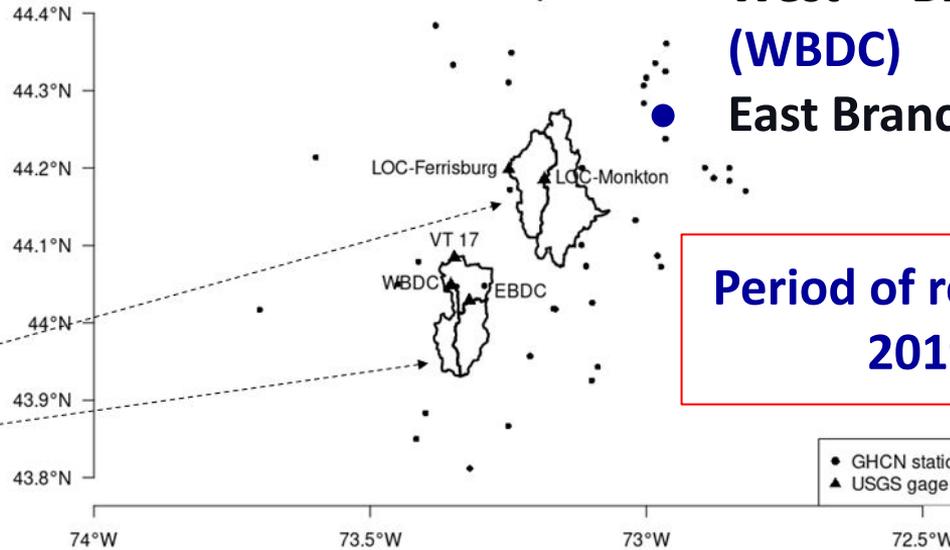
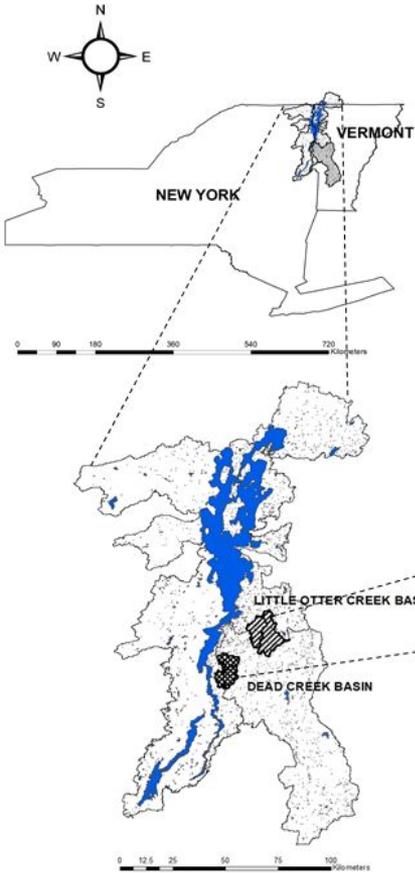


# Watershed Model Parameter Estimation in Low Data Environments

**Roja Kaveh Garna <sup>1</sup>, Daniel Fuka <sup>1</sup>, Joshua W. Faulkner <sup>2</sup>, Robin R. White <sup>3</sup>, Elyce Buell<sup>1</sup>, Sabrina Mehzabin <sup>1</sup>, Binyam W. Asfaw <sup>1</sup>, Barbara dos Reis <sup>3</sup>, Amy S. Collick <sup>4</sup>, Zachary M. Easton <sup>1</sup>**

<sup>1</sup> Biological Systems Engineering, Virginia Tech; <sup>2</sup> Extension Center for Sustainable Agriculture, University of Vermont; <sup>3</sup> Department of Animal and Poultry Science, Virginia Tech; <sup>4</sup> Agricultural Science, Morehead State University

# Overview



- Little Otter Creek-Monkton (LOC-Monkton)
- West Branch Dead Creek (WBDC)
- East Branch Dead Creek (EBDC)

**Period of record for streamflow:  
2019-09 to 2021-11**

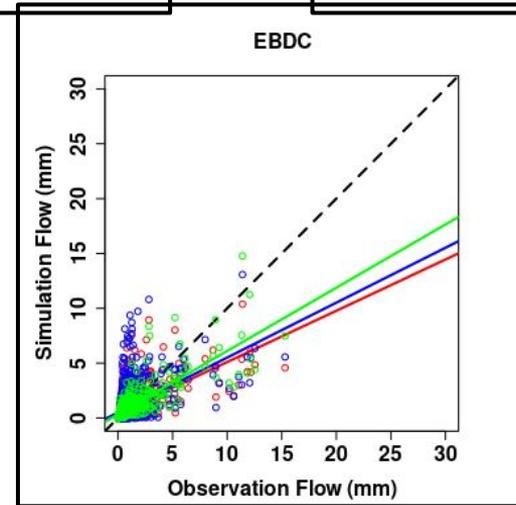
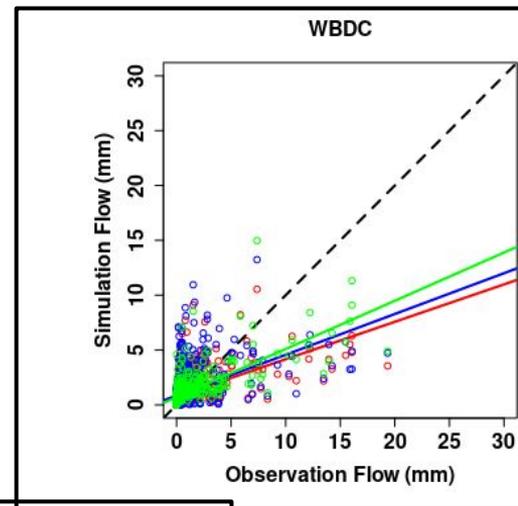
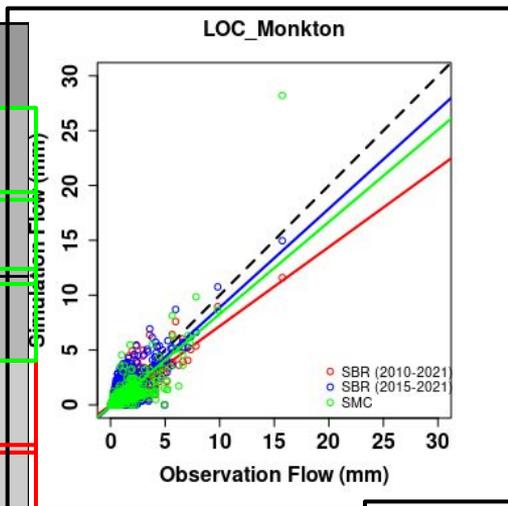
**Model Calibration?**

# Calibration Results

Source	Depth (mm)	AW (mm/mm)	Ksat (mm/hr)
SBR (2010-2021)	892-1270	0.19-0.31	20-38
SBR (2015-2021)	765-1089	0.19-0.30	19-35
SMC	2490-3545	0.22-0.30	5-9
Field measurements	Mostly down to 3000mm+	0.24	Very low

SMC outperforms the SBR (traditional regionalization) method.

	Watershed	NSE
SMC	LOC_Monkton	0.52
	WBDC	0.49
	EBDC	0.60
SBR 2010-2021	LOC_Monkton	0.57
	WBDC	0.25
	EBDC	0.29
SBR 2015-2021	LOC_Monkton	0.60
	WBDC	0.04
	EBDC	0.01



# Discussion

- SMC  better capturing of characteristics and parameter estimation of the regions
- Higher NSE values (2 out of 3) than regionalization method
- No need for the Donor watershed
- Applicable?
  - Most watersheds are not monitored, so this allows a quick install of several basins with much less history needed