

Insurance Company Reactions to Climate Change

PICATR's Climate Adaptation Collective

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**“Climate Change Is Kicking
the Insurance Industry's Butt”**

Mother Jones, October 22, 2014

HURRICANE KILO

HURRICANE IGNACIO

HURRICANE JIMENA

MAX WINDS 110 KT GUSTS 135 KT

MAX WINDS 120 KT GUSTS 145 KT

MAX WINDS 120 KT GUSTS 145 KT



Agenda

- Do Insurers Believe in Climate Change?
- 1992 – A Turning Point
- Insurance is a Worldwide Business
- Insurance Impact on Hawaii





**Do Insurers Believe in
Climate Change?**

HURRICANE KILO

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HURRICANE JIMENA

MAX WINDS 110 KT GUSTS 135 KT

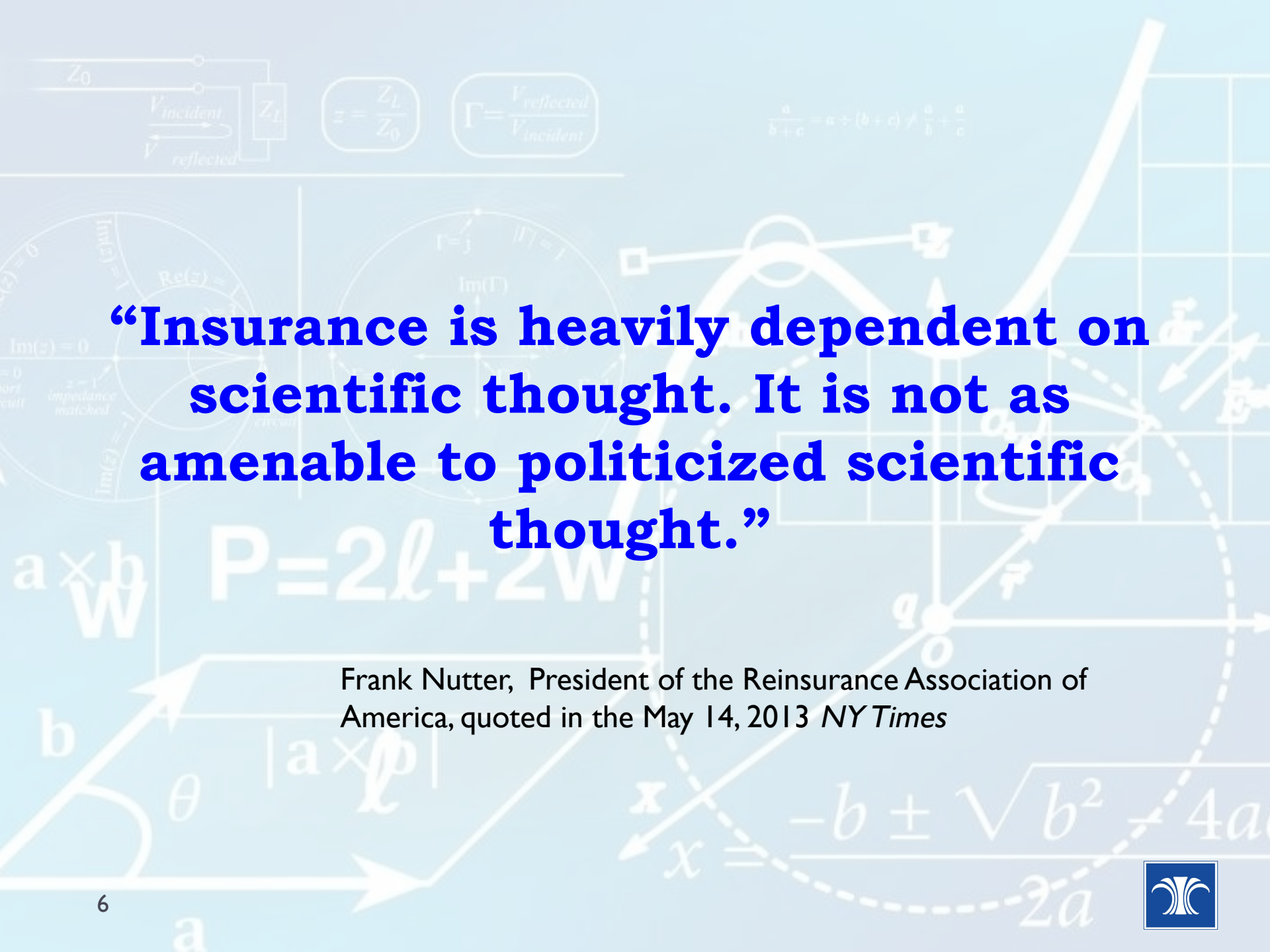
MAX WINDS 120 KT GUSTS 145 KT

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Yes.





“Insurance is heavily dependent on scientific thought. It is not as amenable to politicized scientific thought.”

Frank Nutter, President of the Reinsurance Association of America, quoted in the May 14, 2013 *NY Times*



Insurance Prices are Estimates

- Coverage is provided in the future so the true cost of the policy is not known when a policy is purchased
- Regulators pre-approve pricing and may disagree with an insurer's projections
- Compare to pricing of consumer goods



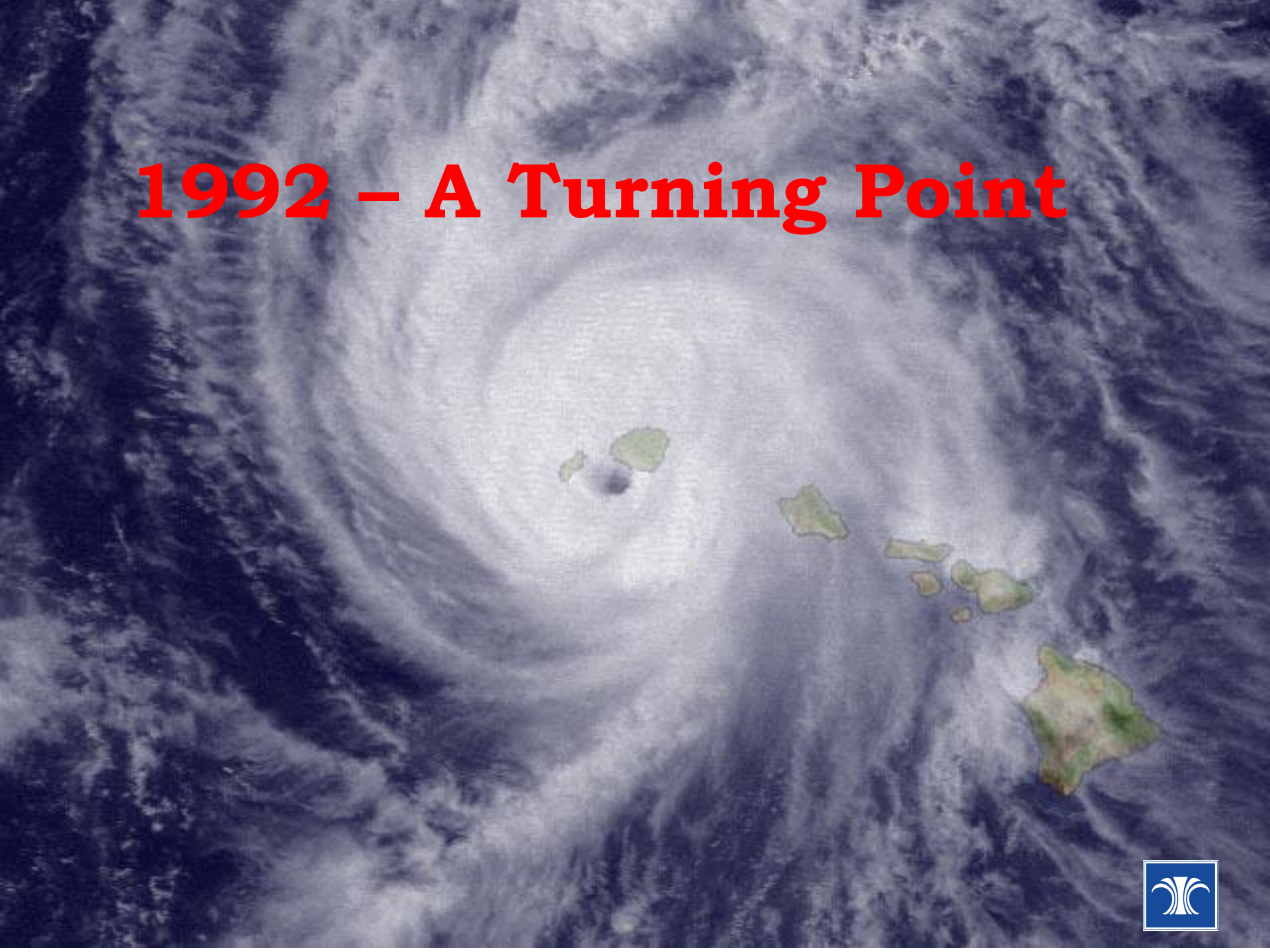
How Do Insurers Determine Prices?

- The things to be insured (exposures)
- The places those things are located
- Projected cost of losses based on historical information and trends
- Cost of reinsurance* protection
- Other company expenses

* Reinsurance is insurance purchased by insurers to protect their entire portfolio. Reinsurers are global (including Lloyd's of London) and are a vital part of the insurance system



1992 – A Turning Point



Before Summer 1992

- Storm activity in previous two decades was relatively benign worldwide
- Property reinsurance was relatively inexpensive and available
- Hurricane Iwa in 1982 caused relatively minor damage
- Popular belief was that wind shear and cooler water temperatures would protect Hawaii



Before Summer 1992

- The average homeowners insurance policy cost \$254
- Deductibles for loss caused by a hurricane were typically \$250
- Did not need to separately purchase hurricane coverage
- So why worry?



August 24 – September 11, 1992

- Hurricane Andrew: Florida, Louisiana, Caribbean
 - August 24-26, \$30.6 billion*
- Super Typhoon Omar: Guam, Taiwan
 - August 28 – September 5, \$1.2 billion*
- Hurricane Iniki: Kauai, Oahu
 - September 11, \$3.6 billion*



Aftermath

- Three storms over 18 days
- Nearly 20 billion 1992 dollars in insured damage
- The insurance industry changes its view of catastrophic losses
- Catastrophe (hurricane) modeling comes to the fore



How Do Insurers Determine Property Insurance Prices Today?

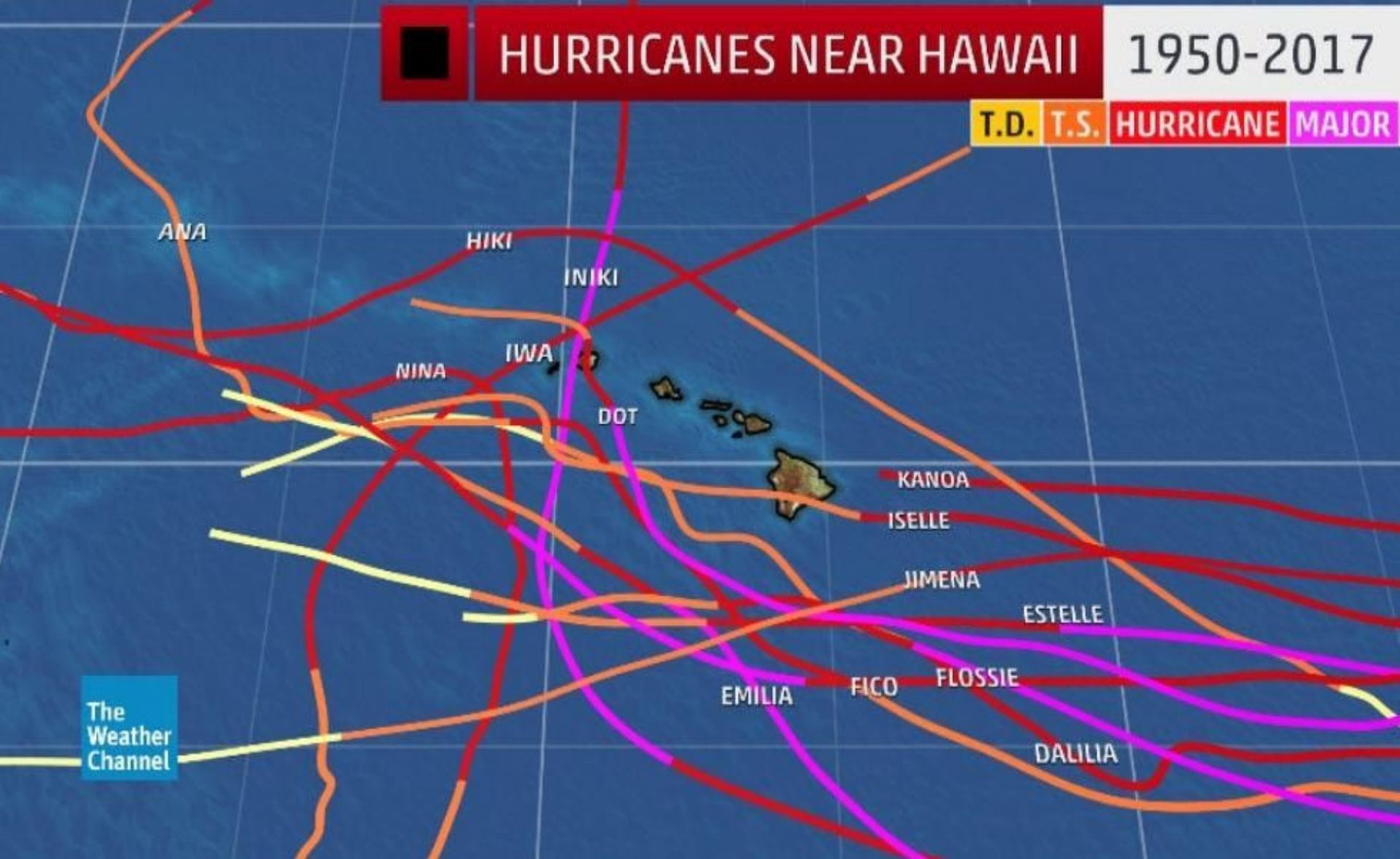
- The things to be insured (exposures)
- The places those things are located
- Projected cost of losses based on historical information and trends *...but see below*
- Cost of reinsurance protection
- Other company expenses
- ***Modeled expected losses***



HURRICANES NEAR HAWAII

1950-2017

T.D. T.S. HURRICANE MAJOR



2018: Hector, Lane, Norman, Olivia,

2019: Barbara, Erick, Flossie

2020: Douglas

2021: No significant activity

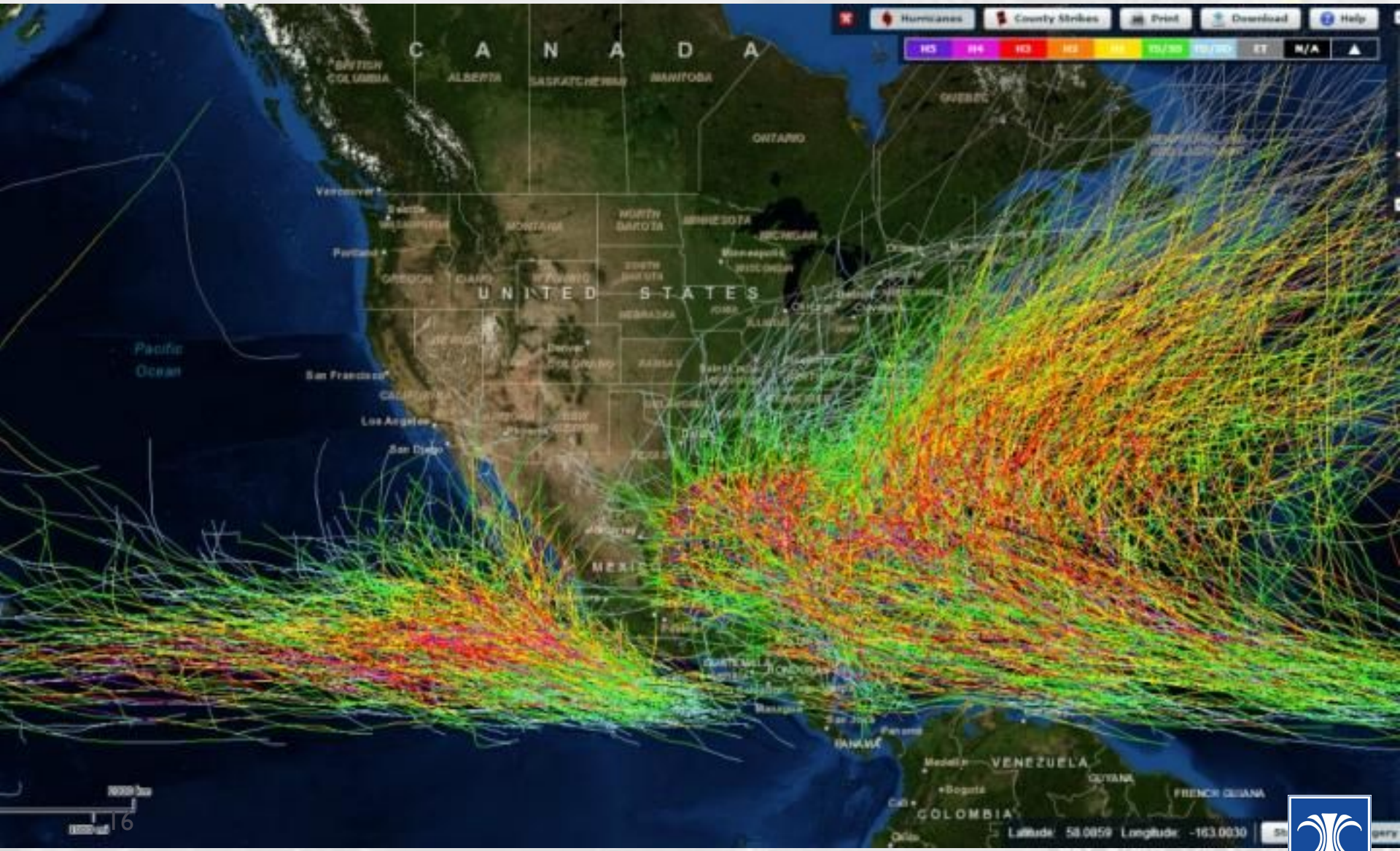


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North American Storms, 1842-2012



A world map showing wind patterns with arrows and color-coded regions. The map is centered on the Atlantic Ocean, showing wind directions and speeds across the continents and oceans. The text "Insurance is a Worldwide Business" is overlaid in blue.

Insurance is a Worldwide Business

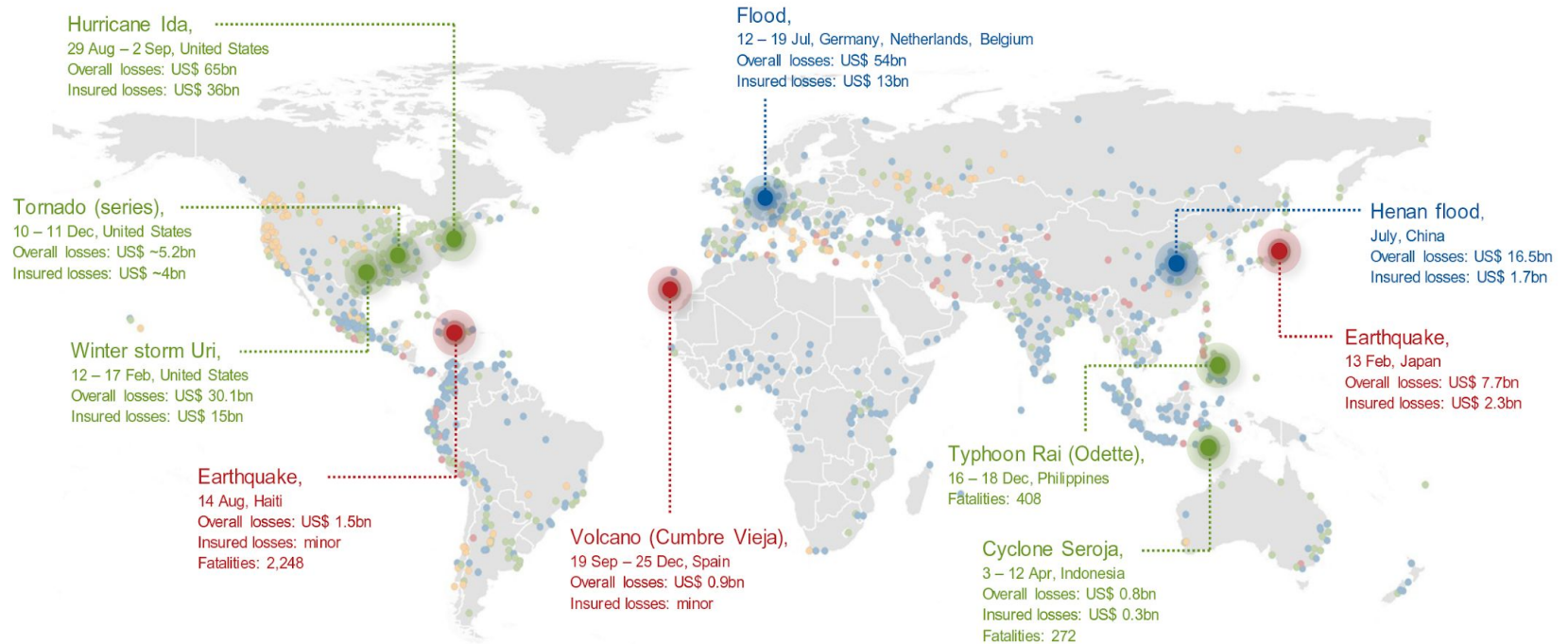


Global 2021 Loss Events

NatCatSERVICE

Relevant natural catastrophe loss events worldwide 2021

Natural disasters caused overall losses of US\$ 280bn



Geophysical events
Earthquake, tsunami, volcanic activity

Meteorological events
Tropical storm, extratropical storm, convective storm, local storm

Hydrological events
Flood, mass movement

Climatological events
Extreme temperature, drought, wildfire









Significant catastrophes
 Small, medium and large loss events

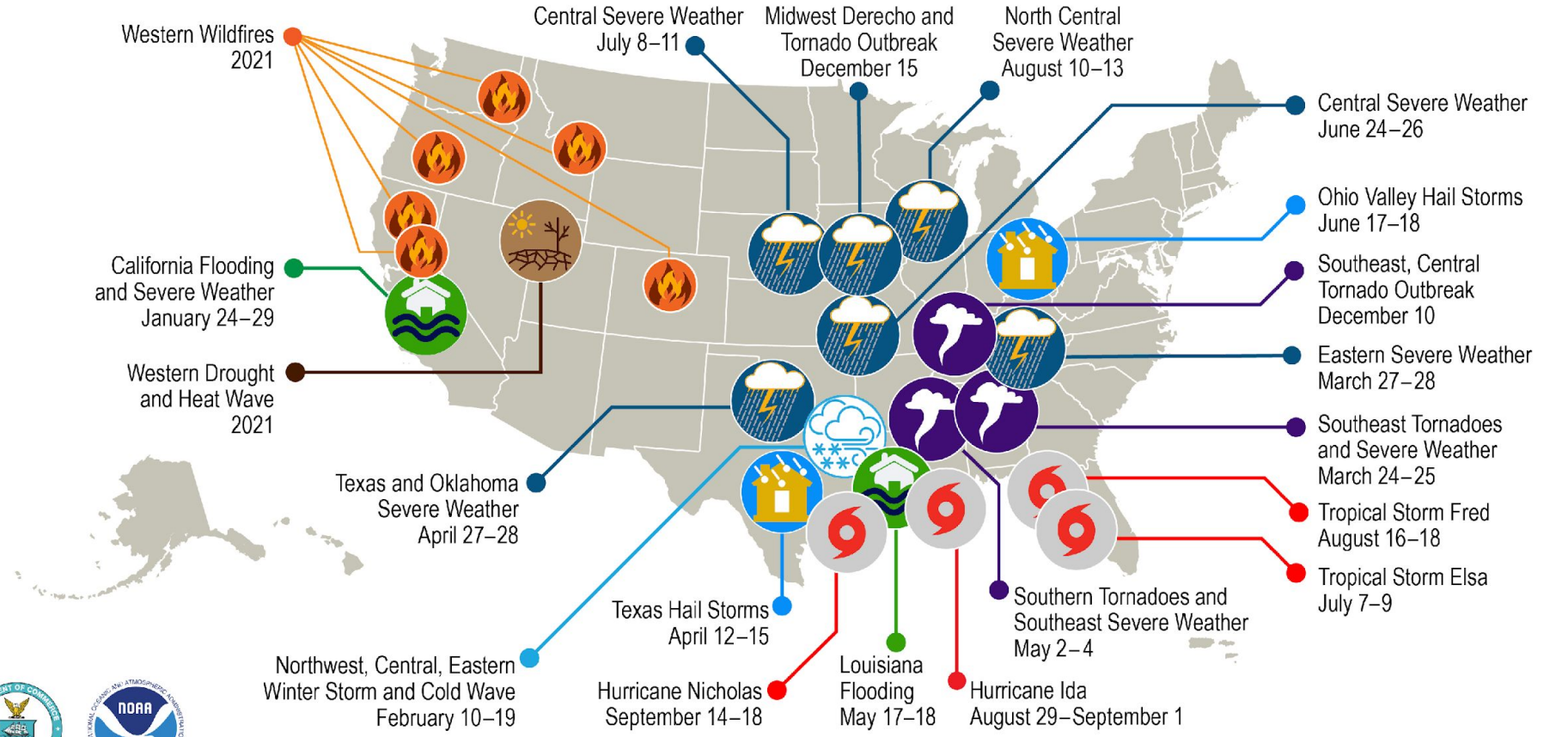
Source: Munich Re, NatCatSERVICE, 2022



United States 2021 Loss Events

U.S. 2021 Billion-Dollar Weather and Climate Disasters

-  Drought/Heat Wave
-  Flooding
-  Hail
-  Hurricane
-  Tornado Outbreak
-  Severe Weather
-  Wildfire
-  Winter Storm/Cold Wave



This map denotes the approximate location for each of the **20 separate billion-dollar weather and climate disasters that impacted the United States in 2021**



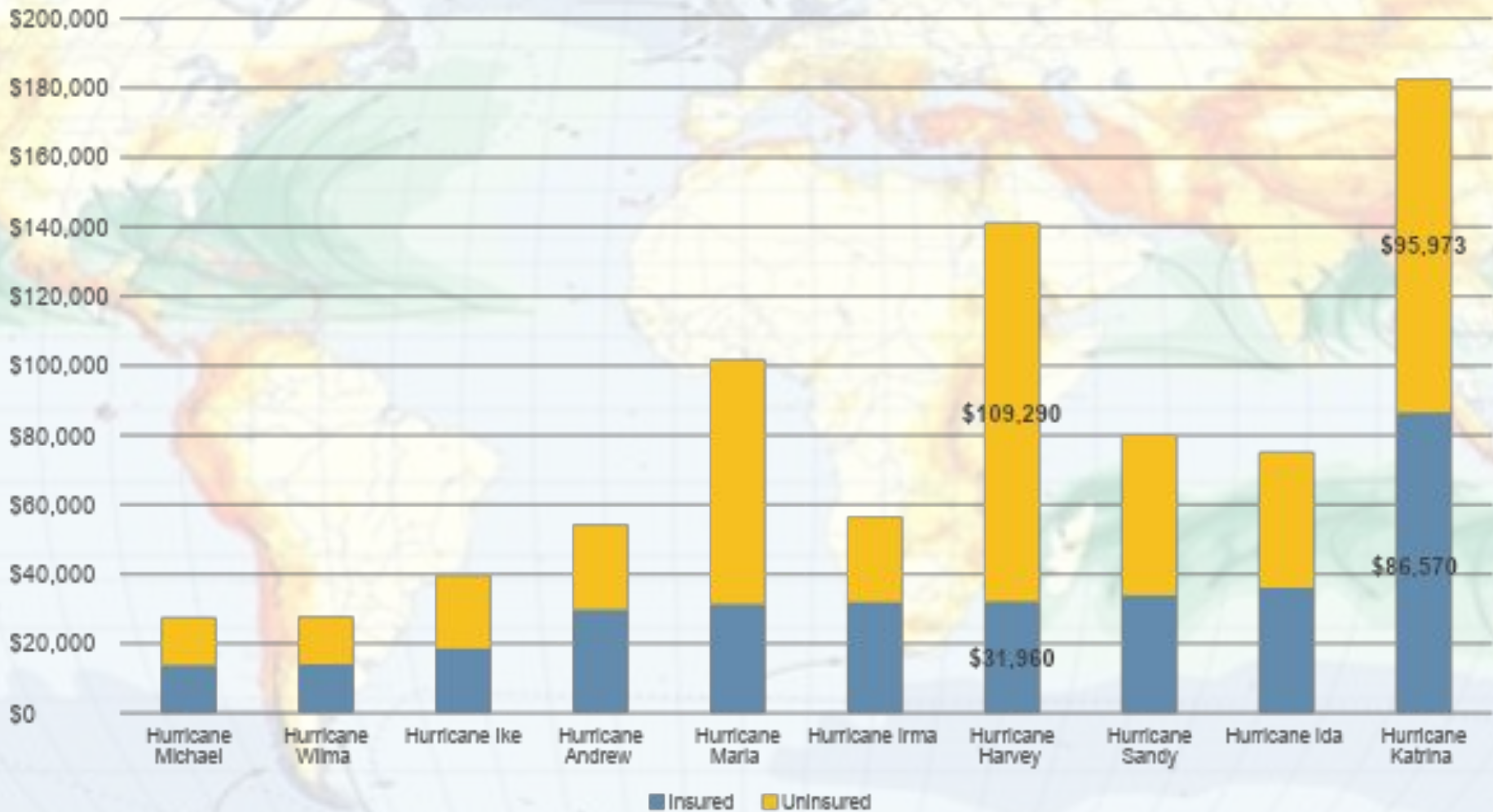
Costliest U.S. Hurricanes

Year	Event	Peak Intensity	Insured Losses (\$Million)
2005	Hurricane Katrina	175 mph	\$89,170
2021	Hurricane Ida	150 mph	36,000
2012	Hurricane Sandy	115 mph	34,950
2017	Hurricane Harvey	130 mph	32,920
2017	Hurricane Irma	185 mph	32,810
2017	Hurricane Maria	175 mph	32,210
1992	Hurricane Andrew	175 mph	30,590
2008	Hurricane Ike	145 mph	19,060
2005	Hurricane Wilma	185 mph	14,430
2018	Hurricane Michael	160 mph	14,120

Source: Insured losses from AON via Insurance Information Institute, 2020 dollars; adjusted to 2021 dollars by applying a 3% inflation factor



Insured vs Uninsured Losses



Source: NOAA, Insurance Information Institute/AON



What are Uninsured Losses?

- Many governmental entities fully or partially self-insure
- Some things are not insurable using traditional insurance products
- Flood is typically insured through FEMA's underutilized and underpriced (until recently) NFIP
- Some consumers and businesses don't buy or don't buy enough insurance even though it is available





Climate change is happening.
What else?



Change in Coastal Population, 1960-2010

Top Ten States

Count			Percentage		
Rank	State	# change	Rank	State	% change
1	California	13,130,000	1	Florida	270.1%
2	Florida	10,360,000	2	Alaska	239.8%
3	Texas	3,732,000	3	New Hampshire	198.0%
4	Washington	2,578,000	4	Texas	161.9%
5	Virginia	1,903,000	5	Virginia	150.8%
6	New York	1,400,000	6	Washington	144.4%
7	New Jersey	1,275,000	7	South Carolina	125.1%
8	Maryland	938,000	8	Hawaii	115.2%
9	Massachusetts	826,000	9	North Carolina	114.4%
10	Hawaii	728,000	10	California	107.2%

Source: U.S. Department of Commerce, Census Bureau



Increase in Coastal Concentration

- Government zoning part of the issue
- So is human nature – living at the beach is aspirational for many
- Strong demand means coastal property values soaring
- Increased potential for significant insured and non-insured losses
 - Storm surge/flooding
 - Infrastructure strain and resulting damage
 - Natural defenses weakened or destroyed



Added Risks of Climate Change

- Wildfires increasing in frequency and severity
- Inaccurate weather models
- Increased property and even liability losses
- Shifting investment performance over time
- *Inadequate insurance pricing*
- Greater risk of insolvency among poorly-capitalized entities



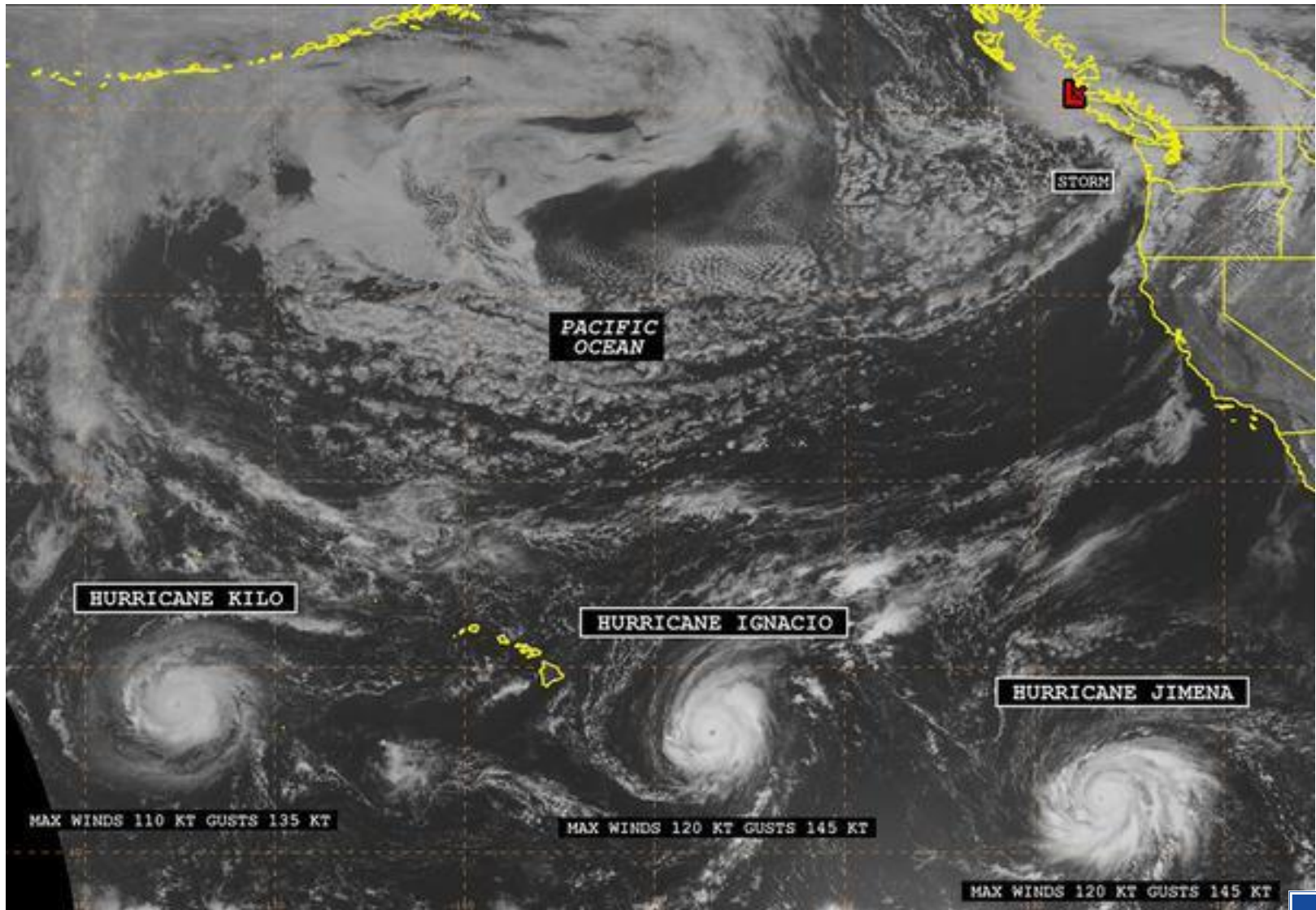
Why Take the Risk?

- Insurers have significant surplus: ~\$975 billion*
- Reinsurers are willing to deploy capital at reasonable, although rising, prices
- Alternative capital sources due to low rates of return from other investment classes
- Refinement of storm and flood models
- Deductibles and coverage limitations used to reduce losses

* As of June 30, 2021



Traditional Insurance Impact in Hawaii



Insurer Options in Response to Climate Change

- Inadequately respond and risk insolvency
- Exit property insurance in exposed areas
- Cancel policies in areas of concentration
- Increase premiums
- Increase deductibles and other conditions
- Buy more reinsurance protection
- Seek governmental assistance



The background of the slide is a composite of three satellite images of hurricanes. The top image shows a large, well-defined hurricane with a clear eye, labeled 'STORM' in a small box. Below it are three smaller satellite images of hurricanes, each with a label in a white box: 'HURRICANE KILO' on the left, 'HURRICANE IGNACIO' in the center, and 'HURRICANE JIMENA' on the right. At the bottom of each of these three images, there is a small text box indicating wind speeds: 'MAX WINDS 110 KT GUSTS 135 KT' for Kilo, 'MAX WINDS 120 KT GUSTS 145 KT' for Ignacio, and 'MAX WINDS 120 KT GUSTS 145 KT' for Jimena. The overall image has a light, semi-transparent overlay.

**All of these things
occurred in the aftermath
of Hurricane Iniki**

HURRICANE KILO

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After Iniki...

- HIG went insolvent
- Pacific Insurance (Hartford) left the market
- Reinsurance premiums tripled overnight
- Many insurers stopped writing hurricane coverage and non-renewed customers
- Some insurers stopped writing new property insurance policies
- Hawaii Hurricane Relief Fund enacted



Currently in Hawaii

- Average single-family Homeowners + Hurricane insurance cost: ~\$2,200*
- Deductible in the event of loss caused by a hurricane: 2% or ~\$10,000*
- Hurricane insurance often provided by a separate policy
- Hawaii generally better off than other coastal locations, but...



Hawaii has not had a significant storm make landfall since Iniki

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What If Iniki Hits Honolulu?

- Over 45% of insured values destroyed
- \$48 Billion of insured property losses *
- Insurer failures possible
- Harbor and other infrastructure damage disrupts supply chain and delays rebuilding
- Economic activity will come to a halt for an extended period of time
- How long until we return to “normal?”



The (Expected) New World

- More frequent and intense El Nino cycles
- Warmer sea surface temperatures result in more frequent, severe storms
- Greater tropical depression activity increases non-hurricane claims
- Wildfires increase in frequency and severity
- Storm surge exacerbated due to sea level rise
- Infrastructure failures occur more frequently



By applying risk-adequate premiums, [insurers] put a price on natural hazards, thereby encouraging carefully considered behaviour to limit the losses.

Torsten Jeworrek, Member of Board of Management
Munich Re; January 10, 2022



and there are consequences

- The cost to insure property will rise as weather events cause damage in Hawaii and elsewhere
- Flood insurance premiums are already rising in high-hazard areas and will rise further
- Policies will be canceled as insurers manage insolvency risk
- Our already high cost of living gets higher



What Can We Do?

- Develop/implement an adaptation and shoreline retreat plan which may:
 - Prevent losses from occurring
 - Reduce severity of losses that do occur
- Catalog infrastructure vulnerabilities and develop plans to remedy them
- Improve building codes and retrofit older homes
- Ensure that insurance prices reflect the true risk of damage as NFIP is attempting
- Explore and employ natural solutions – TNC's coral restoration project is an example
- Start now!!



**The best insurance loss
is the one that was
prevented**



