APPENDIX B: HAZARD AND VULNERABILITY DATA

The information in this appendix supplements the discussion of Mercer County's hazards and vulnerabilities from Section 2: Hazard Identification and Risk Assessment. A complete list of historical incidents of each hazard is provided here. Additionally, detailed data on the anticipated damage to Mercer County from a 100-year flood and earthquake, per HAZUS estimates, is provided.

6.1 HAZARD HISTORY DATA

The National Climactic Data Center has maintained records on weather incidents across the United States since 1950. The tables below provide a complete history of the incidents in Mercer County from 1950 through 2021.

6.1.1 Drought and Extreme Heat

These incidents include all occurrences categorized as drought or extreme heat.

Hazard	Location	Date	Injuries	Deaths	Property Damage	Crop Damage
Drought	Mercer (Zone)	07/01/1999	0	0	0	0
Drought	Mercer (Zone)	08/01/1999	0	0	0	0
Excessive Heat	Mercer (Zone)	07/19/2019	0	0	0	0
Excessive Heat	Mercer (Zone)	07/20/2019	0	0	0	0

6.1.2 Flood

The flood incidents identified in this table include events classified as flood and flash flood that occurred in Mercer County since 1950.

Hazard	Location	Date	Deaths	Injuries	Property Damage	Crop Damage
Flood	Mercer (Zone)	01/17/1996	0	0	20K	0
Flood	Mercer (Zone)	02/27/1997	0	0	0	0
Flood	Mercer (Zone)	03/01/1997	0	0	0	0
Flash Flood	Countywide	06/01/1997	0	0	5K	0
Flash Flood	Countywide	06/11/1997	0	0	0	0
Flash Flood	Countywide	07/22/1998	0	0	0	0
Flash Flood	Celina	06/09/1998	0	0	0	0
Flash Flood	Countywide	04/07/2000	0	0	3K	0
Flash Flood	Celina	07/21/2001	0	0	0	0
Flood	Mercer (Zone)	01/31/2002	0	0	0	0

Hazard	Location	Date	Deaths	Injuries	Property Damage	Crop Damage
Flood	Mercer (Zone)	02/01/2002	0	0	0	0
Flood	Mercer (Zone)	05/09/2003	0	0	0	0
Flood	Mercer (Zone)	05/09/2003	0	0	0	0
Flood	Mercer (Zone)	05/11/2003	0	0	0	0
Flash Flood	Fort Recovery	06/17/2003	0	0	100K	0
Flood	Mercer (Zone)	07/04/2003	0	0	0	0
Flash Flood	Celina	07/04/2003	0	0	10K	0
Flash Flood	Celina	07/06/2003	0	0	20K	0
Flash Flood	North Portion	07/06/2003	0	0	20K	0
Flash Flood	Rockford	07/06/2003	0	0	300K	0
Flash Flood	Rockford	07/07/2003	0	0	200K	0
Flash Flood	Countywide	07/07/2003	0	0	1M	0
Flash Flood	Rockford	07/08/2003	0	0	2M	0
Flash Flood	Celina	07/08/2003	0	0	500K	0
Flash Flood	Celina	07/08/2003	0	0	500K	0
Flash Flood	Countywide	07/08/2003	0	0	1M	0
Flood	Mercer (Zone)	07/21/2003	0	0	0	0
Flood	Mercer (Zone)	08/01/2003	0	0	0	0
Flood	Mercer (Zone)	08/02/2003	0	0	0	0
Flood	Mercer (Zone)	08/04/2003	0	0	0	0
Flood	Mercer (Zone)	09/01/2003	0	0	0	0
Flood	Mercer (Zone)	01/04/2004	0	0	0	0
Flood	Mercer (Zone)	06/13/2004	0	0	0	0
Flood	Mercer (Zone)	06/17/2004	0	0	0	0
Flood	Mercer (Zone)	01/05/2005	0	0	30K	0
Flood	Mercer (Zone)	01/12/2005	0	0	20K	0
Flood	Mercer (Zone)	01/12/2005	0	0	0	0
Flood	Montezuma	06/02/2006	0	0	0	0
Flood	Celina	12/01/2006	0	0	10K	0
Flood	Celina	03/02/2007	0	0	3K	0
Flood	Celina	03/14/2007	0	0	5K	0
Flood	Rockford	02/05/2008	0	0	30K	0
Flash Flood	Mendon	05/27/2009	0	0	5K	0
Flash Flood	Rockford	07/24/2010	0	0	1K	0
Flash Flood	Celina	02/28/2011	0	0	250K	0
Flood	St. Henry	03/01/2011	0	0	10K	0
Flood	Philothea	02/28/2011	0	0	100K	0
Flood	St. Henry	03/01/2011	0	0	10K	0
Flood	Philothea	03/01/2011	0	0	100K	0
Flash Flood	St. Henry	05/07/2012	0	0	1K	0
Flood	Chattanooga	01/13/2013	0	0	1K	0
Flash Flood	Marie Stein	04/10/2013	0	0	1K	0

Hazard	Location	Date	Deaths	Injuries	Property Damage	Crop Damage
Flood	Fort Recovery	07/01/2013	0	0	1K	0
Flood	Chattanooga	06/16/2015	0	0	0	0
Flood	Rockford	06/16/2015	0	0	0	0
Flood	Chattanooga	06/16/2005	0	0	0	0
Flood	Chattanooga	06/16/2005	0	0	0	0
Flood	Mendon	06/16/2005	0	0	0	0
Flood	Chattanooga	06/16/2015	0	0	0	0
Flood	Mendon	06/17/2015	0	0	0	0
Flood	Rockford	06/17/2015	0	0	0	0
Flood	Rockford	06/17/2015	0	0	0	0
Flood	Rockford	06/17/2015	0	0	0	0
Flood	Rockford	06/17/2015	0	0	0	0
Flood	Rockford	06/17/2015	0	0	0	0
Flood	Rockford	06/17/2015	0	0	0	0
Flood	Wabash	06/17/2015	0	0	0	0
Flood	Mercer	06/17/2015	0	0	0	0
Flood	Rockford	06/17/2015	0	0	0	0
Flood	Mercer	06/17/2015	0	0	0	0
Flood	Mendon	06/17/2015	0	0	0	0
Flood	Mendon	06/17/2015	0	0	0	0
Flood	Mendon	06/17/2015	0	0	0	0
Flood	Mendon	06/17/2015	0	0	0	0
Flood	Wabash	06/18/2015	0	0	0	0
Flood	Mercer	06/18/2015	0	0	0	0
Flood	Rockford	06/18/2015	0	0	0	0
Flood	Wabash	06/27/2015	0	0	0	0
Flood	Mercer	05/05/2017	0	0	0	0
Flash Flood	Chattanooga	05/25/2017	0	0	0	0
Flood	Neptune	07/16/2017	0	0	0	0
Flood	Mendon	07/22/2017	0	0	0	0
Flood	Mendon	07/22/2017	0	0	0	0
Flood	Celina	12/31/2018	0	0	0	0
Flood	Celina	04/26/2019	0	0	0	0
Flood	Celina	04/26/2019	0	0	0	0
Flood	Celina	04/26/2019	0	0	0	0
Flood	Celina	04/26/2019	0	0	100K	0
Flood	Montezuma	04/26/2019	0	0	100K	0
Flood	Wabash	04/28/2019	0	0	0	0
Flash Flood	Grand Lake	05/17/2019	0	0	350K	0
Flood	Celina	05/17/2019	0	0	0	0
Flood	Carthagena	06/19/2019	0	0	0	0
Flash Flood	Grand Lake	06/19/2019	0	0	0	0

Hazard	Location	Date	Deaths	Injuries	Property Damage	Crop Damage
Flash Flood	Celina Lakefield Airport	06/19/2019	0	0	30K	0
Flood	Mendon	06/20/2019	0	0	0	0
Flood	Celina	06/21/2019	0	0	0	0
Flood	Celina	07/08/2020	0	0	0	0
Flash Flood	Philothea	09/08/2020	0	0	0	0
Flood	Philothea	09/08/2020	0	0	5K	0
Flood	Mercer	03/18/2021	0	0	0	0

6.1.3 Severe Thunderstorm

Thunderstorm incidents include events that produced any combination of hail, lightning, and thunderstorm wind; all hazards were not necessarily present in all incidents.

Hazard	Location	Date	Deaths	Injuries	Property Damage	Crop Damage
Thunderstorm Wind	Mercer County	07/01/1959	0	0	0	0
Thunderstorm Wind	Mercer County	07/03/1960	0	0	0	0
Thunderstorm Wind	Mercer County	03/04/1964	0	0	0	0
Thunderstorm Wind	Mercer County	05/03/1968	0	0	0	0
Thunderstorm Wind	Mercer County	08/24/1968	0	0	0	0
Thunderstorm Wind	Mercer County	06/25/1971	0	0	0	0
Thunderstorm Wind	Mercer County	07/02/1973	0	0	0	0
Thunderstorm Wind	Mercer County	01/10/1975	0	0	0	0
Thunderstorm Wind	Mercer County	09/03/1975	0	0	0	0
Thunderstorm Wind	Mercer County	11/09/1977	0	0	0	0
Thunderstorm Wind	Mercer County	05/13/1980	0	0	0	0
Thunderstorm Wind	Mercer County	05/13/1980	0	0	0	0
Hail	Mercer County	05/13/1980	0	0	0	0
Thunderstorm Wind	Mercer County	06/07/1980	0	0	0	0
Thunderstorm Wind	Mercer County	07/05/1980	0	0	0	0
Thunderstorm Wind	Mercer County	07/05/1980	0	0	0	0
Thunderstorm Wind	Mercer County	08/10/1980	0	0	0	0
Hail	Mercer County	04/28/1981	0	0	0	0
Hail	Mercer County	04/28/1980	0	0	0	0
Thunderstorm Wind	Mercer County	06/08/1981	0	0	0	0
Thunderstorm Wind	Mercer County	06/24/1981	0	0	0	0
Thunderstorm Wind	Mercer County	06/24/1981	0	0	0	0
Hail	Mercer County	05/22/1982	0	0	0	0
Thunderstorm Wind	Mercer County	06/09/1982	0	0	0	0

Hazard	Location	Date	Deaths	Injuries	Property Damage	Crop Damage
Thunderstorm Wind	Mercer County	06/15/1982	0	0	0	0
Thunderstorm Wind	Mercer County	09/06/1983	0	0	0	0
Thunderstorm Wind	Mercer County	06/13/1984	0	0	0	0
Thunderstorm Wind	Mercer County	09/09/1985	0	0	0	0
Thunderstorm Wind	Mercer County	05/06/1986	0	0	0	0
Thunderstorm Wind	Mercer County	05/06/1986	0	0	0	0
Thunderstorm Wind	Mercer County	05/15/1986	0	0	0	0
Thunderstorm Wind	Mercer County	08/26/1986	0	0	0	0
Thunderstorm Wind	Mercer County	06/29/1987	0	0	0	0
Thunderstorm Wind	Mercer County	07/11/1987	0	0	0	0
Thunderstorm Wind	Mercer County	07/12/1987	0	0	0	0
Thunderstorm Wind	Mercer County	08/02/1988	0	0	0	0
Hail	Mercer County	04/03/1988	0	0	0	0
Thunderstorm Wind	Mercer County	01/07/1989	0	0	0	0
Thunderstorm Wind	Mercer County	05/30/1989	0	0	0	0
Thunderstorm Wind	Mercer County	06/27/1989	0	0	0	0
Thunderstorm Wind	Mercer County	06/02/1990	0	0	0	0
Thunderstorm Wind	Mercer County	06/03/1990	0	0	0	0
Thunderstorm Wind	Mercer County	07/06/1990	0	0	0	0
Thunderstorm Wind	Mercer County	03/27/1991	0	0	0	0
Thunderstorm Wind	Mercer County	07/02/1991	0	0	0	0
Thunderstorm Wind	Mercer County	07/03/1991	0	0	0	0
Thunderstorm Wind	Mercer County	07/08/1991	0	0	0	0
Thunderstorm Wind	Mercer County	08/30/1991	0	0	0	0
Thunderstorm Wind	Mercer County	06/17/1992	0	0	0	0
Hail	Mercer County	06/23/1992	0	0	0	0
Thunderstorm Wind	Mercer County	07/12/1992	0	0	0	0
Hail	Mercer County	09/09/1992	0	0	0	0
Hail	Mercer County	09/09/1992	0	0	0	0
Thunderstorm Wind	Celina	04/27/1994	0	0	50K	0
Thunderstorm Wind	Mercer	05/24/1999	0	0	5K	0
Thunderstorm Wind	Montezuma	06/23/1994	0	0	5K	0
Hail	Celina	06/28/1994	0	0	0	0
Thunderstorm Wind	Celina	07/02/1994	0	1	5K	0
Thunderstorm Wind	Celina	11/27/1994	0	0	5K	0
Thunderstorm Wind	Celina	05/28/1995	0	0	0	0
Thunderstorm Wind	Celina	06/07/1995	0	0	4K	0
Thunderstorm Wind	North Half	06/07/1995	0	0	5K	0
Hail	Countywide	06/08/1995	0	0	0.1K	0
Thunderstorm Wind	St. Henry	06/21/1995	0	0	20K	0
Thunderstorm Wind	Celina	06/23/1995	0	0	4K	0
Hail	Wabash	06/26/1995	0	0	0	0

Hazard	Location	Date	Deaths	Injuries	Property Damage	Crop Damage
Hail	Celina	06/26/1995	0	0	0	0
Hail	Celina	02/27/1996	0	0	0	0
Thunderstorm Wind	Fort Recovery	04/20/1996	0	0	0	0
Hail	Celina	05/01/1996	0	0	0	0
Thunderstorm Wind	Carthagena	10/30/1996	0	0	5K	0
Thunderstorm Wind	Countywide	07/02/1997	0	0	10K	0
Thunderstorm Wind	Celina	07/26/1997	0	0	5K	0
Thunderstorm Wind	Montezuma	07/27/1997	0	0	3K	0
Hail	Celina	04/16/1998	0	0	0	0
Hail	Montezuma	05/19/1998	0	0	0	0
Hail	Celina	05/31/1998	0	0	0	0
Hail	Chickasaw	05/31/1998	0	0	0	0
Hail	Coldwater	06/11/1998	0	0	0	0
Thunderstorm Wind	Coldwater	06/19/1998	0	0	50K	0
Thunderstorm Wind	Neptune	07/04/1998	0	0	3K	0
Thunderstorm Wind	Celina	07/19/1998	0	0	10K	0
Thunderstorm Wind	Fort Recovery	07/19/1998	0	0	10K	0
Thunderstorm Wind	Celina	11/10/1998	0	0	10K	0
Hail	Celina	06/09/1999	0	0	0	0
Thunderstorm Wind	Rockford	07/31/1999	0	0	5K	0
Lightning	Celina	06/13/2000	0	1	0	0
Thunderstorm Wind	Celina	06/14/2000	0	0	2K	0
Thunderstorm Wind	Sharpsburg	08/09/2000	0	0	5K	0
Thunderstorm Wind	Countywide	08/09/2000	0	0	5K	0
Hail	Coldwater	08/09/2000	0	0	0	0
Hail	Mendon	05/15/2001	0	0	0	
Hail	Mendon	05/15/2001	0	0	5K	0
Thunderstorm Wind	Mendon	07/21/2001	0	0	0	0
Thunderstorm Wind	Coldwater	08/18/2001	0	0	0	0
Thunderstorm Wind	Celina	06/25/2002	0	1	50K	0
Thunderstorm Wind	Celina	07/22/2002	0	0	3K	0
Thunderstorm Wind	Rockford	08/11/2002	0	0	05K	0
Thunderstorm Wind	Countywide	09/20/2002	0	0	3K	0
Hail	Celina	11/10/2002	0	0	5K	0
Hail	Celina	04/30/2003	0	0	0	0
Hail	Celina	04/30/2003	0	0	0	0
Hail	Coldwater	04/30/2003	0	0	0	0
Thunderstorm Wind	Fort Recovery	05/01/2003	0	0	3K	0
Thunderstorm Wind	Coldwater	05/09/2003	0	0	2K	0
Thunderstorm Wind	Countywide	05/11/2003	0	0	3K	0
Thunderstorm Wind	Celina	07/04/2003	0	0	3K	0
Thunderstorm Wind	St. Henry	07/04/2003	0	0	6K	0

Hazard	Location	Date	Deaths	Injuries	Property Damage	Crop Damage
Thunderstorm Wind	Coldwater	07/06/2003	0	0	0	0
Thunderstorm Wind	St. Henry	07/06/2003	0	0	3K	0
Thunderstorm Wind	Celina	07/07/2003	0	0	3K	0
Thunderstorm Wind	Countywide	07/08/2003	0	0	15K	0
Hail	Celina	07/23/2003	0	0	0	0
Hail	Celina	07/23/2003	0	0	0	
Thunderstorm Wind	Celina	07/27/2003	0	0	3K	0
Hail	Rockford	08/01/2003	0	0	0	0
Thunderstorm Wind	Fort Recovery	08/01/2003	0	0	2K	0
Thunderstorm Wind	St. Henry	08/01/2003	0	0	2K	0
Thunderstorm Wind	Celina	08/01/2003	0	0	3K	0
Thunderstorm Wind	Mendon	08/26/2003	0	0	10K	0
Thunderstorm Wind	Countywide	05/30/2004	0	0	5K	0
Thunderstorm Wind	Celina	06/13/2004	0	0	3K	0
Hail	Coldwater	06/24/2004	0	0	0	0
Hail	Rockford	07/22/2004	0	0	0	0
Thunderstorm Wind	Celina	06/05/2005	0	0	8K	0
Thunderstorm Wind	Celina	06/05/2006	0	0	3K	0
Thunderstorm Wind	Rockford	03/31/2006	0	0	3K	0
Hail	Coldwater	04/07/2006	0	0	0	0
Hail	Fort Recovery	04/07/2006	0	0	0	0
Hail	Celina	05/26/2005	0	0	6K	0
Hail	Celina	05/26/2005	0	0	0	0
Thunderstorm Wind	Chattanooga	06/22/2006	0	0	15K	0
Thunderstorm Wind	Maria Stein	06/28/2006	0	0	3K	0
Hail	Celina	06/02/2007	0	0	1K	0
Hail	Coldwater	06/03/2007	0	0	1K	0
Thunderstorm Wind	Montezuma	06/03/2007	0	0	2K	0
Thunderstorm Wind	Rockford	06/08/2007	0	0	6K	0
Thunderstorm Wind	Celina	08/09/2007	0	0	5K	0
Thunderstorm Wind	Celina	08/09/2007	0	0	5K	0
Thunderstorm Wind	Celina	08/16/2007	0	0	3K	0
Thunderstorm Wind	Coldwater	12/23/2007	0	0	2K	0
Thunderstorm Wind	Chattanooga	06/06/2008	0	0	3K	0
Thunderstorm Wind	Rockford	06/09/2009	0	0	3K	0
Hail	St. Henry	06/25/2008	0	0	8K	0
Hail	Maria Stein	06/25/2008	0	0	1K	0
Thunderstorm Wind	Tama	07/08/2008		0	8K	0
Thunderstorm Wind	Mercer	08/04/2008	0	0	8K	0
Thunderstorm Wind	Chickasaw	08/05/2008	0	0	3K	0
Thunderstorm Wind	Celina	02/11/2009	0	0	8K	0
Thunderstorm Wind	Celina	03/10/2009	0	0	5K	0

Hazard	Location	Date	Deaths	Injuries	Property Damage	Crop Damage
Thunderstorm Wind	Montezuma	03/11/2009	0	0	3K	0
Thunderstorm Wind	Mendon	05/27/2009	0	0	10K	0
Hail	Rockford	06/01/2009	0	0	0	0
Hail	Celina	06/01/2009	0	0	0	0
Hail	Rockford	06/08/2009	0	0	0	0
Hail	St. Henry	09/28/2009	0	0	0	0
Thunderstorm Wind	Sharpsburg	06/04/2010	0	0	1K	0
Thunderstorm Wind	Coldwater	08/04/2010	0	0	1K	0
Thunderstorm Wind	Celina	10/26/2010	0	0	2K	0
Thunderstorm Wind	Chattanooga	04/19/2011	0	0	9K	0
Hail	Rockford	04/22/2011	0	0	2K	0
Hail	Mendon	04/23/2011	0	0	20K	0
Hail	Mendon	04/23/2011	0	0	0	0
Hail	Maria Stein	05/10/2011	0	0	0	0
Hail	Rockford	05/10/2011	0	0	8K	0
Thunderstorm Wind	Coldwater	05/23/2011	0	0	4K	0
Hail	Mendon	05/25/2011	0	0	0	0
Hail	Coldwater	05/25/2011	0	0	0	0
Thunderstorm Wind	Fort Recovery	08/07/2011	0	0	1K	0
Thunderstorm Wind	Montezuma	08/07/2011	0	0	1K	0
Thunderstorm Wind	Celina	08/13/2011	0	0	2K	0
Thunderstorm Wind	Fort Recovery	03/23/2012	0	0	5K	0
Thunderstorm Wind	Celina	04/30/2012	0	0	5K	0
Hail	Coldwater	05/7/2012	0	0	0	0
Thunderstorm Wind	Rockford	06/29/2012	0	0	5K	0
Thunderstorm Wind	Celina Lakefield Airport	06/29/2012	0	0	0	0
Thunderstorm Wind	Celina	06/29/2012	0	1	10K	0
Thunderstorm Wind	Celina	06/29/2012	0	1	30K	0
Hail	Maria Stein	07/01/2012	0	0	0	0
Hail	Philothea	07/01/2012	0	0	0	0
Thunderstorm Wind	Chattanooga	08/04/2012	0	0	40K	0
Thunderstorm Wind	Mendon	06/12/2013	0	0	50K	0
Thunderstorm Wind	Celina	07/10/2013	0	0	3K	0
Thunderstorm Wind	Philothea	07/10/2013	0	0	3K	0
Thunderstorm Wind	Celina	07/10/2013	0	0	100K	0
Thunderstorm Wind	Rockford	10/31/2013	0	0	2K	0
Thunderstorm Wind	Durbin	11/17/2013	0	0	1K	0
Hail	St. Henry	05/21/2014	0	0	0	0
Hail	Maria Stein	06/18/2014	0	0	0	0
Hail	Celina	07/26/2014	0	0	0	0
Thunderstorm Wind	Celina Lakefield Airport	08/19/2014	0	0	25K	0
Thunderstorm Wind	Rockford	08/26/2014	0	0	1K	0

Hazard	Location	Date	Deaths	Injuries	Property Damage	Crop Damage
Thunderstorm Wind	Mercer	08/26/2014	0	0	1K	0
Hail	Mendon	04/09/2015	0	0	0	0
Thunderstorm Wind	Durbin	05/11/2015	0	0	2K	0
Thunderstorm Wind	Celina	06/07/2015	0	0	0.5K	0
Thunderstorm Wind	Philothea	09/04/2015	0	0	0	0
Hail	Fort Recovery	09/04/2015	0	0	0	0
Thunderstorm Wind	Celina Lakefield Airport	07/13/2016	0	0	0.5K	0
Hail	Rockford	06/05/2017	0	0	0	0
Thunderstorm Wind	Rockford	06/05/2017	0	0	0.5K	0
Thunderstorm Wind	Tama	06/05/2017	0	0	1K	0
Hail	Celina	06/05/2017	0	0	0	0
Hail	Maria Stein	06/05/2017	0	0	0	0
Thunderstorm Wind	Grand Lake	06/13/2017	0	0	5K	0
Thunderstorm Wind	Grand Lake	06/13/2017	0	0	3K	0
Hail	Mendon	07/10/2017	0	0	0	0
Hail	Maria Stein	07/16/2017	0	0	0	0
Thunderstorm Wind	Neptune	08/06/2018	0	0	1K	0
Thunderstorm Wind	Mercer	08/06/2018	0	0	10K	0
Hail	Celina	05/16/2019	0	0	0	0
Thunderstorm Wind	Padua	05/23/2019	0	0	1K	0
Thunderstorm Wind	Padua	08/08/2019	0	0	3K	0
Thunderstorm Wind	Maria Stein	08/08/2019	0	0	2K	0
Thunderstorm Wind	Celina	08/08/2019	0	0	5K	0
Hail	Celina	08/08/2019	0	0	0	0
Thunderstorm Wind	Padua	08/18/2019	0	0	10K	0
Hail	Chattanooga	04/08/2020	0	0	0	0
Hail	Durbin	07/08/2020	0	0	0	0
Thunderstorm Wind	Celina	07/08/2020	0	0	0.5K	0
Thunderstorm Wind	Celina	07/09/2020	0	0	10K	0
Thunderstorm Wind	Celina Lakefield Airport	07/09/2020	0	0	20K	0
Thunderstorm Wind	Celina	07/21/2020	0	0	1K	0
Thunderstorm Wind	Fort Recovery	08/10/2020	0	0	4K	0
Thunderstorm Wind	Fort Recovery	08/10/2020	0	0	1K	0
Thunderstorm Wind	Sharpsburg	08/10/2020	0	0	2K	0

6.1.4 Tornado

Confirmed tornadoes and funnel clouds occurring in Mercer County since 1950 are listed below.

Hazard	Location	Date	Fujita	Deaths	Injuries	Property Damage	Crop Damage
Tornado	Mercer County	04/11/1967	F4	2	24	2.5M	0
Tornado	Mercer County	11/26/1965	F1	0	1	25K	0
Tornado	Mercer County	06/26/1973	F0	0	0	25K	0
Tornado	Mercer County	06/28/1973	F0	0	0	25K	0
Tornado	Mercer County	03/20/1976	F1	0	0	25K	0
Tornado	Mercer County	06/01/1980	F1	0	4	2.5M	0
Tornado	Mercer County	03/10/1986	F1	0	0	250K	0
Tornado	Mercer County	05/25/1989	F1	0	0	250K	0
Tornado	Mercer County	07/24/1990	F0	0	0	25K	0
Tornado	Mercer County	07/12/1992	F2	0	0	250K	0
Tornado	Mercer County	07/12/1992	F1	0	0	50K	5K
Tornado	Mercer County	06/28/1994	F1	0	0	20K	0
Tornado	Rockford	06/22/2006	F0	0	0	20K	20K
Tornado	St. Henry	08/28/2006	F0	0	0	0	5K
Tornado	Neptune	05/27/2009	EF0	0	0	340K	0
Tornado	Celina	04/19/2011	EF2	0	0	0	0
Tornado	Coldwater	05/26/2011	EF0	0	0	40K	0
Tornado	Rockford	06/12/2013	EF0	0	0	0	0
Tornado	Chattanooga	07/10/2017	EF0	0	0	10K	0
Tornado	Padua	11/05/2017	EF2	0	0	11M	30K
Tornado	Celina	11/05/2017	EF2	0	8	5M	0
Tornado	Durbin	05/27/2019	EF3	1	8	15M	0
Tornado	Fort Recovery	06/18/2021	EF2	0	0	1M	50K

6.1.5 Windstorm

Incidents identified as windstorms are limited to wind-only events. Events in which severe wind occurred along with another hazards, such as winter weather or severe thunderstorms, are identified under the primary hazard.

Hazard	Location	Date	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
High Wind	Mercer (Zone)	03/25/1996	60 kts.	0	0	0	0
High Wind	Mercer (Zone)	04/06/1997	60 kts.	0	0	0	0
High Wind	Mercer (Zone)	12/11/2000	58 kts M	0	0	0	0
High Wind	Mercer (Zone)	03/09/2002	55 kts. E	0	7	35K	0
High Wind	Mercer (Zone)	12/01/2006	38 kts. ES	0	1	15K	0

Hazard	Location	Date	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
High Wind	Mercer (Zone)	09/14/2008	52 kts. EG	0	0	4.9M	0
High Wind	Mercer (Zone)	02/11/2009	50 kts. EG	0	0	0	0
High Wind	Mercer (Zone)	12/09/2009	50 kts. EG	0	0	2K	0
High Wind	Mercer (Zone)	04/03/2016	50 kts. EG	0	0	1K	0
High Wind	Mercer (Zone)	03/08/2017	50 kts. EG	0	0	10K	0
High Wind	Mercer (Zone)	02/24/2019	50 kts. EG	0	0	0	0
High Wind	Mercer (Zone)	12/30/2019	50 kts. EG	0	0	0	0
High Wind	Mercer (Zone)	11/15/2020	50 kts. EG	0	0	5K	0
High Wind	Mercer (Zone)	03/25/2021	53 kts. MG	0	0	2K	0

6.1.6 Winter Storm

Winter storm events include incidents classified as blizzard, cold/ extreme cold/wind chill, ice storm, or winter storm that occurred in Mercer County since 1950.

Hazard	Location	Date	Deaths	Injuries	Property Damage	Crop Damage
Winter Storm	Mercer (Zone)	01/02/1996	0	0	50K	0
Winter Storm	Mercer (Zone)	01/06/1996	0	0	500K	0
Ice Storm	Mercer (Zone)	03/06/1996	0	0	0	0
Winter Storm	Mercer (Zone)	01/01/1999	0	0	0	0
Winter Storm	Mercer (Zone)	01/07/1999	0	0	0	0
Winter Storm	Mercer (Zone)	01/13/1999	0	0	0	0
Winter Storm	Mercer (Zone)	03/25/2002	0	0	0	0
Winter Storm	Mercer (Zone)	03/26/2002	0	0	0	0
Winter Storm	Mercer (Zone)	11/22/2002	0	0	0	0
Winter Storm	Mercer (Zone)	12/25/2002	0	0	0	0
Winter Storm	Mercer (Zone)	01/29/2003	0	0	0	0
Winter Storm	Mercer (Zone)	02/15/2003	0	0	0	0
Winter Storm	Mercer (Zone)	01/25/2004	0	0	0	0
Winter Storm	Mercer (Zone)	12/22/2004	0	0	0	0
Winter Storm	Mercer (Zone)	01/05/2005	0	0	0	0
Winter Storm	Mercer (Zone)	01/21/2005	0	0	0	0
Winter Storm	Mercer (Zone)	12/08/2005	0	0	0	0
Winter Storm	Mercer (Zone)	12/15/2005	0	0	0	0
Blizzard	Mercer (Zone)	02/13/2007	0	0	0	0
Winter Storm	Mercer (Zone)	02/01/2008	0	0	0	0
Winter Storm	Mercer (Zone)	02/12/2008	0	0	0	0
Winter Storm	Mercer (Zone)	02/26/2008	0	0	0	0
Ice Storm	Mercer (Zone)	03/04/2008	0	0	0	0

Hazard	Location	Date	Deaths	Injuries	Property Damage	Crop Damage
Winter Storm	Mercer (Zone)	03/07/2008	0	0	0	0
Ice Storm	Mercer (Zone)	12/19/2008	0	0	0	0
Ice Storm	Mercer (Zone)	12/23/2008	0	0	0	0
Ice Storm	Mercer (Zone)	02/01/2011	0	0	0	0
Blizzard	Mercer (Zone)	12/26/2012	0	0	0	0
Winter Storm	Mercer (Zone)	03/05/2013	0	0	0	0
Winter Storm	Mercer (Zone)	03/24/2013	0	0	0	0
Winter Storm	Mercer (Zone)	12/14/2013	0	0	0	0
Winter Storm	Mercer (Zone)	01/05/2014	0	0	0	0
Winter Storm	Mercer (Zone)	02/04/2014	0	0	0	0
Winter Storm	Mercer (Zone)	03/01/2015	0	0	0	0
Ice Storm	Mercer (Zone)	11/14/2018	0	0	0	0
Winter Storm	Mercer (Zone)	01/19/2019	0	0	0	0
Extreme Cold/Wind Chill	Mercer (Zone)	01/30/2019	0	0	0	0
Winter Storm	Mercer (Zone)	02/15/2021	0	0	0	0

6.2 HAZUS LOSS ESTIMATES

HAZUS is a nationally accepted methodology that utilizes U.S. Census and local Geographic Information Systems (GIS) data to estimate losses for earthquakes, hurricanes, and floods. Because floods and earthquakes are identified as risks for Mercer County, HAZUS was used to generate and evaluate the county's vulnerability to these incidents. Estimates from HAZUS were generated using 2010 U.S. Census Bureau data, which calculated the population of Mercer County as 40,814.

6.2.1 Flood

To evaluate Mercer County's vulnerability to flood, a 100-year flood scenario was utilized to generate loss estimates. For a flood of this magnitude, the damage to the county would be significant. The incident would expose a significant portion of the county's buildings to damage. Table 6-1 identifies buildings by occupancy type for all of Mercer County and those exposed to risk in this scenario.

Table 6-1: Building Occupancy Type

Occupancy	Mercer County		100-Year Flood Scenario	
	Exposure ($1000)	Percent of Total	Exposure ($1000)	Percent of Total
Residential	2,032,400	69.3%	445,135	73.9%
Commercial	472,971	16.1%	78,478	13.2%
Industrial	206,990	7.1%	37,179	6.3%
Agricultural	70,970	2.4%	25,129	4.2%
Religion	67,507	2.3%	9,724	1.6%
Government	22,769	0.8%	3,384	0.6%
Education	59.632	2.0%	1,495	0.2%
Total	***2,933,239***	***100.0%***	***600,524***	***100.0%***

Essential Facility Inventory

Essential facilities are healthcare facilities like hospitals and clinics, fire and EMS stations, police stations, and operations and dispatch centers. Schools are included in essential facilities. Essential facilities in Mercer County are identified in Table 6-2.

Table 6-2: Essential Facility Inventory

Facility Type	Number
Hospital	1 (60 beds)
Schools	22
Fire Stations	7
Police Stations	6

Estimated Building Damage

Per HAZUS estimates, 27 building will sustain at least moderate damage. This accounts for 4% of the total buildings identified for the scenario. Additionally, 3 buildings are likely to be completely destroyed. Tables 6-3 and 6-4 identify the anticipated building damage based on occupancy type and building type.

Table 6-3: Expected Building Damage by Occupancy

Occupancy	Percent Damaged					
	1-10%	11-20%	21-30%	31-40%	41- 50 %	> 50%
Agriculture	0	0	0	0	0	0
Commercial	0	-	1	0	0	0
Education	0	0	0	0	0	0
Government	0	0	0	0	0	0
Industrial	0	0	0	0	0	0
Religious	0	0	0	0	0	0
Residential	0	5	6	6	6	3
Total	***0***	***5***	***7***	***7***	***6***	***3***

Table 6-4: Expected Building Damage by Building Type

Building Type	Percent Damaged					
	1-10%	11-20%	21-30%	31-40%	41- 50 %	> 50%
Concrete	0	0	0	0	0	0
Manufactured Housing	0	0	0	0	0	3
Masonry	0	1	1	0	1	0
Steel	0	7	3	0	0	0
Wood	0	4	5	6	5	0
Total	***0***	***12***	***9***	***6***	***6***	***3***

Based on this scenario, HAZUS does not predict that any critical facilities will sustain moderate or significant damage. Therefore, it is anticipated that the hospital beds, emergency services, and institutional services normally present in the county would continue to be functional in a 100-year flood scenario.

Table 6-5: Expected Damage to Essential Facilities

Classification	Total	Moderate Damage	Substantial Damage	Loss of Use
Fire Stations	7	0	0	0
Hospitals	1	0	0	0
Police Stations	6	0	0	0
Schools	22	0	0	0

Shelter Requirements

When flooding forces people from their homes, some will seek refuge at a public shelter. In this incident, it is anticipated that 486 households would be displaced and approximately 398 people would seek temporary shelter.

Building Related Losses

The total economic loss for the identified 100-year flood event is estimated to be $37.38M.

Building-related losses are separated into two loss categories: direct building loss and business interruption loss. Building losses include structural damage and damage to contents. Business interruption losses include the costs associated with not being able to conduct normal business, displaced workers, and lost opportunities. Table 6-6 provides a summary of the anticipated losses.

Table 6-6: Building-Related Economic Loss Estimates

Area	Residential	Commercial	Industrial	Others	Total
Building Loss					
Building	9.71	2.35	1.83	1.01	14.9
Content	5.29	6.56	5.19	3.77	20.81
Inventory	0.00	0.26	0.95	0.37	1.58
Business Interruption					
Income	0.00	0.04	0.00	0.01	0.05
Relocation	0.03	0.01	0.00	0.00	0.04
Rental Income	0.01	0.00	0.00	0.00	0.01
Wage	0.01	0.04	0.00	0.17	0.22
Total	***15.05***	***9.26***	***7.97***	***5.33***	***37.61***

6.2.2 Earthquake

The simulated earthquake epicenter was assumed to be inside the City of Celina, Mercer County's most populated jurisdiction, for a worst-case scenario. The magnitude of the simulated earthquake measured 5.5 on the Richter Scale. The HAZUS loss estimation program utilized 2010 U.S. Census data for this scenario. There are an estimated 18,000 buildings in the county with a replacement value of $4,895M.

Critical Facility Inventory

HAZUS separates critical facilities into essential facilities and high potential loss (HPL) facilities. Essential facilities are healthcare facilities like hospitals and clinics, fire and EMS stations, police stations, and operations and dispatch centers. Schools are included in essential facilities. HPL facilities include dams, levees, nuclear power plants, military installations, and hazardous material sites.

Table 6-7: Critical Facility Inventory

Essential Facilities		High Potential Loss Facilities	
Facility Type	*Number*	*Facility Type*	*Number*
Hospital	1 (60 beds)	Hazardous Materials Sites	17
Schools	22		
Fire Stations	7		
Police Stations	6		

Transportation and Utility Lifeline Inventory

Lifeline systems are defined as transportation and utilities. Transportation systems include highways, railways, and airports. Mercer County has seven identified transportation system. Utility systems include water treatment and potable water plants, wastewater treatment plants, natural gas suppliers, fuel oil suppliers, electrical power plants, and communications hubs. There are six utility systems in the county. The total value of these lifeline systems exceeds $1,499M and includes more than 119 km of highways, 350 bridges, and 3,169 km of pipes.

Table 6-8: Transportation System Inventory

System	Components	Quantity	Replacement Value
Highways	Bridges	350	$85.80M
	Segments	18	$489.60M
Airport	Facilities	1	$10.70M
	Runways	1	$38.00M
Total			***$660.40M***

Table 6-9: Utility System Inventory

System	Components	Quantity	Replacement Value
Potable Water	Distribution Lines	N/A	$31.70M
Wastewater	Distribution Lines	N/A	$19.00M
	Facilities	12	$839.20M
Natural Gas	Distribution Lines	N/A	$12.70M
Communication	Facilities	3	$0.30M
Total			***$902.90M***

Building Damage

The estimated building damage according to HAZUS is extensive. The number of buildings projected to sustain moderate damage is 5,537, approximately 30% of all buildings in the county. It is estimated that 595 buildings would be destroyed. Table 6-10 summarizes the anticipated building damages.

Table 6-10: Expected Building Damage by Occupancy

Occupancy	None	Slight	Moderate	Extensive	Complete
Agriculture	144	74	98	59	20
Commercial	295	226	326	198	85
Education	18	10	14	8	3
Government	17	10	13	7	3
Industrial	90	62	95	63	26
Other Residential	411	351	487	371	138
Religion	44	27	29	17	8
Single Family Residential	7,006	3,986	2,380	777	314
Total	***8,026***	***4,746***	***3,442***	***1,500***	***596***

Depending on the type of building construction, damage from an earthquake can be serious. Based on common types of construction, the scenario is extrapolated into damage according to type of construction type.

Table 6-11: Expected Building Damage by Building Type

Building Type	None	Slight	Moderate	Extensive	Complete
Wood	6,411	3,535	1,680	268	26
Steel	155	88	185	148	60
Concrete	59	33	49	30	8
Precast	53	24	48	43	14
Reinforced Masonry	21	8	16	14	3
Unreinforced Masonry	1,191	891	1,099	670	366
Manufactured Housing	135	168	367	326	119
Total	***8,026***	***4,746***	***3,442***	***1,500***	***596***

Essential Facility Damage

According to HAZUS estimates, only 2 of the county's 60 hospital beds (4%) would be available and functional on the day of the earthquake. These would be needed by patients already hospitalized at the time of the earthquake and by those requiring hospitalization for injuries sustained in the incident. One week post-quake, it is estimated that 9% of these beds would be available. By the 30-day mark, an estimated 31% would be fully functional. Anticipated damage to other essential facilities is detailed in Table 6-12.

Table 6-12: Expected Damage to Essential Facilities

Classification	Total	Moderate Damage >50%	Complete Damage > 50%	With Functionality >50% on Day 1
Hospitals	1	1	0	0
Schools	22	12	0	3
Police Stations	6	2	0	2
Fire Stations	7	2	0	2

Transportation and Utility Lifeline Damage

Per HAZUS estimates, all highways, bridges, railways, and rail bridges will have more than 50% functionality on the first day after an earthquake and will continue to experience greater than 50% function throughout the recovery period. Limited damage to these transportation systems is expected.

All bus stations, ferry docks, and airports are also expected to have at least 50% functionality immediately following the incident. It is anticipated, however, that 1 airport will sustain at least moderate damage. This damage is not expected to prevent them from functioning.

Tables 6-13 and 6-14 describe the anticipated damage to utility system facilities and pipelines.

Table 6-13: Expected Utility System Facility Damage

System	Total	Moderate Damage	Complete Damage	Day 1 >50% Functionality	Day 7 >50% Functionality
Wastewater	12	9	0	0	10
Communication	3	3	0	0	3

Table 6-14: Expected Utility System Pipeline Damage

Utility	Total Pipeline	Anticipated Leaks	Anticipated Line Breaks
Water	1,585 km	245	61
Wastewater	951 km	175	44
Natural Gas	634 km	50	13

Electrical service is more challenging and time consuming to restore. Table 6-15 outlines the number of customers anticipated to be without electric service following the incident. There are 15,532 total households in the county.

Table 6-15: Expected Electric Power System Performance

Days Post-Event	Households Without Service	Percentage of Total
Day 1	8,591	55.3%
Day 3	6,488	41.8%
Day 7	3,398	21.9%
Day 30	796	5.1%
Day 90	10	0.06%

Post-Incident Fire Risk

Because there is often limited water supply following an earthquake, fires can be a significant hazard. HAZUS estimates the number of fires that would occur based upon the prospect of water not being available to fight fires and an abundance of spontaneous ignition. According to these estimates, no fire ignitions are probable, and no damage or loss is anticipated.

Debris Generation

The amount of debris generated by an earthquake can be substantial. HAZUS classifies debris into two types based on the handling equipment required: brick/wood and reinforced concrete/steel. In the given scenario, a total of 0.24 million tons of debris is anticipated. Brick/wood would comprise 48% of that amount. When converting these totals to truckloads, debris removal would require 9,640 truckloads, assuming 25 tons per truck.

Shelter Needs

Temporary public shelters are often necessary post-quake to provide housing for people displaced by the event. HAZUS estimates that 523 households would be displaced and 303 people would seek housing in a temporary shelter.

Casualties

The number of people estimated to be injured or killed by the earthquake is divided into four categories based on the extent of the victim's injuries:

Level 1 – Require medical attention but not hospitalization
Level 2 – Require hospitalization for non-life-threatening injuries
Level 3 – Require hospitalization for critical injuries
Level 4 – Fatalities

Casualty estimates are provided for 3 times of day that represent periods of the day that various sectors of the community operate at peak capacity loads. These figures are provided in Table 6-16.

Table 6-16: Casualty Estimates

Time	Location	Level 1	Level II	Level III	Level IV
2 AM	Commercial	2	1	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	7	2	0	0
	Other Residential	41	10	1	2
	Single Family Residential	139	34	5	10
	TOTAL	***189***	***46***	***6***	***12***
2 PM	Commercial	124	32	5	9
	Commuting	0	0	0	0
	Educational	61	16	2	5
	Hotels	0	0	0	0
	Industrial	51	13	2	3
	Other Residential	9	2	0	1
	Single Family	30	8	1	2
	TOTAL	***276***	***71***	***10***	***20***
5 PM	Commercial	92	24	3	7
	Commuting	1	3	3	1
	Educational	5	1	0	0
	Hotels	0	0	0	0
	Industrial	32	8	1	2
	Other Residential	16	4	0	1
	Single Family Residential	56	14	2	4
	TOTAL	***203***	***54***	***11***	***15***

Building-Related Losses

Total economic loss for this earthquake scenario is estimated to be $1,060.87M. This estimate includes building and lifeline related losses and is based on the building inventory in Mercer County. Building losses are examined in two categories: direct building loss and business interruption loss. Direct building losses include structural damage and damage to contents.

Business interruption losses include the costs associated with not being able to conduct normal business, displaced workers, and lost opportunities.

Total estimated building losses are anticipated to be $818.99M. Business interruption expenses account for 14% of this total. Residential structures are expected to sustain the greatest loss by far, more than 55% of the total loss for the county.

Table 6-17 provides a summary of the anticipated building-related losses. All figures are expressed in millions of dollars.

Table 6-17: Building-Related Economic Loss Estimates

Area	Single-Family	Other Residential	Commercial	Industrial	Other	Total
Income Losses						
Wage	0.00	1.63	20.24	1.51	1.80	25.18
Capital Related	0.00	0.69	16.74	0.92	0.50	18.84
Rental	5.89	4.01	9.61	0.53	0.75	20.79
Relocation	21.37	4.09	15.44	2.24	6.58	49.73
Capital Stock Losses						
Structural	52.04	8.56	27.15	10.43	13.77	111.95
Non-Structural	208.89	44.39	79.50	36.45	29.71	398.94
Content	84.07	13.27	44.99	26.19	17.83	186.34
Inventory	0.00	0.00	1.31	5.28	0.63	7.22
TOTAL	***372.25***	***76.64***	***214.98***	***83.55***	***71.56***	***818.99***

Transportation and Utility Lifeline Losses

Earthquakes often cause extensive damage to a community's infrastructure. Tables 6-18 and 6-19 depict the potential damage Mercer County could expect to its transportation and utility systems. Loss figures address only the cost to repair, not business interruption costs. Numbers are expressed in millions of dollars.

Table 6-18: Transportation System Economic Losses

System	Component	Inventory Value	Economic Loss
Highway	Segments	489.60	$0.00M
	Bridges	85.75	$3.33M
Railways	Segments	36.39	$0.00M
Airport	Facilities	10.65	$5.22M
	Runways	37.96	$0.00M
Total		***660.40***	***$8.50M***

Table 6-19: Utility System Economic Losses

System	Component	Inventory Value	Economic Loss
Potable Water	Distribution Lines	31.70	$1.10M
Wastewater	Facilities	839.20	$231.07M
	Distribution Lines	19.00	$0.79M
Natural Gas	Distribution Lines	12.70	$0.23M
Communication	Facilities	0.30	$0.14M
Total		***902.87***	***$233.33M***

6.3 NATIONAL RISK INDEX

The National Risk Index an online mapping application that identifies the risk communities have for 18 natural hazards. Reports are available on a countywide basis and assess overall risk, expected annual loss, social vulnerability, and community resilience. The Mercer County Community Report referenced in Section 2.0 Hazard Identification and Risk Assessment is included here.

National Risk Index

January 06, 2022

Mercer County, Ohio

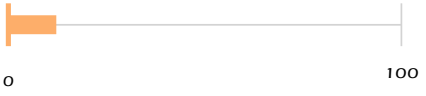
Summary

Risk Index is Very Low

Score 6.57

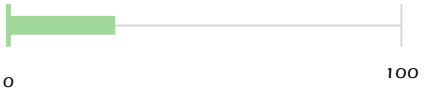
Expected Annual Loss is Relatively Low

Score 12.44



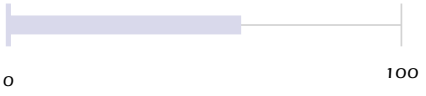
Social Vulnerability is Relatively Low

Score 27.28



Community Resilience is Very High

Score 59.63

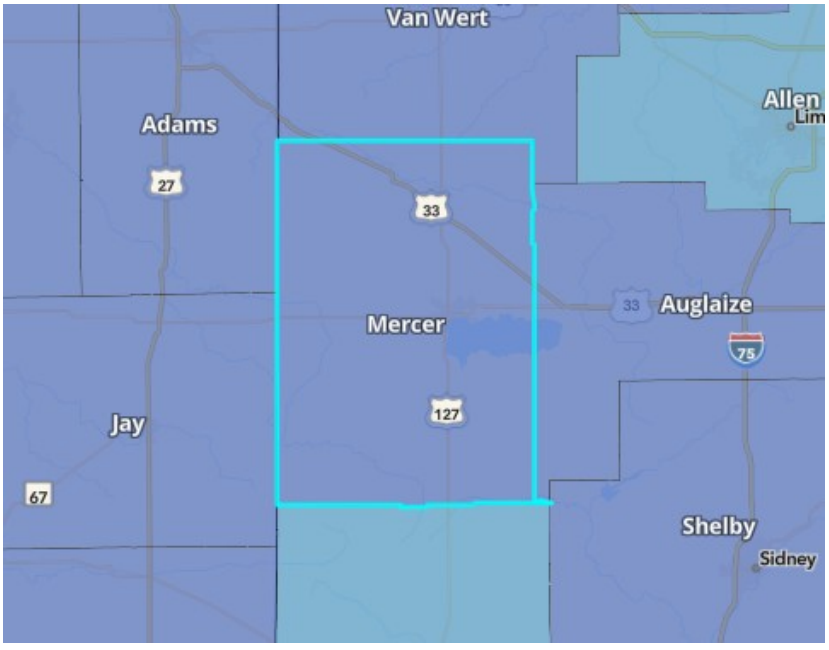


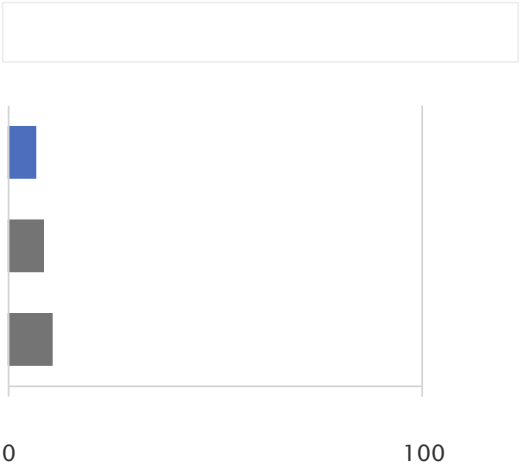
While reviewing this report, keep in mind that low risk is driven by lower loss due to natural hazards, lower social vulnerability, and higher community resilience.

For more information about the National Risk Index, its data, and how to interpret the information it provides, please review the About the National Risk Index and How to Take Action sections at the end of this report. Or, visit the National Risk Index website at hazards.fema.gov/nri/learn-more to access supporting documentation and links.

Risk Index

The Risk Index rating is Very Low for Mercer County, OH when compared to the rest of the U.S.





23.9% of U.S. counties have a lower Risk Index

30.6% of counties in Ohio have a lower Risk Index

Risk Index Legend

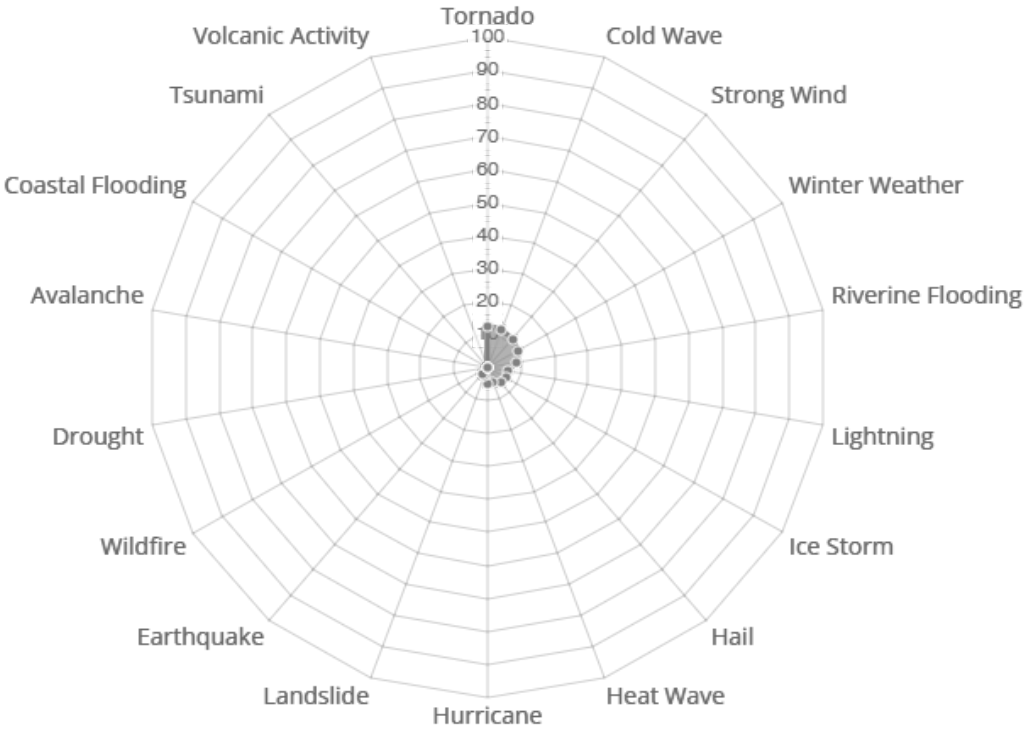
Very High
Relatively High
Relatively Moderate
Relatively Low
Very Low
No Rating
Not Applicable
Insuffcient Data

Hazard Type RiskIndex

Hazard type Risk Index scores are calculated using data for only a single hazard type, and reflect a community's relative risk for only that hazard type.

Hazard Type	Risk Index Rating	Risk Index Score
Avalanche	Not Applicable	--
Coastal Flooding	Not Applicable	--
Cold Wave	Relatively Low	12.22
Drought	No Rating	0.00
Earthquake	Very Low	2.37
Hail	Very Low	5.95
Heat Wave	Relatively Low	4.95
Hurricane	Relatively Low	4.89
Ice Storm	Very Low	6.20
Landslide	Very Low	2.79
Lightning	Very Low	6.28
Riverine Flooding	Relatively Low	8.81
Strong Wind	Relatively Low	11.23
Tornado	Relatively Low	12.42
Tsunami	Not Applicable	--
Volcanic Activity	Not Applicable	--

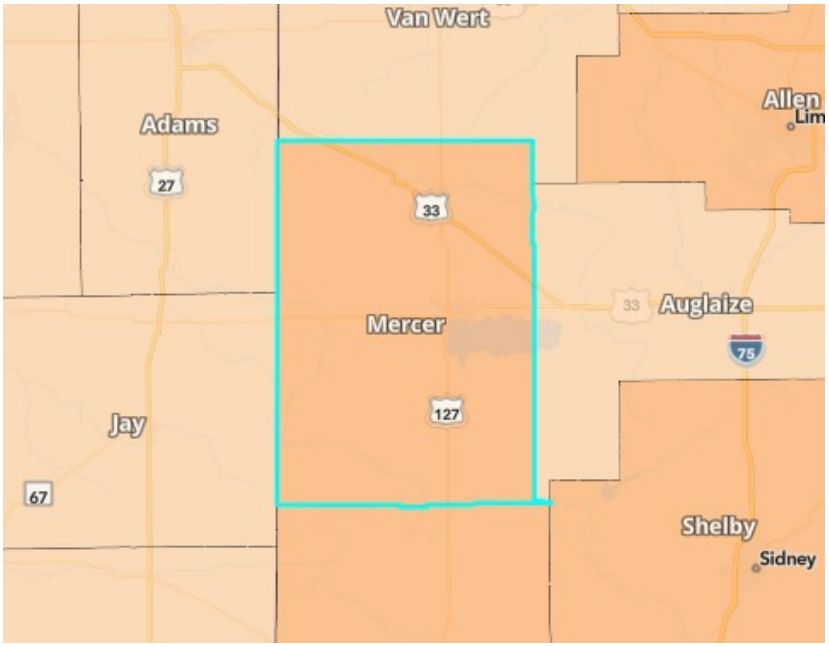
Wildfire	Very Low	0.06	0 100
Winter Weather	Relatively Low	10.40	0 100

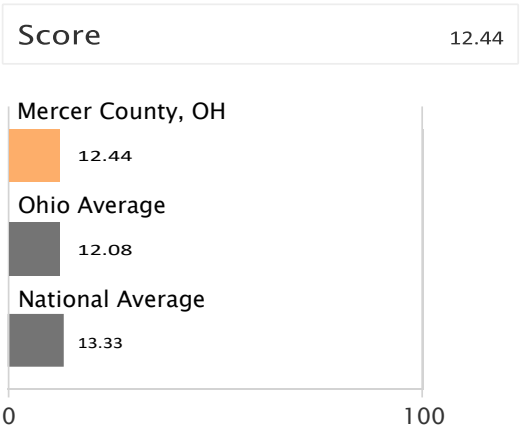


The chart above demonstrates the relative distribution of hazard type Risk Index scores for Mercer County, OH. Risk Index scores are plotted for each hazard type included in the National Risk Index. Higher relative risk corresponds to larger colored areas inside a given hazard type chart slice.

Expected Annual Loss

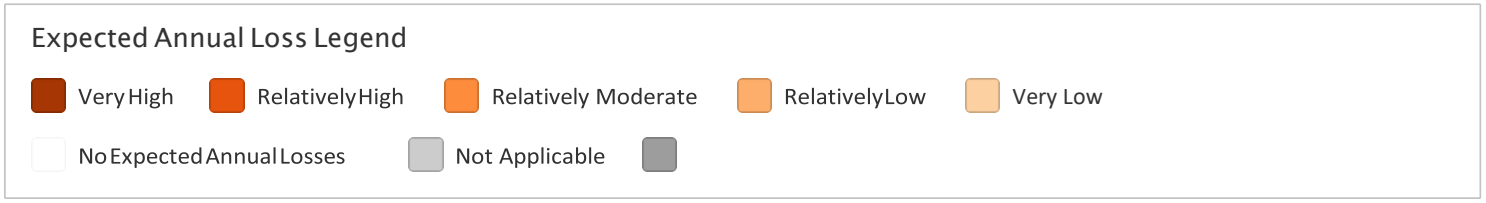
In Mercer County, OH, expected loss each year due to natural hazards is Relatively Low when compared to the rest of the U.S.





56.7% of U.S. counties have a lower Expected Annual Loss

69.3% of counties in Ohio have a lower Expected Annual Loss



Composite Expected Annual Loss	$3,933,666.68

Building Value	$1,578,496.67	Population	0.14 fatalities
Population Equivalence	$1,093,162.39	Agriculture Value	$1,262,007.61

Expected Annual Loss for Hazard Types

Expected Annual Loss scores for hazard types are calculated using data for only a single hazard type, and reflect a community's relative expected annual loss for only that hazard type. 14 of 18 hazard types contribute to the expected annual loss for Mercer County, OH.

Hazard Type	Expected Annual Loss Rating	Expected Annual Loss Score
Avalanche	Not Applicable	--
Coastal Flooding	Not Applicable	--
Cold Wave	Relatively Low	20.77
Drought	No Expected Annual Losses	0.00
Earthquake	Relatively Low	4.49
Hail	Relatively Low	10.54
Heat Wave	Relatively Low	8.95
Hurricane	Relatively Low	7.96
Ice Storm	Relatively Low	13.07
Landslide	Very Low	5.78
Lightning	Relatively Low	15.31
Riverine Flooding	Relatively Moderate	14.35
Strong Wind	Relatively Moderate	31.56
Tornado	Relatively Moderate	20.23
Tsunami	Not Applicable	--
Volcanic Activity	Not Applicable	--

Wildfire	Very Low	0.09	0 100
Winter Weather	Relatively Moderate	21.08	0 100

Expected Annual Loss Values

Hazard Type	Total Value	Building Value	Population Equivalence	Population Value	Agriculture Value
Avalanche	--	--	--	--	--
Coastal Flooding	--	--	--	--	--
Cold Wave	$58,332	$1,330	$28,814	0.00	$28,188
Drought	$0	n/a	n/a	n/a	$0
Earthquake	$145,021	$136,563	$8,459	0.00	n/a
Hail	$78,538	$2,872	$375	0.00	$75,291
Heat Wave	$50,322	$552	$18,168	0.00	$31,602
Hurricane	$263,346	$2,422	$1,621	0.00	$259,303
Ice Storm	$24,538	$2,435	$22,103	0.00	n/a
Landslide	$1,680	$53	$1,627	0.00	n/a
Lightning	$40,020	$9,069	$30,951	0.00	n/a
Riverine Flooding	$1,479,919	$402,430	$217,500	0.03	$859,989
Strong Wind	$563,722	$229,237	$334,008	0.04	$477
Tornado	$1,167,933	$772,423	$390,761	0.05	$4,749
Tsunami	--	--	--	--	--
Volcanic Activity	--	--	--	--	--
Wildfire	$0	$0	$0	0.00	$0
Winter Weather	$60,296	$19,112	$38,776	0.01	$2,409

Exposure Values

Hazard Type	Total Value	Building Value	Population Equivalence	Population	Agriculture Value
Avalanche	--	--	--	--	--
Coastal Flooding	--	--	--	--	--
Cold Wave	$315,713,125,721	$4,895,263,772	$310,186,249,949	40,813.98	$631,612,000
Drought	$0	n/a	n/a	n/a	$0
Earthquake	$315,081,665,000	$4,895,265,000	$310,186,400,000	40,814.00	n/a
Hail	$315,713,277,000	$4,895,265,000	$310,186,400,000	40,814.00	$631,612,000
Heat Wave	$315,713,125,721	$4,895,263,772	$310,186,249,949	40,813.98	$631,612,000
Hurricane	$315,275,745,504	$4,890,288,135	$309,773,663,807	40,759.69	$611,793,562
Ice Storm	$313,521,994,969	$4,869,088,107	$308,652,906,862	40,612.22	n/a
Landslide	$6,731,548,940	$86,004,909	$6,645,544,031	874.41	n/a
Lightning	$315,081,665,000	$4,895,265,000	$310,186,400,000	40,814.00	n/a
Riverine Flooding	$10,269,567,921	$213,995,074	$10,019,533,101	1,318.36	$36,039,746
Strong Wind	$315,713,277,000	$4,895,265,000	$310,186,400,000	40,814.00	$631,612,000
Tornado	$315,713,277,000	$4,895,265,000	$310,186,400,000	40,814.00	$631,612,000
Tsunami	--	--	--	--	--
Volcanic Activity	--	--	--	--	--
Wildfire	$12,029,556	$122,443	$11,864,856	1.56	$42,257
Winter Weather	$315,713,125,721	$4,895,263,772	$310,186,249,949	40,813.98	$631,612,000

Annualized Frequency Values

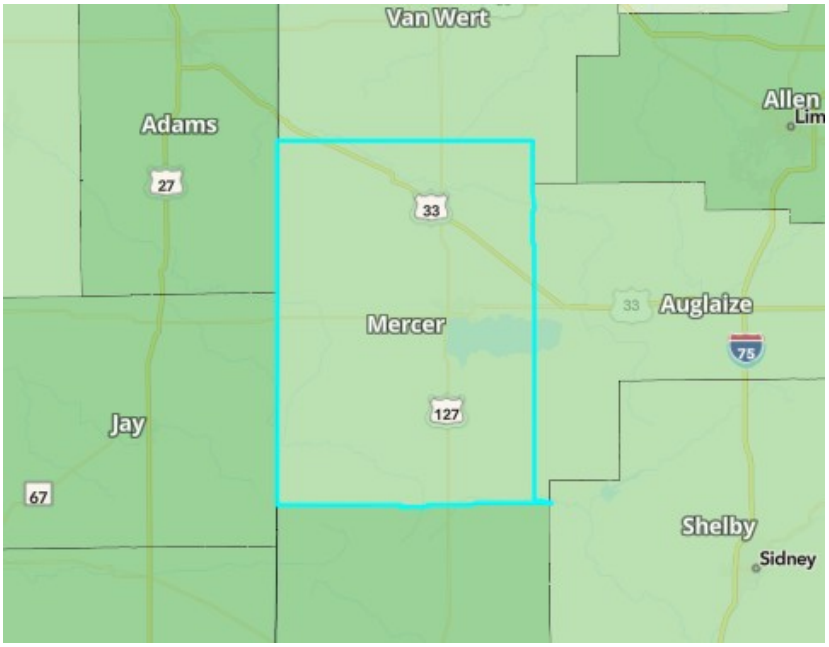
Hazard Type	Annualized Frequency	Events on Record	Period of Record
Avalanche	--	--	--
Coastal Flooding	--	--	--
Cold Wave	0.9 events per year	11	2005-2017 (12 years)
Drought	0 events per year	0	2000-2017 (18 years)
Earthquake	0.074% chance per year	n/a	2017 dataset
Hail	3.9 events per year	125	1986-2017 (32 years)
Heat Wave	0.9 events per year	11	2005-2017 (12 years)
Hurricane	0 events per year	2	East 1851-2017 (167 years) / West 1949-2017 (69 years)
Ice Storm	0.7 events per year	50	1946-2014 (67 years)
Landslide	0 events per year	0	2010-2019 (10 years)
Lightning	71.3 events per year	1,569	1991-2012 (22 years)
Riverine Flooding	2.4 events per year	57	1996-2019 (24 years)
Strong Wind	3.5 events per year	112	1986-2017 (32 years)
Tornado	0.3 events per year	17	1986-2019 (34 years)
Tsunami	--	--	--
Volcanic Activity	--	--	--
Wildfire	Less than 0.001% chance per year	n/a	2016 dataset
Winter Weather	3.3 events per year	40	2005-2017 (12 years)

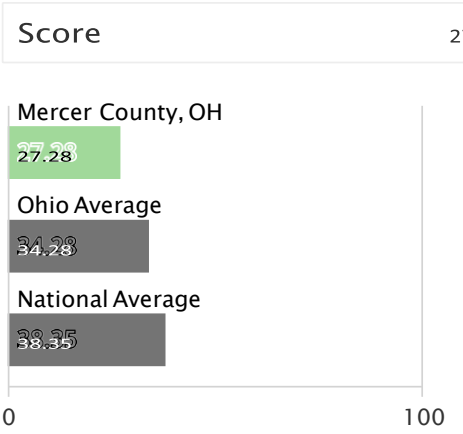
Historic Loss Ratios

Hazard Type	Overall Rating	Building Value	Population	Agriculture Value
Avalanche	--	--	--	--
Coastal Flooding	--	--	--	--
Cold Wave	Very Low	$3.00 per $10M	1.03 per 10M	$4.93 per $100K
Drought	No Rating	n/a	n/a	$1.30 per $1K
Earthquake	Relatively Low	$1.15 per $1B	1.40 per 10K	n/a
Hail	Very Low	$1.51 per $10M	3.10 per 10B	$3.07 per $100K
Heat Wave	Very Low	$1.24 per $10M	6.46 per 100M	$5.52 per $100K
Hurricane	Relatively Moderate	$4.14 per $100K	4.37 per 10M	$3.54 per $100
Ice Storm	Very Low	$6.72 per $10M	9.62 per 100M	n/a
Landslide	Very Low	$6.13 per $100K	2.45 per 100K	n/a
Lightning	Very Low	$2.66 per $100M	1.43 per 1B	n/a
Riverine Flooding	Very Low	$7.92 per $10K	9.14 per 1M	$1.00 per $100
Strong Wind	Very Low	$1.35 per $100K	3.10 per 10M	$2.17 per $10M
Tornado	Very Low	$5.27 per $10K	4.21 per 1M	$2.51 per $100K
Tsunami	--	--	--	--
Volcanic Activity	--	--	--	--
Wildfire	Very Low	$4.00 per $10	6.04 per 10K	$1.36 per $100
Winter Weather	Very Low	$1.18 per $1M	3.79 per 100M	$1.16 per $1M

Social Vulnerability

Social groups in Mercer County, OH have a Relatively Low susceptibility to the adverse impacts of natural hazards when compared to the rest of the U.S.





14.0% of U.S. counties have a lower Social Vulnerability

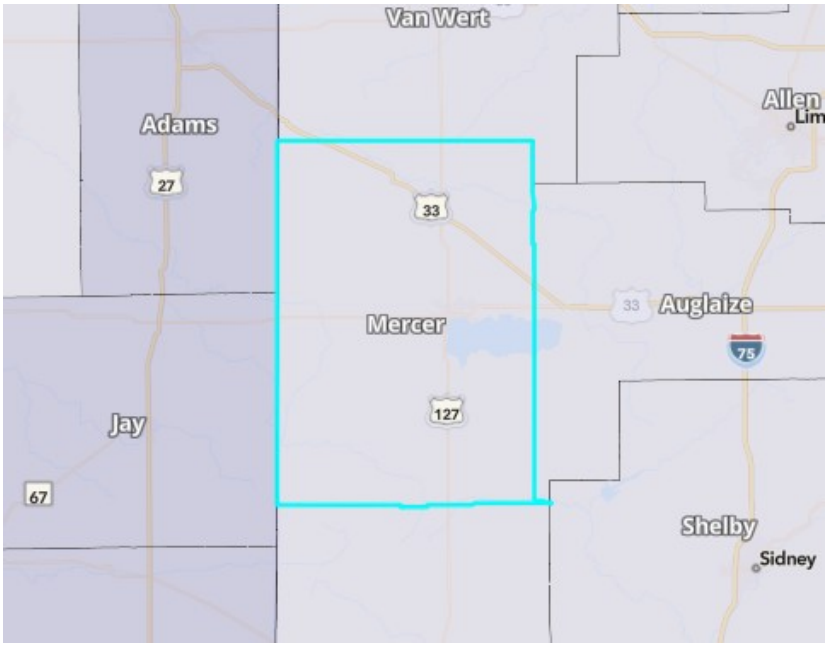
14.7% of counties in Ohio have a lower Social Vulnerability

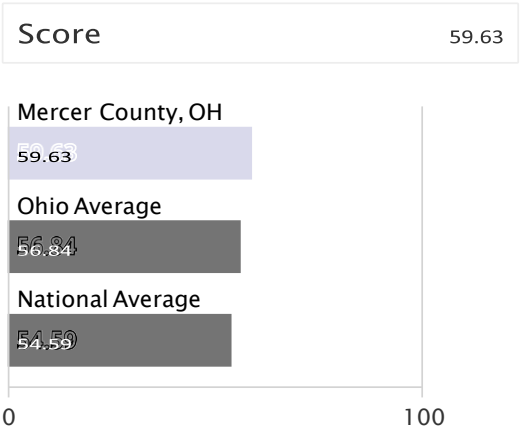
Social Vulnerability Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low | Data Unavailable

Community Resilience

Communities in Mercer County, OH have a Very High ability to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions when compared to the rest of the U.S.





3.2% of U.S. counties have a higher Community Resilience

4.6% of counties in Ohio have a higher Community Resilience

Community Resilience Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low | Data Unavailable

About the National Risk Index

The National Risk Index is a dataset and online tool to help illustrate the United States communities most at risk for 18 natural hazards: Avalanche, Coastal Flooding, Cold Wave, Drought, Earthquake, Hail, Heat Wave, Hurricane, Ice Storm, Landslide, Lightning, Riverine Flooding, Strong Wind, Tornado, Tsunami, Volcanic Activity, Wildfire, and Winter Weather.

The National Risk Index leverages available source data for Expected Annual Loss due to these 18 hazard types, Social Vulnerability, and Community Resilience to develop a baseline relative risk measurement for each United States county and Census tract. These measurements are calculated using average past conditions, but they cannot be used to predict future outcomes for a community. The National Risk Index is intended to fill gaps in available data and analyses to better inform federal, state, local, tribal, and territorial decision makers as they develop risk reduction strategies.

Explore the National Risk Index Map at hazards.fema.gov/nri/map.

Visit the National Risk Index website at hazards.fema.gov/nri/learn-more to access supporting documentation and links.

Calculating the Risk Index

Risk Index scores are calculated using an equation that combines scores for Expected Annual Loss due to natural hazards, Social Vulnerability and Community Resilience:

$$\text{Risk Index} = \text{Expected Annual Loss} \times \text{Social Vulnerability} \div \text{Community Resilience}$$

Risk Index scores are presented as a composite score for all 18 hazard types, as well as individual scores for each hazard type. For more information, visit hazards.fema.gov/nri/determining-risk.

Calculating Expected Annual Loss

Expected Annual Loss scores are calculated using an equation that combines values for exposure, annualized frequency, and historic loss ratios for 18 hazard types:

$$\text{Expected Annual Loss} = \text{Exposure} \times \text{Annualized Frequency} \times \text{Historic Loss Ratio}$$

Expected Annual Loss scores are presented as a composite score for all 18 hazard types, as well as individual scores for each hazard type.

For more information, visit hazards.fema.gov/nri/expected-annual-loss.

Calculating Social Vulnerability

Social Vulnerability is measured using the Social Vulnerability Index (SoVI) published by the University of South Carolina's Hazards and Vulnerability Research Institute (HVRI).

For more information, visit hazards.fema.gov/nri/social-vulnerability.

Calculating Community Resilience

Community Resilience is measured using the Baseline Resilience Indicators for Communities (HVRI BRIC) published by the University of South Carolina's Hazards and Vulnerability Research Institute (HVRI).

For more information, visit hazards.fema.gov/nri/community-resilience.

How to TakeAction

There are many ways to reduce natural hazard risk through mitigation. Communities with high National Risk Index scores can take action to reduce risk by decreasing Expected Annual Loss due to natural hazards, decreasing Social Vulnerability, and increasing Community Resilience.

For information about how to take action and reduce your risk, visit hazards.fema.gov/nri/take-action.

Disclaimer

The National Risk Index (the Risk Index or the Index) and its associated data are meant for planning purposes only. This tool was created for broad nationwide comparisons and is not a substitute for localized risk assessment analysis. Nationwide datasets used as inputs for the National Risk Index are, in many cases, not as accurate as available local data. Users with access to local data for each National Risk Index risk factor should consider substituting the Risk Index data with local data to recalculate a more accurate risk index. If you decide to download the National Risk Index data and substitute it with local data, you assume responsibility for the accuracy of the data and any resulting data index. Please visit the Contact Us page if you would like to discuss this process further.

The methodology used by the National Risk Index has been reviewed by subject matter experts in the fields of natural hazard risk research, risk analysis, mitigation planning, and emergency management. The processing methods used to create the National Risk Index have produced results similar to those from other natural hazard risk analyses conducted on a smaller scale. The breadth and combination of geographic information systems (GIS) and data processing techniques leveraged by the National Risk Index enable it to incorporate multiple hazard types

and risk factors, manage its nationwide scope, and capture what might have been missed using other methods.

The National Risk Index does not consider the intricate economic and physical interdependencies that exist across geographic regions. Keep in mind that hazard impacts in surrounding counties or Census tracts can cause indirect losses in your community regardless of your community's risk profile.

Nationwide data available for some risk factors are rudimentary at this time. The National Risk Index will be continuously updated as new data become available and improved methodologies are identified.

The National Risk Index Contact Us page is available at hazards.fema.gov/nri/contact-us.