

Tech advancements improving accuracy in predicting weather

28 January 2009, By Andrew D. Smith

Study weather reports online, and you might want to give up on meteorology. "Deadly" storms fizzle, while weaker-looking fronts devastate. Temperatures often soar above predicted highs or plummet below predicted lows.

But for all the obvious errors, weather forecasting has gotten much better over the past couple of decades, and the improvements have saved many lives and dollars.

Further forecasting improvements will provide exponentially more benefits to individuals and businesses, although meteorologists doubt they'll ever be able to see more than a couple weeks out.

"Just having really accurate seven-day forecasts will change the world in countless ways," said Walt Zaleski, a warning coordination meteorologist from the National Weather Service office in Fort Worth, Texas.

"Airlines could move flight times to avoid storms. Retailers could schedule more workers for nice days. Utilities could prepare for surging power demands."

We're not there yet, of course, but we're much closer than we were 20 years ago.

The two-day forecast of today is as accurate as the one-day forecast was in 1988. The seven-day forecast now is as accurate as the five-day forecast was then.

Extreme-weather forecasts have improved even more over the same period.

People who once received on average five minutes' warning before a tornado - and no warning at all 74 percent of the time - now get 13 minutes' warning on average, and receive some warning 69 percent of the time.

Flash flood forecasts now come, on average, more than an hour before the floods themselves.

Much of the improvement comes from a new generation of radar that went into service in the early 1990s. Unlike older radar technology, which basically bounced off storms, today's Doppler radar units can peer through fronts and measure things such as wind speed.

The improvement of radar and other weather-sensing technology complements the continual upgrades to computers. More sensors generate more numbers. Faster computers crunch those numbers. And the cycle keeps repeating.

"Not only will we become more accurate over longer periods, we hope to shrink our forecast areas and to forecast different conditions inside the same forecast area," said Mark Fox, a weather service meteorologist in Fort Worth.

"For example, rather than forecasting rain for the entire Dallas-Fort Worth area, we might be able to say it will rain in Dallas but not Fort Worth - or that the rain will hit Fort Worth at 3 and Dallas at 4.

"If you look far enough into the future, we might be able to say it will rain in West Plano but not in East Plano, but that's a long ways off."

Getting to that point will require far better equipment and some big discoveries.

Researchers have already developed the next generation of radar, which sees in all directions at once rather than spinning around.

Perhaps more important, dozens of companies are developing cheap sensors that can provide computers with real-time information in numerous locations.

Rather than getting data from a few dozen spots in

any given area, meteorologists will eventually get data from thousands of spots.

Many companies already use weather forecasts to save money. Shippers route their trucks away from storms, for example. Farmers cover crops on frosty nights. Builders wait for sunny weeks to pour concrete.

More accurate forecasts will make all of that much easier.

A shipper who sends trucks 500 miles out of the way might eventually be able to cut the detour to 100 miles. Builders will see fewer surprise showers that keep their cement from drying properly.

Optimists see even more potential.

Weather affects nearly everything - crime rates, health, even how many people go to stores, restaurants and movies. Accurate forecasts could allow police departments, hospitals, restaurants and other organizations to optimize their staffing for any given day.

Sound far-fetched? British hospitals already work with forecasters to predict surgeries for various ailments affected by the weather. They use those predictions not just to set staffing levels but also to schedule nonemergency procedures on days that are likely to produce fewer emergencies.

"Another area we're excited about is getting more factors into our forecasts, things beyond temperature and precipitation," said Harold Brooks, a research meteorologist at the National Oceanic and Atmospheric Administration's Severe Storms Lab in Boulder, Colo.

"People now might decide that Friday looks like a good day to cut the lawn because we say that it's going to be sunny and cool, but they might change their minds if we could tell them to expect a high UV index and a lot of pollutants in the air.

"That's quite a few years away, but we'll get there."

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