



Investigating Quality and Value of Dissimilar Streamflow Forecasting Systems

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Forecast value and quality

- Value: ultimate objective
- Decisions subject to uncertainty
- Better uncertainty handling = higher value ?
- Is it worth it ?

6 early warning systems

<i>Options</i> \ <i>Systems</i>	A	B	C	D	E	F
Multimodel	✗	✗	✗	✓	✗	✓
EnKF	✗	✗	✓	✗	✓	✓
Met. Ens.	✗	✓	✗	✗	✓	✓
Nb of member	(20x)1	(20x)50	(20x)50	20	(20x)2500	50000

- Different complexity
- Quantification and reduction of uncertainty

6 early warning systems

- Meteorological uncertainty
 - ECMWF EPS
- Initial condition uncertainty
 - Ensemble Kalman Filter
- Hydrological structural uncertainty
 - Hydrological multmodel

Economic value

- Cost-loss ratio
 - Threshold
 - $CLR = C/La$
- Relative Economic Value

$$REV = \frac{E_{noWarn} - E_{EWS}}{E_{noWarn} - E_{Perfect}}$$

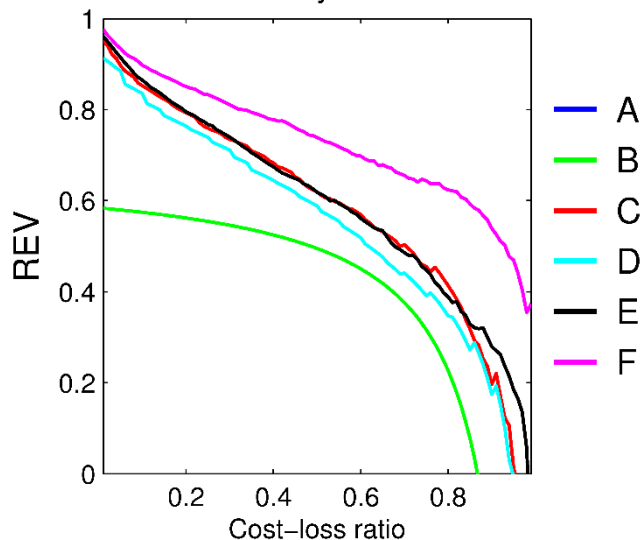
Warning issued

		Warning issued	
		Yes	No
Observed	Yes	Hit (h)	Miss (m)
	No	False Alarm (f)	Correct neg. (c)

Relative Economic Value

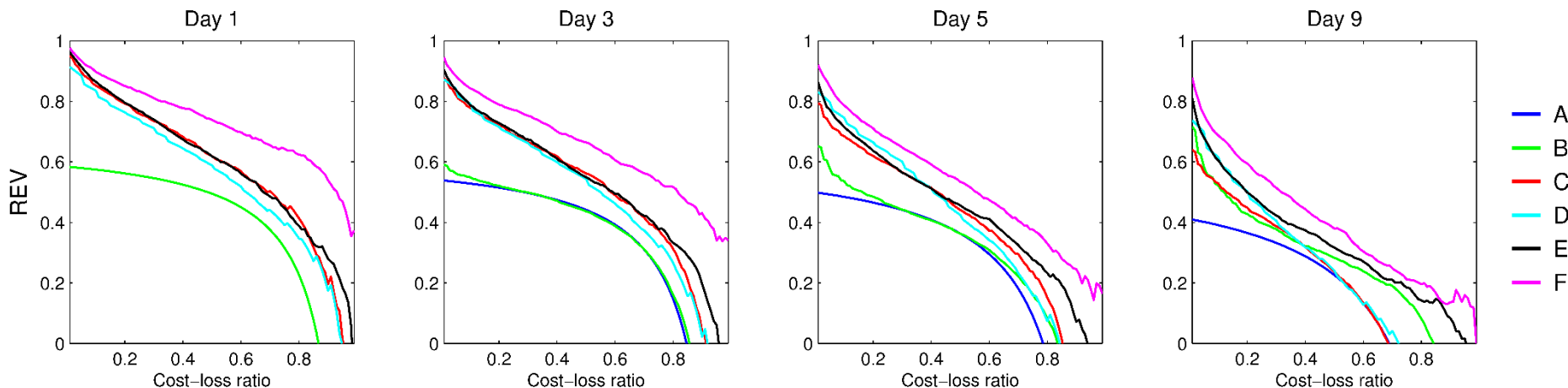
Opt \ Syst	A	B	C	D	E	F
Multimodel	✗	✗	✗	✓	✗	✓
EnKF	✗	✗	✓	✗	✓	✓
Met. Ens.	✗	✓	✗	✗	✓	✓

Day 1



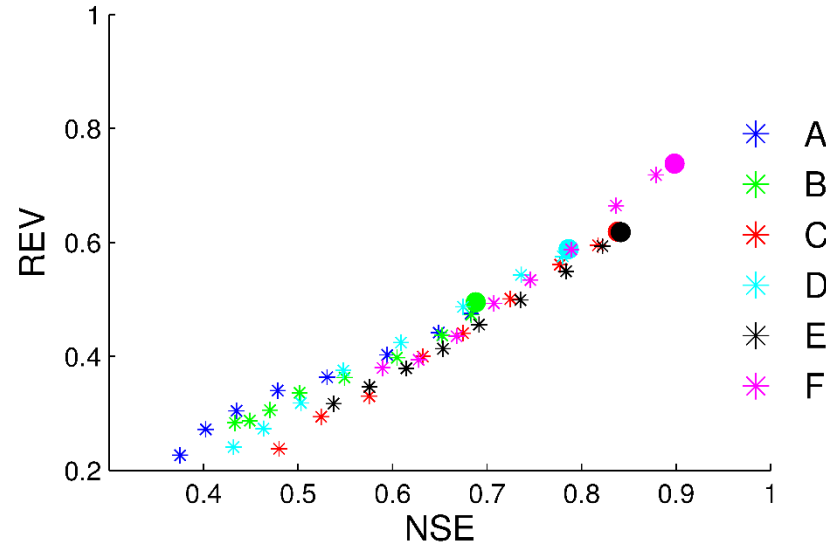
Relative Economic Value

Opt \ Syst	A	B	C	D	E	F
Multimodel	✗	✗	✗	✓	✗	✓
EnKF	✗	✗	✓	✗	✓	✓
Met. Ens.	✗	✓	✗	✗	✓	✓



Relation between quality and value

- Accuracy



Conclusions

- Comparison of the 6 early warning systems
 - Economic gain
 - Most complex systems provide higher
- Relation between quality and economic value
 - Loosely defined
 - Forecast quality poor indicator of forecast value
 - No threshold on accuracy and reliability from which the forecast is valuable