word *environment* (or *environmental*) in the title, but you still need to research that specific job and that specific employer before you can be sure that it's a true green job. **Even with the occupations identified below, keep in mind that an occupation is not a job; rather, an occupation represents similar jobs. So, within an occupation, you can certainly have some jobs that are green and some that are not green.**

Identifying Green Occupations

The O*NET system (from the U.S. Department of Labor) is the nation's primary source of occupational information, providing comprehensive information on key attributes and characteristics of workers and occupations. The Federal Government's occupational taxonomy divides the U.S. workforce into about 900 different occupations. Using the O*NET database, occupations with significant biology knowledge and environmental monitoring requirements were identified.

Occupations were also included on the basis of job tasks that involve preserving and protecting the environment.

Then, to reduce this list of occupations to a manageable size, most health care and animal care occupations with high biology knowledge requirements were eliminated.

Finally, administrative support occupations were not included, although that's not to suggest that a secretary with an environmental consulting firm isn't working in a green job!

Here is the list of 77 Green Occupations - not a magic number by any means - but perhaps a good starting point: (Note that this list does not include a handful of new/emerging occupations that will be discussed in a later section.)

1. Agricultural Engineers
2. Agricultural Inspectors
3. Agricultural Sciences Teachers, Postsecondary
4. Agricultural Technicians
5. Animal Scientists
6. Aquacultural Managers
7. Atmospheric and Space Scientists
8. Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary
9. Biochemists and Biophysicists
10. Biological Science Teachers, Postsecondary
11. Biological Technicians
12. Biologists
13. Biomedical Engineers
14. Chemical Technicians
15. Chemistry Teachers, Postsecondary
16. Chemists
17. Civil Engineering Technicians
18. Civil Engineers
19. Commercial Divers
20. Construction Carpenters
21. Construction Managers
22. Electrical Engineers
23. Electricians
24. Engineering Managers
25. Engineering Teachers, Postsecondary
26. Environmental Compliance Inspectors
27. Environmental Engineering Technicians
28. Environmental Engineers
29. Environmental Science and Protection Technicians, Including Health
30. Environmental Science Teachers, Postsecondary
31. Environmental Scientists and Specialists, Including Health
32. Epidemiologists
33. Farm and Home Management Advisors
34. Farmers and Ranchers
35. Fire Inspectors
36. Fire Investigators
37. Fire-Prevention and Protection Engineers
38. First-Line Supervisors/Managers of Animal Husbandry and Animal Care Workers
39. First-Line Supervisors/Managers of Aquacultural Workers
40. Fish and Game Wardens
41. Forest and Conservation Technicians
42. Forest and Conservation Workers
43. Forest Fire Fighters
44. Forest Fire Fighting and Prevention Supervisors
45. Forest Fire Inspectors and Prevention Specialists
46. Foresters
47. Forestry and Conservation Science Teachers, Postsecondary
48. Geographers
49. Geography Teachers, Postsecondary
50. Geological Sample Test Technicians
51. Geophysical Data Technicians
52. Geoscientists, Except Hydrologists and Geographers
53. Government Property Inspectors and Investigators
54. Hazardous Materials Removal Workers
55. Health Educators
56. Health Specialties Teachers, Postsecondary
57. Hydrologists
58. Industrial Safety and Health Engineers
59. Lawyers (Environmental Law)
60. Medical and Clinical Laboratory Technologists
61. Medical and Health Services Managers
62. Medical Scientists, Except Epidemiologists
63. Microbiologists
64. Municipal Fire Fighters
65. Municipal Fire Fighting and Prevention Supervisors
66. Natural Sciences Managers
67. Nuclear Monitoring Technicians
68. Nursery and Greenhouse Managers
69. Occupational Health and Safety Specialists
70. Park Naturalists
71. Range Managers
72. Soil and Plant Scientists
73. Soil and Water Conservationists
74. Training and Development Managers
75. Tree Trimmers and Pruners
76. Water and Liquid Waste Treatment Plant and System Operators
77. Zoologists and Wildlife Biologists

Initial Assessment of the List of Occupations

One of the first things a person might notice when scanning this list of 77 occupation titles is the predominance of science-related occupations. Of course, since biology knowledge and environmental monitoring criteria were used to help create the initial list, the percentage of science-related occupations comes as no real surprise. But as the purpose of this list is to provide useful career exploration content for people interested in real jobs for green careers, we think the science bias is appropriate.

Green careers are largely science-based, unless you want to be pushing paper, giving park tours, or doing environmental compliance work. You can get a degree in Environmental Philosophy, but then you'll likely find out that there are no jobs for you without also having the science background. Without it, you'll end up going back to college.
-Jessica Carson, Environmental Scientist

Although the science bias may be appropriate for the purpose of this resource guide, one should not forget the example of administrative support occupations which are found in every industry, including those involved in preserving and protecting the environment. Of course, there are countless other occupations where a person's work can have a positive effect on the environment. For example: the artist whose work or inspiration reflects a love and understanding of the natural world; the journalist or writer who chooses stories or subjects where they can help educate the population about important environmental issues; the elementary or secondary school teacher who takes every opportunity to instill in their students a love and respect for the environment; the elected public official who champions causes that preserve and protect the environment; and the fundraiser and their telemarketing staff who work to raise money for non-profit environmental organizations or causes. The list goes on.

Occupation vs. Job

Perhaps another initial reaction to this list is that there are some occupations on the list that don't seem like environmental-related occupations. The thing to remember here is that an *occupation* is not a *job*, even though those two words are often used interchangeably. Instead an occupation is a way of grouping jobs that have similar tasks. Within a single occupation, therefore, you will have some variance. Surely most of the jobs filled by lawyers have little or nothing to do with preserving and protecting the environment. But some lawyers specialize in environmental law; therefore there are some jobs within the occupation of Lawyer that are green. Another example is the occupation of Construction Carpenters, where the typical carpenter job has little or nothing to do with preserving and protecting the environment. However, there is an increasing need and demand for energy-efficient housing and other construction that will utilize solar or other forms of renewable energy. So the carpenters and general building contractors who manage to develop a specialty in this field will be working in green careers.

Wages Comparison

Most career explorers are going to want to know how green occupations pay compared to other occupations. Unfortunately, that's difficult to determine with any certainty because within most of these green occupations you can have some jobs that are green and some that are not green. Also, the criteria used to put together this list of 77 occupations are biased toward science-related occupations. Nevertheless, the average wage for these 77 occupations is just over \$53,000 per year, which compares to an average of about \$40,400 per year for all occupations (when each occupation is weighed equally).

Education and Training Levels

In terms of typical education and training levels, 55 of the 77 occupations (or 71 percent) require a college degree. The other 22 occupations (29 percent) do not typically require a college degree; however, 9 of those 22 occupations do require extensive experience.

<i>Number of Occupations</i>	<i>Typical Education Level</i>	<i>Description</i>
1	Short-term training	Short-term period (less than 1 month) of employer-provided instruction or training is the typical education/training requirement.
3	Moderate-term training	Moderate-term period (1-12 months) of employer-provided instruction or training is the typical education/training requirement.
9	Long-term training	Long-term period (2-4 years) of employer-provided training or apprenticeship-based training is the typical education/training requirement.
9	Extensive experience	Extensive and related work experience is the typical requirement.
0	Postsecondary certificate	Postsecondary technical or vocational training specific to the occupation is the typical education/training requirement.
10	AA/AS degree	An associate degree (2 years of college) is the typical education/training requirement.
17	BA/BS degree	A bachelor degree (4 years of college) is the typical education/training requirement.
0	BA/BS + training	A bachelor degree plus completion of a 1-2 year teacher training program is the typical education/training requirement.
7	BA/BS + experience	A bachelor degree or higher plus extensive experience in related occupations is the typical requirement.
4	MA/MS degree	A masters degree (6 years of college) is the typical education/training requirement.
16	Doctoral degree	A doctoral degree (8 years of college) is the typical education/training requirement.
1	Professional degree	A professional degree is the typical education/training requirement.

Note: See the table with the employment statistics for the typical education levels assessed for each occupation.

Career Clusters/Pathways

In terms of the 16 *career clusters/pathways* defined by the U.S. Department of Education, the majority of the 77 occupations fall into one of two clusters: 1. Agriculture/Natural Resources and 2. Scientific Research/Engineering

<i>Number of Occupations</i>	<i>Career Cluster</i>	<i>Description</i>
23	Agriculture, Food & Natural Resources	The production, processing, marketing, distribution, financing, and development of agricultural commodities and resources including food, fiber, wood products, natural resources, horticulture, and other plant and animal products/resources.
4	Architecture & Construction	Careers in designing, planning, managing, building and maintaining the built environment.
0	Arts, A/V Technology & Communications	Designing, producing, exhibiting, performing, writing, and publishing multimedia content including visual and performing arts and design, journalism, and entertainment services.
1	Business, Management & Administration	Business Management and Administration careers encompass planning, organizing, directing and evaluating business functions essential to efficient and productive business operations. Business Management and Administration career opportunities are available in every sector of the economy.
12	Education & Training	Planning, managing and providing education and training services, and related learning support services.
0	Finance	Planning, services for financial and investment planning, banking, insurance, and business financial management.
2	Government & Public Administration	Executing governmental functions to include Governance; National Security; Foreign Service; Planning; Revenue and Taxation; Regulation; and Management and Administration at the local, state, and federal levels.
3	Health Science	Planning, managing, and providing therapeutic services, diagnostic services, health informatics, support services, and biotechnology research and development.
0	Hospitality & Tourism	Hospitality & Tourism encompasses the management, marketing and operations of restaurants and other foodservices, lodging, attractions, recreation events and travel related services.
0	Human Services	Preparing individuals for employment in career pathways that relate to families and human needs.
0	Information Technology	Building Linkages in IT Occupations Framework: For Entry Level, Technical, and Professional Careers Related to the Design, Development, Support and Management of Hardware, Software, Multimedia, and Systems Integration Services.
9	Law, Public Safety, Security & Corrections	Planning, managing, and providing legal, public safety, protective services and homeland security, including professional and technical support services.
2	Manufacturing	Planning, managing and performing the processing of materials into intermediate or final products and related professional and technical support activities such as production planning and control, maintenance and manufacturing/process engineering.
0	Marketing, Sales & Service	Planning, managing, and performing marketing activities to reach organizational objectives.
23	Science, Technology, Engineering & Mathematics	Planning, managing, and providing scientific research and professional and technical services (e.g., physical science, social science, engineering) including laboratory and testing services, and research and development services.
0	Transportation, Distribution & Logistics	Planning, management, and movement of people, materials, and goods by road, pipeline, air, rail and water and related professional and technical support services such as transportation infrastructure planning and management, logistics services, mobile equipment and facility maintenance.

Green Occupations by Career Cluster

Agriculture, Food & Natural Resources

- Agricultural Inspectors
- Agricultural Technicians
- Animal Scientists
- Aquacultural Managers
- Environmental Engineering Technicians
- Environmental Engineers
- Farmers and Ranchers
- Fire Inspectors
- First-Line Supervisors/Managers of Animal Husbandry and Animal Care Workers
- First-Line Supervisors/Managers of Aquacultural Workers
- Forest and Conservation Technicians
- Forest and Conservation Workers
- Foresters
- Geological Sample Test Technicians
- Geophysical Data Technicians
- Nursery and Greenhouse Managers
- Park Naturalists
- Range Managers
- Soil and Plant Scientists
- Soil and Water Conservationists
- Tree Trimmers and Pruners
- Water and Liquid Waste Treatment Plant and System Operators
- Zoologists and Wildlife Biologists

Architecture & Construction

- Construction Carpenters
- Construction Managers
- Electricians
- Hazardous Materials Removal Workers

Business, Management & Administration

- Training and Development Managers

Education & Training

- Agricultural Sciences Teachers, Postsecondary
- Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary
- Biological Science Teachers, Postsecondary
- Chemistry Teachers, Postsecondary
- Engineering Teachers, Postsecondary
- Environmental Science Teachers, Postsecondary
- Farm and Home Management Advisors
- Forestry and Conservation Science Teachers, Postsecondary
- Geography Teachers, Postsecondary
- Health Educators
- Health Specialties Teachers, Postsecondary
- Medical and Clinical Laboratory Technologists

Government & Public Administration

- Environmental Compliance Inspectors
- Government Property Inspectors and Investigators

Health Science

- Medical and Clinical Laboratory Technologists
- Medical and Health Services Managers
- Occupational Health and Safety Specialists

Law, Public Safety, Security & Corrections

- Fire Inspectors
- Fire Investigators
- Fish and Game Wardens
- Forest Fire Fighters
- Forest Fire Fighting and Prevention Supervisors
- Forest Fire Inspectors and Prevention Specialists
- Lawyers
- Municipal Fire Fighters
- Municipal Fire Fighting and Prevention Supervisors

Manufacturing

- Civil Engineering Technicians
- Commercial Divers

Science, Technology, Engineering & Mathematics

- Agricultural Engineers
- Atmospheric and Space Scientists
- Biochemists and Biophysicists
- Biological Technicians
- Biologists
- Biomedical Engineers
- Chemical Technicians
- Chemists
- Civil Engineers
- Electrical Engineers
- Engineering Managers
- Environmental Science and Protection Technicians, Including Health
- Environmental Scientists and Specialists, Including Health
- Epidemiologists
- Fire-Prevention and Protection Engineers
- Geographers
- Geoscientists, Except Hydrologists and Geographers
- Hydrologists
- Industrial Safety and Health Engineers
- Medical Scientists, Except Epidemiologists
- Microbiologists
- Natural Sciences Managers
- Nuclear Monitoring Technicians

Career Interest Areas

The O*NET system rates occupations using the RIASEC career interest area categories. As you can see from the following table, the vast majority of the Green Occupations are Realistic or Investigative type occupations.

<i>Number of Occupations</i>	<i>RIASEC Career Interest Area</i>	<i>Description</i>
42	Realistic	Tools, Plants and Animals Jobs
32	Investigative	Analytical and Investigative Jobs
0	Artistic	Creative and Artistic Jobs
8	Social	People, Service and Teaching Jobs
13	Enterprising	Leadership, Enterprising and Sales Jobs
2	Conventional	Detail, Data and Administrative Jobs

Note: While the above may suggest to the casual observer that green occupations are not appropriate for individuals with an artistic personality type, this would certainly be a false conclusion. This look at career interest areas was concerned only with primary interest area ratings. To that extent, it is true that none of the 77 occupations have the artistic category rated as the highest-rated interest area. However, there are a number of green occupations in which the artistic characteristics of the occupation rates as moderate or higher:

- Agricultural Sciences Teachers, Postsecondary
- Atmospheric and Space Scientists
- Biochemists and Biophysicists
- Biological Science Teachers, Postsecondary
- Biologists
- Chemistry Teachers, Postsecondary
- Chemists
- Civil Engineers
- Engineering Teachers, Postsecondary
- Epidemiologists
- Forestry and Conservation Science Teachers, Postsecondary
- Geographers
- Geoscientists, Except Hydrologists and Geographers
- Health Educators
- Health Specialties Teachers, Postsecondary
- Hydrologists
- Lawyers
- Medical and Clinical Laboratory Technologists
- Medical and Health Services Managers
- Medical Scientists, Except Epidemiologists
- Park Naturalists
- Tree Trimmers and Pruners

Green Occupations by (Primary) Career Interest Area

Realistic

- Agricultural Engineers
- Agricultural Inspectors
- Agricultural Technicians
- Animal Scientists
- Aquacultural Managers
- Atmospheric and Space Scientists
- Biological Technicians
- Chemical Technicians
- Chemists
- Civil Engineering Technicians
- Civil Engineers
- Commercial Divers
- Construction Carpenters
- Construction Managers
- Electrical Engineers
- Electricians
- Engineering Teachers, Postsecondary
- Environmental Science and Protection Technicians, Including Health
- Environmental Scientists and Specialists, Including Health
- Farmers and Ranchers
- First-Line Supervisors/Managers of Animal Husbandry and Animal Care Workers
- First-Line Supervisors/Managers of Aquacultural Workers
- Fish and Game Wardens
- Forest and Conservation Workers
- Forest Fire Fighters
- Forest Fire Fighting and Prevention Supervisors
- Forest Fire Inspectors and Prevention Specialists
- Foresters
- Geographers
- Geological Sample Test Technicians
- Geophysical Data Technicians
- Hydrologists
- Microbiologists
- Municipal Fire Fighters
- Municipal Fire Fighting and Prevention Supervisors
- Nuclear Monitoring Technicians
- Nursery and Greenhouse Managers
- Range Managers
- Soil and Plant Scientists
- Soil and Water Conservationists
- Tree Trimmers and Pruners
- Water and Liquid Waste Treatment Plant and System Operators

Investigative

- Agricultural Engineers
- Agricultural Sciences Teachers, Postsecondary
- Animal Scientists
- Atmospheric and Space Scientists
- Biological Science Teachers, Postsecondary
- Biologists
- Chemical Technicians
- Chemistry Teachers, Postsecondary
- Chemists

- Civil Engineering Technicians
- Civil Engineers
- Electrical Engineers
- Engineering Teachers, Postsecondary
- Environmental Compliance Inspectors
- Environmental Science and Protection Technicians, Including Health
- Environmental Scientists and Specialists, Including Health
- Epidemiologists
- Fire-Prevention and Protection Engineers
- Foresters
- Forestry and Conservation Science Teachers, Postsecondary
- Geographers
- Health Specialties Teachers, Postsecondary
- Hydrologists
- Industrial Safety and Health Engineers
- Medical and Clinical Laboratory Technologists
- Medical Scientists, Except Epidemiologists
- Microbiologists
- Natural Sciences Managers
- Range Managers
- Soil and Plant Scientists
- Soil and Water Conservationists
- Zoologists and Wildlife Biologists

Social

- Chemistry Teachers, Postsecondary
- Engineering Teachers, Postsecondary
- Farm and Home Management Advisors
- Health Educators
- Medical and Health Services Managers
- Occupational Health and Safety Specialists
- Park Naturalists
- Training and Development Managers

Enterprising

- Aquacultural Managers
- Construction Managers
- Engineering Managers
- Farmers and Ranchers
- First-Line Supervisors/Managers of Animal Husbandry and Animal Care Workers
- First-Line Supervisors/Managers of Aquacultural Workers
- Government Property Inspectors and Investigators
- Industrial Safety and Health Engineers
- Lawyers
- Medical and Health Services Managers
- Natural Sciences Managers
- Nursery and Greenhouse Managers
- Training and Development Managers

Conventional

- Environmental Compliance Inspectors
- Fire Inspectors

Employment Statistics for Green Occupations

<i>Occupation</i>	<i>Jobs 2004</i>	<i>Jobs 2014</i>	<i>Relative Size</i>	<i>Relative Growth</i>	<i>Median Wage/Yr</i>	<i>Typical Ed Level</i>
Agricultural Engineers	3,390	3,798	Very small	About as fast as average	\$60,340	BA/BS degree
Agricultural Inspectors	13,646	14,569	Very small	More slowly than average	\$31,340	Extensive experience
Agricultural Sciences Teachers, Postsecondary ¹	1,628,180	2,152,624	Very large	Much faster than average	\$70,610	Doctoral degree
Agricultural Technicians	22,615	25,646	Small	About as fast as average	\$30,630	AA/AS degree
Animal Scientists	2,657	3,000	Very small	About as fast as average	\$43,170	BA/BS degree
Aquacultural Managers ²	219,727	228,592	Large	More slowly than average	\$50,720	BA/BS + experience
Atmospheric and Space Scientists, including Meteorologists	7,410	8,636	Very small	About as fast as average	\$71,450	BA/BS degree
Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary ¹	1,628,180	2,152,624	Very large	Much faster than average	\$65,250	Doctoral degree
Biochemists and Biophysicists	16,124	19,514	Very small	Faster than average	\$68,700	Doctoral degree
Biological Science Teachers, Postsecondary ¹	1,628,180	2,152,624	Very large	Much faster than average	\$63,750	Doctoral degree
Biological Technicians	64,400	75,475	Medium	About as fast as average	\$34,340	AA/AS degree
Biologists	29,442	34,461	Small	About as fast as average	\$58,900	Doctoral degree
Biomedical Engineers	9,700	12,700	Very small	Much faster than average	\$73,900	BA/BS degree
Chemical Technicians	62,346	65,113	Medium	More slowly than average	\$38,620	AA/AS degree
Chemistry Teachers, Postsecondary ¹	1,628,180	2,152,624	Very large	Much faster than average	\$57,340	Doctoral degree
Chemists	82,127	88,100	Medium	More slowly than average	\$57,090	Doctoral degree
Civil Engineering Technicians	93,549	106,747	Medium	About as fast as average	\$38,640	AA/AS degree
Civil Engineers	237,299	276,464	Large	About as fast as average	\$65,280	BA/BS degree
Commercial Divers	2,876	3,148	Very small	About as fast as average	\$37,220	Moderate-term training
Construction Carpenters	1,349,034	1,534,617	Very large	About as fast as average	\$35,140	Long-term training
Construction Managers	430,635	475,276	Very large	About as fast as average	\$70,770	Extensive experience
Electrical Engineers	155,904	174,279	Large	About as fast as average	\$72,770	BA/BS degree
Electricians	656,227	733,697	Very large	About as fast as average	\$42,220	Long-term training
Engineering Managers	190,366	215,123	Large	About as fast as average	\$99,000	BA/BS + experience
Engineering Teachers, Postsecondary ¹	1,628,180	2,152,624	Very large	Much faster than average	\$74,840	Doctoral degree
Environmental Compliance Inspectors ³	176,605	197,123	Large	About as fast as average	\$48,530	Long-term training
Environmental Engineering Technicians	20,227	25,167	Very small	Faster than average	\$39,980	AA/AS degree
Environmental Engineers	49,257	64,026	Small	Much faster than average	\$67,620	BA/BS degree
Environmental Science and Protection Technicians, Including Health	30,934	35,967	Small	About as fast as average	\$35,480	AA/AS degree
Environmental Science Teachers, Postsecondary ¹	1,628,180	2,152,624	Very large	Much faster than average	\$61,490	Doctoral degree
Environmental Scientists and Specialists, Including Health	73,370	85,923	Medium	About as fast as average	\$51,950	MA/MS degree

Epidemiologists	4,786	6,039	Very small	Faster than average	\$52,520	Doctoral degree
Farm and Home Management Advisors	15,854	17,081	Very small	More slowly than average	\$41,270	BA/BS + experience
Farmers and Ranchers	1,064,951	910,316	Very large	Decline	\$38,600	Long-term training
Fire Inspectors ⁴	12,912	12,200	Very small	Decline	\$46,800	Extensive experience
Fire Investigators ⁴	12,912	12,200	Very small	Decline	\$46,800	Extensive experience
Fire-Prevention and Protection Engineers ⁵	26,520	30,081	Small	About as fast as average	\$64,320	BA/BS degree
First-Line Supervisors/Managers of Animal Husbandry and Animal Care Workers	60,513	62,689	Medium	More slowly than average	\$36,040	Extensive experience
First-Line Supervisors/Managers of Aquacultural Workers	60,513	62,689	Medium	More slowly than average	\$36,040	Extensive experience
Fish and Game Wardens	7,441	8,222	Very small	About as fast as average	\$42,310	Long-term training
Forest and Conservation Technicians	32,611	34,778	Small	More slowly than average	\$33,250	AA/AS degree
Forest and Conservation Workers	17,074	18,092	Very small	More slowly than average	\$19,940	Moderate-term training
Forest Fire Fighters	282,116	350,715	Large	Faster than average	\$38,690	Long-term training
Forest Fire Fighting and Prevention Supervisors ⁶	55,862	67,652	Medium	Faster than average	\$59,760	Extensive experience
Forest Fire Inspectors and Prevention Specialists	1,653	1,602	Very small	Decline	\$34,190	Extensive experience
Foresters	13,176	14,059	Very small	More slowly than average	\$48,800	BA/BS degree
Forestry and Conservation Science Teachers, Postsecondary ¹	1,628,180	2,152,624	Very large	Much faster than average	\$64,120	Doctoral degree
Geographers	844	901	Very small	More slowly than average	\$61,520	MA/MS degree
Geography Teachers, Postsecondary ¹	1,628,180	2,152,624	Very large	Much faster than average	\$57,370	Doctoral degree
Geological Sample Test Technicians ⁷	10,927	11,637	Very small	More slowly than average	\$41,730	AA/AS degree
Geophysical Data Technicians ⁷	10,927	11,637	Very small	More slowly than average	\$41,730	AA/AS degree
Geoscientists, Except Hydrologists and Geographers	27,580	29,866	Small	More slowly than average	\$70,180	MA/MS degree
Government Property Inspectors and Investigators ³	176,605	197,123	Large	About as fast as average	\$48,530	Long-term training
Hazardous Materials Removal Workers	38,398	50,381	Small	Much faster than average	\$33,020	Moderate-term training
Health Educators	49,271	60,351	Small	Faster than average	\$39,670	MA/MS degree
Health Specialties Teachers, Postsecondary	1,628,180	2,152,624	Very large	Much faster than average	\$70,310	Doctoral degree
Hydrologists	8,039	10,577	Very small	Much faster than average	\$60,880	BA/BS degree
Industrial Safety and Health Engineers ⁵	26,520	30,081	Small	About as fast as average	\$64,320	BA/BS degree
Lawyers (Environmental Law)	735,344	845,399	Very large	About as fast as average	\$97,420	Professional degree
Medical and Clinical Laboratory Technologists	155,822	187,818	Large	Faster than average	\$46,710	BA/BS degree
Medical and Health Services Managers	248,235	304,742	Large	Faster than average	\$68,320	BA/BS + experience
Medical Scientists, Except Epidemiologists	72,488	97,178	Medium	Much faster than average	\$60,240	Doctoral degree
Microbiologists	15,063	17,657	Very small	About as fast as average	\$55,300	Doctoral degree
Municipal Fire Fighters	282,116	350,715	Large	Faster than average	\$38,690	Long-term training
Municipal Fire Fighting and Prevention Supervisors ⁶	55,862	67,652	Medium	Faster than average	\$59,760	Extensive experience

Natural Sciences Managers	42,175	47,928	Small	About as fast as average	\$90,080	BA/BS + experience
Nuclear Monitoring Technicians	7,313	8,314	Very small	About as fast as average	\$61,100	AA/AS degree
Nursery and Greenhouse Managers ²	219,727	228,592	Large	More slowly than average	\$50,720	BA/BS + experience
Occupational Health and Safety Specialists	39,771	44,720	Small	About as fast as average	\$52,640	BA/BS degree
Park Naturalists ⁸	18,574	19,747	Very small	More slowly than average	\$52,330	BA/BS degree
Range Managers ⁸	18,574	19,747	Very small	More slowly than average	\$52,330	BA/BS degree
Soil and Plant Scientists	16,900	19,300	Very small	About as fast as average	\$56,100	BA/BS degree
Soil and Water Conservationists ⁸	18,574	19,747	Very small	More slowly than average	\$52,330	BA/BS degree
Training and Development Managers	37,356	47,034	Small	Faster than average	\$70,430	BA/BS + experience
Tree Trimmers and Pruners	55,033	64,115	Medium	About as fast as average	\$26,830	Short-term training
Water and Liquid Waste Treatment Plant and System Operators	94,379	109,633	Medium	About as fast as average	\$34,850	Long-term training
Zoologists and Wildlife Biologists	16,470	18,603	Very small	About as fast as average	\$50,680	Doctoral degree

¹ Data at the detailed occupational level is not available; therefore, the employment statistics and wage data used for these occupations are actually for a summary occupation that encompasses all of the *Postsecondary Teacher* occupations (e.g. Agricultural Sciences; Atmospheric, Earth, Marine, and Space Sciences; Biological Science; Chemistry; Engineering; Environmental Science; Forestry and Conservation Science; Geography; Health Specialties).

² Data at the detailed occupational level is not available; therefore, the employment statistics and wage data used for these occupations are actually for a summary occupation that encompasses all of the *Agricultural Manager* occupations (e.g. Aquacultural Managers; Nursery and Greenhouse Managers).

³ Data at the detailed occupational level is not available; therefore, the employment statistics and wage data used for these occupations are actually for a summary occupation that encompasses all of the *Compliance Officer* occupations (e.g. Environmental Compliance Inspectors; Government Property Inspectors and Investigators).

⁴ Data at the detailed occupational level is not available; therefore, the employment statistics and wage data used for these occupations are actually for a summary occupation that encompasses all of the *Fire Inspectors and Investigators* occupations (e.g. Fire Inspectors; Fire Investigators).

⁵ Data at the detailed occupational level is not available; therefore, the employment statistics and wage data used for these occupations are actually for a summary occupation that encompasses all of the *Health and Safety Engineer* occupations (e.g. Fire-Prevention and Protection Engineers; Industrial Safety and Health Engineers).

⁶ Data at the detailed occupational level is not available; therefore, the employment statistics and wage data used for these occupations are actually for a summary occupation that encompasses all of the *First-Line Supervisors/Managers of Fire Fighting and Prevention Worker* occupations (e.g. Forest Fire Fighting and Prevention Supervisors; Municipal Fire Fighting and Prevention Supervisors).

⁷ Data at the detailed occupational level is not available; therefore, the employment statistics and wage data used for these occupations are actually for a summary occupation that encompasses all of the *Geological and Petroleum Technicians* occupations (e.g. Geological Sample Test Technicians; Geophysical Data Technicians).

⁸ Data at the detailed occupational level is not available; therefore, the employment statistics and wage data used for these occupations are actually for a summary occupation that encompasses all of the *Conservation Scientist* occupations (e.g. Park Naturalists; Range Managers; Soil and Water Conservationists).

Occupational Information Sources

Occupation

Occupation titles and definitions are from the U.S. Department of Labor's O*NET system – which is based on the Standard Occupational Classification (SOC) system. For more information on the nation's "Occupational Information Network," see the O*NET Resource Center or O*NET OnLine.

www.onetcenter.org

<http://online.onetcenter.org>

Jobs 2004 and 2014

These are national statistics from the U.S. Department of Labor's Office of Occupational Statistics and Employment Projections. The estimates of the number of jobs are for the 10-year outlook period of 2004-2014. (These are the most up-to-date employment projections available at the time of producing this resource guide.)

Median Wage/Yr

The annual income estimates are based on national median wage data from the U.S. Department of Labor's Occupational Employment Statistics (OES) program. This program produces estimates of wages by occupation 2x per year based on a semi-annual mail survey of non-farm establishments.

Typical Ed Level

The typical education and training levels were originally based on a general education level assessment by the U.S. Department of Labor. However, the level categories and assessments have since been edited/enhanced by me. Two noteworthy problems I found with the original assessments: One, they frequently assessed lengthy apprenticeship training-based occupations as requiring only "short term training." Two, they didn't have an education level to distinguish teaching occupations that require two years of graduate study and training but don't (usually) result in a Masters Degree. So I made those and other corrections. Note that the education and training levels indicated are intended to reflect the TYPICAL levels for each occupation. As such, they should not be interpreted as *minimum requirements*.

New and Emerging Occupations

Historical/Heritage Interpreters

Museums, Parks and Historical Sites

Involves interpreting historical, cultural, and natural resources in a position in which they greet visitors and answer questions, conduct tours, and participate in educational programs.

Energy Engineers

Construction Industry

Design, develop, and evaluate energy-related projects and programs to reduce energy costs or improve energy efficiency during the designing, building, or remodeling stages of construction. May specialize in electrical systems; heating, ventilation, and air-conditioning (HVAC) systems; green buildings; lighting; air quality; or energy procurement.

Photovoltaic Technicians and Installers

Construction Industry

Design, install, test and repair photovoltaic systems.

Compliance Officers

Energy Industry

Plan, direct, or coordinate environmental, financial, safety or energy activities of an organization to ensure compliance with ethical or regulatory standards.

Energy Auditor

Energy Industry

Conduct energy audits of buildings, building systems and process systems. May also conduct investment grade audits of buildings or systems.

Energy Broker

Energy Industry

Purchase or sell energy for customers.

Renewable Energy Technicians

Energy Industry

Install, inspect, test, maintain, or repair green power and renewable energy systems such as wind or biomass systems.

Occupation Definitions and Major Employment Sectors

Agricultural Engineers

Apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products.

➤ Major employment sectors/percent of jobs:

Local government agencies	15.3
Engineering, surveying, mapping, building inspection, and drafting services	12.3
Federal government agencies	11.7
State government agencies	7.3
State and local educational services	5.7
Agriculture, construction, and mining machinery manufacturing	3.2

Agricultural Inspectors

Inspect agricultural commodities, processing equipment, and facilities, and fish and logging operations, to ensure compliance with regulations and laws governing health, quality, and safety.

➤ Major employment sectors/percent of jobs:

State government agencies	34.7
Federal government agencies	27.6
Animal slaughtering and processing	7.8
Local government agencies	7.2
Business associations and all other professional and similar organizations	5.5
Support activities for agriculture and forestry	4.6
Crop production	3.5

Agricultural Sciences Teachers, Postsecondary aka Instructors, Professors

Teach courses in the agricultural sciences. Includes teachers of agronomy, dairy sciences, fisheries management, horticultural sciences, poultry sciences, range management, and agricultural soil conservation.

➤ Major employment sectors/percent of jobs:

State and local educational services	58.7
Colleges, universities, and professional schools, private	30.2
Junior colleges, private	2.5
Technical and trade schools, private	2.2

Agricultural Technicians

Set up and maintain laboratory equipment and collect samples from crops or animals. Prepare specimens and record data to assist scientist in biology or related science experiments.

➤ Major employment sectors/percent of jobs:

State and local educational services	31.9
State government agencies	9.3
Research and development in the physical, engineering, and life sciences	8.9
Crop production	7.1
Dairy product manufacturing	4.2
Miscellaneous nondurable goods merchant wholesalers	3.8
Support activities for agriculture and forestry	3.4
Animal slaughtering and processing	3.4
Other food manufacturing	3.1
Testing laboratories	2.9
Management, scientific, and technical consulting services	2.3

Animal Scientists

Conduct research in the genetics, nutrition, reproduction, growth, and development of domestic farm animals.

➤ Major employment sectors/percent of jobs:

Self-employment	33.9
State and local educational services	28.9
Research and development in the physical, engineering, and life sciences	8.3
State government agencies	5.9

Aquacultural Managers

Direct and coordinate, through subordinate supervisory personnel, activities of workers engaged in fish hatchery production for corporations, cooperatives, or other owners.

➤ Major employment sectors/percent of jobs (for all Agricultural Manager occupations):

Animal production	44.9
Crop production	36.3
Support activities for agriculture and forestry	4.5

Atmospheric and Space Scientists

Investigate atmospheric phenomena and interpret meteorological data gathered by surface and air stations, satellites, and radar to prepare reports and forecasts for public and other uses. Include weather analysts and forecasters whose functions require the detailed knowledge of a meteorologist.

➤ Major employment sectors/percent of jobs:

Federal government agencies	39.0
Research and development in the physical, engineering, and life sciences	16.2
Marketing research, public opinion polling, and all other professional, scientific, and technical services	12.3
Management, scientific, and technical consulting services	6.1
Television broadcasting	5.3
State and local educational services	5.1
State government agencies	2.6

Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary aka Instructors, Professors

Teach courses in the physical sciences, except chemistry and physics.

➤ Major employment sectors/percent of jobs:

State and local educational services	58.7
Colleges, universities, and professional schools, private	30.2
Junior colleges, private	2.5
Technical and trade schools, private	2.2

Biochemists and Biophysicists

Study the chemical composition and physical principles of living cells and organisms, their electrical and mechanical energy, and related phenomena. May conduct research to further understanding of the complex chemical combinations and reactions involved in metabolism, reproduction, growth, and heredity. May determine the effects of foods, drugs, serums, hormones, and other substances on tissues and vital processes of living organisms.

➤ Major employment sectors/percent of jobs:

Research and development in the physical, engineering, and life sciences	40.3
Pharmaceutical and medicine manufacturing	22.4
State government agencies	8.6
State and local educational services	7.0
General medical and surgical hospitals, private	3.5
Testing laboratories	3.2
Self-employment	3.2
Federal government agencies	2.7
Pesticide, fertilizer, and other agricultural chemical manufacturing	2.2

**Biological Science Teachers, Postsecondary
aka Instructors, Professors**

Teach courses in biological sciences.

➤ Major employment sectors/percent of jobs:

State and local educational services	58.7
Colleges, universities, and professional schools, private	30.2
Junior colleges, private	2.5
Technical and trade schools, private	2.2

Biological Technicians

Assist biological and medical scientists in laboratories. Set up, operate, and maintain laboratory instruments and equipment, monitor experiments, make observations, and calculate and record results. May analyze organic substances, such as blood, food, and drugs.

➤ Major employment sectors/percent of jobs:

Research and development in the physical, engineering, and life sciences	22.7
Federal government agencies	18.6
State and local educational services	12.5
Pharmaceutical and medicine manufacturing	12.5
State government agencies	4.7
General medical and surgical hospitals, private	3.6
Testing laboratories	3.1

Biologists

Research or study basic principles of plant and animal life, such as origin, relationship, development, anatomy, and functions.

➤ Major employment sectors/percent of jobs:

Federal government agencies	56.9
State government agencies	15.7
State and local educational services	13.5
Research and development in the physical, engineering, and life sciences	7.6
Pharmaceutical and medicine manufacturing	4.1
Self-employment	2.9

Biomedical Engineers

Apply knowledge of engineering, biology, and biomechanical principles to the design, development, and evaluation of biological and health systems and products, such as artificial organs, prostheses, instrumentation, medical information systems, and health management and care delivery systems.

➤ Major employment sectors/percent of jobs:

Research and development in the physical, engineering, and life sciences	18.7
Pharmaceutical and medicine manufacturing	15.6
Medical equipment and supplies manufacturing	14.9
General medical and surgical hospitals, private	12
Self-employment	8.7
Navigational, measuring, electromedical, and control instruments	6.1
State and local educational services	3.6
Federal government agencies	3.2
Engineering, surveying, mapping, building inspection, and drafting services	2.6

Chemical Technicians

Conduct chemical and physical laboratory tests to assist scientists in making qualitative and quantitative analyses of solids, liquids, and gaseous materials for purposes, such as research and development of new products or processes, quality control, maintenance of environmental standards, and other work involving experimental, theoretical, or practical application of chemistry and related sciences.

➤ Major employment sectors/percent of jobs:

Testing laboratories	13.6
Basic chemical manufacturing	10.6
Research and development in the physical, engineering, and life sciences	9.3
Pharmaceutical and medicine manufacturing	7.6
Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing	5.9
Management of companies and enterprises	4.0
Paint, coating, and adhesive manufacturing	3.7
Other chemical product and preparation manufacturing	3.6
Soap, cleaning compound, and toilet preparation manufacturing	2.7
Petroleum and coal products manufacturing	2.7

Chemistry Teachers, Postsecondary aka Instructors, Professors

Teach courses pertaining to the chemical and physical properties and compositional changes of substances. Work may include instruction in the methods of qualitative and quantitative chemical analysis. Includes both teachers primarily engaged in teaching, and those who do a combination of both teaching and research.

➤ Major employment sectors/percent of jobs:

State and local educational services	58.7
Colleges, universities, and professional schools, private	30.2
Junior colleges, private	2.5
Technical and trade schools, private	2.2

Chemists

Conduct qualitative and quantitative chemical analyses or chemical experiments in laboratories for quality or process control or to develop new products or knowledge.

➤ Major employment sectors/percent of jobs:

Pharmaceutical and medicine manufacturing	17.6
Research and development in the physical, engineering, and life sciences	13.7
Testing laboratories	10.8
Federal government agencies	7.4
Basic chemical manufacturing	4.6
Management of companies and enterprises	4.0
State government agencies	3.1
Soap, cleaning compound, and toilet preparation manufacturing	3.1
Paint, coating, and adhesive manufacturing	3.0
Local government agencies	2.4
State and local educational services	2.4
Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing	2.3
Other chemical product and preparation manufacturing	2.2

Civil Engineering Technicians

Apply theory and principles of civil engineering in planning, designing, and overseeing construction and maintenance of structures and facilities under the direction of engineering staff or physical scientists.

➤ Major employment sectors/percent of jobs:

Engineering, surveying, mapping, building inspection, and drafting services	40.7
State government agencies	27.7
Local government agencies	18.0
Testing laboratories	3.2

Civil Engineers

Perform engineering duties in planning, designing, and overseeing construction and maintenance of building structures, and facilities, such as roads, railroads, airports, bridges, harbors, channels, dams, irrigation projects, pipelines, power plants, water and sewage systems, and waste disposal units. Includes architectural, structural, traffic, ocean, and geo-technical engineers.

➤ Major employment sectors/percent of jobs:

Engineering, surveying, mapping, building inspection, and drafting services	43.3
State government agencies	13.9
Local government agencies	12.4
Self-employment	4.9
Federal government agencies	4.2
Nonresidential building construction	3.8
Architectural and landscape architectural services	2.1

Commercial Divers

Work below surface of water, using scuba gear to inspect, repair, remove, or install equipment and structures. May use a variety of power and hand tools, such as drills, sledgehammers, torches, and welding equipment. May conduct tests or experiments, rig explosives, or photograph structures or marine life.

➤ Major employment sectors/percent of jobs:

Nonresidential building construction	24.3
Fishing, hunting and trapping	14.3
Other support services	11.3
Other heavy and civil engineering construction	9.5
Self-employment	7.0
Highway, street, and bridge construction	6.3

Construction Carpenters

Construct, erect, install, and repair structures and fixtures of wood, plywood, and wallboard, using carpenter's hand tools and power tools.

➤ Major employment sectors/percent of jobs:

Self-employment	33.1
Residential building construction	20.1
Nonresidential building construction	11.0
Framing contractors and all other foundation, structure, and building exterior contractors	8.8
Finish carpentry contractors and all other building finishing contractors	6.1
Drywall and insulation contractors	2.8

Construction Managers

Plan, direct, coordinate, or budget, usually through subordinate supervisory personnel, activities concerned with the construction and maintenance of structures, facilities, and systems. Participate in the conceptual development of a construction project and oversee its organization, scheduling, and implementation.

➤ Major employment sectors/percent of jobs:

Self-employment	56.0
Nonresidential building construction	9.6
Residential building construction	8.0
Plumbing, heating, and air-conditioning contractors	2.7
Electrical contractors	2.7
Other specialty trade contractors	2.1

Electrical Engineers

Design, develop, test, or supervise the manufacturing and installation of electrical equipment, components, or systems for commercial, industrial, military, or scientific use.

➤ Major employment sectors/percent of jobs:

Engineering, surveying, mapping, building inspection, and drafting services	18.0
Navigational, measuring, electromedical, and control instruments manufacturing	10.8
Semiconductor and other electronic component manufacturing	6.9
Electric power generation, transmission and distribution	6.6
Research and development in the physical, engineering, and life sciences	4.1
Communications equipment manufacturing	3.1
Electrical equipment manufacturing	2.6
Federal government agencies	2.5
Management of companies and enterprises	2.5
Computer systems design and related services	2.2
Local government agencies	2.1
Self-employment	2.1
Computer and peripheral equipment manufacturing	2.0

Electricians

Install, maintain, and repair electrical wiring, equipment, and fixtures. Ensure that work is in accordance with relevant codes. May install or service street lights, intercom systems, or electrical control systems.

➤ Major employment sectors/percent of jobs:

Electrical contractors	60.8
Self-employment	8.8
Local government agencies	2.8

Engineering Managers

Plan, direct, or coordinate activities in such fields as architecture and engineering or research and development in these fields.

➤ Major employment sectors/percent of jobs:

Engineering, surveying, mapping, building inspection, and drafting services	16.4
Federal government agencies	7.2
Navigational, measuring, electromedical, and control instruments manufacturing	5.0
Semiconductor and other electronic component manufacturing	4.7
Aerospace product and parts manufacturing	4.6
Management of companies and enterprises	4.4
Research and development in the physical, engineering, and life sciences	4.0
Computer systems design and related services	3.0
Computer and peripheral equipment manufacturing	2.9
Local government agencies	2.7
Nonresidential building construction	2.1

Engineering Teachers, Postsecondary aka Instructors, Professors

Teach courses pertaining to the application of physical laws and principles of engineering for the development of machines, materials, instruments, processes, and services. Includes teachers of subjects, such as chemical, civil, electrical, industrial, mechanical, mineral, and petroleum engineering. Includes both teachers primarily engaged in teaching and those who do a combination of both teaching and research.

➤ Major employment sectors/percent of jobs:

State and local educational services	58.7
Colleges, universities, and professional schools, private	30.2
Junior colleges, private	2.5
Technical and trade schools, private	2.2

Environmental Compliance Inspectors

Inspect and investigate sources of pollution to protect the public and environment and ensure conformance with Federal, State, and local regulations and ordinances.

➤ Major employment sectors/percent of jobs (for all Compliance Officer occupations):

Federal government agencies	26.4
State government agencies	21.6
Local government agencies	13.6
Direct life, health, and medical insurance carriers and reinsurance carriers	3.3
Depository credit intermediation	2.9
State and local educational services	2.5
Management of companies and enterprises	2.4

Environmental Engineering Technicians

Apply theory and principles of environmental engineering to modify, test, and operate equipment and devices used in the prevention, control, and remediation of environmental pollution, including waste treatment and site remediation.

May assist in the development of environmental pollution remediation devices under direction of engineer.

➤ Major employment sectors/percent of jobs:

Engineering, surveying, mapping, building inspection, and drafting services	23.8
Testing laboratories	11.2
Local government agencies	10.2
Management, scientific, and technical consulting services	9.8
Research and development in the physical, engineering, and life sciences	7.4
Remediation and other waste management services	3.9
State government agencies	3.1
Waste treatment and disposal and waste management services	2.4

Environmental Engineers

Design, plan, or perform engineering duties in the prevention, control, and remediation of environmental health hazards utilizing various engineering disciplines. Work may include waste treatment, site remediation, or pollution control technology.

➤ Major employment sectors/percent of jobs:

Engineering, surveying, mapping, building inspection, and drafting services	25.6
Management, scientific, and technical consulting services	15.0
State government agencies	11.9
Federal government agencies	9.1
Local government agencies	7.7
Research and development in the physical, engineering, and life sciences	5.7
Testing laboratories	2.8
Remediation and other waste management services	2.5

Environmental Science and Protection Technicians, Including Health

Performs laboratory and field tests to monitor the environment and investigate sources of pollution, including those that affect health. Under direction of an environmental scientist or specialist, may collect samples of gases, soil, water, and other materials for testing and take corrective actions as assigned.

➤ Major employment sectors/percent of jobs:

Local government agencies	21.7
Management, scientific, and technical consulting services	18.7
State government agencies	16.0
Testing laboratories	11.2
Engineering, surveying, mapping, building inspection, and drafting services	6.2
General medical and surgical hospitals, private	3.9

Environmental Science Teachers, Postsecondary aka Instructors, Professors

Teach courses in environmental science.

➤ Major employment sectors/percent of jobs:

State and local educational services	58.7
Colleges, universities, and professional schools, private	30.2
Junior colleges, private	2.5
Technical and trade schools, private	2.2

Environmental Scientists and Specialists, Including Health

Conduct research or perform investigation for the purpose of identifying, abating, or eliminating sources of pollutants or hazards that affect either the environment or the health of the population. Utilizing knowledge of various scientific disciplines may collect, synthesize, study, report, and take action based on data derived from measurements or observations of air, food, soil, water, and other sources.

➤ Major employment sectors/percent of jobs:

State government agencies	29.7
Management, scientific, and technical consulting services	15.4
Local government agencies	14.1
Engineering, surveying, mapping, building inspection, and drafting services	9.9
Federal government agencies	7.7
State and local educational services	5.0
Self-employment	4.6
Testing laboratories	3.4
Research and development in the physical, engineering, and life sciences	3.2

Epidemiologists

Investigate and describe the determinants and distribution of disease, disability, and other health outcomes and develop the means for prevention and control.

➤ Major employment sectors/percent of jobs:

State government agencies	35.3
Local government agencies	14.5
Research and development in the physical, engineering, and life sciences	11.8
General medical and surgical hospitals, private	7.5
State and local educational services	5.9
State hospitals	3.4

Farm and Home Management Advisors aka Agricultural Extension Agents

Advise, instruct, and assist individuals and families engaged in agriculture, agricultural-related processes, or home economics activities. Demonstrate procedures and apply research findings to solve problems; instruct and train in product development, sales, and the utilization of machinery and equipment to promote general welfare. Includes county agricultural agents, feed and farm management advisers, home economists, and extension service advisors.

➤ Major employment sectors/percent of jobs:

State and local educational services	69.8
Local government agencies	9.4
Colleges, universities, and professional schools, private	4.3
Self-employment	3.0
State government agencies	2.9
Management, scientific, and technical consulting services	2.8

Farmers and Ranchers

On an ownership or rental basis, operate farms, ranches, greenhouses, nurseries, timber tracts, or other agricultural production establishments which produce crops, horticultural specialties, livestock, poultry, finfish, shellfish, or animal specialties. May plant, cultivate, harvest, perform post-harvest activities, and market crops and livestock; may hire, train, and supervise farm workers or supervise a farm labor contractor; may prepare cost, production, and other records. May maintain and operate machinery and perform physical work.

➤ Major employment sectors/percent of jobs:

Self-employment	99.9
-----------------	------

Fire Inspectors

Inspect buildings and equipment to detect fire hazards and enforce state and local regulations.

➤ Major employment sectors/percent of jobs:

Local government agencies	80.4
State government agencies	9.2

Fire Investigators

Conduct investigations to determine causes of fires and explosions.

➤ Major employment sectors/percent of jobs:

Local government agencies	80.4
State government agencies	9.2

Fire-Prevention and Protection Engineers

Research causes of fires, determine fire protection methods, and design or recommend materials or equipment such as structural components or fire-detection equipment to assist organizations in safeguarding life and property against fire, explosion, and related hazards.

➤ Major employment sectors/percent of jobs (for all Health and Safety Engineer occupations):

Federal government agencies	11.0
Direct insurance (except life, health, and medical) carriers	6.3
State government agencies	5.8
Local government agencies	5.8
Nonresidential building construction	5.6
Engineering, surveying, mapping, building inspection, and drafting services	4.2
Management, scientific, and technical consulting services	3.2
Basic chemical manufacturing	3.0
Management of companies and enterprises	2.3
Research and development in the physical, engineering, and life sciences	2.2
Highway, street, and bridge construction	2.2
Aerospace product and parts manufacturing	2.1

First-Line Supervisors/Managers of Animal Husbandry and Animal Care Workers

Directly supervise and coordinate activities of animal husbandry or animal care workers.

➤ Major employment sectors/percent of jobs:

Crop production	43.4
Self-employment	18.9
Animal production	6.8
Support activities for agriculture and forestry	4.5
Logging	4.3
State government agencies	3.2
Forestry	2.6

First-Line Supervisors/Managers of Aquacultural Workers

Directly supervise and coordinate activities of aquacultural workers.

➤ Major employment sectors/percent of jobs (for all Supervisors/Managers of Farming, Fishing, and Forestry):

Animal production	44.9
Crop production	36.3
Support activities for agriculture and forestry	4.5

Fish and Game Wardens

Patrol assigned area to prevent fish and game law violations. Investigate reports of damage to crops or property by wildlife. Compile biological data.

➤ Major employment sectors/percent of jobs:

State government agencies	89.4
Local government agencies	10.0

Forest and Conservation Technicians

Compile data pertaining to size, content, condition, and other characteristics of forest tracts, under direction of foresters; train and lead forest workers in forest propagation, fire prevention and suppression. May assist conservation scientists in managing, improving, and protecting rangelands and wildlife habitats, and help provide technical assistance regarding the conservation of soil, water, and related natural resources.

➤ Major employment sectors/percent of jobs:

Federal government agencies	75.3
State government agencies	12.7
Local government agencies	4.9

Forest and Conservation Workers

Under supervision, perform manual labor necessary to develop, maintain, or protect forest, forested areas, and woodlands through such activities as raising and transporting tree seedlings; combating insects, pests, and diseases harmful to trees; and building erosion and water control structures and leaching of forest soil. Includes forester aides, seedling pullers, and tree planters.

➤ Major employment sectors/percent of jobs:

State government agencies	32.9
Self-employment	25.6
Local government agencies	12.0
Forestry	11.7
Crop production	7.1
Support activities for agriculture and forestry	2.2

Forest Fire Fighters

Control and suppress fires in forests or vacant public land.

➤ Major employment sectors/percent of jobs (for all Fire Fighter occupations):

Local government agencies	91.8
Federal government agencies	3.0
State government agencies	2.3

Forest Fire Fighting and Prevention Supervisors

Supervise fire fighters who control and suppress fires in forests or vacant public land.

➤ Major employment sectors/percent of jobs (for all Supervisors/Managers of Fire Fighter occupations):

Local government agencies	90.9
State government agencies	4.8
Federal government agencies	2.7

Forest Fire Inspectors and Prevention Specialists

Enforce fire regulations and inspect for forest fire hazards. Report forest fires and weather conditions.

➤ Major employment sectors/percent of jobs:

State government agencies	57.1
Local government agencies	31.9

Foresters

Manage forested lands for economic, recreational, and conservation purposes. May inventory the type, amount, and location of standing timber, appraise the timber's worth, negotiate the purchase, and draw up contracts for procurement. May determine how to conserve wildlife habitats, creek beds, water quality, and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitor trees for healthy growth, and determine the best time for harvesting. Develop forest management plans for public and privately-owned forested lands.

➤ Major employment sectors/percent of jobs:

State government agencies	27.4
Federal government agencies	20.5
Self-employment	9.4
Local government agencies	8.5
Sawmills and wood preservation	8.0
Forestry	5.8
Support activities for agriculture and forestry	3.1
Logging	2.9
Wholesale electronic markets and agents and brokers	2.6
State and local educational services	2.0

Forestry and Conservation Science Teachers, Postsecondary aka Instructors, Professors

Teach courses in environmental and conservation science.

➤ Major employment sectors/percent of jobs:

State and local educational services	58.7
Colleges, universities, and professional schools, private	30.2
Junior colleges, private	2.5
Technical and trade schools, private	2.2

Geographers

Study nature and use of areas of earth's surface, relating and interpreting interactions of physical and cultural phenomena. Conduct research on physical aspects of a region, including land forms, climates, soils, plants and animals, and conduct research on the spatial implications of human activities within a given area, including social characteristics, economic activities, and political organization, as well as researching interdependence between regions at scales ranging from local to global.

➤ Major employment sectors/percent of jobs:

Federal government agencies	70.5
-----------------------------	------

Geography Teachers, Postsecondary

Teach courses in geography.

➤ Major employment sectors/percent of jobs:

State and local educational services	58.7
Colleges, universities, and professional schools, private	30.2
Junior colleges, private	2.5
Technical and trade schools, private	2.2

Geological Sample Test Technicians

Test and analyze geological samples, crude oil, or petroleum products to detect presence of petroleum, gas, or mineral deposits indicating potential for exploration and production, or to determine physical and chemical properties to ensure that products meet quality standards.

➤ Major employment sectors/percent of jobs (for all Geological and Petroleum Technician occupations):

Oil and gas extraction	23.2
Support activities for mining	22.0
Engineering, surveying, mapping, building inspection, and drafting services	15.3
Management, scientific, and technical consulting services	6.1
Testing laboratories	5.5
State and local educational services	2.2
Nonmetallic mineral mining and quarrying	2.2

Geophysical Data Technicians

Measure, record, and evaluate geological data, using sonic, electronic, electrical, seismic, or gravity-measuring instruments to prospect for oil or gas. May collect and evaluate core samples and cuttings.

➤ Major employment sectors/percent of jobs (for all Geological and Petroleum Technician occupations):

Oil and gas extraction	23.2
Support activities for mining	22.0
Engineering, surveying, mapping, building inspection, and drafting services	15.3
Management, scientific, and technical consulting services	6.1
Testing laboratories	5.5
State and local educational services	2.2
Nonmetallic mineral mining and quarrying	2.2

Geoscientists, Except Hydrologists and Geographers

aka Geologists

Study the composition, structure, and other physical aspects of the earth. May use geological, physics, and mathematics knowledge in exploration for oil, gas, minerals, or underground water; or in waste disposal, land reclamation, or other environmental problems. May study the earth's internal composition, atmospheres, oceans, and its magnetic, electrical, and gravitational forces. Includes mineralogists, crystallographers, paleontologists, stratigraphers, geodesists, and seismologists.

➤ Major employment sectors/percent of jobs:

Engineering, surveying, mapping, building inspection, and drafting services	22.9
Oil and gas extraction	19.8
Management, scientific, and technical consulting services	14.2
State government agencies	13.1
Federal government agencies	10.5
Self-employment	5.2
State and local educational services	4.6
Support activities for mining	3.7

Government Property Inspectors and Investigators

Investigate or inspect government property to ensure compliance with contract agreements and government regulations.

➤ Major employment sectors/percent of jobs (for all Compliance Officer occupations):

Federal government agencies	26.4
State government agencies	21.6
Local government agencies	13.6
Direct life, health, and medical insurance carriers and reinsurance carriers	3.3
Depository credit intermediation	2.9
State and local educational services	2.5
Management of companies and enterprises	2.4

Hazardous Materials Removal Workers

Identify, remove, pack, transport, or dispose of hazardous materials, including asbestos, lead-based paint, waste oil, fuel, transmission fluid, radioactive materials, contaminated soil, etc. Specialized training and certification in hazardous materials handling or a confined entry permit are generally required. May operate earth-moving equipment or trucks.

➤ Major employment sectors/percent of jobs:

Remediation and other waste management services	63.6
Waste treatment and disposal	11.6
Local government agencies	3.2
Waste collection	3.2

Health Educators

Promote, maintain, and improve individual and community health by assisting individuals and communities to adopt healthy behaviors. Collect and analyze data to identify community needs prior to planning, implementing, monitoring, and evaluating programs designed to encourage healthy lifestyles, policies and environments. May also serve as a resource to assist individuals, other professionals, or the community, and may administer fiscal resources for health education programs.

➤ Major employment sectors/percent of jobs:

Local government agencies	16.8
State government agencies	15.4
General medical and surgical hospitals, private	15.0
Child, youth, and all other individual and family services	9.7
State and local educational services	4.5
Federal government agencies	4.4
Outpatient care centers, except mental health and substance abuse	3.4
Offices of physicians	3.1
Community food and housing, and emergency and other relief services	3.0

Health Specialties Teachers, Postsecondary aka Instructors, Professors

Teach courses in health specialties, such as veterinary medicine, dentistry, pharmacy, therapy, laboratory technology, and public health.

➤ Major employment sectors/percent of jobs:

State and local educational services	58.7
Colleges, universities, and professional schools, private	30.2
Local government agencies	13.8
Junior colleges, private	2.5
Technical and trade schools, private	2.2

Hydrologists

Research the distribution, circulation, and physical properties of underground and surface waters; study the form and intensity of precipitation, its rate of infiltration into the soil, movement through the earth, and its return to the ocean and atmosphere.

➤ Major employment sectors/percent of jobs:

Federal government agencies	30.5
Engineering, surveying, mapping, building inspection, and drafting services	21.6
Management, scientific, and technical consulting services	18.2
State government agencies	15.1
Self-employment	5.1
Local government agencies	4.6

Industrial Safety and Health Engineers

Plan, implement, and coordinate safety programs, requiring application of engineering principles and technology, to prevent or correct unsafe environmental working conditions.

➤ Major employment sectors/percent of jobs (for all Health and Safety Engineer occupations):

Federal government agencies	11.0
Direct insurance (except life, health, and medical) carriers	6.3
State government agencies	5.8
Local government agencies	5.8
Nonresidential building construction	5.6
Engineering, surveying, mapping, building inspection, and drafting services	4.2
Management, scientific, and technical consulting services	3.2
Basic chemical manufacturing	3.0
Management of companies and enterprises	2.3
Research and development in the physical, engineering, and life sciences	2.2
Highway, street, and bridge construction	2.2
Aerospace product and parts manufacturing	2.1

Lawyers (Environmental Law)

Represent clients in criminal and civil litigation and other legal proceedings, draw up legal documents, and manage or advise clients on legal transactions. May specialize in a single area or may practice broadly in many areas of law.

➤ Major employment sectors/percent of jobs:

Legal services	48.1
Self-employment	26.0
Local government agencies	6.8
State government agencies	4.6
Federal government agencies	3.6

Medical and Clinical Laboratory Technologists

Perform complex medical laboratory tests for diagnosis, treatment, and prevention of disease. May train or supervise staff.

➤ Major employment sectors/percent of jobs:

General medical and surgical hospitals, private	50.0
Medical and diagnostic laboratories	13.2
Offices of physicians	9.3
Local government hospitals	7.7
Federal government agencies	3.4
State government hospitals	2.6
All other ambulatory health care services	2.1

Medical and Health Services Managers

Plan, direct, or coordinate medicine and health services in hospitals, clinics, managed care organizations, public health agencies, or similar organizations.

➤ Major employment sectors/percent of jobs:

General medical and surgical hospitals, private	28.1
Offices of physicians	9.1
Nursing care facilities	6.9
Self-employment	6.2
Local government hospitals	4.8
Home health care services	4.7
Federal government agencies	4.2
Local government agencies	3.8
State government agencies	2.7
Outpatient care centers, except mental health and substance abuse	2.6
State government hospitals	2.4
Community care facilities for the elderly	2.2
Direct life, health, and medical insurance carriers and reinsurance carriers	2.0

Medical Scientists, Except Epidemiologists

Conduct research dealing with the understanding of human diseases and the improvement of human health. Engage in clinical investigation or other research, production, technical writing, or related activities.

➤ Major employment sectors/percent of jobs:

Research and development in the physical, engineering, and life sciences	24.1
State and local educational services	17.1
Pharmaceutical and medicine manufacturing	14.1
General medical and surgical hospitals, private	7.1
Offices of physicians	3.2
Federal government agencies	3.1

Microbiologists

Investigate the growth, structure, development, and other characteristics of microscopic organisms, such as bacteria, algae, or fungi. Includes medical microbiologists who study the relationship between organisms and disease or the effects of antibiotics on microorganisms.

➤ Major employment sectors/percent of jobs:

Pharmaceutical and medicine manufacturing	20.2
Research and development in the physical, engineering, and life sciences	19.9
Federal government agencies	15.8
State government agencies	8.8
State and local educational services	7.3
General medical and surgical hospitals, private	4.1
Testing laboratories	3.8
Local government agencies	3.5

Municipal Fire Fighters

Control and extinguish municipal fires, protect life and property and conduct rescue efforts.

➤ Major employment sectors/percent of jobs (for all Fire Fighter occupations):

Local government agencies	91.8
Federal government agencies	3.0
State government agencies	2.3

Municipal Fire Fighting and Prevention Supervisors

Supervise fire fighters who control and extinguish municipal fires, protect life and property, and conduct rescue efforts.

➤ Major employment sectors/percent of jobs (for all Supervisors/Managers of Fire Fighter occupations):

Local government agencies	90.9
State government agencies	4.8
Federal government agencies	2.7

Natural Sciences Managers

Plan, direct, or coordinate activities in such fields as life sciences, physical sciences, mathematics, statistics, and research and development in these fields.

➤ Major employment sectors/percent of jobs:

Federal government agencies	32.0
Research and development in the physical, engineering, and life sciences	13.1
Pharmaceutical and medicine manufacturing	11.0
State government agencies	7.6
Management, scientific, and technical consulting services	3.6
State and local educational services	3.0
Testing laboratories	2.9
Management of companies and enterprises	2.5
Local government agencies	2.2

Nuclear Monitoring Technicians

Collect and test samples to monitor results of nuclear experiments and contamination of humans, facilities, and environment.

➤ Major employment sectors/percent of jobs:

Research and development in the physical, engineering, and life sciences	9.4
Testing laboratories	3.6
Colleges, universities, and professional schools, private	3.5
Management, scientific, and technical consulting services	2.9
Facilities support services	2.7
General medical and surgical hospitals, private	2.3
Engineering, surveying, mapping, building inspection, and drafting services	2.0

Nursery and Greenhouse Managers

Plan, organize, direct, control, and coordinate activities of workers engaged in propagating, cultivating, and harvesting horticultural specialties, such as trees, shrubs, flowers, mushrooms, and other plants.

➤ Major employment sectors/percent of jobs (for all Agricultural Manager occupations):

Animal production	44.9
Crop production	36.3
Support activities for agriculture and forestry	4.5

Occupational Health and Safety Specialists

Review, evaluate, and analyze work environments and design programs and procedures to control, eliminate, and prevent disease or injury caused by chemical, physical, and biological agents or ergonomic factors. May conduct inspections and enforce adherence to laws and regulations governing the health and safety of individuals. May be employed in the public or private sector.

➤ Major employment sectors/percent of jobs:

Local government agencies	18.1
State government agencies	14.6
General medical and surgical hospitals, private	6.3
Self-employment	4.2
Federal government agencies	3.4
Management, scientific, and technical consulting services	2.6
Management of companies and enterprises	2.4
State and local educational services	2.3

Park Naturalists

Plan, develop, and conduct programs to inform public of historical, natural, and scientific features of national, state, or local park.

➤ Major employment sectors/percent of jobs (for all Conservation Scientist occupations):

Federal government agencies	44.3
State government agencies	15.5
Local government agencies	12.3
Self-employment	9.2
Forestry	5.7
Support activities for agriculture and forestry	3.0
Social advocacy organizations	2.6

Range Managers

Research or study range land management practices to provide sustained production of forage, livestock, and wildlife.

➤ Major employment sectors/percent of jobs (for all Conservation Scientist occupations):

Federal government agencies	44.3
State government agencies	15.5
Local government agencies	12.3
Self-employment	9.2
Forestry	5.7
Support activities for agriculture and forestry	3.0
Social advocacy organizations	2.6

Soil and Plant Scientists

Conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity.

➤ Major employment sectors/percent of jobs:

Self-employment	35.8
Federal government agencies	15.8
State and local educational services	10.9
Research and development in the physical, engineering, and life sciences	6.6
Management, scientific, and technical consulting services	5.7
Miscellaneous nondurable goods merchant wholesalers	5.4
Local government agencies	3.4
State government agencies	2.9
Crop production	2.3

Soil and Water Conservationists

Plan and develop coordinated practices for soil erosion control, soil and water conservation, and sound land use.

➤ Major employment sectors/percent of jobs (for all Conservation Scientist occupations):

Federal government agencies	44.3
State government agencies	15.5
Local government agencies	12.3
Self-employment	9.2
Forestry	5.7
Support activities for agriculture and forestry	3.0
Social advocacy organizations	2.6

Training and Development Managers

Plan, direct, or coordinate the training and development activities and staff of an organization.

➤ Major employment sectors/percent of jobs:

Management of companies and enterprises	9.5
General medical and surgical hospitals, private	4.4
Local government agencies	4.3
Depository credit intermediation	4.0
Management, scientific, and technical consulting services	3.1
Direct life, health, and medical insurance carriers and reinsurance carriers	3.0
State and local educational services	2.8
Computer systems design and related services	2.1

Tree Trimmers and Pruners

Cut away dead or excess branches from trees or shrubs to maintain right-of-way for roads, sidewalks, or utilities, or to improve appearance, health, and value of tree. Prune or treat trees or shrubs using handsaws, pruning hooks, shears, and clippers. May use truck-mounted lifts and power pruners. May fill cavities in trees to promote healing and prevent deterioration.

➤ Major employment sectors/percent of jobs:

Landscaping services	59.9
Self-employment	21.7
Local government agencies	4.4

Water and Liquid Waste Treatment Plant and System Operators

Operate or control an entire process or system of machines, often through the use of control boards, to transfer or treat water or liquid waste.

➤ Major employment sectors/percent of jobs:

Local government agencies	77.7
Water, sewage and other systems	8.9

Zoologists and Wildlife Biologists

Study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management, including the collection and analysis of biological data to determine the environmental effects of present and potential use of land and water areas.

➤ Major employment sectors/percent of jobs:

State government agencies	37.3
Federal government agencies	27.3
Research and development in the physical, engineering, and life sciences	11.6
Management, scientific, and technical consulting services	5.4
State and local educational services	4.8
Museums, historical sites, and similar institutions	3.9
Local government agencies	2.1

Resources: Articles and Publications

Careers for Creature Lovers

Occupational Outlook Quarterly, Winter 2006-07
U.S. Department of Labor, Bureau of Labor Statistics
www.bls.gov/opub/ooq/2006/winter/art01.htm

This magazine article is about careers that involve working with animals.

Careers for Environmental Types & Others Who Respect the Earth

Mike Fasulo & Jane Kinney
McGraw-Hill (2001), 192 pages, \$11

This book is said to be about how to pursue a passion and make a living in an environmental career. Chapters cover environmental education, careers in the private sector, careers in government, careers for eco-entrepreneurs, careers in non-profit organizations, and careers in media.

Careers for Nature Lovers & Other Outdoor Types

Louise Miller
McGraw-Hill (2001), 192 pages, \$13

This book offers information on a variety of jobs in fields such as biology, agriculture, land management, forestry, geology, and waste management. These aren't office jobs, however, as this book focuses on employment opportunities that involve working outdoors.

Careers in the Green Industry

Occupational Outlook Quarterly, Spring 2005
U.S. Department of Labor, Bureau of Labor Statistics
www.bls.gov/opub/ooq/2005/spring/art03.htm

This magazine article is actually about 'Green Thumb' careers, which – to some people – is not even related to careers that involve 'protecting the environment.' Nevertheless, this is a good article for those interested in green thumb occupations.

The Complete Guide to Environmental Careers in the 21st Century

Environmental Careers Organization
Island Press (1999), 448 pages, \$22

Includes discussion of ongoing changes in environmental fields, an overview of environmental professions, case studies of representative work, and individual profiles that give an up-close and personal look at a variety of environmental professionals.

Earth Work: Resource Guide to Nationwide Green Jobs

The Student Conservation Association
Edited by Joan Moody and Richard Wizansky
HarperCollins (1994), 224 pages, \$15

With advice from leading environmentalists, this book details who's hiring and how to land a green job. It discusses six federal agencies and how to complete the required job application forms; it describes nine ways to get hired permanently; it lays out twelve ways to get summer work and lists the types of summer positions available. The book also details the best way to approach state government offices as well as private-for-profit environmental organizations. The book's 1994 publishing date suggests the need for an update.

The ECO Guide to Careers That Make a Difference: Environmental Work for a Sustainable Future

Environmental Careers Organization
Island Press (2004), 320 pages, \$20

This book identifies and describes 40 specific jobs that are representative of environmental career opportunities. Includes "Career Snapshots" of selected employers and the professionals that work there, including government agencies, nonprofit organizations and local advocates.

Environmental Careers

Occupational Outlook Quarterly, Winter 1994
U.S. Department of Labor, Bureau of Labor Statistics

This is an aging Occupational Outlook Quarterly article, but is still relevant today. No longer available through the OOQ archives, but try downloading it at:
www.cassio.com/EnvironmentalCareers.pdf

Environmental Careers: A Practical Guide to Opportunities in the 90s

David J. Warner

Lewis Publishers (1992), 290 pages, \$18

This book provides an overview of employment opportunities in the environmental field. It emphasizes the need to develop a strong technical background in the sciences to be effective in understanding and solving complex environmental problems. It also stresses the importance of relevant work experience through internships or volunteer work to help find entry-level employment in the environmental field. The book's 1992 publishing date suggests the need for an update.

The Environmental Career Guide: Job Opportunities with the Earth in Mind

Nicholas Basta

John Wiley & Sons (1991), 208 pages, out-of-print

Designed to explore the many career options available in the field of preserving and protecting the environment. The book's 1991 publishing date suggests the need for an update (to say the least).

For Job Market Green Means Growth

Brian Wingfield

Forbes.com, July 2007

www.forbes.com/business/2007/07/02/environment-economy-jobs-biz_cx_bw_0703green_greenjobs.html

Excellent article from Forbes.com that covers the latest trends in green jobs. Article includes an accompanying slide show.

Great Jobs for Environmental Studies Majors

Julie DeGalan & Bryon Middlekauff

McGraw-Hill (2002), 256 pages, \$15

This book is designed for environmental studies majors to help them explore their career options. It's divided into two sections, with one being the Job Search and the other being the Career Paths. Also included is a section on Internet resources.

Green at Work: Finding a Business Career that Works for the Environment

Susan Cohn

Island Press (1995), 452 pages, \$30

Includes profiles of more than 70 individuals showing how they have woven their skills, values, and passions into their work for the environment. Also includes a directory of more than 400 "green jobs" employers. The book's 1995 publishing date suggests the need for an update.

Green Careers Journal

Environmental Career Center

Periodical (10 issues/yr) by subscription

<http://environmentalcareer.com/store.htm>

Designed to provide working professionals, college students, and career development professionals with a career resources publication for the environmental careers world.

Green Job Board Guide

Carol McClelland

Transition Dynamics Enterprises (2007), 43 page ebook, \$20

This ebook includes profiles of 30 job boards and 86 recruiters focusing specifically on positions within environmental/sustainable companies. Carol McClelland is the author of *Your Dream Career for Dummies*.

Green Volunteers: The World Guide to Voluntary Work in Nature Conservation

Fabio Ausenda

Universe (2007), 253 pages, \$15

This new book lists over 200 projects worldwide for those who want to experience active conservation work as a volunteer. The projects are in a variety of habitats and countries including wildlife rehabilitation centers, national parks, and protected areas. They range from one week to one year or more. The vast majority of the projects are open to anyone without previous conservation experience, and most do not have language requirements.

Opportunities in Environmental Careers

Odum Fanning

McGraw-Hill (2002), 174 pages, \$16

This career exploration resource covers a variety of careers within the environment field and includes training and education requirements, salary statistics, and professional and Internet resources.

Outdoor Careers: Exploring Occupations in Outdoor Fields

Ellen Shenk

Stackpole Books (2000), 206 pages, \$19

While “outdoor careers” and careers that “protect the environment” are not necessarily the same, there is plenty of overlap with many of the occupations. This book is organized by eight general headings: agriculture and food production, biological sciences, conservation, environmental sciences, engineering, marine careers, recreation, and indoor careers with an outdoor twist. Profiles of people in various professions offer their personal perspectives.

Resumes for Environmental Careers

Editors of VGM Career Books

McGraw-Hill (2002), 160 pages, \$11

For job seekers who want to create effective resumes for environmental jobs. Includes 100 sample resumes and 20 cover letters tailored to a job seeker's needs or field of interest.

Sunshine Jobs: Career Opportunities Working Outdoors

Tom Stienstra

Live Oak Publications (1997), 420 pages, \$17

Includes profiles of 50 different outdoor career fields, including what jobs are available, how much they pay, training and education requirements, the pros and cons of each job, and strategies for getting the desired job. Also includes 100 first-person interviews with working professionals speaking frankly about the dreams, realities and nightmares of each occupation.

The Trade-Off Myth: Fact and Fiction about Jobs and the Environment

Eban Goodstein

Island Press (1999), 206 pages, \$30

This book explores the debate about employment and the environment in which it is widely believed that environmental regulations have caused widespread unemployment and loss of jobs. Goodstein looks at such claims and finds them to be consistently false.

Working for the Environment: A Growing Source of Jobs

Michael Renner

Worldwatch Institute (2000), 85 pages, \$10

This research paper discusses how an environmentally sustainable economy can provide opportunities for job creation, ranging from recycling and remanufacturing of goods, to greater energy and materials efficiency and the development of renewable sources of energy. For example, wind power is already generating lots of new jobs, including wind meteorologists, structural engineers, metal workers, mechanics, and computer operators.

Resources: Websites and Job Boards

Centers for Disease Control and Prevention

www.cdc.gov

The CDC is one of the major bureaus within the U.S. Department of Health and Human Services. They employ 15,000 people in 170 different occupations. See their "Employment Information" website to learn more about their job opportunities.

CoolWorks.com

www.coolworks.com

This website is about helping you find a seasonal job or career in a great place, like at a National or State Park, a ski resort, a theme park; or with one of the many state conservation corps or national conservation corps. Note that only *some* of their jobs would qualify as "protecting the environment." The site includes a privacy policy. CoolWorks.com is based in Gardiner, MT.

Cyber-Sierra's Natural Resources Job Search

www.cyber-sierra.com/nrjobs/

Not much of a job board, but a very helpful resource for job seekers created and maintained by Jean Saffell – originally to help her husband find a job in the environmental field.

EcoEmploy.com

www.ecoemploy.com

This environmental job board website is owned by David R. Brierley, an Environmental Analyst based in Malden, MA. The site includes a privacy policy and job seeker registration is not required. When checked, it had a total of 5 (recent) jobs posted for Environmental Engineer in the U.S. Includes a good list of links.

EnviroNetwork

www.environetwork.com

EnviroNetwork claims to be the web's leading environmental job board. When checked, it had a total of 8 (recent) jobs posted for Environmental Engineer in the U.S. However, the troubling thing about this site is that it lacks any disclosure information. It doesn't tell you who owns or operates it, and it provides no privacy policy or terms of use document. A check of the domain name registration indicates that the site is owned by Naturalist.com, Inc., based in New York, NY. This company operates a network of websites featuring news, job postings, product offerings (including weight-loss products), resources, and other content related to ecology, wildlife, and the environment.

Environmental Career Opportunities

www.ecojobs.com

ECO is an environmental job board website operated by Betty and Dan Brubach, based in Charlottesville, VA. Without a subscription, you can access 100 current job listings on their website. If you subscribe to their service (for less than \$1/day), you get 500 current job listings every two weeks. Registration is not required for non-subscribers.

Environmental Careers Organization

www.eco.org

ECO has decided (as of Spring 2007) to file for bankruptcy due to an ongoing investigation with the U.S. Attorneys Office in Boston regarding management of its Federal agreements. Founded in 1972, ECO is (was) a non-profit organization whose mission has been to develop professionals for the environmental field through paid internships that provide important on-the-job learning experiences for college students and recent graduates. There is one ECO career resource that hopefully will remain online: a list of 65 of the nation's largest environmental consulting firms. To find this list, go to ECO's "Career Center" and select "Career Tips."

EnvironmentalEngineer.com

www.environmentalengineer.com

This website is a job board specifically for environmental engineers, and is part of CareerMarketplace, Inc. based in Canton, OH. When checked, this site had a total of 43 (recent) jobs posted for Environmental Engineer in the U.S. The site includes privacy policy and terms of use documents; job seeker registration is required in order to apply for jobs.

Environmental Expert

www.environmental-expert.com

Environmental Expert claims to connect over 500,000 environmental industry professionals (from around the globe) to more than 11,400 companies that hire them. In a search for Environmental Engineer job listings in the U.S., the results showed a total of 98 jobs. However, a closer look at the job listings indicated that most of those were not actually for Environmental Engineer – which was the search term used. Even though the Environmental Expert search tool does not work as efficiently as one might expect, the site does appear to be a rich source for industry-related information and resources, including publications, events, articles, and news. The site includes privacy policy and terms of use documents. Job seeker registration is not required, but you will need to provide the equivalent information if you try to apply for any of the jobs they have listed. Environmental Expert is based in Madrid, Spain.

EnvironmentalCareer.com

www.environmentalcareer.com

2007 marks the 12th year of operation for this environmental job board website. The site is owned by the Environmental Career Center, based in Hampton, VA, which has been in operation for 27 years. They also publish the *Green Careers Journal*. When checked, this site had a total of 16 (recent) jobs posted for Environmental Engineer in the U.S. The site includes a privacy policy and job seeker registration is not required.

Environmental-Jobs-Online

www.environmental-jobs-online.com

This website is actually a “portal” to WorkTree.com – a membership (fee) based job search site. WorkTree.com claims to be the largest job search portal in the world, but its fee-based approach makes it somewhat unusual – as job seekers are generally given free access to job listings, while employers pay to post their job listings. On the other hand, the fees are actually quite minimal, so if WorkTree.com has found a way to add value that exceeds the competition (such as Monster.com), then they may be offering a fair deal to green career seekers.

GreenBiz.com

www.greenbiz.com/jobs

GreenBiz is a media company with a mission: To be the leading information resource on how to align environmental responsibility with business success. When checked, their job board had a total of 7 (recent) jobs posted for Environmental Engineer in the U.S. The site is owned by Greener World Media, Inc., based in Oakland, CA. The site includes a privacy policy and job seeker registration is not required.

Green Dream Jobs

www.sustainablebusiness.com/jobs

Environmental job board website owned by SustainableBusiness.com, based in Huntington Station, NY. They also publish a monthly newsletter called the *Progressive Investor*. When checked, their job board had a total of 15 (recent) jobs posted for Environmental Engineer in the U.S. The site includes a privacy policy and job seeker registration is not required. The site also includes an excellent list of links.

Land Trust Alliance

www.lta.org

The Land Trust Alliance is the national association that represents more than 1,600 land trusts across America. Their “Alliance Jobs” page may be a bit hard to locate, but this would be a good place to search for administrative positions with land trusts and related organizations.

National Registry of Environmental Professionals

www.nrep.org

The NREP is a registry that seeks to provide legal and professional recognition of individuals possessing education, training and experience as environmental professionals. Their website does include a “Job Bank,” although it has a very small number of job listings. The site does not include privacy policy or terms of use documents for non-registrants; however, job seeker registration is not required and non-registrants are able to access the job listings. The site also offers a “Recruiters” page with a listing of recruitment or headhunting firms that specialize in serving environmental professionals.

National Wildlife Federation

www.nwf.org

Use this website to learn about jobs, internships and volunteer opportunities with the National Wildlife Federation, whose revenues totaled \$115 million in 2006. Most of those resources are spent on programs that include conducting scientific, policy, and legislative research, educating the public on issues relating to wildlife conservation policy and legislation, and taking legal action against environmental polluters and violators that threaten wildlife and wildlife habitat.

The Nature Conservancy

www.nature.org/careers/

The Nature Conservancy has projects in all 50 states and in more than 30 different countries around the world. It employs people in a variety of jobs that protect the lands and waters that our plants, animals and natural communities need to survive. This is their career website for browsing or searching the Nature Conservancy job listings.

New Scientist

www.newscientist.com

"Environmental" science news, blogs, and special reports from the website of *New Scientist* magazine. This site also has a job board called "NewScientist Jobs." When checked, their job board had no Environmental Engineer job listings, but did have a total of 44 (recent) jobs posted for Ecology/Environmental Science jobs in the U.S. The site includes privacy policy and terms of use documents, and job seeker registration is not required.

North American Association for Environmental Education

www.naaee.org

Based in Washington D.C., NAAEE is a professional association for people involved in environmental education. Their website includes a job board called "EE Jobs." When checked, their job board had no job listings for Environmental Engineer, but this would be a good place to search for jobs in the environmental education field. In addition, the NAAEE site is an excellent resource for identifying environmental-related education programs. The site does not include privacy policy or terms of use documents for non-members; however, job seeker registration is not required and non-members are able to access the job listings.

The Orion Society

www.orionsociety.org

The Orion Society is a non-profit organization based in Great Barrington, MA. Its mission is to inform, inspire, and engage individuals and grassroots organizations in becoming a significant cultural force for healing nature and community. They publish *Orion* magazine, which the Boston Globe calls "America's finest environmental magazine." The Orion Grassroots Network connects and empowers groups working for positive social and environmental change across North America and beyond. Orion's Internship & Career Service has hundreds of job listings, internships, and AmeriCorps positions with members of the Orion Grassroots Network. The Orion Society also undertakes educational initiatives, including the Nature Literacy Series. When checked, their job board had no job listings for Environmental Engineer and a total of 57 jobs listings for all types of occupations in the U.S. The site does not include privacy policy or terms of use documents for non-members; however, job seeker registration is not required and non-members are able to access the job listings.

The School for Field Studies

www.fieldstudies.org

SFS is an international non-profit educational organization that provides environmental education and conducts research through its field-based programs. A very small job board includes both academic and nonacademic job openings in U.S. and abroad, as well as some internships.

Society for Ecological Restoration International

www.ser.org

Based in Tucson, Arizona, SER International is a professional association for people involved in ecological restoration work. Their website includes a "Career Center" which has a relatively small job board. When checked, their job board had 2 job listings for Environmental Engineer and a total of 32 jobs listings for all types of occupations. The site does not include privacy policy or terms of use documents for non-members; however, job seeker registration is not required and non-members are able to access the job listings.

TreeHugger

www.treehugger.com

TreeHugger describes itself as the leading media outlet dedicated to driving sustainability mainstream. With an impressive team of international writers, TreeHugger has become one of the most respected and visited environmental sites on the web in just 3 short years. In addition to the articles and the job board, TreeHugger offers green-themed blogs, weekly and daily newsletters, weekly video segments, and a weekly radio show. When checked, their job board had a total of 8 (recent) jobs posted for Environmental Engineer in the U.S. The site includes a privacy policy and job seeker registration is not required.

U.S. Department of the Interior

www.doi.gov

DOI is the federal government's principal conservation agency. It is a large, decentralized agency with over 80,000 employees and 180,000 volunteers at approximately 2,400 locations. See their "DOI JOBS" website to learn more about their job opportunities.

U.S. Environmental Protection Agency

www.epa.gov

The EPA is the federal agency charged with protecting human health and with safeguarding the natural environment: air, water, and land. The agency has 18,000 full-time employees. The agency conducts environmental assessment, research, and education, and more than half of its staff are engineers, scientists, and environmental protection specialists. See their "EPA Careers" website to learn more about their job opportunities. Use this link to find the websites of the Environmental Protection Agencies for each of the States: www.epa.gov/epahome/state.htm

Ubiquity Environmental Careers Page

<http://www.ag.ohio-state.edu/~envjobs/>

This volunteer-based website was founded by Nicholas "Ned" E. D'Amato in 1994 to help people interested in environmental careers. The site offers: environmental job descriptions; an environmental job search page with links as well as hints and tips; and an online forum (courtesy of Yahoo Groups) for current job listings and environmental career discussions.

USAJOBS

www.usajobs.opm.gov

This is a website of the U.S. Office of Personnel Management and is the Federal Government's official one-stop source for Federal jobs and employment information.

About Mainstream Job Boards

Introduction

There are tens of thousands of job board websites. *Monster*, *Yahoo! HotJobs*, and *CareerBuilder* are consistently ranked at the top of most “Best Job Board” lists. Each of these mainstream job board sites serve as repositories for huge numbers of job listings posted by employers and sometimes by recruiters. Job board websites have much in common as they usually offer the same three features: the ability to post resumes (for employers to find); the ability to do your own search for current job openings; and a resource center giving information and advice to help you with your job search and career management. The vast majority of job board websites offer these services free to job seekers - usually requiring only that you set up an account. Some sites will charge job seekers for bulk resume postings and/or for other premium services.

A Fallen Star

Another top ranked job board website is called *America's Job Bank* - which is operated by the U.S. Department of Labor. But *AJB* (as it is called) has recently been targeted for closure because the Government believes that it has become duplicative of what is already available in the private sector. *AJB* was the first job board to reach 1 million job listings, but in recent years it has been unable to compete with the private job boards, which – together - have become a \$2 billion industry.

Don't Overlook Local Job Boards

Many job board websites are local; often operated by local Workforce Investment Boards or One-Stop Career Center Consortia. Another common local job board website is *Craigslist*. And while the total number of job listings for local job boards may not be as impressive as the big job boards, many are excellent resources if your objective is to find a *local* job. To find a local job board website, use one of the top Internet search engines (like Google) and use keywords such as ‘job’ and ‘Chicago’ (insert your geographic area name). To use *Craigslist* go to: www.craigslist.com

Job “Search Engine”

Included below is a different kind of job website called *Indeed*. It is different because it's based on an Internet search engine rather than a repository for job listings. Think Google-for-jobs and you begin to get the idea.

Guide Book

If all this isn't enough to help you find the job-related websites that you're looking for, you may want to consider buying *WEDDLE's 2007/8 Guide to Employment Web Sites* by Peter Weddle. This print publication lists 350 of the top employment sites on the Internet and provides the detailed information needed to evaluate them effectively and to select the right ones for you. Visit www.weddles.com to learn more about this resource publication.

Using Multiple Sites

Whatever job board website(s) you end up using, remember that job search experts always suggest using several of them (and not just choosing one or two). Remember also not to overlook traditional (offline) job hunting methods. Perhaps the majority of jobs are still filled through the *hidden job market* – i.e. jobs that are not advertised in classified ads or posted on commercial job boards.

Privacy Policies

Be sure to carefully read the privacy policies of any website that asks for your name and other personal information. It is your responsibility to ensure that your need for privacy is compatible with their respect for your privacy. If no user-registration is required and you can use the site anonymously, then their privacy policy may not matter to you. But if registration is not required, and yet you have to respond to jobs through the job board (rather than directly through the employer), then you are not using the site anonymously and their privacy policy is relevant.

Links to the Top Mainstream Sites

Monster.com

www.monster.com

Yahoo! HotJobs.com

<http://hotjobs.yahoo.com>

CareerBuilder

www.careerbuilder.com

Indeed

www.indeed.com

About Our Sponsor: CareerDNA

Just as your own DNA instructs your body how to grow and thrive, you're also programmed for one true career path - the one that brings you happiness and success. CareerDNA is a new online, interactive career discovery and assessment tool based on the 30-year practice of Dr. Brian Schwartz, a psychologist and leading career mentor and coach.

A one-year subscription to CareerDNA is \$99.

Visit www.careerdna.net and try the Free Assessment!



CareerDNA also offers next-generation talent management solutions to help organizations meet their workforce challenges. Visit www.careerdna.biz for more information.

About Jim Cassio



Jim Cassio is the President and CEO of Workforce Information Group Inc. - a private consulting firm based in Northern California. Jim is one of the nation's foremost experts in workforce, career, and skills information. He specializes in industry, occupation, and skills research, analysis, and resource product development. In addition to hundreds of projects performed for local and regional clients in all sectors, Jim has coordinated research & development projects for state and federal agencies, including O*NET pilot projects sponsored by the U.S. Department of Labor. Jim is the author of *Your Guide to the Top 100 Careers ...* and ... the *Career Pathways Handbook*, published by Trafford Publishing.

Workforce Information Group Inc.
198 Willow Creek Drive
Folsom, California 95630
(916) 984-9615
www.cassio.com or www.work-info.com