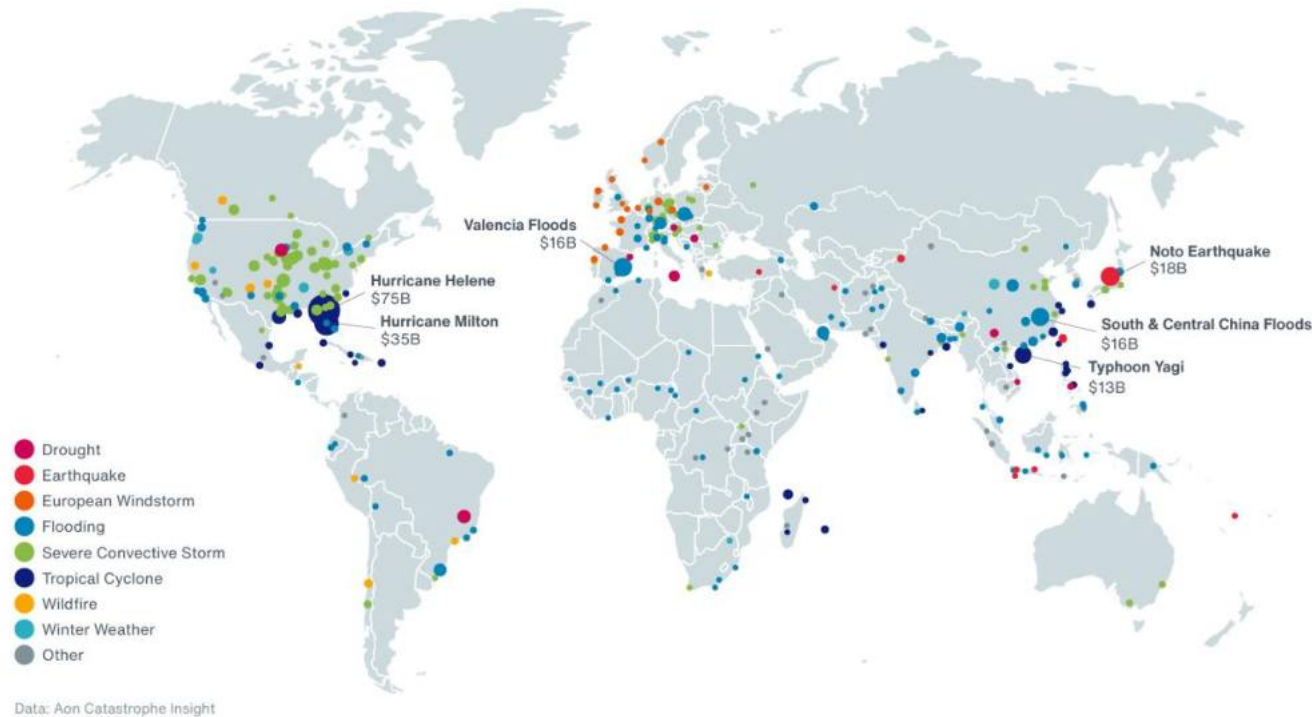




**Climate Risk Management and Regulatory Solutions -
Tokyo Financial Award 2025**

Global Economic Losses

Notable 2024 Economic Loss Events

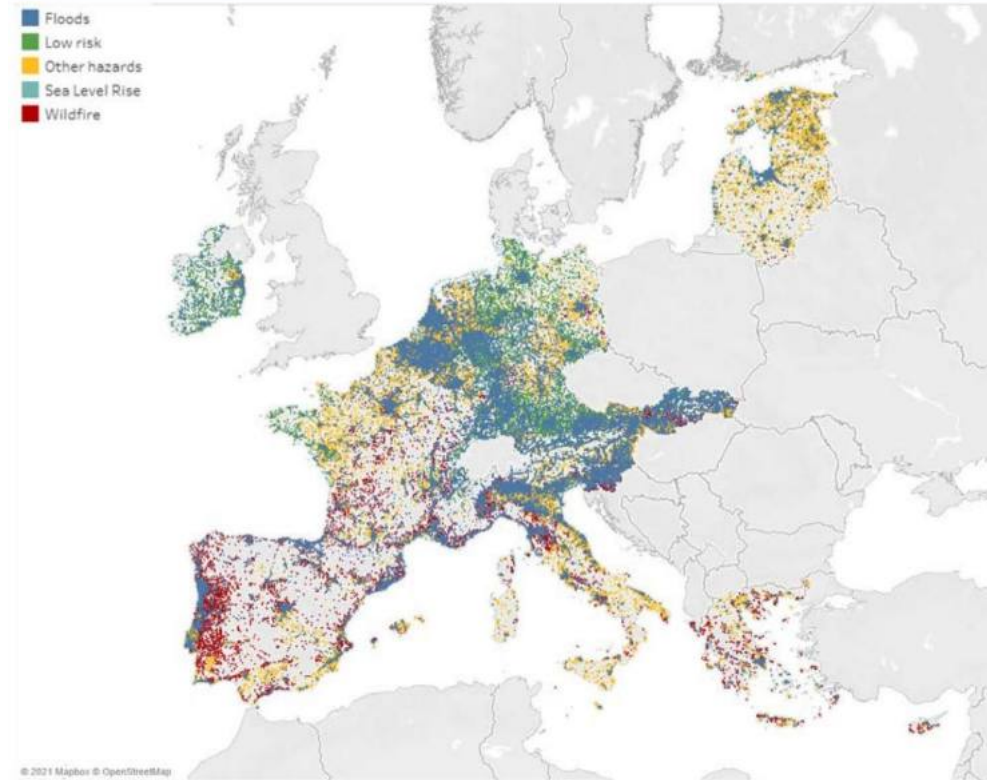


Economic losses from global natural disasters in 2024 are estimated at \$368 billion, about 14 percent above the long-term average since 2000.

Losses in emerging markets such as Brazil, India and China are accounting for an increasing portion of the global toll due to the rapid economic growth and urbanization in high-risk areas in recent years.

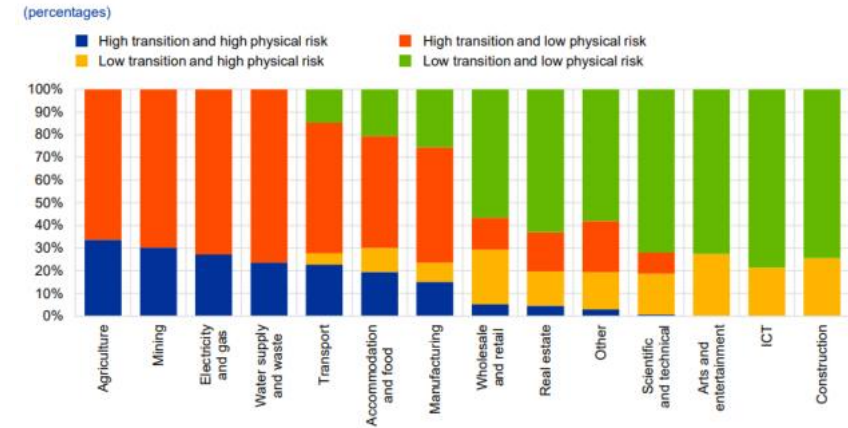
ECB Climate Risk Stress Test Result

Physical risk: intensity and sources across European regions



Source: ECB calculations based on Four Twenty Seven data (2018).

Share of firms subject to climate risk by sector



Source: ECB calculations based on Four Twenty Seven and Urgentem data (2018).
Notes: Firms are categorised as vulnerable to high transition risk if their relative emissions fall into the 70th percentile of Scope 1, 2 and 3 relative emissions for the entire sample. Firms are vulnerable to high physical risk if their probability of suffering from a wildfire or a river or coastal flood in a given year is over 1%. Level 1 NACE sectors are shown.

The probability of default of high-physical risk firms is projected to increase by 2050 by almost 25% under the hot house world scenario, Climate related portfolios with default possibilities five times higher than 2020, subjects to 43 trillion Euro assets. **ECB 2021 Sept**

The Financial Services Agency (FSA) has already introduced a range of Japan mandatory climate disclosure rules into the nation's corporate governance code since **mid-2021**. The FSA and the BOJ, in collaboration with three major banks, conducted the second scenario analysis on climate-related risks in **2025**.



Climate Risk Pricing Is Crucial For
EVERY ASSET!

Current climate risk model Issues

Limited scope

Limited extreme weather events

Uncertainty in climate change

Unable to handle uncertainty in climate change scenario generation

Data availability

Only headquartered location risk

Lack of historical hazard data

Poor local coverage

Low Resolution

Most of the climate models are based on country level

Lack of flexibility

Frameworks inflexible, difficult for organizations requirements adaptation



- IPCC 7 RCPs and 5 SSPs Pathway scenarios, as well as **NGFS scenarios**.
- All company subsidiaries, operational locations
- Full coverage in Hong Kong, China, Asia, Global model
- 5x5m resolution, with altitude choice
- Fully customisation (loss curve, assets location, duration, short-term/long term time-interval)



YoujiVest Solutions

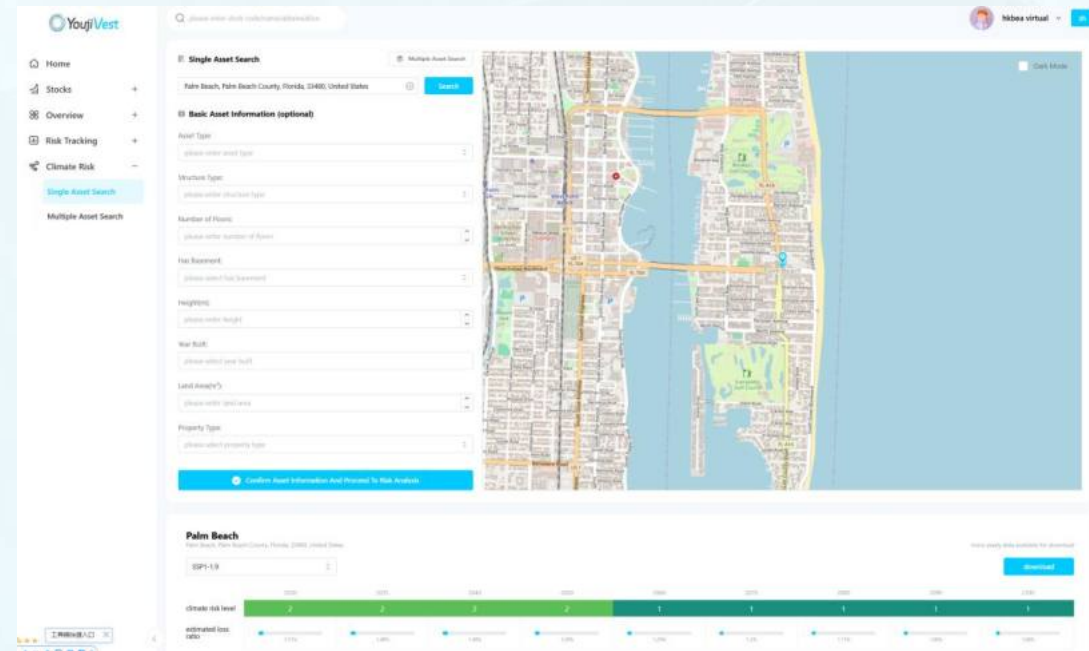
Core Models and Technologies

YoujiVest Climate Risk Model Solutions

-YoujiCRMS

YoujiVest CRM platform provides comprehensive Physical Risk and Transition Risk analysis based on the actual asset locations.

Identify the risks that climate change brings to your business and prepare a risk management plan that deals with climate change



YoujiCRMS Outputs

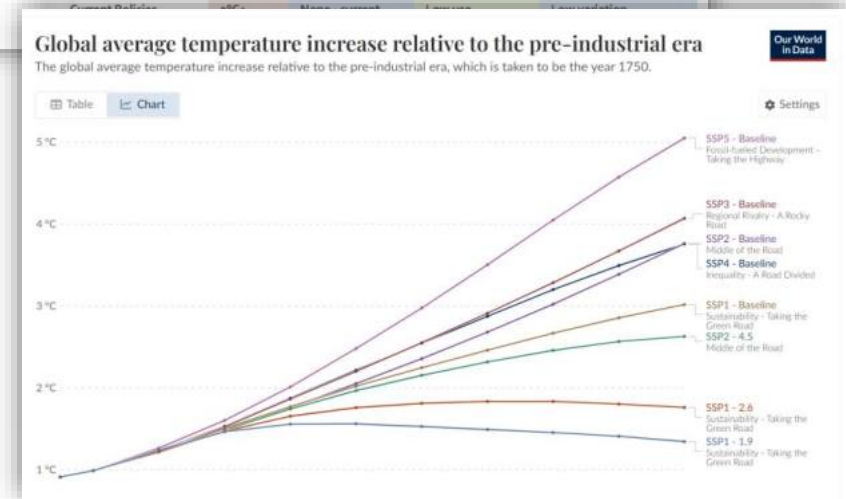
YoujiCRMS outputs produce scenario analyses that display the Expected Annual Impact. It provides comprehensive climate risk assessments for companies under various scenarios, including physical, policy, and transition risks.

YoujiVest covers all **IPCC** 7 RCPs and 5 SSPs Pathway scenarios, as well as **NGFS** scenarios.

SSP1-1.9, SSP1-2.6, SSP2-4.5, SSP3-7.0, SSP5-8.5
Net Zero 2050, Below 2°, Divergent Net Zero, Delayed Transition, NDCs, Current Policies

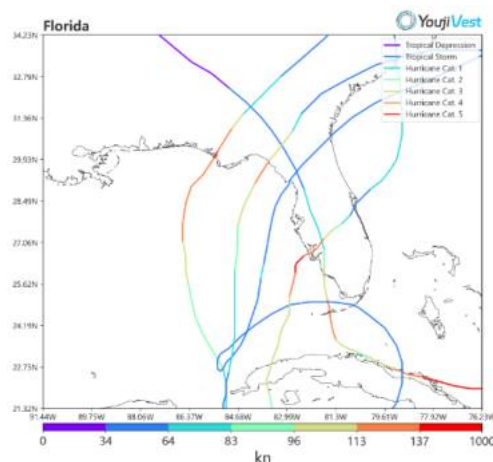
A series of hazards can be analysed via CRMS:
Water Stress, Tropical Cyclones, Floods, Extreme high temperatures, Extreme low temperatures, Wildfires, Landslides, Sea Level rise, etc.

Category	Scenario	Policy ambition	Policy reaction	Carbon dioxide removal	Regional policy variation
Orderly	Net Zero 2050	1.5°C	Immediate and smooth	Medium use	Medium variation
	Below 2°C	1.7°C	Immediate and smooth	Medium use	Low variation
Disorderly	Divergent Net Zero	1.5°C	Immediate but divergent	Low use	Medium variation
	Delayed transition	1.8°C	Delayed	Low use	High variation
Hot House World	Nationally Determined Contributions (NDCs)	-2.5°C	NDCs	Low use	Low variation

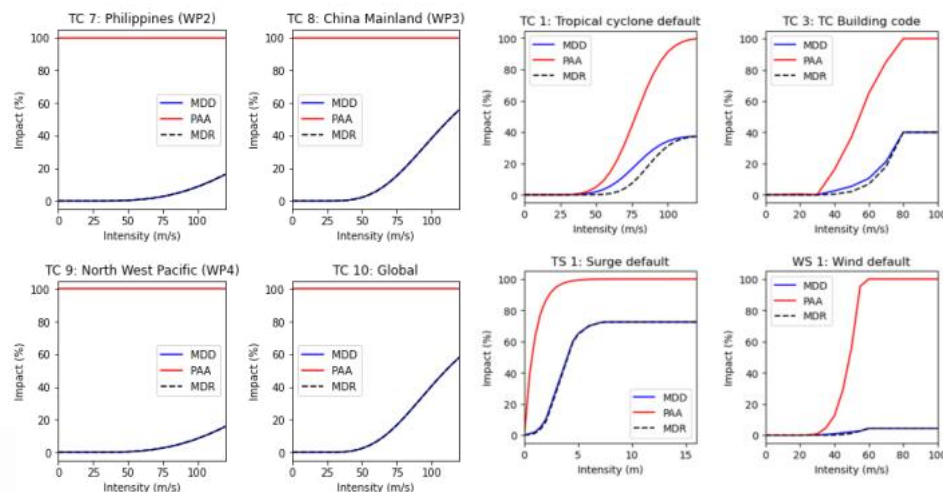
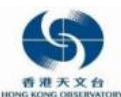


Comprehensive Coverage of Data

YoujiCRMS is a state-of-the-art climate risk model that integrates a wide array of **meteorological data**, **hazard data**, and **geo-economic data**. It not only incorporates extensive historical data, providing insights into past climate events and trends, but is also adaptable for use in a wide variety of future scenarios.



Historical Tropical Cyclone Data of Florida



Worldwide Damage Ratio Curve

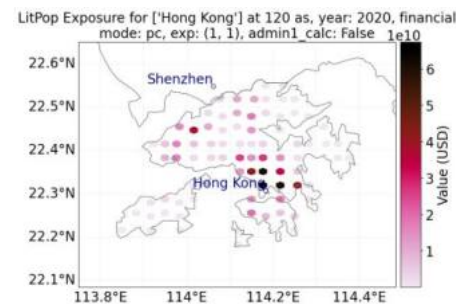
Nearly 200 years global historical hazard track data;

More than **9** synthetic trajectories simulated for each historical events;

Monte Carlo simulations influence distribution.

The damage ratio curve covers global locations and different scenarios.

Hong Kong as an example



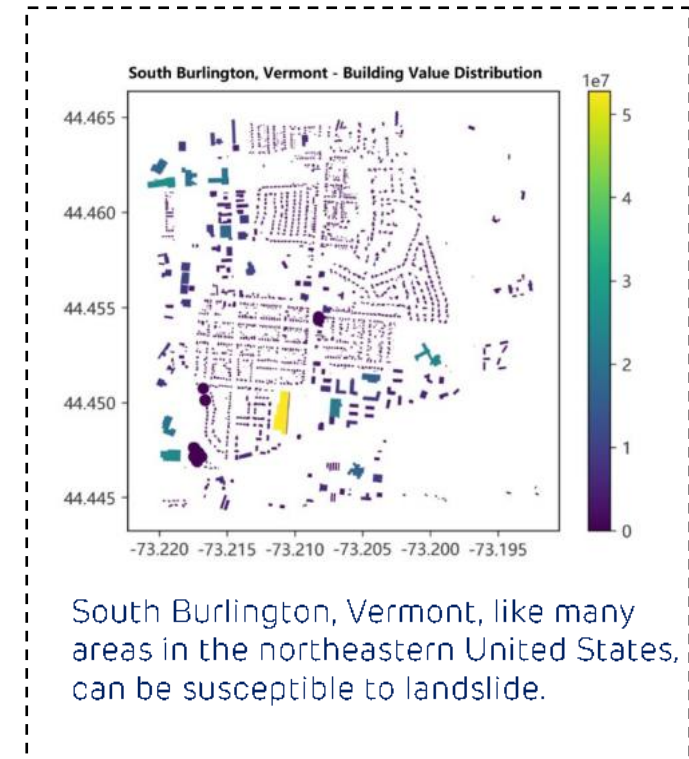
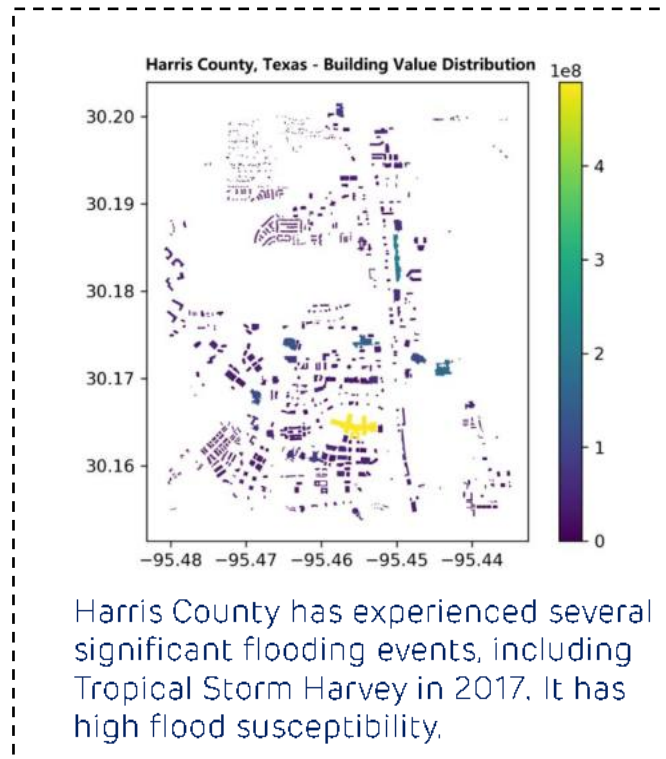
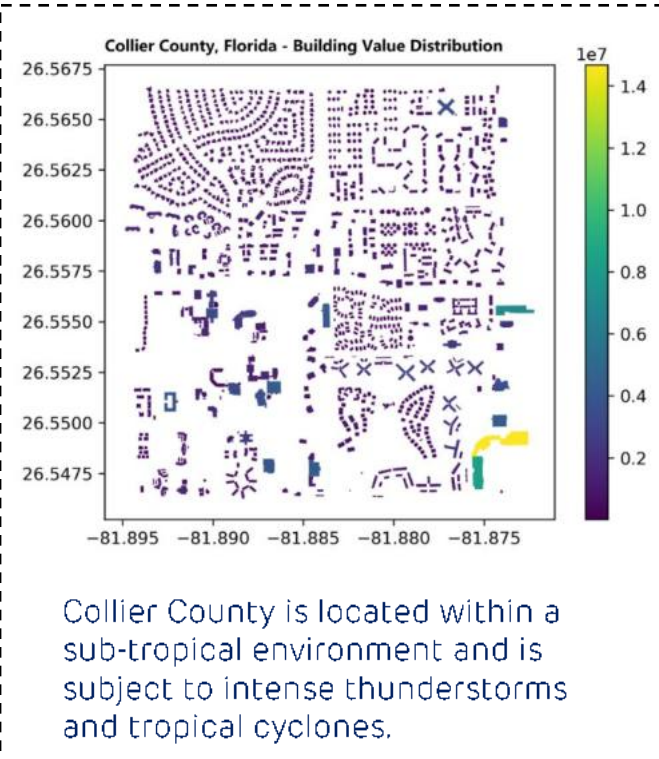
Economic Exposure Distribution of Hong Kong



Expected Annual Impact of Hong Kong

High-Resolution in Practice: County-Specific Analysis

YoujiVest's high-resolution model enables county-level analysis of construction distributions, as well as the values of such constructions. According to the color bar on the right side of the figure, higher positions (closer to the yellow) indicate higher values.

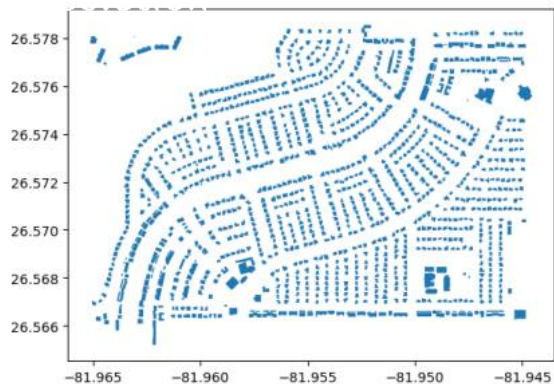




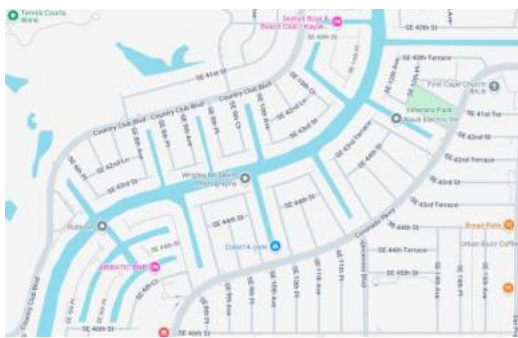
High Resolution for Any Specific Location

YoujiCRMS provides high resolution analysis (**the highest in the market: 5m x 5m**) with satellite imaging and down-scaling techniques.

geographical analysis in high

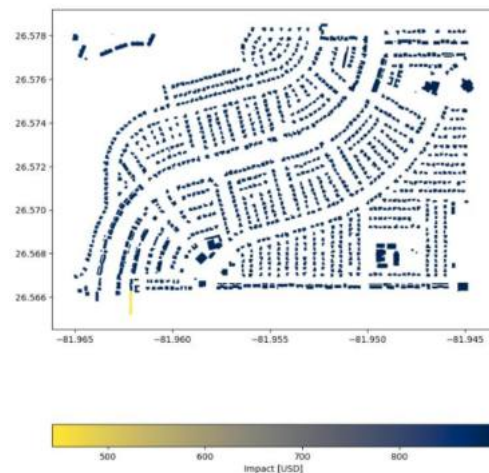


Satellite Auto Detection of Airbatic BNB's Constructions Distribution

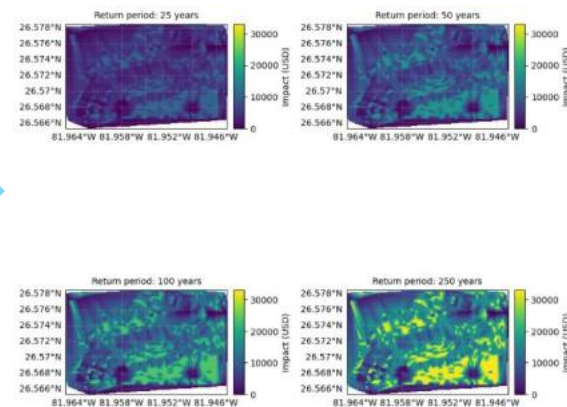


Airbatic BNB's Actual Constructions Distribution

YoujiVest's estimation closely aligns with the real circumstance S.



Expected Annual Impact Simulation of Airbatic BNB

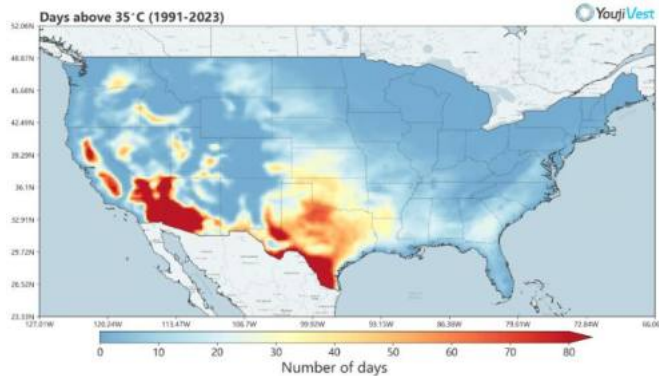


Expected Annual Impact Simulation of Airbatic BNB in different return periods

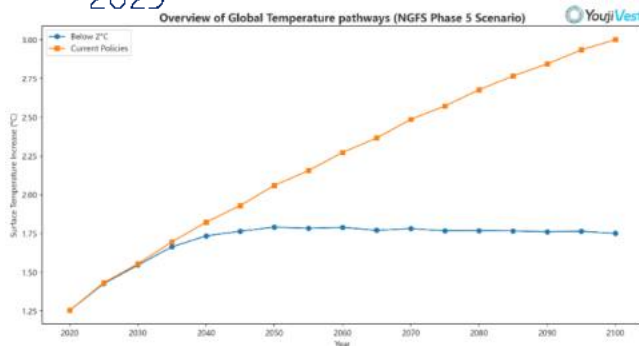
Airbatic BNB is a vacation service provider with a wide array of properties. YoujiCRMS can conduct highly accurate simulations, from modeling its **constructions distributions** to **predicting expected annual impacts**, with the analysis of these impacts extendable to **different return periods**.

High-Resolution in Practice: State-Specific Analysis

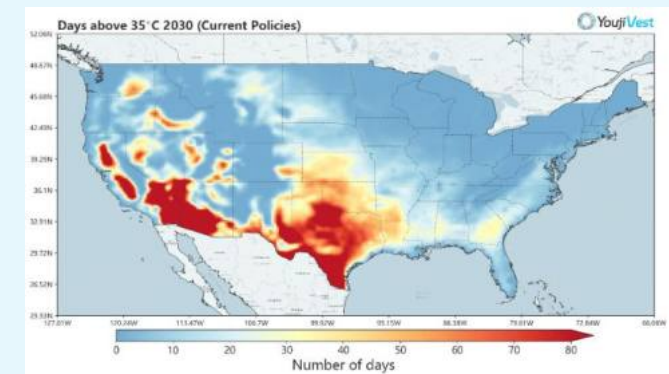
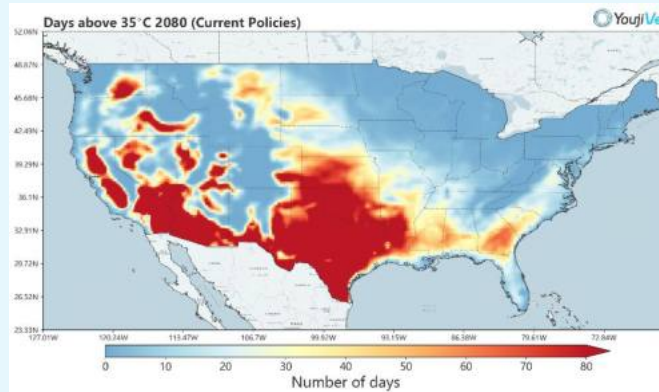
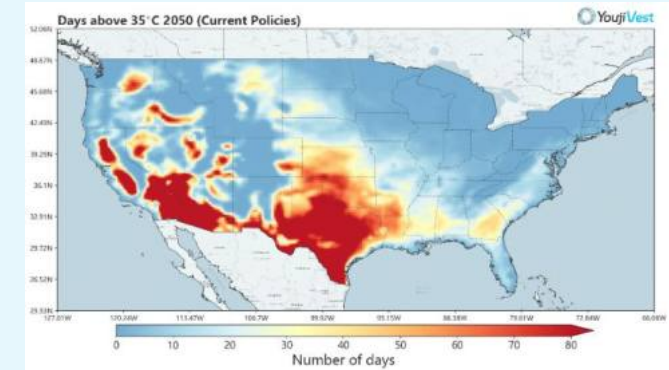
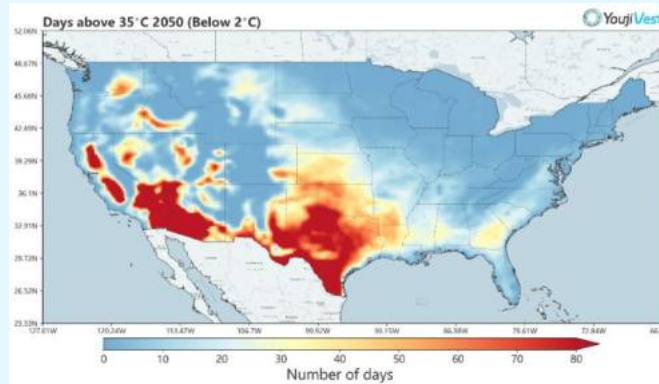
Number of Extreme Heat days in United States



Distribution of Maximum Annual Days Above 35°C Across U.S., 1991-2023



Projected Global Temperature Rise Under Two Scenarios by NGFS



Projected Extreme Heat Days Under different Scenarios by YoujiVest

■ Next-Gen Climate Risk Management: ■ Bridging AI Forecasting with Multidimensional Risk Analytics

**Industry demands actionable,
data-driven solutions**

**YoujiCRMS bridges traditional
and modern approaches**

Vision for Climate Resilience

Core Features & Technological Breakthroughs

Hybrid Risk Modeling Framework

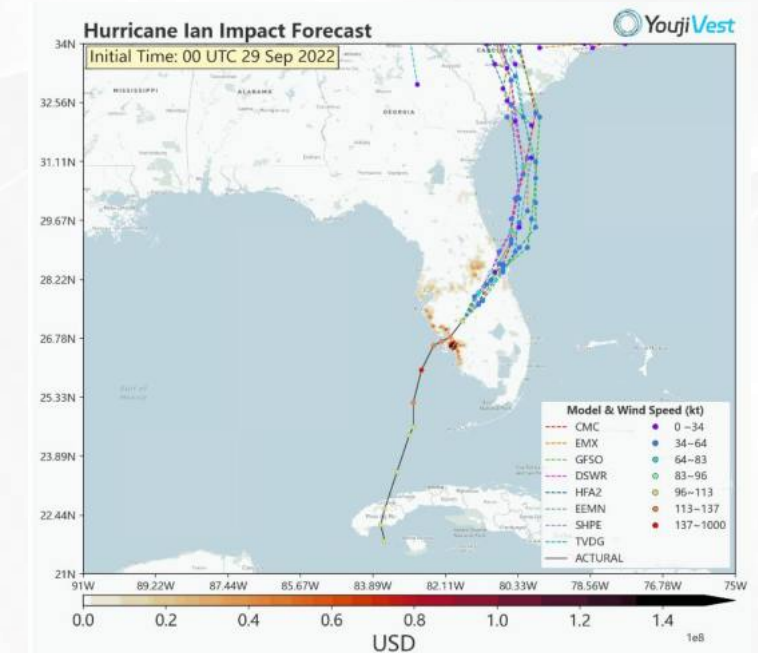
Transformer architecture in near-term weather forecasts.
Climate re-analysis model to simulate long-term scenarios.
Hazard event database to back-test model results.

Global Data Integration

YoujiCRMS's global data hub employs advanced data integration algorithms to integrate diverse data sources including hazard records, geographics, satellite, IoT, and ground sensor data, seamlessly.

Multi-Sector Use Cases

Product customized to meet various use cases in insurance, banking, construction and property sectors.



Competitive Advantages

01

Speed & Efficiency

Offers faster forecasts compared to traditional models.

Achieve zero supercomputer dependency with desktop-compatible models.



02

Data Autonomy

Ensures end-to-end data autonomy without reliance on numerical weather prediction (NWP) models.

Maintain complete control over data sources and processing for enhanced accuracy.



03

Customization & Scalability

Provides API-driven customization for sector-specific needs.

Support large-scale deployments with the ability to handle 100k+ asset-level assessments simultaneously.



Application

YoujiVest Climate Risk Solution has been widely applied to leading financial institutions and corporates, across leading construction firms, mining companies, insurance institutions, and asset managements. Including: catastrophe bond (CAT) analysis, catastrophe actuarial model analysis, engineering climate risk modelling, engineering disaster resilience measurement, and climate compliance report.

KeyBank 

SOLACTIVE
German Index Engineering


TENEX
CAPITAL

 **BEA 東亞銀行**

WORLD
QUINT



FOSUN
复星


KERRY PROPERTIES
嘉里建設

 **中国检验认证集团**
CHINA CERTIFICATION & INSPECTION GROUP

 **中国农业银行**
AGRICULTURAL BANK OF CHINA

中国平安
PING AN

 **China Universal**
Asset Management

 **中信证券**
CITIC SECURITIES

 **太平洋保险**
CPIC

 **五洲(北京)保险经纪有限公司**
CONTINENTAL INSURANCE BROKERS LIMITED

 **中國國際金融香港資產管理有限公司**
CHINA INTERNATIONAL CAPITAL CORPORATION
HONG KONG ASSET MANAGEMENT LIMITED


中國建築


中国建筑建筑设计研究院有限公司
CHINA ARCHITECTURE DESIGN & RESEARCH GROUP



Application in Financial Institution

Case Studies and Innovating Products

Banking | Asset Management | Insurance

2024 SEC's Final Rule: Detailed Climate-related Information Disclosure

Context

On March 21, 2022, the SEC issued for public comment a proposal to amend its rules under the Securities Act of 1933 and the Securities Exchange Act of 1934 to require public companies (including KeyCorp) to provide detailed climate-related information in their registration statements and periodic reports.

In March 2024, the SEC published its final rules for the Enhancement and Standardization of Climate-Related Disclosures for Investors. The new rules follow the recommendations of the TCFD and will be gradually applicable starting in 2025.

Objective

Improve the consistency, comparability, and reliability of climate-related information for investors, based on the TCFD framework and the input of commenters.

Climate-related Risks Disclosure Items

- 1) The type of identified climate-related risk (whether physical or transition);
- 2) The information needed to comprehend the nature and scope of the risk;
- 3) A non-exhaustive list of disclosures to be included, as relevant (for example, the geographic location and characteristics of properties, processes, or operations affected by physical risk, the type of transition risk, and its impact on the registrant).

FINAL RULE

[Copy Link](#)

The Enhancement and Standardization of Climate-Related Disclosures for Investors

Public Comments

[VIEW RECEIVED COMMENTS](#)

Overview

The Securities and Exchange Commission ("Commission") is adopting amendments to its rules under the Securities Act of 1933 ("Securities Act") and Securities Exchange Act of 1934 ("Exchange Act") that will require registrants to provide certain climate-related information in their registration statements and annual reports. The final rules will require information about a registrant's climate-related risks that have materially impacted, or are reasonably likely to have a material impact on, its business strategy, results of operations, or financial condition. In addition, under the final rules, certain disclosures related to severe weather events and other natural conditions will be required in a registrant's audited financial statements.

Note: The scope of disclosure encompasses any material climate-related risks that impact a registrant's business strategy, operational results, or financial condition. A material climate-related risk is defined as one for which there is a significant likelihood that a reasonable investor would deem it important when deciding whether to buy or sell securities, or how to vote. Additionally, a reasonable investor would perceive the omission of such disclosure as having notably changed the overall mix of information available.

Case 1. Banking Climate Risk Stress Testing

Mandatory for SDST banks or upon request by global regulators

Overview

- As compared to the pilot exercise, there are several major enhancements in 2023-2024 CRST in respect of climate scenarios, assumptions, assessment approaches and reporting requirements

Scenario Narratives & Specifications

- Sectoral impacts under transition
- Short-term scenario (2023-2027): combining climate risk drivers (more frequent occurrences of extreme climate events, accelerated transition to a low-emission economy) and Macroeconomic risk drivers (global economic downturn, HK in recession, slowdown in ML)
- Long-term scenario (2023-2050): include below 2 °C, delayed transition, current policies

Assessment Requirements

- Full balance sheet covering both on and off balance sheet
- Assessment approaches, include quantitative analyses, qualitative analysis, balance sheet treatment, physical risk assessment, transition risk assessment, key assessment metrics and projection interval, model risk assessment

Submission of Results

- Results reporting
- Submission timeline (2023 and 2024 results for short-term scenario should be submitted by 20231231 and 20240630 respectively; results for long-term scenarios should be submitted by 20240630)



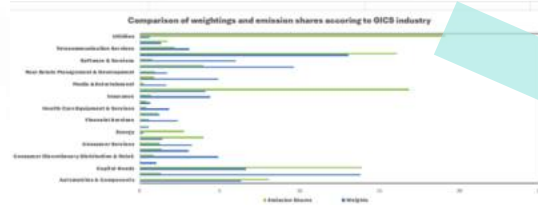
Hong Kong Monetary Authority Climate Risk Stress Test (CRST) Completion Instructions and Reporting Template - Short-term Scenario	
The CRST results under the short-term scenario, together with the supplementary information, should be submitted to the Hong Kong Monetary Authority by 30 June 2024 .	
Note: Authorized institutions should not disclose the completion instructions and reporting template to any third party unless a written consent is obtained from the Hong Kong Monetary Authority.	
Name of AI	
Submission Date	
Reporting Basis	
Contact Person	
Name:	
Title:	
Department:	
Telephone Number:	
Email Address:	

Case 1. Climate Risk Stress Testing Tool

1. Model inputs

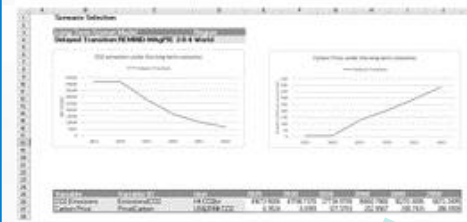
Risk Category	Value
Climate Change	1.2
Water Scarcity	0.8
Physical Risk	0.5
Transition Risk	0.3
Policy Risk	0.1
Reputation Risk	0.2
Operational Risk	0.4
Market Risk	0.6
Credit Risk	0.7
Other Risks	0.9

- Model input based on the Bank's full portfolio exposures
- Analyze sectoral, geographical, obligor, collaterals, covering credit, market, operational risks



Metric	Value
Total Carbon Footprint	1.2
Scope 1 Emissions	0.5
Scope 2 Emissions	0.7
Scope 3 Emissions	0.8
Other Metrics	0.9

2. Model parameters



- Model parameters based on HKMA CRST scenario and assumptions, and also other science-based climate data and projection eg NGFS
- Model also based on historical market and corporates ESG and financials data as parameters

Parameter	Value
Climate Change	1.2
Water Scarcity	0.8
Physical Risk	0.5
Transition Risk	0.3
Policy Risk	0.1
Reputation Risk	0.2
Operational Risk	0.4
Market Risk	0.6
Credit Risk	0.7
Other Risks	0.9

Parameter	Value
Climate Change	1.2
Water Scarcity	0.8
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Transition Risk	0.3
Policy Risk	0.1
Reputation Risk	0.2
Operational Risk	0.4
Market Risk	0.6
Credit Risk	0.7
Other Risks	0.9

3. Model outputs

Output	Value
Climate Change	1.2
Water Scarcity	0.8
Physical Risk	0.5
Transition Risk	0.3
Policy Risk	0.1
Reputation Risk	0.2
Operational Risk	0.4
Market Risk	0.6
Credit Risk	0.7
Other Risks	0.9

Output	Value
Climate Change	1.2
Water Scarcity	0.8
Physical Risk	0.5
Transition Risk	0.3
Policy Risk	0.1
Reputation Risk	0.2
Operational Risk	0.4
Market Risk	0.6
Credit Risk	0.7
Other Risks	0.9

- Model output include climate transition and physical risk impact to the Bank's exposures, including sectoral and obligor level and operational loss assessment
- Model will assess the climate risk impact to the Bank's various risk (credit, market, operational risk RWA), expected credit losses, other regulatory ratios if needed, profitability (earning, provision, loss), impact to fair value of assets, and operational loss.

Model approach:

Model Input: Full bank's portfolio exposures & operations

Model Parameters: CRST scenarios & assumptions

Model Output: Capital impact and risk assessment to the Bank

Key Feature:

1. Scenario-based Analysis
2. Risk Aggregation
3. Time-series Projection
4. User-friendly Interface
5. Compatibility and Integration



Case 1. Fund Level Analysis: Asset Management

For each equity/bond, YoujiVest CRMS calculates all the underlying subsidiaries risk exposure x revenue% of parent company.

YoujiVest													
Portfolio Information													
Name		XXXXX FUND Asia Pacific Low Carbon Index ETF											
Report Date		31/12/2021											
Currency		USD											
NAV		35.172,143											
Portfolio Carbon Metrics													
Portfolio Carbon Emissions (Tons)		Portfolio Carbon Intensity (Tons/USD)		Portfolio Carbon Exposure (Tons/USD)		WACI (Tons/USD)							
ES 36	ES 36	ES 36	ES 36	ES 36	ES 36	ES 36	ES 36						
ESG Industry								Absolute Emissions (CO2e)		Emissions Score			
Automotives & Components								10	6.37	65.70			
Banks								23	12.83	10.96			
Capital Goods								33	6.67	132.43			
Commercial & Professional Services								2	1.08	0.82			
Consumer Discretionary Distribution & Retail								3	4.94	7.02			
Consumer Durables & Apparel								7	3.09	11.25			
Consumer Services								5	3.29	10.26			
Consumer Staples Distribution & Retail								4	1.44	52.54			
Energy								2	0.25	22.67			
Equity Real Estate Investment Trusts (REITs)								1	0.80	2.46			
Financial Services								6	2.40	4.64			
Food Beverage & Tobacco								2	1.20	9.49			
Health Care Equipment & Services								7	1.84	5.27			
Household & Personal Products								3	0.88	1.54			
Insurance								4	4.41	5.64			
Materials								13	4.53	136.42			
Media & Entertainment								2	1.86	7.59			
Pharmaceuticals Biotechnology & Life Sciences								10	4.89	2.55			
Real Estate Management & Development								1	1.73	7.80			
Semiconductors & Semiconductor Equipment								6	9.63	3.99			
Software & Services								3	6.51	4.61			
Technology Hardware & Equipment								14	13.97	18.09			
Telecommunication Services								7	3.17	3.82			
Transportation								4	0.63	34.33			
Utilities								3	0.63	15.13			

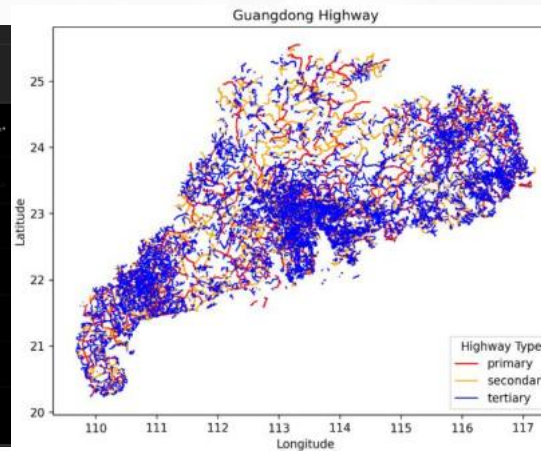
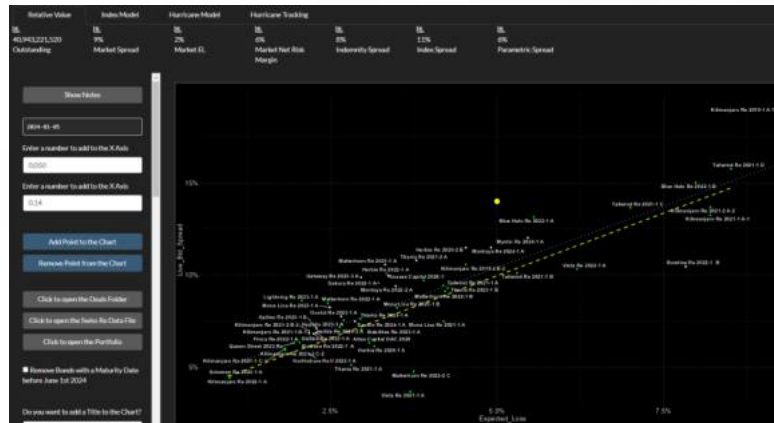
YoujiVest													
ESG 3.0													
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0
ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG 3.0	ESG

Ticker	Company Name	Company Address	EVIC	Reference Year	Weightings	Tropical Cyclones	River Flood	Landslide	Wildfire	Water Stress (Drought)	Extreme Heat	Extreme Cold	Seawater Rise (Coastal Flood)	Tropical Cyclones	River Flood	Landslide	Wildfire	Water Stress (Drought)	Extreme Heat	Extreme Cold	Seawater Rise (Coastal Flood)
12725308	广东能源集团财务有限公司	广州市	143247.34	2008	0.68	82.95	212.06	2.78	0.35	1.63	0.13	0	2.28	116.62	245.38	3.12	0.69	1.96	0.13	0	2.61
12725308	广东能源集团财务有限公司	广州市	143247.34	2008	0.68	82.95	212.06	2.78	0.35	1.63	0.13	0	2.28	116.62	245.38	3.12	0.69	1.96	0.13	0	2.61
12725308	广东能源集团财务有限公司	广州市	143247.34	2008	0.68	82.95	212.06	2.78	0.35	1.63	0.13	0	2.28	116.62	245.38	3.12	0.69	1.96	0.13	0	2.61
12725308	广东能源集团财务有限公司	广州市	143247.34	2008	0.68	82.95	212.06	2.78	0.35	1.63	0.13	0	2.28	116.62	245.38	3.12	0.69	1.96	0.13	0	2.61
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12725308	广东能源集团财务有限公司	广州市	143247.34	2008	0.68	82.95	212.06	2.78	0.35	1.63	0.13	0	2.28	116.62	245.38	3.12	0.69	1.96	0.13	0	2.61
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12725308	广东能源集团财务有限公司	广州市	143247.34	2008	0.68	82.95	212.06	2.78	0.35	1.63	0.13	0	2.28	116.62	245.38	3.12	0.69	1.96	0.13	0	2.61
12725308	广东能源集团财务有限公司	广州市	143247.34	2008	0.68	82.95	212.06	2.78	0.35	1.63	0.13	0	2.28	116.62	245.38	3.12	0.69	1.96	0.13	0	2.61
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12725308	广东能源集团财务有限公司	广州市	143247.34	2008	0.68	82.95	212.06	2.78	0.35	1.63	0.13	0	2.28	116.62	245.38	3.12	0.69	1.96	0.13	0	2.61
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12725308	广东能源集团财务有限公司</																				

Case 2. CAT Bond Analysis: Assets Exposure Assessment

YoujiVest CRMS Provides analysis on

- Distance to the coast
- Construction quality
- Age of building
- Sponsors underwriting track record
- Loss reserving
- Business mix and geographical footprint
- Absolute risk tolerance assessment



Case 2. Florida Hurricane CAT Bond Analysis

SUBJECT TO COMPLETION, DATED MARCH 11, 2022

CONFIDENTIAL

OFFERING CIRCULAR SUPPLEMENT NO. 1 TO THE OFFERING CIRCULAR

Hestia Re Ltd.

§[•] Series 2022-1 Class A Principal At-Risk Variable Rate Notes due April [•], 2025

Hestia Re Ltd. (the "Issuer") is hereby offering §[•] Series 2022-1 Class A Principal At-Risk Variable Rate Notes due April [•], 2025 (the "Series 2022-1 Notes"), which will be exposed to the peril of Named Storms affecting the Covered Area during the Risk Period, on a per occurrence basis as more fully described herein.

This Offering Circular Supplement should only be read together with, the accompanying Offering Circular (the "Offering Circular"). All capitalized terms used but not otherwise defined in this Offering Circular Supplement have the respective meanings ascribed to such terms in the Offering Circular. If there are any differences between terms described in this Offering Circular Supplement and the Offering Circular, the terms of this Offering Circular Supplement will control. The Offering Circular, taken together with this Offering Circular Supplement, will be referred to herein as this "Offering Document."

(Continued on next page)

Investing in the Series 2022-1 Notes is speculative and involves a high degree of risk. See "Risk Factors" beginning on page 14 of the Offering Circular and "Additional Risk Factors" beginning on page S-46 of this Offering Circular Supplement for a discussion of certain factors to be considered in connection with an investment in the Series 2022-1 Notes.

The Series 2022-1 Notes are with limited recourse to certain assets of the Issuer and without recourse to the Ceding Insurer or its subsidiaries or affiliates or any of its respective assets.

THE SERIES 2022-1 NOTES HAVE NOT BEEN AND WILL NOT BE REGISTERED UNDER THE UNITED STATES SECURITIES ACT OR ANY U.S. STATE OR FOREIGN SECURITIES LAWS AND ARE BEING OFFERED AND SOLD IN BOOK-ENTRY FORM ONLY TO INVESTORS THAT (I) ARE QUALIFIED INSTITUTIONAL BUYERS THAT, WITH RESPECT TO U.S. PERSONS, ARE ALSO QUALIFIED PURCHASERS AND (II) ARE RESIDENTS OF, AND PURCHASING IN, AND WILL HOLD THE SERIES 2022-1 NOTES IN, A PERMITTED U.S. JURISDICTION OR A PERMITTED NON-U.S. JURISDICTION. THE SERIES 2022-1 NOTES ARE NOT BEING OFFERED TO THE PUBLIC IN ANY JURISDICTION. PROSPECTIVE PURCHASERS ARE HEREBY NOTIFIED THAT THE SELLERS OF THE SERIES 2022-1 NOTES MAY BE RELYING ON THE EXEMPTION FROM THE PROVISIONS OF SECTION 5 OF THE SECURITIES ACT PROVIDED BY RULE 144A. THE SERIES 2022-1 NOTES ARE NOT TRANSFERABLE EXCEPT IN ACCORDANCE WITH THE RESTRICTIONS DESCRIBED UNDER "NOTICE TO INVESTORS" IN THE OFFERING CIRCULAR. EACH PURCHASER OF THE SERIES 2022-1 NOTES IN MAKING ITS PURCHASE WILL BE DEEMED TO HAVE MADE CERTAIN ACKNOWLEDGMENTS, REPRESENTATIONS AND AGREEMENTS AS SET FORTH UNDER "NOTICE TO INVESTORS—REPRESENTATIONS OF PURCHASERS" IN THE OFFERING CIRCULAR.

The Series 2022-1 Notes will be offered by Swiss Re Capital Markets Corporation and TigerRisk Capital Strategies LLC (known by its marketing name TigerRisk Capital Markets & Advisory) as initial purchasers of the Series 2022-1 Notes (each, an "Initial Purchaser" and collectively, the "Initial Purchasers"), as specified herein, subject to receipt and acceptance by each Initial Purchaser and subject to such Initial Purchaser's right to reject any order in whole or in part. The Initial Purchasers expect to deliver the Series 2022-1 Notes in book-entry form through the facilities of The Depository Trust Company ("DTC") against payment therefor in immediately available funds on the Issuance Date.

Swiss Re Capital Markets
Joint Structuring Agent and
Joint Bookrunner

TigerRisk Capital Markets & Advisory
Joint Structuring Agent and
Joint Bookrunner

Offering Circular Supplement No. 1 dated [•], 2022

not apply to reinsured Policies containing a standard non-exclusion clause.

- (iv) All liability of the Ceding Insurer arising by contract, operation of law, or otherwise from its participation or membership, whether voluntary or involuntary, in any Insolvency Fund. "Insolvency Fund" includes any guaranty fund, insolvency fund, plan, pool, association, fund, or other arrangement, however denominated, established, or governed, that provides for any assessment of or payment or assumption by the Ceding Insurer of part or all of any claim, debt, charge, fee, or other obligation of an insurer, or its successors or assigns, which has been declared by any competent authority to be insolvent, or which is otherwise deemed unable to meet any claim, debt, charge, fee, or other obligation in whole or in part.
- (v) Loss or liability excluded by the "Pools, Associations, and Syndicates Exclusion Clause (Catastrophe)" attached to and forming part of the Reinsurance Agreement. However, no event shall any assessment or similar demand for payment related to the Florida Hurricane Catastrophe Fund or Citizens Property Insurance Corporation be covered under the Reinsurance Agreement.
- (vi) Loss or liability excluded by the "Nuclear Incident Exclusion Clause - Physical Damage - Reinsurance - U.S.A." attached to and forming part of the Reinsurance Agreement.
- (vii) Loss or liability excluded by the "Terrorism Exclusion" attached to and forming part of the Reinsurance Agreement.
- (viii) Losses in the respect of overhead transmission and distribution lines and their supporting structures other than those on or within 150 meters (or 500 feet) of the insured premises. It is understood and agreed that public utilities, extension and or suppliers extension and/or contingent business interruption coverages are not subject to this exclusion, provided that these are not part of a transmitters' or distributors' Policy.
- (ix) Seepage and pollution, defined as any loss or damage or cost or expenses arising from seepage and/or pollution and/or contamination, other than contamination from smoke. Nevertheless, this exclusion does not preclude payment of the cost of the removal of debris of property damage by a loss otherwise covered under the Reinsurance Agreement, subject always to a limit of 25.0% of the Ceding Insurer's property loss under the Policy.
- (x) All liability arising out of mold, spores and/or fungus but this exclusion shall not apply to those losses which follow as a direct result of a loss caused by a peril otherwise covered under the Reinsurance Agreement.

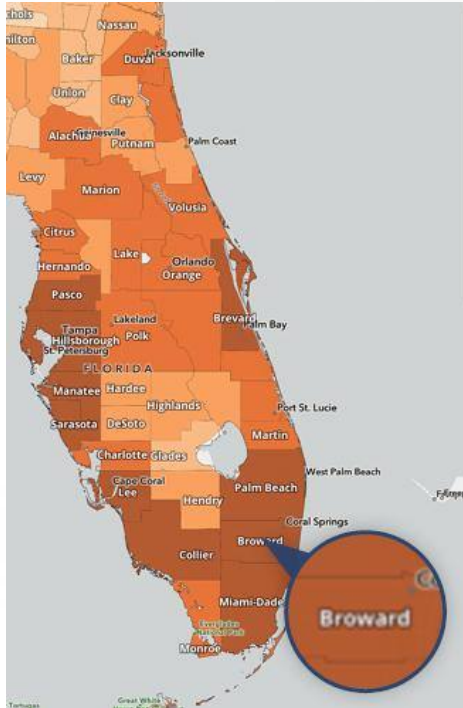
S-22

Expert Risk from traditional Actuarial Model

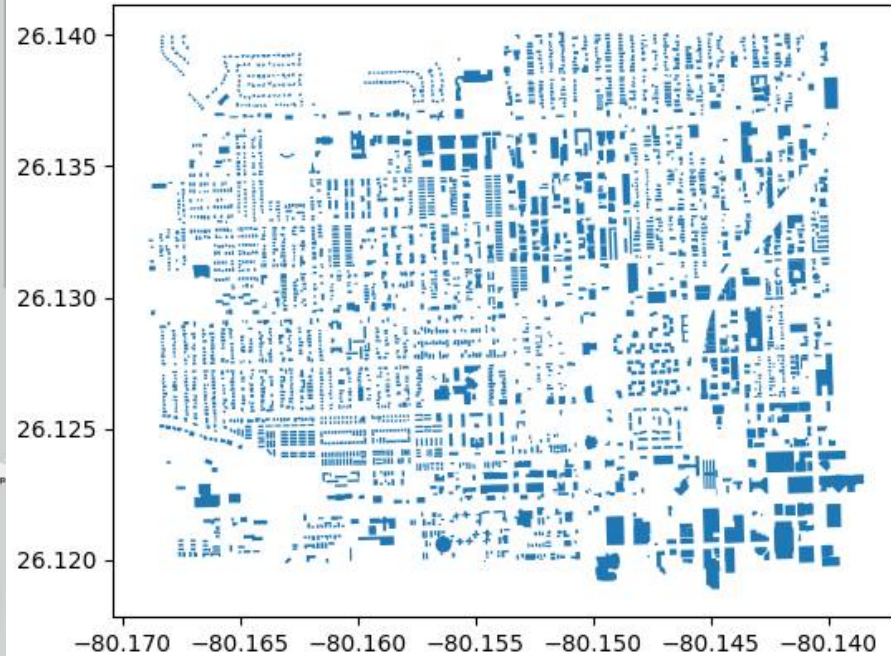
- Other Risks Relating to Permitted Investments
 - While Permitted Investments Are Held in Cash, the Investment Yield Will Be Zero and the Applicable Notes Will Be Exposed to the Risks of Deposits in The Bank of New York Mellon, Including the Risk of Insolvency or Receivership
 - The Reinsurance Trustee May Be Unable to Liquidate Investments in a Timely Manner
 - Future Downgrades of Permitted Investments May Not Result in Their Replacement
- Effective Subordination of the Applicable Notes upon Events of Default; Limitations on Enforcement and Security Interest
- The Reinsurance Trust Agreement Does Not Prevent the Ceding Company from Withdrawing Assets from the Reinsurance Trust Account
- Enforcement of Security Interest Granted to the Indenture Trustee for the Benefit of the Noteholders
- Risks Related to the AIR Expert Risk Analysis Reports
 - The Data and Methodology of AIR Described in the AIR Expert Risk Analysis Report Are Provided "As Is" Without Warranty or Any Guaranty of Any Kind to the Noteholders
 - The AIR Expert Risk Analysis Reports Do Not Address All Types of Loss Occurrences or Types of Covered Losses Resulting Therefrom
 - The Chronology of Loss Occurrences Used in the Risk Analysis Report May Not be Representative of the Chronology the Ceding Company Selects Pursuant to the Reinsurance Agreement
 - The Modeled FHCF Reimbursement Could Differ Materially from the FHCF Reimbursement
 - The Escrow Models May Not Reflect the Most Current Models of AIR
 - There Are No Representations with Respect to the AIR Expert Risk Analysis Reports
 - Data Used in the Risk Analysis May Be Incomplete or May Not Be Representative of the Subject Business
 - AIR's Relationship with the Issuer, the Ceding Company and the Initial Purchasers
 - AIR Has No Direct Contractual Liability to Noteholders
 - AIR Has No Obligation to Update the AIR Expert Risk Analysis Reports
- Use of Different Models
- Additional Regulatory Risks
 - Dodd-Frank's Volcker Rule Could Restrict the Ability of Certain Investors to Invest in the Applicable Notes and Could Have an Adverse Effect on the Marketability and Liquidity of the Applicable Notes
 - Implementation of and/or Changes to the Basel II Risk-Weighted Asset Framework May Result in Changes to the Risk-Weighting of the Applicable Notes
 - Legal and Regulatory Provisions may Limit or Restrict Certain Investors

Florida Hurricane CAT Bond Analysis

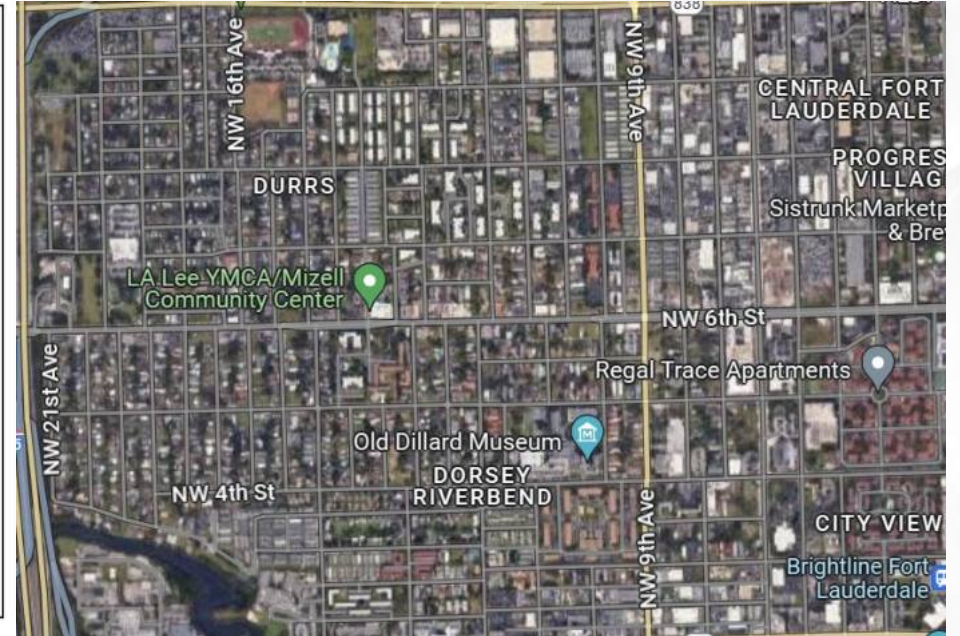
YoujiVest Climate Risk Distribution | Highest-resolution Catastrophy Loss Analysis
Automatic identification with 5m x 5m satellite data



Broward County



YoujiVest Climate Scan

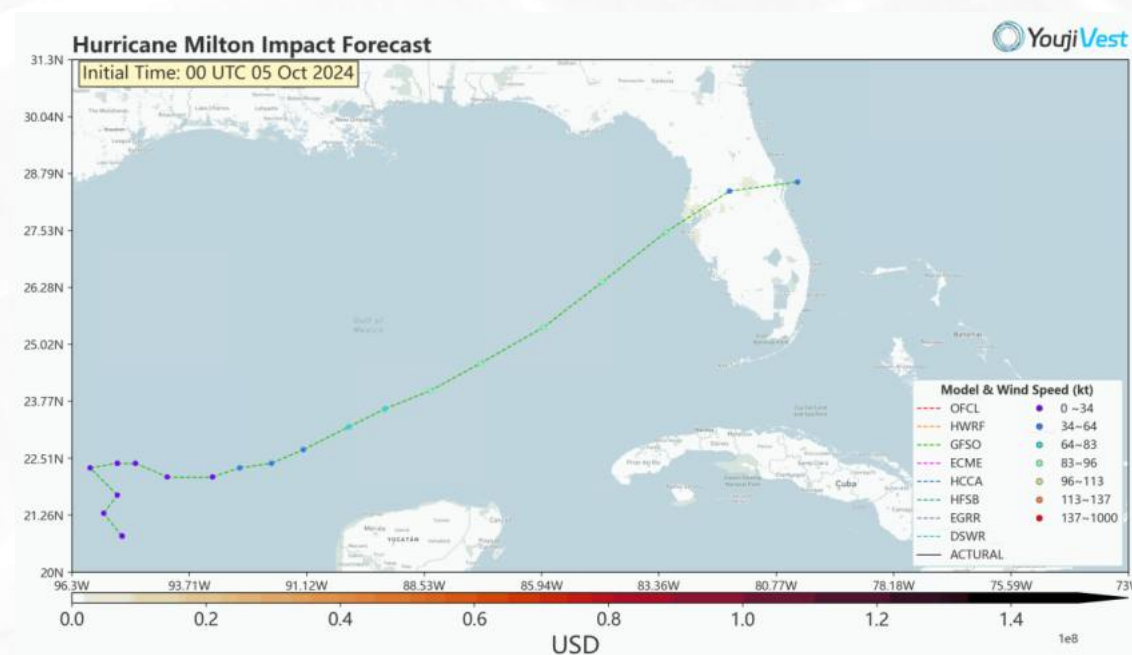
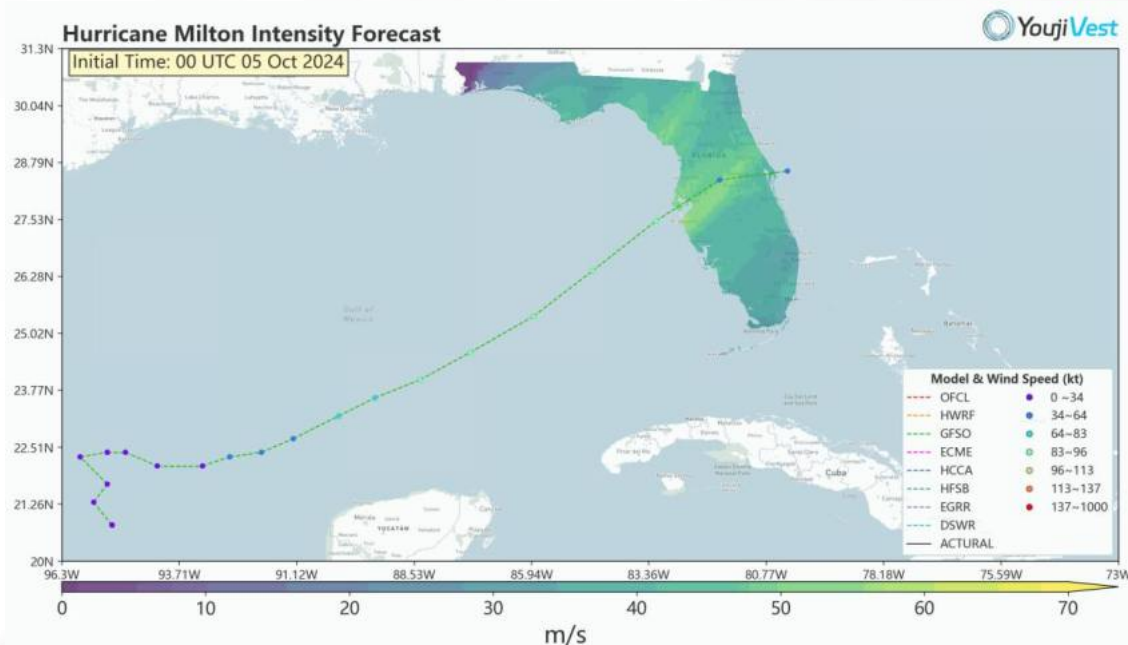


Google Satellite Map

Building Distribution Analysis
Broward County, Florida
YoujiVest Climate Lab

Hurricane Milton

YoujiVest CRMS generates hurricane track and potential loss projections.



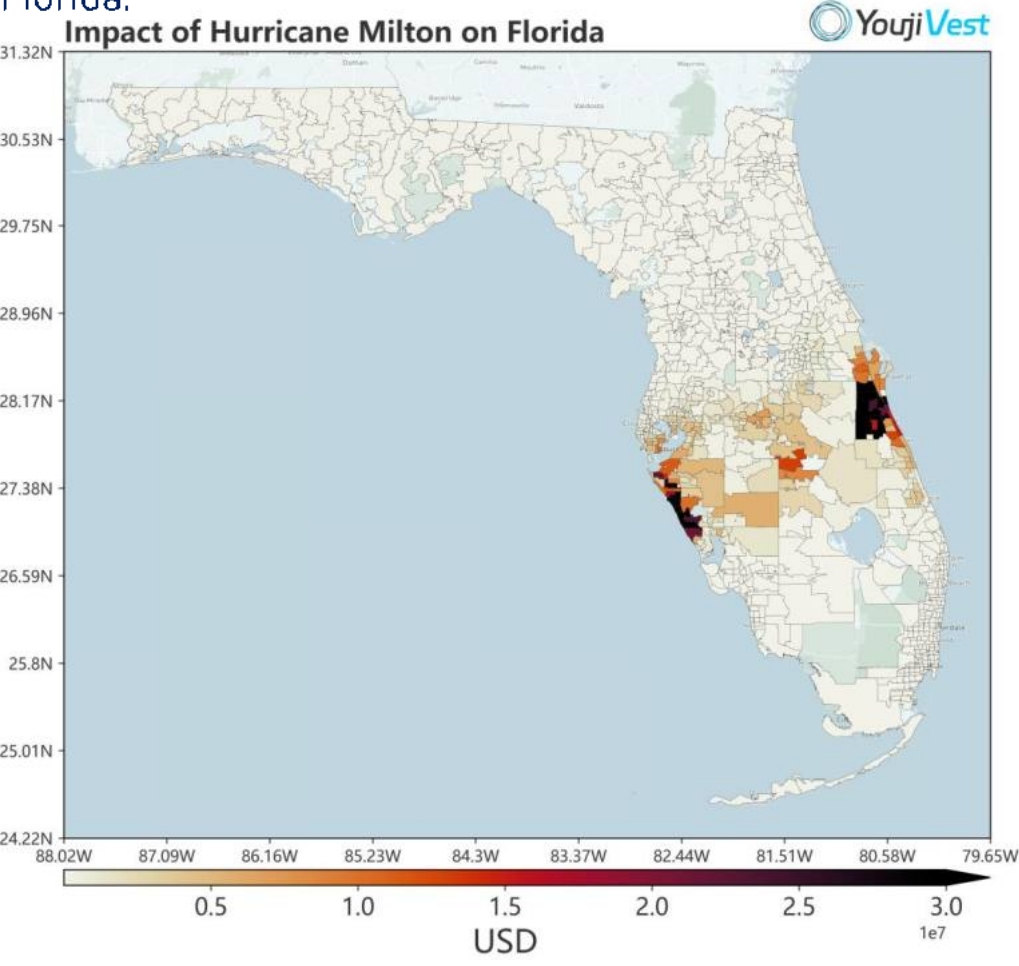
GDP(USD Millions)	AAI(USD Millions)	Percentage	AVG Wind Speed(m/s)	Max Wind Speed(m/s)
1,350,000	22,300	1.65%	24.5	80.4

AAI(USD): Total Annual Average Aggregated Impact Value.

Percentage: Percentage of AAI to annual GDP.

Impact of Hurricane Milton on Florida

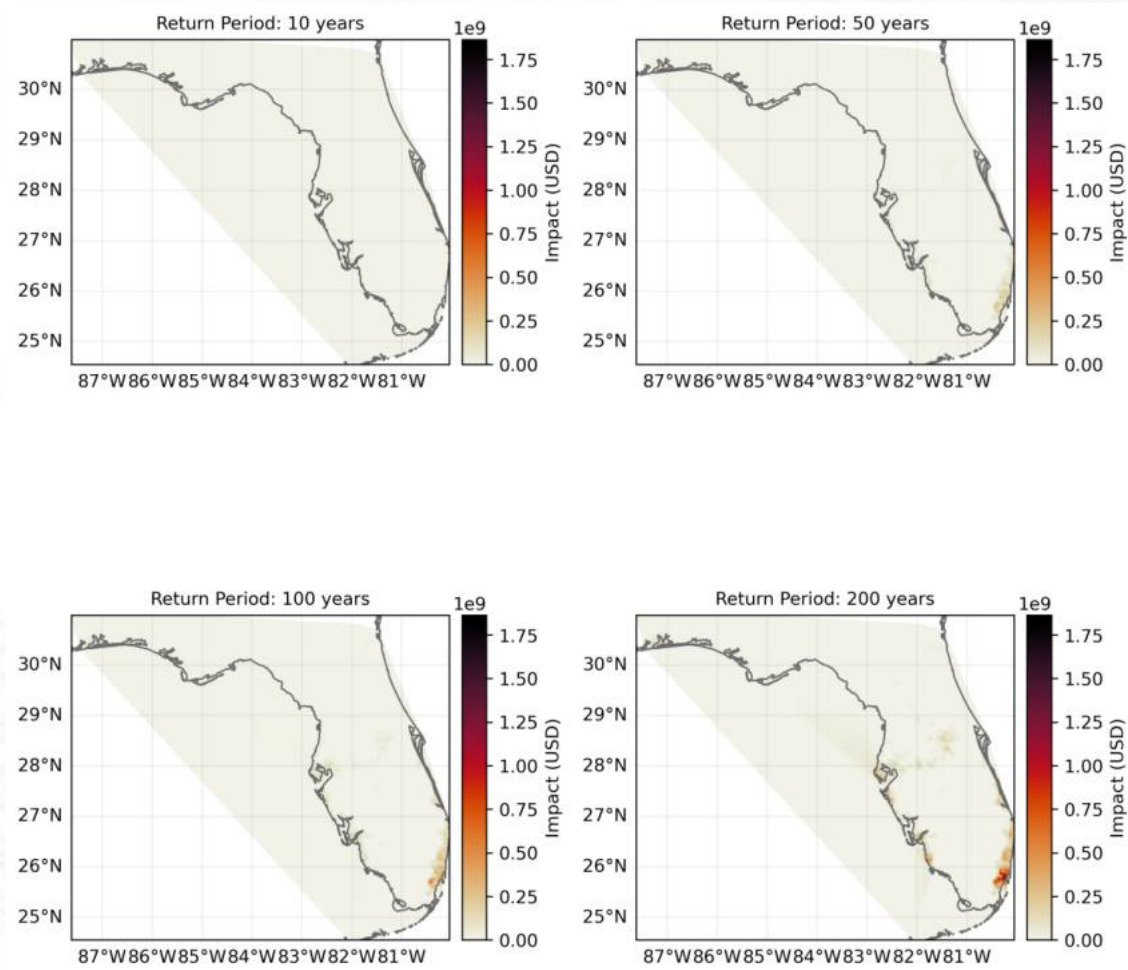
Hurricane Milton has resulted in unexpectedly high damage to counties in central Florida.



Analysis Scenario	Aggregate Loss (USD Millions)	Percentage
2024 (All Hurricane)	2,269.48	0.695%
Milton (2024)	2,185.96	0.669%
Historical Average	1,408.32	0.431%
2030 SSP1-2.6	1,537.16	0.471%
2030 SSP5-8.5	1,616.18	0.495%
2050 SSP1-2.6	1,562.81	0.478%
2050 SSP5-8.5	1,918.85	0.587%

Hurricane OEP results on Florida

Occurrence Exceedance Probability table generated by YoujiVest CRMS.

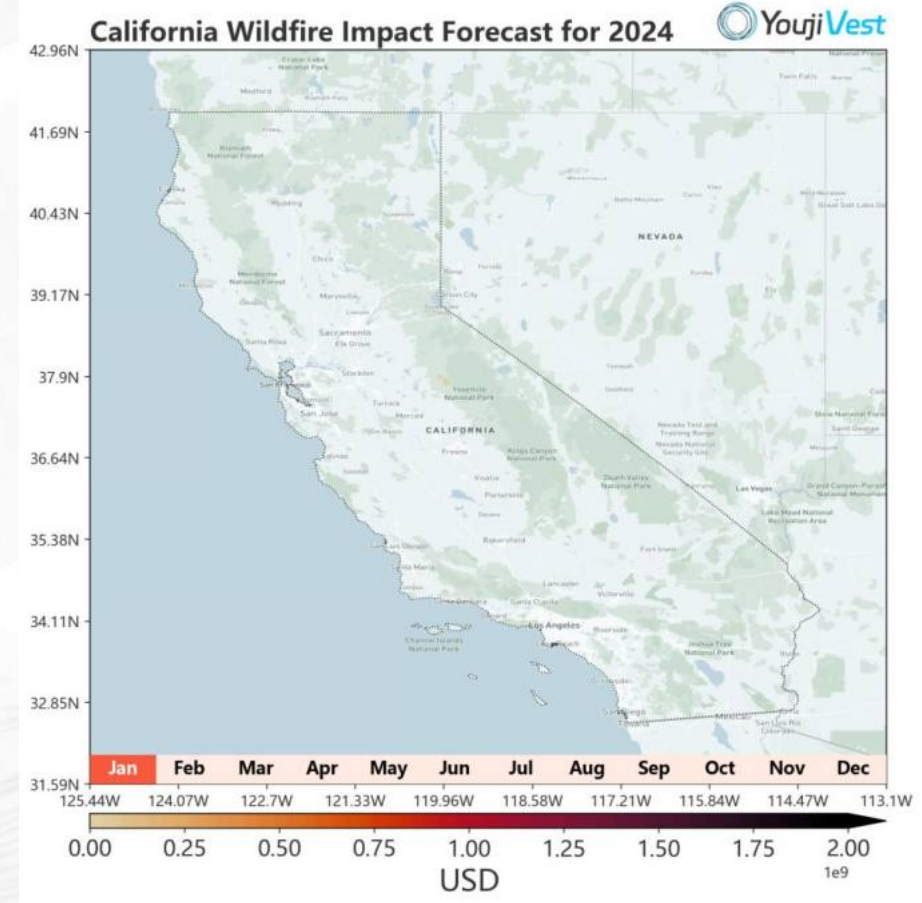
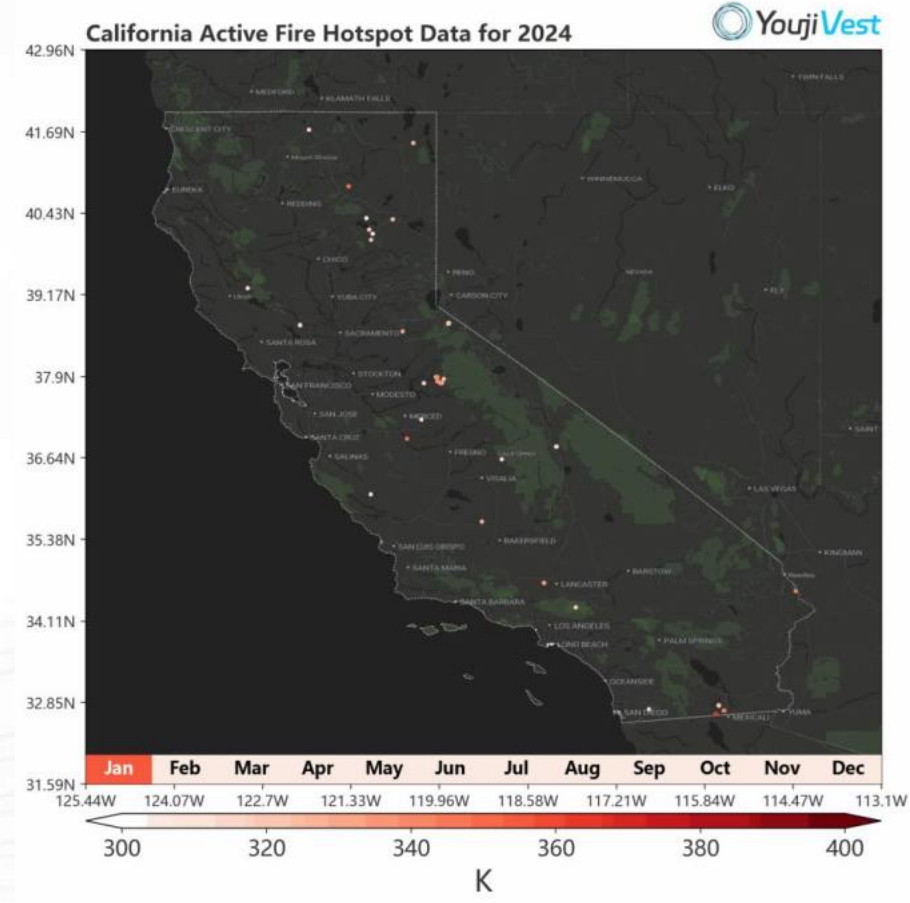


Florida CAT Catastrophe Modelling OEP Results

Exceeding Probability	Return Period	Exceeding intensity (Max, m/s)	Aggregate EP Loss (USD Millions)
0.10%	1000	234.8	1,433,400.00
0.20%	500	141.9	510,963.30
0.40%	250	85.7	217,053.50
0.50%	200	78.1	170,707.30
1.00%	100	67.5	89,799.47
2.00%	50	57.7	26,931
4.00%	25	50.8	5,935.54
10.00%	10	34.3	128.42
20.00%	5	24.0	0.10
Average Annual Loss			2,745.14
Standard Deviation			9,174.75
Coefficient of Variation			3.34

Wildfire in California (2024)

Historical wildfire spots and potential loss on YoujiCRMS.



GDP(USD Millions)	AAI(USD Millions)	Percentage	Events of Wildfire	Maximum brightness of the wildfire
4,172,890	40,883	0.98%	136	509.5



Case 3. Catastrophe Modelling Comparison: Insurance

The 2021 Linfen City, Shanxi Province severe flood event

YoujiVest CRMS improves actuarial model



Shanxi Linfen CAT Catastrophe Modelling OEP Results				
Currency: CNY				
Exceeding Probability	Return Period	AIR V11 Earthquake @ 03/31/2023	AIR V11 Wind/Flood @ 03/31/2023	
0.10%	1,000	124,714,544	42,516	
0.20%	500	18,925,085	16,872	
0.40%	250	9,145,492	6,118	
0.50%	200	6,358,420	4,997	
1.00%	100	2,357,034	281	
2.00%	50	661,992	0	
4.00%	25	11,079	0	
10.00%	10	0	0	
20.00%	5	0	0	
Average Annual Loss		542,092	310	
Standard Deviation		16,188,069	13,870	
Coefficient of Variation		29.86	44.74	
TSI		16,546,650,000	16,546,650,000	

* Value may differ from underwriting information due to some special adjustment from modelling requirement.

AIR model

Shanxi Linfen CAT Catastrophe Modelling OEP Results				
Currency: CNY				
Exceeding Probability	Return Period	YoujiCRMS-River Flood @ 12/31/2023	YoujiCRMS-Drought @ 12/31/2023	YoujiCRMS-Wildfire @ 12/31/2023
0.10%	1,000	10,254,314	10,305,947,646	3,766,968,346
0.20%	500	9,564,841	9,372,965,985	3,338,727,114
0.40%	250	8,875,367	8,439,984,324	2,910,485,875
0.50%	200	8,653,407	8,139,631,333	2,772,622,993
1.00%	100	7,963,933	7,206,649,672	2,344,381,761
2.00%	50	7,274,460	6,273,668,018	1,916,140,529
4.00%	25	6,584,986	5,340,686,357	1,487,899,297
10.00%	10	5,673,552	4,107,351,691	921,795,176
20.00%	5	4,984,079	3,174,370,029	493,553,945
Average Annual Loss		225,543	157,307,772	71,618,937

YoujiVest Model



Introduction to YoujiVest

Our mission, team, and position



About Us

YoujiVest transforms sustainability challenges into market alpha by combining **cutting-edge AI**, **quantitative finance**, and **climate modeling expertise** to empower asset managers, banks, insurers, and corporations to navigate climate risks, meet regulatory requirements, and capture sustainable investment opportunities.

Industry Affiliations

Founding

Founded in 2017 with five offices in Hong Kong, Beijing, Shanghai, Guangzhou and New York to support ESG investment and climate analytics.

Core Team

Core team consisted of engineers and finance practitioners from Chinese Academy of Sciences, Tsinghua Univ., Fudan Univ., UC Berkeley with decades of ESG product experience serving BlackRock, State Street, Nomura, Allianz and more.

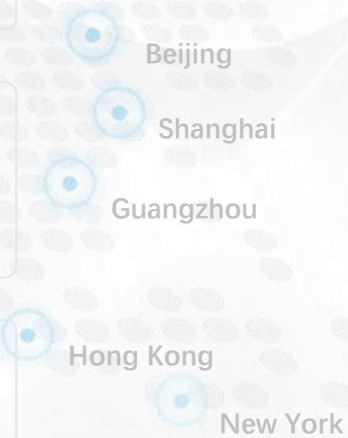
R&D

Combining AI and deep learning techniques to build ESG Ratings, Carbon/Environmental Metrics, and Climate Risk Models.

Qualifications

National high-tech enterprise

ISO9001 certification



Team

Our team consists of finance and technology talents from world-renowned institutions. Of over 120 employees, 85% are engineers trained in **finance**, **big data**, **Insurtech** and **artificial intelligence**.



Vivi Hu
CEO

- Deputy Director of ESG Special Committee of China Enterprise Management Research Association
- LSEG, Director, APAC
- FactSet, Director, Greater China
- UBS 2023 Top 10 Woman Founder



Liangyu Gao
Co-Chairman

- Former Director, CSRC
- Vice Chairman, China Southern Asset Management
- Chairman, CSOP



Dr Hongfei Zhang CFA
Co-Chairman

- UT Austin Mathematics Professor
- Dexia Bank, CRO
- Nationwide Insurance, Managing Director



David Bi CFA
CTO

- MSCI Global Index Manager
- Everbright PGIM Fund, Fund Manager
- FactSet Data Scientist
- HKUST CUHK



Hauman Yang
Consulting Partner

- Advisor on Sustainable Development, United Nations Economic and Social Commission for Asia and the Pacific
- Green Finance Advisor, CUHK



Hongjun Xu PE
Environmental Engineering Partner

- Senior Environmental Engineer
- Registered Engineer in China and the United States
- EHS Auditing
- Tongji University: USC



He Zhou CFA
Product Director

- FactSet-Product Director
- Revere Data-Product Director
- Interactive Brokers Fund Manager
- UC Berkeley



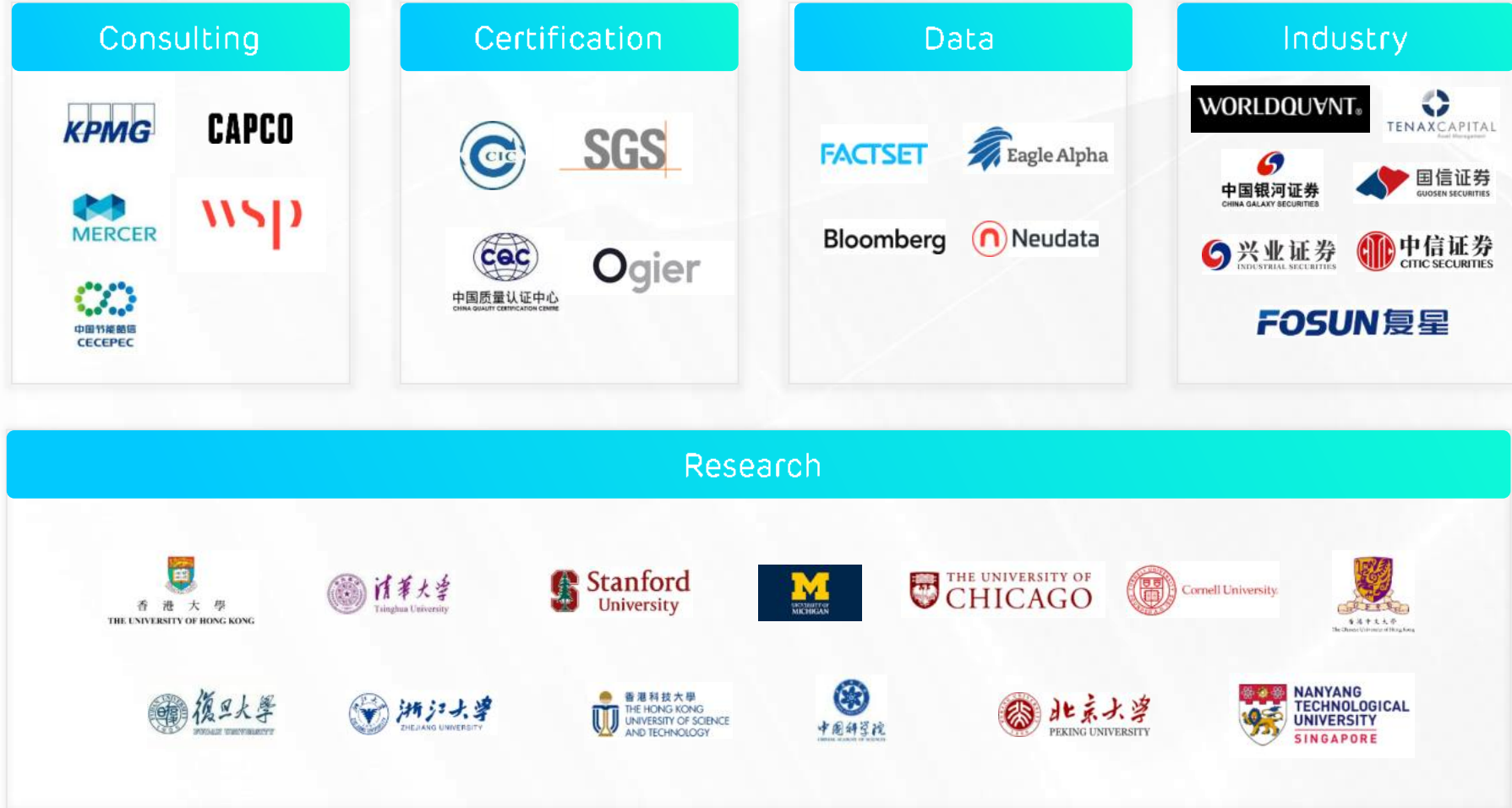
Yufeng Liu
Actuarial Partner

- President of JLT Reinsurance Consulting Group
- AON Benfield Head of East China Region of Reinsurance Broker Company



YoujiVest Partnerships

YoujiVest has established strategic partnerships to deliver comprehensive sustainable and climate finance solutions, including data analytics, fund product design, investment framework development, and more.





Research Collaboration

Climate Related Disasters and The Performance of Chinese-Listed Companies[†]

Guojun He¹, Shuo Li²

We systematically examine the impacts of climate-related natural disasters (extreme temperatures, floods, typhoons, and droughts) on the performances of Chinese listed companies. We show that it is important to measure climate risk exposures separately for their headquarters and the subsidiaries, as only the subsidiaries' exposures have significant negative impacts on the listed companies' performances. Heterogeneity analyses reveal that the agriculture sector, service sector, and small and young firms are particularly vulnerable to extreme weather conditions. Further, the negative impacts of climate risks have decreased substantially in the past two decades, suggesting firms could adapt to climate risks over time. Finally, the stock market does not seem to price in the negative impacts of physical climate risks.

Keywords: Physical climate risk, company performance, climate change, adaptation
JEL Codes: L51, O44, Q52, Q58, R38

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² Faculty of Business and Economics, University of Hong Kong, Hong Kong SAR, China; Email: shuoli@hku.hk

[†] Authors are ranked alphabetically and contributed equally to the manuscript. The authors thank seminar and conference participants at HKU, HKU Jockey Club Inaugural ESG Forum China Climate Impact Conference for valuable comments. The authors also appreciate YoujiVest's data support in the project.

Latest Publish (HKU Prof Guojun He):
Climate Related Disasters and The
performance of Chinese-Listed Companies



证券研究报告 | 2024年03月19日

策略实操系列专题（二） ESG 数据如何在股票投资中获取超额收益？

核心观点

企业环保行为对企业财务绩效、上市公司股票走势的影响是非线性的。从短期来看，企业减排支出会增加企业的成本负担，压缩利润空间，甚至对生产性支出具有一定的挤出效应。企业的减排与企业的财务绩效会呈现此消彼长的关系；从中长期来看，企业减排与财务绩效的增长并非绝对对立。适度的环境规制可以激励企业技术创新，优化自身的资源配置，进而提高企业的长期竞争力。企业技术水平的提升及效率改进所带来的长期收益可以覆盖掉环境规制所带来的短期成本上升，从而实现污染减排和财务绩效增长的双赢。

企业环保类排污数据的检测和应用，是 ESG 领域中较为高频且可覆盖到独立样本的数据口径。本报告的排污数据来源于生态环境部，该数据库收录了全国各省市环保部门发布的排污许可证及环保处罚信息，覆盖排污企业超过 44 万家。其中包含上市公司 2800 余家及其下属子公司超过 10 万家，覆盖污染物超过 600 个种类。该数据库具有覆盖全面、更新及时、数据准确、结构清晰的特点。每月定期数据更新流程后数据质量以自动化方式进行自动校验。在监测环节时会对人工介入来校验数据，提高数据精度。本报告通过测算排污量和股票表现的关系来探讨检测环保数据对具体公司投资的可行性，验证污染数据和股价表现是否存在线性或非线性关系。

有机环保类数据包含的内容有企业的基本信息和排污信息。其中企业的基本信息有企业名称、社会信用代码、省份、生产所在地、行业、主要产品等属性信息；企业的排污信息主要有排污许可证信息（编号、行政区划、行业、发证日期、生效/失效时间等）、排污信息（污染物类别、种类、排放规律、执行标准等）、污染物监测数据（监测的时间、地点、项目、结果、浓度、限值以及是否超标等）和环保处罚信息（处罚机关、处罚的理由、时间、详情等）。

实证检验发现，企业排污情况与股票超额收益率 U 型关系。从各投资组合的年化收益和波动来看，排污环比增长最高的分组合 5 的年化收益高达 21%，排污环比增长最低的分组合 3 的年化收益最低，仅为 13%。虽然各投资组合的年化收益率存在明显差距，但年化波动却几乎没有区别。排污环比增长次高的分组合 4 的年化波动最高，为 23%，比其他组合高 1%。因此各投资组合的超额收益与年化波动相似，与排污环比增长 U 型分布。综上，排污数据在可控制范围内出现一定高收益的信号是订单获取与产量增长的正面效应，而排污量超过一定阈值时则通过环保成本、声誉风险等效应导致股票价格形成抑制，因此对股价表现呈现出短多长空的结构。

风险提示：（1）企业污染排放数据的可得性、高频性与连续性；（2）企业排污数据覆盖率有限，部分企业可能存在选择性漏报问题。

请务必阅读正文之后的免责声明及其下列所有内容

Source: Guosen Securities



Hong Kong Economic Policy Green Paper 2025

Transform Climate Risks into Development Opportunities — Implications for Hong Kong's Economic Development in an Era of Climate Change

Guojun He Qidan Wang Vivi Hu Cheng Bi

1 Introduction

According to the World Economic Forum's Global Risk Report (2023), three key climate issues have been identified as critical challenges facing humanity: extreme weather events, critical change to earth systems, and biodiversity loss and ecosystem collapse. The current warming of 1.44°C compared to pre-industrial times, is already causing disruptive global economic impacts (NASA, 2023).

As a coastal city with low-lying terrain, Hong Kong is frequently affected by extreme weather events and has experienced multiple climate disasters in the past decades. Two climate risks are particularly concerning the occurrence of severe typhoons and rising sea levels. On the one hand, strong tropical cyclones bring heavy rainfall, strong winds, storm surges, and flooding, often disrupting economic production and negatively affecting vulnerable areas and people. On the other hand, most of the economic activities in Hong Kong are concentrated in low-latitude regions, making the economy particularly susceptible to the damages caused by sea level rises.

In the following chapter, we first summarize the major climate risks Hong Kong has been exposed to, with an emphasis on typhoons and sea level rise. Taking "Saika" a recent typhoon, as an example, we review the impact of its path, surge height, and wind intensity. Next, we focus on how typhoons and sea level rises would affect public housing and conduct scenario analysis on the potential economic losses under different climate pathways. Finally, we provide policy recommendations for adaptive strategies to enhance climate resilience and mitigate risks.

2 Overview of Climate Risks in Hong Kong

Hong Kong has been warming up in the last century. Analysis from the Hong Kong Observatory (HKO) showed that the average mean temperature has increased by 0.14°C per decade from 1885 to 2023.

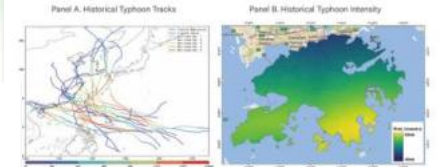
That number reached 0.30°C per decade from 1994 to 2023. Consistent with this trend, the annual average number of hot nights from 2001 to 2023 has increased by 87.18%, while the number of cold days has decreased by 18.19%, relative to 1981-2000 averages.¹ The sea level is also steadily rising, with a growth rate in mean sea level of 31 mm per decade at Victoria Harbor from 1954 to 2023.

Meanwhile, Hong Kong has experienced more typhoons and heavy rainfall in the last two decades. These weather events, including storm surges, strong winds and coastal flooding, have caused significant damages.

2.1 Typhoons: The Most Frequent Climate Disaster in Hong Kong

With its back to the northwest Pacific Ocean, Hong Kong is bordered by a range of east-west mountains to the north and a vast ocean to the south, making it highly susceptible to typhoons. The city's temperature and humidity provide ample moisture for tropical cyclones, creating ideal conditions for typhoon formation.

Figure 1. Historical typhoon tracks and intensity from 2014 to 2023.



Notes: This figure shows the analysis of typhoons affecting Hong Kong with two panels. Panel A (left) shows the statistical representation of typhoons in the northwest Pacific region from 2014 to 2023. Typhoons are categorized by intensity, levels used to co-occurring Category 3 typhoons, which is significant for Hong Kong. The depicted line segments represent typhoon trajectories, with a color gradient from purple to red indicating increasing storm intensity. The maximum intensity recorded is a category 5 or 6 typhoon, or 240 km/h, with the peak observed in 2023. Panel B (right) illustrates the historical record of the maximum intensities of typhoons impacting Hong Kong. Risk intensities across different regions range from 40 m/s to 60 m/s. (Data source: YoujiVest Climate Lab)

¹ According to the Hong Kong Observatory's definition, a hot night is a night with a minimum temperature of 28°C or above, and a cold day refers to a day with a maximum temperature of 22°C or below.

Hong Kong Economic Policy
Green Paper 2025



Recognition: 2025 Hong Kong Green Fintech Map

ESG / Climate Risk Modelling & Assessment

HONG KONG GREEN FINTECH MAP 2025

Carbon Credit Trading, Analytics and Technology



ESG / Climate Risk Modelling & Assessment



ESG Data, Intelligence and Analytics



ESG Disclosure, Compliance & Regulatory Reporting



Green & Digital Finance and Investment



Updated as at 30 June 2025

Recognition: 2025 Global Resilience Technology Competition



After three competitive rounds and over 120 tech innovators from 17 countries, YoujiVest has taken 2nd runner-up at the global finals of the 2025 **Prudence Foundation SAFE STEPS D-Tech Awards**.

Representing China's innovation frontier, Youji Climate Risk Modelling System (CRMS) was recognized for pushing the boundaries of precision in early-warning systems for extreme weather and climate disasters.



Products and Client Segments

Our service

ESG Risk Scores (CERS)	Environmental Pollutant Discharge (CEPD)	Carbon Emission Metrics (CCEM)	Climate Risk Model Solutions (YoujiCRMS)	ESG Disclosure / Enhancement	Index Solutions
- Quantify overall ESG and 25 sub-issue risks through "sentiment" and "event" analysis - Outside-in, negative scoring methodology to minimize "greenwashing" risks - Over 10K+ data sources, including mainstream news, annual/CSR reports, NGOs, government agencies, social media and more	- Quantify 600+ discharged pollutants - Data sourced directly from municipal and provincial sources - A unique, uncorrelated source of "Environmental" alpha - Urban city air pollution level real-time monitor, updated hourly	- Compile, normalize and quantify carbon emissions, carbon intensity and footprints - Data sourced from public, primary sources encompassing Scope 1, 2, 3 GHG emissions - Carbon emissions estimated for undisclosed companies based on proprietary models	- Global Climate Hazards Coverage with high resolution (5m x 5m) - Covering all RCP-SSP scenario analysis pathways - Meet the TCFD and various regulatory needs of listed companies and investors - Quantitative analysis of physical risk and transition risk - Short term / Long term Loss projection	- ESG/ Corporate Sustainability Report preparation - ESG report Assurance - TCFD disclosure service - PRI membership and signatory - ESG Training - MSCI Rating Improvement Services - EcoVadis Reporting Services - CDP Reporting Services	- Develop custom indexes that are investable, and widely relevant - Experience fast and cutting-edge index research and development with an ever-growing collection of full suite of ESG and climate data sets.
Data			Analytics	Consulting	Indexing

Our Clients

Our clients span financial institutions, academic institutions, and corporates, with tailored solutions for each:

- Financial institutions:** YoujiVest's data and climate modeling solutions are widely adopted by leading asset managers, hedge funds, insurers, banks, and brokers for ESG investing, climate stress testing, quantitative strategies, risk management, and actuarial modeling.
- Academic institutions:** Our comprehensive datasets support cutting-edge research in sustainability, climate, and biodiversity, enabling their groundbreaking discoveries. Collaborated with more than 100 global academic institutions.
- Corporates:** YoujiVest offers comprehensive ESG reporting services aligned with international standards, along with customized strategies to enhance third-party ESG ratings and ESG sectors. Our tailored solutions support corporate sustainability initiatives, including pollutant prevention, climate risk resilience planning, natural capital analysis, and supply chain management.

Speak with us about your needs

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