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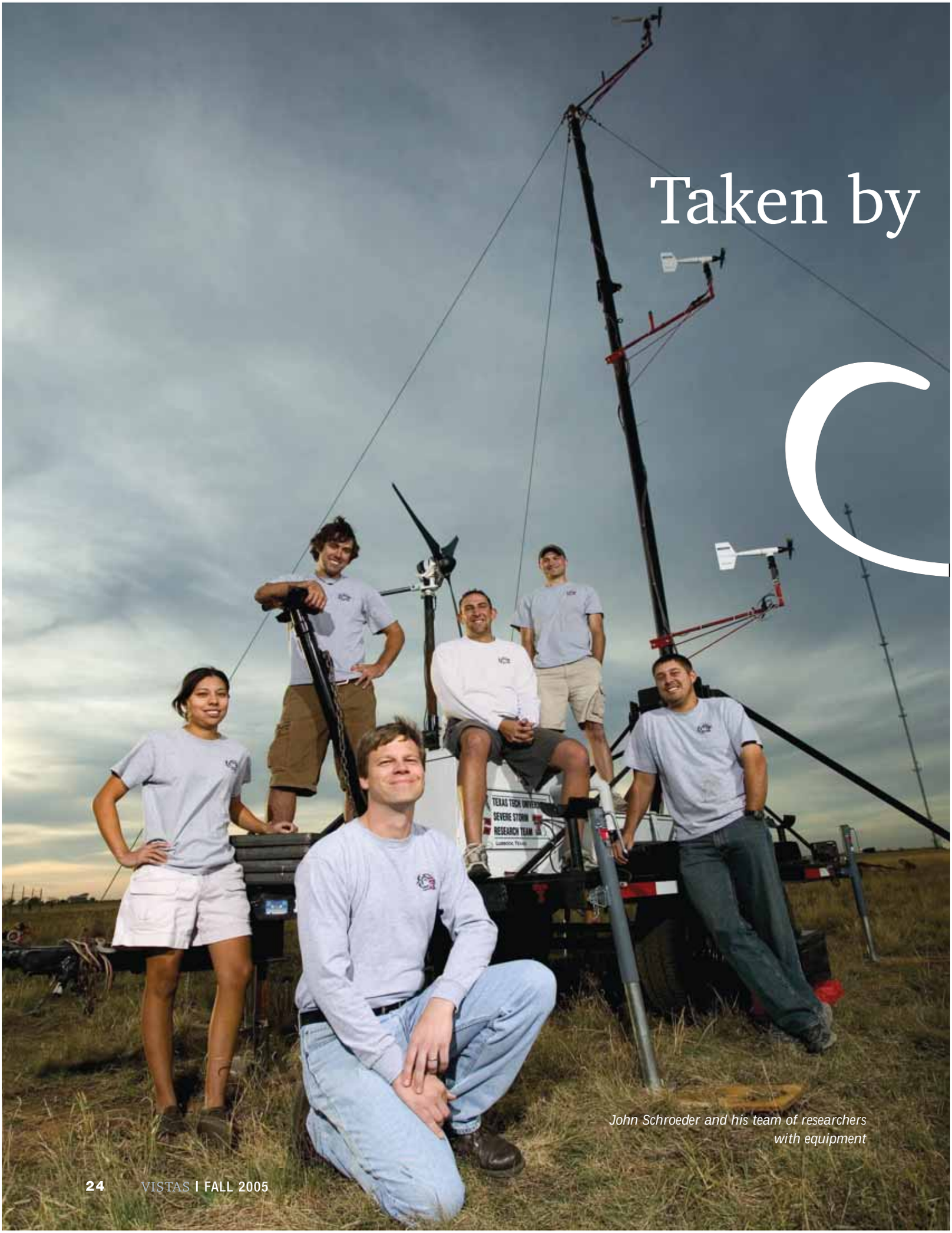

John Schroeder and his team of researchers with equipment

Storm

MAKING THE WORLD SAFER FROM HURRICANES SOMETIMES MEANS FACING THEM HEAD-ON.

BY MICHAEL CASTELLON

"WE WANT TO MITIGATE THE EFFECTS OF HURRICANES IN A WAY THAT THEY'RE MORE LIKE A BUMP IN THE ROAD FOR SOCIETY."

– JOHN SCHROEDER

PHOTOS BY NEAL HINKLE

A narrow window of time often separates tower assembly and hurricane landfall.

More than a week before Hurricane Katrina would ravage the Gulf Coast, John Schroeder sat at his desk in an office at Texas Tech University and pointed to digital images on his computer screen. The images showed his team of researchers setting up data collection systems over the past eight years. They told the story of how storms become hurricanes and how Schroeder, his colleagues and students place themselves in their path to learn more about them.

"Our goal is to provide further understanding of the detailed nature of a hurricane's wind field," Schroeder says. "We want to mitigate the effects of hurricanes in a way that they're more like a bump in the road for society."

To understand more about hurricanes, the team stops just short of throwing themselves into the middle of them. Schroeder says this tactic is the only way to collect data that can be used to better understand the wind field. This leads to better predictions and earlier and more targeted evacuations. Engineers use the data to better understand how hurricanes affect structures.

The planning and equipment required for Schroeder and his team to do this are complex.

For starters, the group deploys several trailers carrying instrumented towers that have their own power source. The towers are strategically set up along the shoreline at the first hint of a hurricane landfall.

The team also collects data with two mobile Doppler radars, each weighing about 26,000 pounds. The radars are used in collaboration with the University of Oklahoma, Texas A&M University and the National Severe Storms Laboratory in Norman, Oklahoma.

A few days after our first meeting, Schroeder wrote to say he and six graduate students were scrambling to make it to Mississippi in the next 24 hours. Hurricane Katrina, which had begun as a tropical storm, made landfall in Florida several days earlier causing moderate damage. It had now shifted course, was gaining momentum and was barreling toward Louisiana and Mississippi as a Category Five system.

It is obvious Schroeder has been waiting patiently for the landfall of a major storm. In fact, to be present at such an event has become his quest. The extreme nature of such a system can result in widespread damage, but the dataset and meteorological insight gained make it extremely valuable for understanding and mitigating future storm damage.

"INCREDIBLE LOGISTICS"

Probably the most difficult aspect for Schroeder is determining exactly when and where to deploy the equipment for a potential landfall. Given Lubbock's distance from the coast, it may take up to three or four days to arrive on site.

SATELLITE PHOTO: GETTY IMAGES

"The logistics we use in a deployment are incredible," Schroeder says. "We usually have about ten people who drive to the coast from Lubbock. Usually one or two are faculty and the rest are undergraduate and graduate students. We provide students the opportunity to learn more about field research. Some students are placed in a leadership role, which complements their studies."

Just before Katrina's landfall, the group assembled towers near Slidell, La., and at Stennis International Airport in Hancock County, Miss.

Team members set up the equipment and then quickly evacuate to safety. The margin between the team's departure and the hurricane's arrival is usually extremely narrow. And because of the unpredictable nature of hurricanes, the setup isn't an exact science; it usually takes four to five hours to complete the full deployment of five towers.

The group rode out Katrina from a motel room farther east in Gautier, Miss. By the time the storm had dissipated, its destruction was apparent.

"There was sheet metal on the highway and lots of flooding, obviously," Schroeder says. "There were areas that had six feet of debris and significant tree damage. We had some idea of the destruction but had no idea what happened right on the coastline until we saw news reports ourselves."

What made Katrina unique was not only its strength, but its size.

"Hurricanes Andrew and Charley were tightly wound, meaning the bulk of the strength was found very close to the center of the storm," Schroeder says. "With Katrina, not only was the center strong, but the wind field was large and significant winds were found outward from the center to a great distance."

The list of storms Schroeder's teams has deployed on reads like a who's who of major meteorological events. There have been 22 storms since the start of the program.

Data the teams collect are distributed in the form of publications and journal articles that contribute to global awareness of the nature of hurricanes and their effect on the world's environment. Katrina dropped to a Category Four storm by the time she hit land. But based on the increased hurricane activity in the Atlantic Ocean over the past several years, Schroeder may still get his chance to observe a Category Five strike land. The odds are higher than average, Schroeder says, thanks largely to more favorable hurricane conditions in recent years.

"We're in the upswing of a multi-decade cycle in hurricane activity," Schroeder says. "Right now, there's a higher probability of seeing action." <