

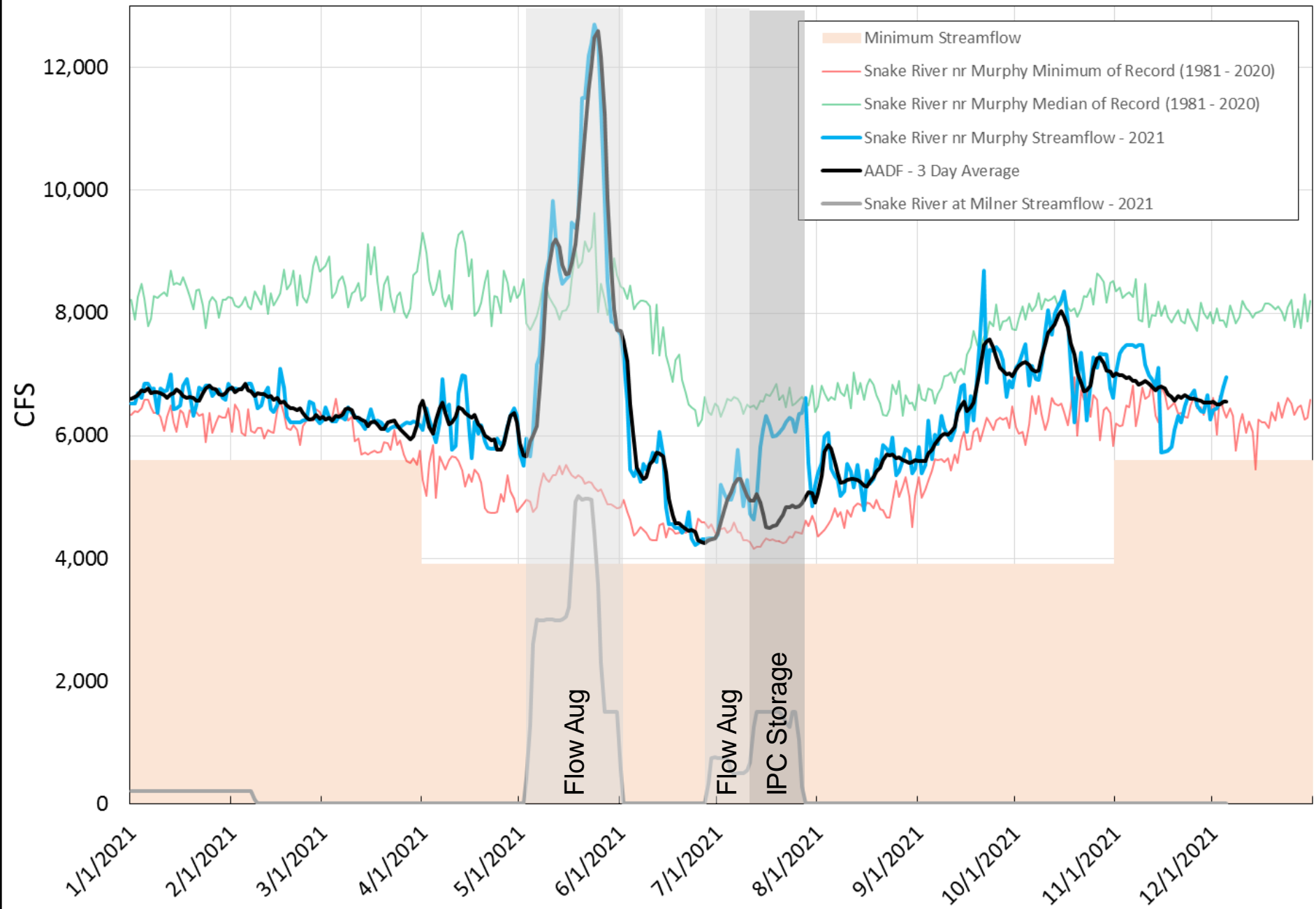
2021 Swan Falls Technical Working Group

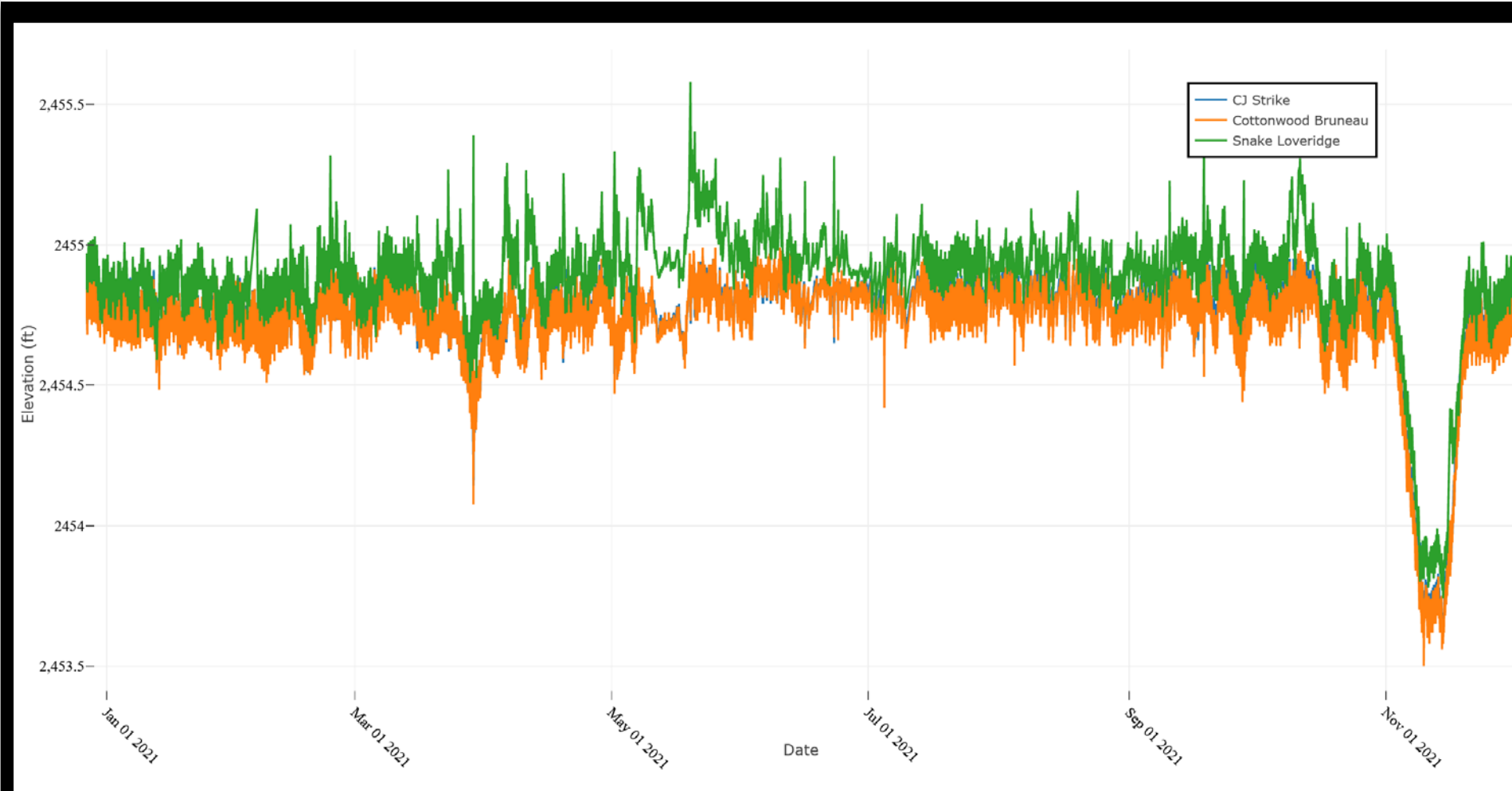
Presented by Ethan Geisler

December 8, 2021



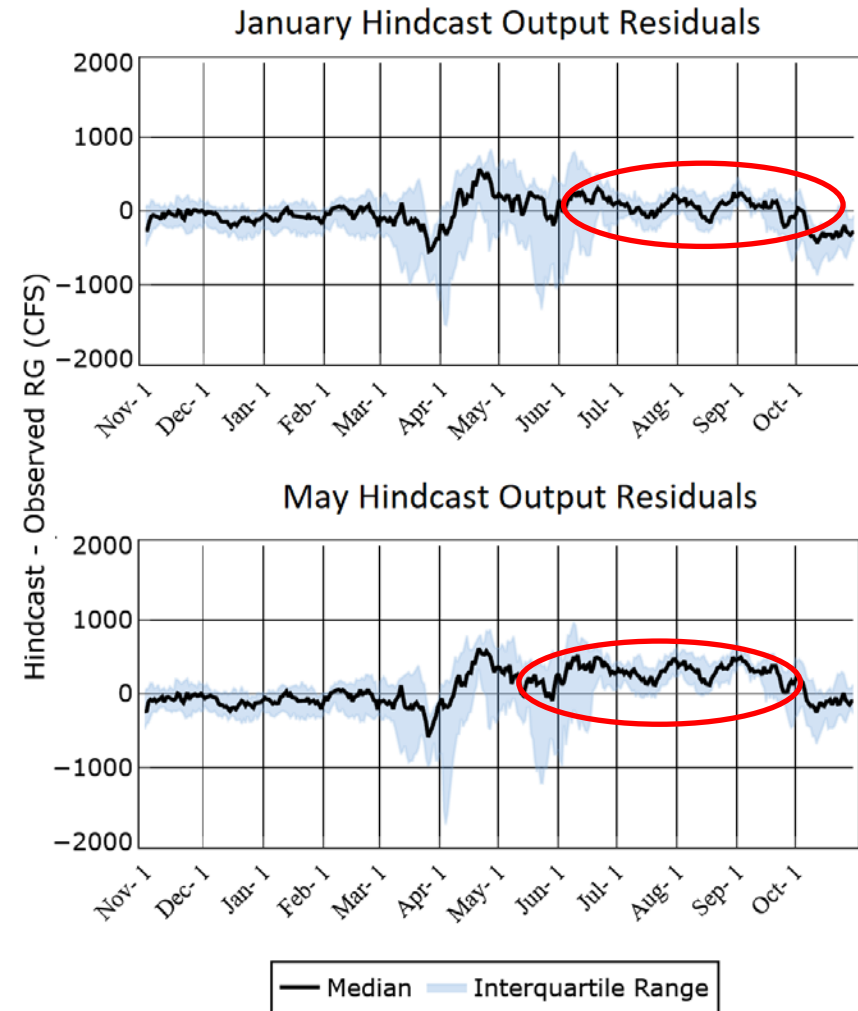
Streamflow at Snake River near Murphy





Swan Falls Forecast Tools Update

- Error Found in Master May ESPAM 2.1 Forecast.
- Pumping Reach gains were added instead of subtracted
- Corrected for May ESPAM 2.2 Forecast
 - Did not impact ESPAM 2.1 version due to calibrating the forecast tool with residuals.



🔍 Search (Alt+Q)

Geisler, Ethan

=P77*0.0165643511

[illegible]

🔍 Search (Alt+Q)

Geisler, Ethan 

$$=0.77 \times 0.0165643511$$
[illegible]

AutoSave: Off Jan_Forecast_v3.xlsx Search (Alt+Q)

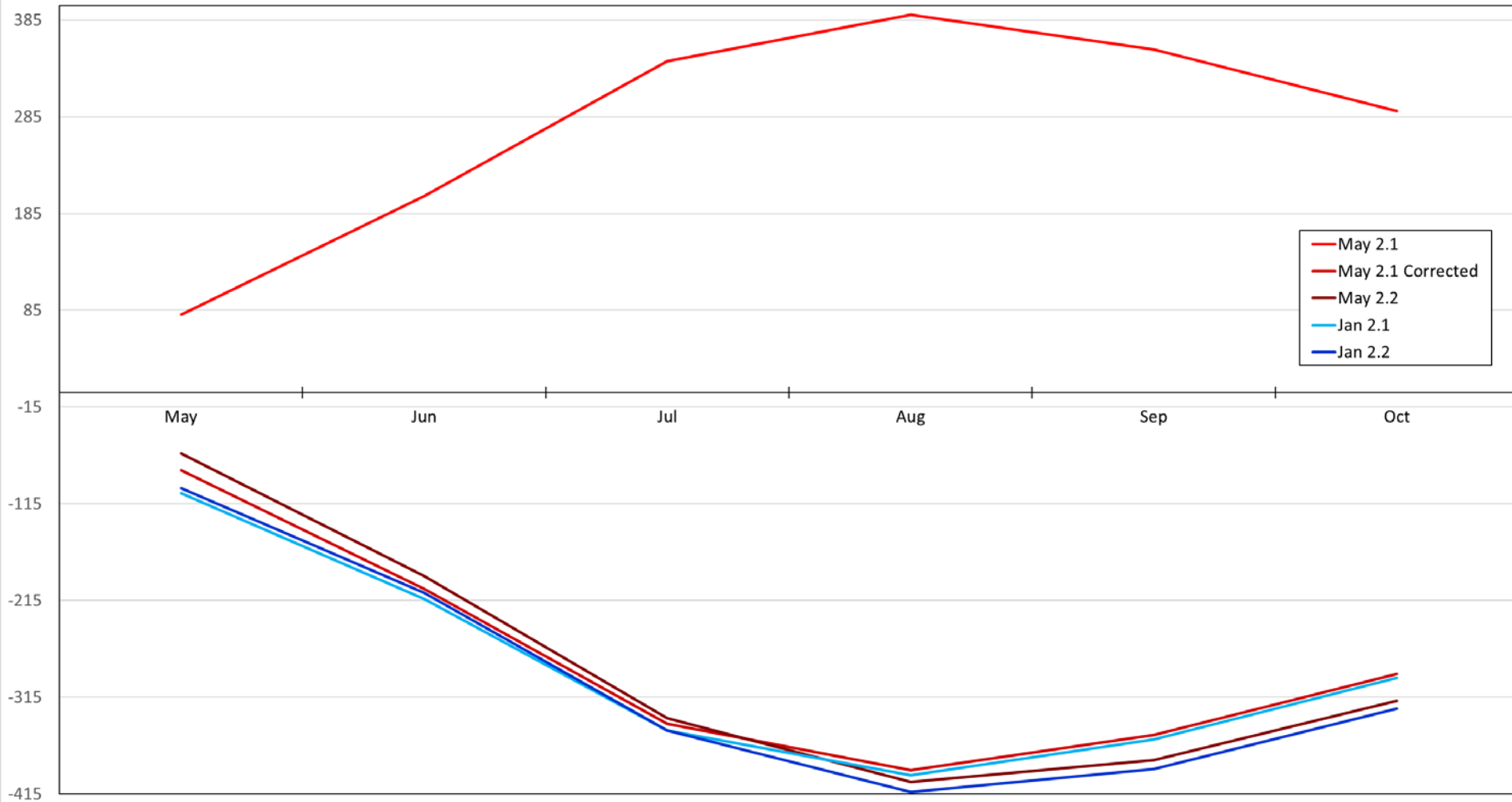
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Clipboard Font Alignment Number Styles Cells Editing Sensitivity Webex

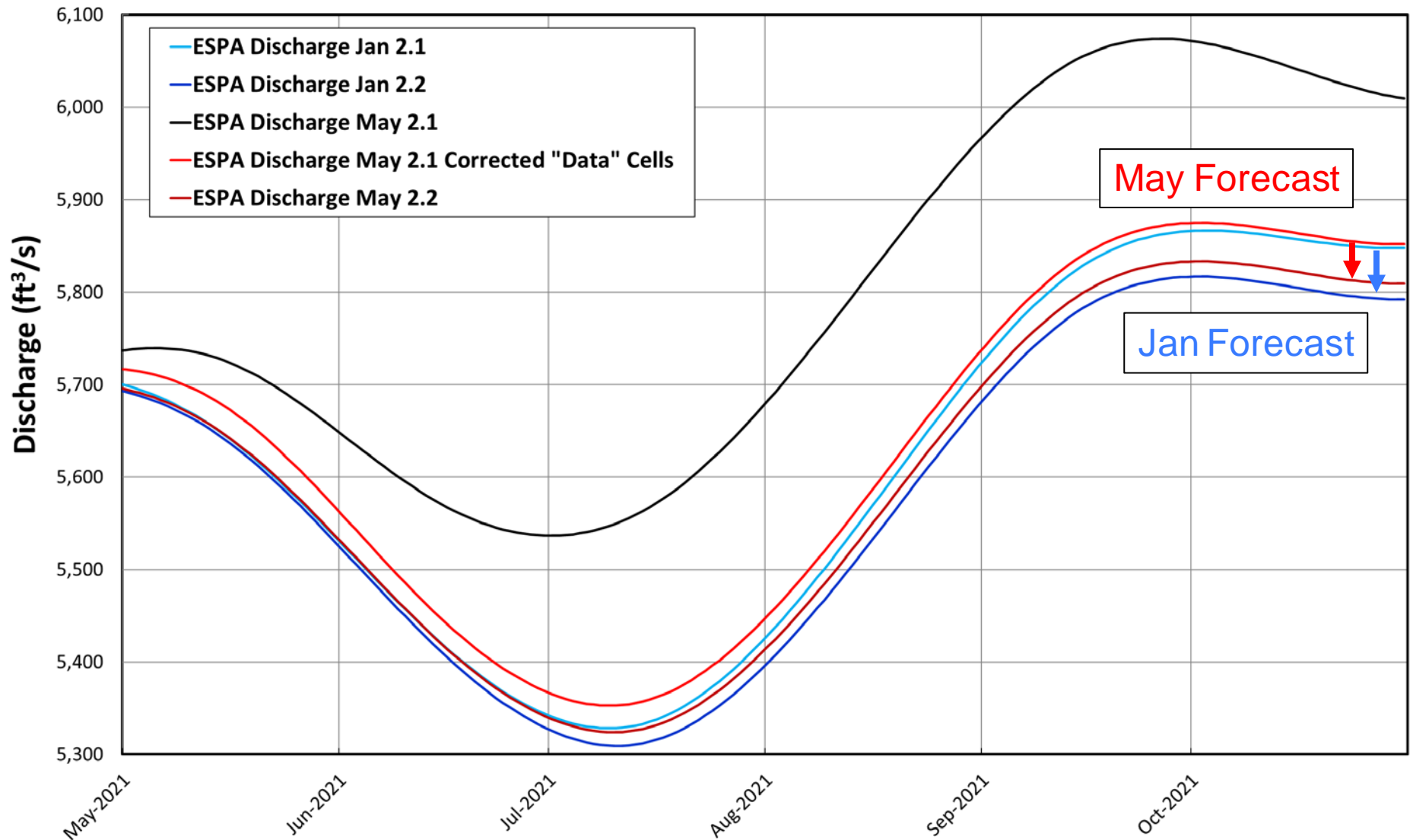
Formulas: =IF(P77<0,0,P77*0.0165643511*-1)

C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
AF/Month																
KIMBERLY TO KING HILL GAINS																
Reach Gains from Diversions					Reach Gains from Managed Recharge											
Northside On-Farm	AmFallsResDist 2 Canal Seepage	AmFallsResDist 2 On-Farm	Gooding-Rich Canal Seepage	Gooding- Rich On- Farm	SW Irrigation District	Milner Gooding Main Canal	Milner Gooding - Shoshone	Milner Gooding - Milepost 31	Northside Main Canal Including Wilson Lake	Twin Falls Canal Co. - Murtaugh Canal	Big Wood Canal Co. - Richfield	Hold for Future Site	Pumping Reach Gains	Starting Heads Reach Gains	TOTAL GAINS	
AF/mo	AF/mo	AF/mo	AF/mo	AF/mo	AF/mo	AF/mo	AF/mo	AF/mo	AF/mo	AF/mo	AF/mo	AF/mo	AF/mo	CFS	AF/mo	
69	-	1	-	7	0	-	46	64	-	-	-	-	(74)	363,770	363,884	
877	-	8	-	48	1	-	303	501	-	1	-	-	(1,421)	358,575	358,890	
867	-	16	-	132	1	-	649	1,199	-	3	0	-	(1,450)	353,204	354,622	
656	-	22	-	216	3	-	851	1,946	-	7	1	-	(714)	348,331	351,329	
566	4	24	-	266	5	-	1,036	2,746	-	13	3	-	(38)	344,080	349,027	
1,567	81	38	82	307	8	-	1,208	3,442	-	20	5	-	1,750	340,418	351,629	
6,099	354	88	562	506	12	-	1,242	3,766	-	28	7	-	6,281	337,270	364,291	
8,585	838	165	1,683	1,056	15	-	1,173	3,746	-	35	10	-	12,882	334,559	377,563	
10,371	1,448	243	3,238	1,821	18	-	807	3,532	-	41	12	-	21,101	332,215	392,150	
13,258	2,070	315	4,899	2,646	20	-	689	3,245	-	46	13	-	23,902	330,171	400,922	
15,582	2,568	379	6,351	3,478	23	-	834	2,950	-	50	15	-	21,669	328,378	401,407	
15,011	2,967	459	7,234	4,156	25	-	575	2,673	-	53	15	-	17,821	326,811	394,226	
CFS																
KIMBERLY TO KING HILL GAINS																
Reach Gains from Diversions					Reach Gains from Managed Recharge											
Northside On-Farm	AmFallsResDist 2 Canal Seepage	AmFallsResDist 2 On-Farm	Gooding-Rich Canal Seepage	Gooding- Rich On- Farm	SW Irrigation District	Milner Gooding Main Canal	Milner Gooding - Shoshone	Milner Gooding - Milepost 31	Northside Main Canal Including Wilson Lake	Twin Falls Canal Co. - Murtaugh Canal	Big Wood Canal Co. - Richfield	Hold for Future Site	Pumping Reach Gains	Starting Heads Reach Gains	TOTAL GAINS	
CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	
1	-	0	-	0	0	-	1	1	-	-	-	-	-	6,026	6,029	
15	-	0	-	1	0	-	5	8	-	0	-	-	-	5,940	5,968	
14	-	0	-	2	0	-	11	20	-	0	0	-	-	5,851	5,898	
11	-	0	-	4	0	-	14	32	-	0	0	-	-	5,770	5,831	
9	0	0	-	4	0	-	17	45	-	0	0	-	-	5,699	5,782	
26	1	1	1	5	0	-	20	57	-	0	0	-	(29)	5,639	5,767	
101	6	1	9	8	0	-	21	62	-	0	0	-	(104)	5,587	5,826	
142	14	3	28	17	0	-	19	62	-	1	0	-	(213)	5,542	5,827	
172	24	4	54	30	0	-	13	59	-	1	0	-	(350)	5,503	5,797	
220	34	5	81	44	0	-	11	54	-	1	0	-	(396)	5,469	5,849	
258	43	6	105	58	0	-	14	49	-	1	0	-	(359)	5,439	5,931	
249	49	8	120	69	0	-	10	44	-	1	0	-	(295)	5,413	5,940	

Pumping Reach Gains (CFS)



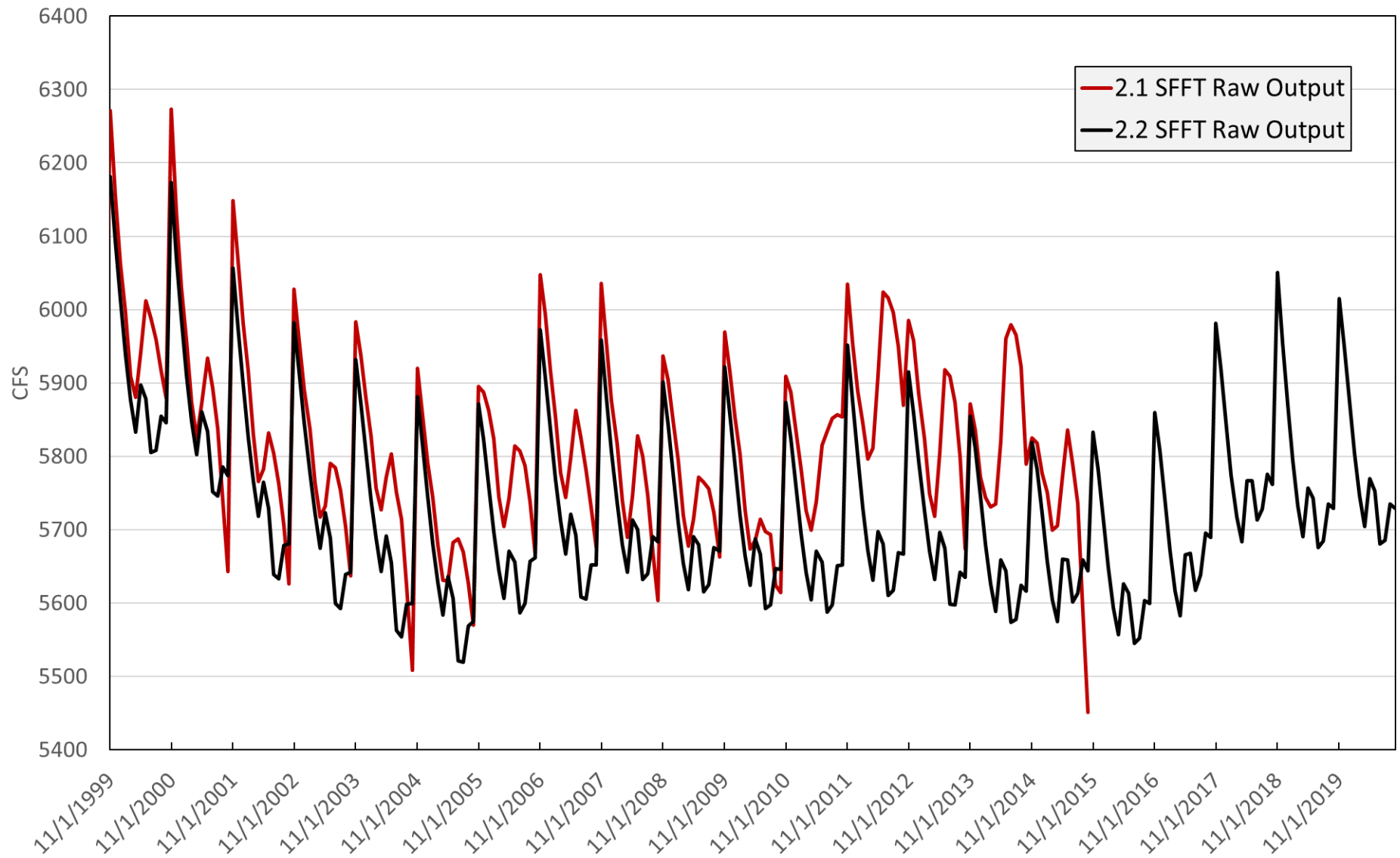
Forecasted ESPA Discharge: 2021



Swan Falls Forecast Tools Update

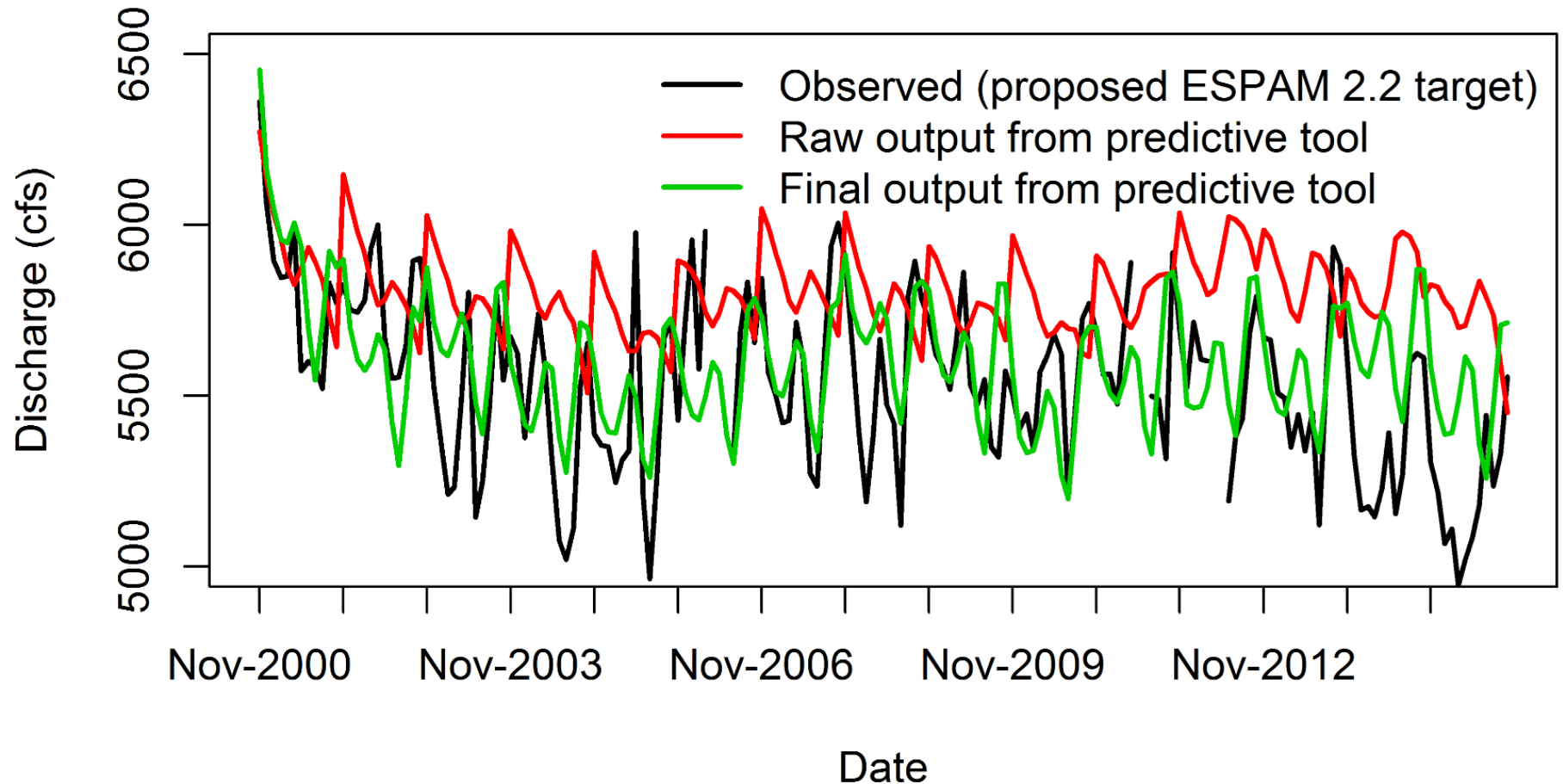
- Error Found in May ESPAM 2.1 Forecast.
- Pumping Reach gains were added instead of subtracted
- Corrected for May ESPAM 2.2 Forecast
 - Did not impact ESPAM 2.1 version due to calibrating the forecast tool with residuals.
- Recalibrated January & May Forecast Tool from 2002-2020
 - Recalibrated SFFT raw output reach gain to ESPAM 2.2 observed reach gain

Swan Falls January Forecast Tool Raw Output

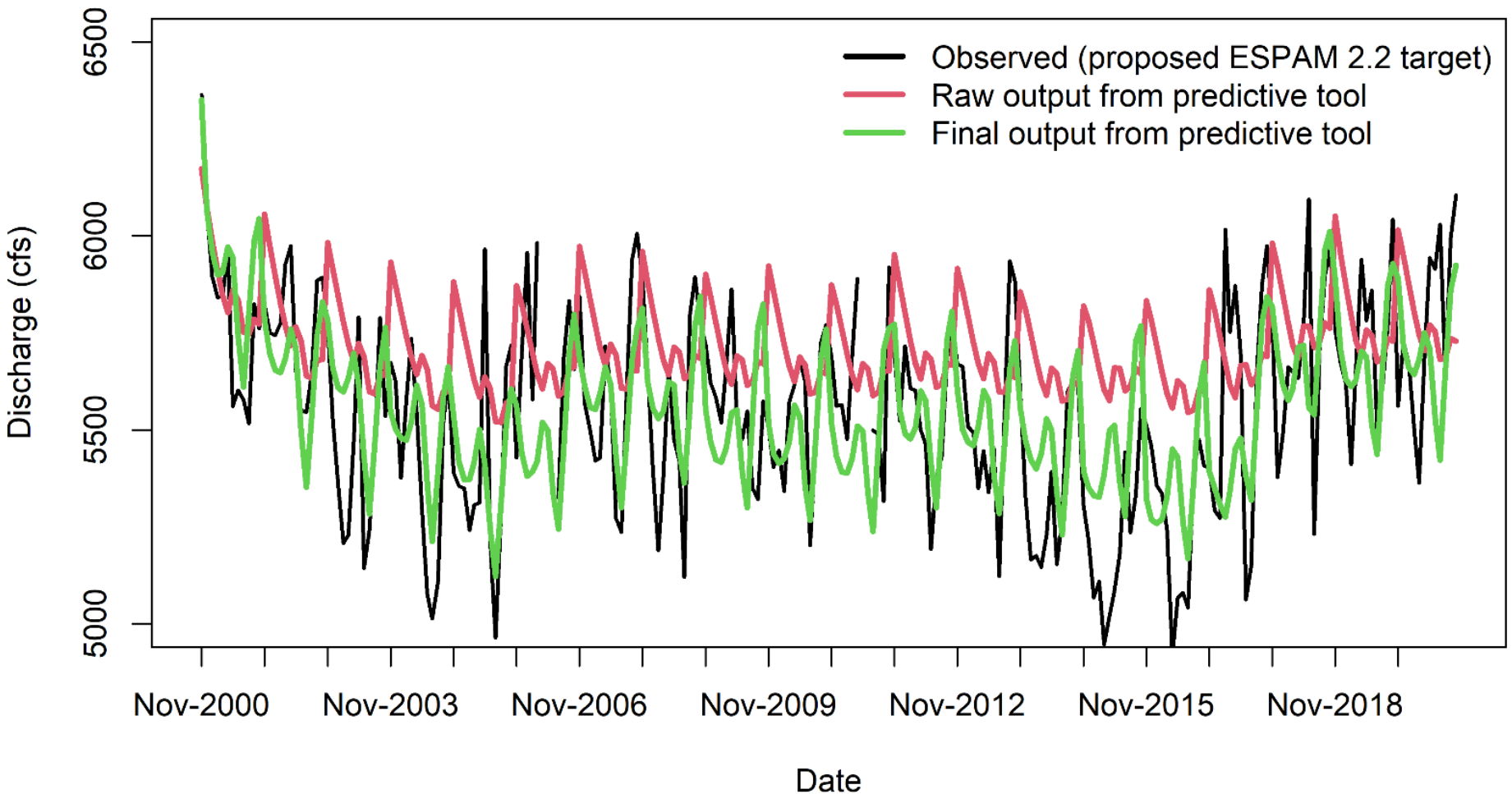


ESPAM 2.1: Figure 3-16

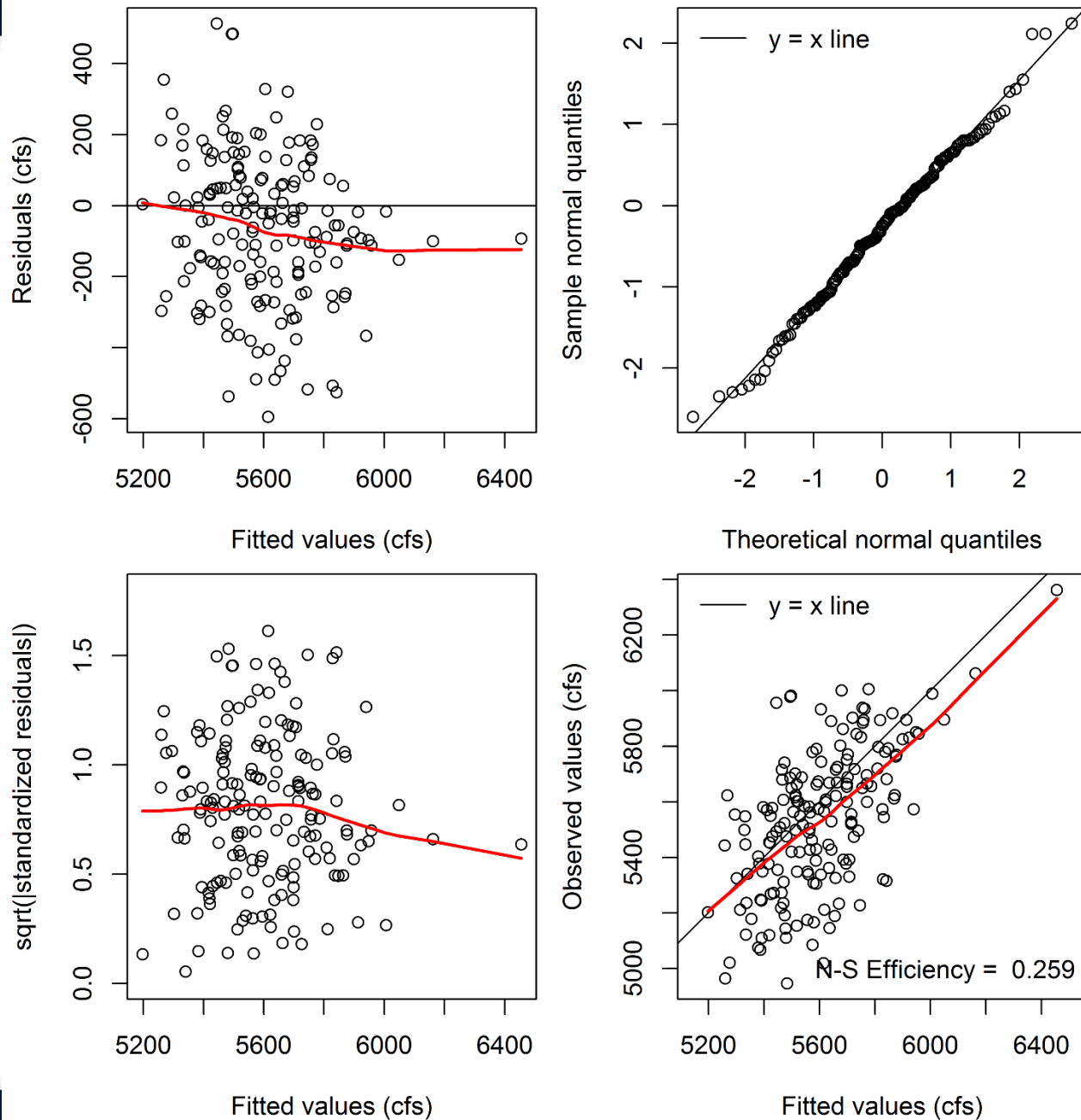
Mean Monthly ESPA Discharge



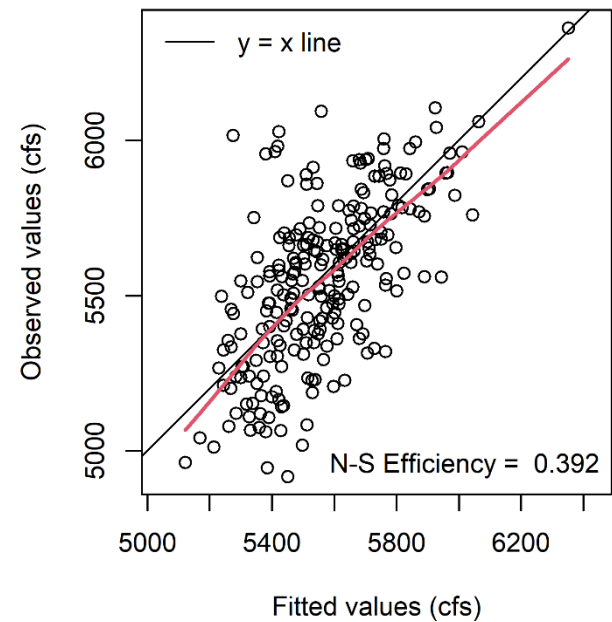
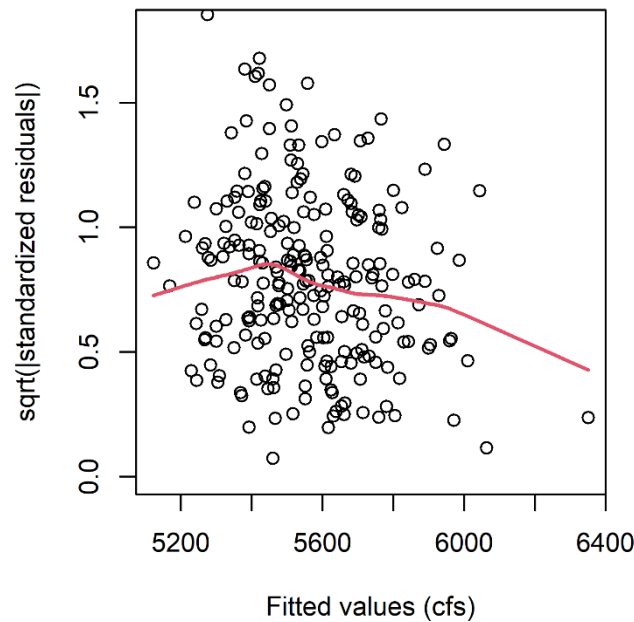
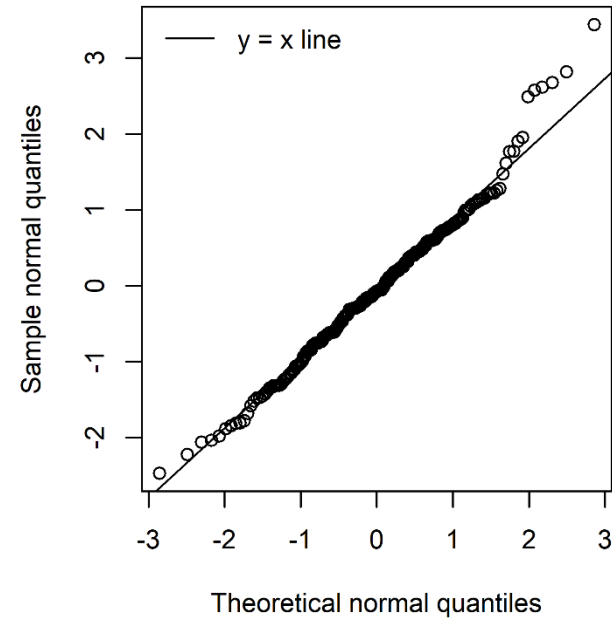
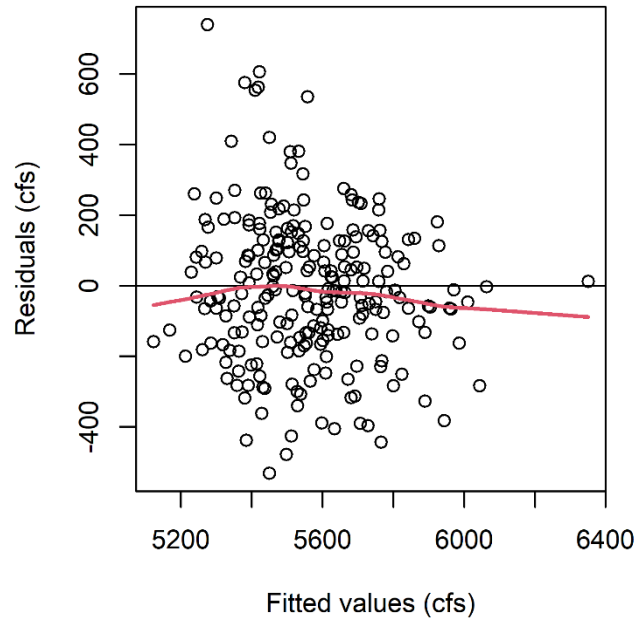
ESPAM 2.2 Mean Monthly ESPA Discharge



Final Calibration Fit (Cross-Validation)



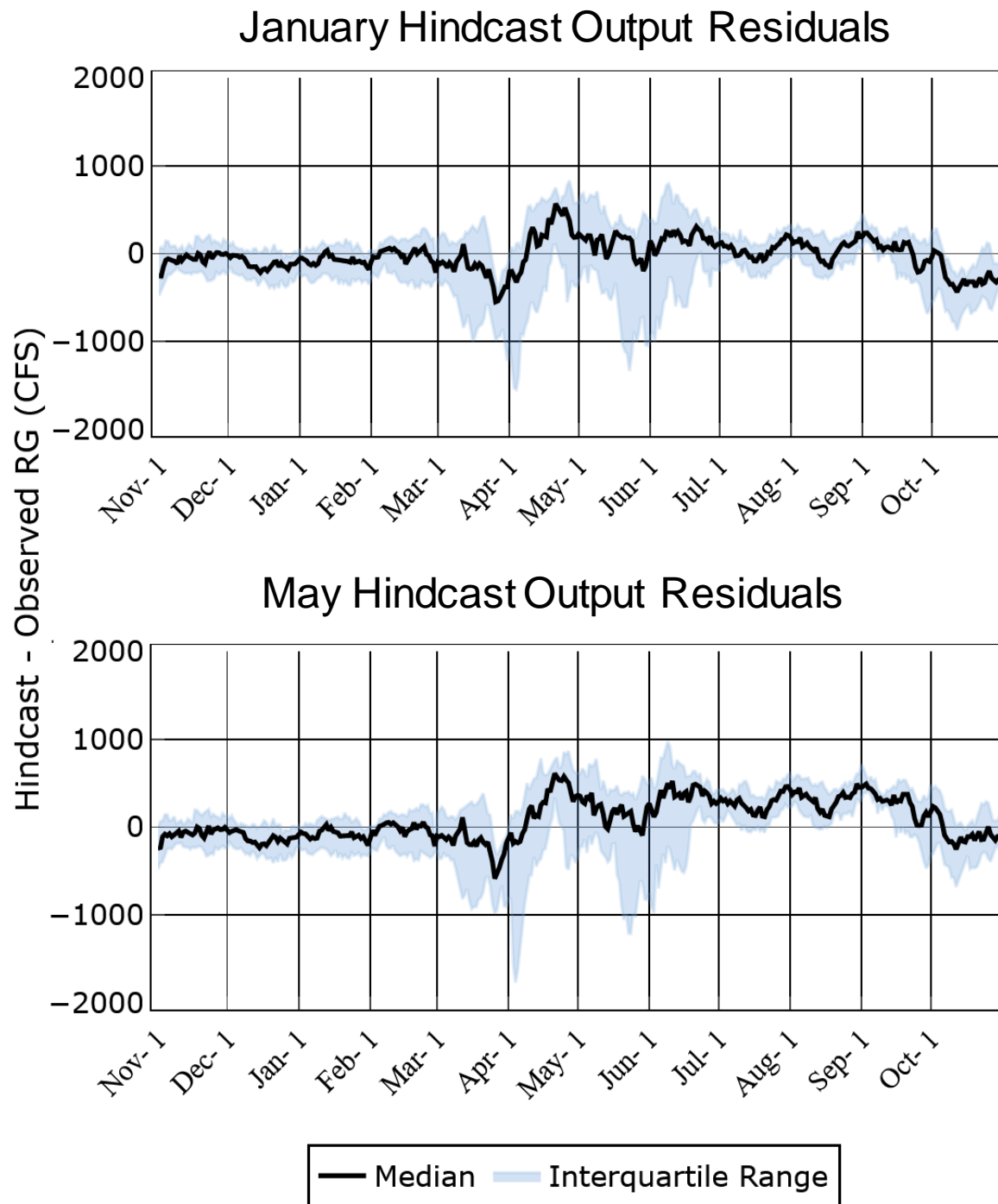
Final Calibration Fit (Cross-Validation)



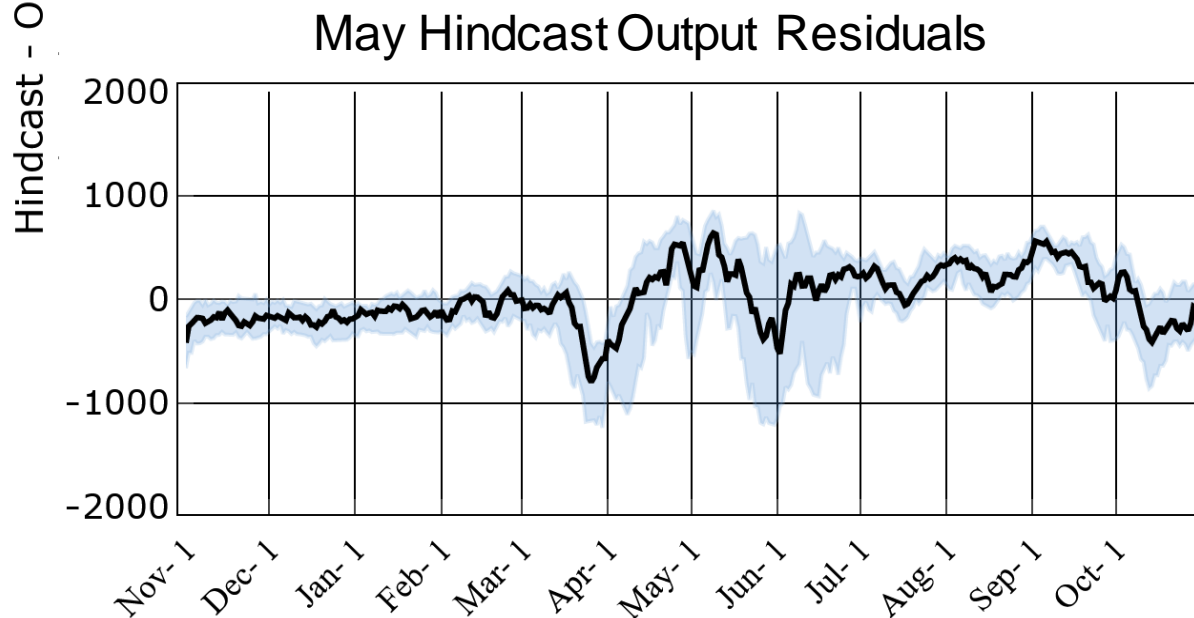
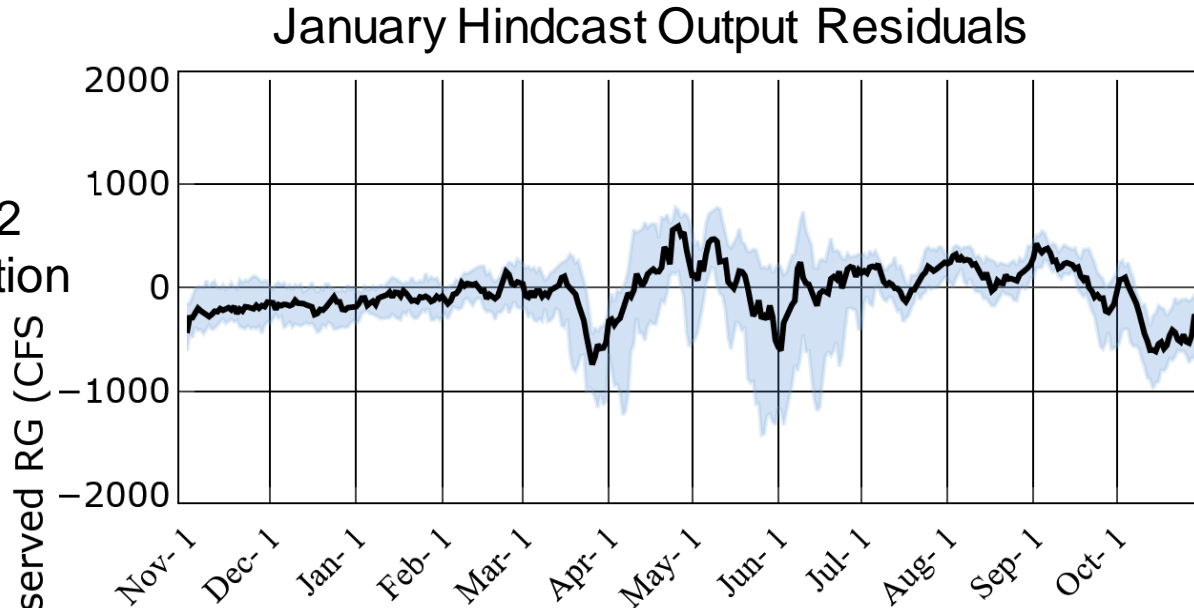
Swan Falls Forecast Tools Update

- Error Found in May ESPAM 2.1 Forecast.
- Pumping Reach gains were added instead of subtracted
- Corrected for May ESPAM 2.2 Forecast
 - Did not impact ESPAM 2.1 version due to calibrating the forecast tool with residuals.
- Recalibrated January Forecast Tool from 2002-2020
 - Recalibrated SFFT raw output reach gain to ESPAM 2.2 observed reach gain
 - Modeled new reach gain from 2002-2020
 - Calculated residuals from Modeled reach gains and observed reach gains (Milner to Murphy reach gain (7 day average, 2 day lag))

ESPAM 2.1
Figure 6-2

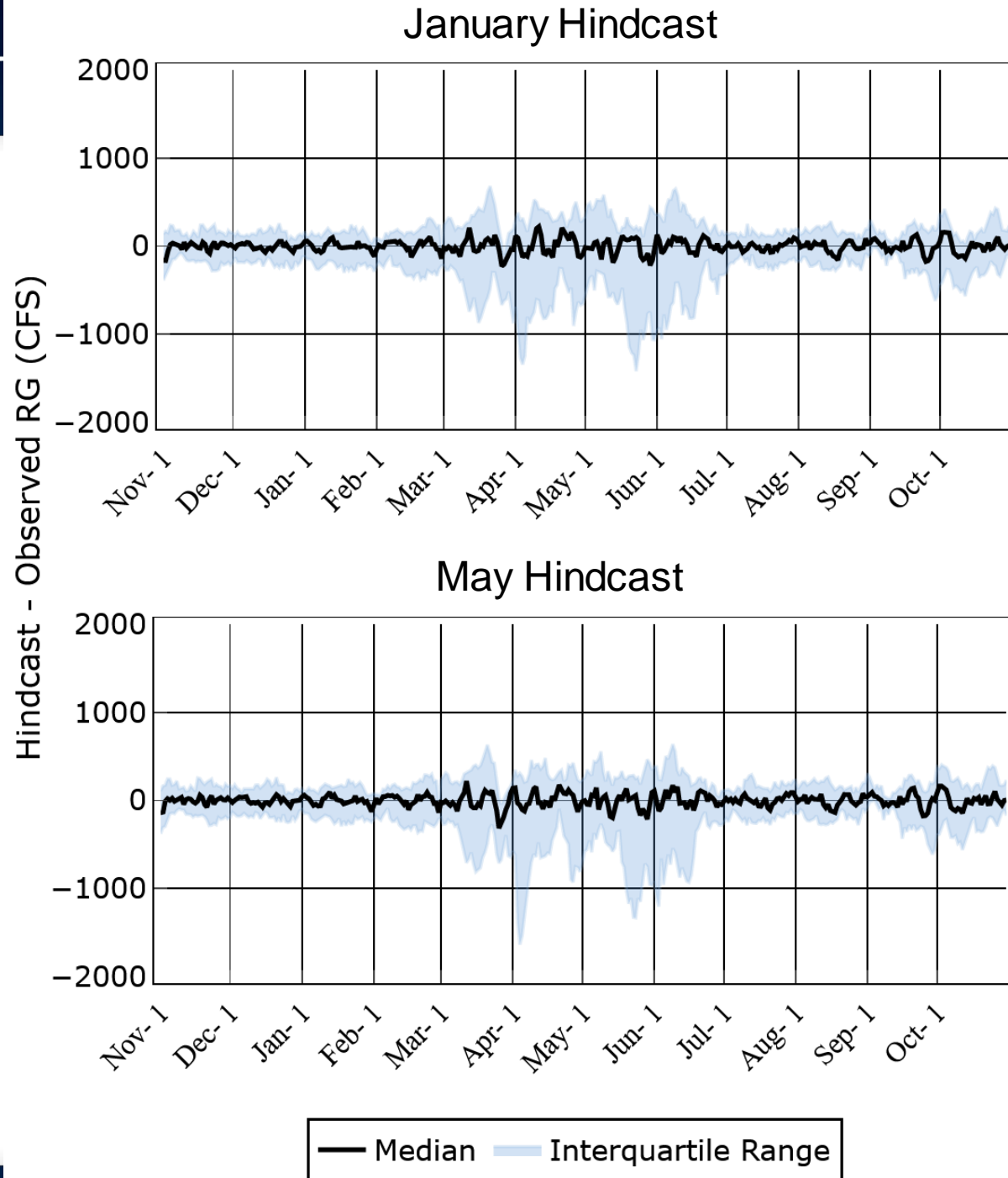


ESPAM 2.2 New Calibration

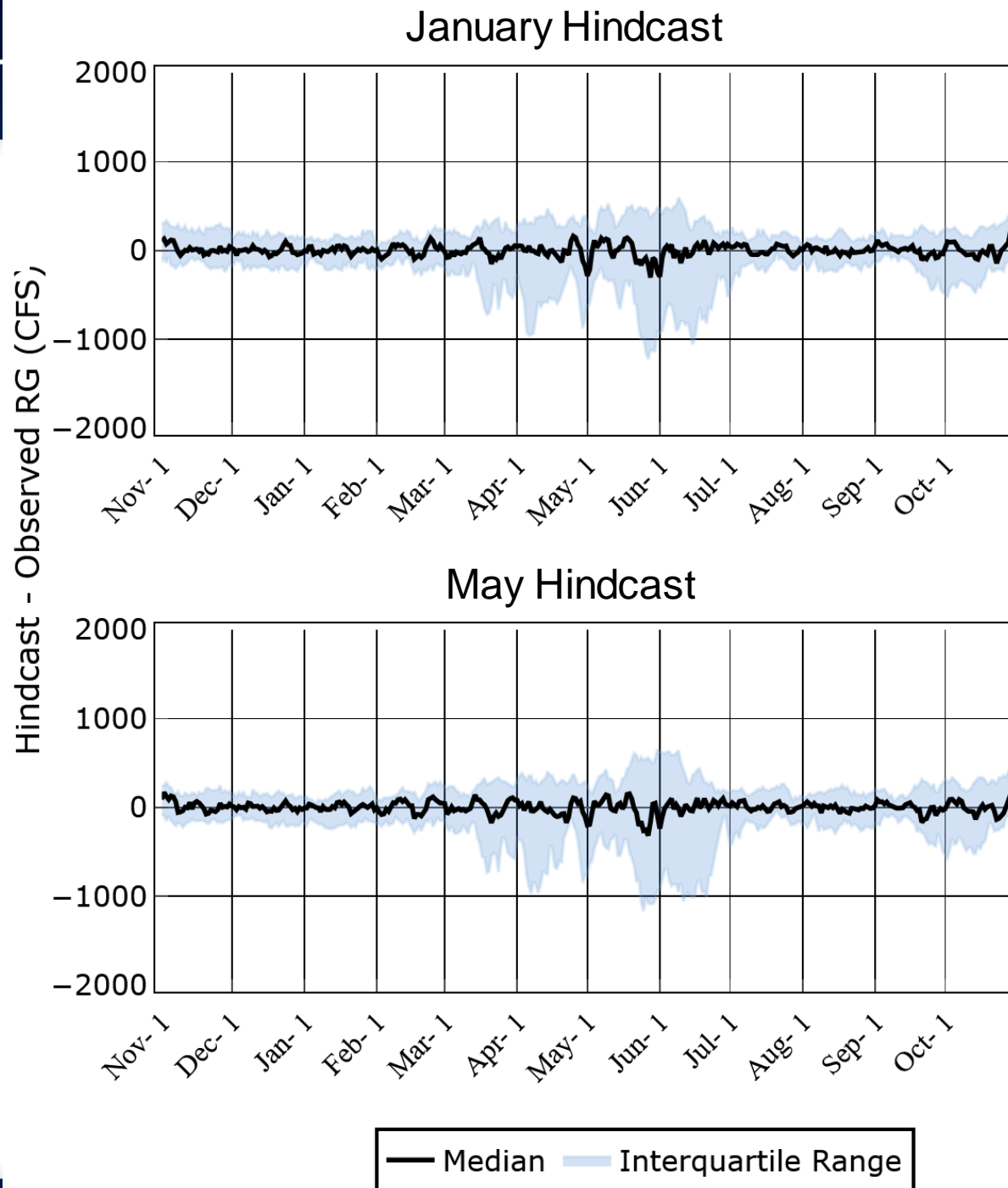


— Median Interquartile Range

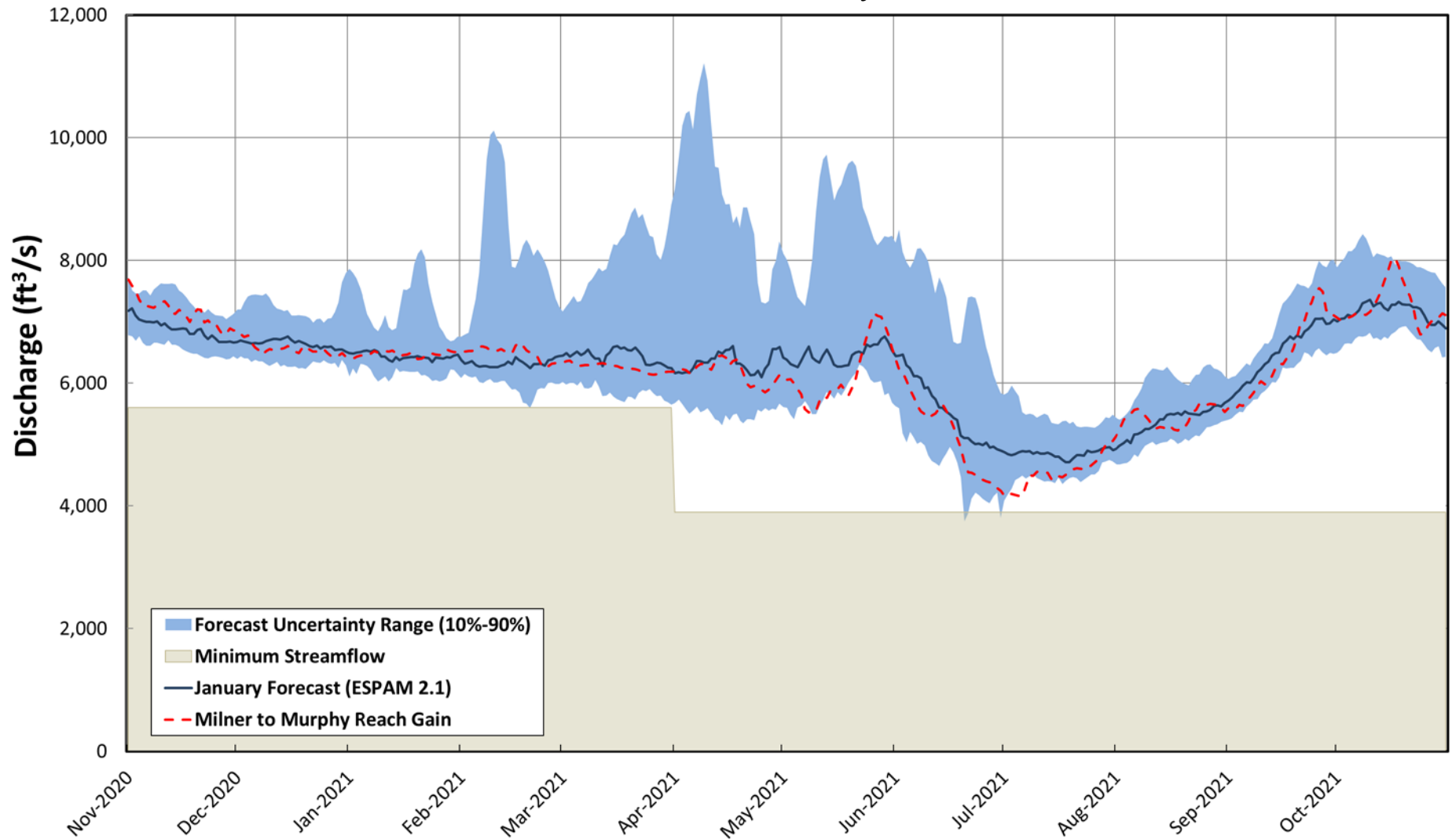
ESPAM 2.1
Figure 6-3



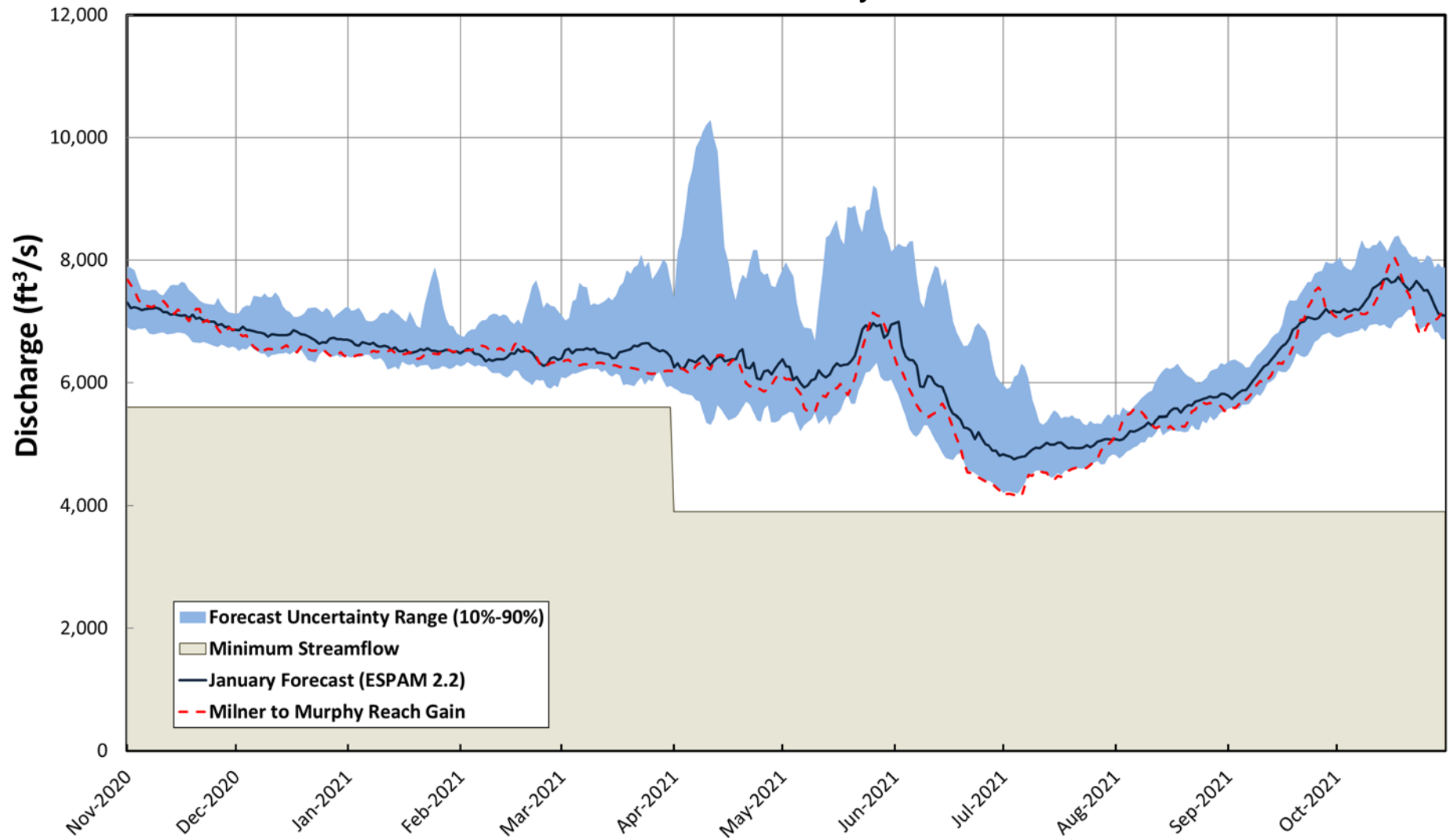
ESPAM 2.2 Figure 6-3



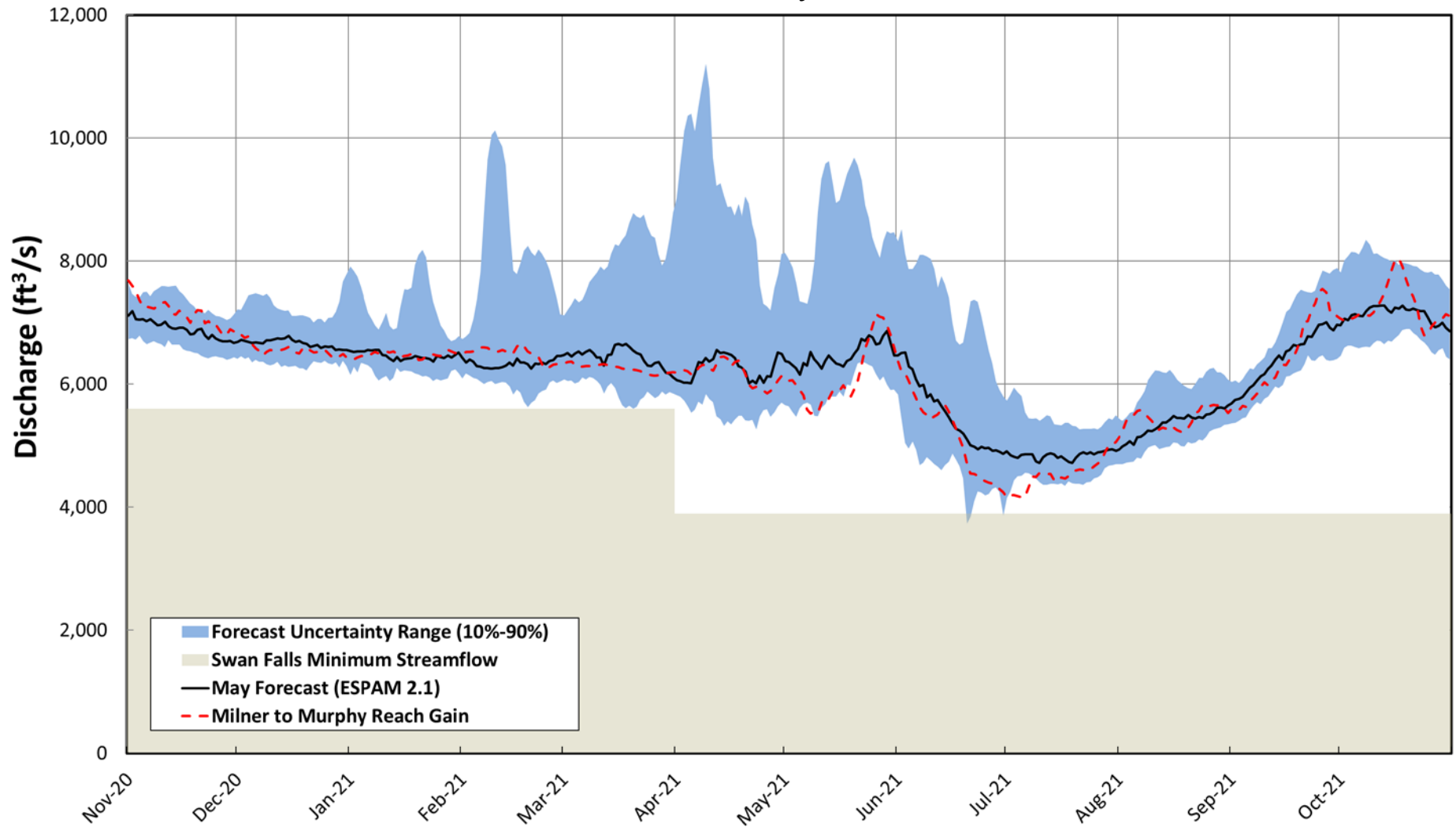
ESPAM 2.1: January Forecast



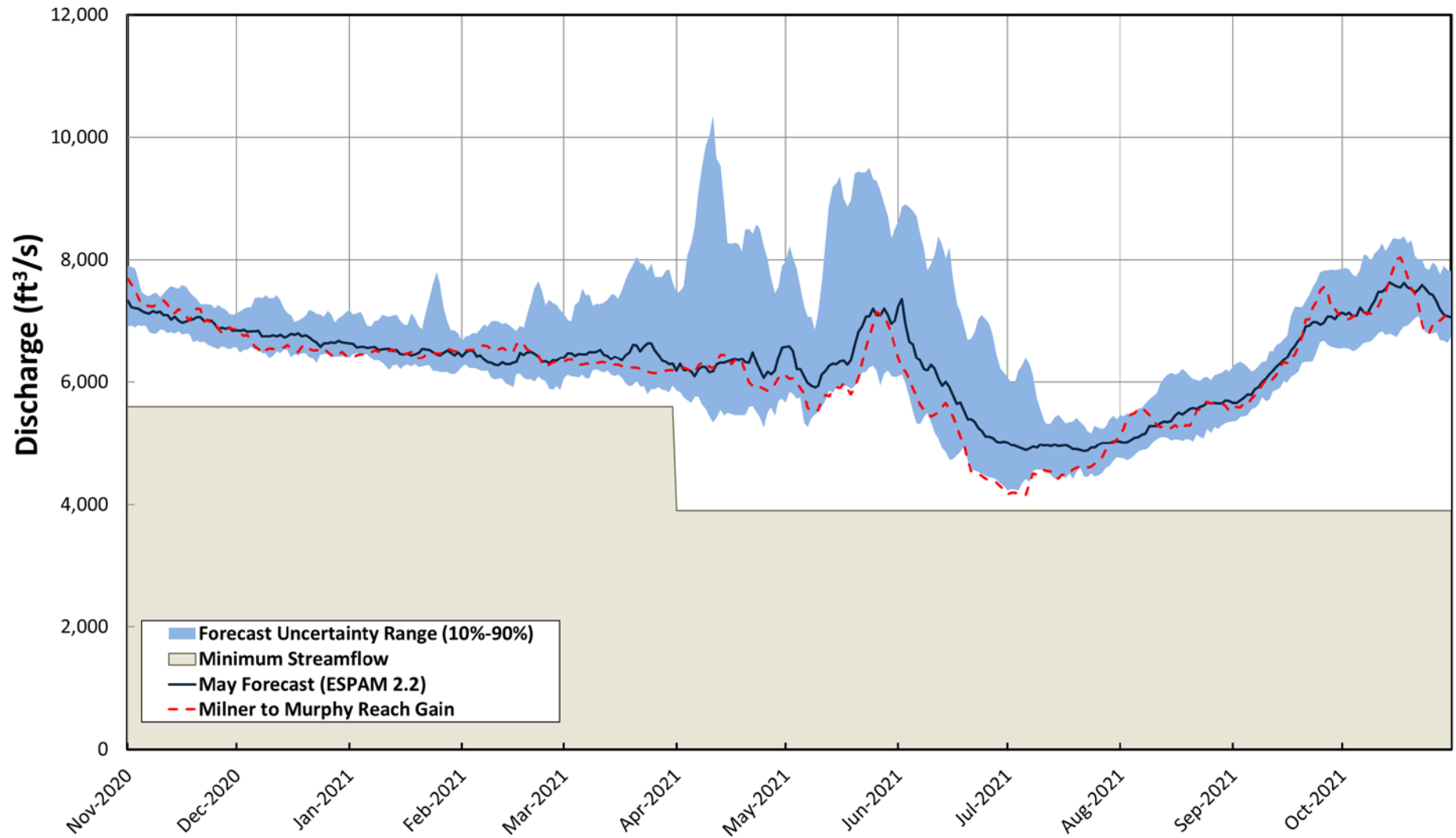
ESPAM 2.2: January Forecast



ESPAM 2.1: May Forecast



ESPAM 2.2: May Forecast



Questions?

