The devastating earthquake in Haiti has focused much needed attention on the preparedness of the U.S. for such an event. While Haiti is very different from the U.S. in many ways, the two countries share some characteristics with regard to the vulnerabilities of property and people living in areas at risk from earthquake damage.

About 200 years separated Haiti from its last major quake and the current devastation; it has been nearly 200 years since the 1811-1812 earthquakes struck along the New Madrid/Wabash Valley Seismic Zone that begins in Missouri and travels through five states as it stretches 120 miles to the south. Construction in Haiti was not governed by modern building codes. Despite the risks, there remain areas vulnerable along the New Madrid fault that lack effective building codes or where building code enforcement is inconsistent.

The adoption and enforcement of modern building codes is a major step toward becoming better prepared for an earthquake. Building codes provide the minimum acceptable standards used to regulate the design, construction and maintenance of buildings for the purpose of protecting the health, safety and general welfare of the building’s users.

Modern codes are consensus documents based on established scientific and engineering principles, drafted through input from leading technical experts, construction professionals, enforcement personnel and the products industries. The International Code Council (ICC) has developed the most widely adopted set of codes to unify the U.S. building regulatory system.

Although the ICC code has been updated several times during the past decade, the seismic provisions have remained relatively unchanged since 2000. Mandatory application and enforcement of these codes and the adoption of local amendments, which affect the building code regulatory process and the protections it provides, vary by state.

There are three regions within the U.S. that are prone to earthquake activity. These include Charleston, S.C., the five states in the New Madrid/Wabash Valley Seismic Zone, and the Pacific West Coast. Current building codes in South Carolina and in the Pacific West Coast states meet acceptable standards for seismic resistance.

**CHARLESTON, S.C.**

Charleston and its outlying areas were the site of an earthquake in 1886 that destroyed approximately one-quarter of the city’s buildings and killed more than 100 people. The state follows the 2006 edition of the International Codes and has made no amendments to the seismic provisions, which are considered adequate protections. The state first adopted a statewide code and mandatory enforcement in July 2003, which equates to a limited inventory of code compliant structures. The latest hazard maps have been revised to include offshore faults that may be capable of generating earthquakes, which may increase the chances of an earthquake in the Charleston area.

**PACIFIC WEST COAST**

The Pacific West Coast includes California, Oregon, and Washington. All three states have mandatory statewide building codes in place in accordance with the 2006 version of the International Codes. Each of the states has passed amendments that exceed the ICC codes to make the seismic requirements more stringent. The building standards in place in this region of the country are more reflective of the latest and best available science.

**NEW MADRID ZONE/WABASH VALLEY**

The New Madrid/Wabash Valley Seismic Zone was the site of three major earthquakes and a series of aftershocks from 1811-1812, which are considered the most intense inter-plate earthquakes to have occurred in recorded U.S. history.

This fault zone crosses the states of Arkansas, Illinois, Indiana, Kentucky, Mississippi, Missouri, and Tennessee. It is apparent from reviewing the status of the building codes in this region that several states do not have adequate code coverage and/or code enforcement in place. This is despite agreement among most scientists that there is a 90 percent probability of an earthquake of a magnitude between 6 and 7 occurring in this region in the next 50 years, according to the U.S. Geological Survey.

The apparent earthquake risk combined with the large geographic area and population that would be affected and the lack of appropriate building codes to reduce earthquake damage make this a region of great concern to the Institute for Business & Home Safety (IBHS).
On Feb. 10, 2010, a quake of magnitude 3.8 shook northern Illinois. The quake was felt in Georgia, Illinois, Indiana, Iowa, Kentucky, Michigan, Ohio, Tennessee and Wisconsin. People reported that dishes rattled, buildings swayed and glass shower doors shook violently. While this quake was not attributed to the New Madrid fault, it demonstrates the effects of even a mild earthquake. By comparison, the earthquake in Haiti registered 7.0, making its magnitude 1,600 times greater than a quake of magnitude 3.8.

STATE BY STATE ANALYSIS

Arkansas adopted a statewide building code, but its use is not mandatory. Power is given to individual jurisdictions to adopt and enforce the code. If a jurisdiction chooses to move forward with code adoption and enforcement, it must do so in accordance with the state-approved code. In this case, the 2006 International Codes. The state allows for local modifications for more stringent, but not weaker, amendments.

Illinois and Missouri have no statewide mandatory code in place, although some local jurisdictions such as Chicago and St. Louis have adopted and enforce citywide building codes. The seismic provisions of these local codes vary, along with the requirements for mandatory enforcement.

Indiana has a mandatory statewide code based on the 2006 version of the International Code and requires mandatory enforcement. However, the Indiana Department of Homeland Security has stated that some jurisdictions lack building inspection departments and therefore the code is not being enforced, despite the requirements. The state allows for local modification for more stringent, but not weaker, amendments.

Mississippi adopted the 2003 version of the International Code, but local jurisdictions have the power to adopt and enforce it and to decide on seismic provisions. Like Arkansas, if a jurisdiction in Mississippi chooses to adopt and enforce a code, it must be consistent with the code adopted by the state.

In Tennessee, the 2006 version of the International Code is generally in effect, but some areas of the state are exempt.

After reviewing building codes in effect in the three main seismic areas of the continental U.S., IBHS sees a clear need for improvement as it relates to property protection against earthquake damage in the New Madrid/Wabash Valley zone. All residents should evaluate their vulnerability and take appropriate steps to reduce earthquake-related losses.

To that end, IBHS offers a variety of earthquake property loss prevention projects for both the interior and exterior of homes and businesses, including a complete retrofit guide in English and Spanish and a guide to the Top 10 Structural Retrofits. At a minimum, residents should take steps to protect interiors by completing affordable projects, such as securing book shelves, cabinets and suspended light fixtures and bracing water heaters and large appliances. A common source of loss during a low-level earthquake is the displacement of valuable electronics, including wall-mounted televisions and computer equipment.

To learn more about the building code issues facing earthquake-prone areas, contact IBHS Director of Code Development Wanda Edwards at wedwards@ibhs.org or (813) 675-1036. To find out how your company can use IBHS earthquake retrofit information, contact Member Relations Manager Joy Whaley at jwhaley@ibhs.org or (813) 675-1050.