



At a Glance

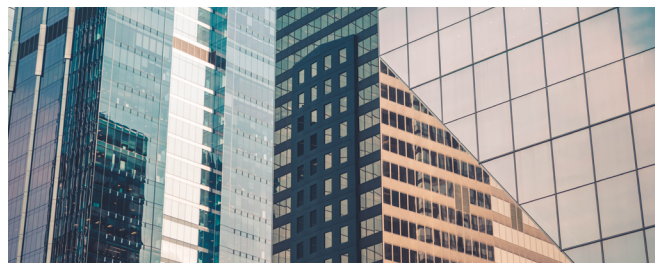
- NOAA National Centers for Environmental Information (NCEI) offers relevant climate and weather data, products, and services from NOAA satellite, radar, and in situ observing systems that support a range of transactions in the finance and insurance sector.
- The performance of U.S. financial and insurance markets, a \$1.5 trillion economic sector, is influenced by a range of climate and weather events including hurricanes, tornadoes, floods, extreme heat, and cold snaps.
- The financial sector relies on NCEI's climate and weather data and information to determine insurance premiums and payouts for losses due to extreme events and to inform investment decisions and drive trading transactions.

Sector Overview

Finance and insurance, the leading global economic sector, is a major driver of U.S. economic activity and employment. In 2017, finance and insurance accounted for 7.5% of the U.S. Gross Domestic Product (GDP), equaling \$1.5 trillion.

A range of factors influence the performance of this sector, including climate and weather. Extreme events like hurricanes directly impact physical assets and investments, disrupt revenue generation, workforce productivity, and earnings. Slow-onset risks like increasing temperature and water scarcity affect the productivity of resource-dependent industries and investments.

Financial services regularly turn to NCEI to understand the impact of climate and weather on the economy and to drive transactions.



“ NCEI data is invaluable to the reinsurance industry, and it would be really hard to put a tangible price tag on it. Everything that is being compiled and maintained [by NCEI] is the foundation for so many transactions in the financial sector that, without it, we would lose literally billions of dollars of economic activity in the United States.

– Mark Bove, Senior Meteorologist, Munich Re North America

Select Applications of NCEI's Data in Finance and Insurance

Catastrophe Models, Insurance, and Reinsurance

Reinsurance simply put, is insurance for insurance companies. To accurately price risk, reinsurance companies, brokers, and intermediaries develop peril-specific catastrophe (CAT) models to estimate sustained economic losses from extreme weather events including hurricanes, tornadoes, floods, wildfires, and hail. Reinsurance companies depend on NCEI's hurricane track, severe weather, daily temperature and precipitation data to develop and validate CAT models and set premiums accurately. NCEI's information, along with other industry-specific data, enables catastrophe model development and therefore the service provided by insurance and reinsurance.

Investments in Weather-Sensitive Industries

Investment banks and equity firms rely on a range of NCEI products to understand how weather influences macroeconomic factors, company performance, and product sales. For example, as part of a due-diligence process in reviewing potential investments, Charlotte, North Carolina-based equity firm, Ridgemont Equity Partners, sought to understand how snowfall and winter storms correlate to the performance of an automotive repair company. They plotted NCEI's Regional Snowfall Index (RSI) against the company's revenue over a multi-year period to see how closely they aligned. The analysis confirmed the speculation that the company performs best during winter and following winter-storm conditions. As weather is so closely tied to the company's performance, NCEI's information is critical to the overall investment decision worth tens of millions of dollars.

Energy Trading

Energy is traded on the market just like any other commodity. Energy traders rely on NCEI's model data to speculate how weather will affect energy demand and make decisions to buy, sell, and trade natural gas and power on the market. NCEI's archived model data and reanalysis data are used to compute deviations from average climatic conditions on a global grid. These deviations are compared against real-time model outputs to understand how demand may be influenced in the 1 to 15 day range or the five to six week range. The market for natural gas and electricity has soared in recent decades as markets have matured and investors recognize these commodities as investments. The global revenue for energy trading and risk management is estimated at a \$1.22 billion and is growing at a rate of 2.32% per year.

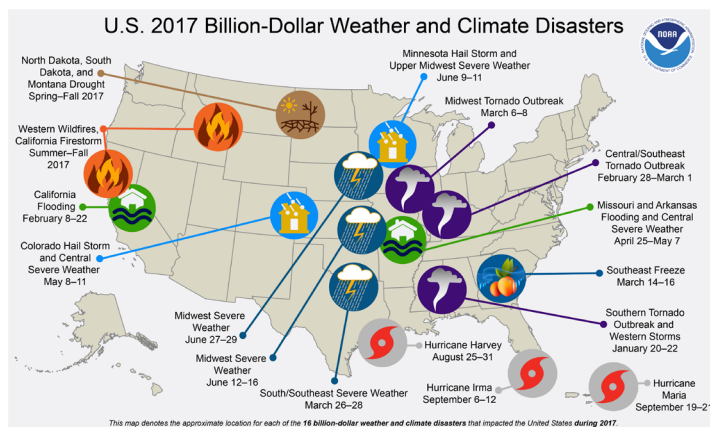


Image: NCEI's U.S. Billion Dollar Disasters is a quarterly publication that highlights U.S. climate and weather events that have at least \$1 billion in losses. Reinsurance companies use the publication to reference past events and understand how these events would drive losses under present-day exposure.

Regional Snowfall Index 22 -24 January 2016

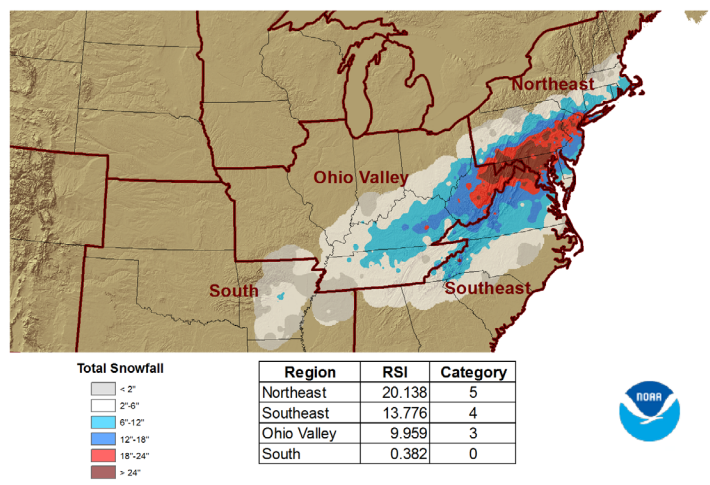


Image: Investment bankers and equity investors rely on NCEI's Regional Snowfall Index (RSI) to understand how snowfall affects overall economic activity and company-specific performance. The RSI categorizes snowfall on a 1-5 severity scale, factoring spatial extent, snowfall totals, and population data.

NOAA National Centers for Environmental (NCEI), part of the U.S. Department of Commerce, provides access to one of the most significant archives of comprehensive oceanic, atmospheric, and geophysical data on Earth. From the depths of the ocean to the surface of the sun and from million-year-old ice cores to near-real-time satellite images, NCEI hosts over 37 petabytes of data. Public and private sectors rely on NCEI's authoritative and trusted information to create economic opportunity, mitigate climate- and weather-related losses, and preserve ecological resources.



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