

layer may show soil composition, another may show forest cover, and yet another the road system in an area. Most maps combine several layers and provide a great deal of information that can be altered by adding or subtracting layers. The layers may be analyzed as they interact, and may be used to solve a multitude of problems, such as soil erosion, water pollution, or the viability of building houses on hillsides.

**A GPS (global positioning system)** uses a series of satellites, tracking stations, and receivers to determine precise absolute locations on earth. Remote-sensing satellites orbiting the earth scan the surface, and then transmit digital images to receiving stations on earth. Images of tiny areas are organized by pixels (picture elements) to create larger images or maps. Although the technology has vast untapped potential for geographers, they already use GPS to map vegetation arrangements and gather data for the ice cover around the North and South Poles. GPS technology is also used to navigate airplanes and ships, and most recently, it is used in automobiles to guide drivers as they try to reach their destinations.

### **HOW GEOGRAPHERS WORK: FIELD AND CENSUS DATA**

Geographers gather their data and get their ideas from many different places. Their methods are reflected in the variety of jobs that geographers have. Many teach in secondary schools and universities, and others work for local, state, or national governments where they may analyze water, minerals, weather, climate, or soil. Recently, geographers have helped fill a demand for environmental managers and technicians. They sometimes consult with builders, architects, or politicians on the impact of human projects on the environment. A knowledge of geography is important to people in health care, transportation, population studies, economic development, and international studies.

Field-based skills refer to the ability to gather, assemble, and analyze data that may affirm, alter, or contradict conventional wisdom in the field. Field-based observations are directly made by the geographer, and go beyond simply reading and understanding the observations of others.

Field-based skills include:

- Familiarity with and ability to manipulate and interpret GIS
- Familiarity with GPS and ability to use remote sensing data
- Cartography and computer mapping
- Competence in data analysis and problem-solving

One of the biggest employers of geographers in the United States is the **U.S. Census Bureau**. Every ten years since 1790, the U.S. government has collected information about the country's inhabitants and compiled a census report. In modern day census forms are mailed to millions of homes in all 50 states, the District of Columbia, and Puerto Rico. Census workers try to count people without permanent residences, but this is a difficult task, particularly in large cities. Data collected from the census includes information about age, race, gender, language, education, employment, income, and housing. This data is useful to many social scientists, including geographers. Today geographers analyze massive amounts of data and arrange and display it in many different types of maps that reflect the nation's changing geographical characteristics.

More than anything, geographic skills are based on keen and careful observations of the world at different scales, a curiosity about why objects are where they are, and the desire to see the world through a geographer's eyes.