

Supplementary Material

EM-DAT 2023–2024 Archive Comparison Report: Revisions, Additions, and Structural Changes

2026-04-30

Supplement to: The 2024 Emergency Events Database Archive
The Year in Review and Historical Data Updates

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Data Note (Preprint) — Version 2026-04-30

Overview

This document provides the full quantitative comparison between the EM-DAT 2023 FAIR Archive (1900–2023, Version 1) [1] and the 2024 FAIR Archive (1900–2024, Version 2) [2], with figures generated programmatically in Python. It documents structural schema changes (S1), entry-level additions and removals (S2), aggregate impact revisions by year (S3), changes in external identifier coverage (S4), and geocoding completeness statistics (S5) referenced in the main text.

- [1] Delforge, D., Wathelet, V., Below, R., Lanfredi Sofia, C., Tonnelier, M., van Loenhout, J. A. F., & Speybroeck, N. (2024). *The EM-DAT Emergency Events Database Archive* (Version 1) [Dataset]. Open Data @ UCLouvain. <https://doi.org/10.14428/DVN/I0LTPH>
- [2] Delforge, D., Wathelet, V., Below, R., Lanfredi Sofia, C., Tonnelier, M., van Loenhout, J. A. F., & Speybroeck, N. (2026). *The EM-DAT Emergency Events Database Archive* (Version 2) [Dataset]. Open Data @ UCLouvain. <https://doi.org/10.14428/DVN/I0LTPH>

S1. Structural Changes

S1.1 Schema Evolution

One column was added in the 2024 archive; no columns were removed.

Added column: GADM Admin Units — provides linkage to the Global Administrative Areas (GADM) geographic classification system, enabling finer spatial interoperability.

S1.2 Most Frequently Edited Columns

The table below lists the ten columns with the highest number of revised values across entries present in both archives. The CPI (Consumer Price Index) column dominates due to the annual update of the inflation adjustment series applied to all historical economic damage figures.

Column	Number of Edits
CPI	26,218
Last Update	8,996
Total Damage, Adjusted ('000 US\$)	5,759
External IDs	2,372
Insured Damage, Adjusted ('000 US\$)	1,123
Location	571
End Day	369
Start Day	358
Event Name	355
Magnitude	248

S2. Entry-Level Changes

S2.1 Entry Counts

Between the two archives, 578 net entries were added. This reflects a combination of new 2024 events, retrospective additions of historical events, and a small number of removed entries (typically consolidations or corrections).

Metric	Value
Benchmark entries (2023 archive)	26,368
Candidate entries (2024 archive)	26,946
Net difference	+578
Removed entries	150
New entries within the benchmark period (1900–2023)	124
New entries beyond the benchmark period (2024 events)	604

S2.2 Top Removed Entries — Total Deaths

The following entries were present in the 2023 archive but absent from the 2024 archive, sorted by their recorded death toll.

DisNo	Classification	Deaths
1930-0024-DMA	Tropical storm	2,000
1961-0052-HND	Tropical storm	275
1922-0002-ITA	Landslide	100
1979-9270-BGD	Drought	18
1939-0018-ITA	Riverine flood	10
2001-0482-BOL	Cold wave	9
2001-0519-AGO	Bacterial disease	9
2003-0190-BGD	Storm	9
2002-0434-IDN	Air accident	9
2010-0667-CHN	Ground movement	8

S2.3 Top Added Entries — Total Deaths

The following entries are new in the 2024 archive, sorted by recorded death toll. The two top entries correspond to the 1934 Bihar-Nepal earthquake, which was split into country-level records.

DisNo	Classification	Deaths
1934-0001-NPL	Earthquake	8,519
1934-0001-IND	Earthquake	7,188
1934-0007-HND	Tropical storm	468
2010-0712-MMR	Heat wave	260
1930-0004-FRA	Riverine flood	230
1974-0047-GTM	Tropical storm	200
1926-0009-DOM	Tropical storm	162
2023-0043-MOZ	Bacterial disease	141
1932-0006-CYM	Tropical storm	110
2023-0879-MYS	Viral disease	100

S2.4 Top Edited Entries — Total Deaths

The table below lists the entries with the largest absolute change in recorded deaths between archives.

DisNo	Classification	2023 Archive	2024 Archive	Change
1956-0013-CHN	Tropical storm	2,000	4,935	+2,935
1952-0036-SUN	Tsunami	0	2,336	+2,336
2023-0636-AFG	Earthquake	2,445	1,480	-965
2018-0235-GBR	Heat wave	0	820	+820

DisNo	Classification	2023 Archive	2024 Archive	Change
1954-0070-JPN	Tropical storm	1,172	1,761	+589
2023-0166-NGA	Bacterial disease	562	1,055	+493
1962-0008-ESP	Flash flood	445	815	+370
1926-0009-BHS	Tropical storm	0	263	+263
1915-0005-USA	Tropical storm	525	275	-250
1937-0001-USA	Riverine flood	137	385	+248

S2.5 Top Removed Entries — Total Affected

The following entries were present in the 2023 archive but absent from the 2024 archive, sorted by their recorded number of affected people.

DisNo	Classification	Affected
2022-9863-URY	Drought	409,115
1988-9408-TZA	Drought	110,000
2001-0783-BIH	Riverine flood	9,000
1979-9270-BGD	Drought	2,000
2015-0384-GRC	Riverine flood	500
2002-0012-FRA	Riverine flood	180
2011-0339-IDN	Maritime accident	93
2001-0519-AGO	Bacterial disease	88
2002-0285-OMN	Tropical storm	83
2006-0381-CMR	Bacterial disease	71

S2.6 Top Added Entries — Total Affected

The following entries are new in the 2024 archive, sorted by their recorded number of affected people.

DisNo	Classification	Affected
2023-9881-SYR	Drought	650,000
2023-0879-MYS	Viral disease	123,133
1977-0117-CHN	Tropical storm	120,000
2023-0884-SYR	Wildfire	50,005
1956-0015-PRI	Tropical storm	45,093
2023-0043-MOZ	Bacterial disease	33,544
1959-0012-JPN	Tropical storm	18,088
1930-0004-FRA	Riverine flood	16,200
2023-0001-LBR	Riverine flood	15,200
1934-0007-USA	Tropical storm	15,000

S2.7 Top Edited Entries — Total Affected

The table below lists the entries with the largest absolute change in the number of affected people between archives.

DisNo	Classification	2023 Archive	2024 Archive	Change
1956-0013-CHN	Tropical storm	0	11,016,617	+11,016,617
2023-0868-COG	Riverine flood	321,000	1,800,000	+1,479,000
1937-0001-USA	Riverine flood	0	1,000,000	+1,000,000
1973-0042-PHL	Tropical storm	0	1,000,000	+1,000,000
2023-0054-SYR	Earthquake	8,808,700	8,011,774	-796,926
1959-0012-KOR	Tropical storm	0	782,126	+782,126
1953-0018-JPN	Tropical storm	1,000,000	1,746,819	+746,819
1951-0014-USA	Riverine flood	0	518,000	+518,000
1952-0008-PHL	Tropical storm	349	500,349	+500,000
1912-0005-CHN	Tropical storm	0	500,000	+500,000

S2.8 Top Removed Entries — Total Damage ('000 US\$)

The following entries were present in the 2023 archive but absent from the 2024 archive, sorted by their recorded economic damage.

DisNo	Classification	Damage ('000 US\$)
2012-0549-GBR	Flash flood	785,000
2001-0386-DEU	Lightning storm	300,000
2001-0386-ITA	Lightning storm	175,000
2001-0536-ITA	Flash flood	100,000
2015-0605-EGY	Lightning storm	100,000
2002-0879-ESP	Flash flood	87,000
2019-0015-ESP	Riverine flood	58,000
1991-0296-DFR	Riverine flood	56,000
1992-9090-CHN	Drought	53,200
2021-0274-MEX	Severe storm	50,000

S2.9 Top Added Entries — Total Damage ('000 US\$)

The following entries are new in the 2024 archive, sorted by their recorded economic damage.

DisNo	Classification	Damage ('000 US\$)
1979-0280-USA	Tropical storm	320,000
2020-0437-GRC	Severe storm	240,000
2016-0035-GBR	Extratropical storm	160,000
1991-0296-DEU	Riverine flood	56,000
2005-0382-GRD	Tropical storm	44,900

DisNo	Classification	Damage ('000 US\$)
1956-0015-PRI	Tropical storm	40,000
2020-0232-CZE	Flash flood	32,000
1971-0051-USA	Tropical storm	25,000
1997-0001-PRT	Storm	25,000
2010-0485-SVN	Riverine flood	19,989

S2.10 Top Edited Entries — Total Damage ('000 US\$)

The table below lists the entries with the largest absolute change in recorded economic damage between archives. The top entry reflects the correction of a duplicated damage value for the 2016 Kumamoto earthquake sequence (Japan).

DisNo	Classification	2023 Archive	2024 Archive	Change
2016-0107-JPN	Earthquake	38,000,000	0	−38,000,000
2023-0497-SVN	Riverine flood	0	3,257,083	+3,257,083
2020-0238-USA	Severe storm	850,000	2,100,000	+1,250,000
2012-0548-GBR	Riverine flood	450,000	1,600,000	+1,150,000
2020-0051-DEU	Extratropical storm	0	1,100,000	+1,100,000
1979-0088-USA	Tropical storm	2,300,000	1,700,000	−600,000
1978-0033-USA	Blizzard	100,000	520,000	+420,000
1962-0015-HKG	Tropical storm	0	335,000	+335,000
1954-0057-JPN	Tropical storm	0	300,000	+300,000
2007-0359-USA	Tropical storm	0	248,000	+248,000

S3. Aggregate Impact Revisions by Year

Years with no net change between archives are omitted. Differences reflect both the addition/removal of entries and revisions to existing records.

S3.1 Total Deaths

Year	2023 Archive	2024 Archive	Change
1903	7,822	7,830	+8
1907	1,313,275	1,313,428	+153
1909	1,506,606	1,506,656	+50
1910	149,095	149,111	+16
1912	55,093	55,098	+5
1915	33,416	33,166	−250
1916	1,841	1,856	+15
1920	3,206,924	3,206,966	+42
1922	101,436	101,336	−100

Year	2023 Archive	2024 Archive	Change
1923	258,696	258,714	+18
1924	303,303	303,318	+15
1925	6,973	6,986	+13
1926	427,852	428,313	+461
1929	3,402	3,450	+48
1930	11,472	9,702	-1,770
1932	4,934	5,091	+157
1933	31,795	31,817	+22
1934	7,427	23,667	+16,240
1936	6,259	6,173	-86
1937	13,342	13,604	+262
1939	563,866	563,856	-10
1940	23,857	23,654	-203
1945	11,562	11,571	+9
1948	122,326	122,297	-29
1950	7,603	7,606	+3
1951	18,346	18,764	+418
1952	7,246	9,582	+2,336
1953	13,606	13,913	+307
1954	45,378	45,999	+621
1955	6,164	6,172	+8
1956	10,870	13,851	+2,981
1959	2,013,838	2,014,191	+353
1960	40,531	40,537	+6
1961	17,837	17,575	-262
1962	17,638	18,015	+377
1964	13,901	13,918	+17
1965	1,566,750	1,566,708	-42
1970	388,346	388,330	-16
1971	18,843	18,865	+22
1972	22,442	22,504	+62
1973	111,563	111,401	-162
1974	88,944	89,230	+286
1975	28,692	28,683	-9
1976	281,535	281,571	+36
1977	24,098	24,308	+210
1978	40,811	40,914	+103
1979	10,484	10,538	+54
1980	25,355	25,356	+1
1981	122,188	122,165	-23

Year	2023 Archive	2024 Archive	Change
1982	16,070	16,052	-18
1983	465,406	465,419	+13
1984	22,168	22,179	+11
1985	64,817	64,820	+3
1986	17,115	17,116	+1
1987	33,211	33,244	+33
1990	61,768	61,770	+2
1992	26,280	26,286	+6
1993	31,356	31,358	+2
1994	24,837	24,840	+3
1995	34,449	34,447	-2
1996	40,989	41,007	+18
1997	38,016	38,030	+14
1998	71,310	71,309	-1
1999	85,562	85,587	+25
2000	28,014	27,990	-24
2001	47,991	47,961	-30
2002	34,023	33,997	-26
2003	123,871	123,856	-15
2004	255,033	255,034	+1
2005	105,152	105,158	+6
2006	39,753	39,737	-16
2007	30,048	30,069	+21
2008	248,927	248,923	-4
2009	22,920	22,924	+4
2010	336,647	336,900	+253
2011	40,787	40,774	-13
2012	17,699	17,698	-1
2013	28,944	28,945	+1
2014	27,359	27,354	-5
2015	33,824	33,811	-13
2016	17,078	17,079	+1
2017	16,550	16,553	+3
2018	19,883	20,806	+923
2019	27,388	27,386	-2
2020	18,157	18,195	+38
2021	19,187	19,192	+5
2022	83,934	84,368	+434
2023	143,599	143,196	-403

S3.2 Total Affected

Year	2023 Archive	2024 Archive	Change
1903	60,023	67,403	+7,380
1907	90,000	96,000	+6,000
1909	3,345	18,345	+15,000
1912	117,915	617,915	+500,000
1920	20,000,167	20,001,541	+1,374
1927	253,494	254,114	+620
1930	52,651	68,851	+16,200
1932	30,701	110,521	+79,820
1933	3,600,450	3,601,450	+1,000
1934	5	15,005	+15,000
1937	7,700	1,008,500	+1,000,800
1940	84,784	99,784	+15,000
1941	46,292	46,434	+142
1945	1,906,365	1,907,366	+1,001
1948	765,032	770,277	+5,245
1950	10,887,980	10,888,208	+228
1951	734,580	1,372,897	+638,317
1952	1,007,082	1,507,742	+500,660
1953	3,394,173	4,152,280	+758,107
1954	437,493	585,409	+147,916
1955	405,902	541,107	+135,205
1956	1,081,339	12,148,249	+11,066,910
1957	938,650	961,850	+23,200
1958	29,519	36,419	+6,900
1959	1,523,363	2,515,105	+991,742
1960	2,821,270	2,904,856	+83,586
1961	1,315,755	1,325,770	+10,015
1962	245,900	502,877	+256,977
1963	6,195,756	6,252,806	+57,050
1965	123,119,664	123,121,164	+1,500
1970	47,206,897	47,414,197	+207,300
1971	11,737,724	11,946,699	+208,975
1972	219,195,924	219,199,082	+3,158
1973	11,902,186	12,930,186	+1,028,000
1974	45,084,155	45,309,907	+225,752
1975	51,162,682	51,201,510	+38,828
1976	24,601,619	24,601,869	+250
1977	28,593,619	28,733,877	+140,258

Year	2023 Archive	2024 Archive	Change
1978	55,218,285	55,516,140	+297,855
1979	62,331,924	62,333,874	+1,950
1980	75,546,622	75,646,122	+99,500
1981	33,116,744	33,141,044	+24,300
1984	66,637,468	66,639,468	+2,000
1986	32,637,454	32,646,854	+9,400
1987	374,306,417	374,343,017	+36,600
1988	206,746,836	206,681,536	-65,300
1989	172,787,357	172,794,157	+6,800
1990	84,423,856	84,444,756	+20,900
1992	68,682,172	68,689,702	+7,530
1993	171,919,383	171,927,783	+8,400
1995	222,809,688	222,760,488	-49,200
1996	220,043,392	220,040,192	-3,200
1997	70,530,922	70,544,118	+13,196
1998	343,877,811	343,903,891	+26,080
1999	282,340,019	282,340,729	+710
2000	174,274,622	174,332,533	+57,911
2001	109,022,799	109,030,543	+7,744
2002	659,458,578	659,481,311	+22,733
2003	255,772,617	255,772,786	+169
2004	162,581,666	162,635,366	+53,700
2005	160,794,770	160,831,210	+36,440
2006	126,502,913	126,514,206	+11,293
2007	212,900,186	212,915,848	+15,662
2008	221,870,697	221,872,372	+1,675
2009	201,829,237	201,854,480	+25,243
2010	259,998,006	260,053,150	+55,144
2011	212,829,958	212,841,342	+11,384
2012	123,504,577	123,524,732	+20,155
2013	99,407,666	99,413,557	+5,891
2014	143,058,136	143,066,736	+8,600
2015	431,971,026	431,973,126	+2,100
2016	205,499,629	205,507,633	+8,004
2017	104,249,483	104,263,987	+14,504
2018	84,071,932	84,132,056	+60,124
2019	109,263,744	109,290,011	+26,267
2020	103,773,429	103,798,797	+25,368
2022	186,264,511	185,870,293	-394,218
2023	118,283,811	119,836,533	+1,552,722

S3.3 Total Economic Damage ('000 US\$)

Year	2023 Archive	2024 Archive	Change
1903	480,000	481,600	+1,600
1906	644,000	648,154	+4,154
1909	0	22,000	+22,000
1912	35,000	36,500	+1,500
1913	200,000	100,000	-100,000
1915	121,000	124,000	+3,000
1918	129,000	134,000	+5,000
1926	104,000	129,051	+25,051
1932	30,000	76,000	+46,000
1933	41,500	62,400	+20,900
1934	50,000	64,000	+14,000
1935	8,000	41,000	+33,000
1936	21,000	221,000	+200,000
1945	505,000	512,730	+7,730
1950	226,000	227,560	+1,560
1951	1,528,250	1,614,410	+86,160
1952	142,900	152,900	+10,000
1953	987,880	988,073	+193
1954	1,068,150	1,424,950	+356,800
1955	882,000	1,098,800	+216,800
1956	65,000	125,000	+60,000
1959	683,200	839,150	+155,950
1960	1,859,041	1,861,041	+2,000
1961	529,905	530,205	+300
1962	1,529,000	1,884,000	+355,000
1963	1,884,090	1,884,345	+255
1970	3,076,654	3,145,654	+69,000
1971	1,706,589	1,776,189	+69,600
1972	4,393,313	4,495,313	+102,000
1973	2,418,793	2,418,853	+60
1974	3,990,827	3,995,628	+4,801
1975	3,165,353	3,401,353	+236,000
1976	14,205,390	14,399,890	+194,500
1977	10,115,641	10,138,641	+23,000
1978	6,221,569	6,641,569	+420,000
1979	4,535,289	4,352,289	-183,000
1982	11,501,343	11,551,343	+50,000
1983	16,958,892	16,957,892	-1,000

Year	2023 Archive	2024 Archive	Change
1986	16,928,028	16,937,228	+9,200
1991	39,146,821	39,145,821	-1,000
1992	55,316,500	55,233,200	-83,300
1993	51,123,836	51,121,836	-2,000
1995	156,073,239	156,073,039	-200
1999	112,254,166	112,258,570	+4,404
2001	27,089,401	26,512,401	-577,000
2002	61,715,559	61,528,559	-187,000
2004	137,686,448	137,721,448	+35,000
2005	214,625,533	214,670,433	+44,900
2007	75,262,997	75,510,997	+248,000
2009	48,302,793	48,287,793	-15,000
2010	152,547,096	152,830,085	+282,989
2011	364,097,869	364,128,969	+31,100
2012	156,782,432	157,147,432	+365,000
2015	87,725,817	87,625,817	-100,000
2016	186,034,521	148,217,721	-37,816,800
2017	326,649,569	326,770,569	+121,000
2018	133,588,222	133,598,222	+10,000
2019	100,979,056	100,921,056	-58,000
2020	188,625,447	191,247,447	+2,622,000
2021	257,663,038	257,613,038	-50,000
2023	202,660,285	206,134,368	+3,474,083

S4. Interoperability

S4.1 External Identifier Coverage

The 2024 archive introduced linkage to the HANZE (Historical Analysis of Natural Hazards in Europe) database, adding 878 cross-referenced entries. The number of events linked to the GLIDE (GLobal IDentifier) system increased substantially (+1,504), reflecting a systematic retrospective matching effort.

External ID	2023 Archive	2024 Archive	Change
DFO	294	296	+2
GLIDE	1,832	3,336	+1,504
USGS	425	544	+119
HANZE	0	878	+878

Note: A disaster entry can carry multiple identifiers under the same label. The “Change” column counts entries with at least one external ID of the specified label that were entirely absent from the benchmark; it does not capture additional IDs added to entries already present in the benchmark.

S5. Geocoding Completions

S5.1 Administrative Geocoding

The table below reports geocoding completeness by year for events recorded since 2000. Two levels of geocoding are tracked: administrative-unit geocoding (presence of any sub-national location using the GAUL administrative boundary dataset) and GADM geocoding (linkage to the newly added GADM administrative boundary dataset). Only natural hazards, excluding biological ones, are currently geocoded in EM-DAT. Number of events and percentage values are relative to this hazard subset.

Year	Total Events	Geocoded (GAUL)	% (GAUL)	Geocoded (GADM)	% (GADM)
2000	386	386	100.00%	357	92.49%
2001	357	355	99.44%	328	91.88%
2002	404	403	99.75%	355	87.87%
2003	354	353	99.72%	317	89.55%
2004	347	347	100.00%	306	88.18%
2005	429	427	99.53%	382	89.04%
2006	401	400	99.75%	364	90.77%
2007	411	408	99.27%	368	89.54%
2008	348	348	100.00%	316	90.80%
2009	343	342	99.71%	316	92.13%
2010	391	386	98.72%	352	90.03%
2011	327	324	99.08%	306	93.58%
2012	347	346	99.71%	312	89.91%
2013	335	329	98.21%	305	91.04%
2014	320	320	100.00%	306	95.62%
2015	381	379	99.48%	350	91.86%
2016	325	318	97.85%	302	92.92%
2017	346	327	94.51%	305	88.15%
2018	320	276	86.25%	262	81.88%
2019	399	382	95.74%	344	86.22%
2020	399	384	96.24%	354	88.72%
2021	430	414	96.28%	389	90.47%
2022	417	264	63.31%	340	81.53%
2023	440	116	26.36%	121	27.50%
2024	430	3	0.70%	17	3.95%