Emerging from a wall of rain and hail as a storm deteriorates: An eastbound Union Pacific empty grain train departs North Platte, Neb., on May 17, 2000. Blair Kooistra

Only the crew of the *Chief* had any warning of an approaching tornado. The residents did not receive a warning from the National Weather Service until about three minutes after the tornado raked through town, killing one woman who was ejected from her home with one of her children and landed in a tree. Eleven were injured and much of the town was destroyed. The weather service initially thought the worst of the weather threat had already moved east into Kansas. Many survived this moderate intensity tornado, unlike the one in Greensburg.

WeatherData, a division of AccuWeather, had given BNSF a warning of the tornado at 7:45 p.m., valid from 7:55 p.m. to 8:25 p.m., enabling the Amtrak train to halt less than 10 miles from Holly. The tornado leveled the town at 8 p.m. The timing is such that it was quite possible the train would have been in the path of the storm without the warning.

Mike Smith, chief executive of WeatherData, emphasizes he is not in competition with the weather service. He says, in fact, he makes extensive use of weather service information. He noted this example is "not to indicate this is us versus them when it comes to the National Weather Service. We respect them and rely on their raw data." He says the example illustrates "the custom nature of the data we provide."

One of weather forecasting's legendary figures, John McCarthy, passed through Holly the following day aboard the *Chief*. McCarthy was one of a band of dedicated weather forecasters who persuaded a reluctant Federal Aviation Administration that a violent weather phenomenon, a downdraft called a microburst, existed and was killing airline passengers. He then invented and perfected terminal Doppler weather radar, which has all but eliminated microburst crashes.

Destruction knows no bounds

McCarthy, a railfan who travels by train whenever he can, says he was stunned by the sight of Holly. Such raw destruction is not a normal sight even for lifetime meteorologists. Emergency vehicles with lights flashing were still roaming town looking for survivors.

"I just looked out the window as the train slowly moved through what seemed like a set from the Wizard of Oz," McCarthy says. "I could not believe it."

McCarthy suspected that Smith had a hand in the save. The conductor knew only that the dispatcher had ordered the train to stop. So McCarthy contacted Smith, once his student at the University of Oklahoma.

"John e-mailed me and wanted to know if WeatherData had something to do with the stop order," Smith recalls. "After I checked our records, I found the answer was yes. Our meteorologists did their usual terrific job."

Smith established WeatherData in August 1981. He sold the company to AccuWeather in March 2006, but remains as chief executive. Basically, AccuWeather serves the public and the news media while WeatherData works with business clients to avoid the risk of high-impact weather.

Smith is a railfan. "I have a love of trains as a result of an uncle who loved trains and his father who worked as an engineer for the Santa Fe," he says. He has a model train layout, but says he models only railroads that are his clients. Major customers are UP, BNSF, Canadian National, Kansas City Southern, and RailAmerica. CSX is also a customer, but until recently only for hurricane threats to Florida.

Eddie Walker uses WeatherData's proprietary software. MSE: Katherine Bay

At its annual shareholders meeting in New Orleans in June, CSX acknowledged that it had made a mistake in not moving locomotives and rolling stock out of New Orleans before Hurricane Katrina hit land on Aug. 29, 2005. During tours of a sparkling new yard, with track that looks as if it could take 60-mph speeds, CSX officials showed photos of the destruction. Prominent were photos of lines of locomotives and cars half-buried in mud. A company like WeatherData could have prevented this expensive destruction.

WeatherData is not the only private weather service in North America. In fact, such services are growing rapidly. However, WeatherData seems to have wrapped up most railroad business. Smith says WeatherData is the only company that creates a complete suite of storm warnings independent of those of the government.

Tornadoes and hurricanes are not the only railroad-unfriendly natural disasters. Floods, including flash floods, can be killers, especially when welded rail continues to hang over gaps. Signal systems will remain clear even though the rail cannot possibly take the weight of a train.

Exactly that sort of situation transpired on the New England Central Railroad on Oct. 9, 2005. At 3:40 a.m., WeatherData told American Rail Dispatch Corp., which handles New England Central's dispatching, that a heavy rainfall near Putney, Vt., could lead to flash flooding and a washout at a low spot near a river. A passenger train, Amtrak's *Vermonter*, would be the next train over the bridge in a few hours. The dispatcher ordered an inspection, and indeed 90 feet of rail was suspended over a major washout.

"If the train had gone over that section at 59 miles an hour, there could have been fatalities," Tom Murphy, director of American Rail Dispatch, told the *Wall Street Journal*. "It would have been a catastrophe."

Beyond flooding, there are blizzards, high winds, and other phenomena that can cause trouble. In July 2007 in southeastern Kansas, the National Weather Service and other services predicted a minor flooding event. However, WeatherData predicted major flooding, enabling UP and BNSF to prepare and start rerouting trains. Twenty inches of rain fell over three days, producing major flooding.

Predicting a major blizzard can be a blessing to a busy railroad, enabling it to detour traffic in advance to more open routes. That happened beginning Nov. 25, 2007, when a blizzard hit Nebraska. BNSF began rerouting freight before the storm hit.

On July 19, 2006, WeatherData gave its clients 30 minutes warning that a windstorm with gusts to 80 mph was headed for downtown St. Louis from the north. Terminal Railroad Association of St. Louis allowed a train to cross a bridge over the Mississippi River just as the wind hit. The train derailed and piled up on the bridge. The railroad was not a client of WeatherData; it is now.

The history of weather forecasting is not so glorious. In fact, beginning in 1895, the chief of the U.S. Weather Bureau, Willis Moore, dictated that the words "hurricane" and "tornado" could never be used in forecasts. According to Smith, Moore had a phobia of misforecasting major storms and being wrong, so he simply banned use of the words, although it was OK to say a storm was *not* a hurricane or tornado.

Chief Executive Mike Smith, WeatherData

Strangely, his ban lasted through numerous administrations right into the late 1950s when stubborn meteorologists defied the ban and began research on shoestring budgets.

The science of weather forecasting has burgeoned since those days. Storm forecasting is so accurate, in fact, that meteorologists such as Smith have begun to muse whether the major problem now is getting the word to people in the path of the storm. One futuristic idea is a "reverse 911" system in which every phone and cell phone in a storm's path would be called simultaneously. It's already in place in a limited number of communities.

Meanwhile, U.S. weather remains among the most violent on earth. The world's most violent tornadoes are on the Great Plains; in fact, many parts of the globe have no tornadoes at all. Hurricanes hit only the U.S., the Caribbean, and Mexico in the Western Hemisphere, and only the countries of South Asia in the Eastern Hemisphere, where they are called cyclones. The North Atlantic in winter is the most turbulent ocean on earth.

Lately, the violence seems to have stepped up, with 2008 being one of the worst years for tornadoes in recent history. Feb. 13, 2008, in fact, could be called the "super Tuesday" of tornadoes because dozens of tornadoes raked across the Southeast, killing 57 people. They occurred on political "super Tuesday" when numerous states held primary elections. No railroad people were among the dead, even though a tornado tore across the BNSF yard in Memphis. All were warned.

Nonetheless, the death tolls are extremely low today compared with earlier in the century. A tornado at Woodward, Okla., in 1947 killed 181 people. Tornadoes in 1953 killed 114 in Waco, Texas, 115 in Flint, Mich., and 94 at Worcester, Mass. Thousands were injured.

A more dramatic example is Smith's comparison of the tornadoes that hit Greensburg in 2005 and nearby Udall in 1955. The tornadoes themselves were almost identical: both violent F-5s, and both from the south along nearly the same track. Both hit at night within 35 minutes of each other, both were cloaked by heavy rain and hail, and both towns lost 95 percent of their buildings.

At Udall, population 505, a total of 82 were killed and 260 were injured. At Greensburg, population 1,500, a total of 11 were killed and 59 injured. In other words, 68 percent of the population of Udall was killed or injured. The same figure for Greensburg was 4.7 percent.

The difference? Udall had no warning. Greensburg had a modern warning system that gave almost everyone time to seek shelter. The local CBS station, KWCH TV, has the WeatherData system, and constantly updated the tornado's progress. Together, the National Weather Service's warning and the media's continuous storm coverage as the tornado approached helped save more than 200 lives.

With WeatherData team's eyes on the storm, railroads avoid damaging equipment and, more importantly, losing lives. T

Blizzards dimming visibility: Union Pacific GP38-2 585, modified with a flanger for snow removal, waits to leave the maintenance-of-way yard in Truckee, Calif., on March 28, 2006. Ray Lewis

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