Journal of Geophysical Research – Earth Surface

Supporting Information for

Stochastic in Space and Time: Part 1, Characterizing Orographic Gradients in Mean Runoff and Daily Runoff Variability

A.M. Forte[1] and M.W. Rossi[2]

[1] Department of Geology and Geophysics, Louisiana State University, Baton Rouge, Louisiana, USA.

[2] Earth Lab, Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado, Boulder, Colorado, USA.

Contents of this file

Introduction

This supplemental file contains two supplemental figures.

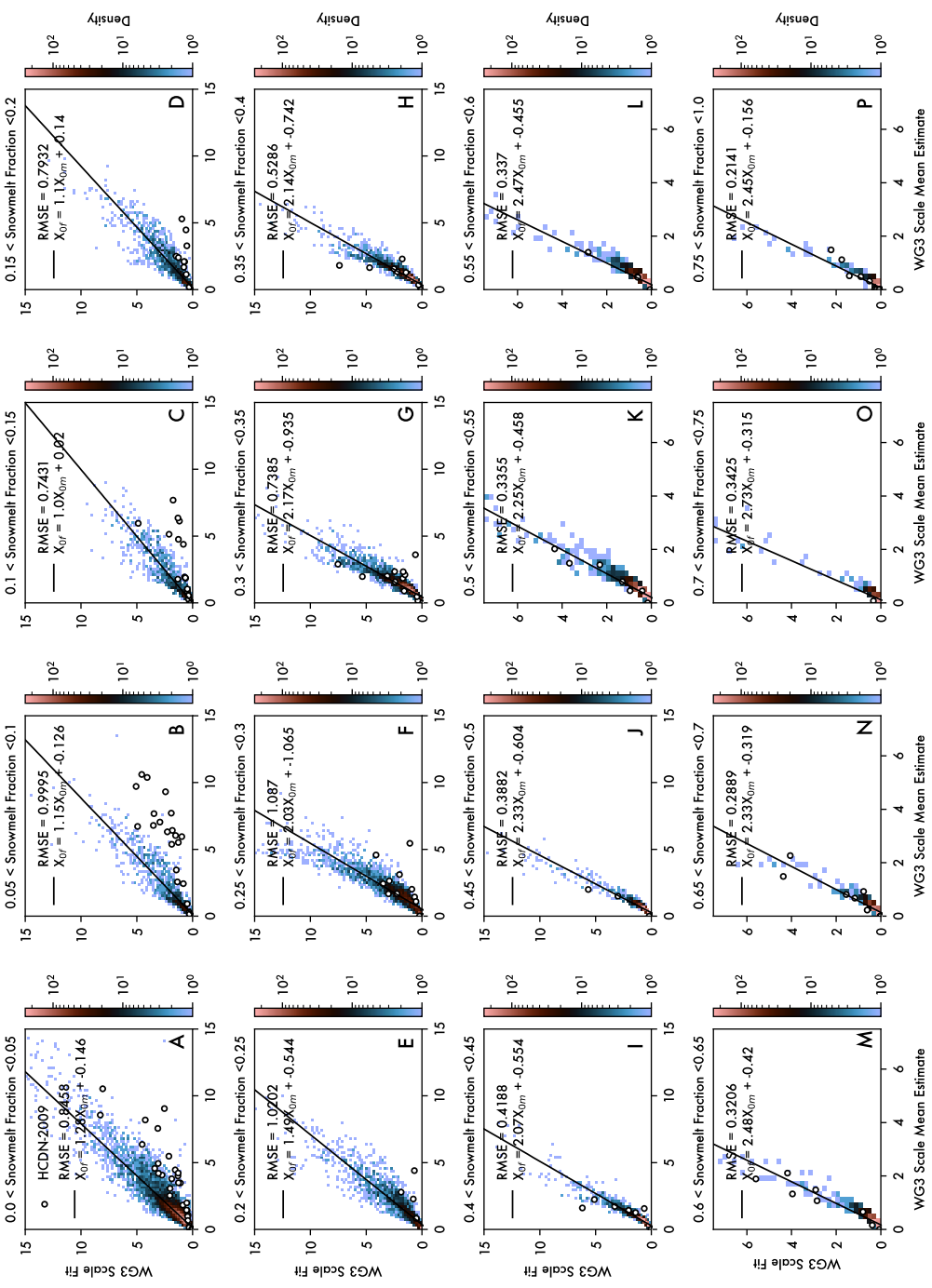
0.0 < Snowmelt Fraction <0.05
HCDN-2009
RMSE = 0.8458
$X_{0f} = 1.26X_{0m} + -0.146$
A
0.05 < Snowmelt Fraction <0.1
RMSE = 0.9995
$X_{0f} = 1.15X_{0m} + -0.126$
B
0.1 < Snowmelt Fraction <0.15
RMSE = 0.7431
$X_{0f} = 1.0X_{0m} + 0.02$
C
0.15 < Snowmelt Fraction <0.2
RMSE = 0.7932
$X_{0f} = 1.1X_{0m} + 0.14$
D
0.2 < Snowmelt Fraction <0.25
RMSE = 1.0202
$X_{0f} = 1.49X_{0m} + -0.544$
E
0.25 < Snowmelt Fraction <0.3
RMSE = 1.087
$X_{0f} = 2.03X_{0m} + -1.065$
F
0.3 < Snowmelt Fraction <0.35
RMSE = 0.7385
$X_{0f} = 2.17X_{0m} + -0.935$
G
0.35 < Snowmelt Fraction <0.4
RMSE = 0.5286
$X_{0f} = 2.14X_{0m} + -0.742$
H
0.4 < Snowmelt Fraction <0.45
RMSE = 0.4188
$X_{0f} = 2.07X_{0m} + -0.554$
I
0.45 < Snowmelt Fraction <0.5
RMSE = 0.3882
$X_{0f} = 2.33X_{0m} + -0.604$
J
0.5 < Snowmelt Fraction <0.55
RMSE = 0.3355
$X_{0f} = 2.25X_{0m} + -0.458$
K
0.55 < Snowmelt Fraction <0.6
RMSE = 0.337
$X_{0f} = 2.47X_{0m} + -0.455$
L
0.6 < Snowmelt Fraction <0.65
RMSE = 0.3206
$X_{0f} = 2.48X_{0m} + -0.42$
M
0.65 < Snowmelt Fraction <0.7
RMSE = 0.2889
$X_{0f} = 2.33X_{0m} + -0.319$
N
0.7 < Snowmelt Fraction <0.75
RMSE = 0.3425
$X_{0f} = 2.73X_{0m} + -0.315$
O
0.75 < Snowmelt Fraction <1.0
RMSE = 0.2141
$X_{0f} = 2.45X_{0m} + -0.156$
P
WG3 Scale Fit
WG3 Scale Mean Estimate
Density

Figure S1. Density plots show the relationship between the scale parameter fit to the data versus those implied by the empirical mean for the filtered WaterGAP3 data: (A-O) Plots binned by snowmelt fraction in increments of 0.05 up to 0.75 snowmelt. (P) The last panel is for the remaining data that has >0.75 snowmelt. In all panels, linear fits to the data are shown. Black dots are HCDN-2009 watersheds filtered in the same way. For HCDN-2009 data, snowmelt fraction was taken from WaterGAP3 data.

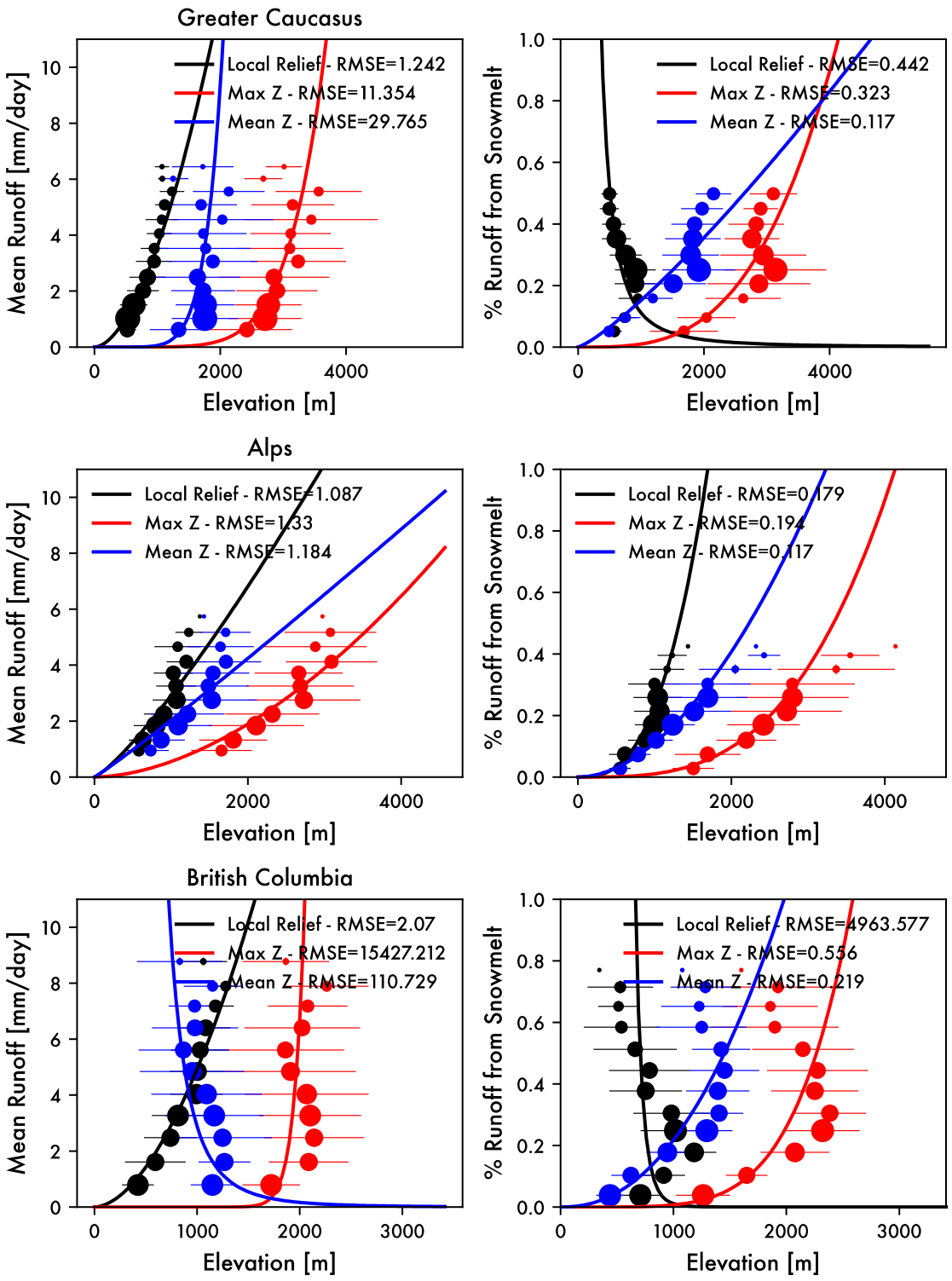

Figure S2. Comparisons of power law fits to either mean runoff (left column) or snowmelt fraction (right column) to mean local relief (black), maximum elevation (red), or mean elevation (blue). Also shown are root mean squared errors (RMSE) for each fit. Linear and exponential fits were also tested, but power law fits produced the most sensible results.

29
30