Role of Insurance in Adaptation to Extreme Events

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NAS Panel Discussion on Extreme Events & Insurance

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Extreme Events, Insurance, and Adaptation

Key Takeaway

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Insurance plays a critical role in helping communities recover from extreme events and encouraging adaptation and mitigation, but the insurance industry alone cannot solve the societal challenges associated with increasing losses from extreme events.

All affected stakeholders, from the federal government to individuals, have a role to play in making effective adaptation a reality.

Insurance Primer

Importance of Risk Adequate Rates

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- Insurance companies want to make a profit and remain solvent after a large loss event.
- The U.S. property insurance market is highly competitive and highly regulated at the state level. Underwriting profit margins on individual policies are typically quite small.
  - Admitted insurers (subject to state regulation) publicly file rates that all their competitors can see.
  - States typically only allow insurance rates to be based on historical data, not prognostic assessments of current and future risk.
- Due to tight margins, it is imperative that insurers accurately calculate **risk-adequate rates** for every peril covered by an insurance policy.

  Risk adequate rate = average annualized loss to an insured risk over an infinite time period.
- Calculating risk-adequate rates relies on large quantities of historical loss data.
  - Works very well for house fires or auto collisions. Low uncertainty in calculating risk adequate rates.
  - Limited historical extreme event data means there is high uncertainty in calculating risk adequate rates, even if one assumes a stationary climate (no change in hazard with time).

SCS Loss Trends

Insured Property Losses Due to SCS (Severe Thunderstorms) in the USA, 1980 - 2025

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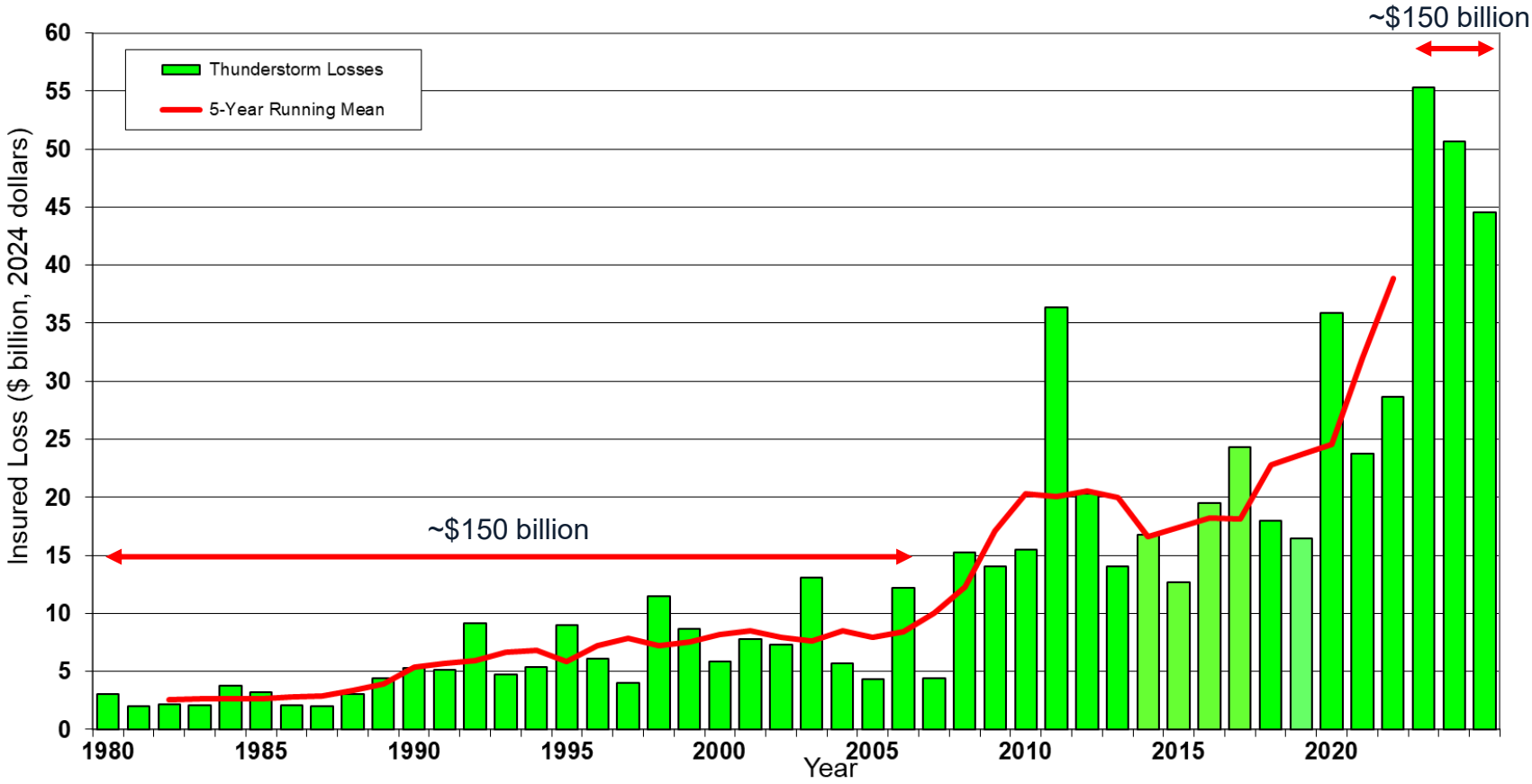

Data: PCS

Loss Trends: SCS vs. Tropical Cyclones

Insured Property Losses in the USA, 1980 - 2025

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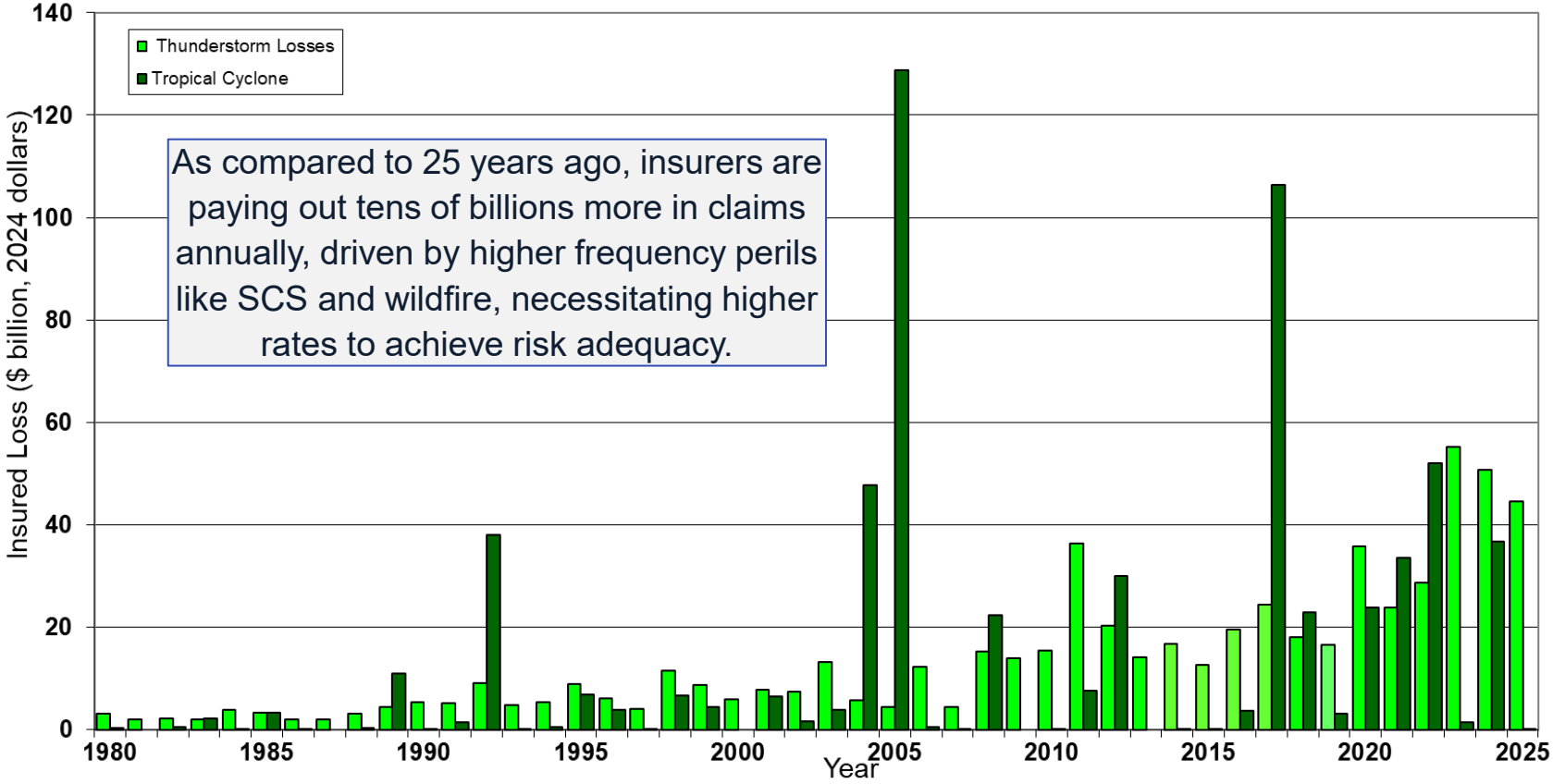

Data: PCS

Factors Influencing Extreme Event Risk

Vulnerability is the only variable society can influence

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Natural Catastrophe Risk = *f(hazard, vulnerability, value)*

Most likely slowly increasing over time due to ACC

Increasing due to macro- and microeconomic trends

Buildings can be built to withstand all but the strongest of windstorms, lowering risk and loss for most event occurrences.

Working Towards a More Disaster Ready Nation

IBHS History

- Founded in 1979 by US P&C Industry as a 501(c)(3) non-profit organization.
- Funded by member donations
- Due to increasing Nat Cat issues during the 1980s, the organization began providing the industry with technical information about building codes, effective land use controls, new building designs and retrofit applications, becoming the organization's primary focus in the 1990s.
- During the 2000s, it was realized a large-scale testing facility was needed to best further the goals of the IBHS and received enough insurance industry financing to build the IBHS Research Center in Richburg, SC, which opened in 2010.

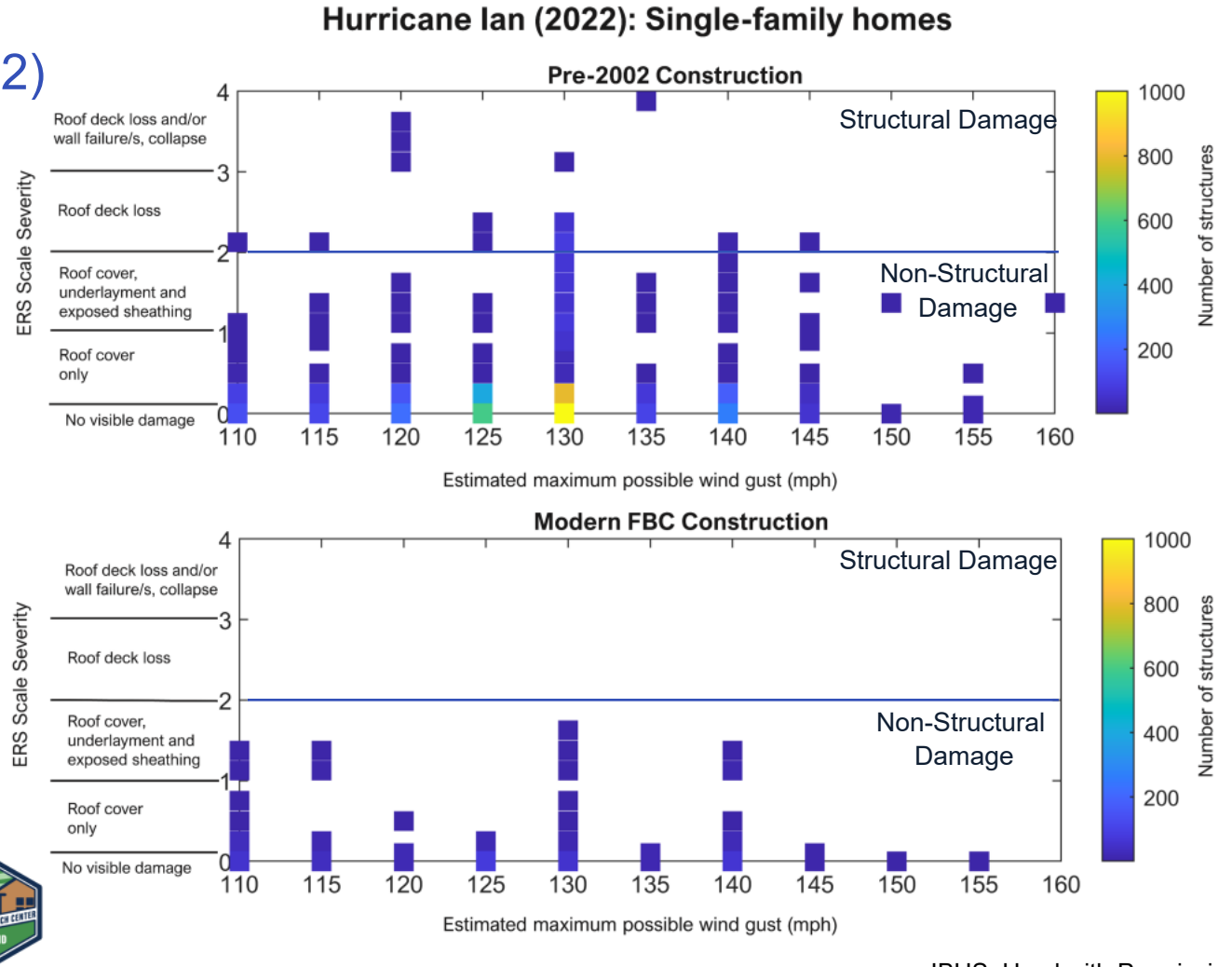
www.ibhs.org

www.disastersafety.org

Damage from Ian (2022)

Wind Codes Work!

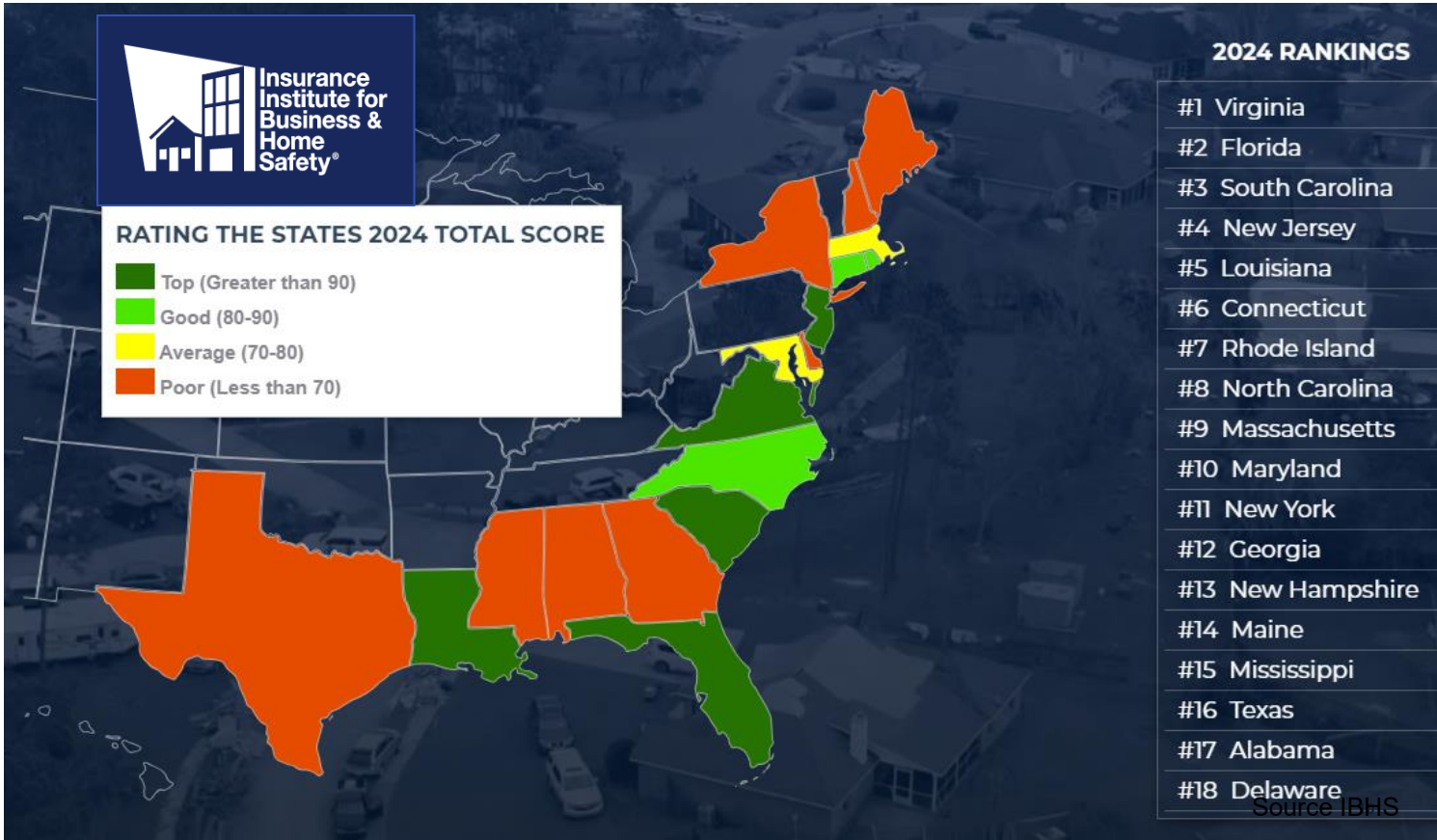
- The Florida Building Code (FBC), enacted in 2002 and strengthened in 2020, has been a game changer in reducing structural damage from landfalling hurricanes in the state.
- We know how to build homes and businesses to resist structural damage from all but the most severe storms, and ideally other states should follow Florida's example.



IBHS. Used with Permission

Wind Resiliency along the U.S Atlantic Coast

- The success of the FBC in reducing wind damage has not compelled many additional states to enact them (Louisiana post-Katrina in 2005 is the biggest exception.)
- Many jurisdictions still have no in-force residential building codes at the state level.



Source IBHS

Can Insurance Drive Adaptation?
Challenges

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- **Higher risk & loss potential = higher risk-adequate rates.**
- Land Use Planning & Construction Quality:
  - States and local communities have a strong interest in attracting new residents and businesses that build up their tax base and political clout at the state and federal levels.
  - Insurers have no say in where buildings are built, and many homes and businesses are constructed in high-risk areas (coasts, flood plains, wildland-urban interface, etc.) where risk adequate rates may be (or are now becoming) too expensive for many to afford.
  - Urban sprawl creates more targets to hit during an extreme event, increasing aggregated losses.
  - Vulnerable and disadvantaged communities are often located in high-risk areas, driving up cost for those who can least afford it.
  - Lack of resilient building codes in most US jurisdictions. Large pre-code building inventories remain in states that have enacted resilient building codes as well.
  - Retrofitting homes to be more resilient is more expensive than building new, resilient structures, and many homeowners cannot afford such retrofits.

Can Insurance Drive Adaptation?
Challenges, Part 2

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- Adverse selection:
  - Situation where only properties at high risk for a given peril purchase insurance coverage, resulting in an insufficient premium pool to pay for incurred losses or earn a profit.
  - Flood insurance is the most notable example of adverse selection in the U.S.
  - However, better analytical tools are slowly increasing the availability of private flood insurance on the U.S. market again.
- Homeowners:
  - Insurance companies are arguably not the best messenger for stressing the importance of adaptation to individuals.
  - Homeowners tend to be uninformed as to the quality of their home's construction or the resiliency of its roof system to extreme events.
  - Human risk perception fallacies:
    - "Never going to happen to me."
    - "The government will bail me out."

Climate Risk Finance Innovations in Insurance

Working to close the “Insurance Gap”

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- **Climate Risk Assessments**: High-resolution climate risk assessments to physical properties, especially regarding flood & sea level rise. Development of sensor / IoT networks for real-time physical risk monitoring.
- **Community-Based Catastrophe Insurance (CBCI):** Community institution that helps residents access and afford insurance. Can purchase group policies, create its own risk-bearing entity, or simply facilitate insurance access.
- **Climate Adaptation-As-A-Service:** Long-term financing of climate adaptation projects to increase affordability.
- **Climate Investment Intermediaries**: Entities that match asset owners with investors interested in climate adaptation products.


Photo: US National Guard

Thank you for your attention!

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