MDPI

Article

Variability and Trend Detection in the Sediment Load of the Upper Indus River

Sardar Ateeq-Ur-Rehman [1,*], Minh Duc Bui [1] and Peter Rutschmann [1]

[1] Chair of Hydraulic and Water Resources Engineering, Arcisstr. 21, D-80333, Technical University of Munich; sardar.ateeq@tum.de (S.A); bui@tum.de (M.D.B); p.rutschmann@tum.de (P.R)

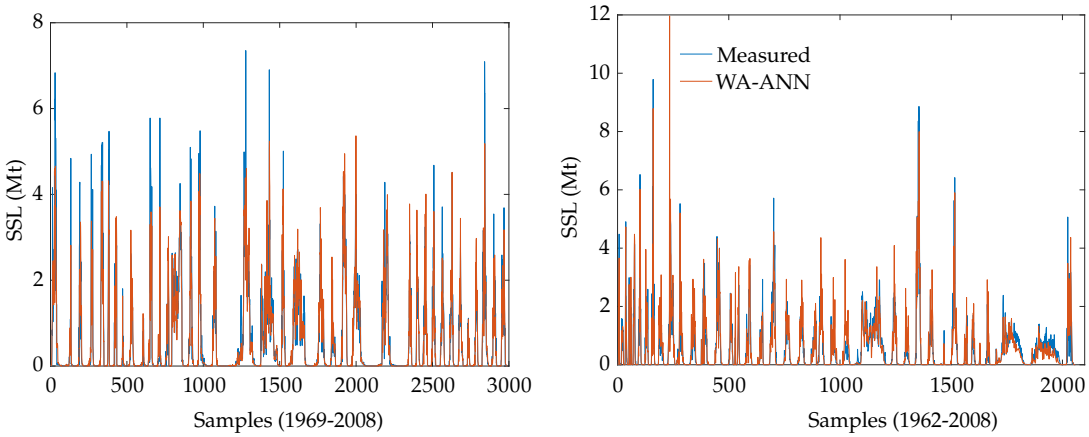
* Correspondence: sardar.ateeq@tum.de; Tel.: +49-89-289-27161; Fax: +49-89-289-23172

Academic Editor: name
Version December 15, 2017 submitted to Water

1. Supplementary Material

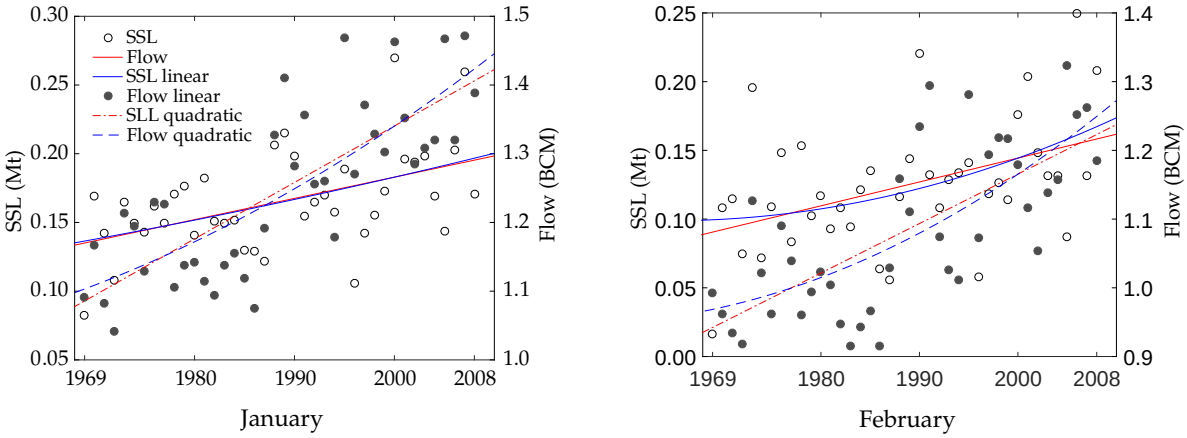
Table S1. Statistical parameters of annual linear and quadratic trends of reconstructed SSLs and observed discharges for the Besham Qila and the Partab Bridge sites. Note: Q_s is annual SSL in Mt, Q is annual flow volume in BCM for Besham Qila ($1969 \leq y \leq 2008$) and Partab Bridge ($1962 \leq y \leq 2008$).

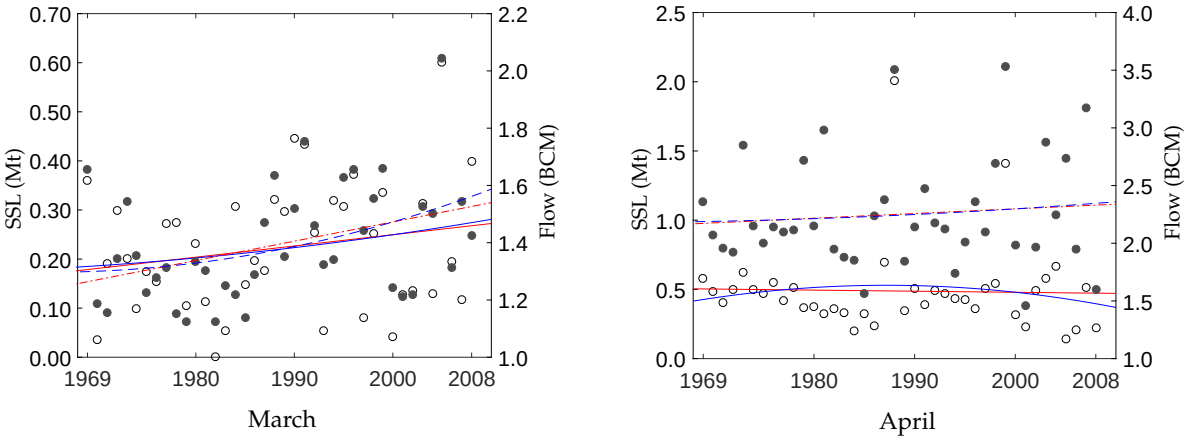
Trend	Besham Qila		Partab Bridge	
	Equation	$\mathbf{R^2}$	**Equation**	$\mathbf{R^2}$
SSL linear	$Q_s = -0.315097y + 786$	0.0087	$Q_s = 0.555835y - 932$	0.0148
SSL quadratic	$Q_s = -0.029615y^2 + 117.465y - 116,312$	0.0169	$Q_s = 0.131748y^2 - 522.485y + 518,161$	0.1368
Flow linear	$Q = 0.075016y - 72$	0.0082	$Q = 0.155112y - 251$	0.0863
Flow quadratic	$Q = -0.006747y^2 + 26.908y - 26,750$	0.0153	$Q = 0.002850y^2 - 11.158y + 10,976$	0.0906

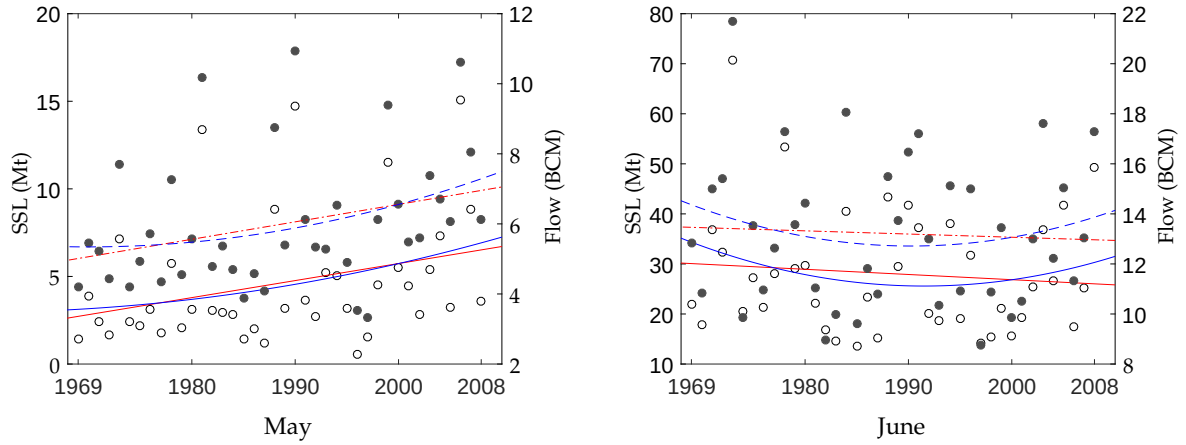


(a) Besham Qila **(b)** Partab Bridge

Figure S1. Comparison between the mass of suspended sediment sampled daily and computed results using WA-ANN models., (legends for (S1b) also apply for (S1a)).


SSL
Flow
SSL linear
Flow linear
SLL quadratic
Flow quadratic
SSL (Mt)
Flow (BCM)
January
February


SSL (Mt)
Flow (BCM)
March
April


SSL (Mt)
Flow (BCM)
May
June

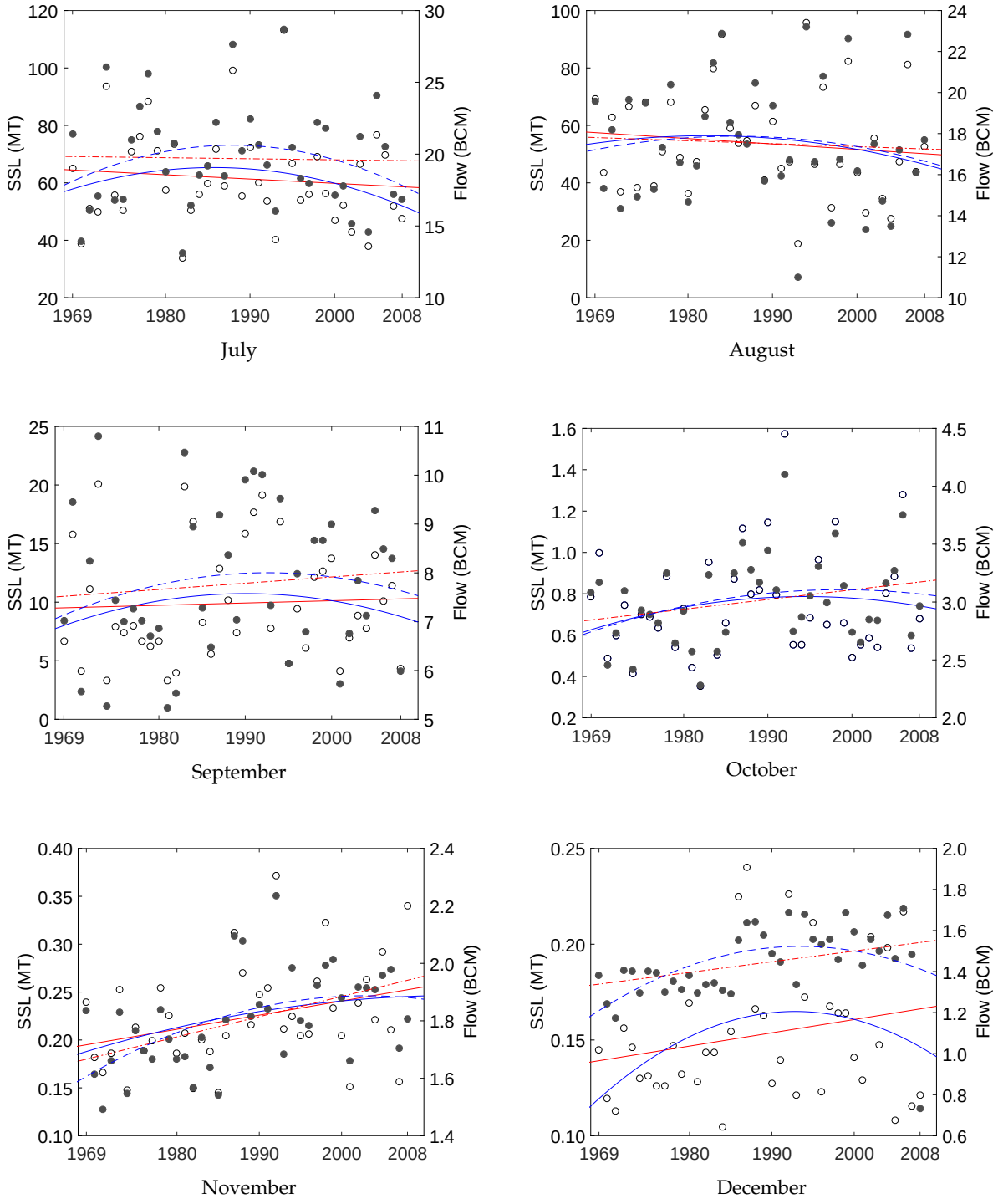
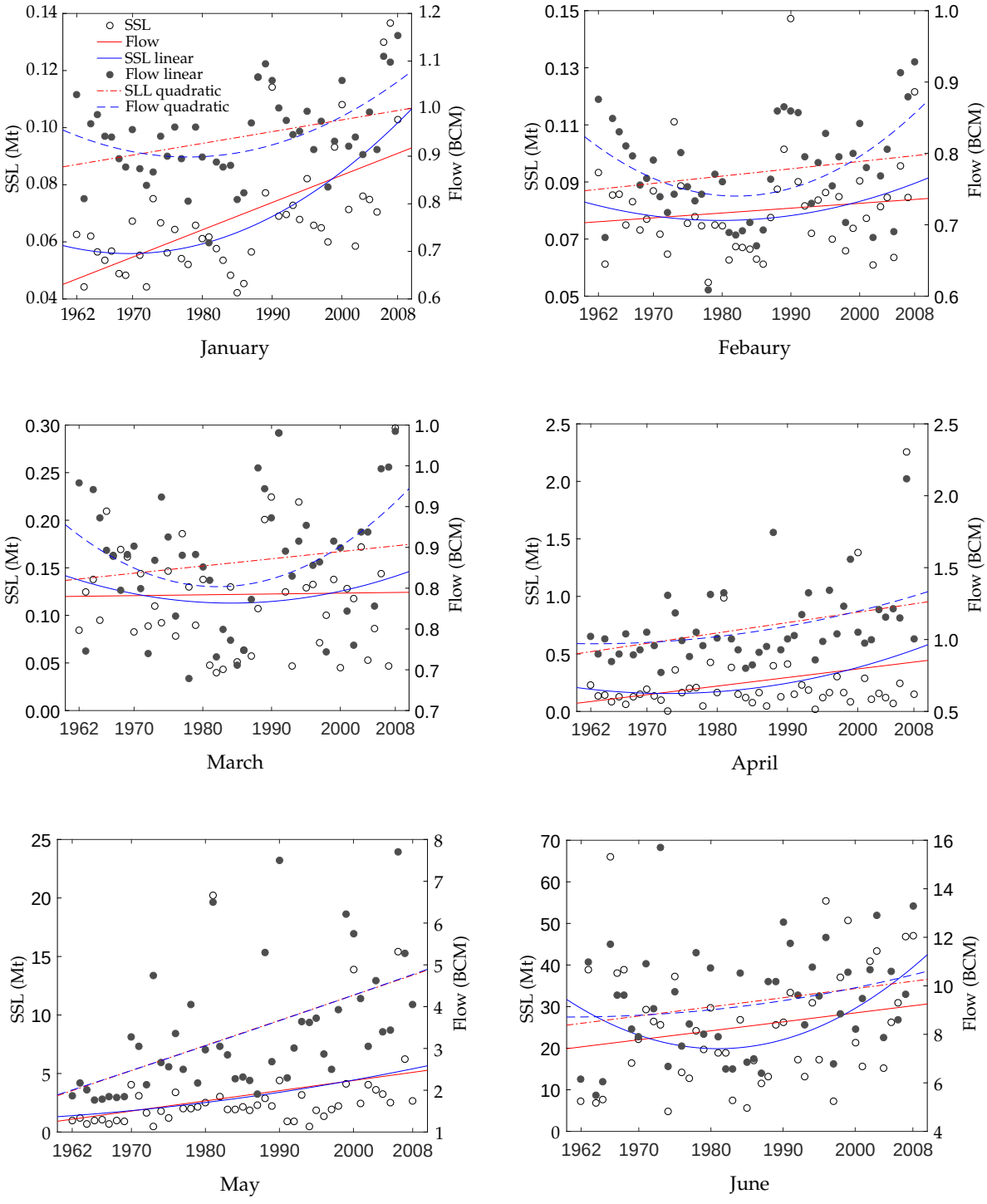


Figure S2. Mean monthly linear and quadratic trends in SSLs and discharges at Besham Qila site from 1969-2008.



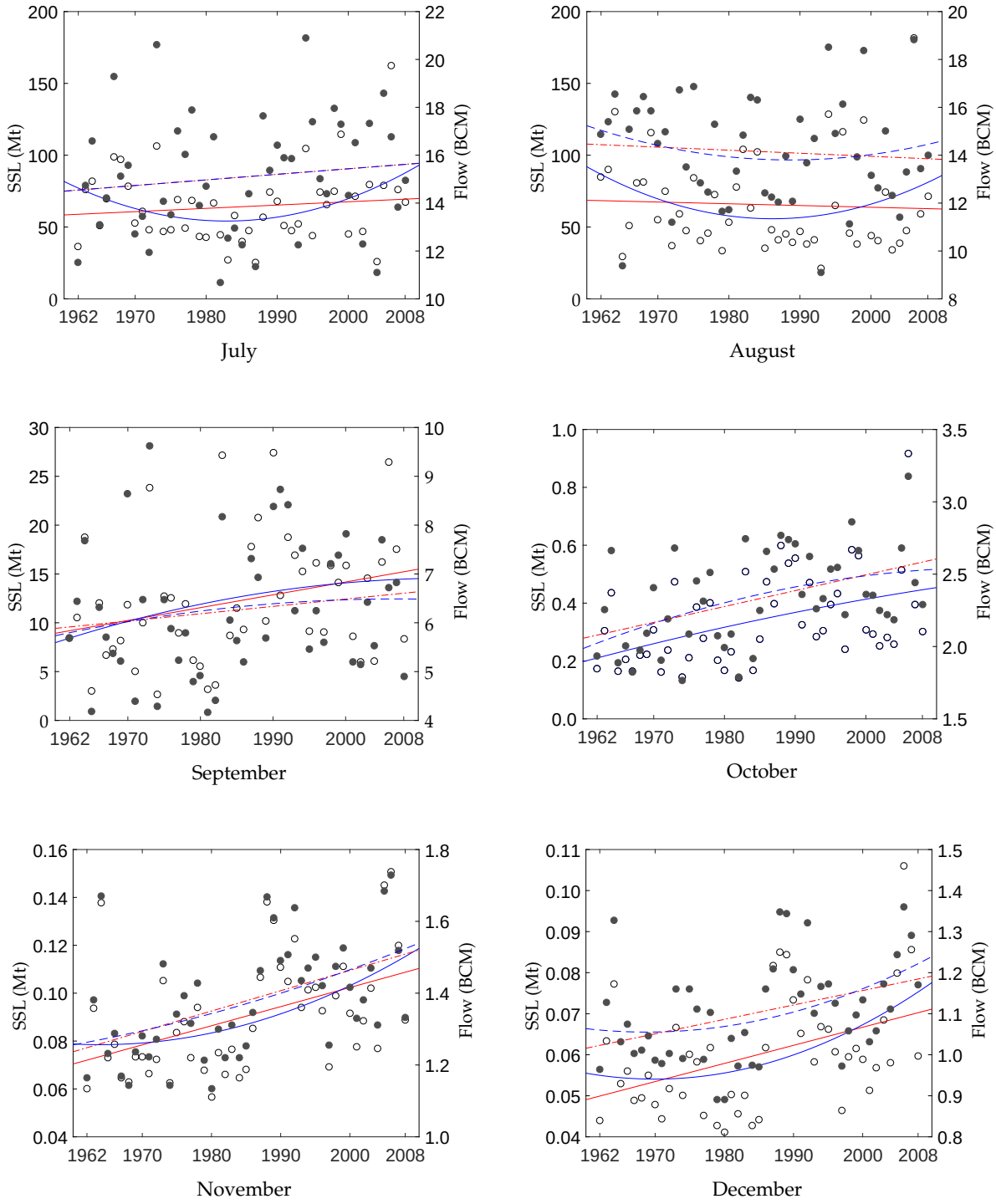


Figure S3. Mean monthly linear and quadratic trends in SSLs and discharges at Partab Bridge site from 1962-2008.