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Advancing Disaster Resistant University Planning Beyond the Basic Requirements

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ADVANCING DISASTER RESISTANT UNIVERSITY PLANNING BEYOND THE BASIC REQUIREMENTS

Melanie Gall
DRU Workshop
University of New Orleans
March 21, 2013



LSU System DRU Plan

- 4 campuses:
 - Alexandria (2,700 students)
 - Baton Rouge (28,000 students)
 - LSU AgCenter
 - Pennington Biomedical Research Ctr.
 - Paul M. Hebert Law Center
 - Eunice (3,000 students)
 - Shreveport (4,600 students)
- Organizational setup
 - Technical working group
 - Advisory group
 - Planning group
 - GOHSEP support



DISASTER RESISTANT UNIVERSITY
MULTI-HAZARD MITIGATION PLAN

November 2012



http://dsm.lsu.edu/pr_hazmit.htm



Steps beyond the Cross-Walk

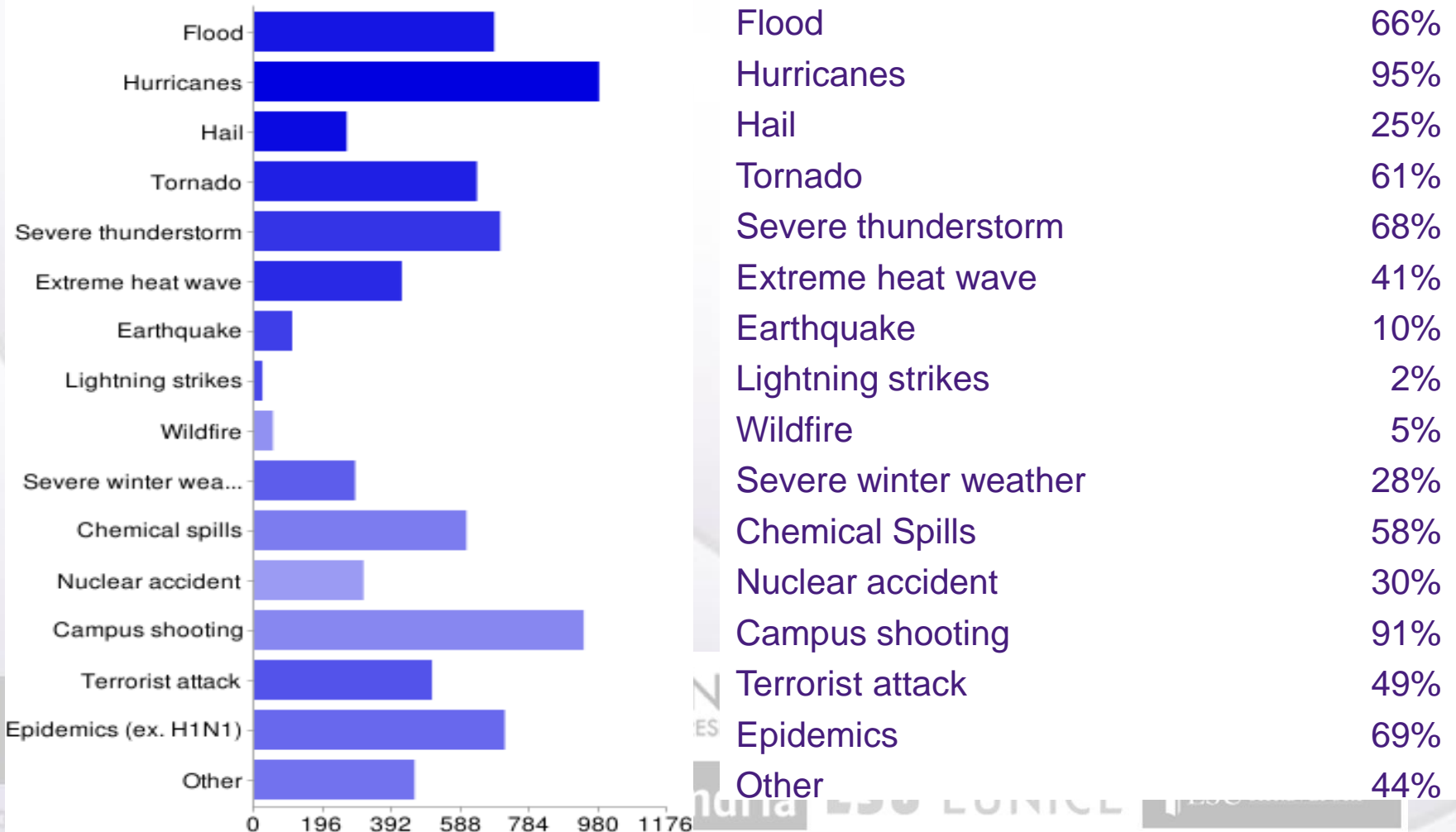
1. Campus Participation and Communication
2. Student Involvement
3. Data Collection
 - Non-natural Hazards
 - Building Inventory
4. Predictive Modeling

1. Campus Participation

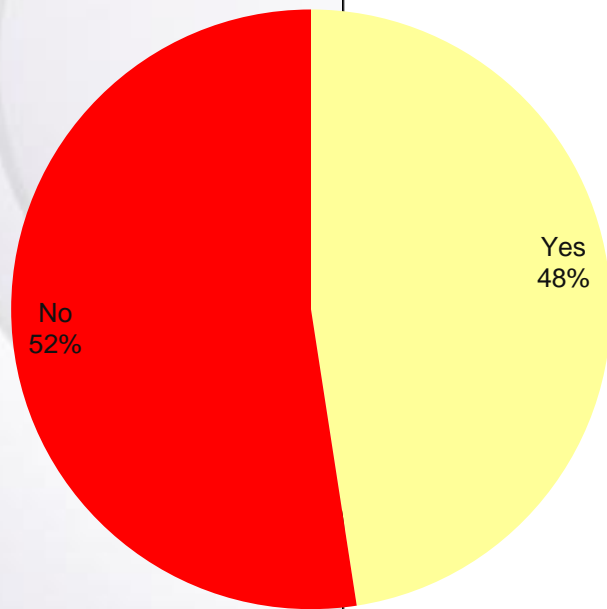
- Outreach Strategy:
 - Online Survey
 - LSUA: 73 responses
 - LSUE: 306 responses
 - LSUS: not administered
 - LSU: 1,036 responses
 - Administration Survey
 - Research Survey
 - Labs Survey

Example: LSU Online Survey

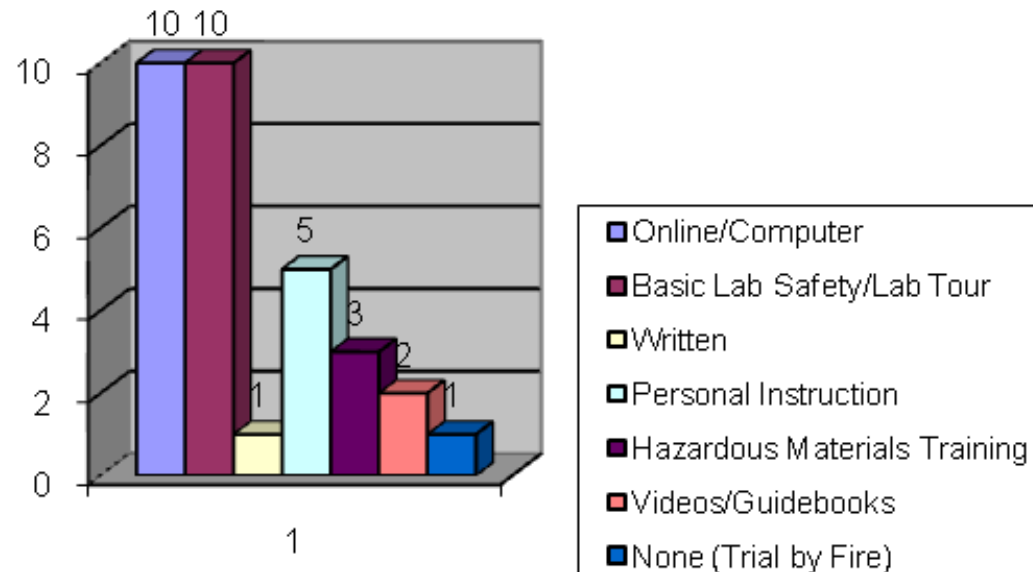
Question 1: What hazards do you think the university needs to prepare for?



Example: Were you required to complete a safety training course prior to working in the lab?



Safety Training Description (n=53)



Type of Training

1. Campus' Input and Participation (cont.)

- **Communication Strategy**

- Basecamp
- Project website
 - Meeting minutes
 - Plan draft
 - Feedback
- Twitter

- **Visualization Strategy**

- Flex Viewer

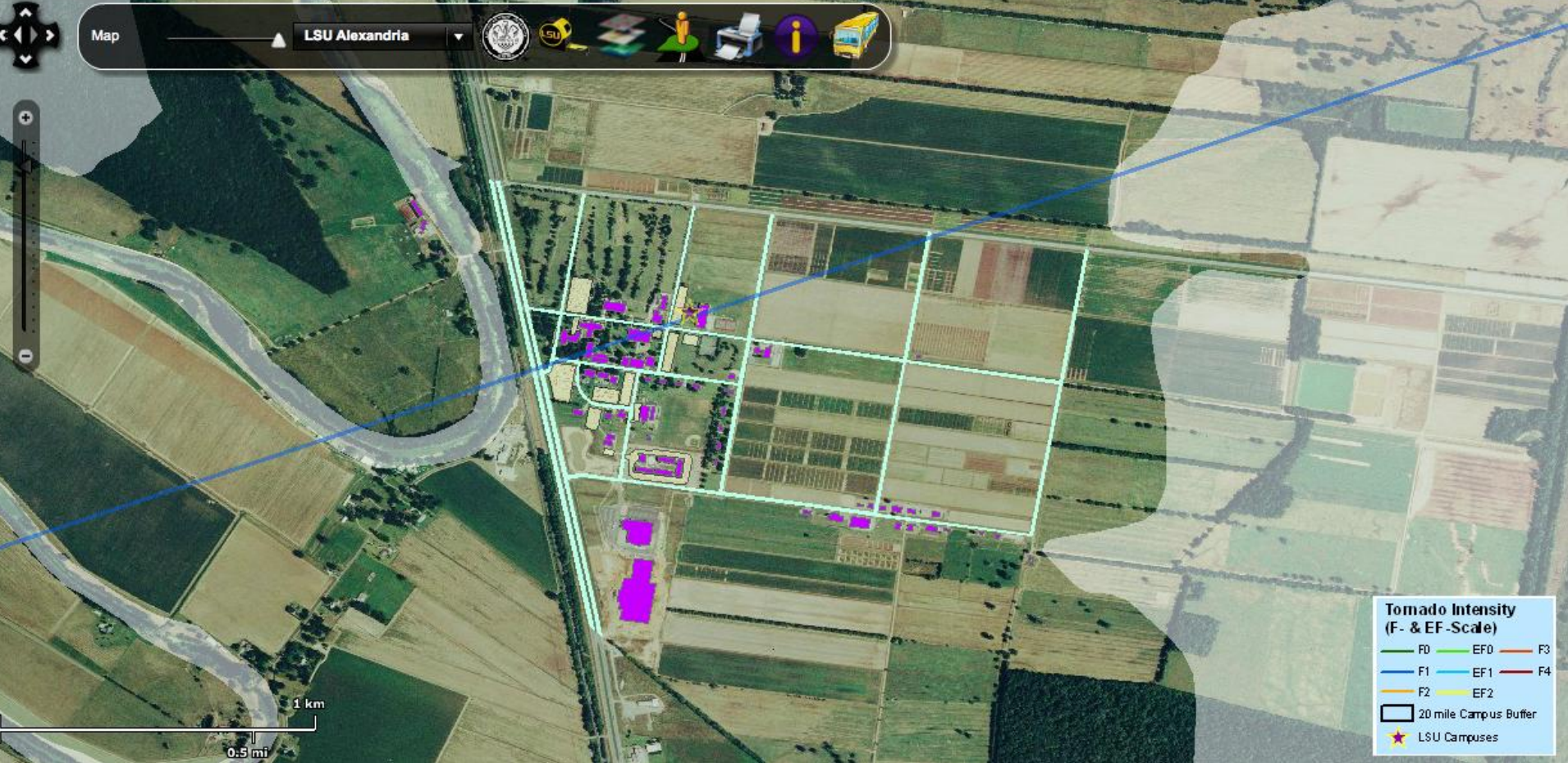
The screenshot shows a web-based project management interface. At the top, there are navigation links: "Back to Dashboard", "Switch to a different project", "Project Settings", "My Info", "Sign out", and "HELP". The main header reads "LSU System Multi-Hazard Mitigation Plan Louisiana State University". Below this is a secondary navigation bar with tabs: "Overview", "Messages", "To-Dos", "Calendar", "Writeboards", and "Files". On the right side of this bar are "People & Permissions" and "Search" buttons.

The main content area is titled "To-do lists" and includes a "Reorder lists" link. It is divided into three sections, each with a "Private" label:

- Mitigation Strategies**:
 - Add supplemental info to plan (e.g., quotes for generators - LSUA/LSUE) Ryan Orgera
 - [Add an item](#)
- Capacity Assessment**:
 - fill in non-natural hazards Melanie Gall
 - finish updates for LSUE risk assessment and create subset of plan that we can share with LSUE Ryan Orgera
 - [Add an item](#)
- Risk Assessment**:
 - ensure CDMS - HAZUS integration works Andrew Joyner
 - clarify which buildings fall into the various HAZUS categories (dorm/apt; campus; utilities; essential, etc.) Andrew Joyner
 - LSUS Vulnerability Section: add that drought causes electrical issues at LSUS. The subsidence of ground causes fissures and cracks in duct banks resulting in electrical outages. Ryan Orgera
 - [Add an item](#)

On the right side of the dashboard, there is a "New to-do list" button and several filters and lists:

- "Show to-dos assigned to" dropdown menu (set to "Anyone")
- "Show to-dos that are due" dropdown menu (set to "Anytime")
- "Current to-do lists" section with links: [Mitigation Strategies](#), [Capacity Assessment](#), [Risk Assessment](#), [Engineering To Do List](#), [Complete Hazard Assessment](#)
- "Completed to-do lists" section with link: [Capacity Assessment](#)



2. Student Involvement

- **Planning team**
 - Data collection
 - Data analysis
 - Plan writing
- **Service-Learning course**
 - Grant application
 - Survey development and deployment

Environmental Hazards Analysis (ENVS 4262)

- Community partner: LSU Public Safety
- Syllabus covered all elements of mitigation planning
- Assignments supported pre-plan and plan data collection (capacity assessment)
- Training in areas outside of course material
- Lots of team work
- Interaction with non-students
 - Community partner, assignments, ...
- Guest presentations by State's Hazard Mitigation Officer

Assignments - Pre-Plan

- DRU Vulnerability questionnaire (individual)
- Identify the hazards (data collection, team work)
- Impact assessment (surveys, team work)
- Identify mitigation actions (research, individual)
- DRU Vulnerability questionnaire “plus” (individual)
- Reflection paper
- Midterm and final exams

Assignments in support of plan

- Human subjects training (NIH certificate, individual)
- Draft surveys (online, face-to-face, 5 teams)
 - General, H1N1, admin/staff, labs, researchers
- IS-22 Citizen Preparedness certificate (individual)
- Deliver completed surveys (20 per person)
- Present survey findings
- Reflection paper
- Midterm and final exams

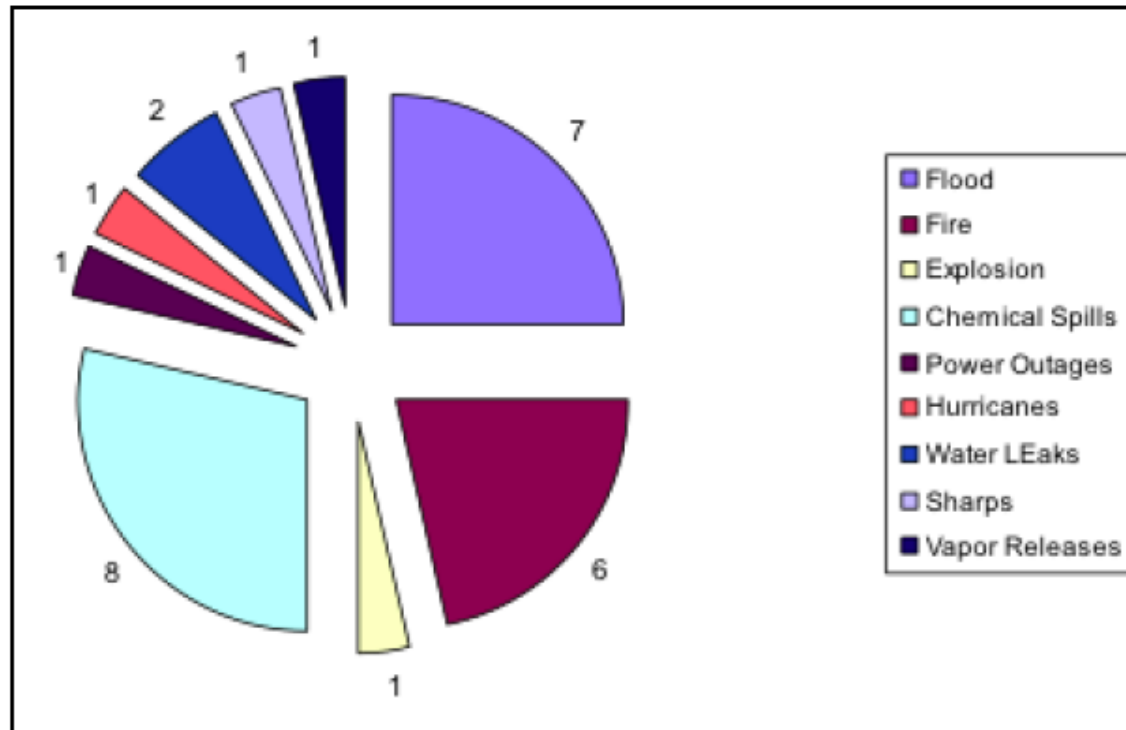
3. Data Collection

- **Surveys**
 - Perception
 - Capabilities
 - Vulnerabilities (business continuity, buildings, etc.)
- **Archival Research (campus newspapers)**
- **Inventories**
 - Buildings
 - Populations
 - Chemicals

Non-natural Hazards

- LSU Environmental Health and Occupational Safety
- LSU EOC

Figure IV-15: Type on lab incidents on the main campus based on interviews.
Source: ENVS 4262 (Spring 2010)

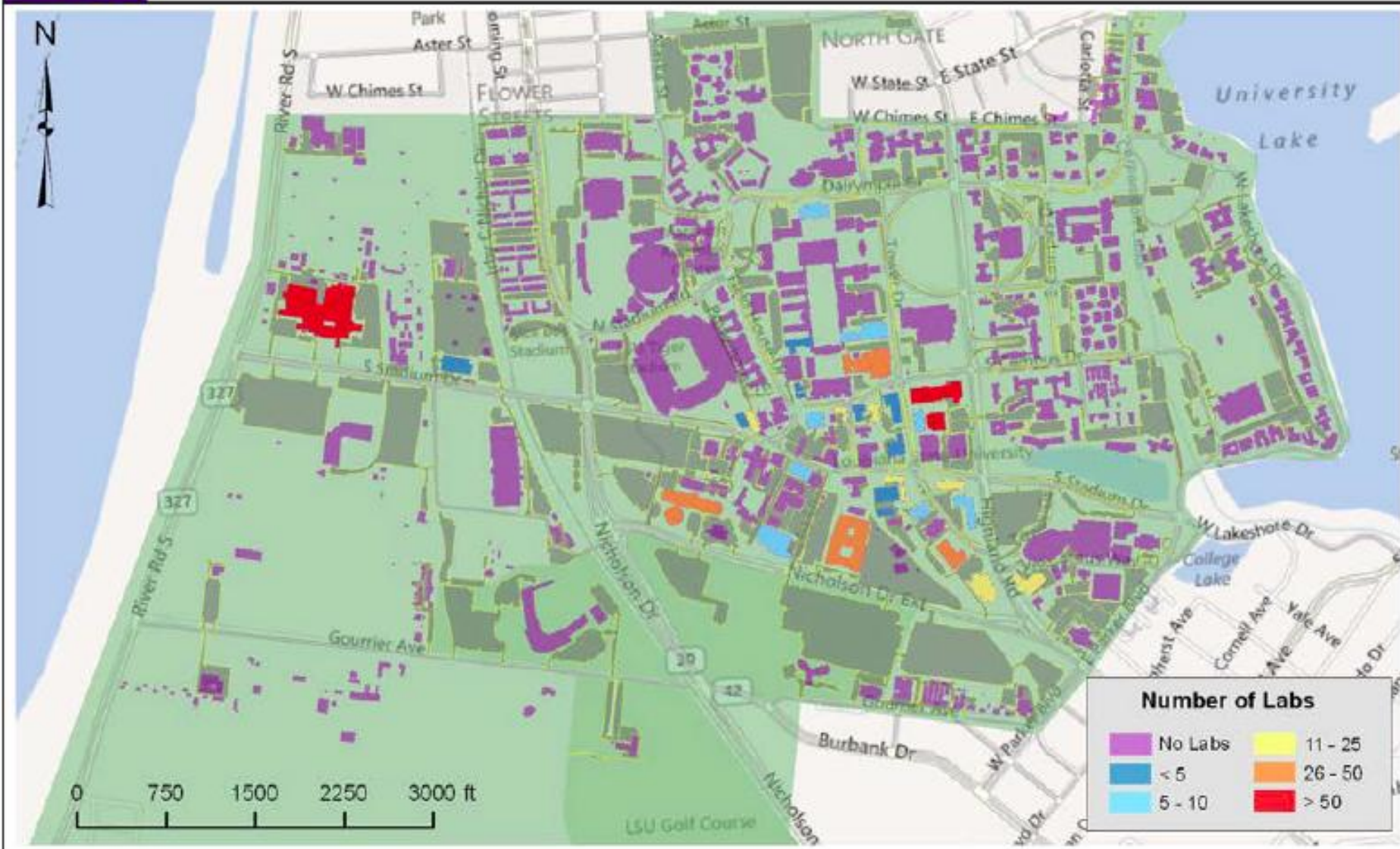


Past Occurrences:

11/15/2001: Lab in Life Science Annex had an explosion in the hood. Personnel were scaling up a reaction when the reaction vessel exploded due to formation of organic peroxides. The lab worker suffered cuts, lacerations, burns, and eye injury.

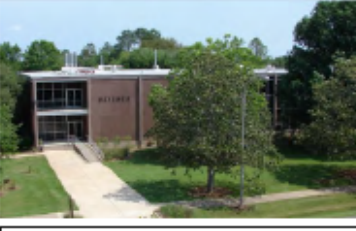


LSU A&M Chemical Labs



Source: Jerry E. Steward - LSU A&M Chemical Safety Manager

Building Inventory (Dept. of Constr. Mmgt)

LSU-Alexandria		Science Building Building ID: 1	
		Building Information	
		Building Condition: Good Building Type: Steel Substructure: Basement Cladding: Brick Veneer Number of Stories: 2 Basement Levels: 1 Lowest Floor Elevation (ft): 3 Mechanical Equip. Height (ft):	Building Openings: 41 to 50% Door Protection: None Garage Doors: None Window Area: Medium Glass Type: Unknown Glass Construction: Unknown Shutters: No
Building Comments: 1) Shielding Height: Taller Trees, Shorter Trees 2) Wind-Borne Debris Source: Arch. Features, Sheds 3) Cladding: Brick Veneer, Glass, Granite		Site Information	
		Topography: Flat Wind Exposure: Open Land Wind Shielding: One Side Wind-Borne Debris Source: Unknown	
		Roof Information	
Roof Comments		Roof Covering Condition: Good Roof Covering Type: Asphalt Section, Membrane without Ballast Roof Deck Type: Steel Roof Geometry: Flat Roof Slope: 0 Roof Height: 0 Feet Roof Span: > 40 Feet Overhang Length: >2 Approximate Roof Area (SF): Aggregate Roof Ballast Size: None	
		Elevated Penthouse: No Parapet: Surrounded Parapet Height (ft): 0.5 Roof Skylights: Yes Atrium Glass: No	
Anchorage		Drainage	
Ventilation System (Vents) Anchored: Yes Exhaust Fan Anchored: Yes Exhaust Stack Anchored: Yes HVAC on Roof Anchored: NA		Number of Roof Drains: 18 Avg. Drain Diameter(in): 2 Roof Scupper: No Roof Gutter: Yes	
Satellite Dish Anchored: NA Communication Antenna Anchored: NA Lightning Protection System Anchored: NA Other Rooftop Equipment Anchored: NA			

Current Problems & Vulnerabilities



Drainage Issue: Evidence of water ponding on rooftop



Drainage Issue: Roof drain is clogged, preventing adequate drainage.



Overhanging Trees: Tree located near or above structures should be trimmed periodically to prevent damage to the structure and reduce the amount of organic debris on rooftops which pose drainage issues and potential fire hazards.



Securing Small Rooftop Equipment to Curbs: Attach stacks, exhaust fans and air intakes to the curb with corrosion resistant fasteners not exceeding 6in. on centers between the equipment, transition pieces, and the roof curb. (Ref. 1)

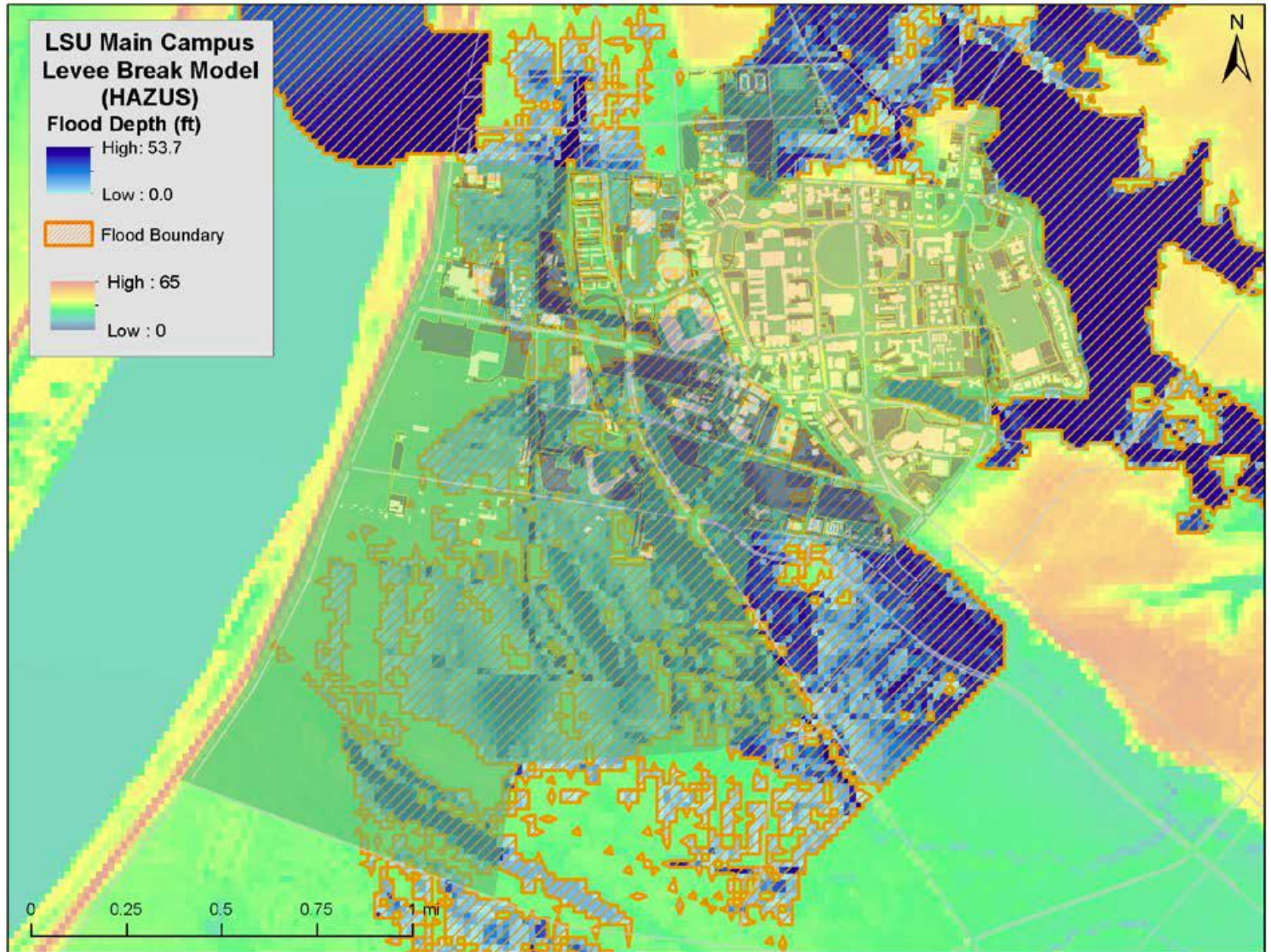


Attached Structures: Periodically check connections of carports, canopies and porches to prevent wind related damages: 1) Connections between tops of columns and roof. 2) Connections between bottom of columns and foundation. (Ref. 6)

4. Predictive Modeling

- **Utilization of HAZUS-MH**
 - Replaced building inventory
 - Replaced census data
 - Analysis at building level - not block level
- **Climate change**
 - Likelihood of future occurrences

Levee Failure



Planning for a University

- **Data not readily available**
 - NCDC and SHELDES inadequate for campus scale
 - HAZUS-MH default database inadequate
- **Opportunity for beneficial spin offs**
 - Real-time connection between chemical db and building footprints
- **Highlight response and other state support activities**
- **Bases mitigation actions in facts, i.e. risk assessment**



The 800-bed medical facility at LSU is the largest acute care field hospital ever created in U. S. history and is currently the largest acute care hospital in Louisiana, according to Chris Trevino, M. D., the medical director of the facility.

Thank you for your attention!

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