

# The Value of NCEI Weather and Climate Data

Eye on Earth Symposium

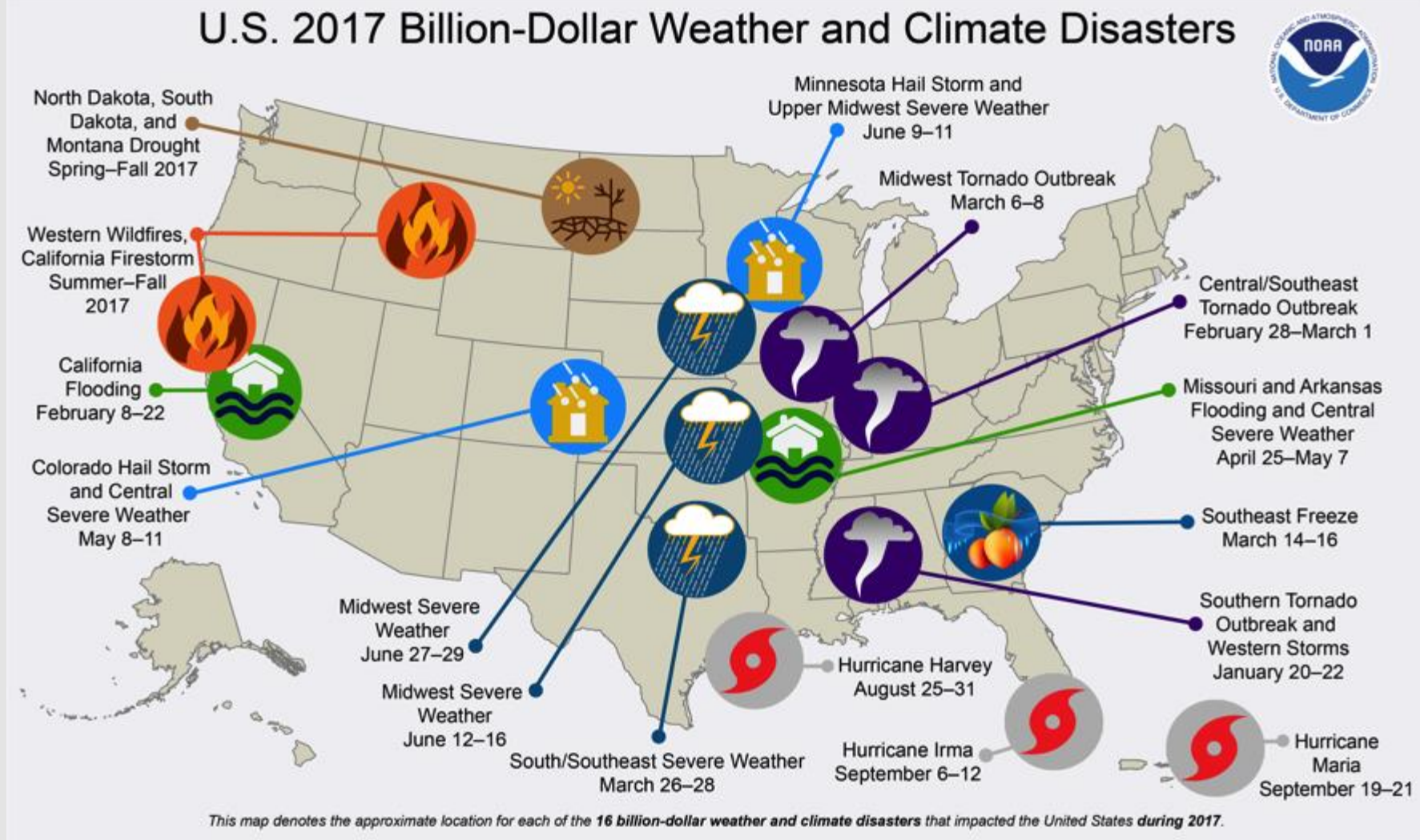
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# Center for Weather and Climate Products



# U.S. 2017 Billion Dollar Disasters



# Utility Company

- **From NCEI:** Climatological and historical datasets
- **Uses:** San Diego Gas & Electric combined climate datasets to create a set of criteria that minimize grid system weaknesses and litigation
- **Impact:** >\$2 billion in savings for similar events



# Logistics and Transport Industry

- **From NCEI:** International Station Meteorological Climate Summary
- **Uses:** FedEx, UPS, and major railways land planes, set speed limits, and determine where to hub
- **Impact:** \$1.48T in revenues, brand image

**Weather and Climate Data in Action**

The logistics and transport sector significantly contributes to the U.S. economy. NOAA's National Center for Environmental Information (NCEI) weather and climate data help ensure business continuity by managing weather-related risks to business operations.

**\$1.48 T**  
Logistics and transport contribute revenues of \$1.48 trillion to the U.S. economy.

**8%**  
That's 8% of annual GDP (2015).

The U.S. freight rail network transports 5 million tons of cargo on a daily basis.

The \$60 billion dollar industry operates on 140,000 miles of track.

That's enough track to circle the equator nearly 6 times!

Air and express couriers provide expedited and time-sensitive services for documents, small parcels, and high-value items.

This makes up an \$82 billion industry!

**Adverse weather poses a challenge for logistics and transport companies. NCEI's data helps air express couriers and railways reduce weather-related risk, optimize performance and customer satisfaction.**

**Railways access NCEI's station-based weather and climate data products.**

NCEI data are used to analyze weather and climate hazards to railway infrastructure.

These data also help planners optimize new track placement to minimize weather risk.

These analyses enhance safety and minimize weather-related service disruption.

**Express couriers like UPS rely on NCEI's record of airport weather observations.**

NCEI data are used to conduct probability analyses for effective operational decisions.

For example, on average, which airport, A or B, has better weather for takeoff and landing?

This information supports decision-making to minimize weather impacts on operations.

**NCEI's climate and weather data helps to protect businesses' profits and reputation, improve worker and bystander safety, reduce risk to equipment and property, and resolve legal liabilities.**

Over the last 10 years, sinkholes caused 366 derailments amounting to over \$167 million in losses! And extensive legal liability.

Analysis with NCEI's data informs procedures that help avoid derailments, potentially saving lives and millions of dollars in avoided losses.

NCEI's certified data serve as evidence in a court of law, helping railways to resolve legal liability.

A plane that is unable to land due bad to weather means that roughly 50,000 packages will be delayed! The courier then fails to deliver on its expedited service promise.

NCEI's data helps to mitigate weather-related delays to ensure packages arrive on time.

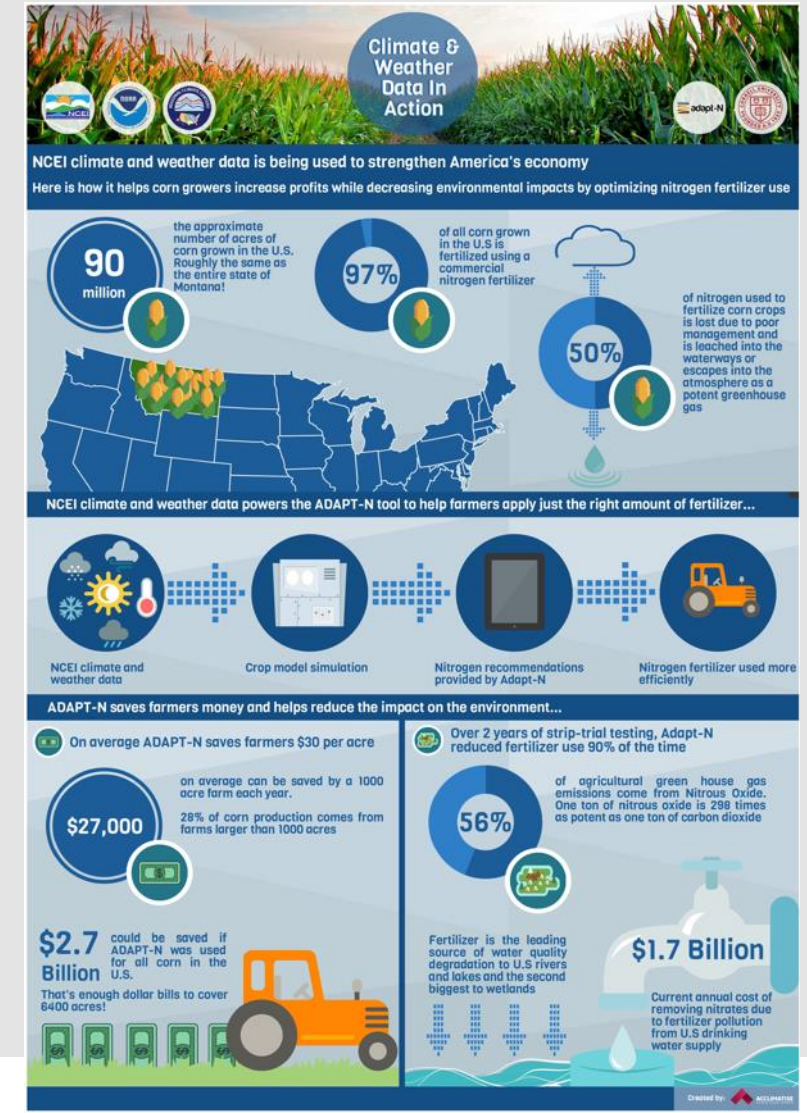
Delivering on time ensures customer satisfaction and protects against economic losses.

This work was performed under NOAA Contract DG132E-16-CG-0034 T0006

# Agriculture Industry

## U.S. Corn Growers

- **From NCEI:** Global Historical Climatological Network—Daily
- **Uses:** Farmers use climatological data to determine how much fertilizer to apply in order to minimize waste
- **Impact:** \$2.7B/yr saved in application costs; lessens runoff/water pollution (\$1.7B annual cost avoidance)



# Retail Industry

- **From NCEI:** State of the Climate Reports
- **Uses:** Conagra ties sales of dry goods to weather and uses trends to inform product sales forecasts and to stock stores
- **Impact:** \$100,000 lost revenue from in 2 regions from warm January

**Weather & Climate Data In Action**

Retail and manufacturing are the backbone of the U.S. economy. Weather and climate data from NOAA's National Centers for Environmental Information (NCEI) help these industries understand the past and plan for the future.

**16%+** In 2015, retail & manufacturing accounted for more than 22 million jobs (16.6% of total employment). 1 in 6 Americans are employed in these industries.

**6%** In 2016, the U.S. retail industry accounted for almost 6% of GDP. That's double the size of the entire housing industry.

Manufacturing contributes over \$2 trillion to U.S. GDP. A stack of \$2 trillion dollars in \$1 bills would weigh 20 tons. That's the weight of more than 12 cars (sedans!).

The U.S. has the largest manufacturing industry in the world. The U.S. produces 18.2% of the world's goods.

**\$64 billion** In 2016, investors made over \$64 billion in retail investments.

NCEI's Climate Monitoring products, including the State of the Climate reports and the Regional Snowfall Index (RSI), help retailers, manufacturers, and investors understand the impacts of weather on their business.

State of the Climate reports & RSI → Help retailers and manufacturers analyze sales performance relative to weather → Inform future sales goals, set budgets, and optimize product placement → Investors use data to inform decisions on prospective investments.

Weather influences retail and manufacturing in a major way. Understanding these impacts help businesses and investors understand past sales and plan for future success.

NCEI's 'State of the Climate' reports discuss climate-related conditions on a national and global scale. Retailers use these to better understand sales performance and budgets. Warmer winters mean lower heating costs for retailers. Foot Locker Inc. noticed that warmer temperatures meant lower utility bills across its 3,000 retail locations in the U.S. These savings can now be budgeted into business growth rather than expenses. **1.5° rise in temp.** Conagra, a major U.S. food company, found that a January temperature rise of 1.5° led to a drop in sales that cost over \$100,000. **\$100,000 in lost sales.**

NCEI's 'Regional Snowfall Index' (RSI) is used by investors to understand the degree to which winter weather affects prospective investments. Ridgmont Equity Partners mapped performance of an automotive repair business against RSI data. The analysis showed that the business performed best following snowstorms when there was greater demand for parts. **\$152 million** Investments in retail are also impacted by severe snow events. A single day shutdown in New York because of a major snowstorm can result in \$152 million in lost sales.

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# Other Case Studies

- Reinsurance
- Livestock Agriculture
- Air Transportation and Safety
- Private Sector Weather Providers
- Coral Reefs
- Fisheries (Gulf & Atlantic)

**Weather & Climate Data In Action**

The cost of extreme weather events in the U.S. is rising. Data from NOAA's National Centers for Environmental Information provides economic insulation against the impacts of weather-related catastrophes.

- \$3.5 billion**: Hail stones the size of baseballs fell on northern Texas in 2016. The storm cost an estimated \$3.5 billion in damage.
- \$11 billion**: In April 2011 a series of tornado outbreaks in the south east cost \$11 billion - the most expensive tornado events in a decade.
- \$154 billion**: Hurricane Katrina, caused \$154 billion of damage. It was the single largest loss event in the history of insurance.
- \$20 billion**: A catastrophe costing \$20 billion happens on average every 10-12 years.
- \$1.1+ trillion**: Combined cost of the billion-dollar weather-related disasters that have hit the U.S. since 1980.

The reinsurance sector uses climate and weather data from NCEI in two main ways: as input into catastrophe (CAT) models, and to validate the performance of CAT models.

NCEI weather and climate data is used to develop catastrophe (CAT) models. That are used by reinsurers to assess portfolio risk. And enable them to underwrite policies for insurance companies for \$60.5 billion.

The ability to price risk means that reinsurance can provide a safety net for primary insurance in the event of natural disasters. These sectors protect communities from the economic impacts of extreme weather events time and time again.

**Weather-related loss events worldwide (1980-2015)**

Number of events by peril

Peril	Color
Metereological events (Tropical storm, non-tropical storm, convection storm, local storm)	Green
Hydrological events (Flood, snow movement)	Blue
Climatological events (Wildfire, temperature, drought, heat wave)	Orange

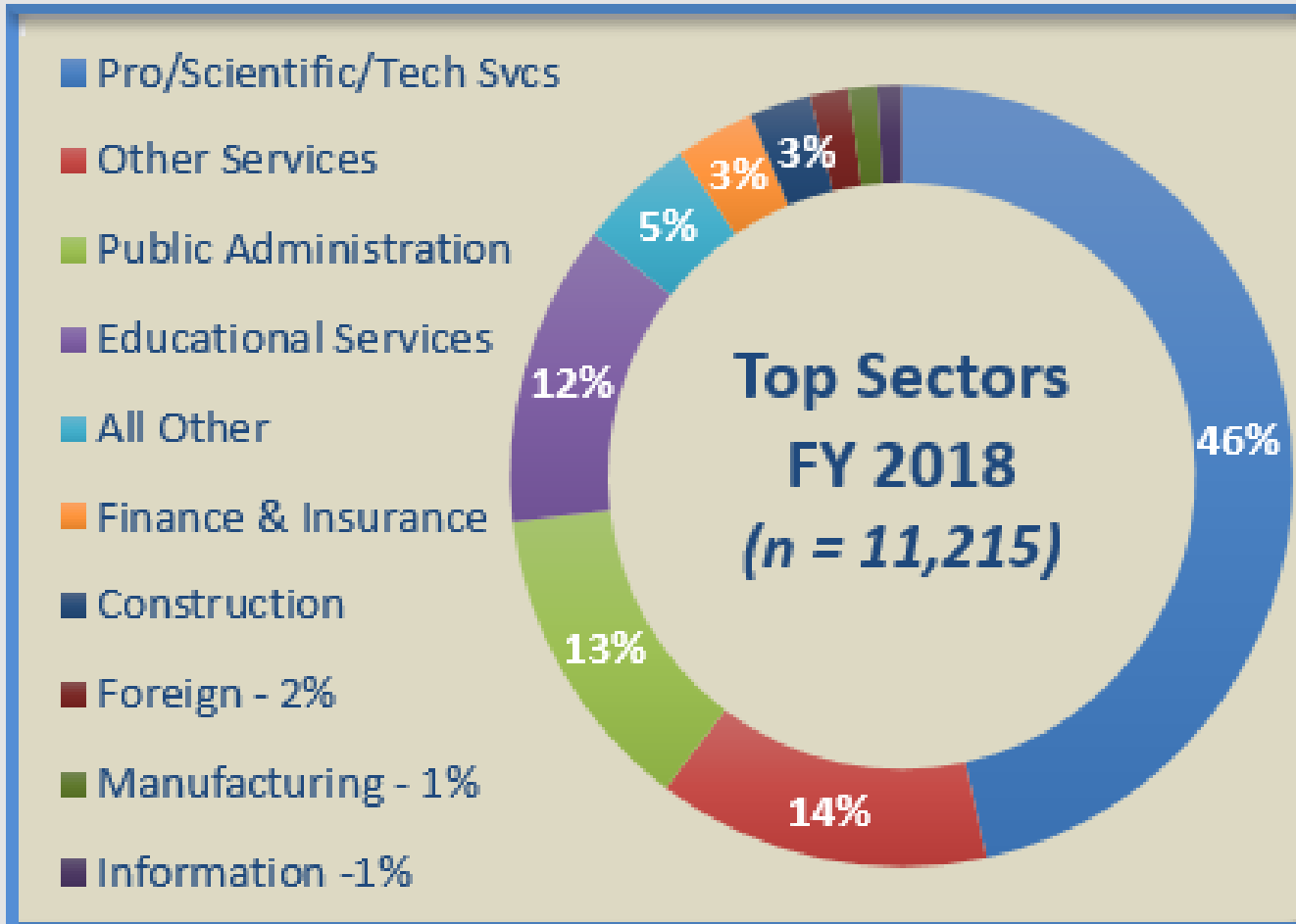
Weather-related loss events worldwide have risen by about 350% between 1980 to 2015.

- 7%**: The finance and reinsurance industry is the single biggest contributor to the U.S. economy, contributing 7% GDP or \$1.293 trillion.
- 65%**: Reinsurers usually bear around 65% of insured losses when a large natural disaster occurs.

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# NCEI Stakeholder Profile 2018



**Insights are  
difficult if you  
don't know  
your users**

For all stakeholders that contacted NCEI. Does not include those who view or download data without contact.

# Summary

- Every day, climate data adds to the quality of life of many people and communities
- From TV weather forecasts to Smartphone apps, data provide a backbone to our lives
- Safety, security, and many modern conveniences are built on climate data and information



# Contacts

- Websites
- [www.ncei.noaa.gov](http://www.ncei.noaa.gov)
- [www.ncdc.noaa.gov](http://www.ncdc.noaa.gov)
- [www.ncdc.noaa.gov/customer-support](http://www.ncdc.noaa.gov/customer-support)
- [www.ncdc.noaa.gov/data-access](http://www.ncdc.noaa.gov/data-access)
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