

Kanawha Putnam Emergency Management Plan Hazard Identification Annex	
Earthquake Revised December 2015; Reviewed Annually	B14
Risk Low	Vulnerability Low

I. Introduction

- A. Although rare, earthquakes have affected the metropolitan area. Specific areas have been identified that could be locations for seismic activity that could affect the metropolitan area.
- B. This annex discloses some historic information and discusses the risk factors associated with earthquakes. It also identifies plan elements that could be applied in the event of a damaging earthquake event affecting the metropolitan area.

II. Situation and Assumptions

- A. Earthquake activity has occurred within West Virginia, or near enough to the state that minor damage occurred.
- B. Earthquakes occur with no advance warning.
- C. Secondary events, known as “aftershocks” can pose a risk to response personnel working at incident scenes as a result of the initial earthquake event.
- D. Earthquakes have the demonstrated potential to cause loss of life and significant damage to property and infrastructure sufficient to cause a declared state of emergency.
- E. Earthquake activity has the potential to cause building collapse and damage to critical infrastructure such as government buildings, highways, bridges and dams.

- F. The largest earthquake to affect West Virginia occurred at 8pm local on November 19, 1969. The event was centered in Giles County, Virginia and reportedly caused broken windows in Mercer County, WV. The event registered M=4.5¹.
- G. The most recent earthquake event in West Virginia occurred in Kanawha County at 1:35pm local time on June 28, 1991. The event was centered at 38.38N, 81.67W, or in a rural area WNW of Kanawha State Forest². The event registered M=3.2. No damage reports are available.
- H. Of interest to the metropolitan area are two regions of increased risk of seismic activity. The first is known as the Giles County (Virginia) Seismic Zone and is situated generally south of Bluefield, WV. The second is known as the Central Virginia Seismic Zone and is generally situated between Charlottesville and Richmond, VA. Seismic activity from these two areas could affect the metropolitan area.
- I. No fault areas exist in or near West Virginia³.
- J. A model predicting the likelihood of an earthquake occurring in the metropolitan area in a fifty-year time span is attached as Figure B14.1.

III. Functional Annex Components

- A. Primary Functional Annexes – include, but are not limited to:
 - 1. [A01 – Public Warning](#)
 - 2. [A02 – Emergency Public Information](#)
 - 3. [A03 – Communications](#)
 - 4. [A08 – Health and Medical](#)
 - 5. [A12 – Special Needs Population](#)
 - 6. [A14 – Law Enforcement/Security](#)

¹ http://earthquake.usgs.gov/regional/states/events/1969_11_20.php

² http://neic.usgs.gov/neis/last_event_states/states_west_virginia.html

³ According to data supplied by the US Geological Survey

7. [A15 – Resource Management](#)

8. [A21 – Search and Rescue](#)

B. Support Functional Annexes – include, but are not limited to:

1. [A04 – Evacuation](#)

2. [A05 – Transportation](#)

3. [A07 – Mass Care](#)

4. [A19 – Crisis Relocation](#)

5. [A23 – Volunteer Response](#)

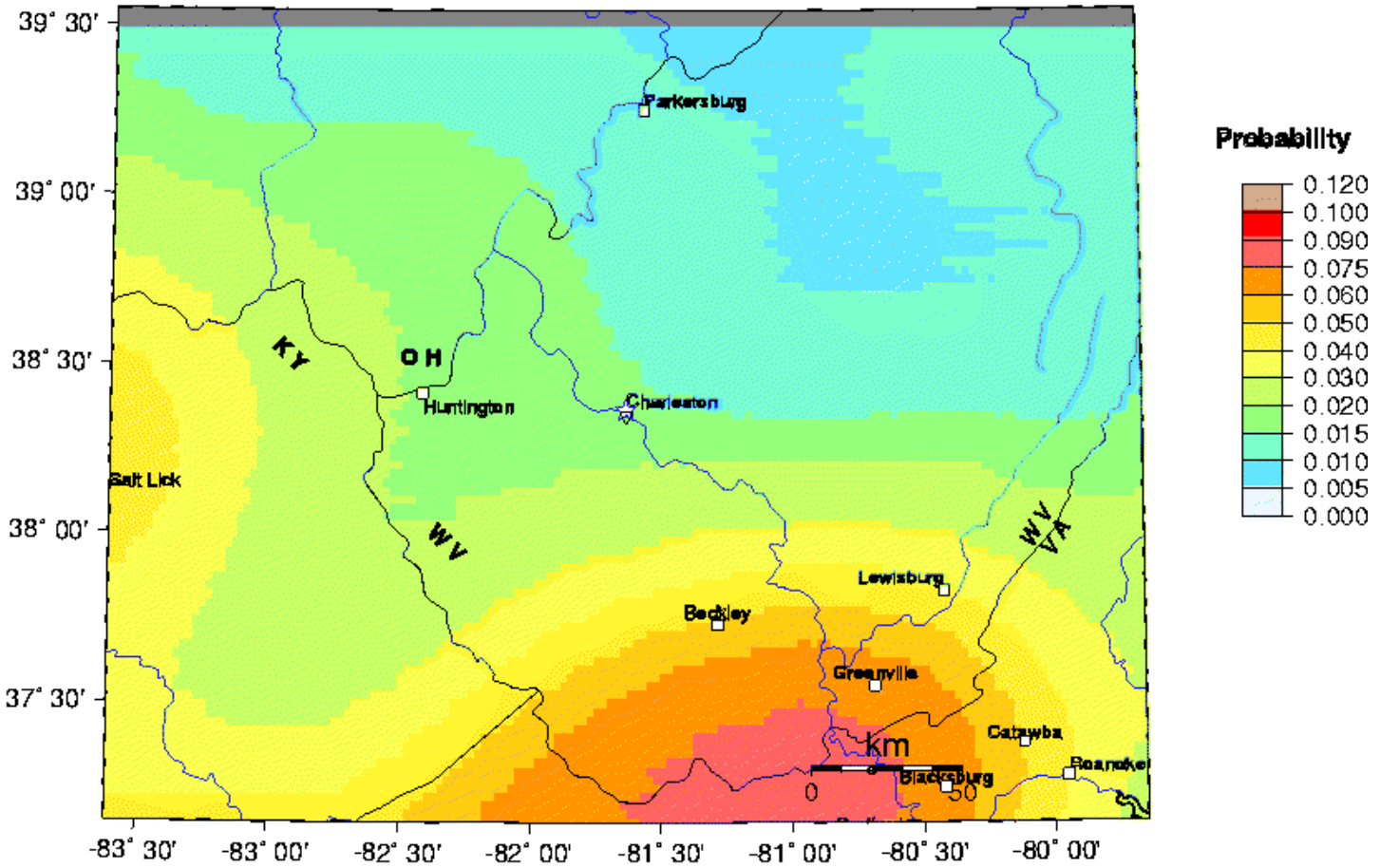
6. [A24 – Recovery](#)

7. [A27 – Catastrophic Event](#)

Probability of earthquake with $M \geq 4.75$ within 50 years & 50 km

U.S. Geological Survey PSHA Model

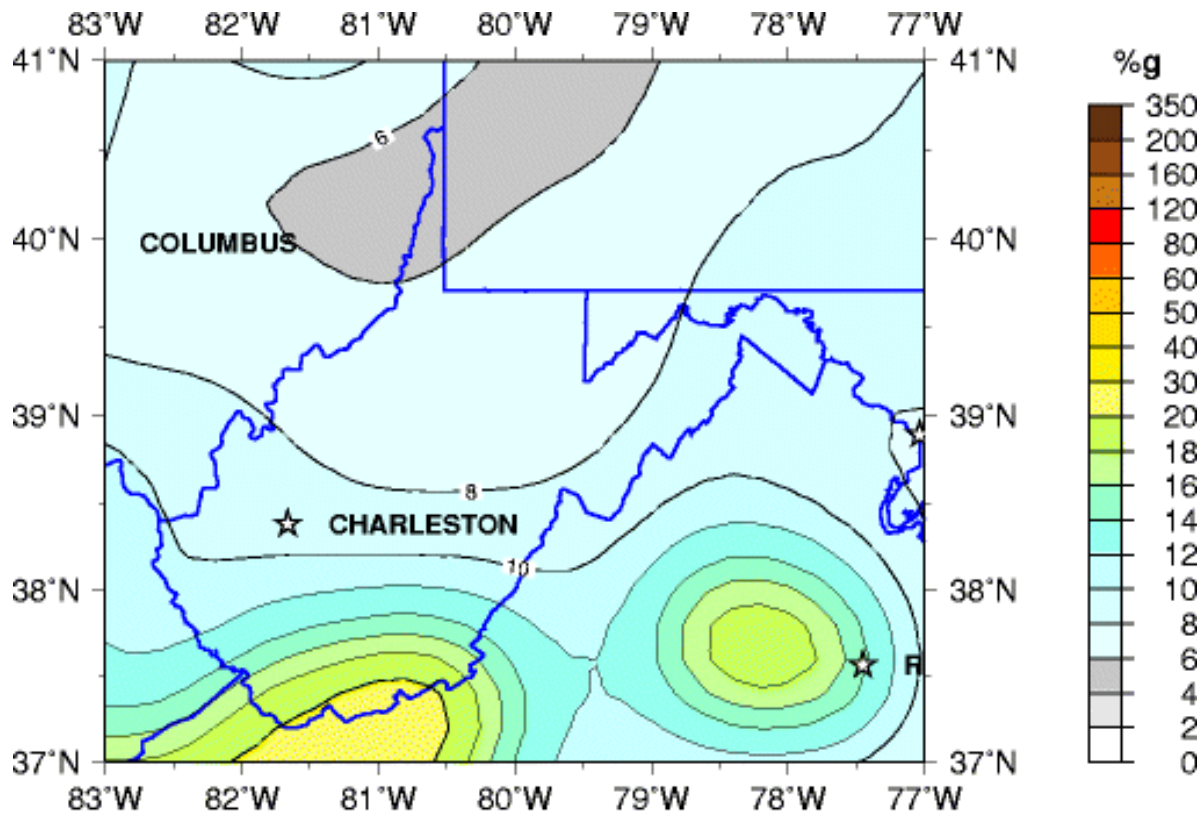
Site: CHARLESTON WV ZipCode .



GMT Mar 31 10:05 Earthquake probabilities from USGS OFR_02-420 PSHA, 50 km maximum horizontal distance. Site of interest: triangle. Epicenters $m_b > 5$ black circles; rivers blue.

Figure B14.1 – Probability of Earthquake equal to, or greater than, magnitude 4.75 occurring in the metropolitan area in 50 years.

Source: US Geological Survey



**Peak Acceleration (%g) with 2% Probability of Exceedance in 50 Years
 site: NEHRP B-C boundary
 National Seismic Hazard Mapping Project**