

Careers in Soil Science



What is a soil scientist?

A soil scientist studies the upper few meters of the Earth's crust in terms of its physical and chemical properties; distribution, genesis and morphology; and biological components. A soil scientist needs a strong background in the physical and biological sciences and mathematics.

What is soil science?

Soil science is the science dealing with soils as a natural resource on the surface of the Earth including soil formation, classification, and mapping; physical, chemical, biological, and fertility properties of soils; and these properties in relation to the use and management of the soils. Soils play multiple roles in the quality of life throughout the world. Soils are not only the resource for food production, but they are the support for our structures, the medium for waste disposal, they maintain our playgrounds, distribute and store water and nutrients, and support our environment. They support more life beneath their surface than exists above. They facilitate the life cycle of growth, sustenance and decay. They influence the worldwide distribution of plants, animals, and people.

What does a soil scientist do?

Soil scientists work for federal and state governments, universities, and the private sector. The job of a soil scientist includes collection of soil data, consultation, investigation, evaluation, interpretation, planning or inspection relating to soil science. This career includes many different assignments and involves making recommendations about many resource areas.

A soil scientist needs good observation skills to be able to analyze and determine the characteristics of different types of soils. Soil types are complex and the geographical areas a soil scientist may survey are varied. Aerial photos or various satellite images are often used to research the areas. Computer skills and geographic information systems help the scientist to

analyze the multiple facets of geomorphology, topography, vegetation, and climate to discover the patterns left on the landscape.

Soil scientists work in both the office and field. The work may require walking over rough and uneven land and using shovels and spades to gather samples or examine a soil pit exposure.

Soil scientists work in a variety of activities that apply soil science knowledge. This work is often done with non-soil science professionals. A soil scientist's job may involve:

- conducting general and detailed soil surveys
- determining the hydric (wetness) characteristics of the soil
- recommending soil management programs
- helping to design hydrologic plans in suburban areas
- monitoring the effects of farm, ranch, or forest activities on soil productivity
- giving technical advice used to help plan land management programs
- predicting the effect of land management options on natural resources
- preparing reports describing land and soil characteristics
- advising land managers of capabilities and limitations of soils (e.g., timber sales, watershed rehabilitation projects, transportation planning, soil productivity, military maneuvers, recreation development)
- training other personnel
- preparing technical papers and attending professional soil science meetings
- conducting research in public and private research institutions
- managing soils for crop production, forest products and erosion control management.
- evaluating nutrient and water availability to crops
- managing soils for landscape design, mine reclamation, and site restoration
- investigating forest soils, wetlands, environmental endangerment, ecological status, and archeological sites
- assessing application of wastes including non-hazardous process wastes (residue and sludge management)
- conducting studies on soil stability, moisture retention or drainage, sustainability, and environmental impact
- assessing environmental hazards, including hazardous waste sites that involve soil investigation techniques, evaluation of chemical fate and transport phenomena, and remediation alternatives
- regulating the use of land and soil resources by private and public interests (government agencies)

These are some of the activities which soil scientists regularly practice. This work is most often conducted in coordination with other professionals with lesser training and knowledge of soil systems.

Well-trained soil scientists are in high demand for a wide array of professional positions with public agencies or private firms. Here are some specific examples of positions currently held by soil science graduates from one just university over the past 10 years.

- Wetland specialist

- Watershed technician
- Hydrologist with Board of Health
- Environmental technician
- State soil and water quality specialist
- Soil Conservationist
- County Agricultural Agent
- Landscaping business
- Farming
- On-site evaluation
- Crop consultant
- Soil scientist, mapping and interpretation, U.S. Department of Agriculture
- Research technician
- Conservation planner
- District marketing manager for an agricultural firm
- County conservationist
- Crop production specialist
- Research scientist

What kind of people become soil scientists?

People that become soil scientists usually have one or more of the following characteristics:

- love of science
- enjoy working outdoors
- enthusiasm for maps and relationships in nature
- desire to be an integral in environmental decisions related to soil conservation, land use, water quality, or waste management
- willingness to communicate their knowledge about soils and the environment to all aspects of society
- hunger for answers to questions and solutions to problems in agricultural and environmental settings
- desire to contribute to the success of others

How do people become soil scientists?

Most soil scientists have earned at least a bachelor degree from a major agricultural university. At many universities, two choices are available for specialized training in soils. The Soil Science option prepares students to enter the agricultural sector as farm advisors, crop consultants, soil and water conservationists, or as representatives of agricultural companies. The Environmental Soil Science option prepares soil scientists for careers in environmental positions dealing with water quality concerns, remediation of contaminants or for on-site evaluation of soil properties in construction, waste disposal, or recreational facilities.