

## Quick Response to Natural Disasters

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# Quick Response to Natural Disasters

GARY W. BARRETT

**A**s chair of the Board of Professional Certification of the Ecological Society of America (ESA), I had the privilege of organizing a symposium entitled “Quick Response to Natural Disasters” for the ESA annual meeting, held in Montreal, Canada, in August 2005. This theme was selected because in the preceding year, four major hurricanes (Charlie, Frances, Ivan, and Jeanne) had struck Florida and a tsunami had caused many human deaths and vast destruction in several countries, among them Indonesia, Sri Lanka, South India, and Thailand. No one could have predicted at that time that hurricanes Katrina and Rita would become two of the greatest natural disasters of the past century, devastating much of the Gulf Coast of the United States and causing untold suffering, and that a 7.6-magnitude earthquake in Pakistan would take tens of thousands of lives and cause tremendous loss of property.

Discussions during and after the symposium, and especially after the two catastrophic hurricane and earthquake events, have generated challenges and provided service and research opportunities for a diversity of scientists, especially biologists and ecologists, who recognize that they need to be ready to respond to and quantify these disturbances at several levels of organization—cellular, organismal, population, community, ecosystem, landscape, and global—and at various temporal and spatial scales. As ecology program director for the National Science Foundation (NSF) from 1981 through 1983, I had the opportunity to recommend support for, and then to observe, research following the eruption of Mount

St. Helens on 18 May 1980. The impact of and response to landscape-scale events such as the eruption of Mount St. Helens, the surge of floodwaters and hazardous materials back into Lake Pontchartrain, and the changes brought about by major wildfires on the West Coast provide unique research opportunities—opportunities that could couple scientists with service organizations to benefit those social and ecological systems that are most affected.

Biologists and ecologists would most likely agree that responses in biological and ecological systems are most severe immediately following a natural disaster, although the long-term recovery processes of such systems provide vital information related to disturbance ecology, landscape management, resource restoration, ecosystem health, and public policy. In many instances, baseline data are available for comparisons of ecosystem and landscape dynamics before and after a natural disaster.

NSF plans to award about 30 exploratory research grants of between \$10,000 and \$30,000 during the next few weeks (see the 23 September issue of *Science*, pp. 1980–1981), but perhaps the National Science Board of NSF should also consider New Orleans as a third NSF-sponsored LTER (Long Term Ecological Research) site in the area of urban ecology. Perhaps it is also time to consider establishing endowments within each state or region to fund quick-response research teams composed of scientists willing to contribute their skills and knowledge to research-planning efforts.

There is general agreement that the Department of Homeland Security, the

Federal Emergency Management Agency, and even the Red Cross were slow to respond to the effects of hurricanes Katrina and Rita. In addition to the service organizations, military services, and health professionals involved, future response teams need to include ecologists and biologists who are trained to collect and store data that can be used in response and restoration models developed to more effectively prepare for future major disturbances.

Because AIBS serves as a federation of many professional societies and organizations, the institute would be well positioned to generate a white paper report to outline the mechanisms and funding (e.g., endowments or state appropriations) whereby scientists can be identified to form these interdisciplinary research teams. State academies of science might also help anchor this endeavor at the state or regional level. Members of each team must be trained to respond to a future natural disaster (e.g., disease, earthquake, hurricane, tsunami, or wildfire), preferably within 24 hours' notice. Each team will require efficient communication, preapproved agreements (if possible), travel support, equipped mobile laboratories, data storage capabilities, and safety equipment for collecting data. This strategy will provide the infrastructure necessary to save lives, to manage natural resources, and to conserve and restore biotic diversity. We need not be reminded that the next “big event” is sure to occur.

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