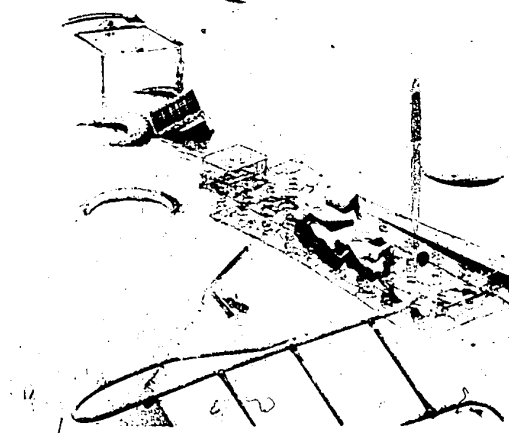


OBSERVER NEWSPAPERS

LEFT: From the Plymouth Rd. overpass, you couldn't tell which was the Rouge River and which was the E.N. Hines Parkway. This was the road scene Wednesday morning in Plymouth.

RIGHT: A constant headache to Houghton and Mason street residents, in southwest Livonia, was aggravated Wednesday when more water collected in this pond. Mothers complain the area is a breeding ground for mosquitoes, snakes and rats, hence unsafe for dozens of young children who live nearby.



Warm, Muddy Water

What suburbia's lawns and farms needed was a number of gentle, slow-soaking rains. What they got was a down-pour—one of the worst in years—that flooded streets, interrupted power service, produced mosquito-spawning ponds, dampened floors and basements, and washed-out gardens.

Worst flooding in 10 years, said Plymouth city officials. "A five-year rain," said Livonia's engineering office.

THE WESTERN suburbs appeared to be harder hit than the surrounding city and rural areas. Whereas Metropolitan Airport reported 0.63 of an inch in a 24-hour period, the Livonia engineering office measured

3.45 inches in only a slightly longer period, 26 hours. What made it a "five-year rain"—that is, a rainfall one could expect once in five years—was the 1 1/2 inches that fell in a single hour, from 7:30 to 8:30 Wednesday morning. Another 1.35 inches were recorded from 5:10 p.m. to 9:30 p.m.

Farmington got off relatively easily. Traffic was tied up when foot-deep water ran over the streets at Eight Mile and Grand River, Detroit Edison Co. there reported only five calls, mostly for minor lightning damage, and no areas or substations without power. Only Farmington flooding reportedly was in the township's

Woodbine Subdivision, where sewers are being constructed. Plymouth's flood waters couldn't get through tubes at Burroughs and Coolidge streets and backed up for two hours. Several streets reported flooding.

Water reached the floors of mobile homes in a Ridge Road trailer court. The Plymouth fire department reported wires down on Hamilton between Ann Arbor Trail and Maple, and on M-14. In the township, wires were down in several places, and lightning did light damage to two houses on N. Territorial Road.

A power failure knocked out lights in Plymouth's West Junior High School, at Sheldon

and N. Territorial roads, delaying a Wednesday assembly program an hour.

LIVONIA SEENED hardest hit. Lightning hit two poles on Farmington Road south of Five Mile. The electrical failure which resulted set off burglar alarms in city offices. The public works department reported at least 20 flooded basements—in Sunset Hills, Roseale Gardens and scattered points—along with a dozen flooded back yards and 14 flooded streets.

A COMPLAINT to this newspaper came from residents on Houghton Street in the Schoolcraft-Newburgh area. Excavations by a development

firm west of Houghton have left several broad holes that fill with water. The ponds that are created are a breeding ground for mosquitoes, rats and snakes, and people use the open area as a dump.

The water there—as everywhere, for that matter—is a small boys' playground, but the residents said the depth is a potential hazard to small children.

As usual, the Edward N. Hines Parkway, which runs from Northville through Plymouth and southern Livonia to Dearborn, collected a heavy amount of water. It's in a low spot, paralleling a branch of the Rouge River.



PUDDLES ARE FUN — at least to sisters Sandra and Sherri Ferguson, who waded along Jacksonville Street near Grand River (the ave-

nue, not the stream) in Farmington Township. Not far away, however, traffic was tied up for a half-hour.



TWO PLYMOUTH TOWNSHIP public works employees worked on a plugged drain along E. Ann Arbor Trail. Parts of Plymouth had their worst floods in 10 years.

U-M Meteorologist Explains

What The Weatherman's Odds Mean To You

Q. & A.

We may be unable to do much about the weather, but we can clear our activities to the weather—especially if we have good forecasts and know precisely the odds that something will occur.

So contents Prof. Edward S. Epstein, a meteorologist at the University of Michigan. The weather Bureau supplements its forecasts of "possible showers," or "chance of snow" with the mathematical odds—"40 per cent chance of rain" or "20 per cent chance of snow." These, Epstein says, acknowledge the uncertainty of forecasting.

The National Science Foundation has granted him \$12,500 for studies of how to evaluate probability forecasts, work that involves a knowledge of probability statistics as much as meteorology.

So we dropped into his Ann Arbor office one day to talk about the weather.

Its Economics

Q. Many city-dwellers can go from their houses to their garages without going outdoors, drive to work, walk a few feet to the office or plant and work indoors all day. We get lots of weather reports, but is urban America really as dependent on the weather as the agricultural America of 75 or more years ago?

A. Prof. Epstein: "We can do something about our activities more so than in the past; the forecasts are more useful. In times past, forecasts may not have been available. But even if they were, in the rural, agricultural society there was little that could be done about it."

"Today we're in activities—particularly major economic activities—such that we can react to these forecasts and do something about it, and there can be major economic benefits from the right kind of response to weather information."

"A major example might be something like the construction industry. I know of a study of the impact of weather information on the construction industry, which happens to be a major contributor to the gross national product. It was found quite clearly the value of weather information is very substantial."

"Certainly, you and I can get along very well without this weather information—get into our cars and drive through. Unless it happens to be a situation where the roads are impassable, we can get along without it for our every day activities."

"But weather changes have much more of an impact economically than they ever had before. In the past, we used to think tornadoes were very infrequent . . . but as we look at our records, the number of tornadoes seems to have gone up. This isn't because they have really gone up, it's because there are more people around to see them and to get in their way. A tornado can do a tremendous amount of damage to an urban society."

Q. What you're saying then, is that we may not be able to do anything about the weather, but we can do something about our activities and economic decisions if we have good weather information.

A. Epstein: "That's exactly it. 'One of the most important things is to get weather information to the public so they can make the right kinds of decisions.'"

He also cited electric utilities' dependence on weather information for scheduling repair crews and materials.

What Odds Mean...

Q. When the weather forecaster predicts a "40 per cent chance of rain," what does this mean? Does it mean that 40 per cent of the area will have rain? Or that the entire area has a 40 per cent chance of rain?

A. Epstein: "Let me say first that the probability statement is probably the best way

of communicating to the public the maximum amount of information about the weather in a concise form.

"The forecast of the probability of precipitation should be interpreted as it would intuitively be interpreted if one didn't worry too much about what it means. It other words, it represents the chance that you will experience precipitation within a particular period no matter where you are in the area of the forecast."

"Now the probability represents the fact that the forecaster can't give you an exact statement as to where and when rain will fall. Sometimes it is because there's a situation where rain will fall in some areas and not others; he is not able to say where the rain will fall. One could argue in very scientific terms why this is impossible, but let's just say it can't be done, as things are now . . ."

"On the other hand, there's also the fact that maybe the total precipitation system will not necessarily develop in a well predictable fashion, so there is that uncertainty whether precipitation will occur at all."

"(Now the forecaster's statement is actually a combination of these two factors.)"

...What They're Worth

Q. You're doing some work in the mathematical evaluation of weather forecasts. Can you tell us about that?

A. Epstein: "We have not evaluated any forecasts, but rather we have been concerned with how does one proceed to make these evaluations,

"We've been most interested in evaluating these probability statements. The problem one faces in any kind of evaluation is that the reason you carry it out will affect the way in which it is carried out."

"The easiest example: It is easy to conceive of a situation where these forecasts be very valuable in one sense and not very useful in another. The example might be comparing two users of this information—one may want to carry out an activity any time there's a reasonable chance there won't be any rain; if it rains, it won't hurt him too much. If there's a 70 per cent chance of rain, he'll go ahead."

"Someone else may be involved in an activity where rain might be disastrous, economically, if the probability of rain is beyond, say, 10 per cent."

"Now a particular set of forecasts may distinguish very well between those chances when the probability is 90 per cent vs. 50 per cent. Let's take the extreme case where the forecaster always says either 90 per cent or 50 per cent. The person who makes his decision depending on whether the forecast is above or below 70 per cent is very happy. But the person who has to wait until the forecast is less than 10 per cent can never do his job."

"Obviously, if you're trying to evaluate the forecasts, it depends on whose interests you have in mind . . ."

"The forecaster is interested in evaluation in a different sense. He would like to say nothing but zero per cent or 100 per cent, but he knows he can't do this. So he wants to know how closely he approaches this ultimate objective . . ."

"The probability represents his best judgment. Now, how good is his judgment? If he kept forecasting 75 per cent chance of rain, and it rained on three (consecutive) occasions, he'd have to recognize that this could happen

just accidentally. If it happened 10 or 15 times, he'd have to recognize something was wrong with his forecasts."

"What we've done is developed a scheme where we've given him 'limits'."

"Let's say he has made a forecast of 40 per cent probability of precipitation on 20 occasions. We'd expect eight times it should have rained, though it could have been six or nine or something close to eight."

"On the other hand, if it had rained only three times, then there is good reason to think something is wrong. The forecaster knows the 'limits' we've evolved for this situation—40 per cent probability 20 times—the limits are between four and 12." (That is, he is reasonably correct if there were rain not less than four nor more than 12 times; and if he approached the upper or lower limits, however, he would suspect his own accuracy.)

Human Judgment

Q. A number of times, you have used the word "judgment." We know weather forecasters have many more tools and sources of information, some even coming from satellites. Is there really room for "judgment" in modern weather forecasting?

A. Epstein: "There's still probably more room for judgment than many of us would like to see."

"We have many kinds of tools, analyses, computations. A forecaster is given a great deal of guidance from the most sophisticated of equipment—this includes the satellites and the largest computers available."

"He has to assimilate all this information, and he has to put it together in terms of his own knowledge, his own experience in the area for which he is issuing a forecast."

"So his judgment still plays a very major role in the forecast."