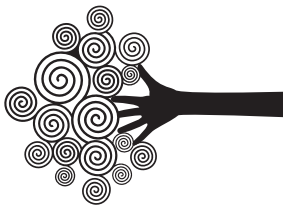


What is a *Green Career* and Where are the *Green Jobs*?

Going Green

Before we get into a discussion of green industries, jobs and careers, it might be good to discuss the principal values that help to define a person who has "gone green." However, it's not a checklist. There is no absolute list of green values or agreement on how to define them. But together these and other green values reflect an approach to life — including home, family, community and work — that centers on an awareness of our impact on the planet and its people:

- Environmental protection/preservation
- Eco-friendly design
- Sustainable development
- Renewable energy
- Organic/natural products
- Fair trade
- Holistic health
- Clean technology
- Peace and justice
- Social conscience

What is a green career?

Green careers involve working in green jobs that are focused on sustainability and/or environmental protection and preservation. These jobs can be defined either by the nature and purpose of the job or by the nature and purpose of the employer.

Merriam-Webster defines "sustainability" as a method of harvesting or using a resource so that the resource is not depleted or permanently damaged.

Sustainable agriculture refers to the ability of a farm to produce food indefinitely without causing irreversible damage to ecosystem health.

A sustainable business or organization generally means that they are committed to:

- Conserving energy
- Using renewable energy sources

- Preventing pollution
- Reducing waste
- Conserving water

An "occupation" is a way of categorizing similar jobs. For example, the occupation of journalist encompasses a variety of journalist jobs, including those that specialize in politics, technology or entertainment. Some journalists specialize in environmental issues. Occupations are not defined on the basis of the *greenness* of their jobs or the employers they work for. There are two important consequences of this reality:

1. You can't judge an individual job for greenness on the basis of its title or on the basis of the parent occupation to which it is related. There are scarce few occupations in which *all* of its jobs are green. Therefore you must look at the nature and purpose of the individual job, or the nature and purpose of the employer, in order to determine if it's a green job.
2. You can't know how many green jobs currently exist or how many will exist in the future — based on our government's current employment statistics research programs. These employment statistics depend on the Standard Occupational Classification (SOC) system which is never up-to-date on current workforce trends. Therefore valid statistics on individual green jobs are impossible without doing an extensive survey of the employment in specific green industries or in a specific geographic area.

Just to be clear, the above definition of "green careers" includes "green collar jobs," which can be defined in any number of ways, depending on your perspective and/or agenda. The definition of "green collar jobs" can range from manual labor jobs that are green to any green job, without regard to education level.

Our definition of "green careers" includes jobs at every level of skill and experience, including manual labor jobs as well as the environmental science and engineering professions that form the traditional foundation for green/environmental work. But the definition also includes a wide variety of other career fields, including those of management, support and administrative staff that can be found in virtually all industries — if and when those jobs meet our green jobs criteria.

Where Are the Green Jobs?

In response to climate change and other concerns, our society is going green, and that includes the workplace. Many employers are creating new green jobs

and changing their existing jobs in terms of how the work is done. Others are starting up new businesses built on a foundation of green values. Although we don't know the exact number of green jobs, recent studies are now suggesting that five to seven percent of the jobs in the US are green jobs, and that percentage is expected to increase significantly through 2030 to where green jobs may account for one of every four or five jobs. So it is clear that both the number and the percentage of green jobs is growing. It is also clear that green jobs now represent a wide variety of occupational choices that didn't exist just two to three years ago. They can now be found in every corner of the workplace and economy.

The following list shows the industries and their sectors where most green jobs can be found.

Advertising and Public Relations Services Industry (Green)

- All sectors

Agriculture and Food Industry

Green sectors include:

- Green/Natural/Organic Food Restaurants
- Makers of Natural/Organic Food Products
- Sellers of Prepared Natural/Organic Food
- Sustainable/Organic Farms
- Sustainable/Organic Nurseries/Greenhouses
- Sustainable Aquaculture Farms/Fish Hatcheries

Alternative Fuel Vehicles Industry

Green sectors include:

- Advanced Technology Vehicle Manufacturers (electric, hybrids, fuel cell, hydrogen)
- Alternative Fuel Vehicle Manufacturers
- Alternative Fuel Producers/Distributors
- Alternative Fuel Vehicle Repairers (technicians, first-responders)
- Alternative Fuel Vehicle Sales/Service
- Battery Manufacturers

Bicycle Industry

Green sectors include:

- Bicycle Courier and Cargo Services
- Bicycle Manufacturing
- Bicycle Sales and Service

Biotech/Life Sciences Industry

Green sectors include:

- Blue Biotechnology (marine and aquatic applications)
- Green Biotechnology (agricultural applications)
- Red Biotechnology (medical applications)
- White Biotechnology (industrial applications)
- Bioeconomy (investments and economic output)

Building Industry (Green/Sustainable)

Green sectors include:

- Architectural Services
- Building Materials
- Building/Construction/Specialty Trade Contractors
- Furniture/Cabinet Makers (using environmentally certified/recycled wood)
- Salvage and Deconstruction Services

Cleaning and Janitorial Services Industry (Green Cleaning)

- All sectors

Clothing and Accessories Industry (Organic/Natural/Recycled Material)

Green sectors include:

- Design
- Manufacturing
- Wholesale
- Retail

Ecotourism Industry

- All sectors

Engineering Services Industry (Green)

Green sectors include:

- Chemical
- Civil
- Construction Management Services
- Environmental
- Land Planning
- Manufacturing/Production
- Surveying
- Transportation

Environmental Health and Safety Services Industry (Consulting)

- All sectors

Environmental and Hazardous Materials (HazMat) Services Industry

Green sectors include:

- Environmental Consulting Services
- Hazardous Materials (HazMat) Services
- Environmental Engineering Services — see Engineering Services Industry

Geography and GIS Services Industry

- All sectors

Government

Green sectors include:

- Federal: e.g., Army Corps of Engineers; Bureau of Land Management (BLM); Centers for Disease Control and Prevention (CDC); Department of Energy; Environmental Protection Agency; Fish and Wildlife Service; Forest Service; Geological Survey (USGS); National Oceanic and Atmospheric Administration (NOAA); National Park Service; Natural Resources Conservation Service (NRCS)
- State: e.g., Agriculture and Food Safety; Coastal Zone Management; Community and Economic Development; Emergency Services; Energy; Fisheries and Wildlife Protection; Parks and Recreation; Planning; Pollution Control and Prevention; Public Health; Water Resources
- Local (cities, towns, counties, special districts): e.g., Air Quality Management; Conservation/Park Land Management; Electricity; Green Building; Green Business; Public Transportation; Recycling; Regional Planning; Waste Management; Water and Wastewater Treatment

Investment Services Industry (Sustainable/Socially Responsible Investing/SRI)

- All sectors

Journalism and Publishing Industry (Green/Sustainable)

- All sectors

Landscaping and Habitat Restoration Services Industry (Green)

Green sectors include:

- Arborist/Tree Services
- Gardening/Landscape Maintenance Services
- Habitat Restoration Services

- Landscape Architectural Services
- Landscape Contractors

Legal Services Industry (Environmental and Land Use Law)

- All sectors

Natural Sciences Consulting Services

Specialties include:

- Atmospheric and Space Scientists
- Biochemists, Biophysicists and Toxicologists
- Chemists and Forensic Toxicologists
- Environmental Scientists
- Epidemiologists
- Foresters and Forest Pathologists
- Geoscientists, Environmental Geologists, Hydrogeologists and Marine Geologists
- Hydrologists and Water Resources Managers
- Microbiologists and Environmental Health Microbiologists
- Physicists and Health Physicists
- Soil and Plant Scientists
- Soil and Water Conservationists
- Zoologists, Wildlife Biologists and Marine Biologists

Non-profit Organizations (Green/Environmental)

- All environmental sectors

Printing Industry (Green/Sustainable)

- All sectors

Recycling Industry (Green)

Green sectors include:

- Electronics (cell phones, computers)
- Glass
- Metal
- Paper
- Plastics
- Textiles
- Wood

Renewable Energy Industry

Green sectors include:

- Biomass

- Solar Systems Manufacturing
- Solar Systems Sales, Installation and Service
- Wind Turbines Manufacturing
- Wind Turbines Sales, Installation and Service

Utilities Industry

Green sectors include:

- Electric Power Generation, Transmission and Distribution
- Natural Gas Distribution
- Water, Sewage and Other Systems

Other: Misc. Retail (Green/Sustainable/Organic Products)

Green sectors include:

- Crafts/Artwork made by Third World Artisans
- Gardening Supplies
- Recycled, Reclaimed and Earth-friendly Products
- Outdoor Apparel/Equipment
- Scooters

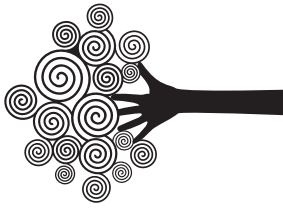
What Occupations?

Remember that an occupation is a way of categorizing similar jobs. Therefore a given occupation typically describes both green jobs and non-green jobs. The reason for this is simply that occupations are not defined on the basis of the *greenness* of their jobs. The same principle is true for industries; they are not generally defined on the basis of the *greenness* of their employers. Take recycling, for example. The recycling industry is largely green, but not always. That may come as a shock to some of us who have been conditioned to think that all recycling is good for the environment. But even with the best intentions, some recycling is inefficient and some is even harmful to the environment. So whether you are looking at occupations or industries, you still have to assess each individual job and each individual employer to know to what extent a job is green.

The career fields (occupations) that we chose to profile in this book do not constitute a comprehensive list of green careers. And there is good reason for this: The more occupations you add to any list of green careers, the more you get into the gray area between green and non-green jobs. Is veterinarian a green career? Not by our definition, but you could certainly be a green veterinarian. What about forest firefighters — is this not a green career? While it's true that they protect our natural resources by fighting forest fires, the reality is that their priority is to protect personal property — even at the expense

of our natural resources. So, by our definition, this career field doesn't quite meet our green criteria. But that doesn't mean you can't be green *and* work as a forest firefighter. In fact, it should be said that it is equally noble to be a green individual working for a non-green employer, where you can use your skills and values to help your employer become meaningfully green. If not you, then who will do it?

Green Career Profiles



Engineering Group

- Chemical Engineers, including Green Chemical Engineers
- Civil Engineering Technicians
- Civil Engineers, including Green Building, Irrigation/Reservoir and Waste Management Engineers
- Conservation, Biological and Agricultural Engineers
- Electrical Engineering Technicians, including Photovoltaic, Wind and Biomass Energy Technicians
- Electrical Engineers, including Recycling, Solar/Photovoltaic, Wind and Biomass Engineers
- Environmental Engineering and Pollution Control Technicians
- Environmental Engineering Professors
- Environmental Engineers, including Ecological and Air Quality Engineers
- Mechanical Engineers

Chemical Engineers, including Green Chemical Engineers

Chemical engineers design chemical plant equipment and devise processes for manufacturing chemicals and products, such as gasoline, synthetic rubber, plastics, detergents, cement, paper and pulp, by applying principles and technology of chemistry, physics and engineering.

Qualifications and Advancement

A bachelor's degree in chemical engineering is the typical education requirement. However, a graduate degree is usually necessary for college and university teaching positions and for many jobs in research and development.

Entry-level engineers usually begin their careers as junior engineers, working under the supervision of experienced engineers. As they gain experience and knowledge, they generally advance to positions of greater responsibility. For engineers, advancement can lead to senior engineer, project manager, research and development manager and vice president for engineering. Some

become consultants or start their own engineering firms. Those with a graduate degree can also become college and university professors.

Salary Survey

Median salary: $78,860 (very high)
Typical range: $62,410 to $98,100

Job Outlook and Employment

Average growth is projected for this occupation in the US, from 30,444 jobs in 2006 to 32,842 in 2016. Although overall employment in the chemical manufacturing industry is expected to decline, chemical companies will continue to research and develop new chemicals and more efficient processes to increase output of existing chemicals. However, most employment growth for chemical engineers will be in service-providing industries such as professional, scientific and technical services, particularly for research in energy and the developing fields of biotechnology and nanotechnology.

Where the Jobs Are

Research and development in the physical, engineering and life sciences (12.54%); Basic chemical manufacturing (11.09%); Resin, synthetic rubber and artificial synthetic fibers and filaments manufacturing (6.16%); Petroleum and coal products manufacturing (5.77%); Pharmaceutical and medicine manufacturing (4.86%); Federal government, excluding postal service (3.79%); Self-employed: 1.9%

Resources

American Chemical Society (ACS): portal.acs.org
American Institute of Chemical Engineers (AIChE): aiche.org
Engineering Central: engcen.com
Green Chemistry Institute: chemistry.org
National Society of Professional Engineers: nspe.org
O*NET OnLine: online.onetcenter.org (see chemical engineers)
US Dept. of Labor, Bureau of Labor Statistics: bls.gov/oco/ocos027.htm

Q&A **Tony Kingsbury**
Executive, Dow Chemical; Executive in Residence, Haas School of Business, University of California, Berkeley, from an interview with Jim in 2008.

How did you get into this career field? What was your education and experience, including any green–related training or certification?

My educational background is chemical engineering. My first job at Dow Chemical was actually in production — making plastics. As I worked in that environment, I kept asking more and more questions, like "What are the customers doing with the plastic we're making?" And that led to a technical troubleshooting/product development job where I worked with plastics customers. So in that job I would work with customers to figure out if there was something wrong with the way they were working with the plastic or if was there something wrong in terms of what Dow had supplied. In some cases, this meant there was a need for a new product to be developed to meet their needs. And that was a great job. I worked with folks in packaging, consumer electronics, toys, medical — a whole broad range of industry segments. And then, as environmentalism grew in late 80s, I asked if I could move into that area. More and more of our customers were asking: "How do we recycle this stuff?" "What do we need to be doing?" "What's Dow doing?" "How will this law being proposed affect me?" And I had a passion for that. I also had an interest in politics. You look how things have emerged in sustainability and in environmentalism, and there's a clear link between what's going on in the political realm and what's going on in business development. You can't separate the two. So, at the same time that my career was advancing through production and product development, I was also very much aware of what was going on from a political standpoint. I was working in Southern California at the time, so I asked to get involved in lobbying up in Sacramento and with various industry groups that were working on things which gave me a greater insight into how the twists and turns of all this were going. And then, one thing led to another.

What is your current job title and how would you describe the work you do in a typical day? What are your most common tasks, including those that make yours a green job?

There's what I'm doing now, and then there's what I was just doing. Right now, I am on loan from Dow Chemical to the University of California, Berkeley to start up a new sustainability program. That also includes teaching a graduate class on measuring sustainability. But to get here, I spent 25 years at Dow Chemical. My last role at Dow was as their global plastics sustainability leader — looking at sustainability in plastics on a global basis for Dow, which is the largest plastic manufacturer in the world. Right now my official title is executive in residence at the Haas School of Business at UC Berkeley. I'm starting up what we're calling the sustainable products and solutions program, which is a multidisciplinary program with start-up funding provided by the Dow Chemical Company Foundation. Not from the company, but from the

foundation. They asked me to come here and get it up and rolling for the first couple of years.

If you could give advice to a young person who wants to work in this career field someday, what would you tell them? How can they best groom themselves for this field?

Build a broad base of work experience wherever you can. If you look at the dynamics of what's going on in the world and what's going on in society, then being able to deal with multiple industries and with multiple people within a company is helpful. To be able to talk to the business folks, the technical folks, the marketing folks and the public policy folks — any chance you have to interact with all those folks is valuable experience. And that's beneficial, because to truly come up with sustainable solutions you have to think about all of those various aspects. You can't just think about one area, anymore, which kind of goes back to what I'm trying to do here at UC Berkeley with this program. We're trying to break down some of the walls that exist here on campus. For example: where chemistry just does chemistry and doesn't look at the business aspects of what they're doing. They need to think about the business aspect, and we need to get the business people talking with the chemistry people, talking with the engineers and so forth, so that we can come up with a viable sustainable solution at the end of the day. The world is the marketplace. You never know where your competition is going to come from. You never know where your products are going to come from. So you have to think globally. Read the *Economist*, the *New York Times*, the *San Francisco Chronicle*. Also, travel to expand your view of the world.

What kind of career advancement opportunities can one expect in this field? What kind of salary range would reflect that career path (from entry-level to the more advanced position)?

I would suggest starting with a technical degree. With that, you can always go into business or into public affairs or public policy. But if you get a degree in public policy or public affairs, it is extremely difficult to go into a technical area. Chemical engineering is one example of a technical degree. Mechanical engineering is another. Chemistry is yet another. Even things like toxicology and public health. Dow Chemical's current vice president of sustainability has a PhD in public health and toxicology from Harvard. So from a career-path standpoint, you can go anywhere you want, or you can stay on the technical side and work on a specific area that may become your specialty. But by the same token, if you've got talents in some of these other areas, you can move up the ladder. You can start as a basic engineer or chemist and you've

got a good starting salary. Then you can look at senior management positions at $150,000 or more per year. A chief sustainability officer can be well over $200,000 per year.

In your opinion, what are some of the best schools, degrees and certificates for jobs in this career field, including green–specific training?
Obviously UC Berkeley is an excellent school. But there are a lot of great schools out there. It is important to pick a quality school for the subject you are majoring in. Beyond that, make sure you are comfortable with the professors and staff you will be working with. Look for schools that offer you the ability to take classes and explore your interests in areas like business or politics — in addition to your science degree. I have a chemical engineering degree from Oregon State, and I had the opportunity to do a lot of things outside of chemistry and chemical engineering, and that expanded my horizons. So I think that's what you want to look for in a school. Obviously the popular schools for engineering are a bonus in terms of recruiting opportunities, but look for schools that also give you the opportunity to think outside the box. I think schools like Arizona State, that are trying to integrate sustainability into a broad spectrum of class offerings, will be helpful for students that want to get into this area in their careers. Also, look for opportunities to volunteer outside of the school experience. Internships are great, but if you can't do something on the social side of sustainability, and if you enjoy the political side, volunteer and get involved in these things. I think that's the kind of stuff that not only looks good on a resumé, but also gives you a sense of what you want to be engaged in and what kind of company you want to work for in the future. One of the things I always tell people is that I had great summer jobs in college. And one of the things I found out from my summer jobs was not so much what I wanted to do when I graduated, but what I didn't want to do. As far as what degree, I think that you can go far with a bachelor's degree. My advice would be to get your bachelor's degree and get into the working world before you pursue a master's degree. I wouldn't recommend jumping right into a master's program unless you really know what it is you want. With some work experience, you may decide that you need to pursue something on the business side, like an MBA.

How does someone without previous experience in this career field land a job? What are the best strategies for job-hunting in this field?
These days you need to search for jobs both online and offline. Online job searching is a key tool in looking for positions. But I also think networking is a key thing. Pursuing internships and summer jobs in areas that you are

interested in is an awfully good way to get an "in" with a company. And if not with that company, maybe they don't end up hiring the summer that you graduate, for example, but if you've made good contacts there, those folks can get you in touch with other folks who might be hiring. So the networking side of things is critical.

Are there any professional associations that you would recommend joining?
There are all sorts of associations for technical folks. So pick your favorite: chemical engineering, or AIChE; chemistry, or ACS; mechanical engineering; industrial engineering or whatever. And getting really involved in these organizations also shows that you're a leader. And it presents the opportunity to network with folks who are engaged in what they're doing.

What emerging careers do you see developing now and into the future for this career field? What new technologies will have the greatest impact on this field?
The whole energy area is a huge area of opportunity and will include many opportunities for chemical engineers, chemists and mechanical engineers. The jobs could be related to power, or to transport, or to design, or to energy storage. Or, on the other side of it, if you think about climate change as it relates to energy, how do you siphon off the CO_2 and store it so that it's not released into the atmosphere? That's a huge opportunity for chemists, chemical engineers and the whole engineering field in general. And all of those fields need great thinkers. And bio-derived fuels — what makes sense from a sustainability standpoint? There has been a lot of criticism lately of ethanol from corn. For example, can we afford to divert half of our corn crop to making fuel while the world starves? I'm guessing the answer is no, we can't. So what are the other things we can do without using food crops and food acreage to supply bio-derived fuels? Energy conservation is going to need a lot of engineering and chemistry behind it. Even things like toxicology, with chemists getting into the whole toxicology area. If you look at what's happening in Europe, there's a law that basically says chemistry tests have to be done and approved before you can put a product on the market. So that's going to lead to huge opportunities in terms of being able to evaluate those things and to predict what's going to be successful or not. And we're going to have to change how we use materials, how we recycle materials and how we reuse materials. That kind of thing is going to lead to great opportunities. At the same time, you're going to need chemists and chemical engineers and engineers to think about the business side of all this. At the end of the day, how do you make money doing these things? And think about the global aspects of where the stuff is manufactured and used. What are the end-of-life implications of making this? What are the

social implications of this stuff being made by 11-year-olds in a third-world country? We live in a world where you have to look at all three legs of that sustainability stool.

Resources from Q&A

American Chemical Society (ACS): portal.acs.org
American Institute of Chemical Engineers (AIChE): aiche.org
Arizona State University: asu.edu
Dow Chemical Company: dow.com
Economist: economist.com
Harvard University: harvard.edu
New York Times: nytimes.com
Oregon State University: oregonstate.edu
San Francisco Chronicle: sfgate.com/chronicle/
University of California, Berkeley | Haas School of Business: haas.berkeley.edu

Civil Engineering Technicians

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.

Qualifications and Advancement

An associate's degree in civil engineering technology or a related field is the typical education/training requirement. Although employers don't usually require engineering technicians to be certified, such certification can provide job-seekers with a competitive advantage. The National Institute for Certification in Engineering Technologies has established a voluntary certification program for civil engineering technicians.

Entry-level engineering technicians usually begin by performing routine duties under the close supervision of an experienced technician, technologist or engineer. As experience is gained, they are given more difficult assignments with decreasing supervision. Some civil engineering technicians may become supervisors. Some others will go on to complete a bachelor's degree and become professional engineers.

Salary Survey

Median salary: $40,560 (high)
Typical range: $31,310 to $51,230

Job Outlook and Employment

Average growth is projected for this occupation in the US, from 90,650 jobs in 2006 to 99,888 in 2016. Spurred by population growth and the related need to improve the nation's infrastructure, more civil engineering technicians will be needed to expand transportation, water supply and pollution control systems, as well as large buildings and building complexes. They also will be needed to repair or replace existing roads, bridges and other public structures.

Where the jobs are

State government (25.45%); Local government (17.54%); Testing laboratories (3.33%).

Resources

National Institute for Certification in Engineering Technologies (NICET): nicet.org
Natural Resources Conservation Service (NRCS): nrcs.usda.gov
American Society of Certified Engineering Technicians (ASCET): ascet.org
O*NET OnLine: online.onetcenter.org (see civil engineering technicians)
US Dept. of Labor, Bureau of Labor Statistics: bls.gov/oco/ocos112.htm
See also resources for civil engineer

Q&A

George A. Riley, Jr.
Civil Engineering Technician,
Natural Resources Conservation Service,
from an interview with Alice in 2008

How did you get into this career field? What was your education and experience, including any green-related training or certification?
Well I always had a great love of the outdoors and was always in the creek or woods with my best friend while growing up. I caught and released my first fish at age six, and the beauty and spectacular power of the moment has inspired me ever since. Growing up on a farm allowed me to gain an appreciation of the environment, the connection and relationship of all life. When in school, I thrived with the Earth Science classes. I started going to a community college and was able to get into a special program that helped by providing jobs for students with state and federal agencies. I worked with the USDA Soil Conservation Service, now the Natural Resources Conservation Service (NRCS).

The great thing about these agencies was that they provided a very good training program, and they encouraged your participation. They also had programs to advance your education, but this would require a career change into the management field. I never took advantage of this because I wanted to work one on one with the local landowners, get my hands dirty and see the positive benefits of our working together. I enjoyed that down-to-earth communal, plus it kept me close to the outdoors — which I love so much. I only had 1.5 years of community college in forestry and geology. But I had a fair knowledge and experience working on farms prior to going to college, and that aided in understanding the issues faced by the farm community.

What is your current job title and how would you describe the work you do in a typical day? What are your most common tasks, including those that make yours a green job?

I'm currently a civil engineering technician; prior to that, I did a lot of farm planning, developing management systems and operation plans, along with some engineering practice designs. Now all I do is engineering designs and practice installations and assist resource planners with best-fit engineering methods to solve resource concerns. Generally, I'm either in the field collecting design data, in the office running through design computations and developing project designs or in the field reviewing planned designs with the landowners or assisting with the installation of the designed projects. Most of our projects will have significant positive impacts on the environment, which is great, but most of the time when working with farmers — these are side benefits for them. It's great when you can design a project that will collect waste that may be going into a stream or ditch and, at the same time, create an opportunity for farmers to benefit their crop production. At the same time, you helped clean up the streams and improved the habitat for so many critters.

If you could give advice to a young person who wants to work in this career field someday, what would you tell them? How can they best groom themselves for this field?

You definitely need to get a degree to get hired with most agencies. But going to school also provides job opportunities, as there are some programs out there where one can do summer work with the agencies and go to school during the winter. This gives both parties a chance to check each other out to see if this would be a desirable career opportunity or not. Take soil classes, geology, math and engineering classes. We do a lot of survey work, and that field has changed so much with GPS and all the other electronic gadgets out there.

What kind of career advancement opportunities can one expect in this field? What kind of salary range would reflect that career path (from entry-level to the more advanced position)?
As a civil engineering technician or soil conservation technician with USDA NRCS, there are some limitations in the career advancement, as you may start out at a GS-4 or 5, depending on your experience and background, and will top out your grade at a GS-9 or 10. There are some agencies that do go a little bit higher, but not much.

The pay will vary around the country, but in the local Puget Sound area, it will range from +/– $28,000 to $68,000.

In your opinion, what are some of the best schools, degrees and certificates for jobs in this career field, including green-specific training?
Washington State University has a good engineering program, as well as Gonzaga in Spokane, Washington, and St Martin's in Lacey, Washington. I think either civil engineering or ag engineering degrees would set you up well, and any training you can get in computer-aided drawing (CAD) would also be a big boost for your career.

How does someone without previous experience in this career field land a job? What are the best strategies for job-hunting in this field?
I would try and find an agency that has the summer work program in your field of interest. Check with the human resources department of the different agencies.

What emerging careers do you see developing now and into the future for this career field? What new technologies will have the greatest impact on this field?
Survey and CAD areas seem to be going strong and would seem an area to focus on currently and in the next ten years.

Resources from Q&A
Gonzaga University: gonzaga.edu
Natural Resources Conservation Service (NRCS): nrcs.usda.gov
Saint Martin's University: stmartin.edu
Washington State University: wsu.edu

Civil Engineers, including Green Building, Irrigation/ Reservoir and Waste Management Engineers

Civil engineers perform engineering duties in planning, designing and overseeing construction and maintenance of building structures and facilities,