HEFS workshop, 03/12/2015

Seminar E: review results from Exercise 4

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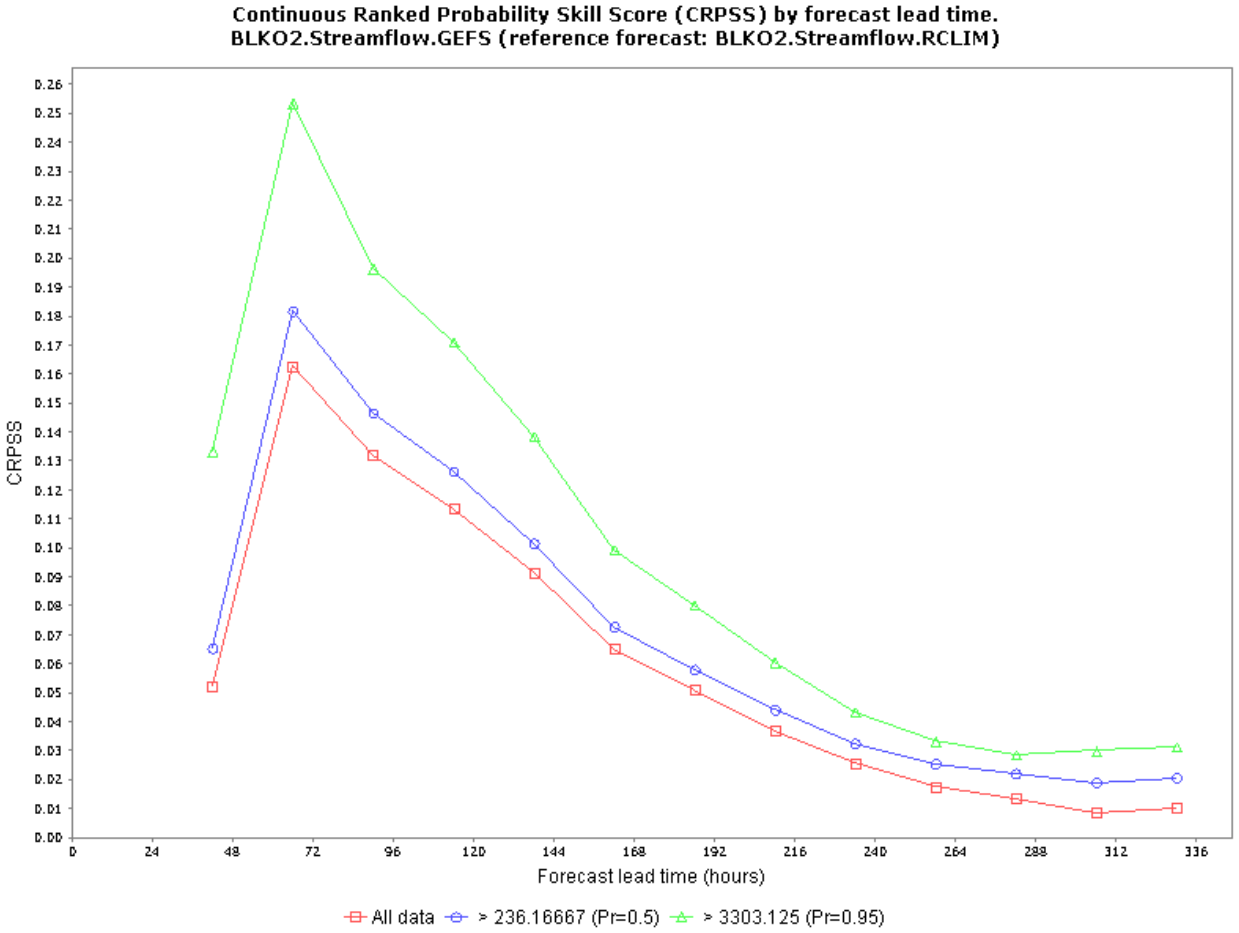
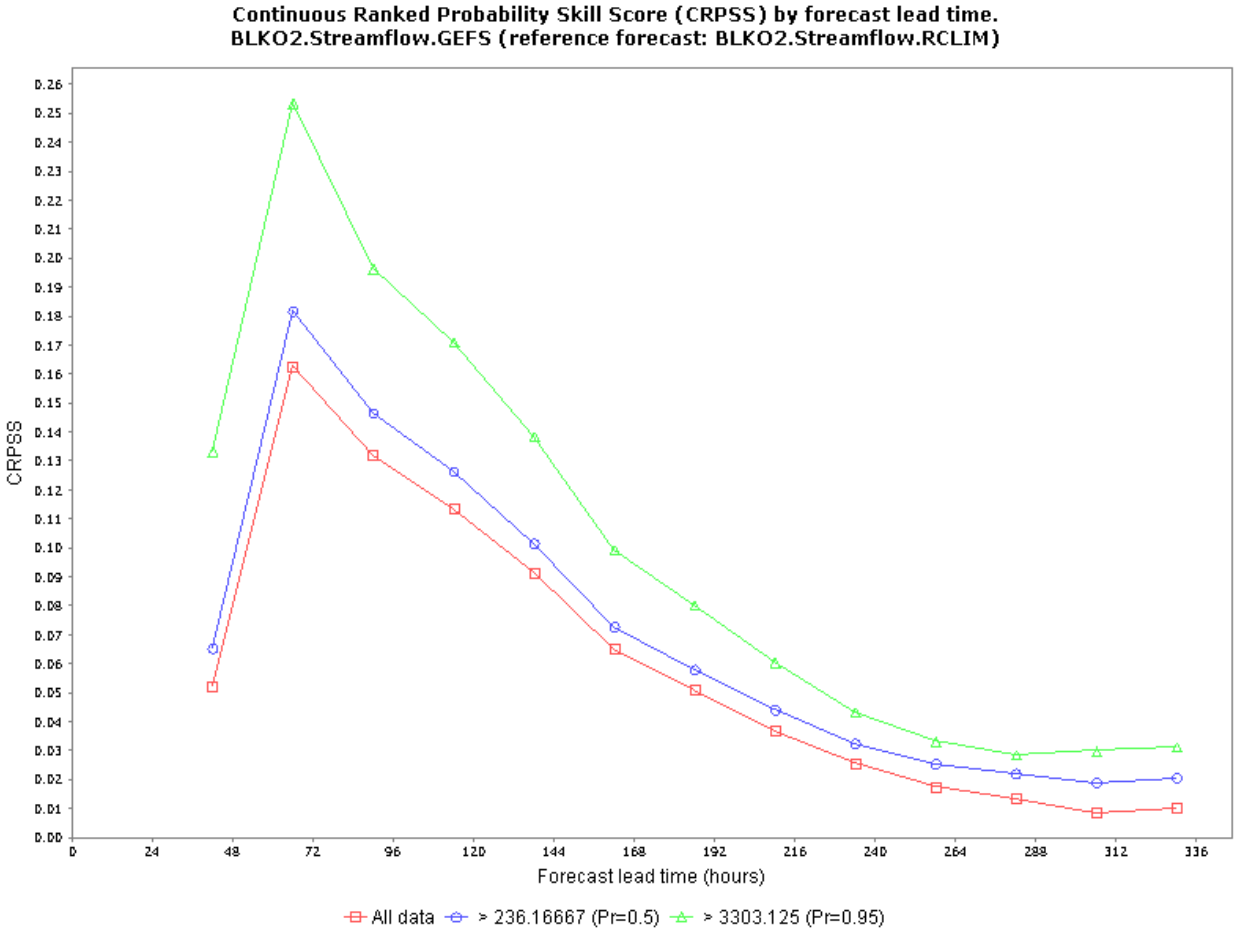
Exercise 4: Q1 (BLKO2)



Q1: Are the MEFP-GEFS forecasts more skilful than climatology?

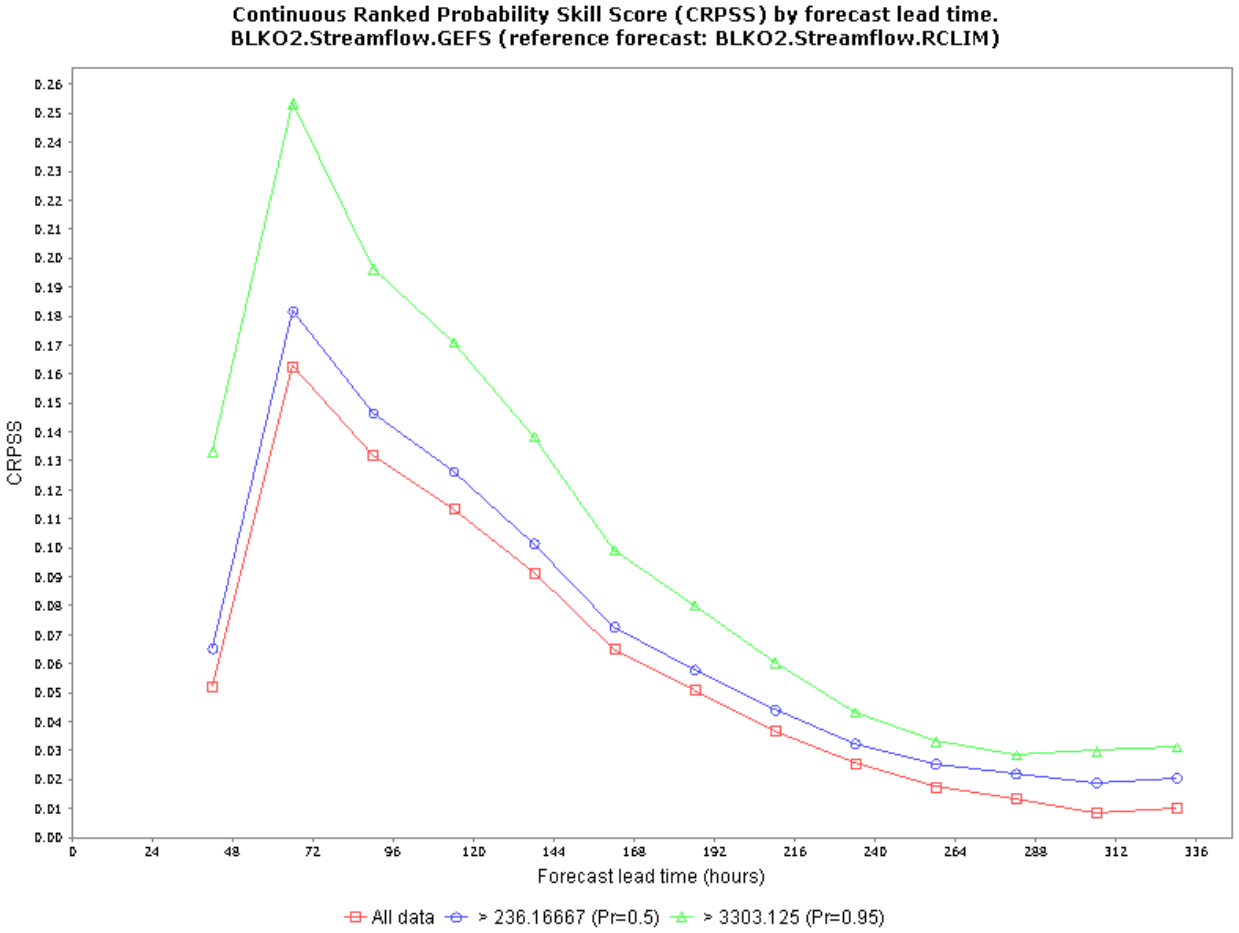
Exercise 4: Q1 (BLKO2) answer



Q1: Are the MEFP-GEFS forecasts more skilful than climatology?

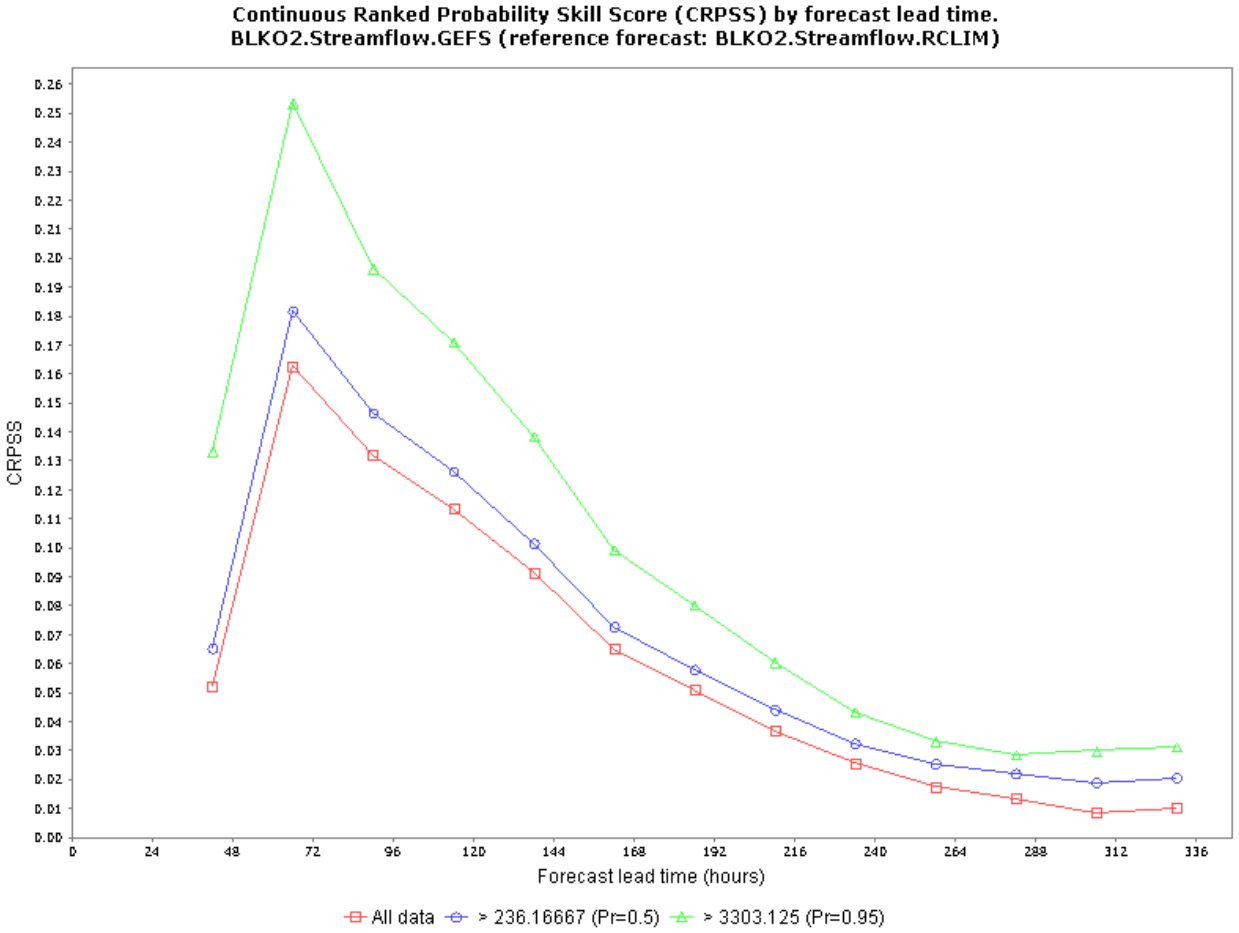
A1: In general, substantially so at moderate lead times and higher flows

Exercise 4: Q2 (BLKO2)



Q2: Why does the skill increase rapidly from 42-66 hours then decline?

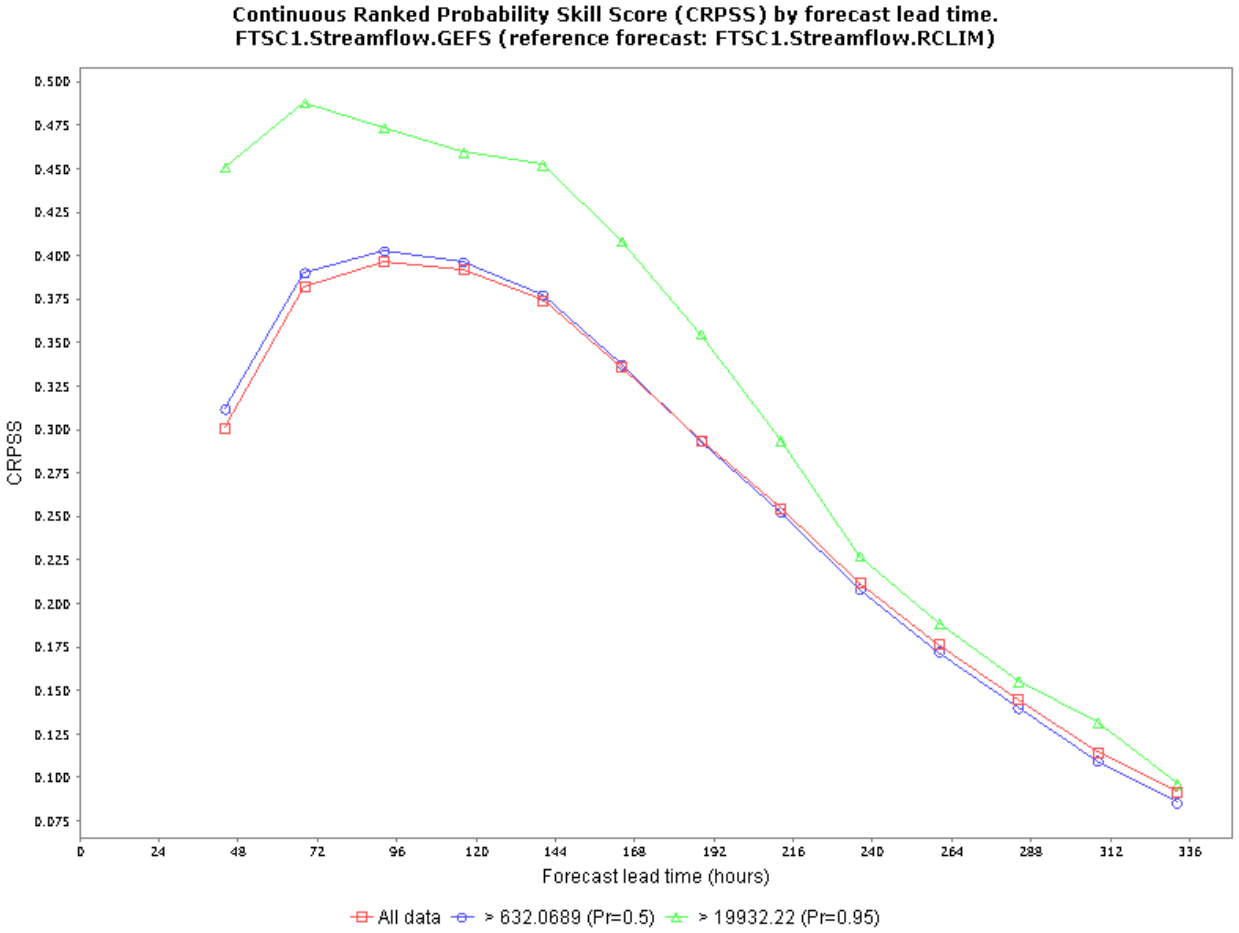
Exercise 4: Q2 (BLKO2) answer



Q2: Why does the skill increase rapidly from 42-66 hours then decline?

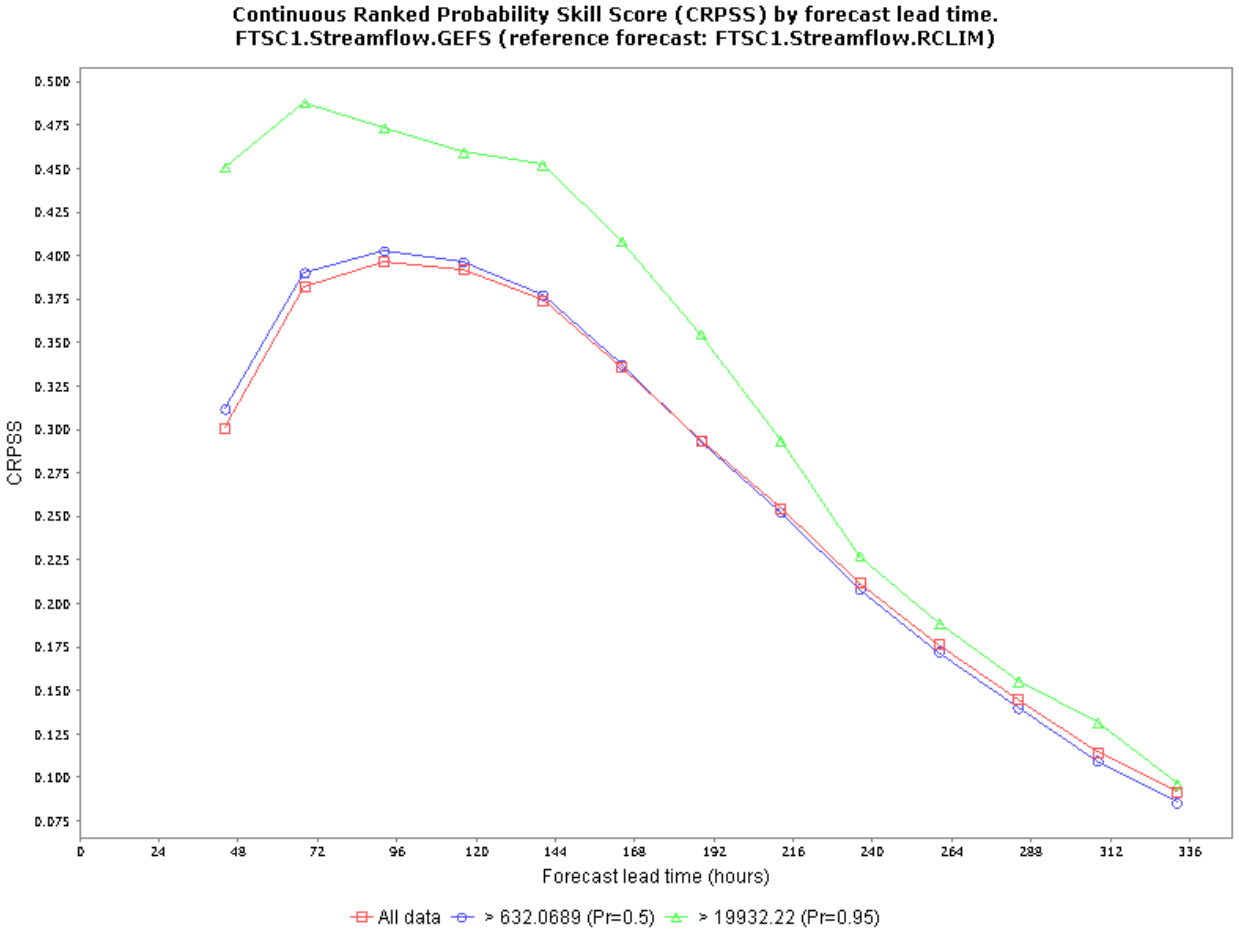
A2: Early lead times driven by persistent model states (also in reference)

Exercise 4: Q3 (FTSC1)



Q3: Are the forecasts more skillful at higher or lower flows? Why?

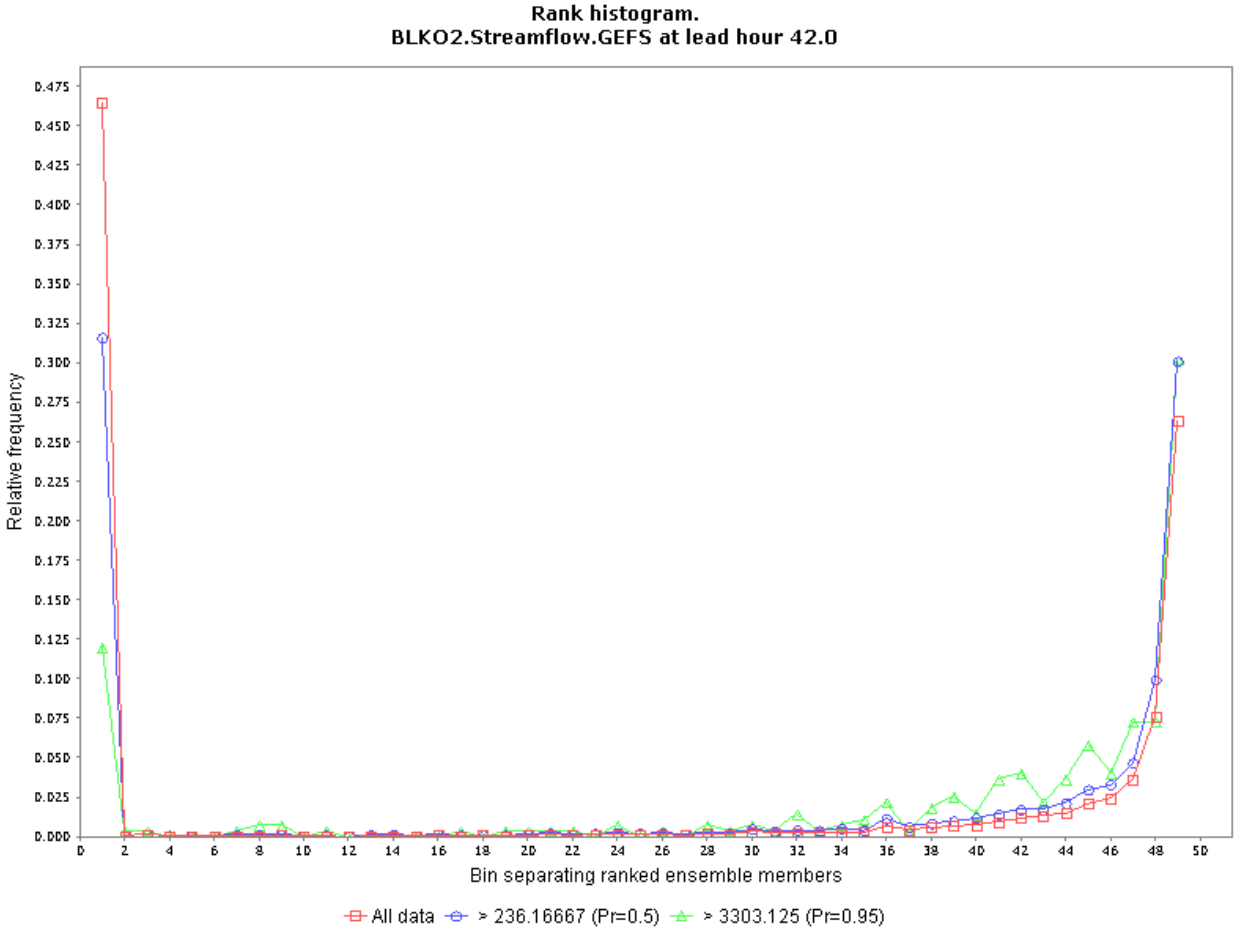
Exercise 4: Q3 (FTSC1) answer



Q3: Are the forecasts more skillful at higher or lower flows? Why?

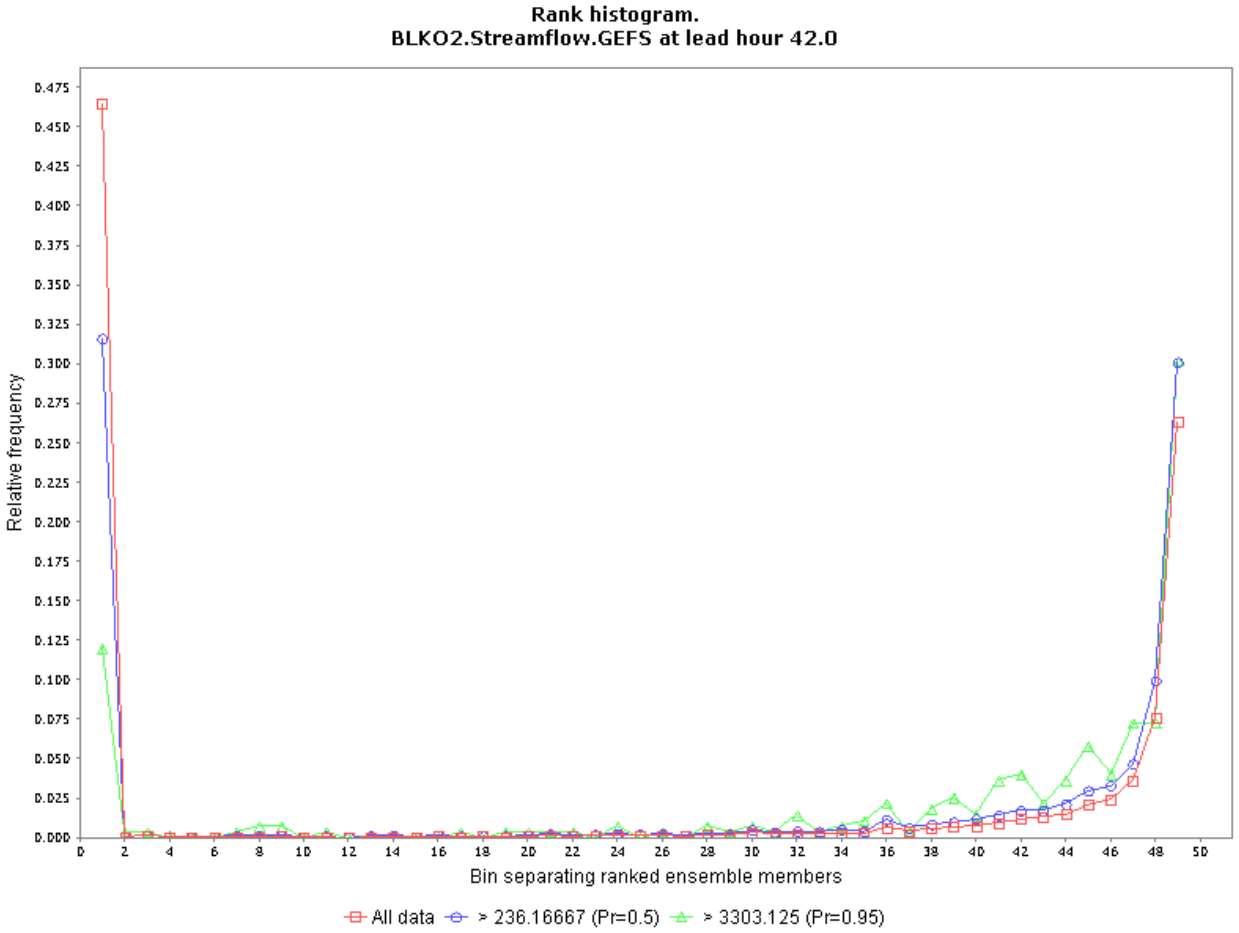
A3: High. Good forcing & hydro calibration, plus climatology lacks skill.

Exercise 4: Q4 (BLKO2)



Q4: Focusing on “all data” (red), are the forecasts broadly reliable? How?

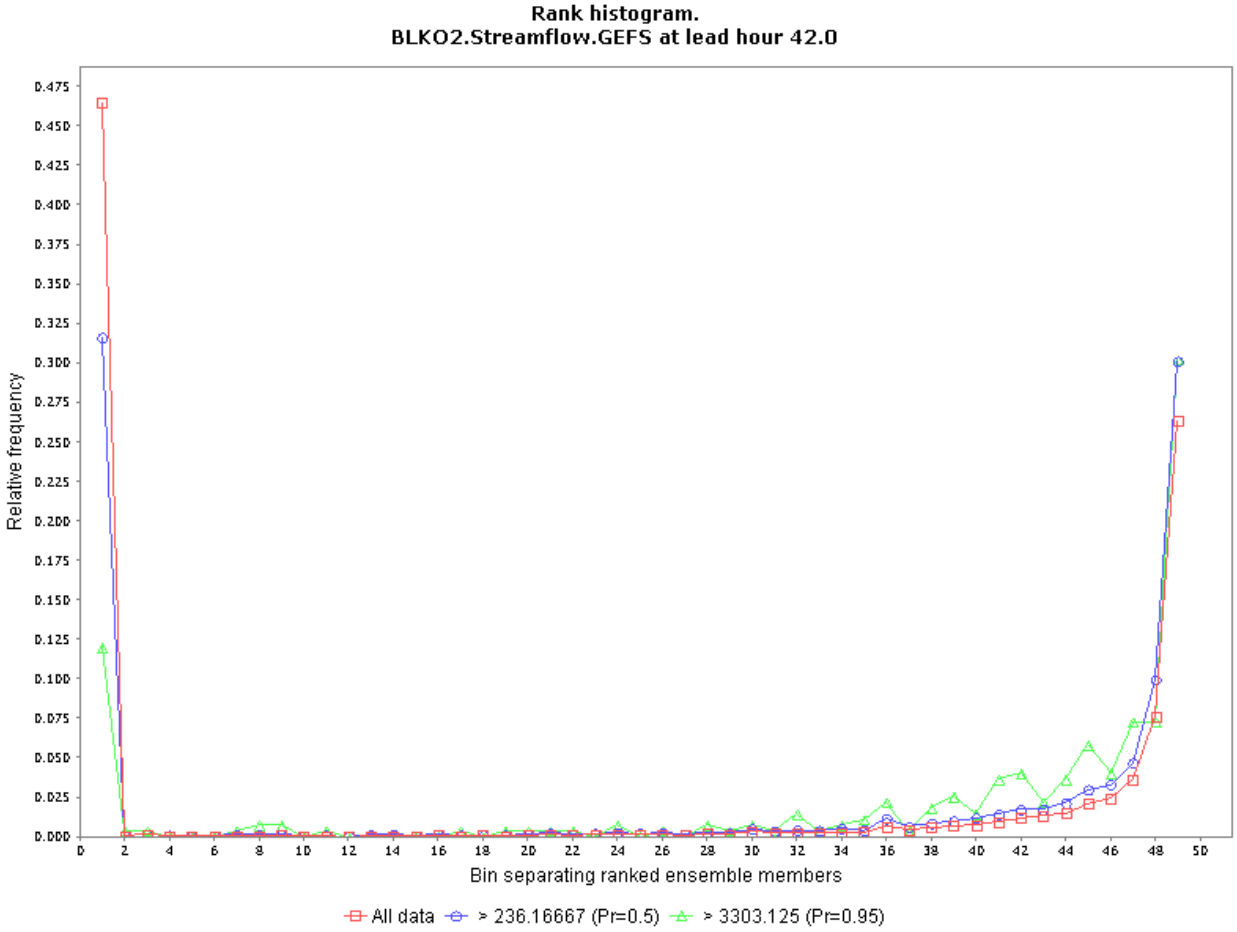
Exercise 4: Q4 (BLKO2) answer



Q4: Focusing on “all data” (red), are the forecasts broadly reliable? How?

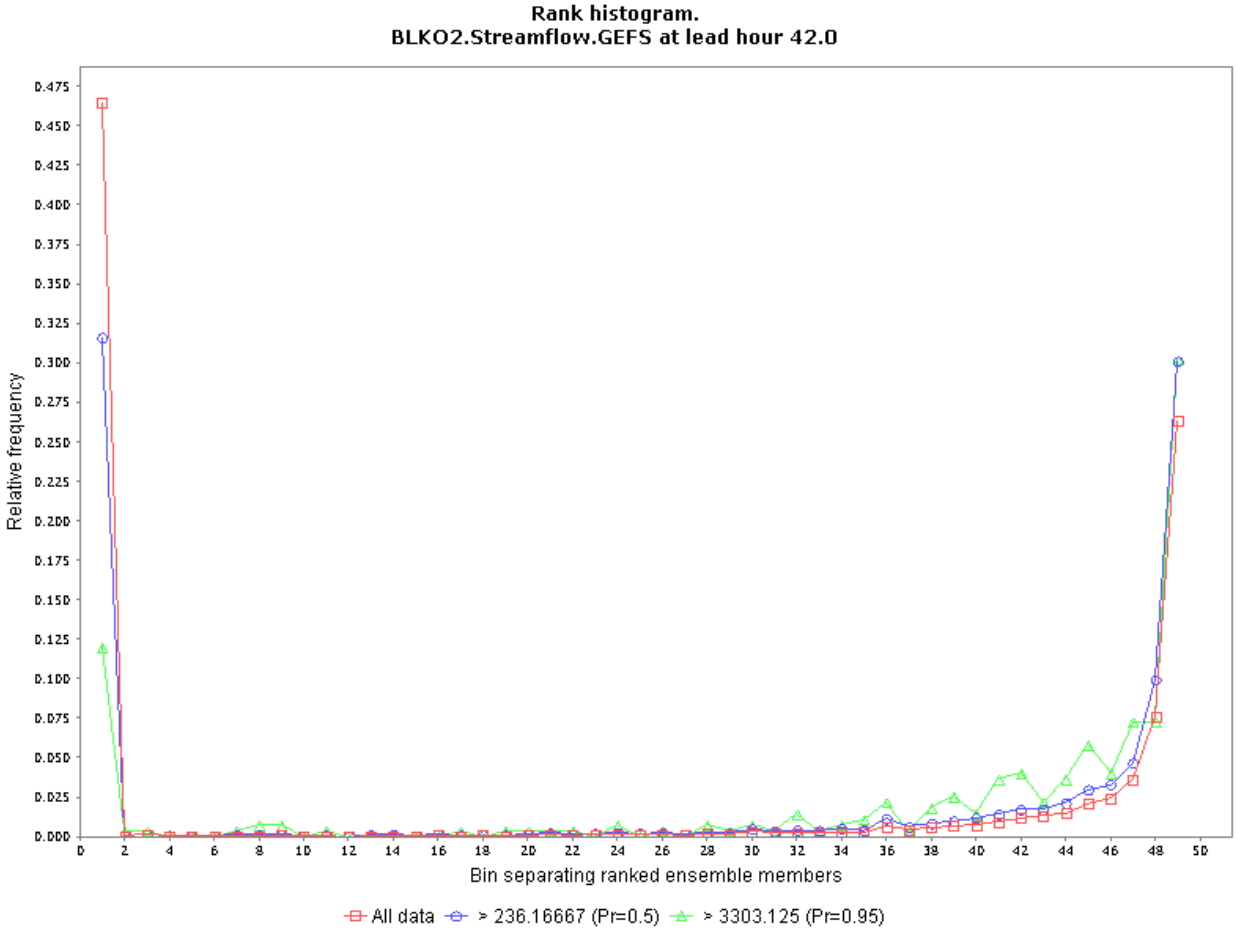
A4: Not really. Too many observations fall at high and low ends of forecast

Exercise 4: Q5 (BLKO2)



Q5: What might explain the “U-shape”?

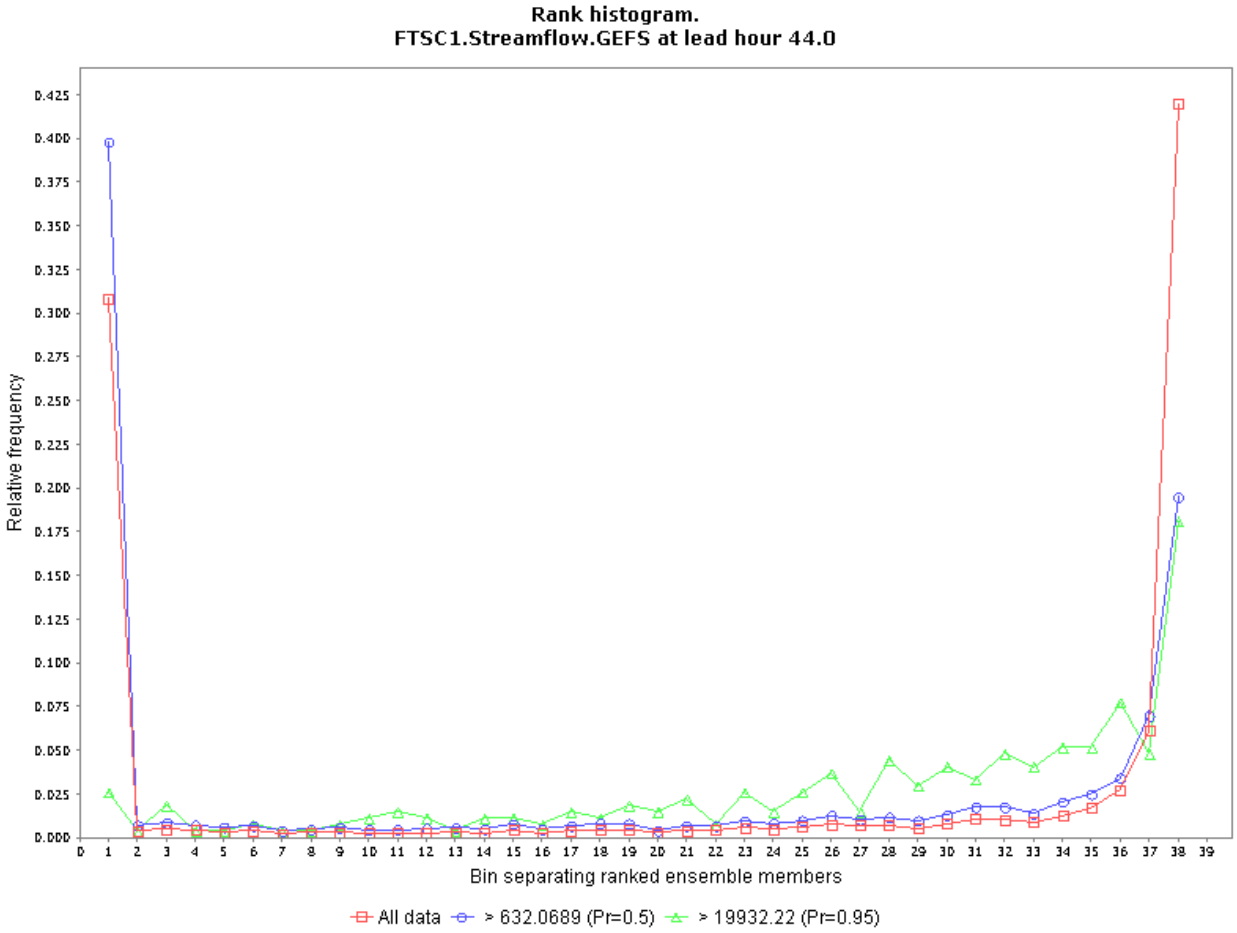
Exercise 4: Q5 (BLKO2) answer



Q5: What might explain the “U-shape”?

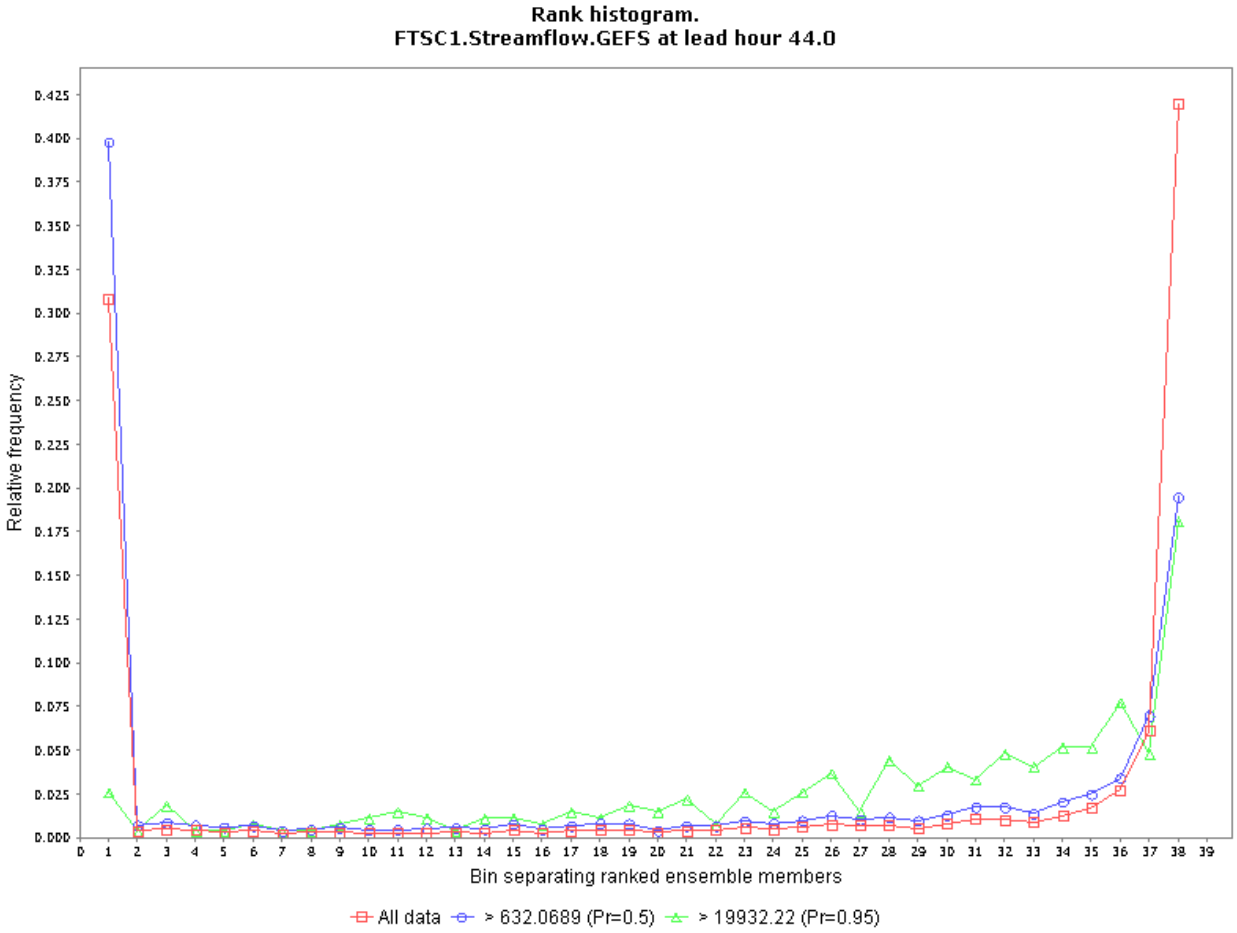
A5: This is classic behavior indicative of lack of spread (over-confidence)

Exercise 4: Q6 (FTSC1)



Q6: What might explain the tendency for higher frequencies in upper tail?

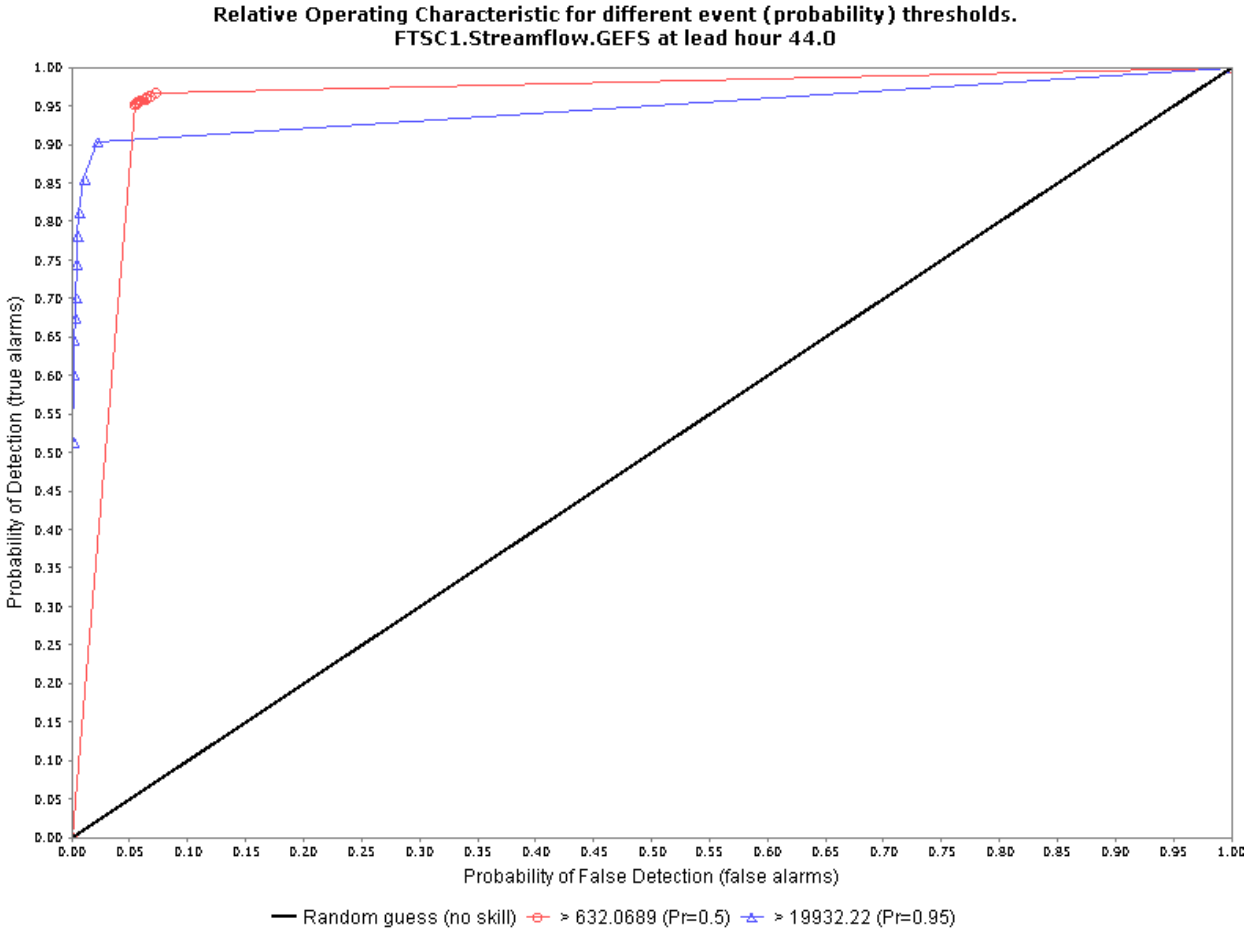
Exercise 4: Q6 (FTSC1) answer



Q6: What might explain the tendency for higher frequencies in upper tail?

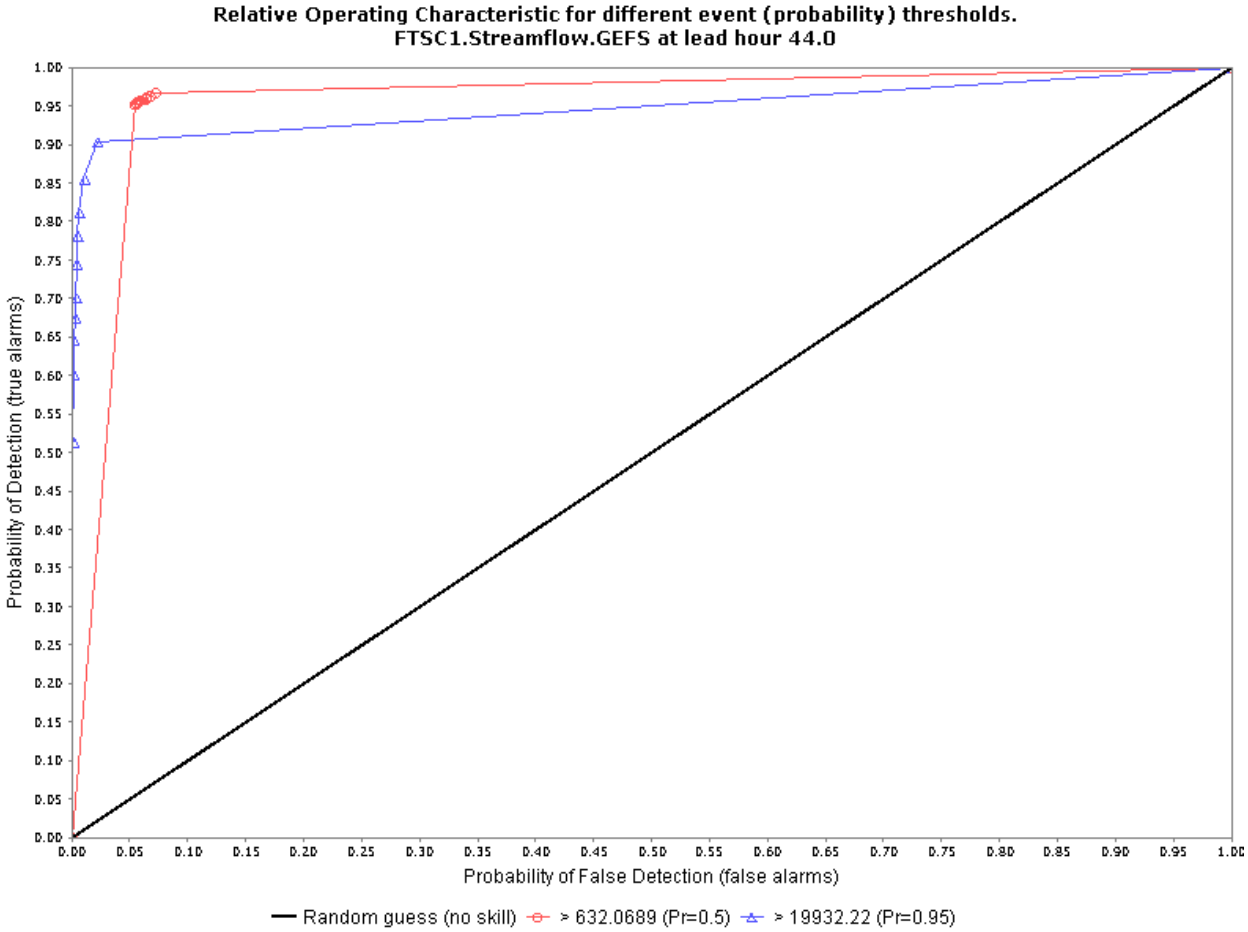
A6: Two things. Lack of spread (both tails) and a conditional bias (too low)

Exercise 4: Q7 (FTSC1)



Q7: Can the forecasts discriminate occurrences from non-occurrences?

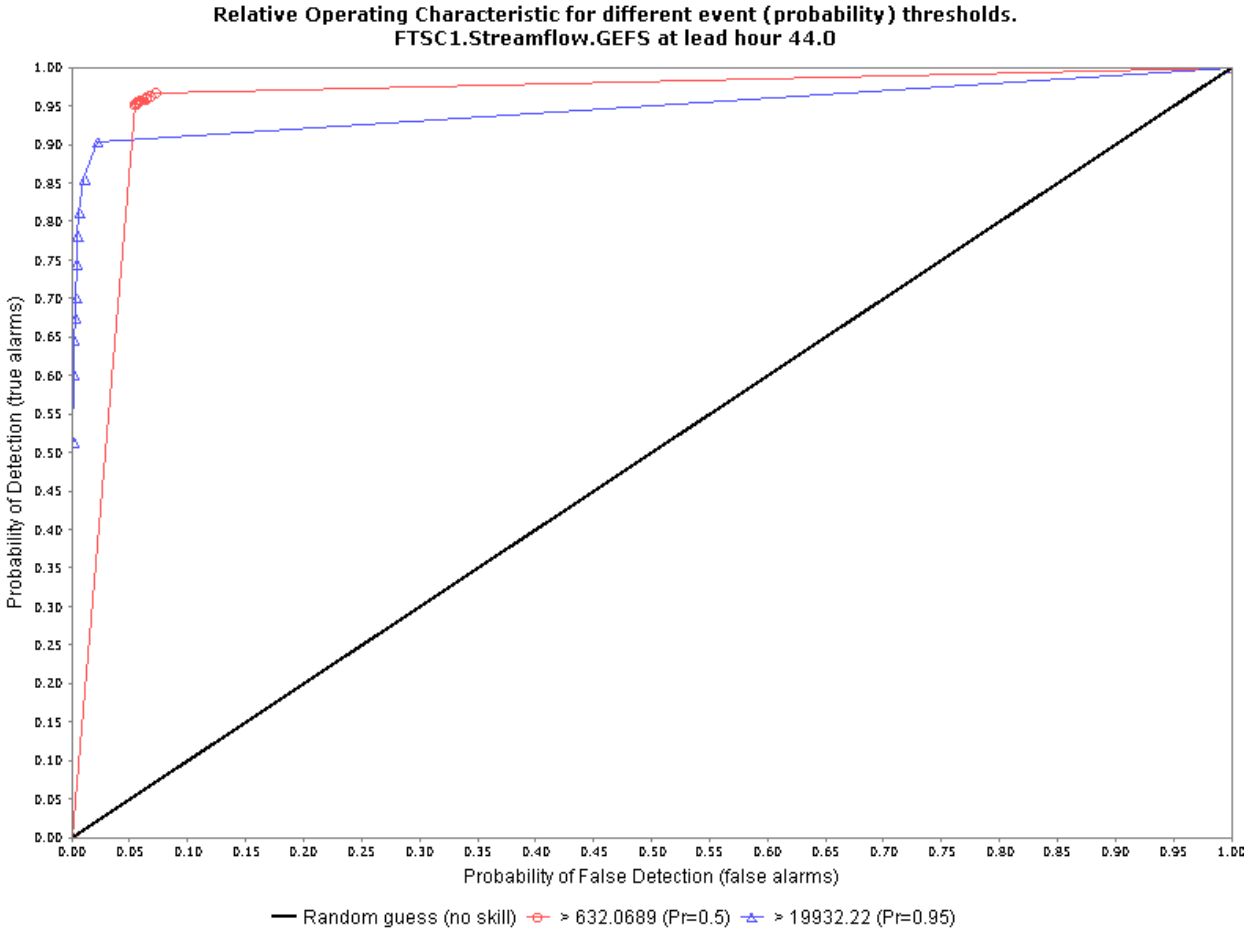
Exercise 4: Q7 (FTSC1) answer



Q7: Can the forecasts discriminate occurrences from non-occurrences?

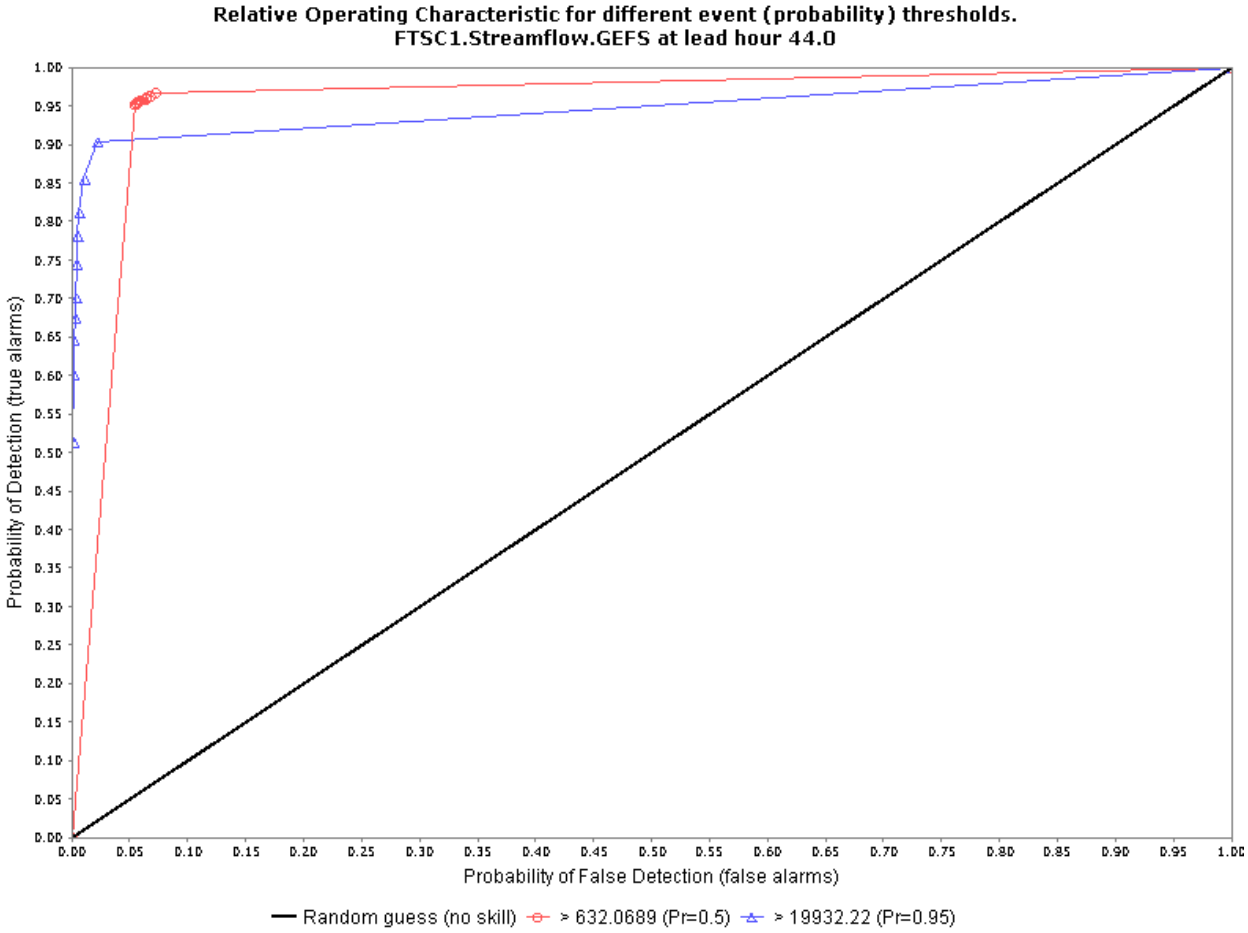
A7: Yes, much better than climatology. PoD much higher than PoFD.

Exercise 4: Q8 (FTSC1)



Q8: Decision maker: accept 5% PoFD for flows > 19,932 CFS. What PoD?

Exercise 4: Q8 (FTSC1) answer

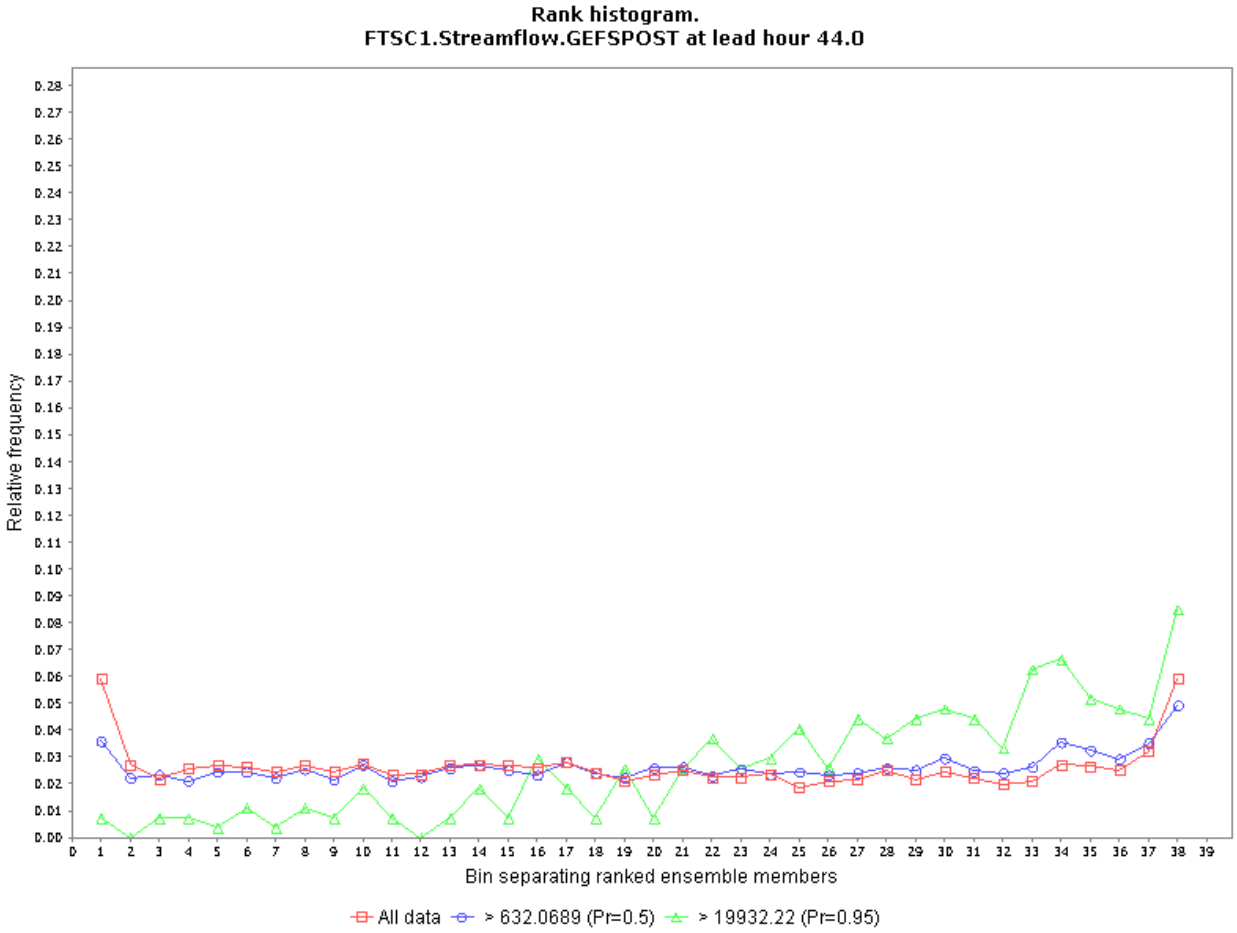


Q8: Decision maker: accept 5% PoFD for flows > 19,932 CFS. What PoD?

A8: About 90%, i.e. when event occurred, warnings were correct ~90%

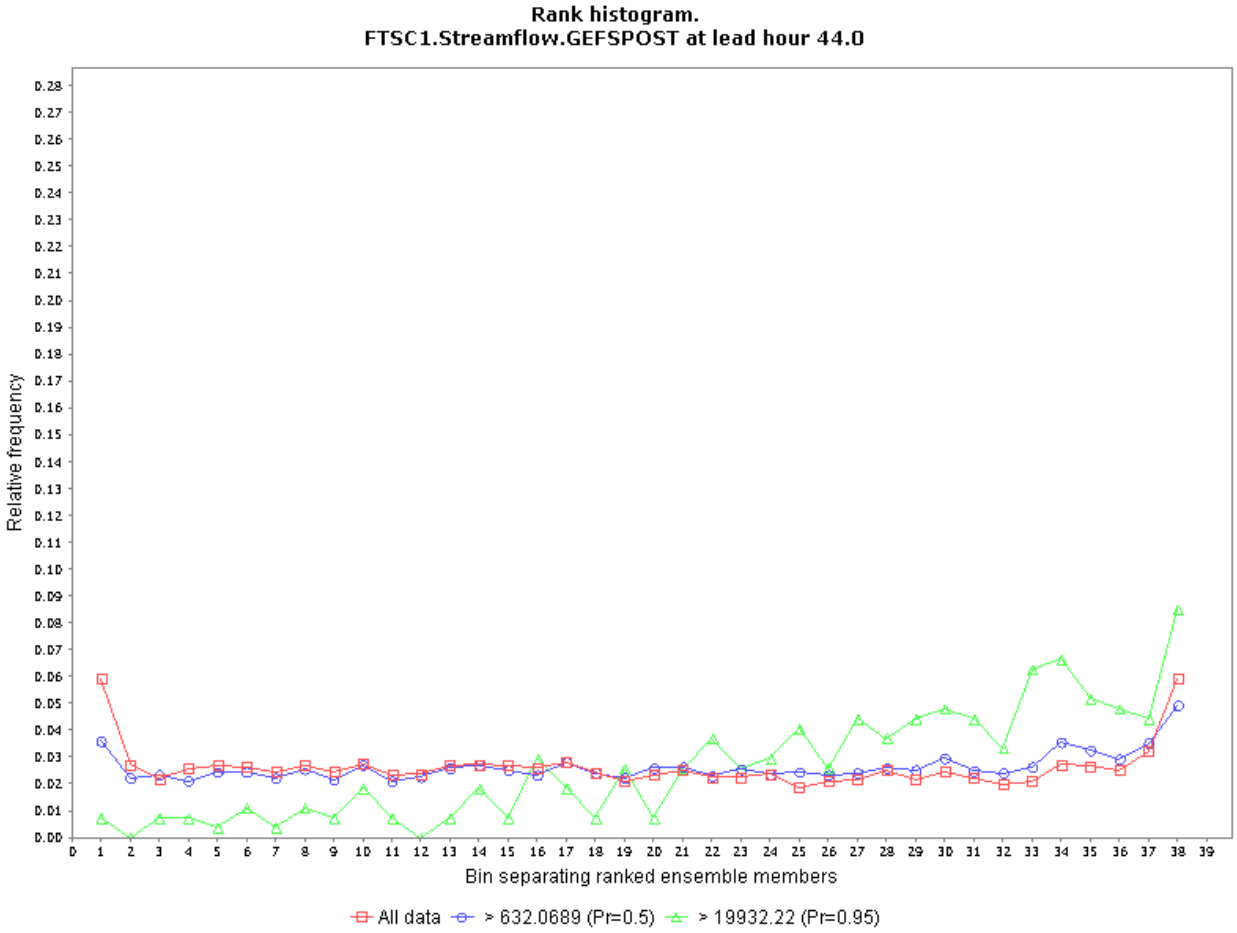
Additional questions

Exercise 4: Q9 (FTSC1)



Q9: Compare with histogram before EnsPost (SE.13). More reliable after?

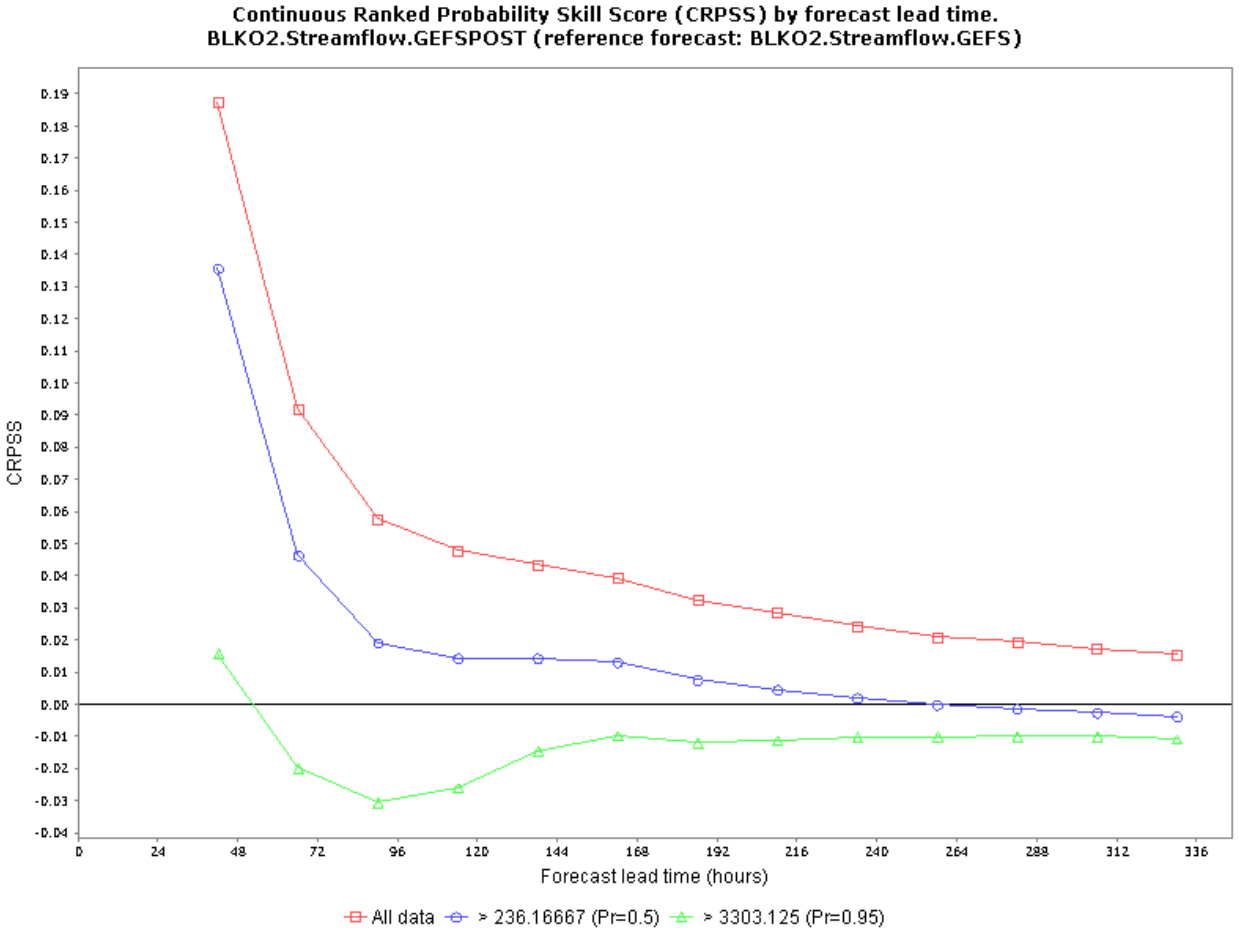
Exercise 4: Q9 (FTSC1) answer



Q9: Compare with histogram before EnsPost (SE.13). More reliable after?

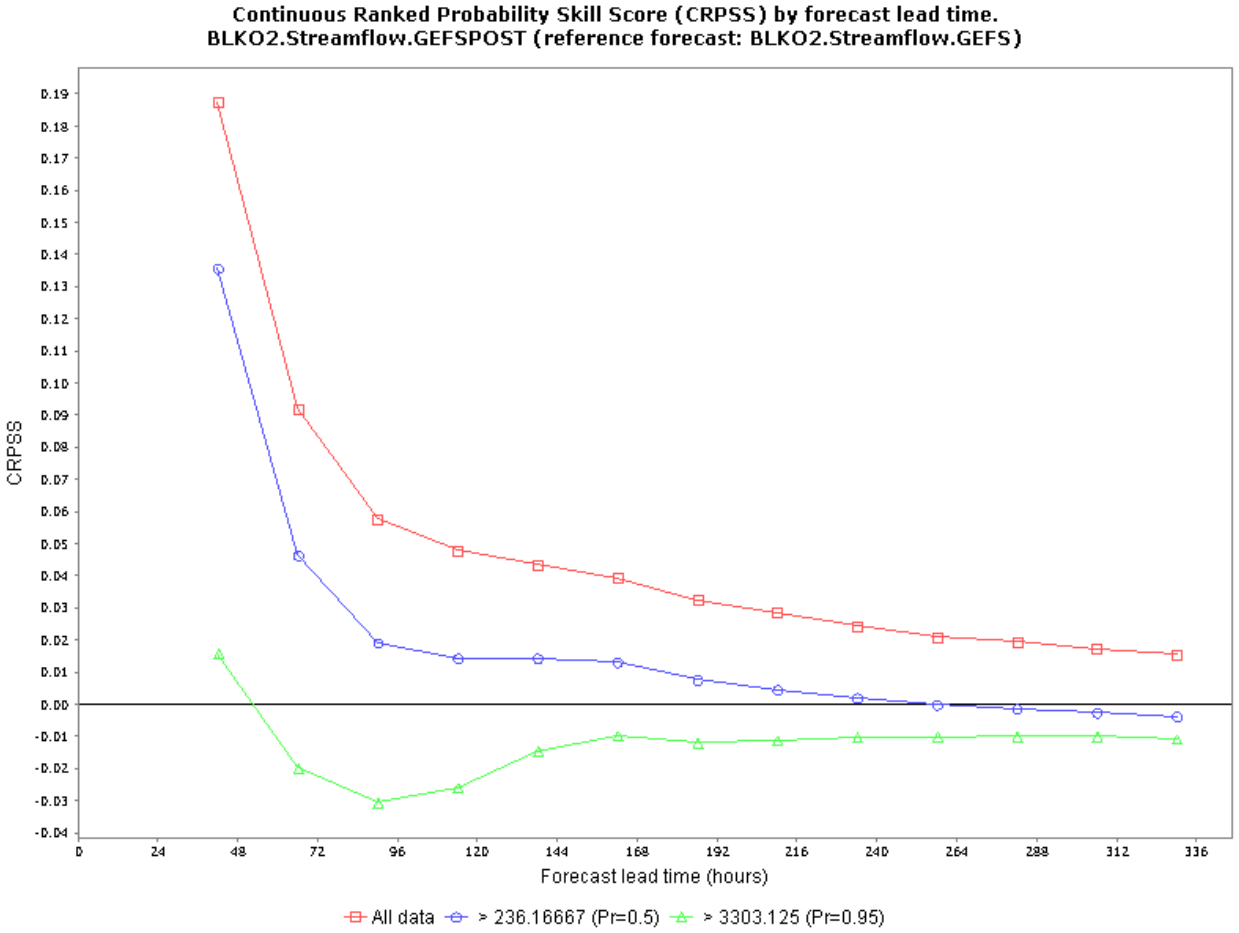
A9: Yes, for “all data”, the EnsPost substantially increases reliability

Exercise 4: Q10 (BLKO2)



Q10: To what extent has EnsPost increased skill of raw forecasts?

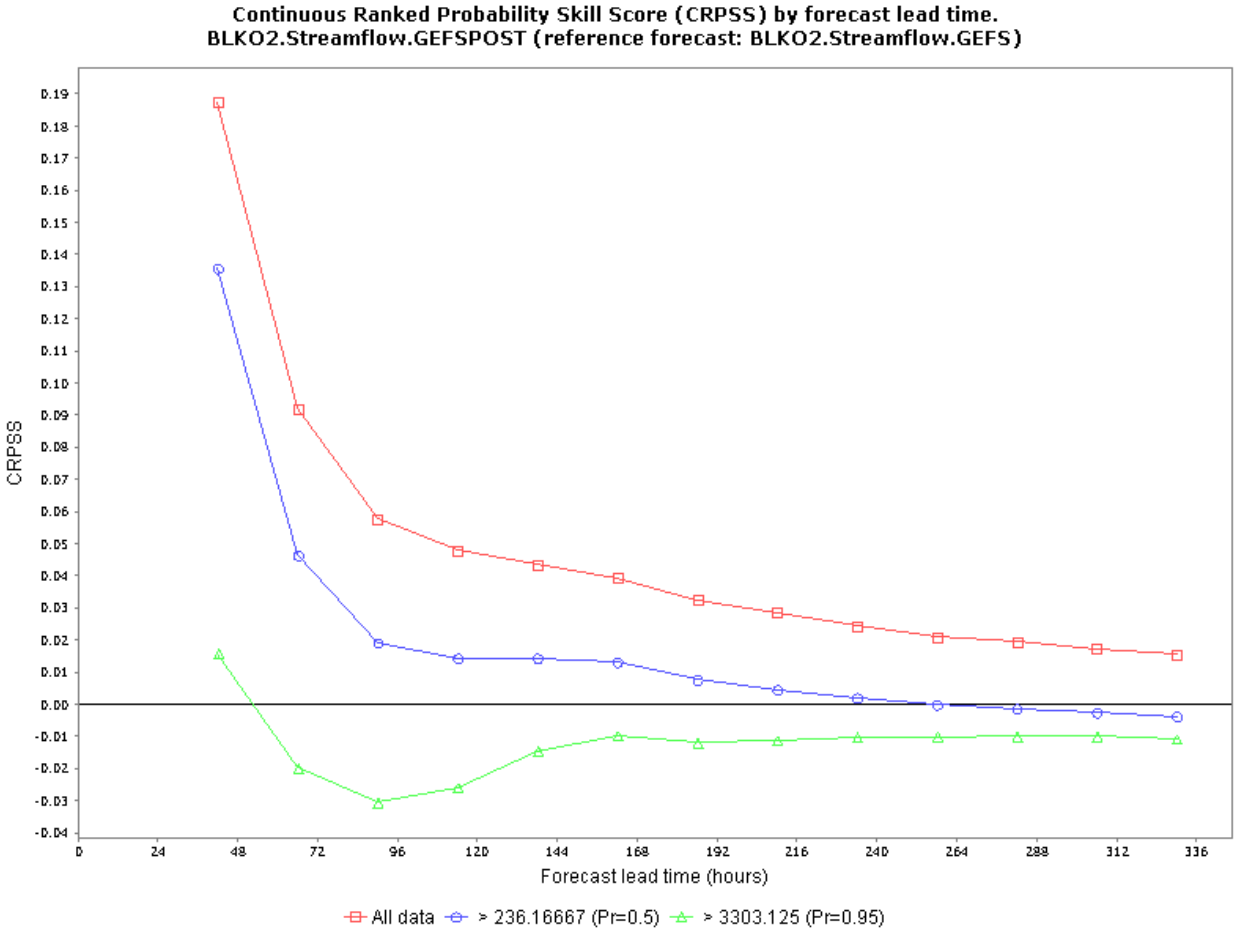
Exercise 4: Q10 (BLKO2) answer



Q10: To what extent has EnsPost increased skill of raw forecasts?

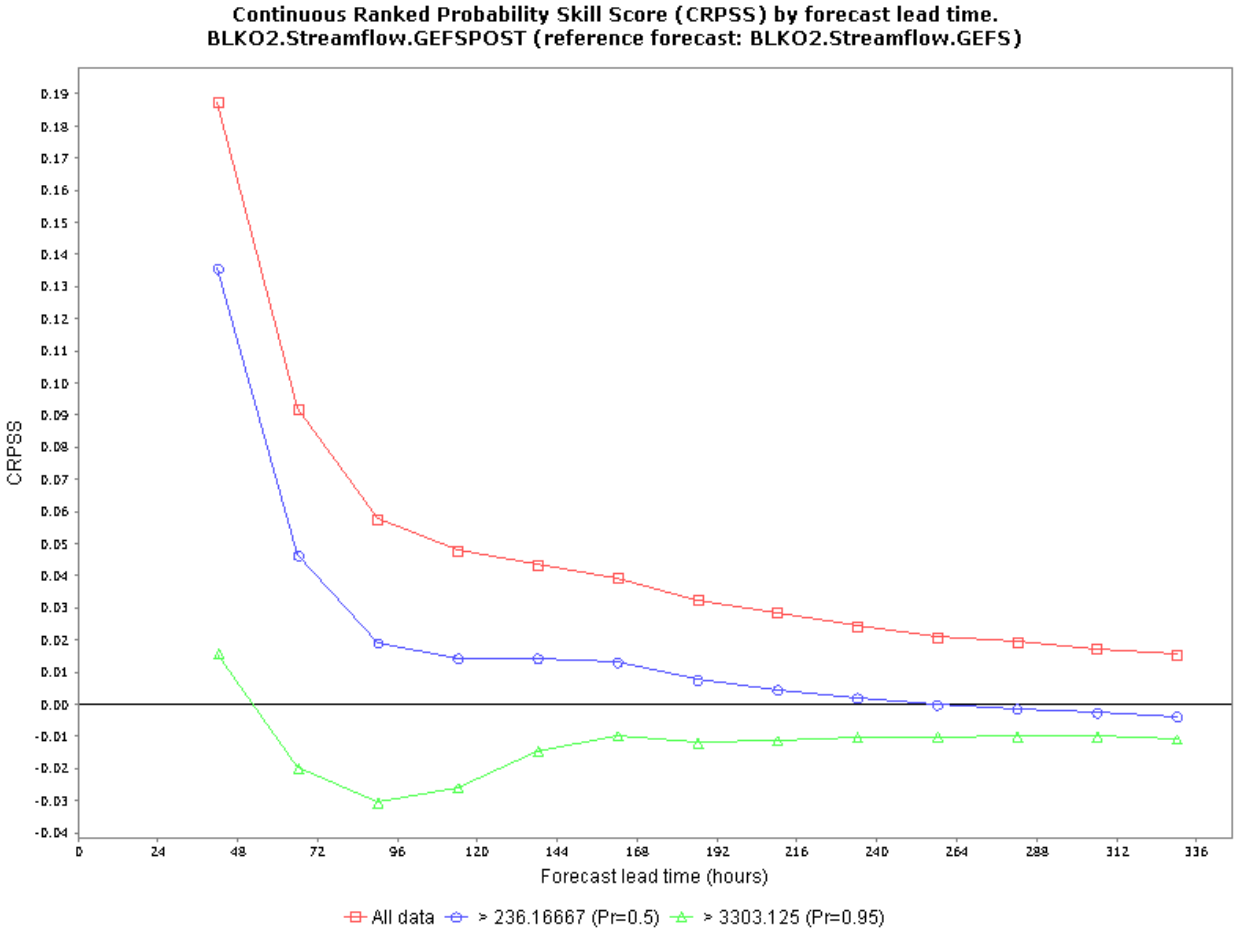
A10: Notably, for low/moderate flows. Not for high flows after ~72 hours.

Exercise 4: Q11 (BLKO2)



Q11: Why would EnsPost perform better at early lead times?

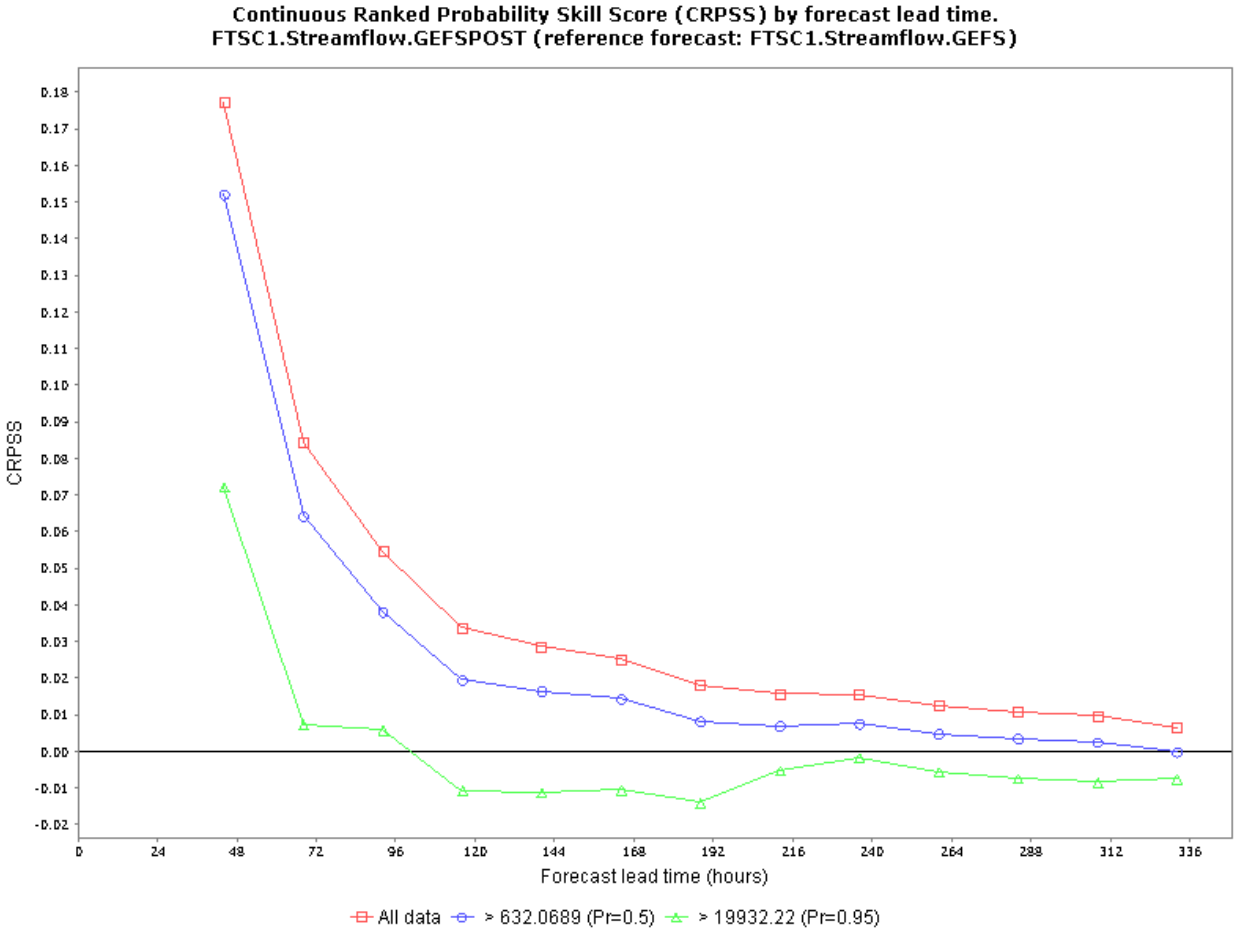
Exercise 4: Q11 (BLKO2) answer



Q11: Why would EnsPost perform better at early lead times?

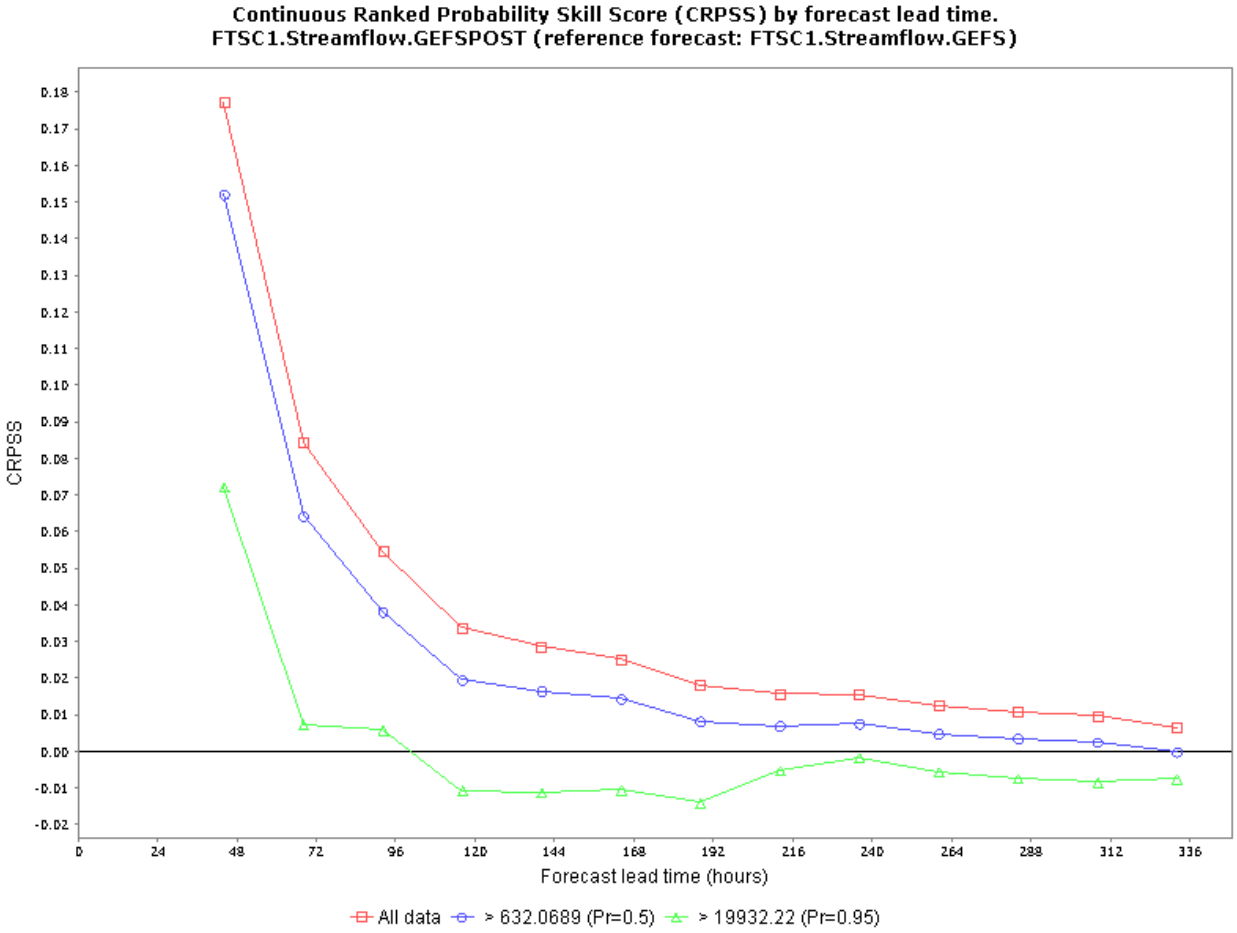
A11: Because EnsPost uses prior observation as a predictor (~Adjust-Q).

Exercise 4: Q12 (FTSC1)



Q12: To what extent has EnsPost increased skill of raw forecasts?

Exercise 4: Q12 (FTSC1) answer



Q12: To what extent has EnsPost increased skill of raw forecasts?

A12: As with BLKO2, notably, except for high flows at long lead times.