### Deadliest Floods in West Virginia History, Ranked by Fatalities

*Draft. J. Steven Kite, West Virginia University Geology & Geography, 17 August 2016*

<table>
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<tr>
<th>Date(s)</th>
<th>Locations</th>
<th>Description</th>
<th>Fatalities</th>
<th>WV Damage (adjusted to 2015 $)</th>
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<td>26 Feb 1972</td>
<td>Buffalo Creek, Logan County</td>
<td>Coal waste dam failure; USGS calculated 1,400 cms (50,000 cfs) peak flow from 15.7 km² (6.05 mi²) basin; 1/3 of material behind dam was sediment; may have begun as hyper-concentrated or debris flow. Modest 94 mm, 3-day rainfall; nearby streams had only 2-10 year flows.</td>
<td>125, including 4 missing 1,100 injured &gt;4000 homeless</td>
<td>$30,000,000 to $100,000,000 ($170,454,000 to $568,181,000) $100 million suit ($50 million for damages &amp; clean up) settled for only $1 million, COE cleanup cost $3.7 million; class action suits by victims &amp; child survivors settled for $18.3 million; 551 homes destroyed, 943 damaged. FEMA Decl. 323</td>
<td>Davies et al., 1972; Erickson, 1976; Stern, 1976; WV Division of Culture &amp; History, 2015.</td>
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<td>9 Aug 1916</td>
<td>Cabin Creek, incl. Cane Creek, Coal Creek, Little Coal Creek</td>
<td>Cloudburst floods, 2 reports of 150 mm rainfall at Madison; antecedent Hurricanes 1 &amp; 3, tracked SW of WV in July</td>
<td>40 to 60  Henry (1916): &lt;50 Erskine (1952): 40 Hoyt &amp; Langbein, (1955): 60</td>
<td>$5,000,000 ($108,696,000) $575,000 ($12,500,000) damage according to later dispatches</td>
<td>Erskine (1952) p. 3; Henry 1916; Hoyt &amp; Langbein (1955) p. 362;</td>
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<td>4-7 Nov 1985</td>
<td>Cheat, Potomac, Shenandoah, Greenbrier, Elk, Buckhannon, Tygart, Monongahela, Upper Gauley rivers</td>
<td>Tropical low tracked over eastern WV after Hurricane Juan passed thru Western KY; Many debris flows in Potomac Highlands, Cheat runoff nearly unprecedented in Ohio River basin; 100-300 mm rain in 48 hr. over large area.</td>
<td>47 in WV 22 in VA, 1 in MD, 1 in PA 18,000 homeless in all states</td>
<td>Nearly $700,000,000 in WV ($1,540,000,000) WV only: ~4000 homes and 2,027 bridges destroyed; &gt;968 homes damaged, 711 business destroyed or damaged; FEMA Decl. 753</td>
<td>Carpenter (1990); Clark et al., 1987; Colucci et al. (1993); Janssen (1985); Jacobson (1993); Jacobson et al. (1987); Jacobson et al. (1993); Kite &amp; Linton (1993); Lesinsky (1986); Miller &amp; Parkinson (1993); Noonan (1988); Region III Interagency Flood Hazard Mitigation Team (1985);</td>
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<td>30 Sep 1870</td>
<td>Shenandoah River, especially Virginnius Island, Harpers Ferry</td>
<td>“Waterspout” south of Front Royal, VA; Potomac R. was not flooding, thus high velocity flow on Shenandoah R. at Harpers Ferry. &gt;200 mm rain in 48 hr.</td>
<td>43 in WV 17 dead in VA (42 or more die on Virginnius Island)</td>
<td>$5,000,000 ($91,000,000) in whole Shenandoah Valley, incl. every bridge &amp; all but two mills. 70 buildings destroyed on Virginnius Island</td>
<td>Hoyt &amp; Langbein (1955), p. 340; Janssen (1985), p. 30-31; Johnson (1995); Kite, (1908?) p. 70-79; National Park Service, (undated); Silvius, (1998); WV Division of Culture &amp; History (1997).</td>
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<td>24-26 Jun 1950</td>
<td>West Fork, Hughes, &amp; Little Kanawha rivers, Middle Island &amp; Leading Crk.; Berea, West Union, Weston, Smithburg, Doddridge &amp; Ritchie Co.</td>
<td>Torrential rains &amp; flash floods; Charleston Gazette: 175 to 200 mm in 5 hr; USGS bucket survey: &gt;350 mm total rainfall.</td>
<td>31 to 35 1000 families homeless</td>
<td>&gt;$10,000,000 (&gt; $98,000,000) 123 homes destroyed; 1292 damaged</td>
<td>Charleston Gazette, 1950a &amp; 1950b; Gilchrist, 1997; Hoyt &amp; Langbein, 1955, p. 405-406; Ruffner &amp; Blair (1981); Wells, (1954) p. 977</td>
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<td>19 Jul 1888</td>
<td>Caldwell's Run, Wheeling &amp; Ohio Co.</td>
<td>Most appalling cloudburst ever known in this section of WV for nearly 2 hr. Unofficial estimates of 150-200 mm.</td>
<td>~ 25</td>
<td>$300,000-$582,000 ($7,500,000-$14,550,000) Loss of 2 city bridges &amp; 6 trestles (B&amp;O, Elm Grove RR)</td>
<td>Preston County Journal, 1888; Wheeling Intelligencer, 1888a; 1888b; New York Times, 1888; Anonymous, 2013.</td>
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<td>4-5 Aug 1943</td>
<td>Little Kanawha R. basin, incl. small tributaries</td>
<td>Severe flash floods from violent thunderstorms that produced up to 375 mm rainfall in 2 hr.</td>
<td>23</td>
<td>$1,300,000 ($17,808,000)</td>
<td>Erskine (1952); Hoyt &amp; Langbein, 1955, p. 60, 397; Ruffner &amp; Blair (1981)</td>
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<td>23 Jun 2016</td>
<td>Greenbrier, Elk, Gauley river basins, incl. numerous smaller streams, including Howard Creek.</td>
<td>Flash floods from repeated lines of intense convective storms along a stationary front; 100-200 mm 12-24 hr. rainfall over &gt;4000 km² area.</td>
<td>23</td>
<td>Preliminary $340,000,000 in disaster assistance cost, estimated by State of WV; &gt;1,000 (?) homes destroyed or damaged beyond repair; FEMA Disaster Declaration 4273 in 12 counties</td>
<td>West Virginia Office of the Governor press releases (2016); DiLiberto (2016), FEMA 2016a; 2016b; numerous AP and other media news stories</td>
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<td>19 Jul 1961</td>
<td>Small streams near Charleston, incl. Magazine Hollow (Garrison Ave.)</td>
<td>Cloudburst during wettest July in history causes flash floods and debris flows; 146 mm rainfall in 4 hr.</td>
<td>22 (2 landslide fatalities; &gt;200 homeless families)</td>
<td>$4,000,000 ($31,746,000) FEMA Disaster Declaration 117</td>
<td>Charleston Gazette, 1991; Rostvedt (1965); Ruffner &amp; Blair (1981)</td>
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<td>10-11 Jul 1932</td>
<td>Paint &amp; Armstrong Crks., Fayette &amp; Kanawha Co.; Otter Crk., Tucker Co.</td>
<td>Flash floods, most damage in Powellton, Elridge; landslides in Tucker Co.</td>
<td>20 (1 landslide fatality; &gt;500 homeless)</td>
<td>$2,500,000 ($43,103,000) &gt;205 homes destroyed</td>
<td>Deitz, 1988; Erskine (1952) p. 3; Fansler (1962); Hoyt &amp; Langbein (1955) p. 376</td>
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<td>18 Jul 1889</td>
<td>Little Kanawha R. basin, esp. streams near Limestone Hill: Slate, Lee, Pond, &amp; Sandy crks; Wood, Wirt, Jackson, &amp; Ritchie Co.</td>
<td>Cloudburst causes “torrent” &amp; landslides (debris flows?); Tygart Crk. rose 6.7 m in 1 hr; Tucker Crk. at Morristown rose 6.1 m in &lt;2 hr; 495 mm rainfall in 2 hr. 10 min at Rockport (WV record).</td>
<td>19 to 23</td>
<td>$650,000 ($16,670,000)</td>
<td>The Daily State Journal (1889); Ruffner &amp; Blair (1981); Smith et al. (2011)</td>
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Damage Conversions to 2015 $ from Sahr, 2016
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Note: Need to Confirm from primary sources:

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