



# Environmental Pioneers

When he was growing up as a child in South Carolina, Ron Kendall watched with his grandfather the consequences of industrial waste releases into the rivers and waters of the state, prompting fish kills. Kendall's grandfather ingrained in his grandson awareness that people must be responsible for how they treat the environment or the consequences can become very negative. Those early stages of life led Kendall into a collegiate exploration of studying environmental science. He eventually became one of the earliest scientific figures in the field of wildlife and environmental toxicology.

Ronald J. Kendall, PhD

By Kippra D. Hopper | Photos by Jerod Foster



Ronald J. Kendall, Ph.D., is now a professor and director of The Institute of Environmental and Human Health (TIEHH), a major research arm of the Texas Tech University System that has involved hundreds of faculty members from dozens of academic fields at both the university and the Texas Tech University Health Sciences Center. Kendall and the institute were on the founding edge of the environmental toxicology research area, with the institute being under development for the past 30 years.

When the world community needs an assessment of the consequences of environmental issues, TIEHH is called upon, becoming a media machine for the university.

“There will always be a demand for TIEHH graduates, as fast as we can produce them. There is a tremendous demand for our expertise. I have never seen a greater demand for our researchers and research capabilities. The field has never been brighter,” Kendall says.

From the Deepwater Horizon Gulf oil spill, to water quality issues, to the development of agricultural chemicals, to safety for the environment and human health, TIEHH researchers are in incredible demand both in the United States and internationally. Kendall mentions, for example, that officials in Finland have invited him to meet with that country’s scientists because Russian oil development is taking place in the sea off the coast of Finland, and the officials want to know how to protect their environment from accidental oil releases, as has been seen with the British Petroleum oil spill in the U.S. Gulf of Mexico.

During the Deepwater Horizon Gulf oil spill, many news organizations, including *The New York Times*, *Discovery*, *National Geographic*, *Washington Post* and “Good Morning America,” interviewed Kendall about the worst environmental disaster in the history of the United States. TIEHH faculty have made multiple trips to different parts of the coast, collecting samples

to analyze impacts of the oil and dispersants on the area’s wildlife and environment. Kendall testified before the U.S. Senate Committee on Environment and Public Works at a hearing titled, “Oversight Hearing on the Use of Oil Dispersants in the Deepwater Horizon Oil Spill.” Kendall’s testimony made news throughout the world. TIEHH’s entire faculty have been involved heavily with the Deepwater Horizon Gulf oil spill, conducting field and lab work to look at the effects of dispersants and oil on marine organisms. The institute’s research on the impacts of the oil spill will continue into the future.

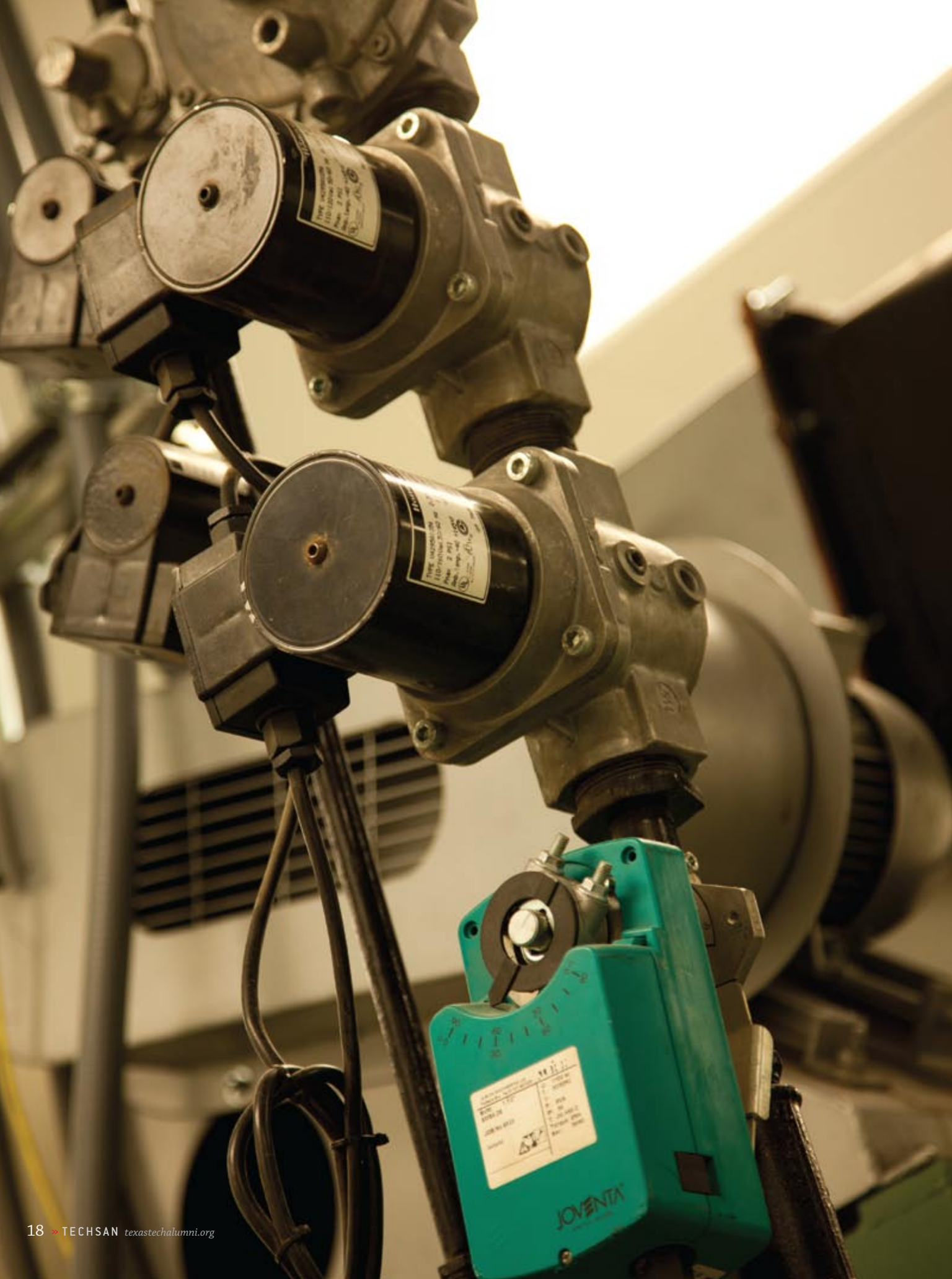
Kendall, who also is the chairperson of the Department of Environmental Toxicology at Texas Tech, believes the oil’s persistence, as well as the profligate use of dispersants, could lead to entirely new environmental effects. In one media article, he compares the dispersants to mineral spirits used to clean up oil spots in a garage.

“If you pour mineral spirits on your skin, it’ll burn,” he says. “You breathe it, it’ll be very antagonistic to your sinuses. You drink it, it’ll be very harmful. There were a lot of organisms that came into contact with the use of dispersants in the deep ocean, and on the surface.”

Kendall thinks dispersants probably contributed to the underwater oil plume’s presence. If the oil had not been dissipated into micro droplets as it was spewing from the well, more of it would have floated to the surface, he says.

“A lot of that oil, and the toxic constituents in that oil, has probably been dispersed into the water column, and that is what these scientific discoveries are finding out—there appear to be these plumes,” he says.

Kendall said that research is only just beginning.



“To me, we’re still in the very early phases of this. Quite frankly, we may not fully figure out the ultimate impact of this for many years to come.”

TIEHH research interests will continue in water quality assessments, both of fresh water and the water in the Gulf of Mexico. Researchers also are interested in marine ecotoxicology and aquatic systems.

Interest in wildlife toxicology, with pesticides and other contaminants, is the topic of an international bestselling publication, “Wildlife Toxicology: Emerging Contaminant and Biodiversity Issues,” published by Taylor & Francis/CRC Press, and edited by TIEHH scientists Kendall, George Cobb and Stephen Cox, along with Tom Lacher of Texas A&M University. The textbook is the first to address environmental threats to wildlife in a single volume and to recommend proven mitigation techniques to protect and sustain Earth’s wildlife populations.

“These textbooks get attention because they establish academic leadership,” Kendall says. “Students say they want to come here because we are the leaders. It is inspiring to us. This book is a part of Texas Tech’s research journey in environmental toxicology. The book itself has international participation from here to Africa and around the world.”

The Institute of Environmental and Human Health and the Department of Environmental Toxicology stimulate and develop environmental and health sciences research and education at Texas Tech University and Texas Tech Health Sciences Center within an atmosphere of superior scholarship and collegiality to position Texas Tech to be premier in the state, nation and the world in the integration of environmental impact assessment of toxic chemicals with human health consequences, framed in the context of science-based risk assessment to support sound environmental policy and law.

Other research areas and graduate education programs all have in common a public policy element.

“To be honest, I am most proud of our faculty and students,” Kendall says. “Our program is extremely nimble; we don’t know where the next crisis will come from. We were involved in the Gulf from the first because of our talent, expertise and the willingness of our faculty to engage in environmental issues. We have been sought out by national and world press outlets to comment because we have provided science and information that can be used by scientists and policy makers to make better decisions.”

The major research emphasis at TIEHH concerns: analytical toxicology, aquatic toxicology, biochemical and molecular toxicology, bioterrorism countermeasures, environmental law and policy, epidemiology, human health sciences, modeling and GIS, nonwovens and advanced materials, ecotoxicology, and wildlife toxicology.

“As we look forward in next five years,” Kendall notes, “oil issues in the environment are extremely important as are counter-terrorism, water conservation and management, nanotechnology and toxicology.”

TIEHH researchers continue to engage in environmental issues in the Middle East and other international locations in topics regarding water and hazardous waste, to chemical management, and risk assessment and management.

Other major research projects, among the many taking place currently, that also are attracting national and international attention for the university and TIEHH has been nonwoven textile technology, which has implications for cleaning up the oil in the Gulf and for other applications in counterterrorism research. Dozens of other major research projects at TIEHH also have to do with countermeasures to chemical and biological terrorism and involve faculty from both the university and the health sciences center. The researchers' work has produced many publications and several patents. The U.S. Army funds the research.

Researchers through TIEHH strive to establish collaborative and interdisciplinary relationships to further enhance applied and basic science, law and policy. TIEHH has engaged in multiple partnerships with federal agencies and national research institutes such as: the Agency for Toxic Substances and Disease Registry, Canadian Wildlife Services, Idaho National Engineering and Environmental Laboratory, National Forest Service, National Institute of Environmental Health Sciences, National Oceanic and Atmospheric Administration, United States Air Force, Air Force Institute of Environment Safety and Occupational Health Risk Analysis, Brooks Air Force Base, United States Air Force Tracy Analysis Center, Patrick Air Force Base, United States Army, United States Army Corps of Engineers, United States Department of Defense, United States Department of Energy, United States Environmental Protection Agency, United States Fish and Wildlife Service, United States Geological Survey, United States National Ocean Service, and United States Navy. Additionally, TIEHH has developed innovative public/private partnerships with independent firms.

The educational component of TIEHH is assuring the availability of future scientists and policy makers to deal with future environmental issues.

"The quality of the master's and doctoral students coming from our program and impacting the world in environmental toxicology makes me very proud," Kendall says. "Their success is a reflection of our success. Our program is rated very high, and our students are an acid test as to how well our graduates are doing and a testimonial of the hard work of our faculty and staff to create an environment where future leaders are developed at Texas Tech University. Our goal when we came to Texas Tech was to establish a world-class program in environmental toxicology, and I believe we have achieved that. Our achievements are building our successes into the future."

The graduate programs at TIEHH include the degrees of Doctor of Philosophy and Master of Science in Environmental Toxicology, and dual degree programs of: M.P.A./M.S. in Environmental Toxicology, J.D./M.S. in Environmental Toxicology, and M.B.A./M.S. in Environmental Toxicology.

The Department of Environmental Toxicology underwent a formal peer-review in 2006. The review team consisted of faculty from Texas Tech University, as well as faculty external to Texas Tech. Comments included "The review team finds that the ENTX graduate program meets its vision very well. The self-study provides data indicating that in the area of environmental toxicology, the program stands at or near the top of graduate programs. ... In general, the graduate program in ENTX is rated as one of the leading, if not the leading, program in the country." In May 2009, the Department of Environmental Toxicology and The Institute of Environmental and Human Health received the 2009 Texas Environmental Excellence Award in Education from the Texas Commission on Environmental Quality and Texas Gov. Rick Perry. This is the highest environmental award offered in the State of Texas.

The facilities at TIEHH consist of 150,000-square feet of offices, laboratories, instrumentation and testing facilities. Personnel within these laboratories develop



state-of-the-art methods for the determination of the potential impact of toxic chemicals in the environment. Analytical instrumentation is available at TIEHH to allow for the determination of a wide variety of chemical species. TIEHH faculty and students also have access to complete animal facilities located on the main campus and at the health sciences center. The Institute of Environmental and Human Health is located at Reese Technology Center, which is approximately 10 miles west of the Texas Tech/Texas Tech University Health Sciences Center main campus. Reese Technology Center was formerly known as Reese Air Force Base.

Ron Kendall's achievements in environmental science have been recognized across the world, most recently this past summer as Virginia Tech's Department of Fisheries and Wildlife Sciences in the College of Natural Resources and Environment presented Kendall with the Gerald H. Cross Alumni Leadership Award. The award recognizes scholars for their dedication and outstanding achievements in leading others. Kendall earned his doctorate in fisheries and wildlife sciences from Virginia Tech in 1980. Kendall was recognized for playing a leading role in the initiation of the field of wildlife toxicology and for leaving an indelible mark on the discipline through the students he has mentored and the work he has fostered by establishing and leading research institutes. Kendall has made more than 200 public and scientific presentations in the field of wildlife and environmental toxicology, and served as principal investigator on 138 grants totaling more than \$50 million.