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SUPPLEMENTARY MATERIAL

Hydrological characteristics of extreme floods in the Klaserie River, a headwater stream in southern Africa

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Tab. 1. Results of the univariate analysis of differences in the annual rainfall and frequency of 50, 75, 100 and 150 mm rainfall events in the upper Klaserie River.

	Shapiro Wilk test	**Kruskal-Wallis (5-year)**	**Kruskal-Wallis (10-year)**
Annual rainfall	$W = 0.940$, $p = 0.005$	$\chi^2 = 12.54$, $df = 12$, $p = 0.403$	$\chi^2 = 7.676$, $df = 6$, $p = 0.263$
Frequency of rainfall >50 mm	$W = 0.930$, $p = 0.002$	$\chi^2 = 8.733$, $df = 12$, $p = 0.726$	$\chi^2 = 6.541$, $df = 6$, $p = 0.365$
Frequency of rainfall >75 mm	$W = 0.899$, $p < 0.001$	$\chi^2 = 11.01$, $df = 12$, $p = 0.528$	$\chi^2 = 5.479$, $df = 6$, $p = 0.484$
Frequency of rainfall >100 mm	$W = 0.798$, $p < 0.001$	$\chi^2 = 9.615$, $df = 12$, $p = 0.650$	$\chi^2 = 5.697$, $df = 6$, $p = 0.458$
Frequency of rainfall >150 mm	$W = 0.607$, $p < 0.001$	$\chi^2 = 14.49$, $df = 12$, $p = 0.271$	$\chi^2 = 11.769$, $df = 6$, $p = 0.067$

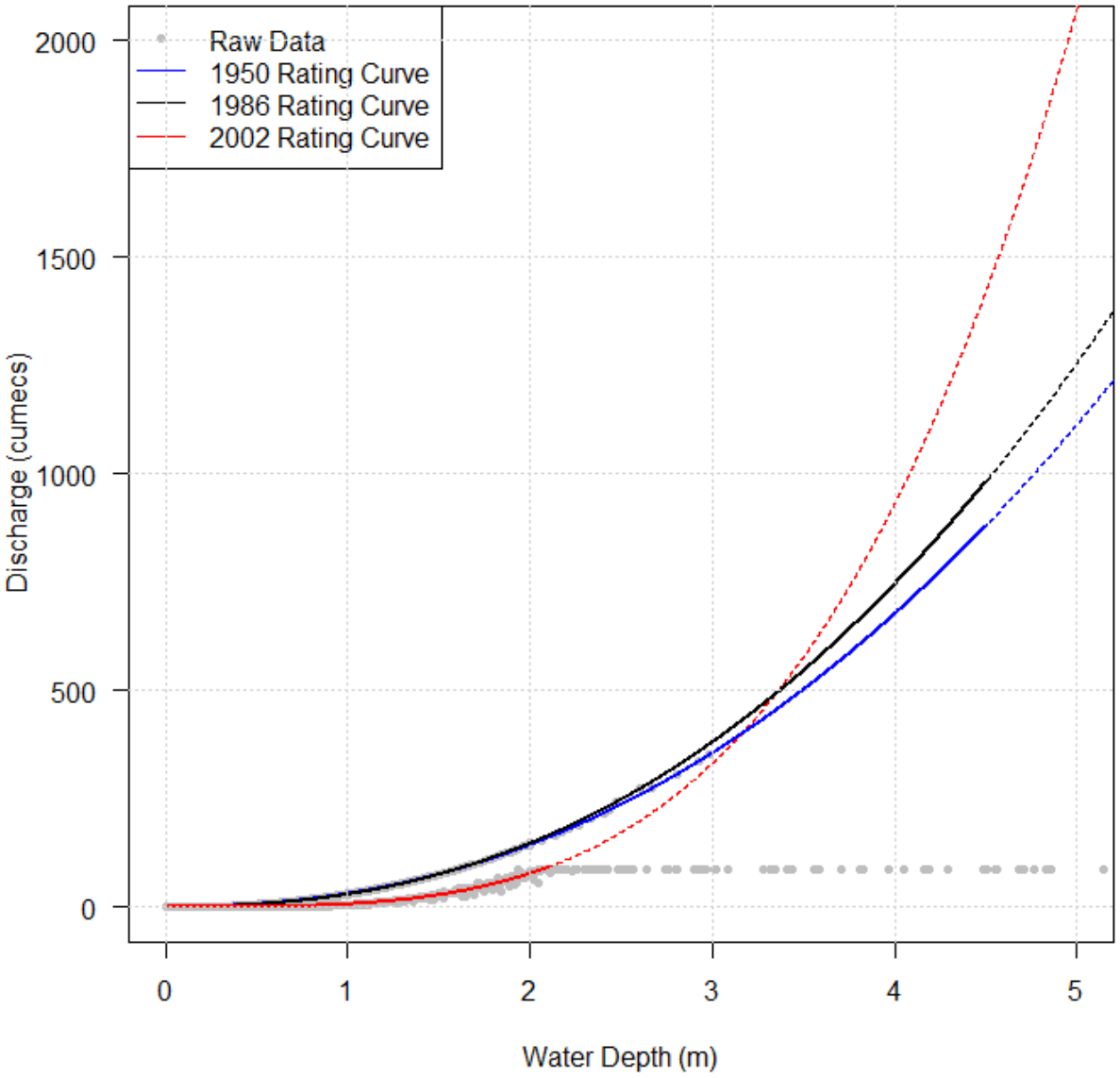

Fig. 1. Raw flow data (grey markers) and empirical rating curves for the Fleur-de-Lys gauging station (B7H004) on the upper Klaserie River. The solid lines indicate the region of the rating curves within the rating table while the dotted lines represent empirical extrapolations of the rating curves beyond the range of the rating tables.

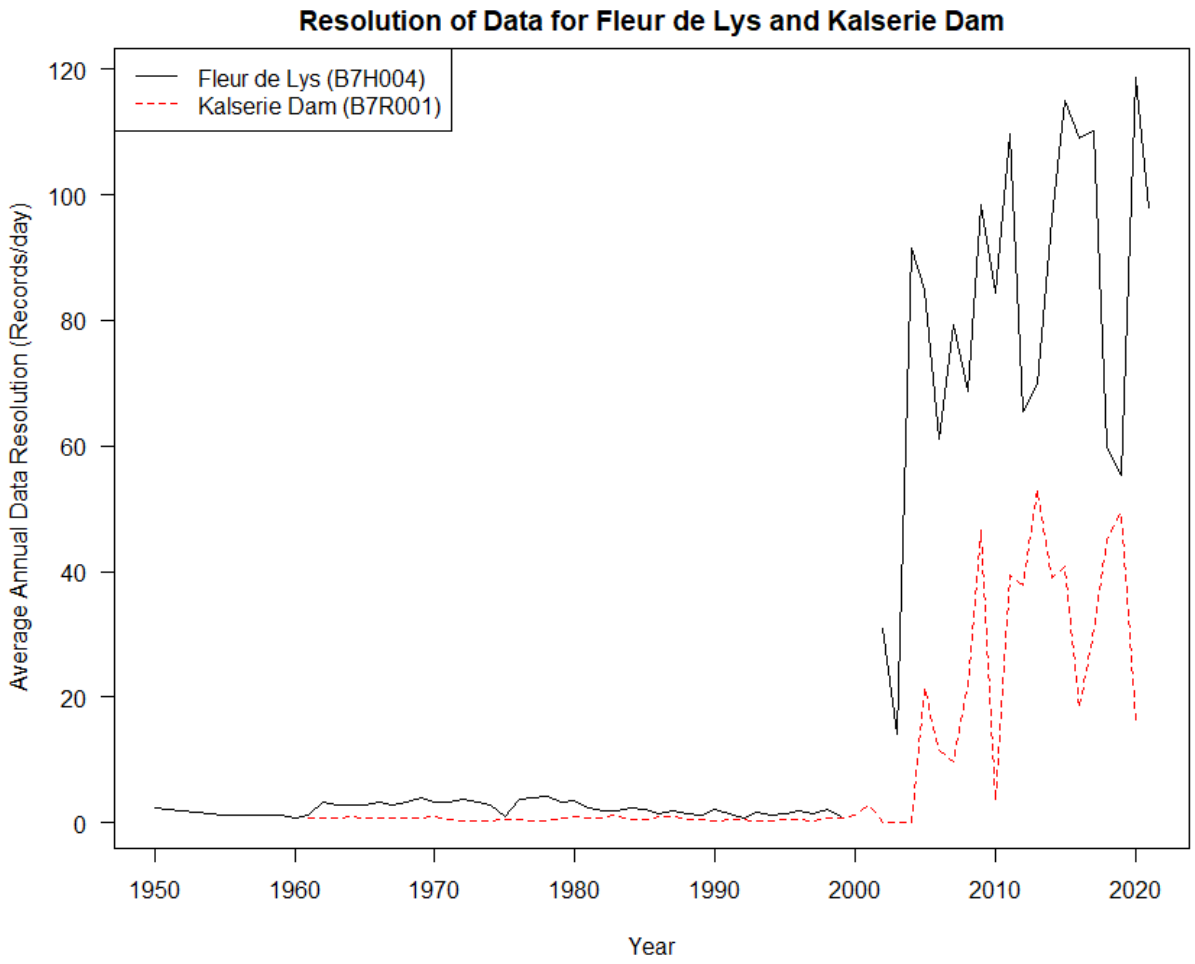

Fig. 2. Resolution of the flow data form the Fleur-de-Lys and Klaserie Dam gauging stations on the Klaserie River.

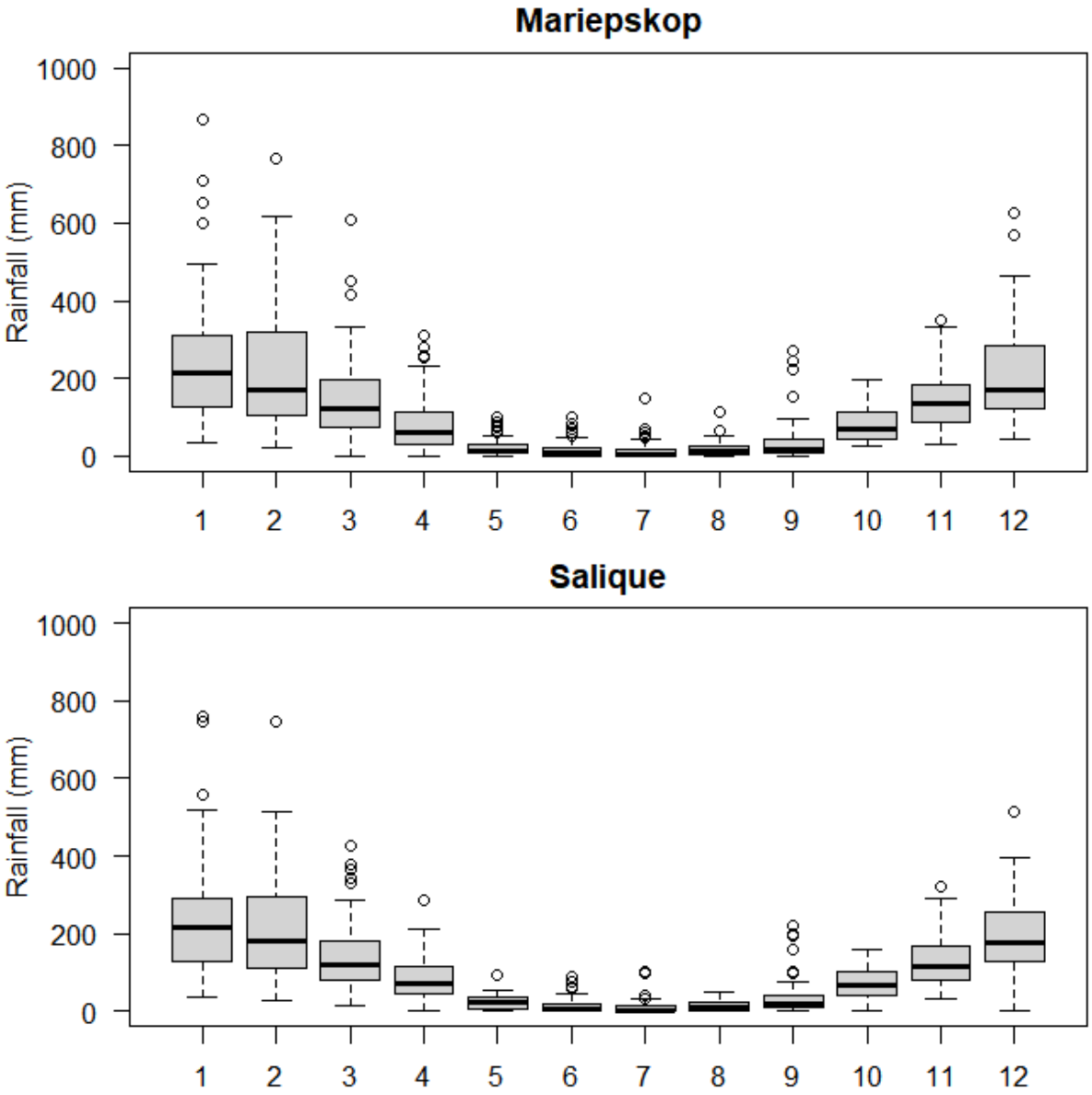

Fig. 3. Box plots of the monthly rainfall from the Mariepskop and Salique forestry stations in the upper Klaserie River.

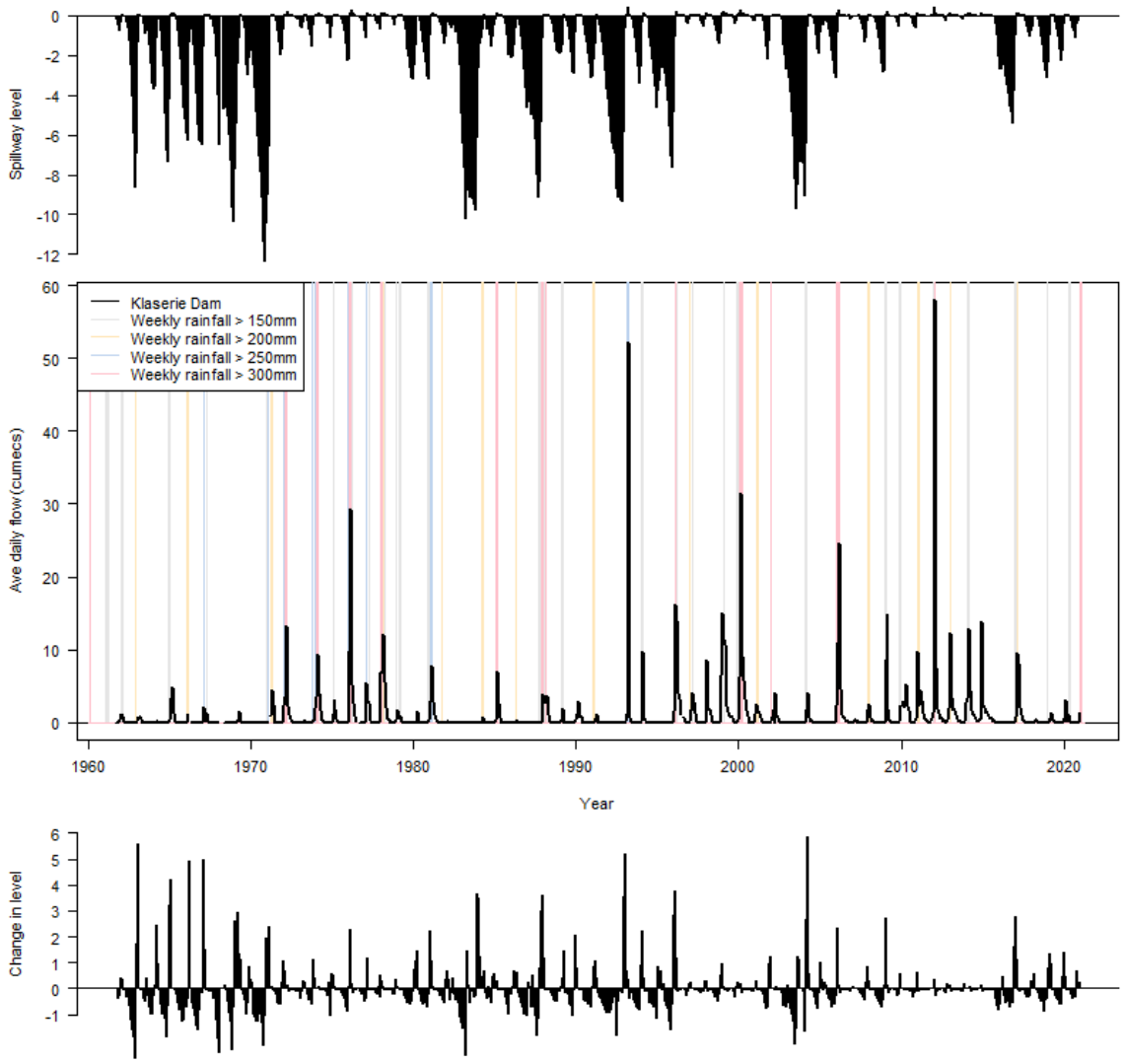

Fig. 4. Time series plots for the Klaserie Dam wall gauging station (B7R001). The top panel shows the monthly average impoundment water level relative to the spillway level. The middle panel presents the daily mean spillage flow averaged for the month (black line) at gauging station B7R001. The lower panel presents the change in monthly impoundment water level relative to the spillway level, reflecting filling events at the impoundment..

R Code to evaluate whether the slope of a regression is equal to a specific value

Perform the linear regression. The *t* value is calculated using the formula:

$$t = \frac{\hat{\beta} - \beta H_0}{\text{s. e.}\left(\hat{\beta}\right)}$$

where $\hat{\beta}$ is the calculated slope parameter from the linear regression, βH_0 is the specific value being tested (1 in this example) and $s.e.(\hat{\beta})$ is the standard error of the calculated slope parameter $\hat{\beta}$. The degrees of freedom for the *t*-test are n-2, the same as they would be for a test with H0: β=0.

R Code for the *t*-test function

```
ttest <- function(reg, coefnum, val){
  co <- coef(summary(reg))
  tstat <- (co[coefnum,1]-val)/co[coefnum,2]
  2 * pt(abs(tstat), reg$df.residual, lower.tail = FALSE)
}
```

Usage

```
myline.fit1 <- lm(Mid.vid1 ~ snorkel1)
summary(myline.fit1)
ttest(myline.fit1, 2,1)
```

Source:

https://stats.stackexchange.com/questions/111559/test-model-coefficient-regression-slope-against-some-value/111566

Accessed 6th June 2018