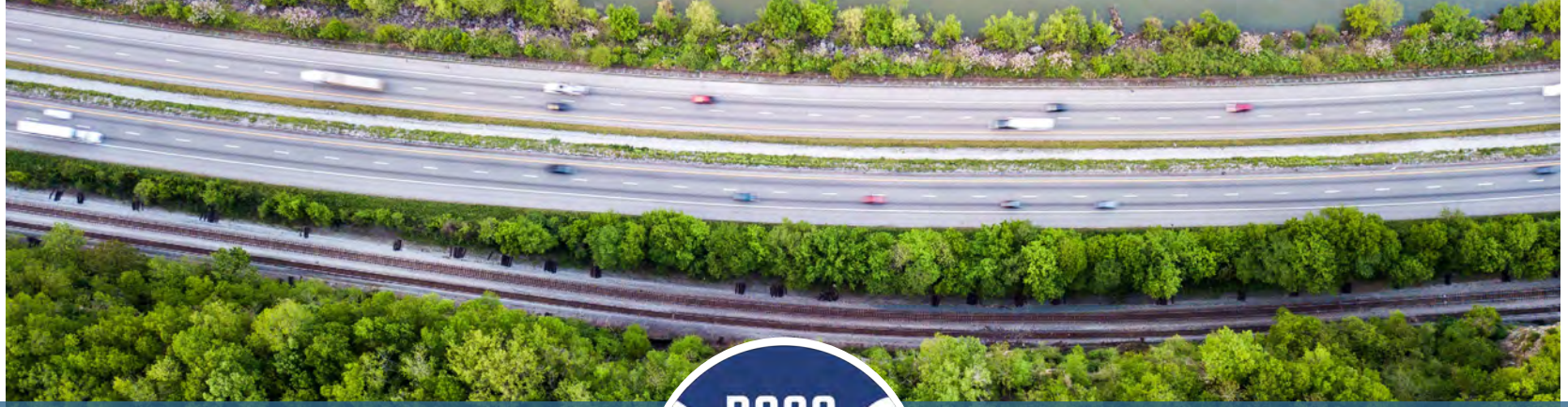


NOAA National Centers for Environmental Information

Sectoral Information
TRANSPORTATION

At a Glance

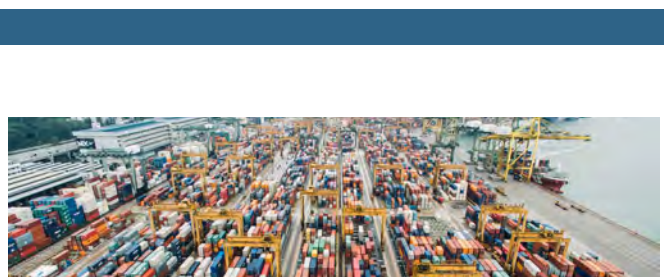
- **NOAA National Centers for Environmental Information (NCEI) delivers authoritative climate and weather data, products, and services including NOAA satellite, radar, and in situ observing systems that support the transportation sector.**
- **A host of climate and weather events influence the performance of the $1.7 trillion transportation sector, including snowstorms, extreme heat, fog, and hurricanes.**
- **The transportation sector relies on NCEI's climate and weather data to avoid delays and accidents, enhance safety, and plan and optimize performance.**

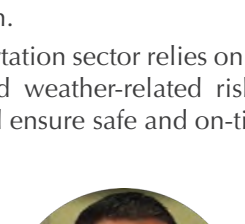
Sector Overview

The U.S. transportation sector, including air travel, ground and marine transport, and railways, facilitates the movement of people and goods across the country and world. An integral part of the U.S. economy, the transportation sector employs millions of people and contributes 9% or $1.7 trillion to the Gross Domestic Product (GDP).

Many climate and weather factors influence the performance of this sector. Snow and ice conditions can bring trucks and trains to a standstill, fog can prevent airplanes from safely landing, and rough conditions at sea may require a ship to change course or cause a loss of cargo. Infrastructure that supports the transportation sector including, airports, highways, ports, and warehouse facilities, is also vulnerable to damage and deterioration.

The transportation sector relies on NCEI's information to mitigate climate- and weather-related risks, inform strategic decision-making, and ensure safe and on-time services.





"If we didn't have NCEI's climate disk [International Station Meteorological Climate Summary] there would be a significant impact to our company in terms of trying to make accurate decisions to avoid weather impacts.

– Jeff Sarver, Meteorologist, UPS

Select Applications of NCEI's Data in Transportation

Strategic Planning of Airport Locations

Due to the time-sensitive nature of the service and daily impact of weather, express couriers like FedEx and UPS have in-house meteorology teams to advise aviation decisions. To understand the probability of weather impacts on operations, couriers depend on NCEI's International Station Meteorological Climate Summary (ISMCS), a record of climate summaries from over 6,000 stations, mostly airports, around the world.

When considering expansion into a new hub in the Southeast, UPS used the ISCMS to compare average weather conditions at Mobile, Alabama, and Pensacola, Florida. While the airports are only 59 miles apart, they exhibit unique fog frequencies resulting in different probabilities of successful landings. Analysis with ISMCS helped UPS make important planning decisions reducing weather-related disruptions.

Image: UPS plane landing in fog. The ISMCS informs decision-making and helps reduce weather-related disruptions. Photo ©UPS

Forensic Analysis of Aviation Incidents and Accidents

Following aviation accidents, public agencies like the National Transportation Safety Board (NTSB) conduct forensic analysis to understand probable causes. Using NCEI's archive of Next Generation Radar Data (NEXRAD), forensic analysts recreate weather conditions at the time of the accident to understand the weather-related drivers.

These analyses, and subsequent safety recommendations directed at airlines and public agencies, serve the interest of increasing safety, mitigating loss of life, and avoiding economic losses and liabilities associated with plane crashes.

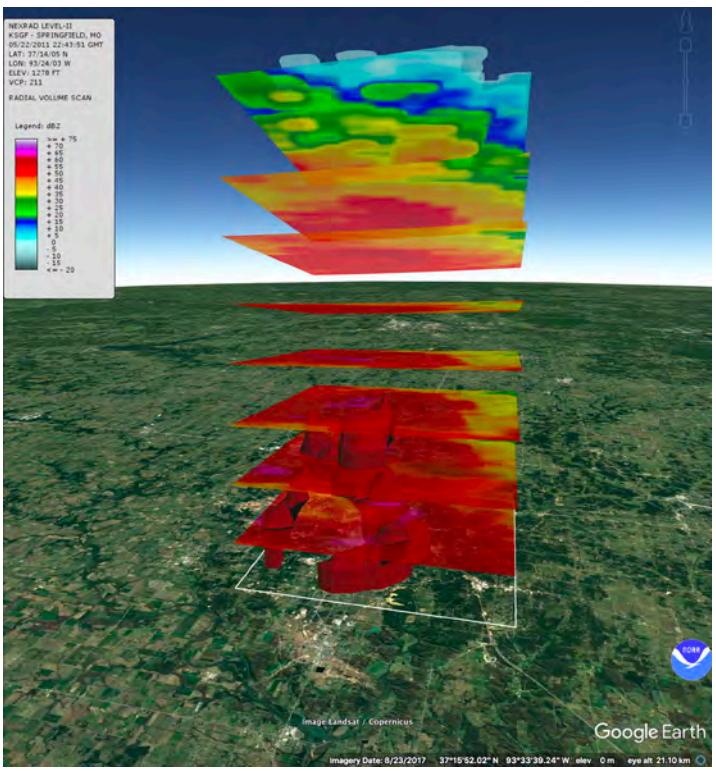


Image: The image, generated with the NOAA Weather and Climate Toolkit and Google Earth, represents the May 22, 2011 Joplin, Missouri, tornado. NCEI's archive of NEXRAD data shows storm formation and air pressure pertinent to analyzing the weather-related causes of aviation accidents.

Planning and Optimization for Railways

Sunlight and high temperatures can cause train tracks to expand and bend, forming a "sunkink". If undetected, a passing train can derail, potentially causing loss of life, extensive property damage, and liability. Between 2007-2017, sunkinks caused 366 derailments amounting to a reported $167.2 million in losses. Railways and their service providers conduct analyses using NCEI's in-situ or surface observation data products to understand how weather exposure leads to sunkinks.

These analyses drive management actions such as decreasing train speeds, carrying reduced loads during peak heat, or dispatching railway workers to search for visible signs of track damage to reduce risk and provide an on-time, accident-free service.

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.

For more information about NCEI, please contact:

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www.ncei.noaa.gov

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