

APPENDIX E:

LSPC Snow Module Calibration and Validation

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PARKS CREEK
Station ID: PRK
10/01/2003 - 09/30/2019

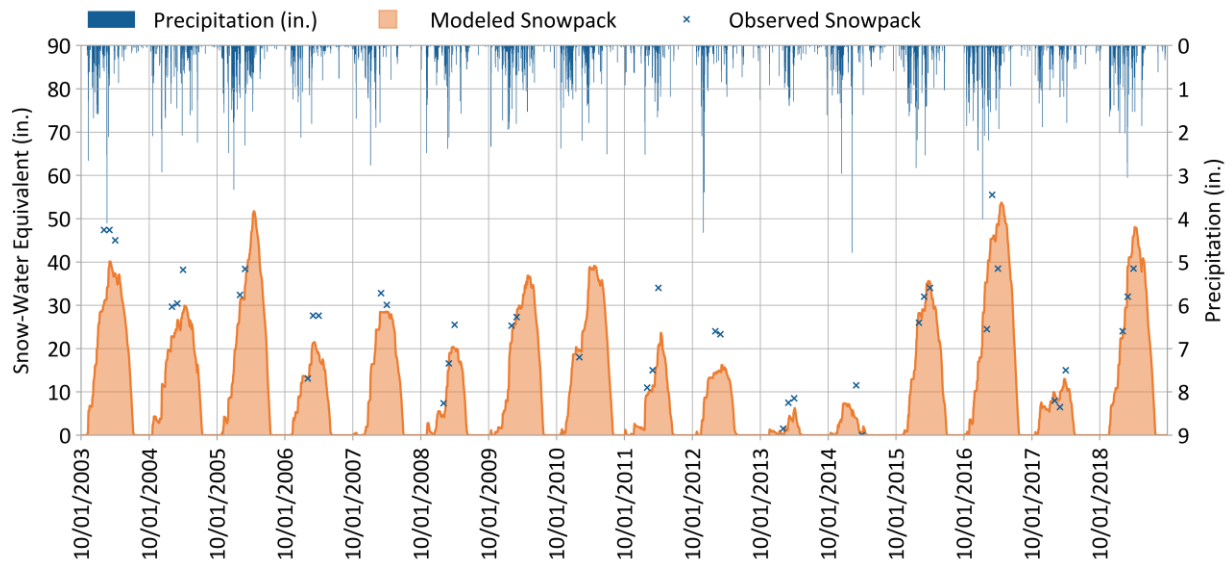


Figure E-1. PARKS CREEK (PRK) - Snow calibration: Simulated vs. daily observed snowpack.

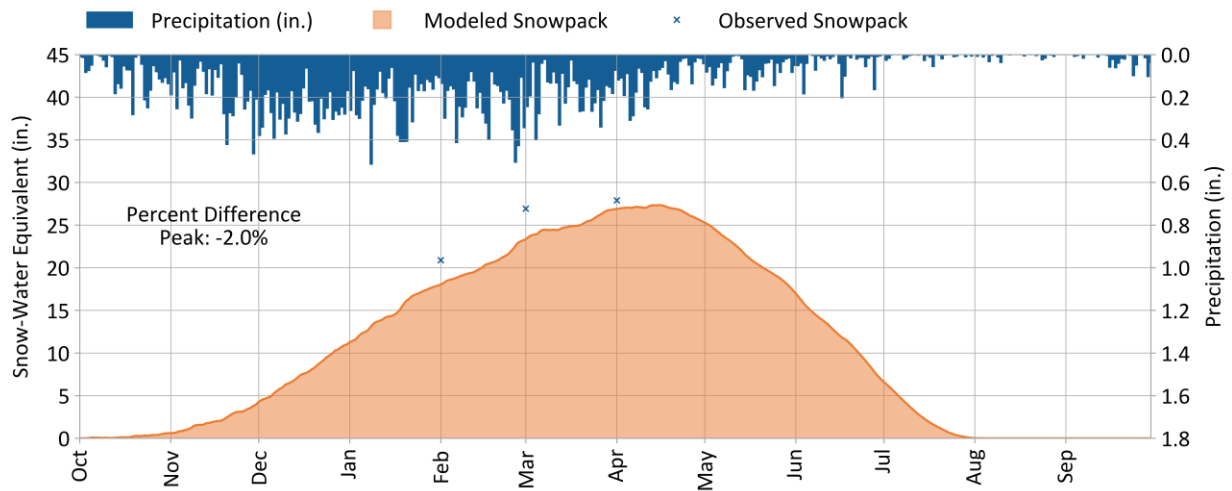


Figure E-2. PARKS CREEK (PRK) - Snow calibration: Simulated vs. daily seasonal average snowpack.

SWEETWATER
Station ID: SWT
10/01/2003 - 09/30/2019

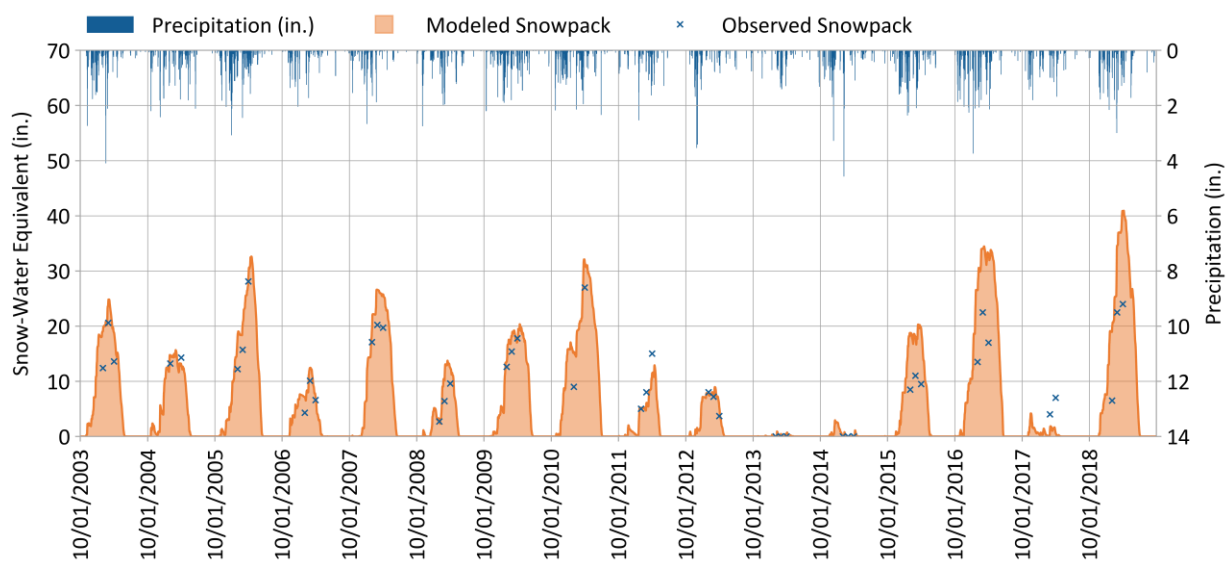


Figure E-3. SWEETWATER (SWT) - Snow calibration: Simulated vs. daily observed snowpack.

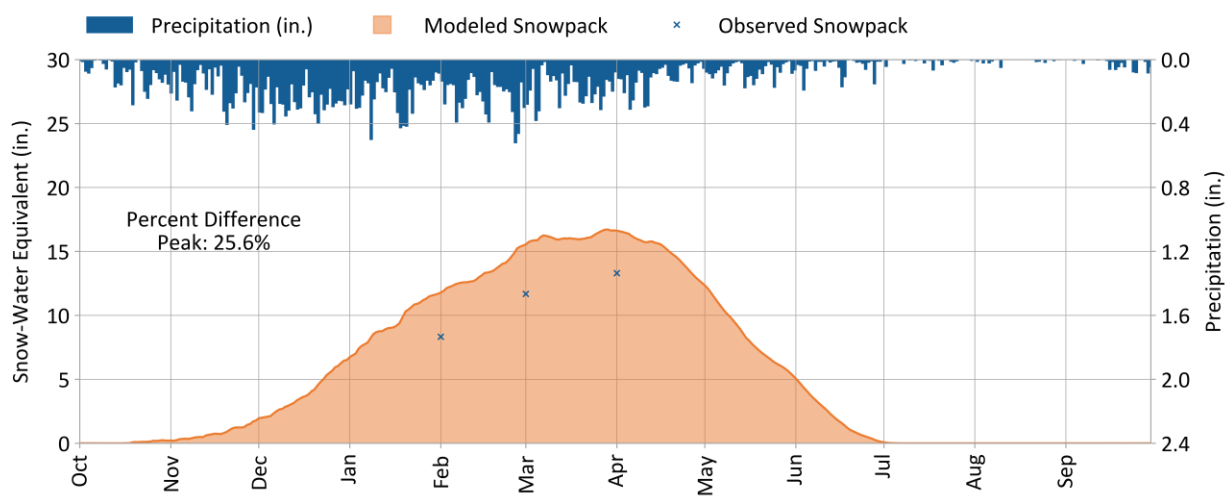


Figure E-4. SWEETWATER (SWT) - Snow calibration: Simulated vs. daily seasonal average snowpack.

LITTLE SHASTA
Station ID: LSH
10/01/2003 - 09/30/2019

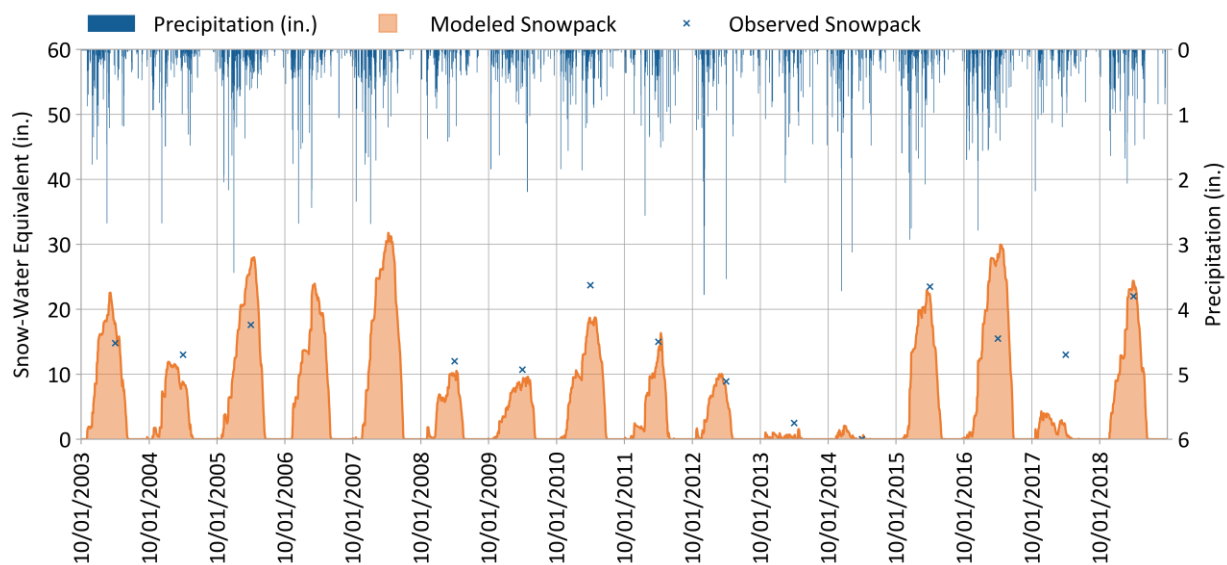


Figure E-5. LITTLE SHASTA (LSH) - Snow calibration: Simulated vs. daily observed snowpack.

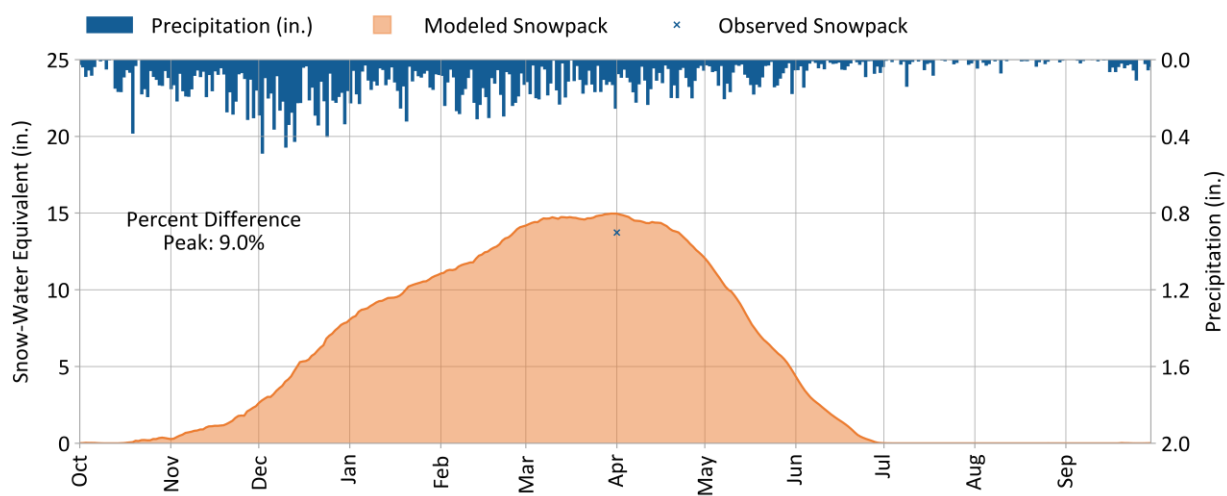


Figure E-6. LITTLE SHASTA (LSH) - Snow calibration: Simulated vs. daily seasonal average snowpack.

MOUNT SHASTA
Station ID: MSH
10/01/2003 - 09/30/2019

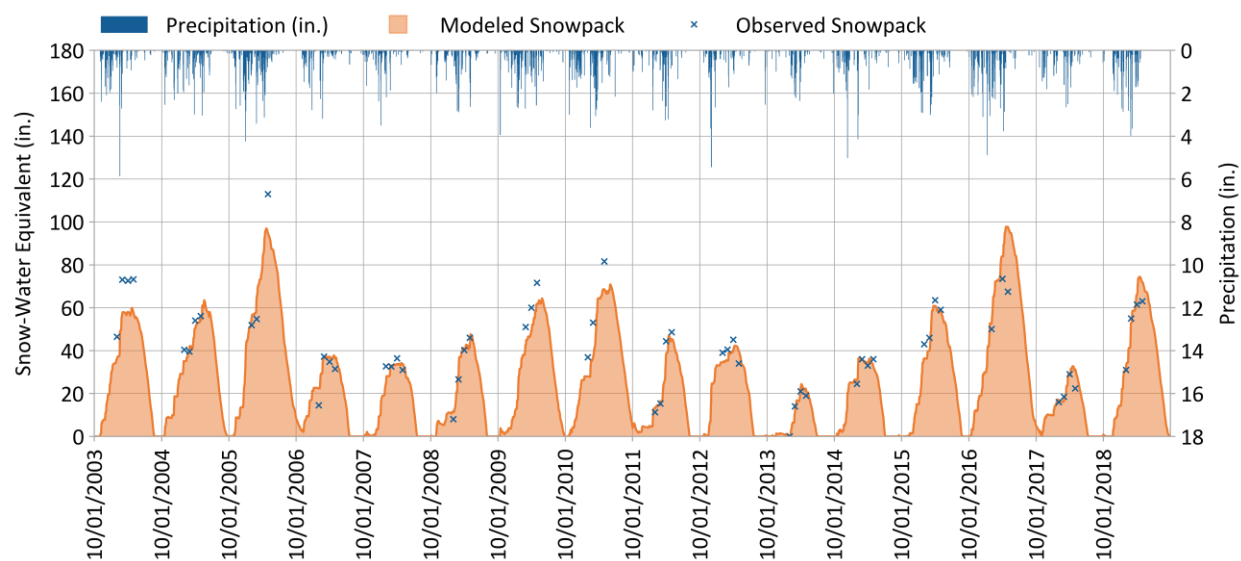


Figure E-7. MOUNT SHASTA (MSH) - Snow calibration: Simulated vs. daily observed snowpack.

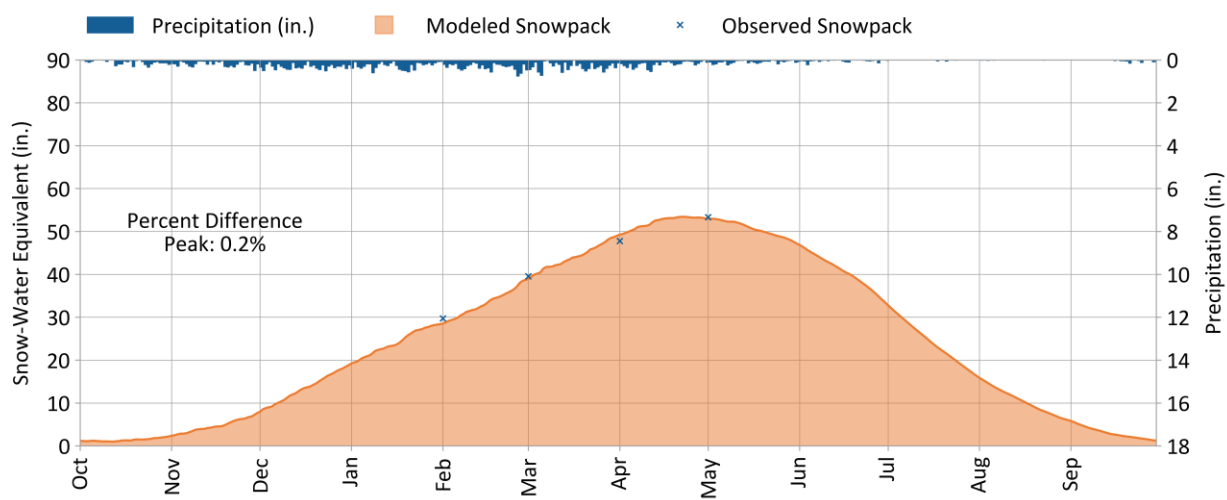


Figure E-8. MOUNT SHASTA (MSH) - Snow calibration: Simulated vs. daily seasonal average snowpack.

SAND FLAT (COURSE)
Station ID: SFT
10/01/2003 - 09/30/2019

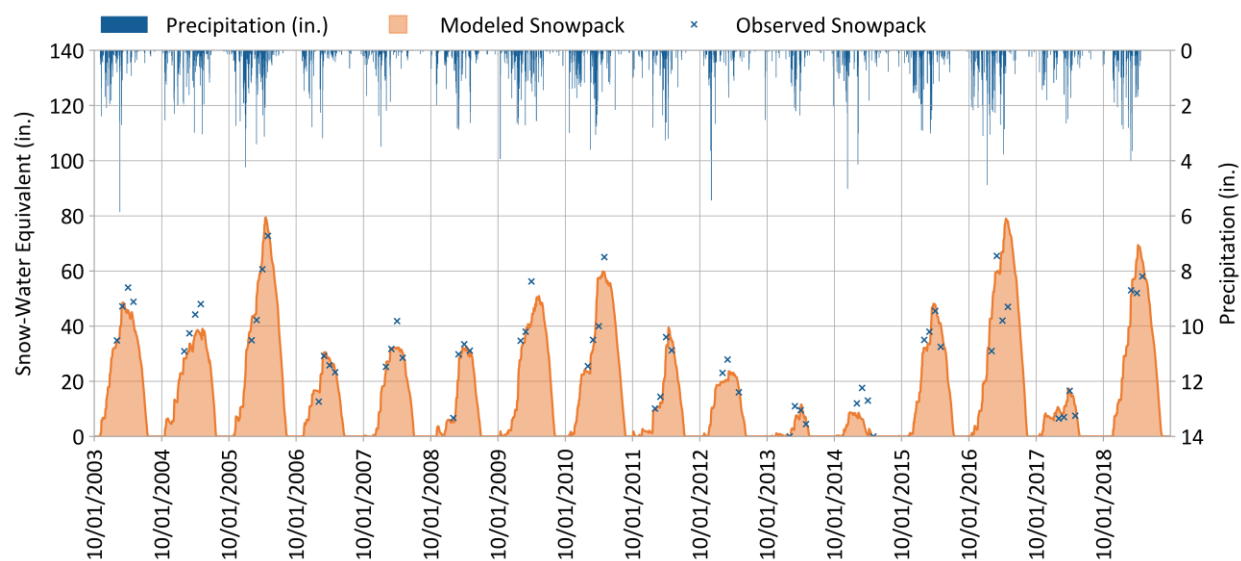


Figure E-9. SAND FLAT (COURSE) (SFT) - Snow calibration: Simulated vs. daily observed snowpack.

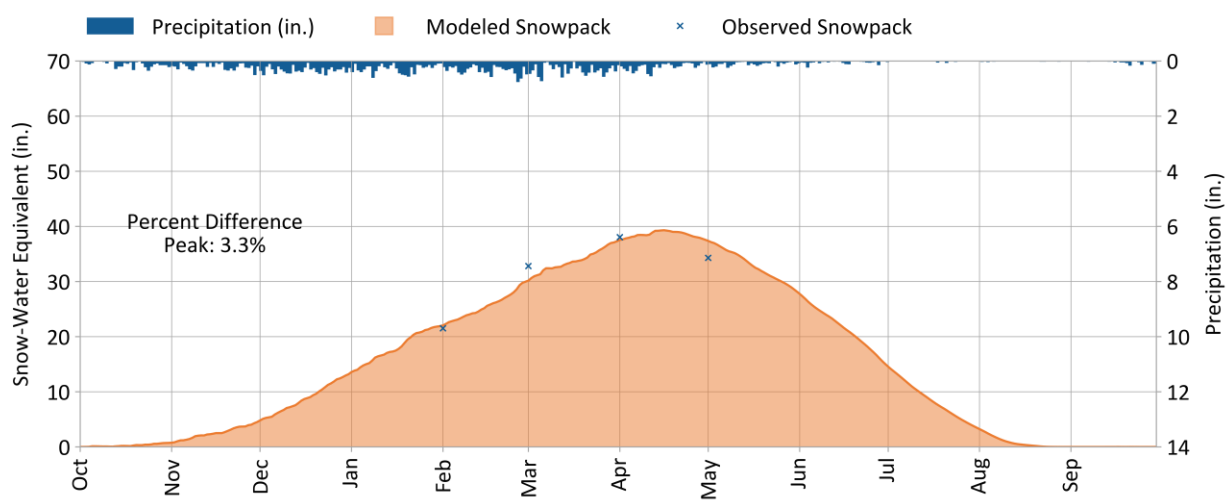


Figure E-10. SAND FLAT (COURSE) (SFT) - Snow calibration: Simulated vs. daily seasonal average snowpack.

BREWER CREEK
Station ID: BWR
10/01/2003 - 09/30/2019

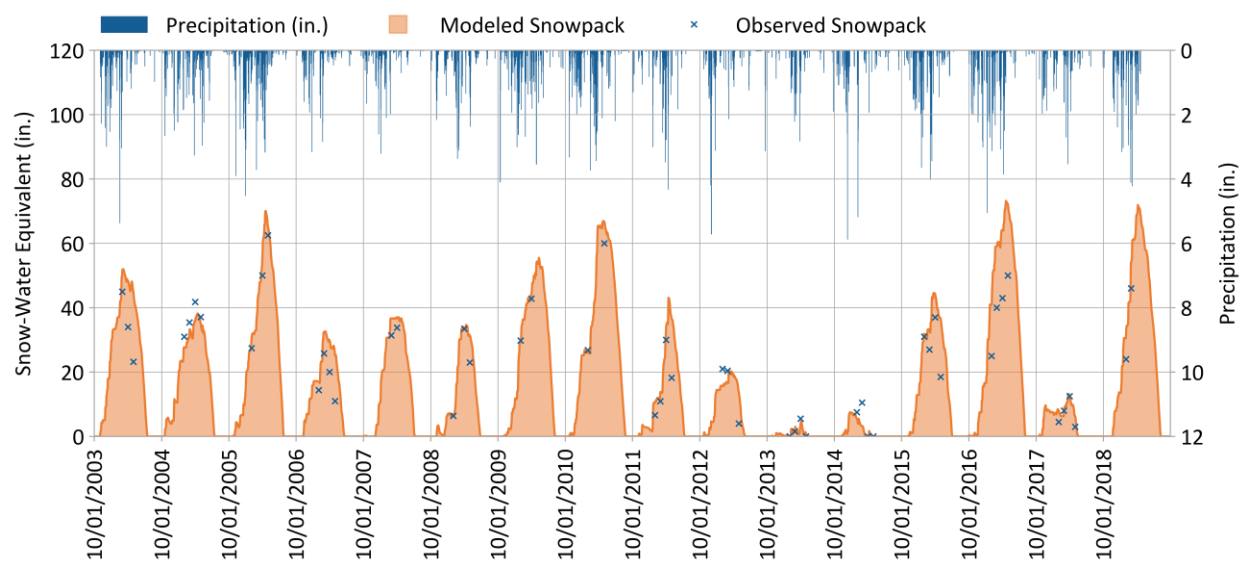


Figure E-11. BREWER CREEK (BWR) - Snow calibration: Simulated vs. daily observed snowpack.

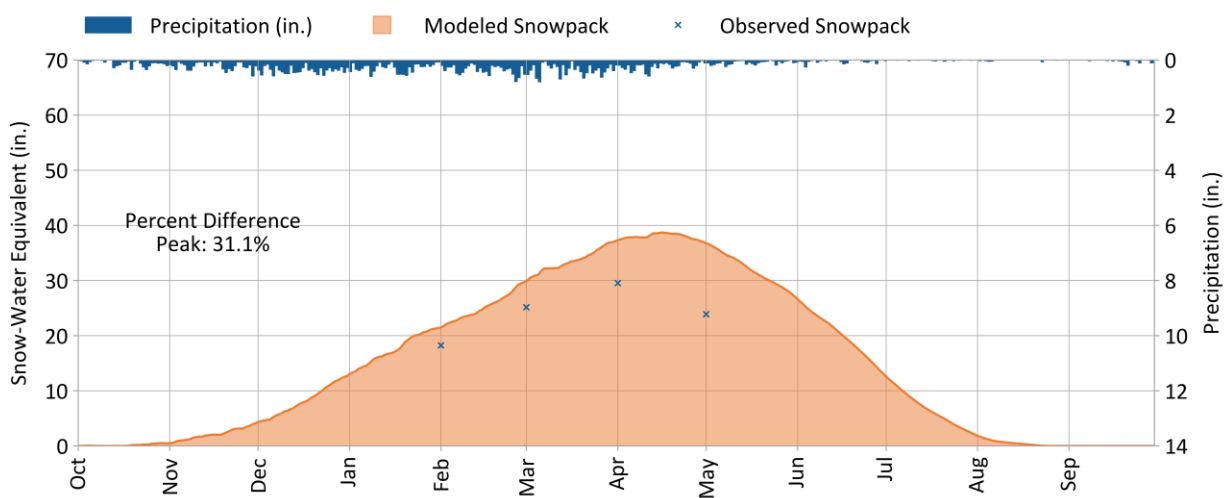


Figure E-12. BREWER CREEK (BWR) - Snow calibration: Simulated vs. daily seasonal average snowpack.

Big Red Mountain
Station ID: BRM
10/01/2003 - 09/30/2019

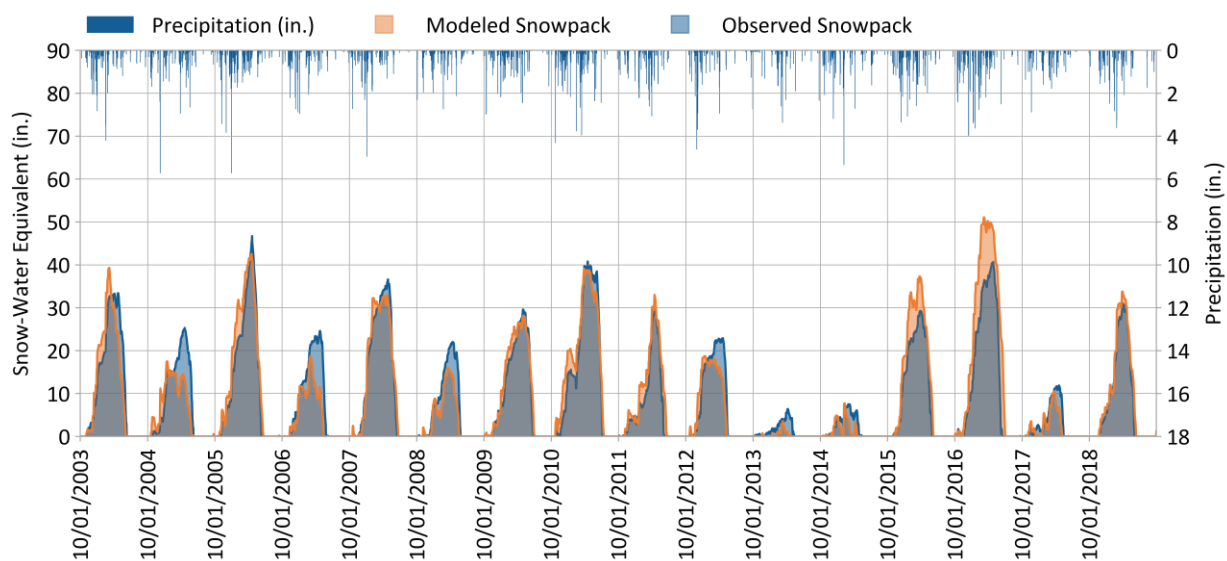


Figure E-13. Big Red Mountain (BRM) - Snow calibration: Simulated vs. daily observed snowpack.

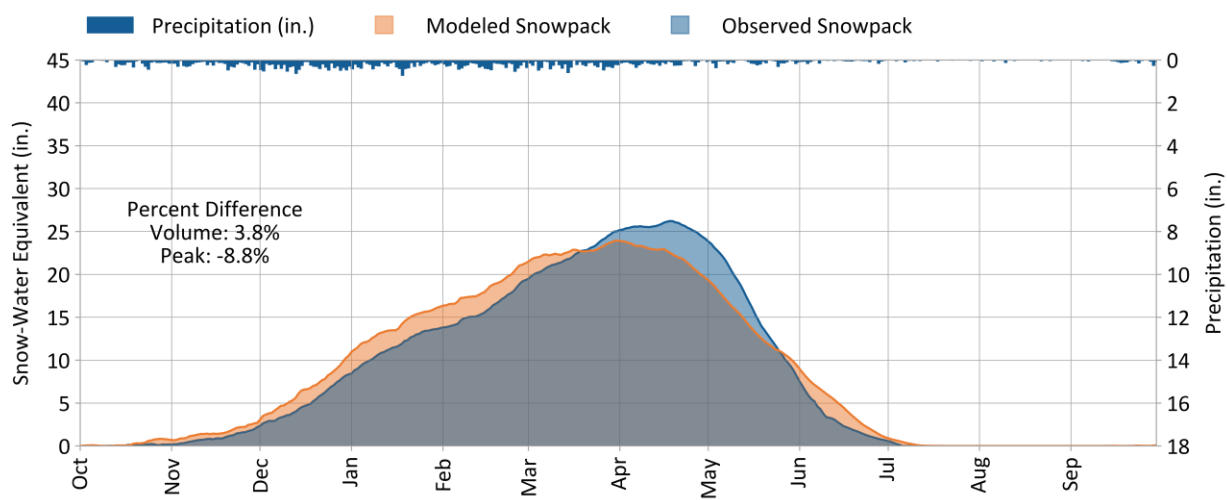


Figure E-14. Big Red Mountain (BRM) - Snow calibration: Simulated vs. daily seasonal average snowpack.

Table E-1. Big Red Mountain (BRM) - Snow calibration: statistical metric for simulated vs. daily seasonal average snowpack

Water Year	NSE	PBIAS	R ²	Min Temperature (°F)	Max Temperature (°F)	Mean Temperature (°F)	Median Temperature (°F)
2004	0.86	3%	0.87	18	61	36	34
2005	0.62	24%	0.68	21	59	36	36
2006	0.94	-13%	0.96	17	56	35	33
2007	0.60	39%	0.76	14	55	36	35
2008	0.97	-1%	0.97	17	56	34	33
2009	0.76	33%	0.90	14	59	36	35
2010	0.96	-8%	0.97	10	52	34	32
2011	0.95	-9%	0.96	15	62	33	32
2012	0.89	-26%	0.94	16	56	35	35
2013	0.83	14%	0.85	16	63	35	35
2014	0.04	75%	0.34	12	55	37	37
2015	0.43	45%	0.53	17	63	39	39
2016	0.84	-30%	0.98	14	63	36	35
2017	0.66	-47%	0.94	13	53	33	33
2018	0.71	32%	0.78	16	57	36	35
2019	0.97	-13%	0.99	17	56	35	34

GOOSENEST
Station ID: SVG
10/01/2020 - 09/30/2023

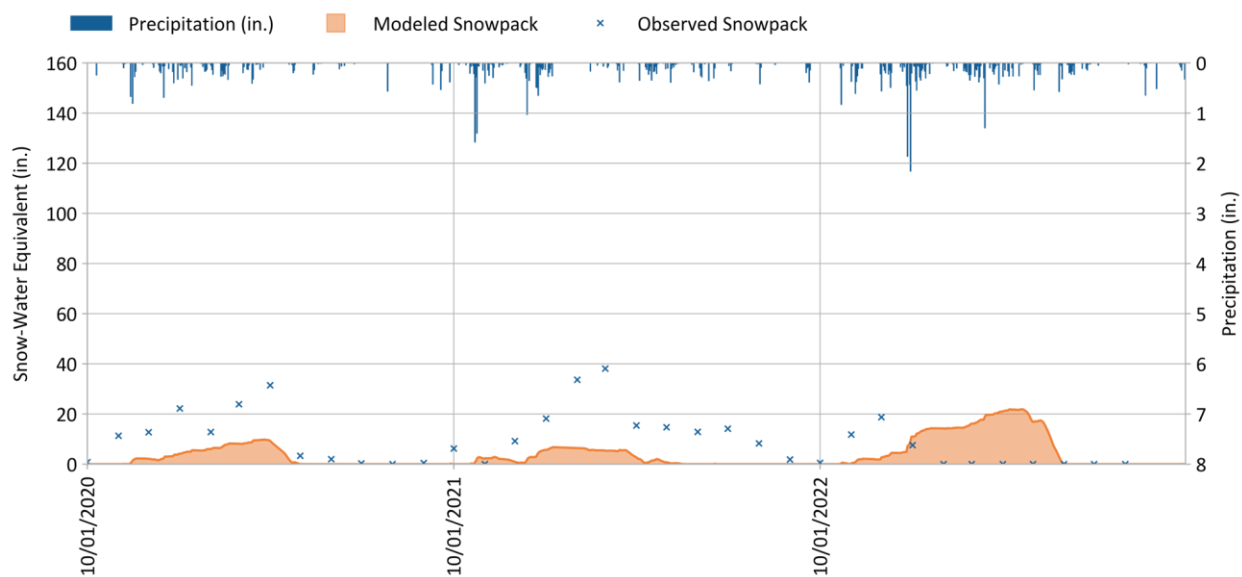


Figure E-15. GOOSENEST (SVG) - Snow validation: Simulated vs. observed snowpack.

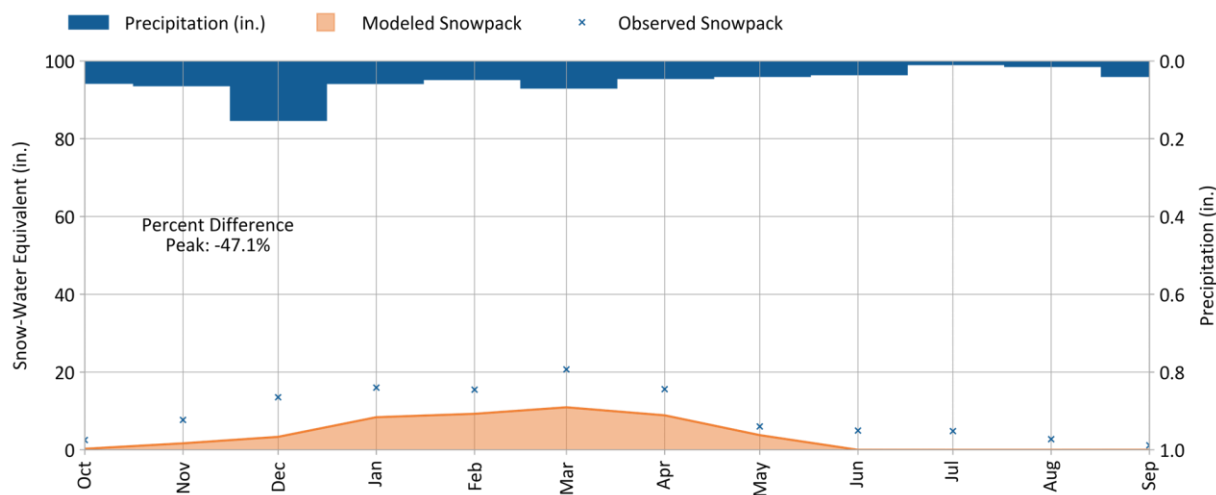


Figure E-16. GOOSENEST (SVG) - Snow validation: Simulated vs. observed seasonal average snowpack.

BOLAM
Station ID: SVB
10/01/2020 - 09/30/2023

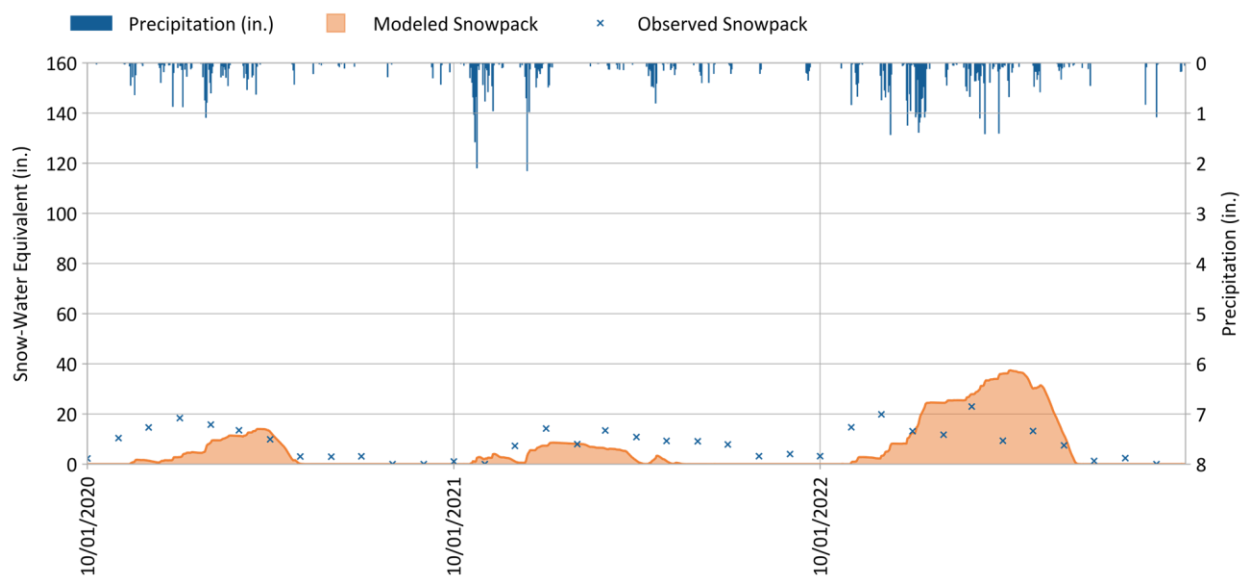


Figure E-17. BOLAM (SVB) - Snow validation: Simulated vs. observed snowpack.

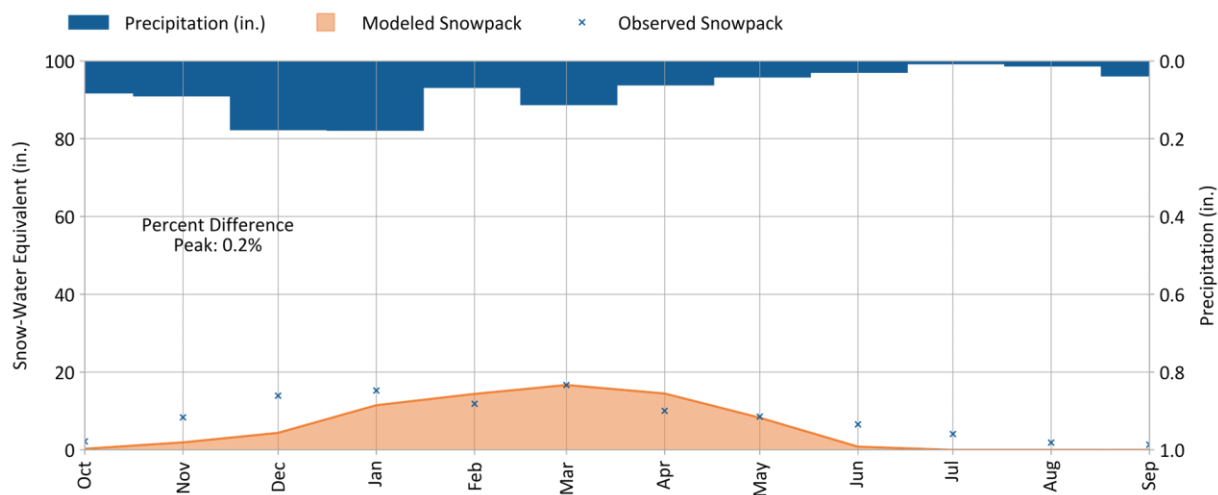


Figure E-18. BOLAM (SVB) - Snow validation: Simulated vs. observed seasonal average snowpack.

PARKS CREEK
Station ID: PRK
10/01/2003 - 09/30/2023

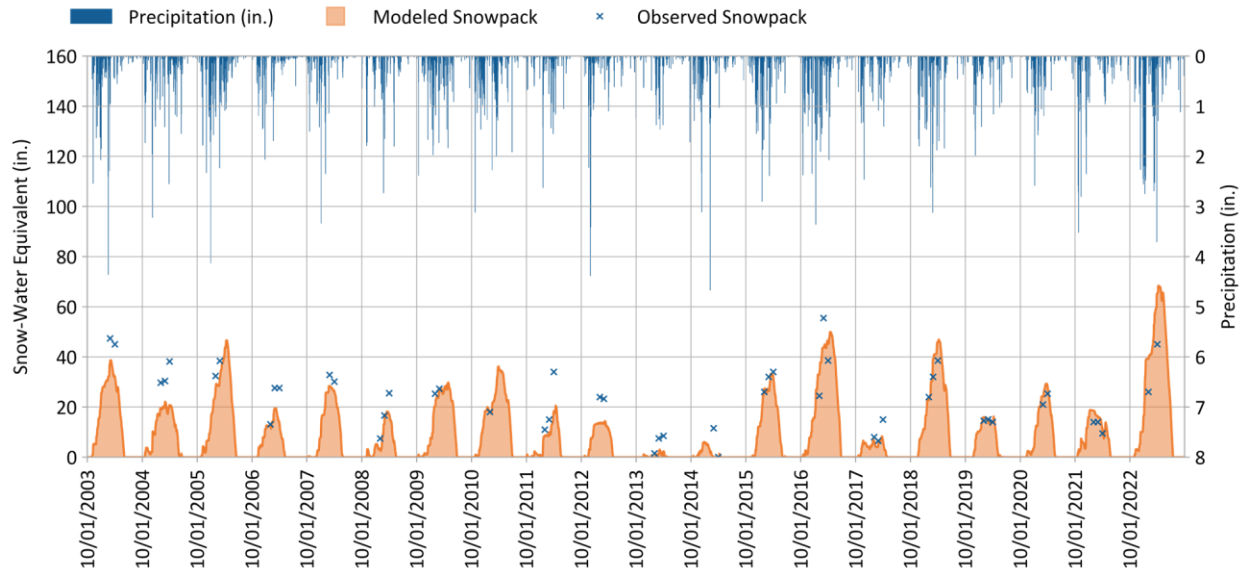


Figure E-19. PARKS CREEK (PRK) - Snow validation: Simulated vs. observed snowpack.

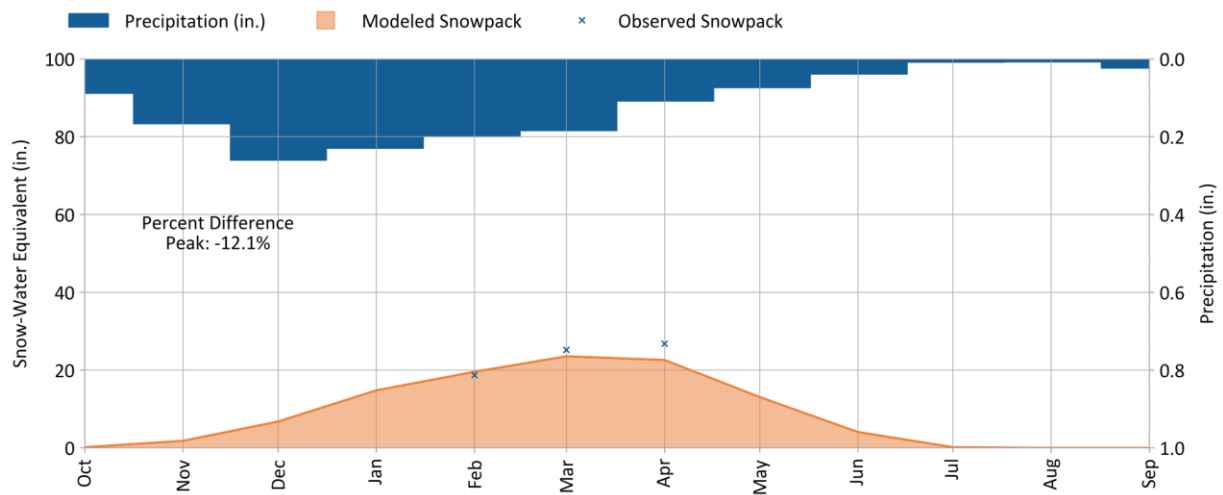


Figure E-20. PARKS CREEK (PRK) - Snow validation: Simulated vs. observed seasonal average snowpack.

SWEETWATER
Station ID: SWT
10/01/2003 - 09/30/2023

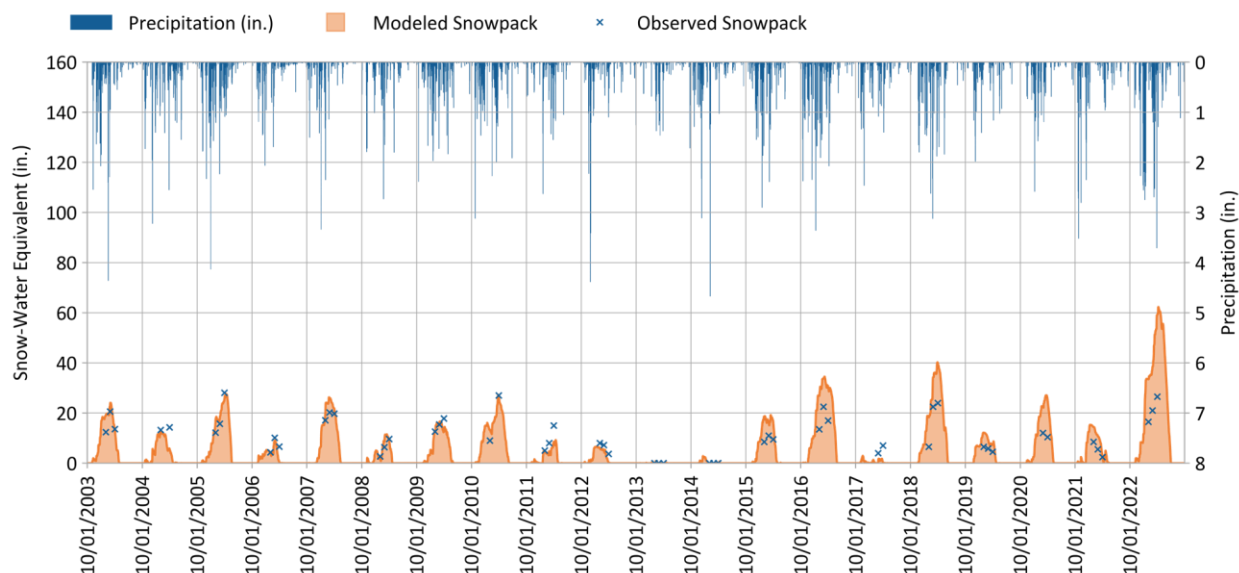


Figure E-21 SWEETWATER (SWT) - Snow validation: Simulated vs. observed seasonal average snowpack.

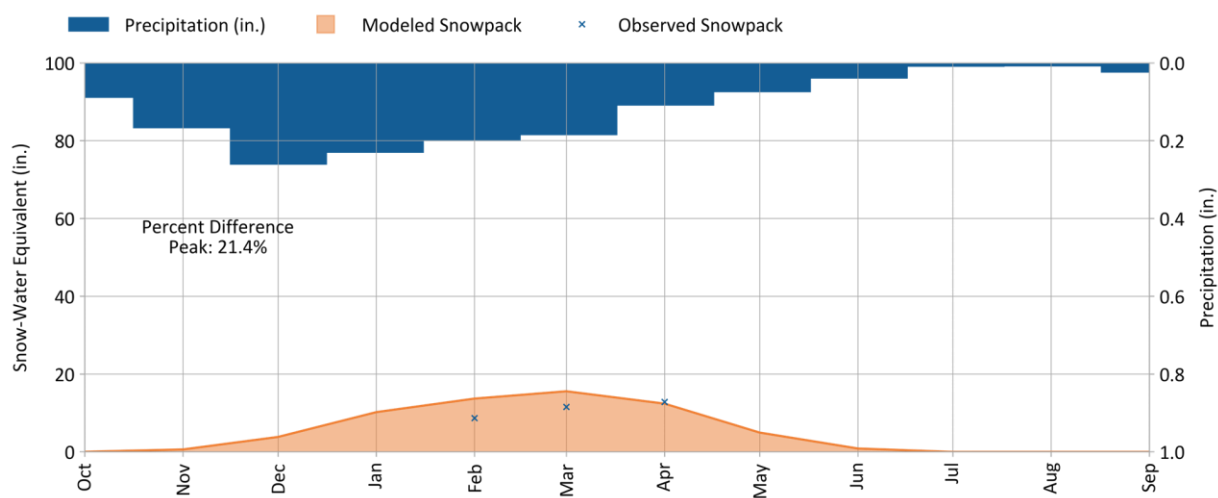


Figure E-22 SWEETWATER (SWT) - Snow validation: Simulated vs. observed seasonal average snowpack.

LITTLE SHASTA
Station ID: LSH
10/01/2003 - 09/30/2023

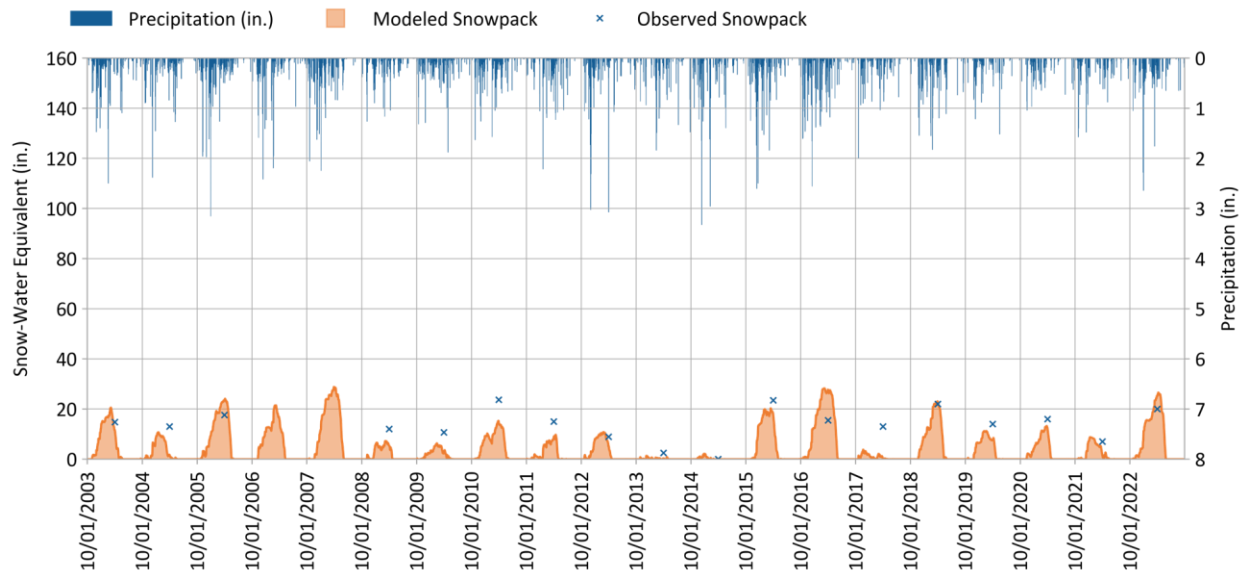


Figure E-23 LITTLE SHASTA (LSH) - Snow validation: Simulated vs. observed snowpack.

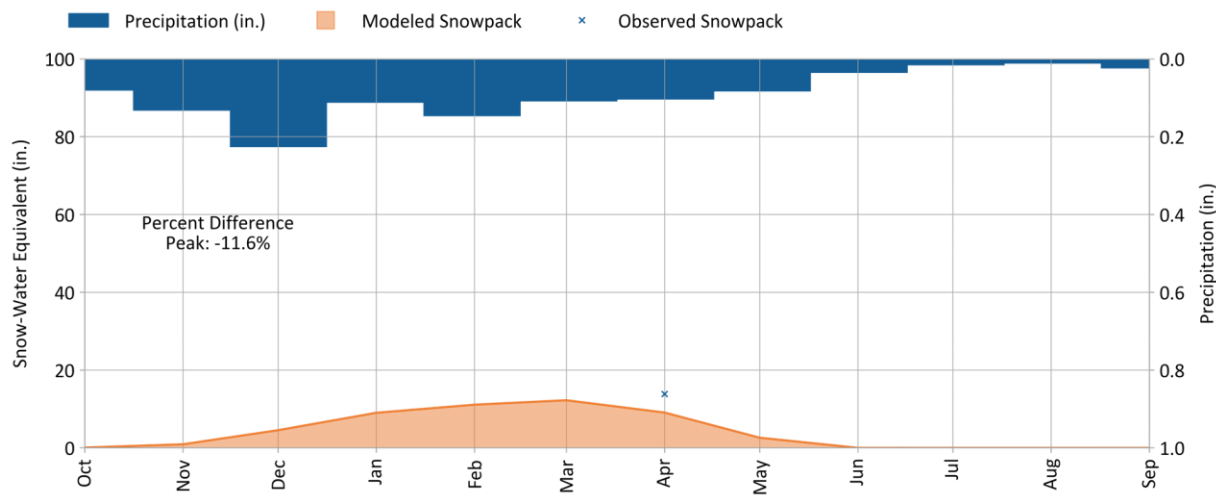


Figure E-24 LITTLE SHASTA (LSH) - Snow validation: Simulated vs. observed seasonal average snowpack.

Big Red Mountain
Station ID: BRM
10/01/2003 - 09/30/2023

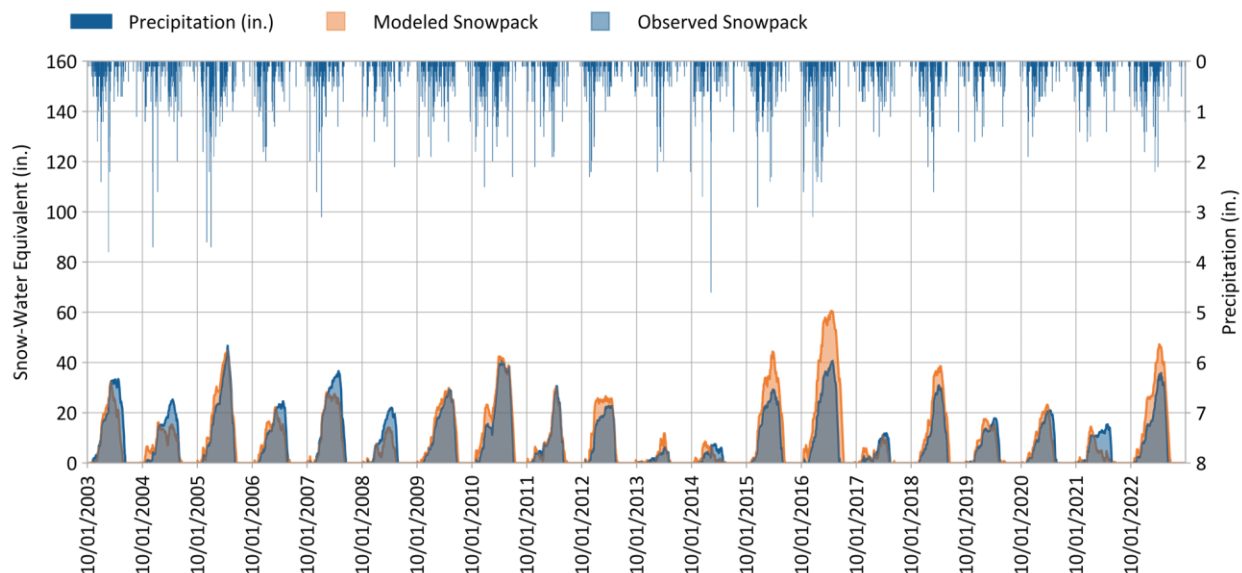


Figure E-25. Big Red Mountain (BRM) - Snow validation: Simulated vs. daily observed snowpack.

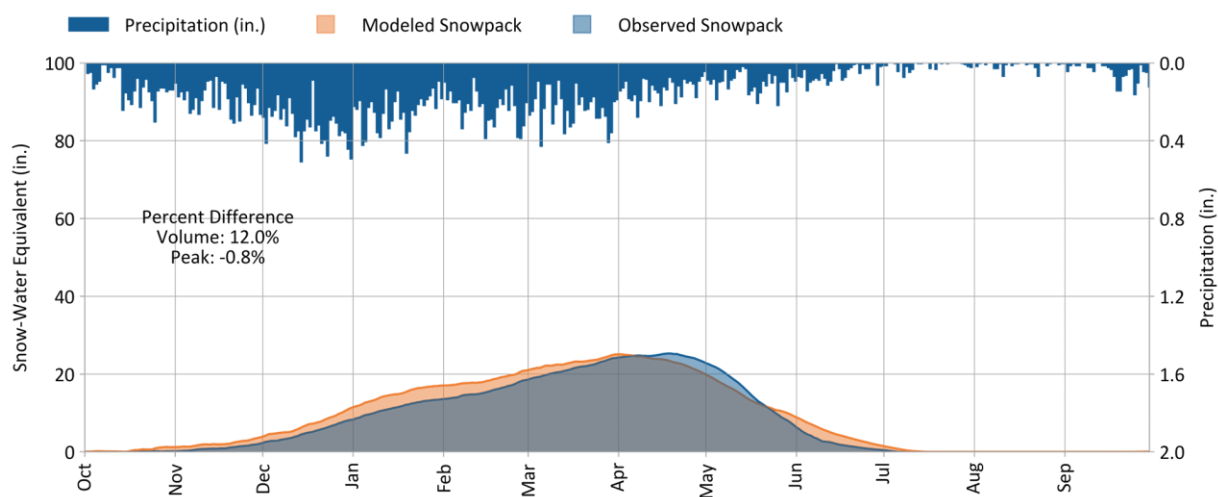


Figure E-26. Big Red Mountain (BRM) - Snow validation: Simulated vs. daily seasonal average snowpack.

Table E-2 Big Red Mountain (BRM) - Snow validation: Statistical metric for simulated vs. daily seasonal average snowpack

Water Year	NSE	PBIAS	R ²	Min Temperature (°F)	Max Temperature (°F)	Mean Temperature (°F)	Median Temperature (°F)
2004	0.76	24%	0.81	21	59	36	34
2005	0.71	22%	0.82	21	57	36	35
2006	0.95	-14%	0.97	16	53	34	33
2007	0.81	12%	0.83	14	53	36	35
2008	0.88	21%	0.94	17	55	33	32
2009	0.59	46%	0.83	15	56	36	35
2010	0.95	-13%	0.97	11	53	34	32
2011	0.94	-18%	0.97	16	61	33	32
2012	0.98	0%	0.98	16	52	35	35
2013	0.81	-32%	0.95	14	62	35	35
2014	0.16	-30%	0.81	12	53	37	37
2015	0.13	15%	0.31	17	61	39	38
2016	0.58	-50%	0.97	14	61	36	35
2017	0.04	-84%	0.91	14	52	33	33
2018	0.76	13%	0.77	16	56	36	35
2019	0.81	-39%	0.98	18	55	35	34
2020	0.81	1%	0.83	19	53	35	35
2021	0.81	1%	0.83	18	61	35	34
2022	0.17	47%	0.35	16	56	35	36
2023	0.66	-49%	0.97	15	60	33	30

University of California, Santa Barbara Snow Lab Model Comparison

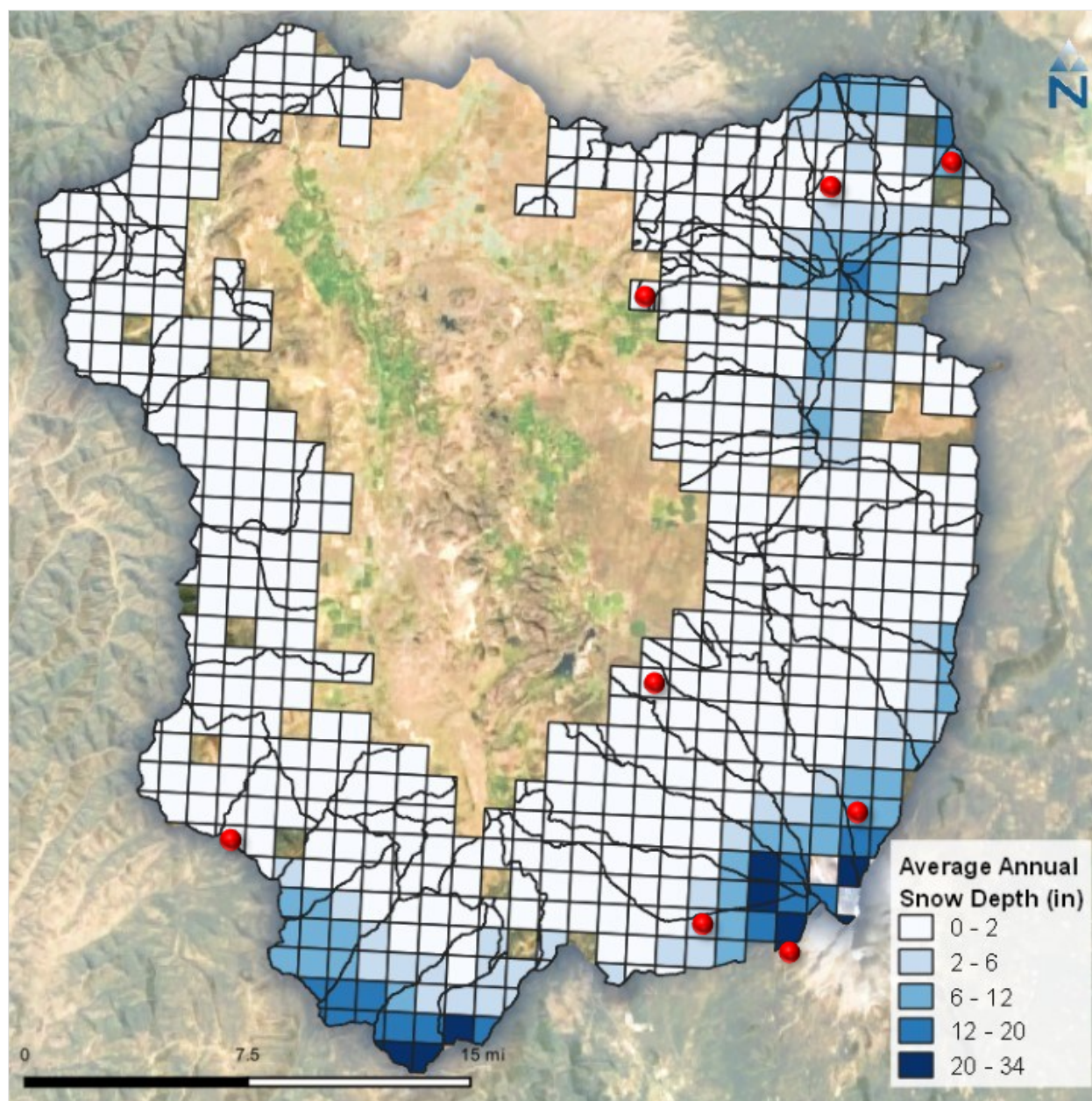


Figure E-27. Modeled average annual snowpack in the Shasta River watershed. Red dots represent grid cells selected for comparison with the UCSB snow model.

23600718
Station ID: 23600718
10/01/2000 - 09/30/2018

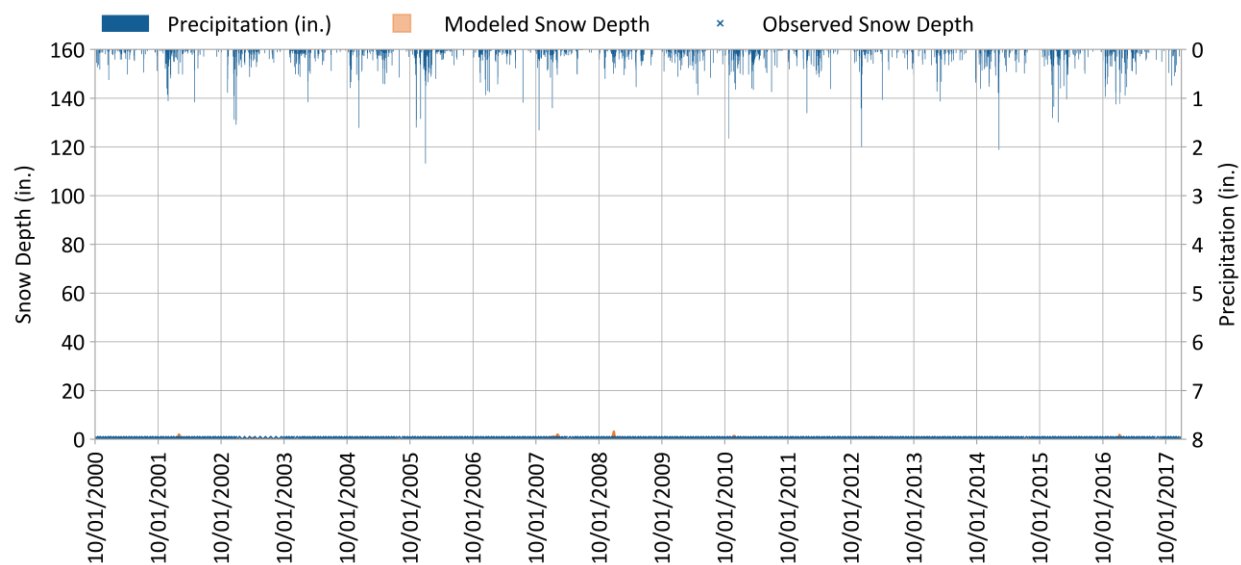


Figure E-28. 23600718 (23600718) - Snow calibration: Simulated vs. daily observed snow depth.

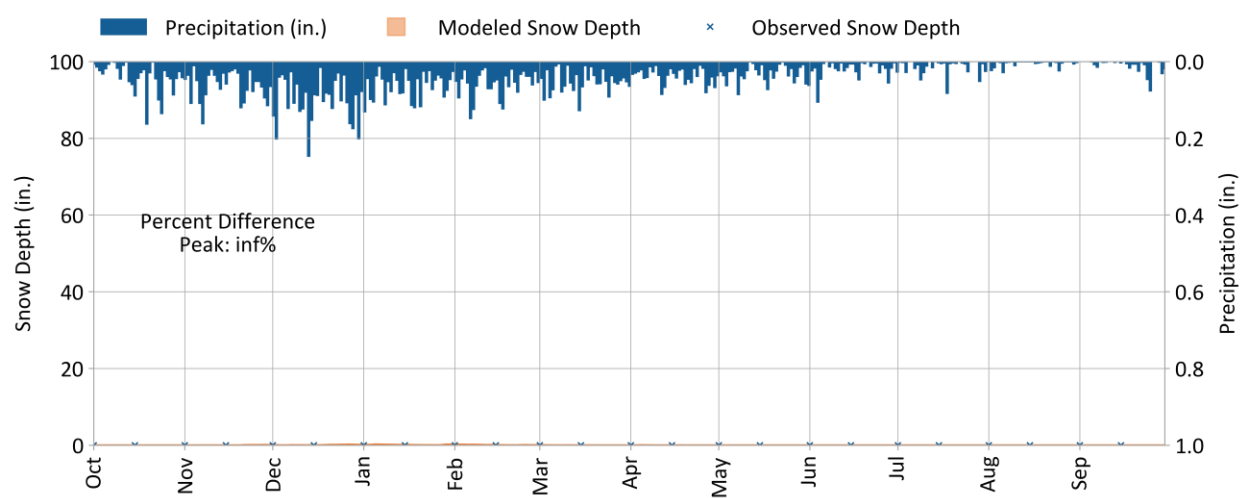


Figure E-29. 23600718 (23600718) - Snow calibration: Simulated vs. daily seasonal average snow depth.

16902609
Station ID: 16902609
10/01/2000 - 09/30/2018

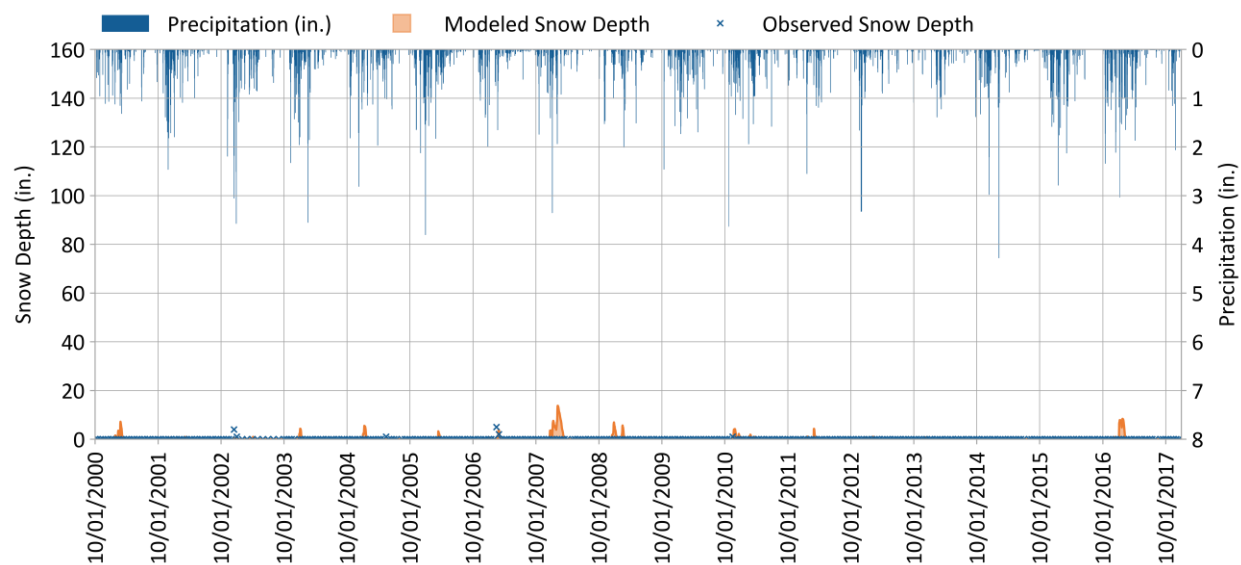


Figure E-30. 16902609 (16902609) - Snow calibration: Simulated vs. daily observed snow depth.

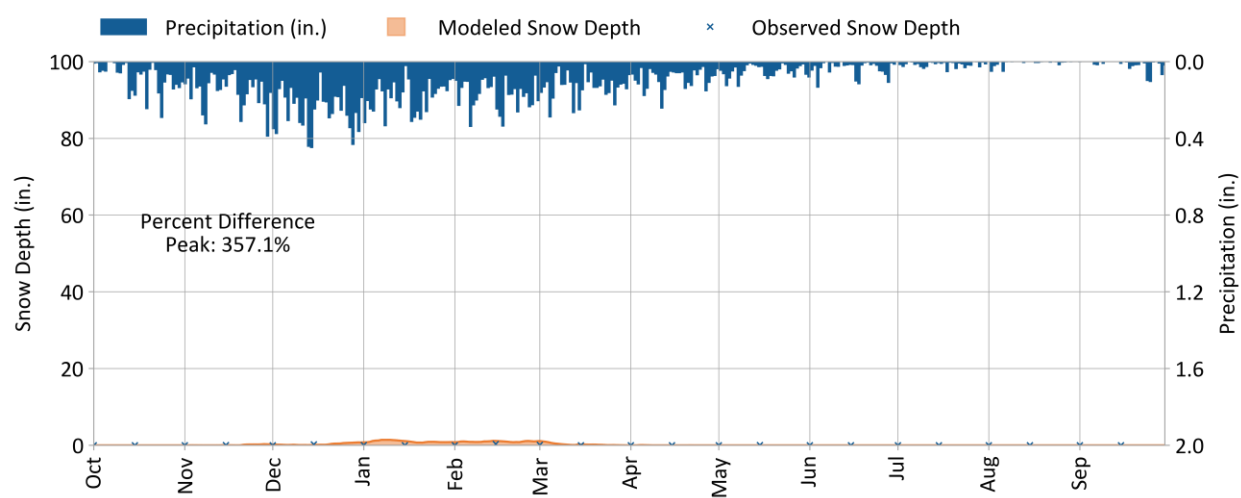


Figure E-31. 16902609 (16902609) - Snow calibration: Simulated vs. daily seasonal average snow depth.

10200312
Station ID: 10200312
10/01/2000 - 09/30/2018

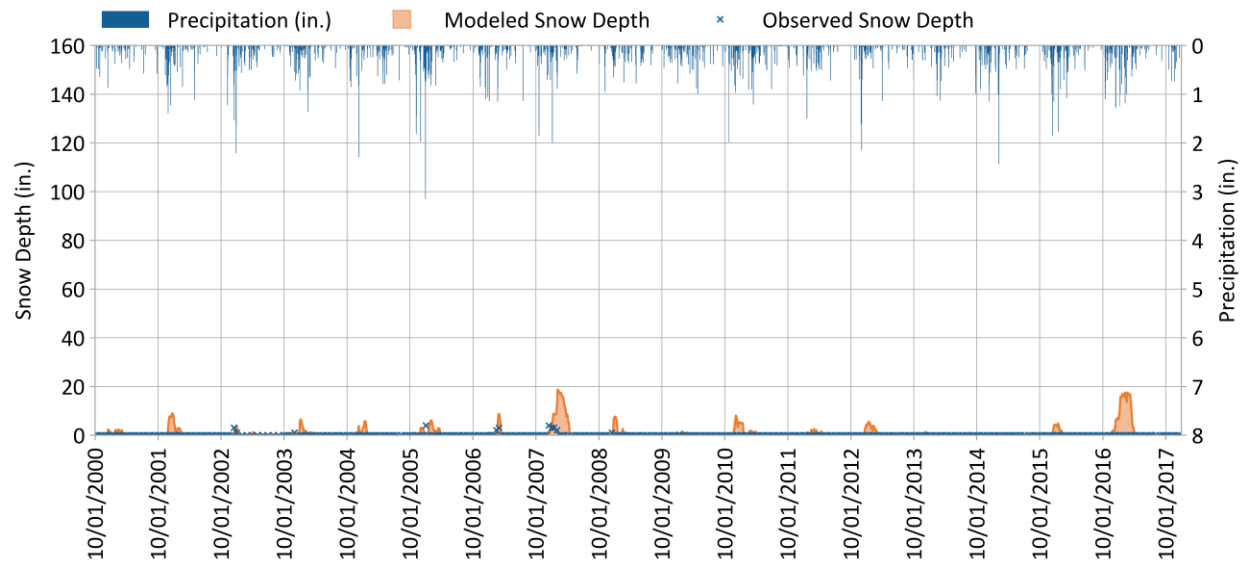


Figure E-32. 10200312 (10200312) - Snow calibration: Simulated vs. daily observed snow depth.

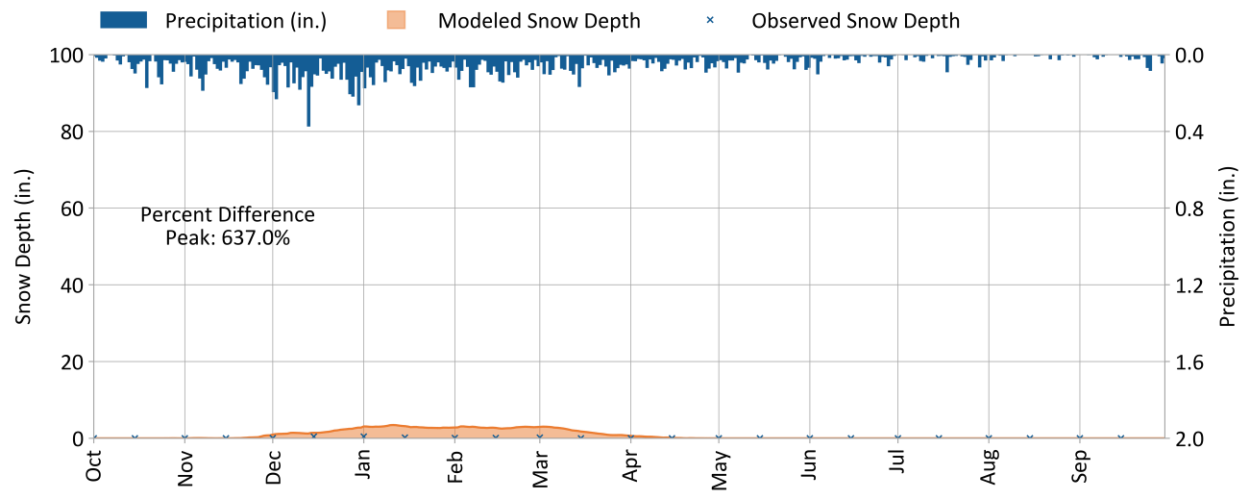


Figure E-33. 10200312 (10200312) - Snow calibration: Simulated vs. daily seasonal average snow depth.

21202525
Station ID: 21202525
10/01/2000 - 09/30/2018

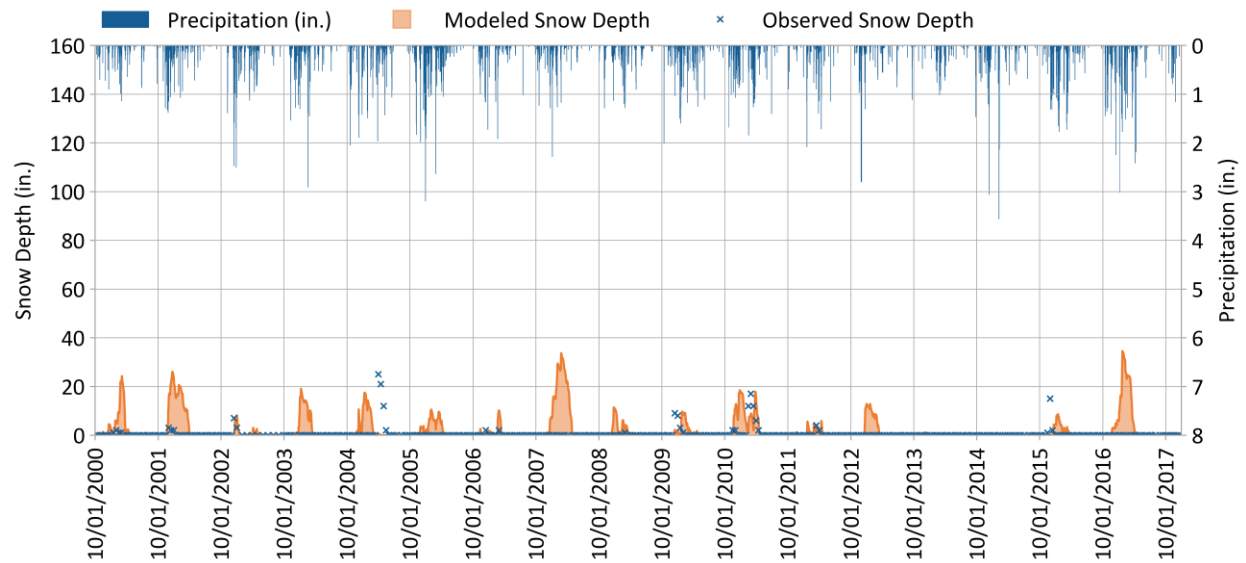


Figure E-34. 21202525 (21202525) - Snow calibration: Simulated vs. daily observed snow depth.

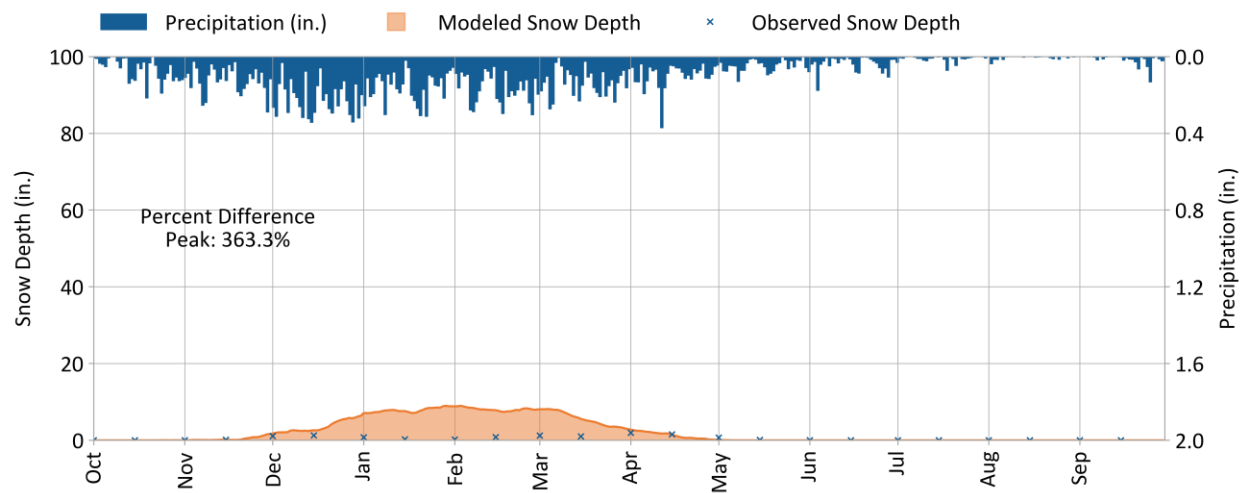


Figure E-35. 21202525 (21202525) - Snow calibration: Simulated vs. daily seasonal average snow depth.

22303317
Station ID: 22303317
10/01/2000 - 09/30/2018

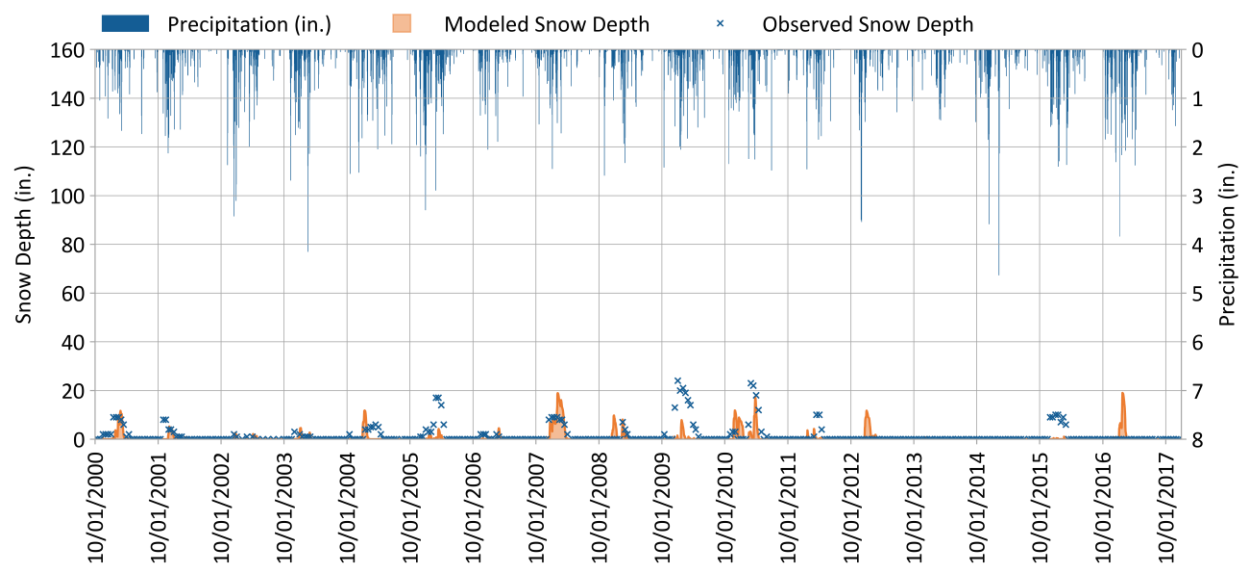


Figure E-36. 22303317 (22303317) - Snow calibration: Simulated vs. daily observed snow depth.

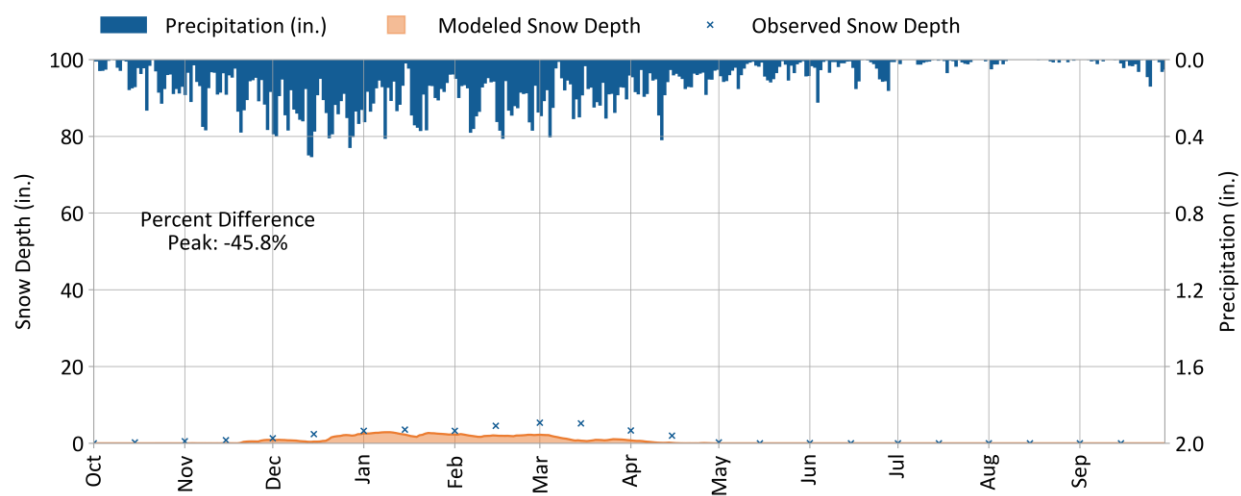


Figure E-37. 22303317 (22303317) - Snow calibration: Simulated vs. daily seasonal average snow depth.

15400429
Station ID: 15400429
10/01/2000 - 09/30/2018

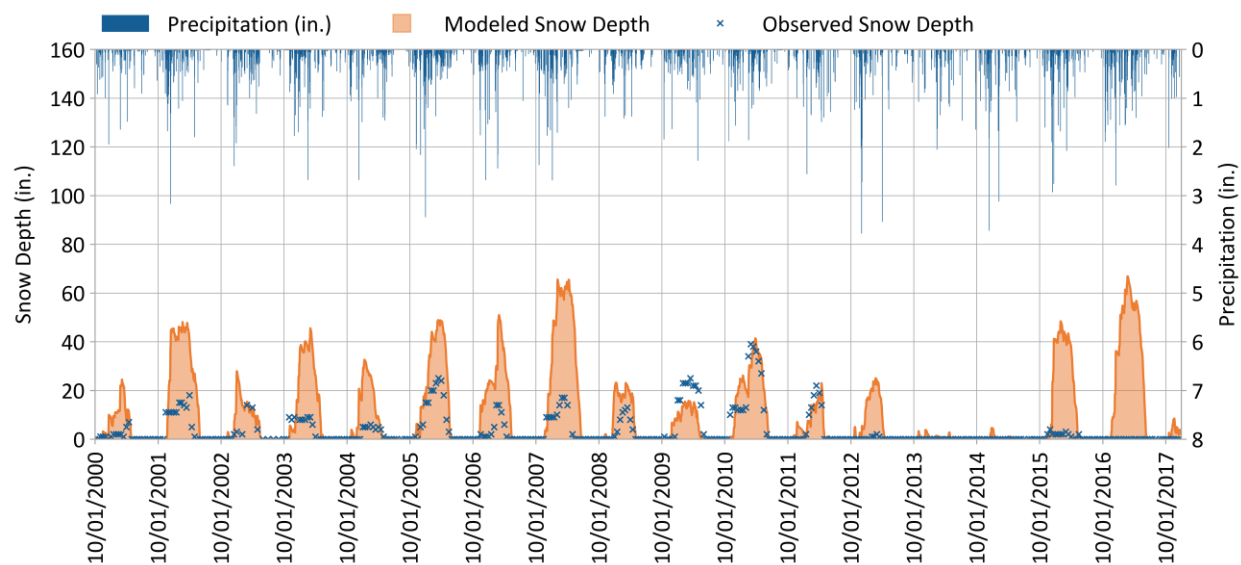


Figure E-38. 15400429 (15400429) - Snow calibration: Simulated vs. daily observed snow depth.

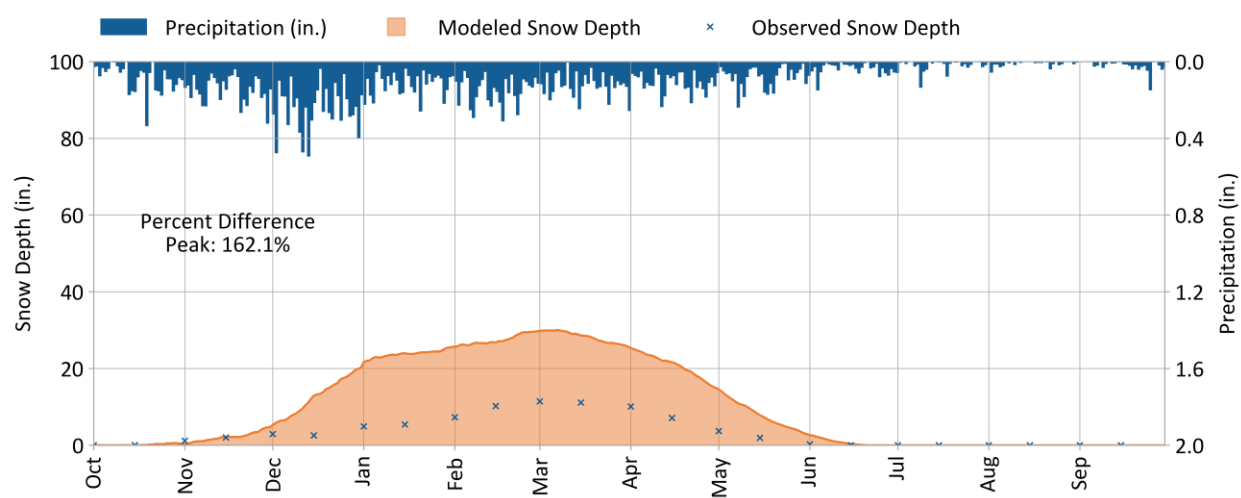


Figure E-39. 15400429 (15400429) - Snow calibration: Simulated vs. daily seasonal average snow depth.

15201029
Station ID: 15201029
10/01/2000 - 09/30/2018

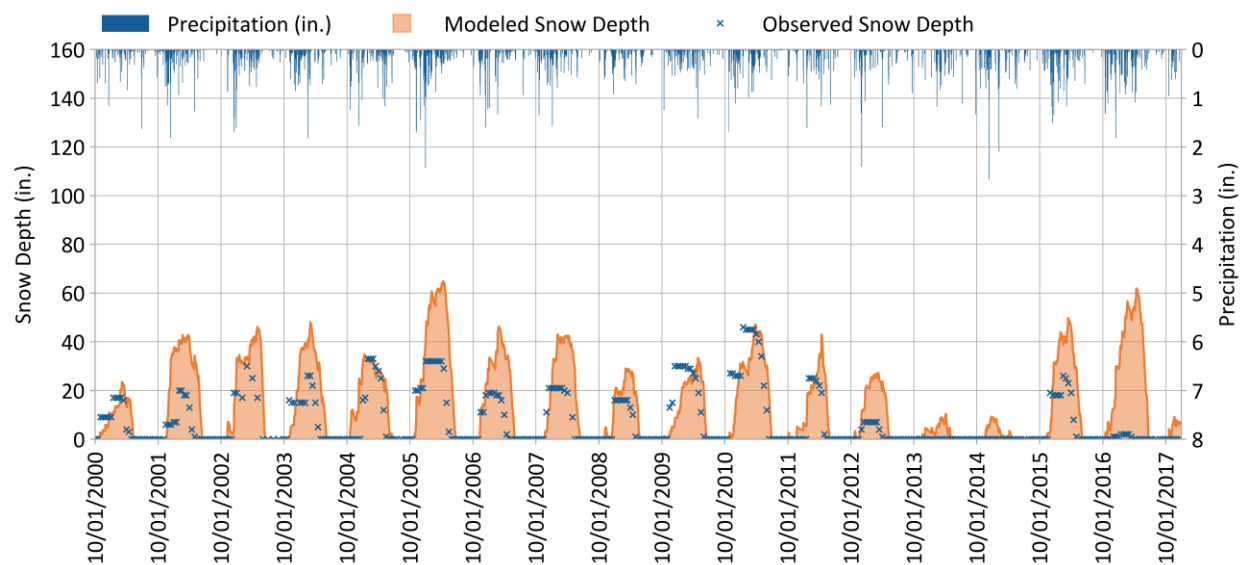


Figure E-40. 15201029 (15201029) - Snow calibration: Simulated vs. daily observed snow depth.

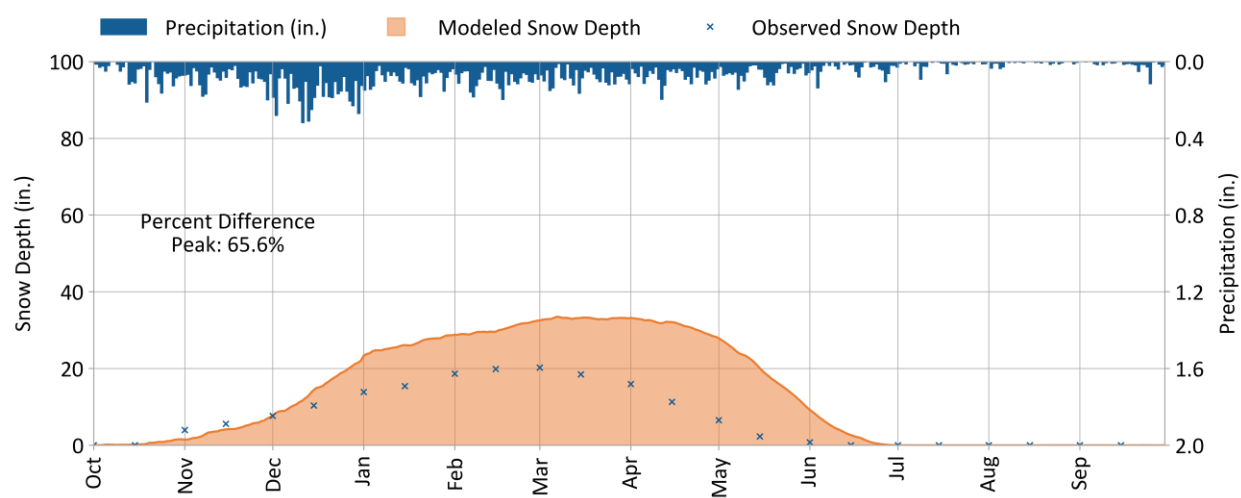


Figure E-41. 15201029 (15201029) - Snow calibration: Simulated vs. daily seasonal average snow depth.

21903228
Station ID: 21903228
10/01/2000 - 09/30/2018

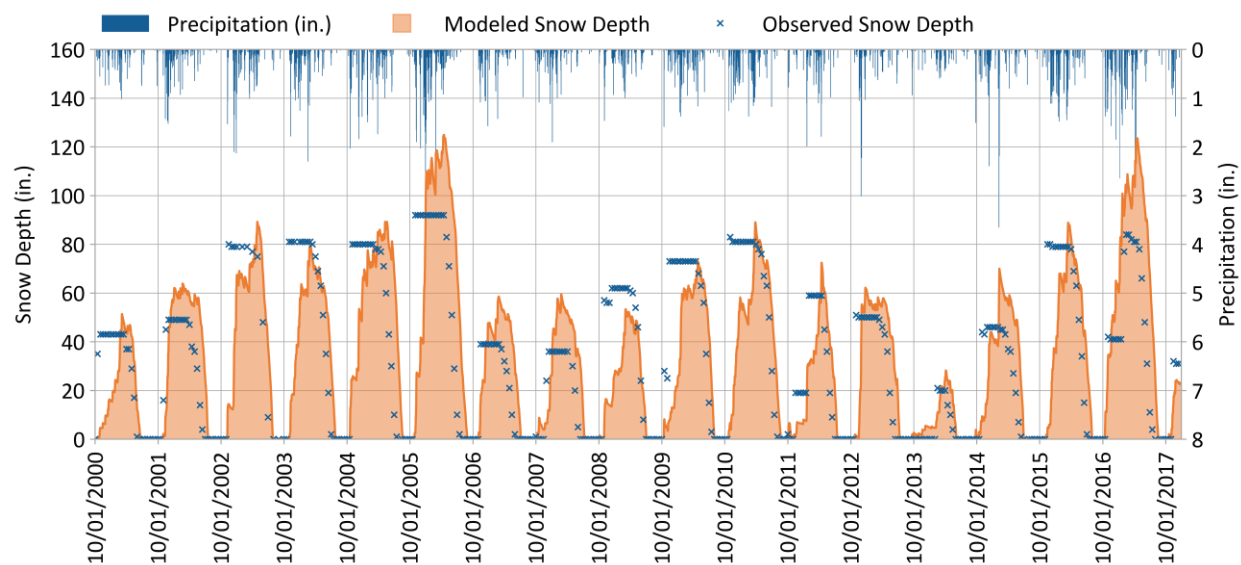


Figure E-42. 21903228 (21903228) - Snow calibration: Simulated vs. daily observed snow depth.

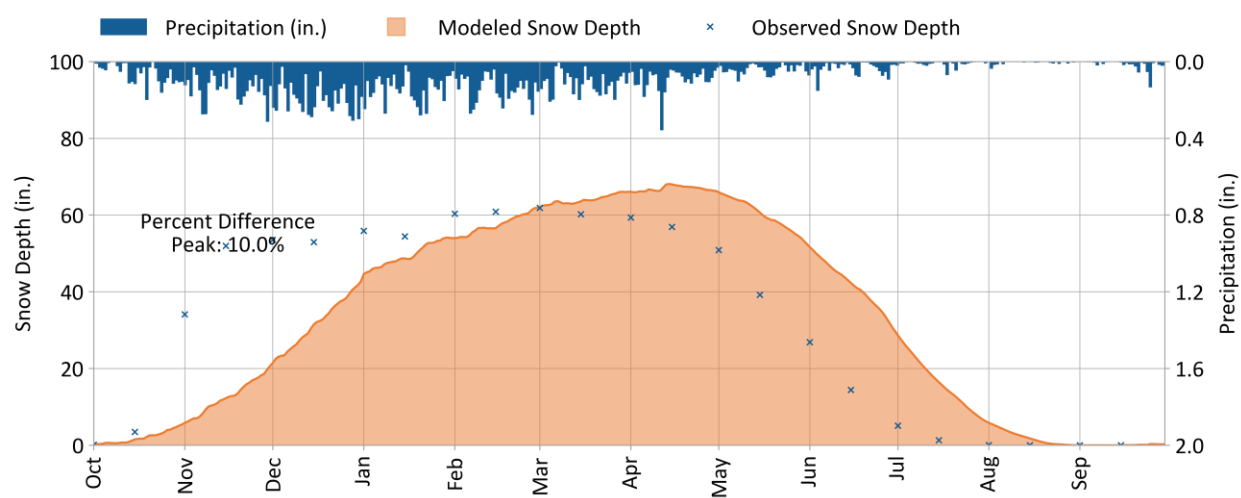


Figure E-43. 21903228 (21903228) - Snow calibration: Simulated vs. daily seasonal average snow depth.