Interpretation of Output – Grid and Point Stat

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Point and Grid Stat Output Lines

- CTC - Contingency Table Counts

- CTS - Contingency Table Statistics

- CNT - Continuous Statistics

- FHO - Forecast, Hit, Observation Rates

- PCT - Contingency Table counts for Probabilistic forecasts

- PSTD – Contingency table Statistics for Probabilistic forecasts with Dichotomous outcomes

- PJC - Joint and Conditional factorization for Probabilistic forecasts

- PRC - Receiver Operating Characteristic for Probabilistic forecasts

- SL1L2 - Scalar L1L2 Partial Sums

- SAL1L2 - Scalar Anomaly L1L2 Partial Sums when climatological data is supplied

- VL1L2 - Vector L1L2 Partial Sums

- VAL1L2 - Vector Anomaly L1L2 Partial Sums when climatological data is supplied

- MPR - Matched Pair data

Point and Grid stat output example

Header Line:

TOTAL BASER   BASER_NCL BASER_NCU BASER_BCL BASER_BCU FMEAN FMEAN_NCL FMEAN_NCU FMEAN_BCL FMEAN_BCU ACC   ACC_NCL ACC_NCU ACC_BCL ACC_BCU FBIAS   FBIAS_BCL FBIAS_BCU PODY PODY_NCL PODY_NCU PODY_BCL PODY_BCU PODN PODN_NCL PODN_NCU PODN_BCL PODN_BCU POFD POFD_NCL POFD_NCU POFD_BCL POFD_BCU FAR FAR_NCL FAR_NCU FAR_BCL FAR_BCU CSI   CSI_NCL CSI_NCU CSI_BCL CSI_BCU GSS   GSS_BCL GSS_BCU HK HK_NCL HK_NCU HK_BCL HK_BCU HSS HSS_BCL HSS_BCU ODDS ODDS_NCL ODDS_NCU ODDS_BCL ODDS_BCU

Data Line:

CTS   5   1.00000 0.56552 1.00000 NA   NA   0.40000 0.11762 0.76928 NA   NA   0.40000 0.11762 0.76928 NA   NA   0.40000 NA   NA   0.40000 0.11762 0.76928 NA   NA   NA NA   NA   NA   NA NA   NA   NA   NA 0.00000 0.00000 0.43448 NA   NA   0.40000 0.11762 0.76928 NA   NA   0.00000 NA   NA   NA NA NA   NA   NA   NA 0.00000 NA   NA   NA NA   NA   NA   NA

Example Contingency Table Statistics
See Appendix C of MET documentation for equations and details

- TOTAL – Count of total pairs included in the stats for this line
- BASER – base rate (e.g. sample climatological rate of event)
- ACC - accuracy
- FBIAS – frequency bias
- PODY – probability of detection (events)
- PODN – probability of detection (non-events)
- POFD – probability of false detection
- FAR – False Alarm Ratio
- CSI – Critical success index
- GSS – Gilbert Skill Score
- HK - Hanssen-Kuipers Discriminant
- HSS - Heidke Skill Score
- ODDS – Odds Ratio
- Etc., etc., etc. . .

Confidence Intervals for some measures are included with the following suffixes:
_NCL = Normal Confidence Lower
_NCU = Normal Confidence Upper
_BCL = Bootstrap Confidence Lower
_BCU = Bootstrap Confidence Upper

Example Continuous Statistics
See Appendix C of MET documentation for equations and details

Confidence Intervals for some measures are included with the following suffixes:
_NCL = Normal Confidence Lower
_NCU = Normal Confidence Upper
_BCL = Bootstrap Confidence Lower
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- FBAR – Forecast average
- OBAR– Observation average
- ME – Mean Error
- ESTDEV– Estimated standard deviation of the error
- MAE – Mean absolute error
- MSE – Mean squared error
- BCMSE – Bias corrected mean squared error
- RMSE – Root mean squared error
- E50 – Median (50% percentile) of the error.
- Etc., etc., etc. . .

# Example Probability Forecast Statistics
See Appendix C of MET documentation for equations and details

- RELIABILITY – conditional bias
- RESOLUTION – discrimination ability of forecast
- UNCERTAINTY – variability of the observations
- ROC_AUC - Area under the receiver operating characteristic curve
- BRIER – Brier Score
- CALIBRATION_i - conditional probability of an event given each probability forecast
- REFINEMENT_i – probability of each forecast category
- LIKELIHOOD_i - conditional probability for each forecast category given the event
- BASER_i - probability of an event for each forecast category

Example of Appendix C info

- **<u>Accuracy -</u>** for a 2x2 contingency table is defined as $\dfrac{n_{11} + n_{00}}{T}$

- That is, it is the proportion of forecasts that were either hits or correct rejections – the fraction that were correct.

- Accuracy ranges from 0 to 1; a perfect forecast would have an accuracy value of 1.

- Accuracy should be used with caution, especially for rare events, because it can be strongly influenced by large values of n_{00}.

Example Scatter Plot

blue=Base rate(emc_4km), red=Gilbert ETS(emc_4km)
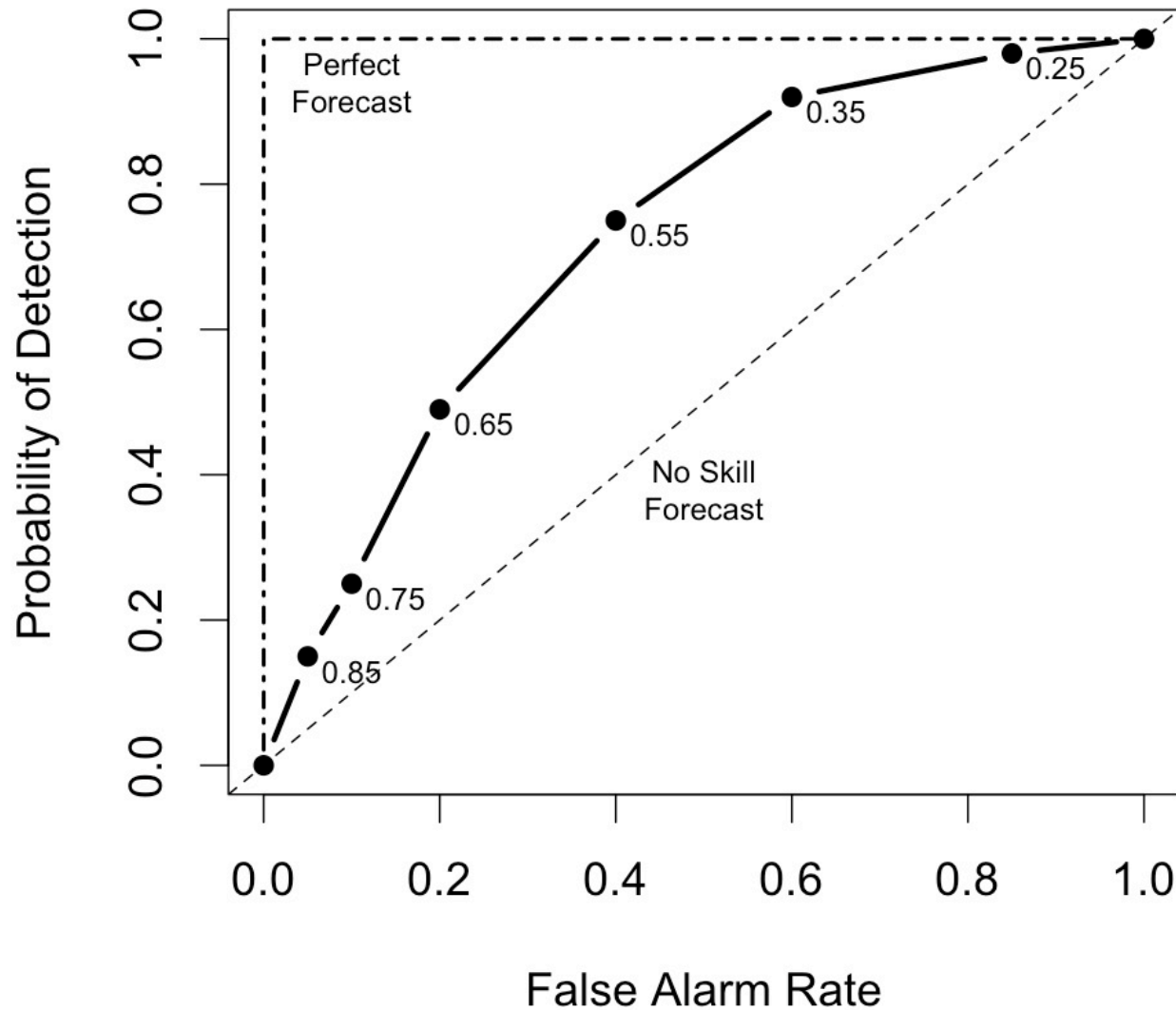
Forecast valid date
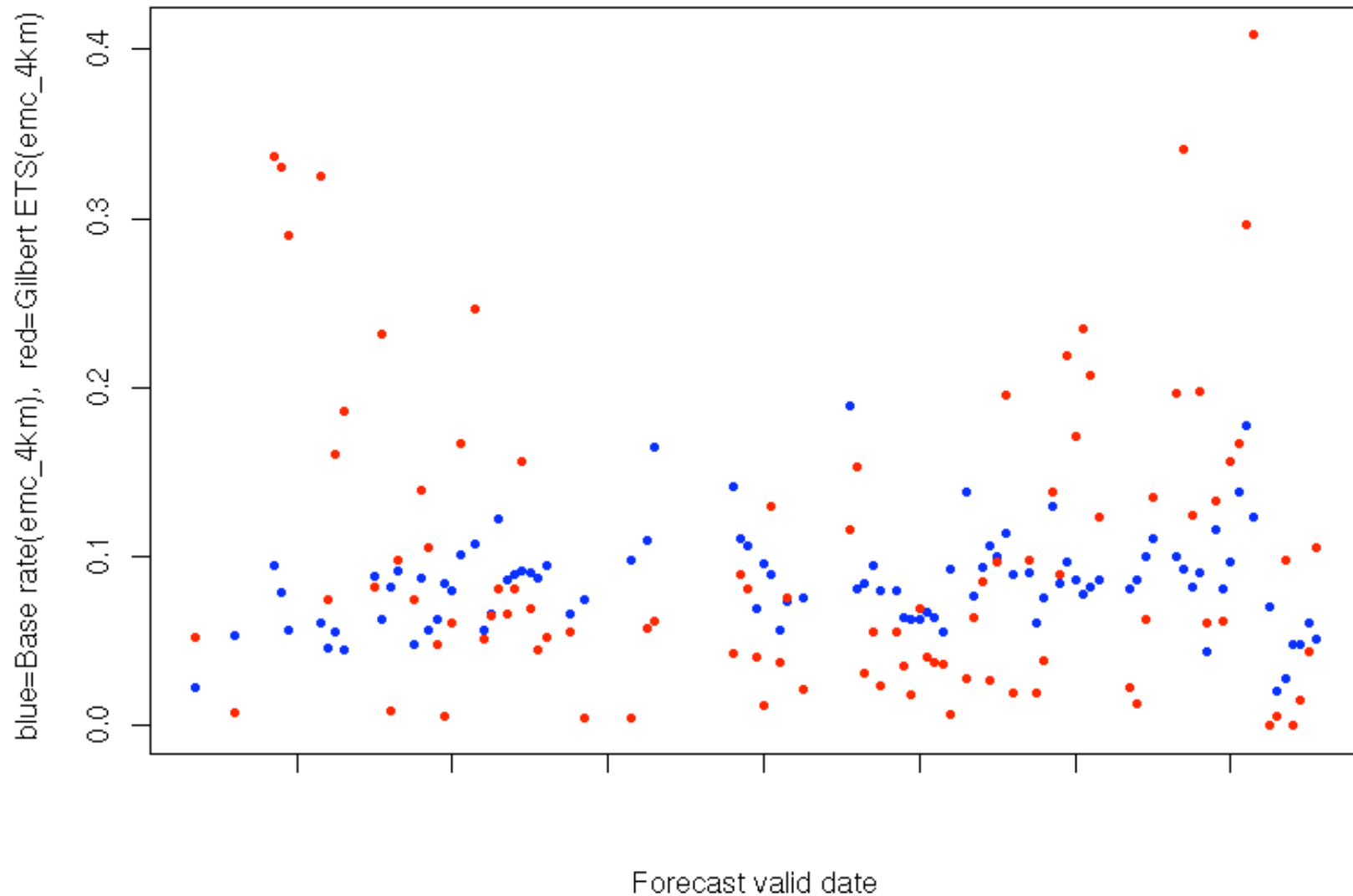
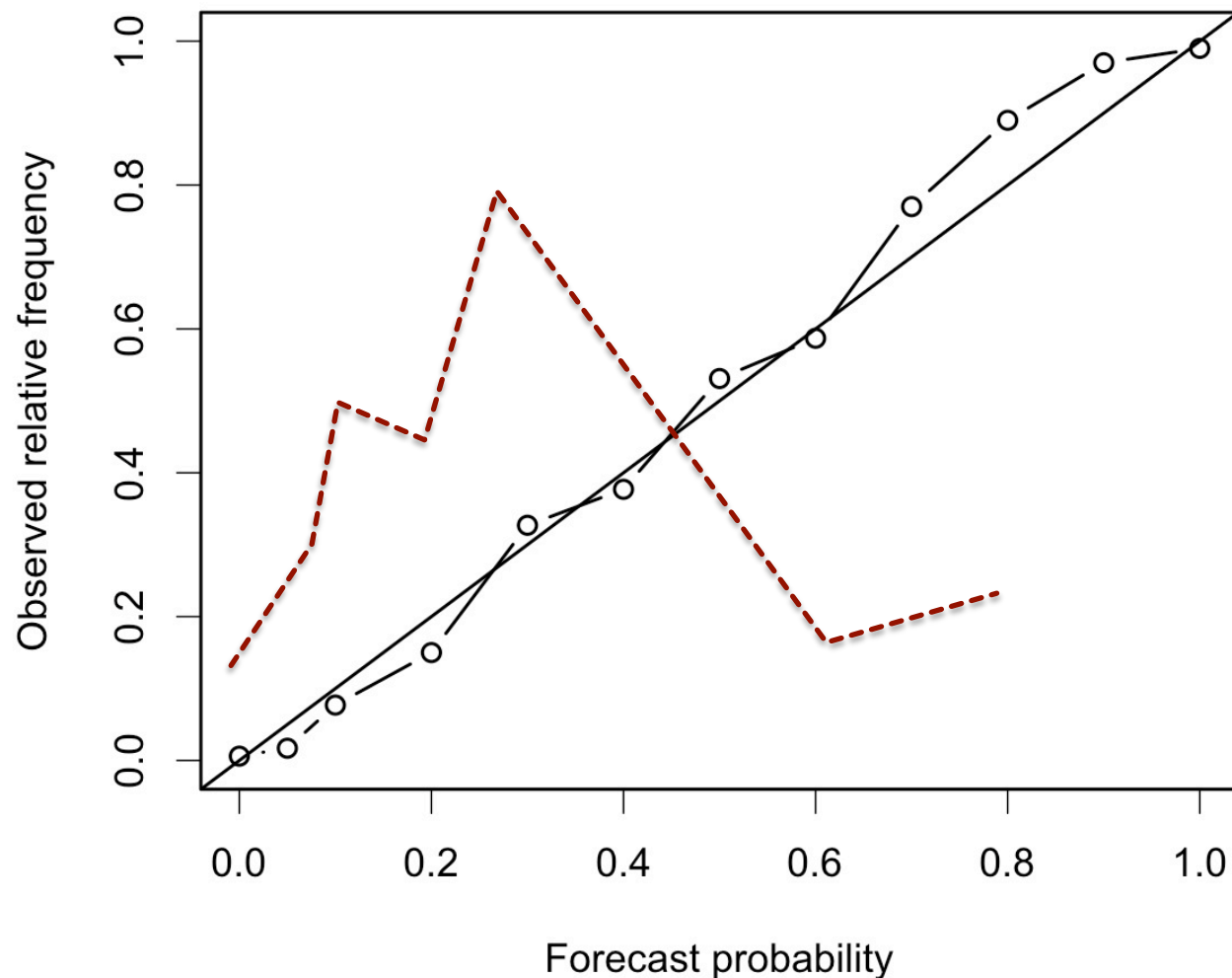# Example Box (and Whisker) Plot
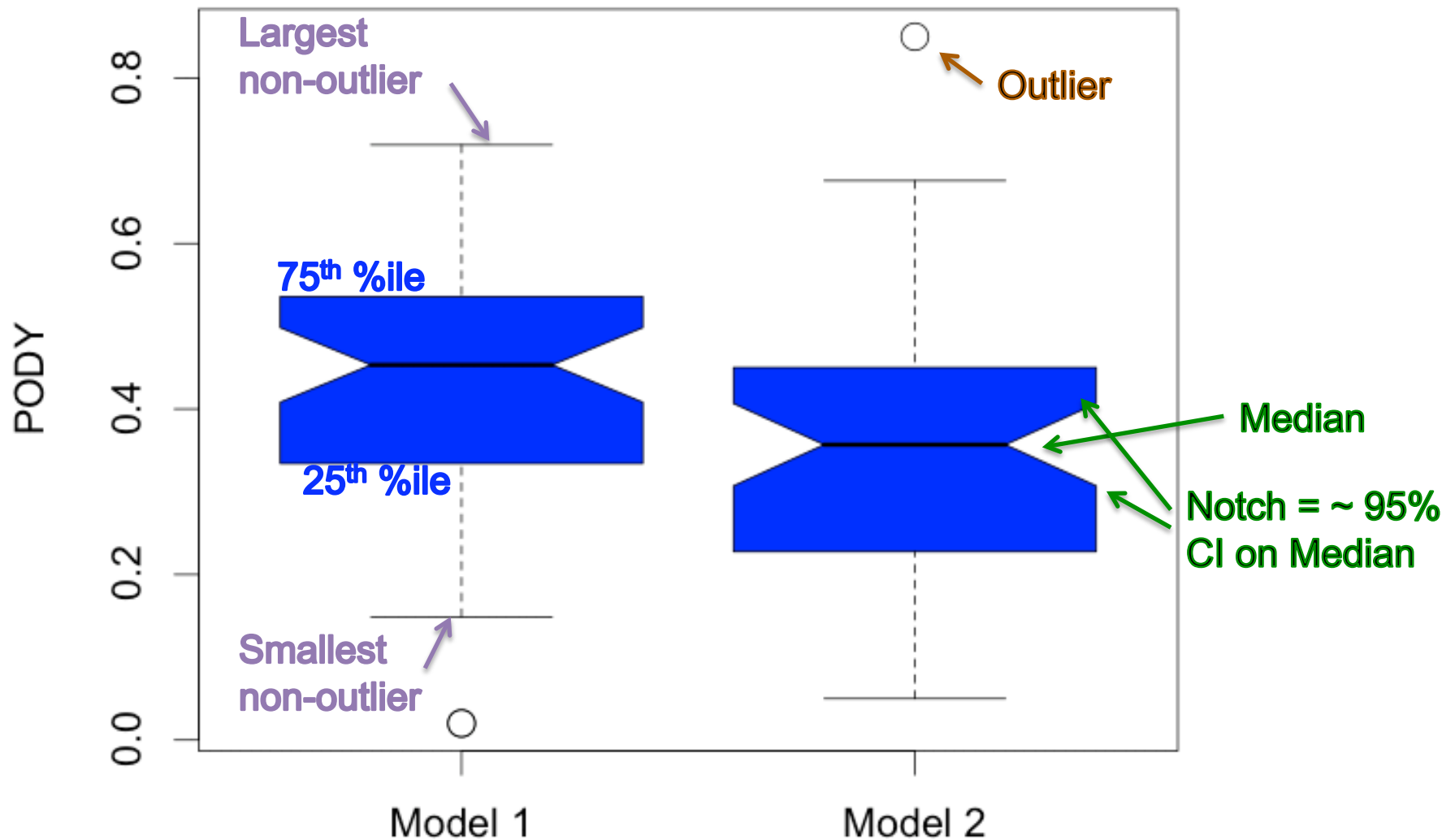
Example Receiver Operating Characteristic Plot

Create with points from PRC line type.

Example Reliability Diagram

A measure of conditional bias.

Do the forecast and observed probabilities match?

One to one line (solid) shows perfect reliability.

Forecast 1 (the line with dots) has good reliability.

Forecast 2 (the dashed line) has very poor reliability.

Information from PJC line type.