

Leelanau County, MI

Risk-assessment baseline packet

Unit **County area 26089** Release **2026-10** As of **2026-09-28** Storm Events data through **2026-06-30**

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A starting point for the plan's risk assessment (FEMA Local Mitigation Plan Review Tool, Element B). It does not replace local data or FEMA review. Section headings say which FEMA review item each table supports; whether an item is satisfied is decided by the plan and its reviewers.

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Plan clock

Status	Approved, expires 2029-09-23	Plan	Leelanau County HMP Update (FEMA plan 109435)
Approved	2024-09-24	Expires	2029-09-23
As of	2026-09-28	Days	1,091 days to expiry

What changed since your last plan (approved 2024-09-24)

New federal declarations	none (0 declaration rows; 0 counted incidents)	Storm Events records since approval	10 (data through 2026-06-30)
Repetitive loss now	FMA RL 0, SRL 0 (44 CFR 77.2); any definition: 0	Repeat-flood change	First release: no prior release to compare.

SOURCES: FEMA, OpenFEMA HazardMitigationPlanStatuses v1, version 2026-09-26T121003Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/HazardMitigationPlanStatuses> (API); FEMA, OpenFEMA DisasterDeclarationsSummaries v2, version 2026-09-27T010817Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v2/DisasterDeclarationsSummaries> (API); NOAA NCEI, NOAA NCEI Storm Events Database, details files (csvfiles v1.0), version c20260918, pulled 2026-09-28, <https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/>; FEMA, OpenFEMA NfipMultipleLossProperties v1, version 2026-08-04T164045Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/NfipMultipleLossProperties> (API)

Plan status for every jurisdiction listed in this county: 15 rows, in the section "Plan clock: Plan status for every jurisdiction listed in this county" after these cover pages.

State plan status and tribal plans in this state: see the state page.

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Plan clock

Plan status for every jurisdiction listed in this county

Jurisdiction	Type	Status	Plan	Approved	Expires	Days to expiry negative = days since expiry	Update underway	Notes
Leelanau County	County	Approved, expires 2029-09-23	Leelanau County HMP Update (FEMA plan 109435)	2024-09-24	2029-09-23	1,091		
Empire village	Village	Approved, expires 2029-09-23	Leelanau County HMP Update (FEMA plan 109435)	2024-09-24	2029-09-23	1,091		
Northport village	Village	Approved, expires 2029-09-23	Leelanau County HMP Update (FEMA plan 109435)	2024-09-24	2029-09-23	1,091		member approved 2024-10-10
Suttons Bay village	Village	Approved, expires 2029-09-23	Leelanau County HMP Update (FEMA plan 109435)	2024-09-24	2029-09-23	1,091		
Bingham township	Township	Approved, expires 2029-09-23	Leelanau County HMP Update (FEMA plan 109435)	2024-09-24	2029-09-23	1,091		
Centerville township	Township	Approved, expires 2029-09-23	Leelanau County HMP Update (FEMA plan 109435)	2024-09-24	2029-09-23	1,091		
Cleveland township	Township	Approved, expires 2029-09-23	Leelanau County HMP Update (FEMA plan 109435)	2024-09-24	2029-09-23	1,091		
Elmwood charter township	Township	Approved, expires 2029-09-23	Leelanau County HMP Update (FEMA plan 109435)	2024-09-24	2029-09-23	1,091		
Empire township	Township	Approved, expires 2029-09-23	Leelanau County HMP Update (FEMA plan 109435)	2024-09-24	2029-09-23	1,091		
Glen Arbor township	Township	Approved, expires 2029-09-23	Leelanau County HMP Update (FEMA plan 109435)	2024-09-24	2029-09-23	1,091		
Kasson township	Township	Approved, expires 2029-09-23	Leelanau County HMP Update (FEMA plan 109435)	2024-09-24	2029-09-23	1,091		member approved 2024-10-10
Leelanau township	Township	Approved, expires 2029-09-23	Leelanau County HMP Update (FEMA plan 109435)	2024-09-24	2029-09-23	1,091		member approved 2024-10-10
Leland township	Township	Approved, expires 2029-09-23	Leelanau County HMP Update (FEMA plan 109435)	2024-09-24	2029-09-23	1,091		
Solon township	Township	Approved, expires 2029-09-23	Leelanau County HMP Update (FEMA plan 109435)	2024-09-24	2029-09-23	1,091		member approved 2024-10-10
Suttons Bay township	Township	Approved, expires 2029-09-23	Leelanau County HMP Update (FEMA plan 109435)	2024-09-24	2029-09-23	1,091		

SOURCE

FEMA, OpenFEMA HazardMitigationPlanStatuses v1, version 2026-09-26T121003Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/HazardMitigationPlanStatuses> (API)

Supports B1-a: hazards

Hazards NRI does not cover: check locally

- dam failure (incl. upstream dams)
- levee failure
- flash flood as its own subtype
- ice jams
- debris flows
- erosion (riverine and coastal)
- land subsidence and sinkholes
- expansive soils

The 18 National Risk Index hazards, ranked by expected annual loss (EAL)

Rank by EAL	Hazard	NRI risk rating	EAL rating	EAL buildings <i>modeled dollars per year</i>	EAL agriculture <i>modeled dollars per year</i>	EAL population equivalence <i>statistical value of life and injury, \$13.7M per life, not property damage</i>	EAL total (see note) <i>modeled dollars per year</i>	Storm Events records since 1996 <i>count</i>	Evidence for an omission <i>NRI Not Applicable, no declaration and no Storm Events record since 1996</i>	Storm Events coverage note
1	Cold Wave	Relatively High	Relatively High	\$175	\$1,889,111	\$7,149,598	\$9,038,884	4		Includes 1 Frost/Freeze record, event types the NRI definition of this hazard leaves out.
2	Inland Flooding	Relatively Low	Relatively Low	\$5,249,927	\$30	\$409	\$5,250,366	8		
3	Winter Weather	Relatively High	Relatively High	\$2,146	\$621	\$415,893	\$418,660	142		
4	Strong Wind	Relatively Low	Relatively Low	\$203,473	\$1,105	\$38,815	\$243,393	59		Includes 13 High Wind records and 3 Strong Wind records, event types the NRI definition of this hazard leaves out.
5	Tornado	Very Low	Very Low	\$151,412	\$153	\$70,568	\$222,133	1		
6	Hail	Relatively Low	Relatively Low	\$99,337	\$64,348	\$12,185	\$175,870	37		
7	Lightning	Relatively Low	Relatively Low	\$5,541		\$108,784	\$114,325	2		
8	Heat Wave	Very Low	Very Low	\$477	under \$1	\$47,316	\$47,793	2		
9	Landslide	Relatively Low	Relatively Low	\$1,759		\$12,988	\$14,746	0		No recorded events in Storm Events since 1996 (data through 2026-06-30). Storm Events coverage of this hazard is limited; absence is not evidence of low risk.
10	Coastal Flooding	Very Low	Very Low	\$9,666		\$463	\$10,129	0		No recorded events in Storm Events since 1996 (data through 2026-06-30).
11	Wildfire	Very Low	Very Low	\$4,745	\$4	\$344	\$5,093	0		No recorded events in Storm Events since 1996 (data through 2026-06-30). Storm Events coverage of this hazard is limited; absence is not evidence of low risk.
12	Earthquake	Very Low	Very Low	\$3,042		\$643	\$3,684			Not in Storm Events. Storm Events coverage of this hazard is limited; absence is not evidence of low risk.

Rank by EAL	Hazard	NRI risk rating	EAL rating	EAL buildings <i>modeled dollars per year</i>	EAL agriculture <i>modeled dollars per year</i>	EAL population equivalence <i>statistical value of life and injury, \$13.7M per life, not property damage</i>	EAL total (see note) <i>modeled dollars per year</i>	Storm Events records since 1996 <i>count</i>	Evidence for an omission <i>NRI Not Applicable, no declaration and no Storm Events record since 1996</i>	Storm Events coverage note
13	Hurricane	Very Low	Very Low	\$1,826	\$738	under \$1	\$2,564	0		No recorded events in Storm Events since 1996 (data through 2026-06-30).
14	Ice Storm	Very Low	Very Low	\$920		\$1,518	\$2,438	4		
15	Drought	No Rating	No Expected Annual Losses		\$0		\$0	1		
	Avalanche	Not Applicable	Not Applicable					0	NRI rates avalanche Not Applicable for this county, and no federal declaration for this county names it.	No recorded events in Storm Events since 1996 (data through 2026-06-30).
	Tsunami	Insufficient Data	Insufficient Data					0		No recorded events in Storm Events since 1996 (data through 2026-06-30). Storm Events coverage of this hazard is limited; absence is not evidence of low risk.
	Volcanic Activity	Not Applicable	Not Applicable					0	NRI rates volcanic activity Not Applicable for this county, and no federal declaration for this county names it.	No recorded events in Storm Events since 1996 (data through 2026-06-30). Storm Events coverage of this hazard is limited; absence is not evidence of low risk.

Total = buildings + agriculture + population equivalence; FEMA values each expected death (or 10 injuries) at \$13.7 million (2024 dollars).

SOURCES
FEMA, FEMA National Risk Index 1.20.0 (December 2025), county and census tract tables, version 1.20.0, pulled 2026-09-28, https://www.fema.gov/about/reports-and-data/openfema/nri/v120/NRI_Table_Counties.zip (download, 25 MB), https://www.fema.gov/about/reports-and-data/openfema/nri/v120/NRI_Table_CensusTracts.zip (download, 635 MB)
NOAA NCEI, NOAA NCEI Storm Events Database, details files (csvfiles v1.0), version c20260918, pulled 2026-09-28, <https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/>

Check your state hazard mitigation plan's hazard list for this county; explain any hazard you drop.

Supports B1-b: location

Where each hazard occurs

Hazard	Location	Census tracts rated <i>rated of all tracts</i>
Avalanche	Census tract rating counts from the National Risk Index tract table (see B1-f). Tract maps and place names are not in this packet.	0 of 9
Coastal Flooding	The FEMA Flood Insurance Rate Map (FIRM) is the required location source for flooding. See the FEMA Flood Map Service Center (https://msc.fema.gov) for this county.	9 of 9
Cold Wave	Affects the whole planning area; national data do not distinguish locations within the county. Confirm locally.	9 of 9
Drought	Affects the whole planning area; national data do not distinguish locations within the county. Confirm locally.	0 of 9
Earthquake	Census tract rating counts from the National Risk Index tract table (see B1-f). Tract maps and place names are not in this packet.	9 of 9
Hail	Affects the whole planning area; national data do not distinguish locations within the county. Confirm locally.	9 of 9
Heat Wave	Affects the whole planning area; national data do not distinguish locations within the county. Confirm locally.	9 of 9
Hurricane	Census tract rating counts from the National Risk Index tract table (see B1-f). Tract maps and place names are not in this packet.	9 of 9

Hazard	Location	Census tracts rated <i>rated of all tracts</i>
Ice Storm	Affects the whole planning area; national data do not distinguish locations within the county. Confirm locally.	9 of 9
Inland Flooding	The FEMA Flood Insurance Rate Map (FIRM) is the required location source for flooding. See the FEMA Flood Map Service Center (https://msc.fema.gov) for this county.	9 of 9
Landslide	Census tract rating counts from the National Risk Index tract table (see B1-f). Tract maps and place names are not in this packet.	9 of 9
Lightning	Affects the whole planning area; national data do not distinguish locations within the county. Confirm locally.	9 of 9
Strong Wind	Affects the whole planning area; national data do not distinguish locations within the county. Confirm locally.	9 of 9
Tornado	Census tract rating counts from the National Risk Index tract table (see B1-f). Tract maps and place names are not in this packet.	9 of 9
Tsunami	Census tract rating counts from the National Risk Index tract table (see B1-f). Tract maps and place names are not in this packet.	0 of 9
Volcanic Activity	Census tract rating counts from the National Risk Index tract table (see B1-f). Tract maps and place names are not in this packet.	0 of 9
Wildfire	Census tract rating counts from the National Risk Index tract table (see B1-f). Tract maps and place names are not in this packet.	9 of 9
Winter Weather	Affects the whole planning area; national data do not distinguish locations within the county. Confirm locally.	9 of 9

SOURCE
FEMA, FEMA National Risk Index 1.20.0 (December 2025), county and census tract tables, version 1.20.0, pulled 2026-09-28, https://www.fema.gov/about/reports-and-data/openfema/nri/v120/NRI_Table_Counties.zip (download, 25 MB), https://www.fema.gov/about/reports-and-data/openfema/nri/v120/NRI_Table_CensusTracts.zip (download, 635 MB)

Supports B1-c: extent

Extent: scale, observed range and worst recorded event per hazard

Hazard	Scale	Records <i>count, years</i>	Observed range	Worst recorded event	Most damaging (when different)	How it applies to members	Note
Avalanche	none (count and damage)	0					Physical measure: in event narratives only; local data required.
Coastal Flood, Storm Surge/ Tide	none in data (FIRM for depth)	0					Flood depth: see the FEMA Flood Insurance Rate Map.
Cold/Wind Chill, Extreme Cold/Wind Chill	wind chill	3, 2007 to 2026 (3 zone-level)	1 day to 3 days (median 2 days); 3 with a recorded value	3 consecutive days, 2026-01-22 to 2026-01-24, zone-level		Zone-level records: applies countywide; national data do not locate these events within the county.	Wind chill: in event narratives only; local data required.
Frost/Freeze (outside NRI Cold Wave definition)	crop damage	1, 2012 to 2012 (1 zone-level)		Frost/Freeze, 2012-04-27, \$37,500,000 crop damage, reported for the zone (2012 dollars); NWS zone MIZ020 (LEELANAU), zone-level: may include parts of neighboring counties		Zone-level records: applies countywide; national data do not locate these events within the county.	Temperature: in event narratives only; local data required.

Hazard	Scale	Records <i>count, years</i>	Observed range	Worst recorded event	Most damaging (when different)	How it applies to members	Note
Drought	US Drought Monitor D-scale	1, 2001 to 2001 (1 zone-level)	9 days; 1 with a recorded value	9 days, 2001-08-01 to 2001-08-09, zone-level		Zone-level records: applies countywide; national data do not locate these events within the county.	Storm Events enters a drought at D2 or worse east of the Rockies and D3 or worse from the Rockies west (NWS Instruction 10-1605); NRI drought counts D3 and D4 only.
Earthquake	Modified Mercalli (local data)	0					No Storm Events record; local data required (e.g., USGS).
Hail	hail size (inches)	37, 1998 to 2025	0.75 in to 3 in (median 1 in); 37 with a recorded value	3 in hail, 2016-07-08		Event records naming member places: Suttons Bay township (8 records), Suttons Bay village (8 records), Leland township (7 records), Empire township (3 records), Empire village (3 records), Northport village (3 records), Bingham township (1 record), Glen Arbor township (1 record).	
Excessive Heat, Heat	heat index (narratives)	2, 2001 to 2018 (2 zone-level)	1 day to 9 days (median 5 days); 2 with a recorded value	9 consecutive days, 2001-08-01 to 2001-08-09, zone-level		Zone-level records: applies countywide; national data do not locate these events within the county.	Heat index: in event narratives only; local data required.
Hurricane, Tropical Storm, Tropical Depression	Saffir-Simpson	0					Storm Events files every zone of a storm's episode under the storm's event type and category, so a Hurricane (Typhoon) record, especially an inland or remnant one, does not by itself mean hurricane-force winds here; read the damage and wind columns.
Ice Storm	Sperry-Piltz (local data)	4, 2001 to 2008 (4 zone-level)		No damage reported in 4 records.		Zone-level records: applies countywide; national data do not locate these events within the county.	Ice thickness: in event narratives only; local data required.
Flash Flood, Flood, Lakeshore Flood	damage and flood days (FIRM for depth)	8, 1999 to 2023 (3 zone-level)		Lakeshore Flood, 2019-10-21, \$175,000 property; \$0 crops, reported for the zone (2019 dollars); NWS zone MIZ020 (LEELANAU), zone-level: may include parts of neighboring counties		Event records naming member places: Empire township (1 record), Empire village (1 record), Solon township (1 record). Zone-level records (3) apply countywide.	Flood depth: see the FEMA Flood Insurance Rate Map. Storm Events damage can be \$0 or blank even for a major flood, so the worst record here may not be the worst flood; compare FEMA Public Assistance by declaration in B1-d.
Debris Flow	none (count and damage)	0					Physical measure: in event narratives only; local data required.

Hazard	Scale	Records <i>count, years</i>	Observed range	Worst recorded event	Most damaging (when different)	How it applies to members	Note
Lightning	annualized frequency (the measure FEMA's Local Mitigation Planning Handbook names)	2, 2000 to 2007		Lightning, 2007-08-12, \$40,000 property; \$0 crops (2007 dollars)		No event record names a member place.	Storm Events lists lightning with damage or casualties; physical measure in event narratives only; local data required.
High Wind and Strong Wind (outside NRI Strong Wind definition)	wind speed (kt and mph)	16, 1998 to 2025 (16 zone-level)	41 kt (47 mph) to 68 kt (78 mph) (median 50 kt (58 mph)); 15 with a recorded value	68 kt (78 mph) measured gust, High Wind, 2003-11-12; NWS zone MIZ020 (LEELANAU), zone-level: may include parts of neighboring counties	High Wind, 2005-11-13, \$25,000 property; crops not reported, reported for the zone (2005 dollars)	Zone-level records: applies countywide; national data do not locate these events within the county.	
Thunderstorm Wind	wind speed (kt and mph)	52, 1975 to 2025	50 kt (58 mph) to 78 kt (90 mph) (median 52 kt (60 mph)); 47 with a recorded value	78 kt (90 mph) estimated gust, Thunderstorm Wind, 2015-08-02		Event records naming member places: Leland township (7 records), Northport village (7 records), Suttons Bay township (7 records), Suttons Bay village (7 records), Empire township (4 records), Empire village (4 records), Glen Arbor township (4 records), Solon township (2 records), Bingham township (1 record).	
Tornado	Enhanced Fujita (F before Feb 2007)	3, 1977 to 2011	F/EF0 to F/EF1 (median between F/EF0 and F/EF1); 2 with a recorded value	F1 tornado, 1977-07-31, 8.4 mi path length (records before 1996 may include the whole path; rating and listing come from the county where the tornado began), 167 yd wide, \$25,000 property; crops not recorded (1977 dollars)	Tornado, 1978-08-15, \$250,000 property; crops not recorded (1978 dollars)	Event records naming member places: Leland township (1 record).	From 1996 on, tornado records are per-county segments and length is the path length within this county (NWS Instruction 10-1605); records before 1996 may give the whole path length, including the path outside this county, and before 1996 a tornado is listed once, under the county where it began, with the whole path's rating; counties farther along the path may not list it. Length is not used to rank tornadoes.
Tsunami	none (count and damage)	0					Physical measure: in event narratives only; local data required.
Volcanic Ash, Volcanic Ashfall	Volcanic Explosivity Index (local data)	0					Physical measure: in event narratives only; local data required.
Wildfire	acres burned (local data)	0					Acres burned: in event narratives only; local data required.

Hazard	Scale	Records <i>count, years</i>	Observed range	Worst recorded event	Most damaging (when different)	How it applies to members	Note
Winter Storm, Heavy Snow, Blizzard, Lake- Effect Snow, Winter Weather, Sleet	none in data (snowfall local)	142, 1996 to 2026 (142 zone-level)		Heavy Snow, 2012-03-02, \$650,000 property; \$13,000,000 crops, reported for the zone (2012 dollars); NWS zone MIZ020 (LEELANAU), zone-level: may include parts of neighboring counties		Zone-level records: applies countywide; national data do not locate these events within the county.	Snow depth: in event narratives only; local data required.

Storm Events records are more complete after 1996; before 1996 only Tornado (from 1950), Hail and Thunderstorm Wind (from 1955) exist. Zone-level records are placed with NWS zone-county files, which exist from 2020 on; an earlier record is placed by its zone number in the nearest later file only when its zone name matches that file, records from zones NWS renumbered are placed by name or left out, and a record whose zone is in no known file is left out of every count, so counts before 2020 can be low. Some current zones are also missing from the NWS files, so recent counts can be low too.

Dollars are nominal (as reported), labeled with the year; not adjusted for inflation.

SOURCES

NOAA NCEI, NOAA NCEI Storm Events Database, details files (csvfiles v1.0), version c20260918, pulled 2026-09-28, <https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/>
NOAA National Weather Service, NWS county-public forecast zones correlation file, version bp03mr20 to bp16ap26 (11 files; newest bp16ap26), pulled 2026-09-28, <https://www.weather.gov/gis/ZoneCounty>

Supports B1-d: previous occurrences

Declaration rows 5 Counted incidents 2

Federal disaster declarations for this county

Declared	Incident began	FEMA number	Type	Title	Mapped hazard	County Public Assistance <i>federal share obligated, nominal dollars</i>	Flags	Notes
2020-03-27	2020-01-20	DR-4494-MI	Major disaster	COVID-19 PANDEMIC	Non-natural, not counted	\$75,256.40		
2020-03-13	2020-01-20	EM-3455-MI	Emergency	COVID-19	Non-natural, not counted	none found		same incident as DR-4494
2005-09-07	2005-08-29	EM-3225-MI	Emergency	HURRICANE KATRINA EVACUATION	Hurricane: evacuation support, not a local hazard event; not counted	none found		
1978-01-27	1978-01-27	EM-3057-MI	Emergency	BLIZZARDS & SNOWSTORMS	Winter Weather	none found		
1977-03-02	1977-03-02	EM-3035-MI	Emergency	DROUGHT	Drought	none found		

County Public Assistance: applicants the FEMA record places in this county, including any state agencies FEMA files there; statewide rows are listed on the state page; federal share obligated, nominal dollars.
Dollars are nominal (as reported), labeled with the year; not adjusted for inflation.

SOURCES

FEMA, OpenFEMA DisasterDeclarationsSummaries v2, version 2026-09-27T010817Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v2/DisasterDeclarationsSummaries> (API)
FEMA, OpenFEMA PublicAssistanceFundedProjectsSummaries v1, version 2026-09-26T151157Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/PublicAssistanceFundedProjectsSummaries> (API)
FEMA, OpenFEMA HazardMitigationPlanStatuses v1, version 2026-09-26T121003Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/HazardMitigationPlanStatuses> (API)

Statewide declarations

Declared	Incident began	FEMA number	Type	Title	Mapped hazard	Flags	Notes
1956-04-05	1956-04-05	DR-53-MI	Major disaster	TORNADO	Tornado		
1953-06-09	1953-06-09	DR-6-MI	Major disaster	TORNADO	Tornado		
1953-06-02	1953-06-02	DR-4-MI	Major disaster	TORNADO	Tornado		

FEMA recorded these with designated area Statewide and no county. Listed on every county page in the state; not counted with county rows.

SOURCE

FEMA, OpenFEMA DisasterDeclarationsSummaries v2, version 2026-09-27T010817Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v2/DisasterDeclarationsSummaries> (API)

Previous occurrences by hazard, with explicit no-event rows

Hazard	Storm Events records <i>full period</i>	Since plan approval records	During plan review records	Last 5 years records	Declared incidents <i>distinct incidents</i>	Declared since approval <i>distinct incidents</i>	Period	Statement
Avalanche	0	0	0	0	0	0	1996 to 2026-06-30	No recorded events, 1996 to 2026-06-30, NOAA NCEI Storm Events
Coastal Flooding	0	0	0	0	0	0	1996 to 2026-06-30	No recorded events, 1996 to 2026-06-30, NOAA NCEI Storm Events
Cold Wave	4	1	0	1	0	0	1996 to 2026-06-30	Includes 1 Frost/Freeze record, event types the NRI definition of this hazard leaves out.
Drought	1	0	0	0	1	0	1996 to 2026-06-30	
Earthquake	0	0	0	0	0	0		No Storm Events record; local data required (e.g., USGS).
Hail	37	1	0	2	0	0	1955 to 2026-06-30	
Heat Wave	2	0	0	0	0	0	1996 to 2026-06-30	
Hurricane	0	0	0	0	0	0	1996 to 2026-06-30	No recorded events, 1996 to 2026-06-30, NOAA NCEI Storm Events
Ice Storm	4	0	0	0	0	0	1996 to 2026-06-30	
Inland Flooding	8	0	0	1	0	0	1996 to 2026-06-30	
Landslide	0	0	0	0	0	0	1996 to 2026-06-30	No recorded events, 1996 to 2026-06-30, NOAA NCEI Storm Events
Lightning	2	0	0	0	0	0	1996 to 2026-06-30	
Strong Wind	68	2	0	6	0	0	1955 to 2026-06-30	Includes 13 High Wind records and 3 Strong Wind records, event types the NRI definition of this hazard leaves out.
Tornado	3	0	0	0	0	0	1950 to 2026-06-30	
Tsunami	0	0	0	0	0	0	1996 to 2026-06-30	No recorded events, 1996 to 2026-06-30, NOAA NCEI Storm Events

Hazard	Storm Events records <i>full period</i>	Since plan approval <i>records</i>	During plan review <i>records</i>	Last 5 years <i>records</i>	Declared incidents <i>distinct incidents</i>	Declared since approval <i>distinct incidents</i>	Period	Statement
Volcanic Activity	0	0	0	0	0	0	1996 to 2026-06-30	No recorded events, 1996 to 2026-06-30, NOAA NCEI Storm Events
Wildfire	0	0	0	0	0	0	1996 to 2026-06-30	No recorded events, 1996 to 2026-06-30, NOAA NCEI Storm Events
Winter Weather	142	6	1	14	1	0	1996 to 2026-06-30	

SOURCES

NOAA NCEI, NOAA NCEI Storm Events Database, details files (csvfiles v1.0), version c20260918, pulled 2026-09-28, <https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/>

FEMA, OpenFEMA DisasterDeclarationsSummaries v2, version 2026-09-27T010817Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v2/DisasterDeclarationsSummaries> (API)

NOAA National Weather Service, NWS county-public forecast zones correlation file, version bp03mr20 to bp16ap26 (11 files; newest bp16ap26), pulled 2026-09-28, <https://www.weather.gov/gis/ZoneCounty>

Notable Storm Events records

Date	Event type	Magnitude or extent	Damage <i>nominal dollars</i>	Direct deaths, injuries <i>indirect not counted</i>	Location	Flags	Why listed
2026-01-22	Extreme Cold/ Wind Chill		damage not reported	0, 0	NWS zone MIZ020 (LEELANAU), zone-level: may include parts of neighboring counties	new since last plan; within last 5 years	B1-c worst recorded: Cold/Wind Chill, Extreme Cold/Wind Chill
2019-10-21	Lakeshore Flood		\$175,000 property; \$0 crops, reported for the zone (2019 dollars)	0, 0	NWS zone MIZ020 (LEELANAU), zone-level: may include parts of neighboring counties		B1-c worst recorded: Flash Flood, Flood, Lakeshore Flood
2016-07-08	Hail	3 in	\$85,000 property; \$2,000,000 crops (2016 dollars)	0, 0	EMPIRE to GLEN ARBOR		B1-c worst recorded: Hail
2015-08-02	Thunderstorm Wind	78 kt (90 mph) estimated gust	\$18,800,000 property; \$0 crops (2015 dollars)	0, 0	GLEN HAVEN to RENNIES		B1-c worst recorded: Thunderstorm Wind
2012-04-27	Frost/Freeze		\$0 property; \$37,500,000 crops, reported for the zone (2012 dollars)	0, 0	NWS zone MIZ020 (LEELANAU), zone-level: may include parts of neighboring counties		B1-c worst recorded: Frost/Freeze (outside NRI Cold Wave definition)
2012-03-02	Heavy Snow		\$650,000 property; \$13,000,000 crops, reported for the zone (2012 dollars)	0, 0	NWS zone MIZ020 (LEELANAU), zone-level: may include parts of neighboring counties		B1-c worst recorded: Winter Storm, Heavy Snow, Blizzard, Lake-Effect Snow, Winter Weather, Sleet
2008-02-10	Extreme Cold/ Wind Chill		\$0 property; \$0 crops, reported for the zone (2008 dollars)	1, 0	NWS zone MIZ020 (LEELANAU), zone-level: may include parts of neighboring counties		deaths or injuries recorded
2007-08-12	Lightning		\$40,000 property; \$0 crops (2007 dollars)	0, 0	GREILICKVILLE		B1-c worst recorded: Lightning
2003-11-12	High Wind	68 kt (78 mph) measured gust	damage not reported	0, 0	NWS zone MIZ020 (LEELANAU), zone-level: may include parts of neighboring counties		B1-c worst recorded: High Wind and Strong Wind (outside NRI Strong Wind definition)

				Direct deaths, injuries <i>indirect not counted</i>			
Date	Event type	Magnitude or extent	Damage <i>nominal dollars</i>		Location	Flags	Why listed
2001-08-01	Heat		damage not reported	0, 0	NWS zone MIZ020 (LEELANAU), zone-level: may include parts of neighboring counties		B1-c worst recorded: Excessive Heat, Heat
2001-08-01	Drought		damage not reported	0, 0	NWS zone MIZ020 (LEELANAU), zone-level: may include parts of neighboring counties		B1-c worst recorded: Drought
1977-07-31	Tornado	F1, 8.4 mi path length (records before 1996 may include the whole path; rating and listing come from the county where the tornado began), 167 yd wide	\$25,000 property; crops not recorded (1977 dollars)	0, 0	location not recorded		B1-c worst recorded: Tornado

The full list is in the XLSX file, sheet "B1-d Storm Events history" (271 rows).

Storm Events records are more complete after 1996; before 1996 only Tornado (from 1950), Hail and Thunderstorm Wind (from 1955) exist. Zone-level records are placed with NWS zone-county files, which exist from 2020 on; an earlier record is placed by its zone number in the nearest later file only when its zone name matches that file, records from zones NWS renumbered are placed by name or left out, and a record whose zone is in no known file is left out of every count, so counts before 2020 can be low. Some current zones are also missing from the NWS files, so recent counts can be low too.

SOURCES

NOAA NCEI, NOAA NCEI Storm Events Database, details files (csvfiles v1.0), version c20260918, pulled 2026-09-28, <https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/>
NOAA National Weather Service, NWS county-public forecast zones correlation file, version bp03mr20 to bp16ap26 (11 files; newest bp16ap26), pulled 2026-09-28, <https://www.weather.gov/gis/ZoneCounty>
FEMA, OpenFEMA HazardMitigationPlanStatuses v1, version 2026-09-26T121003Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/HazardMitigationPlanStatuses> (API)

State-declared emergencies are not in federal data. Add them from your state emergency management agency.

Tribal and special-area declarations in this state are listed on the state page.

Supports B1-e: probability

Probability: FEMA annualized frequency and descriptor per hazard

		FEMA annualized frequency (modeled) <i>unit per row</i>				NRI events or days in its record period (hail, wind and tornado are area-weighted, so can be fractional)			
Hazard		Unit	In plain terms	Descriptor	Descriptor basis		NRI period	Location	Note
Avalanche		events per year					1994 to 2023 (30 years)	see B1-f	Not Applicable in NRI for this county; no descriptor.
Coastal Flooding	0.0136	events per year at a location (modeled)	about 0.014 per year at a given location in the county		Storm Events records in 0 of 30 years, 1996 to 2025 (0%)	not shown	modeled	see B1-f	No Storm Events record of this hazard, 1996 to 2025; descriptor not assigned (the NRI value is the chance at a location in the county, not how often the hazard affects the county)
Cold Wave	0.789	event-days per year	about 0.789 days per year	Possible	event-days in 2 of 30 years, 1996 to 2025 (6.67%)	15	2005-11-12 to 2024-11-12 (19 years)	countywide	Frost/Freeze records are not counted in this descriptor: they record crop freezes, not cold waves.

Hazard	FEMA annualized frequency (modeled) <i>unit per row</i>	Unit	In plain terms	Descriptor	Descriptor basis	NRI events or days in its record period (hail, wind and tornado are area- weighted, so can be fractional)	NRI period	Location	Note
Drought	0	event-days per year	none modeled	Possible	event-days in 1 of 30 years, 1996 to 2025 (3.33%)	0	2000 to 2025 (25.25 years; D3 and D4 only)	countywide	NRI models no drought event-days here (2000 to 2025, 25.25 years; D3 and D4 only), but Storm Events has a record in 1 of 30 years. The descriptor comes from Storm Events, which records events NRI's definition leaves out, so the two use different thresholds; read them together.
Earthquake	0.00026	annual probability at a location	chance a given location in the county has at least minor-damage shaking in a year: 0.026%			not shown	modeled	see B1-f	Descriptor not assigned: the NRI value is the chance at a location in the county, not how often the hazard affects the county, and Storm Events does not record earthquakes.
Hail	0.599	events per year	about 0.6 per year	Likely	FEMA annualized frequency (modeled)	46.2 (modeled)	1986 to 2023 (38 years)	countywide	
Heat Wave	0.737	event-days per year	about 0.737 days per year	Possible	event-days in 2 of 30 years, 1996 to 2025 (6.67%)	12	2005-11-12 to 2024-11-12 (19 years)	countywide	
Hurricane	0.01	events per year	about 1 in 100 years	Possible	FEMA annualized frequency (modeled)	0	1851 to 2024 (Atlantic)	see B1-f	NRI counts hurricane and tropical storm tracks passing within storm-force wind range; federal declarations are counted separately in B1-d and need not match.
Ice Storm	0.0149	event-days per year	about 0.0149 days per year	Likely	event-days in 4 of 30 years, 1996 to 2025 (13.3%)	0	1946-12-31 to 2014-02-12 (67 years)	countywide	
Inland Flooding	0.25	event-days per year	about 0.25 days per year	Likely	event-days in 6 of 30 years, 1996 to 2025 (20%)	7	1996 to 2023 (28 years)	see B1-f	
Landslide	0.29	events per year (modeled)	about 1 in 3 years	Likely	FEMA annualized frequency (modeled)	not shown	modeled	see B1-f	
Lightning	24	days per year with a strike	about 24 days per year	Highly likely	FEMA annualized frequency (modeled)	not shown	1995 to 2023 (29 years; CONUS)	countywide	
Strong Wind	0.668	events per year	about 0.67 per year	Likely	FEMA annualized frequency (modeled)	8	1986 to 2023 (38 years)	countywide	

Hazard	FEMA annualized frequency (modeled) <i>unit per row</i>	Unit	In plain terms	Descriptor	Descriptor basis	NRI events or days in its record period (hail, wind and tornado are area-weighted, so can be fractional)	NRI period	Location	Note
Tornado	0.166	events per year	about 1 in 6 years	Likely	FEMA annualized frequency (modeled)	not shown	1950 to 2023 (EF2+); 1986 to 2023 (EF0-1)	see B1-f	
Tsunami		annual probability at the most exposed location (used in place of a county value)			Storm Events records in 0 of 30 years, 1996 to 2025 (0%)	not shown	modeled	see B1-f	No Storm Events record of this hazard, 1996 to 2025; descriptor not assigned (the NRI value is the chance at a location in the county, not how often the hazard affects the county)
Volcanic Activity		annual probability				not shown	modeled	see B1-f	Not Applicable in NRI for this county; no descriptor.
Wildfire	0.0000322	annual probability at a location	chance a given location in the county burns in a year: 0.00322%		Storm Events records in 0 of 30 years, 1996 to 2025 (0%)	not shown	modeled	see B1-f	No Storm Events record of this hazard, 1996 to 2025; descriptor not assigned (the NRI value is the chance at a location in the county, not how often the hazard affects the county)
Winter Weather	34.5	event-days per year	about 34.5 days per year	Highly likely	event-days in 29 of 30 years, 1996 to 2025 (96.7%)	656	2005-11-12 to 2024-11-12 (19 years)	countywide	

FEMA annualized frequency (modeled) comes from the National Risk Index v1.20 (December 2025). It is not recorded events divided by years, and what it measures depends on the hazard. For most hazards it estimates how often the hazard affects this county each year: it counts events or event-days (drought, heat wave, cold wave, winter weather, ice storm and inland flooding are in days per year; lightning is the number of days per year with a recorded cloud-to-ground strike, from the NOAA Storm Prediction Center daily lightning climatology); it may count events in the surrounding area (hail, strong wind, tornado, hurricane and ice storm use a 49 km grid and buffers) and is averaged over the county's area; and some hazards use a minimum value for places with no recorded event. Earthquake, wildfire and coastal flooding are different: FEMA computes them for each census block and averages them over the county, so the value is the chance (for coastal flooding, the modeled number of floods per year) at a location in the county, which is lower than the chance that the hazard strikes somewhere in the county. Earthquake is the chance of at least minor-damage shaking (U.S. Geological Survey model); wildfire is the chance that a location burns in a large fire (U.S. Forest Service burn probability); coastal flooding comes from FEMA flood zones and NOAA high-tide flooding, so it can be above 1 where high-tide flooding is frequent. Tsunami is the value at the county's most exposed location, from recorded events and modeled return periods. For these four hazards the packet gives no "1 in N years" and takes the descriptor from Storm Events (none for earthquake) unless the value is 1 or more a year. Landslide is a U.S. Geological Survey modeled county rate spread by slope susceptibility. Volcanic activity is the chance that a volcano affecting the county erupts in a year. Drought counts only extreme and exceptional drought (D3 and D4). Source: FEMA, National Risk Index Technical Documentation v1.20, sections 5.2.2 (Table 5), 5.2.3, 7.4, 10.4, 16.5, 17.1, 17.3.1, 17.5, 20.3.1, 21.4, 22.4 and 6 to 23.

SOURCES
FEMA, FEMA National Risk Index 1.20.0 (December 2025), county and census tract tables, version 1.20.0, pulled 2026-09-28, https://www.fema.gov/about/reports-and-data/openfema/nri/v120/NRI_Table_Counties.zip (download, 25 MB), https://www.fema.gov/about/reports-and-data/openfema/nri/v120/NRI_Table_CensusTracts.zip (download, 635 MB)
NOAA NCEI, NOAA NCEI Storm Events Database, details files (csvfiles v1.0), version c20260918, pulled 2026-09-28, <https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/>

Descriptor scale used in this packet (defined per unit)

Unit	Descriptor	Definition
events per year	Highly likely	1 or more per year
events per year	Likely	about once in 1 to 10 years
events per year	Possible	about once in 10 to 100 years
events per year	Unlikely	less than once in 100 years
annual probability	Likely	10% to under 100% chance in a given year

Unit	Descriptor	Definition
annual probability	Possible	1% to under 10% chance in a given year
annual probability	Unlikely	under 1% chance in a given year
event-days (share of years)	Highly likely	event-days recorded in 90% or more of years
event-days (share of years)	Likely	event-days recorded in 10% to under 90% of years
event-days (share of years)	Possible	event-days recorded in some years but under 10% of years
lightning strike-days	Highly likely	cloud-to-ground strikes on 1 or more days per year

SOURCES
FEMA, FEMA National Risk Index 1.20.0 (December 2025), county and census tract tables, version 1.20.0, pulled 2026-09-28, https://www.fema.gov/about/reports-and-data/openfema/nri/v120/NRI_Table_Counties.zip (download, 25 MB), https://www.fema.gov/about/reports-and-data/openfema/nri/v120/NRI_Table_CensusTracts.zip (download, 635 MB)
NOAA NCEI, NOAA NCEI Storm Events Database, details files (csvfiles v1.0), version c20260918, pulled 2026-09-28, <https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/>

Intensity bands: historical frequency (Storm Events)

Hazard	Band	Years	Events <i>county-coded records</i>	Years in period	Events per year <i>events / years</i>
Hail	1.00-1.99 in	1996 to 2025	21	30	0.7
Hail	2.00 in+	1996 to 2025	1	30	0.0333
Strong Wind (Thunderstorm Wind records)	50-64 kt	1996 to 2025	42	30	1.4
Strong Wind (Thunderstorm Wind records)	65 kt+	1996 to 2025	1	30	0.0333
Strong Wind (Thunderstorm Wind records)	unmeasured or below 50 kt	1996 to 2025	0	30	0
Tornado	EF0-1	1996 to 2025	1	30	0.0333
Tornado	EF2-3	1996 to 2025	0	30	0
Tornado	EF4-5	1996 to 2025	0	30	0
Tornado	unrated (EFU)	1996 to 2025	0	30	0

Hail smaller than 1 inch is not counted: on 2010-01-05 the National Weather Service raised its severe-hail threshold from 3/4 inch to 1 inch, so smaller reports became less common after 2009 (NWS Service Change Notice 09-52). NRI hail frequency uses a 0.75 inch threshold.

SOURCE
NOAA NCEI, NOAA NCEI Storm Events Database, details files (csvfiles v1.0), version c20260918, pulled 2026-09-28, <https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/>

Optional: future conditions. Not a required item in the 2025 FEMA Local Mitigation Planning Policy Guide; some states ask for it. The federal Climate Mapping for Resilience and Adaptation (CMRA) site gives county exposure to future climate conditions.

Supports B1-f: variation across the planning area

Range of census tract risk within the county

Hazard	Risk score		Median	Max	Tracts by rating	Note
	Tracts <i>rated of all</i>	min <i>NRI score, 0 to 100</i>				
Avalanche	0 of 9				Not Applicable 9	

Hazard	Tracts rated of all	Risk score min NRI score, 0 to 100	Median	Max	Tracts by rating	Note
Coastal Flooding	9 of 9	69.8	78.4	81.8	Relatively Low 6, Very Low 3	
Cold Wave	9 of 9	95.7	99.0	99.5	Very High 9	National data give a county-wide or coarse (49 km grid or NWS zone) frequency for this hazard, so they cannot show members' hazard differing. The tract range above mostly reflects where buildings and people are. Confirm locally.
Drought	0 of 9				No Rating 9	National data give a county-wide or coarse (49 km grid or NWS zone) frequency for this hazard, so they cannot show members' hazard differing. The tract range above mostly reflects where buildings and people are. Confirm locally.
Earthquake	9 of 9	0.8	2.9	4.6	Very Low 9	
Hail	9 of 9	50.3	68.7	75.1	Relatively Moderate 4, Relatively Low 5	National data give a county-wide or coarse (49 km grid or NWS zone) frequency for this hazard, so they cannot show members' hazard differing. The tract range above mostly reflects where buildings and people are. Confirm locally.
Heat Wave	9 of 9	4.2	6.4	9.7	Very Low 9	National data give a county-wide or coarse (49 km grid or NWS zone) frequency for this hazard, so they cannot show members' hazard differing. The tract range above mostly reflects where buildings and people are. Confirm locally.
Hurricane	9 of 9	20.3	25.8	28.5	Very Low 9	
Ice Storm	9 of 9	2.2	3.2	3.9	Very Low 9	National data give a county-wide or coarse (49 km grid or NWS zone) frequency for this hazard, so they cannot show members' hazard differing. The tract range above mostly reflects where buildings and people are. Confirm locally.
Inland Flooding	9 of 9	13.8	47.6	81.6	Relatively High 1, Relatively Moderate 3, Relatively Low 4, Very Low 1	
Landslide	9 of 9	90.0	93.3	95.6	Relatively Moderate 1, Relatively Low 8	
Lightning	9 of 9	39.2	52.7	65.5	Relatively Moderate 7, Relatively Low 2	National data give a county-wide or coarse (49 km grid or NWS zone) frequency for this hazard, so they cannot show members' hazard differing. The tract range above mostly reflects where buildings and people are. Confirm locally.
Strong Wind	9 of 9	46.0	64.9	73.7	Relatively Moderate 8, Relatively Low 1	National data give a county-wide or coarse (49 km grid or NWS zone) frequency for this hazard, so they cannot show members' hazard differing. The tract range above mostly reflects where buildings and people are. Confirm locally.
Tornado	9 of 9	26.7	35.1	39.5	Relatively Low 8, Very Low 1	
Tsunami	0 of 9				Insufficient Data 9	
Volcanic Activity	0 of 9				Not Applicable 9	
Wildfire	9 of 9	43.9	61.2	69.9	Relatively Low 1, Very Low 8	
Winter Weather	9 of 9	95.8	98.0	99.1	Very High 8, Relatively High 1	National data give a county-wide or coarse (49 km grid or NWS zone) frequency for this hazard, so they cannot show members' hazard differing. The tract range above mostly reflects where buildings and people are. Confirm locally.

Rated tracts only: No Rating (score 0.0), Not Applicable and Insufficient Data tracts are counted but not used for the minimum, median and maximum.

SOURCE

FEMA, FEMA National Risk Index 1.20.0 (December 2025), county and census tract tables, version 1.20.0, pulled 2026-09-28, https://www.fema.gov/about/reports-and-data/openfema/nri/v120/NRI_Table_Counties.zip (download, 25 MB), https://www.fema.gov/about/reports-and-data/openfema/nri/v120/NRI_Table_CensusTracts.zip (download, 635 MB)

Per-member block (Starter, confirm locally)

Member	Type	Plan status	Repetitive loss <i>FMA RL and SRL (44 CFR 77.2); repeat-flood, any definition</i>	Public Assistance matched <i>federal share obligated, nominal dollars</i>	Event records naming this place <i>all years; since the member's plan</i>	Notes
Leelanau County	County	Approved, expires 2029-09-23	FMA RL 0, SRL 0; any 0	none found	0; 0	
Empire village	Village	Approved, expires 2029-09-23	FMA RL 0, SRL 0; any 0	none found	8; 0	
Northport village	Village	Approved, expires 2029-09-23	FMA RL 0, SRL 0; any 0	none found	10; 0	
Suttons Bay village	Village	Approved, expires 2029-09-23	FMA RL 0, SRL 0; any 0	none found	15; 0	
Bingham township	Township	Approved, expires 2029-09-23	FMA RL 0, SRL 0; any 0	none found	2; 1	
Centerville township	Township	Approved, expires 2029-09-23	FMA RL 0, SRL 0; any 0	none found	0; 0	
Cleveland township	Township	Approved, expires 2029-09-23	FMA RL 0, SRL 0; any 0	none found	0; 0	
Elmwood charter township	Township	Approved, expires 2029-09-23	FMA RL 0, SRL 0; any 0	none found	0; 0	
Empire township	Township	Approved, expires 2029-09-23	FMA RL 0, SRL 0; any 0	none found	8; 0	
Glen Arbor township	Township	Approved, expires 2029-09-23	FMA RL 0, SRL 0; any 0	none found	5; 1	
Kasson township	Township	Approved, expires 2029-09-23	FMA RL 0, SRL 0; any 0	none found	0; 0	
Leelanau township	Township	Approved, expires 2029-09-23	FMA RL 0, SRL 0; any 0	none found	0; 0	
Leland township	Township	Approved, expires 2029-09-23	FMA RL 0, SRL 0; any 0	none found	15; 0	
Solon township	Township	Approved, expires 2029-09-23	FMA RL 0, SRL 0; any 0	none found	3; 0	
Suttons Bay township	Township	Approved, expires 2029-09-23	FMA RL 0, SRL 0; any 0	none found	15; 0	

Member rows are whole NFIP communities and need not add up to the county total: a community that extends into another county is counted in full on each member row, while the county table counts only its part in this county.

School districts and special districts get a plan clock row only.

SOURCES

FEMA, OpenFEMA HazardMitigationPlanStatuses v1, version 2026-09-26T121003Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/HazardMitigationPlanStatuses> (API)

FEMA, OpenFEMA NfipMultipleLossProperties v1, version 2026-08-04T164045Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/NfipMultipleLossProperties> (API)

FEMA, OpenFEMA PublicAssistanceFundedProjectsSummaries v1, version 2026-09-26T151157Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/PublicAssistanceFundedProjectsSummaries> (API)

NOAA NCEI, NOAA NCEI Storm Events Database, details files (csvfiles v1.0), version c20260918, pulled 2026-09-28, <https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/>

Supports B2-a and B2-b: assets and impacts

Local data required

County-level starter. The plan must describe impacts for each participant and its own assets.

- Critical facilities and lifelines per hazard
 - A problem statement per participant per hazard
- Changes in development in hazard-prone areas since the last approval, or a statement of none (E1-a)
 - Future assets

County-level starter: exposure, expected annual loss and damage since the plan

Hazard	Building exposure <i>modeled dollars</i>	Agriculture exposure <i>modeled dollars</i>	Population exposed <i>people</i>	EAL buildings <i>modeled dollars per year</i>	EAL agriculture <i>modeled dollars per year</i>	EAL population equivalence <i>statistical value of life and injury, \$13.7M per life, not property damage</i>	EAL as % of exposure <i>buildings; agriculture where noted</i>	Storm Events damage since 2024-09-24 <i>county-coded records, property plus crops, nominal dollars</i>	Zone-level damage since plan <i>property plus crops, reported for the zone</i>	Public Assistance since plan <i>nominal dollars; see note</i>	Note
Avalanche											Not Applicable in NRI for this county
Coastal Flooding	\$1,611,769,931		408	\$9,666		\$463	0.0006%				
Cold Wave	\$8,374,514,205	\$54,639,013	22,255	\$175	\$1,889,111	\$7,149,598	under 0.0001%				
Drought		\$0			\$0						agriculture exposure is 0 in NRI
Earthquake	\$13,626,019,230		22,301	\$3,042		\$643	under 0.0001%				
Hail	\$8,374,514,205	\$54,639,013	22,255	\$99,337	\$64,348	\$12,185	0.00119%				
Heat Wave	\$8,374,514,205	\$54,639,013	22,255	\$477	under \$1	\$47,316	under 0.0001%				
Hurricane	\$8,374,514,205	\$54,639,013	22,255	\$1,826	\$738	under \$1	under 0.0001%				
Ice Storm	\$8,374,514,205		22,255	\$920		\$1,518	under 0.0001%				
Inland Flooding	\$8,329,447,096	\$8,811	274	\$5,249,927	\$30	\$409	n/a (see note)				NRI counts the full building value of any census block with some flood loss; this is not the value of buildings in the floodplain. Use local FIRM overlays for B2-a/B2-b. EAL as % of exposure: n/a.
Landslide	\$544,085,553		1,599	\$1,759		\$12,988	0.000323%				
Lightning	\$8,374,514,205		22,255	\$5,541		\$108,784	under 0.0001%				
Strong Wind	\$8,374,514,205	\$54,639,013	22,255	\$203,473	\$1,105	\$38,815	0.00243%				
Tornado	\$8,374,514,205	\$54,639,013	22,255	\$151,412	\$153	\$70,568	0.00181%				
Tsunami											NRI publishes no building exposure for this county
Volcanic Activity											Not Applicable in NRI for this county

Hazard	Building exposure <i>modeled dollars</i>	Agriculture exposure <i>modeled dollars</i>	Population exposed <i>people</i>	EAL buildings <i>modeled dollars per year</i>	EAL agriculture <i>modeled dollars per year</i>	EAL population equivalence <i>statistical value of life and injury, \$13.7M per life, not property damage</i>	EAL as % of exposure <i>buildings; agriculture where noted</i>	Storm Events damage since 2024-09-24 <i>county-coded records, property plus crops, nominal dollars</i>	Zone-level damage since plan <i>property plus crops, reported for the zone</i>	Public Assistance since plan <i>nominal dollars; see note</i>	Note
Wildfire	\$2,469,172,139	\$13,475,947	7,072	\$4,745	\$4	\$344	0.000192%				
Winter Weather	\$8,374,514,205	\$54,639,013	22,255	\$2,146	\$621	\$415,893	under 0.0001%				

Totals since 2024-09-24 (Storm Events through 2026-06-30): 2 county-coded records, 0 with a damage value recorded (including \$0), \$0; 8 zone-level records, 0 with a damage value recorded (including \$0), \$0 reported for the zone; Public Assistance on counted declarations none found (0 declarations, 0 with PA).

Total = buildings + agriculture + population equivalence; FEMA values each expected death (or 10 injuries) at \$13.7 million (2024 dollars).

FEMA does not split Public Assistance by hazard. A declaration mapped to several hazards is listed under each of them with its full amount, so the per-hazard column must not be added up; the unit total counts each declaration once.

Dollars are nominal (as reported), labeled with the year; not adjusted for inflation.

SOURCES

FEMA, FEMA National Risk Index 1.20.0 (December 2025), county and census tract tables, version 1.20.0, pulled 2026-09-28, https://www.fema.gov/about/reports-and-data/openfema/nri/v120/NRI_Table_Counties.zip (download, 25 MB), https://www.fema.gov/about/reports-and-data/openfema/nri/v120/NRI_Table_CensusTracts.zip (download, 635 MB)
NOAA NCEI, NOAA NCEI Storm Events Database, details files (csvfiles v1.0), version c20260918, pulled 2026-09-28, <https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/>
NOAA National Weather Service, NWS county-public forecast zones correlation file, version bp03mr20 to bp16ap26 (11 files; newest bp16ap26), pulled 2026-09-28, <https://www.weather.gov/gis/ZoneCounty>
FEMA, OpenFEMA DisasterDeclarationsSummaries v2, version 2026-09-27T010817Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v2/DisasterDeclarationsSummaries> (API)
FEMA, OpenFEMA PublicAssistanceFundedProjectsSummaries v1, version 2026-09-26T151157Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/PublicAssistanceFundedProjectsSummaries> (API)
FEMA, OpenFEMA HazardMitigationPlanStatuses v1, version 2026-09-26T121003Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/HazardMitigationPlanStatuses> (API)

Supports B2-a: context

County context

Measure	Value
Population	22,255
Building value (total, not at risk)	\$8,374,514,205
Agriculture value (total, not at risk)	\$54,639,013
NRI risk rating (all hazards)	Relatively Low
Expected annual loss, buildings and agriculture, all hazards	\$7,690,554
Expected annual loss, population equivalence, all hazards (NRI values each statistical life at \$13.7M; a modeled value of expected deaths and injuries, not property damage)	\$7,859,524
Social vulnerability rating	Relatively Moderate
Community resilience rating	Very High
NRI version	December 2025

FEMA's all-hazard expected annual loss total adds buildings, agriculture and population equivalence; the two parts are shown separately so the property figure is not read as including the statistical value of life.

SOURCE

FEMA, FEMA National Risk Index 1.20.0 (December 2025), county and census tract tables, version 1.20.0, pulled 2026-09-28, https://www.fema.gov/about/reports-and-data/openfema/nri/v120/NRI_Table_Counties.zip (download, 25 MB), https://www.fema.gov/about/reports-and-data/openfema/nri/v120/NRI_Table_CensusTracts.zip (download, 635 MB)

Supports B2-c: repetitive loss

Repetitive loss in this county, both definitions

Definition	Properties	Severe repetitive loss	Properties
Repetitive loss, FMA definition (44 CFR 77.2)	0	Severe repetitive loss, FMA definition (44 CFR 77.2)	0
Repetitive loss, NFIP insurance definition	0	Severe repetitive loss, NFIP insurance definition	0

Your state NFIP coordinator's list may use the NFIP insurance definition, so its counts can be higher.

SOURCES

FEMA, OpenFEMA NfipMultipleLossProperties v1, version 2026-08-04T164045Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/NfipMultipleLossProperties> (API)
FEMA, OpenFEMA HazardMitigationPlanStatuses v1, version 2026-09-26T121003Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/HazardMitigationPlanStatuses> (API)

Repeat-flood properties: county and state-level rows

Scope	RL, FMA <i>properties</i>	SRL, FMA <i>properties</i>	RL, NFIP <i>properties</i>	SRL, NFIP <i>properties</i>	Any category <i>properties</i>	Mitigated <i>properties</i>	Currently insured <i>properties</i>
County total	0	0	0	0	0	0	0
State level, not in this county: county not reported	0	0	4	0	4	0	0

SOURCES

FEMA, OpenFEMA NfipMultipleLossProperties v1, version 2026-08-04T164045Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/NfipMultipleLossProperties> (API)
FEMA, OpenFEMA HazardMitigationPlanStatuses v1, version 2026-09-26T121003Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/HazardMitigationPlanStatuses> (API)

Repeat-flood properties by plan member (NFIP community)

Member	NFIP community ID	RL, FMA <i>properties</i>	SRL, FMA <i>properties</i>	RL, NFIP <i>properties</i>	SRL, NFIP <i>properties</i>	Any category <i>properties</i>	Mitigated <i>properties</i>	Currently insured <i>properties</i>	Note
Leelanau County	261889	0	0	0	0	0	0	0	
Empire village	260605	0	0	0	0	0	0	0	
Northport village	260580	0	0	0	0	0	0	0	
Suttons Bay village	260283	0	0	0	0	0	0	0	
Bingham township	260772	0	0	0	0	0	0	0	
Centerville township	260625	0	0	0	0	0	0	0	
Cleveland township	260302	0	0	0	0	0	0	0	
Elmwood charter township	260113	0	0	0	0	0	0	0	
Empire township	260765	0	0	0	0	0	0	0	
Glen Arbor township	260604	0	0	0	0	0	0	0	
Kasson township	261509	0	0	0	0	0	0	0	
Leelanau township	260114	0	0	0	0	0	0	0	
Leland township	260760	0	0	0	0	0	0	0	
Solon township	261510	0	0	0	0	0	0	0	

Member	NFIP community ID	RL, FMA <i>properties</i>	SRL, FMA <i>properties</i>	RL, NFIP <i>properties</i>	SRL, NFIP <i>properties</i>	Any category <i>properties</i>	Mitigated <i>properties</i>	Currently insured <i>properties</i>	Note
Suttons Bay township	260770	0	0	0	0	0	0	0	

Per-member types: XLSX sheet 'B2-c Members'.

Member rows are whole NFIP communities and need not add up to the county total: a community that extends into another county is counted in full on each member row, while the county table counts only its part in this county.

SOURCES

FEMA, OpenFEMA NfipMultipleLossProperties v1, version 2026-08-04T164045Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/NfipMultipleLossProperties> (API)
FEMA, OpenFEMA HazardMitigationPlanStatuses v1, version 2026-09-26T121003Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/HazardMitigationPlanStatuses> (API)

County repeat-flood properties by occupancy group

Occupancy group	RL, FMA <i>properties</i>	SRL, FMA <i>properties</i>	RL, NFIP <i>properties</i>	SRL, NFIP <i>properties</i>	Any category <i>properties</i>	Mitigated <i>properties</i>	Currently insured <i>properties</i>
single-family residential	0	0	0	0	0	0	0
2 to 4 unit residential	0	0	0	0	0	0	0
other residential	0	0	0	0	0	0	0
non-residential	0	0	0	0	0	0	0
not reported	0	0	0	0	0	0	0

Institutional properties cannot be separated in this data: FEMA's occupancy groups have no institutional class, so they fall in non-residential or other residential in the table by occupancy group.

SOURCES

FEMA, OpenFEMA NfipMultipleLossProperties v1, version 2026-08-04T164045Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/NfipMultipleLossProperties> (API)
FEMA, OpenFEMA HazardMitigationPlanStatuses v1, version 2026-09-26T121003Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/HazardMitigationPlanStatuses> (API)

FMA RL and FMA SRL are the Flood Mitigation Assistance definitions (44 CFR 77.2), the ones the FEMA Local Mitigation Planning Policy Guide cites; OpenFEMA's fmaRl field description omits the Increased Cost of Compliance clause of 44 CFR 77.2(i). NFIP repetitive loss (FEMA insurance definition, nfipRl) is 2 or more claims over \$1,000 in 10 years and can drop to false when a property is mitigated. Also shown: NFIP severe repetitive loss, any category, mitigated and currently insured.

Your state NFIP coordinator's list may use the NFIP insurance definition, so its counts can be higher.

Counts are aggregates of FEMA's public NFIP Multiple Loss Properties file (as of 2026-08-02). No property is identified. County assignment is FEMA's geocode.

Counts may differ from your state NFIP coordinator's list, which is the source the Handbook names.

In this county 0 properties are FMA repetitive loss but not NFIP repetitive loss, and 0 properties are NFIP repetitive loss but not FMA repetitive loss.

Exact counts; no count suppression.

Sources

Every table above lists its own sources. The full list, for the plan's bibliography (FEMA review item A4-a):

- 1. FEMA, OpenFEMA HazardMitigationPlanStatuses v1, version 2026-09-26T121003Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/HazardMitigationPlanStatuses> (API)
- 2. FEMA, OpenFEMA DisasterDeclarationsSummaries v2, version 2026-09-27T010817Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v2/DisasterDeclarationsSummaries> (API)
- 3. FEMA, OpenFEMA PublicAssistanceFundedProjectsSummaries v1, version 2026-09-26T151157Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/PublicAssistanceFundedProjectsSummaries> (API)
- 4. FEMA, OpenFEMA NfipMultipleLossProperties v1, version 2026-08-04T164045Z, pulled 2026-09-28, <https://www.fema.gov/api/open/v1/NfipMultipleLossProperties> (API)

5. FEMA, FEMA National Risk Index 1.20.0 (December 2025), county and census tract tables, version 1.20.0, pulled 2026-09-28, https://www.fema.gov/about/reports-and-data/openfema/nri/v120/NRI_Table_Counties.zip (download, 25 MB), https://www.fema.gov/about/reports-and-data/openfema/nri/v120/NRI_Table_CensusTracts.zip (download, 635 MB)
6. NOAA NCEI, NOAA NCEI Storm Events Database, details files (csvfiles v1.0), version c20260918, pulled 2026-09-28, <https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/>
7. NOAA National Weather Service, NWS county-public forecast zones correlation file, version bp03mr20 to bp16ap26 (11 files; newest bp16ap26), pulled 2026-09-28, <https://www.weather.gov/gis/ZoneCounty>
8. U.S. Census Bureau, Census 2024 Gazetteer, 2020 place by county, CT county-to-cousub crosswalk, version 2024-gazetteer, pulled 2026-09-28, https://www2.census.gov/geo/docs/maps-data/data/gazetteer/2024_Gazetteer/2024_Gaz_counties_national.zip, [https://www2.census.gov/geo/docs/maps-data/data/gazetteer/2024_Gazetteer/2024_Gaz_cousubs_national.zip](https://www2.census.gov/geo/docs/maps-data/data/gazetteer/2024_Gaz_cousubs_national.zip), [https://www2.census.gov/geo/docs/maps-data/data/gazetteer/2024_Gazetteer/2024_Gaz_place_national.zip](https://www2.census.gov/geo/docs/maps-data/data/gazetteer/2024_Gaz_place_national.zip), [https://www2.census.gov/geo/docs/maps-data/data/gazetteer/2024_Gazetteer/2024_Gaz_unsd_national.zip](https://www2.census.gov/geo/docs/maps-data/data/gazetteer/2024_Gaz_unsd_national.zip), [https://www2.census.gov/geo/docs/maps-data/data/gazetteer/2024_Gazetteer/2024_Gaz_elsd_national.zip](https://www2.census.gov/geo/docs/maps-data/data/gazetteer/2024_Gaz_elsd_national.zip), [https://www2.census.gov/geo/docs/maps-data/data/gazetteer/2024_Gazetteer/2024_Gaz_scsd_national.zip](https://www2.census.gov/geo/docs/maps-data/data/gazetteer/2024_Gaz_scsd_national.zip), https://www2.census.gov/geo/docs/reference/codes2020/national_place_by_county2020.txt, https://www2.census.gov/geo/docs/reference/ct_change/ct_cou_to_cousub_crosswalk.xlsx

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Corrections: to report an error, name the packet, the table and what your records show. Contact: to be added

Hazard Plain release 2026-10. As of 2026-09-28; Storm Events data through 2026-06-30. File hazard-plain_2026-10_MI_26089. Preview: automated baseline.