Appendix A: R Linear Regression Diagnostic Plots

*No plots or individual regressions are included for Mill, Etna, or Patterson Creeks due to lack of sufficient streamflow measurements.

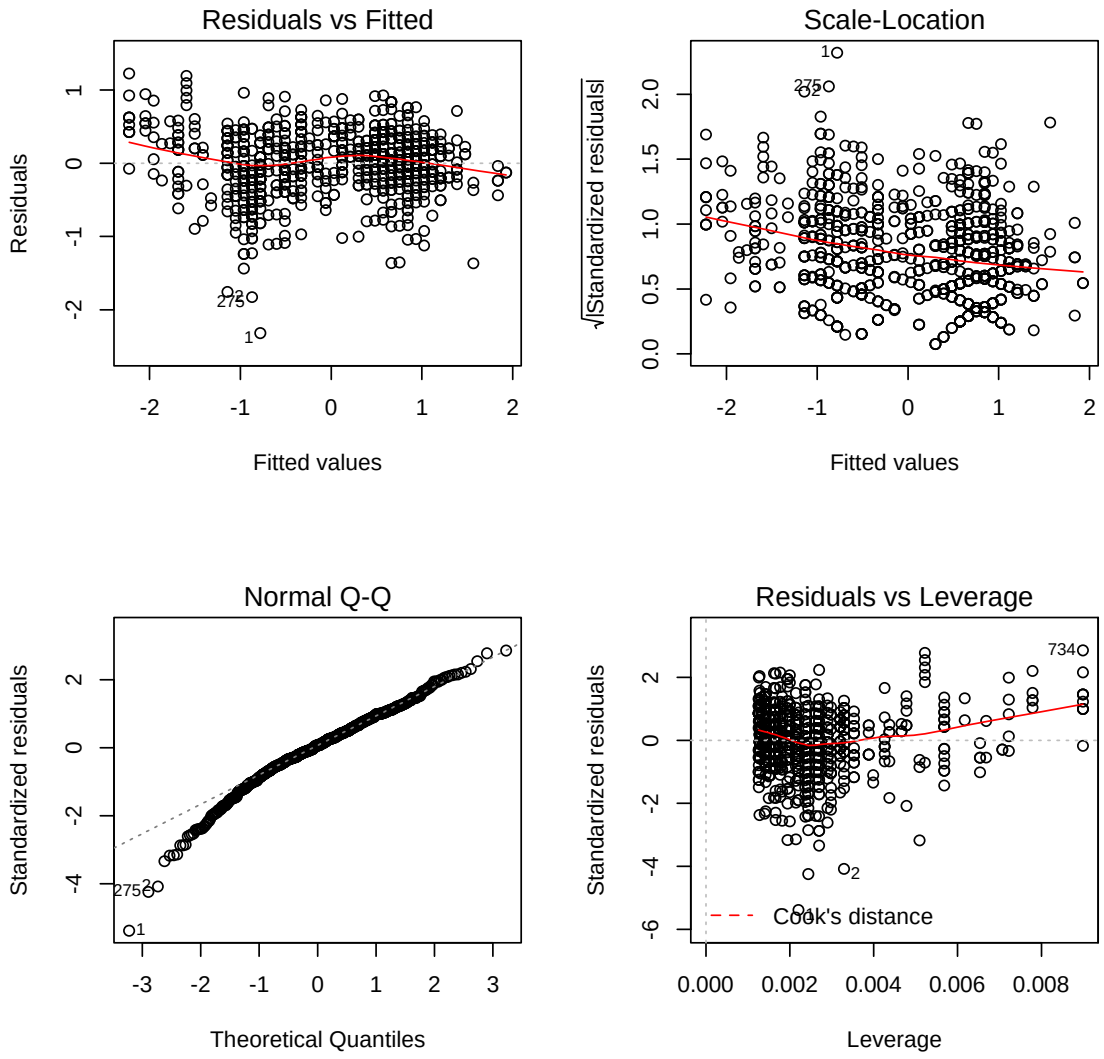


Figure XX: Linear Regression Validation – Norm(Tribs) vs. Norm(Scott)
Y=0.90289X+0.12186
r-squared=0.8124

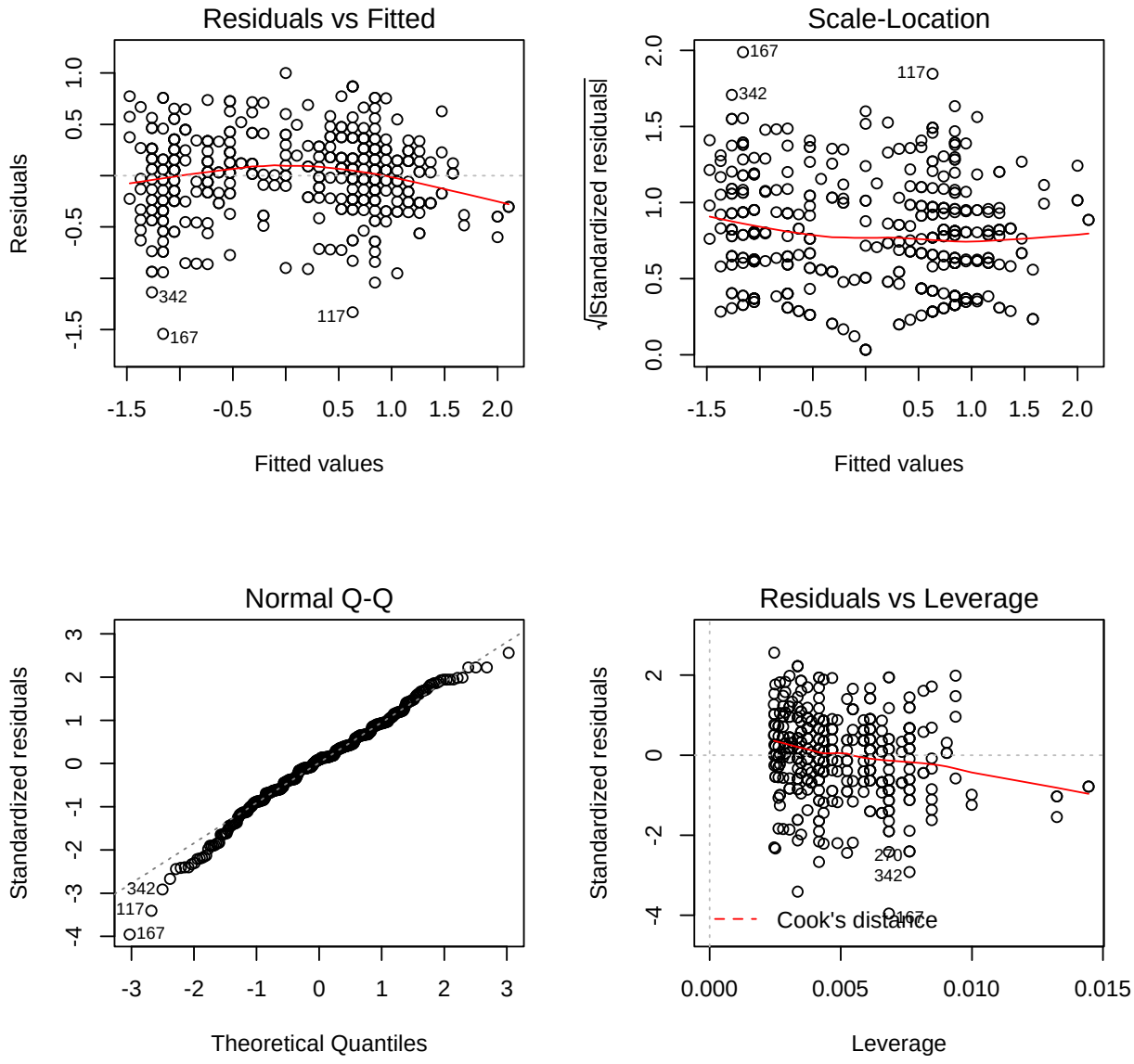


Figure XX: Linear Regression Validation – Norm(Tribs)PRE1972 vs. Norm(Scott)
Y=1.0527045553X-0.0004048692
r-squared=0.8473

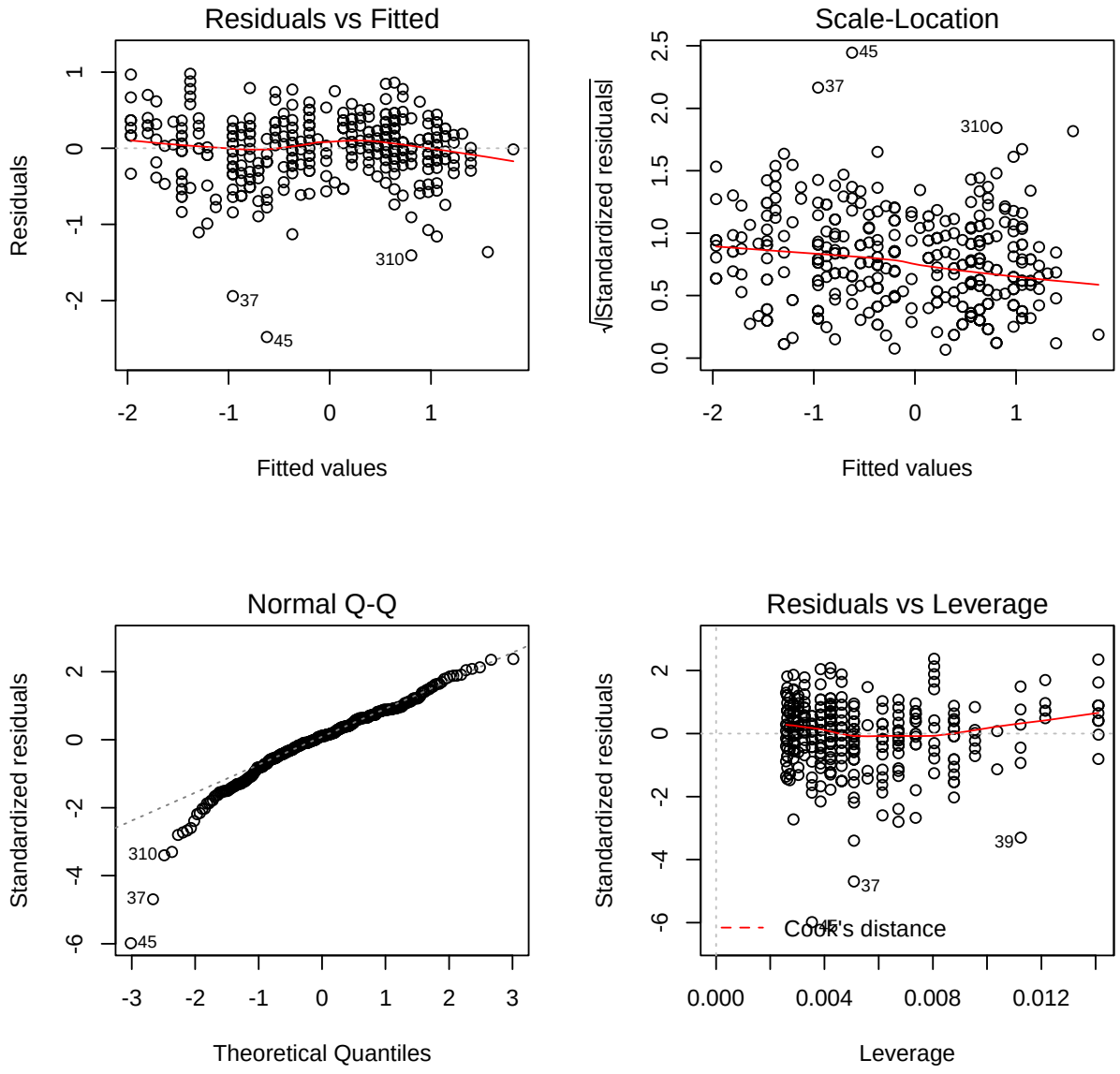
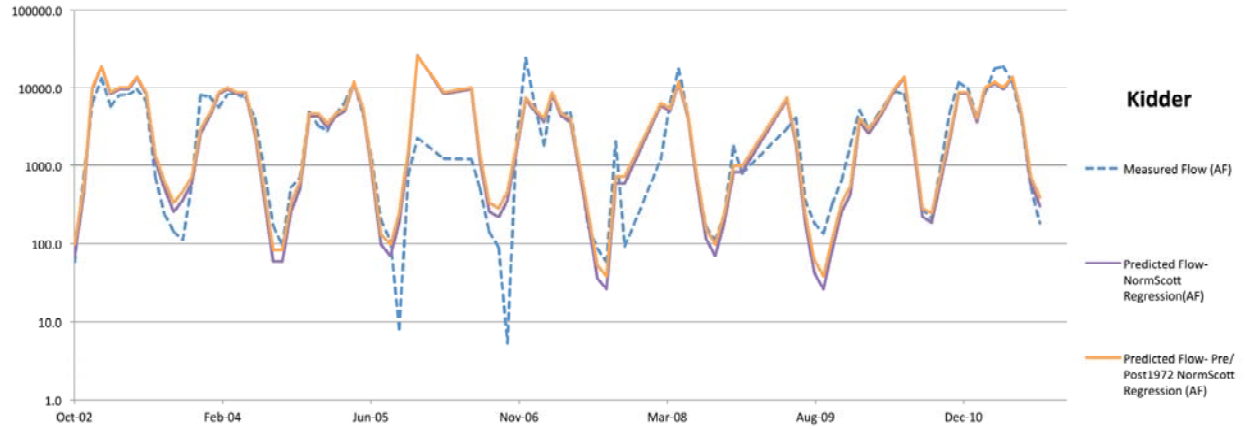


Figure XX: Linear Regression Validation – Norm(Tribs)POST1972 vs. Norm(Scott)
Y=0.8403529X+0.2177937
r-squared=0.8236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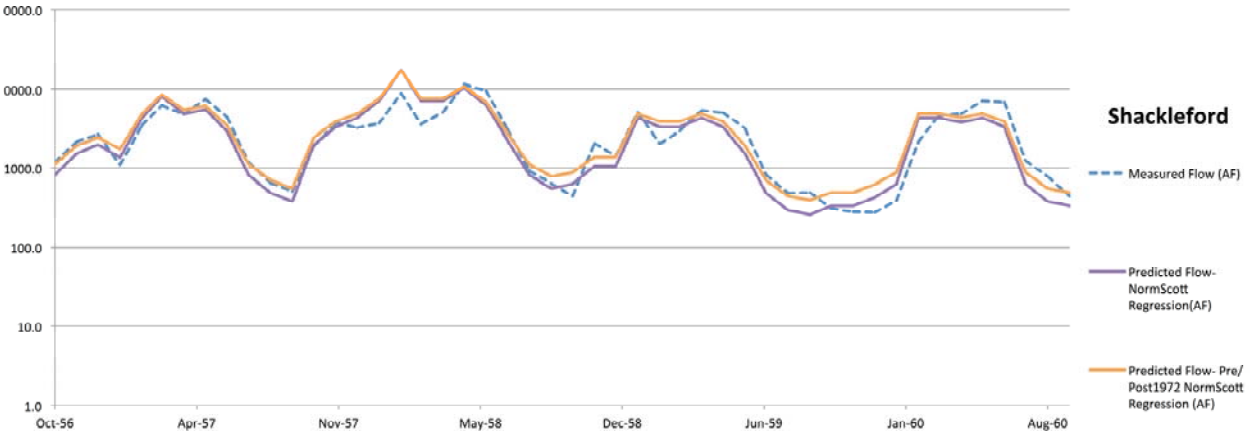
10.0
1.0
Oct-02
Feb-04
Jun-05
Nov-06
Mar-08
Aug-09
Dec-10
Measured Flow (AF)
Predicted Flow- NormScott Regression(AF)
Predicted Flow- Pre/ Post1972 NormScott Regression (AF)


Shackleford
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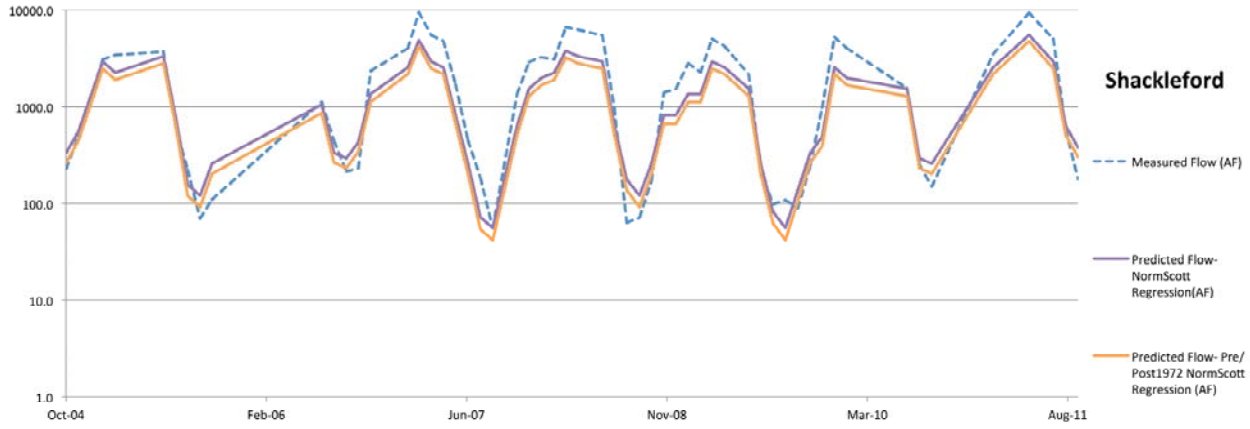
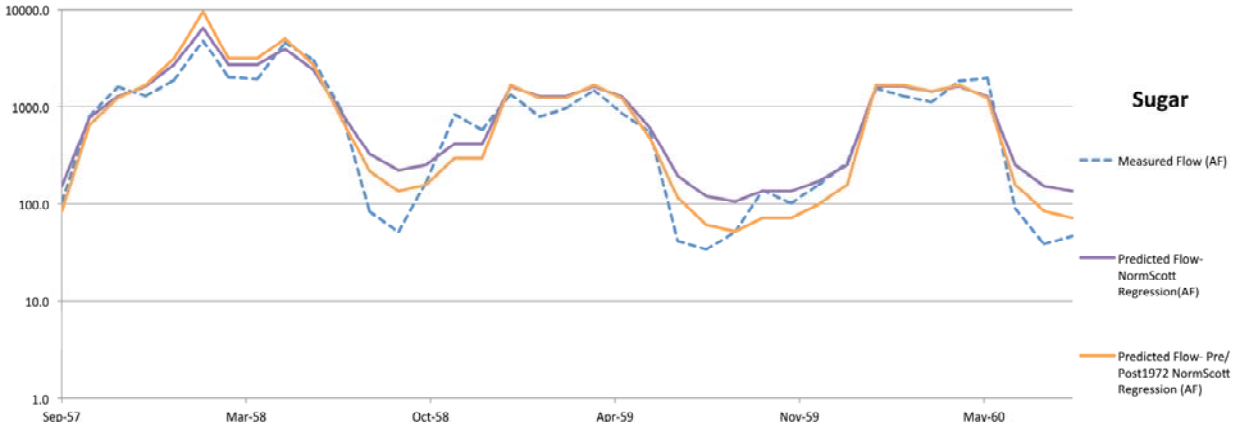
0000.0
1000.0
100.0
10.0
1.0
Oct-56
Apr-57
Nov-57
May-58
Dec-58
Jun-59
Jan-60
Aug-60
Measured Flow (AF)
Predicted Flow- NormScott Regression(AF)
Predicted Flow- Pre/ Post1972 NormScott Regression (AF)


Shackleford
10000.0
1000.0
100.0
10.0
1.0
Oct-04
Feb-06
Jun-07
Nov-08
Mar-10
Aug-11
Measured Flow (AF)
Predicted Flow- NormScott Regression(AF)
Predicted Flow- Pre/ Post1972 NormScott Regression (AF)


Sugar
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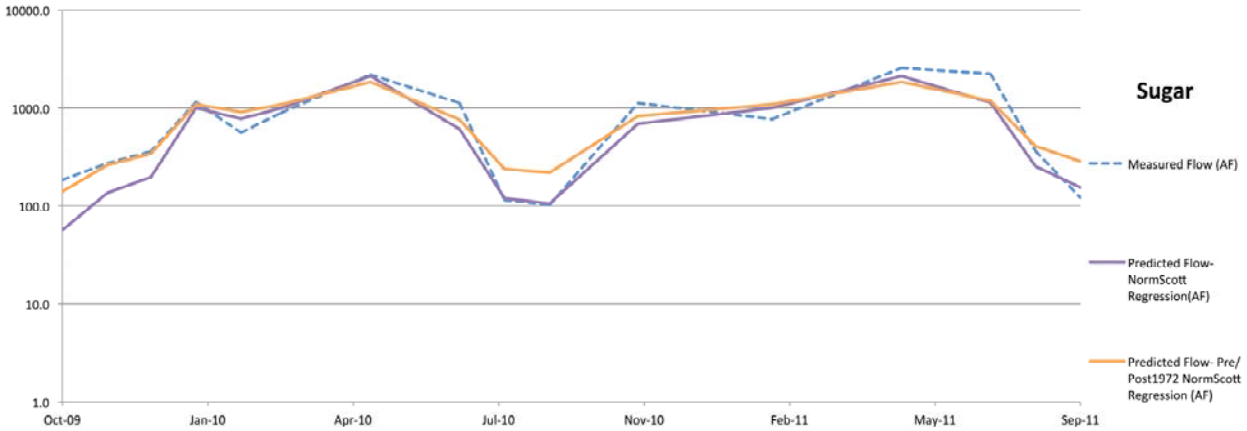
100.0
10.0
1.0
Sep-57
Mar-58
Oct-58
Apr-59
Nov-59
May-60
Measured Flow (AF)
Predicted Flow-NormScott Regression(AF)
Predicted Flow- Pre/Post1972 NormScott Regression (AF)


Sugar
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1.0
Oct-09
Jan-10
Apr-10
Jul-10
Nov-10
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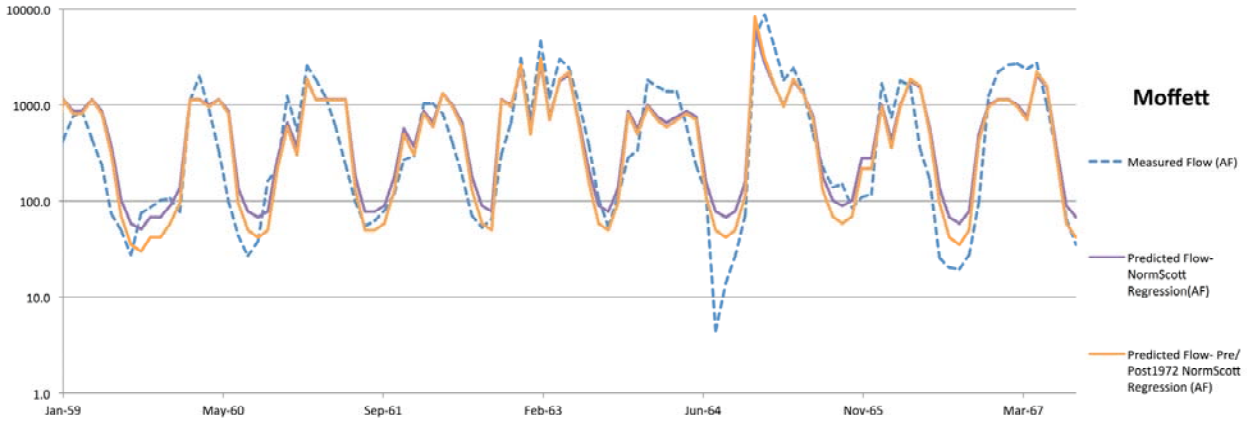
May-11
Sep-11
Measured Flow (AF)
Predicted Flow-NormScott Regression(AF)
Predicted Flow- Pre/Post1972 NormScott Regression (AF)


Moffett
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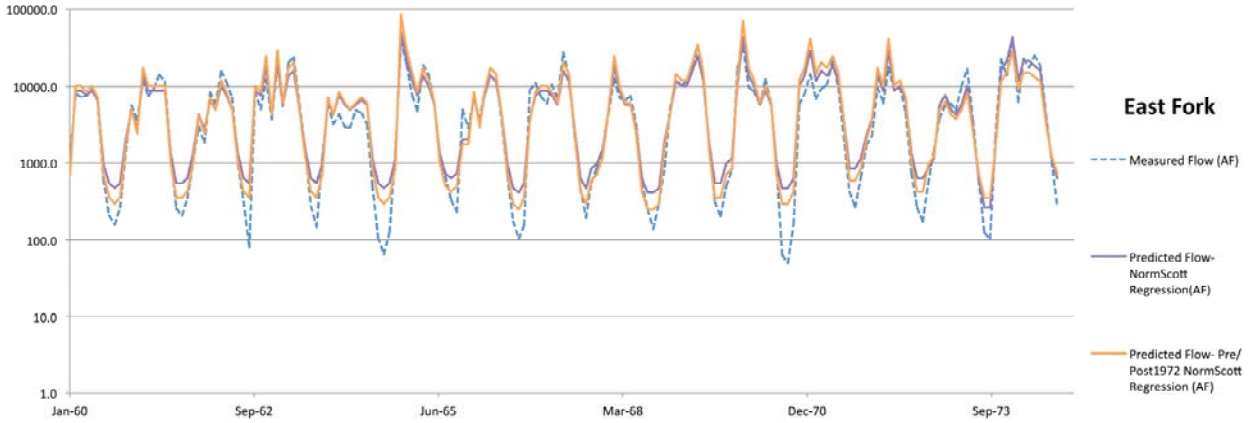
1000.0
100.0
10.0
1.0
Jan-59
May-60
Sep-61
Feb-63
Jun-64
Nov-65
Mar-67
Measured Flow (AF)
Predicted Flow-NormScott Regression(AF)
Predicted Flow- Pre/Post1972 NormScott Regression (AF)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10000.0
1000.0
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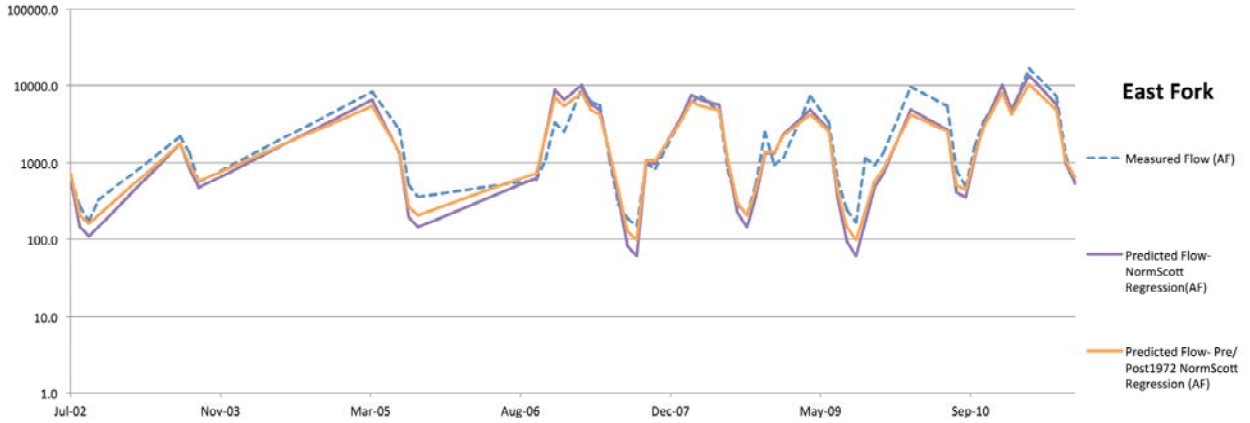
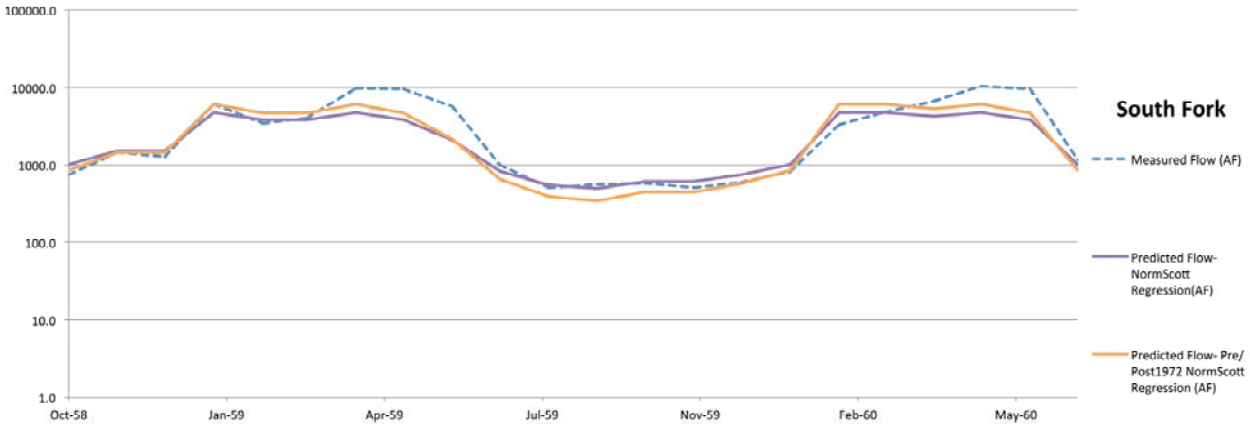
10.0
1.0
Jan-60
Sep-62
Jun-65
Mar-68
Dec-70
Sep-73
Measured Flow (AF)
Predicted Flow- NormScott Regression(AF)
Predicted Flow- Pre/ Post1972 NormScott Regression (AF)


East Fork
100000.0
10000.0
1000.0
100.0
10.0
1.0
Jul-02
Nov-03
Mar-05
Aug-06
Dec-07
May-09
Sep-10
Measured Flow (AF)
Predicted Flow- NormScott Regression(AF)
Predicted Flow- Pre/ Post1972 NormScott Regression (AF)


South Fork
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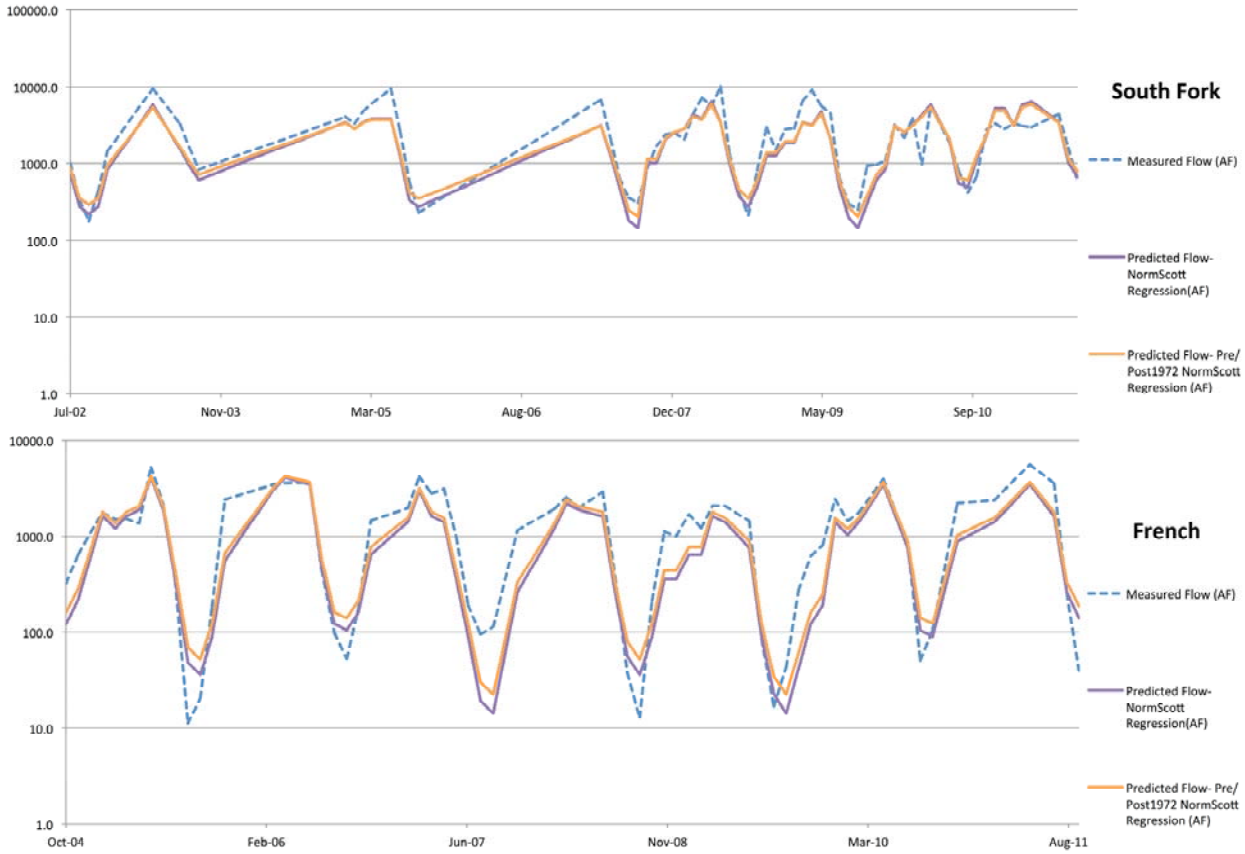
10000.0
1000.0
100.0
10.0
1.0
Oct-58
Jan-59
Apr-59
Jul-59
Nov-59
Feb-60
May-60
Measured Flow (AF)
Predicted Flow- NormScott Regression(AF)
Predicted Flow- Pre/ Post1972 NormScott Regression (AF)


South Fork
100000.0
10000.0
1000.0
100.0
10.0
1.0
Jul-02
Nov-03
Mar-05
Aug-06
Dec-07
May-09
Sep-10
Measured Flow (AF)
Predicted Flow- NormScott Regression(AF)
Predicted Flow- Pre/ Post1972 NormScott Regression (AF)
French
10000.0
1000.0
100.0
10.0
1.0
Oct-04
Feb-06
Jun-07
Nov-08
Mar-10
Aug-11
Measured Flow (AF)
Predicted Flow- NormScott Regression(AF)
Predicted Flow- Pre/ Post1972 NormScott Regression (AF)

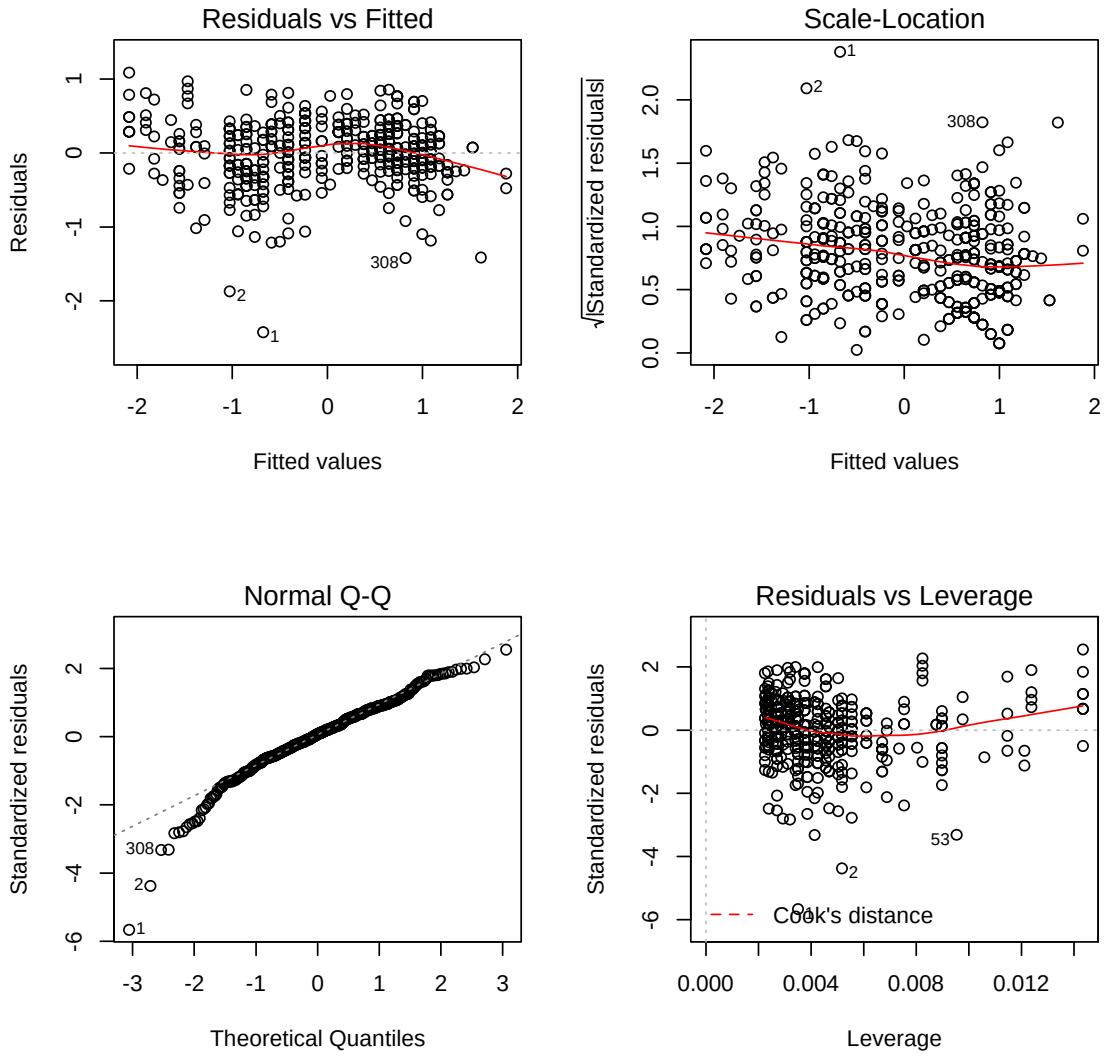


Figure XX: Linear Regression Validation – Norm(WestTribs) vs Norm(Scott)
Y=0.88107X+0.20462
r-squared=0.8141

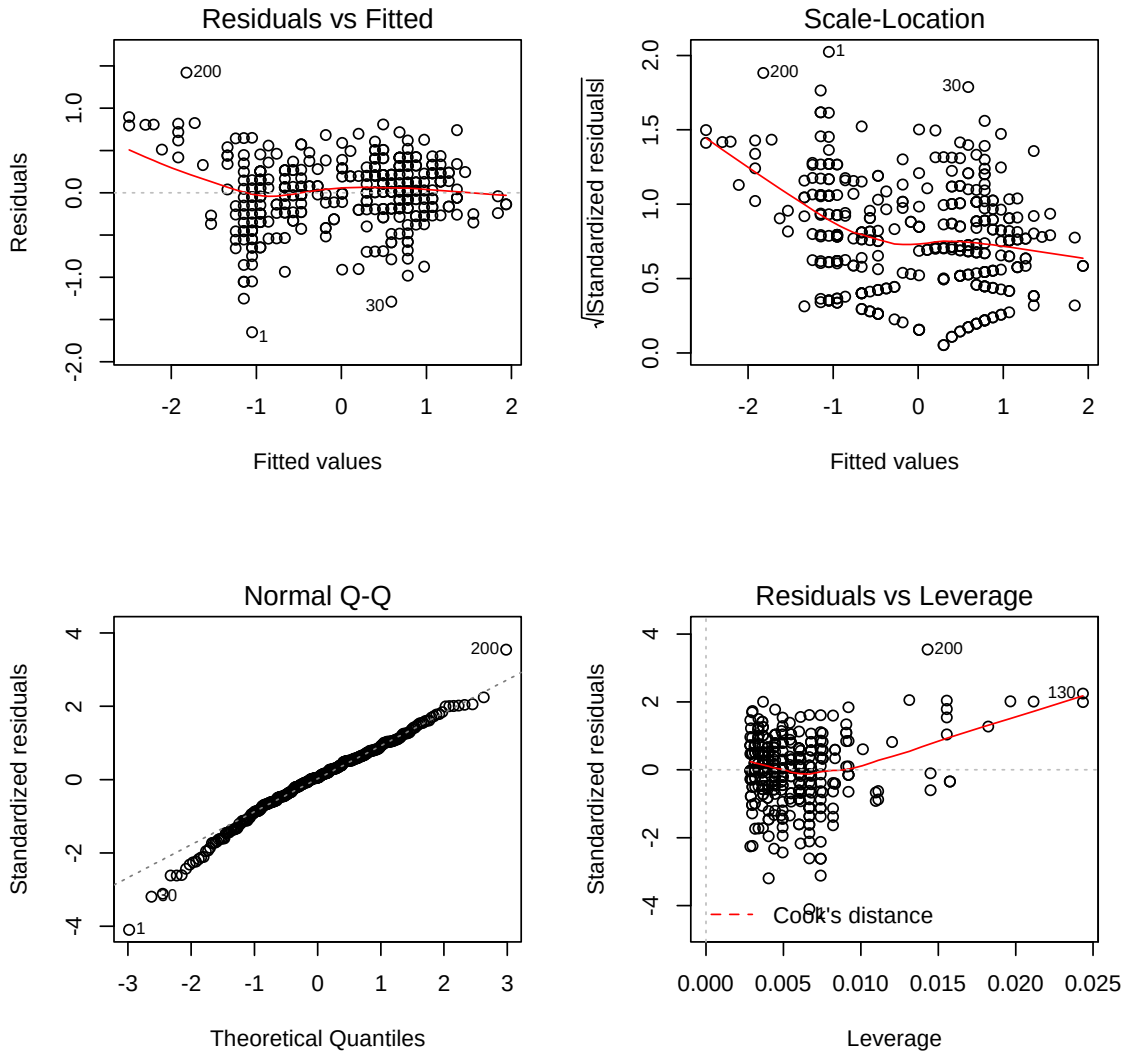


Figure XX: Linear Regression Validation – Norm(EastTribs) vs Norm(Scott)
Y=0.963748X+0.009748
r-squared=0.8370

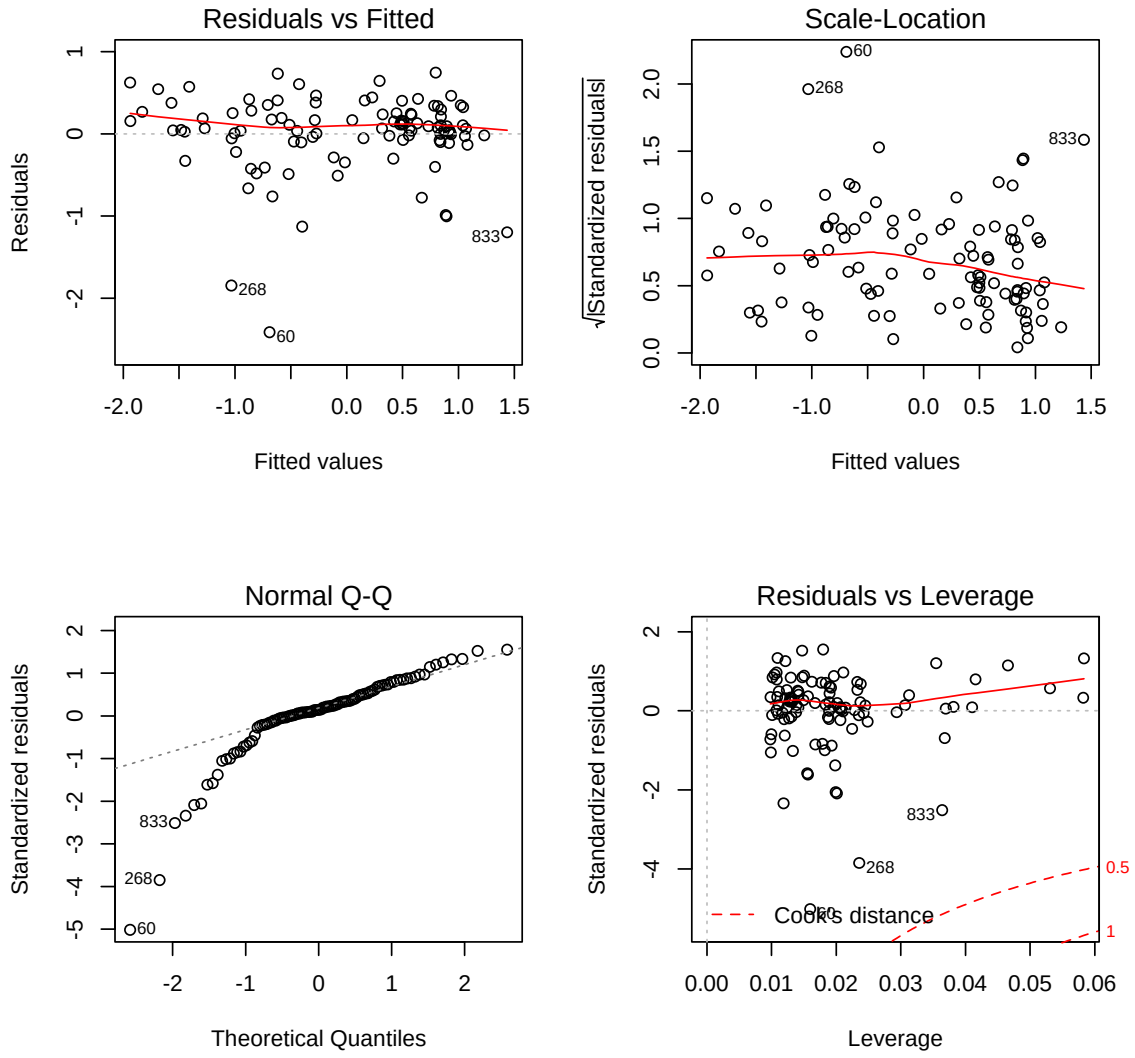
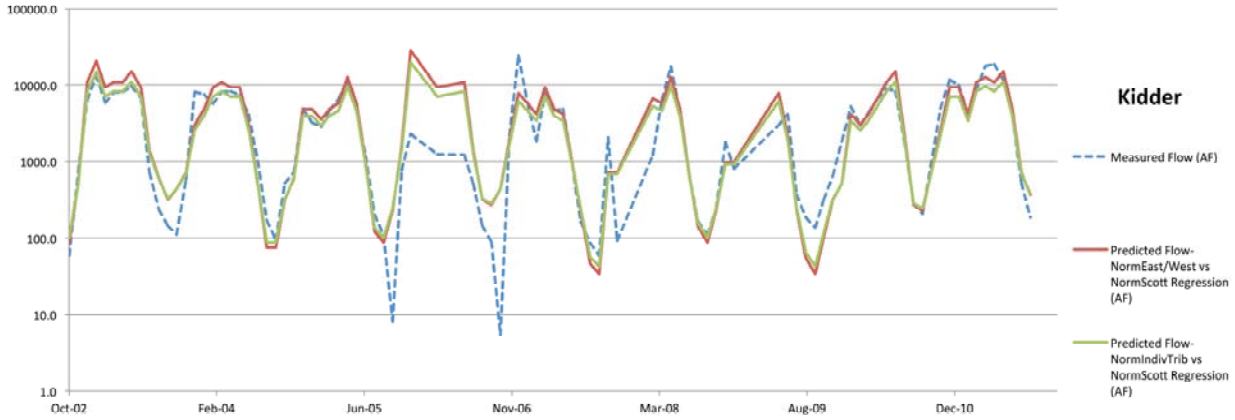


Figure XX: Linear Regression Validation – Norm(Kidder) vs Norm(Scott)
Y=0.8043904X+0.1288423
r-squared=0.7669



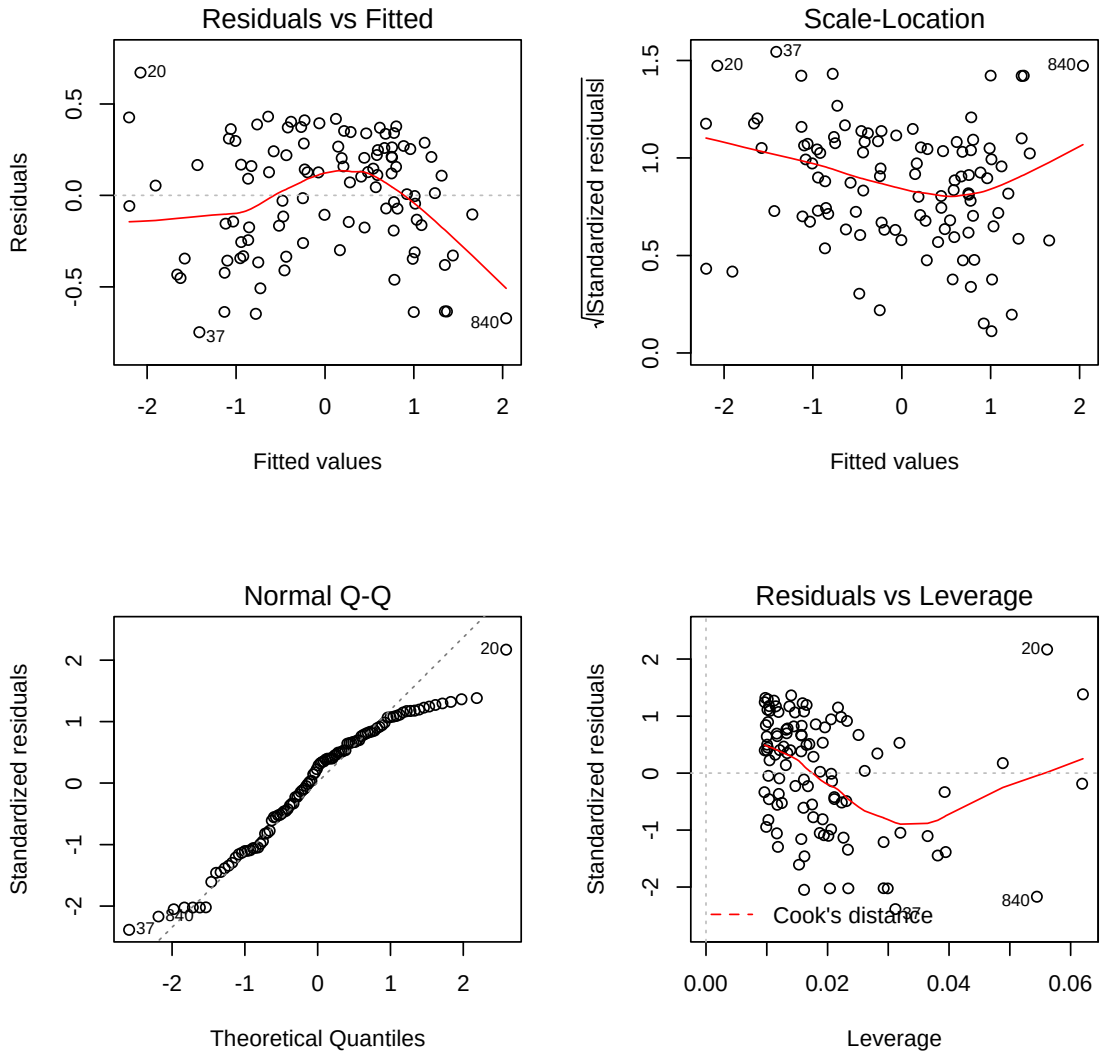
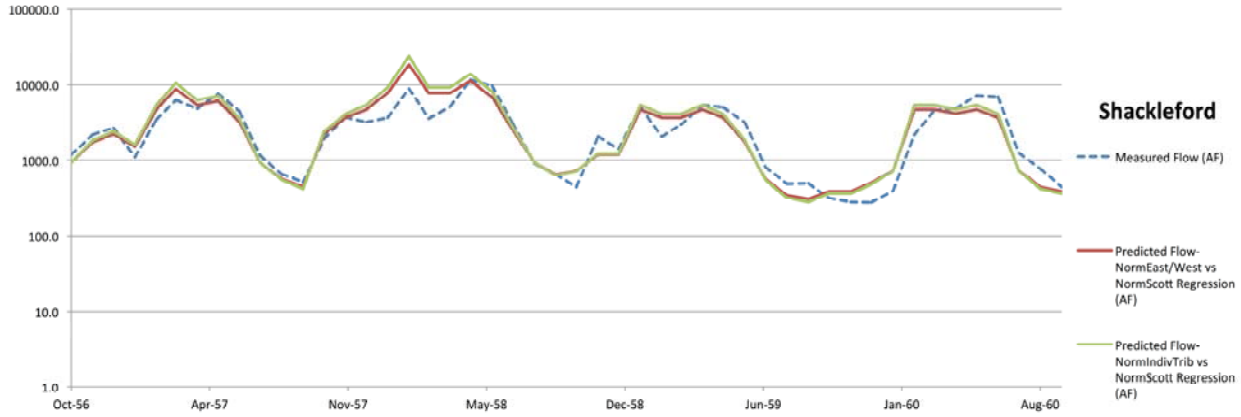


Figure XX: Linear Regression Validation – Norm(Shackleford) vs Norm(Scott)
Y=0.9520769X+0.2433991
r-squared=0.8994



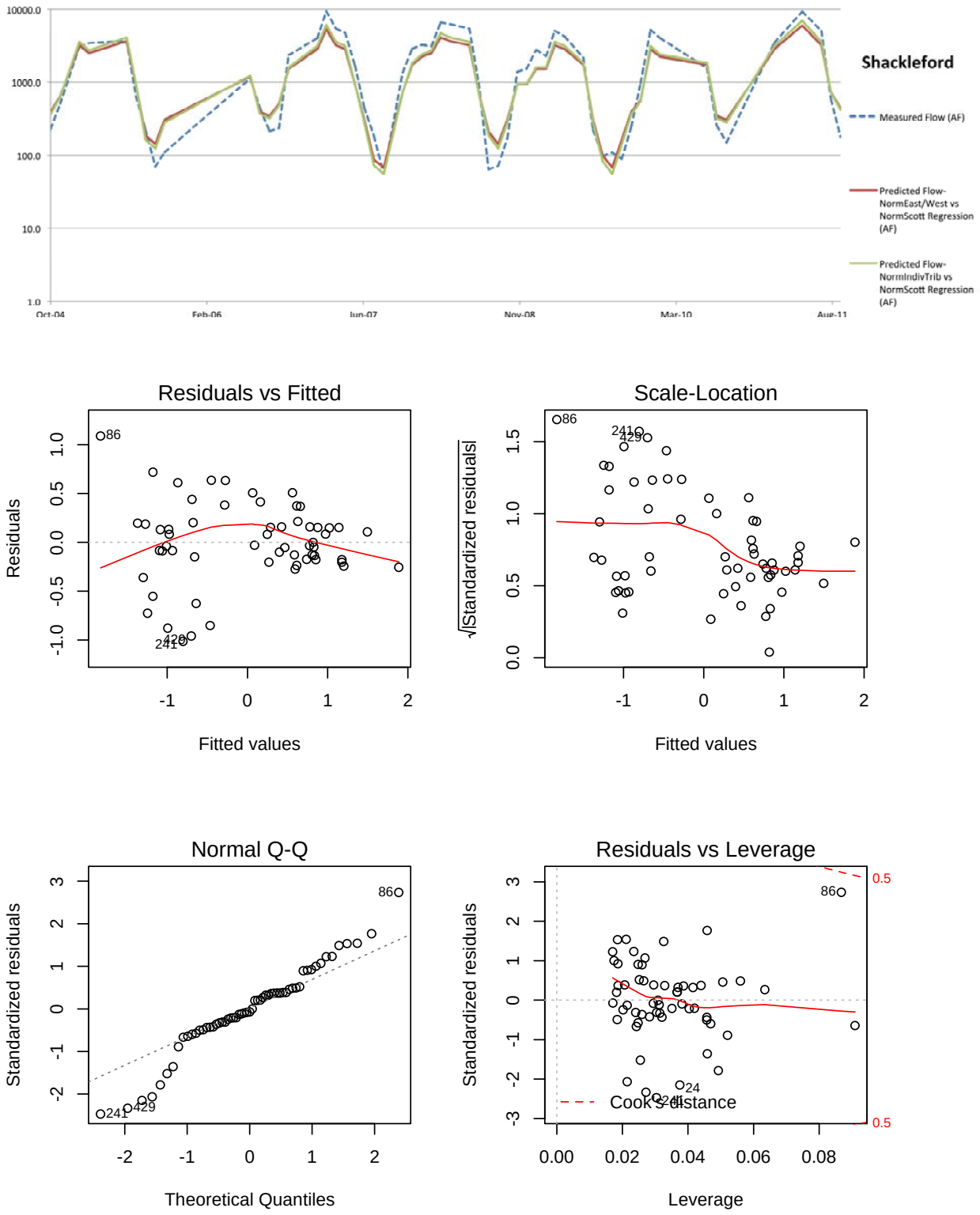
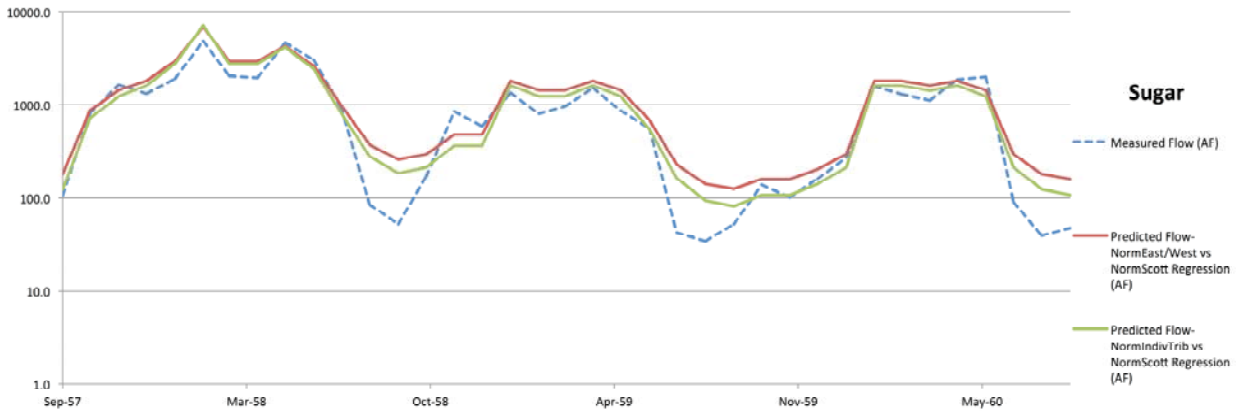
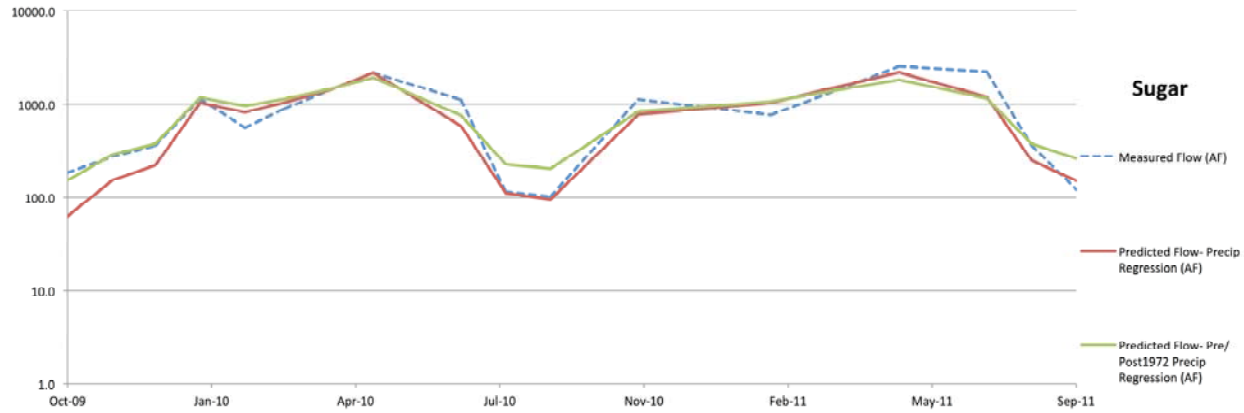


Figure XX: Linear Regression Validation – Norm(Sugar) vs Norm(Scott)
Y=0.97936973X+0.04060655
r-squared=0.8295


10000.0
1000.0
100.0
10.0
1.0
Sep-57
Mar-58
Oct-58
Apr-59
Nov-59
May-60
Sugar
Measured Flow (AF)
Predicted Flow- NormEast/West vs NormScott Regression (AF)
Predicted Flow- NormIndivTrib vs NormScott Regression (AF)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10.0
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Oct-09
Jan-10
Apr-10
Jul-10
Nov-10
Feb-11
May-11
Sep-11
Sugar
Measured Flow (AF)
Predicted Flow- Precip Regression (AF)
Predicted Flow- Pre/ Post1972 Precip Regression (AF)

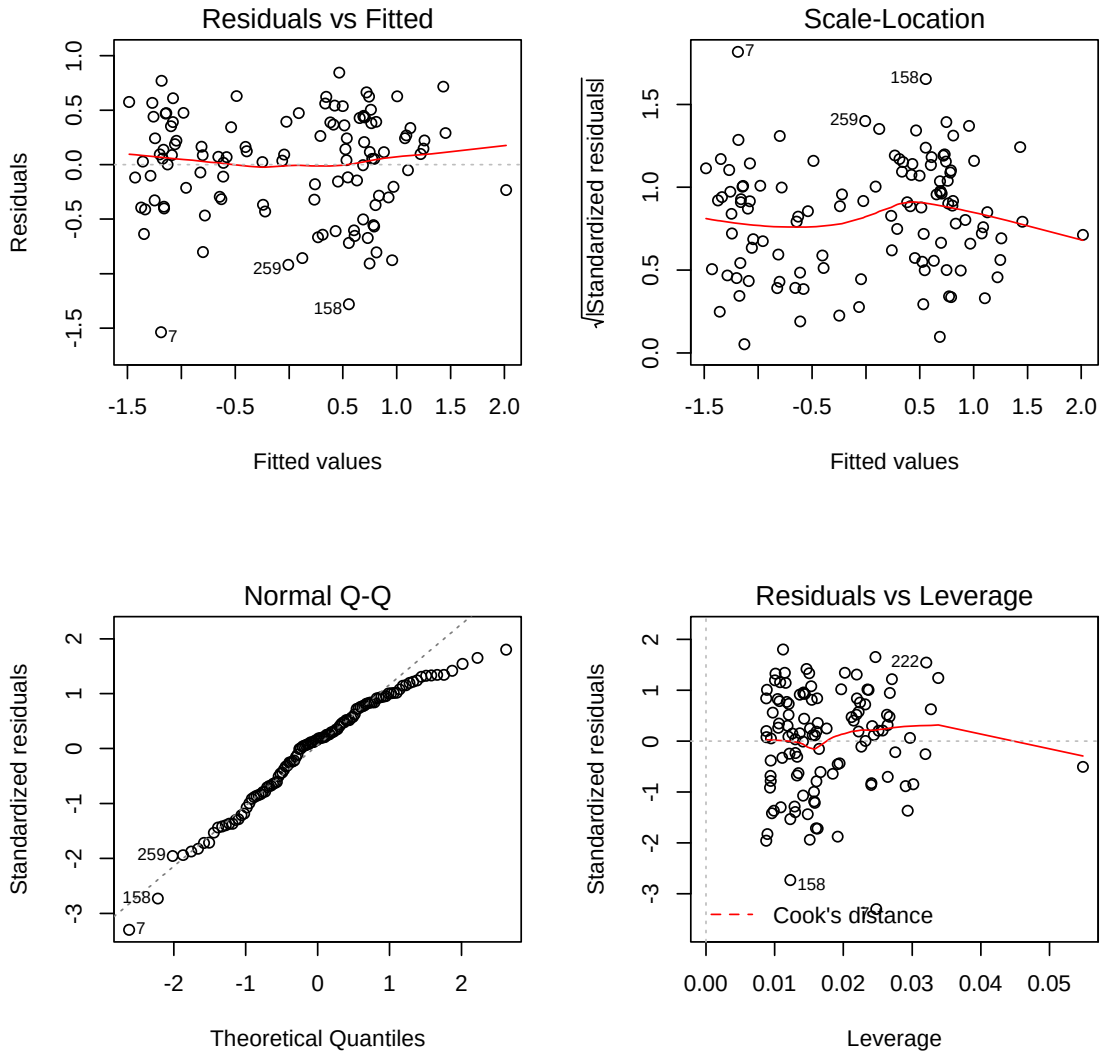
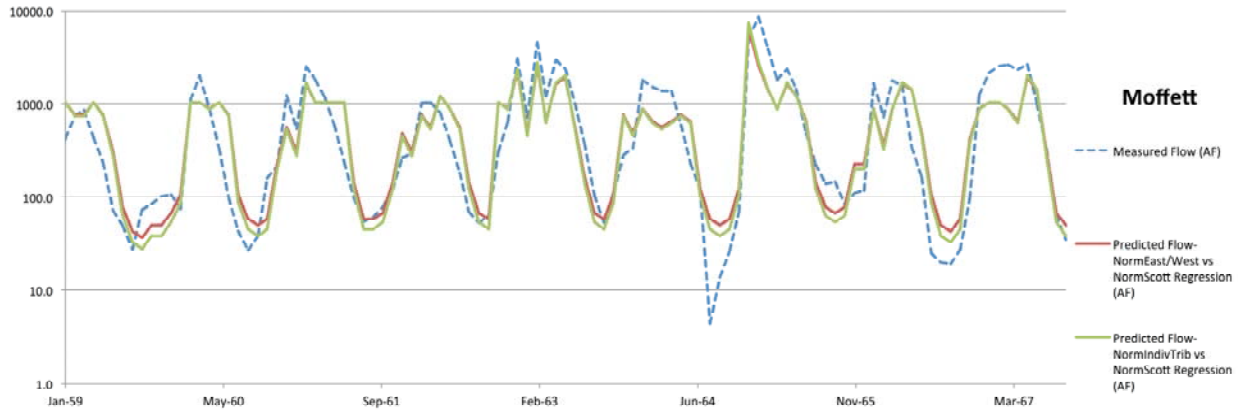


Figure XX: Linear Regression Validation – Norm(Moffett) vs Norm(Scott)
Y=1.04374231X-0.05671512
r-squared=0.7795



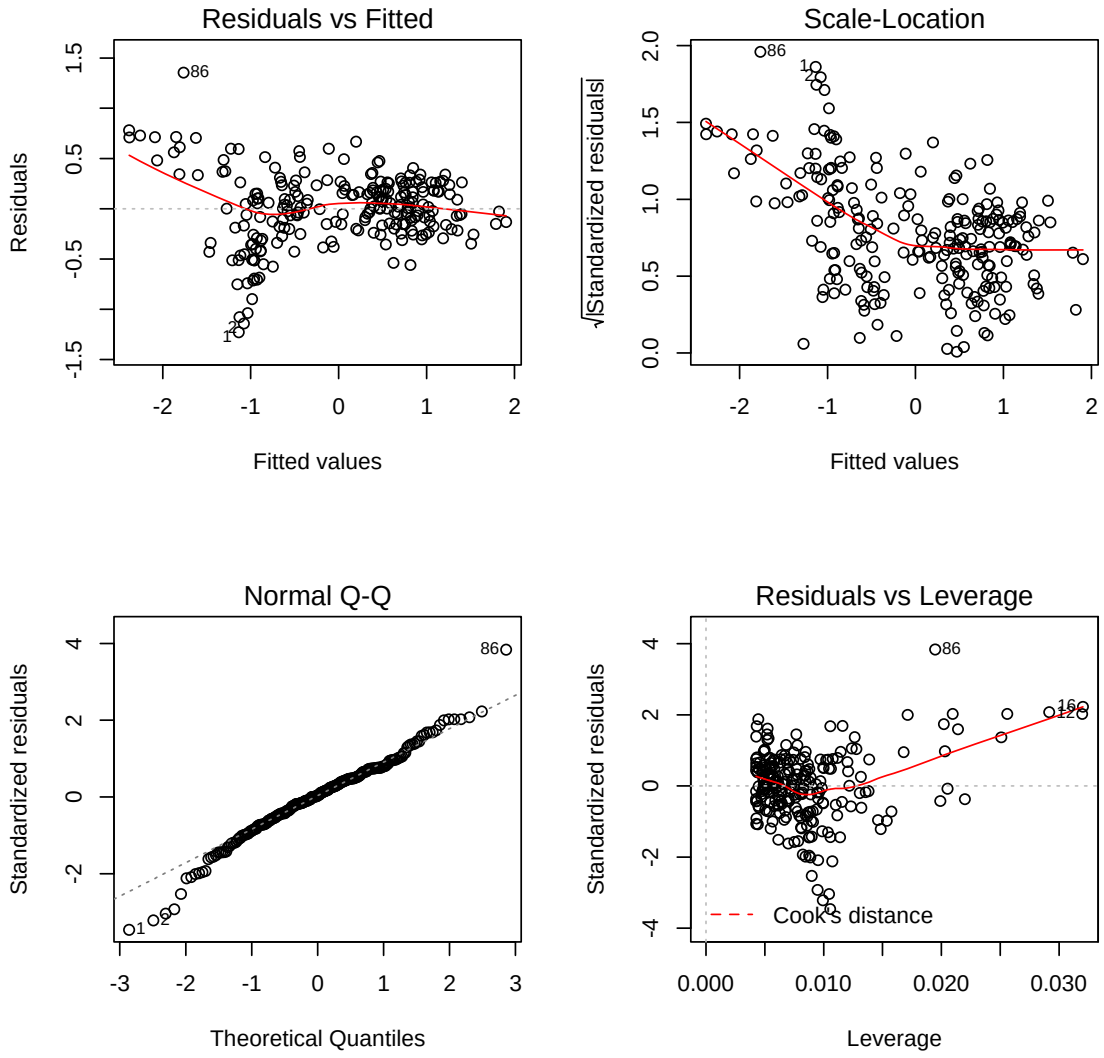
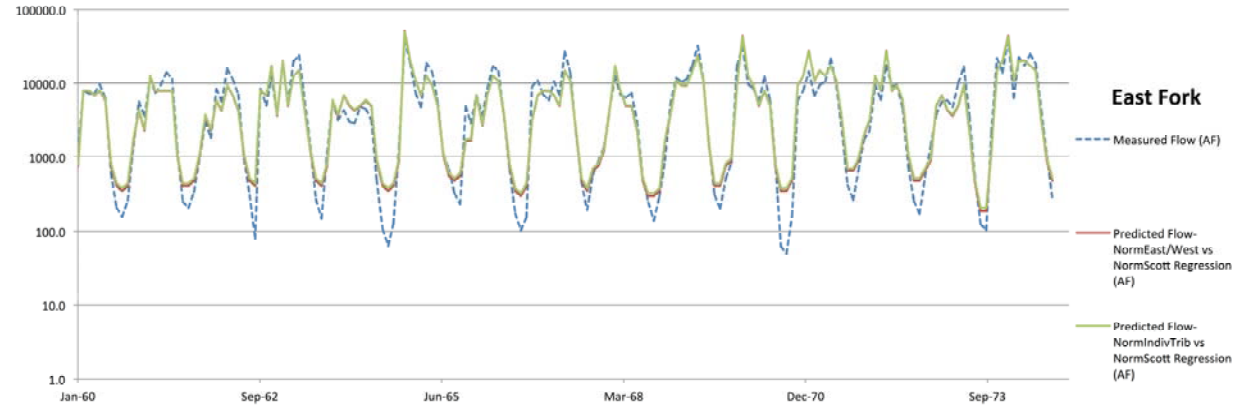
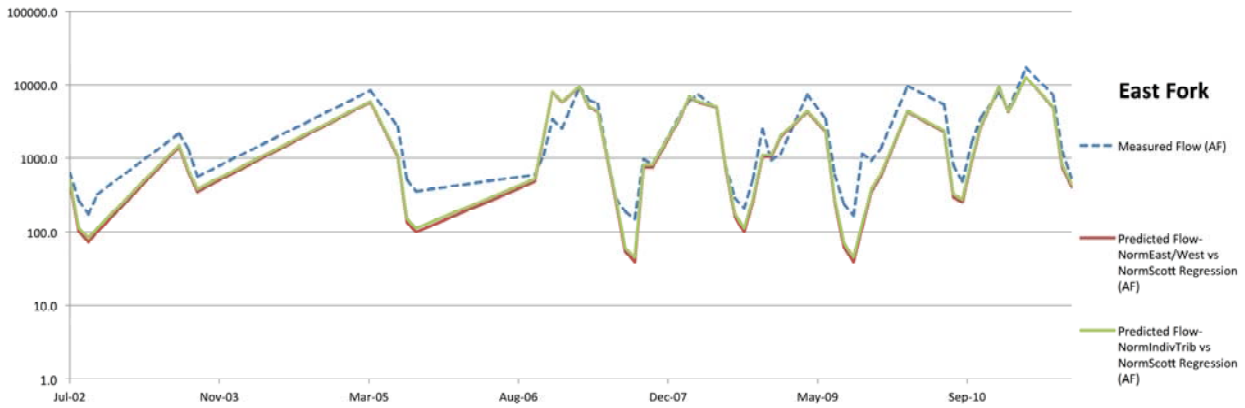


Figure XX: Linear Regression Validation – Norm(East Fork) vs Norm(Scott)
Y=0.94105316X+0.03638635
r-squared=0.8735





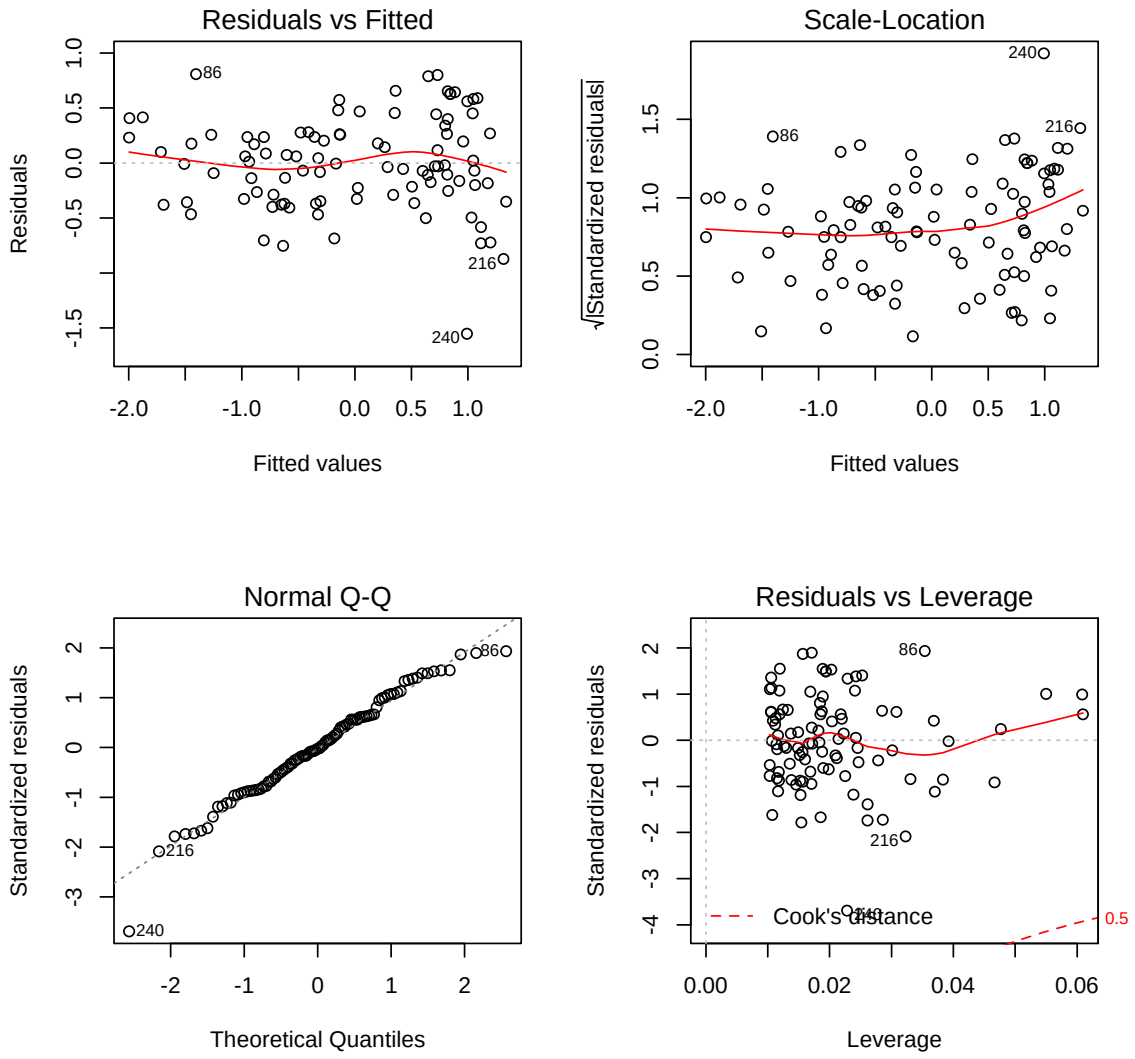
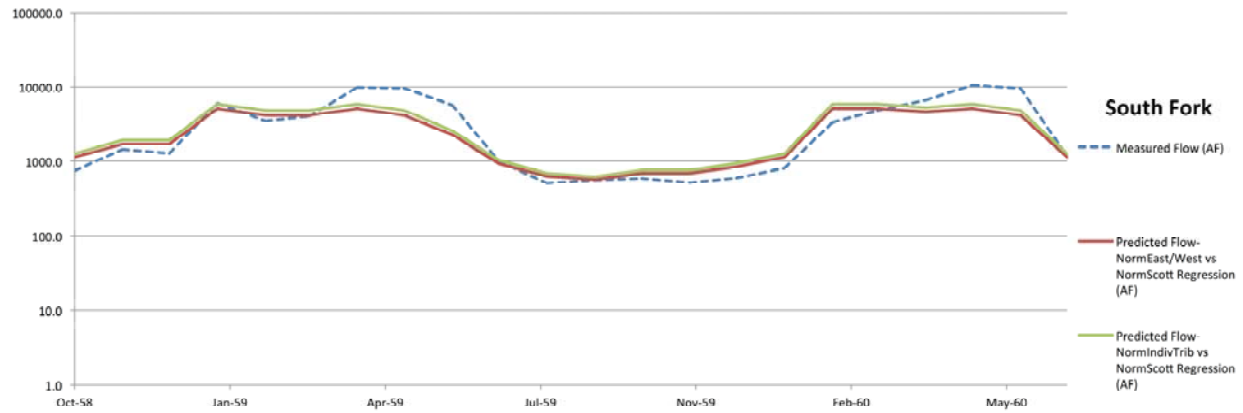


Figure XX: Linear Regression Validation – Norm(South Fork) vs Norm(Scott)
Y=0.9004591X+0.3171394
r-squared=0.8207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1000.0
100.0
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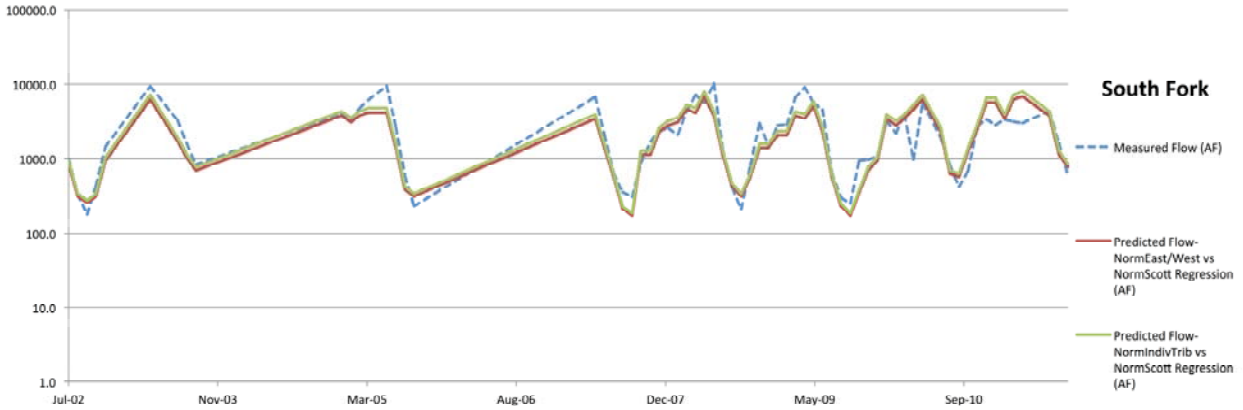
Oct-58
Jan-59
Apr-59
Jul-59
Nov-59
Feb-60
May-60
South Fork
Measured Flow (AF)
Predicted Flow-NormEast/West vs NormScott Regression (AF)
Predicted Flow-NormIndivTrib vs NormScott Regression (AF)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10000.0
1000.0
100.0
10.0
1.0
Jul-02
Nov-03
Mar-05
Aug-06
Dec-07
May-09
Sep-10
South Fork
Measured Flow (AF)
Predicted Flow-NormEast/West vs NormScott Regression (AF)
Predicted Flow-NormIndivTrib vs NormScott Regression (AF)

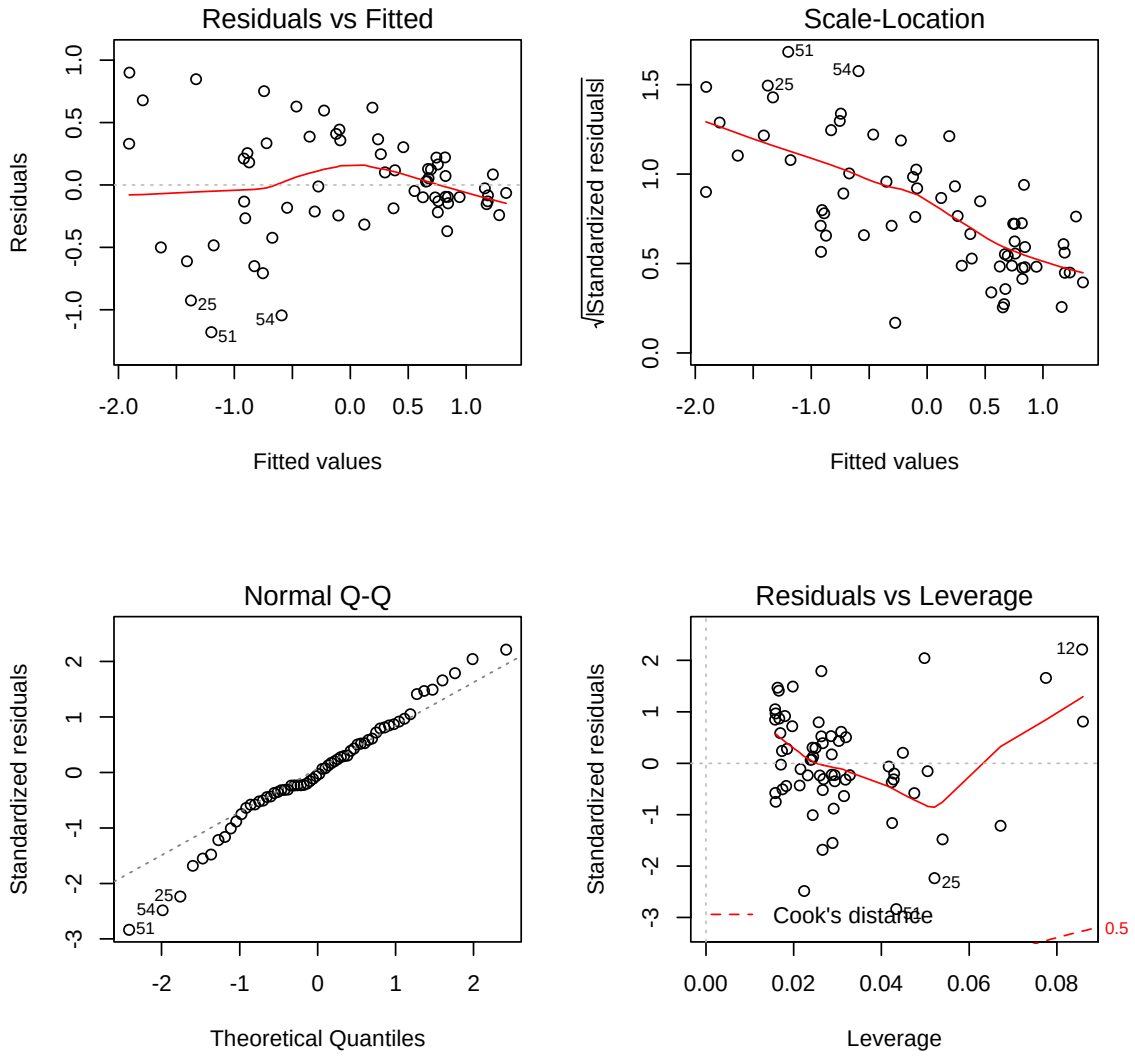
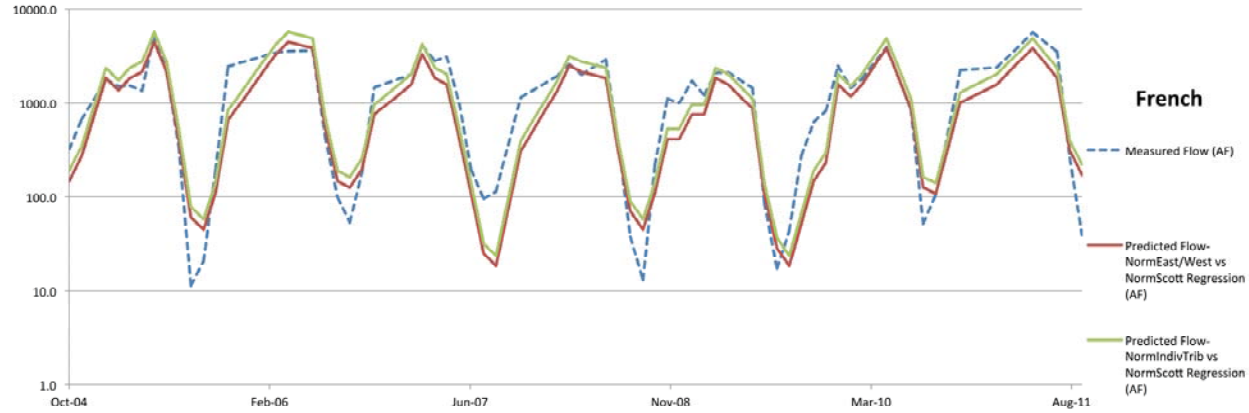


Figure XX: Linear Regression Validation – Norm(French) vs Norm(Scott)
Y=0.8786790X+0.3504734
r-squared=0.8217



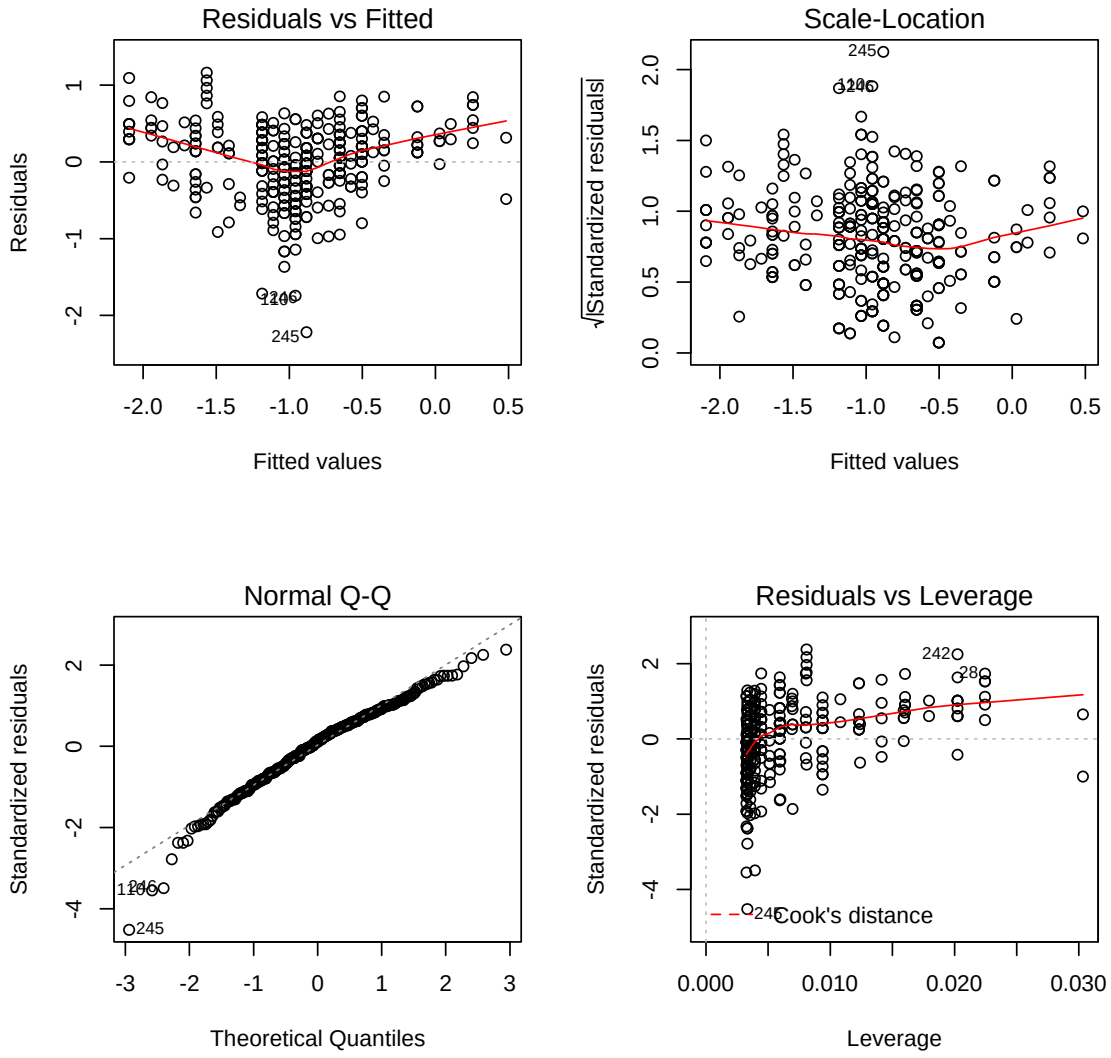
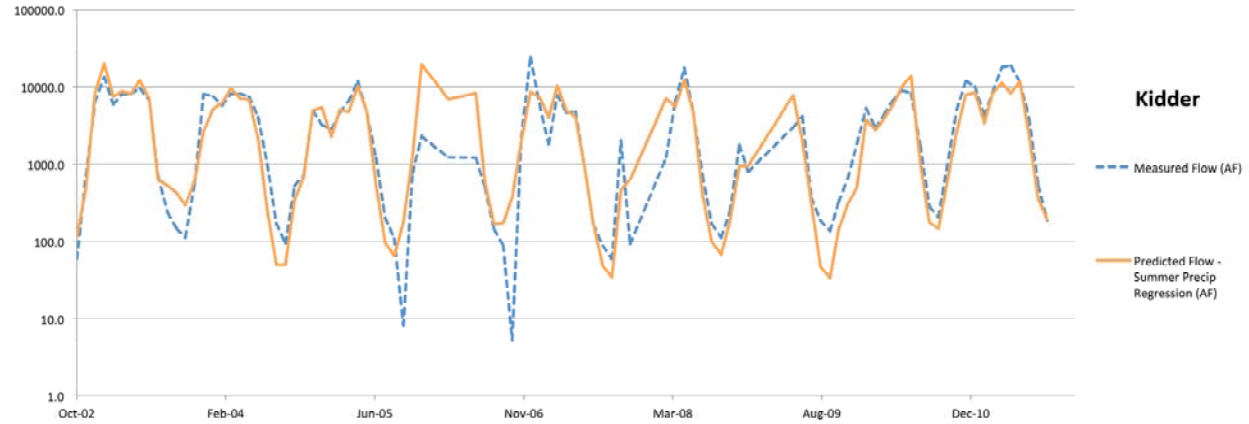
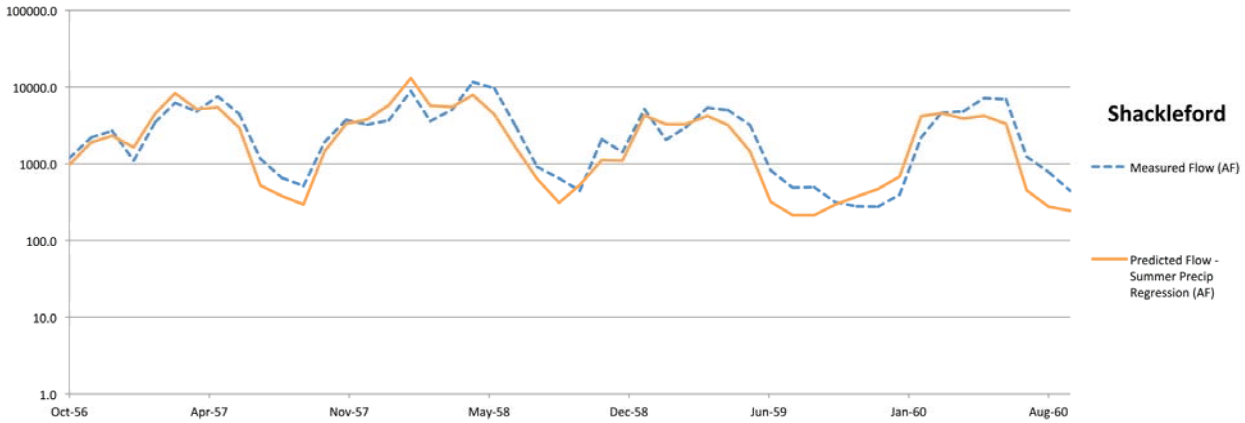


Figure XX: Linear Regression Validation – Norm(TribsSummer) vs Norm(Scott)
Y=0.7584698X-0.1233600
r-squared=0.5089

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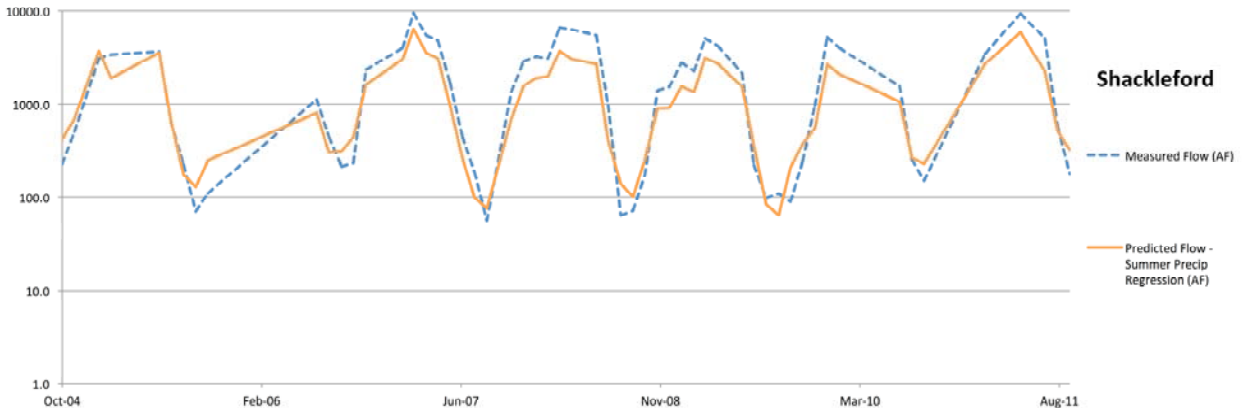
Oct-56
Apr-57
Nov-57
May-58
Dec-58
Jun-59
Jan-60
Aug-60
Shackleford
Measured Flow (AF)
Predicted Flow - Summer Precip Regression (AF)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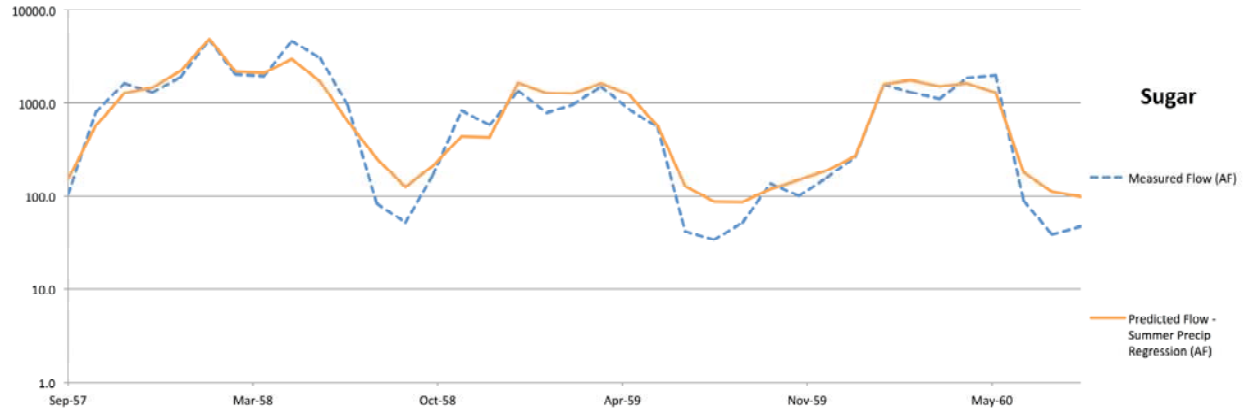
10.0
1.0
Oct-04
Feb-06
Jun-07
Nov-08
Mar-10
Aug-11
Shackleford
Measured Flow (AF)
Predicted Flow - Summer Precip Regression (AF)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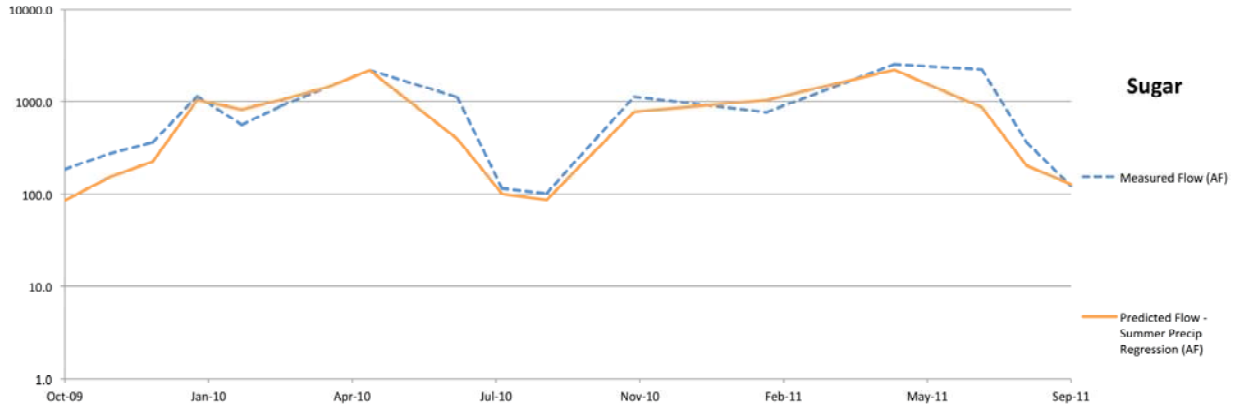
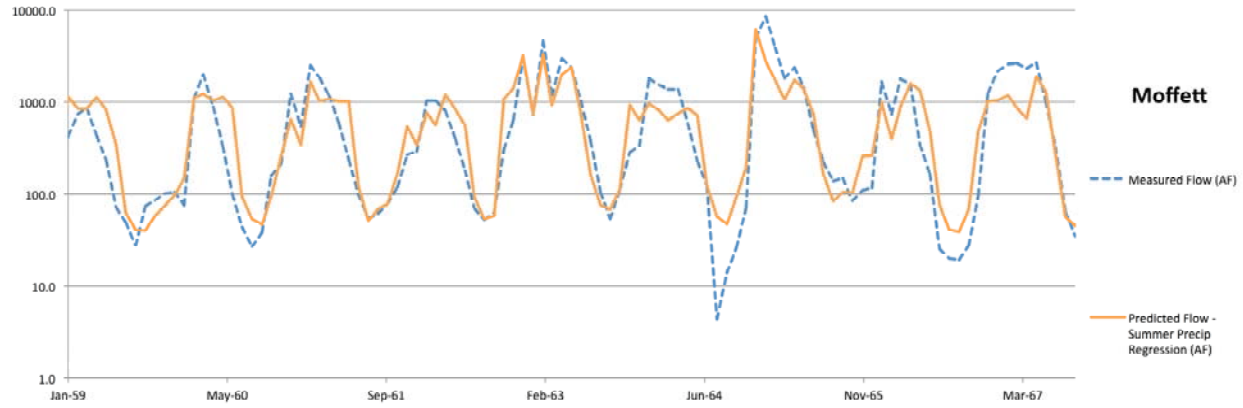
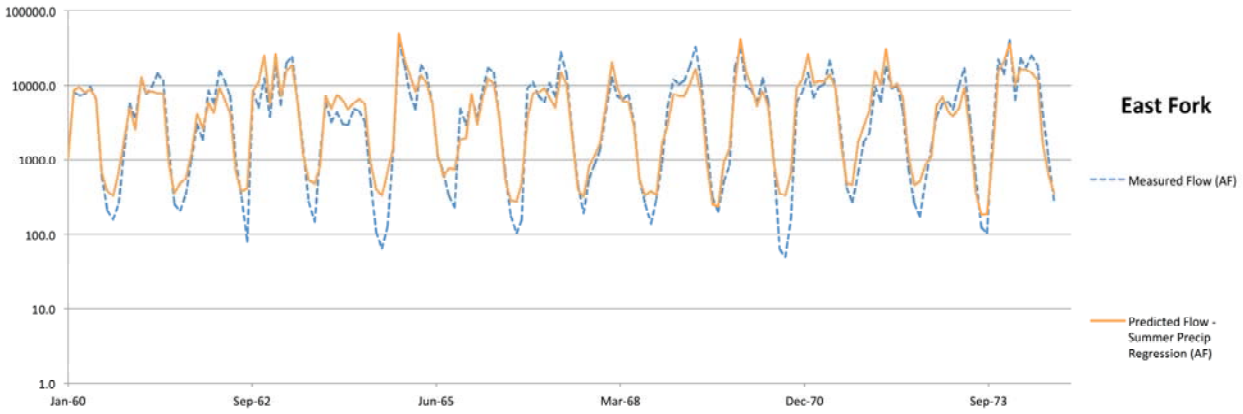
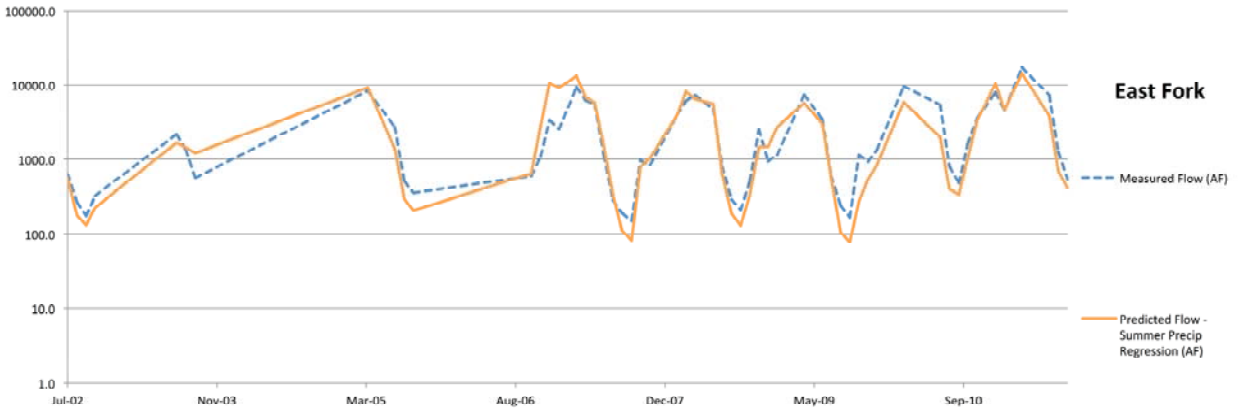
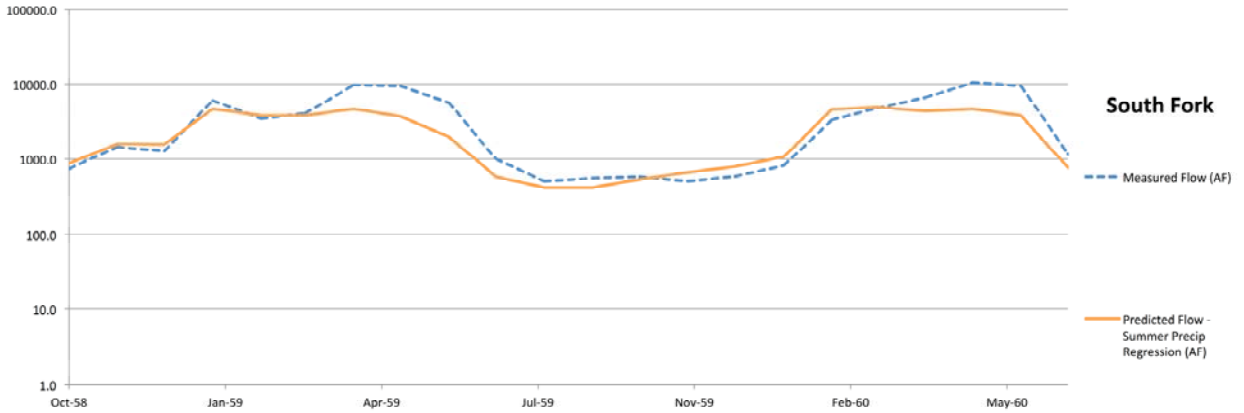
100.0
10.0
1.0
Sep-57
Mar-58
Oct-58
Apr-59
Nov-59
May-60
Sugar
Measured Flow (AF)
Predicted Flow - Summer Precip Regression (AF)

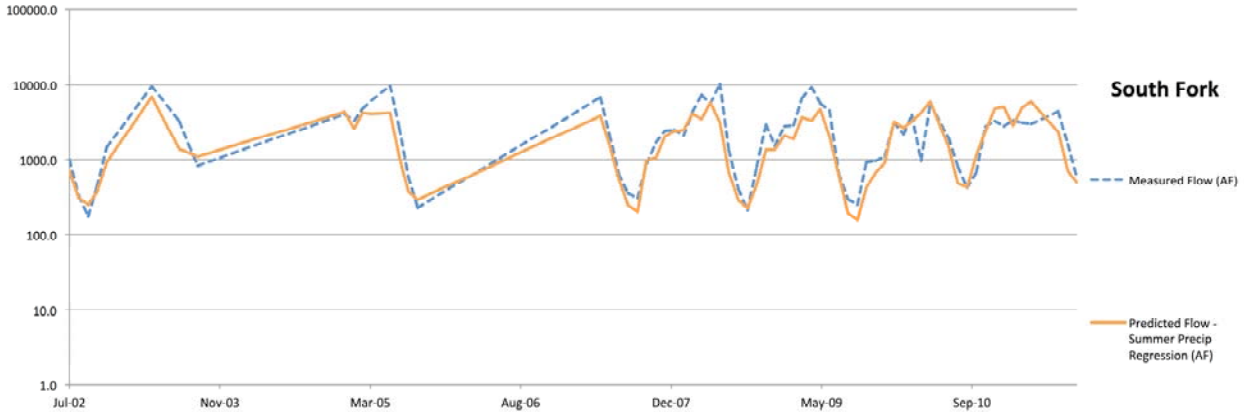

Sugar
10000.0
1000.0
100.0
10.0
1.0
Oct-09
Jan-10
Apr-10
Jul-10
Nov-10
Feb-11
May-11
Sep-11
Measured Flow (AF)
Predicted Flow - Summer Precip Regression (AF)

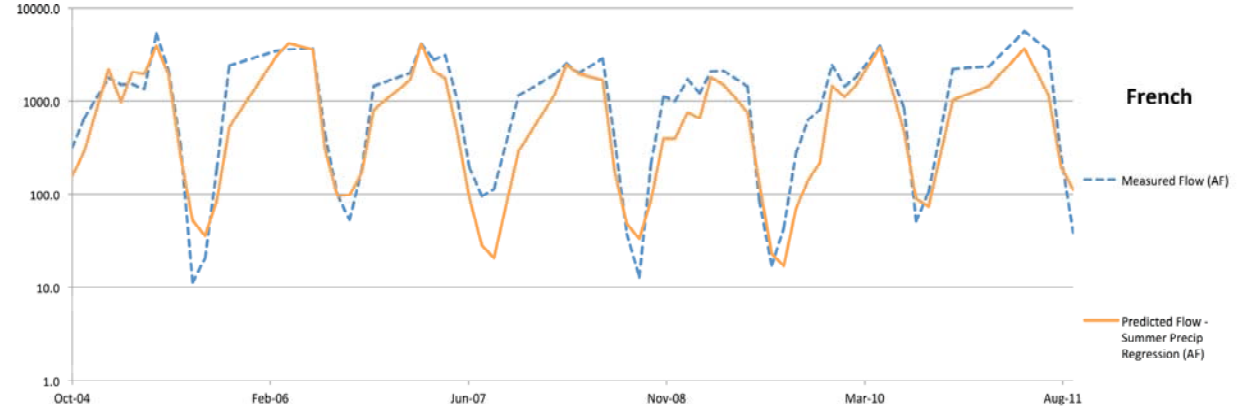

Moffett
10000.0
1000.0
100.0
10.0
1.0
Jan-59
May-60
Sep-61
Feb-63
Jun-64
Nov-65
Mar-67
Measured Flow (AF)
Predicted Flow - Summer Precip Regression (AF)


East Fork
100000.0
10000.0
1000.0
100.0
10.0
1.0
Jan-60
Sep-62
Jun-65
Mar-68
Dec-70
Sep-73
Measured Flow (AF)
Predicted Flow - Summer Precip Regression (AF)


East Fork
100000.0
10000.0
1000.0
100.0
10.0
1.0
Jul-02
Nov-03
Mar-05
Aug-06
Dec-07
May-09
Sep-10
Measured Flow (AF)
Predicted Flow - Summer Precip Regression (AF)


South Fork
100000.0
10000.0
1000.0
100.0
10.0
1.0
Oct-58
Jan-59
Apr-59
Jul-59
Nov-59
Feb-60
May-60
Measured Flow (AF)
Predicted Flow - Summer Precip Regression (AF)


South Fork
100000.0
10000.0
1000.0
100.0
10.0
1.0
Jul-02
Nov-03
Mar-05
Aug-06
Dec-07
May-09
Sep-10
Measured Flow (AF)
Predicted Flow - Summer Precip Regression (AF)


French
10000.0
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100.0
10.0
1.0
Oct-04
Feb-06
Jun-07
Nov-08
Mar-10
Aug-11
Measured Flow (AF)
Predicted Flow - Summer Precip Regression (AF)

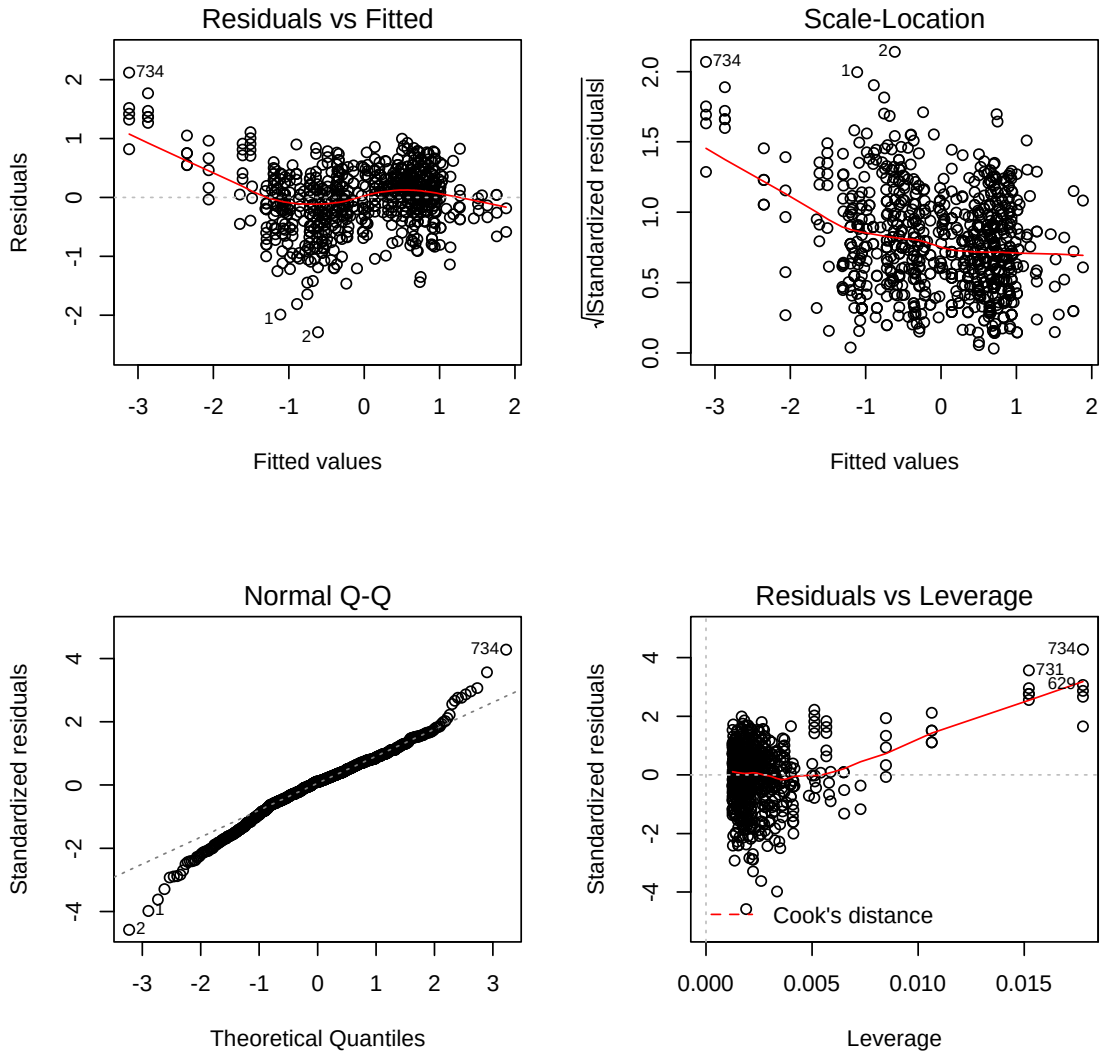


Figure XX: Linear Regression Validation – Norm(Tribs) vs $\frac{\text{Norm(Scott)}}{\sqrt{\text{WYPrecip} * \text{AvgSnowWC}}}$

Y=18.6556812X+0.1422847
r-squared=0.3697

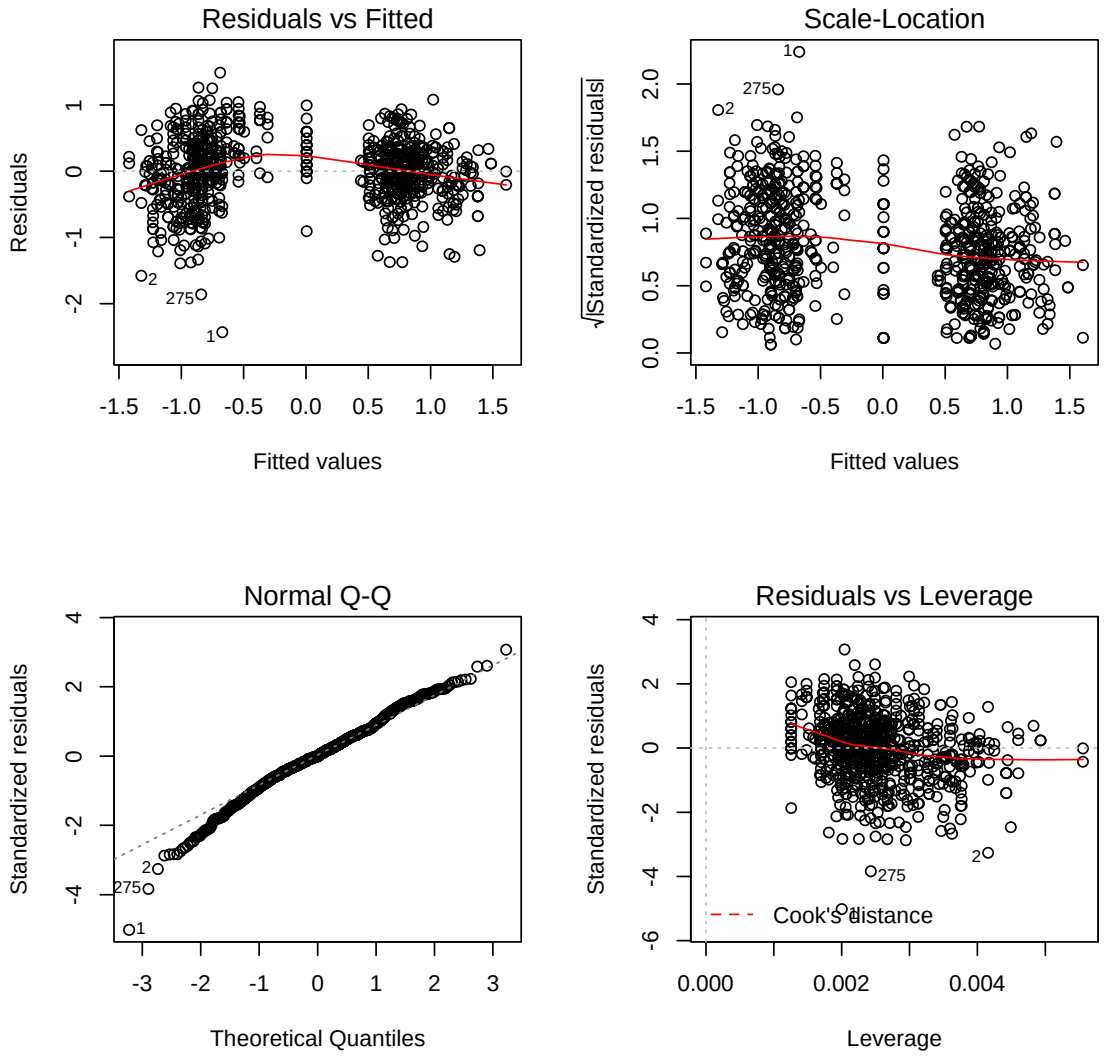
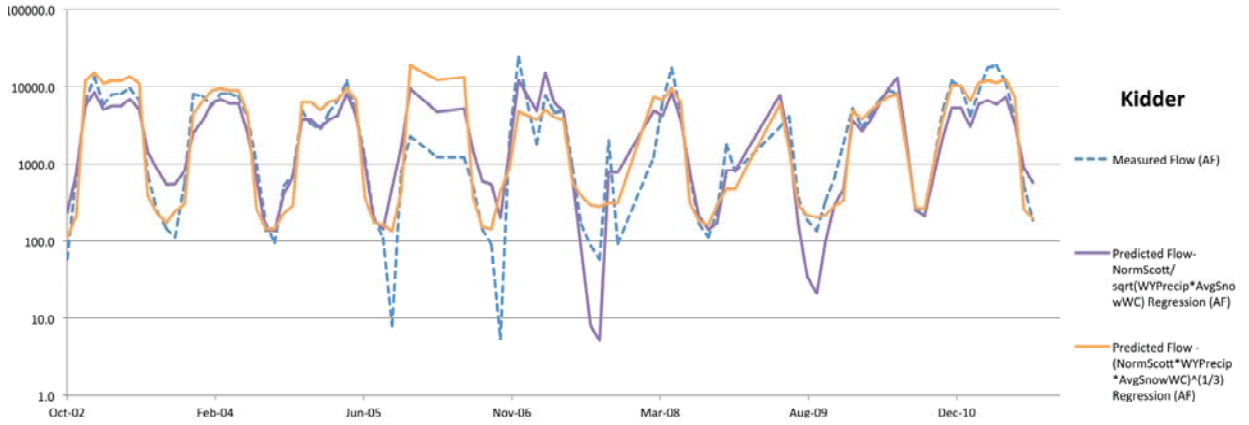
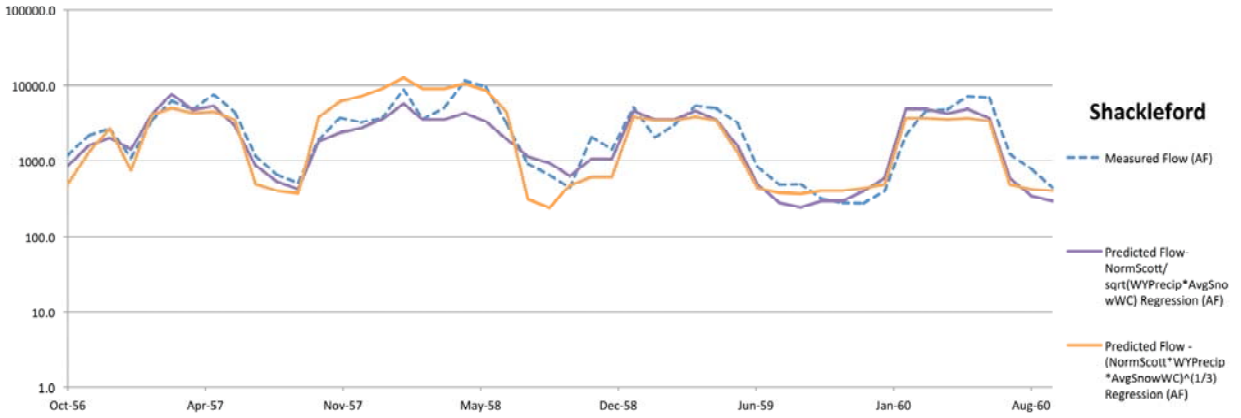


Figure XX: Linear Regression Validation – Norm(Tribs) vs $\sqrt[3]{\text{Norm(Scott)} * \text{WYPrecip} * \text{AvgSnowWC}}$

Y=0.111770079X+0.006066384

r-squared=0.7627

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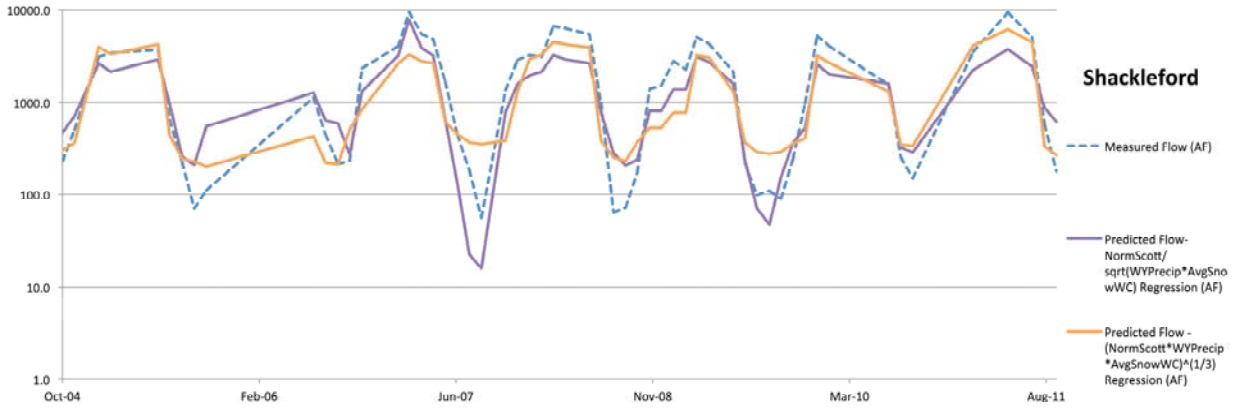
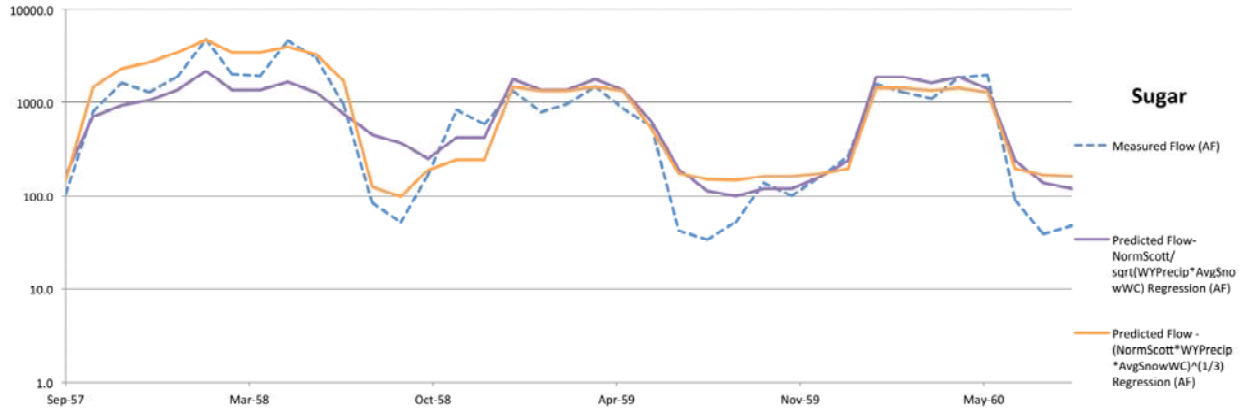
10000.0
1000.0
100.0
10.0
1.0
Oct-56
Apr-57
Nov-57
May-58
Dec-58
Jun-59
Jan-60
Aug-60
Shackleford
Measured Flow (AF)
Predicted Flow-NormScott/sqrt(WYPrecip*AvgSnowWC) Regression (AF)
Predicted Flow - (NormScott*WYPrecip*AvgSnowWC)^(1/3) Regression (AF)


10000.0
1000.0
100.0
10.0
1.0
Oct-04
Feb-06
Jun-07
Nov-08
Mar-10
Aug-11
Shackleford
Measured Flow (AF)
Predicted Flow-NormScott/sqrt(WYPrecip*AvgSnowWC) Regression (AF)
Predicted Flow - (NormScott*WYPrecip*AvgSnowWC)^(1/3) Regression (AF)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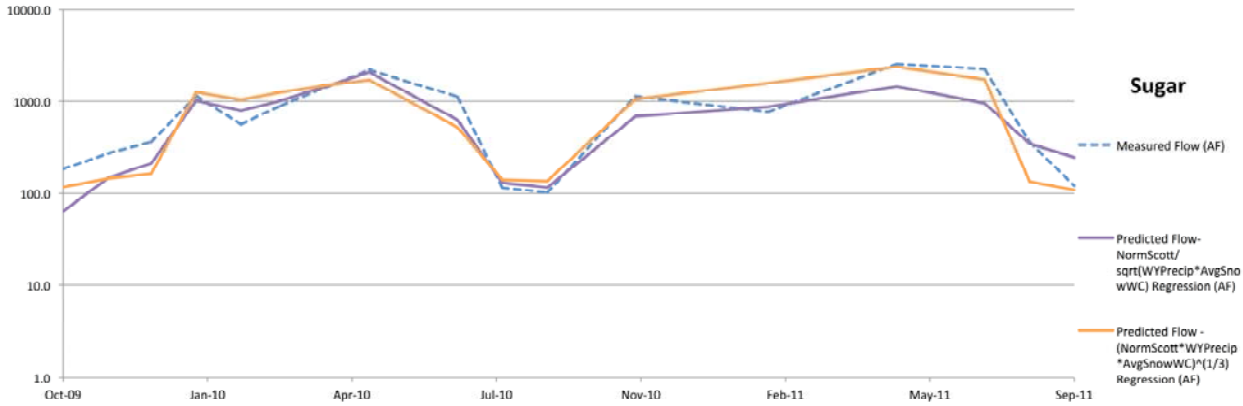
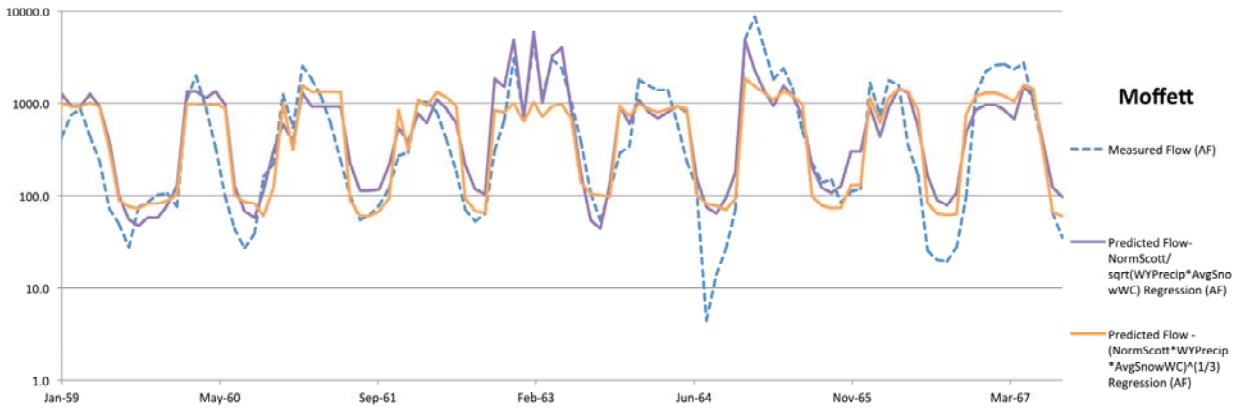
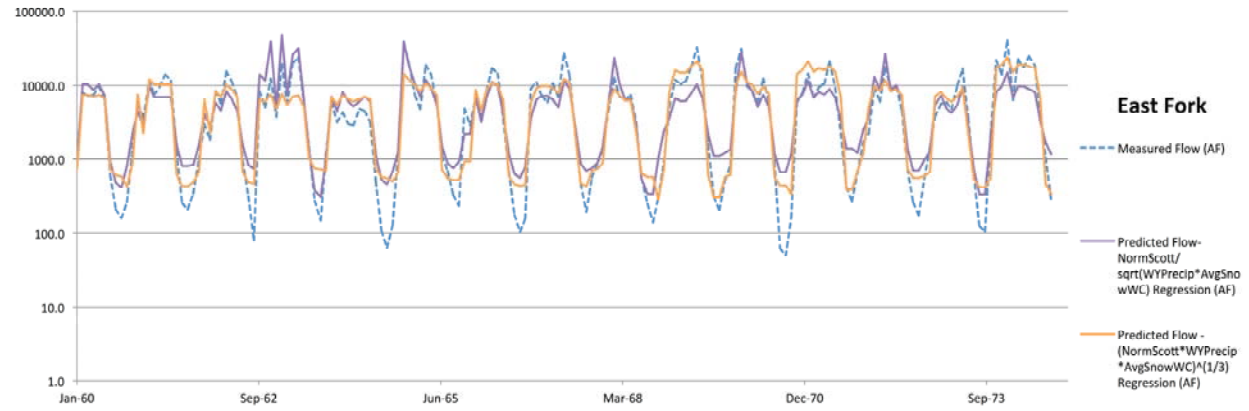
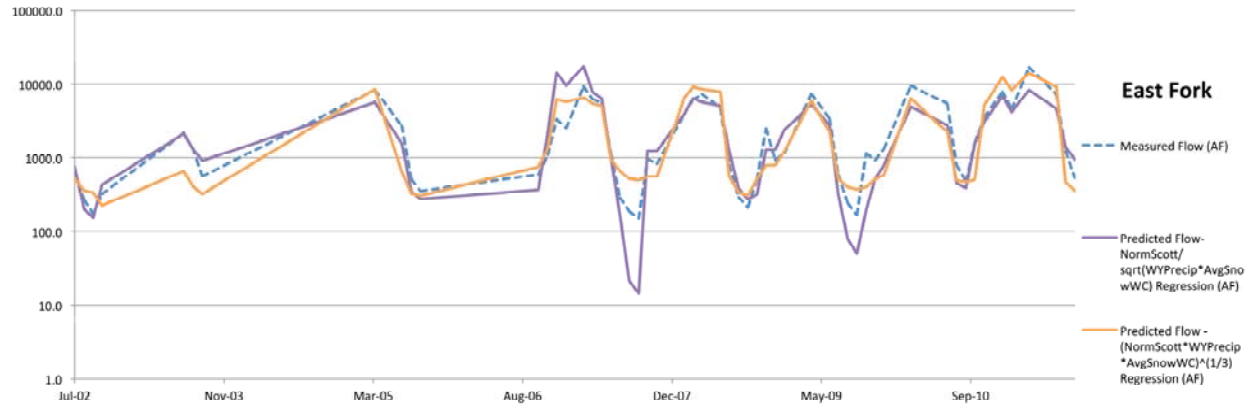
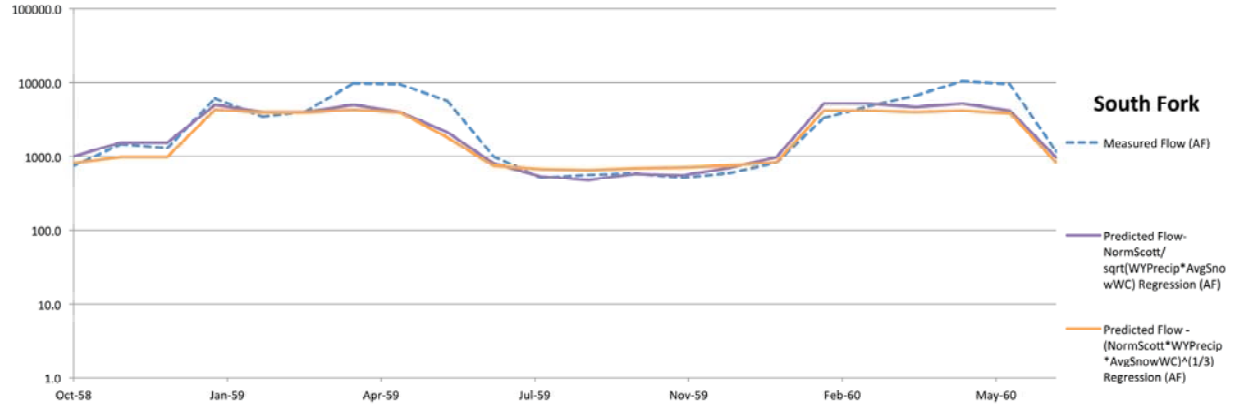
100.0
10.0
1.0
Sep-57
Mar-58
Oct-58
Apr-59
Nov-59
May-60
Sugar
Measured Flow (AF)
Predicted Flow-NormScott/sqrt(WYPrecip*AvgSnowWC) Regression (AF)
Predicted Flow - (NormScott*WYPrecip*AvgSnowWC)^(1/3) Regression (AF)

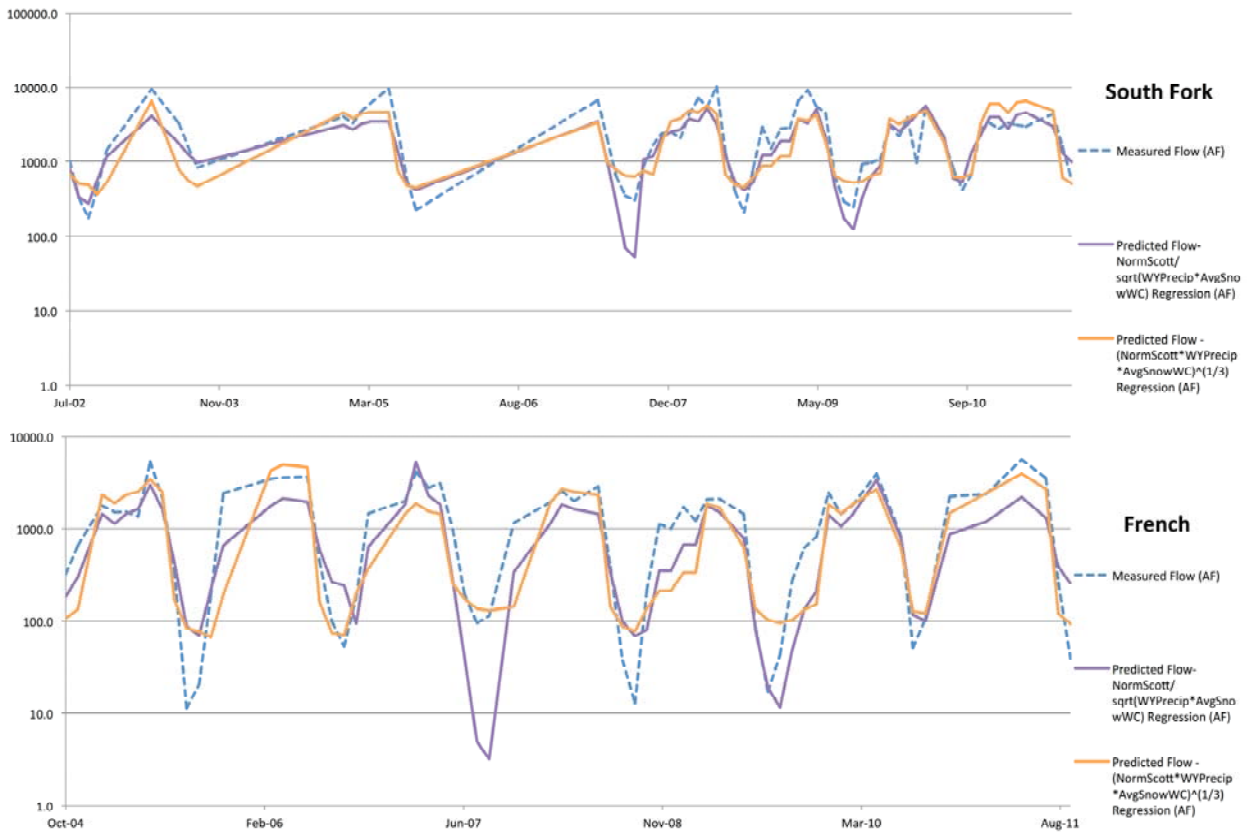

10000.0
1000.0
100.0
10.0
1.0
Oct-09
Jan-10
Apr-10
Jul-10
Nov-10
Feb-11
May-11
Sep-11
Sugar
Measured Flow (AF)
Predicted Flow-NormScott/sqrt(WYPrecip*AvgSnowWC) Regression (AF)
Predicted Flow - (NormScott*WYPrecip*AvgSnowWC)^(1/3) Regression (AF)


Moffett
Measured Flow (AF)
Predicted Flow-NormScott/sqrt(WYPrecip*AvgSnowWC) Regression (AF)
Predicted Flow - (NormScott*WYPrecip*AvgSnowWC)^(1/3) Regression (AF)
10000.0
1000.0
100.0
10.0
1.0
Jan-59
May-60
Sep-61
Feb-63
Jun-64
Nov-65
Mar-67


East Fork
Measured Flow (AF)
Predicted Flow-NormScott/sqrt(WYPrecip*AvgSnowWC) Regression (AF)
Predicted Flow - (NormScott*WYPrecip*AvgSnowWC)^(1/3) Regression (AF)
100000.0
10000.0
1000.0
100.0
10.0
1.0
Jan-60
Sep-62
Jun-65
Mar-68
Dec-70
Sep-73


East Fork
Measured Flow (AF)
Predicted Flow-NormScott/sqrt(WYPrecip*AvgSnowWC) Regression (AF)
Predicted Flow - (NormScott*WYPrecip*AvgSnowWC)^(1/3) Regression (AF)
100000.0
10000.0
1000.0
100.0
10.0
1.0
Jul-02
Nov-03
Mar-05
Aug-06
Dec-07
May-09
Sep-10


South Fork
Measured Flow (AF)
Predicted Flow-NormScott/sqrt(WYPrecip*AvgSnowWC) Regression (AF)
Predicted Flow - (NormScott*WYPrecip*AvgSnowWC)^(1/3) Regression (AF)
100000.0
10000.0
1000.0
100.0
10.0
1.0
Oct-58
Jan-59
Apr-59
Jul-59
Nov-59
Feb-60
May-60


South Fork
100000.0
10000.0
1000.0
100.0
10.0
1.0
Jul-02
Nov-03
Mar-05
Aug-06
Dec-07
May-09
Sep-10
Measured Flow (AF)
Predicted Flow-NormScott/sqrt(WYPrecip*AvgSnowWC) Regression (AF)
Predicted Flow - (NormScott*WYPrecip*AvgSnowWC)^(1/3) Regression (AF)
French
10000.0
1000.0
100.0
10.0
1.0
Oct-04
Feb-06
Jun-07
Nov-08
Mar-10
Aug-11
Measured Flow (AF)
Predicted Flow-NormScott/sqrt(WYPrecip*AvgSnowWC) Regression (AF)
Predicted Flow - (NormScott*WYPrecip*AvgSnowWC)^(1/3) Regression (AF)

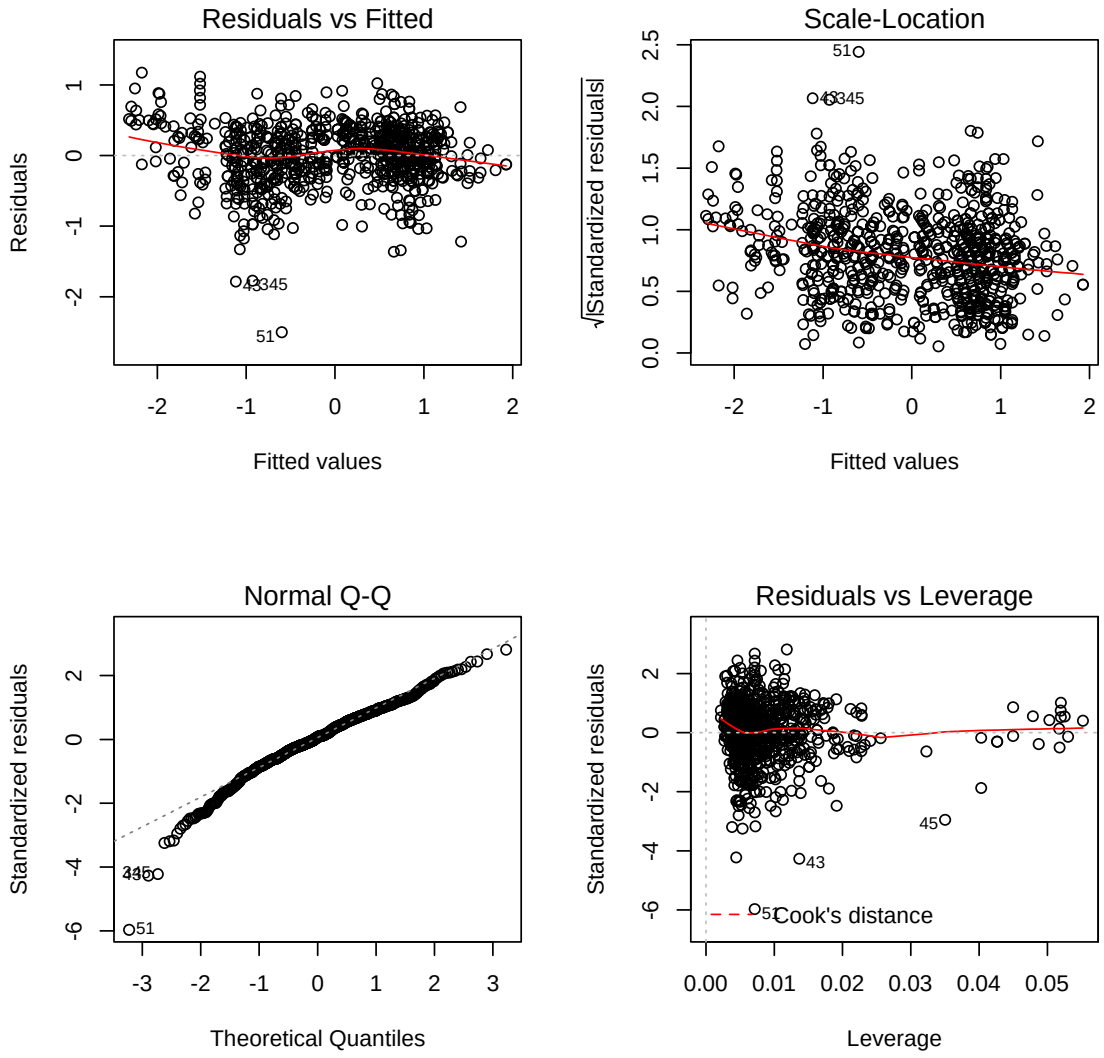


Figure XX: Linear Regression Validation – Precip Regression: Norm(Tribs) vs [Norm(Scott)+WYPrecip+WYPrecip2Date+MoPrecip+PrevMoPrecip+AvgSnowWC]

$Y=0.930376971X_1+0.004645783X_2-0.009200116X_3-0.01199766X_4+0.008203078X_5-0.008558482X_6+0.370479454$

r-squared=0.8228

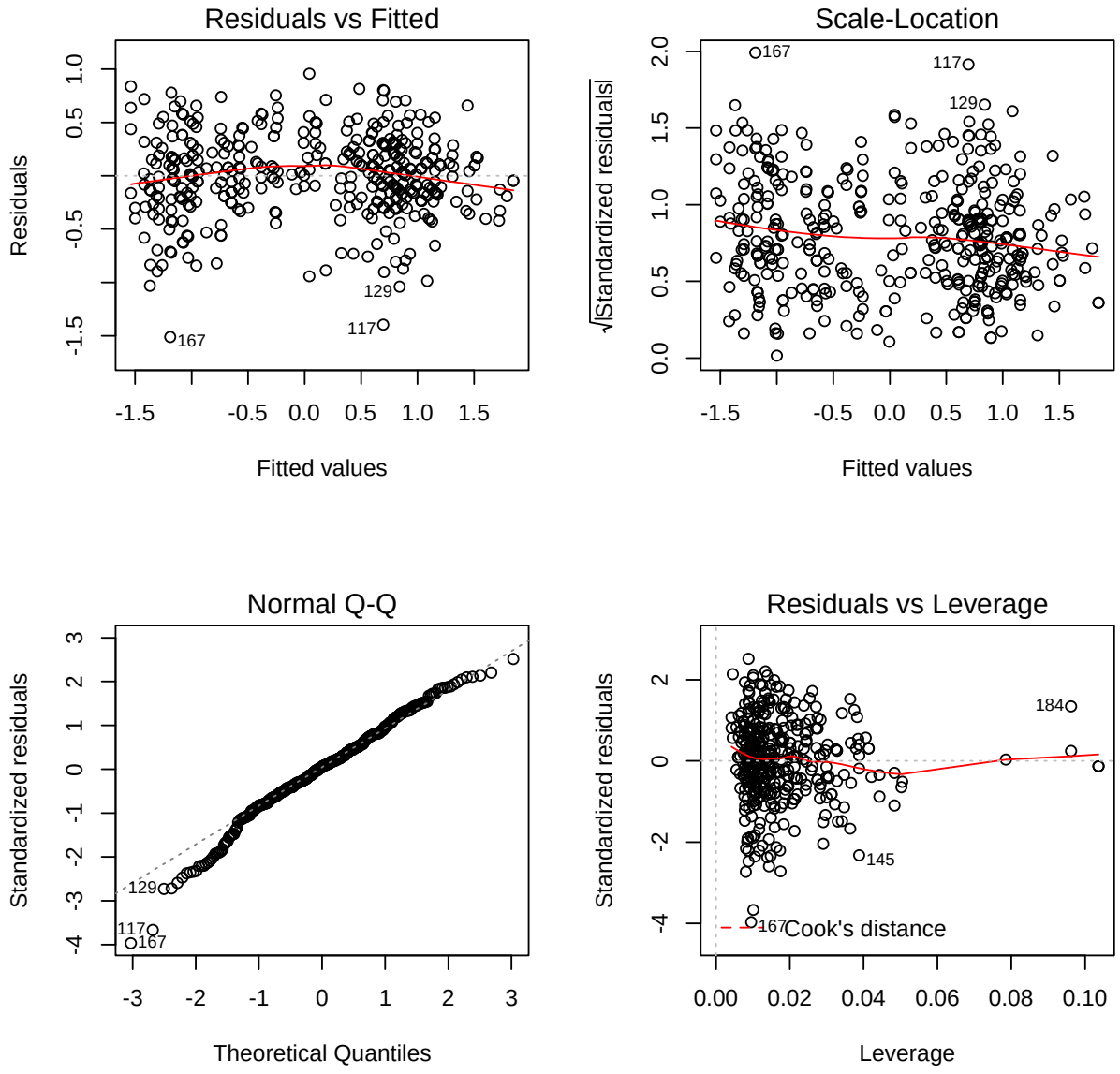


Figure XX: Linear Regression Validation – Precip RegressionPRE1972: Norm(Tribs) vs [Norm(Scott)+WYPrecip+WYPrecip2Date+MoPrecip+PrevMoPrecip+AvgSnowWC]
$Y=1.111352299X_1+0.001588091X_2-0.008430218X_3-0.032898590X_4-0.001317307X_5-0.003971558X_6+ 0.240226718$
r-squared=0.8556

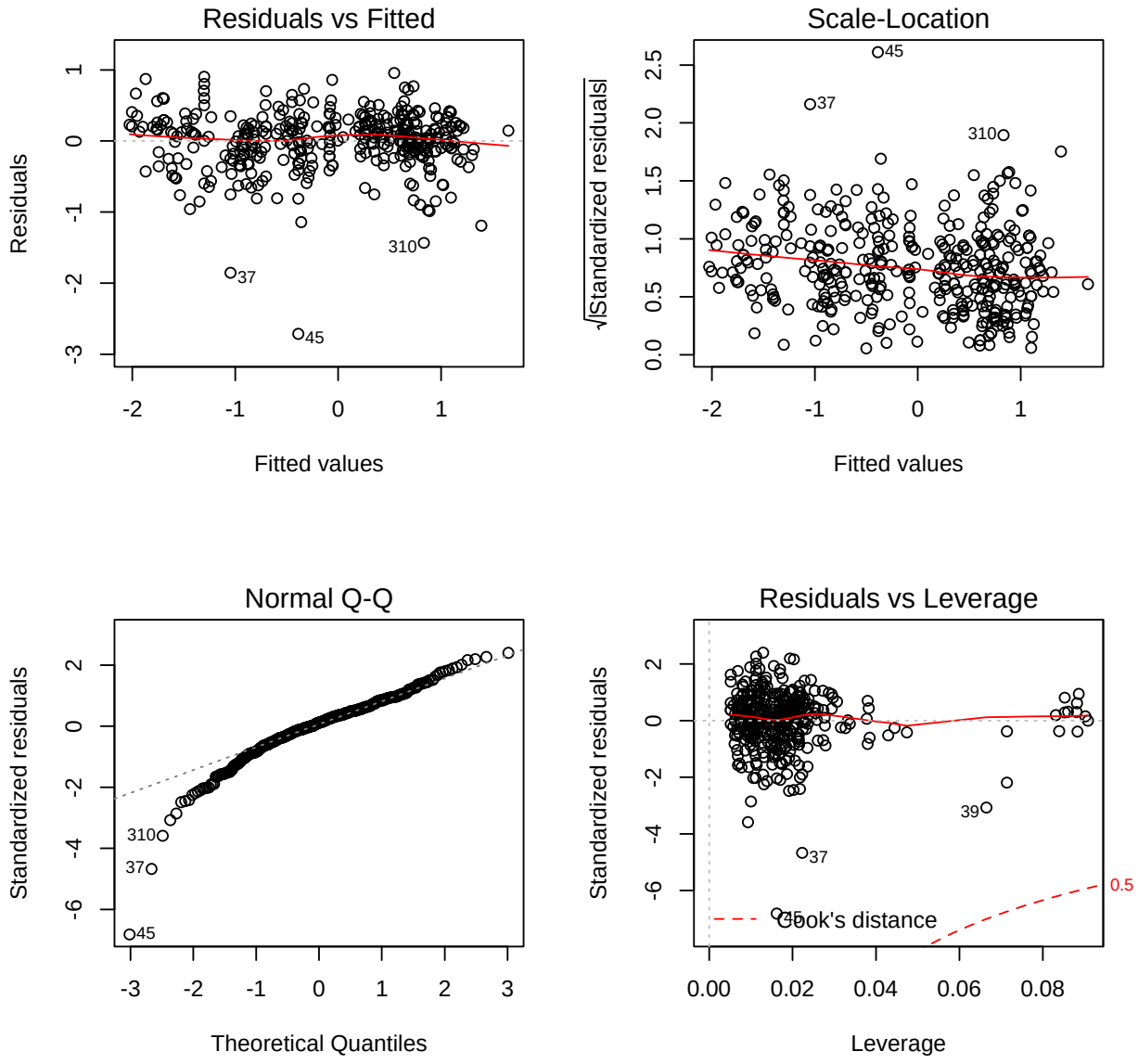
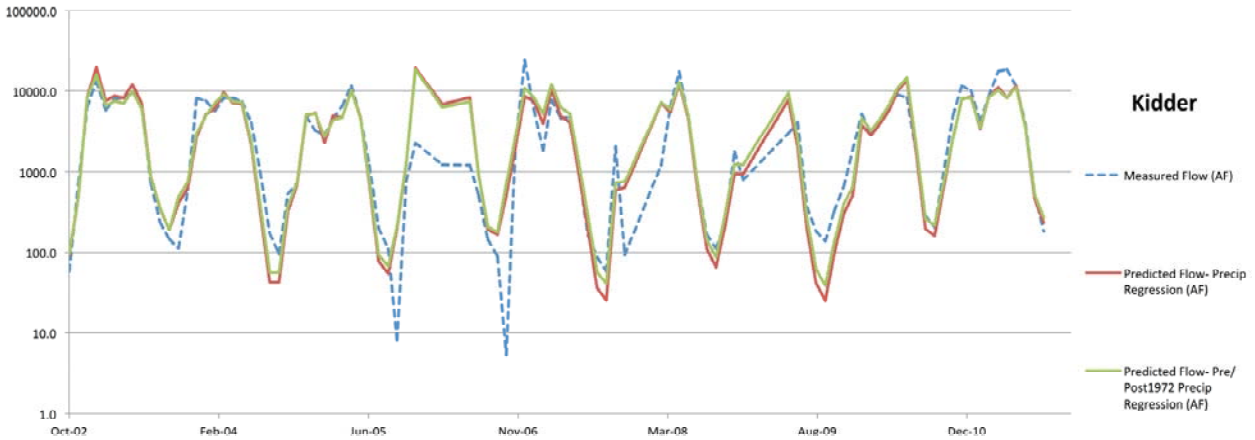
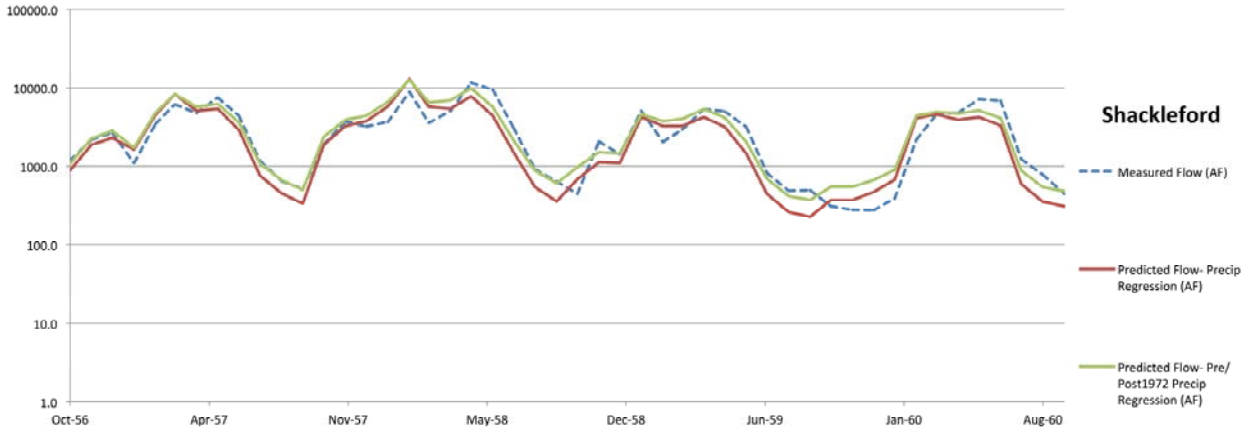
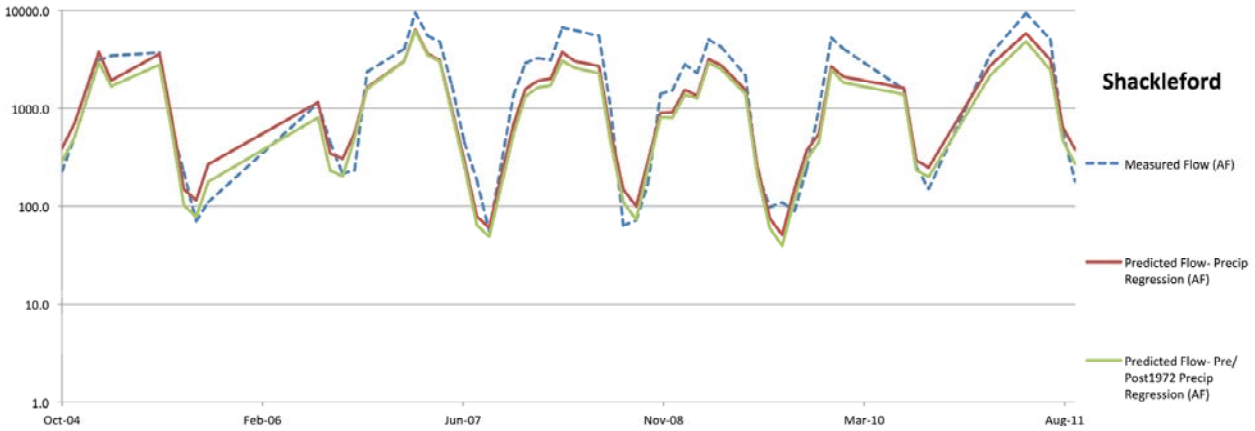
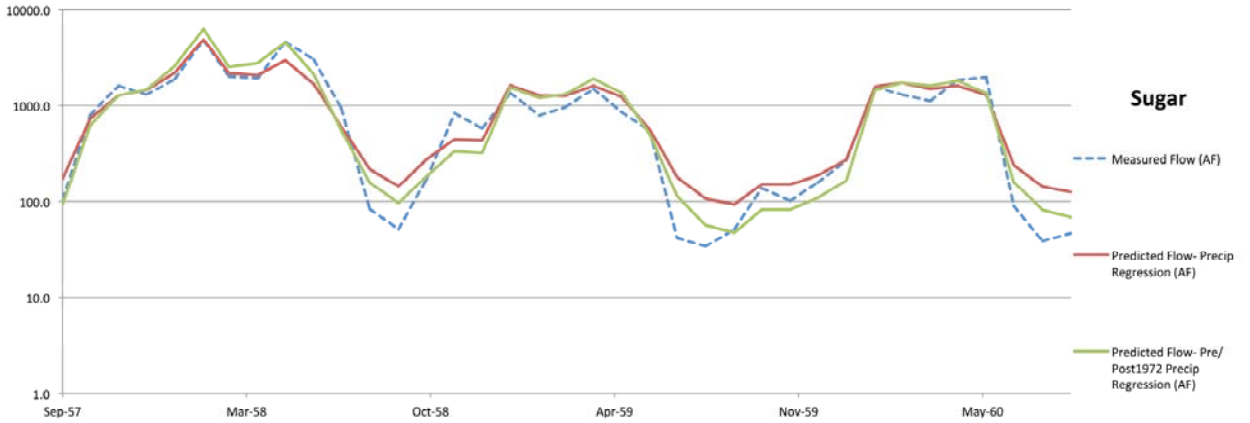


Figure XX: Linear Regression Validation – Precip RegressionPOST1972: Norm(Tribs) vs [Norm(Scott)+WYPrecip+WYPrecip2Date+MoPrecip+PrevMoPrecip+AvgSnowWC]
$Y=0.876317775X_1-0.003278966X_2-0.008496572X_3-0.004610148X_4+0.002753552X_5-0.010423202X_6+0.682412646$
r-squared=0.8373


Kidder
100000.0
10000.0
1000.0
100.0
10.0
1.0
Oct-02
Feb-04
Jun-05
Nov-06
Mar-08
Aug-09
Dec-10
Measured Flow (AF)
Predicted Flow- Precip Regression (AF)
Predicted Flow- Pre/ Post1972 Precip Regression (AF)


Shackleford
100000.0
10000.0
1000.0
100.0
10.0
1.0
Oct-56
Apr-57
Nov-57
May-58
Dec-58
Jun-59
Jan-60
Aug-60
Measured Flow (AF)
Predicted Flow- Precip Regression (AF)
Predicted Flow- Pre/ Post1972 Precip Regression (AF)


Shackleford
10000.0
1000.0
100.0
10.0
1.0
Oct-04
Feb-06
Jun-07
Nov-08
Mar-10
Aug-11
Measured Flow (AF)
Predicted Flow- Precip Regression (AF)
Predicted Flow- Pre/ Post1972 Precip Regression (AF)


Sugar
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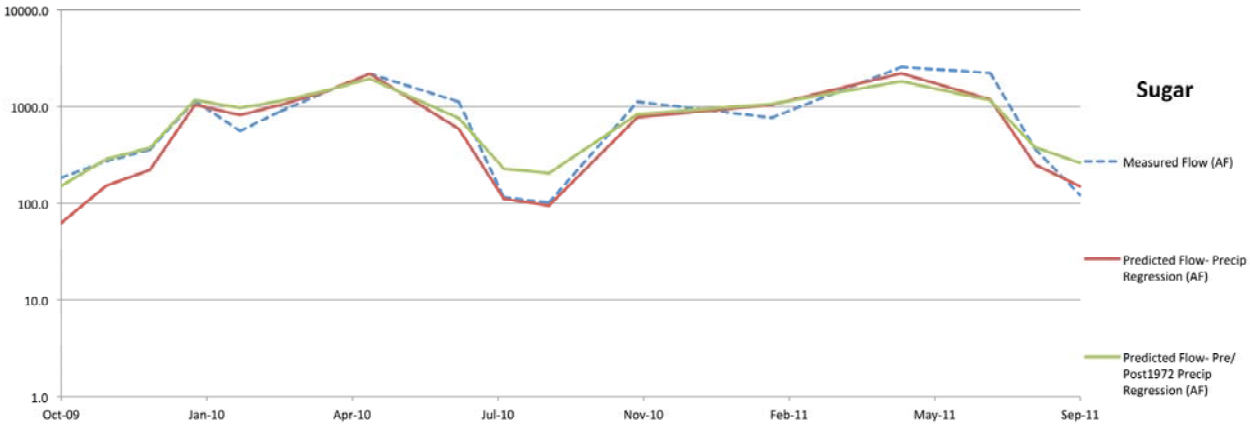
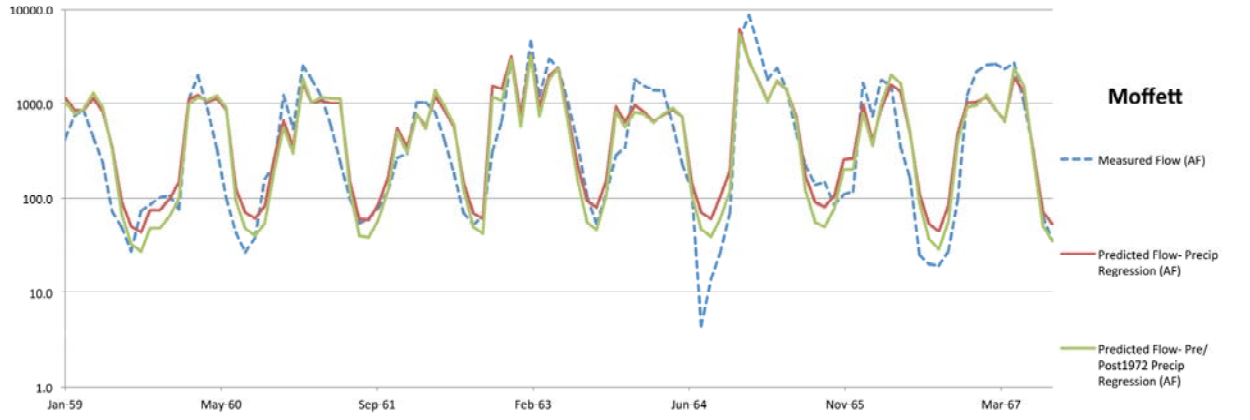
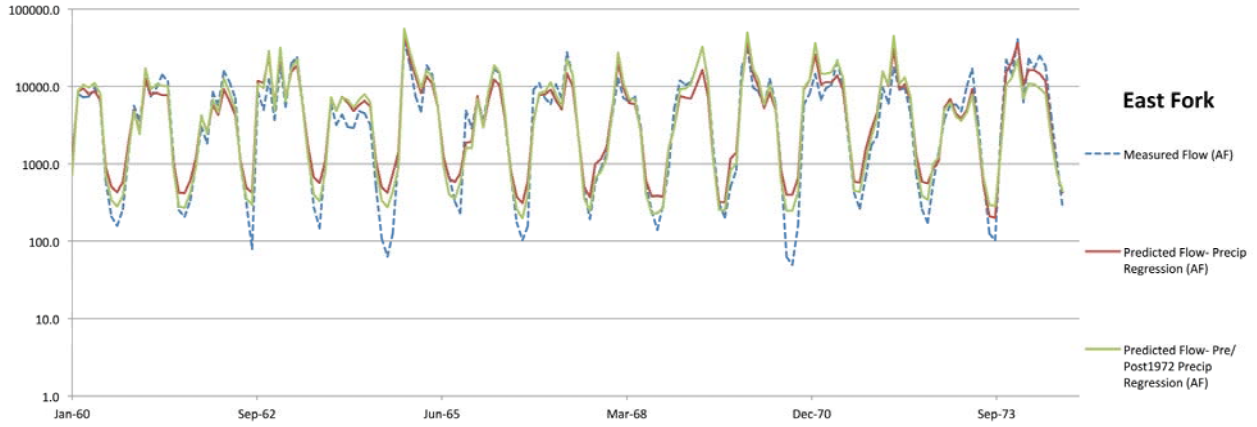
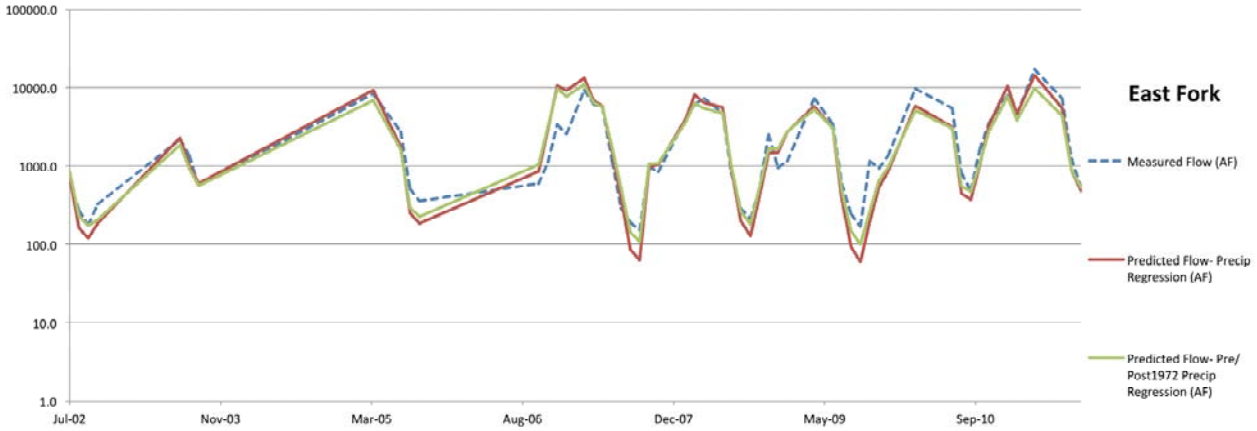
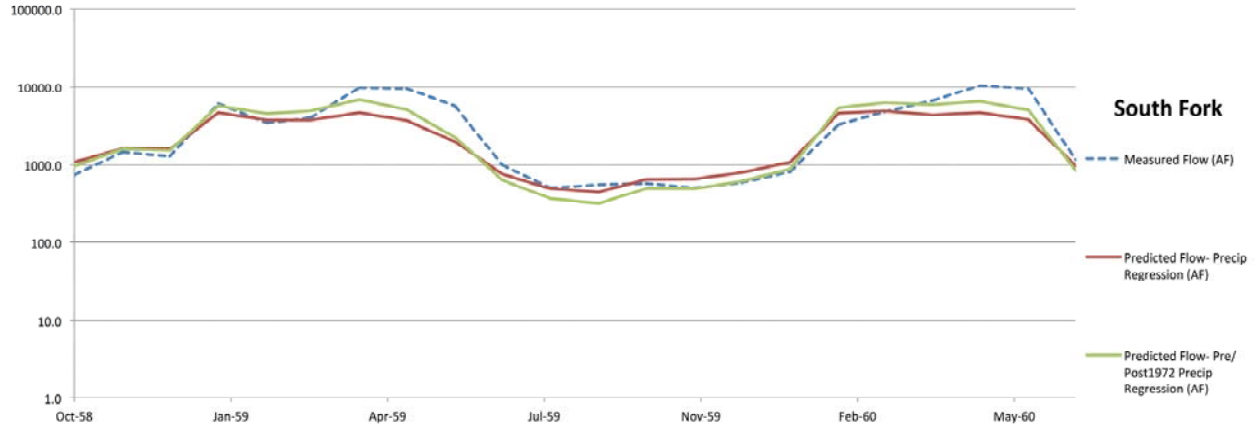
1000.0
100.0
10.0
1.0
Sep-57
Mar-58
Oct-58
Apr-59
Nov-59
May-60
Measured Flow (AF)
Predicted Flow- Precip Regression (AF)
Predicted Flow- Pre/ Post1972 Precip Regression (AF)

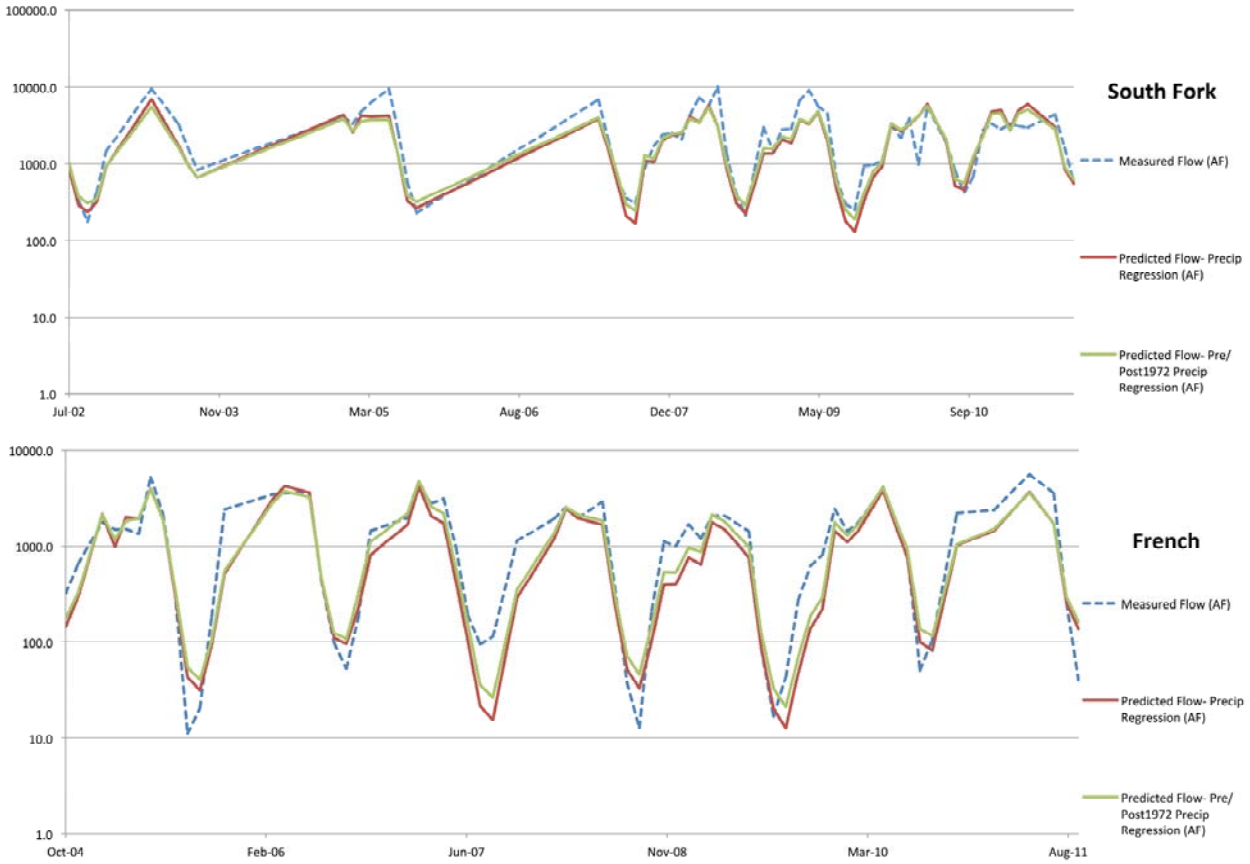

Sugar
10000.0
1000.0
100.0
10.0
1.0
Oct-09
Jan-10
Apr-10
Jul-10
Nov-10
Feb-11
May-11
Sep-11
Measured Flow (AF)
Predicted Flow- Precip Regression (AF)
Predicted Flow- Pre/ Post1972 Precip Regression (AF)


Moffett
10000.0
1000.0
100.0
10.0
1.0
Jan-59
May-60
Sep-61
Feb-63
Jun-64
Nov-65
Mar-67
Measured Flow (AF)
Predicted Flow- Precip Regression (AF)
Predicted Flow- Pre/ Post1972 Precip Regression (AF)


East Fork
Measured Flow (AF)
Predicted Flow- Precip Regression (AF)
Predicted Flow- Pre/ Post1972 Precip Regression (AF)
100000.0
10000.0
1000.0
100.0
10.0
1.0
Jan-60
Sep-62
Jun-65
Mar-68
Dec-70
Sep-73


East Fork
Measured Flow (AF)
Predicted Flow- Precip Regression (AF)
Predicted Flow- Pre/ Post1972 Precip Regression (AF)
100000.0
10000.0
1000.0
100.0
10.0
1.0
Jul-02
Nov-03
Mar-05
Aug-06
Dec-07
May-09
Sep-10


South Fork
Measured Flow (AF)
Predicted Flow- Precip Regression (AF)
Predicted Flow- Pre/ Post1972 Precip Regression (AF)
100000.0
10000.0
1000.0
100.0
10.0
1.0
Oct-58
Jan-59
Apr-59
Jul-59
Nov-59
Feb-60
May-60


South Fork
100000.0
10000.0
1000.0
100.0
10.0
1.0
Jul-02
Nov-03
Mar-05
Aug-06
Dec-07
May-09
Sep-10
Measured Flow (AF)
Predicted Flow- Precip Regression (AF)
Predicted Flow- Pre/ Post1972 Precip Regression (AF)
French
10000.0
1000.0
100.0
10.0
1.0
Oct-04
Feb-06
Jun-07
Nov-08
Mar-10
Aug-11
Measured Flow (AF)
Predicted Flow- Precip Regression (AF)
Predicted Flow- Pre/ Post1972 Precip Regression (AF)