

RECOMMENDATIONS

AUGUST 2017 • STRENGTHENING THE DISASTER RESILIENCE OF THE ACADEMIC BIOMEDICAL RESEARCH COMMUNITY: PROTECTING THE NATION'S INVESTMENT

RECOMMENDATION 1: DESIGNATE A QUALIFIED, SENIOR INDIVIDUAL WITH OVERSIGHT OF DISASTER RESILIENCE EFFORTS FOR THE RESEARCH ENTERPRISE

Academic research institutions should designate a qualified, senior individual with oversight of disaster resilience efforts for the research enterprise. The qualified, senior individual should be integrated within the framework for institutional disaster preparedness to ensure that the research enterprise is represented in and coordinated with overall institutional disaster resilience efforts. The qualified, senior individual should lead a research enterprise planning committee to work in coordination with the institution to assess the unique characteristics of the research enterprise; to determine resilience goals and objectives; and to develop, implement, and maintain plans.

Possible responsibilities of this individual could include, but are not limited to:

- Developing a vision of resilience to protect the research enterprise.
- Providing oversight, communication, collaboration, and coordination of a broad and diverse group of institutional stakeholders to engage in all-hazards planning for the research enterprise in concert with institutional planning.
- Developing, enhancing, and leveraging local, state, and national partnerships that inform efforts to enhance the disaster resilience of the research enterprise.
- Supporting the understanding and use of the National Incident Management System and the incident command system among peers.
- Enhancing disaster resilience of the research enterprise through the development of training and exercises germane to the research community.
- Striving for multidimensional communications and enhancing education, awareness, and understanding of what to do before, during, and after disasters among students, staff, and faculty of the research enterprise.
- Monitoring the implementation of and compliance with disaster resilience policies and procedures.

RECOMMENDATION 2: IMPLEMENT COMPREHENSIVE AND INTEGRATIVE DISASTER RESILIENCE PLANNING EFFORTS FOR THE RESEARCH ENTERPRISE

Academic research institutions should implement comprehensive and integrative disaster resilience planning efforts for their research enterprise that are aligned with planning at the local, state, and national levels (the National Preparedness System). The fundamental goal of these efforts should be to protect human life, research animals, and property and the environment and to maintain the integrity and continuity of the research.

Possible actions could include, but are not limited to:

- Identifying dedicated resources and individuals with the authority to oversee the development and execution of disaster resilience planning.
- Developing and implementing policies, plans, and procedures related to disaster resilience.
- Compiling up-to-date threat and hazard identification and risk assessments based upon the local and regional hazards that are relevant to the academic research institution and specifically the research enterprise.
- Determining which research programs and research functions are critical for the continuing viability of the academic research institution and the safety of the community. Research programs should be prioritized, and the necessary resources to safeguard and support these programs should be identified and acquired.
- Engaging principal investigators in the disaster resilience planning for their research program and laboratories.
- Developing a training and exercise plan to document overall training and exercise priorities for a specific multiyear time period.

RECOMMENDATION 3: DEVELOP, ENHANCE, AND LEVERAGE LOCAL, STATE, AND NATIONAL PARTNERSHIPS

Academic research institutions should actively engage with key local, state, and national agencies to establish a mutual understanding of the unique disaster resilience efforts necessary for the research enterprise. Local agencies with the delegated authority to respond during a disaster should understand the unique laboratory conditions. In the event of disaster, the research enterprise's resources could prove valuable to the local community.

Possible actions could include, but are not limited to:

- Identifying a method of engagement with external community partners such as the local emergency planning committee, emergency management, law enforcement, fire, public works, weather service, department of transportation, and others.
- Developing a mechanism to engage the local emergency operations center.
- Establishing partnerships with suppliers and peer institutions so that crucial resources (e.g., food, water, emergency generator fuel) can be directed to the institution promptly following an interruption of normal supply channels. Examples of formal agreements include mutual aid agreements and memoranda of understanding.
- Developing a mechanism for peer institutions to engage in proactive dialogue about disaster management and resilience and to foster communication and transparency between institutions.
- Carrying out exercises together on a regular basis.

RECOMMENDATION 4: ENSURE THE PRESERVATION OF RESEARCH DATA, SAMPLES, AND REAGENTS

Principal investigators should work with their academic research institution to safeguard and preserve critical research data, samples, and reagents. As stewards of their research and creators of the valuable intellectual property of their academic research institutions, principal investigators should play a pivotal role in protecting the intellectual assets of their academic research institution through the development and implementation of policies, plans, and procedures related to disaster resilience. Academic research institutions should work to increase incentives for offsite storage and the duplication of critical samples and data. Protecting the research data, samples, and reagents of the research enterprise is ultimately the responsibility of both the principal investigator and the academic research institution.

Possible actions could include, but are not limited to:

- Developing and implementing plans, policies, and procedures to ensure operational continuity.
- Ensuring critical research data are backed up using reliable, tested, and secure methods.
- Documenting and backing up research methodology.
- Storing selected duplicate samples in a remote location.

RECOMMENDATION 5: IMPLEMENT MANDATORY DISASTER RESILIENCE EDUCATION AND TRAINING PROGRAMS

Academic research institutions should implement mandatory disaster resilience education and training programs and integrate these programs within the broader safety, ethics, and compliance training programs for students, staff, and faculty of the research enterprise. Those individuals in the research enterprise who are responsible for responding during a disaster should understand their roles; therefore, education and training programs for researchers should be modeled after education and training programs for first responders.

Possible actions could include, but are not limited to:

- Educating and training new researchers in disaster resilience upon hiring or enrollment. Training should emphasize that personal preparation is the key to participation in any disaster response, and new researchers should have plans for family independence and communication in place before a disaster strikes.
- Involving research students in the education and training process, both because they can bring a fresh enthusiastic perspective to the planning efforts, and because they provide an opportunity to educate the next generation of researchers about disaster resilience-related activities.
- Training of the key responders at the institution in the incident command system (e.g., ICS Courses 100.HE and 700) to greatly improve their ability to communicate with the first responders outside of the academic research institution.

RECOMMENDATION 6: IMPROVE THE DISASTER RESILIENCE OF ANIMAL RESEARCH PROGRAMS

Academic research institutions should acknowledge that there is an ethical imperative to conduct disaster resilience efforts to preserve the lives and prevent the suffering of research animals. Academic research institutions should consider designating vivaria as essential facilities and should work to incorporate fail-safe design criteria.

Possible actions could include, but are not limited to:

- Conducting comprehensive planning for the animal research program by a multidisciplinary planning group that is integrated with the institutional planning group.
- Identifying a method of engagement with external community partners, such as the local emergency planning committee, emergency management, law enforcement, fire, public works, weather service, department of transportation, and others, to communicate the unique public health and safety issues of the animal research program.
- Developing evacuation and shelter-in-place procedures, as well as procedures in the event research animals escape, in emergency operations plans for animal facilities. Facilities maintenance staff should be involved in the planning process so that they are aware of the power and other utilities requirements for the vivarium post-disaster for successful sheltering in place. Plans should include contact information for the people who can facilitate the acquisition of outside assistance and help meet regulatory reporting requirements. The Office of the State Veterinarian (or the authority having jurisdiction for animals) is the point of contact for obtaining any outside assistance for animals that might be available at the local, state, or federal levels. Institutions that receive Public Health Service funds are required to contact NIH–OLAW; those with species regulated under the Animal Welfare Act are required to contact USDA–APHIS; and accredited organizations are required to contact AAALAC International.
- Incorporating fail-safe criteria in vivarium design, as appropriate for each animal research program. Examples include (a) designing and testing emergency power systems on a schedule that is similar to that required for a hospital; and (b) ensuring that the valves controlling reheat coils on heating, ventilation, and air-conditioning systems fail in the closed position.
- Basing the vivarium location on a threat and hazard identification and risk assessment. A safe location within the building should be selected. A vivarium should never be placed in flood-prone areas within a building.

RECOMMENDATION 7: DEVELOP PERFORMANCE-BASED STANDARDS FOR RESEARCH FACILITIES

Academic research institutions should work with key stakeholders to develop performance-based standards for facilities and critical infrastructure that support their research enterprise.

Possible actions could include, but are not limited to:

- Aligning the resilience plan and performance-based standards with the Department of Veterans Affairs Standard H-18-80 and the National Institute of Standards and Technology's Community Resilience Planning Guide for Buildings and Infrastructure Systems.
- Ensuring that disaster-resistant construction is an explicit design requirement for all new research buildings. For each new research building that is planned, performance goals and expectations should be set during the architectural planning process. If the new research building includes a vivarium, incorporating fail-safe design criteria is essential.
- Preparing an inventory based on vulnerability to existing hazards for existing research buildings. As existing research buildings require repairs or renovations, disaster-resistant features should be incorporated where possible. Build-back standards should be adopted and used to improve the overall resiliency of research buildings owned by the academic institution.

RECOMMENDATION 8: DEVELOP AN INSTITUTIONAL FINANCIAL INVESTMENT STRATEGY FOR DISASTER RESILIENCE EFFORTS FOR THE RESEARCH ENTERPRISE

Academic research institutions should develop an institutional financial investment strategy based upon comprehensive and integrated resilience planning activities for their research enterprise.

Possible actions could include, but are not limited to:

- Conducting business continuity analytics, disaster resilience vulnerability assessments, short- and long-range mitigation plans that resolve identified vulnerabilities, and, most importantly, developing a financial plan to implement the mitigation measures proposed in an institution's approved short- and long-range capital plans.
- Carrying commercial disaster insurance, as well as purchasing supplemental, business interruption, or cyber insurance.

RECOMMENDATION 9: CONVENE A CONSORTIUM OF STAKEHOLDERS TO DISCUSS EFFORTS TO ENHANCE THE DISASTER RESILIENCE OF THE ACADEMIC BIOMEDICAL RESEARCH COMMUNITY

The National Institutes of Health should convene a consortium of research sponsors (both federal and private), academic research institutions, professional associations, and private-sector stakeholders to jointly discuss efforts that research sponsors can take to enhance the disaster resilience of the academic biomedical research community.

In support of this effort, key federal agencies that support biomedical research should each identify within their respective agencies a locus of responsibility and authority to lead and coordinate efforts in pursuit of a resilient academic biomedical research community. This initiative would guide and support academic research institutions in their development of disaster resilience programs for their research enterprises.

Possible discussions could include mechanisms for research sponsors to:

- Conduct evaluations of prior disaster response and recovery actions taken by research sponsors.
- Communicate with academic research institutions pre-disaster to discuss potential disaster response and recovery actions, set expectations, and highlight current initiatives in place.
- Standardize response and recovery procedures.
- Match or leverage incentives to encourage academic research institutions and researchers to incorporate disaster resilience into their research programs.
- Provide funding sources for capital improvements that will improve the resiliency of research facilities at academic research institutions so that they meet appropriate performance goals.
- Establish resilience standards and require evidence of disaster-resistant design and construction and business continuity planning as conditions of award.
- Increase incentives for offsite storage and duplication of critical samples and data.
- Develop a national approach to preserve unique animal lines, samples, and data through disaster resilient repositories.
- Explore funding for national centers of excellence for disaster resilience efforts at academic research institutions that would analyze existing data, serve as a repository for after-action reports and post-disaster analyses, and promulgate best practices for the academic biomedical research community.
- Actively participate in the Healthcare and Public Health Sector–specific activities, such as the Government Coordinating Council.

RECOMMENDATION 10: RECOGNIZE AND ENGAGE THE ACADEMIC BIOMEDICAL RESEARCH COMMUNITY AS A SUBSECTOR OF THE HEALTHCARE AND PUBLIC HEALTH CRITICAL INFRASTRUCTURE SECTOR

The Department of Health and Human Services, as the Healthcare and Public Health Sector–Specific Agency, should explicitly recognize and engage the academic biomedical research community as a subsector of the Healthcare and Public Health Critical Infrastructure Sector, and actively work to engage the academic biomedical research community in sector-specific activities—such as the Sector Coordinating Council and the Government Coordinating Council.

Engaging the academic biomedical research community in the Healthcare and Public Health Sector–specific activities could be achieved through the following mechanisms

- Active participation of appropriate academic biomedical research community associations and stakeholders on the Sector Coordinating Council.
- Active participation of key federal agencies that support biomedical research on the Government Coordinating Council.

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