

Severe Weather and Property Coverage: An Imperfect Storm



Presenters



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Agenda

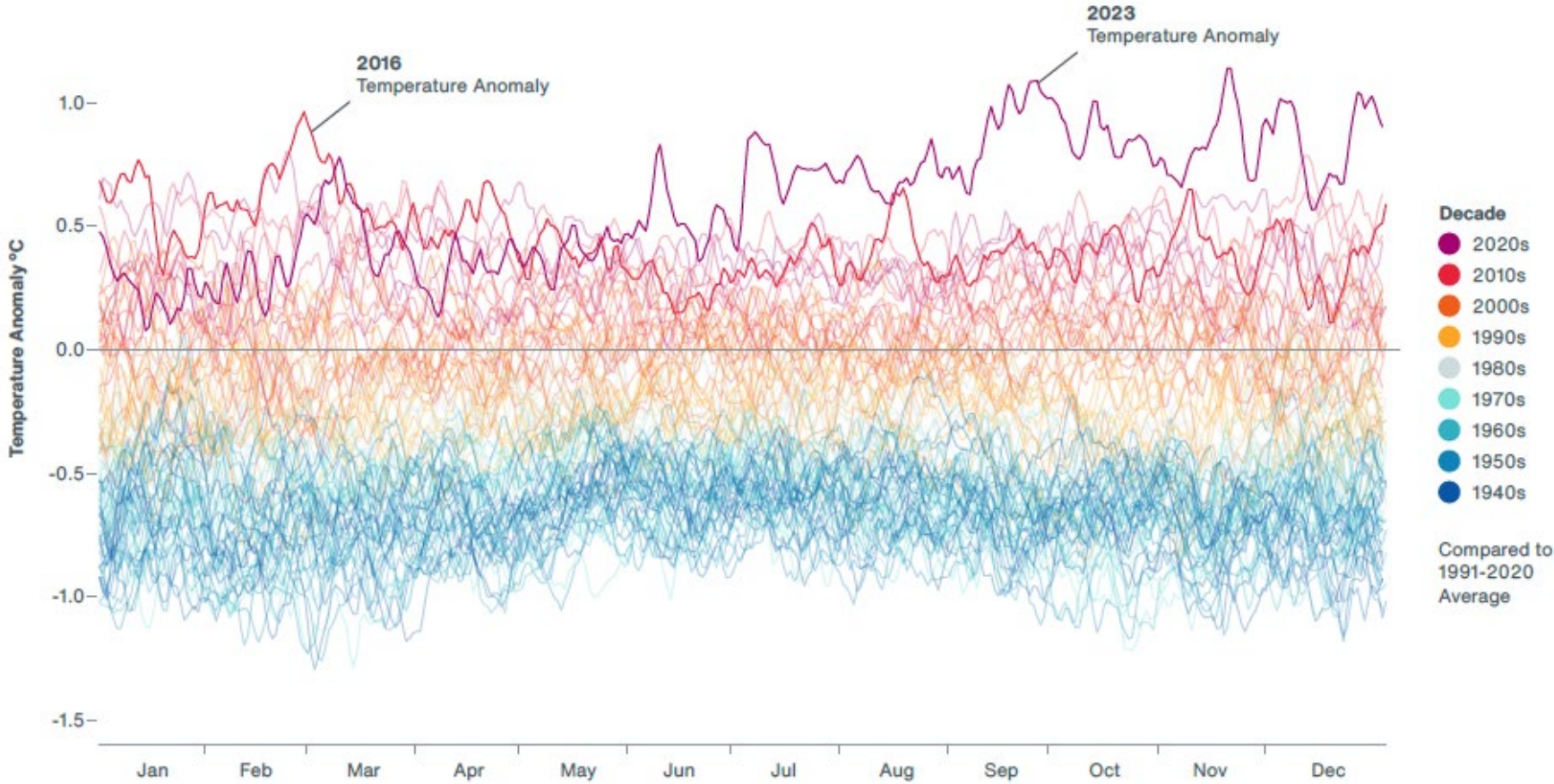
- Current Weather Patterns and Trends
- Global Insured Impact
- U.S. Insured Impact
- Texas Insured Impact
- Texas Public Schools Impact
- Closing Thoughts



Current Weather Patterns and Trends



Global Temperature Anomalies 1857-2023 (°C)

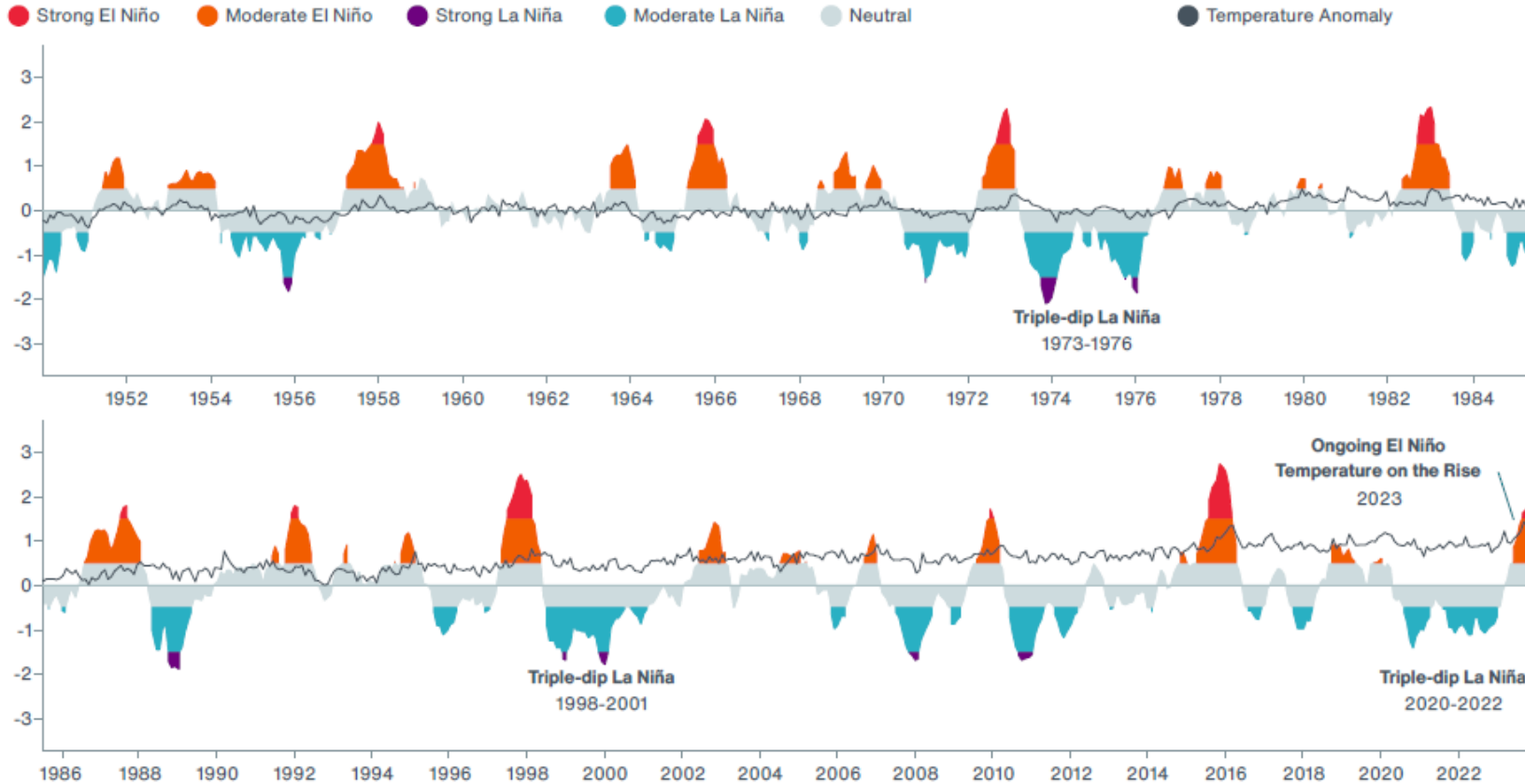


Data source: ERA5 Reanalysis, Copernicus Climate Change Service

Temperatures in 2023

- 2023 was recorded as the warmest year in recent history
- July 2023 was the warmest recorded month
- In 2023, 24 countries and territories broke or tied their previous maximum temperature records

Monthly ENSO Phase Based on Oceanic Niño 3.4 Index And Temperature Anomaly (°C)



Data source: Climate Prediction Center / NOAA

El Niño

- Above-average sea-surface temperatures across east-central equatorial Pacific (Warm Cycle).
- Typically lasts 9-12 months.
- Wetter and snowier conditions
- Contributes to eastern and central Pacific hurricanes

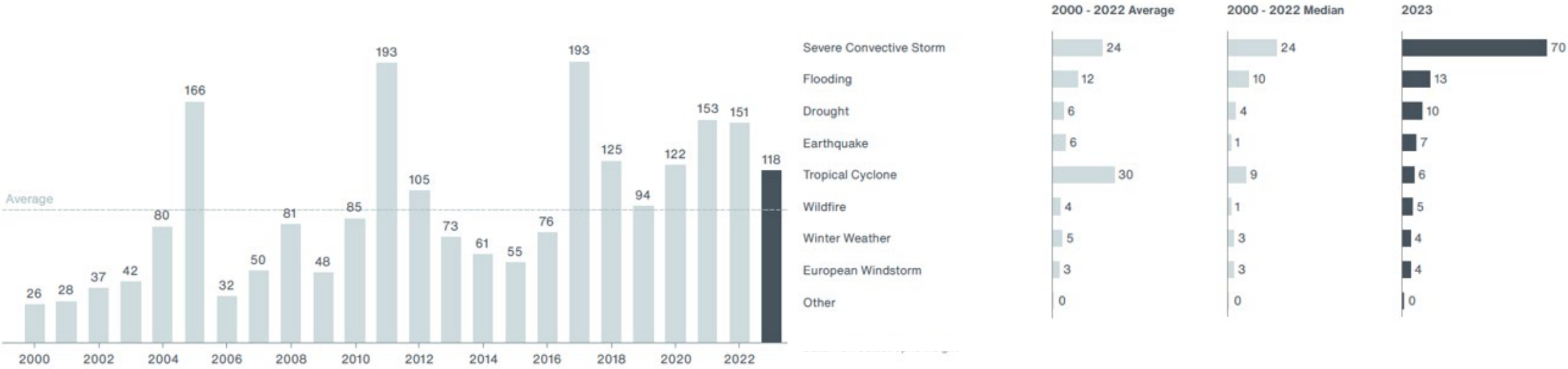
La Niña

- Cool sea-surface temperatures across east-central equatorial Pacific (Cool phase).
- Typically last 1-3 years.
- Drier and warmer conditions
- Contributes to Atlanta hurricanes

Global Insured Impact



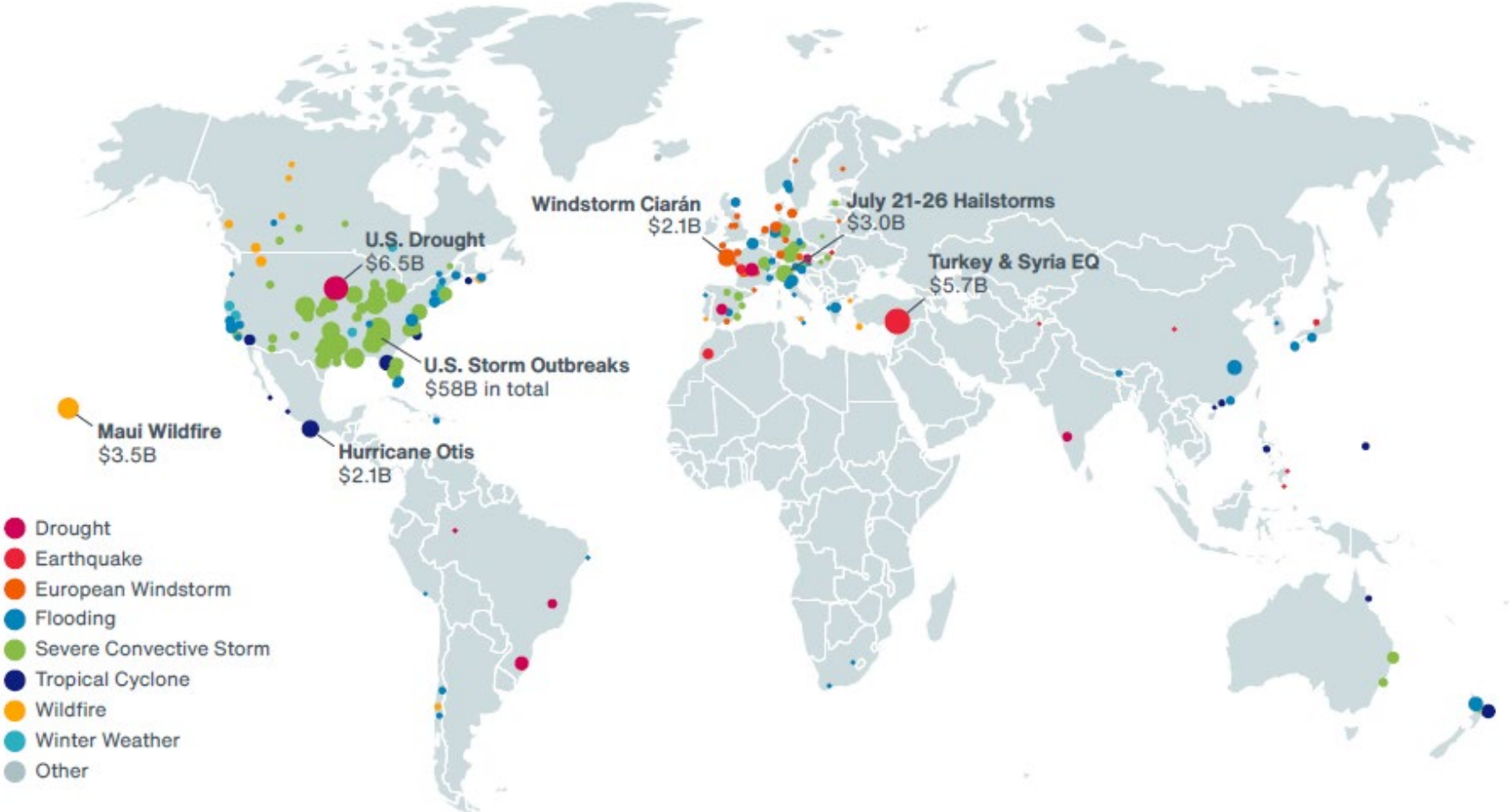
Global Insured Losses from Natural Disasters (\$Billions)



Data source: Aon Catastrophic Insight

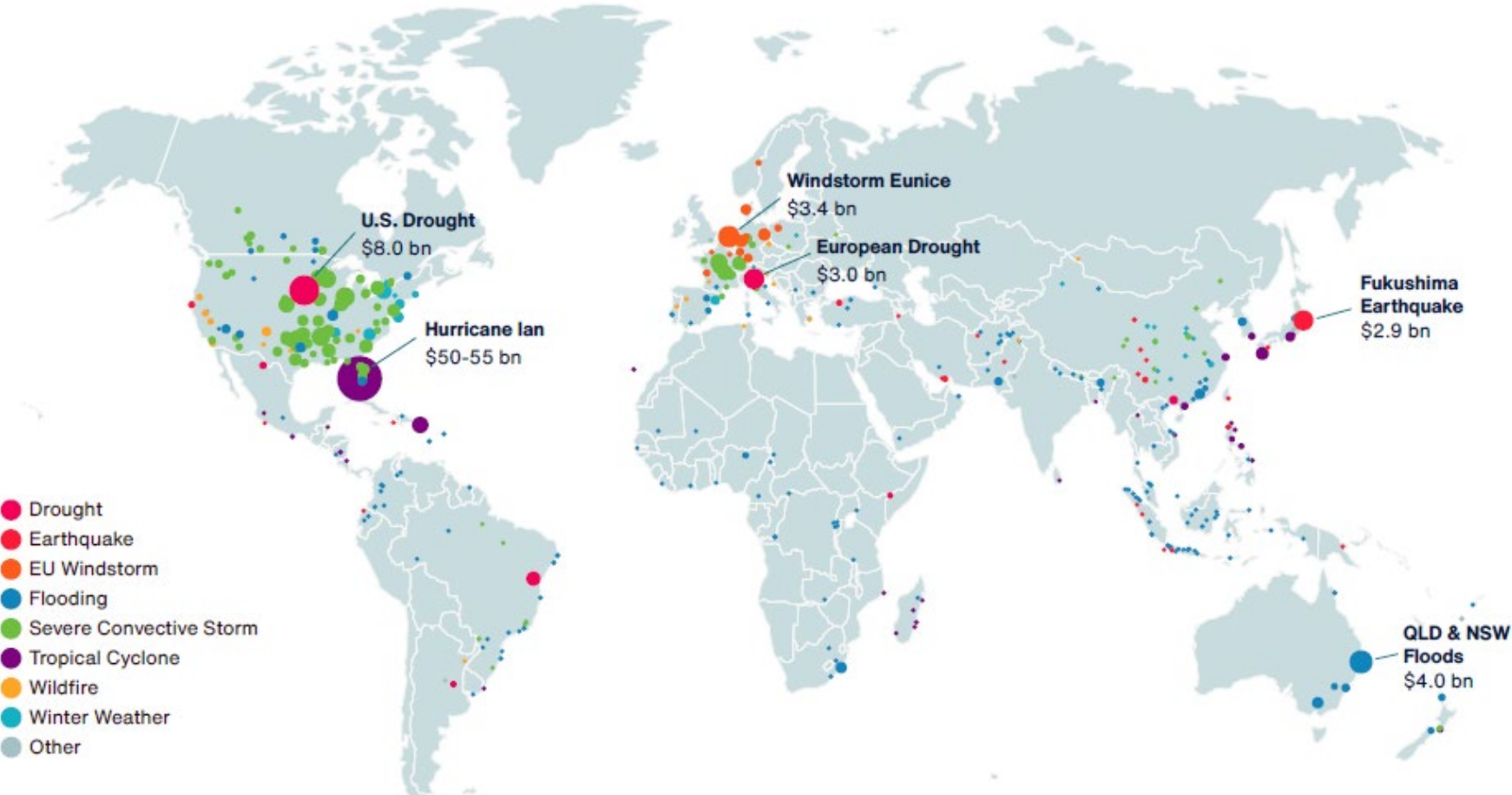


2023 Significant Global Insured Loss Events



Data source: Aon Catastrophic Insight

2022 Significant Global Insured Loss Events



Data source: Aon Catastrophic Insight

United States Insured Impact



United States Weather Losses in 2023

Severe Convective Storm Outbreaks

Record-setting year with 21 billion-dollar insured loss events
\$73B economic loss,
\$58B insured loss

Lahaina Wildfire

Deadliest U.S. wildfire in over a century
\$5.5B economic loss,
\$3.5B insured loss,
100 fatalities

Intense Drought

Prolonged drought conditions throughout 2023
\$14B economic loss,
\$6.5B insured loss



Hurricane Idalia

Strongest hurricane on record for Florida Big Bend region
\$3.5B economic loss,
\$1.5B insured loss,
4 fatalities



31 days

Consecutive days of 110 °F (43 °C) or greater in Phoenix, AZ, in June-July 2023, a new record



766

Number of filtered Storm Prediction Center storm reports on August 7, the highest daily number for 2023



-108 °F (-78 °C)

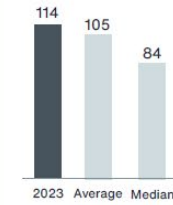
Coldest wind chill ever measured in U.S. history at Mount Washington, NH on February 3



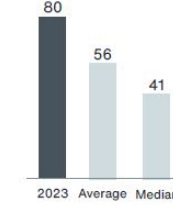
5.25 in (13.3 cm)

New Colorado state record for hailstone diameter; measured on August 8 in Yuma County

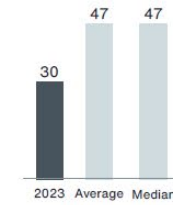
Economic Losses (2023 \$ billion)



Insured Losses (2023 \$ billion)



Protection Gap (%)



30%

of global economic losses



67%

of global insured losses



70%

of losses covered by insurance

Economic Losses (2023 \$ billion)

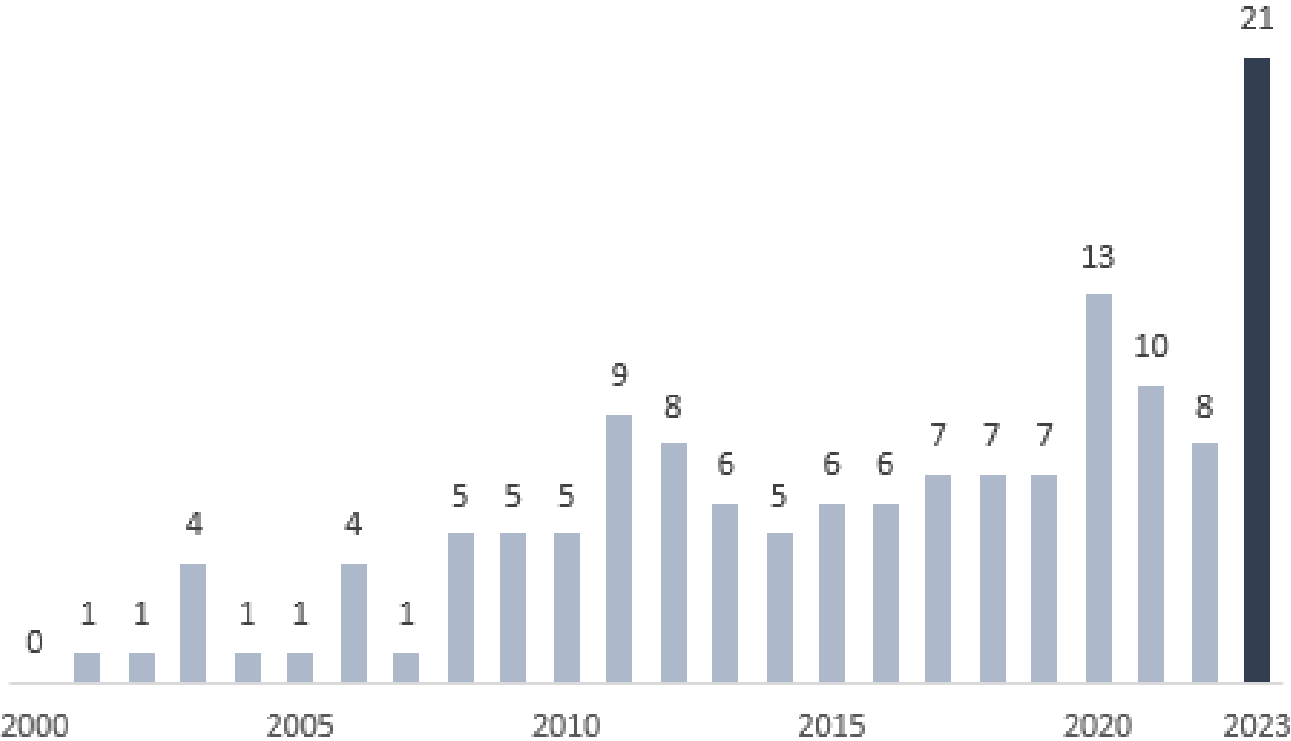


| | |
|-------------------------|-----|
| Severe Convective Storm | 73 |
| Drought | 14 |
| Flooding | 12 |
| Wildfire | 6 |
| Other | 9.5 |

Data source: Aon Catastrophic Insight

United States Severe Convective Storms (SCS) \$1B Events

Number of SCS Events in U.S. Above \$1B



Notable U.S. SCS Events

- August 2020 Midwest Derecho – \$9.2B
- March 2023 SCS - \$4.9B
- March-April 2023 Tornado - \$4.3B
- May 2019 SCS - \$3.7B
- June 2023 SCS – \$4.3B

Data source: Aon Catastrophic Insight, Storm Prediction Center

Tropical Cyclones in U.S.

Top 10 Costliest Tropical Cyclones: Insured Loss

| Date(s) | Event | Location | Insured Loss (Nominal \$ billion) | Insured Loss (2023 \$ billion) |
|-------------------------|-------------------|-------------------------|--------------------------------------|-----------------------------------|
| August 2005 | Hurricane Katrina | United States | 65 | 102 |
| September 2022 | Hurricane Ian | U.S., Cuba | 54 | 56 |
| September 2017 | Hurricane Irma | U.S., Caribbean | 33 | 42 |
| August - September 2021 | Hurricane Ida | U.S., Caribbean | 36 | 41 |
| October 2012 | Hurricane Sandy | U.S., Caribbean, Canada | 30 | 40 |
| August 2017 | Hurricane Harvey | United States | 30 | 38 |
| September 2017 | Hurricane Maria | U.S., Caribbean | 30 | 37 |
| August 1992 | Hurricane Andrew | U.S., Caribbean | 16 | 35 |
| September 2008 | Hurricane Ike | U.S., Caribbean | 18 | 26 |
| October 2005 | Hurricane Wilma | U.S., Caribbean | 13 | 19 |

Data: Aon Catastrophic Insight

Farmers Insurance and AAA no longer writing business in Florida



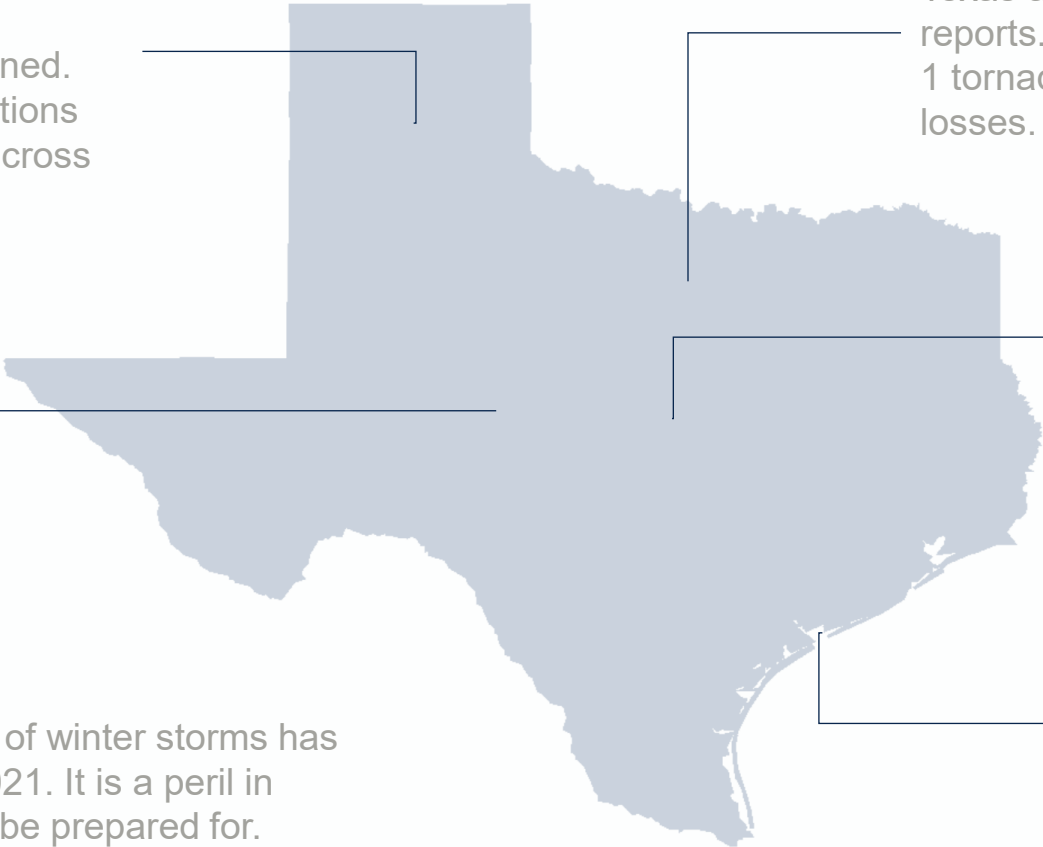
Texas Impact

Inclement and Severe Weather Hazards in Texas:

- Heat
- Cold
- Floods (River Basin and Flash Flooding)
- Tropical Cyclones
- Lightning
- Hail
- Tornadoes
- Winter Storms (Freezing Rain, Sleet, Snow)
- Wildfires
- Drought



Texas Significant Weather Loses



2024 Wildfires

Estimated 1.1M acres burned.
Continuous drought conditions fuels the risk of wildfires across the state.

Tornadoes

Texas averages 34 days a year with observed tornado reports. In 2019, the Dallas area experienced EF-3 and EF-1 tornadoes that produced an estimated \$1.5 billion in losses.

Hail

Hail continues to impact the state every year. 2023 was the most active year of hail since 2012.
05/17/23-05/20/24
\$1.75B Economic loss

Winter Freeze 2021

\$17B Insured Loss
\$38B Economic Loss
The frequency and severity of winter storms has increased in Texas since 2021. It is a peril in which the entire state must be prepared for.

Hurricane Harvey 2017

\$30B Insured Loss
\$125B Economic Loss
Hurricane Harvey was the last major hurricane to impact Texas, and prior to that, Hurricane Ike in 2008. The Fund estimates a major hurricane will impact the state once every five years.

Data Source: Aon Catastrophic Insight / Climate Prediction Center / NOAA

Texas Public Schools Impact

Texas Schools Still Tallying Storm Costs, And Some Won't Reopen Soon

KERA | By Aliyya Swaby | Texas Tribune
Published February 28, 2021 at 12:00 PM CST



Community Impact | News

Round Rock ISD identifies up to \$70 million in hail damage from September storm

★ Houston Chronicle

Deer Park, Pasadena schools closed Wednesday in aftermath of Houston-area tornadoes

Community Impact

Alvin ISD's property insurance goes up 72%

Alvin ISD trustees approved a \$5.8 million property insurance policy—up by more than \$2.4 million from the year before.

3 school districts closed Friday due to storm damage, power outages

By FOX 4 Staff | Published March 3, 2023 | McKinney | FOX 4 | ↗

KVII

Wildfire force school closures in Texas panhandle

NBC News

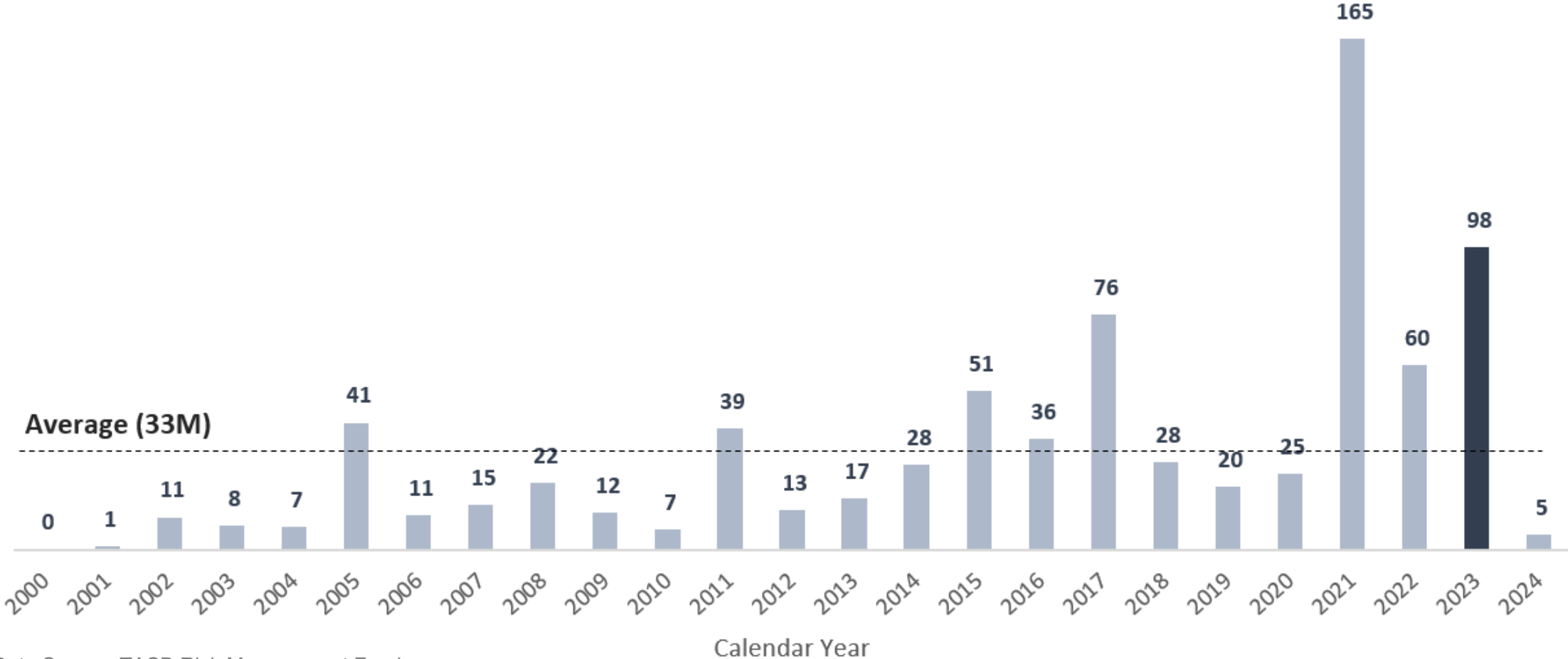
Security video shows moments EF-3 tornado tears through Texas school

KERA News

[After Tornado Destroys An Elementary School, A Community Rallies To Create A New School](#)



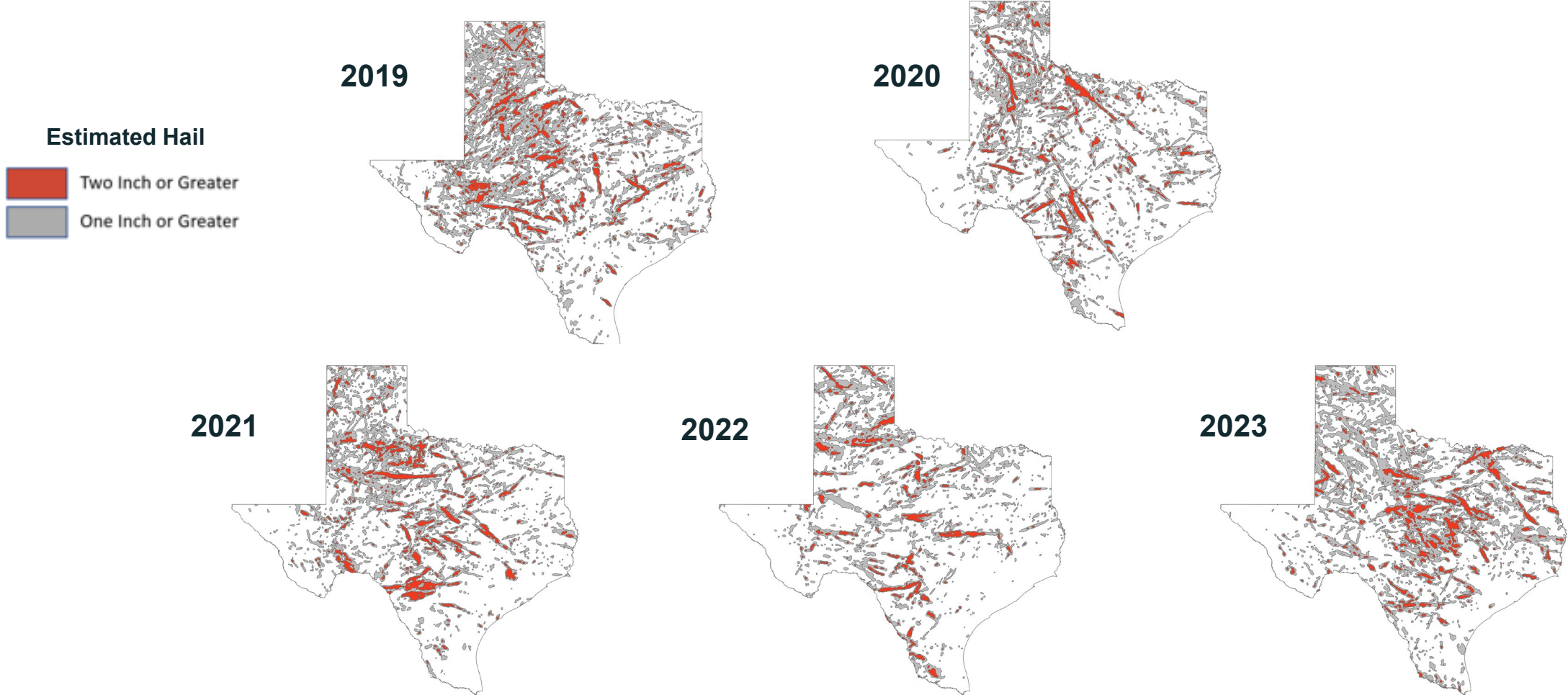
The Fund's Weather-Related Losses (\$Millions)



Data Source: TASB Risk Management Fund



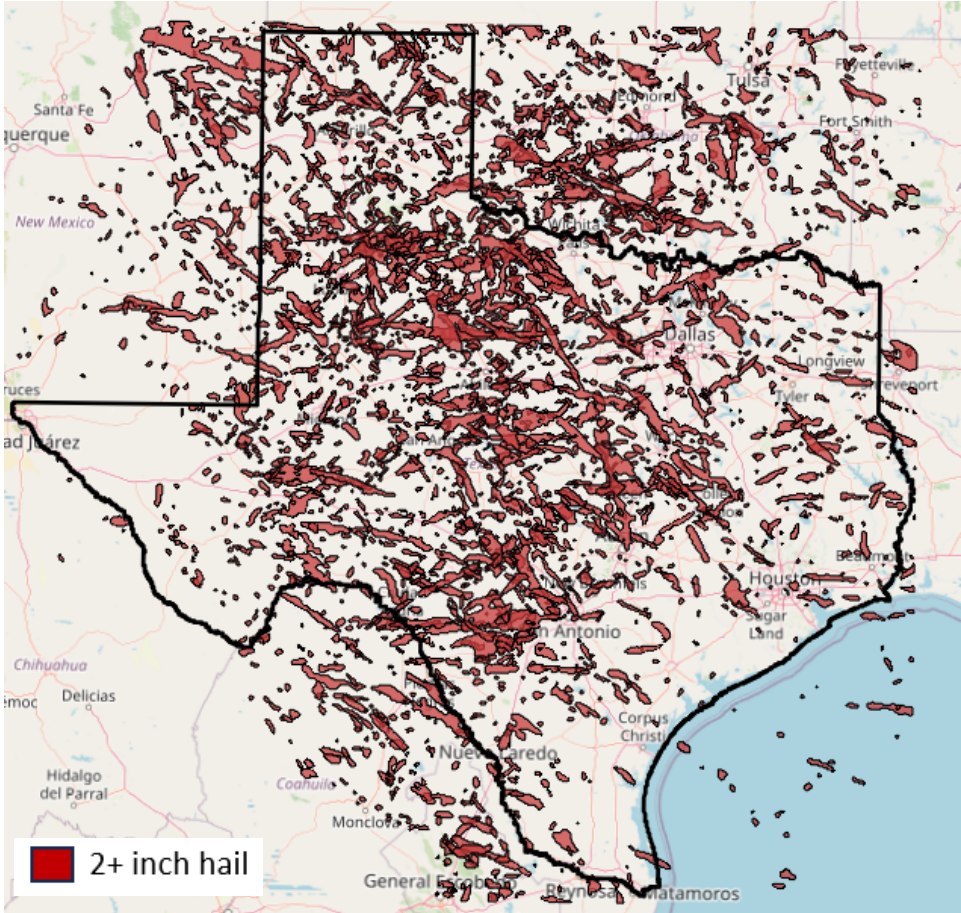
Texas Hail Experience



Data Source: TASB Risk Management Fund

Texas Hail Experience

2019-2023 Hail Swath – Estimated Hail Impact



\$500 million

Total incurred associated with hail losses the Fund has experienced since 2000.

\$76 million

Total incurred associated with hail losses in 2023 - Highest in a single year for the Fund.

58%

Percent of the Fund’s 2023 property members estimated to be impacted by golf ball sized hail or larger.

93 claims

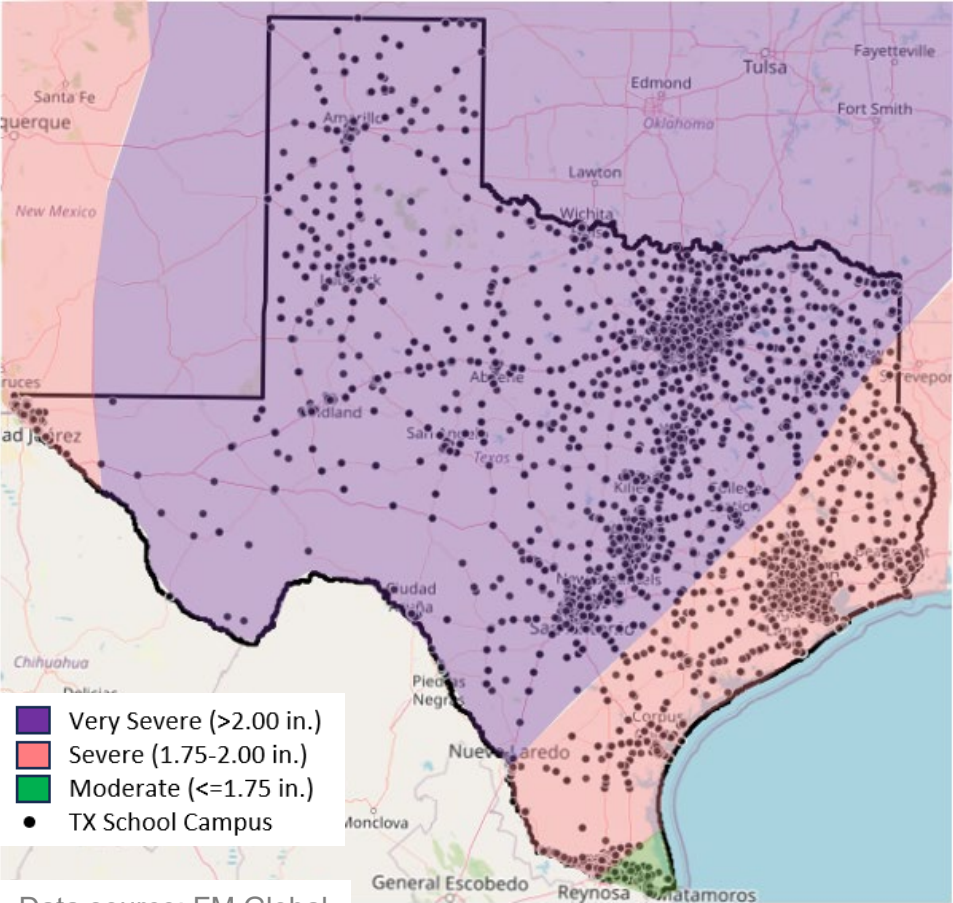
Number of hail claims with over \$1 million in total incurred reported by Fund members since 2015.

Data Source: TASB Risk Management Fund

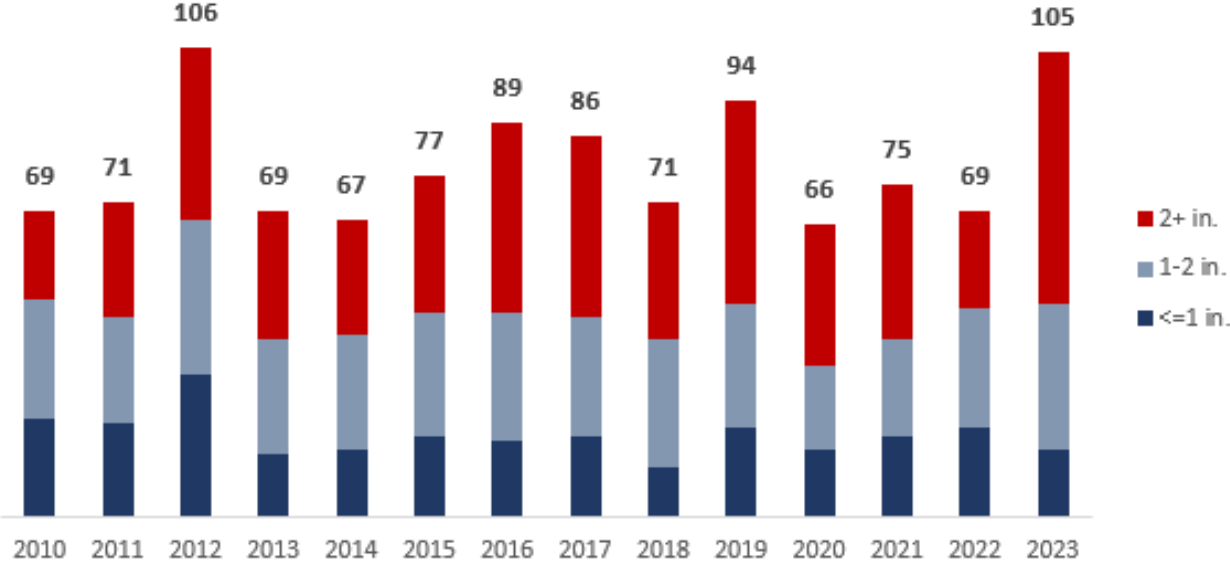


Know Your Hail Territory

FM Global's Hail Zones



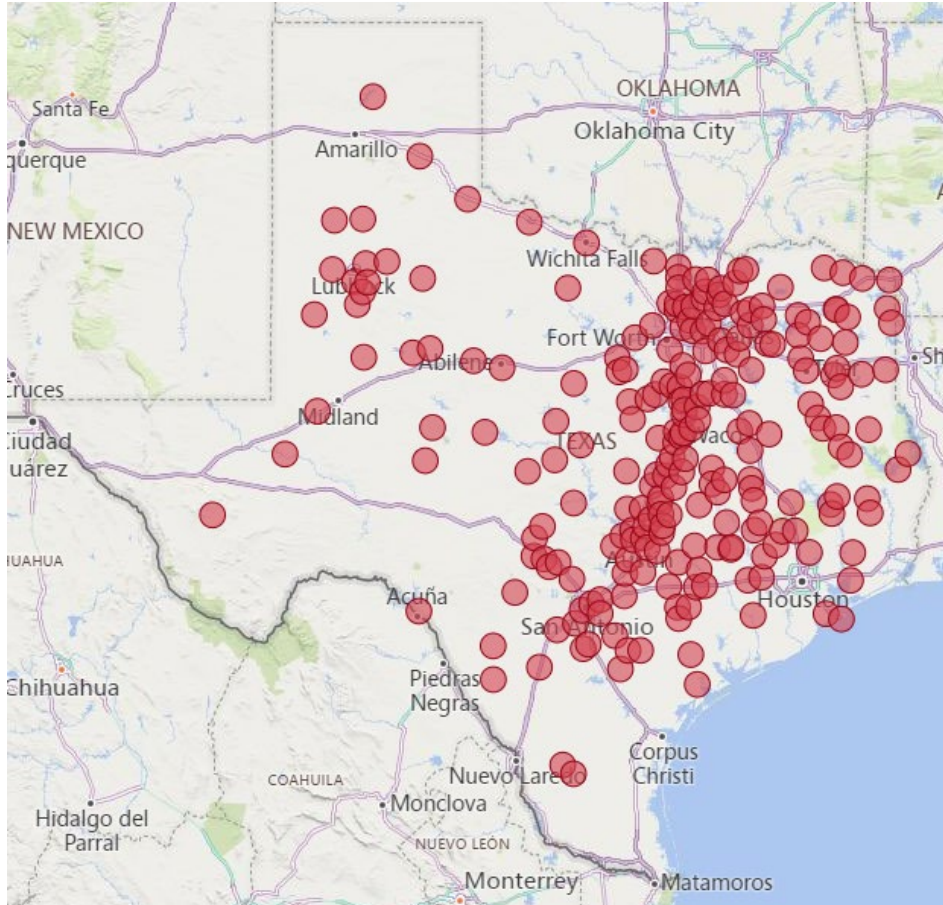
Number of Days with Reported Hail in Texas



Data: Climate Prediction Center / NOAA

Winter Storms (Freezing Rain, Sleet, Snow)

Winter Storm Feb 2021 - Fund Claims



Fund's largest single occurrence loss

- 240 claims
- \$102.2M in losses

Winter Storm 2021

- Combination of continuous severe cold temperatures and power grid failure
- Significant business interruptions across the state
- \$21B estimated loss in U.S.
- Estimated to be a 1 in 40-year event

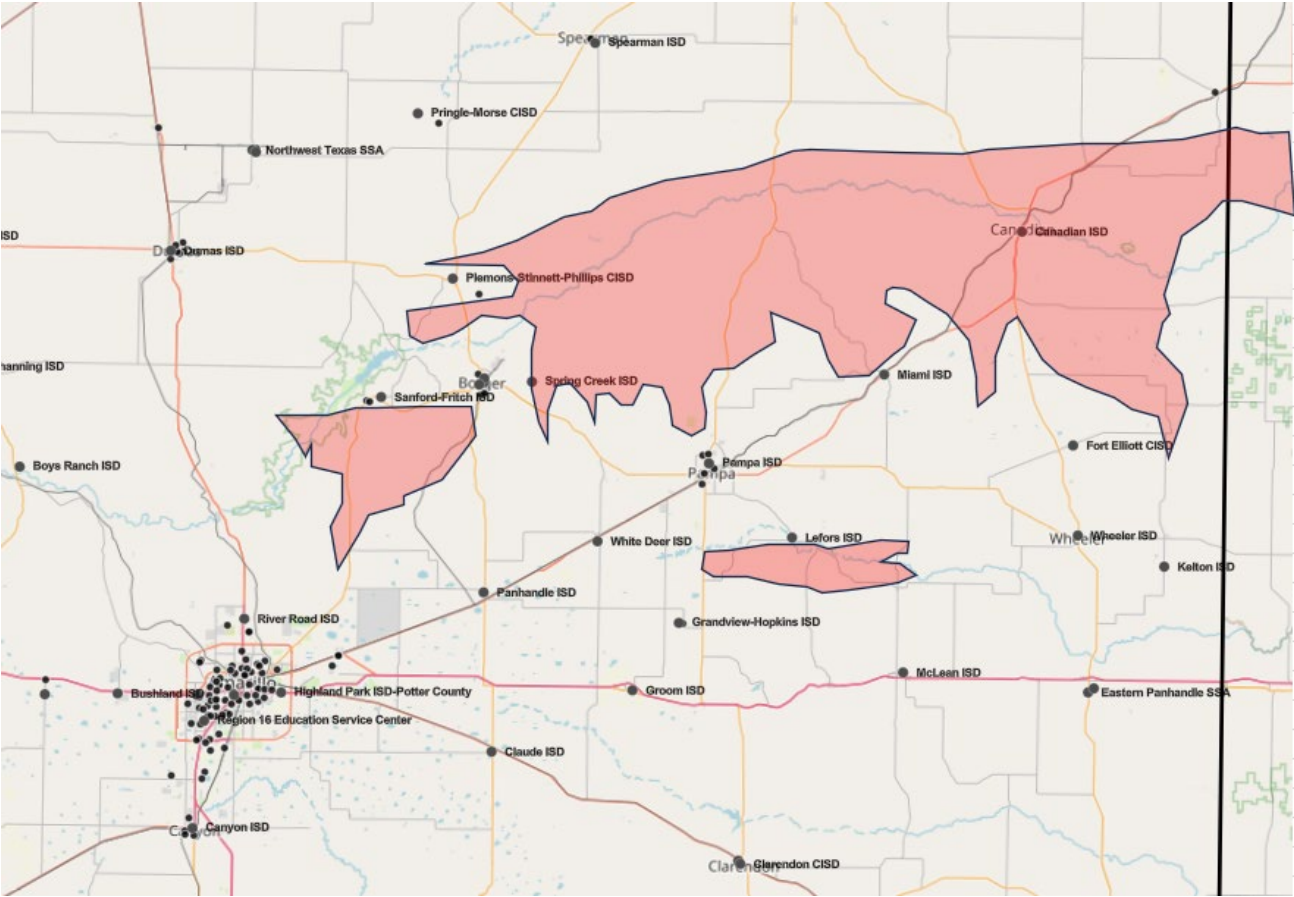
Winter Storm Dec 2022

- \$2.7B economic loss in U.S.

Data Source: TASB Risk Management Fund

Drought & Wildfires

Feb 2024 Panhandle Wildfires



• Texas School Campus

Data Source: Texas A&M Forest Service

2024 Panhandle Wildfires

- 1M+ acres burned

2022 Drought Impact in U.S.

- \$8.0B insured loss
- \$16.0B economic loss

2023 Drought Impact in U.S.

- \$6.5B insured loss
- \$14.0B economic loss

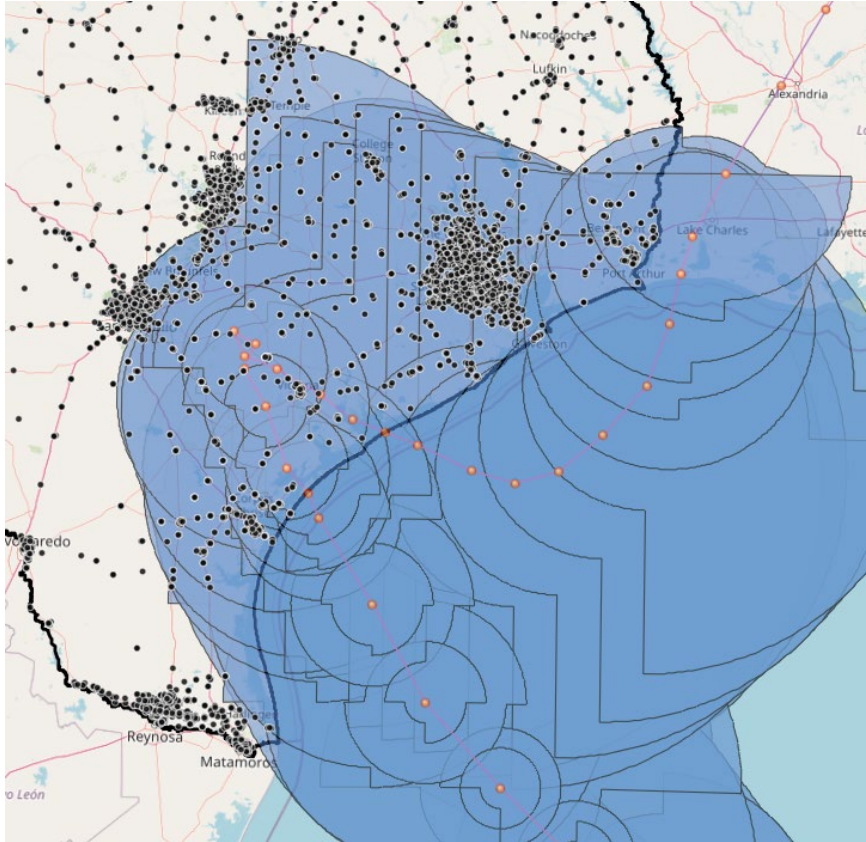
Hawaii Fire Loss

- \$3.5B insured loss

State Farm and Allstate are non-renewing or not writing new business in California

Tropical Cyclones

Hurricane Harvey 2017



- Texas School Campus

Data Source: Texas Education Agency/ESRI

Fund's Hurricane Harvey Loss Experience

- 56 Claims
- \$32M Total Incurred

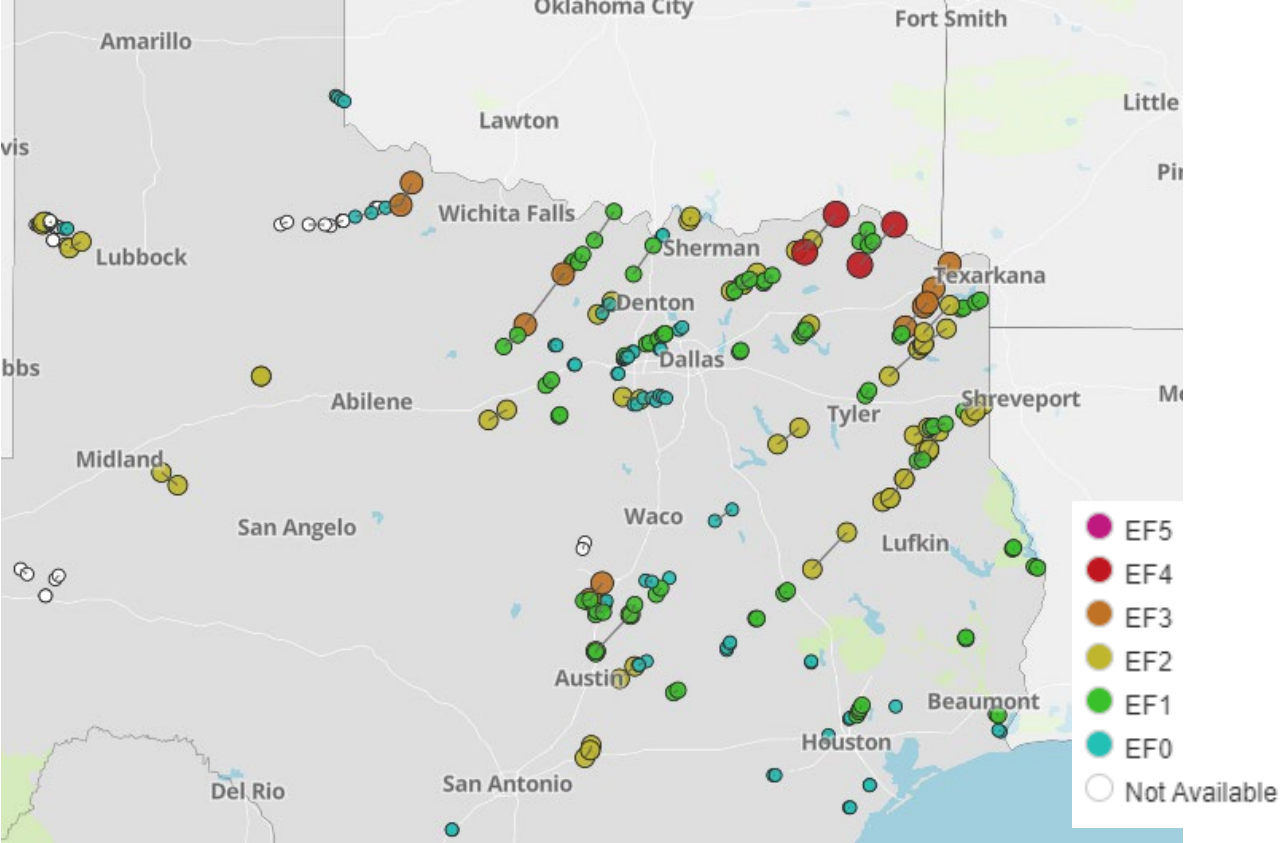
Notable Texas Hurricanes and Tropical Storms (TS)

- TS Allison 2001 – \$8.7B Estimated Loss
- Hurricane Dolly 2008 – \$2.1B Estimated Loss
- Hurricane Ike 2008 – \$37.5B Estimated Loss
- Hurricane Harvey 2017 – \$125B Estimated Loss
- TS Imelda 2019 – \$5B Estimated Loss

In catastrophic modeling, the Probable Maximum Loss (PML) estimates indicate significant damage from San Antonio to the Texas/Oklahoma border, resulting from tornadoes that emerge as named and numbered windstorms move inland. According to NOAA, Hurricane Harvey spawned 52 known tornadoes as it traveled through the U.S.

Tornadoes

2022 Tornadoic Activity



Data source: Climate Prediction Center / NOAA

Fund Notable Tornado and Wind Claims

- Dec 2022 – \$15.5M - Tornado
- June 2023 - \$4.9M - Tornado
- April 2019 – \$1.3M - Tornado
- 2023 - \$16M in Wind Losses

Straight Line Wind vs Tornado Wind

Case Study #1 (3-4 April 1974) Xenia (OH) High School



Image: NOAA Natural Disaster Survey Report



Images: <https://ohiomemory.org/digital/collection/p267401coll36/id/24785>

Case Study #2 (1 March 2007) Enterprise (AL) High School

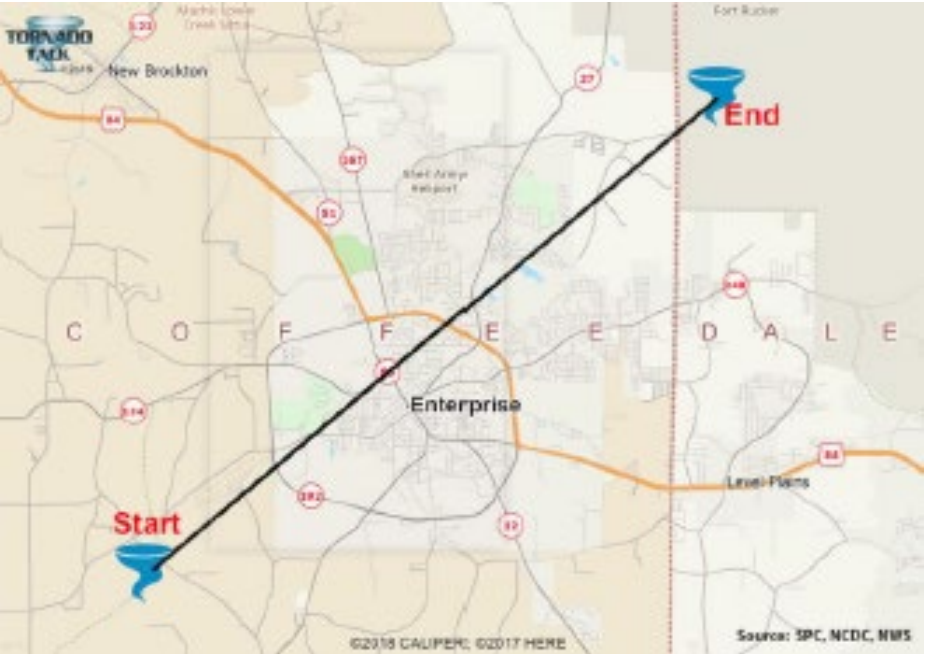


Image source: tornadotalk.com



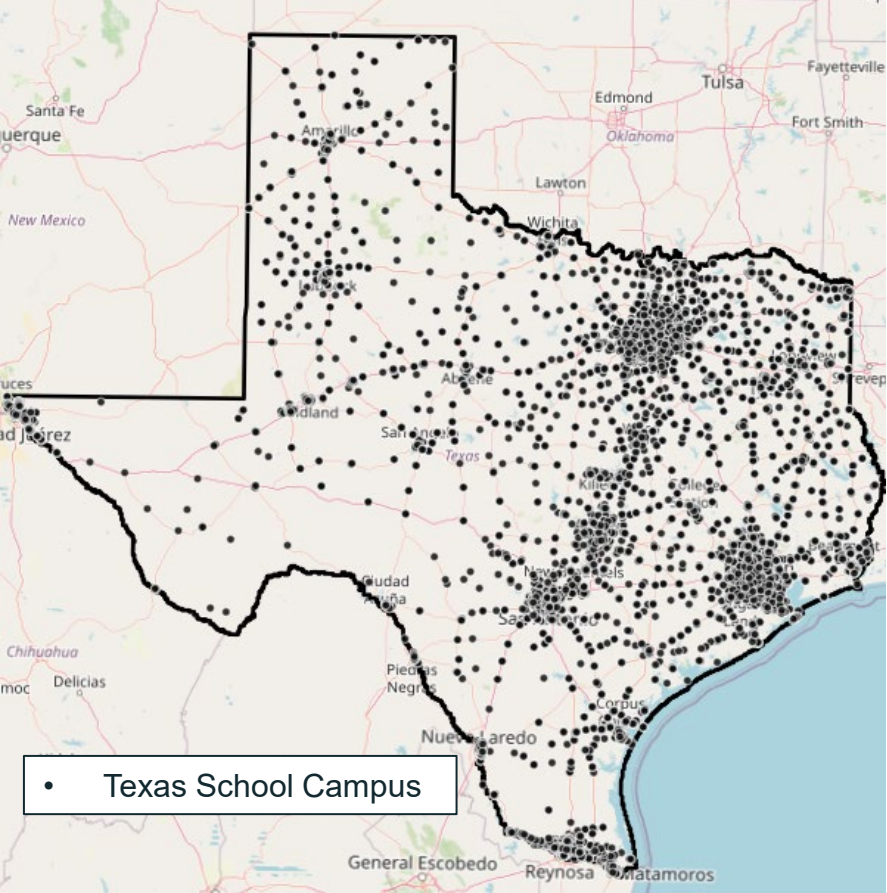
February 23, 2000



March 5, 2007

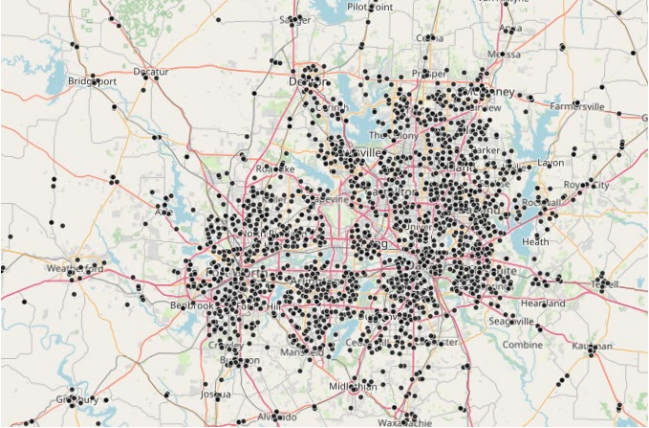
Image source: earthobservation.nasa.gov

Concentration of Risk – Texas ISD School Campuses

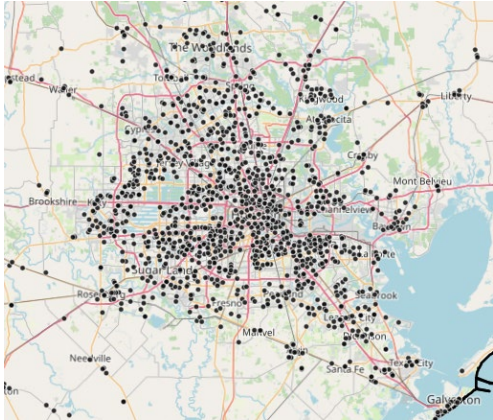


Data Source: Texas Education Agency

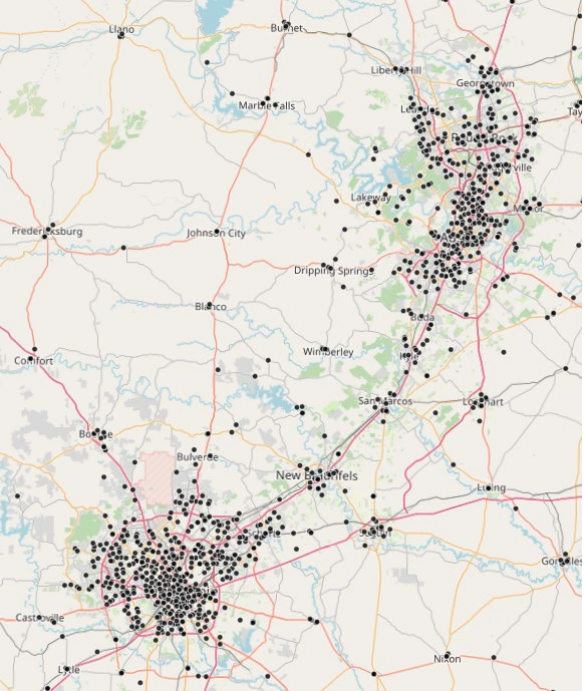
DFW Area



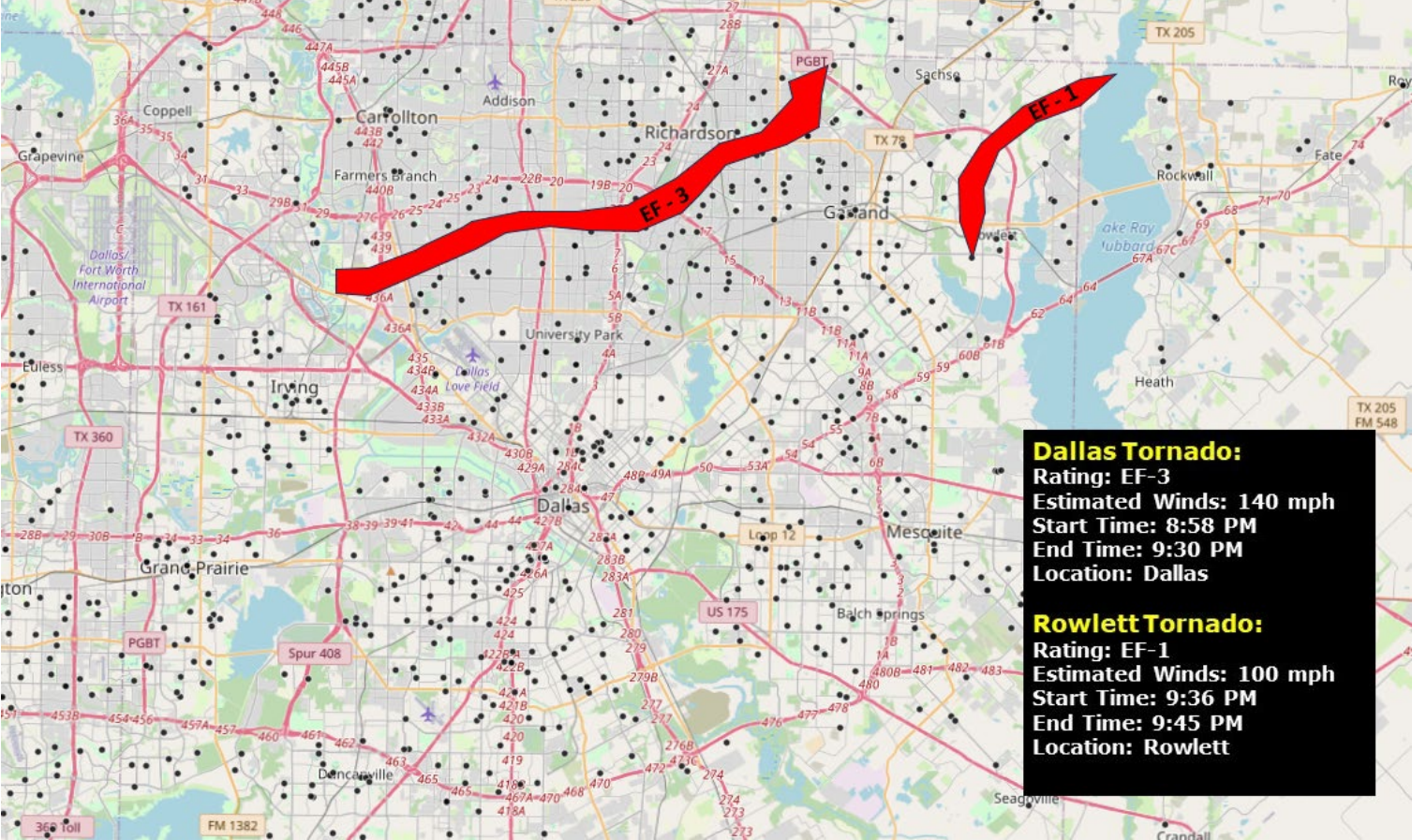
Houston Area



Central Texas



Concentration of Risk – Dallas 2019 Tornado



- Texas School Campus

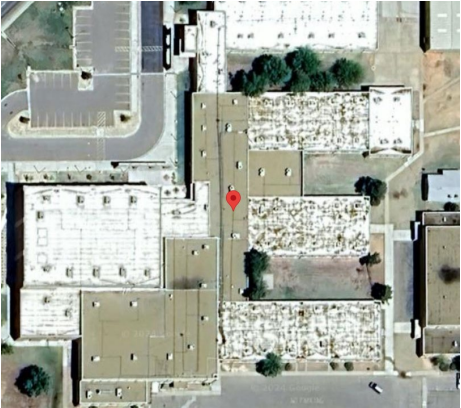
Data Source: Texas Education Agency/Weather.gov

School Districts Continue to Grow and Build

Stable Enrollment

Growing Enrollment

Middle School



\$22.6M
91,600 Sq Ft.

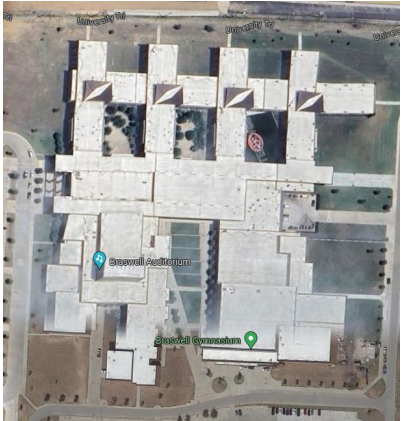


\$69.5M
178,800 Sq Ft.

High School



\$22.3M
96,000 Sq Ft.



\$204.2M
528,000 Sq Ft.

Data Source: TASB Risk Management Fund

Individual Building Values Continue to Grow

| Number of Bldgs. | Value \$25M-\$50M | Value \$50M-\$75M | Value \$75M-\$100M | \$100M+ |
|-----------------------|--------------------|-------------------|--------------------|---------------------|
| January 31, 2014 | 120 | 27 | 13 | 1 |
| January 31, 2019 | 175 | 37 | 13 | 5 |
| January 31, 2024 | 455 | 70 | 27 | 47 |
| 10 Year Change | +335 / 279% | +43 / 159% | +14 / 108% | +46 / 4,600% |

- Newly built schools are larger and more expensive to cover.
- Aging buildings and roofs impacted by harsh Texas weather
- Roof Resiliency - need to withstand at least 2-inch hail
- Capital investment planning

Data Source: TASB Risk Management Fund



Closing thoughts on weather and impact on school communities



Questions?



Thank you!

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