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Non-stationary low-flow frequency analysis with Mixture Weibull distribution – Copula based framework

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1. Motivation

Accurate low-flow frequency information is crucial for effective water management and minimising the impacts of extreme low flow on ecosystems, the economy, and society, especially during dry periods.

Question: How to extend low-flow frequency analysis for mixed summer or winter regimes to non-stationary regimes??



Data:

- 154 catchments in Austria, Minimum
- annual & seasonal flow (MAM(7-day))
- Period : 1977 -2020

Table 1. Trend test (%)

MAM(7-day)	Summer	Winter	
Trend	24	18	
No trend	76	82	

Table 3. Mixture rate

Catchment (%)	
28	
18	
54	

MAM(7-day)	Summer	Winter
Increasing trend	46	89

Decreasing trend

Table 2. Sen's slope (%)

Table 4. Correlation	on summ	ner and	winter

54

τ	Catchment (%)
Low ($\tau < \pm 0,3$)	36
Moderate	64
$(\pm 0, 3 \le \tau \le \pm 0, 7)$	
High ($\tau > \pm 0,7$)	-

7. References

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