Why Forecasts Go Wrong

Name: Date: Class:

Read the lesson at myweatherrock.com/journal/explainers/why-forecasts-go-wrong (or the printed copy), then answer below.

Remember

Forecasts go wrong because the atmosphere amplifies small errors. No set of observations is perfect or complete, and the equations of weather compound every imperfection, doubling small differences until two nearly identical starting points produce two different weekends. That is chaos, demonstrated by Edward Lorenz in 1963, and it is why forecasters now run ensembles: the same model dozens of times with slightly wobbled starts, reading confidence from the spread. You can watch the decay in this site's own graded record: as of the receipts page's August 13 update, our wet-or-dry calls verified 92 percent of the time one hour out and 77 percent at 48 hours. Same rock, same math, longer lead.

Questions

1. What did Lorenz's 1961 rerun demonstrate?

- ☐ A. His computer was broken
- ☐ B. Tiny differences in starting conditions grow into completely different weather
- ☐ C. Weather models need more than twelve equations

2. Why do forecast centers run the same model dozens of times with slightly different starts?

- ☐ A. To keep the computers busy between storms
- ☐ B. Because the starting snapshot cannot be perfect, and the spread of results measures confidence
- ☐ C. To average away the need for observations

3. On this site's own graded record, what happened to wet-or-dry accuracy between 1 hour and 48 hours of lead?

- ☐ A. It held steady near 92 percent
- ☐ B. It fell from 92 percent to 77 percent
- ☐ C. It rose, because longer forecasts are more careful

4. The 12-hour row on the receipts page reads 96 percent, better than the 1-hour row. The right reaction is:

- ☐ A. Forecasts are most accurate at exactly 12 hours
- ☐ B. Suspicion: 175 calls is a small sample, and small samples wobble
- ☐ C. The 1-hour forecasts must be broken

5. Which part of a day-ahead forecast typically misses by the most?

- ☐ A. Temperature
- ☐ B. Precipitation placement and timing
- ☐ C. The date

In your own words

The forecast for next Saturday changes three times during the week. Using error growth, explain why that is honest behavior from a forecaster and not a broken forecast.

Answer key (for the teacher)

1. What did Lorenz's 1961 rerun demonstrate?

B. Tiny differences in starting conditions grow into completely different weather — He re-entered rounded numbers, one part in ten thousand off, and the rerun diverged from the original entirely. The atmosphere's equations amplify small errors rather than forgetting them; he published the result in 1963.

2. Why do forecast centers run the same model dozens of times with slightly different starts?

B. Because the starting snapshot cannot be perfect, and the spread of results measures confidence — That is an ensemble. Agreement among the runs means the atmosphere is in a predictable regime; scatter means the answer is genuinely not knowable yet, and the spread says so honestly.

3. On this site's own graded record, what happened to wet-or-dry accuracy between 1 hour and 48 hours of lead?

B. It fell from 92 percent to 77 percent — The receipts page's August 2026 update grades 92 percent at one hour and 77 percent at 48. That decay is error growth measured on real published forecasts, ours.

4. The 12-hour row on the receipts page reads 96 percent, better than the 1-hour row. The right reaction is:

B. Suspicion: 175 calls is a small sample, and small samples wobble — Skill cannot genuinely improve with more lead. A thin sample bounces around its true value, which is why the receipts page flags small samples instead of bragging with them.

5. Which part of a day-ahead forecast typically misses by the most?

B. Precipitation placement and timing — On our own ledger, temperature misses stayed near two and a half degrees at every lead while wet-or-dry accuracy fell steadily. The yes-or-no and the when are what lead time eats first.

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