Model Fits 2021

This document shows the observed versus modeled streamflow volume and center of mass with data through 2021 for each location and each months model.

Data Inputs

Data is automatically downloaded from the USGS, NRCS and AgriMet (Fairfield and Picabo).

	Station	HUC	Start	End	Abv
1	BIG WOOD RIVER AT HAILEY ID TOTAL FLOW	17040219	2006-10-01	2021-12-12	bwb
2	BIG WOOD RIVER AT STANTON CROSSING NR BELLEVUE ID	17040219	1996-09-18	2021-12-12	bws
3	CAMAS CREEK NR BLAINE ID	17040220	1987-08-17	2021-12-12	cc
5	SILVER CREEK AT SPORTSMAN ACCESS NR PICABO ID	17040221	1987-08-18	2021-12-12	sc

start	end	site_name	huc8	abv
1992-10-01	2021-12-12	chocolate gulch	219	cg.swe
1979-10-01	2021-12-12	galena	219	g.swe
1978-10-01	2021-12-12	galena summit	219	gs.swe
1979-10-01	2021-12-12	hyndman	219	hc.swe
1979-10-01	2021-12-12	lost-wood divide	219	lwd.swe
1979-10-01	2021-12-12	dollarhide summit	219	ds.swe
1991-10-01	2021-12-12	camas creek divide	220	ccd.swe
1985-10-01	2021-12-12	soldier r.s.	220	sr.swe
1979-10-01	2021-12-12	garfield r.s.	221	ga.swe
1978-10-01	2021-12-12	swede peak	221	sp.swe
1979-10-01	2021-12-12	stickney mill	303	sm.swe
1979-10-01	2021-12-12	bear canyon	101	bc.swe

February

	AdjR2	Loocv R2
BWH	83.56	73.71
BWS	94.62	89.82
SC	85.29	70.36
CC	83.91	74.26

	AdjR2	Loocv R2
BWH	98.96	98.05
BWS	97.48	96.3
SC	91.05	79.65
CC	95.02	92.56

Irrigation Season Volume Models

log(Big Wood Hailey Vol)~ bwb.wq + sr.swe + nj.t.cg + nj.t.bc + nj.t.sm + nj.t.p + nj.t.f

log(Big Wood Stanton Vol)~ ccd.swe + sr.swe + sm.swe + log.cg.swe + log.g.swe + log.lwd.swe + log.ga.swe + nj.t.hc + nj.t.lw + nj.t.sp + nj.t.p + nj.t.f

log(Silver Creek Vol)~ sc.wq + bwb.wq + ccd.swe + sm.swe + log.gs.swe + log.lwd.swe + log.bc.swe + nj.t.cg + nj.t.ccd + nj.t.bc + nj.t.ds + nj.t.g + nj.t.sm + nj.t.sp

log(Camas Creek Vol)~ bwb.wq + ds.swe + sr.swe + sm.swe + log.cg.swe + log.ga.swe + log.bc.swe + nj.t.cg + nj.t.bc + nj.t.sm + nj.t.p + nj.t.f

Center of Mass Models

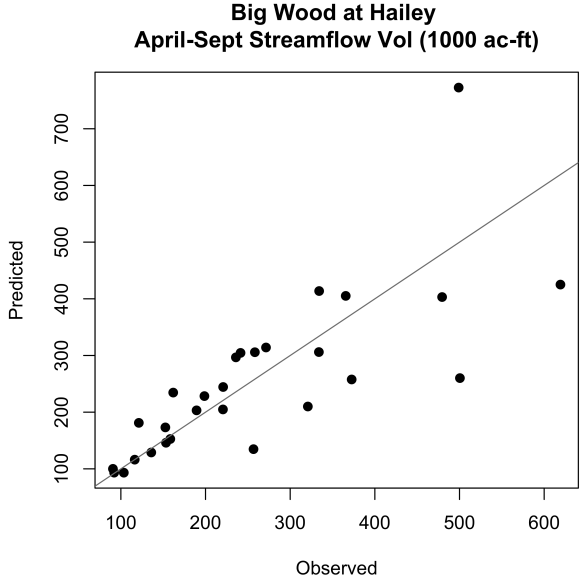
Big Wood Hailey CM~ bwb.wq + sr.swe + nj.t.cg + nj.t.bc + nj.t.sm + nj.t.p + nj.t.f

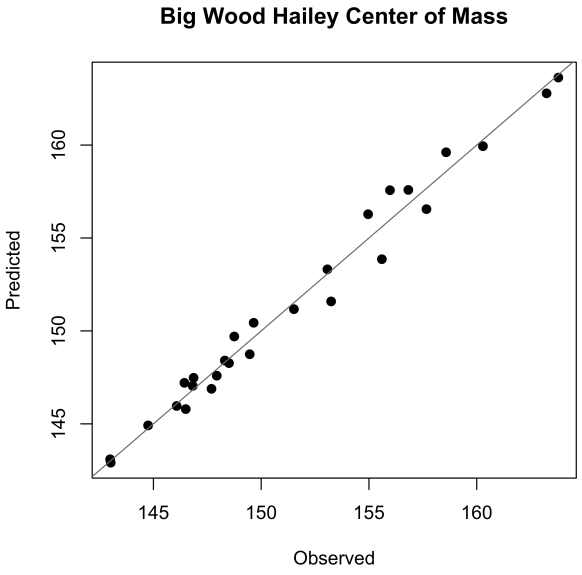
Big Wood Stanton CM~ ccd.swe + sr.swe + sm.swe + log.cg.swe + log.g.swe + log.lwd.swe + log.ga.swe + nj.t.hc + nj.t.lw + nj.t.sp + nj.t.p + nj.t.f

Silver Creek CM~ sc.wq + bwb.wq + ccd.swe + sm.swe + log.gs.swe + log.lwd.swe + log.bc.swe + nj.t.cg + nj.t.ccd + nj.t.bc + nj.t.ds + nj.t.g + nj.t.sm + nj.t.sp

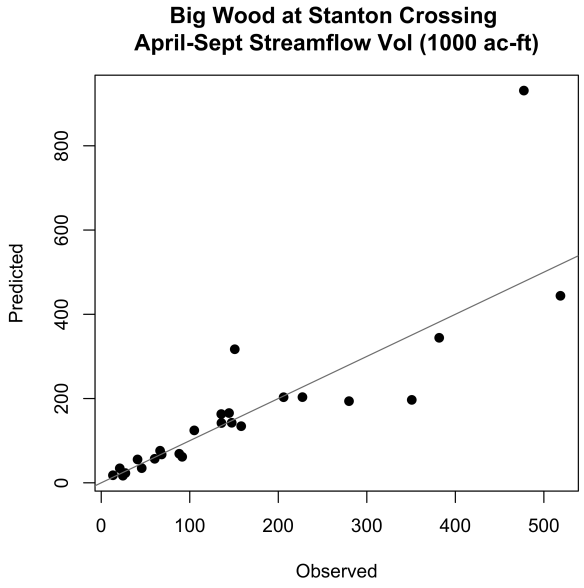
Camas Creek CM~ bwb.wq + ds.swe + sr.swe + sm.swe + log.cg.swe + log.ga.swe + log.bc.swe + nj.t.cg + nj.t.bc + nj.t.sm + nj.t.p + nj.t.f

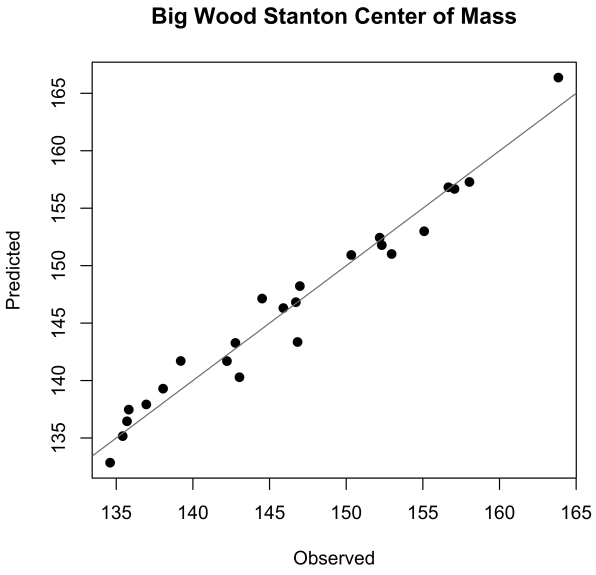
Big Wood Hailey



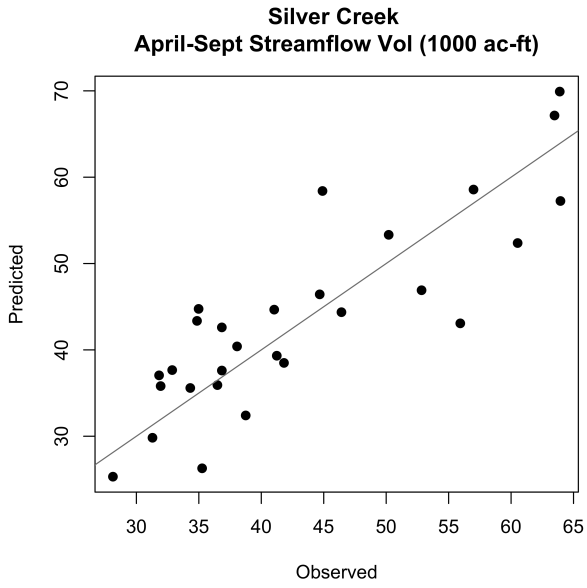


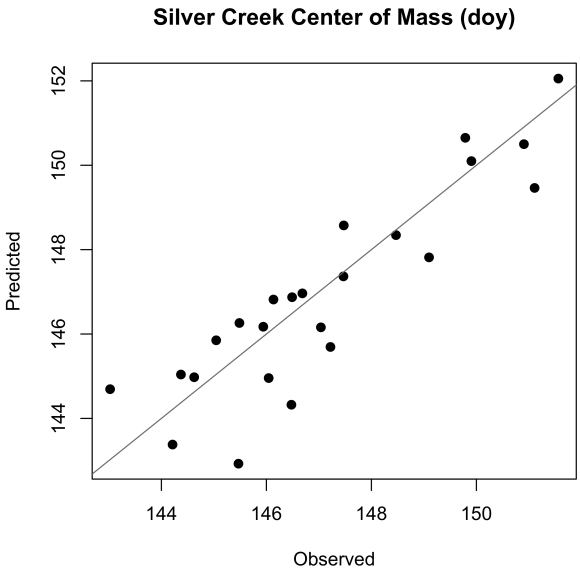
Big Wood Stanton



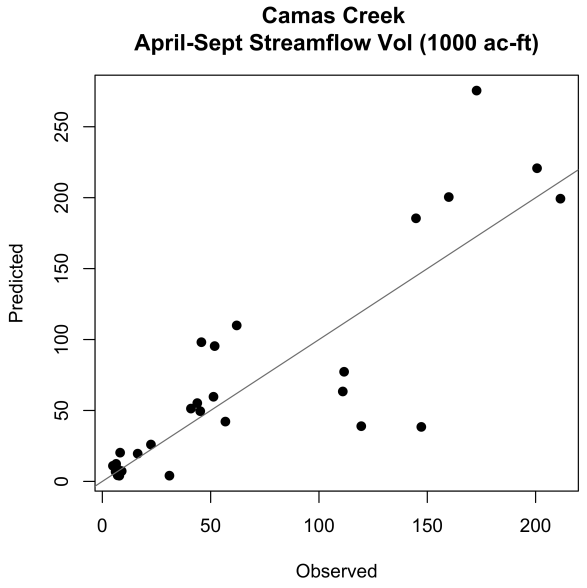


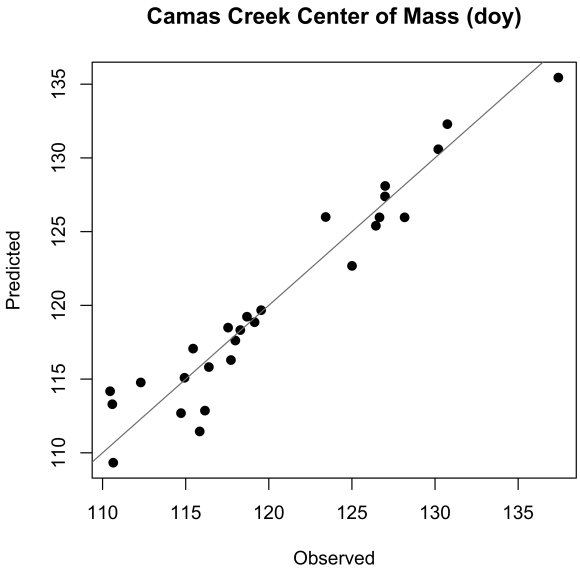
Silver Creek





Camas Creek





March

	AdjR2	Loocv R2
BWH	80.23	73.8
BWS	90.44	80.28
SC	94.1	86.77
CC	84.88	81.52

	AdjR2	Loocv R2
BWH	98.56	98.02
BWS	97.42	96.14
SC	93.57	83.96
CC	91.3	86.06

Irrigation Season Volume Models

log(Big Wood Hailey Vol)~ sp.swe + log.g.swe + log.gs.swe + nj.t.bc + nj.t.ds + nj.t.f

log(Big Wood Stanton Vol)~ ds.swe + sr.swe + sp.swe + log.g.swe + log.gs.swe + log.lwd.swe + log.bc.swe + nj.t.hc + nj.t.sm + nj.t.sp + nj.t.p + nj.t.f

log(Silver Creek Vol)~ sc.wq + sr.swe + sp.swe + log.cg.swe + log.hc.swe + log.lwd.swe + log.ga.swe + log.bc.swe + nj.t.bc + nj.t.ds + nj.t.g + nj.t.sm + nj.t.gs + nj.t.f

log(Camas Creek Vol)~ sr.swe + log.cg.swe + log.g.swe + log.gs.swe + nj.t.bc + nj.t.ds + nj.t.ga + nj.t.f

Center of Mass Models

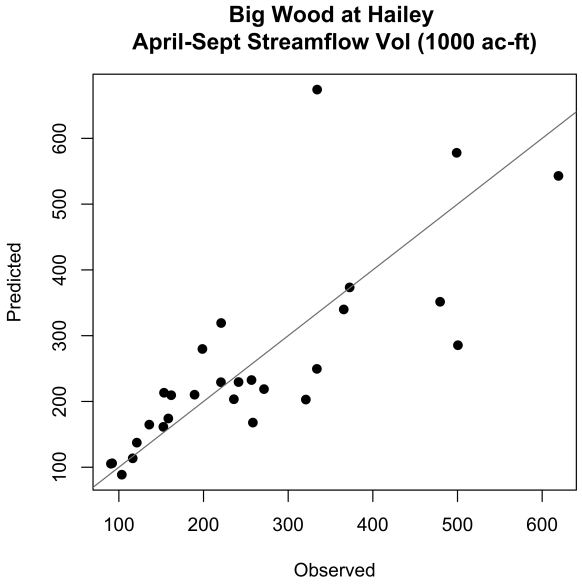
Big Wood Hailey CM~ bwb.wq + ccd.swe + log.gs.swe + aj.t.cg + aj.t.hc + aj.t.sp + nj.t.hc + nj.t.sp + nj.t.f

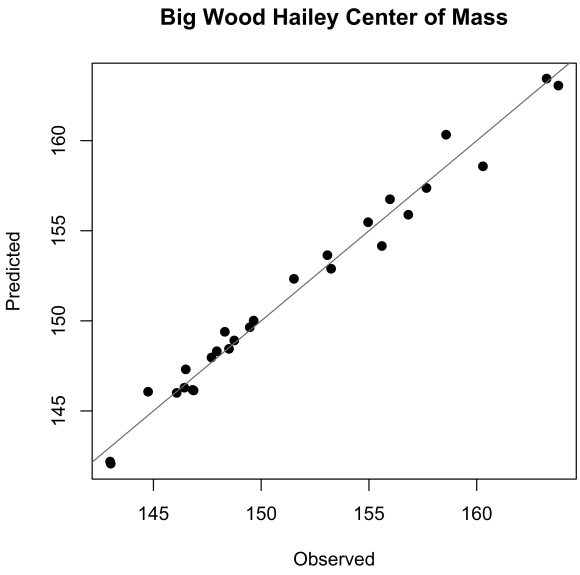
Big Wood Stanton CM~ aj.t.cg + aj.t.bc + aj.t.gs + nj.t.bc + nj.t.g + nj.t.p

Silver Creek CM~ sm.swe + log.gs.swe + aj.t.cg + aj.t.ccd + aj.t.g + aj.t.hc + aj.t.sm + nj.t.g + nj.t.lw + nj.t.gs

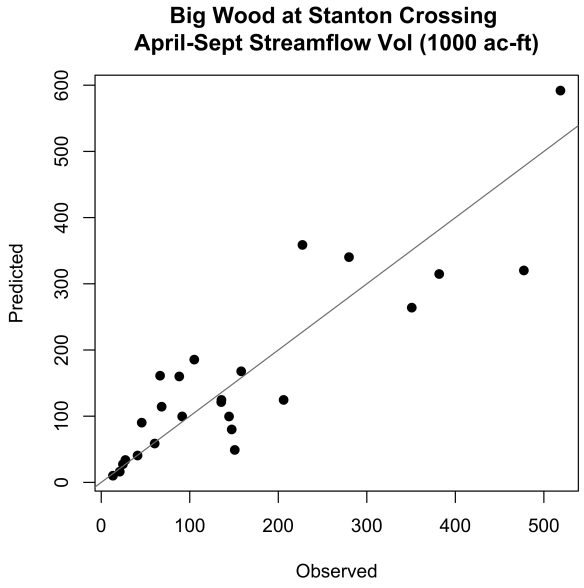
Camas Creek CM~ ccd.swe + log.g.swe + log.hc.swe + aj.t.ds + aj.t.ga + aj.t.hc + aj.t.lw + nj.t.bc + nj.t.g + nj.t.f

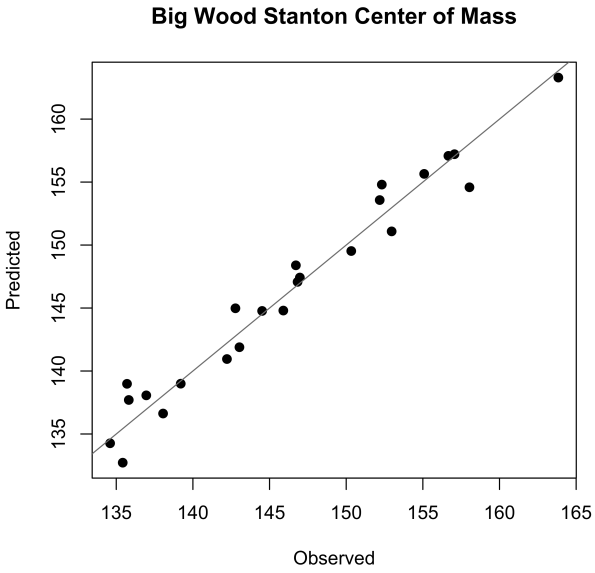
Big Wood Hailey



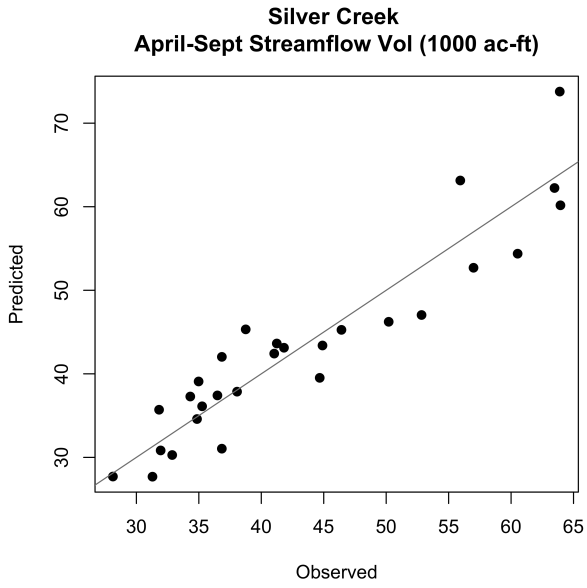


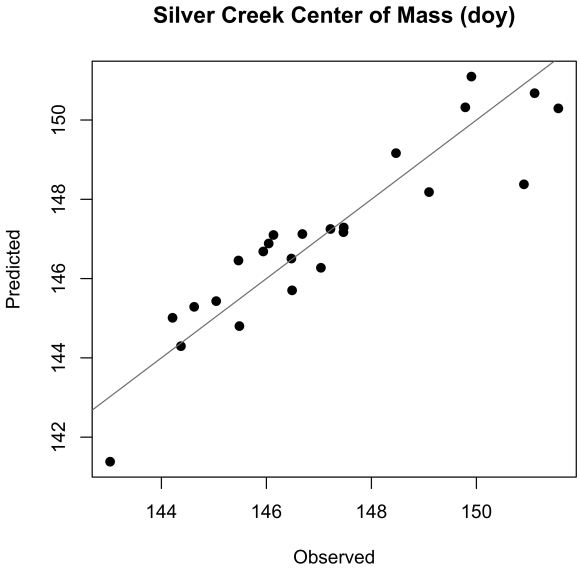
Big Wood Stanton



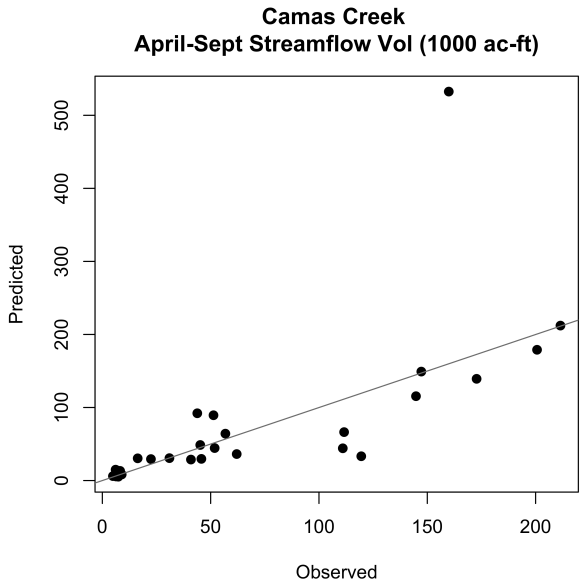


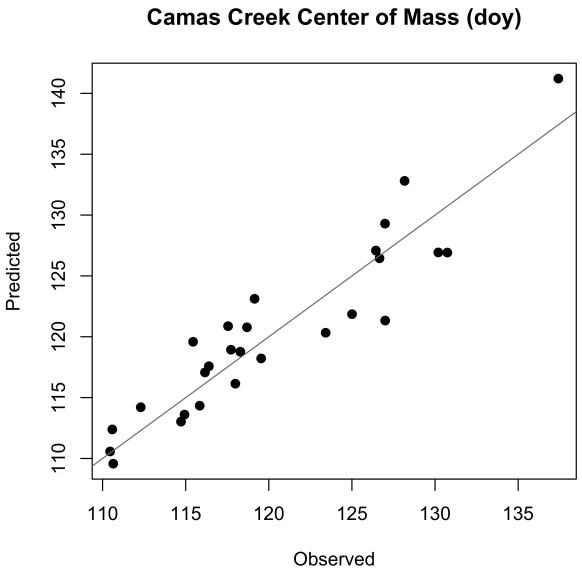
Silver Creek





Camas Creek





April

	AdjR2	Loocv R2
BWH	98.48	94.24
BWS	99.38	98.19
SC	96.09	89.81
CC	99.05	97.55

	AdjR2	Loocv R2
BWH	98.93	97.67
BWS	97.83	97.22
SC	97.49	90.77
CC	96.96	92.46

Irrigation Season Volume Models

log(Big Wood Hailey Vol)~ bwb.wq + sr.swe + log.hc.swe + log.ga.swe + nj.t.cg + nj.t.ccd + nj.t.bc + nj.t.ga + nj.t.lw + nj.t.gs + nj.t.sp + nj.t.p

log(Big Wood Stanton Vol)~ ds.swe + sp.swe + log.cg.swe + log.g.swe + log.bc.swe + nj.t.ccd + nj.t.bc + nj.t.ds + nj.t.g + nj.t.hc + nj.t.lw + nj.t.sp

log(Silver Creek Vol)~ sc.wq + ccd.swe + sr.swe + sp.swe + log.g.swe + log.hc.swe + log.lwd.swe + nj.t.cg + nj.t.bc + nj.t.ga + nj.t.hc + nj.t.sm + nj.t.p + nj.t.f

log(Camas Creek Vol)~ cc.wq + ds.swe + ccd.swe + sm.swe + log.lwd.swe + log.ga.swe + log.bc.swe + nj.t.ds + nj.t.lw + nj.t.sm + nj.t.sp + nj.t.f

Center of Mass Models

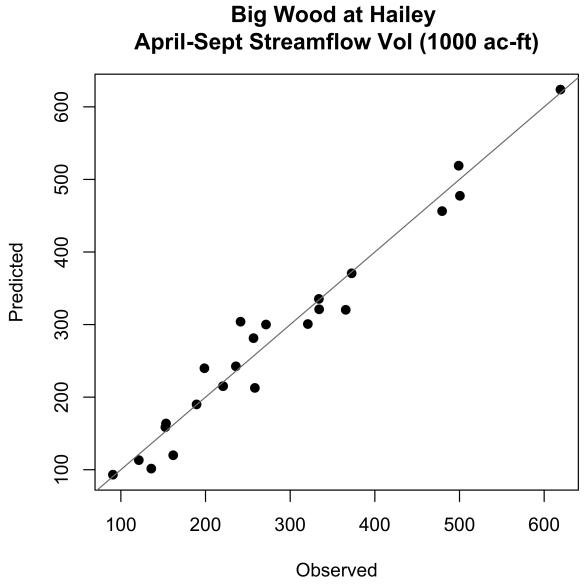
Big Wood Hailey CM~ bwb.wq + ds.swe + sr.swe + log.g.swe + log.ga.swe + aj.t.sm + aj.t.gs + aj.t.p + nj.t.ccd + nj.t.g

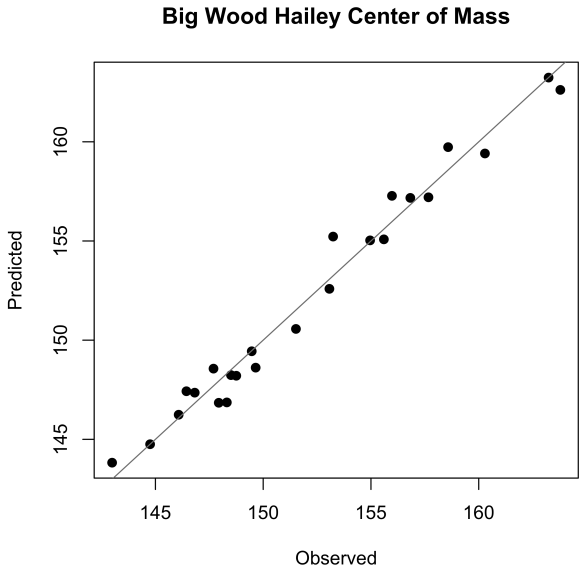
Big Wood Stanton CM~ aj.t.cg + aj.t.gs + aj.t.sp + nj.t.cg + nj.t.gs + nj.t.p

Silver Creek CM~ bws.wq + ds.swe + aj.t.ds + aj.t.g + aj.t.gs + aj.t.sp + aj.t.p + nj.t.lw + nj.t.gs + nj.t.sp

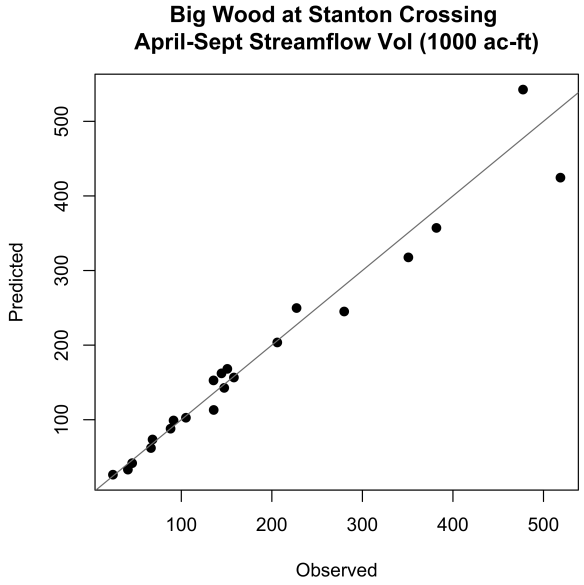
Camas Creek CM~ ds.swe + sm.swe + log.bc.swe + aj.t.bc + aj.t.g + aj.t.hc + aj.t.gs + aj.t.sp + nj.t.ds + nj.t.g

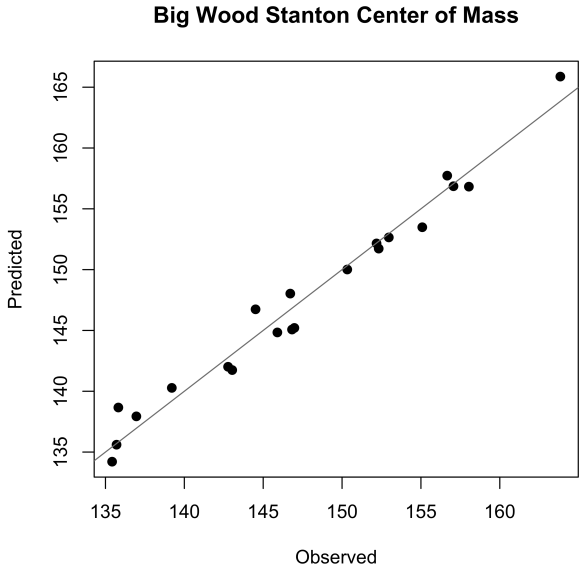
Big Wood Hailey



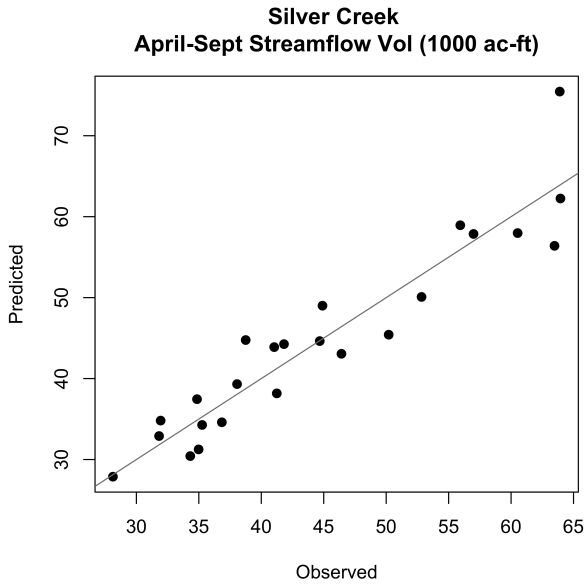


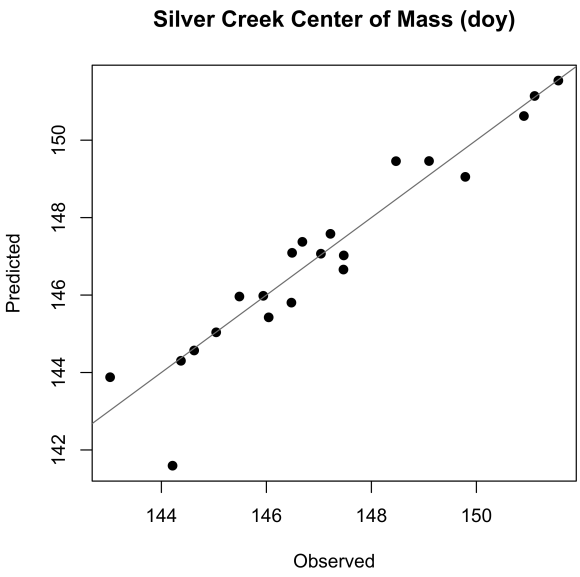
Big Wood Stanton



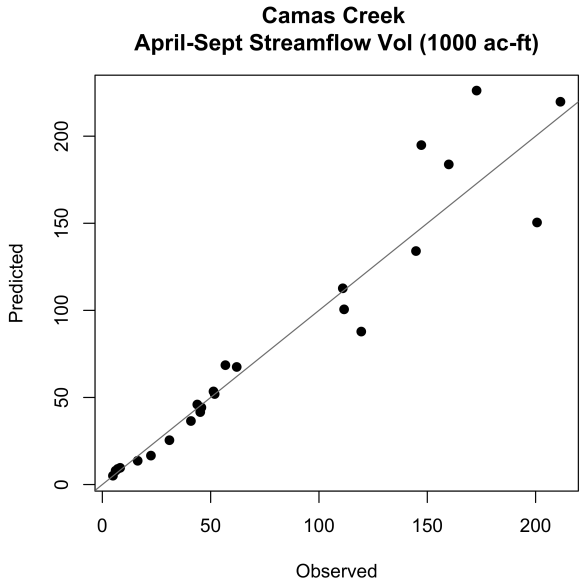


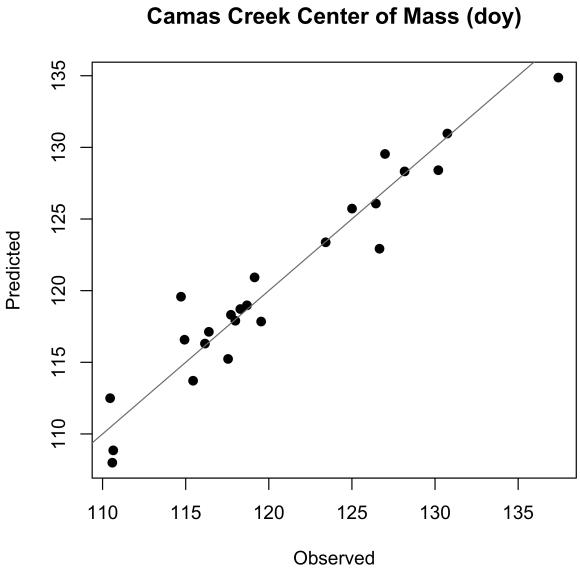
Silver Creek





Camas Creek





Water Right Curtailment Models

The variables for each water right model are show in the tables for each month. The adjusted R squared is a metric of model fit, with 1 being perfect and anything under 0.75 not being a strong fit. The "LOOCV" stands for leave-one-out cross validation, it is a stronger metric of model fit because it removes one data point at a time and evaluates the fit iteratively, thus incorperating how strongly an individual point impacts the overall fit. "RMSE" is the root mean square error - a metric that quantifies the spread in the divergence the predicted values are from the observed value. High RMSE correlates with low R2, and are particularly valuable for comparing across models. For example, in February, while the Big Wood Below Magic C had a Adj R2 of 0.85 (which is good), its LOOCV R2 is 0.42 (not great) and its RMSE is 32, which is significantly

higher than the rest of the models. By March, this RMSE drops to 10, showing a significant improvement in the model.

February Water Right Curtailment Parameters & Fits

	Adj R2	LOOCV R2	RMSE
bw_ab_magicA	0.93	0.91	7
bw_bl_magicA	0.89	0.82	14
sc_lwA	0.9	0.84	0
bw_ab_magicB	0.91	0.85	11
bw_bl_magicB	0.87	0.81	15
sc_lwB	0.95	0.92	11
bw_ab_magicC	0.92	0.85	9
bw_bl_magicC	0.85	0.43	32
sc_lwC	0.93	0.85	20

bw_ab_magicA	bw_ab_magicB	bw_ab_magicC
bwb.vol	bwb.vol	bws.vol
bwb.wq	bws.vol	cc.vol
ds.swe	cc.vol	sc.vol
ccd.swe	log.lwd.swe	cc.wq
log.g.swe	log.bc.swe	log.g.swe
nj.t.ds	nj.t.ds	log.hc.swe
nj.t.sp	nj.t.hc	log.bc.swe
nj.t.p	nj.t.lw	nj.t.p

bw_bl_magicA	bw_bl_magicB	bw_bl_magicC
sr.swe	sr.swe	bwb.vol
sp.swe	sp.swe	bws.wq
log.cg.swe	log.cg.swe	cc.wq
log.hc.swe	log.hc.swe	sp.swe
nj.t.ccd	nj.t.ccd	log.cg.swe
nj.t.bc	nj.t.bc	nj.t.cg
nj.t.g	nj.t.g	nj.t.bc
nj.t.lw	nj.t.lw	nj.t.lw

sc_lwA	sc_lwB	sc_lwC
cc.vol	bwb.vol	bwb.vol
sc.vol	sc.wq	bwb.wq
sc.wq	ccd.swe	sc.wq
sp.swe	log.g.swe	log.cg.swe
log.cg.swe	log.lwd.swe	log.lwd.swe
nj.t.bc	log.bc.swe	nj.t.g
nj.t.g	nj.t.ds	nj.t.p
nj.t.sp	nj.t.lw	nj.t.f

March Water Right Curtailment Parameters

	Adj R2	LOOCV R2	RMSE
bw_ab_magicA	0.95	0.91	7
bw_bl_magicA	0.94	0.89	11
sc_lwA	0.91	0.84	0
bw_ab_magicB	0.96	0.9	7
bw_bl_magicB	0.97	0.93	10
sc_lwB	0.98	0.95	9
bw_ab_magicC	0.96	0.93	5
bw_bl_magicC	0.96	0.92	10
sc_lwC	0.98	0.94	14

bw_ab_magicA	bw_ab_magicB	bw_ab_magicC
bwb.vol.nat	bws.vol	cc.vol
bwb.wq	cc.wq	gs.swe
log.scwq	log.ccwq	sr.swe
ds.swe	cg.swe	ga.swe
sp.swe	sm.swe	nj.t.ds
bc.swe	log.bc.swe	nj.t.lw
log.g.swe	nj.t.ga	nj.t.gs
nj.t.gs	nj.t.f	nj.t.sp

bw_bl_magicA	bw_bl_magicB	bw_bl_magicC
bws.vol	bwb.vol	bws.vol
bws.vol.nat	g.swe	bwb.wq
lwd.swe	sm.swe	g.swe
sr.swe	log.cg.swe	lwd.swe
log.g.swe	nj.t.sr	ccd.swe
nj.t.ccd	nj.t.bc	sr.swe
nj.t.bc	nj.t.lw	log.hc.swe
nj.t.lw	nj.t.sp	nj.t.sr

sc_lwA	sc_lwB	sc_lwC
bws.vol	bws.vol.nat	sc.vol.nat
sc.vol	lwd.swe	sc.wq
sr.swe	ccd.swe	log.hc.swe
nj.t.sr	sp.swe	log.ga.swe
nj.t.ds	log.gs.swe	nj.t.cg
nj.t.g	nj.t.sr	nj.t.sr
nj.t.ga	nj.t.lw	nj.t.ga
nj.t.lw	nj.t.sm	nj.t.sm

April Water Right Curtailment Parameters

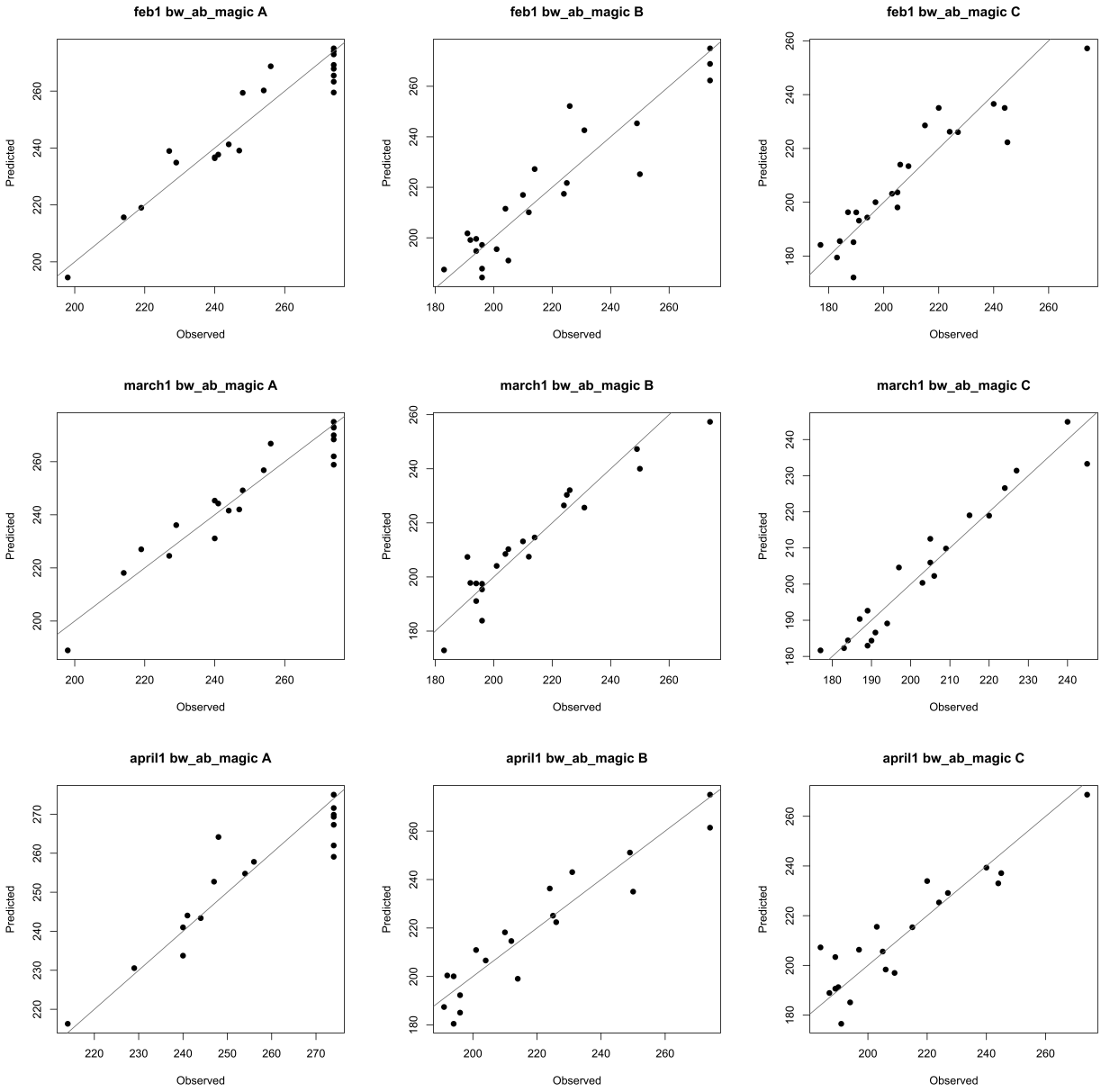
	Adj R2	LOOCV R2	RMSE
bw_ab_magicA	0.9	0.86	7
bw_bl_magicA	0.99	0.97	5
sc_lwA	0.93	0.82	0
bw_ab_magicB	0.95	0.9	9
bw_bl_magicB	0.98	0.95	7
sc_lwB	0.97	0.96	7
bw_ab_magicC	0.91	0.83	10
bw_bl_magicC	0.94	0.78	15
sc_lwC	0.98	0.96	9

bw_ab_magicA	bw_ab_magicB	bw_ab_magicC
bwb.wq	bwb.vol	cc.vol
bws.wq	bws.vol	cc.wq
ccd.swe	log.gs.swe	sr.swe
sm.swe	log.hc.swe	log.hc.swe
log.hc.swe	log.lwd.swe	log.lwd.swe
log.bc.swe	log.bc.swe	log.bc.swe
nj.t.ccd	nj.t.cg	nj.t.bc
nj.t.bc	nj.t.ga	nj.t.sp

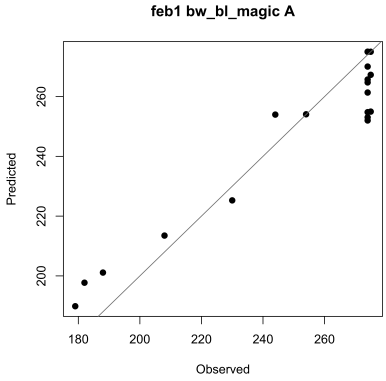
bw_bl_magicA	bw_bl_magicB	bw_bl_magicC
bws.vol	bws.vol	bws.vol
sc.vol	sc.vol	bws.wq
bwb.wq	bwb.wq	ccd.swe
sr.swe	sr.swe	log.cg.swe
log.g.swe	log.g.swe	log.hc.swe
nj.t.cg	nj.t.cg	log.bc.swe
nj.t.ccd	nj.t.ccd	nj.t.g
nj.t.ds	nj.t.ds	nj.t.hc

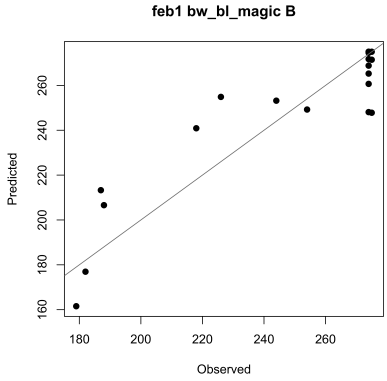
sc_lwA	sc_lwB	sc_lwC
cc.vol	bwb.vol	bwb.vol
sc.vol	sc.vol	cc.vol
log.hc.swe	sc.wq	bwb.wq
log.lwd.swe	log.lwd.swe	sc.wq
log.ga.swe	log.bc.swe	log.lwd.swe
nj.t.ds	nj.t.cg	log.bc.swe
nj.t.g	nj.t.ds	nj.t.bc
nj.t.sp	nj.t.ga	nj.t.ds

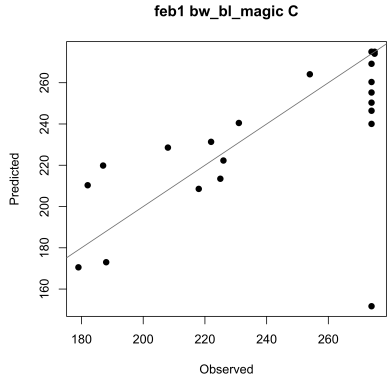
Big Wood Above Magic

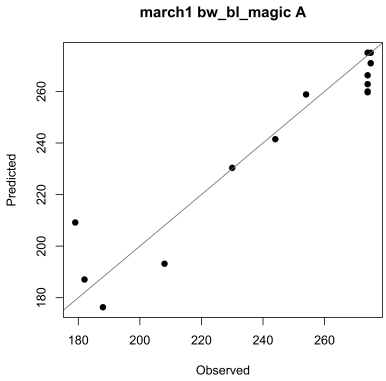


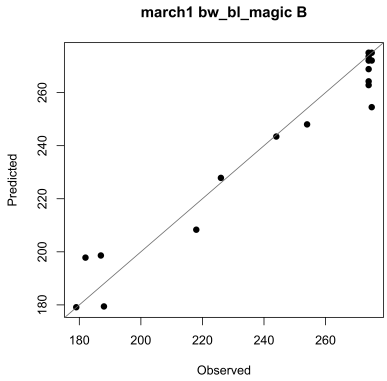
Big Wood Below Magic

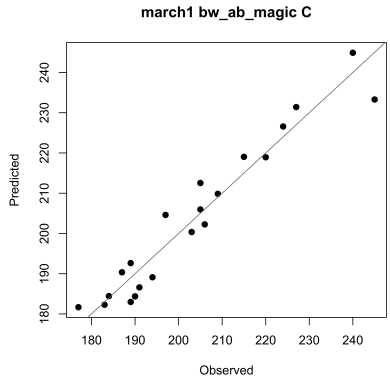


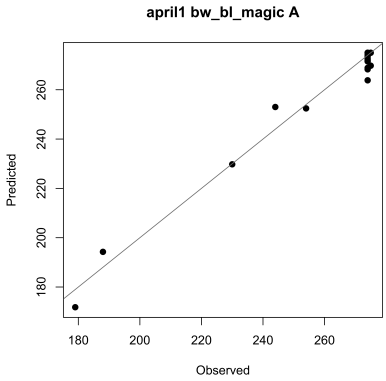


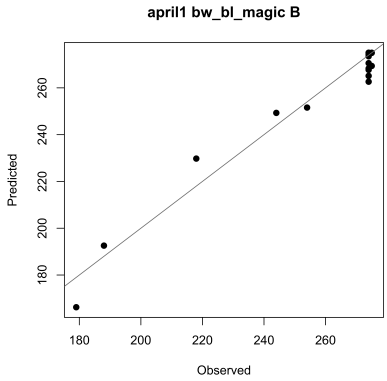


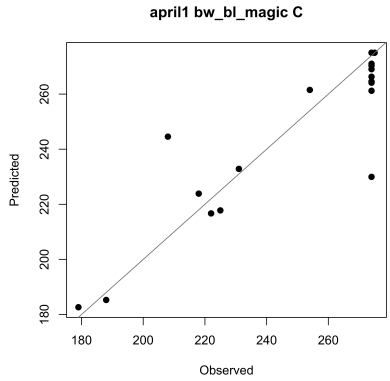












Silver Creek