

Annual Catastrophe Losses: How Secondary Perils Are Taking On a Primary Role

Prepared by Steve Bowen; Managing Director & Head of Catastrophe Insight



AON

Overview



Secondary

Coming after, less important than, or resulting from someone or something else that is primary

Primary



**Tropical
Cyclone**



Earthquake

Secondary



Flooding



**Severe
Convective Storm**



Wildfire



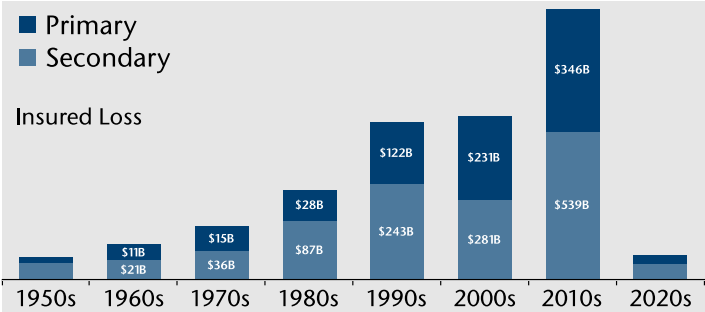
**Winter
Weather**



Drought



**European
Windstorm**



Secondary Perils
Costlier in 61 of 71 Years
Since 1950

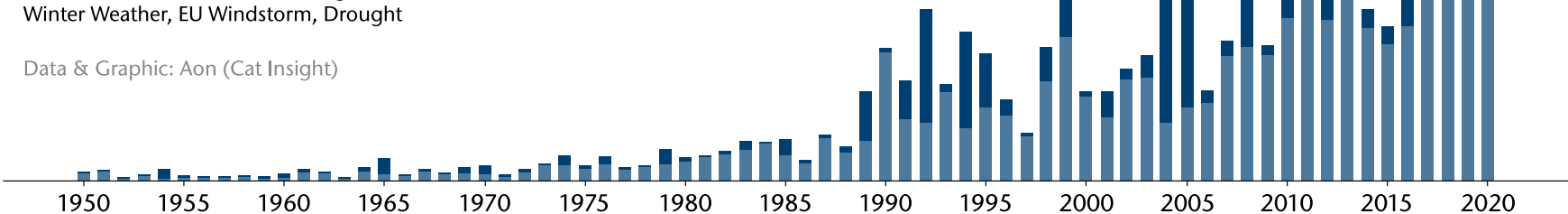
"Primary"

Tropical Cyclone & Earthquake

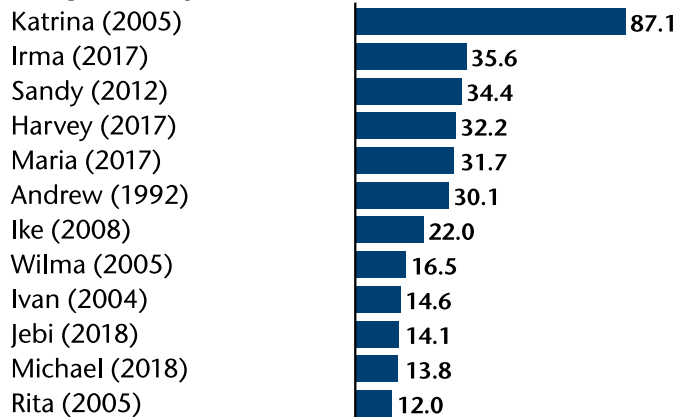
"Secondary"

Severe Convective Storm, Flooding, Wildfire,
Winter Weather, EU Windstorm, Drought

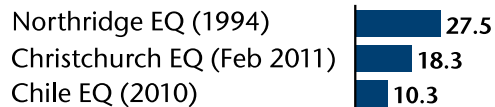
Data & Graphic: Aon (Cat Insight)



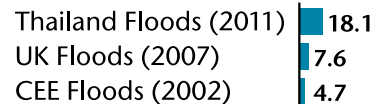
Tropical Cyclone



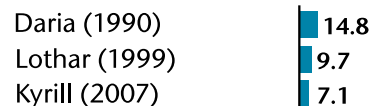
Earthquake



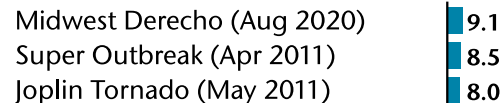
Flood



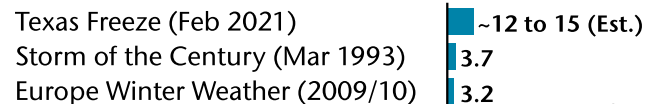
EU Windstorm



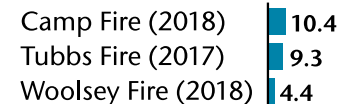
Severe Convective Storm



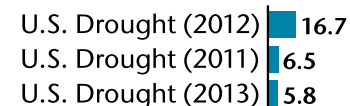
Winter Weather



Wildfire



Drought



Insured Losses in 2021 USD bn
Source: Aon (Cat Insight)

Severe Convective Storm

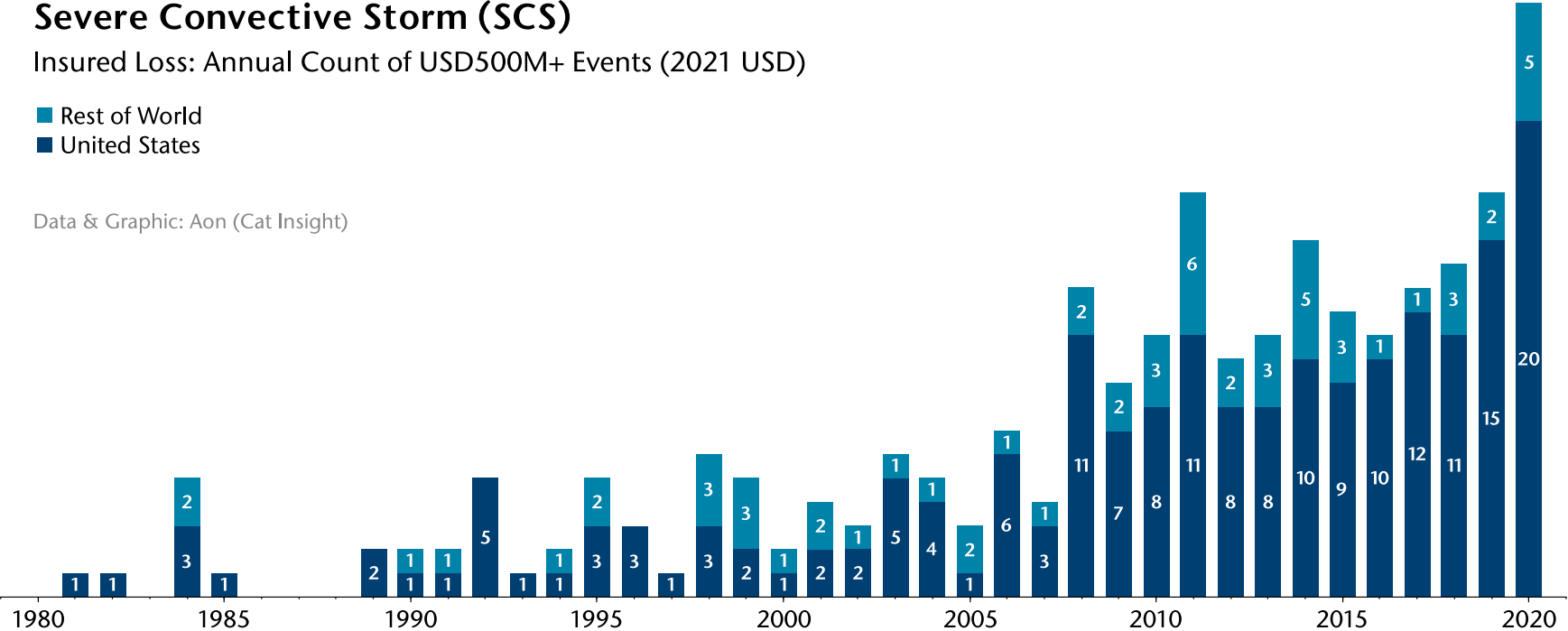


Severe Convective Storm (SCS)

Insured Loss: Annual Count of USD500M+ Events (2021 USD)

- Rest of World
- United States

Data & Graphic: Aon (Cat Insight)

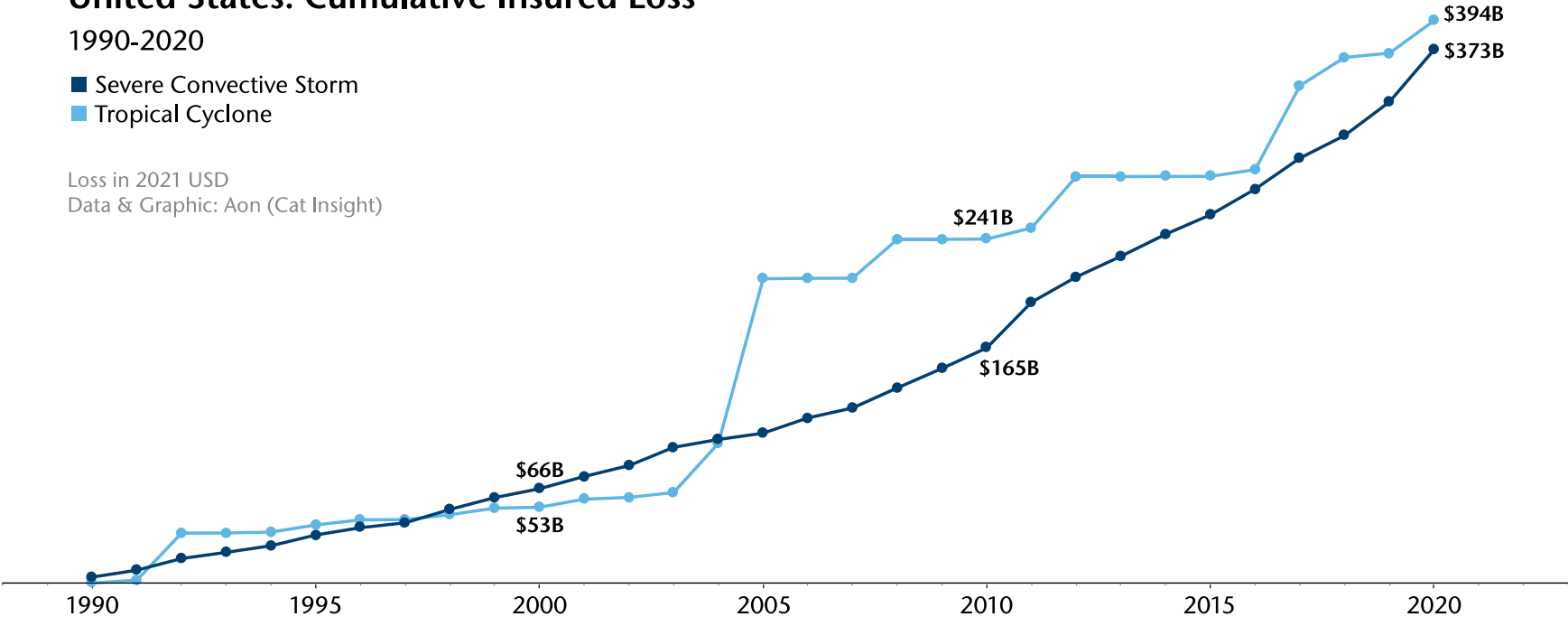


United States: Cumulative Insured Loss

1990-2020

- Severe Convective Storm
- Tropical Cyclone

Loss in 2021 USD
Data & Graphic: Aon (Cat Insight)





\$10+ billion

Annual U.S. Insured Loss

50 to 80%

Estimated Percentage of
Annual SCS Claims

Hail Prone U.S. Cities

Dallas – Fort Worth, TX

San Antonio, TX

Denver, CO

Colorado Springs, CO

Minneapolis, MN

Omaha, NE

St. Louis, MO

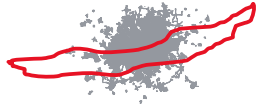
Chicago, IL

Kansas City, MO

Oklahoma City, OK

"Expanding Bullseye" Hail Swath Example Dallas / Fort Worth (Texas) Metroplex

1950



Population: 1.25M
Housing Units: 403K

1970



Population: 2.43M
Housing Units: 826K

2000



Population: 5.19M
Housing Units: 2.01M

Today



Population: ~8.0M
Housing Units: ~3.0M

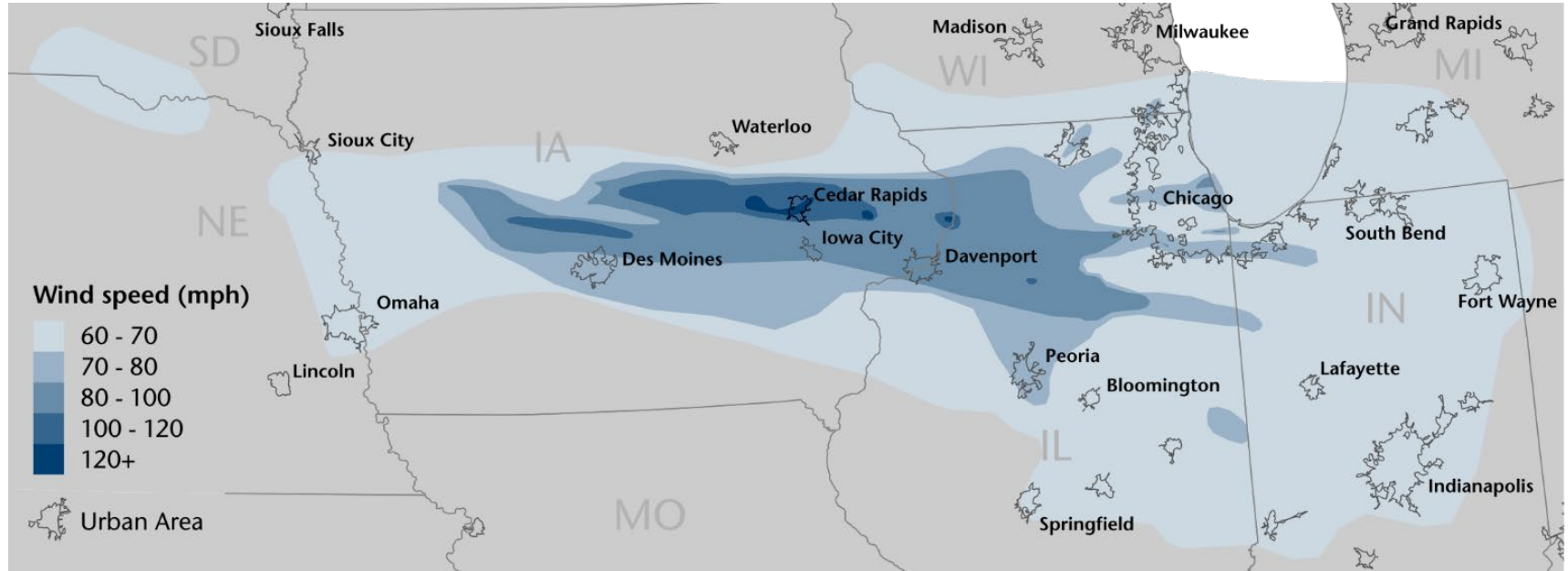
As population grows and the urban footprint expands, the risk of potential damage increases.

*Totals include Collin, Dallas, Denton, Ellis, Hunt, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise counties

Adapted from Ashley, et al (2014)

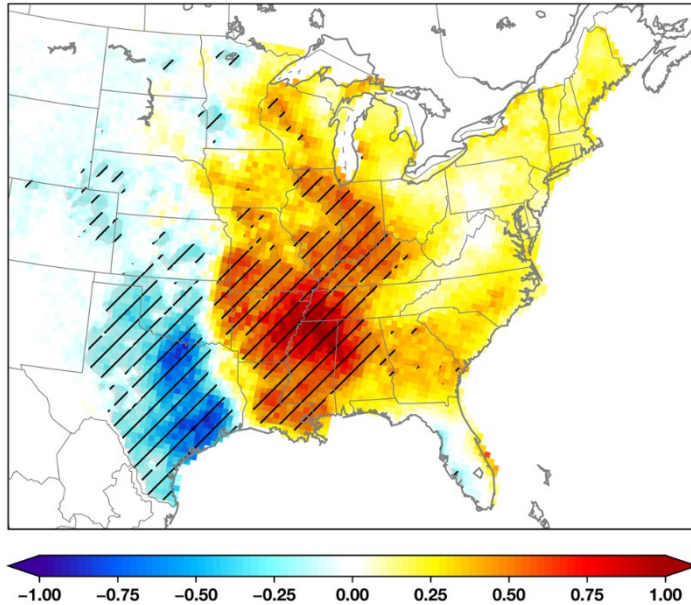
Data: U.S. Census Bureau
Graphic & Analysis: Aon (Cat Insight)

August 10, 2020 U.S. Midwest Derecho Wind Footprint



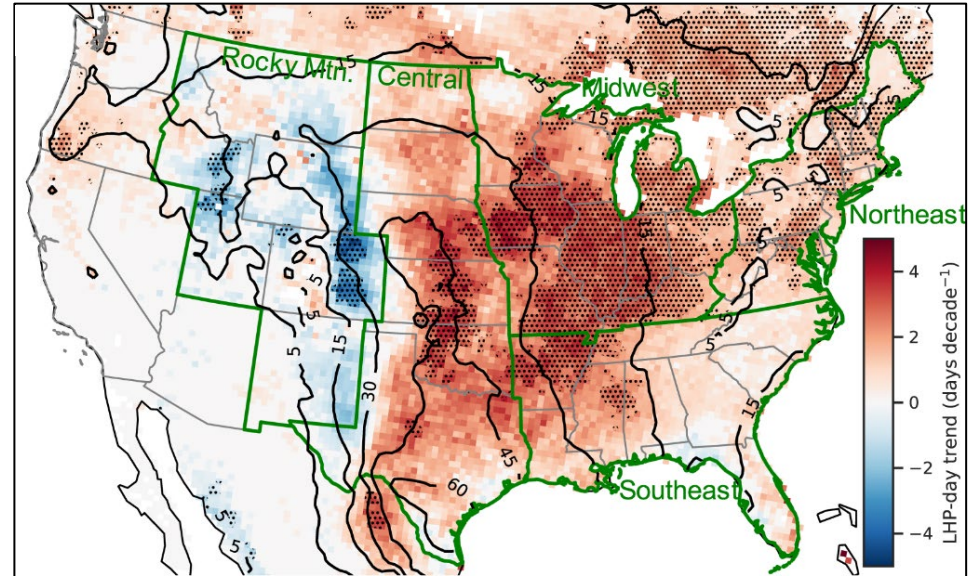
Includes tornado swaths in Illinois, Wisconsin, and Indiana. Data: NOAA

Shift in Tornado Environment



<https://www.nature.com/articles/s41612-018-0048-2>

Shift in Large Hail Environment Days

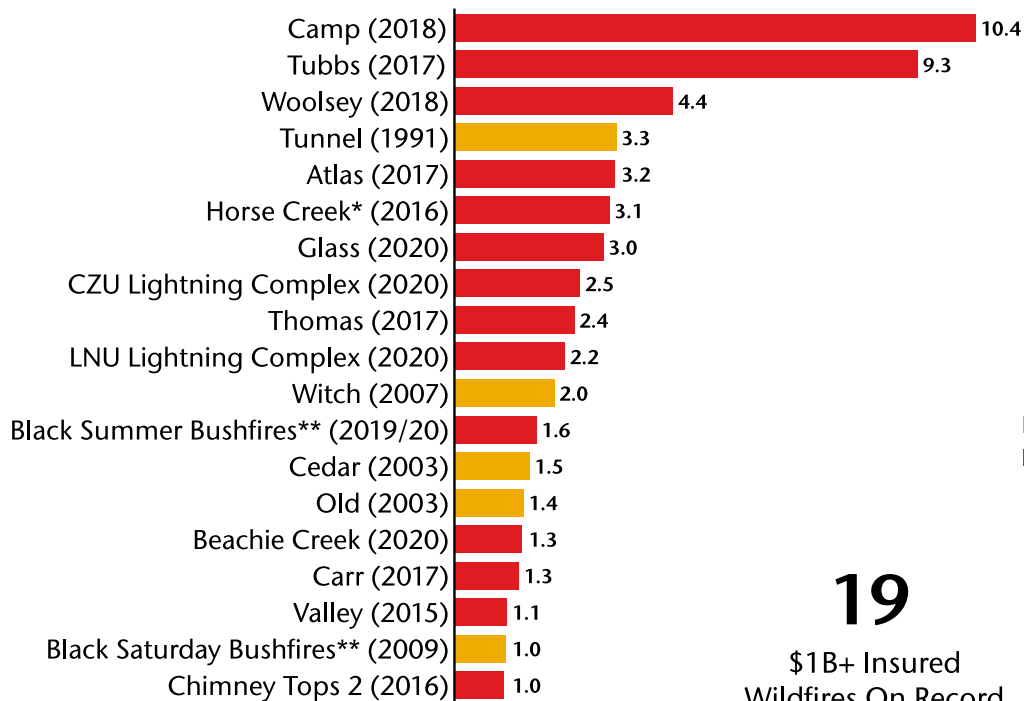


<https://www.nature.com/articles/s41612-019-0103-7>

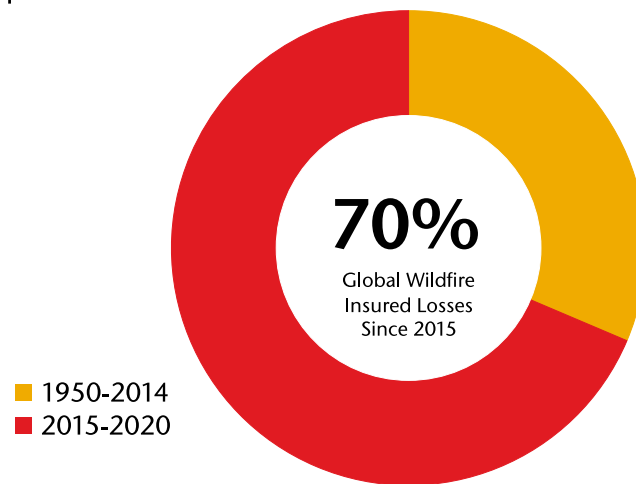
Wildfire



Increasing Wildfire Losses



*Canada Event **Australia Event

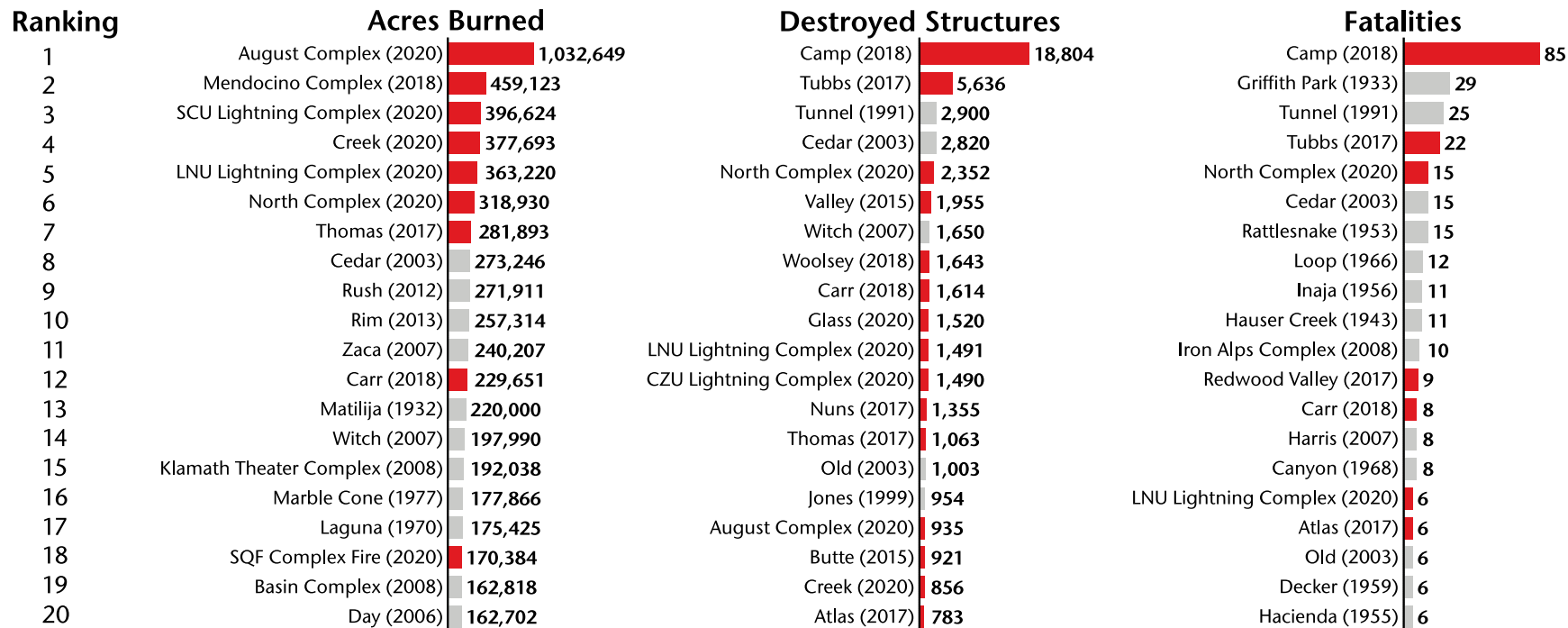


19
\$1B+ Insured
Wildfires On Record

14
\$1B+ Insured
Wildfires Since 2015

Insured losses in 2021 USD bn
Data: Aon (Cat Insight)

Record-Setting California Fires

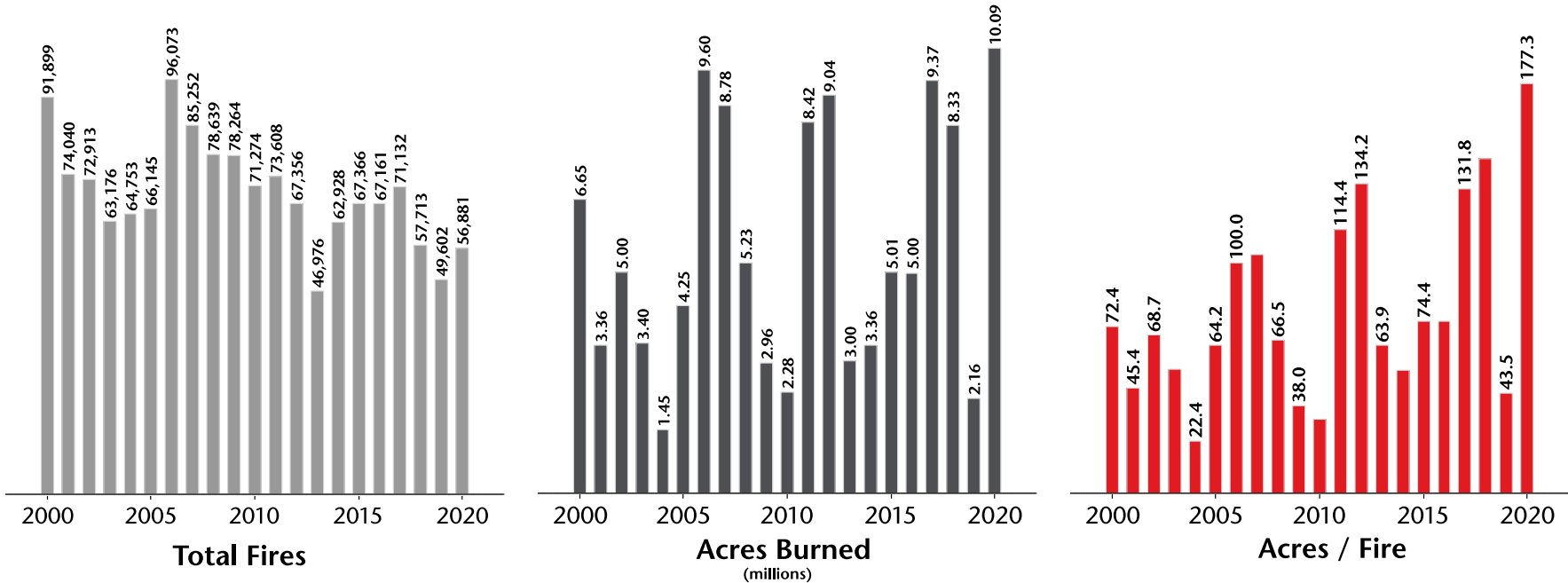


California Fires Since 2015 Data: NIFC / CalFire Graphic: Aon (Cat Insight)

Wildfire Behavior is Changing

Data: NIFC
Graphic: Aon (Cat Insight)

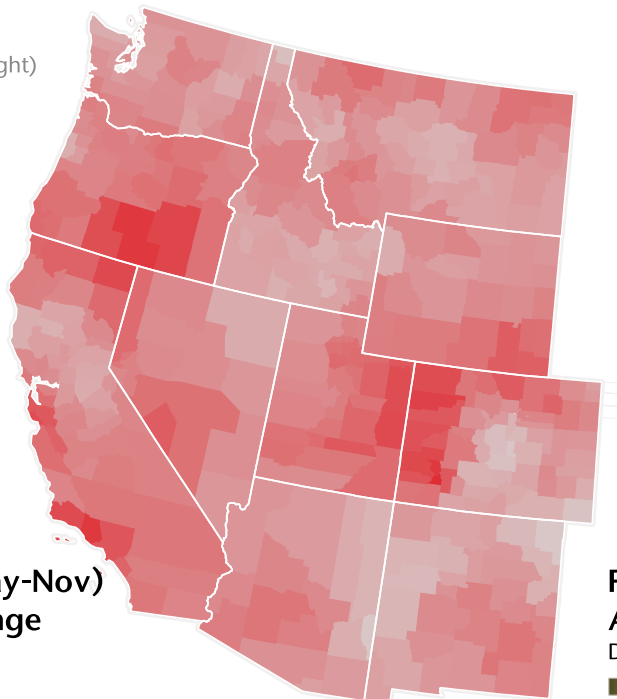
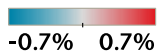
Wildfire Statistics: CONUS (Lower 48)



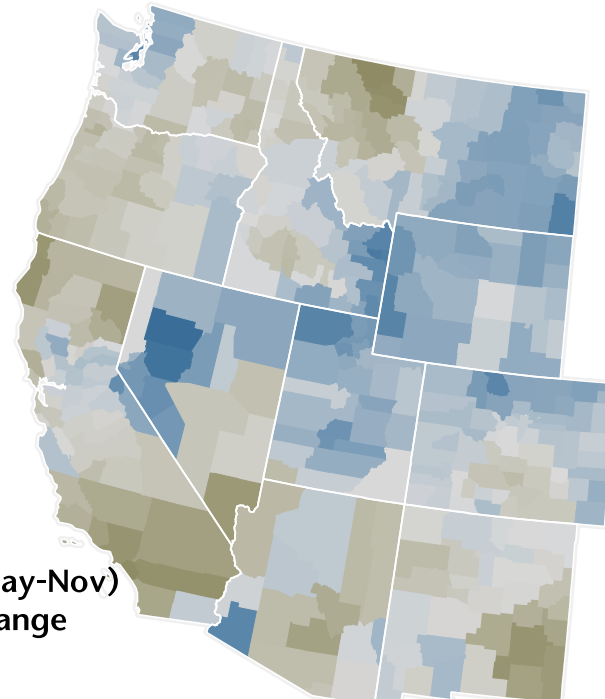
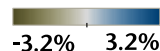
Fire Season Weather Conditions Are Worsening

Data: NOAA
Graphic: Aon (Cat Insight)

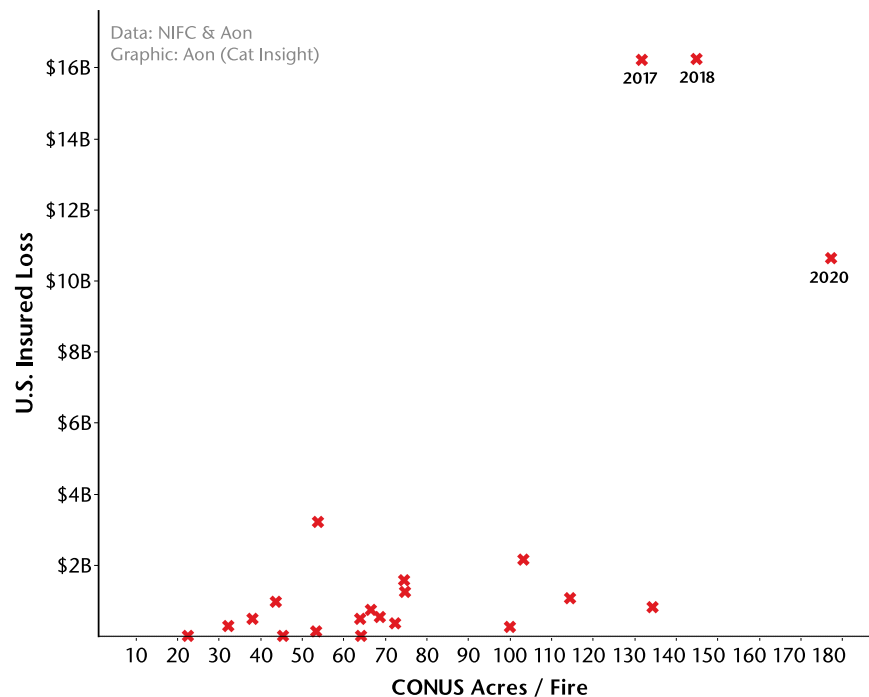
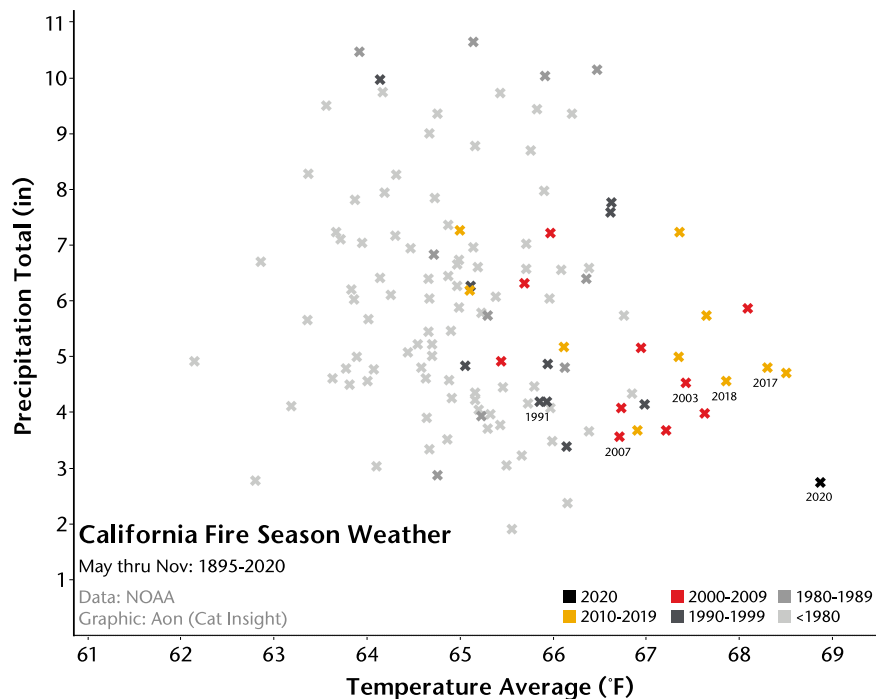
**Fire Season (May-Nov)
Avg Temp Change**
Decadal: 1895-2020



**Fire Season (May-Nov)
Avg Precip Change**
Decadal: 1895-2020

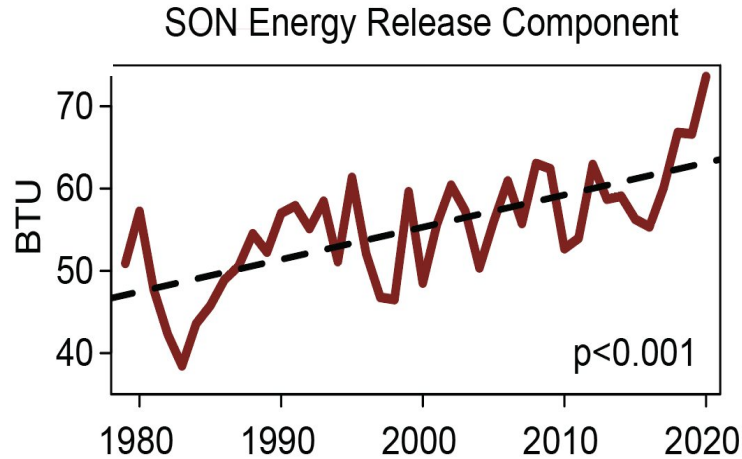


Fire Season Weather Conditions Are Worsening



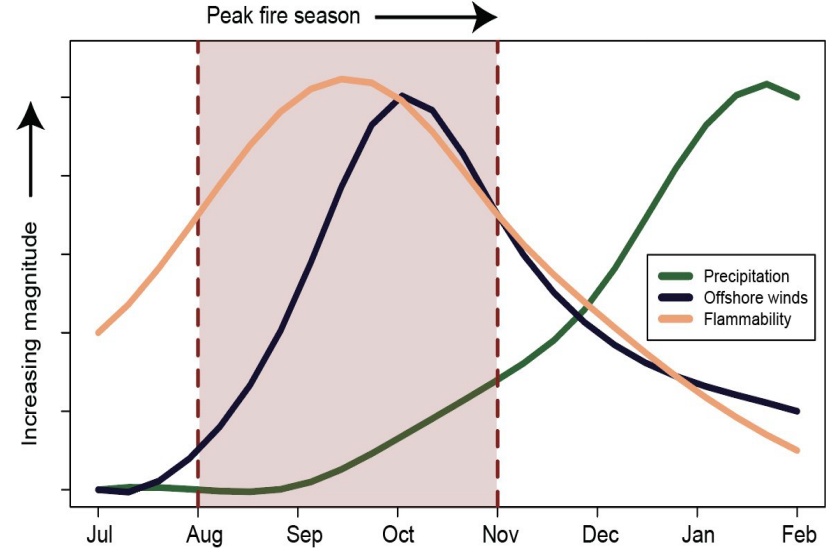
Climate Change & California Wildfires

Increasingly Flammable Vegetation in Peak Fire Months



<https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2021GL092843>

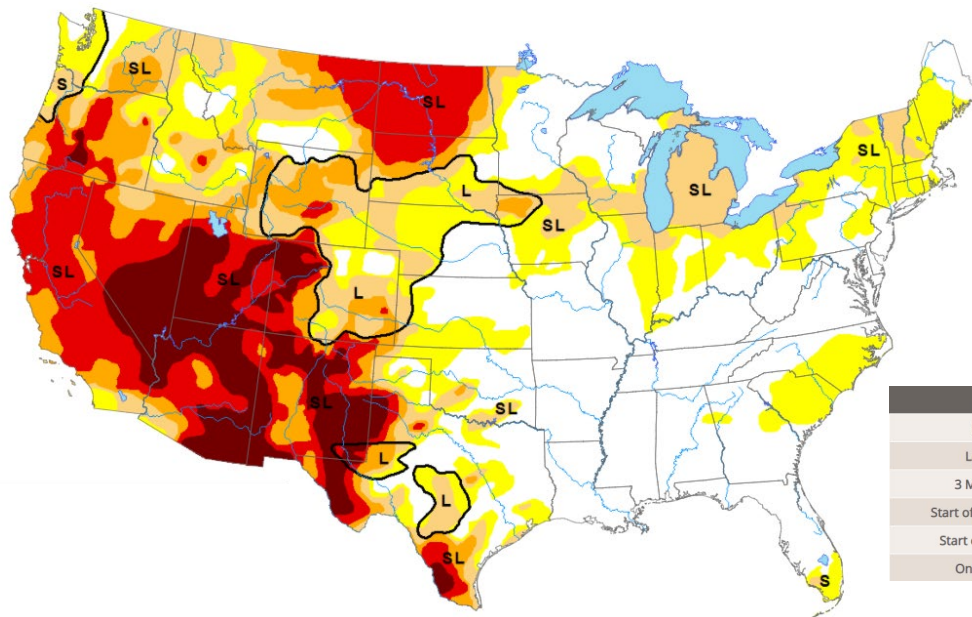
Shorter, More Intense Rainy Seasons & Amplified / Prolonged Fire Seasons



2021 Wildfire Risk

Map released: May 6, 2021

Data valid: May 4, 2021



Intensity:

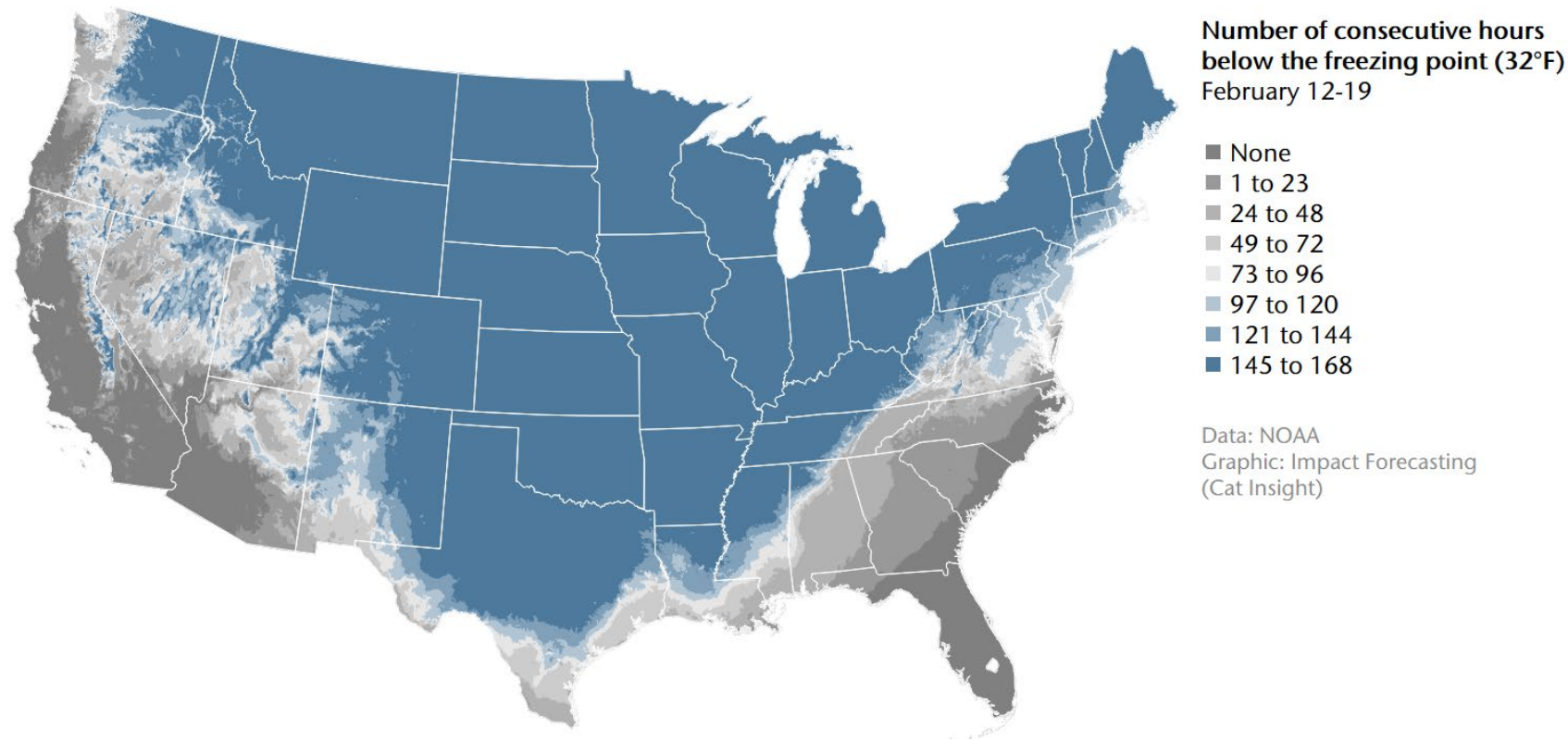
- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)

Week	Date	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	2021-05-04	34.36	65.64	46.55	32.23	22.55	9.04
Last Week	2021-04-27	31.73	68.27	48.37	32.48	21.72	9.22
3 Months Ago	2021-02-02	35.64	64.36	45.77	31.48	20.38	8.78
Start of Calendar Year	2020-12-29	33.59	66.41	48.99	34.22	22.21	9.89
Start of Water Year	2020-09-29	38.05	61.95	42.59	27.37	14.63	1.20
One Year Ago	2020-05-05	69.22	30.78	16.09	6.27	0.97	0.00

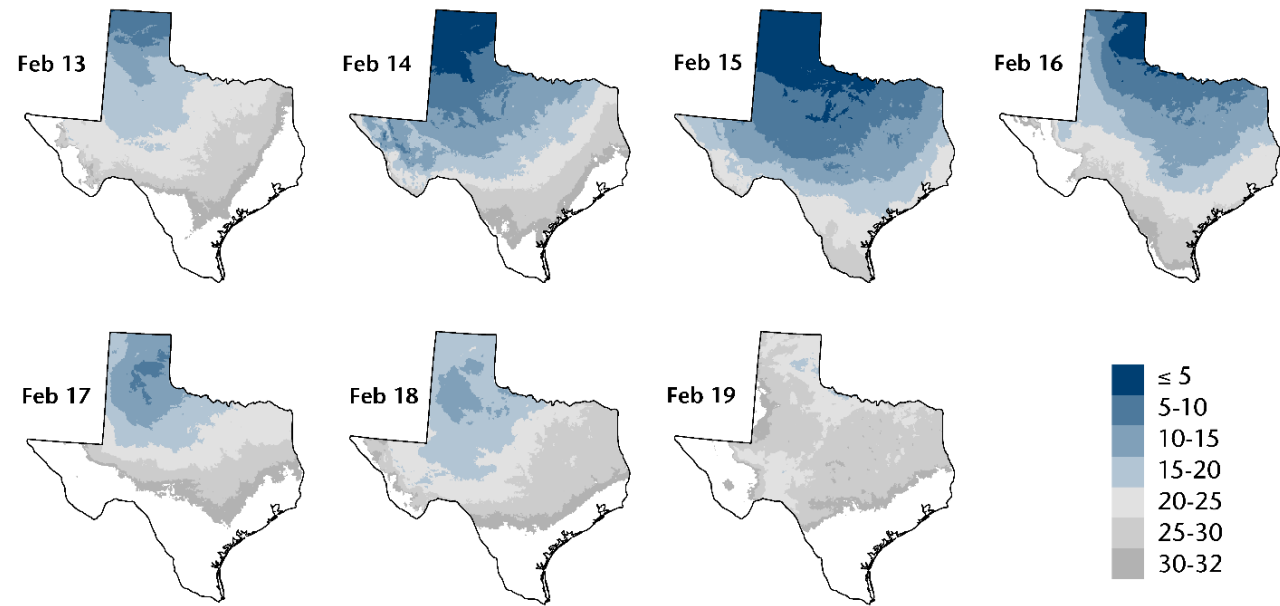
Winter Weather



Impact Forecasting Revealed 2021

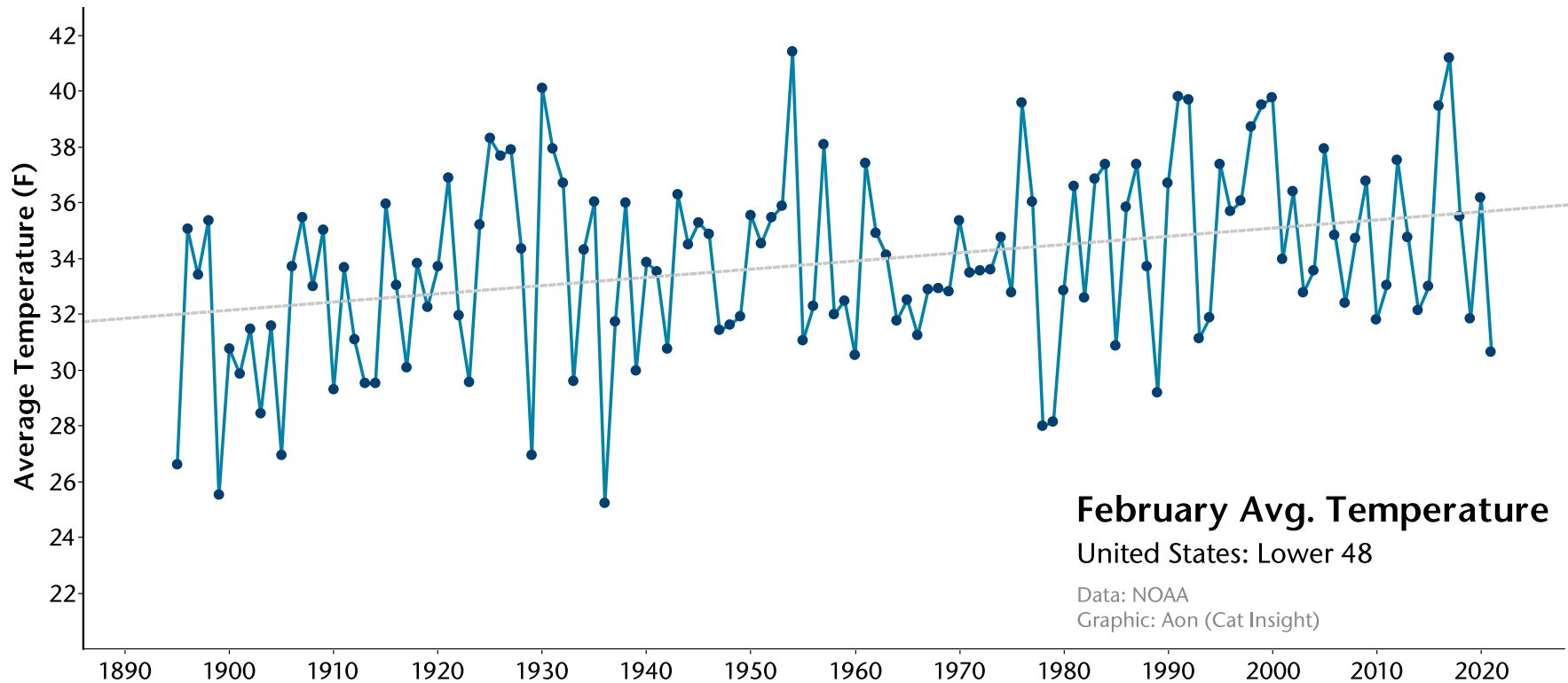


Texas Average Daily Temperatures (°F)
February 13-19 (12AM-11PM CST)



Data: NOAA/URMA
Graphic: Impact Forecasting (Cat Insight)

Impact Forecasting
Revealed 2021



February Avg. Temperature
United States: Lower 48

Data: NOAA
Graphic: Aon (Cat Insight)

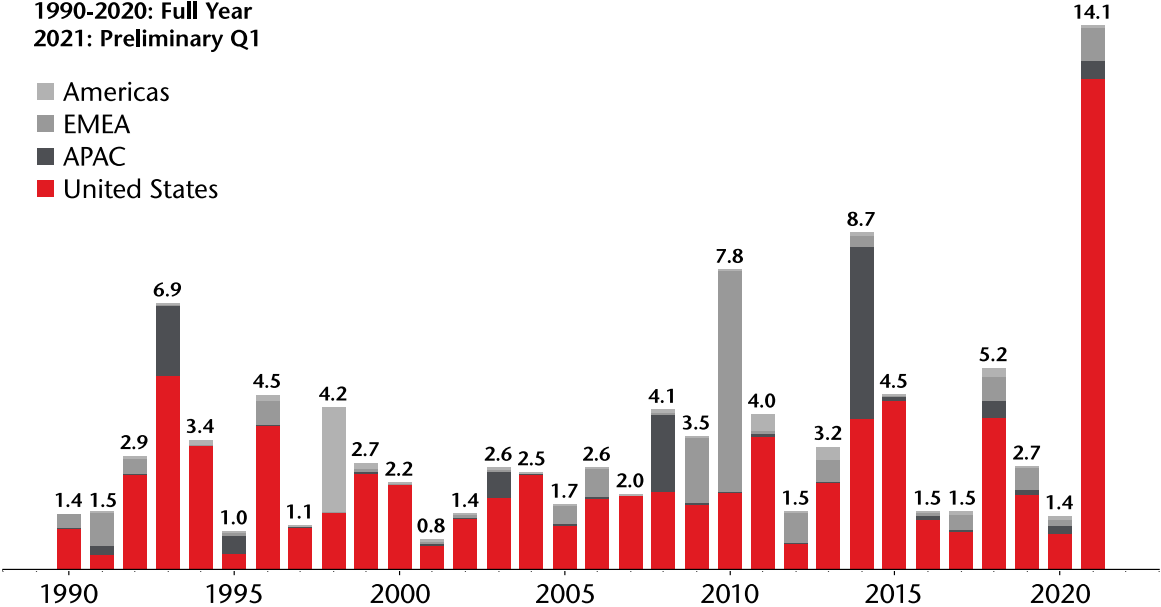


Global Insured Loss: Winter Weather

1990-2021

1990-2020: Full Year
2021: Preliminary Q1

- Americas
- EMEA
- APAC
- United States



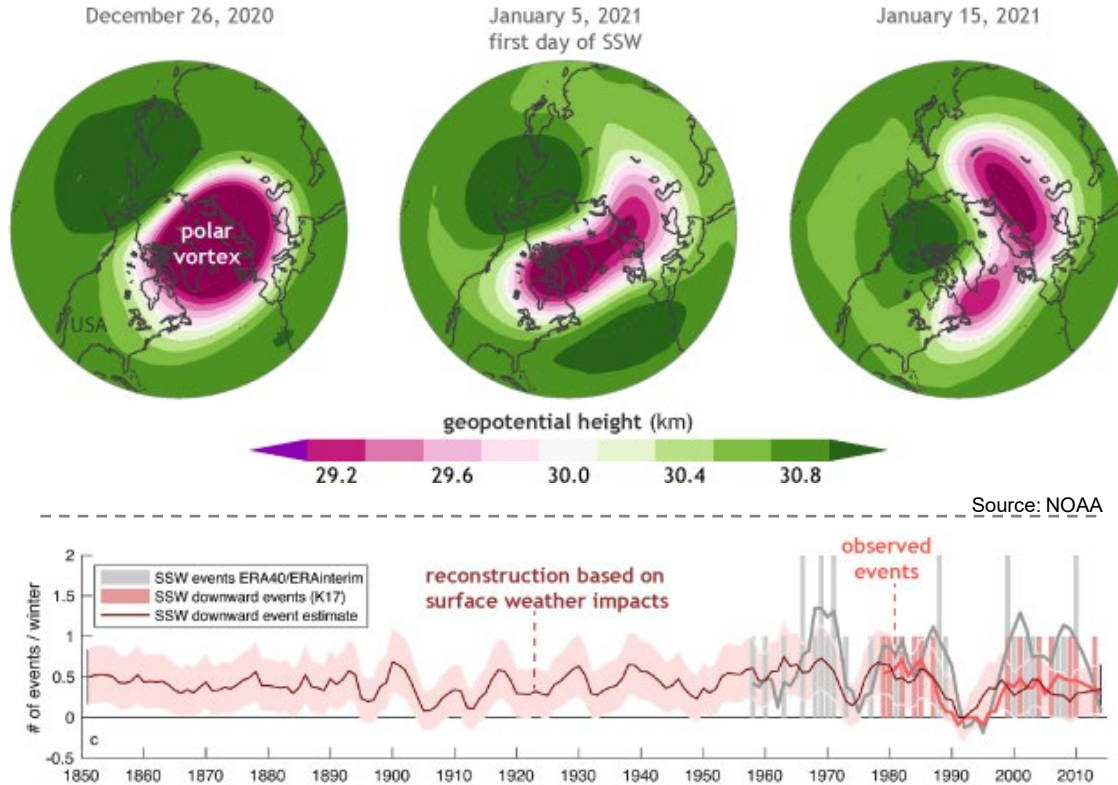
U.S. February 2021

Costliest Winter Weather
Event on Record

USD20+ billion
Economic Loss

USD12+ billion
Insured Loss

Losses in 2021 USD
Data & Graphic: Aon (Cat Insight)



Sudden Stratospheric Warming

Occur ~6x Per Decade

Warm Air Intrusion Weakens
Polar Vortex

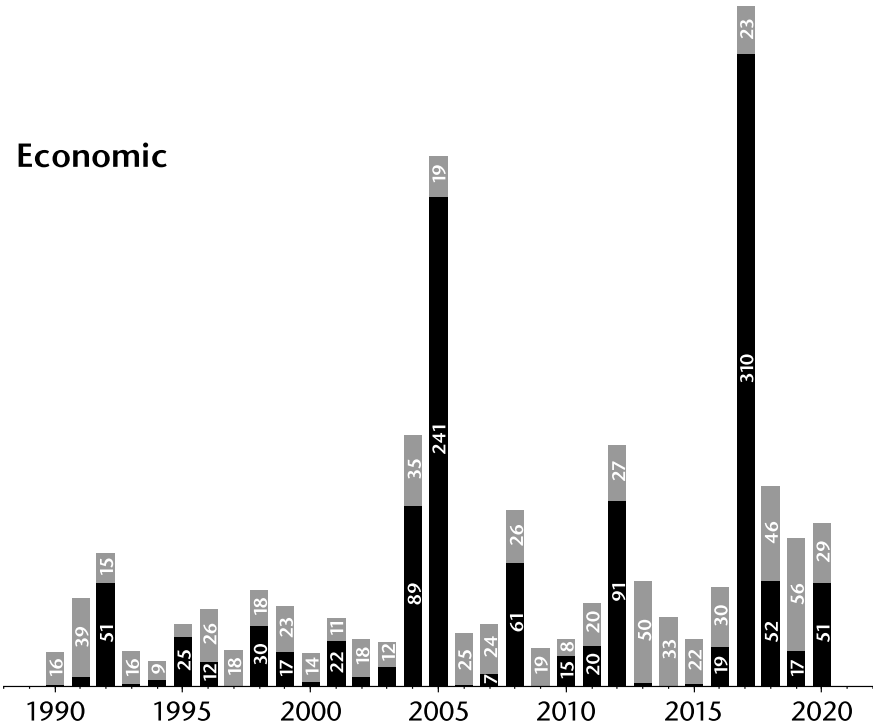
“Wavier” Jet Streams Lead to
Polar Vortex Lobes Sinking
into the Mid-Latitudes in the
U.S., Europe, and Asia

Frequency Increase? TBD

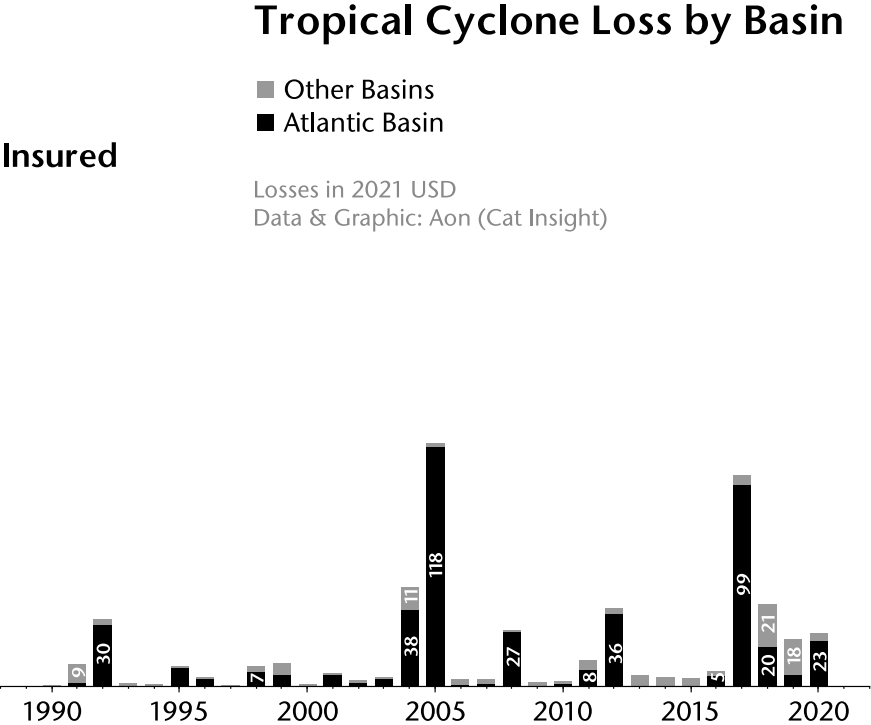
Tropical Cyclone



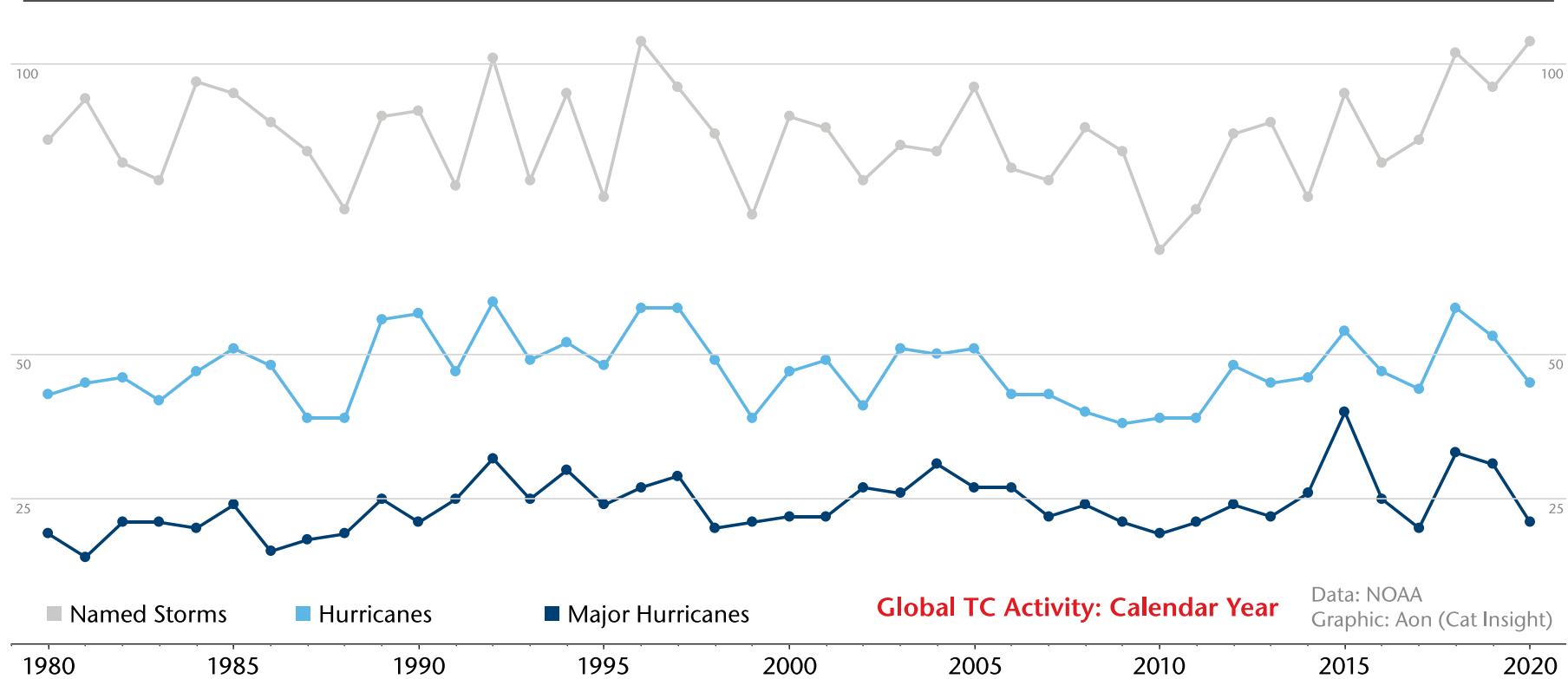
Economic

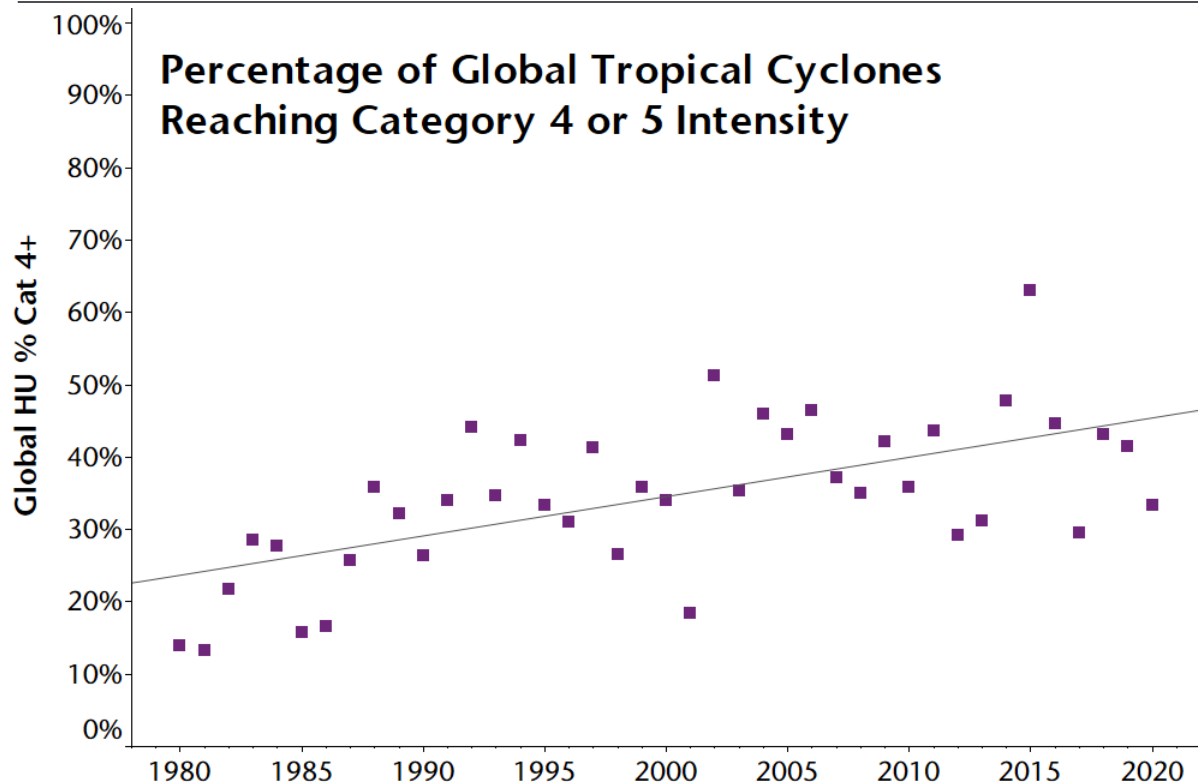


Insured



Impact Forecasting Revealed 2021





Since 1990

-0.7

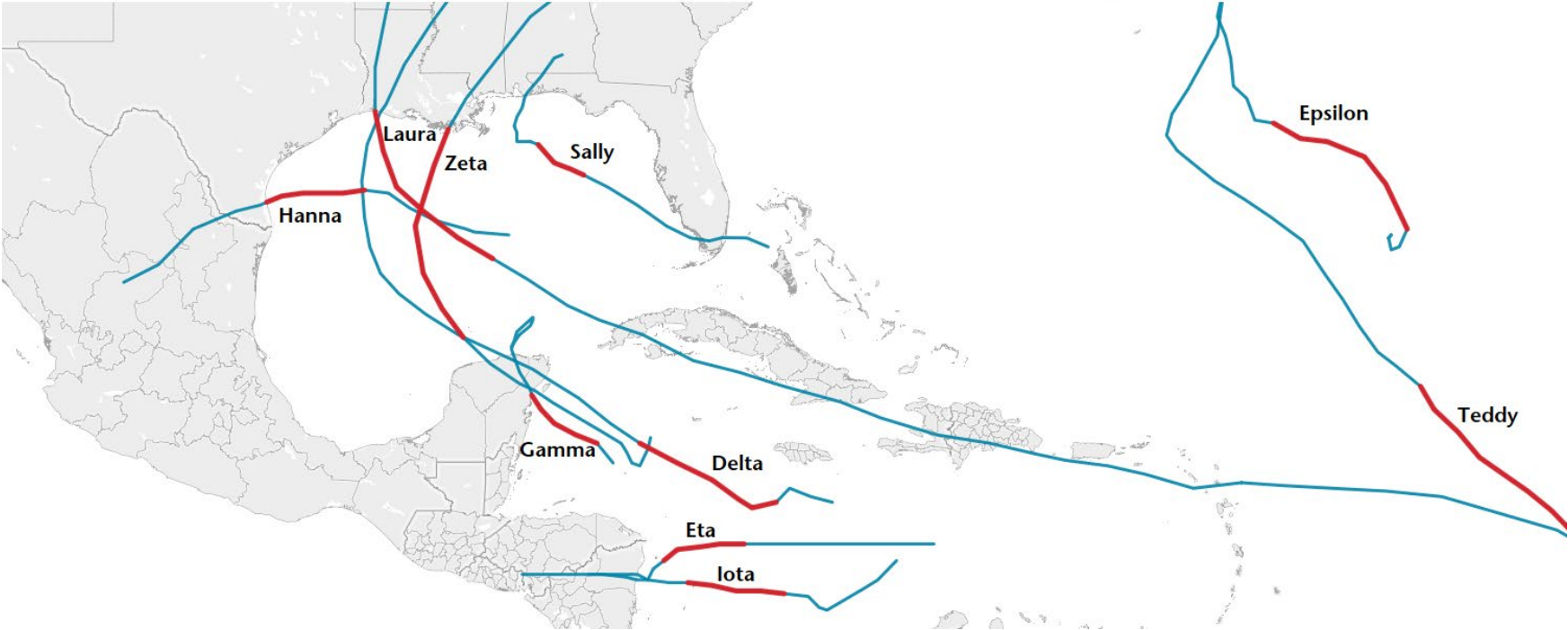
Decadal Linear Trend
Rapid Intensification
of 25+ knots in 24 hours

+1.8

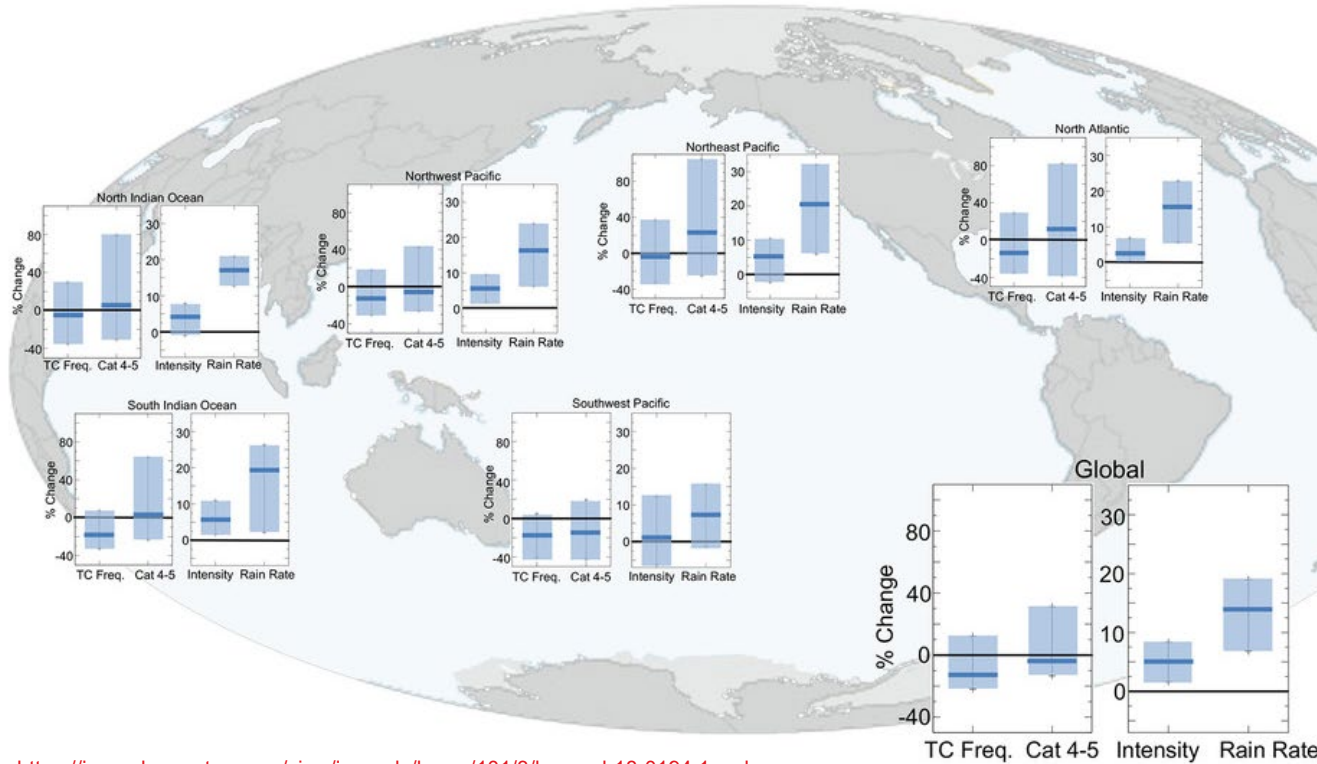
Decadal Linear Trend
Rapid Intensification
of 50+ knots in 24 hours

Data: NOAA
Graphic: Aon (Cat Insight)

2020 Atlantic Ocean Rapid Intensification Data: NOAA Graphic: Aon (Cat Insight)



Assumption 2°C Global Warming



<https://journals.ametsoc.org/view/journals/bams/101/3/bams-d-18-0194.1.xml>

Concluding Thoughts





Primary / Secondary

Recent decade of
loss performance has
changed how we
view individual peril risk;
Let's Drop the Labels



Climate Change

Scientific research is
making progress in the
understanding of how
peril behavior may evolve
in the future



Communicate

Critical need to improve
how we explain peril risk
to global stakeholders;
Don't Scare -- Inform!

Meteorological

Tropical Cyclone, Severe Convective Storm, Flood, Winter Weather, EU Windstorm

Climatological

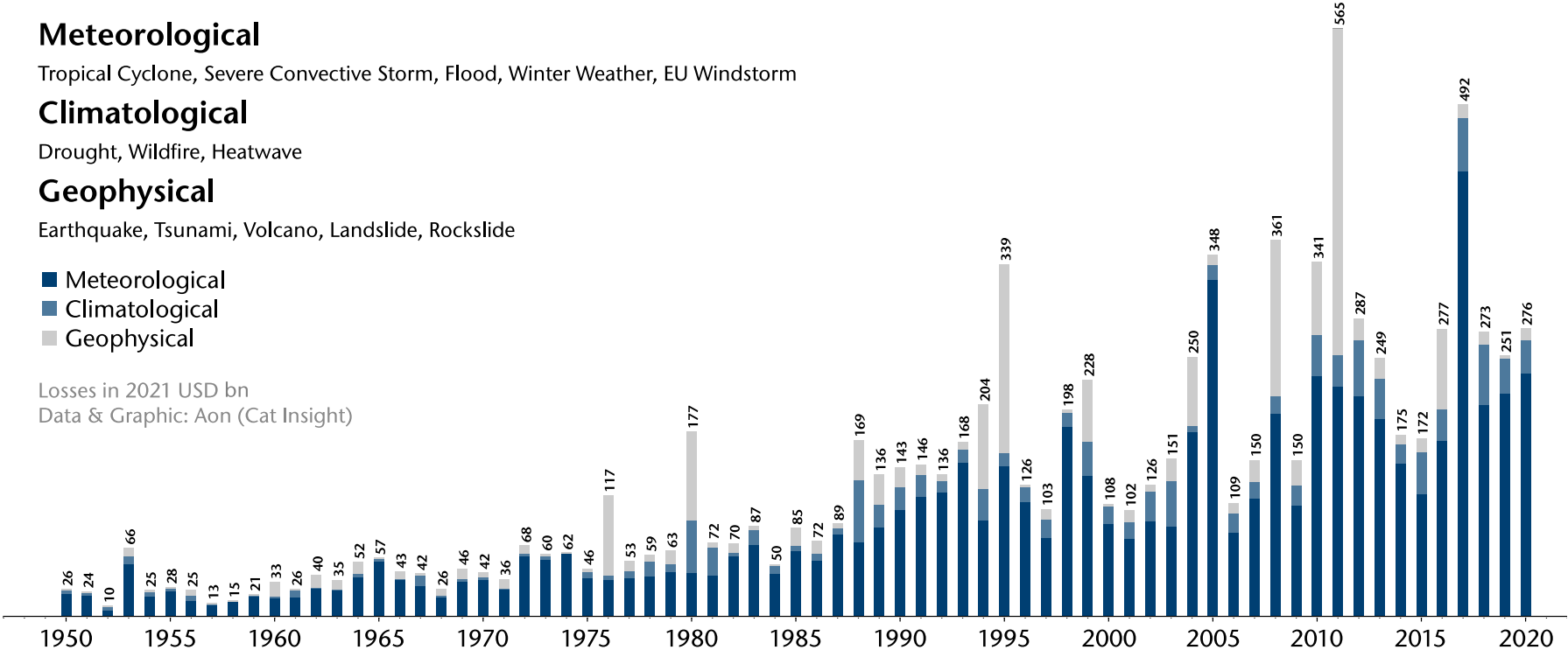
Drought, Wildfire, Heatwave

Geophysical

Earthquake, Tsunami, Volcano, Landslide, Rockslide

- Meteorological
- Climatological
- Geophysical

Losses in 2021 USD bn
Data & Graphic: Aon (Cat Insight)



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