Appendix F. LS ECM V2 Results at Observation Stations

This appendix has additional tables and figures related to the LS ECM V2 results at observation stations. The statistical analysis was conducted in the period from Jan. 1, 2002 to Nov. 1, 2007, which is longer than the period considered in Appendixes B and C that ended in Jan 1, 2007. This may cause slight differences in the statistical parameters presented.

The meaning of symbols for the statistical parameter used in this appendix is

ME: mean error;
MAE: mean absolute error;
RMSE: root mean square error;
R: Correlation coefficient;
PL: average performance level, which is number in the range from 1.0 (high) to 3.0 (low).

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Mining Pits

Table F1. Difference of the model results at mining pits and lakes.

Lidar Point	D V1 (ft)	D V2 (ft)	Lidar Point	D V1 (ft)	D V2 (ft)	Lidar Point	D V1 (ft)	D V2 (ft)
1	1.2	1.7	22	-2.1	-0.8	43	-0.9	0.0
2	6.3	6.8	23	-2.1	-0.9	44	-0.9	-0.1
3	-2.5	-0.3	24	-3.3	-1.9	45	0.3	1.2
4	-3.0	-0.8	25	-3.4	-1.9	46	-0.9	0.0
5	-3.7	-1.4	26	2.8	2.8	47	-1.2	-0.3
6	-2.2	-0.6	27	2.4	2.8	48	-2.6	-1.6
7	-2.6	-0.8	28	-3.2	-1.6	49	-0.9	0.1
8	-0.8	0.1	29	-0.3	1.0	50	-0.6	0.3
9	-3.8	-1.5	30	-0.3	1.0	51	0.3	1.3
10	-2.7	-1.6	31	0.7	1.8	52	-0.8	0.2
11	-4.4	-2.7	32	-1.0	-1.1	53	-0.8	0.2
12	-3.1	-2.3	33	2.8	2.8	54	0.4	1.5
13	-2.1	-1.0	34	2.8	3.0	55	-3.3	-2.4
14	-2.4	-1.0	35	2.1	2.5	56	-1.6	-0.6
15	-1.9	-1.0	36	0.8	1.8	57	-4.6	-4.0
16	-3.9	-2.3	37	-6.9	-5.6	58	-3.3	-2.6
17	-1.9	-1.0	38	0.6	1.7	59	-0.1	0.3
18	-3.0	-1.8	39	0.8	1.7	60	-0.1	0.5
19	-3.1	-1.9	40	3.8	4.1	61	-3.1	-2.7
20	-3.1	-1.9	41	0.9	1.7	62	0.8	1.2
21	-2.7	-1.5	42	6.9	4.4	**mean**	**-1.04**	**-0.07**

Note: "D" stands for difference between Lidar elevation and water level from model, "V1" for LC ECM V1 and "V2" for LC ECM V2.

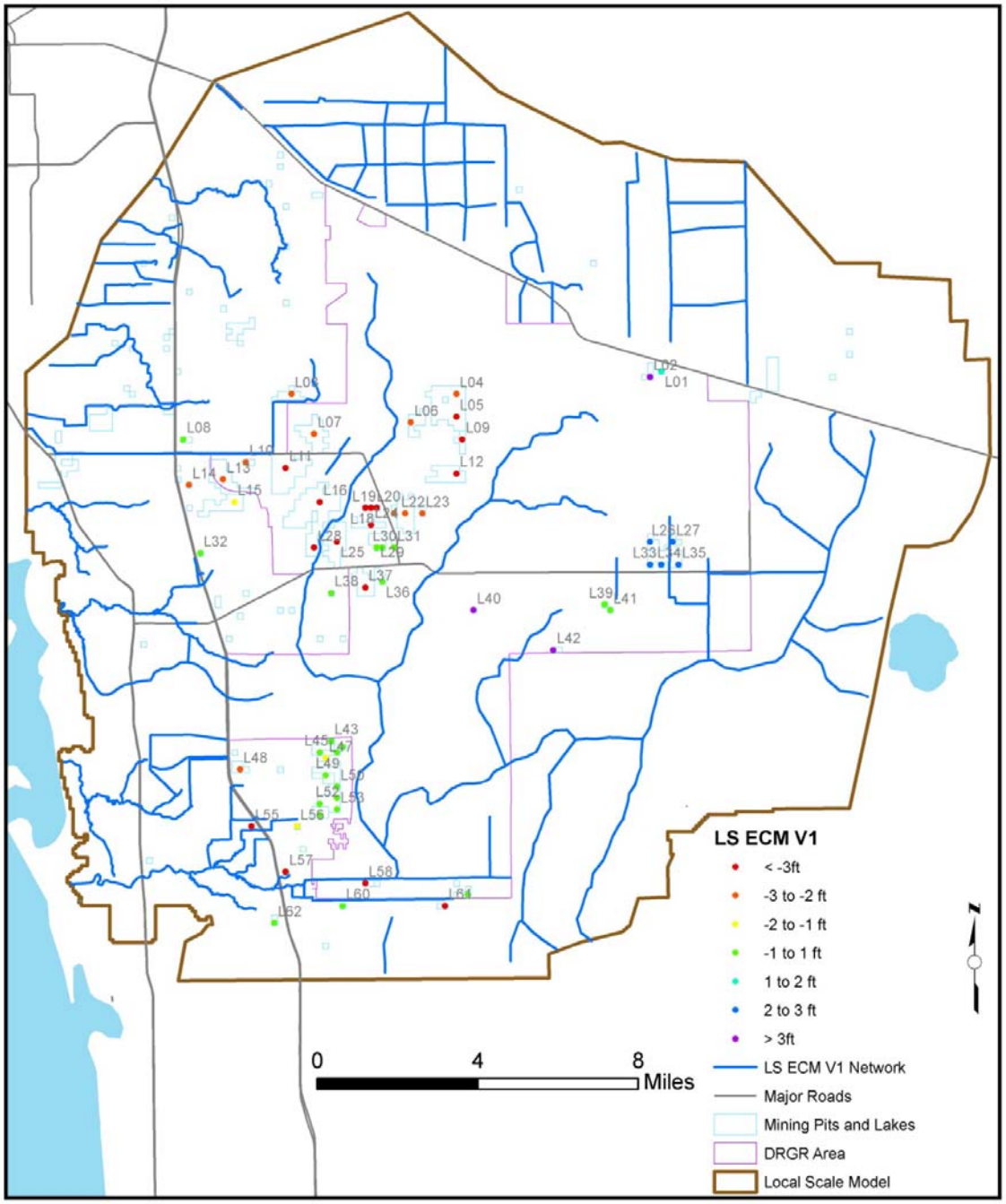


Figure F1. Water level differences (Lidar – model) in mining pits and lakes from previous (V1) model.

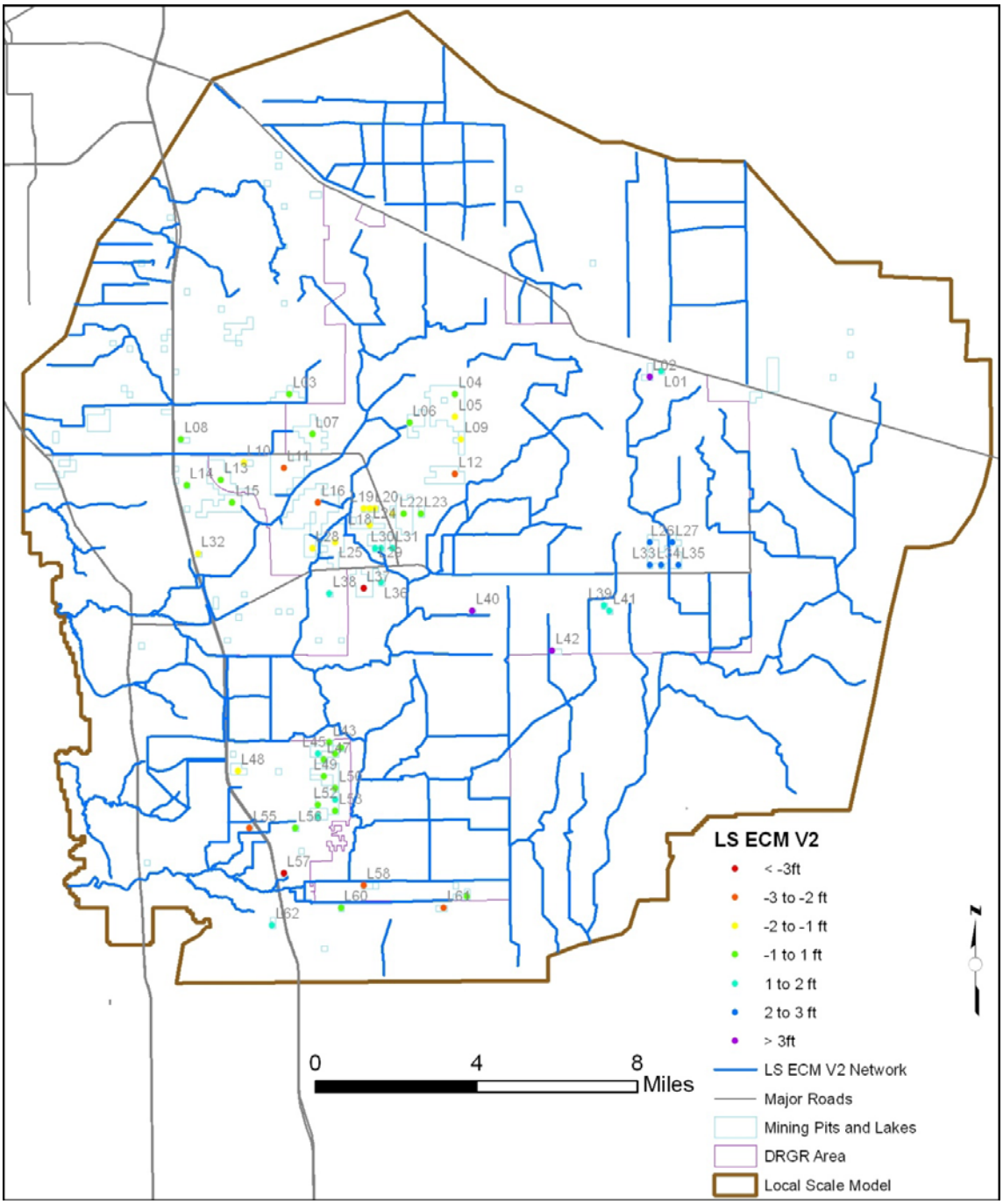


Figure F2. Water level differences (Lidar – model) in mining pits and lakes from new (V2) model.

Observation Wells

Table F2. Statistical parameters at observation wells.

		LS ECM V1					LS ECM V2				
Name	Layer	ME (ft)	MAE (ft)	RMSE (ft)	R	PL	ME (ft)	MAE (ft)	RMSE (ft)	R	PL
49-GW3	1	0.11	0.90	1.14	0.40	1.5	0.93	1.32	1.63	0.37	2.0
49-GW6	1	0.38	1.18	1.43	0.75	1.5	0.76	1.16	1.54	0.72	1.5
49-GW7	1	0.44	0.86	1.29	0.58	1.5	0.20	0.78	1.14	0.61	1.3
49-GW8	1	1.79	1.79	2.19	0.23	2.3	1.64	1.64	2.03	0.23	2.3
49-GW9	1	1.31	1.34	1.61	0.84	1.8	1.53	1.57	1.81	0.82	1.8
49-GW10	1	-0.46	0.88	1.06	0.87	1.0	-0.02	0.81	0.96	0.88	1.0
49-GW11	1	0.20	1.07	1.35	0.85	1.5	0.88	1.23	1.57	0.87	1.5
49-GW12	1	0.56	0.85	1.12	0.87	1.0	1.16	1.24	1.48	0.90	1.8
49-GW14	1	-0.14	0.64	0.76	0.89	1.0	0.12	0.61	0.78	0.87	1.0
49-GW15	1	1.72	1.76	1.92	0.53	2.0	1.54	1.56	1.69	0.57	2.0
49L-GW1	1	0.23	0.78	0.96	0.77	1.0	0.85	0.99	1.21	0.81	1.0
L-1985	2	0.19	2.51	3.04	0.61	2.3	1.19	2.66	3.57	0.52	2.5
FP2_GW1	1	0.50	1.09	1.53	0.80	1.5	1.26	1.54	2.19	0.71	1.8
FP3_GW1	1	0.28	0.60	0.73	0.86	1.0	0.82	0.86	1.10	0.85	1.0
FP4_GW1	1	-0.22	0.55	0.70	0.89	1.0	0.20	0.79	0.95	0.84	1.0
L-5874	3	-3.50	3.77	4.65	0.71	2.5	-3.04	3.52	4.37	0.66	2.8
FP5_GW1	1	-0.33	0.60	0.76	0.88	1.0	0.01	0.75	0.95	0.82	1.0
FP6_GW1	1	-0.41	0.76	0.94	0.87	1.0	0.10	0.79	1.01	0.82	1.0
FP7_GW1	1	-0.41	0.84	1.03	0.86	1.0	0.25	0.80	1.03	0.84	1.0
FP8_GW1	1	-0.27	0.70	0.85	0.88	1.0	0.17	0.79	0.99	0.84	1.0
FP9_G	1	-0.39	0.83	1.02	0.86	1.0	0.27	0.81	1.05	0.83	1.0
L-5667	1	1.08	1.28	1.39	0.93	1.8	1.80	1.88	2.02	0.89	1.8
FP10_G	1	-0.25	0.54	0.72	0.89	1.0	0.09	0.77	0.99	0.82	1.0
46A-GW3	1	-2.14	2.14	2.39	0.72	2.3	-1.97	1.98	2.20	0.77	1.8
46A-GW4	1	-0.52	1.12	1.36	0.74	1.5	0.07	1.00	1.21	0.72	1.0
L-5649	4	-7.45	7.45	8.15	0.63	2.8	-7.38	7.38	8.10	0.58	2.8
46A-GW10	1	-0.25	0.53	0.70	0.81	1.0	-0.63	0.74	0.91	0.81	1.0
46A-GW11	1	-1.28	1.28	1.36	0.92	1.8	-1.49	1.49	1.55	0.93	1.8
46A-GW12	1	-1.69	1.78	2.10	0.69	2.0	-1.64	1.65	2.00	0.83	1.8
46A-GW13	1	-0.94	1.00	1.12	0.86	1.0	-0.84	0.91	1.07	0.82	1.0
46A-GW14	1	-0.96	1.21	1.39	0.58	1.8	-0.63	1.05	1.18	0.54	1.5
46A-GW15	1	-0.53	0.62	0.81	0.91	1.0	0.01	0.42	0.58	0.91	1.0
46A-GW18	1	-1.05	1.22	1.40	0.85	1.8	-0.58	0.92	1.07	0.86	1.0
46A-GW21	1	-1.01	1.10	1.28	0.73	1.8	-1.10	1.17	1.37	0.70	1.8
46A-GW25	1	0.06	0.48	0.60	0.86	1.0	-0.10	0.48	0.60	0.87	1.0
46A-GW26	1	-0.27	0.47	0.61	0.78	1.0	-0.37	0.53	0.67	0.79	1.0

		LS ECM V1					LS ECM V2				
Name	Layer	ME (ft)	MAE (ft)	RMSE (ft)	R	PL	ME (ft)	MAE (ft)	RMSE (ft)	R	PL
40-GW1	1	0.21	0.82	1.11	0.67	1.3	-1.17	1.34	1.65	0.67	2.0
40-GW2	1	0.86	1.36	1.65	0.45	2.0	0.80	1.28	1.65	0.46	2.0
40-GW3	2	-0.65	0.86	1.03	0.80	1.0	-0.73	0.94	1.09	0.81	1.0
40-GW4	2	-3.86	3.86	3.97	0.78	2.5	-4.65	4.65	4.74	0.80	2.5
40-GW5	1	-0.74	1.11	1.37	0.77	1.5	-2.49	2.49	2.69	0.75	2.5
40-GW6	1	0.38	1.24	1.67	0.44	2.0	0.42	1.27	1.68	0.46	2.0
40-GW7	1	-0.42	0.79	1.12	0.69	1.3	-0.45	0.86	1.20	0.63	1.3
HF1_G	1	-4.28	4.43	5.98	0.27	3.0	-4.30	4.51	6.06	0.22	3.0
HF2_G	1	-0.37	1.04	1.24	0.71	1.3	-0.38	1.10	1.30	0.69	1.8
HF3_G	1	2.24	2.27	2.63	0.80	2.5	2.23	2.25	2.59	0.81	2.5
HF4_G	1	-1.37	1.78	2.20	0.62	2.0	-1.40	1.83	2.24	0.60	2.0
HF7_G	1	-1.42	1.69	2.08	0.59	2.0	-1.43	1.76	2.14	0.56	2.0
ST1_G	1	-0.44	0.72	0.85	0.86	1.0	-0.44	0.78	0.91	0.82	1.0
ST2_G	1	0.05	0.61	0.73	0.86	1.0	0.04	0.63	0.76	0.84	1.0
ST3_G	1	-0.34	0.80	0.92	0.80	1.0	-0.12	0.75	0.91	0.76	1.0
L-2192	3	1.64	4.35	5.53	0.14	2.8	0.76	4.27	5.50	0.06	2.5
WF1_G	2	1.06	1.06	1.12	0.94	1.5	-0.01	0.42	0.51	0.94	1.0
L-730	2	0.72	0.75	0.99	0.80	1.0	0.02	0.86	1.09	0.65	1.3
WF2_G	2	1.31	1.39	1.73	0.77	1.8	0.31	1.25	1.49	0.62	1.8
WF3_G	1	1.54	1.54	1.71	0.86	1.8	0.42	1.09	1.36	0.70	1.8
WF4_G	1	0.95	1.05	1.27	0.83	1.5	-0.07	1.07	1.30	0.71	1.5
WF5_G	1	1.02	1.08	1.40	0.81	1.8	-0.10	1.30	1.52	0.64	1.8
WF6_G	1	0.87	0.91	1.18	0.85	1.0	-0.19	1.11	1.29	0.71	1.5
WF7_G	1	1.16	1.18	1.49	0.81	1.8	0.07	1.25	1.48	0.64	1.8
Corkscrew S.	1	-0.53	0.99	1.05	0.85	1.0	-0.39	0.99	1.08	0.81	1.0
L-1138	1	-0.19	0.76	0.89	0.81	1.0	-0.32	0.81	0.98	0.76	1.0
L-2204	2	-0.71	0.75	0.91	0.90	1.0	-0.99	1.01	1.16	0.89	1.3
L-5664	4	-9.75	9.75	10.74	0.57	2.8	-10.2	10.23	11.20	0.61	2.8
L-5669R	3	0.14	0.37	0.52	0.88	1.0	1.72	1.82	2.26	0.88	1.8
L-5673	3	-8.69	8.73	9.46	0.68	2.8	-7.61	7.66	8.34	0.70	2.8
L-739	2	0.54	0.60	0.74	0.96	1.0	1.05	1.05	1.15	0.95	1.5
MPW02	1	-0.66	0.70	0.80	0.94	1.0	-0.47	0.69	0.82	0.87	1.0
MPW03	1	-0.77	0.78	0.87	0.92	1.0	-0.56	0.77	0.92	0.71	1.0
MPW04	1	-0.01	0.50	0.65	0.91	1.0	-0.08	0.68	0.83	0.85	1.0
MPW05	1	0.25	0.53	0.57	0.78	1.0	-0.38	0.44	0.59	0.83	1.0
MPW08	1	1.11	1.11	1.18	0.93	1.5	0.65	0.68	0.85	0.87	1.0
MPW25	1	-0.27	0.35	0.39	0.95	1.0	-0.82	0.82	0.86	0.94	1.0
MPW27	1	0.45	0.50	0.79	0.86	1.0	0.40	0.65	0.96	0.72	1.0

		LS ECM V1					LS ECM V2				
Name	Layer	ME (ft)	MAE (ft)	RMSE (ft)	R	PL	ME (ft)	MAE (ft)	RMSE (ft)	R	PL
MPW28	1	0.95	0.95	1.00	0.77	1.0	-0.03	0.14	0.17	0.93	1.0
MPW29	1	-0.08	0.31	0.40	0.97	1.0	0.07	0.33	0.42	0.96	1.0
MPW30	1	0.39	0.79	1.16	0.61	1.3	0.08	1.00	1.22	0.57	1.3
MPW31	1	0.23	0.27	0.43	0.96	1.0	0.17	0.45	0.68	0.86	1.0
MPW33	1	-0.94	1.21	1.48	0.72	1.5	-0.93	1.26	1.51	0.69	1.8
MPW34	1	0.49	0.49	0.49	0.98	1.0	-0.16	0.16	0.17	0.98	1.0
MPW35	1	-1.02	1.05	1.21	0.91	1.5	-0.22	0.58	0.76	0.88	1.0
MPW36	1	-0.20	0.62	0.75	0.85	1.0	0.16	0.53	0.66	0.88	1.0
MPW39	1	0.47	2.74	3.18	0.48	2.5	1.61	2.96	3.81	0.31	2.8
MW1	1	-0.30	0.92	1.68	0.49	1.8	-0.86	0.99	1.65	0.70	1.3
MW2	1	0.79	0.90	1.40	0.55	1.5	0.35	1.40	1.77	0.18	2.0
MW3	1	1.32	1.32	1.58	0.72	1.8	0.78	1.24	1.69	0.42	2.0
MW4	1	0.17	0.81	0.94	0.81	1.0	-0.12	0.58	0.81	0.87	1.0
Lake	1	0.74	0.87	1.33	0.59	1.5	0.31	1.31	1.67	0.24	2.0
L-5844	2	-7.34	7.34	7.38	0.75	2.5	-7.96	7.96	8.01	0.70	2.8
DEW-MW-1	1	-3.14	3.14	3.22	0.63	2.8	-2.44	2.44	2.55	0.54	2.8
DEW-MW-2	1	-2.87	2.87	2.89	0.87	2.5	-1.96	1.96	1.99	0.89	1.8
LM-1891	1	-2.55	2.55	2.64	0.77	2.5	-1.53	1.53	1.66	0.69	2.0
LM-1892	1	-1.80	1.80	1.97	0.00	2.3	-0.07	0.63	0.68	0.00	1.5
LM-2290	1	-3.66	3.66	3.73	0.88	2.5	-1.79	1.79	2.04	0.37	2.3
LM-2993	1	-3.49	3.49	3.58	0.82	2.5	-2.22	2.22	2.47	0.65	2.5
Section_11_W	1	-0.09	0.46	0.55	0.89	1.0	0.79	0.79	0.90	0.86	1.0
Section_11_E	1	-2.76	2.76	2.82	0.73	2.5	-1.08	1.09	1.24	0.70	1.5
PWS-MW-1	1	-4.18	4.18	4.25	0.66	2.8	-2.37	2.37	2.52	0.22	3.0

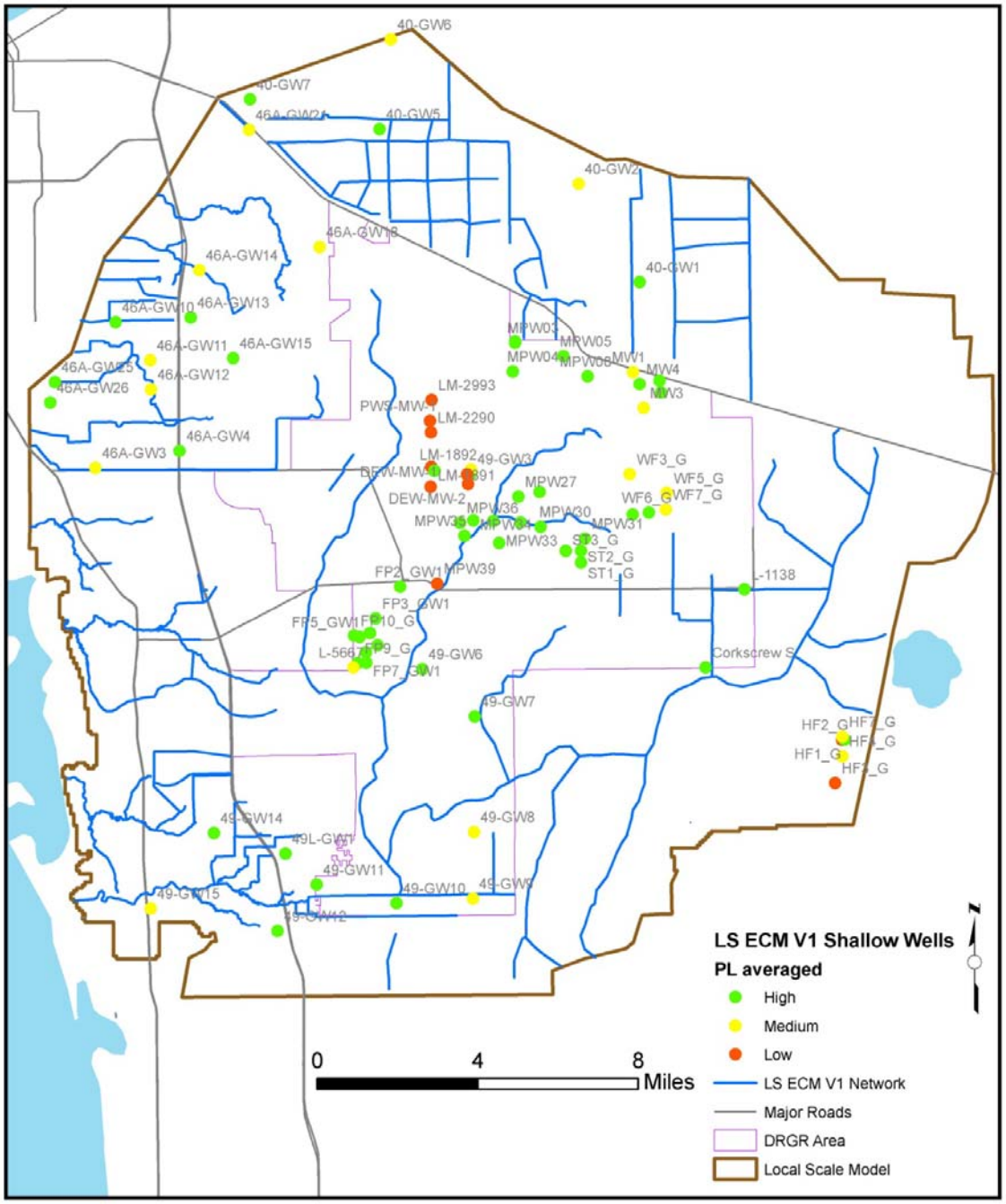


Figure F3. Average performance levels in shallow wells (layer 1) from previous (V1) model.

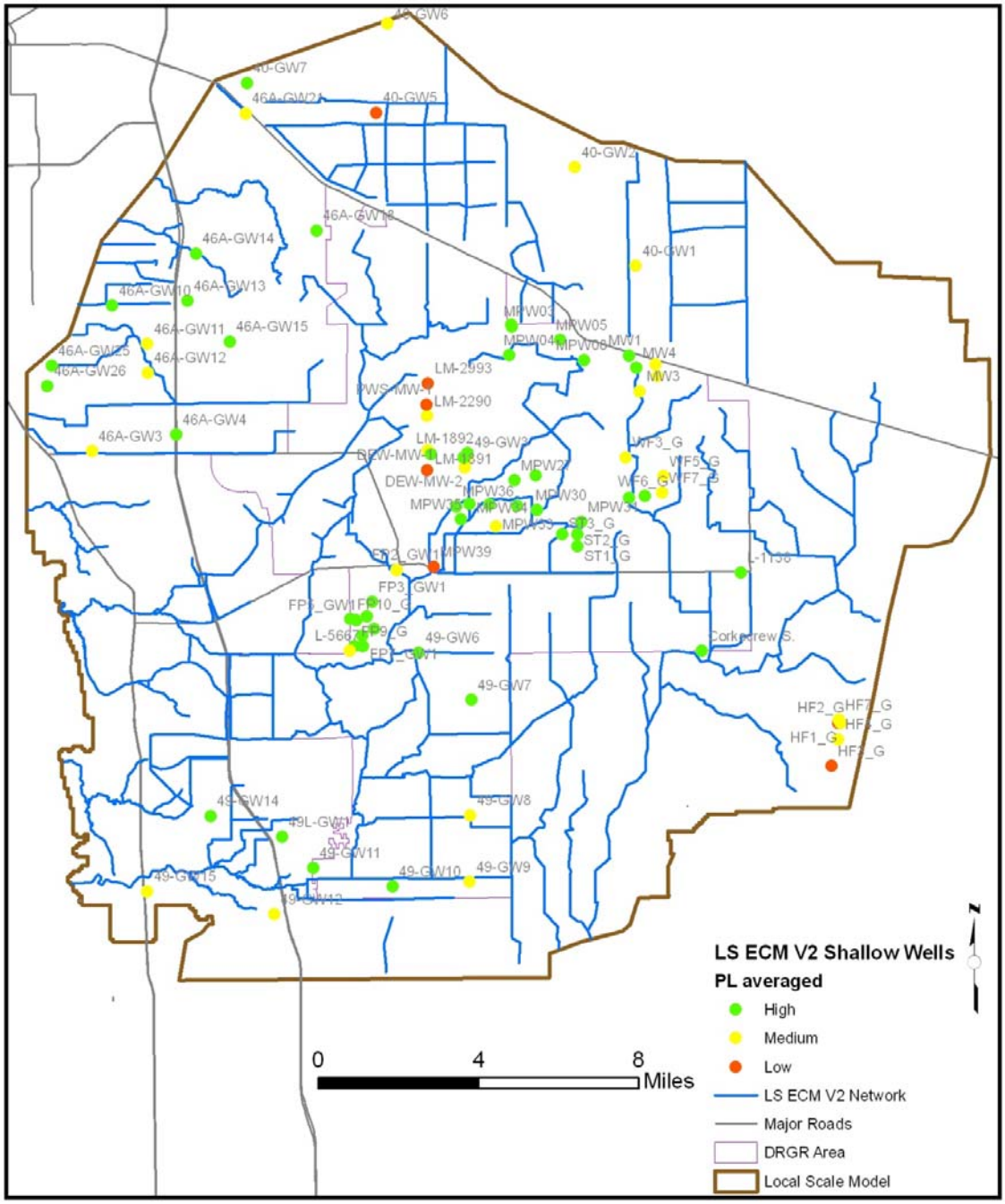


Figure F4. Average performance levels in shallow wells (layer 1) from new (V2) model.

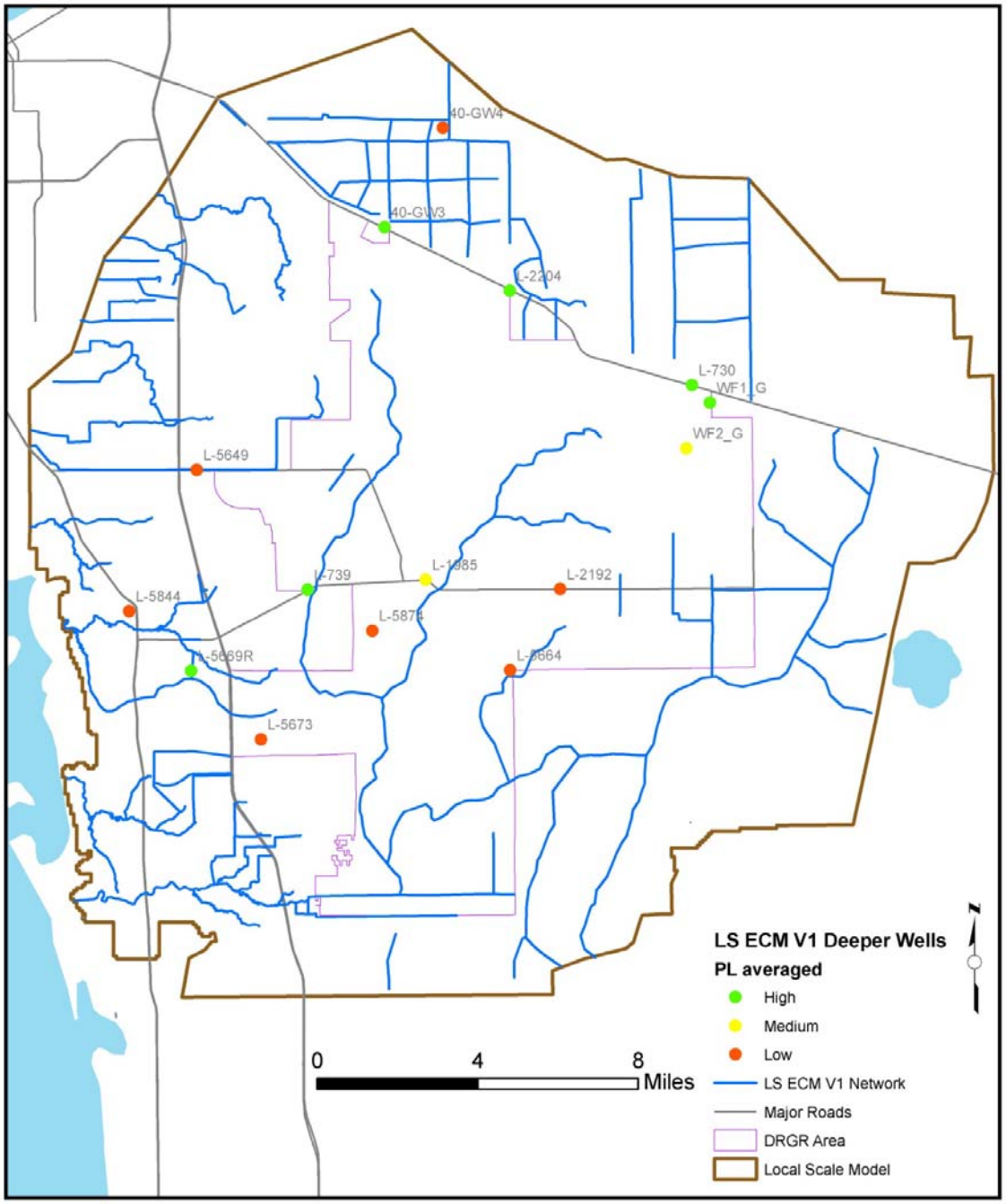


Figure F5. Average performance levels in deeper wells (layer> 1) from previous (V1) model.

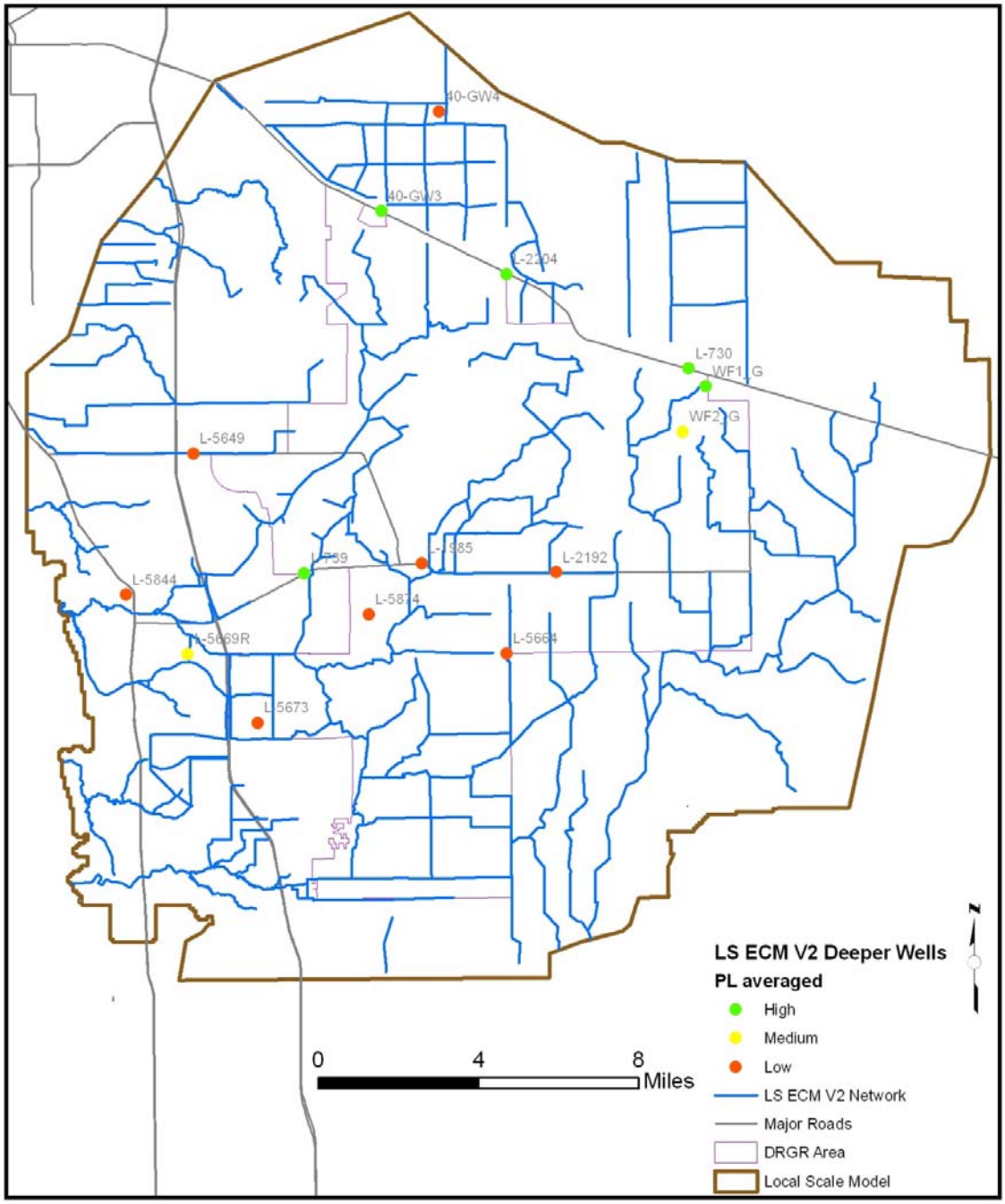
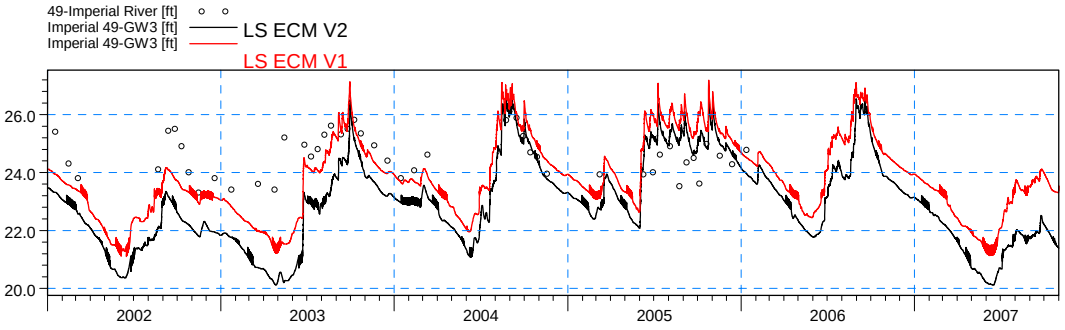
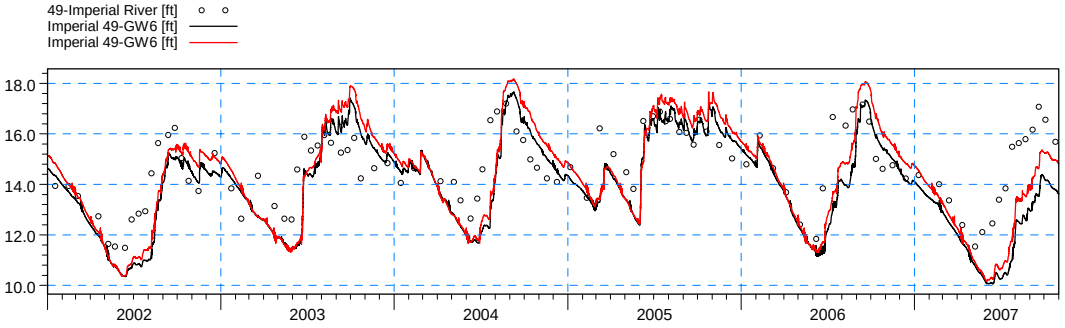


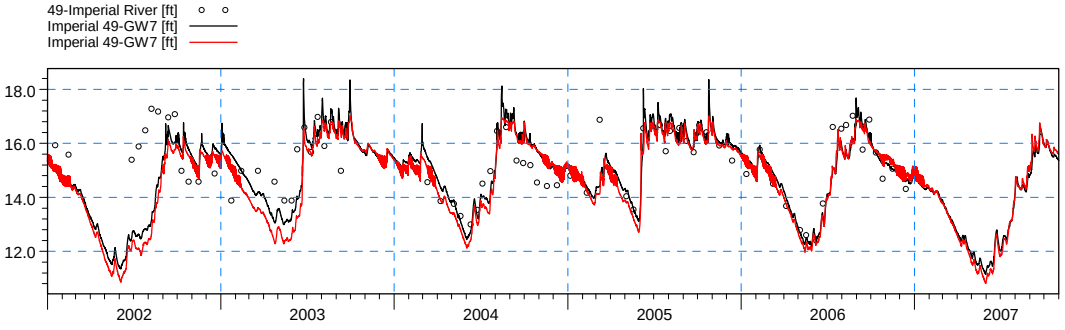
Figure F6. Average performance levels in deeper wells (layer> 1) from new (V2) model.



ME=0.928667
MAE=1.31542
RMSE=1.62539
STDres=1.33397
R(Correlation)=0.367991
R2(Nash_Sutcliffe)=-4.11759

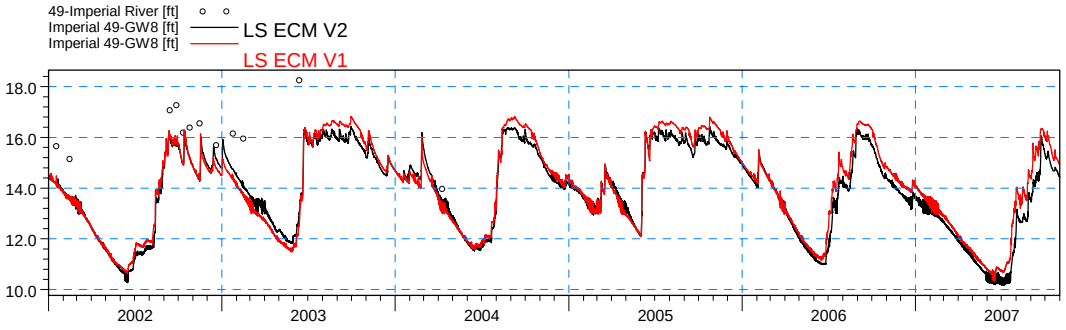


ME=0.760025
MAE=1.16258
RMSE=1.5387
STDres=1.3379
R(Correlation)=0.72251
R2(Nash_Sutcliffe)=-0.11579

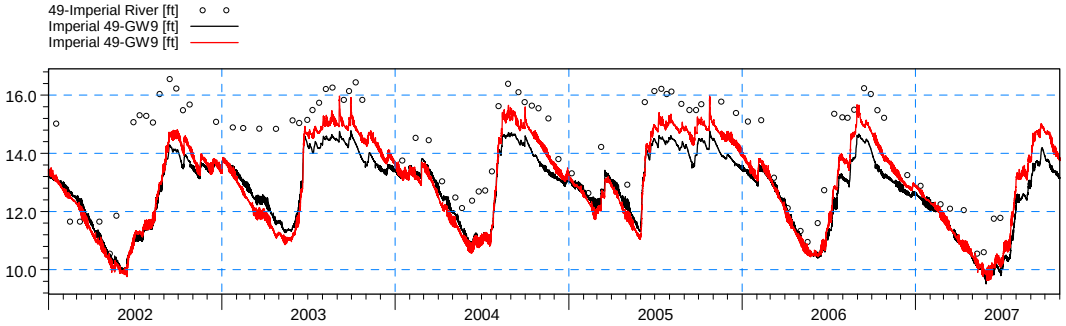


ME=0.195154
MAE=0.783466
RMSE=1.13887
STDres=1.12203
R(Correlation)=0.60994
R2(Nash_Sutcliffe)=0.117423

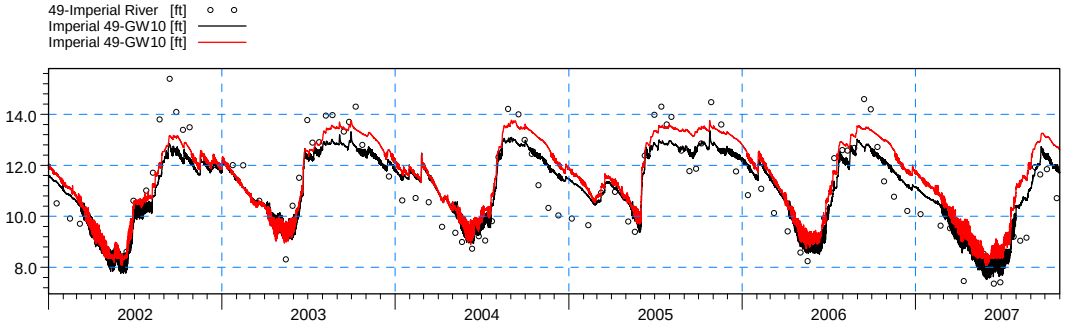
Figure F7. Water level at stations 49-GW3, 49-GW6 and 49-GW7.



ME=1.64345
MAE=1.64345
RMSE=2.02825
STDres=1.18864
R(Correlation)=0.234107
R2(Nash_Sutcliffe)=-2.80765

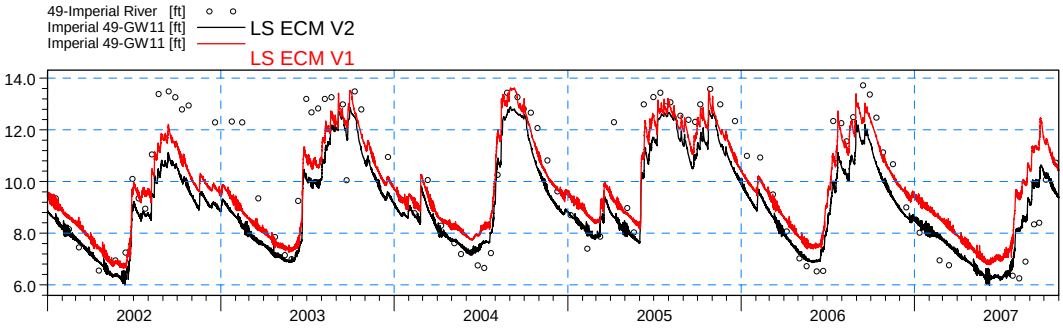


ME=1.53249
MAE=1.56704
RMSE=1.8135
STDres=0.969677
R(Correlation)=0.822169
R2(Nash_Sutcliffe)=-0.135542

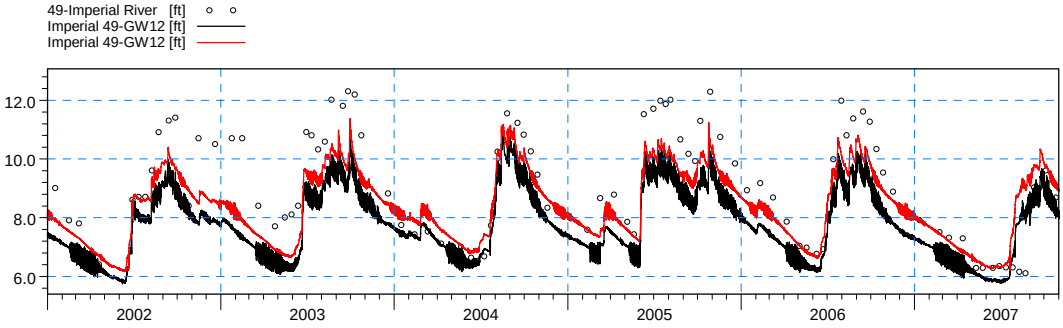


ME=-0.0185733
MAE=0.807532
RMSE=0.957893
STDres=0.957713
R(Correlation)=0.880488
R2(Nash_Sutcliffe)=0.752261

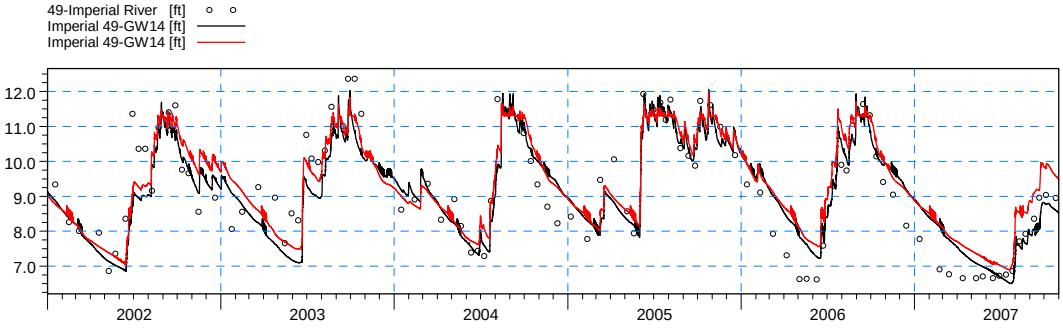
Figure F8. Water level at stations 49-GW8, 49-GW9 and 49-GW10.



ME=0.884991
MAE=1.23019
RMSE=1.56555
STDres=1.29141
R(Correlation)=0.86854
R2(Nash_Sutcliffe)=0.598687

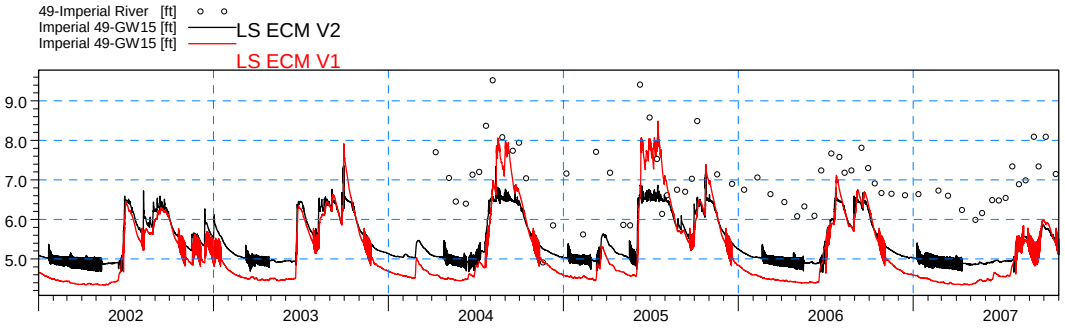


ME=1.161
MAE=1.24364
RMSE=1.47802
STDres=0.914669
R(Correlation)=0.901193
R2(Nash_Sutcliffe)=0.330969

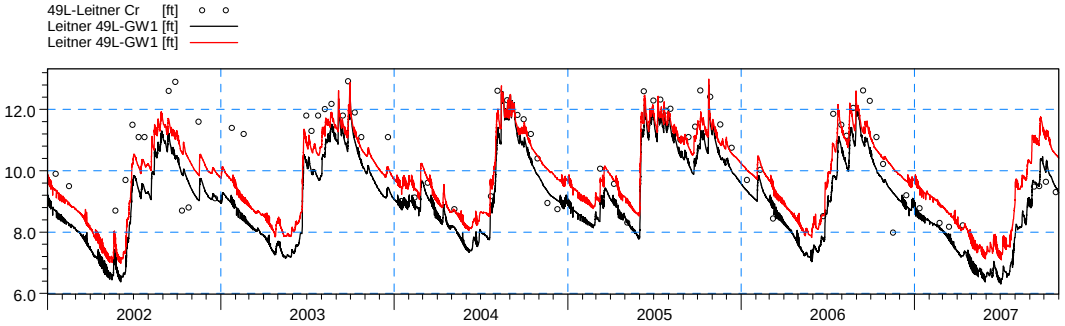


ME=0.116818
MAE=0.614708
RMSE=0.783266
STDres=0.774506
R(Correlation)=0.874479
R2(Nash_Sutcliffe)=0.759295

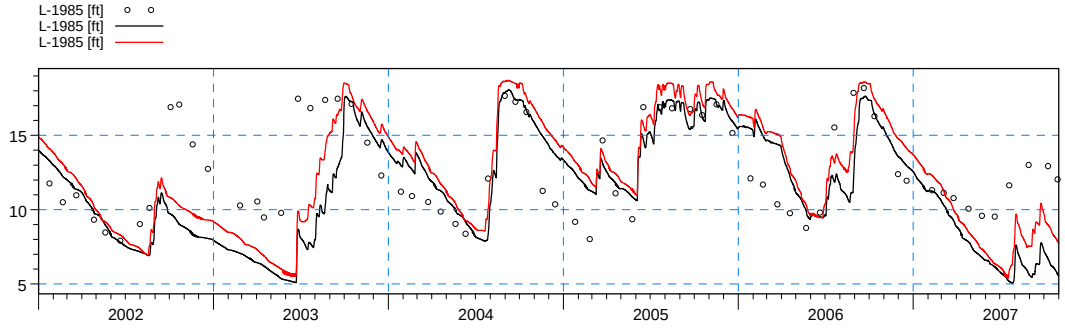
Figure F9. Water level at stations 49-GW11, 49-GW12 and 49-GW14.



ME=1.54118
MAE=1.56087
RMSE=1.69222
STDres=0.698843
R(Correlation)=0.5745
R2(Nash_Sutcliffe)=-3.01491

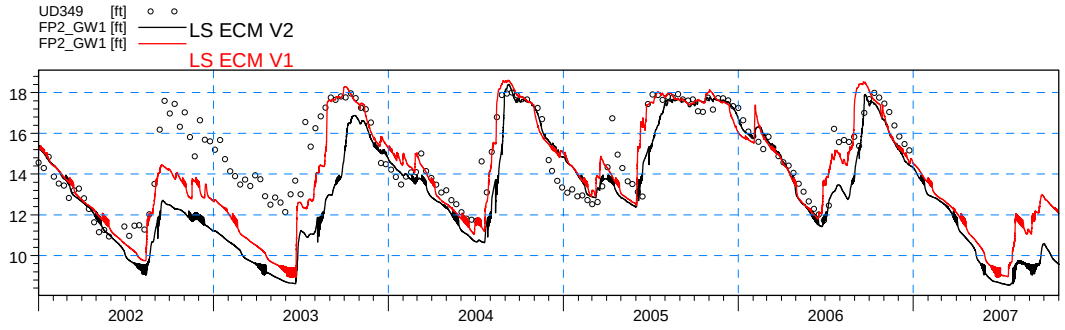


ME=0.852282
MAE=0.992982
RMSE=1.208
STDres=0.856081
R(Correlation)=0.807232
R2(Nash_Sutcliffe)=0.306173

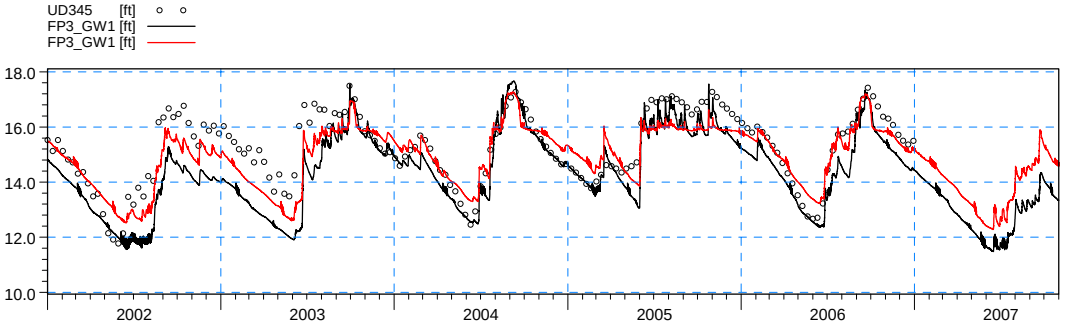


ME=1.19071
MAE=2.65966
RMSE=3.56893
STDres=3.36444
R(Correlation)=0.517265
R2(Nash_Sutcliffe)=-0.275658

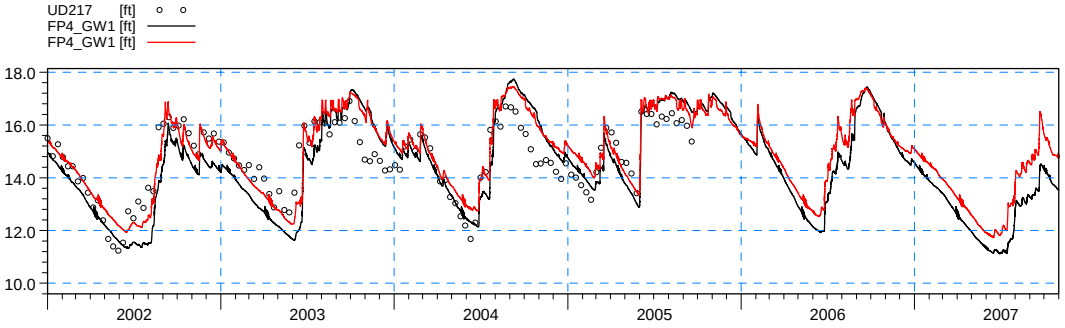
Figure F10. Water level at stations 49-GW15, 49L-GW1 and L-1985.



ME=1.2566
MAE=1.53616
RMSE=2.19289
STDres=1.79715
R(Correlation)=0.706801
R2(Nash_Sutcliffe)=-0.125362

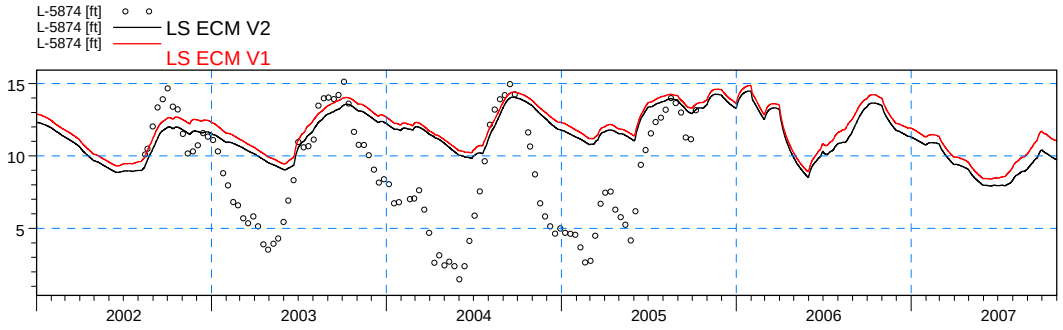


ME=0.820998
MAE=0.855789
RMSE=1.09537
STDres=0.725123
R(Correlation)=0.852103
R2(Nash_Sutcliffe)=0.296092

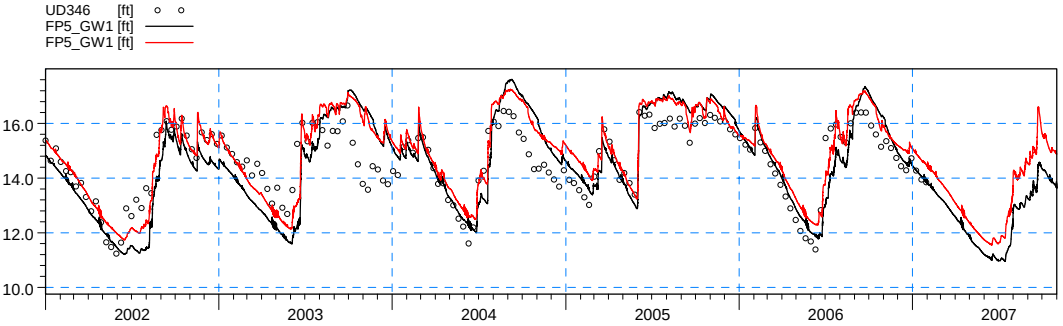


ME=0.196406
MAE=0.785355
RMSE=0.945135
STDres=0.924502
R(Correlation)=0.838132
R2(Nash_Sutcliffe)=0.485834

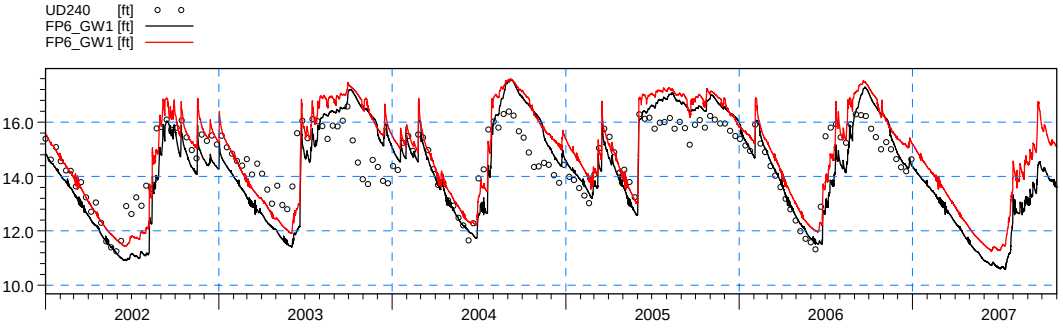
Figure F11. Water level at stations FP2_GW1, FP3_GW1 and FP4_GW1.



ME=-3.03926
MAE=3.51852
RMSE=4.36571
STDres=3.13406
R(Correlation)=0.660625
R2(Nash_Sutcliffe)=-0.30949

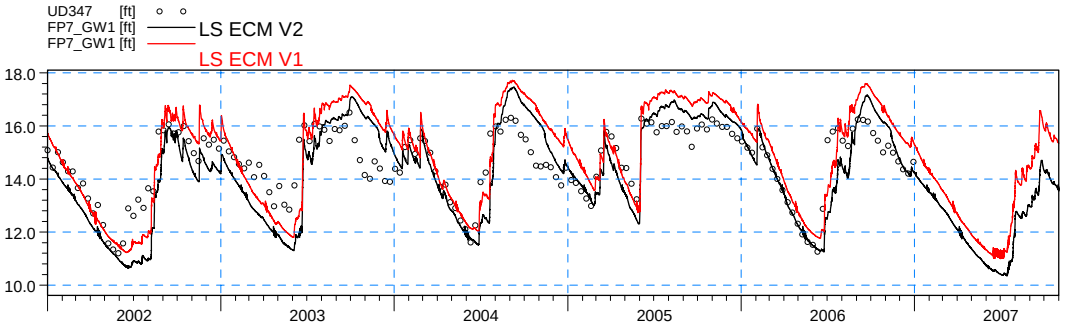


ME=0.00606229
MAE=0.74983
RMSE=0.946131
STDres=0.946112
R(Correlation)=0.821293
R2(Nash_Sutcliffe)=0.464288

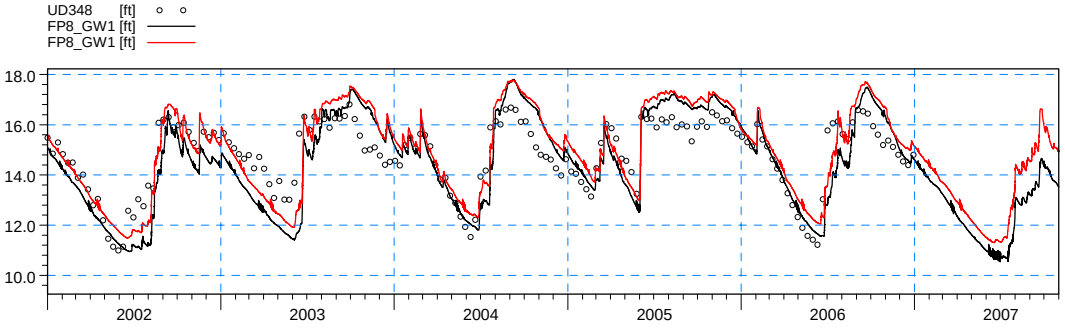


ME=0.0994867
MAE=0.790845
RMSE=1.01067
STDres=1.00576
R(Correlation)=0.824413
R2(Nash_Sutcliffe)=0.385011

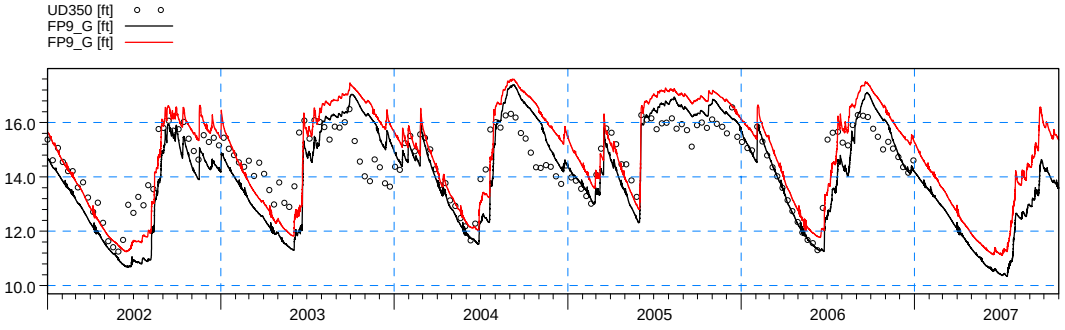
Figure F12. Water level at stations L-5874, FP5_GW1 and FP6_GW1.



ME=0.253485
MAE=0.801306
RMSE=1.03486
STDres=1.00333
R(Correlation)=0.835082
R2(Nash_Sutcliffe)=0.357735

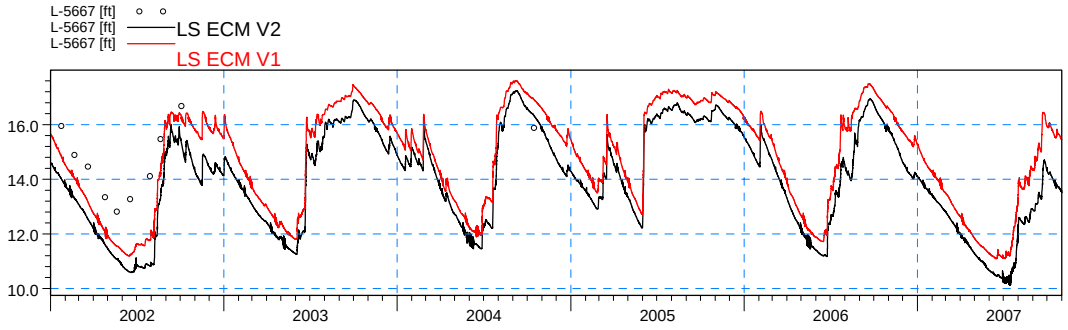


ME=0.171644
MAE=0.793099
RMSE=0.987878
STDres=0.972853
R(Correlation)=0.844639
R2(Nash_Sutcliffe)=0.49894

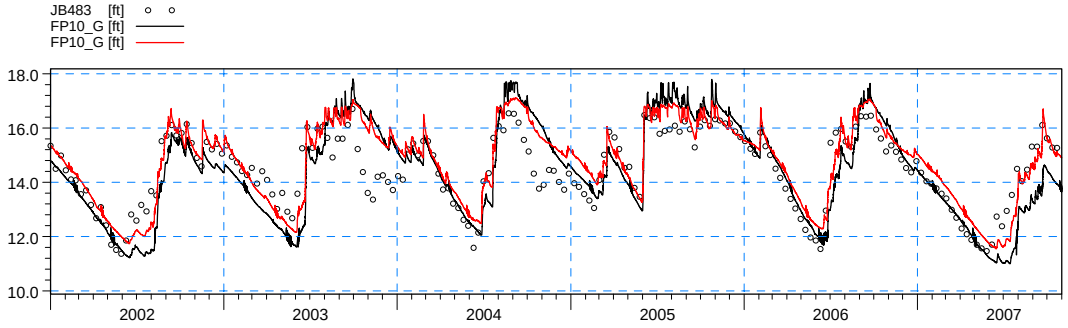


ME=0.268576
MAE=0.814621
RMSE=1.0513
STDres=1.01641
R(Correlation)=0.826398
R2(Nash_Sutcliffe)=0.322206

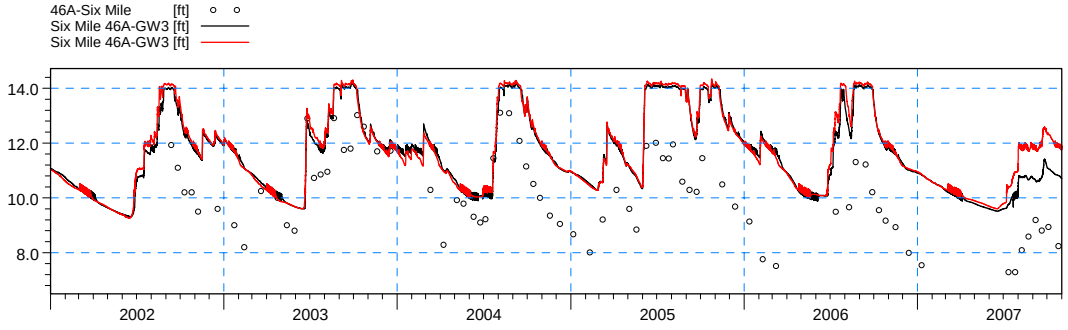
Figure F13. Water level at stations FP7_GW1, FP8_GW1 and FP9_G.



ME=1.79898
MAE=1.88811
RMSE=2.02046
STDres=0.919754
R(Correlation)=0.893708
R2(Nash_Sutcliffe)=-1.6552

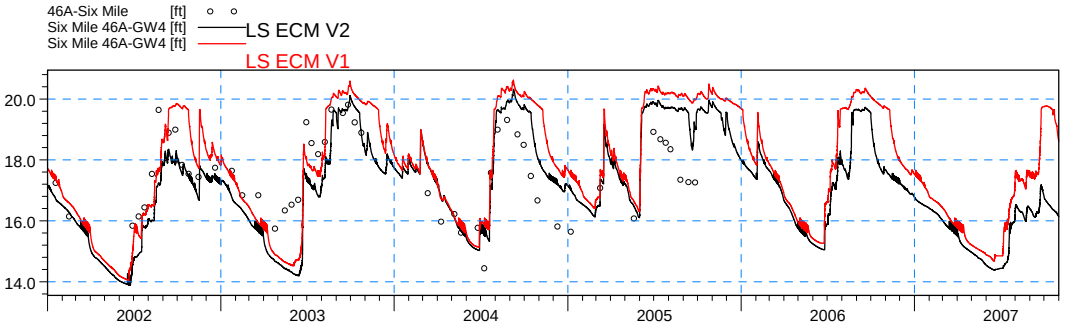


ME=0.0903254
MAE=0.767146
RMSE=0.990473
STDres=0.986345
R(Correlation)=0.820547
R2(Nash_Sutcliffe)=0.458677

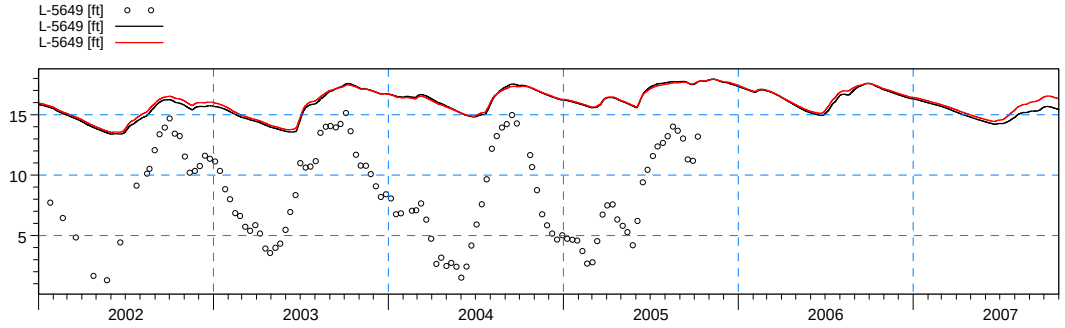


ME=-1.96547
MAE=1.9787
RMSE=2.19747
STDres=0.982751
R(Correlation)=0.76932
R2(Nash_Sutcliffe)=-1.14887

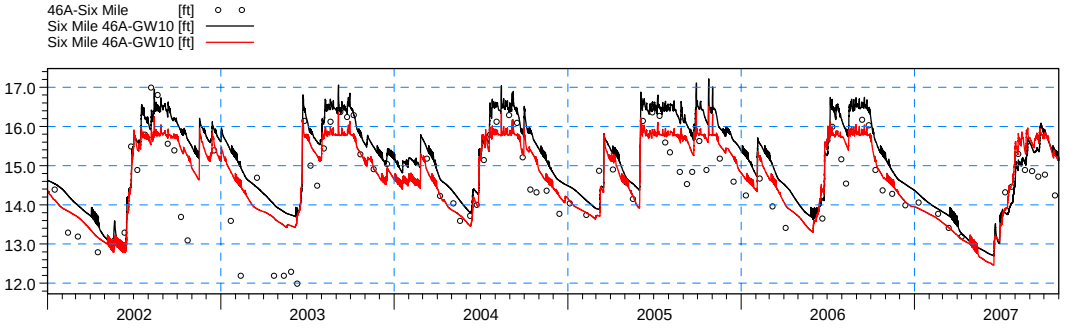
Figure F14. Water level at stations L-5667, FP10_G and 46A-GW3.



ME=0.0693236
MAE=0.997836
RMSE=1.20518
STDres=1.20318
R(Correlation)=0.720727
R2(Nash_Sutcliffe)=0.144251

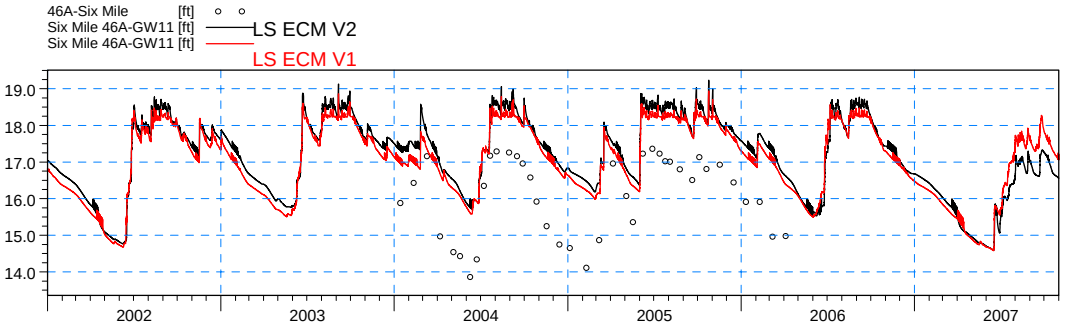


ME=-7.38298
MAE=7.38298
RMSE=8.09769
STDres=3.32631
R(Correlation)=0.576726
R2(Nash_Sutcliffe)=-3.49379

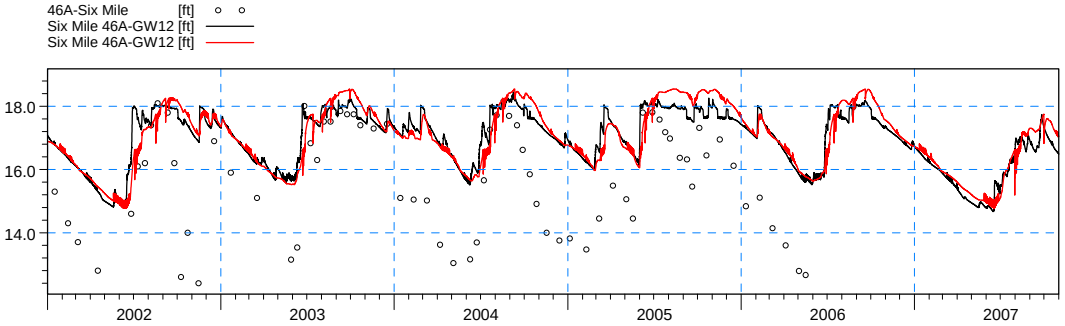


ME=-0.627015
MAE=0.735143
RMSE=0.90816
STDres=0.656967
R(Correlation)=0.810578
R2(Nash_Sutcliffe)=0.333214

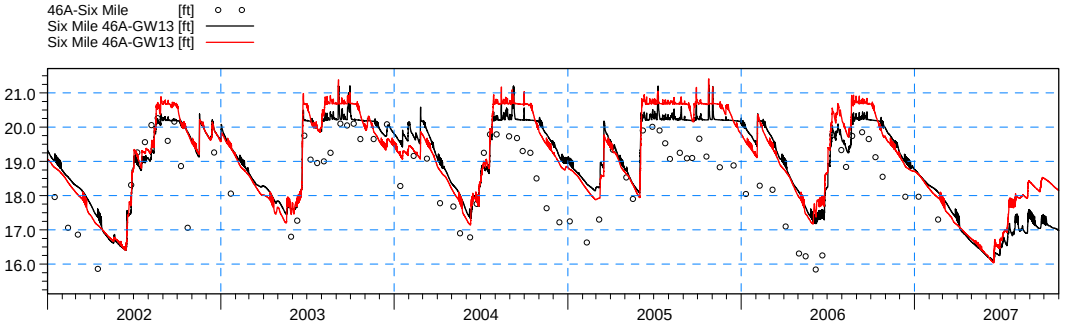
Figure F15. Water level at stations 46A-GW4, L-5649 and 46A-GW10.



ME=-1.48578
MAE=1.48578
RMSE=1.54828
STDres=0.435471
R(Correlation)=0.926756
R2(Nash_Sutcliffe)=-1.08579

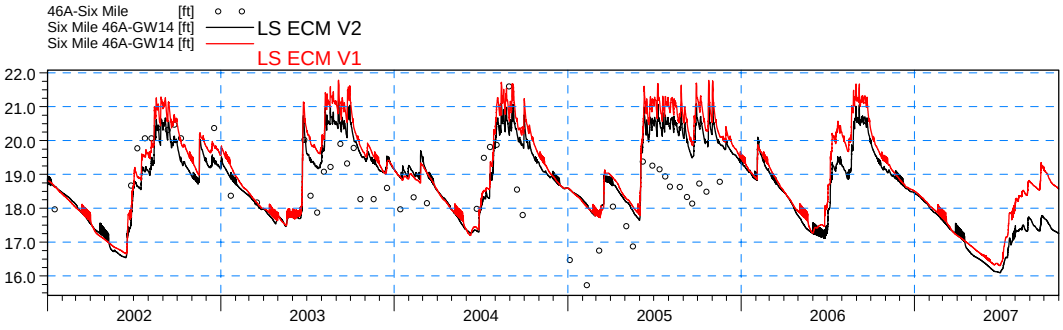


ME=-1.63555
MAE=1.6484
RMSE=2.00175
STDres=1.1541
R(Correlation)=0.832697
R2(Nash_Sutcliffe)=-0.386939

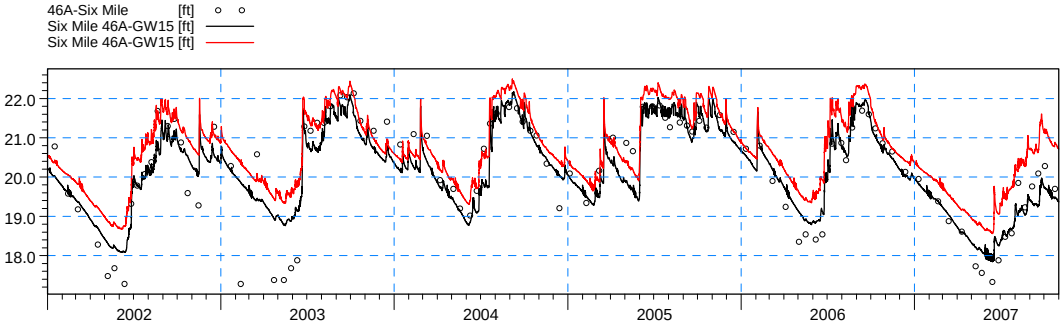


ME=-0.835668
MAE=0.907148
RMSE=1.07451
STDres=0.675454
R(Correlation)=0.82112
R2(Nash_Sutcliffe)=0.172915

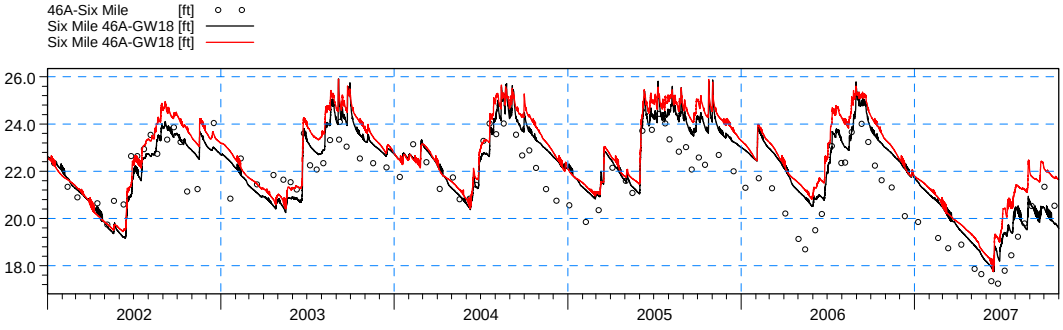
Figure F16. Water level at stations 46A-GW11, 46A-GW12 and 46A-GW13.



ME=-0.633166
MAE=1.04854
RMSE=1.17828
STDres=0.993704
R(Correlation)=0.536455
R2(Nash_Sutcliffe)=-0.100747

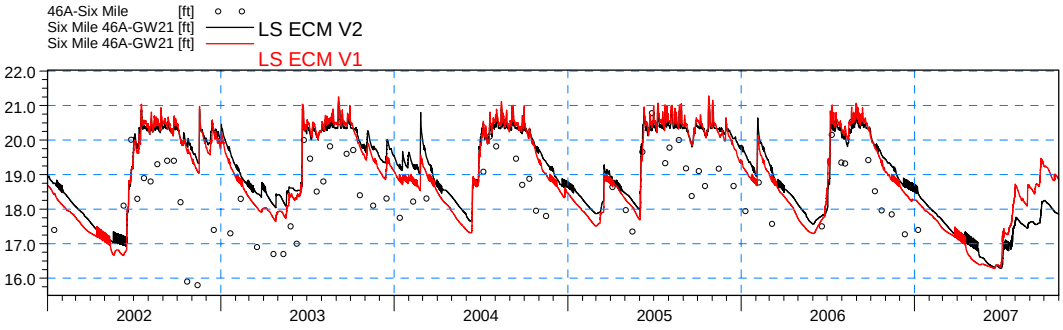


ME=0.0132922
MAE=0.420701
RMSE=0.579842
STDres=0.57969
R(Correlation)=0.910394
R2(Nash_Sutcliffe)=0.817

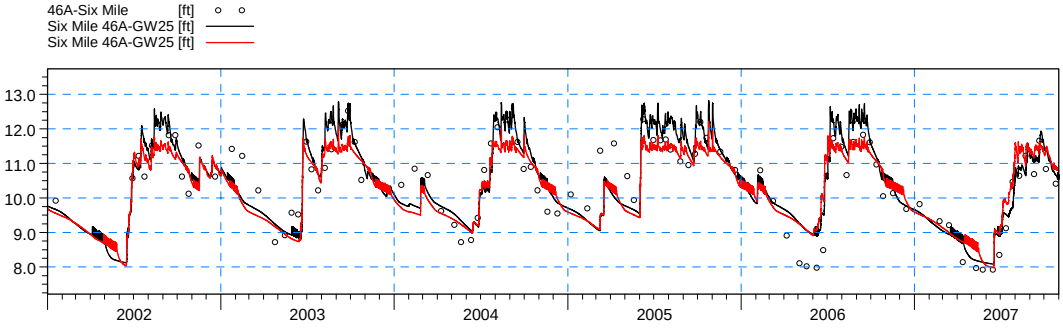


ME=-0.584637
MAE=0.918928
RMSE=1.07369
STDres=0.90056
R(Correlation)=0.857026
R2(Nash_Sutcliffe)=0.58789

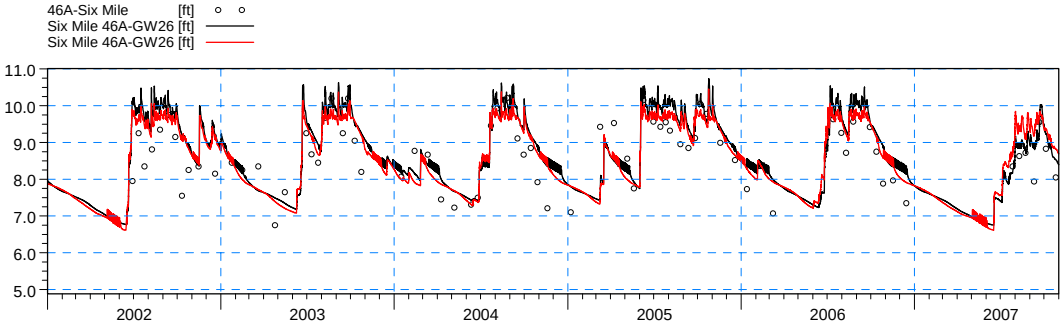
Figure F17. Water level at stations 46A-GW14, 46A-GW15 and 46A-GW18.



ME=-1.10457
MAE=1.17259
RMSE=1.36703
STDres=0.805412
R(Correlation)=0.702932
R2(Nash_Sutcliffe)=-0.457639

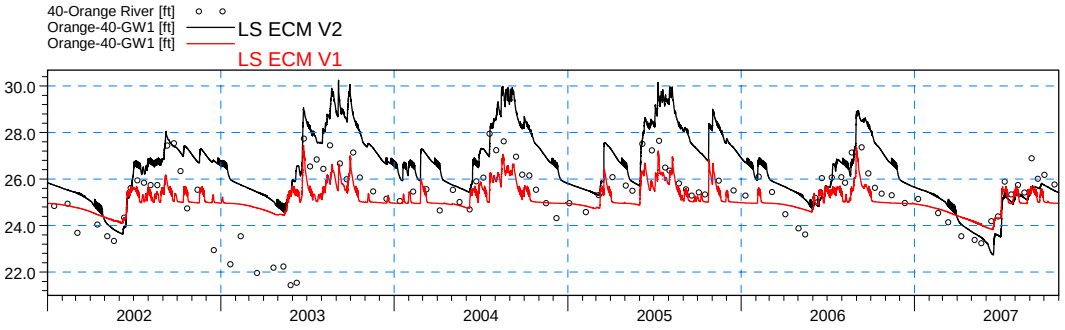


ME=-0.0967145
MAE=0.483999
RMSE=0.601889
STDres=0.594068
R(Correlation)=0.872256
R2(Nash_Sutcliffe)=0.737757

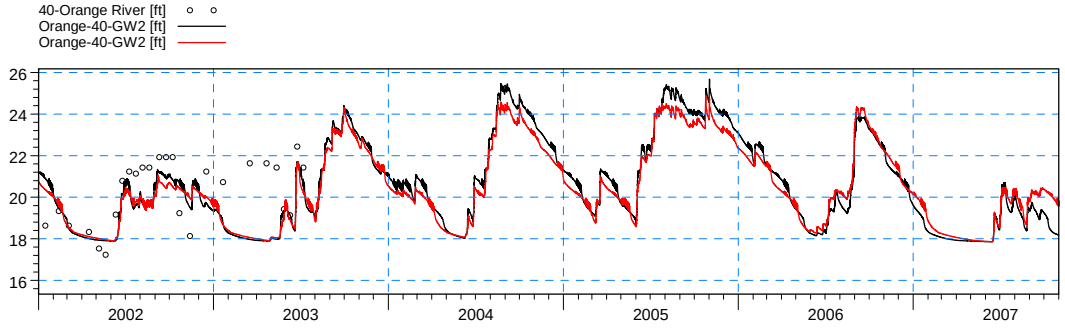


ME=-0.372104
MAE=0.526823
RMSE=0.667543
STDres=0.554213
R(Correlation)=0.786185
R2(Nash_Sutcliffe)=0.384867

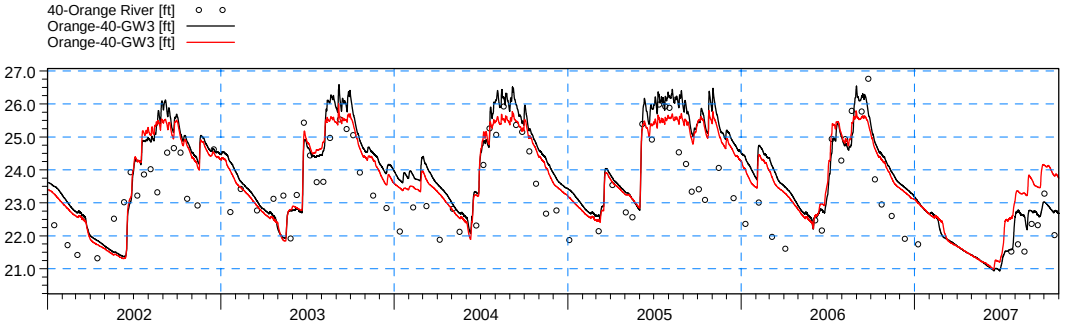
Figure F18. Water level at stations 46A-GW21, 46A-GW25 and 46A-GW26.



ME=-1.16861
MAE=1.34197
RMSE=1.64971
STDres=1.16443
R(Correlation)=0.672008
R2(Nash_Sutcliffe)=-0.429208

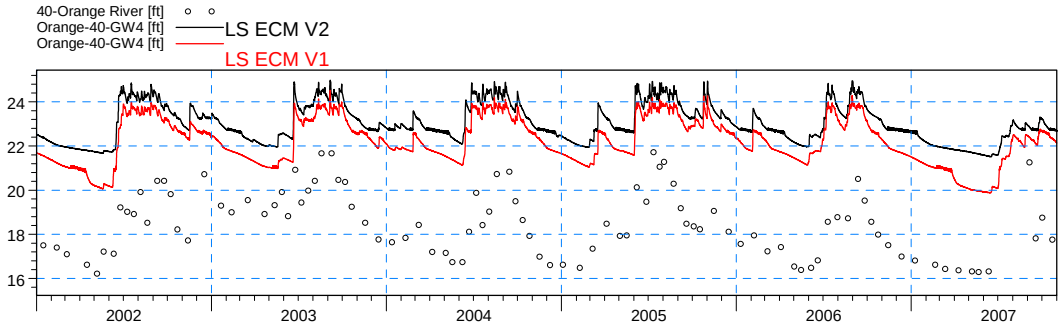


ME=0.800792
MAE=1.28491
RMSE=1.64867
STDres=1.44112
R(Correlation)=0.457632
R2(Nash_Sutcliffe)=-0.163253

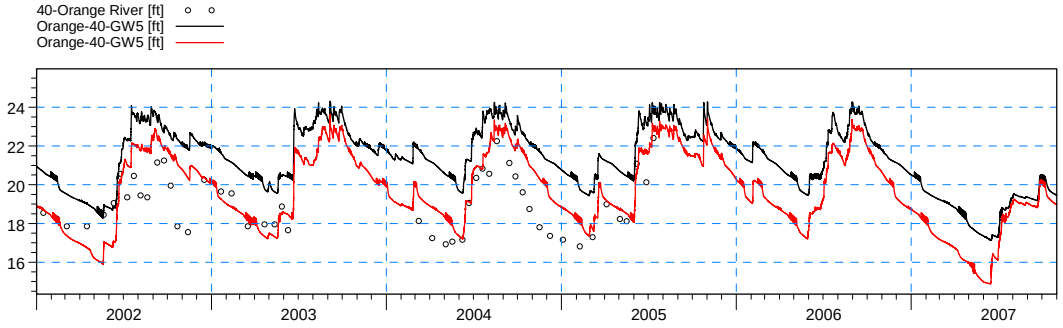


ME=-0.734208
MAE=0.938841
RMSE=1.09181
STDres=0.808072
R(Correlation)=0.805109
R2(Nash_Sutcliffe)=0.312379

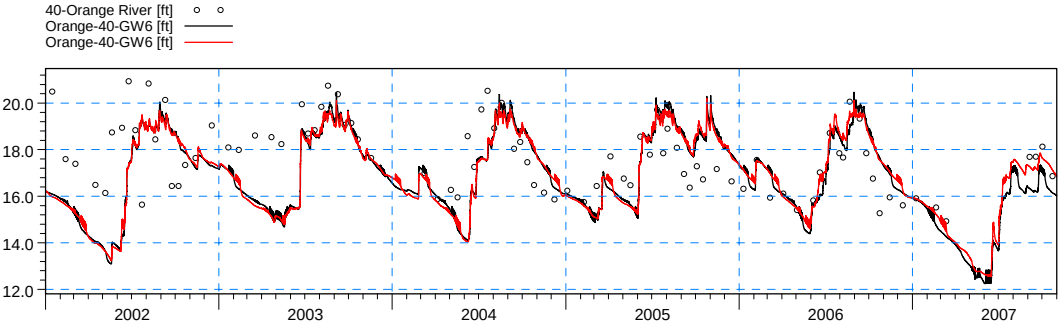
Figure F19. Water level at stations 40-GW1, 40-GW2 and 40-GW3.



ME=-4.64784
MAE=4.64784
RMSE=4.74232
STDres=0.941899
R(Correlation)=0.795238
R2(Nash_Sutcliffe)=-9.35542

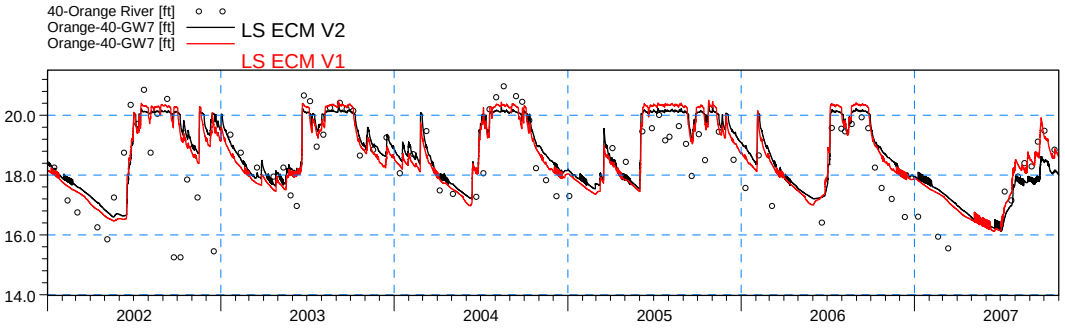


ME=-2.48622
MAE=2.49422
RMSE=2.68792
STDres=1.02157
R(Correlation)=0.75197
R2(Nash_Sutcliffe)=-2.38502

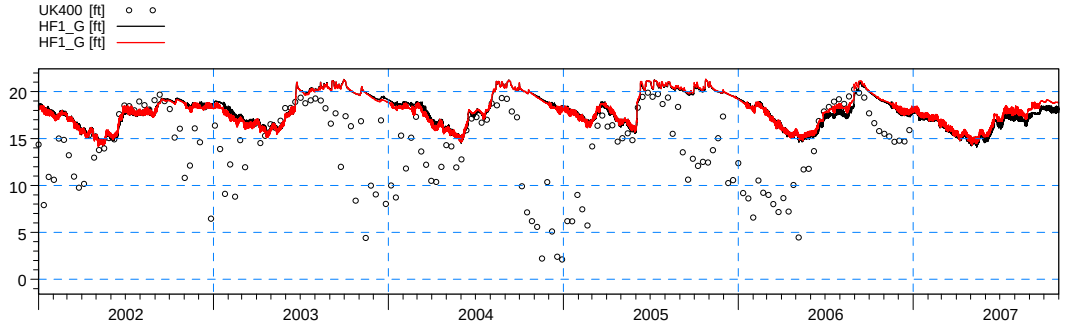


ME=0.416372
MAE=1.27452
RMSE=1.68279
STDres=1.63046
R(Correlation)=0.458984
R2(Nash_Sutcliffe)=-0.278596

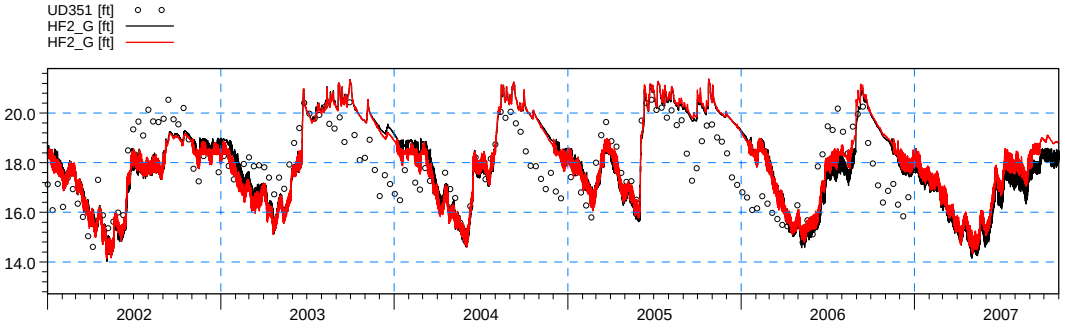
Figure F20. Water level at stations 40-GW4, 40-GW5 and 40-GW6.



ME=-0.453916
MAE=0.855878
RMSE=1.20032
STDres=1.11119
R(Correlation)=0.630409
R2(Nash_Sutcliffe)=0.272248

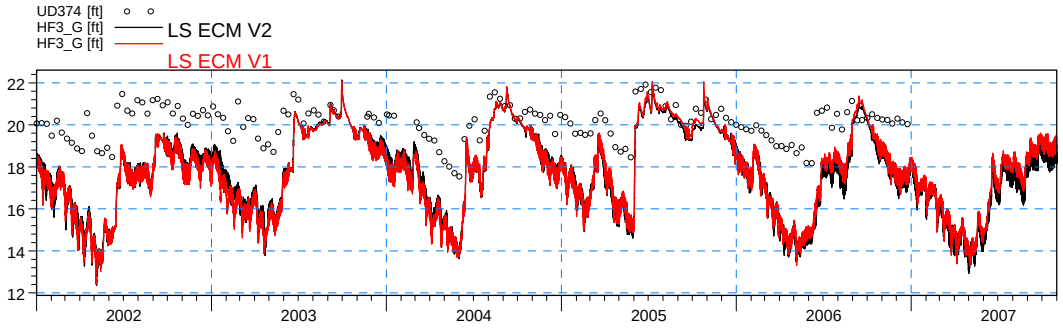


ME=-4.29685
MAE=4.50584
RMSE=6.05635
STDres=4.26807
R(Correlation)=0.217302
R2(Nash_Sutcliffe)=-0.973993

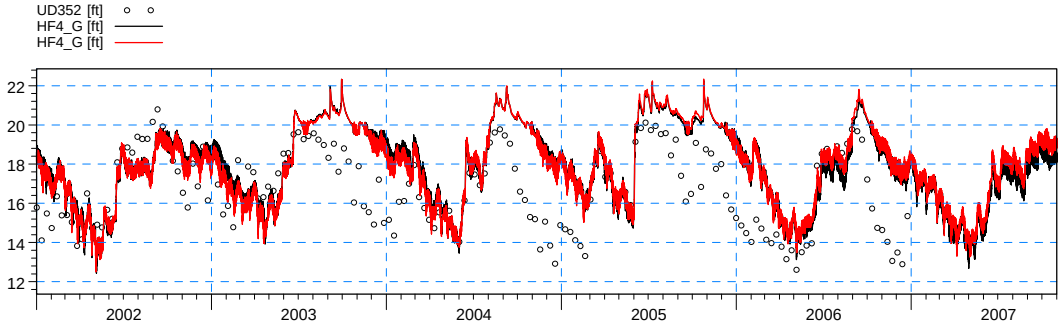


ME=-0.378918
MAE=1.10245
RMSE=1.30104
STDres=1.24464
R(Correlation)=0.686602
R2(Nash_Sutcliffe)=0.243064

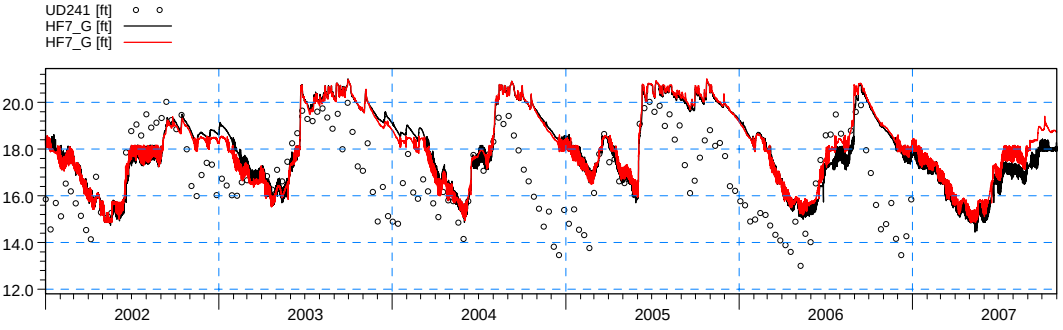
Figure F21. Water level at stations 40-GW7, HF1_G and HF2_G.



ME=2.224
MAE=2.24635
RMSE=2.58703
STDres=1.32157
R(Correlation)=0.807014
R2(Nash_Sutcliffe)=-8.19052

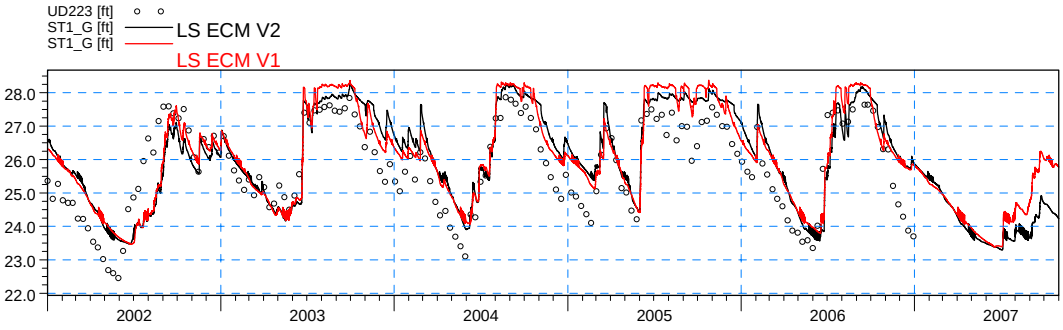


ME=-1.40059
MAE=1.83101
RMSE=2.23815
STDres=1.74575
R(Correlation)=0.604931
R2(Nash_Sutcliffe)=-0.24648

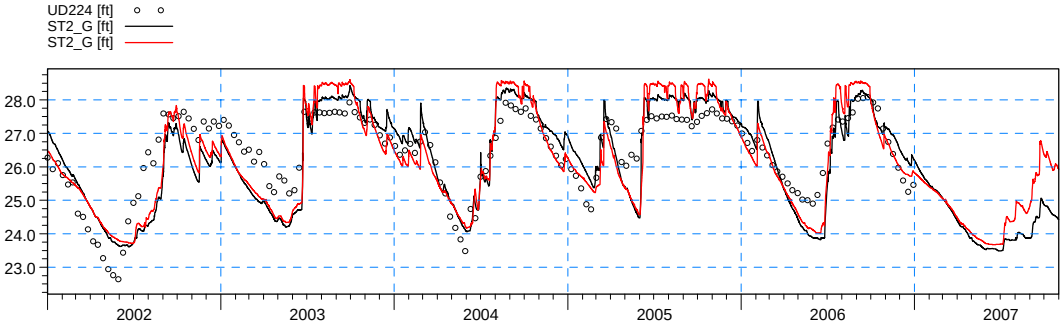


ME=-1.42636
MAE=1.75994
RMSE=2.14145
STDres=1.59728
R(Correlation)=0.556199
R2(Nash_Sutcliffe)=-0.404011

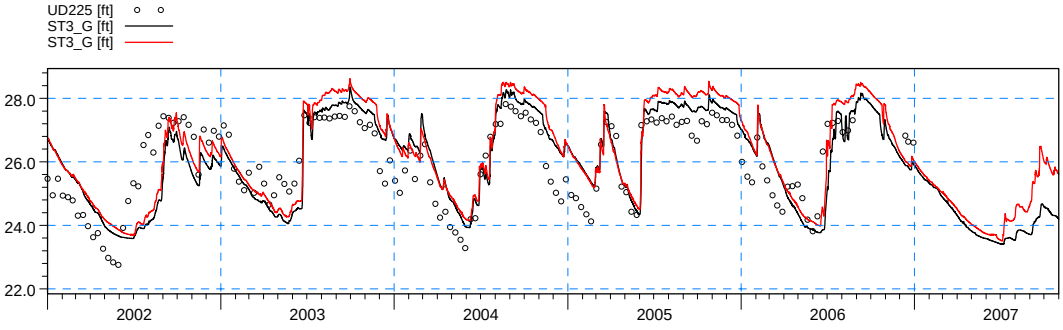
Figure F22. Water level at stations HF3_G, HF4_G and HF7_G.



ME=-0.439627
MAE=0.779628
RMSE=0.912106
STDres=0.799165
R(Correlation)=0.82231
R2(Nash_Sutcliffe)=0.550735

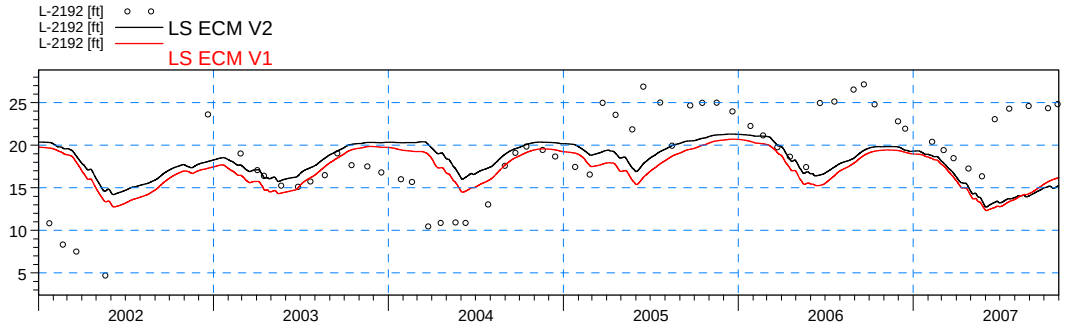


ME=0.0415042
MAE=0.633851
RMSE=0.756923
STDres=0.755784
R(Correlation)=0.838168
R2(Nash_Sutcliffe)=0.611754

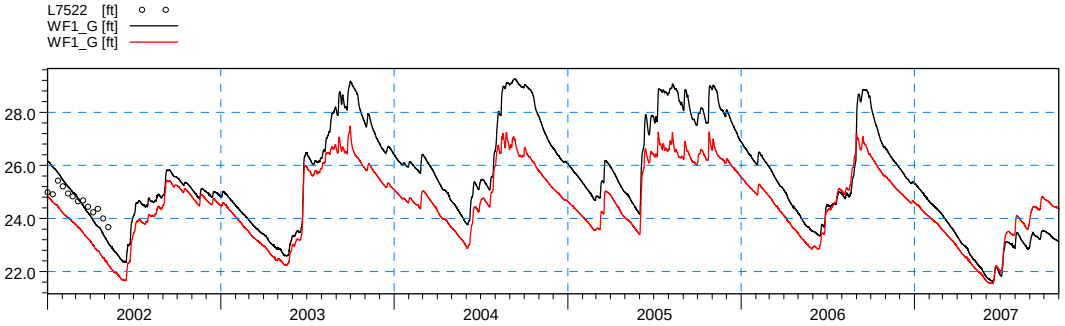


ME=-0.118018
MAE=0.747905
RMSE=0.908431
STDres=0.900733
R(Correlation)=0.762848
R2(Nash_Sutcliffe)=0.496975

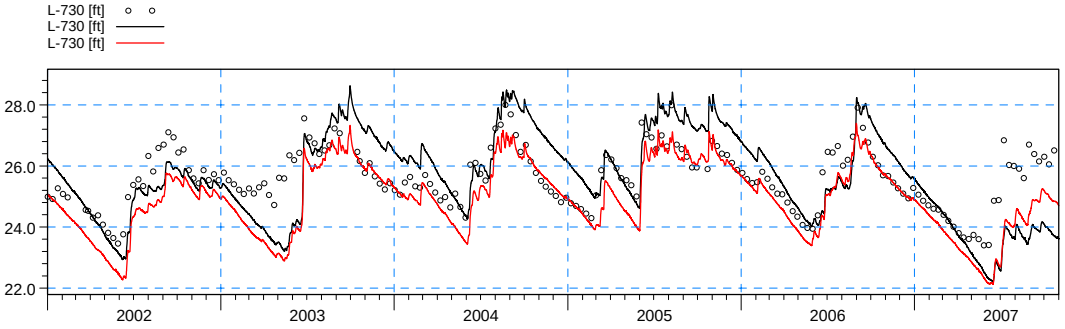
Figure F23. Water level at stations ST1_G, ST2_G and ST3_G.



ME=0.757833
MAE=4.26817
RMSE=5.50089
STDres=5.44844
R(Correlation)=0.0637399
R2(Nash_Sutcliffe)=-0.133474

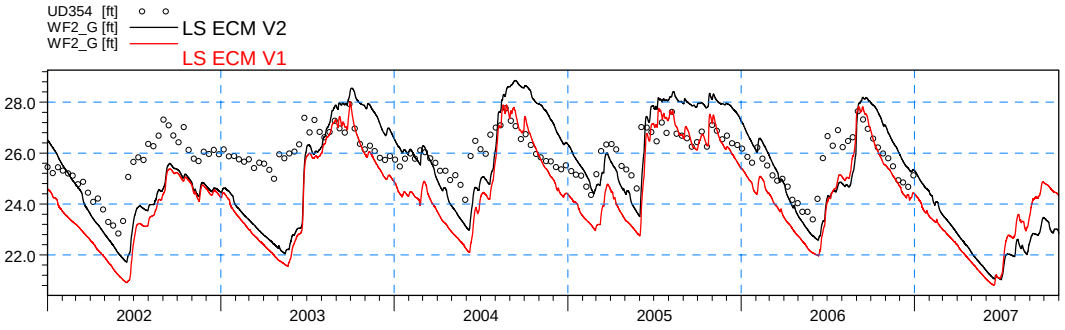


ME=-0.0147408
MAE=0.422168
RMSE=0.508144
STDres=0.507931
R(Correlation)=0.940139
R2(Nash_Sutcliffe)=-0.0267335

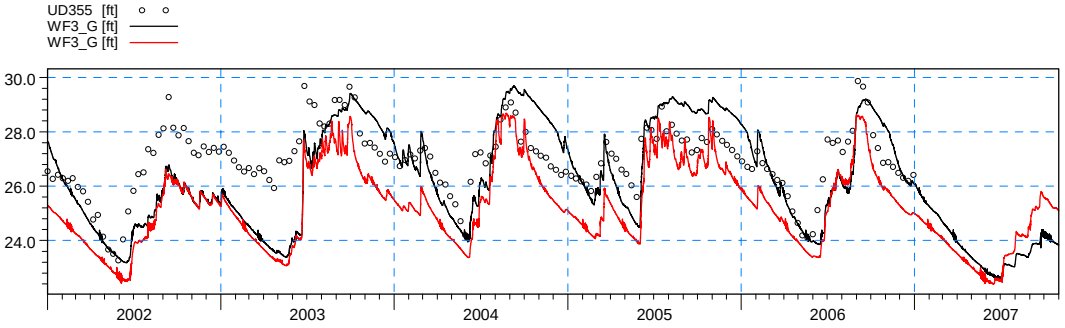


ME=0.0199252
MAE=0.862797
RMSE=1.08906
STDres=1.08888
R(Correlation)=0.645654
R2(Nash_Sutcliffe)=-0.210692

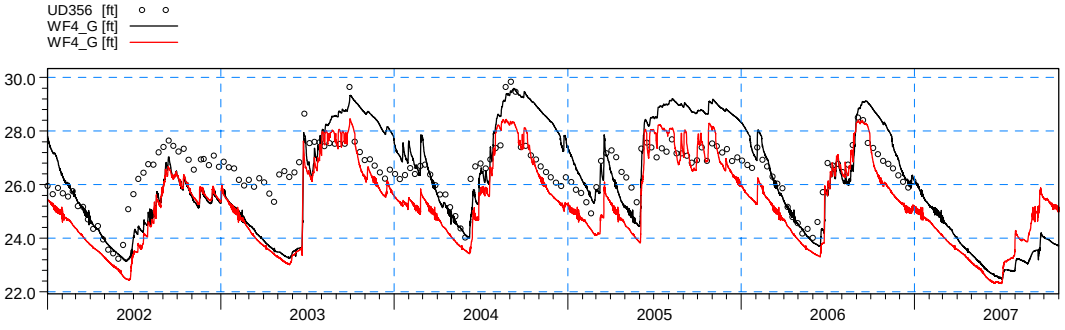
Figure F24. Water level at stations L-2192, WF1_G and L-730.



ME=0.307578
MAE=1.24616
RMSE=1.48709
STDres=1.45494
R(Correlation)=0.623587
R2(Nash_Sutcliffe)=-1.26022

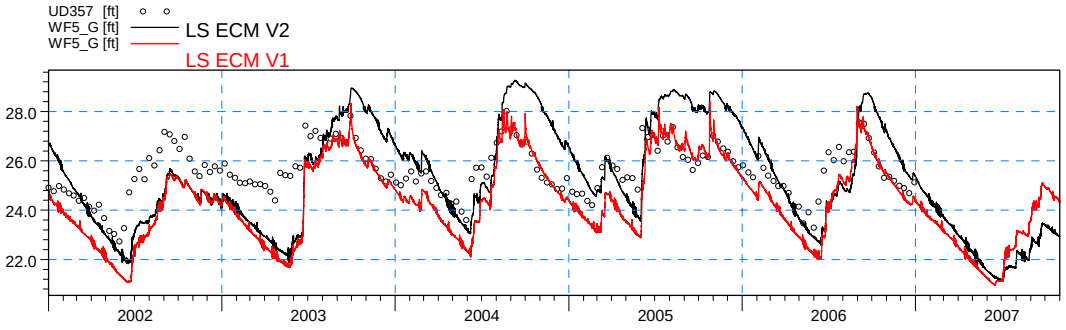


ME=0.417843
MAE=1.08771
RMSE=1.35914
STDres=1.29332
R(Correlation)=0.697686
R2(Nash_Sutcliffe)=-0.173521

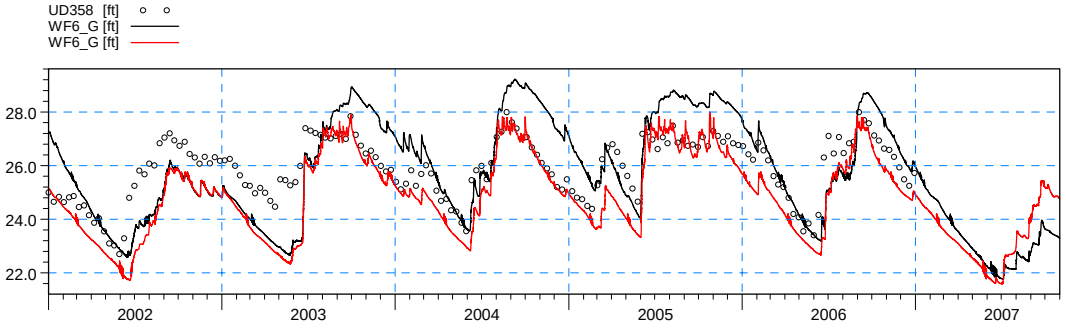


ME=-0.0678897
MAE=1.06785
RMSE=1.29757
STDres=1.29579
R(Correlation)=0.706617
R2(Nash_Sutcliffe)=-0.33779

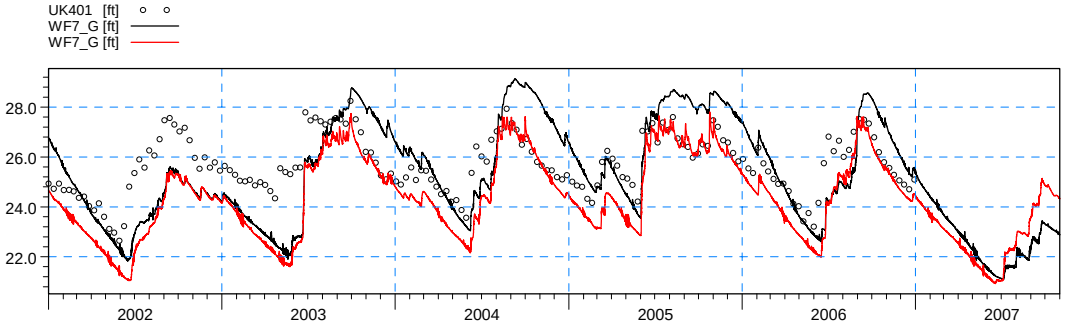
Figure F25. Water level at stations WF2_G, WF3_G and WF4_G.



ME=-0.101636
MAE=1.29838
RMSE=1.52371
STDres=1.52032
R(Correlation)=0.640811
R2(Nash_Sutcliffe)=-1.14789

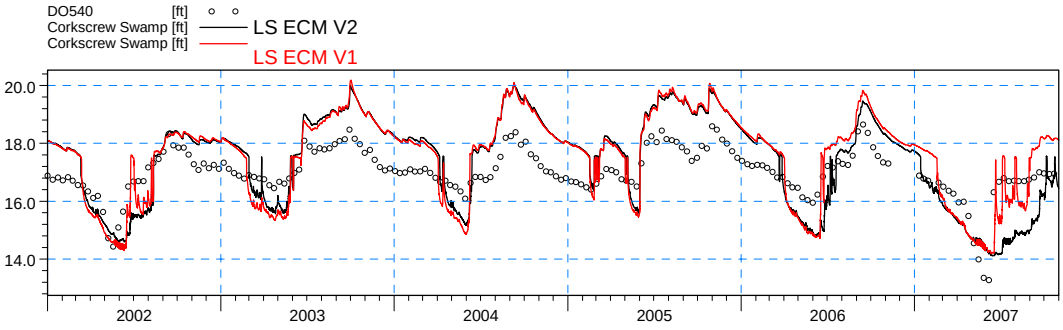


ME=-0.188608
MAE=1.1085
RMSE=1.29443
STDres=1.28062
R(Correlation)=0.705489
R2(Nash_Sutcliffe)=-0.277809

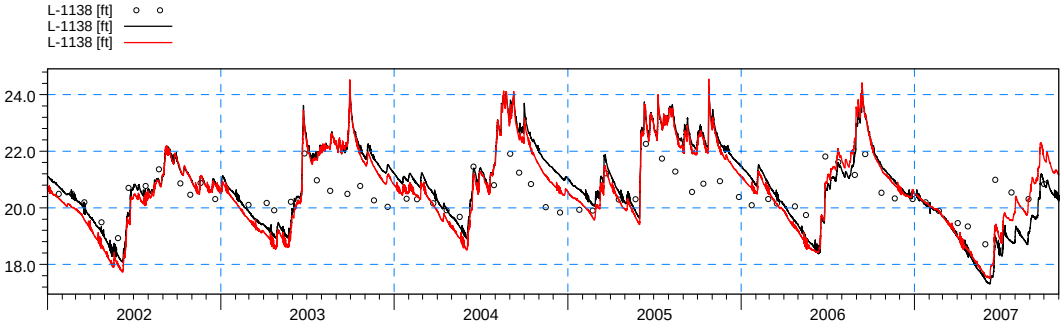


ME=0.0712018
MAE=1.2495
RMSE=1.47858
STDres=1.47687
R(Correlation)=0.637882
R2(Nash_Sutcliffe)=-0.583145

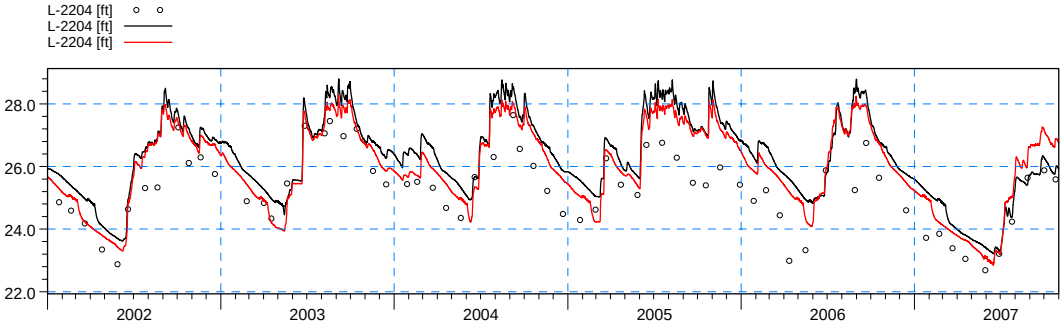
Figure F26. Water level at stations WF5_G, WF6_G and WF7_G.



ME=-0.388986
MAE=0.989496
RMSE=1.08493
STDres=1.0128
R(Correlation)=0.809904
R2(Nash_Sutcliffe)=-0.725558

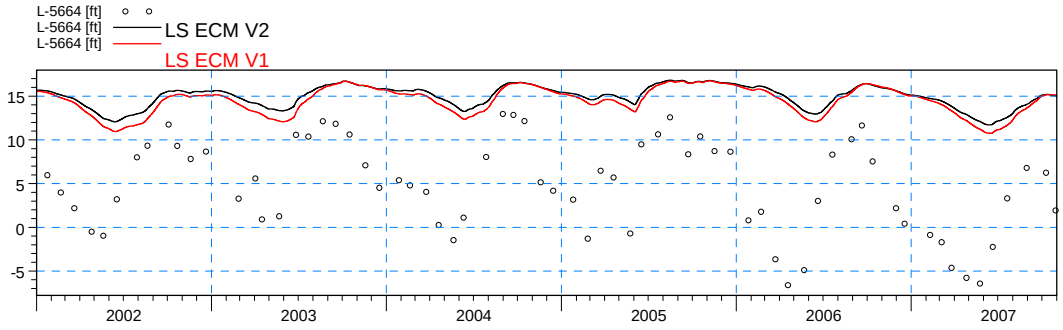


ME=-0.318008
MAE=0.807974
RMSE=0.973164
STDres=0.919739
R(Correlation)=0.758298
R2(Nash_Sutcliffe)=-0.925606

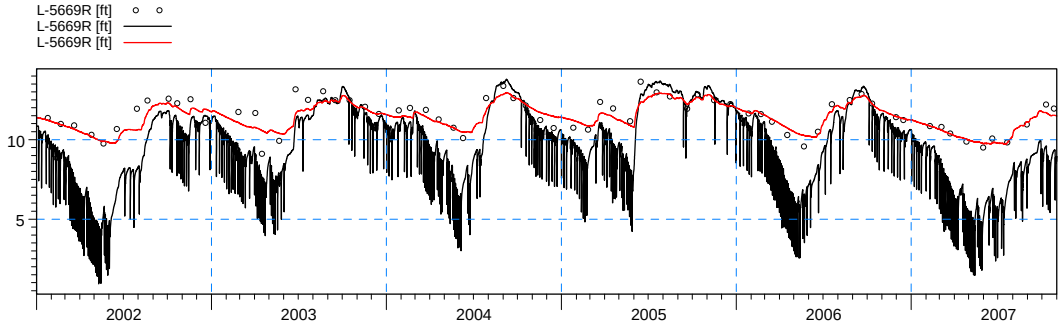


ME=-0.982822
MAE=1.00955
RMSE=1.15462
STDres=0.605971
R(Correlation)=0.887034
R2(Nash_Sutcliffe)=0.0637709

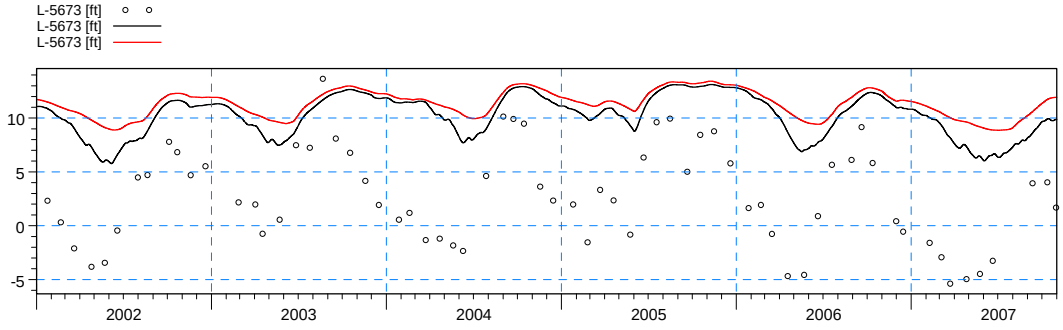
Figure F27. Water level at stations Corkscrew Swamp, L-1138 and L-2204.



ME=-10.2311
MAE=10.2311
RMSE=11.1984
STDres=4.55273
R(Correlation)=0.610895
R2(Nash_Sutcliffe)=-3.60109

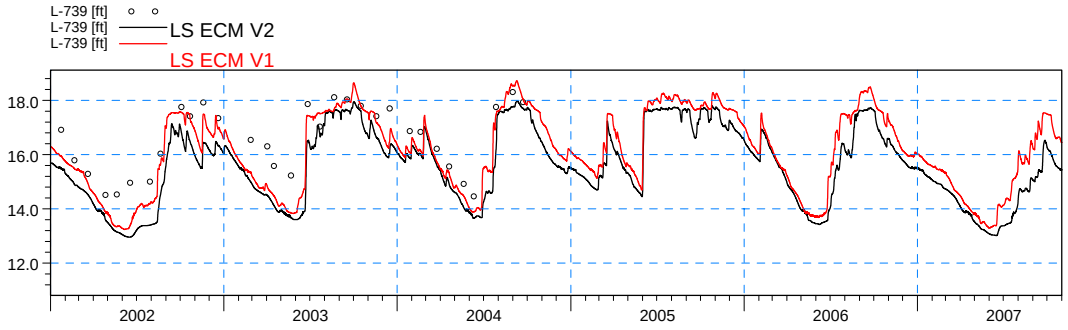


ME=1.72524
MAE=1.82986
RMSE=2.32578
STDres=1.55974
R(Correlation)=0.869257
R2(Nash_Sutcliffe)=-3.90674

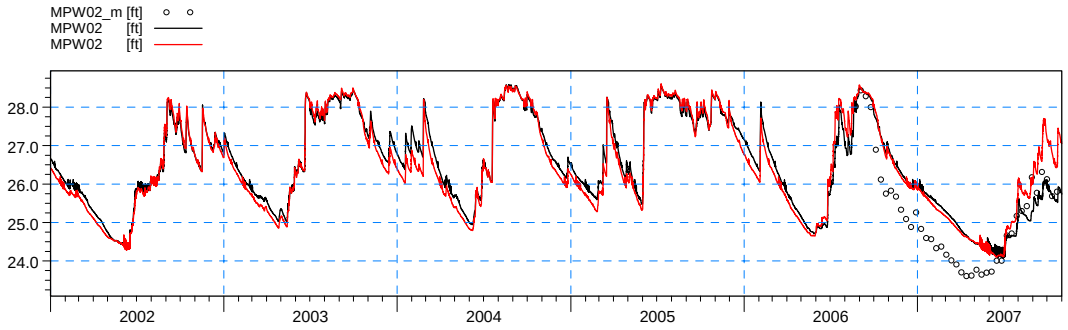


ME=-7.60688
MAE=7.66441
RMSE=8.3439
STDres=3.42869
R(Correlation)=0.69694
R2(Nash_Sutcliffe)=-2.48487

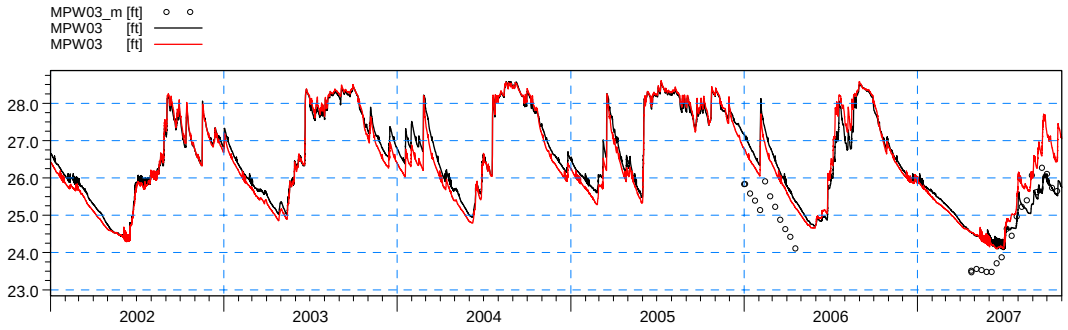
Figure F28. Water level at stations L-5664., L-5669R and L-5673.



ME=1.04864
MAE=1.04864
RMSE=1.15593
STDres=0.486325
R(Correlation)=0.947397
R2(Nash_Sutcliffe)=0.109867

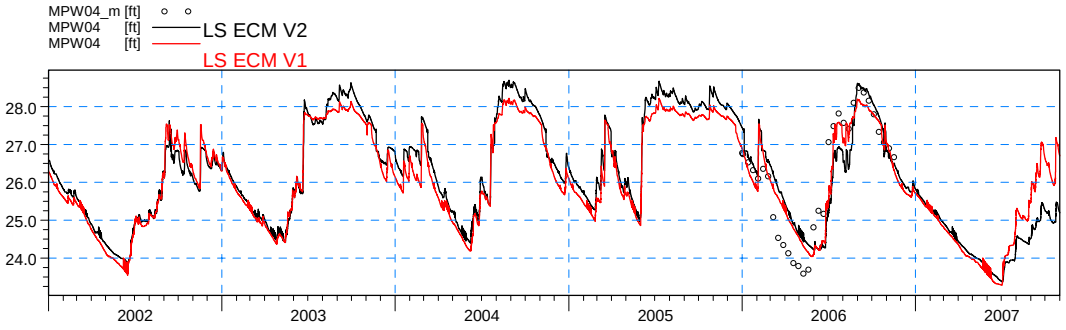


ME=-0.474392
MAE=0.690324
RMSE=0.817473
STDres=0.665743
R(Correlation)=0.865793
R2(Nash_Sutcliffe)=0.622451

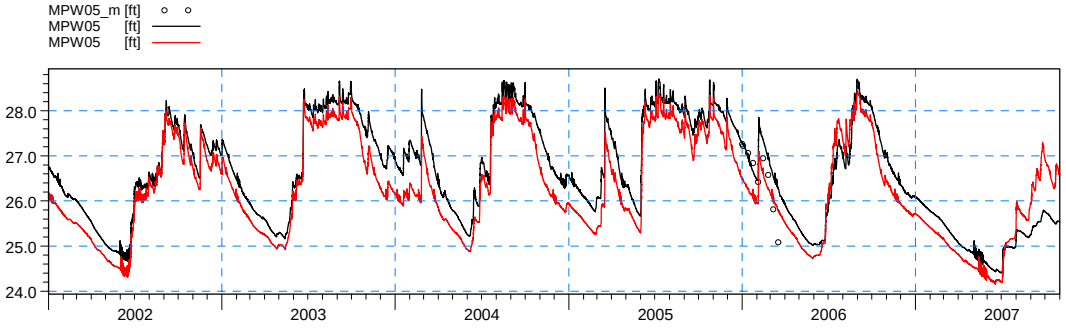


ME=-0.563431
MAE=0.774108
RMSE=0.917913
STDres=0.724644
R(Correlation)=0.708055
R2(Nash_Sutcliffe)=0.0713091

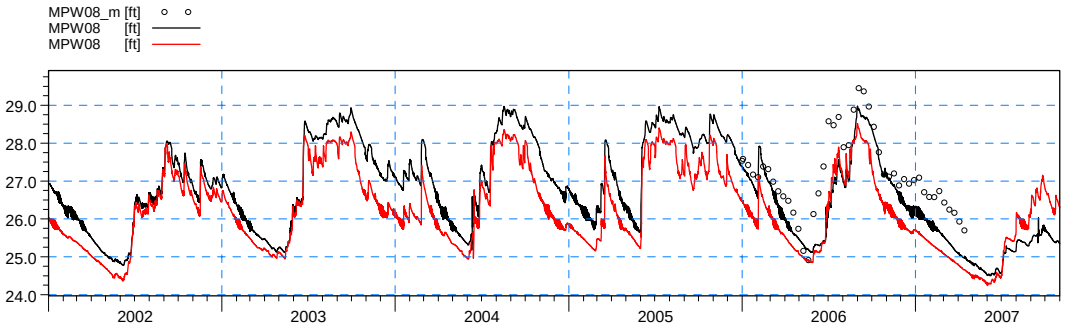
Figure F29. Water level at stations L-739, MPW02 and MPW03.



ME=-0.085591
MAE=0.68176
RMSE=0.83146
STDres=0.827043
R(Correlation)=0.845089
R2(Nash_Sutcliffe)=0.711009

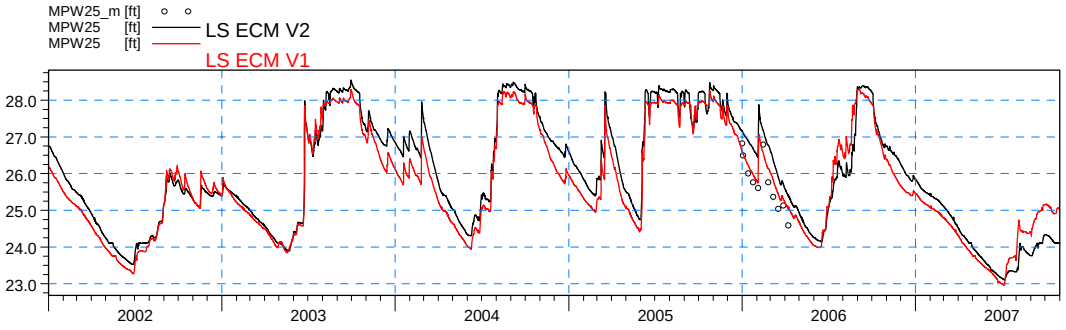


ME=-0.382236
MAE=0.434151
RMSE=0.586628
STDres=0.445004
R(Correlation)=0.832089
R2(Nash_Sutcliffe)=0.350118

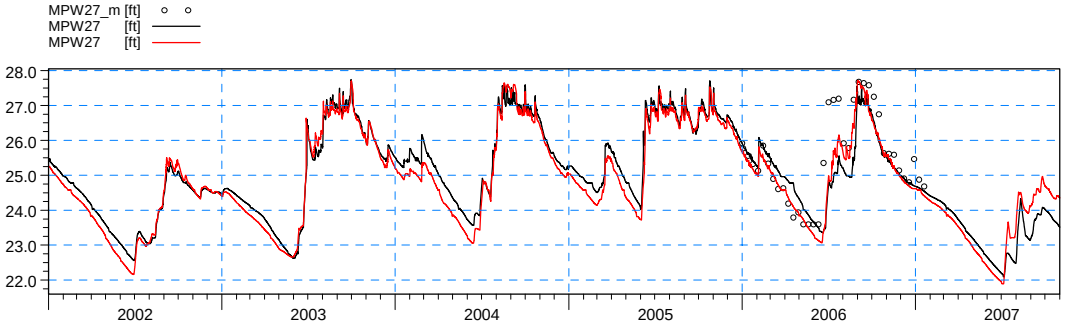


ME=0.655246
MAE=0.6819
RMSE=0.852676
STDres=0.545626
R(Correlation)=0.866049
R2(Nash_Sutcliffe)=0.358498

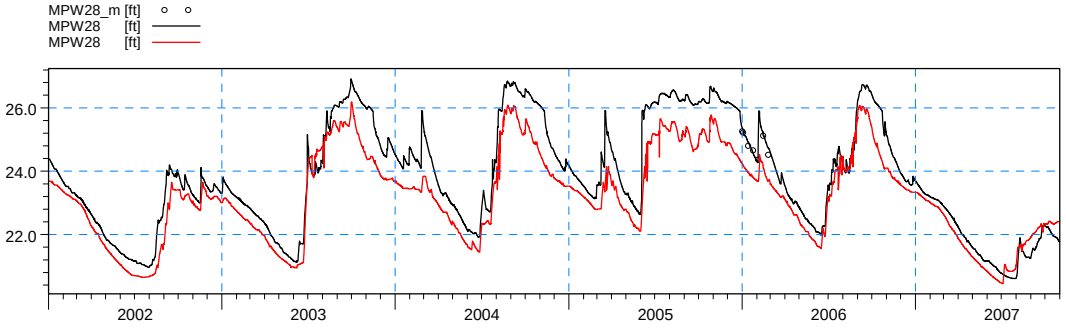
Figure F30. Water level at stations MPW04, MPW05 and MPW08.



ME=-0.818232
MAE=0.822706
RMSE=0.858243
STDres=0.258993
R(Correlation)=0.939809
R2(Nash_Sutcliffe)=-0.306249

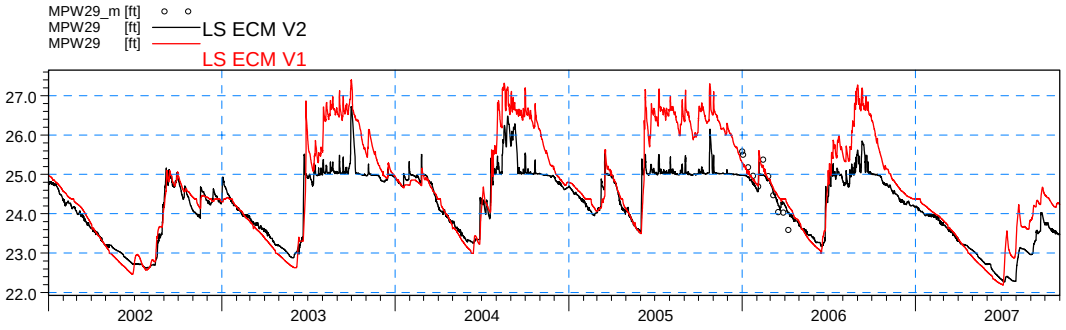


ME=0.401152
MAE=0.650942
RMSE=0.959506
STDres=0.871624
R(Correlation)=0.721175
R2(Nash_Sutcliffe)=0.418404

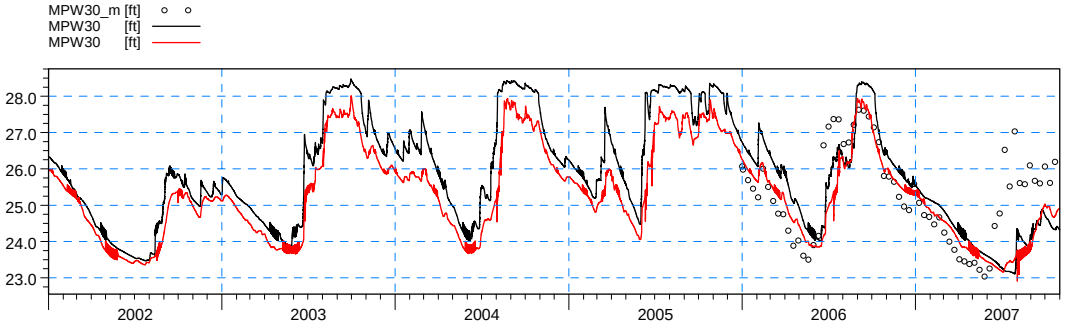


ME=-0.0327467
MAE=0.142218
RMSE=0.169961
STDres=0.166777
R(Correlation)=0.932394
R2(Nash_Sutcliffe)=0.856129

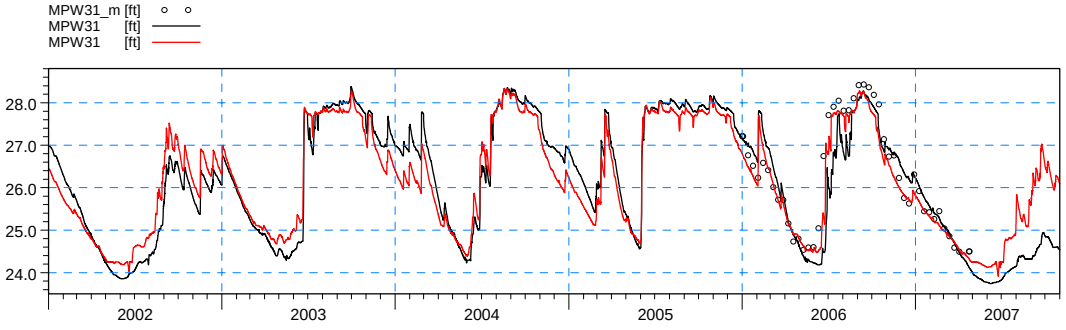
Figure F31. Water level at stations MPW25, MPW27 and MPW28.



ME=0.0656189
MAE=0.326192
RMSE=0.418012
STDres=0.41283
R(Correlation)=0.954564
R2(Nash_Sutcliffe)=0.684484

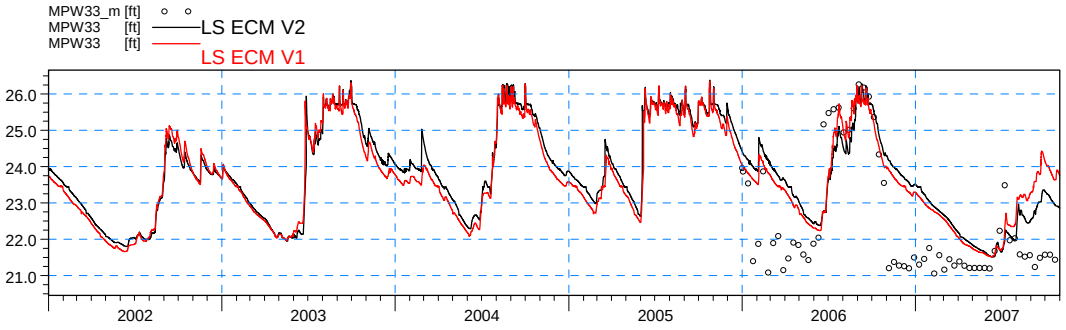


ME=0.0751656
MAE=0.997357
RMSE=1.21889
STDres=1.21657
R(Correlation)=0.568616
R2(Nash_Sutcliffe)=0.132616

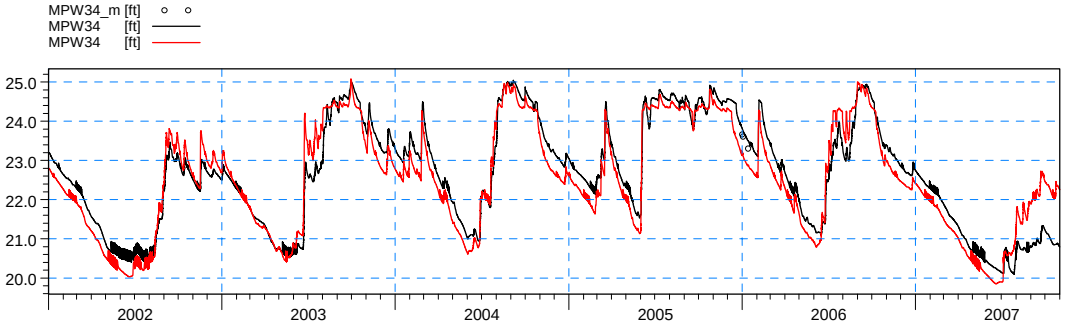


ME=0.174281
MAE=0.452815
RMSE=0.677352
STDres=0.654547
R(Correlation)=0.863579
R2(Nash_Sutcliffe)=0.722141

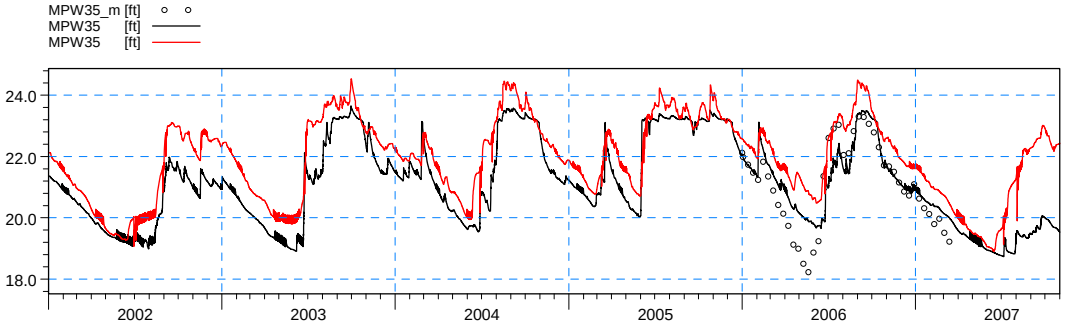
Figure F32. Water level at stations MPW29, MPW30 and MPW31.



ME=-0.927827
MAE=1.26371
RMSE=1.50598
STDres=1.18622
R(Correlation)=0.689761
R2(Nash_Sutcliffe)=0.155017

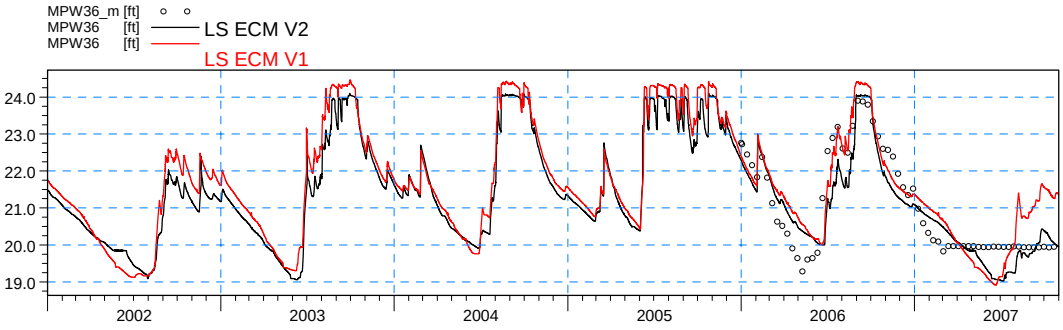


ME=-0.157151
MAE=0.157151
RMSE=0.160488
STDres=0.0325545
R(Correlation)=0.982522
R2(Nash_Sutcliffe)=-0.21218

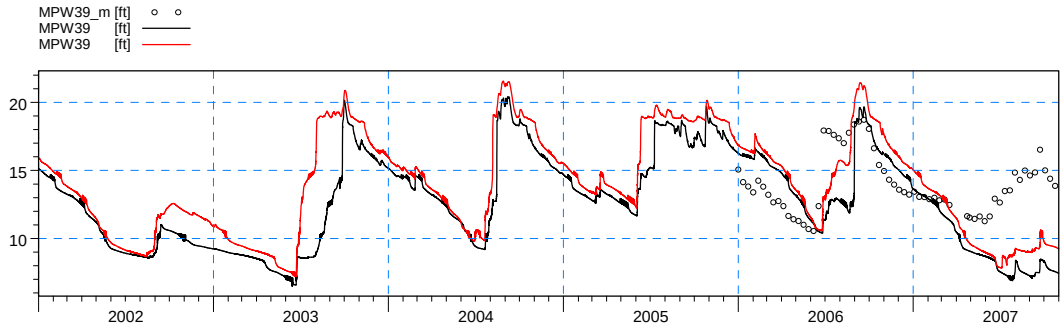


ME=-0.217088
MAE=0.57899
RMSE=0.761336
STDres=0.72973
R(Correlation)=0.877901
R2(Nash_Sutcliffe)=0.720095

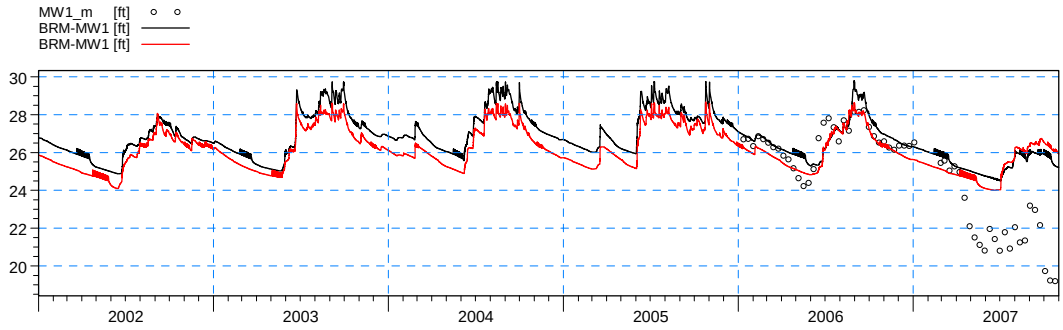
Figure F33. Water level at stations MPW33, MPW34 and MPW35.



ME=0.160134
MAE=0.531803
RMSE=0.660696
STDres=0.640996
R(Correlation)=0.879355
R2(Nash_Sutcliffe)=0.758759

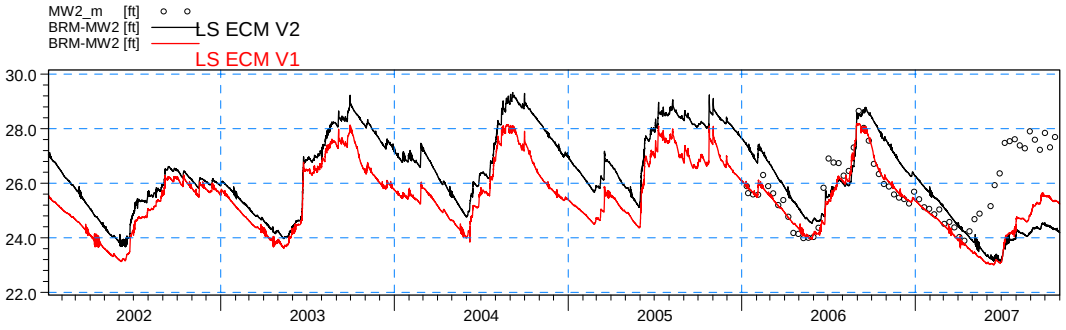


ME=1.60872
MAE=2.9622
RMSE=3.80712
STDres=3.45054
R(Correlation)=0.308197
R2(Nash_Sutcliffe)=-2.15991

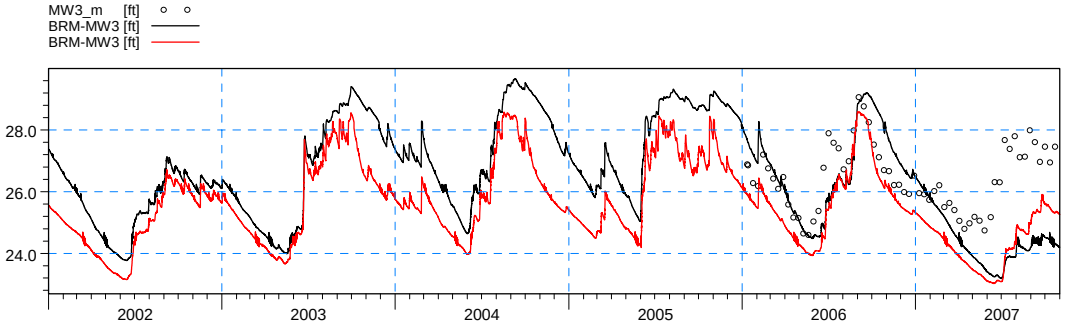


ME=-0.84697
MAE=0.980215
RMSE=1.64717
STDres=1.41273
R(Correlation)=0.699422
R2(Nash_Sutcliffe)=0.241058

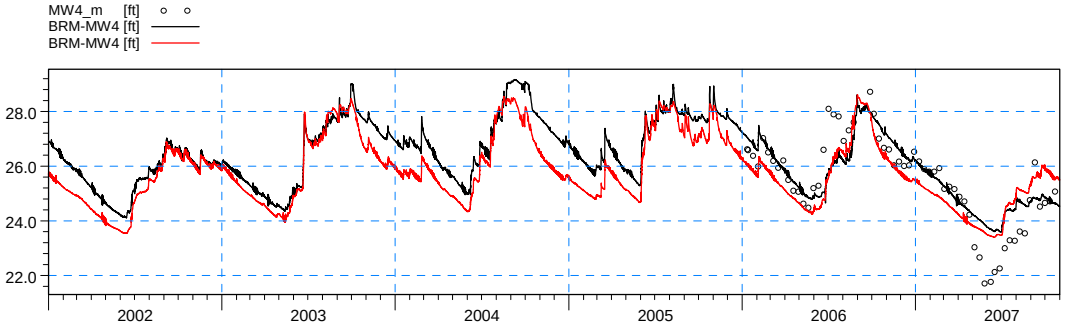
Figure F34. Water level at stations MPW36, MPW39 and MW1.



ME=0.354983
MAE=1.40266
RMSE=1.7749
STDres=1.73904
R(Correlation)=0.178412
R2(Nash_Sutcliffe)=-0.899738

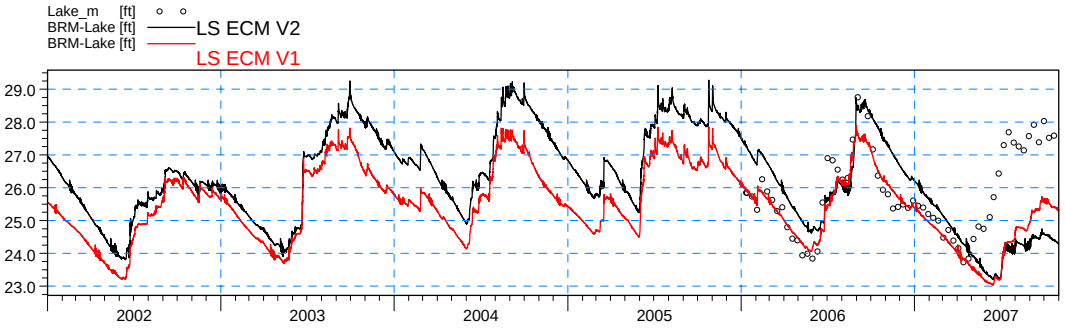


ME=0.77829
MAE=1.23914
RMSE=1.68884
STDres=1.49881
R(Correlation)=0.417489
R2(Nash_Sutcliffe)=-1.39268

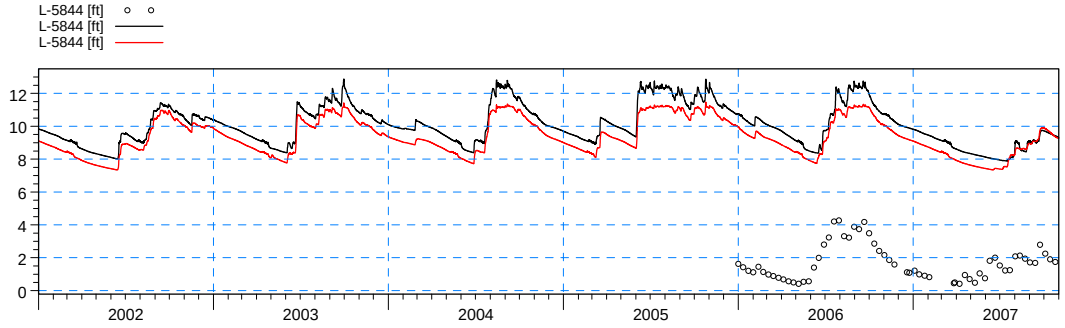


ME=-0.124469
MAE=0.5848
RMSE=0.811354
STDres=0.80175
R(Correlation)=0.865538
R2(Nash_Sutcliffe)=0.712295

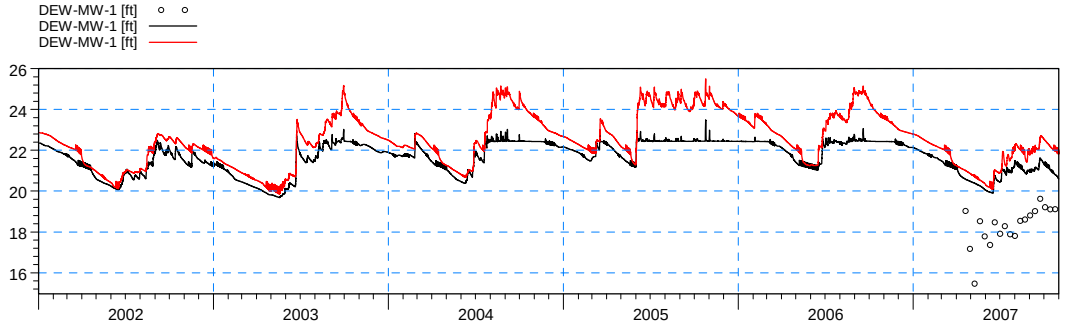
Figure F35. Water level at stations MW2, MW3 and MW4.



ME=0.313462
MAE=1.30658
RMSE=1.67343
STDres=1.64381
R(Correlation)=0.241735
R2(Nash_Sutcliffe)=-0.584749

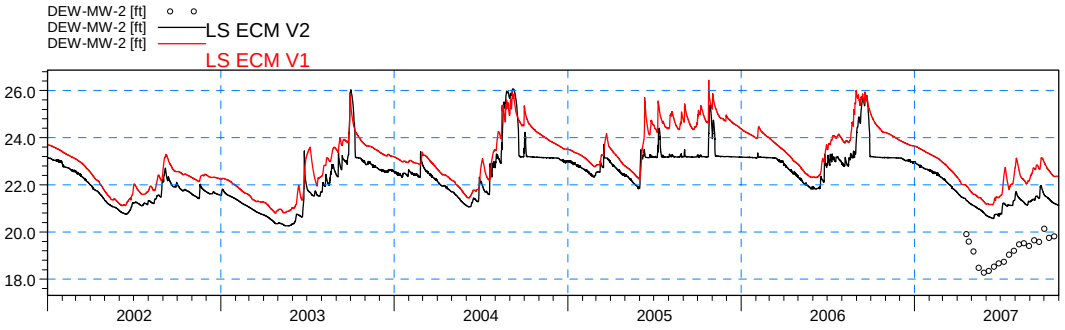


ME=-7.95745
MAE=7.95745
RMSE=8.01093
STDres=0.924117
R(Correlation)=0.698025
R2(Nash_Sutcliffe)=-54.2434

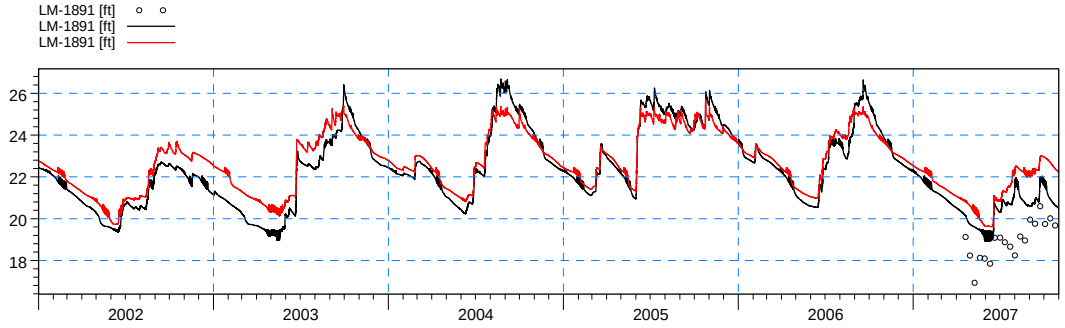


ME=-2.44421
MAE=2.44421
RMSE=2.54955
STDres=0.725271
R(Correlation)=0.543725
R2(Nash_Sutcliffe)=-7.7192

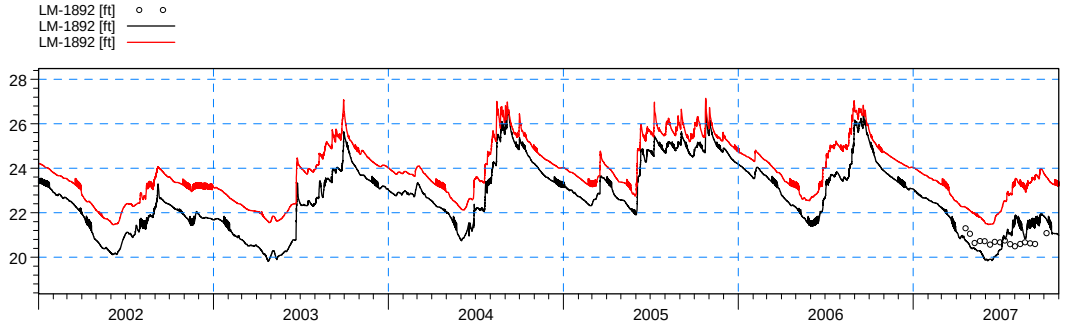
Figure F36. Water level at stations Lake, L-5844 and DEW-MW-1.



ME=-1.95976
MAE=1.95976
RMSE=1.99132
STDres=0.353081
R(Correlation)=0.88987
R2(Nash_Sutcliffe)=-10.1697

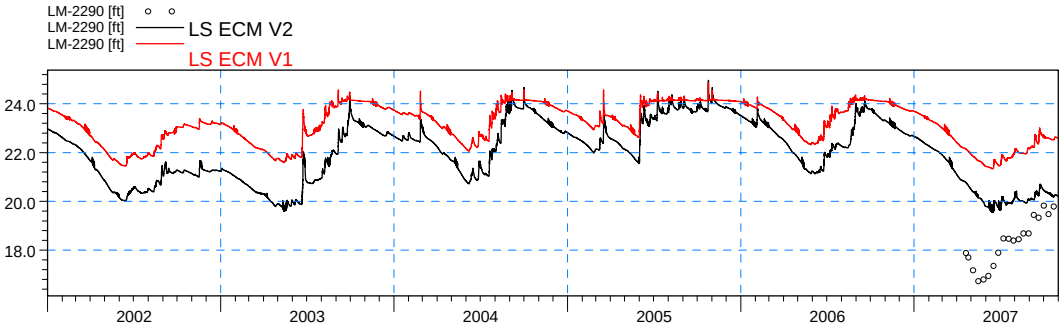


ME=-1.52895
MAE=1.52895
RMSE=1.65229
STDres=0.626419
R(Correlation)=0.691132
R2(Nash_Sutcliffe)=-3.18463

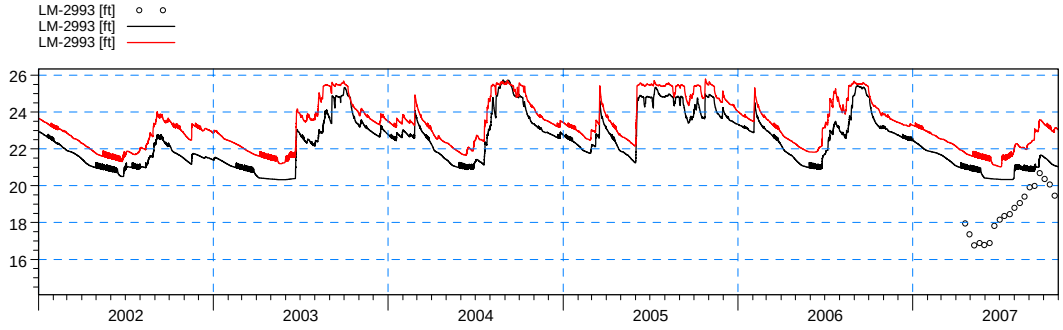


ME=-0.0692077
MAE=0.629409
RMSE=0.688247
STDres=0.684758
R(Correlation)=-0.218026
R2(Nash_Sutcliffe)=-13.0404

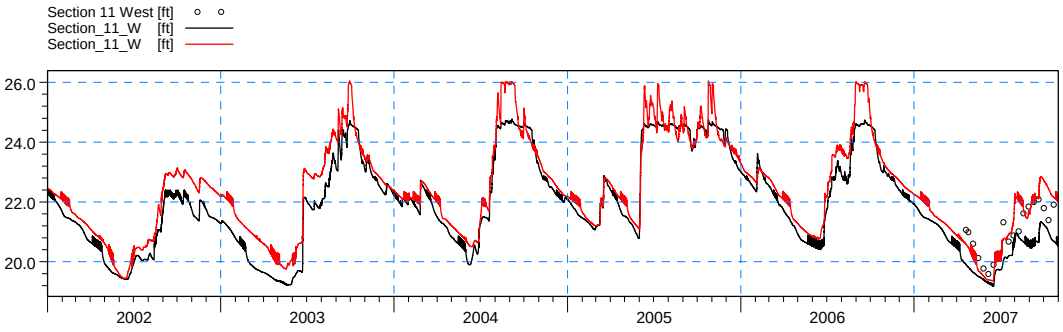
Figure F37. Water level at stations DEW-MW-2, LM-1891 and LM-1892.



ME=-1.7844
MAE=1.7844
RMSE=2.04109
STDres=0.990942
R(Correlation)=0.370224
R2(Nash_Sutcliffe)=-2.72798

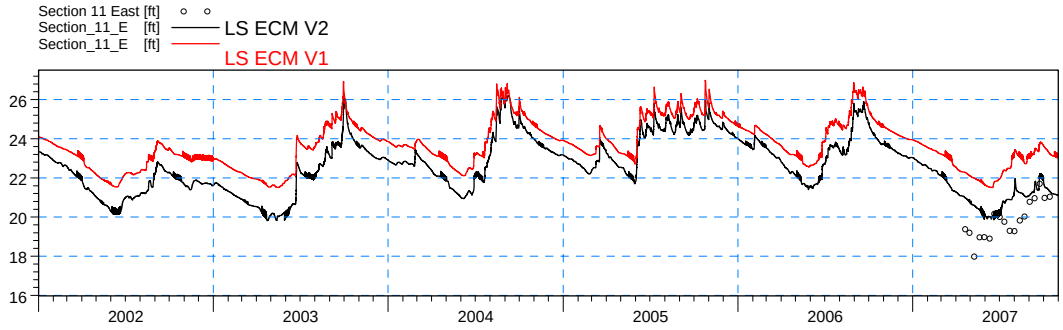


ME=-2.22414
MAE=2.22414
RMSE=2.47778
STDres=1.09205
R(Correlation)=0.627732
R2(Nash_Sutcliffe)=-2.69222

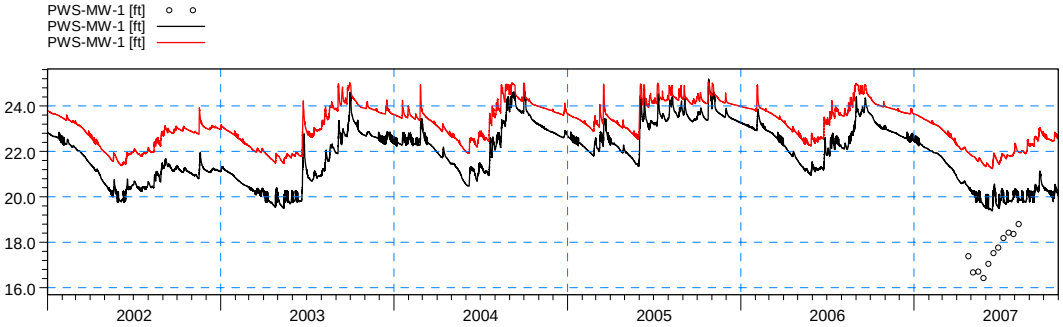


ME=0.789927
MAE=0.789931
RMSE=0.895454
STDres=0.421725
R(Correlation)=0.857483
R2(Nash_Sutcliffe)=-0.224348

Figure F38. Water level at stations LM-2290, LM-2993 and Section_11_W.



ME=-1.06859
MAE=1.07931
RMSE=1.23839
STDres=0.625884
R(Correlation)=0.685332
R2(Nash_Sutcliffe)=-1.07662



ME=-2.37652
MAE=2.37652
RMSE=2.53353
STDres=0.878016
R(Correlation)=0.18815
R2(Nash_Sutcliffe)=-7.1626

Figure F39. Water level at stations Section_11_E, and PWS-MW-1.

Surface water stations

Table F3. Statistic parameters at surface water stations.

	LS ECM V1					LS ECM V2				
Name	ME (ft)	MAE (ft)	RMSE (ft)	R	PL	ME (ft)	MAE (ft)	RMSE (ft)	R	PL
KehlCan_HW	1.05	1.66	2.07	0.68	2.5	1.57	1.78	2.21	0.75	2.5
KehlCan_TW	0.08	0.64	0.98	0.93	1.0	-0.34	0.81	0.95	0.96	1.3
S-SF-1_HW	0.23	0.28	0.32	0.82	1.0	0.24	0.26	0.29	0.87	1.0
S-SF-1 Q	---	---	---	0.70	1.0	---	---	---	0.74	2.0
S-SF-1_TW	-0.02	0.30	0.48	0.44	1.5	-0.01	0.30	0.45	0.44	1.5
S-NM-2_HW	0.00	0.19	0.24	0.60	1.3	-0.01	0.19	0.25	0.57	1.5
S-NM-2 Q	---	---	---	0.41	3.0	---	---	---	0.46	3.0
S-NM-2_TW	0.80	1.04	1.16	0.43	2.3	0.84	1.07	1.20	0.43	2.3
S-YT-2_HW	1.63	1.74	1.96	0.76	2.3	1.42	1.51	1.70	0.71	2.0
Mullock Creek	0.78	0.83	0.86	0.65	1.5	0.81	0.84	0.88	0.66	1.8
EsteroRiv	2.04	2.05	2.17	0.76	2.5	-0.34	0.83	1.18	0.78	1.8
EsteroRiv Q	---	---	---	0.67	2.0	---	---	---	0.80	2.0
EsteroRivS	0.08	0.79	1.03	0.81	1.3	-0.89	0.96	1.48	0.77	2.0
EsteroRivS Q	---	---	---	0.77	1.0	---	---	---	0.75	2.0
SpringCRSS	0.17	0.30	0.43	0.59	1.3	0.16	0.31	0.44	0.58	1.5
SpringCRSS Q	---	---	---	0.69	2.0	---	---	---	0.74	2.0
Imperial	-0.06	0.74	1.16	0.88	1.3	-0.38	1.18	1.35	0.92	1.5
Imperial Q	---	---	---	0.79	1.0	---	---	---	0.83	1.0
Halfway_S HW	-1.24	1.24	1.36	0.78	1.8	0.78	0.89	1.01	0.48	2.0
Halfway_S TW	0.27	0.27	0.28	0.56	1.3	0.96	0.96	1.28	0.00	2.3
Copperleaf	-0.88	0.88	0.98	0.84	1.5	1.69	1.70	1.84	0.66	2.5
HalfwayCrDS HW	-0.96	0.96	1.05	0.91	1.8	1.71	1.72	1.84	0.79	2.5
HalfwayCrDS TW	0.13	0.27	0.31	0.81	1.0	1.75	1.77	1.97	0.00	2.8

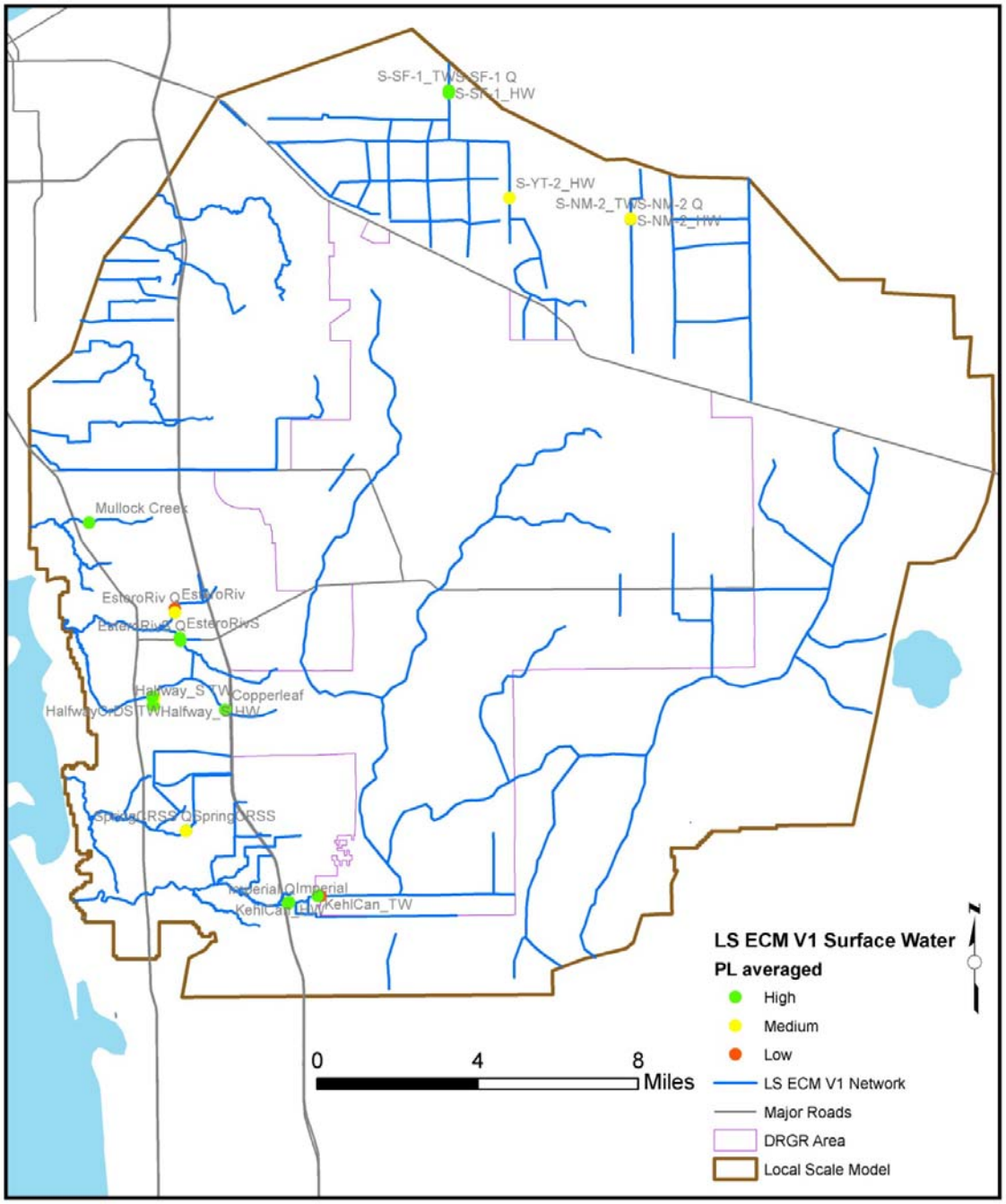


Figure F40. Average performance levels in surface water stations from previous (V1) model.

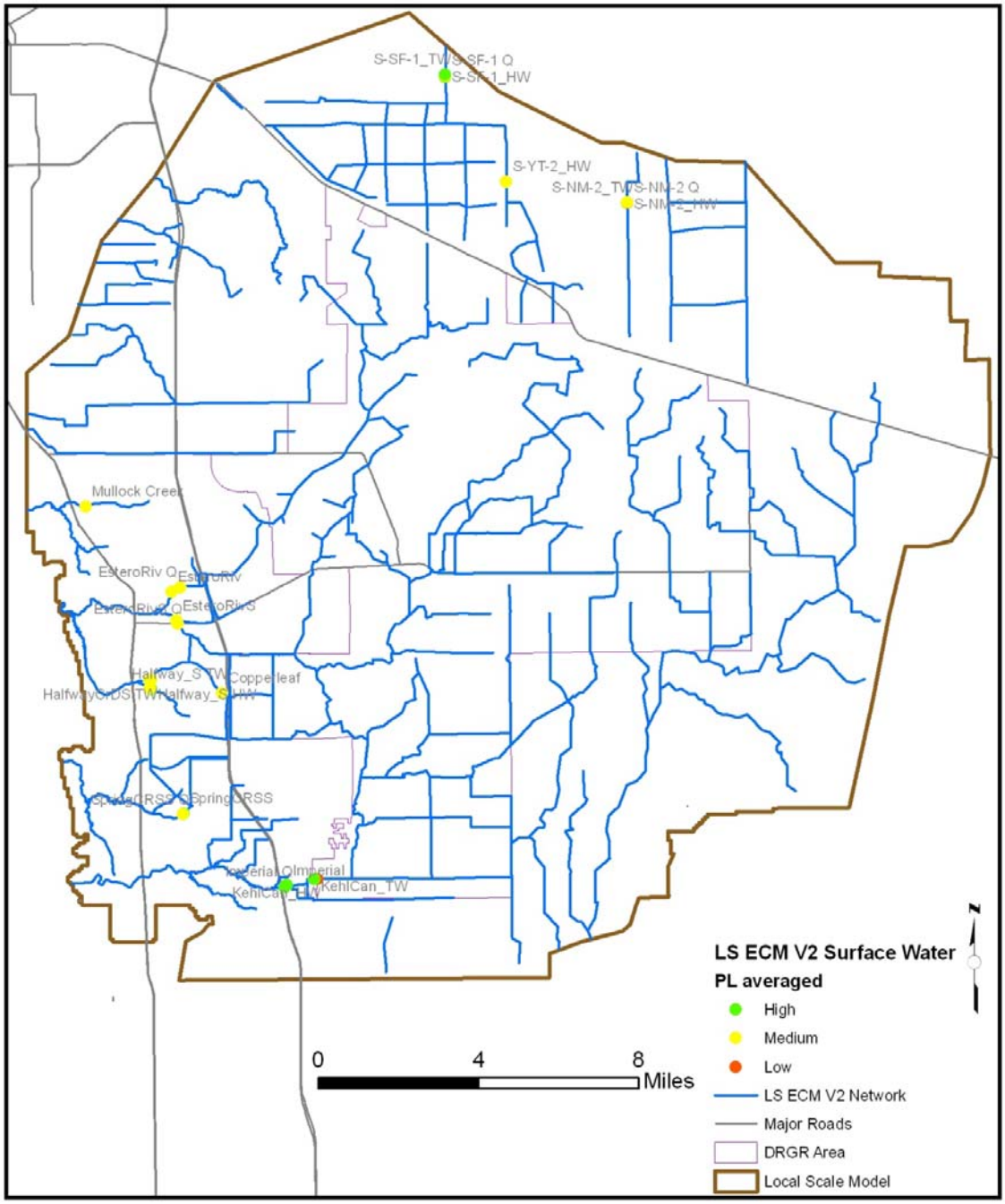
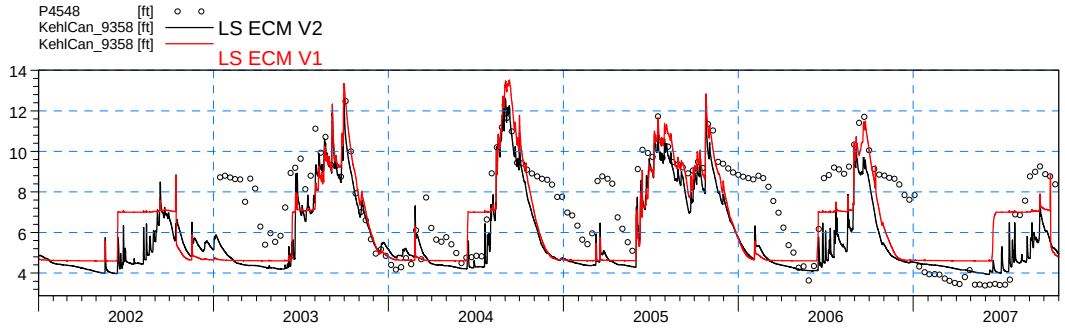
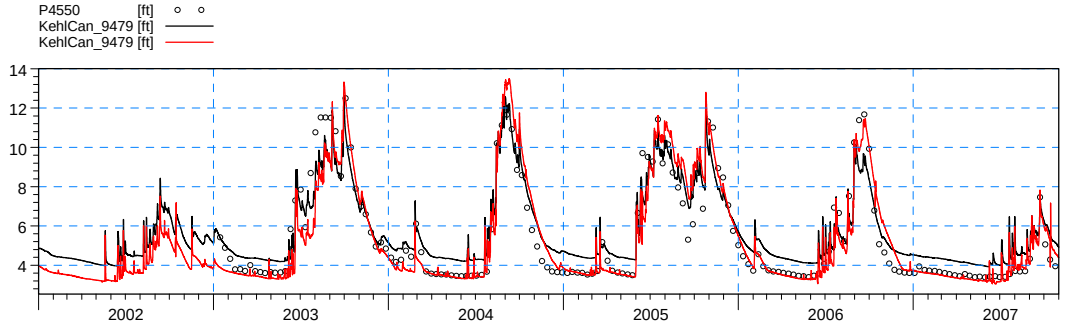


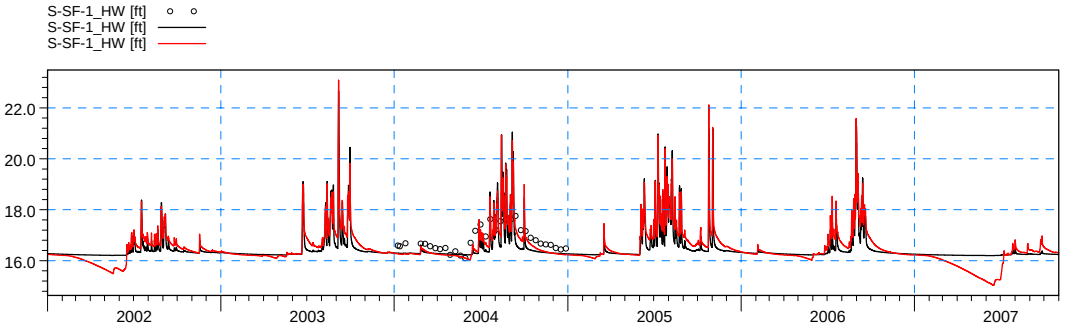
Figure F41. Average performance levels in surface water stations from new (V2) model.



ME=1.56669
MAE=1.78205
RMSE=2.2035
STDres=1.54948
R(Correlation)=0.751892
R2(Nash_Sutcliffe)=0.09941

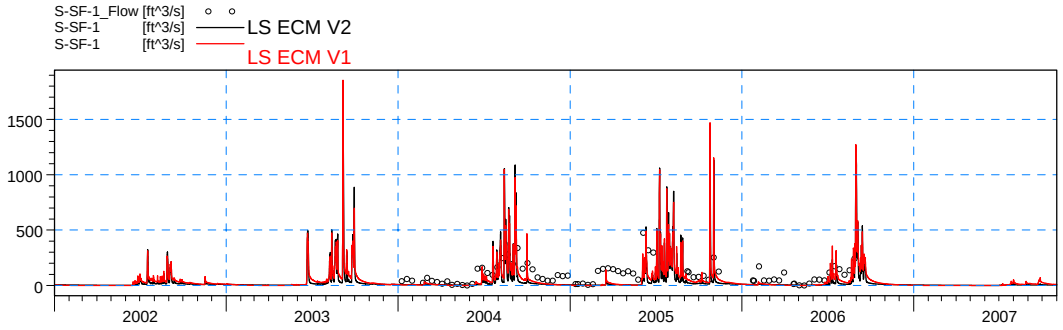


ME=-0.337993
MAE=0.838303
RMSE=0.973898
STDres=0.913366
R(Correlation)=0.956622
R2(Nash_Sutcliffe)=0.858693

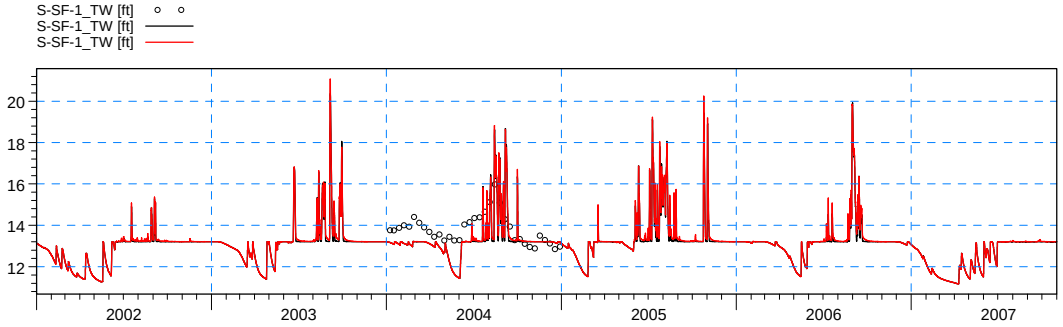


ME=0.31857
MAE=0.35693
RMSE=0.41375
STDres=0.264011
R(Correlation)=0.653733
R2(Nash_Sutcliffe)=-1.02533

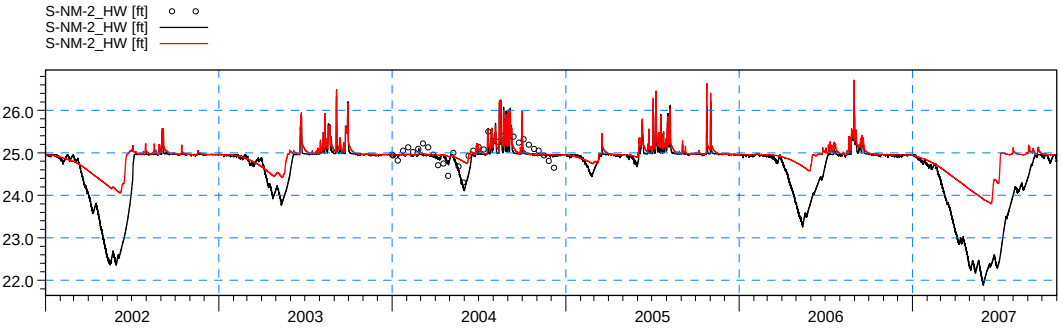
Figure F42. Comparison plots at surface water stations KehlCan_HW, KehlCan_TW and S-SF-1_HW.



ME=78.6087
MAE=89.4908
RMSE=119.284
STDres=89.7182
R(Correlation)=0.649162
R2(Nash_Sutcliffe)=-0.322842

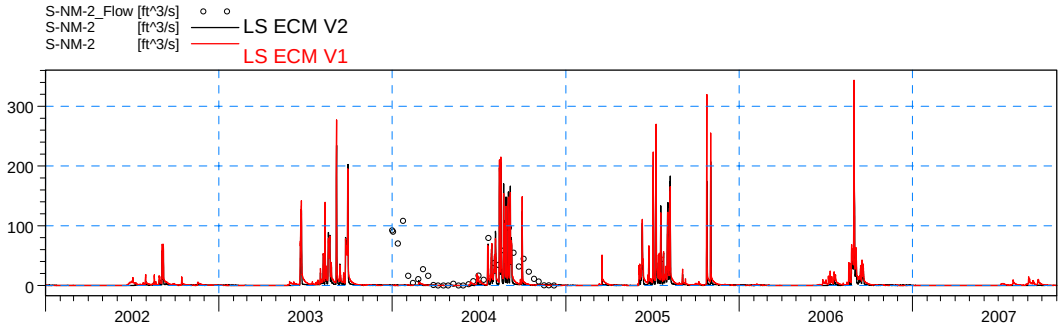


ME=-0.00204762
MAE=0.300898
RMSE=0.469909
STDres=0.469905
R(Correlation)=0.432146
R2(Nash_Sutcliffe)=-0.21991

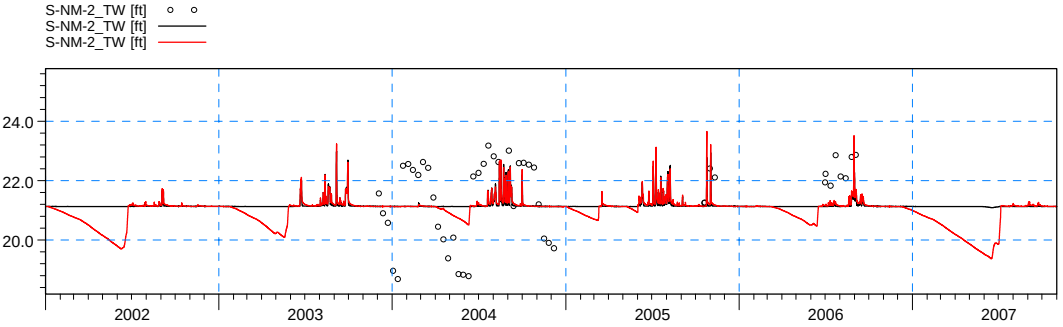


ME=0.0641465
MAE=0.187051
RMSE=0.234191
STDres=0.225235
R(Correlation)=0.694068
R2(Nash_Sutcliffe)=0.401755

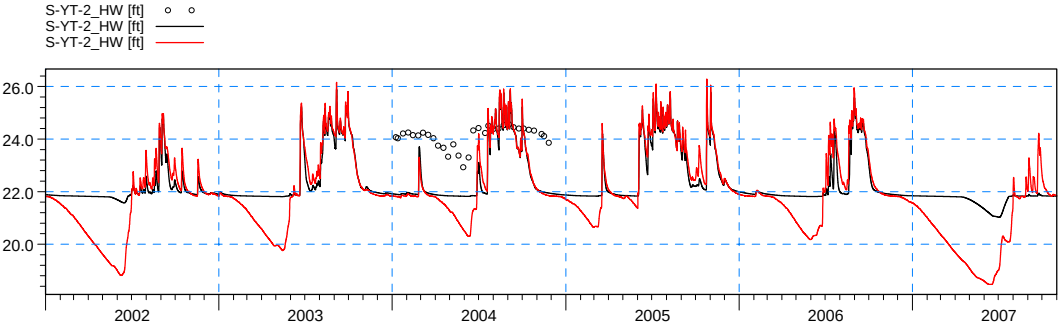
Figure F43. Comparison plots at surface water stations S-SF-1 Q, S-SF-1_TW and S-NM-2_HW.



ME=18.3076
MAE=22.832
RMSE=37.6788
STDres=32.9322
R(Correlation)=0.403244
R2(Nash_Sutcliffe)=-0.35379

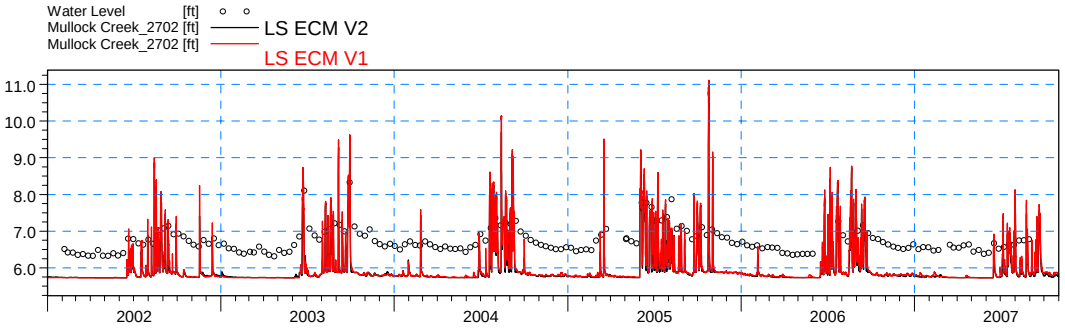


ME=0.849101
MAE=1.08698
RMSE=1.21366
STDres=0.867178
R(Correlation)=0.350905
R2(Nash_Sutcliffe)=-0.72574

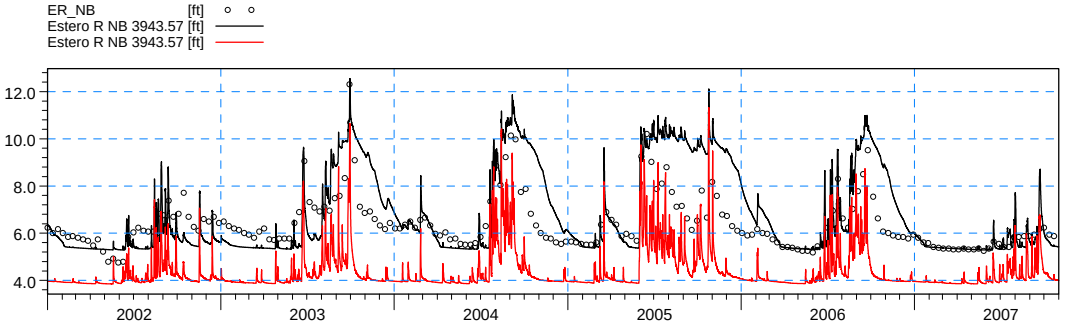


ME=1.45668
MAE=1.55253
RMSE=1.73205
STDres=0.937046
R(Correlation)=0.613843
R2(Nash_Sutcliffe)=-16.2504

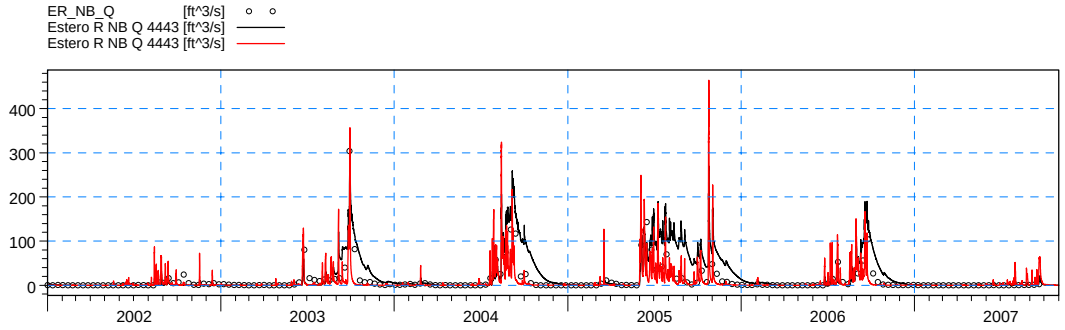
Figure F44. Comparison plots at surface water stations S-NM-2 Q, S-NM-2_TW and S-YT-2_HW.



ME=0.810328
MAE=0.841549
RMSE=0.877263
STDres=0.336094
R(Correlation)=0.662824
R2(Nash_Sutcliffe)=-5.73976

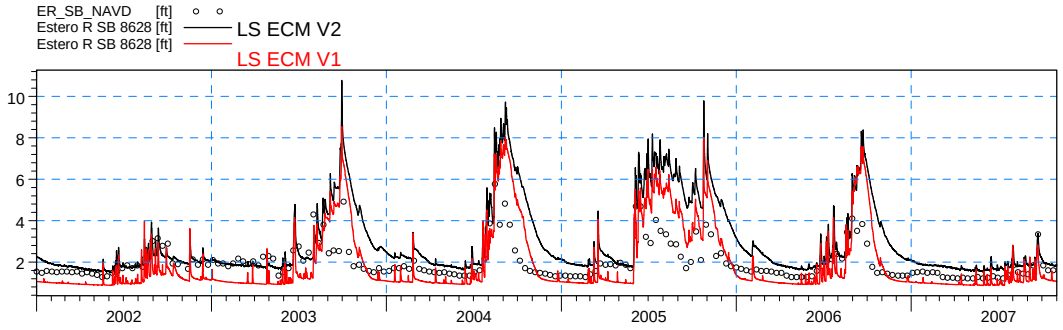


ME=-0.368303
MAE=0.832851
RMSE=1.19206
STDres=1.13374
R(Correlation)=0.779159
R2(Nash_Sutcliffe)=-0.0823293

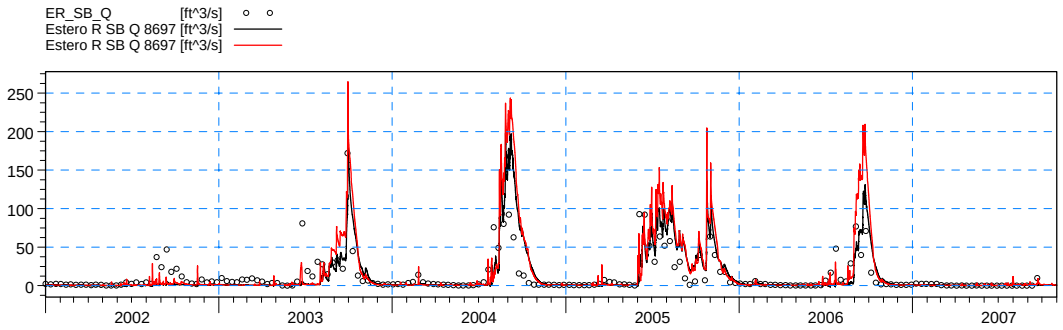


ME=-7.49791
MAE=12.1924
RMSE=24.9457
STDres=23.7922
R(Correlation)=0.797865
R2(Nash_Sutcliffe)=0.4221

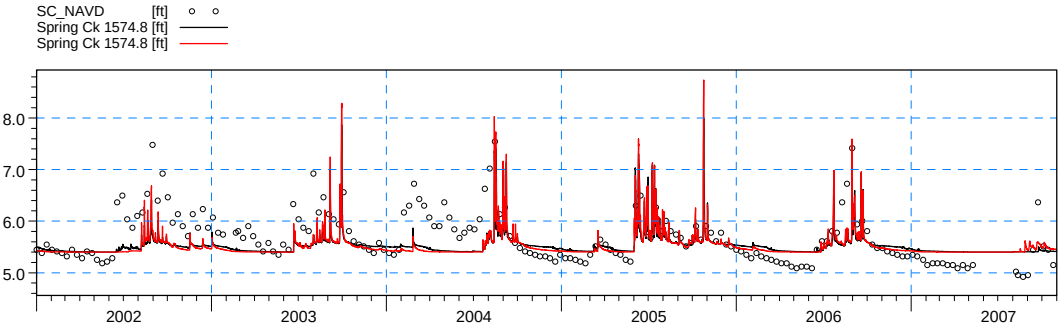
Figure F45. Comparison plots at surface water stations Mullock Creek, EsteroRiv and EsteroRiv Q.



ME=-0.925731
MAE=0.98899
RMSE=1.4937
STDres=1.17224
R(Correlation)=0.774002
R2(Nash_Sutcliffe)=-2.09299

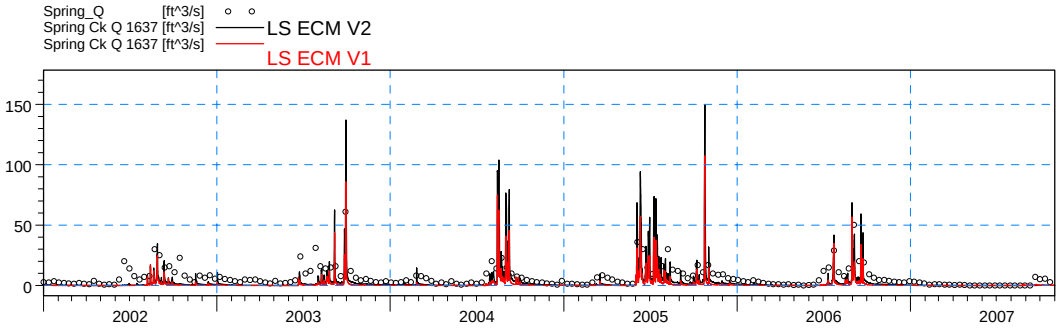


ME=-0.0426489
MAE=9.30175
RMSE=18.9981
STDres=18.9981
R(Correlation)=0.759021
R2(Nash_Sutcliffe)=0.40971

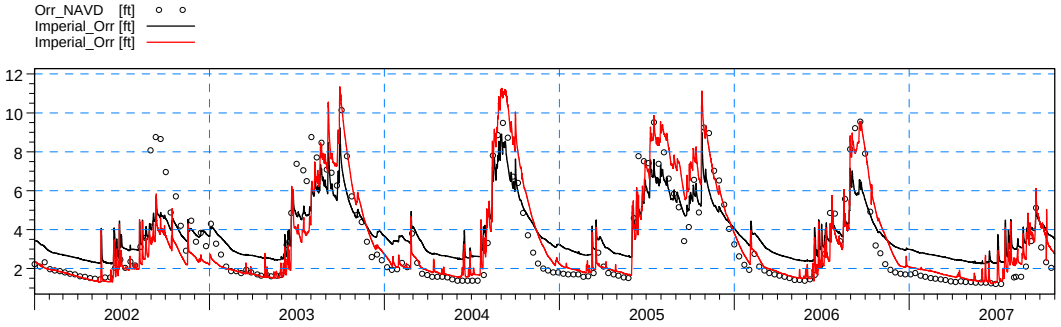


ME=0.157102
MAE=0.308744
RMSE=0.434797
STDres=0.405422
R(Correlation)=0.575771
R2(Nash_Sutcliffe)=0.211537

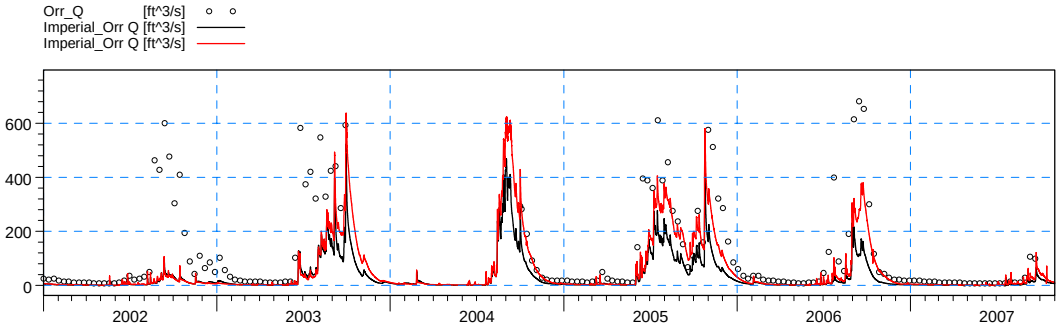
Figure F46. Comparison plots at surface water stations EsteroRivS, EsteroRivS Q and SpringCRSS.



ME=4.54128
MAE=4.99979
RMSE=8.00712
STDres=6.59475
R(Correlation)=0.730066
R2(Nash_Sutcliffe)=0.299306

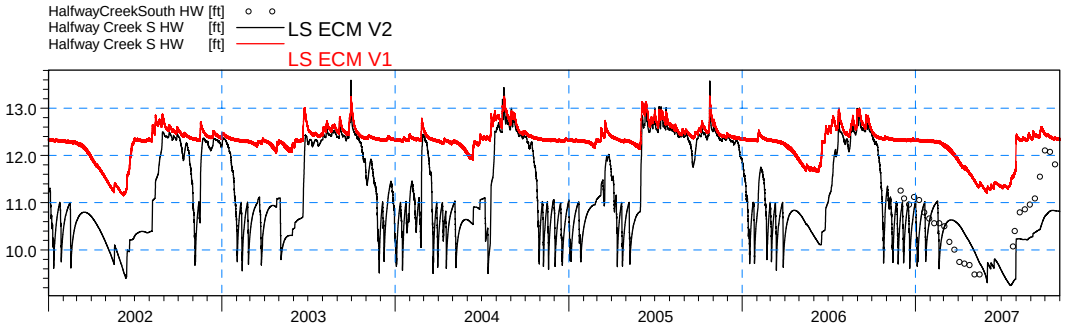


ME=-0.379481
MAE=1.20114
RMSE=1.37731
STDres=1.324
R(Correlation)=0.919475
R2(Nash_Sutcliffe)=0.685333

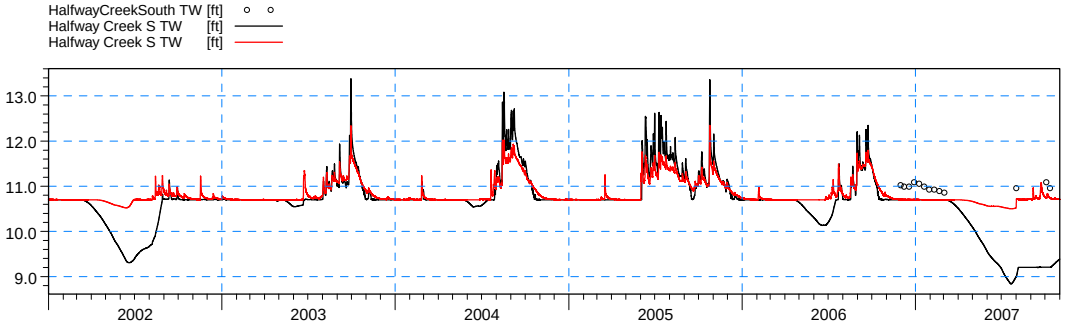


ME=87.778
MAE=87.8659
RMSE=156.134
STDres=129.123
R(Correlation)=0.817226
R2(Nash_Sutcliffe)=0.147011

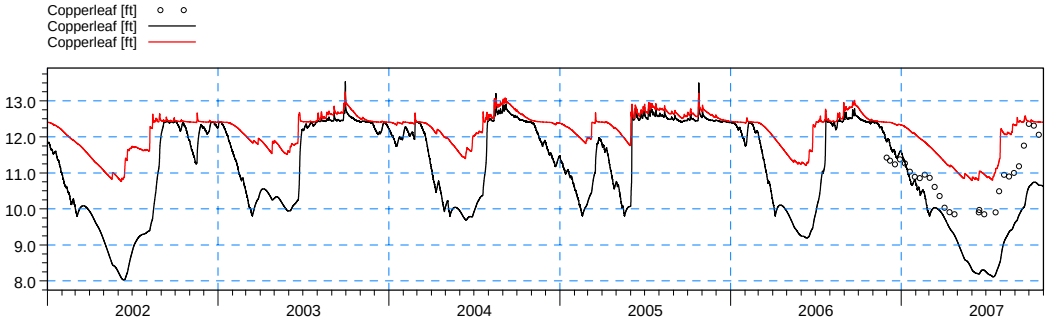
Figure F47. Comparison plots at surface water stations SpringCRSS Q, Imperial and Imperial Q.



ME=0.606666
MAE=0.767439
RMSE=0.848345
STDres=0.592997
R(Correlation)=0.594267
R2(Nash_Sutcliffe)=-0.340278

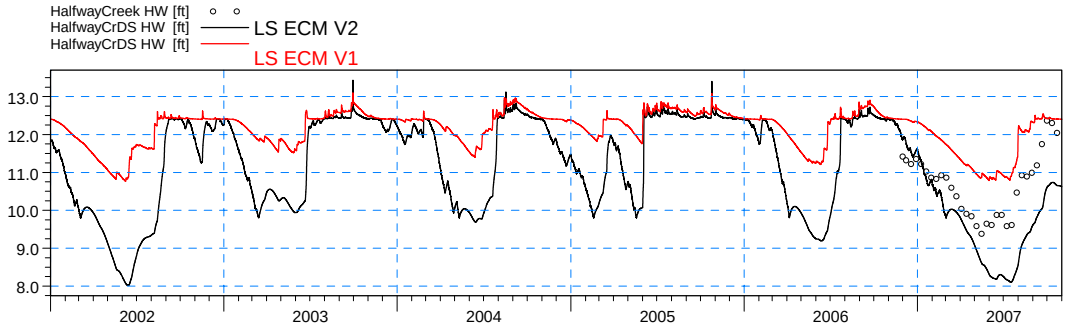


ME=0.903012
MAE=0.903012
RMSE=1.18691
STDres=0.770276
R(Correlation)=-0.213961
R2(Nash_Sutcliffe)=-213.979

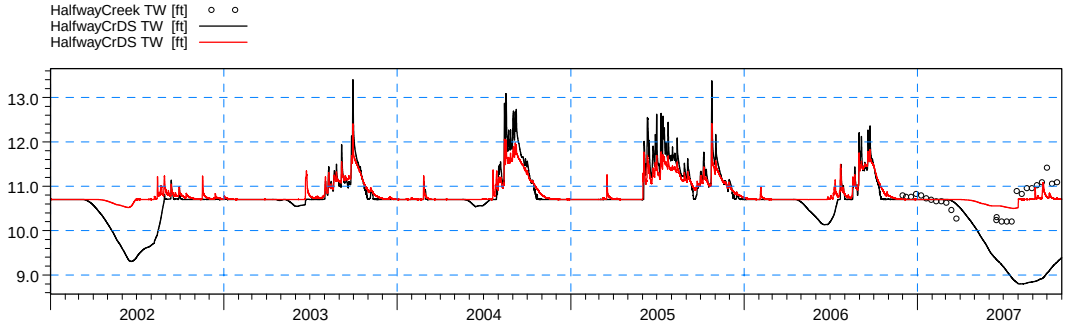


ME=1.26965
MAE=1.31116
RMSE=1.43999
STDres=0.679374
R(Correlation)=0.66763
R2(Nash_Sutcliffe)=-2.72523

Figure F48. Comparison plots at surface water stations Halfway_S HW, Halfway_S TW and Copperleaf.



ME=1.26894
MAE=1.30463
RMSE=1.41574
STDres=0.627795
R(Correlation)=0.798173
R2(Nash_Sutcliffe)=-1.38573



ME=1.50847
MAE=1.52967
RMSE=1.72303
STDres=0.832681
R(Correlation)=-0.226145
R2(Nash_Sutcliffe)=-22.1851

Figure F49. Comparison plots at surface water stations HalfwayCrDS HW, and HalfwayCrDS TW.