RISK TRANSFER & RESILIENCE

HOW CATASTROPHE BONDS SUPPORT DISASTER RECOVERY AND PORTFOLIO STABILITY

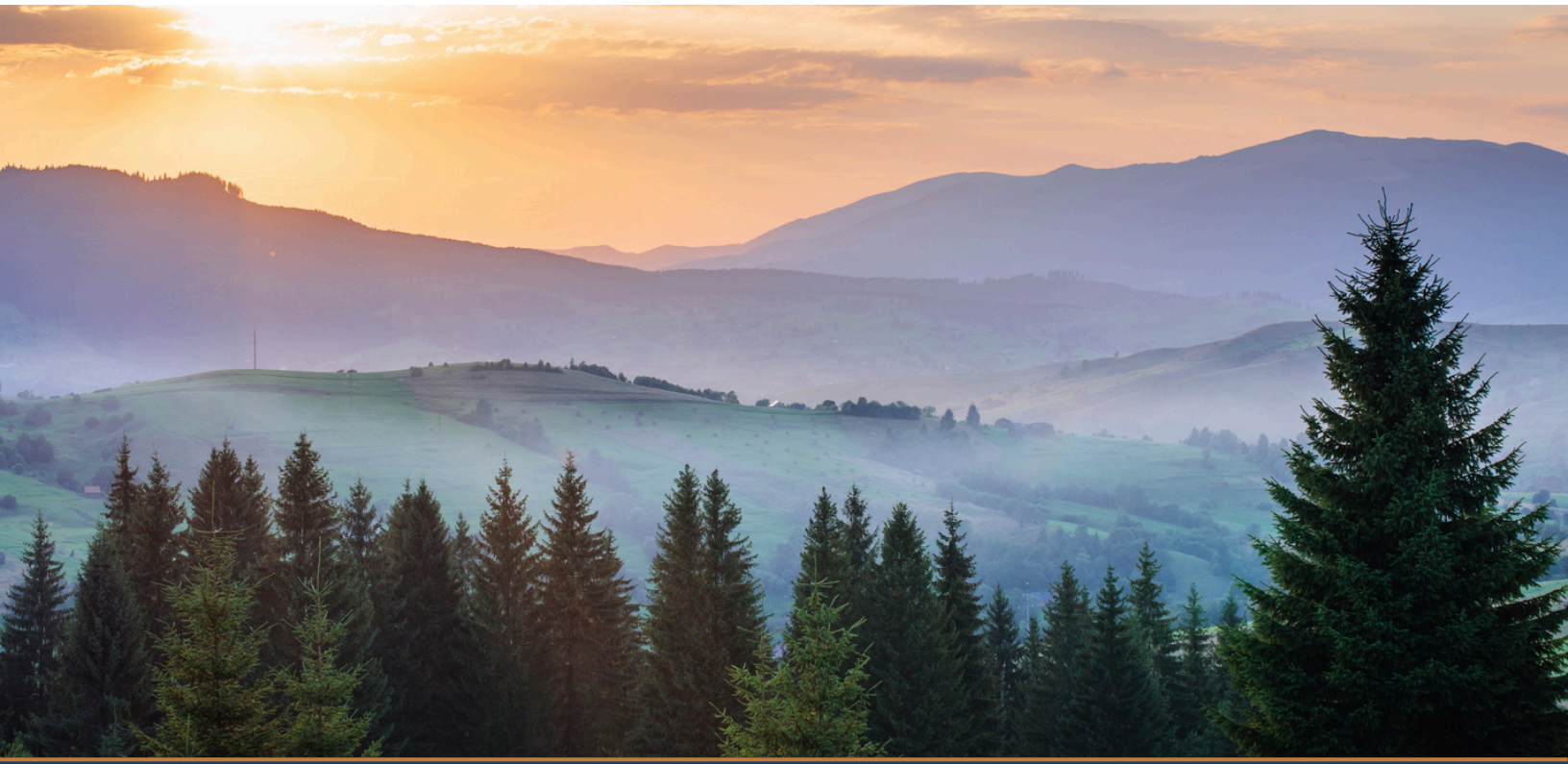
THREE CASE STUDIES THAT DEMONSTRATE SURPRISINGLY POSITIVE INVESTOR OUTCOMES DURING MAJOR CATASTROPHIC EVENTS

ILS

CAT BOND ETF BY BCM

EXECUTIVE SUMMARY

Insurance-linked securities (ILS), particularly catastrophe bonds, represent a unique asset class that transfers insurance risk from carriers to the capital markets. These financial instruments serve a dual purpose: providing essential risk transfer capacity for insurers and offering investors access to floating rate yields and returns that are largely uncorrelated with traditional financial markets.



Over the past quarter-century, the ILS market has experienced substantial growth. At the turn of the century, total outstanding issuance in the ILS and catastrophe bond market was still under $3 billion. Halfway through 2025, the market is nearly $57 billion in total outstanding issuance as institutional investors have increasingly recognized its distinct advantages (Artemis, 2025).

- **Uncorrelated Returns**: Historical correlation of approximately 0.2 to equities and fixed income (Swiss Re Cat Bond Index)
- **Attractive Yield Potential**: Risk spread net of expected loss should average between 5-7% over the risk free rate (Bloomberg, 2024)
- **Inflation Resilience**: Cash-collateralized structures with floating rate coupon that adapt to rising rate environments
- **Low Credit & Macro Risk**: Cat bonds carry low credit and macroeconomic risk because they are fully cash collateralized and isolated from the issuer's bankruptcy. Their losses are tied to natural disasters, not economic events, so they typically don't move in sync with other risk assets—providing valuable diversification when it's most needed.
- **Attractive Risk-Adjusted Return Profile:** The Swiss Re Global Cat Bond Index 20-year Sharpe Ratio is 1.01, compared to the US Corporate High Yield Index Sharpe Ratio of .602 and the BB Global Aggregate Bond Index Sharpe Ratio of .103

Crucially, despite widespread concerns about catastrophe bonds suffering major losses during disaster events, historical evidence reveals a remarkably different story. From 1997-2023, cumulative catastrophe bond losses totaled just 2.69% of notional issued—far below typical high-yield bond default rates of 4-6% annually—and demonstrating exceptional capital preservation even during the most severe catastrophic events (Fitch).

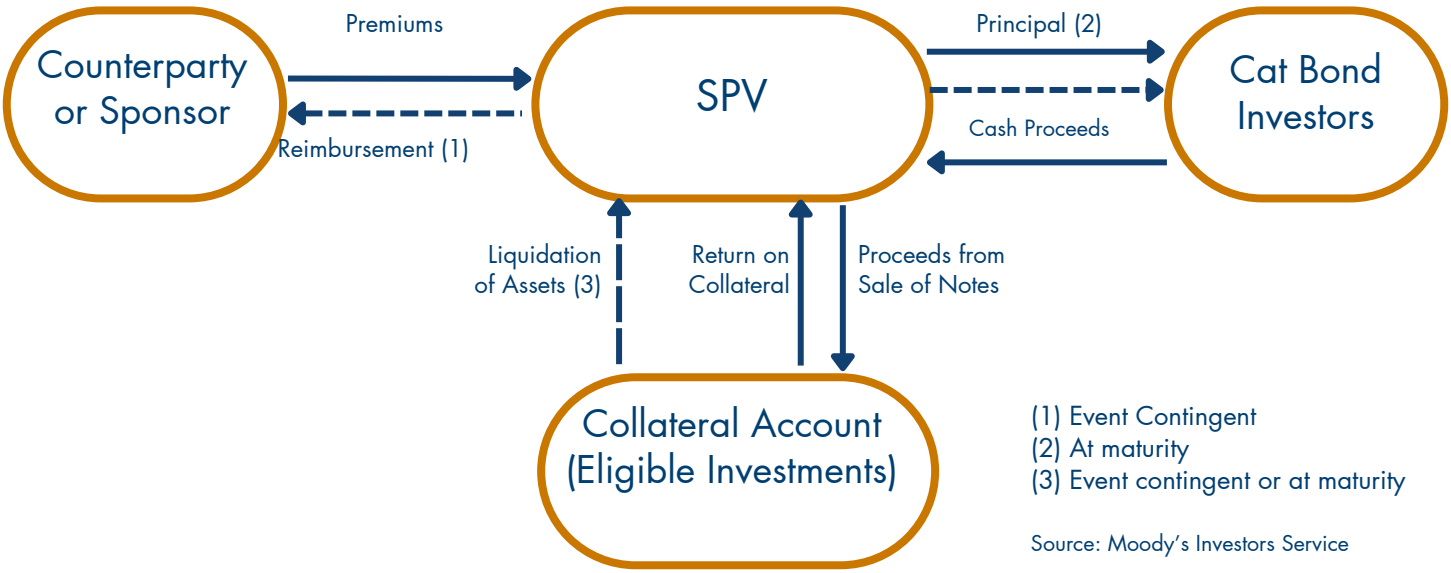
This white paper explores how ILS bonds function in real-world scenarios through three case studies: **the 2025 Los Angeles wildfires, Hurricane Ian, and Chilean earthquakes**. An analysis of these three case studies should demonstrate the effectiveness of ILS bonds in disaster recovery financing, and perhaps more importantly, the surprisingly upbeat financial outcomes for investors who participated in these critical risk transfer mechanisms.

UNDERSTANDING ILS BONDS

WHAT ARE ILS BONDS?

Insurance-linked securities are financial instruments that transfer specific insurance risks from insurers, reinsurers, or governments to investors via capital markets. The graphic below shows how catastrophe bonds ("cat bonds"), the most common form of ILS, are typically structured.

A sponsor (insurer/reinsurer) creates a Special Purpose Vehicle (SPV). The SPV issues bonds to investors, with proceeds held in a collateral account. If a series of catastrophic events do not occur during the bond term (typically 3-5 years), investors receive their principal in addition to their quarterly coupon payments. If qualifying catastrophic events occur exceeding the predefined trigger (e.g. indemnifying the sponsor for losses over a large threshold), some or all principal is transferred to the sponsor to cover losses.



Trigger Types

Indemnity
Activated based on the sponsor's actual losses within a specified geography exceeding a predetermined threshold.

Parametric
Activated when objective measurements (e.g., earthquake magnitude, wind speed) exceed specified levels within a specified geography.

Industry Loss
Activated when industry-wide losses from an event within a specified geography exceed a predetermined threshold.

Modeled Loss
Activated when losses calculated by a modeling firm exceed a predetermined threshold within a specified geography.

HISTORICAL CONTEXT AND MARKET GROWTH

The ILS market emerged after Hurricane Andrew (1992) demonstrated the insurance industry's vulnerability to catastrophic losses. The first catastrophe bond was issued in 1997, but the market gained significant momentum following the 2008 financial crisis, which highlighted the benefits of fully collateralized structures.

Market growth has been substantial:

1997
First cat bond issued

2008
Shift to favor fully collateralized SPVs

2024
More than $50 billion outstanding

(Aon, 2024)

This growth reflects increasing participation from diverse issuers including insurers, reinsurers, and public entities such as the California Earthquake Authority, Florida Hurricane Catastrophe Fund, and Texas Windstorm Insurance Association.

RISK AND RETURN PROFILE

ILS bonds derive their value proposition from their low correlation to traditional asset classes and their distinctive risk-return characteristics.

Low Correlation
Historical correlation of approximately 0.2 to equities and fixed income markets (Swiss Re Cat Bond Index)

Crisis Resilience
Minimal relative drawdowns during noteworthy global market periods, including the 2008 financial crisis (Equities -37%, Hedge Funds -19%, Gold -2.8% and Cat Bonds full year return of +2.5%), 2020 pandemic (Global Equities -22.81% and Cat Bonds -0.70%), and 2022 stock and bond market corrections (Boths bonds and stocks collapsed double-digits while Cat bonds dipped due to Hurricane Ian-related losses and rebounded in 2023 with a 19.7% return.)

Transparent Risk Modeling
Third-party catastrophe models provide objective assessments of exposure likelihood and severity

CASE STUDY 1: 2025 LOS ANGELES WILDFIRES

MINIMAL INVESTOR LOSSES DESPITE $76-275 BILLION IN ESTIMATED DAMAGES

BACKGROUND

The January 2025 Los Angeles wildfire season devastated Southern California with unprecedented destruction. The fires destroyed thousands of structures across Los Angeles County, with economic loss estimates ranging from $76 billion to $275 billion depending on methodology. UCLA Anderson estimated $76 - $131 billion in property losses with insured losses up to $45 billion, while other estimates reached $250 – $275 billion in total damages. This event surpassed the 2018 Camp Fire's insured losses of $12.5 billion, becoming the most costly wildfire event in U.S. history. The devastation caused by these fires presented the scenario that catastrophe bond skeptics feared would devastate investor portfolios.

BOND MECHANICS AND MARKET EXPOSURE

Various entities had issued catastrophe bonds to transfer extreme wildfire risks away from insurance companies and to capital markets investors.

KEY BOND FEATURES

Indemnity-based triggers with loss thresholds typically exceeding $500 million.	Layered coverage protecting specific segments of the loss distribution.	Multi-year terms providing predictable pricing for both issuers and investors.

Despite the unprecedented wildfire destruction experienced in Southern California, the catastrophe bond market's structure provided significant investor protection through diversification. Only a portion of the global catastrophe bond market carried wildfire exposure, with the remainder of the risk spread across issuance linked to hurricanes, earthquakes, floods, and other perils spanning different continents.

INVESTOR OUTCOMES PRESENT A SURPRISINGLY POSITIVE STORY

When final assessments were completed, the results defied the skeptics' expectations of significant investor losses.

Overall Principal Impact Remained Minimal

Swiss Re Cat Bond Total Return Index declined only 0.27% during the wildfire period.	Fitch noted temporary price drops of 20% or greater in eight 144A tranches, but projected no principal losses.	Actual investor losses were limited, despite unprecedented local damage.

Fitch and Artemis projected minimal long-term impact, with no principal loss expected and rapid market stabilization anticipated. Secondary market prices did temporarily drop more than 20% on a small subset of the market, but these represented mark-to-market adjustments rather than permanent capital loss.

KEY LESSONS

The 2025 Los Angeles wildfire experience validated three critical principles. First, diversification proved remarkably effective even during extreme regional disasters. Second, trigger mechanisms successfully protected investor capital while providing meaningful risk transfer. Third, sophisticated structuring enabled the market to handle exactly the type of scenarios it was designed to address.

CASE STUDY 2: HURRICANE IAN

RAPID RECOVERY DESPITE INITIAL MARKET SHOCK

BACKGROUND

Hurricane Ian struck Florida on September 28, 2022, as a Category 4 storm that ultimately caused approximately $113 billion in damages and became one of the costliest hurricanes in U.S. history. The storm devastated Florida's southwest coast, with communities like Fort Myers Beach and Sanibel Island suffering near-total destruction. This high-profile catastrophic event provided a real-time test of how catastrophe bond investors would fare during a massive, well-publicized disaster.

INITIAL MARKET SHOCK VS. ULTIMATE REALITY

The immediate aftermath of Hurricane Ian created the type of market volatility that catastrophe bond skeptics point to as evidence of the asset class's risks. But the evolution from initial shock to final outcomes ultimately told a very different story.

Initial Market Impact

- **Swiss Re Global Cat Bond Total Return Index:** ~10% immediate decline in the week ending September 30
- **Master Capital Cat Bond Fund Index:** -3.56% decline
- **Stone Ridge Reinsurance Risk Premium Interval Fund:** -13.6% drop in September 2022

Recovery Timeline and Outcomes

- **Swiss Re Index**: Recovered to +6% by year-end 2022, then surged to +19.7% in 2023
- **Stone Ridge Fund**: Fully recovered by April 2023, achieving +40.4% YTD returns by late 2023
- **Marketwide**: As loss estimates narrowed from initial $30B-100B range to $30B-60B, mark-to-market gains helped indices close strong

PORTFOLIO CONSTRUCTION VALIDATION

Well-diversified portfolios experienced significantly less volatility than Florida-specific hurricane bonds, validating the critical value of portfolio diversification demonstrating how institutional-quality portfolio management can significantly mitigate event impact even during major catastrophes.

Strategic Benefits	Geographic diversification across non-Florida risks	Focus on higher attachment point bonds covering more extreme, less frequent events	Diversification across non-correlated perils and geographies

CASE STUDY 3: CHILEAN EARTHQUAKES

COMPLETE CAPITAL PRESERVATION THROUGH PARAMETRIC DESIGN

BACKGROUND

Chile's position along the Pacific "Ring of Fire" makes it one of the world's most seismically active countries. Major earthquakes like the 2010 Maule earthquake (magnitude 8.8) and 2015 Illapel earthquake (magnitude 8.3) demonstrated the country's vulnerability to catastrophic seismic events. Chile's relatively underdeveloped insurance market creates a significant protection gap, making government resources critical for disaster response but often insufficient for immediate post-earthquake liquidity needs.

INNOVATIVE PARAMETRIC SOLUTION

The World Bank and the Republic of Chile recognized these challenges and began utilizing parametric catastrophe bonds that represented a sophisticated evolution in catastrophe risk transfer and moved beyond traditional indemnity-based approaches toward objective, measurable triggers.

Parametric Structure Benefits

- **Objective Triggers:** Based on verified seismic data (e.g., Richter scale measurements exceeding specified levels)
- **Rapid Deployment:** Immediate capital deployment to government disaster relief programs within days, not months
- **Transparent Activation:** Binary clarity (either the specified earthquake magnitude occurred in the designated area, or it didn't)
- **Multi-Year Coverage:** Fixed pricing providing predictable return profiles over extended periods

The parametric structure provided clear, objective triggers based on measurable criteria like earthquake magnitude and location. This binary approach - either the specified parameters are met or they aren't - offers rapid payout certainty compared to loss adjustment processes required for indemnity-based bonds and thus investor protection through careful design.

INVESTOR OUTCOMES: STRONG CAPITAL PRESERVATION

The Chilean earthquake bond experience represents perhaps the most compelling example of achieving the dual objectives of meaningful disaster risk transfer while preserving investor capital.

A Perfect Track Record

- **World Bank IBRD CAR Series 116**: $350 million parametric earthquake bond issued March 2023
- **Coverage structure**: 30/70/100% tiers based on severity and location triggers
- **Capital preservation**: No triggered events to date, complete capital preservation through March 2026 maturity
- **Zero documented major principal losses** for Chile-specific earthquake bonds during seismic events

The careful calibration of parametric triggers covered only the most extreme events. Even during significant earthquakes requiring government response, bonds remained unaffected because specific magnitude and location criteria weren't met. When trigger events might occur, the rapid payout mechanisms facilitate swift reconstruction funding while investors retain their principal throughout non-trigger scenarios. This scenario clearly represents structure-driven successes for both issuers and investors.

Portfolio Benefits

- **Geographic Diversification:** Minimal correlation to U.S. hurricane, wildfire, or European flood risks
- **Attractive Yields:** Often exceeding 9% for these specific risks
- **Social Impact:** Supporting disaster resilience in emerging markets while earning solid returns

GLOBAL VALIDATION

International development organizations point to the Chilean model as particularly successful because it has demonstrated strong capital preservation for investors while providing genuine value for sponsors. The success validated parametric approaches and demonstrated how careful structuring and trigger design can provide attractive yields while maintaining strong downside protection, a combination increasingly appealing to mission-driven institutional investors seeking both financial returns and social impact.

ILS MARKET ACCESS

FROM INSTITUTIONAL-ONLY TO RETAIL AVAILABILITY

HISTORICAL EVOLUTION

The catastrophe bond market was historically accessible only to institutional investors through direct participation or specialized hedge funds. This began changing in the mid-2010s with the launch of more retail-accessible vehicles in the form of retail ILS interval funds. In April 2025, the first exchange-traded fund providing daily liquid access was launched.

CURRENT ACCESS METHODS

Investors can now access the ILS market through several vehicles.

Interval Funds

- Generally higher fees, including performance fees
- Quarterly liquidity windows
- Includes private deals versus owning only 144A bonds

Exchange-Traded Funds

- Daily liquidity and transparency
- Lower expense ratios than traditional alternatives
- Broad market access through exchange listing

These differing vehicle types have shown varying performance characteristics during stress events, with diversified approaches generally outperforming concentrated strategies.

THE INVESTOR REALITY

SUPERIOR OUTCOMES DESPITE DISASTER HEADLINES

HISTORICAL LOSS PERFORMANCE

The most compelling evidence for catastrophe bonds lies in their exceptional loss history.

- **Cumulative losses 1997-2023:** Just 2.69% of notional issued over 26 years
- **Comparison to traditional bonds:** Far below high-yield bond default rates of 4-6% annually
- **Model accuracy:** Estimated modeled loss rates (2-3%) closely align with realized loss experience
- **Consistent performance:** Loss rates remain stable across different catastrophic event types

RECOVERY CHARACTERISTICS VERSUS OTHER ASSET CLASSES

Catastrophe bonds have historically demonstrated superior recovery characteristics.

- **Rapid stabilization:** Cat bonds recover within weeks to months post-event once trigger status is clarified, versus 3-7 years for corporate bond defaults
- **Event-driven recovery:** Unlike credit markets, catastrophe bond recovery depends on specific event resolution rather than broader economic factors
- **Uncorrelated performance:** Low systemic correlation means disasters affecting cat bonds typically don't impact other portfolio holdings

PORTFOLIO DIVERSIFICATION BENEFITS

Real-world evidence supports the diversification thesis.

- **Geographic spread:** Disasters are typically regional, leaving most of a diversified portfolio unaffected
- **Peril diversification:** Earthquakes, hurricanes, wildfires, and other perils rarely occur simultaneously
- **Structural protection:** Trigger mechanisms and attachment points provide downside protection

THE FUTURE OF ILS

CLOSING THE PROTECTION GAP

INCREASING DEMAND DRIVERS

The global "protection gap" (the difference between economic losses and insured losses) continues to widen. Key factors include:

- **Urbanization Trends** (particularly the increasing development in catastrophe-prone areas)
- **Property Value Inflation** and rising asset values in high-risk locations
- **Climate Considerations** and ever-evolving risk patterns affecting traditional insurance pricing
- **Capacity Constraints** as traditional insurance and reinsurance markets reach their limits

THE CAPITAL MARKETS ROLE

As traditional markets face constraints, capital markets can provide essential solutions. Among them:

- **Complementary Capacity** where Cat bonds supplement strained traditional systems
- **Global Reach** as structured solutions enable coverage in underdeveloped insurance markets
- **Multi-Year Certainty & Stability** for disaster-prone regions thanks to collateralized coverage
- **Scalable Solutions** thanks to the increased capacity the capital markets can provide above that of traditional reinsurance

INVESTMENT OPPORTUNITY

For institutional investors and financial advisors, catastrophe bonds and insurance linked securities can present some compelling characteristics.

- **Superior Risk-Adjusted Returns** vs. traditional high-yielding fixed income
- **Social Impact** by participating in socially beneficial disaster risk transfer
- **Portfolio Enhancement** through diversifying in a low-correlation asset class
- **Inflation Protection** thanks to floating rate structures

CONCLUSION

THE REALITY BEHIND THE HEADLINES

Insurance-linked securities represent a sophisticated risk transfer mechanism that delivers dual benefits: supporting critical disaster recovery financing while providing investors with attractive, uncorrelated returns and exceptional capital preservation.

The case studies presented here reveal a consistent pattern of catastrophic events generating dramatic headlines and causing genuine human suffering, while catastrophe bond investors provided essential risk transfer capacity and consistently retained the vast majority of their capital while earning attractive yields.

Key Investor Takeaways

1. **Historical Performance:** 97.31% capital preservation over 26 years (1997-2023) (Swiss Re)
2. **Event Resilience:** Even during major disasters, diversified portfolios experience minimal actual losses
3. **Recovery Characteristics:** Faster recovery timelines (weeks to months) compared to corporate bond defaults (years)
4. **Diversification Effectiveness:** Geographic and peril diversification provides robust protection

It's important to recognize that ILS bonds are not climate speculation instruments—they are structured insurance solutions designed to provide specific risk transfer functions. Their unique characteristics make them valuable portfolio diversifiers regardless of climate trend perspectives.

Multiple access vehicles now enable diversified, liquid access to this historically institutional-only asset class. For financial advisors and institutions seeking to enhance portfolio resilience while participating in socially beneficial risk transfer, the evidence strongly supports considering a structural allocation to insurance-linked securities.

The surprising reality? In a world where disasters dominate headlines, catastrophe bond investors have quietly enjoyed one of the most resilient and consistent alternative asset class performance records available in modern finance.

SOURCES

Artemis.bm Catastrophe Bond Market Statistics
Swiss Re Cat Bond Index Annual Returns
Fitch Report on High Yield Default Rates from 2001 to 2022
NOAA Billion Dollar Weather and Climate Disasters
UCLA Anderson Economic Impact Analysis
Aon Reinsurance Market Outlook 2024
Aon Securities Post Hurricane Ian Market Update (2023)
Fitch Ratings Hurricane Ian Analysis (2022)
Frontier Advisors Catastrophe Bond Research (2023)
World Bank Catastrophe Risk Profile: Chile
Stone Ridge Fund Performance Reports
Cat Bond Capital Preservation Rates

IMPORTANT DISCLOSURES

All investing involves risk. Loss of principal is possible.

Because catastrophe bonds and other forms of ILS are typically rated below investment grade or unrated, a substantial portion of the Fund's assets ordinarily will consist of below investment grade (high yield) debt securities that are high risk or speculative.

Reinsurance-Related Securities Risks. The Fund is subject to the risk that a triggering event(s) of a particular size/magnitude occurring in a designated geographic area, and as a result, the Fund will lose all or a significant portion of the principal it has invested in a particular security and the right to additional interest payments with respect to the security. If multiple triggering events occur that impact a significant portion of the Fund's portfolio, the Fund could suffer substantial losses. In addition, it is possible that certain triggering events, such as hurricanes, earthquakes and other natural catastrophes, will significantly impact the Fund's net asset value, market price, and volatility, in the period leading up to, during, and immediately after, such triggering event as market participants assess the impact of the event and the particular terms of the Fund's investments. A majority of the Fund's assets will be invested directly or indirectly in reinsurance-related securities tied to natural events and disasters, and there is inherent uncertainty as to whether, when or where such events will occur. There is no way to accurately predict whether a triggering event will occur and, because of this significant uncertainty, reinsurance-related securities carry a high degree of risk.

Market Risk. The market prices of securities or other assets held by the Fund may go up or down, sometimes rapidly or unpredictably, due to general market conditions, such as real or perceived adverse economic, political, or regulatory conditions, political instability, recessions, inflation, changes in interest or currency rates, lack of liquidity in the bond markets, the spread of infectious illness or other public health issues, weather or climate events, armed conflict, market disruptions caused by tariffs, trade disputes, sanctions or other government actions, or other factors or adverse investor sentiment. If the market prices of the Fund's securities and assets fall, the value of your investment will go down. A change in financial condition or other event affecting a single issuer or market may adversely impact securities markets as a whole.

Debt Securities Risk.

Credit Risk. Credit risk is the risk that an issuer or guarantor of debt instruments will be unable or unwilling to make its timely interest and/or principal payments or to otherwise honor its obligations. Debt instruments are subject to varying degrees of credit risk, which may be reflected in their credit ratings. There is the chance that the Fund's portfolio holdings will have their credit ratings downgraded or will default (i.e., fail to make scheduled interest or principal payments), potentially reducing the Fund's income level or share price.

High Yield Bond Risk. The Fund will invest primarily in securities rated below investment grade or that are unrated and may be subject to greater risks than other investments, including greater levels of risk related to changes in interest rates, credit risk (including a greater risk of default), and illiquidity risk. Such investments are speculative and are more susceptible to real or perceived adverse economic and competitive industry or business conditions than higher-grade investments. Yields on securities rated below investment grade or that are unrated will fluctuate and may, therefore, cause the Fund's value to be more volatile. Certain investments of the Fund may be initially rated investment grade but may be downgraded to belowinvestment-grade status (or may be determined by the Adviser or Sub-Adviser to be of comparable quality) after the Fund purchases them.

Investors should consider the investment objectives, risks, charges and expenses carefully before investing. For a prospectus or summary prospectus with this and other information about the Fund, please call 888.671.6273 or visit our website at www.ilsetf.com. Read the prospectus or summary prospectus carefully before investing.

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