What is good enough?

2b. Demonstration of improved performance

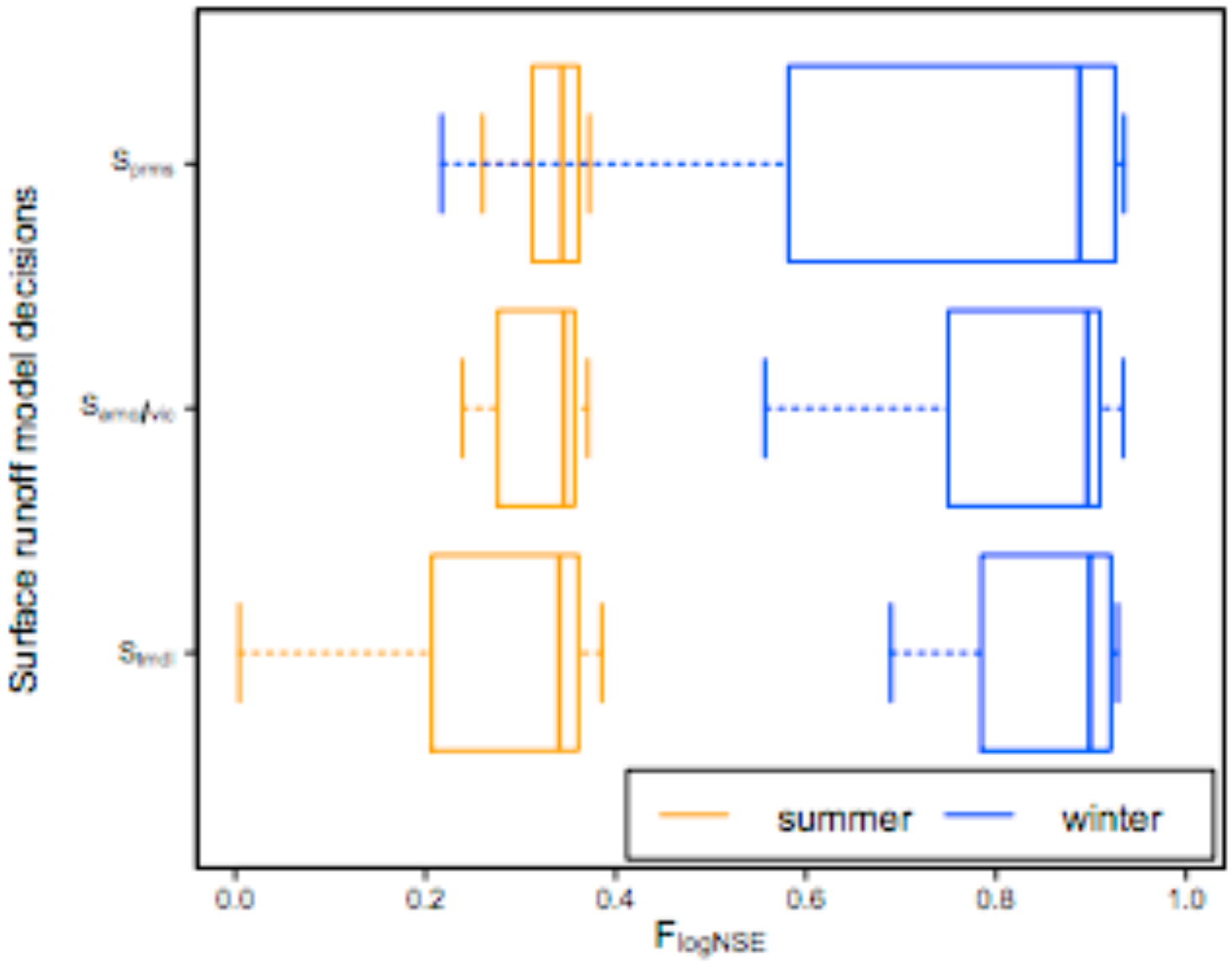

Fig. 8. Boxplots of model performance for summer and winter streamflow simulations for the three surface runoff decision options.

Plot demonstrates the effect of different model structures (surface runoff assumptions adapted from VIC, PRMS, TOPMODEL) on performance

Staudinger, M., Stahl, K., Seibert, J., Clark, M. P., and Tallaksen, L. M.: Comparison of hydrological model structures based on recession and low flow simulations, Hydrol. Earth Syst. Sci. Discuss., 8, 6833-6866, doi:10.5194/hessd-8-6833-2011, 2011.

Performance Measures

Root Mean Square Error (RMSE)

$$SSE = \frac{1}{n}\sum_{i=1}^{n}(m_i - o_i)^2$$

$$RMSE = \sqrt{SSE}$$

Nash Sutcliffe Efficiency (NSE)

$$\sum_{i=1}^{n}(o_i - m_i)^2$$

$$NSE = \frac{}{\sum_{i=1}^{n}(o_i - \bar{o})^2}$$

Nash and Sutcliffe, 1970, J. of Hydrology

Widely used in hydrology

Range – infinity to +1.0

Overly sensitive to extreme values

BIAS or Percent Error (Err)

$$Err = \frac{(\bar{m} - \bar{o})}{\bar{o}} * 100$$

Useful for determining if there is a long term flow over or under estimation

*Others: Cor, R^2