

PRIMER ON CLIMATE CHANGE

by Tom Kuennen

Can You Depend On Long-Range Weather Forecasts, Scenarios?

June 2000 -- Why is it that when the weather forecast calls for sunny and pleasant, an all-day rain will dampen your picnic? It's because ultimately, weather forecasts are educated guesses.

But the new draft of a U.S. government document -- released for public comment in June 2000 -- takes long-term weather or climate forecasts and uses them to describe potential changes in the United States' ecology, economy and lifestyles over the next 100 years.

This poses the question: If they can't accurately forecast the weather five days from now, how can they forecast it into the next century?

Scary scenarios posed

The proposed *U.S. National Assessment: The Potential Consequences of Climate Variability and Change* was released for public comment June 12.

"Four years in the making, the report reflects the most ambitious attempt to gauge the impact of climate change on America," reported the Associated Press.

The assessment takes two different climate change forecast models and prognosticates big changes for this country. And while the assessment includes some positive aspects of presumed climate change -- such as enhanced hardwood forests -- overall, it offers scary scenarios of a changed United States.

"Some ecosystems that are already constrained by climate, such as alpine meadows in the Rocky Mountains, are likely to face extreme stress, and may disappear entirely," the draft states. Other anticipated events include the forests of the Southeast breaking up into a mosaic of forests,

savannas and grasslands, and the loss of sugar maples in the forests of the Northeast.

"Sea level rise will very likely cause further loss of coastal wetlands ... and put coastal communities at greater risk of storm surges, especially in the Southeast," the draft national assessment states. "Reduction in snowpack will very likely alter the timing and amount of water supplies, potentially exacerbating water shortages and conflicts, particularly throughout the western U.S."

How reliable are forecasts?

So how reliable are these forecasts? Weather forecasts are based on review of various supercomputer model projections. Studies of forecast accuracy indicate predictions as far as seven days can be accurate enough to be useful.

But new supercomputers and prediction models often are powerless to predict even short-range changes. That's what happened on the East Coast in January.

There, a new National Weather Service (NWS) supercomputer -- put online Jan. 18 -- was being leased for two years at a cost of \$35 million. In January, the NWS computer was operating at five times the speed of its predecessor, with an operating speed of 28 times faster anticipated by September 2000.

But it wasn't fast enough a little over a week later to predict a 15-inch snow on Tuesday, Jan. 25 at Baltimore-Washington International Airport, and over 9 inches at Ronald Reagan Washington National Airport, breaking a 95-year-old record there. Early forecasts had predicted partly sunny and mild for Tuesday. It wasn't until 9 p.m. Monday that winter storm warnings were issued.

Similarly, in Atlanta during the week of Super Bowl XXXIV held there, schools and businesses were closed in advance of predicted winter storms that never came.

Seasonal predictions off, too

While short-term forecasts often are off-target, the NWS is using longer-term models to predict seasonal forecasts. But these are often wrong, too. For example, early this year the federal government predicted continuing drought and hot temperatures throughout the upper Midwest through 2000.

Instead, persistent rainy, cloudy cool weather eliminated the threat of drought and has pushed grain crop futures lower.

"At about the time the government began warning about the danger of drought, we started getting rain," said Dan Zwicker, grain analyst with

Agrivisor, an advisory service affiliated with the Illinois Farm Bureau, as reported in the Chicago *Tribune*. Now, with just the right moisture, a bumper crop of corn could be on the way, he said.

And in mid-June in east central Iowa, adequate to surplus soil moisture levels, with cooler than average temperatures, were reported by Iowa Agricultural Statistics, Des Moines.

Changing the rules

Even the rules under which weather reporting takes place can change in mid-stream. For example, the wind chill index is used in winter to estimate the effect of cold air temperatures combined with wind speed on exposed skin.

The wind chill reading -- which always is lower than air temperature, and is used to dramatic effect by television weathercasters -- is supposed to indicate what the cold weather "really feels like" to people outside.

But in February 2000 Maurice Bluestein, a professor of mechanical engineering technology at the University of Indiana-Purdue University at Indianapolis, offered proof that wind chills are actually about 10 degrees higher than previously thought.

He is proposing that the NWS revise its wind chill scale, because businesses and schools make decisions on whether to stay open based on predicted wind chills, with accompanying economic and educational losses.

Policy based on speculation

It's probably not fair, or correct, to judge the accuracy of supercomputers and weather forecasting models based on individual events. The models incorporate long-term data and experience to come to their conclusions, and must be judged over the long term.

However, it's just as incorrect to set national public policy -- such as global warming regulations -- to forestall presumed ecological disasters on the basis of climate models which may be just as flawed as the weather forecasts we all endure.

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