



FRESH STARTS

## Hiring in Hydrology Resists the Slump



Peter DaSilva for The New York Times

Scott D. Warner, principal hydrogeologist for Amec Geomatrix, says demand for his company's services has been strong since the 1980s.

By EILENE ZIMMERMAN  
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THE Earth may be two-thirds water, but only about 1 percent of that water is actually usable for human consumption and agriculture. What's more, as the planet warms and the population shifts, even that 1 percent is at risk.

That is why demand for hydrologists has been predicted to grow 24 percent from 2006 to 2016, much faster than the average for all occupations, according to the [Bureau of Labor Statistics](#).

Hydrologists study the distribution, circulation and physical properties of water, with hydrogeologists focusing specifically on groundwater. (According to the [United States Geological Survey](#), there is 100 times more water beneath the ground than there is in all the world's lakes and rivers.)

"Hydrologist is a fairly broad term, but generally, any research or problems having to do with water, there's a hydrologist working on it," said Matthew C. Larsen, a hydrologist and associate director for water at the Geological Survey.

Most hydrologists did not earn degrees in hydrology; in fact, only a handful of undergraduate and graduate hydrology programs exist across the country. It is far more common for hydrologists to come from a hard-science or engineering background. Though it is possible to enter the field with a bachelor's degree — most often as a lab technician — moving up in the career requires an advanced degree, Mr. Larsen said.

After creation of the [Environmental Protection Agency](#) in 1970 and passage of the [Clean Air Act](#) in 1977 and [Superfund](#) legislation in 1980, hydrologists' work was largely focused on water quality. Today, however, "an increasing percentage of hydrologists are interested in water quantity and supply, which is an emerging issue and where global [climate change](#) plays a big role," said Dork Sahagian, professor of earth and environmental science at Lehigh University and director of its Environmental Initiative in Bethlehem, Pa.

"But concern with water quality — which involves local, site-based issues — still drives the job market," he said. "Most hydrologists in this part of the world are still hired to cope

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with the availability of clean water for drinking and municipal supplies.”

Hydrologists use samples of water and soil, which they have traditionally collected themselves by wading out into a river or lake. Computers, however, have changed the nature of that field work. The Geological Survey now uses computerized samplers set up in rivers and streams throughout the nation.

But some field work is still required, especially early in a hydrologist’s career, and is often considered a perk — the ability to work outdoors and in beautiful places. That work could involve inspecting a dam, drilling a well or measuring a river’s flow.

“I used to say the worst day in the field still beat the best day in the office,” said Mark Wigmosta, a hydrologist with the Pacific Northwest National Laboratory, an Energy Department research center in Richland, Wash. “I don’t spend as much time out in the field, and I miss it. My work now is primarily in front of a computer.”

In fact, computers have revolutionized hydrology in ways beyond sampling. Data collected in the field is now plugged into complex mathematic models that allow hydrologists to make predictions — for example, about the effect of climate change on sea levels. The models also help them develop recommendations for solving problems, like how much water can be diverted from a river to combat a drought.

“People interested in hydrology often don’t understand you need to be very strong in math,” said Michael Boufadel, an engineer and hydrologist and the chairman of the civil and environmental engineering department at [Temple University](#) in Philadelphia.

They also need to communicate well, because their research is often written in reports and presented to others — to policy makers, if they work in the public sector, or to clients in the private sector.

According to the Bureau of Labor Statistics, about 28 percent of hydrologists are employed by the federal government, at the Geological Survey and the Defense Department. An additional 21 percent work for state agencies and state departments of conservation. Others work in architecture, engineering and for management, scientific and technical consulting firms.

SCOTT D. WARNER, principal hydrogeologist and a vice president at the environmental consulting firm Amec Geomatrix in Oakland, Calif., said demand for his firm’s services had been strong since the 1980s. “Our firm is growing, even in this economic downturn,” he said. Much of Amec’s work is with municipal water districts that need to find ways to manage their water and predict their needs.

Salaries for hydrologists range from an entry level of about \$35,000 to well into six figures for the most senior scientists at consulting firms. Jobs in consulting firms generally pay higher salaries than those with the government.

But few choose the profession to become rich, Mr. Warner said. Most often, the reason is that the work is fulfilling. “We’re not oil tycoons, but we feel good about the type of work we do and the problems we solve,” he said. “You really learn something new every day.”

*Fresh Starts is a monthly column about emerging jobs and job trends.*

