

Kalkaska County, MI

Risk-assessment baseline packet

County FIPS: 26079 Release: 2026-10 Data as of: 2026-09-30 Storm Events data through: 2026-06-30

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Summary

Plan status as of 2026-09-30: Approved, expires 2029-01-22. Plan: Kalkaska County HMP Update (FEMA plan 109333), approved 2024-01-23.

Since the plan was approved on 2024-01-23: 2 new hazard declarations (2 incidents) and 13 NOAA Storm Events records; details under "What changed since your last plan".

Highest expected annual loss (FEMA National Risk Index, modeled total; see B1-a): Inland Flooding (\$3,123,672 a year), Cold Wave (\$2,104,542) and Tornado (\$376,537).

The tables that follow are organized by the items of FEMA's Local Mitigation Plan Review Tool, Element B (B1-a to B2-c); each heading says which item its tables support.

TERMS USED

EAL: expected annual loss: FEMA's modeled average yearly loss from a hazard.

NRI: FEMA's National Risk Index (version 1.20, December 2025).

NFIP: National Flood Insurance Program.

RL, SRL: repetitive loss and severe repetitive loss: flood-insured properties with repeated claims (definitions in B2-c).

FMA, HMGP: Flood Mitigation Assistance and Hazard Mitigation Grant Program, FEMA mitigation grants.

PA: FEMA Public Assistance: disaster aid to governments and some nonprofits.

Zone-level: NOAA logged the event for a National Weather Service forecast zone, which may include parts of neighboring counties.

County-coded: NOAA logged the event to this county.

FIPS: the federal code for a place; 26079 is this area.

D0 to D4: U.S. Drought Monitor categories, from abnormally dry (D0) to exceptional drought (D4).

F/EF, EFU: Fujita and Enhanced Fujita tornado ratings; EFU is an unrated tornado.

kt, CONUS: knots (1 kt is about 1.15 mph); the contiguous United States.

CFR: Code of Federal Regulations.

A4-a, E1-a: other items of FEMA's Local Mitigation Plan Review Tool (sources, and changes since the last plan).

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

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Plan clock

Status:	Approved, expires 2029-01-22	Plan:	Kalkaska County HMP Update (FEMA plan 109333)
Approved:	2024-01-23	Days to expiry:	845

What changed since your last plan (approved 2024-01-23)

New federal declarations:	2 new hazard declarations (2 incidents): DR-4880-MI (Severe Winter Storm), DR-4925-MI (Severe Storms, Tornadoes, and Flooding)	Storm Events records since approval:	13 records (data through 2026-06-30)
Repetitive loss now:	FMA RL 0, SRL 0 (44 CFR 77.2); any definition: 0	Repeat-flood change:	this release sets the baseline count.

Sources: 1, 2, 4, 6 (numbered list at the end)

Plan status for every jurisdiction listed in this county: 14 rows, in the section "Plan clock: Plan status for every jurisdiction listed in this county" on the following pages.

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

Plan clock

Plan status for every jurisdiction listed in this county

Source: 1

Jurisdiction	Type	Status	Plan	Approved	Expires	Days to expiry negative = days since expiry	Notes
Kalkaska County	County	Approved, expires 2029-01-22	Kalkaska County HMP Update (FEMA plan 109333)	2024-01-23	2029-01-22	845	
Kalkaska village	Village	Approved, expires 2029-01-22	Kalkaska County HMP Update (FEMA plan 109333)	2024-01-23	2029-01-22	845	this jurisdiction approved 2024-06-04
Bear Lake township	Township	Approved, expires 2029-01-22	Kalkaska County HMP Update (FEMA plan 109333)	2024-01-23	2029-01-22	845	this jurisdiction approved 2024-06-04
Blue Lake township	Township	Approved, expires 2029-01-22	Kalkaska County HMP Update (FEMA plan 109333)	2024-01-23	2029-01-22	845	this jurisdiction approved 2024-06-04
Boardman township	Township	Approved, expires 2029-01-22	Kalkaska County HMP Update (FEMA plan 109333)	2024-01-23	2029-01-22	845	this jurisdiction approved 2024-06-04
Clearwater township	Township	Approved, expires 2029-01-22	Kalkaska County HMP Update (FEMA plan 109333)	2024-01-23	2029-01-22	845	this jurisdiction approved 2024-06-04
Coldsprings township	Township	Approved, expires 2029-01-22	Kalkaska County HMP Update (FEMA plan 109333)	2024-01-23	2029-01-22	845	this jurisdiction approved 2024-06-04
Excelsior township	Township	Approved, expires 2029-01-22	Kalkaska County HMP Update (FEMA plan 109333)	2024-01-23	2029-01-22	845	this jurisdiction approved 2024-06-04
Garfield township	Township	Approved, expires 2029-01-22	Kalkaska County HMP Update (FEMA plan 109333)	2024-01-23	2029-01-22	845	this jurisdiction approved 2024-06-04
Kalkaska township	Township	Approved, expires 2029-01-22	Kalkaska County HMP Update (FEMA plan 109333)	2024-01-23	2029-01-22	845	this jurisdiction approved 2024-06-04
Oliver township	Township	Approved, expires 2029-01-22	Kalkaska County HMP Update (FEMA plan 109333)	2024-01-23	2029-01-22	845	this jurisdiction approved 2024-06-04
Orange township	Township	Approved, expires 2029-01-22	Kalkaska County HMP Update (FEMA plan 109333)	2024-01-23	2029-01-22	845	this jurisdiction approved 2024-06-04
Rapid River township	Township	Approved, expires 2029-01-22	Kalkaska County HMP Update (FEMA plan 109333)	2024-01-23	2029-01-22	845	this jurisdiction approved 2024-06-04
Springfield township	Township	Approved, expires 2029-01-22	Kalkaska County HMP Update (FEMA plan 109333)	2024-01-23	2029-01-22	845	this jurisdiction approved 2024-06-04

Supports FEMA checklist item B1-a: hazard identification

Hazards NRI does not cover (local data needed)

- 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)

Sources: 5, 6

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>	Cost of expected deaths and injuries <i>FEMA's dollar value per year, not property damage</i>	EAL total (see note) <i>modeled dollars per year</i>	Storm Events records, 1996 to 2026-06-30 <i>count</i>	Storm Events coverage note
1	Inland Flooding	Very Low	Very Low	\$3,123,661	\$2	\$10	\$3,123,672	2	
2	Cold Wave	Relatively Moderate	Relatively Moderate	\$32	\$4,897	\$2,099,613	\$2,104,542	5	
3	Tornado	Relatively Low	Relatively Low	\$159,529	\$89	\$216,920	\$376,537	4	
4	Winter Weather	Relatively High	Relatively High	\$4,404	\$115	\$315,800	\$320,319	144	
5	Strong Wind	Relatively Low	Relatively Low	\$129,659	\$376	\$87,146	\$217,181	42	Includes 4 High Wind records (a NOAA non-thunderstorm wind type, outside NRI's Strong Wind definition).
6	Hail	Relatively Low	Relatively Low	\$119,964	\$7,756	\$16,222	\$143,942	16	
7	Lightning	Relatively Low	Relatively Low	\$2,343	n/a	\$92,691	\$95,034	2	
8	Wildfire	Very Low	Very Low	\$49,894	\$6	\$3,883	\$53,784	1	
9	Heat Wave	Very Low	Very Low	\$302	under \$1	\$37,911	\$38,213	2	
10	Earthquake	Very Low	Very Low	\$5,481	n/a	\$1,710	\$7,191		Storm Events does not record earthquakes.
11	Ice Storm	Very Low	Very Low	\$3,129	n/a	\$1,136	\$4,265	4	
12	Landslide	Very Low	Very Low	\$136	n/a	\$2,117	\$2,253	0	No recorded events in Storm Events since 1996 (data through 2026-06-30).
13	Hurricane	Very Low	Very Low	\$1,612	\$189	\$1	\$1,801	0	No recorded events in Storm Events since 1996 (data through 2026-06-30).
14	Drought	No Rating	No Expected Annual Losses	n/a	\$0	n/a	\$0	1	

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

NRI risk rating combines expected annual loss with social vulnerability and community resilience; EAL rating rates expected annual loss alone. Both compare this county with all U.S. counties.

Local data needed: state and local landslide records (Storm Events records this hazard only in part).

Not applicable to this county per NRI, with no federal declaration and no Storm Events record since 1996: avalanche, coastal flooding, tsunami and volcanic activity. That is the evidence for leaving them out of the plan.

The state hazard mitigation plan also lists hazards for this county; FEMA asks the plan to explain any hazard it leaves out.

Supports FEMA checklist item B1-b: hazard location

Affects the whole county (national data give no location within it): Cold Wave, Drought, Hail, Heat Wave, Ice Storm, Lightning, Strong Wind and Winter Weather.

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.

Hazards that vary within the county: highest-rated census tracts

Source: 5

Hazard	Highest-rated census tracts <i>NRI risk rating, score 0 to 100</i>
Earthquake	tract 9503 (Very Low, 11.4); tract 9504 (Very Low, 10.6); tract 9506.02 (Very Low, 7.8)
Hurricane	tract 9504 (Very Low, 29.6); tract 9503 (Very Low, 29.4); tract 9506.02 (Very Low, 28.4)
Landslide	tract 9504 (Relatively Low, 91.0); tract 9502.01 (Relatively Low, 89.8); tract 9503 (Relatively Low, 89.3)
Tornado	tract 9504 (Relatively Moderate, 61.8); tract 9503 (Relatively Moderate, 59.8); tract 9506.01 (Relatively Low, 49.2)
Wildfire	tract 9504 (Relatively Low, 88.1); tract 9506.02 (Relatively Low, 87.6); tract 9503 (Relatively Low, 83.4)

Up to 3 census tracts per hazard, highest National Risk Index rating first, then highest score; a tract number is the Census tract number (for example 9503 is Census Tract 9503). FEMA's Resilience Analysis and Planning Tool maps the National Risk Index for every tract: <https://www.fema.gov/emergency-managers/practitioners/resilience-analysis-and-planning-tool>

Supports FEMA checklist item B1-c: hazard extent

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

Sources: 6, 7

Hazard	Scale	Records <i>count and years</i>	Observed range	Worst recorded event	Most damaging (when different)	How it applies to jurisdictions	Note
Cold/Wind Chill, Extreme Cold/Wind Chill	wind chill	5 records, 2007 to 2026 (5 zone-level)	1 day to 3 days (median 2 days); 5 with a recorded value	3 consecutive days, 2026-01-22 to 2026-01-24, zone-level		Countywide (zone-level records).	
Frost/Freeze (outside NRI's Cold Wave definition)	crop damage	0					
Drought	U.S. Drought Monitor scale (D0 to D4)	1 record, 2001 (1 zone-level)	9 days; 1 with a recorded value	9 days, 2001-08-01 to 2001-08-09, zone-level		Countywide (zone-level records).	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					Storm Events does not record earthquakes; the USGS earthquake catalog is the source.

Hazard	Scale	Records <i>count and years</i>	Observed range	Worst recorded event	Most damaging (when different)	How it applies to jurisdictions	Note
Hail	hail size (inches)	19 records, 1963 to 2024	0.75 in to 1.75 in (median 1 in); 19 with a recorded value	1.75 in hail, 2016-07-08; same size also recorded on 1963-10-28, 1996-07-08, 2008-06-15, 2013-05-20		Event records naming jurisdictions in the plan: Kalkaska township (3 records), Kalkaska village (3 records).	
Excessive Heat, Heat	heat index (in event narratives)	2 records, 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		Countywide (zone-level records).	
Hurricane, Tropical Storm, Tropical Depression	Saffir-Simpson	0					Storm Events files every zone of a storm's episode under the storm's type; flooding from the storm is filed as Flood or Flash Flood records.
Ice Storm	Sperry-Piltz ice scale (local data)	4 records, 2001 to 2008 (4 zone-level)		No damage reported in 4 records.		Countywide (zone-level records).	
Flash Flood, Flood, Lakeshore Flood	damage and flood days (flood depth: FIRM)	2 records, 2001 to 2006		Flash Flood, 2006-06-07, \$20,000 property; crops not reported (2006 dollars)		Event records naming jurisdictions in the plan: Kalkaska township (1 record), Kalkaska village (1 record).	Flood depth: see the FEMA Flood Insurance Rate Map. Storm Events damage is often \$0 or blank for floods, major ones included; FEMA Public Assistance by declaration (B1-d) shows which floods cost the most.
Debris Flow	none (count and damage only)	0					
Lightning	annualized frequency (the measure FEMA's Local Mitigation Planning Handbook names)	2 records, 2000 to 2005		Lightning, 2005-06-27, damage not reported, 1 direct injury		Event records naming jurisdictions in the plan: Kalkaska township (1 record), Kalkaska village (1 record).	Storm Events lists lightning with damage or casualties.
High Wind and Strong Wind (outside NRI's Strong Wind definition)	wind speed (kt and mph)	4 records, 1998 to 2021 (4 zone-level)	50 kt (58 mph) to 55 kt (63 mph) (median 50 kt (58 mph)); 4 with a recorded value	55 kt (63 mph) estimated gust, High Wind, 2010-10-27; NWS zone MIZ027	High Wind, 2021-12-16, \$10,000 property; \$0 crops (zone total, 2021 dollars)	Countywide (zone-level records).	
Thunderstorm Wind	wind speed (kt and mph)	46 records, 1981 to 2021	50 kt (58 mph) to 78 kt (90 mph) (median 52 kt (60 mph)); 42 with a recorded value	78 kt (90 mph), measurement type not recorded, Thunderstorm Wind, 1998-05-31	Thunderstorm Wind, 2015-08-02, \$540,000 property; \$0 crops (2015 dollars)	Event records naming jurisdictions in the plan: Kalkaska township (20 records), Kalkaska village (20 records).	
Tornado	Enhanced Fujita (Fujita before Feb 2007)	8 records, 1974 to 2014	F/EF0 to F/EF2 (median F/EF1); 8 with a recorded value	F2 tornado, 1976-07-23, 3.3 mi path length (whole path, pre-1996), 83 yd wide, \$25,000 property; crops not recorded (1976 dollars), 5 direct injuries	Tornado, 2007-10-18, \$1,100,000 property; \$0 crops (2007 dollars)	Event records naming jurisdictions in the plan: Kalkaska township (3 records), Kalkaska village (3 records).	Before 1996 a tornado is listed once, under the county where it began, with its whole path's rating and length; from 1996 on, each county lists its own segment. Length is not used to rank tornadoes (see Methods).

Hazard	Scale	Records <i>count and years</i>	Observed range	Worst recorded event	Most damaging (when different)	How it applies to jurisdictions	Note
Wildfire	acres burned (local data)	1 record, 2010 (1 zone-level)		Wildfire, 2010-05-18, \$125,000 property; \$0 crops (2010 dollars); NWS zone MIZ027		Countywide (zone-level records).	
Winter Storm, Heavy Snow, Blizzard, Lake- Effect Snow, Winter Weather, Sleet	none in data (snowfall: local data)	144 records, 1996 to 2026 (144 zone- level)		Heavy Snow, 2012-03-02, \$250,000 property; \$0 crops (2012 dollars); NWS zone MIZ027		Countywide (zone-level records).	

In event narratives only (local data needed): wind chill, temperature, heat index, ice thickness, acres burned and snow depth; any physical measure of debris flow and lightning.

Storm Events records are more complete after 1996; before 1996 only Tornado (from 1950), Hail and Thunderstorm Wind (from 1955) exist. Zone-level records from zones that no NWS zone-county file places in this county (mostly before 2020) are not counted here (the Methods page explains the zone matching).

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

Supports FEMA checklist item B1-d: previous occurrences

Federal declarations for this county: 7 declarations covering 4 separate hazard incidents counted in this packet (declarations for the same incident count once; non-natural and evacuation-only declarations are not counted).

Federal disaster declarations for this county

Sources: 1, 2, 3

Declared	Incident began	FEMA number	Type	Title	Mapped hazard	County Public Assistance <i>federal share obligated, nominal dollars</i>	Flags	Notes
2026-06-30	2026-04-10	DR-4925-MI	Major disaster	Severe Storms, Tornadoes, and Flooding	Inland Flooding (primary); also designated: Tornado	\$37,694.47	new since last plan; within last 5 years	
2025-07-22	2025-03-28	DR-4880-MI	Major disaster	Severe Winter Storm	Ice Storm (primary); also designated: Winter Weather	no Public Assistance recorded	new since last plan; within last 5 years	
2020-03-27	2020-01-20	DR-4494-MI	Major disaster	COVID-19 Pandemic	Non-natural, not counted	no Public Assistance recorded		
2020-03-13	2020-01-20	EM-3455-MI	Emergency	COVID-19	Non-natural, not counted	no Public Assistance recorded		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	no Public Assistance recorded		
1978-01-27	1978-01-27	EM-3057-MI	Emergency	Blizzards & Snowstorms	Winter Weather	no Public Assistance recorded		
1977-03-02	1977-03-02	EM-3035-MI	Emergency	Drought	Drought	no Public Assistance recorded		

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.

Statewide declarations

Source: 2

Declared	Incident began	FEMA number	Type	Title	Mapped hazard
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, so they are listed on every county page in the state and not counted with county rows. Local data needed: whether each one affected this county.

Previous occurrences by hazard, with explicit no-event rows

Sources: 2, 6, 7

Hazard	Storm Events records, all years on file <i>(years in the Period column)</i>	Since plan approval records	In the 12 months before plan approval records	Last 5 years records	Declared incidents, all years <i>separate disasters</i>	Declared since approval <i>separate disasters</i>	Period	Statement
Cold Wave	5	2	0	2	0	0	1996 to 2026-06-30	
Drought	1	0	0	0	1	0	1996 to 2026-06-30	
Earthquake	0	0	0	0	0	0		Storm Events does not record earthquakes; the USGS earthquake catalog is the source.
Hail	19	3	0	3	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	1	1	1996 to 2026-06-30	
Inland Flooding	2	0	0	0	1	1	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	50	0	0	1	0	0	1955 to 2026-06-30	Includes 4 High Wind records.
Tornado	8	0	0	0	1	1	1950 to 2026-06-30	
Wildfire	1	0	0	0	0	0	1996 to 2026-06-30	
Winter Weather	144	8	3	16	2	1	1996 to 2026-06-30	

Notable Storm Events records

Sources: 1, 6, 7

Date	Event type	Magnitude or extent	Damage <i>nominal dollars</i>	Deaths, injuries <i>direct only</i>	Location	Flags	Why listed
2026-01-22	Extreme Cold/ Wind Chill		damage not reported	0, 0	NWS zone MIZ027 (KALKASKA), zone-level	new since last plan; within last 5 years	B1-c worst recorded: Cold/Wind Chill, Extreme Cold/Wind Chill
2016-07-08	Hail	1.75 in	\$0 property; \$0 crops (2016 dollars)	0, 0	DARRAGH		B1-c worst recorded: Hail
2012-03-02	Heavy Snow		\$250,000 property; \$0 crops (zone total, 2012 dollars)	0, 0	NWS zone MIZ027 (KALKASKA), zone-level		B1-c worst recorded: Winter Storm, Heavy Snow, Blizzard, Lake-Effect Snow, Winter Weather, Sleet
2010-10-27	High Wind	55 kt (63 mph) estimated gust	\$5,000 property; \$0 crops (zone total, 2010 dollars)	0, 0	NWS zone MIZ027 (KALKASKA), zone-level		B1-c worst recorded: High Wind and Strong Wind
2010-05-18	Wildfire		\$125,000 property; \$0 crops (zone total, 2010 dollars)	0, 0	NWS zone MIZ027 (KALKASKA), zone-level		B1-c worst recorded: Wildfire
2007-10-18	Tornado	EF2, 4.45 mi within this county, 430 yd wide	\$1,100,000 property; \$0 crops (2007 dollars)	1, 1	CROFTON to KALKASKA		deaths or injuries recorded
2006-06-07	Flash Flood		\$20,000 property; crops not reported (2006 dollars)	0, 0	KALKASKA		B1-c worst recorded: Flash Flood, Flood, Lakeshore Flood
2005-06-27	Lightning		damage not reported	0, 1	KALKASKA		deaths or injuries recorded
2001-08-01	Heat		damage not reported	0, 0	NWS zone MIZ027 (KALKASKA), zone-level		B1-c worst recorded: Excessive Heat, Heat
2001-08-01	Drought		damage not reported	0, 0	NWS zone MIZ027 (KALKASKA), zone-level		B1-c worst recorded: Drought
1998-05-31	Thunderstorm Wind	78 kt (90 mph), measurement type not recorded	damage not reported	0, 0	KALKASKA		B1-c worst recorded: Thunderstorm Wind
1976-07-23	Tornado	F2, 3.3 mi path length (whole path, pre-1996), 83 yd wide	\$25,000 property; crops not recorded (1976 dollars)	0, 5	location not recorded		deaths or injuries recorded

The full list is in the Excel file, sheet "B1-d Storm Events history" (238 rows).

Location is the place NOAA recorded, as written in its data; it need not be a jurisdiction in this plan.

Local data needed: state-declared emergencies, from your state emergency management agency (federal data do not include them).

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

Supports FEMA checklist item B1-e: probability of future events

Probability: FEMA annualized frequency and descriptor per hazard

Sources: 5, 6

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
Cold Wave	1.37	event-days per year	about 1.37 days per year	Likely	Storm Events event-days in 3 of 30 years, 1996 to 2025 (10%)	26	2005-11-12 to 2024-11-12 (19 years)	countywide	
Drought	0	event-days per year	none modeled	Possible	Storm Events 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); Storm Events has a record in 1 of 30 years. The descriptor comes from Storm Events, which counts D2 drought that NRI leaves out.
Earthquake	0.000335	annual probability at a location	chance a given location in the county has at least minor-damage shaking in a year: 0.0335%			not shown	modeled	see B1-f	No descriptor (Storm Events does not record earthquakes).
Hail	1	event per year	about 1 per year	Highly likely	FEMA annualized frequency (modeled)	38.1 (modeled)	1986 to 2023 (38 years)	countywide	
Heat Wave	0.737	event-days per year	about 0.737 days per year	Possible	Storm Events 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 in B1-d.
Ice Storm	0.103	event-days per year	about 0.103 days per year	Likely	Storm Events event-days in 4 of 30 years, 1996 to 2025 (13.3%)	7	1946-12-31 to 2014-02-12 (67 years)	countywide	
Inland Flooding	0.0714	event-days per year	about 0.0714 days per year	Possible	Storm Events event-days in 2 of 30 years, 1996 to 2025 (6.67%)	2	1996 to 2023 (28 years)	see B1-f	
Landslide	0.146	events per year (modeled)	about 1 in 7 years	Likely	FEMA annualized frequency (modeled)	not shown	modeled	see B1-f	

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
Lightning	26.2	days per year with a strike	about 26.2 days per year	Highly likely	FEMA annualized frequency (modeled)	not shown	1995 to 2023 (29 years; CONUS)	countywide	
Strong Wind	1.02	events per year	about 1.02 per year	Highly likely	FEMA annualized frequency (modeled)	39	1986 to 2023 (38 years)	countywide	
Tornado	0.0939	events per year	about 1 in 11 years	Possible	FEMA annualized frequency (modeled)	not shown	1950 to 2023 (EF2+); 1986 to 2023 (EF0-1)	see B1-f	
Wildfire	0.000339	annual probability at a location	chance a given location in the county burns in a year: 0.0339%	Possible	Storm Events records in 1 of 30 years, 1996 to 2025 (3.33%)	not shown	modeled	see B1-f	
Winter Weather	32.6	event-days per year	about 32.6 days per year	Highly likely	Storm Events event-days in 29 of 30 years, 1996 to 2025 (96.7%)	619	2005-11-12 to 2024-11-12 (19 years)	countywide	

FEMA annualized frequency (modeled) is the National Risk Index v1.20 (December 2025) estimate of how often a hazard affects this county in a year; it is not recorded events divided by years, and its unit differs by hazard (events, event-days, or days with a lightning strike per year). For earthquake, wildfire, coastal flooding and tsunami the value is the chance (or number of events) at a location in the county, not across the county, so no "1 in N years" is given and the descriptor comes from Storm Events where it has a record (none for earthquake). The Methods page gives each hazard's method, from FEMA's National Risk Index Technical Documentation v1.20.

Where NRI gives event-days, the descriptor comes from the share of years with a Storm Events record; NRI's source records more events, so the two differ.

Descriptor scale used in this packet (defined per unit)

Sources: 5, 6

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
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

Intensity bands: historical frequency (Storm Events)

Source: 6

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	10	30	0.333
Hail	2.00 in+	1996 to 2025	0	30	0
Thunderstorm Wind (counted as NRI Strong Wind)	50-64 kt	1996 to 2025	36	30	1.2
Thunderstorm Wind (counted as NRI Strong Wind)	65 kt+	1996 to 2025	2	30	0.0667
Thunderstorm Wind (counted as NRI Strong Wind)	unmeasured or below 50 kt	1996 to 2025	0	30	0
Tornado	EF0-1	1996 to 2025	3	30	0.1
Tornado	EF2-3	1996 to 2025	1	30	0.0333
Tornado	EF4-5	1996 to 2025	0	30	0
Tornado	unrated (EFU)	1996 to 2025	0	30	0

The bands show how often events of each severity were recorded in this county, to profile how severe events have been (FEMA's probability item asks for the range of intensities).

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.

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 (<https://resilience.climate.gov/>).

Supports FEMA checklist item B1-f: hazards that vary across jurisdictions

Range of census tract risk within the county

Source: 5

Hazard	Tracts <i>rated of all</i>	NRI risk score, 0 to 100			Tracts by rating
		Min	Median	Max	
Cold Wave	6 of 6	90.3	91.2	96.8	Very High 2, Relatively High 4
Drought	0 of 6				No Rating 6
Earthquake	6 of 6	4.4	6.6	11.4	Very Low 6
Hail	6 of 6	67.9	72.7	81.9	Relatively Moderate 4, Relatively Low 2
Heat Wave	6 of 6	6.9	7.4	14.8	Very Low 6
Hurricane	6 of 6	24.9	27.2	29.6	Very Low 6
Ice Storm	6 of 6	5.5	7.0	26.1	Very Low 6
Inland Flooding	6 of 6	27.0	51.9	77.9	Relatively Moderate 4, Relatively Low 2
Landslide	6 of 6	86.7	89.2	91.0	Relatively Low 6
Lightning	6 of 6	56.6	57.5	78.1	Relatively High 1, Relatively Moderate 5
Strong Wind	6 of 6	66.3	70.0	86.1	Relatively High 1, Relatively Moderate 5

Hazard	Tracts <i>rated of all</i>	NRI risk score, 0 to 100			Tracts by rating
		Min	Median	Max	
Tornado	6 of 6	47.3	49.0	61.8	Relatively Moderate 2, Relatively Low 4
Wildfire	6 of 6	76.5	83.0	88.1	Relatively Low 6
Winter Weather	6 of 6	98.1	98.4	99.6	Very High 6

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.

The score ranks a tract against all U.S. tracts (100 = highest). The rating is FEMA's category for the tract's risk value, computed differently, so the two can disagree.

Frequency data for cold wave, hail, heat wave, ice storm, lightning, strong wind and winter weather are county-wide or coarse (49 km grid or NWS zone), the same for every jurisdiction; the tract range mostly reflects where buildings and people are.

Each jurisdiction (starting figures from federal data)

Sources: 1, 3, 4, 6

Jurisdiction	Type	Plan status	Repetitive loss <i>FMA RL and SRL (44 CFR 77.2); repeat-flood, any definition</i>	Public Assistance to this jurisdiction <i>FEMA records matched by applicant name; federal share obligated, nominal dollars</i>	Event records naming this place <i>all years; since its plan</i>	Notes
Kalkaska County	County	Approved, expires 2029-01-22		\$22,786.47	0 total; 0 since its plan	No NFIP community ID on this jurisdiction's plan row.
Kalkaska village	Village	Approved, expires 2029-01-22	FMA RL 0, SRL 0; any 0	no Public Assistance recorded	28 total; 0 since its plan	
Bear Lake township	Township	Approved, expires 2029-01-22		no Public Assistance recorded	0 total; 0 since its plan	No NFIP community ID on this jurisdiction's plan row.
Blue Lake township	Township	Approved, expires 2029-01-22		no Public Assistance recorded	0 total; 0 since its plan	No NFIP community ID on this jurisdiction's plan row.
Boardman township	Township	Approved, expires 2029-01-22	FMA RL 0, SRL 0; any 0	\$14,908	0 total; 0 since its plan	
Clearwater township	Township	Approved, expires 2029-01-22		no Public Assistance recorded	0 total; 0 since its plan	No NFIP community ID on this jurisdiction's plan row.
Coldsprings township	Township	Approved, expires 2029-01-22		no Public Assistance recorded	0 total; 0 since its plan	No NFIP community ID on this jurisdiction's plan row.
Excelsior township	Township	Approved, expires 2029-01-22		no Public Assistance recorded	0 total; 0 since its plan	No NFIP community ID on this jurisdiction's plan row.
Garfield township	Township	Approved, expires 2029-01-22		no Public Assistance recorded	0 total; 0 since its plan	No NFIP community ID on this jurisdiction's plan row.
Kalkaska township	Township	Approved, expires 2029-01-22	FMA RL 0, SRL 0; any 0	no Public Assistance recorded	28 total; 0 since its plan	
Oliver township	Township	Approved, expires 2029-01-22		no Public Assistance recorded	0 total; 0 since its plan	No NFIP community ID on this jurisdiction's plan row.
Orange township	Township	Approved, expires 2029-01-22		no Public Assistance recorded	0 total; 0 since its plan	No NFIP community ID on this jurisdiction's plan row.

Jurisdiction	Type	Plan status	Repetitive loss <i>FMA RL and SRL (44 CFR 77.2); repeat-flood, any definition</i>	Public Assistance to this jurisdiction <i>FEMA records matched by applicant name; federal share obligated, nominal dollars</i>	Event records naming this place <i>all years; since its plan</i>	Notes
Rapid River township	Township	Approved, expires 2029-01-22		no Public Assistance recorded	0 total; 0 since its plan	No NFIP community ID on this jurisdiction's plan row.
Springfield township	Township	Approved, expires 2029-01-22		no Public Assistance recorded	0 total; 0 since its plan	No NFIP community ID on this jurisdiction's plan row.

Repetitive-loss counts are for whole NFIP communities, which can extend beyond this county (see the note in B2-c).

Supports FEMA checklist items B2-a and B2-b: vulnerability and potential impacts

Local data needed

The table below gives county-level starting figures; the plan describes impacts for each jurisdiction and its own assets.

- Critical facilities and lifelines per hazard
- A problem statement per jurisdiction 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

Sources: 1, 2, 3, 5, 6, 7

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>	Cost of expected deaths and injuries <i>FEMA's dollar value per year, not property damage</i>	EAL as % of exposure <i>buildings; agriculture where noted</i>	Storm Events damage since 2024-01-23 <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
Cold Wave	\$5,302,115,266	\$10,721,130	17,909	\$32	\$4,897	\$2,099,613	under 0.0001%				
Drought	n/a	\$0	n/a	n/a	\$0	n/a					agriculture exposure is 0 in NRI
Earthquake	\$8,953,596,251	n/a	17,939	\$5,481	n/a	\$1,710	under 0.0001%				
Hail	\$5,302,115,266	\$10,721,130	17,909	\$119,964	\$7,756	\$16,222	0.00226%	\$0			
Heat Wave	\$5,302,115,266	\$10,721,130	17,909	\$302	under \$1	\$37,911	under 0.0001%				
Hurricane	\$5,302,115,266	\$10,721,130	17,909	\$1,612	\$189	\$1	under 0.0001%				
Ice Storm	\$5,277,378,710	n/a	17,790	\$3,129	n/a	\$1,136	under 0.0001%			no Public Assistance recorded (1 declaration)	

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>	Cost of expected deaths and injuries <i>FEMA's dollar value per year, not property damage</i>	EAL as % of exposure <i>buildings; agriculture where noted</i>	Storm Events damage since 2024-01-23 <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
Inland Flooding	\$5,288,340,509	\$1,684	81	\$3,123,661	\$2	\$10	n/a (see note)			\$37,694.47	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.
Landslide	\$58,963,405	n/a	221	\$136	n/a	\$2,117	0.00023%				
Lightning	\$5,302,115,266	n/a	17,909	\$2,343	n/a	\$92,691	under 0.0001%				
Strong Wind	\$5,302,115,266	\$10,721,130	17,909	\$129,659	\$376	\$87,146	0.00245%				
Tornado	\$5,302,115,266	\$10,721,130	17,909	\$159,529	\$89	\$216,920	0.00301%			\$37,694.47	
Wildfire	\$1,475,199,610	\$2,696,124	6,832	\$49,894	\$6	\$3,883	0.00338%				
Winter Weather	\$5,302,115,266	\$10,721,130	17,909	\$4,404	\$115	\$315,800	under 0.0001%			no Public Assistance recorded (1 declaration)	

Totals since 2024-01-23 (Storm Events through 2026-06-30): 3 county-coded records, 1 with a damage value recorded (including \$0), \$0; 10 zone-level records, 0 with a damage value recorded (including \$0), \$0 reported for the zone; Public Assistance: \$37,694.47 on 2 counted declarations, 1 of them with Public Assistance.

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 does not add up to the total; the unit total counts each declaration once.

NRI computes earthquake exposure on its own basis, so it exceeds the county building value in B2-a.

Supports FEMA checklist item B2-a: vulnerability (county context)

County context

Source: 5

Measure	Value
Population	17,909
Building value (total, not at risk)	\$5,302,115,266
Agriculture value (total, not at risk)	\$10,721,130
NRI risk rating (all hazards)	Very Low
Expected annual loss, buildings and agriculture, all hazards	\$3,613,574
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)	\$2,875,160
Social vulnerability rating	Relatively Moderate
Community resilience rating	Relatively Moderate
NRI version	December 2025

FEMA's all-hazard expected annual loss adds buildings, agriculture and population equivalence; this table gives the property part and the population-equivalence part as separate rows.

Social vulnerability: higher means people are more likely to be harmed and slower to recover. Community resilience: lower means the community is less able to recover. High social vulnerability and low resilience both raise the NRI risk rating.

Supports FEMA checklist item B2-c: repetitive loss properties

Repetitive loss in this county, both definitions

Sources: 1, 4

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

The state NFIP coordinator's list, the source FEMA's Handbook names, often uses the NFIP insurance definition (second row).

Repeat-flood properties: county and state-level rows

Sources: 1, 4

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
Statewide, no county in FEMA's file	0	0	4	0	4	0	0

The statewide row counts properties FEMA's file gives with no county in this state; they are listed for reference and are not in this county's counts.

Repeat-flood properties by jurisdiction in the plan (NFIP community)

Sources: 1, 4

Jurisdiction	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
Kalkaska village	261539	0	0	0	0	0	0	0	shared NFIP community; count covers the joint community
Boardman township	260430	0	0	0	0	0	0	0	
Kalkaska township	261539	0	0	0	0	0	0	0	shared NFIP community; count covers the joint community

Counts by occupancy group for each jurisdiction are in the Excel file, sheet "B2-c Jurisdictions".

Jurisdiction 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 jurisdiction row, while the county table counts only its part in this county.

County repeat-flood properties by occupancy group: 0 in every occupancy group.

Sources: 1, 4

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. NFIP repetitive loss (the FEMA insurance definition) is 2 or more claims over \$1,000 in 10 years, and a property can leave that group once it is mitigated. Also shown: NFIP severe repetitive loss, any category, mitigated and currently insured. The Methods page gives the OpenFEMA field details.

Counts are aggregates of FEMA's public NFIP Multiple Loss Properties file (FEMA's data date 2026-08-02; file version 2026-08-04). No property is identified. County assignment is FEMA's geocode.

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

Tables cite these sources by number. The full list, for the plan's bibliography (FEMA review item A4-a):

1. FEMA, OpenFEMA HazardMitigationPlanStatuses v1, version 2026-09-29T134039Z, pulled 2026-09-30, <https://www.fema.gov/api/open/v1/HazardMitigationPlanStatuses> (API)
2. FEMA, OpenFEMA DisasterDeclarationsSummaries v2, version 2026-09-29T162832Z, pulled 2026-09-30, <https://www.fema.gov/api/open/v2/DisasterDeclarationsSummaries> (API)
3. FEMA, OpenFEMA PublicAssistanceFundedProjectsSummaries v1, version 2026-09-29T150754Z, pulled 2026-09-30, <https://www.fema.gov/api/open/v1/PublicAssistanceFundedProjectsSummaries> (API)
4. FEMA, OpenFEMA NfipMultipleLossProperties v1, version 2026-08-04T164045Z, pulled 2026-09-30, <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 2026-09-30, 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 2026-09-30, <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 2026-09-30, <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 2026-09-30, 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 (used to match place names and codes; no table prints its values)

What this packet is and what the plan adds

This packet is the federal data for the plan's risk assessment (the summary on page 1 says how it is organized); the plan and FEMA's review decide whether each item is met.

The plan adds what only the community has: local data on assets, critical facilities, development and each jurisdiction's impacts; local hazard history, including state-declared emergencies; the mitigation strategy; and adoption.

How the federal data are built: National Risk Index values are FEMA's model, not counts of events. Storm Events is more complete from 1996; zone-level records are placed by forecast zone, not by location in the county. Public Assistance for a jurisdiction is matched by applicant name. The Methods page gives every rule and the known edge cases.

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Corrections: to report an error, name the packet, the table and what your records show. Contact: contact@hazardplain.org