

EGU GENERAL ASSEMBLY 2026

Integrating Financial & Meteorological Sciences

Progress in Risk Prevention and Resilience Modeling
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2026 Perspective: Global Urgency




The Climate-Finance Connection

As we transition through 2026, meteorological hazards have cemented their role as the primary threat to financial stability.

- ⚠️ 90%+ of natural disasters are weather-linked.
- 📈 1%-3% GDP loss currently in China.
- ⚙️ #1 Risk: Extreme weather dominates the 10-year outlook.



Risk Transmission Channels

-  **Real Economy Impact:** Physical hazards cause direct asset damage and production halts, leading to revenue decline and credit quality deterioration for firms and households.
-  **Financial System Vulnerability:** Asset devaluation reduces collateral worth, triggering market volatility and increasing default risks across institutional balance sheets.
-  **Systemic Feedback Loops:** Liquidity shocks and cross-sector contagion amplify through the network, destabilizing macro-financial stability and tightening credit conditions.

Dimensions of Climate Risk



Physical

Acute extreme events (storms, floods) and chronic climatic shifts (sea-level rise) directly impacting production assets.



Transition

Financial losses stemming from climate policy changes, low-carbon technological shifts, and market revaluation.



Systemic

The feedback loop where localized climate-driven shocks amplify through the entire interconnected financial network.

Meteorological Instrument Adoption

Weather Index Insurance

92% Adoption

Catastrophe Bonds

78% Global Share

Weather Derivatives

65% Growth

Stress Testing Adoption

48% Central Banks



Sectoral Impact & Resilience



Thermal Power

Risk: High Transition Cost

Carbon norms drive 2-3x cost increase.
Requires stable transition and limited
new project financing.



Cement & Const.

Risk: Overcapacity/Market

Post-urbanization demand slowdown
leads to asset devaluation. Requires
intensive credit monitoring.



Aquaculture

Risk: Physical Extremes

Direct yield losses from temp/rain.
Hedged via temperature index insurance
and counterparty derivatives.

Research Progress & Innovation

The Triple Pillars of Financial Meteorology in China

Innovative Service Products



Indices & Futures

Standardized temp/rain indices for exchange-traded hedging products.



TCFD Disclosures

Automated climate reporting tools for mandatory financial sustainability audits.



AI Resilience

Nesting AI-driven weather scenarios into systemic financial risk models.

Strategic Roadmap (2024–2026)

2024

Foundation



Formalized interdisciplinary theories; "Financial Meteorology" innovate teams established nationwide.

2025

Expansion



Launch of localized weather indices for Tier-1 cities; Integration of weather into bank credit systems.

2026

Integration



Full deployment of the systemic risk monitoring platform; AI-driven mandatory disclosure standard.

Key Institutional Challenges

- ! **Data Granularity Mismatch**
Financial data is high-frequency but spatially coarse; Meteorological data is spatially fine but lacks financial linkage.
- ! **Horizon Misalignment**
Decision cycles (1-5y) versus climate materialization (30-50y). Requires new forward-looking modeling frameworks.
- ! **Fat-Tail Quantification**
Complexity in modeling concurrent extreme events (compound risk) and non-linear economic shocks.

The Path Forward

"By integrating atmospheric science into the financial core, we empower an economic system that thrives amidst climatic uncertainty."

Risk-Reduction

From disaster response to proactive reduction.

Global Standards

Leading international climate-finance norms.

Questions?

Thank you for your attention.

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Image Sources



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