

## Supporting Information for

# Mass-Conserving Downscaling of Climate Model Precipitation over Mountainous Terrain for Water Resource Applications

**A. Rugg<sup>1</sup>, E. D. Gutmann<sup>1</sup>, R. R. McCrary<sup>1</sup>, F. Lehner<sup>2,1,3</sup>, A. J. Newman<sup>1</sup>, J. H. Richter<sup>1</sup>, M. R. Tye<sup>1,4</sup>, A. W. Wood<sup>1</sup>**

<sup>1</sup>National Center for Atmospheric Research, Boulder CO

<sup>2</sup>Department of Earth and Atmospheric Sciences, Cornell University, Ithaca, NY, USA

<sup>3</sup>Polar Bears International, Bozeman, MT, USA

<sup>4</sup>Whiting School of Civil Engineering, Johns Hopkins, Baltimore, MD, USA

### Contents of this File

#### Table S1

### Introduction

This supporting information contains a table with the root mean squared errors and errors in centroid runoff timing for the hydrographs plotted in Figure 3 of the paper.

**Table S1:** RMSEs and error in CT for each CESM2 hydrograph in Fig. 3. Values in parentheses indicate the percent change compared to the CESM2-Raw. Bold text indicates statistics discussed in the text because they break a general pattern.

Region	Metric	CESM2-Raw	CESM2-Elev	CESM2-Full	CESM2-Full-BC
Pacific Northwest	RMSE [mm day <sup>-1</sup> ]	0.45	0.34 (-24.2%)	0.31 (-31.4%)	0.31 (-31.0%)
	CT error [days]	-23	-17 (-26.1%)	-15 (-34.8%)	10 (-56.6%)
Great Basin	RMSE [mm day <sup>-1</sup> ]	0.27	0.28 (+1.9%)	<b>0.27</b> <b>(+1.6%)</b>	0.03 (-89.1%)
	CT error [days]	-34	-31 (-8.8%)	-29 (-14.7%)	8 (-76.5%)
Upper Colorado	RMSE [mm day <sup>-1</sup> ]	0.15	<b>0.15</b> <b>(-4.7%)</b>	<b>0.17</b> <b>(+9.5%)</b>	0.03 (-81.2%)
	CT error [days]	-32	-25 (-21.9%)	-23 (-28.1%)	2 (93.8%)
Yakima	RMSE [mm day <sup>-1</sup> ]	0.87	0.78 (-10.8%)	0.71 (-19.3%)	0.62 (-28.8%)
	CT error [days]	-61	-51 (-16.4%)	-47 (-23.0%)	8 (-86.9%)
Boise	RMSE [mm day <sup>-1</sup> ]	0.83	<b>0.74</b> <b>(-11.0%)</b>	0.78 (-6.1%)	0.41 (-50.5%)
	CT error [days]	-40	-35 (-12.5%)	-33 (-17.5%)	1 (-97.5%)
Tuolumne	RMSE	1.43	0.97	0.90	1.30

	[mm day <sup>-1</sup> ]		(-31.9%)	(-37.0%)	(-9.1%)
	CT error [days]	-40	-14 (-65.0%)	-14 (-65.0%)	29 (-27.5%)
Upper Colorado at Cameo	RMSE [mm day <sup>-1</sup> ]	0.36	0.29 (-20.3%)	0.28 (-23.5%)	0.07 (-79.6%)
	CT error [days]	-30	-22 (-26.7%)	-20 (-33.3%)	3 (-90.0%)
Animas	RMSE [mm day <sup>-1</sup> ]	0.49	<b>0.32</b> <b>(-33.4%)</b>	0.36 (-25.9%)	0.18 (-63.1%)
	CT error [days]	-35	-19 (-45.7%)	-18 (-48.6%)	2 (-94.3%)