

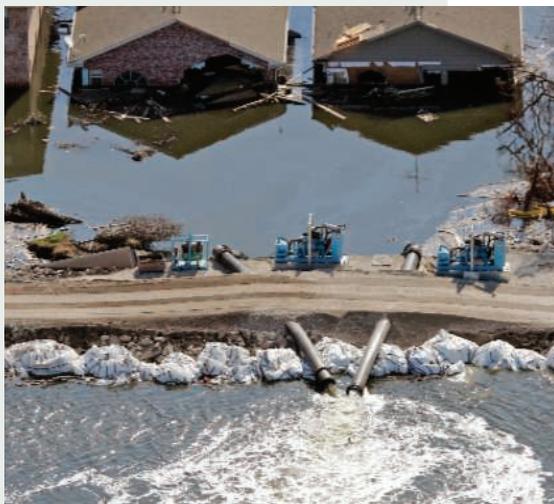
Katrina Leaves Behind a Pile of Scientific Questions

Amid the cleanup in Katrina's wake, scientists are rushing into the field to gather data before they disappear. It's a sobering exercise. Havidan Rodriguez, who is leading a team from the Disaster Research Center at the University of Delaware, Newark, that is asking evacuees along the Gulf Coast how their basic needs are being met, says the task "is turning out to be more difficult" than similar efforts in Sri Lanka after the 26 December 2004 tsunami. "The breakdown of infrastructure is far greater," he says, "and the poverty is endemic."

One major focus is to reconstruct how the hurricane overcame New Orleans's defenses. The Hurricane Center (HC) at Louisiana State University (LSU), in nearby Baton Rouge, has become the de facto headquarters for that effort. After a whirlwind tour of the region, the center's researchers reported that the storm surge reached a height of 9 meters in some places. They are also updating a model of the floodwater's impact on the city. If the pumps hold out and no new tropical storms hit, says HC coastal scientist Hassan Mashriqui, the city should be fully drained by the end of the month.

Another priority involves tracking the consequences of dumping the city's contaminated floodwater into the surrounding environment. Initial tests by the Environmental Protection Agency and the Louisiana Department of Environmental Quality have allayed the worst fears: Fecal bacteria counts are high, but according to a preliminary analysis, it would take exposure of "a year or longer" to the chemicals at measured concentrations to cause serious health effects. Toxic algal blooms are another fear; the LSU Earth Scan Laboratory has been using an Indian satellite to search Lake Pontchartrain for signs of growth. Colder temperatures next month are expected to make blooms less likely and reduce the risk of further storms.

To help cover the costs of these and other projects, the National Science Foundation (NSF) is providing supplementary funding to existing grants. This week, NSF hoped to award about 30 "exploratory" research grants of between \$10,000 and \$30,000 chosen from some 120 proposals it received. A second competition closes this week for a larger pot of money. The timing could not have been worse, says NSF's Dennis Wenger, because "Katrina hit right at the end of the fiscal year." But "we're making it work." —JOHN BOHANNON



Go with the flow. Scientists are monitoring the impact of floodwater being pumped back into Lake Pontchartrain.

part, are worried about damage to sensitive equipment such as electron microscopes.

With their campuses closed until January, many scientists have accepted offers of temporary digs at other institutions. Xavier University microbiologist Shubha Ireland feels especially lucky. She was offered a spot in a molecular biology lab at Oak Ridge National Laboratory in Tennessee. ORNL officials also secured a part-time administrative job for her husband Rick, a lawyer. And a local real estate developer donated a new four-bedroom house for the family to stay in for 6 months. "It's like a dream come true," says Ireland.

Although some scientists expect to use the time mainly to write papers, many others are determined to get back to the bench as quickly as possible. "Nobody is going to miss a beat—at least not in my group," says Zeev Rosenzweig, a chemist from UNO now living in McLean, Virginia, and working at the

nearby National Science Foundation (NSF). Rosenzweig moved up by 2 years the start date of a rotating position as officer for NSF's analytical and surface chemistry program and intends to relocate most of his group to the Washington, D.C., area.

Some hope their research will benefit from the unexpected move. UNO physicist Leonard Spinu was invited by a colleague from his native Romania to the National High Magnetic Field Laboratory at Florida State University in Tallahassee, which has some of the best facilities anywhere for his research on magnetic nanomaterials, he says. Tulane neuroscientist Andrei Belousov says his time in the lab of Sacha Nelson at Brandeis University in Waltham, Massachusetts, could spark new collaborations. "I hope it's something we can work together on, not simply charity," says Belousov.

Still others are preparing to rebuild

essential research materials. Haas, who lost 20 years' worth of samples for studying the ubiquitin system, expects to spend time re-expressing recombinant proteins at LSU's biomedical research center in Baton Rouge. "We've just got to bang out clones," he says.

Especially hard-hit are graduate students. Tulane's Vincent Shaw, whose adviser is evolutionary biologist Duncan Irshick, found a temporary spot at Brown University in Providence, Rhode Island. But he and his labmates needed to finish a paper in press, experimental animals now likely to be dead, and freezers full of thawed samples. "Researchwise, I am in a bad place," says Shaw.

Funding agencies are working to smooth these temporary transfers and help displaced researchers get back on track. NSF and NIH are relaxing rules to accommodate those caught in the catastrophe.

"We want to protect researchers so that they don't get stuck with the tab" for incurring expenses related to relocation or repair of federally funded projects, says NSF's Jean Feldman, who oversees a hotline that is getting 50 calls and e-mails a day.

In addition to information, the hotlines provide some therapy, says her NIH counterpart, Carol Alderson. "Some PIs [principal investigators] are resilient and just want to know what it'll take to get back to work," says Alderson. "Others sound like the people you hear on television; they've gone through the worst, and they don't think that their institution will ever recover."

Although federal agencies have promised to be as flexible as possible, there's a limit to how far they can bend. NIH, for example, has struck deals with Tulane and LSU allowing faculty to temporarily submit grant applications directly, but NSF says any proposal must still come from the institution. At the same time, both agencies plan to be lenient about enforcing application deadlines, with NSF decreeing a 1-year extension for any scientist in the three-state region whose grant would have expired this month or next.

Although grateful for the outpouring of help, New Orleans administrators worry that some universities are seeing the disaster as a chance to snap up talented faculty. At least a few have already taken permanent positions. "We do not want to see a brain drain. It would be terrible for the region," says Tulane's Whelton. "Our full aspiration is to get back in business and have an even stronger institution than when we left. And we'll need all the help we can to get to that point." —JOCELYN KAISER

With reporting by Adrian Cho, Eli Kintisch, Jeffrey Mervis, and Elizabeth Pennisi.

Katrina Leaves Behind a Pile of Scientific Questions

John Bohannon

Science **309** (5743), 1981.

DOI: 10.1126/science.309.5743.1981

ARTICLE TOOLS

<http://science.sciencemag.org/content/309/5743/1981>

RELATED CONTENT

<file:/content/sci/309/5743/news-summaries.full>

PERMISSIONS

<http://www.sciencemag.org/help/reprints-and-permissions>

Use of this article is subject to the [Terms of Service](#)

Science (print ISSN 0036-8075; online ISSN 1095-9203) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. The title *Science* is a registered trademark of AAAS.

© 2005 American Association for the Advancement of Science