Projects

Verification practice with meteorological data

General

- Observations from the WMO-managed Global Telecommunications System (GTS), available in near real time globally

- Forecasts all from NWP centers' operational models, deterministic (2,3), ensembles (1)

- Project 4 different: All data from Demeter, a project focused on seasonal forecasting models (not operational)

  - "observations" from analysis

Strong suggestions

▶ First step – plot the data in forecast-obs plots, to check for "bad" values

▶ Projects are all comparative – 3 model forecasts verifying at the same times and places

  ▶ Which model is "better" and why?

  ▶ Use confidence limits to assess the comparative results

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▶ Otherwise, up to each group to design experiment, following verification principles:

  ▶ Consider user needs – modeller, flood or wind energy etc.

  ▶ Need for multiple measures to fully assess quality

▶ Prepare presentation for Friday afternoon

  ▶ 15 minutes

ATTRIBUTE	DEFINITION	SCORES FOR CONTINUOUS	SCORES FOR CATEGORICAL	SCORES FOR PROBABILITY
Bias	Correspondence between mean forecast and mean observation	Mean error		reliability component of BS, RPS, CRPS
Association	Strength of linear relationship between forecasts and observations	Covariance, correlation		
Accuracy	Average correspondence between individual pairs of observations and forecasts	MAE, (R)MSE	TS, HR, FAR, SEDS, pct correct	BS, RPS, CRPS
Skill	Accuracy of forecasts relative to accuracy of forecasts from a standard method	RV (wrt mean), MAESS	HSS, ETS	BSS, RPSS, CRPSS
Reliability	Correspondence between conditional mean observation and conditioning forecast, over all forecasts	linear bias (conditional)	Frequency bias	Conditional bias
Resolution	Difference between conditional mean observation and unconditional mean observation, over all forecasts			Resolution component of BS (RPS, CRPS)
Sharpness (diagnostic)	Variability of forecasts as described by distribution of forecasts	Forecast variance, std		Variance of forecasts
Discrimination	Difference between conditional mean forecast and unconditional mean forecast, over all observations	(ROC)	KSS, EDI, SEDI, (ROC)	ROC
Uncertainty (diagnostic)	Variability of observations as described by the distribution of observations	Observation variance, std		Variance of observations