Empirical Validation of Automated Redistricting Algorithms on the Virginia House of Delegates District Map

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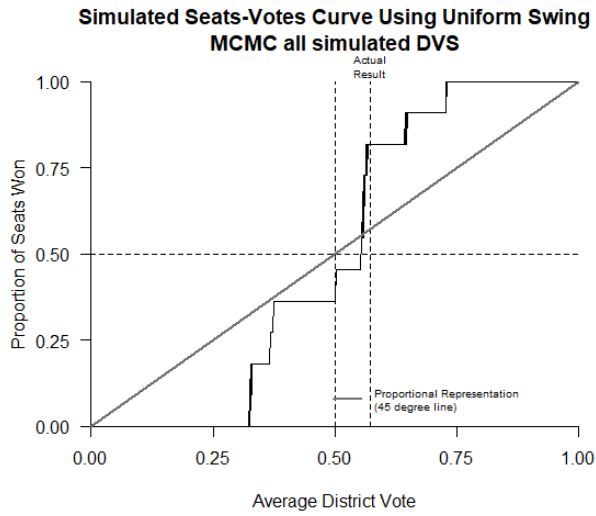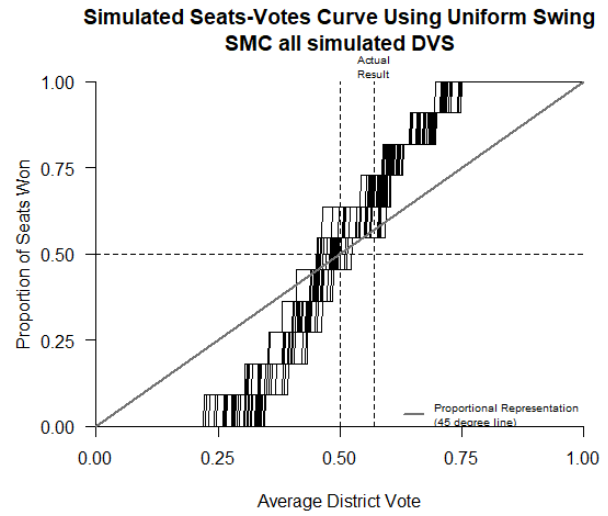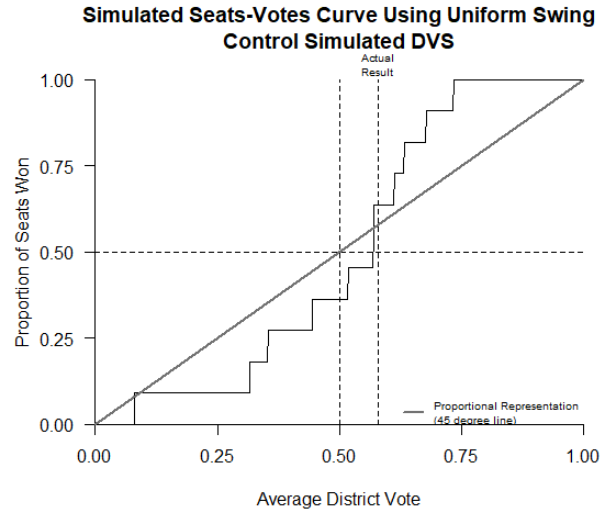
AP Research
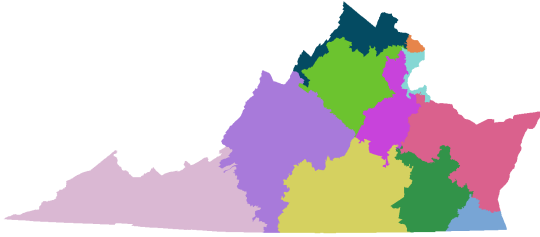
Randall S. Huberman

May 20th, 2021

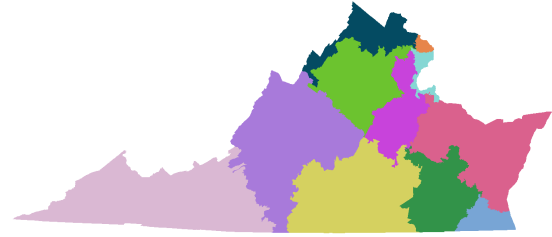| type	alg measure	control	mcmc	smc
compact	ecc	0.777428	0.774128	0.816295
	fh	2.15416e+21	1.66564e+21	1.84849e+21
	pp	0.185835	0.172610	0.165511
fair	dseats	7.00000	9.00000	7.28000
	bias	-0.136364	-0.136364	0.0436364
	dec	0.0406080	-0.485947	-0.0304248
	effgap	-0.00292268	-0.179412	-0.0170277
	effgapeqpop	-0.0220841	0.172966	0.0204446
	lopwin	0.0886207	0.000318324	0.0664807
	meanmed	0.0680291	0.0533195	-0.0159417
	resp	0.00000	9.09091	0.363636
	taugap	-1.14986	-0.0848905	-0.368612

Table 1

Mean Fairness and Compactness Measures for MCMC, SMC, and Control

(a) *MCMC Seats-Votes Curve*

(b) *SMC Seats-Votes Curve*

(c) *Real Seats-Votes Curve*
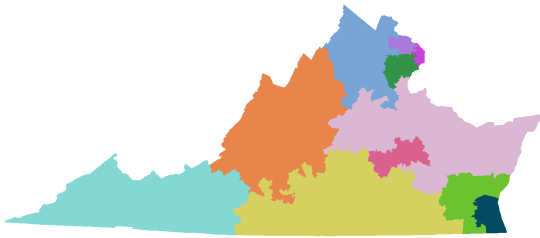
Figure 8

Seats Votes Curves

MCMC map with greatest Polsby-Popper score

MCMC map with greatest Edge-Cut Compactness score
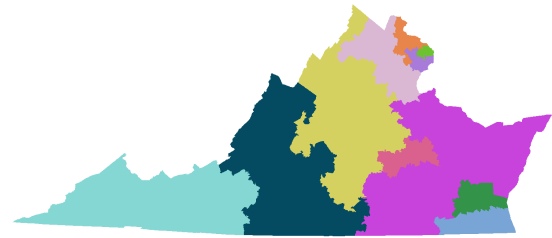
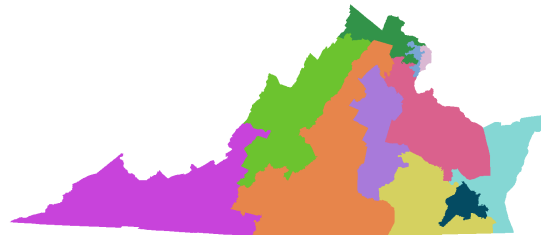(a) *MCMC Map with Greatest Polsby-Popper Score*

(b) *MCMC Map with Greatest Edge-Cut Compactness Score*

SMC map with greatest Polsby-Popper score

SMC map with greatest Edge-Cut Compactness score

(c) *SMC Map with Greatest Polsby-Popper Score*

(d) *SMC Map with Greatest Edge-Cut Compactness Score*

Control map

(e) *Control Map*

Figure 9

Maps of Most Compact Redistricting Plans