

# UNH

The Magazine of the University of New Hampshire | Winter 2017

**New Hampshire Impact:** UNH's value to the state only starts with educating its workforce. | 50

**Team Approach:** Some of the university's best work comes out of community partnerships. | 24

**Setting the Bar:** UNH Law's Daniel Webster Scholar Honors Program is one of a kind. | 44



**CELEBRATE 150:**  
150 UNH Moments.

# Water Wizards

## Emery & Garrett's UNH-heavy team uses science to solve water problems

In 1992, Jamie Emery '80, president of Emery & Garrett Groundwater Investigations (EGGI), was retained by the Virginia State Department of Corrections to identify new water sources for a prison in Culpeper County. The caveat: he first had to drill at a site a local dowser hired by the state had chosen. After poking around with his forked stick, the dowser placed his ear to the ground, told Emery he heard a subterranean river, and advised Emery to drill on the spot.

"We got 10 gallons of water a minute,"

recalls Emery — a less-than-optimal result. When the dowser suggested drilling 15 additional wells, the state instead chose to drill the first of several sites EGGI had identified using satellite imagery, geologic mapping, bedrock fracture fabric analysis and other scientific methods. That well produced 300 gallons of water a minute, and the state went on to hire EGGI for six additional projects. "That's groundwater exploration using site-specific exploration methods," Emery says. "It works."

You could think of Emery and his team as scientific dowsers: Instead of sticks, they use high-tech tools like glacial mapping technology, geophysical survey techniques and groundwater modeling to unravel complex water resource problems. Since the company's 1989 founding, EGGI has completed more than 1,500 projects for businesses and municipalities throughout the eastern United States, including federal agencies, universities, hospitals, municipal utilities, public water authorities, counties, states and Fortune 500 companies. Here in New Hampshire, the firm weighed in on the potential effects of the

Northeast Energy Direct pipeline on groundwater resources as well as ongoing discussions about the impact of contaminant perfluorooctanoic acid on domestic and public water supplies. EGGI also pioneered a project for UNH and the town of Durham to augment existing groundwater supply that could "change the paradigm for how we use water in the future," Emery says.

### Small firm, big impact

Based in an unassuming building in Meredith not far from the shores of Lake Winnepesaukee, EGGI was founded by Emery and hydrogeologist Peter Garrett. The two met in the 1980s, when Garrett was working for the Maine Department of Environmental Protection cleaning up contaminated groundwater sites. He and Emery decided their new company would handle "clean" (i.e., groundwater exploration and development) and "dirty" (contaminated groundwater) water projects. The firm now works exclusively on clean groundwater projects and has built a reputation for superb scientific expertise that Emery credits to the firm's collegial atmosphere. "Our projects are hard and often very complicated," he says. "It takes everyone's skill sets and talents, working together, to succeed. We help each other out to serve our clients in the best ways possible."

Perhaps not coincidentally, seven of the firm's employees are former Wildcats: Emery; vice presidents John Brooks '90 and Daniel Tinkham '86; senior project managers Jeff Marts '96 and Peter Foster '00; and field supervisors Ryan Allen '00 and Michael O'Brien '05. "Our work requires skills in all of the sciences: physics, chemistry, geology and biology," says Tinkham. "UNH has a great pool of people to draw from for our industry."

Nearly all of those Wildcats were involved when the firm took on a recent water development/management project for the university and the town of Durham that could become a national template for water sustainability.

Durham's water demand is highest when its primary sources of water, the Lamprey and Oyster Rivers, are at their lowest flows: during

*continued on p. 22*



PROPS FOR THE PD: During the summer, UNH's police department was reaccredited by the Commission on Accreditation for Law Enforcement Agencies (CALEA), reaffirming its position among a select group of law enforcement agencies across the country. Police Chief Paul Dean says the CALEA reaccreditation means his department meets the highest industry standards in the United States for public safety. "Roughly only 5 percent of law enforcement agencies are accredited, so we're very proud to be part of an elite group of agencies," Paul says.

**"Our work requires skills in all of the sciences: physics, chemistry, geology and biology. UNH has a great pool of people to draw from for our industry."**

**Water Wizards** (cont.)

JEREMY GASOWSKI / UNH



the fall, when students return to campus. After years of testing and monitoring, EGGI determined that a new groundwater supply could be created by transferring water from the Lamprey into the adjacent Spruce Hole Aquifer when the river is at its peak flow — a process called artificial recharge. Excess water is pumped into underground basins in the aquifer, where it’s treated and filtered naturally by the soil and sand and gravel deposits. The first artificial recharge project to be approved in New Hampshire, the process creates a sustainable water resource and eases concerns about droughts — like the one New Hampshire is currently in. “It’s a perfect solution for a coastal area, where water supply demands are continually increasing” says Emery. “Testing determined that the introduction of surface water doesn’t contaminate groundwater and, at the same time, we’re protecting wetlands and the environment.”

EGGI teamed with the College of Engineering and Physical Sciences to help prove the project’s viability. Tom Ballestero, a hydrogeologist and director of the UNH Stormwater Center, provided background data on the Spruce Hole Aquifer’s hydrogeology and its potential as a groundwater source; Matthew Davis, associate professor of earth sciences, was hired by EGGI to help determine how the aquifer was affected by new groundwater wells; the department of civil and environmental engineering’s Robin Collins analyzed water samples and conducted field tests in the aquifer; and Wesley East, chief operator of UNH’s water treatment plant, provided the water quality analysis that supported the project.

Emery is often asked to share his expertise with government and public policy officials. Last year, he addressed the World Bank and Pentagon staff on critical water supply, protection and conservation issues. He’s also discussed water security with the National Security Agency and groundwater development opportunities with the U.S. Army and led a countrywide groundwater investigation for the Dominican Republic. Still, he’s matter-of-fact about his work. “You’re only as good as your last project,” he says. “We have one of the best, most experienced groundwater exploration groups in the country. The fact that many of us have worked together for 25 years or so provides great benefits to all of the clients we serve.” ♦

— Debbie Kane

## FACULTY NEWS

Associate dean **Charles “Chuck” Zercher** has been named interim dean of the College of Engineering and Physical Sciences. The associate dean for academic affairs since 2014, he began his new role July 1. Zercher served as chair of the chemistry department from 2010 to 2013. He was awarded the Outstanding Assistant Professor Award in 1996 and was promoted to professor in 2003.



Graduate school associate dean **Cari Moorhead** has been appointed to a one-year term as interim dean, following the July 1 retirement of dean Harry Richards. Moorhead is the longtime associate dean of the graduate school and an affiliate assistant professor in the College of Liberal Arts department of education.



From the treetops to the ocean deep, new grants will help UNH researchers in their quest to better understand our world. With a contract of \$6.5 million from the federal Bureau of Ocean Energy Management, marine acoustician **Jennifer**

**Miksis-Olds** will “eavesdrop” on the ocean environment. Miksis-Olds, who is the associate director of research for UNH’s School of Marine Science and Ocean Engineering, will lead the development of a network of deep-water observatory moorings along the U.S. Atlantic coast.



In the Caribbean, research professor of microbiology **Michael Lesser** and a team from UNH will take a literal deep dive into the sponge microbiome; with \$2.2 million from the National Science Foundation, they aim to understand how sponges might contribute to the overall



health of coral reefs. On land, researchers from the Institute for the Study of Earth, Oceans and Space received \$1.25 million from the NSF to explore how the biodiversity of forests might affect climate change. ♦