BBC Weather

Probabilistic Forecasts - Do you want to be happy?

Experts at the London School of Economics are using new types of weather forecasts to save you time and money.

They use "probabilistic" forecasts, such as "20% chance of rain" to help businesses and individuals make some unusual decisions. Although the course of action they'll suggest may seem bizarre in the short term, they claim that your overall "happiness" over a longer period will be improved.

Here's an example - I want to go out to dinner every Friday for the next year. I also want to wear my posh new dinner suit. Should I pay for a taxi every night, or should I walk, and risk a freak rain-shower ruining the suit?

If there's any chance of rain at all, I'm going to take the taxi. After all, the DJ wasn't cheap. But is this the right thing to do? If the taxi fare is quite steep, I might end up paying more on transport than I would on the occasional replacement dinner suit!

Okay, it's unlikely I'll find myself in this situation. I'd probably never walk to the restaurant, and besides, I could always buy an umbrella. But it shows that what seems like a good short-term decision could cost me more in the long-run.

Let's get more realistic. You own a café, and if the weather's dry, you can open your outdoor pavement section to attract more customers. You do however have to book an extra waiter in advance to cover that section. If it actually turns out wet, the waiter will have nothing to do, but he'll still need to be paid.

It may seem sensible to only book the waiter when the forecast guarantees tomorrow will be fine. But

Also see:

A to Z Index

Sports features

Travel features

Flood Risk Areas

Year So Far

SKI-ING

Off to the slopes?
Check out our World
Skiing Guide.

SPORT

If you're off to a sporting fixture this week, check out the sporting forecasts

calculating your "happiness matrix" (where happiness means profit!), you'll find that depending on your expected additional profit and the waiter's wage, it might be worth a gamble on a heavy chance of rain.

To see an example showing how much profit you could make, click here.

How are probabilistic forecasts different from normal forecasts?

Traditional forecasts commit themselves to a certain weather prediction. However, we can't know the precise state of the weather everywhere today, and so we don't really have an accurate starting point to predict from.

The Met Office and the European Centre for Medium Range Weather Forecasting reflect this uncertainty by taking many starting points, all slightly different, and producing an ensemble of predictions.

Tim Palmer, from the ECMWF, explains: "The atmosphere is a chaotic system, which means that small errors in observing the atmosphere will grow during the forecast period, and eventually lead to complete loss of forecast accuracy.

If the atmosphere is in a chaotic state, the individual forecasts within the ensemble will diverge dramatically within a couple of days.

Conversely if the atmosphere is in a predictable state then the individual forecasts within the ensemble will more or less tell the same story a week or more ahead."

So, if many of the ensemble forecasts predict rain, there is a high probability of rain. If only a few predict it, there is a low probability. The LSE experts believe this can be more useful than traditional forecasts.

Ken Mylne, Ensemble Forecasting Research Manager at the Met Office, agrees: "A traditional forecast gives our best estimate of what will happen, but this is not the best information for all users. Probability forecasts allow our customers to make rational judgments based on their own cost/loss sensitivity. By contrast a conventional best-estimate forecast is well-tuned for only a minority of potential users".

The atmosphere is too huge to be analysed or predicted perfectly, which means weather forecasts are always going to be tinged with uncertainty. The best we can hope for is to predict how likely bad or good weather will be, and use the probability effectively to maximise our happiness.

As Mark Roulston, visiting fellow at LSE, says:

"Every time you make a decision in the face of uncertainty you're effectively gambling. Probabilistic forecasts let you know whether the odds are favourable."

Related links
Probabilistic Forecasts Part 2
Met Office
ECMWF

(The BBC is not responsible for the content of external websites)

| Other Features: | ▼ | GO |

- -

Top: ▲

- -

About the BBC | Help | Terms of Use | Privacy & Cookies Policy