MULTIHAZARD ISSUES IN THE CENTRAL UNITED STATES

UNDERSTANDING THE HAZARDS AND REDUCING THE LOSSES

Edited by James E. Beavers, Ph.D., P.E.

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Monograph No. 3
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Cover Photo: Flooding of the Russell and Allison Levee in Indiana, June 2008. Ronald Elliott/U.S. Army Corp of Engineers

Editor's Note

Undertaking major steps towards mitigating the effects of natural and technological hazards in the central United States is far past its time. This status report is an outcome of the American Society of Civil Engineers' (ASCE) Council on Disaster Risk Management (CDRM) symposium held as part of the ASCE annual meeting in Chicago, IL, on October 18, 2006.

ASCE's CDRM organized the symposium to take a snapshot of hazards and mitigating events in the central United States and/or look at what's going on in other states that could be helpful. There were 13 presentations that varied from changing the way engineers approach designing, or not designing, for every day hazards to specific recommendations for certain hazards. Nine papers have been written as a result of that symposium and are included in this monograph. The first monograph paper provides an introduction to natural and technological hazards in the central United States, while the remaining eight papers represent some of the topics presented and discussed at the symposium.

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Observations on Steps Toward Mitigating the Effects of Natural and Technological Hazards in the Central United States—An Introduction

James E. Beavers[1] *and William J Hall*[2]

Introduction

Regional definitions of the central United States vary from source to source. Wikipedia (2007) defines the region as including Arkansas, Iowa, Kansas, Louisiana, Minnesota, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota, and Texas (see Figure 1.1). Alternate definitions may include some or all of Alabama, Colorado, Illinois, Indiana, Kentucky, Michigan, Mississippi, Montana, New Mexico, Ohio, Tennessee, Wisconsin, and Wyoming.

In focusing on natural and technological hazards, it seems wise to first focus on some of the elements at risk in three states—specifically Missouri, Illinois and Tennessee—as examples. In addition, this paper briefly identifies a number of governmental regulations, followed by some comments on the three states, including some details on major natural and technological hazards and implications to the three states. This material is intended to place in perspective examples of the current risks, related regulation, and implications for the three states as examples.

The Central States

The Census Bureau estimates (Census Bureau States 2006a) that on July 1, 2006 there were more than 54 million people in the 11 solid states, an increase of 4 million compared to 2000 census. If we included all central states, the estimated population for July 1, 2006 exceeds 126 million, up from more than 117 million in the 2000 census. Thus, today, more than 126 million people are at risk to natural and technological hazards in the central United States.

The most frequent hazards in the central United States are fires, floods, thunderstorms, tornadoes, and winter storms. For example, more than 1,000 tornadoes touch down each year in the central United States resulting in lost lives and millions of dollars in damage. From 1976 to 2000, the average number of deaths per year from tornadoes was 54 (Brooks and Doswell 2001). It should also be mentioned that these central states experienced the most costly natural hazard in U.S. history, possibly exceeding $100 billion, when Hurricane Katrina made landfall in Mississippi and Louisiana in 2005.

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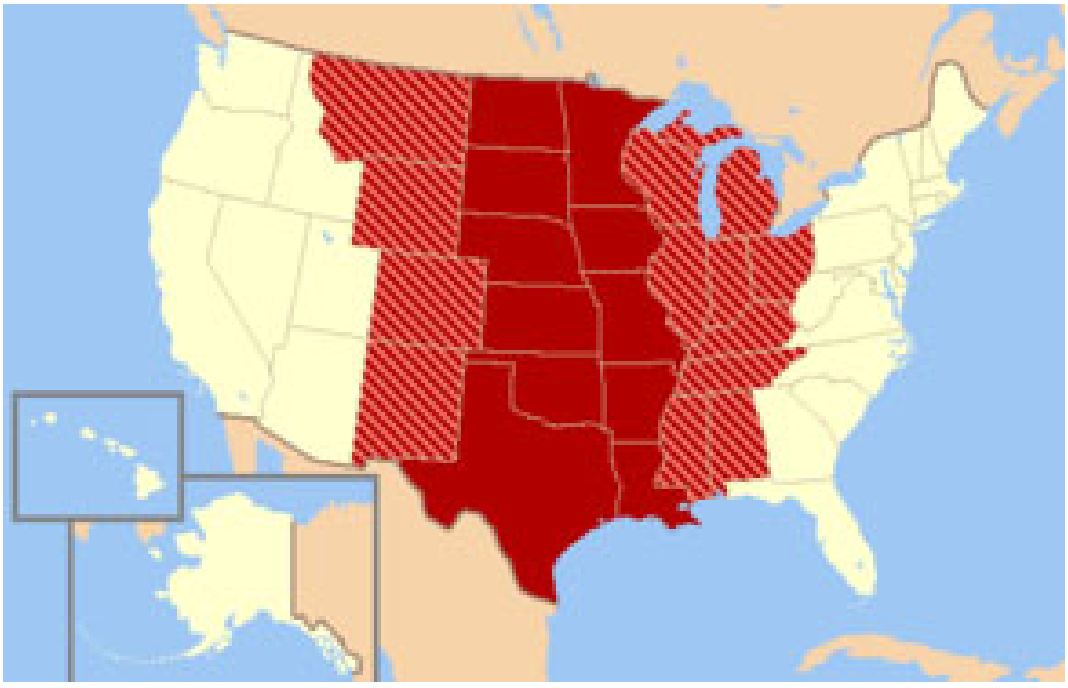

Figure 1.1. The Central United States.

Table 1.1 presents the Federal Emergency Management Agency's (FEMA) defined natural and technological hazards (FEMA 2006) showing 15 hazards for which FEMA must be prepared to respond. All central states have experienced some level of all of these hazards, except for tsunamis, volcanoes, and nuclear incident. In the case of a nuclear incident, the state of Tennessee did experience a nuclear incident in 1958 when a criticality occurred at the nuclear facilities in Oak Ridge, TN (CA 1958).

Table 1.1. FEMA Defined Natural and Technological Hazards

Dam Failure	Earthquake	Heat
Fire/Wildfire	Flood	Hazardous Materials
Hurricane	Landslide	Nuclear Incident
Terrorism	Thunderstorm	Tornado
Tsunami	Volcano	Winter Storm

Source: FEMA Web site.

DMA 2000

Because the United States continues to experience damaging natural and technological hazards yearly in almost every state, during the 106th Congress the Disaster Mitigation Act of 2000 was passed and is known as Public Law 106-390 (DMA 2000). This act was

to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act to authorize a program for predisaster mitigation, to streamline the administration of disaster relief, to control the federal cost of disaster assistance, and for other purposes. The act states:

"(a) FINDINGS.—Congress finds that—

(1) natural disasters, including earthquakes, tsunamis, tornadoes, hurricanes, flooding, and wildfires, pose great danger to human life and to property throughout the United States;

(2) greater emphasis needs to be placed on—

(A) identifying and assessing the risks to states and local governments (including Indian tribes) from natural disasters;

(B) implementing adequate measures to reduce losses from natural disasters; and

(C) ensuring that the critical services and facilities of communities will continue to . . ."

"(b) PURPOSE.—The purpose of this title is to establish a national disaster hazard mitigation program—

(1) to reduce the loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural disasters; and

(2) to provide a source of predisaster hazard mitigation funding that will assist states and local governments (including Indian tribes) in implementing effective hazard mitigation measures that are designed to ensure the continued functionality of critical services and facilities after a natural disaster."

The mitigation planning final rule (FEMA 2002) lists the following hazards to be considered: coastal storm, terrorism, volcano, severe storm, nuclear, virus threat, winter storm, mudslide/landslide, extreme temperatures, chemical/biological, earthquake, technological, fire, industry hardship, tornado, wildfire, hurricane/tropical storm, drought, typhoon, flooding, dam/levee break, and tsunami.

Title 44 of the Code of Federal Regulations Parts 201 and 206 (CFR 2002) states the following: "Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act or the Act), 42 U.S.C. 5156, enacted under §104 the Disaster Mitigation Act of 2000, (DMA 2000) P.L. 106-390, provides new and revitalized approaches to mitigation planning. This section (1) continues the requirements for a standard state mitigation plan as a condition of disaster assistance . . ." with the intent over a period of time to provide an opportunity to reduce the nation's disaster losses through mitigation planning. As stated, the language in the act, taken as a whole, emphasizes the importance of strong state and local planning processes and comprehensive program management at the state level. It also requires states to have an approved hazard mitigation plan to receive Stafford Act assistance. Finally, the rule states that all state mitigation plans must be reviewed, revised, and re-approved by FEMA every three years. It also requires states and localities (cities and counties) to have plans in effect that meet the minimum requirements under this rule as a condition of receiving mitigation assistance after November 1, 2003.