Climate & Earth Systems | Jun 19, 2026 | 10 min read | By Bryan White

115 Billion Dollars Later: How 2025 Redefined the US Climate Baseline

Environment * Climate Change * Weather

Shifting the U.S. Climatological Baseline

Between 2025 and late 2026, high-impact weather in the United States escalated in frequency, intensity, and seasonality. In 2025, 23 individual disasters each exceeded USD 1 billion in inflation-adjusted losses -- the third-highest count behind 2023 and 2024 -- totaling USD 115 billion and 276 fatalities[1][2]. The average interval between billion-dollar events contracted from 82 days in the 1980s to 16 days in the 2020s, and to 10 days in 2025[3][4]. After federal cuts discontinued NOAA's updates, Climate Central assumed stewardship of the historical dataset[4][5]: the first half of 2026 added 12 billion-dollar events totaling USD 31.9 billion (the fifth-highest January-June count on record)[6], and a September-November 2026 methodological revision incorporating standalone wildfire accounting brought the cumulative 1980-2026 toll to 453 disasters exceeding USD 3.2 trillion and 17,200 deaths[7], alongside stochastic projections indicating a 54 percent probability that 2026-2030 losses will top USD 1 trillion[8].

A core physical driver of the 2025-2026 anomalies is hydroclimate whiplash -- rapid swings between pluvial extremes and acute desiccation[9][10]. Under positive radiative forcing and the Clausius-Clapeyron relation, saturation vapor pressure rises ~7 percent per deg C (~4 percent per deg F) of warming[9][10]. This thermodynamic scaling intensifies both convective rainfall and evaporative demand, amplifying drought and flood cycles[9][10].

| Year | | Total Billion-Dollar Disasters | | Severe Storm Events | | Tropical Cyclones | | Wildfires | | Total Estimated Cost (USD Billions) | | Total Fatalities |

| 2023 | | 28 | | 19 | | 4 | | 1 | | 95.0 | | 492 |

| 2024 | | 27 | | 18 | | 3 | | 2 | | 108.5 | | 315 |

| 2025 | | 23 | | 21 | | 0 | | 1 | | 115.0 | | 276 |

| 1980-2025 Average | | 9.2 | | 4.1 | | 1.8 | | 0.8 | | 67.6 | | 135 |

Macro-Scale Teleconnections and the January 2025 Los Angeles Wildfires

Synoptic volatility was governed by the El Ni o-Southern Oscillation (ENSO) and stratospheric polar vortex disruption. Following La Ni a, El Ni o strengthened sharply through 2026, with NOAA's November 12, 2026 diagnostic update reporting Ni o-3.4 sea surface temperature anomalies reaching +2.5 deg C (+3.6 deg C in Ni o-3; >+10.0 deg C subsurface thermocline anomalies) on track for a strong-to-very strong event on the Relative Oceanic Ni o Index and exciting an amplified Rossby wave train across North America[11][12]. Earlier in the year, a mid-January 2026 Sudden

Stratospheric Warming weakened circumpolar westerlies, carving deep eastern troughs for Arctic air advection while reinforcing western ridging[13].

Hydroclimate whiplash culminated between January 7 and 31, 2025, when the Palisades and Eaton fires burned over 40,000 acres across Greater Los Angeles, destroying 16,000+ structures, displacing 200,000 residents, causing 31 direct deaths, and inflicting USD 61.2 billion in losses -- the costliest wildfire disaster in U.S. history[1][2][14]. Two wet winters of heavy brush growth were followed by a record-dry autumn that dropped 1000-hour dead fuel moisture to its sixth-lowest mark as vapor pressure deficit spiked[14][15]. A cut-off low paired with Great Basin high pressure drove hurricane-force Santa Ana gusts (100 mph on Mount Lukens; <15 percent relative humidity)[14][16][17]. Attribution science showed warming made these fire-weather conditions 35 percent more likely and 6 percent more intense[16].

Convective Extremes: Early-Season Supercells and Tornado Outbreaks

Convective storms comprised 21 of the 23 billion-dollar disasters in 2025 (USD 50 billion total)[1]. During the March 14-16, 2025 outbreak (115+ tornadoes, 43 deaths, USD 11.0 billion), Warn-on-Forecast and ProbSevere machine learning models provided 80-minute lead times in Missouri, even as twin EF-4 tornadoes struck Arkansas (one tracking ~120 miles) alongside 90 mph haboob winds across Texas and Oklahoma[1][18][19].

Convection escalated on March 6-11, 2026: after Michigan's earliest recorded EF-3 tornado struck Union City on March 6 (160 mph winds)[23], a shortwave trough on March 10 eroded a capping inversion along a stationary front and Lake Michigan thermal boundary[20][21][22]. Pronounced helicity and deep updrafts into the upper troposphere spawned a cyclic supercell generating multiple tornadoes -- including a 36.6-mile EF-3 track across the Kankakee, Illinois-Lake Village/DeMotte, Indiana corridor (150 mph, three deaths) and a state-record 6.0-inch hailstone in Kankakee[20][21][22]. On March 11, an erroneous automated Damage Assessment Toolkit feed briefly mislabeled a Wells County, Indiana tornado as EF-5 before National Weather Service Northern Indiana ground surveys verified brief EF-0 tornadoes (~80 mph winds) in Wells and Jay counties alongside the March 10 Starke County EF-2[21].

| Tornado Location | | Date | | EF Rating | | Path Length (Miles) | | Peak Winds (mph) | | Key Meteorological Drivers |

| Wells County, IN | | March 11, 2026 | | EF-0 (survey-verified) | | Brief (NWS survey) | | ~80 | | Squall-line spin-up along cold front; initial automated feed erroneously listed EF-5 before NWS IWX ground correction. |

| Kankakee, IL to Lake Village / DeMotte, IN | | March 10, 2026 | | EF-3 | | 36.6 | | 150 | | Lake-breeze thermal boundary; uninhibited warm-sector supercell. |

| Starke County, IN | | March 10, 2026 | | EF-2 | | N/A | | 115 | | Cyclic supercell dynamics following the primary EF-3 occlusion. |

| Union City, MI | | March 6, 2026 | | EF-3 | | N/A | | 160 | | Stalled warm front; unseasonably high CAPE for early March. |

On April 17, 2026 (CAPE ~3,000 J/kg; helicity >400 m2/s2), a major tornado outbreak struck the Upper Midwest, including the Buffalo County (140 mph) and Ringle (145

mph) EF-3s in Wisconsin, with zero fatalities[24][25]. Conversely, May 2026 recorded 166 preliminary Storm Prediction Center tornado reports (well below the 1991-2020 climatological average of 268) as the transitioning ENSO state reduced vertical shear and persistent troughing limited warm-sector instability[26].

Hydrological Volatility and Cryospheric Extremes

From July 4 to 7, 2025, remnants of Tropical Storm Barry and Hurricane Flossie stalled with a Mesoscale Convective Vortex over the Texas Hill Country (precipitable water 2.52 inches)[27][28][29]. Rainfall reached 5.22 in/hr and 20.33 inches total over the Balcones Escarpment; the Guadalupe River surged 26 feet in 45 minutes at Hunt (cresting at 37.52 feet; 177,000 ft3/s at Comfort), causing 139 deaths and USD 1.1 billion in damage, with warming amplifying rainfall rates[27][28][29]. In February 2026, California atmospheric rivers (Integrated Vapor Transport >500 kg m 1 s 1) triggered southern urban floods before dumping 72+ inches of Sierra Nevada snow, lifting statewide snowpack from 52 to 75 percent of normal[30][31].

Polar vortex stretching also drove damaging eastern and midwestern winter storms. During January 23-27, 2026, Gulf moisture overriding Arctic air (-40 deg F wind chills) produced 1 inch of southern ice and 30-40 cm of northern snow, causing 1M+ power outages and 174 deaths[13][32]. On February 22-24, 2026, Storm Hernando bombed out by 41 mbar to 965 mbar off North Carolina, bringing 98 mph gusts in Wellfleet, Massachusetts, an all-time record 37.9 inches of snow in Providence, Rhode Island, 30 fatalities, and USD 500 million in losses[33][34]; days earlier on February 17-19, lake-enhanced forcing along Lake Superior dropped 40.4 inches near Hovland, Minnesota[35].

| Location | | Snowfall Total (Inches) | | Event | | Significance |

| Providence, RI | | 37.9 | | Feb 2026 Blizzard | | All-time highest snowfall record (breaking 1978 benchmark). |

| Blue Hill Observatory, MA | | 24.8 | | Feb 2026 Blizzard | | 11th largest snowfall in Observatory record. |

| New York City (borough peak), NY | | 29.0 | | Feb 2026 Blizzard | | Outer-borough peak (>29 in. noted by CIRA; 15.1 in. Central Park); thundersnow observed. |

| Hovland, MN | | 40.4 | | Feb 17-19, 2026 Winter Storm | | 72-hour lake-enhanced North Shore storm maximum. |

Expanding Heat Domes and Attribution Science

Between June 22 and 25, 2025, an anticyclonic heat dome across central and eastern states broke dozens of daily high-minimum and maximum temperature records as heat indices pushed past 110-120 deg F and June ranked among the warmest on record nationally[36][38]. Consistent with climate sensitivity projections, separate World Weather Attribution analysis of early 2026 western North American heat records found that such regional thermal anomalies would have been virtually impossible without human-caused warming[37].

Conclusion: Adapting to Compounding Atmospheric Hazards

The 2025-2026 meteorological record confirms a shift toward year-round compounding extremes -- from January Los Angeles firestorms and early-March EF-3 tornadoes to devastating Texas flash floods and record Northeast bomb cyclones. Navigating 10-to-16-day disaster intervals requires pairing AI-assisted ensemble forecasting with hardened civil and grid infrastructure.

Updates... (Nov 22, 2026): Corrected the title of Fovell & Mass (#14, "Santa Ana Winds in the San Gabriel Valley and the January 2025 Eaton Fire"), replaced the rolling NOAA CPC ENSO advisory URL (#11) with the permanent November 12, 2026 archive URL, and enriched all 38 citations with exact publication dates alongside the 2026 Climate Central and NWS storm updates.

Works Cited

* [1] Climate Central (Jan 8, 2026). U.S. Billion-Dollar Weather and Climate Disasters in 2025. https://www.climatecentral.org/US_Billion-Dollar_Disasters_2025.pdf

* [2] Climate Central (Jan 8, 2026). 2025 in Review: U.S. Billion-Dollar Disasters. https://www.climatecentral.org/climate-matters/2025-in-review

* [3] Smith, A. (2026). U.S. Billion-Dollar Weather and Climate Disasters - 2025 in Review. 106th American Meteorological Society Annual Meeting (Paper 473421). https://ams.confex.com/ams/106ANNUAL/meetingapp.cgi/Paper/473421

* [4] Union of Concerned Scientists (Jan 8, 2026). New Analysis Confirms Growing Trend of Billion-Dollar, Extreme Weather Disasters Amid Trump Administration's Ongoing Cuts to Climate Research and Emergency Response. https://www.ucs.org/about/news/new-analysis-confirms-growing-trend-billion-dollar-extreme-weather-disasters-amid-trump

* [5] NOAA National Centers for Environmental Information (NCEI) (2025). Billion-Dollar Weather and Climate Disasters: United States Summary. https://www.ncei.noaa.gov/access/billions/state-summary/US

* [6] Climate Central (Jul 29, 2026). Mid-2026 Update: U.S. Billion-Dollar Weather and Climate Disasters. https://www.climatecentral.org/climate-matters/mid-year-billion-dollar-disasters

* [7] Climate Central (2026). U.S. Billion-Dollar Weather and Climate Disasters (1980-2026 Dataset). https://www.climatecentral.org/climate-services/billion-dollar-disasters

* [8] University of Chicago Institute for Climate and Sustainable Growth (Feb 10, 2026). U.S. Weather and Climate Disasters Could Cause Over $1 Trillion in Damage in Next Five Years. https://climate.uchicago.edu/news/u-s-weather-and-climate-disasters-could-cause-over-1-trillion-in-damage-in-next-five-years/

* [9] McDermott, A. (Jun 10, 2026). Driven by climate change, sudden swings between wet and dry create "hydrologic whiplash". Proceedings of the National Academy of Sciences, 123. https://www.pnas.org/doi/10.1073/pnas.2617960123

* [10] Swain, D. L., Prein, A. F., Abatzoglou, J. T., et al. (Jan 9, 2025). Hydroclimate volatility on a warming Earth. Nature Reviews Earth & Environment,

6(1), 35-50. https://doi.org/10.1038/s43017-024-00624-z

* [11] NOAA Climate Prediction Center (CPC) (Nov 12, 2026). El Ni o/Southern Oscillation (ENSO) Diagnostic Discussion. -- https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_disc_nov2026/ensodisc.shtml

* [12] Columbia Climate School - State of the Planet (Jun 9, 2026). You Asked: What Exactly Is a 'Super' El Ni o? https://news.climate.columbia.edu/2026/06/09/you-asked-what-exactly-is-a-super-el-nino/

* [13] Keel, T., Brierley, C., Messori, G., & White, R. (Sep 28, 2025). Representing the teleconnection between the jet stream and extreme cold air outbreaks over North America. Geophysical Research Letters, 52(20). https://doi.org/10.1029/2025gl116984

* [14] Fovell, R. G., & Mass, C. F. (Sep 18, 2026). Santa Ana Winds in the San Gabriel Valley and the January 2025 Eaton Fire. Weather and Forecasting, 41(4), 569-588. -- https://doi.org/10.1175/waf-d-26-0067.1

* [15] CalMatters (Jan 15, 2025). 'Literally off the charts': LA's critically dry conditions stun scientists as fires rage. https://calmatters.org/environment/wildfires/2025/01/dry-danger-zone-california-fires-climate-change/

* [16] World Weather Attribution (Jan 2025). Climate change increased the likelihood of wildfire disaster in highly exposed Los Angeles area. https://www.worldweatherattribution.org/climate-change-increased-the-likelihood-of-wildfire-disaster-in-highly-exposed-los-angeles

* [17] Los Angeles Fire Department (Oct 8, 2025). Palisades Fire After-Action Review Report. https://lafd.org/sites/default/files/pdf_files/Palisades_AARR_10_08_2025_final.pdf

* [18] NOAA NESDIS (Mar 2025). NOAA Satellites Monitor Severe Weather Outbreak. https://www.nesdis.noaa.gov/news/noaa-satellites-monitor-severe-weather-outbreak

* [19] NASA Applied Sciences (Jul 17, 2026). Tracking Tornadoes from Space. https://appliedsciences.nasa.gov/our-impact/story/tracking-tornadoes-space

* [20] National Weather Service - Central Illinois (ILX) (2026). March 10-11, 2026 - 6 Tornadoes, Severe Storms. https://www.weather.gov/ilx/2026_03_10_severeweather

* [21] National Weather Service - Northern Indiana (IWX) (2026). March 10-11 Severe Weather and Tornadoes. https://www.weather.gov/iwx/03102026_severeweather

* [22] National Weather Service - Chicago (LOT) (2026). March 10, 2026: Several Tornadoes in the Kankakee River Valley and Record Large Hail. https://www.weather.gov/lot/2026_03_10_Severe_Weather

* [23] National Weather Service - Northern Indiana (IWX) (2026). March 6th 2026 Severe Weather and Tornadoes in Southern Lower Michigan. https://www.weather.gov/iwx/03062026_LowerMichiganTornadoes

* [24] National Weather Service - Green Bay (GRB) (2026). Preliminary Summary: April 17, 2026 Tornadoes. https://www.weather.gov/grb/041726_tornadoes

* [25] National Weather Service - La Crosse (ARX) (2026). The Tornado Outbreak of April 17, 2026. https://www.weather.gov/arx/apr1726

* [26] WeatherNation / NOAA Storm Prediction Center (2026). May 2026 Tornado Recap:

Below Average, But Not Without Impact.
https://www.weathernationtv.com/news/may-2026-tornado-recap-below-average-but-not-without-impact

* [27] Bose, A., Furl, C., Giacomoni, M., & Sharif, H. (Feb 9, 2026). Flash Flood Alley Unleashed: Hydrometeorological Factors and Consequences of the Guadalupe River Catastrophe on July 4, 2025. ESS Open Archive.
https://doi.org/10.22541/essoar.177067517.79159919/v1

* [28] ClimaMeter (Jul 2025). 2025/07/04 Texas Floods.
https://www.climameter.org/20250704-texas-floods

* [29] NWS Austin-San Antonio / Esri ArcGIS StoryMaps (Apr 15, 2026). Meteorological Overview of the July 2025 Texas Floods.
https://storymaps.arcgis.com/stories/b2fc22b8fe464beab1a9148ce249bfb8

* [30] Center for Western Weather and Water Extremes (CW3E) (Feb 24, 2026). Quick Summary of the Winter Storms Impacting California During 15-19 February.
https://cw3e.ucsd.edu/wp-content/uploads/2026/02/24Feb2026_Quick_Summary.pdf

* [31] City of San Diego / CW3E Regional Briefing (Mar 16, 2026). Atmospheric Rivers, Flooding, and the Changing Climate in the San Diego Region.
https://www.sandiego.gov/sites/default/files/2026-03/item-8a-atmospheric-rivers.pdf

* [32] ClimaMeter (Jan 2026). 2026/01/24-25 North American Winter Storm.
https://www.climameter.org/20260124-25-north-american-winter-storm

* [33] Cooperative Institute for Research in the Atmosphere (CIRA) Satellite Library (Feb 22, 2026). Blizzard of 2026.
https://satlib.cira.colostate.edu/event/blizzard-of-2026/

* [34] Blue Hill Observatory & Science Center (Mar 4, 2026). February 2026 Summary: Tenth Snowiest on Record.
https://bluehill.org/february-2026-summary-tenth-snowiest-on-record/

* [35] National Weather Service - Duluth (DLH) (2026). Mid-February 2026 Winter Storm and Blizzard. https://www.weather.gov/dlh/2026-02-17--19-winter-storm

* [36] NOAA NCEI (Jul 8, 2025). Assessing the U.S. Climate in June 2025.
https://www.ncei.noaa.gov/news/national-climate-202506

* [37] World Weather Attribution (Mar 17, 2026). Record-shattering March temperatures in Western North America virtually impossible without climate change.
https://www.worldweatherattribution.org/record-shattering-march-temperatures-in-western-north-america-virtually-impossible-witho

* [38] Union of Concerned Scientists (Jul 30, 2025). Hot Summer 2025 Could Be the Coolest for the Rest of Our Lives: 6 Things to Know.
https://blog.ucs.org/erika-spanger-siegfried/hot-summer-2025-could-be-the-coolest-for-the-rest-of-our-lives-6-things-to-know/