



TEXAS WINDSTORM
INSURANCE ASSOCIATION

Texas Windstorm Insurance Association

Estimated Aggregate Annual Losses

Based on Hurricane and Severe Thunderstorm Catastrophe Models:

RMS RiskLink

Verisk Touchstone

Impact Forecasting ELEMENTS

CoreLogic RQE

**Exposures In-Force as of
11/30/2023 and 11/30/2024**



Cautionary Language Regarding Catastrophe Model Loss Estimates

The following tables present hurricane and severe thunderstorm loss estimates prepared for the Association based on four leading industry models: RMS RiskLink, Verisk Touchstone, Impact Forecasting ELEMENTS, and CoreLogic RQE. Developing models to estimate losses resulting from catastrophes or other large-scale events is an inherently subjective and imprecise process, involving judgment about a variety of environmental, demographic, and regulatory factors. Such factors are inherently uncertain, and the Association does not model all the types of perils that may result in losses to the Association.

The assumptions and/or methodologies used in connection with the preparation of estimated losses derived by the Association may not constitute the exclusive set of reasonable assumptions, and the use of alternative assumptions and/or methodologies could yield results materially different from those generated or relied upon by the Association. Each model run is based on exposure information that will differ from the Association's actual exposure in the future based on future action the Association may take, including changes to existing policies and the writing of new business. Loss distribution models are not facts and should not be relied upon as such. Actual loss experience can materially differ from the modeled loss estimates used by the Association.

The Board of Directors considers the results of the models and other factors in connection with its decisions with respect to the purchase of reinsurance, including the amount of total limit sought. The Board also considers the results of the models in considering to its obligations under Chapter 2210.453 which require that the Association maintain total available loss funding in an amount not less than the probable maximum loss for the association for a catastrophe year with a probability of one in 100.

These models simulate thousands of hurricane and severe thunderstorm scenarios and apply the simulated hurricanes and severe thunderstorms to the Association's insured business to calculate the probability of aggregate losses for the entire year. The results below were generated using Association exposures as of November 30, 2023 and November 30, 2024. The loss estimates are used by the Association in the course of its business operations. The data and analysis provided by TWIA herein are provided "as is", without warranty of any kind whether express or implied.

This report includes information that is output from catastrophe models of Verisk Analytics, Inc. (Verisk), Risk Management Solutions, Inc. (RMS), Impact Forecasting, LLC (IF) and CoreLogic (CoreLogic). The information from these models is provided by Aon Benfield Inc. (Aon) under the terms of its license agreements with Verisk, RMS, IF, and CoreLogic. The results in this report from Verisk, RMS, IF, and CoreLogic are the products of the exposures modeled, the financial assumptions made concerning insurance terms such as deductibles and limits, and the risk models that project the dollars of damage that may be caused by defined catastrophe perils. Aon recommends that the results from these models in this report not be relied upon in isolation when making decisions that may affect the underwriting appetite, rate adequacy, or solvency of the company. The Verisk, RMS, IF, and CoreLogic models are based on scientific data, mathematical and empirical models, and the experience of engineering, geological, meteorological, and terrorism experts. Calibration of the models using actual loss experience is based on very sparse data, and material inaccuracies in these models are possible. The loss probabilities generated by the models are not predictive of future hurricanes, other windstorms, or earthquakes or other natural or man-made catastrophes, but provide estimates of the magnitude of losses that may occur in the event of such catastrophes. Aon makes no warranty about the accuracy of the Verisk, RMS, IF, and CoreLogic models and has made no attempt to independently verify them. Aon will not be liable for any loss or damage arising from or related to any use of, or decisions based upon, data developed using the models of Verisk, RMS, IF, and CoreLogic, including without limitation special, indirect, or consequential damages.



Definitions

Aggregate Loss Estimate: The most basic output of a catastrophe model is the estimate of losses for every simulated event. Losses presented on an aggregate basis include estimated total losses from all events in any given year. In contrast, an “occurrence basis” reflects the losses from the largest single event in any given year. The aggregate loss estimates do not include a provision for loss adjustment expenses. TWIA staff would recommend adding an amount equal to 15% of the estimated aggregate losses to represent the estimated loss adjustment expenses. Loss adjustment expenses represent costs associated with investigating and settling claims.

Aggregate Exceedance Probability: Aggregate exceedance probability represents the probability of the total losses from all events in any given year meeting or exceeding a given threshold.

Average Annual Loss (AAL): The AAL is the expected value of losses to be experienced in any given year. It is equal to the sum of all simulated event losses multiplied by the probability of each of those events. Average annual losses are also calculated by dividing the total losses for all simulated storms by the number of simulated years in the computer simulation.

Demand Surge: Demand surge estimates the degree to which losses are escalated by a combination of economic, social, and operational conditions that follow a given event. Demand surge accounts for three separate mechanisms of escalation arising from (1) increase in the costs of building materials and labor costs as demand exceeds supply, (2) cost inflation due to the difficulties in fully adjusting claims following a catastrophic event, and (3) under certain extreme scenarios, coverage and loss expansion due to a complex collection of factors such as containment failures, evacuation effects, and systemic economic downturns in selected urban areas.

Gross Basis: Gross basis refers to the total losses before any recoveries from reinsurance or other funding mechanisms.

Near Term vs. Long Term (Historical) Event Set: Hurricanes in the Atlantic basin are known to follow multidecadal periods of heightened or diminished activity in terms of frequency of events, intensity, and landfall frequency. To account for these frequency changes, catastrophe model vendors provide alternative event catalogs or rates set alongside the long-term mean. Near-term or medium-term rates represent the five-year, medium-term outlook of North Atlantic hurricane activity. Long-term rates represent the event rates that are consistent with the long-term historical average.

Return Period: The return period is simply the inverse of the exceedance probability. For example, a 1% exceedance probability is equal to a 100-year return period. The return period term can be misleading by implying a period of time that would be expected to pass between events of that magnitude, when in reality they are representative of the probability of meeting or exceeding that level of loss in any given year.

Risk Count: Risk count refers to the number of individual structures insured. Some policies may cover more than one structure.

Storm Surge: Storm surge refers to the damage caused by rising ocean water levels along coastlines affected by a hurricane that can cause widespread flooding. Losses from storm surge and other forms of flooding are not covered by TWIA policies.



Model	Data as of:	Portfolio
RMS RiskLink v23.0 WS/CS	11/30/2023	HUR & SCS
RMS RiskLink v23.0 WS/CS	11/30/2024	HUR & SCS

Verisk Touchstone 10.0 TC/Sev Thun	11/30/2023	HUR & SevThun
Verisk Touchstone 12.0 TC/Sev Thun	11/30/2024	HUR & SevThun

Impact Forecasting v18.0 TC/SCS	11/30/2023	HUR & SCS
Impact Forecasting v18.0 TC/SCS	11/30/2024	HUR & SCS

CoreLogic RQE v23.0 HU/SCS	11/30/2023	HUR & SCS
CoreLogic RQE v23.0 HU/SCS	11/30/2024	HUR & SCS

TWIA Exposures as of:	11/30/2023	11/30/2024	Percent Change
Total Insured Values (000s)	\$113,543,081	\$135,973,526	19.8%
Total Insured Limits (000s)	\$104,780,130	\$125,293,799	19.6%
Risk Count (#)	256,479	281,072	9.6%

Texas Windstorm Insurance Association

Catastrophe Model Output Summary

All Perils (Hurricane and Severe Convective Storm) Gross Loss Estimates

RMS RiskLink, Verisk Touchstone, Impact Forecasting ELEMENTS, and CoreLogic RQE

Exposures In-Force as of 11/30/2024



		VaR (PML) - All Peril Near-Term (Stochastic)			
Return Period	Annual Exceedence Probability (AEP)	RMS RiskLink v23.0 WS/CS	Verisk Touchstone 12.0 TC/Sev Thun	Impact Forecasting v18.0 TC/SCS	CoreLogic RQE v23.0 HU/SCS
		(1)	(2)	(3)	(4)
1,000	0.10%	20,542,188,927	20,000,420,574	14,532,514,513	15,442,211,840
500	0.20%	15,615,745,009	16,705,734,994	11,708,207,977	12,470,845,440
250	0.40%	10,862,819,693	12,079,349,146	8,698,653,563	9,579,610,112
100	1.00%	6,433,755,060	7,832,090,460	5,315,249,550	6,042,633,216
50	2.00%	3,917,632,457	4,515,937,382	3,274,491,418	3,615,660,800
25	4.00%	2,195,809,050	2,436,028,039	1,844,386,097	1,935,073,024
20	5.00%	1,778,736,150	1,973,311,547	1,472,658,496	1,547,534,208
Annual avg (AAL)		383,736,887	411,380,211	315,485,542	328,362,272
Std dev		1,525,233,865	1,552,268,813	1,205,725,289	1,226,166,144

		VaR (PML) - All Peril Long-Term (Historical)			
Return Period	Annual Exceedence Probability (AEP)	RMS RiskLink v23.0 WS/CS	Verisk Touchstone 12.0 TC/Sev Thun	Impact Forecasting v18.0 TC/SCS	CoreLogic RQE v23.0 HU/SCS
		(1)	(2)	(3)	(4)
1,000	0.10%	20,112,950,543	20,000,420,574	14,150,861,007	14,524,469,248
500	0.20%	15,191,594,465	16,393,640,376	11,254,955,085	11,703,587,840
250	0.40%	10,501,078,883	11,485,723,262	8,415,540,997	8,886,478,848
100	1.00%	6,192,987,504	7,175,690,393	4,962,755,478	5,540,469,248
50	2.00%	3,740,923,394	4,252,818,691	3,081,890,239	3,248,236,288
25	4.00%	2,078,306,521	2,232,208,739	1,697,215,369	1,734,381,056
20	5.00%	1,673,257,630	1,806,812,758	1,340,042,675	1,368,615,936
Annual avg (AAL)		361,013,056	387,017,630	294,790,912	294,813,952
Std dev		1,484,788,519	1,497,509,935	1,157,501,027	1,139,433,472

Aggregate annual expected loss by return period based on TWIA exposure data as of 11/30/2024 and

- (1) the indicated RMS windstorm and convective storm model version with loss amplification impact, excluding storm surge;
- (2) the indicated Verisk tropical cyclone and severe thunderstorm model version with demand surge impact, excluding storm surge;
- (3) the indicated IF tropical cyclone and convective storm model version with demand surge impact, excluding storm surge; or
- (4) the indicated RQE hurricane and convective storm model version with demand surge impact, excluding storm surge

Texas Windstorm Insurance Association
Catastrophe Model Output Summary
All Perils (Hurricane and Severe Convective Storm) Gross Loss Estimates
RMS RiskLink
Exposures In-Force as of 11/30/2023 and 11/30/2024



Return Period	AEP - All Perils Near-Term (Stochastic)		
	A	B	B vs A
	11/30/23	11/30/24	11/30/24 v23
	Exposures	Exposures	to 11/30/23 v23
	RMS v23	RMS v23	Exposure Change
1,000	17,201,252,941	20,542,188,927	19.4%
500	13,149,931,111	15,615,745,009	18.8%
250	9,243,022,175	10,862,819,693	17.5%
100	5,534,943,379	6,433,755,060	16.2%
50	3,408,918,791	3,917,632,457	14.9%
25	1,932,051,895	2,195,809,050	13.7%
20	1,572,596,645	1,778,736,150	13.1%
Annual avg (AAL)	333,773,888	383,736,887	15.0%
Std dev	1,293,564,601	1,525,233,865	17.9%

Return Period	AEP - All Perils Long-Term (Historical)		
	A	B	B vs A
	11/30/23	11/30/24	11/30/24 v23
	Exposures	Exposures	to 11/30/23 v23
	RMS v23	RMS v23	Exposure Change
1,000	16,843,155,144	20,112,950,543	19.4%
500	12,800,996,654	15,191,594,465	18.7%
250	8,940,160,695	10,501,078,883	17.5%
100	5,331,030,216	6,192,987,504	16.2%
50	3,257,197,754	3,740,923,394	14.9%
25	1,830,384,798	2,078,306,521	13.5%
20	1,480,797,189	1,673,257,630	13.0%
Annual avg (AAL)	313,789,003	361,013,056	15.0%
Std dev	1,259,153,323	1,484,788,519	17.9%

Aggregate annual expected loss by return period based on indicated RMS windstorm and convective storm model version and exposure data (as of 11/30/2023 or 11/30/2024), with loss amplification impact, excluding storm surge impact, using either near term (stochastic) or long term (historical) event frequency as noted

A RMS Risklink v23 model output using 11/30/2023 exposure data

B RMS Risklink v23 model output using 11/30/2024 exposure data

This model output was used by the TWIA Board in the determination of the 1:100 PML for the 2025 reinsurance placement

Texas Windstorm Insurance Association
Catastrophe Model Output Summary
All Perils (Hurricane and Severe Convective Storm) Gross Loss Estimates
Verisk Touchstone
Exposures In-Force as of 11/30/2023 and 11/30/2024



AEP - All Perils (Warm Sea Surface Temperature)			
Return Period	A	B	B vs A
	11/30/23	11/30/24	11/30/2024 v12
	Exposures	Exposures	to 11/30/2023 v10
	Verisk v10	Verisk v12	Exposure Change
1,000	17,441,833,092	20,000,420,574	14.7%
500	15,283,631,528	16,705,734,994	9.3%
250	11,276,842,942	12,079,349,146	7.1%
100	7,061,919,745	7,832,090,460	10.9%
50	4,148,837,536	4,515,937,382	8.8%
25	2,221,541,081	2,436,028,039	9.7%
20	1,784,917,575	1,973,311,547	10.6%
Annual avg (AAL)	382,485,448	411,380,211	7.6%
Std dev	1,413,851,563	1,552,268,813	9.8%

AEP - All Perils (Standard)			
Return Period	A	B	B vs A
	11/30/23	11/30/24	11/30/2024 v12
	Exposures	Exposures	to 11/30/2023 v10
	Verisk v10	Verisk v12	Exposure Change
1,000	17,441,833,092	20,000,420,574	14.7%
500	15,122,923,345	16,393,640,376	8.4%
250	10,366,072,568	11,485,723,262	10.8%
100	6,690,067,070	7,175,690,393	7.3%
50	3,910,142,236	4,252,818,691	8.8%
25	2,062,449,141	2,232,208,739	8.2%
20	1,656,478,449	1,806,812,758	9.1%
Annual avg (AAL)	360,030,563	387,017,630	7.5%
Std dev	1,362,680,184	1,497,509,935	9.9%

Aggregate annual expected loss by return period based on indicated Verisk tropical cyclone and severe thunderstorm model version and exposure data (as of 11/30/2023 or 11/30/2024), with demand surge impact, excluding storm surge impact, using either warm sea surface temperature (near term) or standard (long term) event frequency as noted

A Verisk Touchstone v10 model output using 11/30/2023 exposure data

B Verisk Touchstone v12 model output using 11/30/2024 exposure data

This model output was not used by the TWIA Board in the determination of the 1:100 PML for the 2025 reinsurance placement

Texas Windstorm Insurance Association
Catastrophe Model Output Summary
All Perils (Hurricane and Severe Convective Storm) Gross Loss Estimates
Impact Forecasting ELEMENTS
Exposures In-Force as of 11/30/2023 and 11/30/2024



Return Period	AEP - All Perils Near-Term (Stochastic)		
	A	B	B vs A
	11/30/23	11/30/24	11/30/24 v18
	Exposures	Exposures	to 11/30/23 v18
	IF v18	IF v18	Exposure Change
1,000	13,534,947,461	14,532,514,513	7.4%
500	10,922,549,088	11,708,207,977	7.2%
250	8,077,320,248	8,698,653,563	7.7%
100	4,916,396,087	5,315,249,550	8.1%
50	3,043,660,601	3,274,491,418	7.6%
25	1,721,196,520	1,844,386,097	7.2%
20	1,360,891,348	1,472,658,496	8.2%
Annual avg (AAL)	279,340,159	315,485,542	12.9%
Std dev	1,120,655,663	1,205,725,289	7.6%

Return Period	AEP - All Perils Long-Term (Historical)		
	A	B	B vs A
	11/30/23	11/30/24	11/30/24 v18
	Exposures	Exposures	to 11/30/23 v18
	IF v18	IF v18	Exposure Change
1,000	13,285,191,807	14,150,861,007	6.5%
500	10,425,852,613	11,254,955,085	8.0%
250	7,719,636,546	8,415,540,997	9.0%
100	4,580,814,760	4,962,755,478	8.3%
50	2,872,717,144	3,081,890,239	7.3%
25	1,584,056,544	1,697,215,369	7.1%
20	1,246,200,373	1,340,042,675	7.5%
Annual avg (AAL)	259,490,169	294,790,912	13.6%
Std dev	1,073,404,617	1,157,501,027	7.8%

Aggregate annual expected loss by return period based on indicated Impact Forecasting windstorm and convective storm model version and exposure data (as of 11/30/2023 or 11/30/2024), with loss amplification impact, excluding storm surge impact, using either near term (stochastic) or long term (historical) event frequency as noted

A Impact Forecasting ELEMENTS v18 model output using 11/30/2023 exposure data

B Impact Forecasting ELEMENTS v18 model output using 11/30/2024 exposure data

This model output was used by the TWIA Board in the determination of the 1:100 PML for the 2025 reinsurance placement

Texas Windstorm Insurance Association
Catastrophe Model Output Summary
All Perils (Hurricane and Severe Convective Storm) Gross Loss Estimates
CoreLogic RQE
Exposures In-Force as of 11/30/2023 and 11/30/2024



Return Period	AEP - All Perils Near-Term (Stochastic)		
	A	B	B vs A
	11/30/23	11/30/24	11/30/24 v23
	Exposures	Exposures	to 11/30/23 v23
	RQE v23	RQE v23	Exposure Change
1,000	13,749,226,216	15,442,211,840	12.3%
500	11,137,047,072	12,470,845,440	12.0%
250	8,641,026,638	9,579,610,112	10.9%
100	5,497,154,818	6,042,633,216	9.9%
50	3,300,797,569	3,615,660,800	9.5%
25	1,777,002,824	1,935,073,024	8.9%
20	1,422,239,705	1,547,534,208	8.8%
Annual avg (AAL)	295,772,361	328,362,272	11.0%
Std dev	1,104,167,929	1,226,166,144	11.0%

Return Period	AEP - All Perils Long-Term (Historical)		
	A	B	B vs A
	11/30/23	11/30/24	11/30/24 v23
	Exposures	Exposures	to 11/30/23 v23
	RQE v23	RQE v23	Exposure Change
1,000	13,046,378,301	14,524,469,248	11.3%
500	10,491,241,320	11,703,587,840	11.6%
250	7,998,463,964	8,886,478,848	11.1%
100	5,023,391,036	5,540,469,248	10.3%
50	2,972,362,459	3,248,236,288	9.3%
25	1,601,018,409	1,734,381,056	8.3%
20	1,257,850,675	1,368,615,936	8.8%
Annual avg (AAL)	265,343,901	294,813,952	11.1%
Std dev	1,026,565,511	1,139,433,472	11.0%

Aggregate annual expected loss by return period based on indicated RQE windstorm and convective storm model version and exposure data (as of 11/30/2023 or 11/30/2024), with loss amplification impact, excluding storm surge impact, using either near term (stochastic) or long term (historical) event frequency as noted

A CoreLogic RQE v23 model output using 11/30/2023 exposure data

B CoreLogic RQE v23 model output using 11/30/2024 exposure data

This model output was used by the TWIA Board in the determination of the 1:100 PML for the 2025 reinsurance placement