



NOAA's Surface Weather Program

Each year about 7,400 people die and 700,000 are injured in 1.5 million weather-related crashes on the Nation's roads. The economic impact is staggering: \$42 billion in annual losses attributed to weather related crashes and delays.

NOAA's Surface Weather Program applies the agency's multi-modal environmental monitoring and prediction expertise to surface transportation. NOAA is partnering with the environmental and transportation communities to improve safety, mobility and productivity on the Nation's roads, rails and transit systems. Our goal is to develop solutions that enhance safety and productivity while moving people and freight safely and efficiently.



The Surface Weather Problem

Those who use the Nation's roads, rails, transit, and pipeline networks need more timely and accurate environmental information to support their decisions. According to U.S. Department of Transportation (DOT) statistics, the 10-year average for weather-related fatalities on the Nation's roads is approximately 7,400. Delay caused by adverse road weather has reached nearly one billion hours per year.

DOT statistics show that adverse weather was a factor in nearly 25% of total highway crashes. Most of these incidents occurred on wet roads. Reduced visibility and frozen/freezing precipitation (e.g. fog, snow, freezing rain) contributed to the remainder of crashes.

Surveys and assessments of traffic managers and road maintenance engineers have helped identify three fundamental deficiencies:

1. Lack of relevant surface weather observations and road condition data
2. Lack of road/environmental awareness
3. Lack of relevant weather and environmental analysis and prediction information, i.e., high resolution and at the transportation surface

The NOAA Surface Weather Program

The Surface Weather Program focuses NOAA resources on surface transportation weather deficiencies. Many states have invested in Road Weather Information Systems to support road maintenance and traffic management; however, there is no national system to integrate these observations into multi-use formats.

A priority for the Surface Weather Program is to shift the Meteorological Assimilation Data Ingest System (MADIS) from research into operation. MADIS provides a means to ingest data from disparate platforms and observation networks, ensure quality control, and output the information into standard formats. The result is near real time data sets available for numerous surface transportation and environmental applications:

- Model input
- Traffic management and road maintenance
- Traveler information services
- Weather and hydrologic warnings and forecasts.

Once shifted to operations, MADIS will provide public, private, academic and research organizations with high quality environmental data in near real time.

To help improve awareness, NOAA and the Federal Highway Administration established a formal partnership. One outcome of this partnership is a joint effort to inform state road maintenance and traffic managers about NOAA services. In addition, NOAA is now informing its National Weather Service staff about state and local DOT weather.

NOAA is committed to improving data assimilation techniques to improve prediction at finer temporal and spatial resolutions. To ensure weather and environmental information is relevant to the surface transportation system, the nation needs further research on known weaknesses. This includes research to improve the accuracy of prediction models for the atmospheric boundary layer (the layer near the surface).

NOAA will provide the private sector with data it needs to offer detailed route and application-specific analysis and prediction.



Benefits

Imagine trip planning that automatically factors weather and road conditions into route selection, travel time and traffic management. Imagine travel weather information available at your fingertips or by voice command in your vehicle. Imagine vehicles themselves providing environmental data and road conditions and sharing this data with meteorologists, transportation managers and even nearby vehicles.

One day you will be driving to work when suddenly a warning to **STOP NOW** flashes on your dashboard or windshield and a message from your vehicle's sound system tells you, "Icy road, accidents ahead—stop now!" This warning, courtesy of data from roadside sensors and fellow drivers' vehicles, will allow you to take action before you encounter the hazard! Government/industry partnerships and multi-discipline research will make this scenario a reality.



The nation's freight industry, in particular trucking, will benefit from more and higher resolution environmental data. The smooth flow of freight is important to our Nation's economy and to maintaining global connectivity as imports and exports flow through our ports, airports and borders. Almost every U.S. export and import depends on truck or rail service. Improved surface weather information combined with smart infrastructure will allow freight companies to operate more efficiently and safely.



As demand for freight transportation grows, so do the demands for efficiency and productivity. Environmental data relevant to the surface transportation system helps reduce

the cost of doing business. By including timely and accurate environmental data into their operating models, the freight industry can better use people and equipment and provide more reliable service. These savings can then be passed on to retailers, distributors, wholesalers, factories and manufacturers who can then carry smaller inventories.

Manufacturing industries can use time dependent production strategies with greater assurance that materials will arrive on time. If weather conditions change and materials are delayed, freight companies will be able to provide more accurate, advanced notice to customers, allowing them time to adjust labor priorities.

Weather information combined with road condition data and intelligent freight routing models will allow dispatchers to reroute their fleet to alternate routes. This information will also reduce pollution from vehicle emissions and save fuel wasted in traffic jams. Capital and labor are better used when a fleet can keep moving toward destinations.

Better surface weather data will reduce damage to the environment and expense from the over-application of winter maintenance chemicals.

NOAA's Commitment

NOAA commitment is to contribute its environmental monitoring and prediction expertise. Partnerships among industry, government and the research community, combined with rapidly evolving technology and increased awareness of weather impacts, will help reduce weather-related crashes on the roads, rails or transit systems.

NOAA can play a pivotal role by providing a foundation for the environmental needs of this community. The Surface Weather Program will advocate needs of the surface transportation enterprise within the agency. NOAA is committed to improving the level of service that supports the Nation's surface transportation system.

For more information contact:

Mike Campbell,
NOAA Surface Weather Program Manager
1325 East-West Highway, Silver Spring, MD 20910
mike.campbell@noaa.gov