INIGO

HOW IS CLIMATE CHANGE AFFECTING US NATURAL CATASTROPHE RISK

INIGO

FOR THE LOVE OF DATA

CLIMATE CHANGE IS INCREASING THE SEVERITY OF US HURRICANES

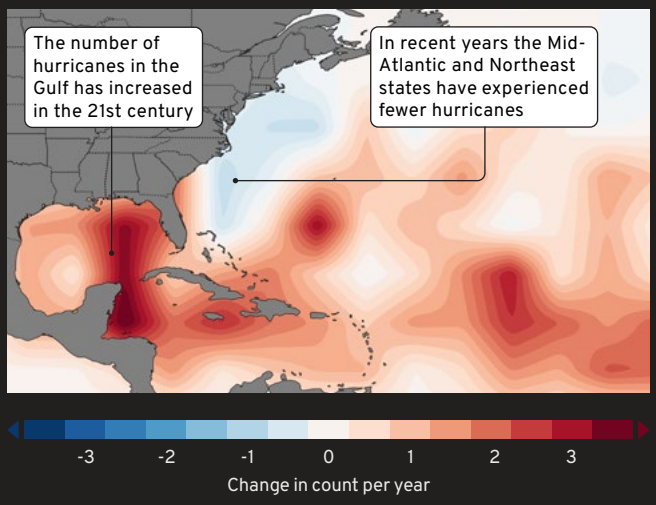
Increase in observed frequency

- The observational record shows an increase in the average number of Atlantic hurricanes in the recent past.
- There is no scientific consensus on the impact of climate change on hurricane frequency.

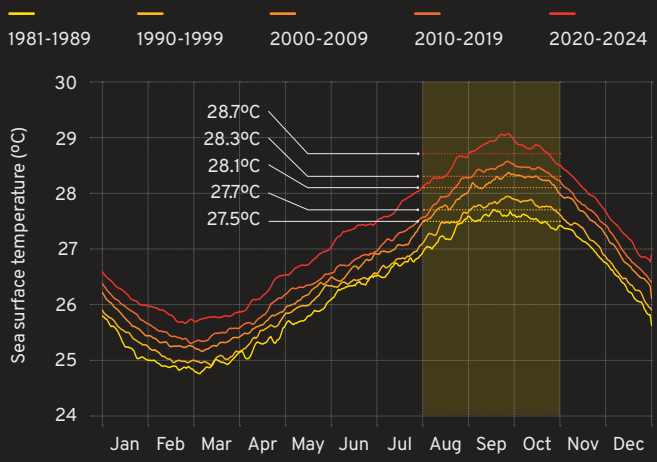
Increasing intensity

- Sea surface temperatures in the Atlantic have been increasing in every decade since the 1980s.
- Warmer waters fuel hurricanes, increasing the odds that they will reach the most devastating category 4 or 5 strength.

CHANGE IN HURRICANE TRACK DENSITY: 2000-2024 VS 1950-1999



AVERAGE DAILY SEA SURFACE TEMPERATURE BY DECADE



Hurricane tracks are from the Hurdat dataset and sea surface temperature data are from HadISST.

It is expected that there will be more major hurricanes with climate change

DEFINING THE INIGO VIEW OF RISK

DIFFERENCE IN MAJOR HURRICANE LANDFALLS BETWEEN THE INIGO VIEW OF RISK AND THE VENDOR VIEW

- The vendor model relies on historic hurricane frequencies which don't reflect present-day risk.
- Using alternative data sources like Reask, we create a present-day risk view showing higher major hurricane landfall rates, reflecting both frequency and severity changes.

SCIENCE-INFORMED RISK FRAMEWORK

INFORM

Collaborate with leading climate scientists at the University of Cambridge to ensure our understanding of the science is robust and market-leading.

InSPIRe — OUR CAMBRIDGE COLLABORATION

DEFINE

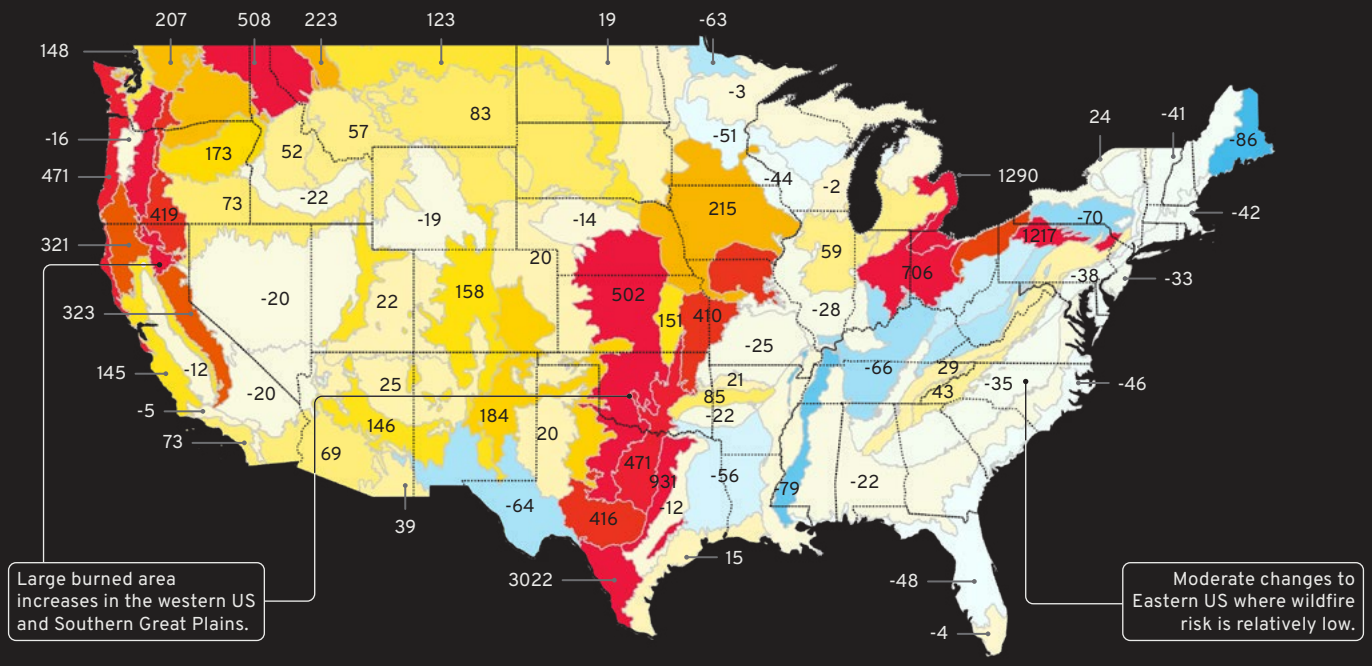
Integrate the latest science, internal expertise, and vendor models to define an evidence-led Inigo View of Risk.

VALIDATE

Validate the Inigo View of Risk through rigorous review by academic and industry experts.

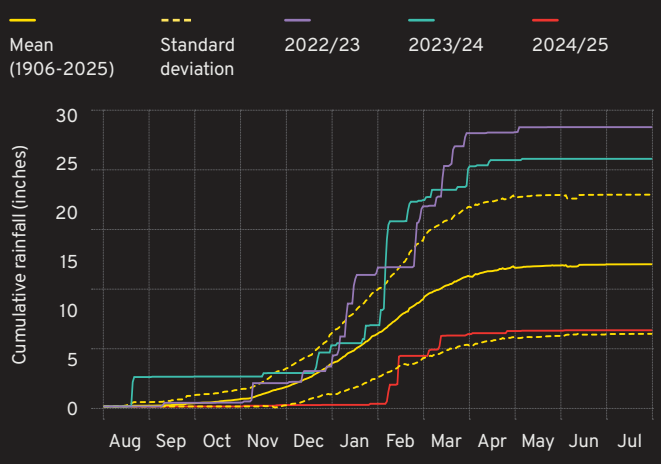
WILDFIRE RISK IS INCREASING WITH CLIMATE CHANGE

CHANGE IN AVERAGE ANNUAL BURNED AREA: COMPARING 1992-2002 TO 2012-2022 (%)



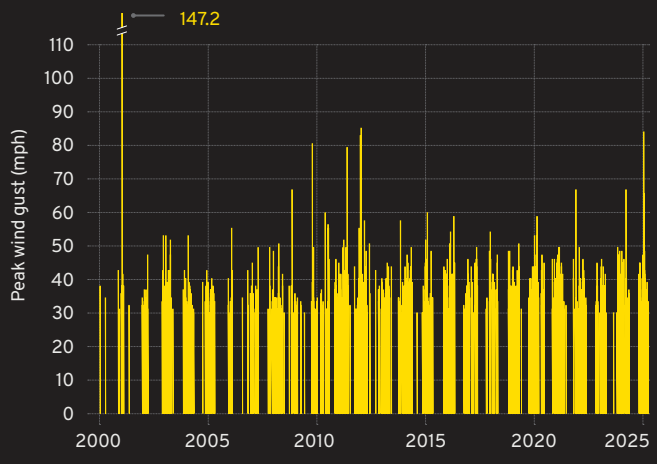
Los Angeles Wildfires a Product of Weather Whiplash and High Winds

LOS ANGELES PRECIPITATION



- LA fires on January 7th-8th 2025 damaged 13,500 buildings and generated $30-50bn of insured loss.
- Wet years in 2023/24 fuelled growth which dried out in a record-breaking dry start to 2025.
- 'Whiplash' between very wet and very dry years is becoming increasingly likely (Swain et al., 2025).

LOS ANGELES DAILY WIND MAXIMUM

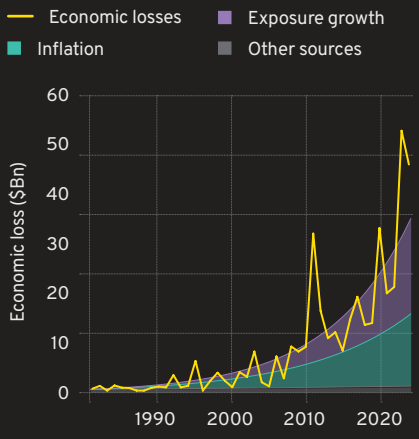


- Highest Santa Ana winds since December 2011 contributed to a fire weather 'perfect storm'.
- On average, California's wet season now arrives a month later than it did in 1960 (Lukovic et al., 2021).
- Increasing overlap between the dry season and the autumn/winter windy season heightens wildfire risk.

Burned area data from Fire Program Analysis Database (1992-2020) and National Interagency Fire Centre (2021-2022) split into Environmental Protection Agency Level III Ecoregions. Precipitation data for Los Angeles from Global Historical Climatology Network daily summaries. Maximum peak gust recorded across Los Angeles' airports (Automated Surface Observing Systems).

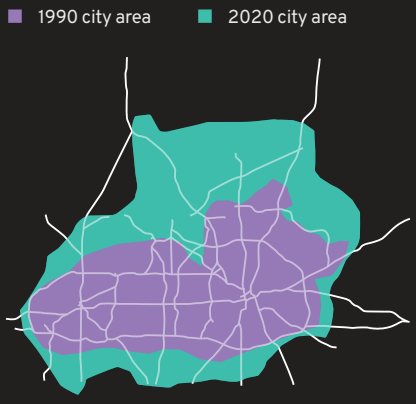
EXPOSURE GROWTH AND INFLATION DRIVE SCS LOSS INCREASES

LOSSES HAVE SURGED



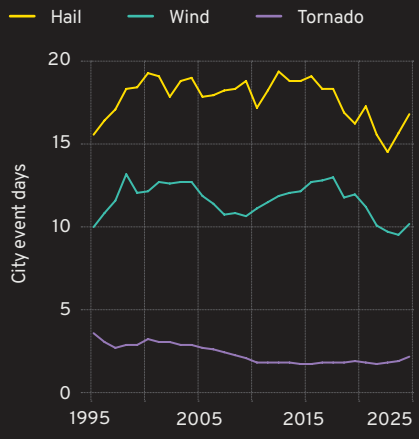
- US SCS losses have surged in recent years, driven primarily by inflation and exposure growth as populations in SCS exposed areas grow.
- Other inflationary sources include aging homes, social inflation, and climate variability.

EXPOSURE HAS GROWN



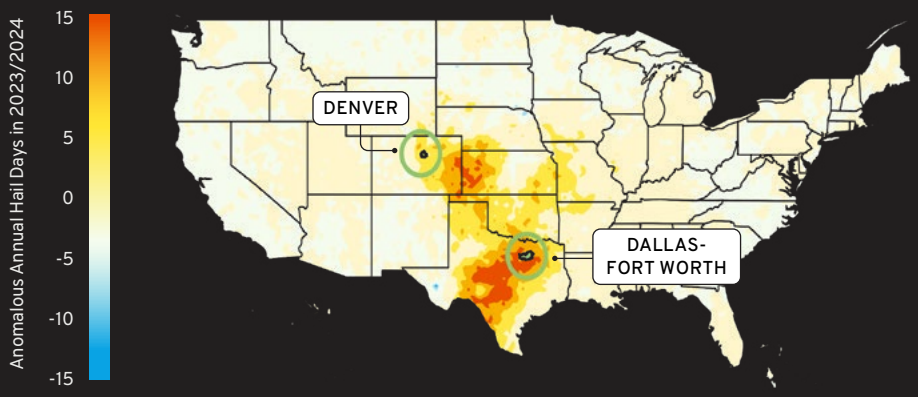
- Urban sprawl has made it increasingly likely that US SCS events occur in populated areas.
- Dallas-Fort Worth (shown above) has seen tremendous population growth and sprawl. The populated area is now over 40% larger than in 1990.

HAZARD IS STABLE



- There is no significant trend in the frequency of SCS hazard across the US.
- Climate change may alter the severity and frequency of SCS in the future, but this has not yet been observed.

What drove record 2023/2024 losses?



- 2023 and 2024 featured anomalous amounts of hail near two major population centers – Denver and Dallas-Fort Worth.
- This combination of high hazard and high exposure was emblematic of the longer term increases that have occurred.

Loss data from the NCEI billion dollar losses database. Hazard data from Inigo's historical hail hazard dataset and SPC hazard reports. Population data from the US census bureau.

INIGO CATASTROPHE RESEARCH TEAM

ADAM ALVAREZ
Head of Climate and Capital Strategies

LUDOVICO NICOTINA
Head of Catastrophe Research, PhD in Hydrology

RUTH PETRIE
Principal Risk Scientist, PhD in Meteorology and Climate Science

TYLER COX
Risk Scientist, PhD in Atmospheric Sciences

PATRICK BALL
Risk Scientist, PhD in Earth Sciences