

Why do we forecast ?

To reduce uncertainty about future!

Measure reduction of uncertainty using skill score

- Accuracy vs skill – is the distinction relevant to users?
- References:
 - Persistence (Eulerian or Lagrangian, short range)
 - Climate (sample – hard to beat, long term, medium range)
 - "practically perfect forecast" – important for extreme events
 - Other method (other model, automatic vs human forecasters, competitors (not systematic - single cases, "fatal skill"))
 - What about references for new spatial/fuzzy methods ?
- MET: what reference for which user?

$$ETS = \frac{a - a_{ref}}{a + b + c - a_{ref}}$$

$$ETS_{low_resolution} = \frac{0 - 0}{a + b + c} = 0$$

$$ETS_{high_resolution} = \frac{a_{sample_random} - a_{sample_random}}{a + b + c - a_{sample_random}} = 0$$

$$ETS_{high_resolution} = \frac{a_{sample_random}}{a + b + c} > 0$$

Extremes verification – extremely difficult

Questions

answers

- Can not get away anymore with violation of a lot of the assumptions inherent in using statistics to do verification (Gaussianity, small bias, fixed variance) – THINK, TRANSFORM,
- Categorical ver: base rate influence
- Continuous: amplitude (link to reference forecast)
- Extreme events or/and extreme errors
- Additional parameters for warnings: lead time and duration flexible to a certain degree
- Gross observational errors tend to be extreme – skewed loss function: "a miss is worth a thousand false alarms"
- Use other reports (tornado spotters, statistics from insurance companies, ...)
- MET: allow for good analysis of (more than one) standard case studies of extreme events, maybe store collection of all obs, including non-standard ones.
- Confidence intervals particularly important for extremes and case studies

- "extremes analysis", when assumptions for optimum interpolation like analysis are strongly violated
- Scores: include everything + EDS
- MET: stratification of data particularly important