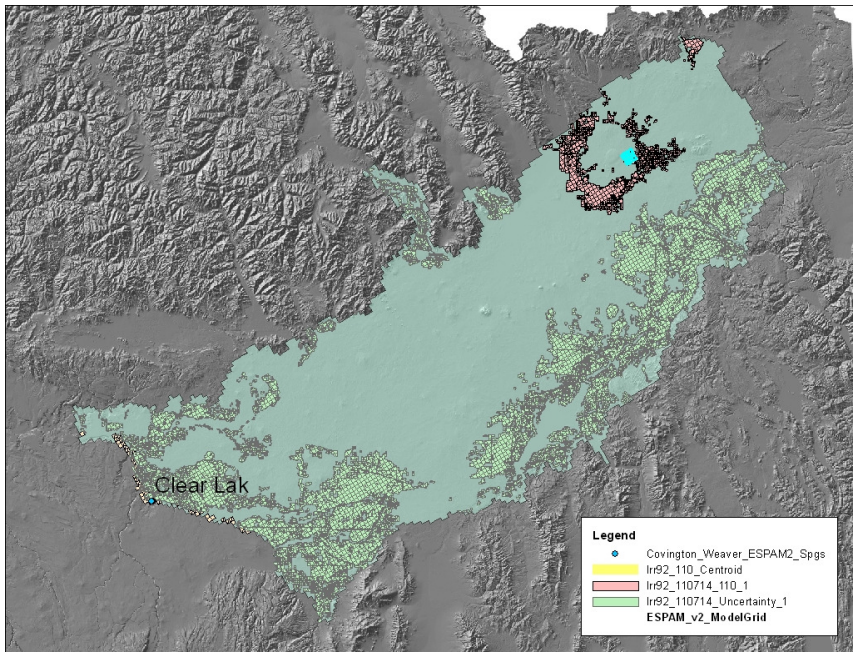
Predictive Uncertainty Test

Allan Wylie IDWR

Predictive Uncertainty



- Impact of centroid for irrigated lands within WD110 on Clear Lakes
- How tightly assumptions and calibration data constrain prediction
- +0.17%/-3.9%
- Maximize = maximize the prediction
- Minimize = minimize the prediction

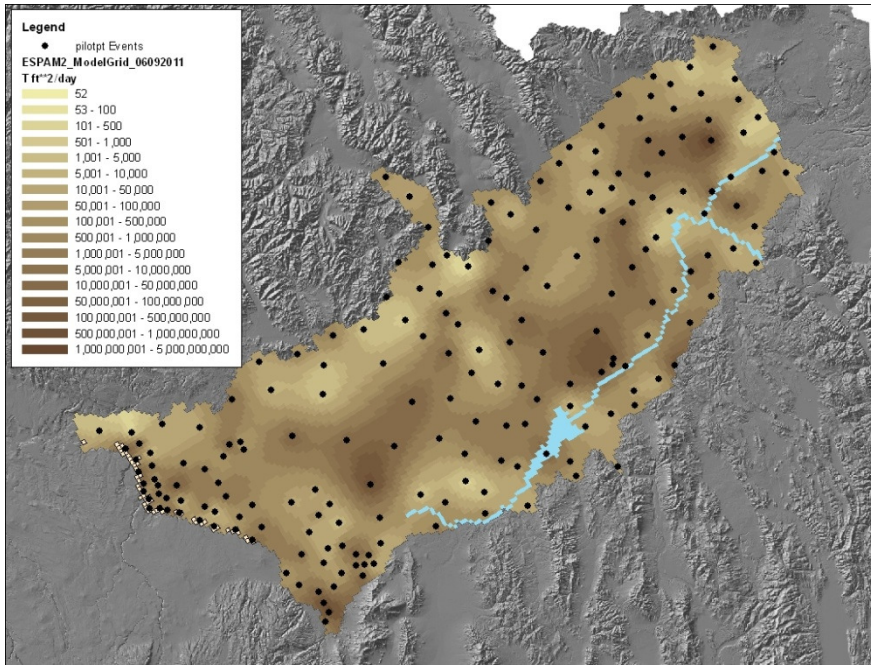
Calibration with E110712A, A B & C Springs and Return Flow Targets

- Adjustable Parameters
  - Transmissivity
    - Pilot Points
      - 1e-10 – 1e+10
  - Specific Yield
    - Pilot Points
      - 0.01 – 0.30
  - Riverbed Conductance
    - By reach
      - 1.0 – 1e+10
  - Drain Conductance
    - By drain cell
      - Up to 2 drain cells per model cell
      - 1e-10 - 3e+8
  - Canal seepage
    - Uniform by entity
      - 1.05 – 0.95
  - Non-irrigated recharge
    - Thin Thick and Lava
    - 2.0 – 1.0e-6
  - ET
    - Surface Water Entity
      - Sprinkler and Gravity
      - +/-5%
    - Groundwater Entity
      - Sprinkler and Gravity
      - +/-5%
  - Perched River Seepage
    - River reach
    - +/-20%
  - Tributary Underflow
    - 2 – 0.5
    - Split Cam/Bev and Hnry Fork
      - 8 – 1e-6

Calibration with E110712A, A B & C Springs and Return Flow Targets

- Adjustable Parameters (cont)
  - On Farm Parameters
    - EffSp
      - Fixed 0.85
    - EffGr
      - Fixed 0.8
    - DPin
      - 0.98 – 0.6
    - DPex
      - 0.98 – 0.6
    - Entities with no returns DPin and DPex fixed at 1.0

Maximize



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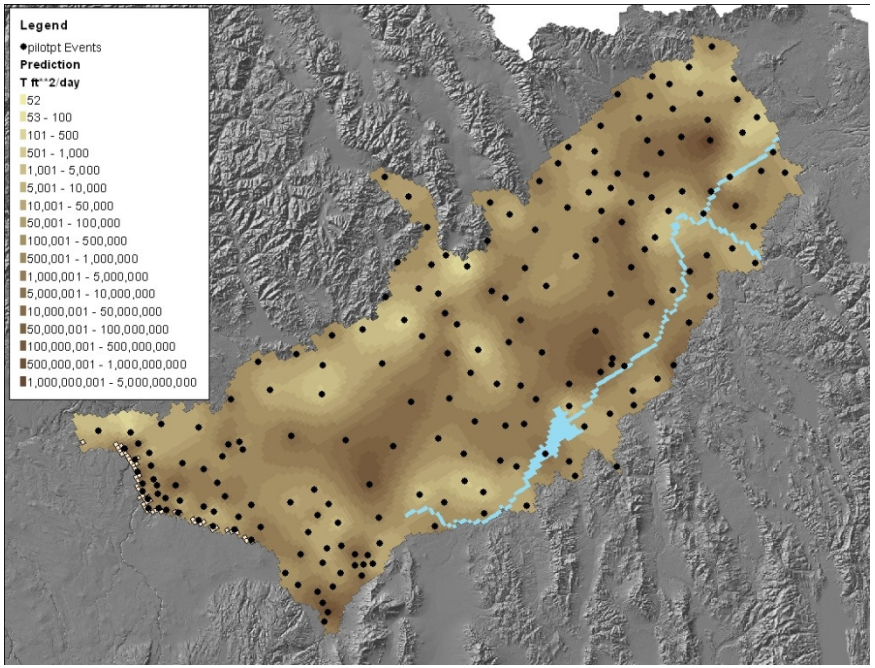

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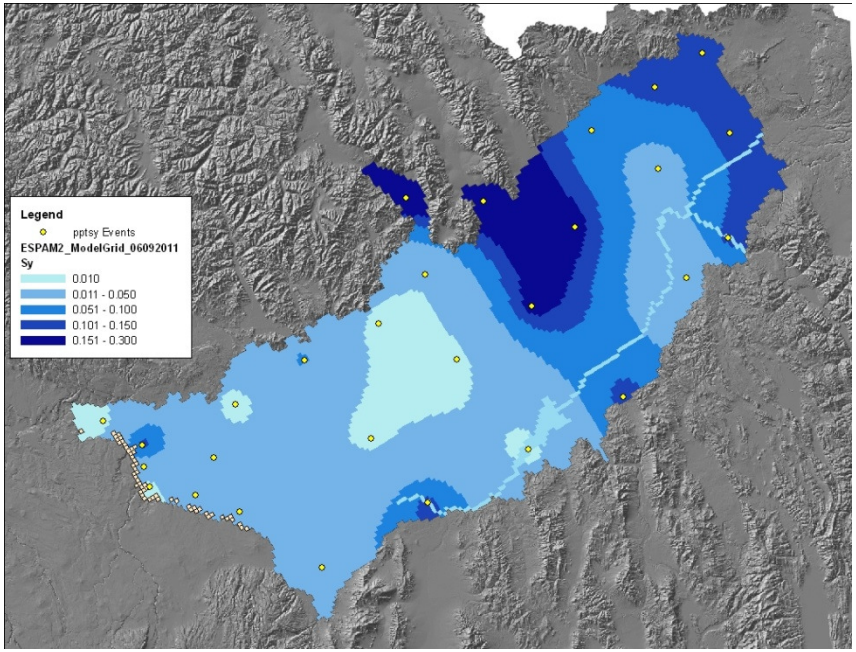

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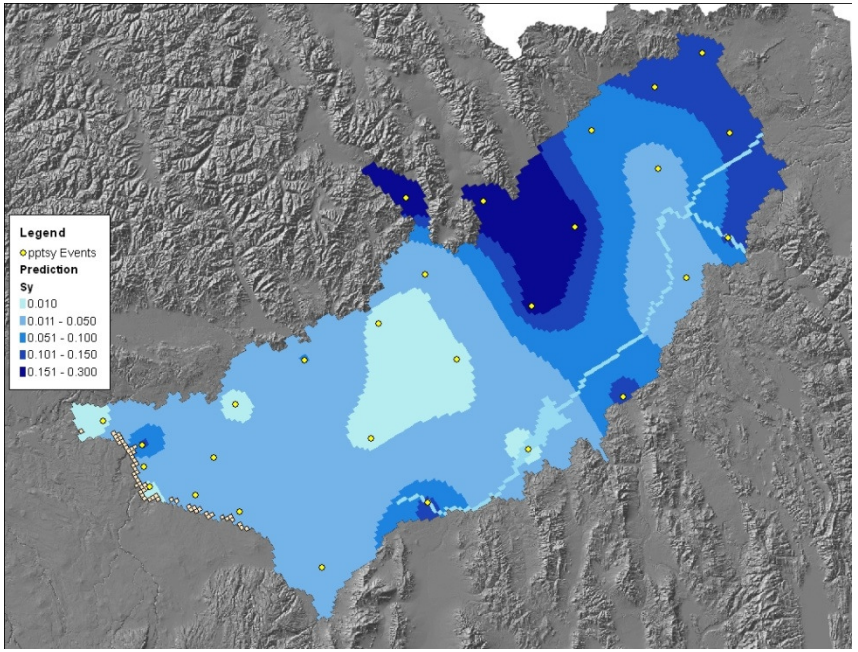

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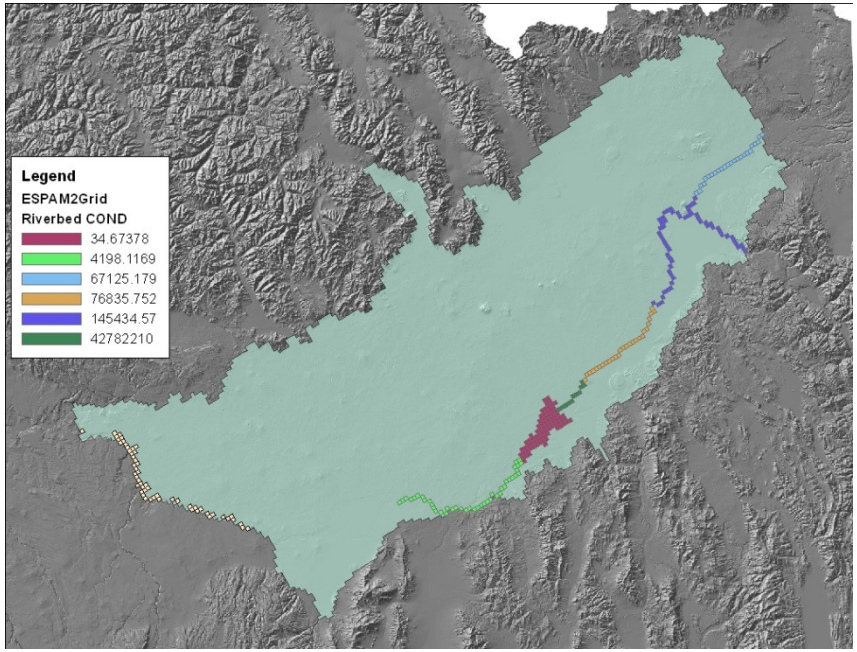

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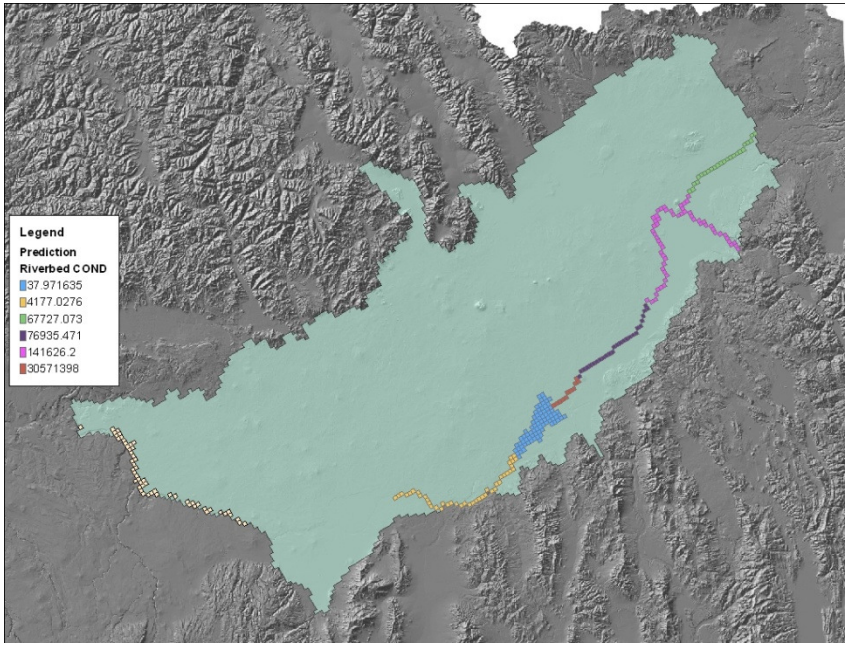

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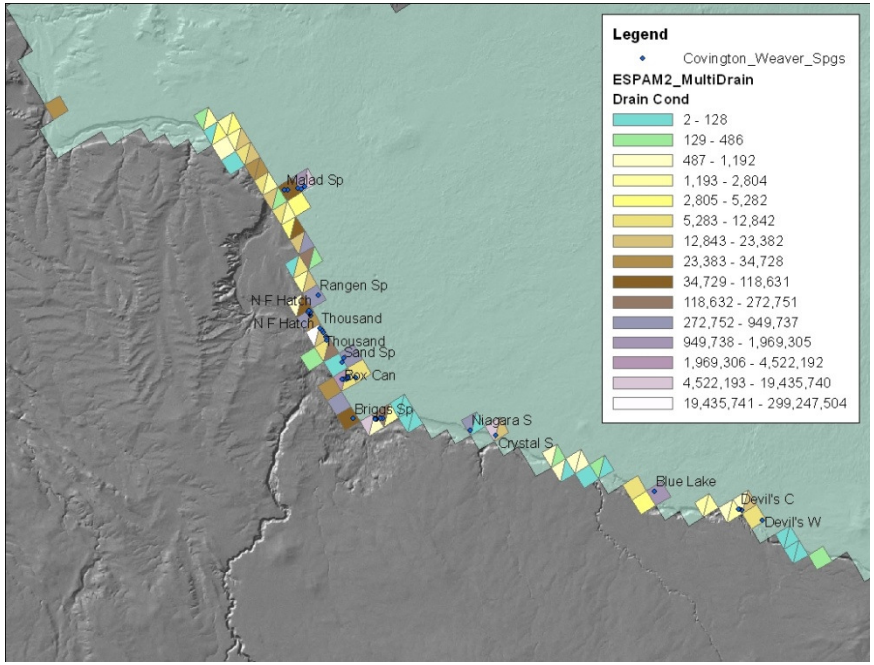

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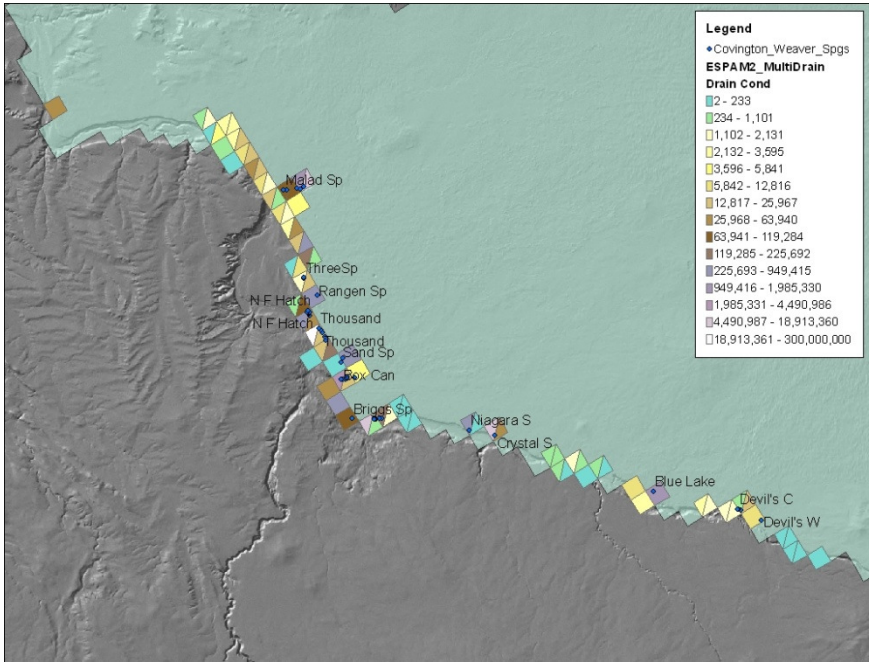

Perched River Seepage

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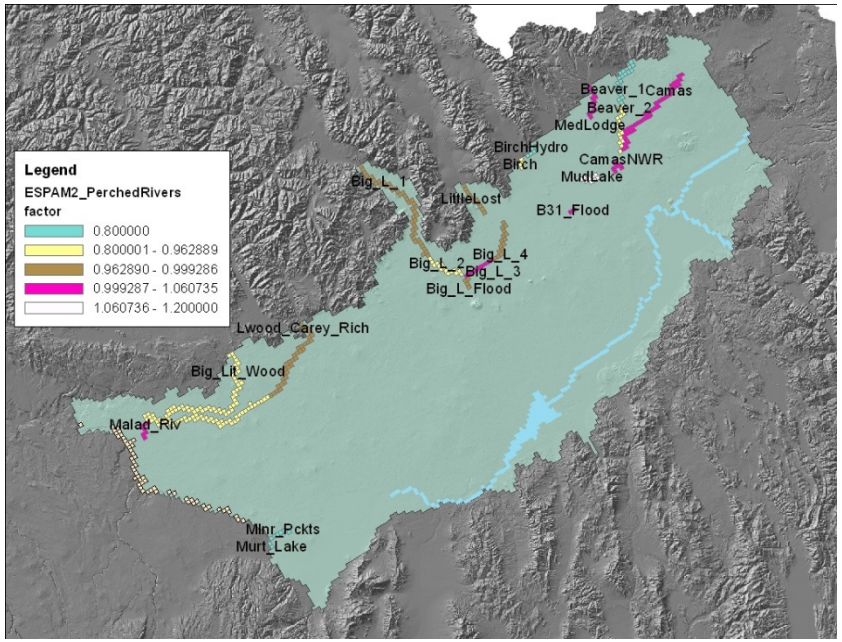

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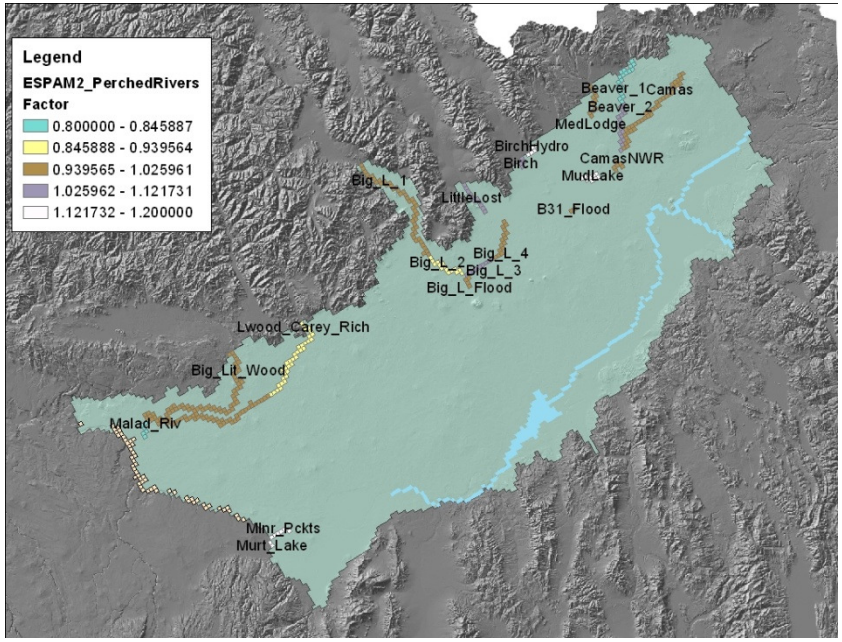

Tributary Underflow

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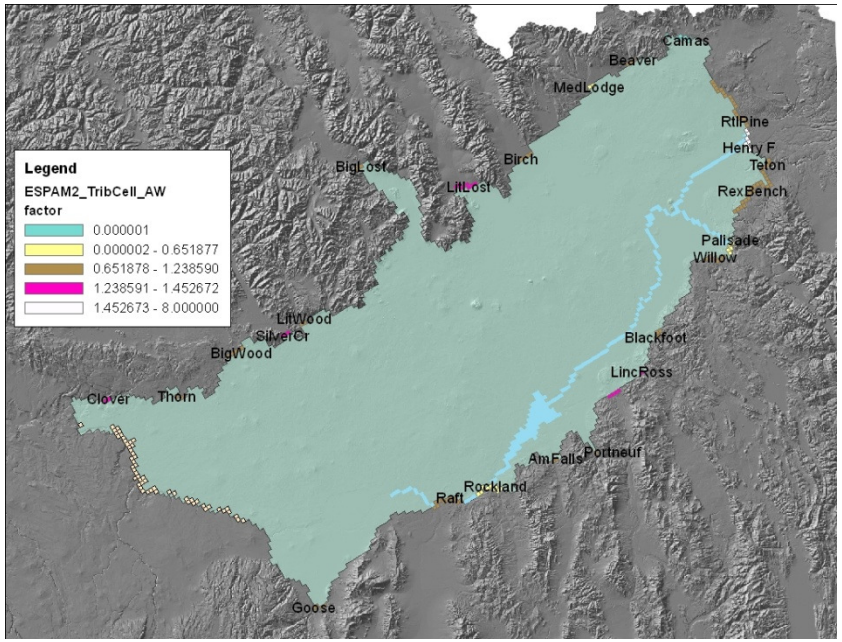

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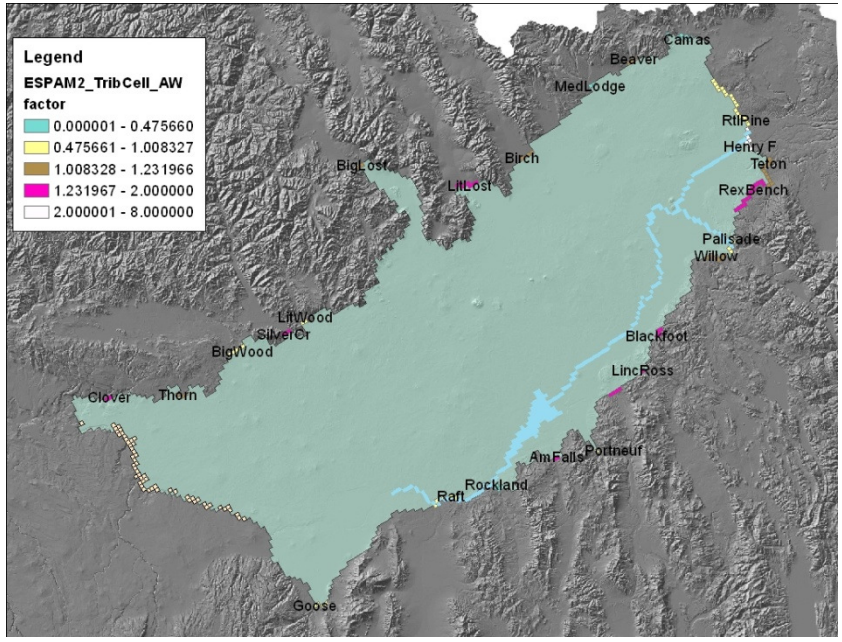

Non-irrigated Recharge

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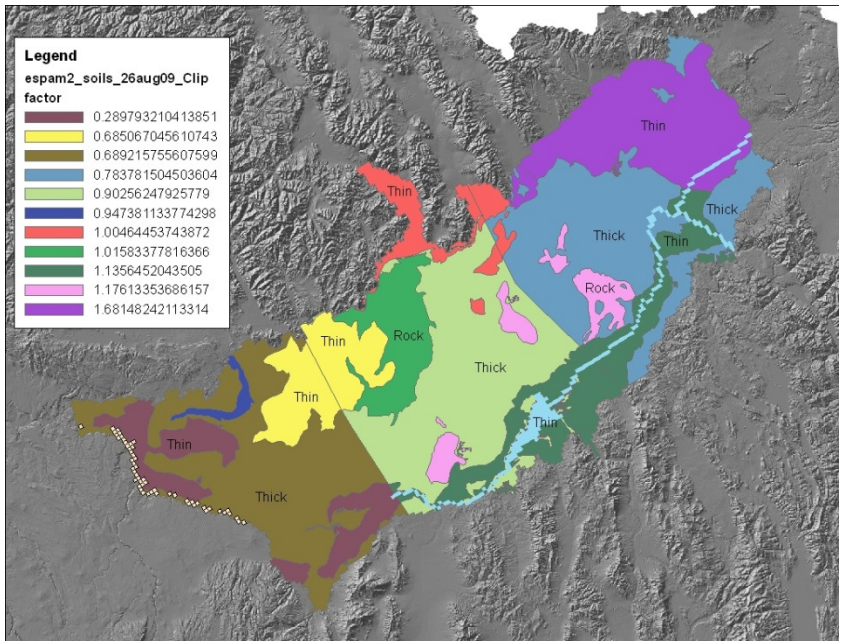

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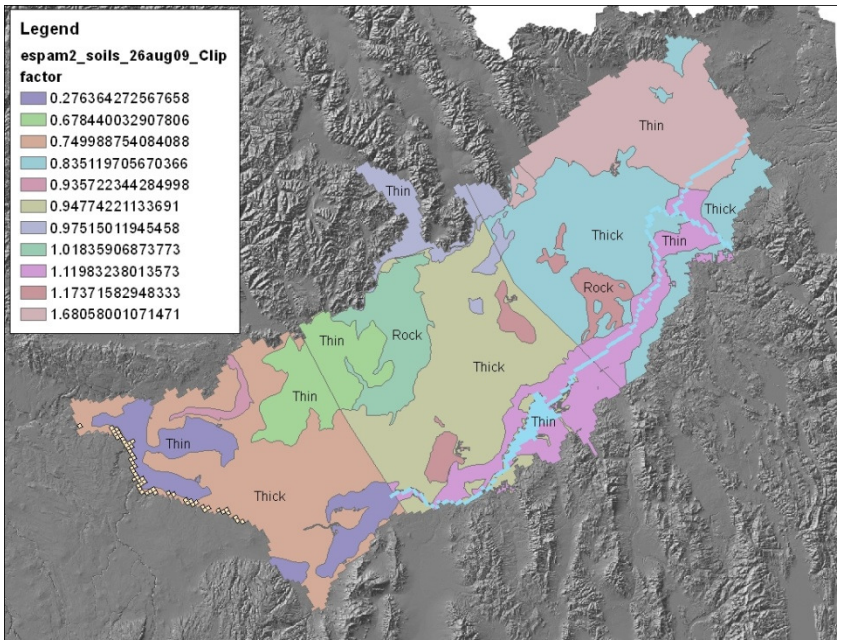

ET Surface Water Sprinkler

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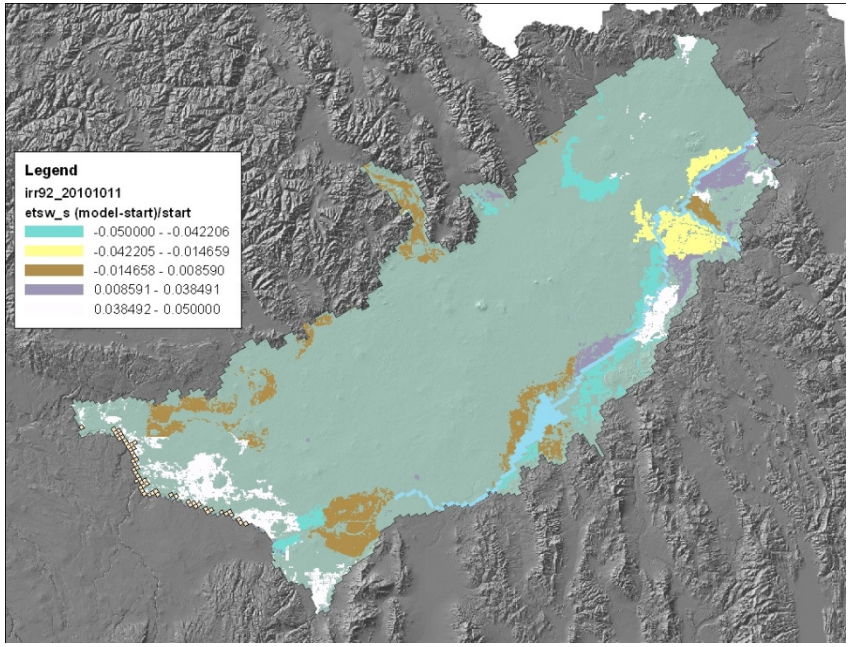

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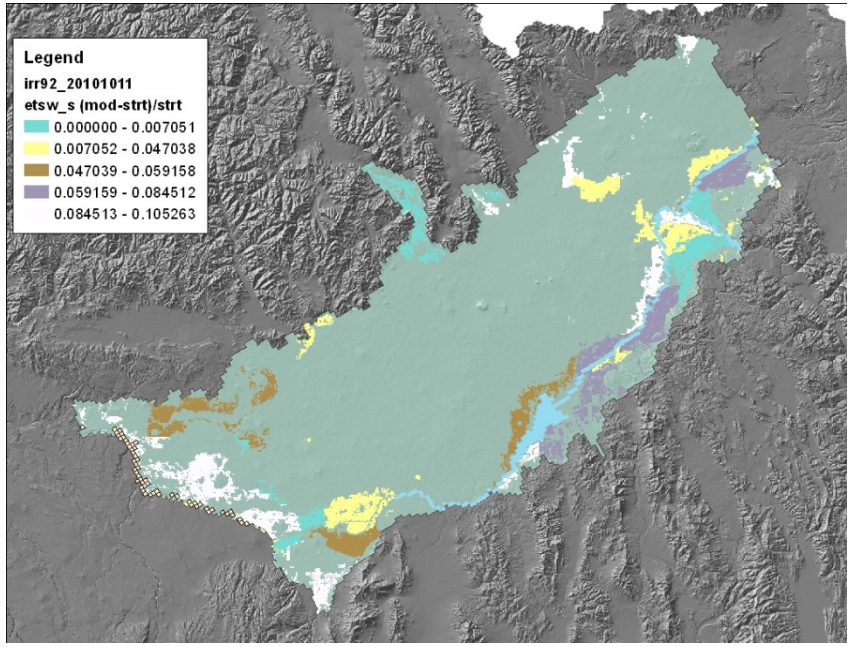

ET Surface Water Gravity

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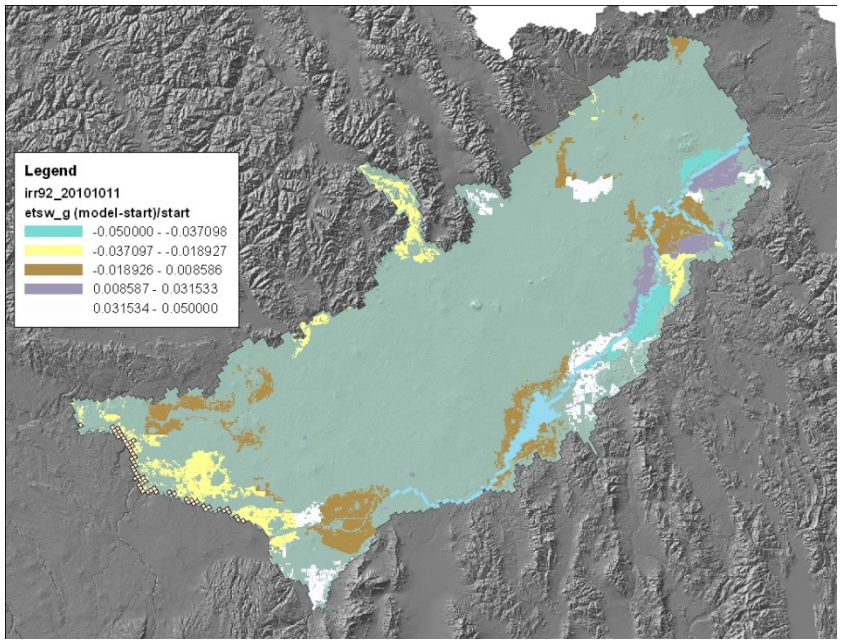

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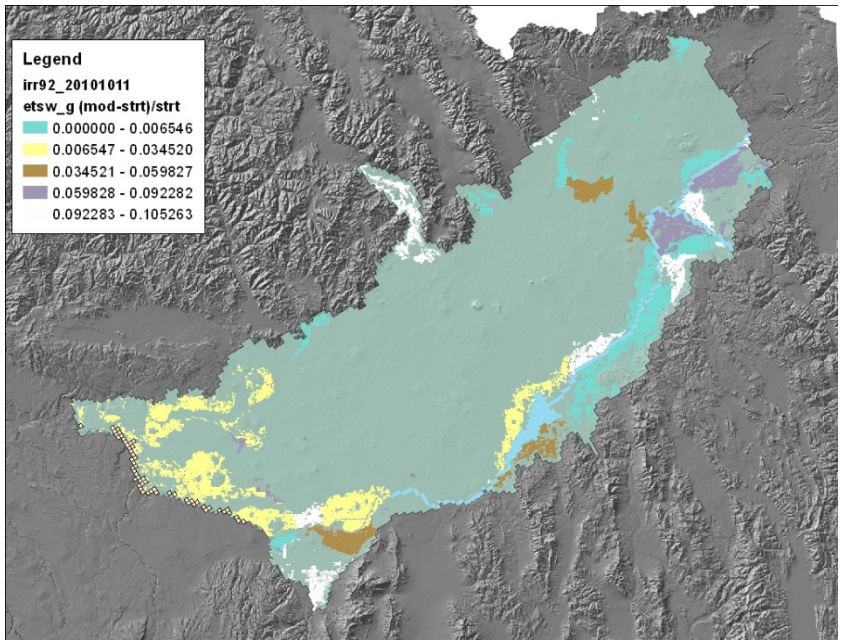

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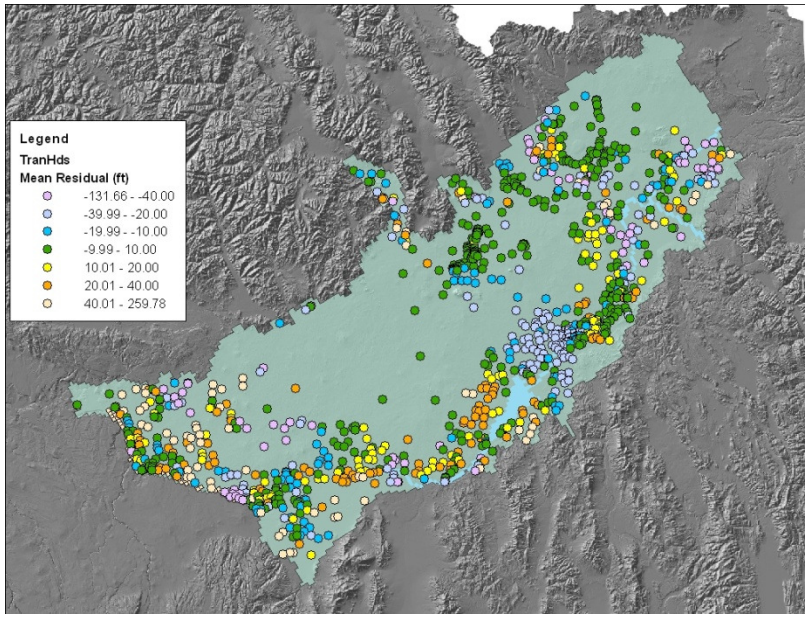
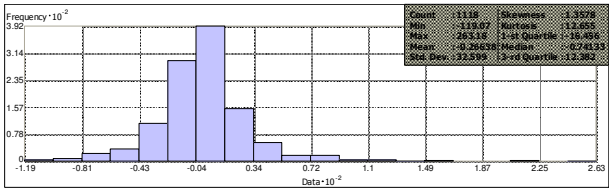


Histogram
Transformation: None



Data Source: TranHds Attribute: Mean

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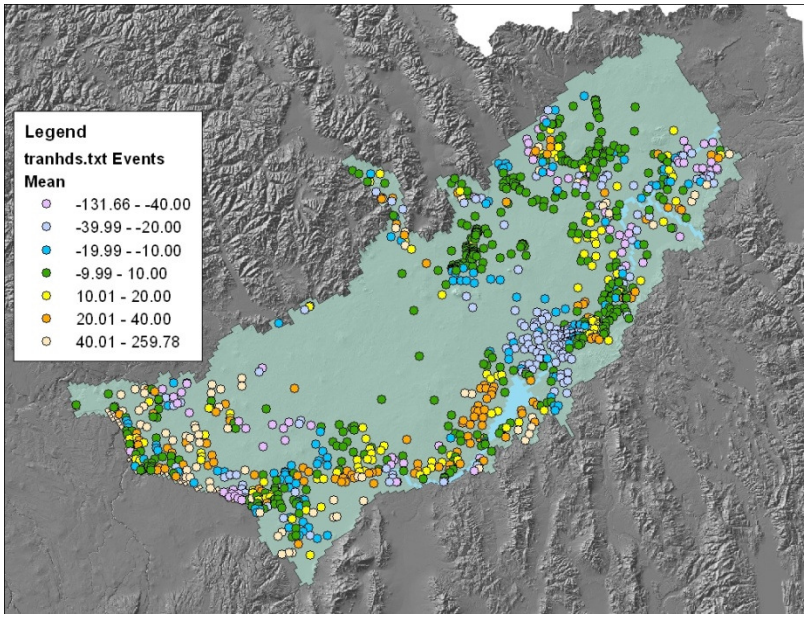

Histogram
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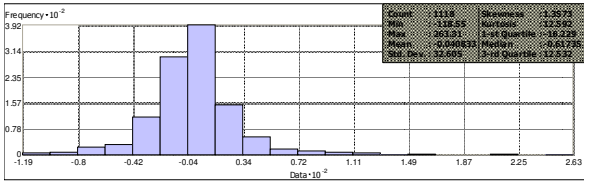

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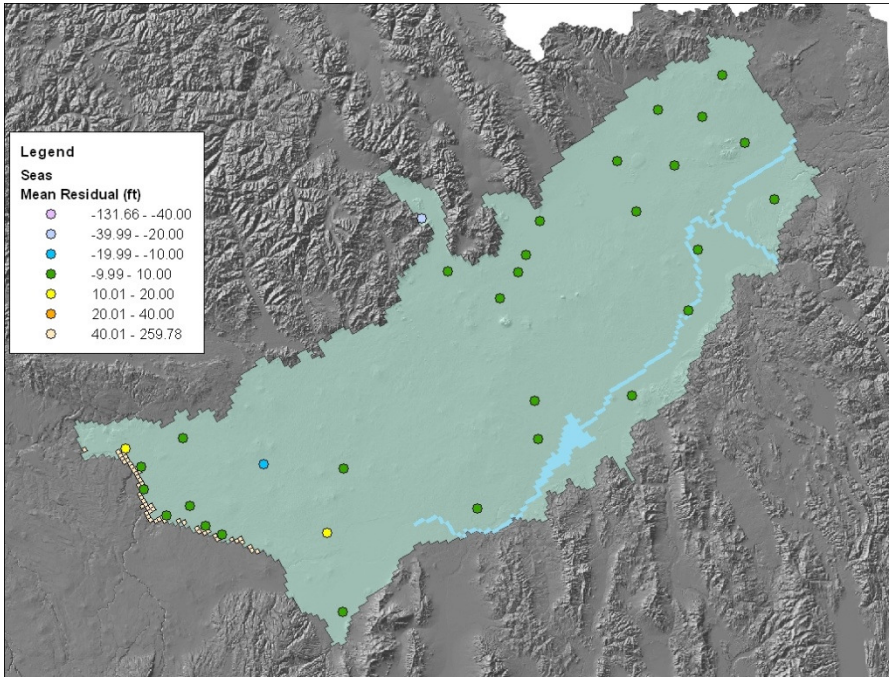

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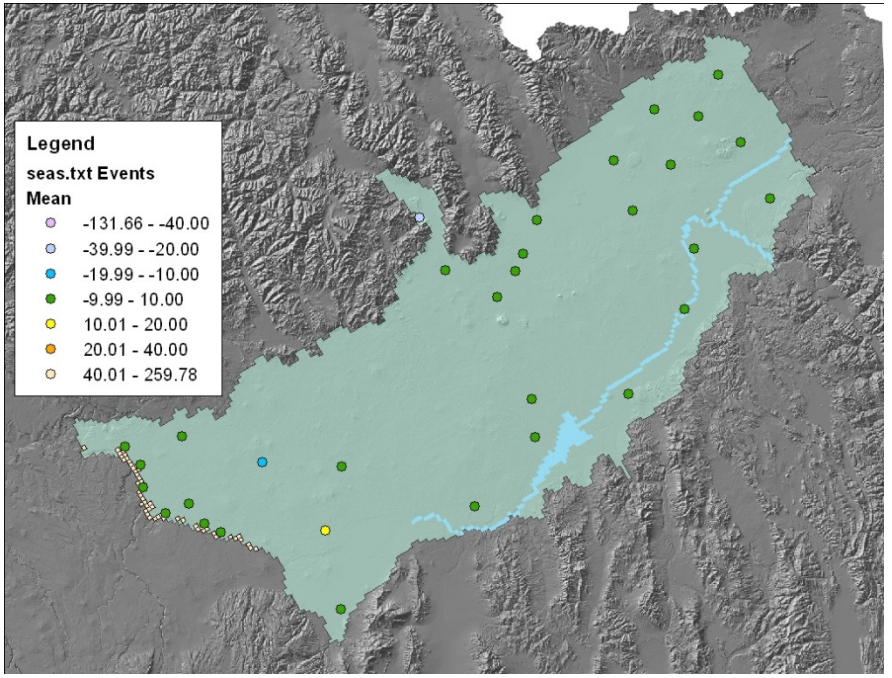
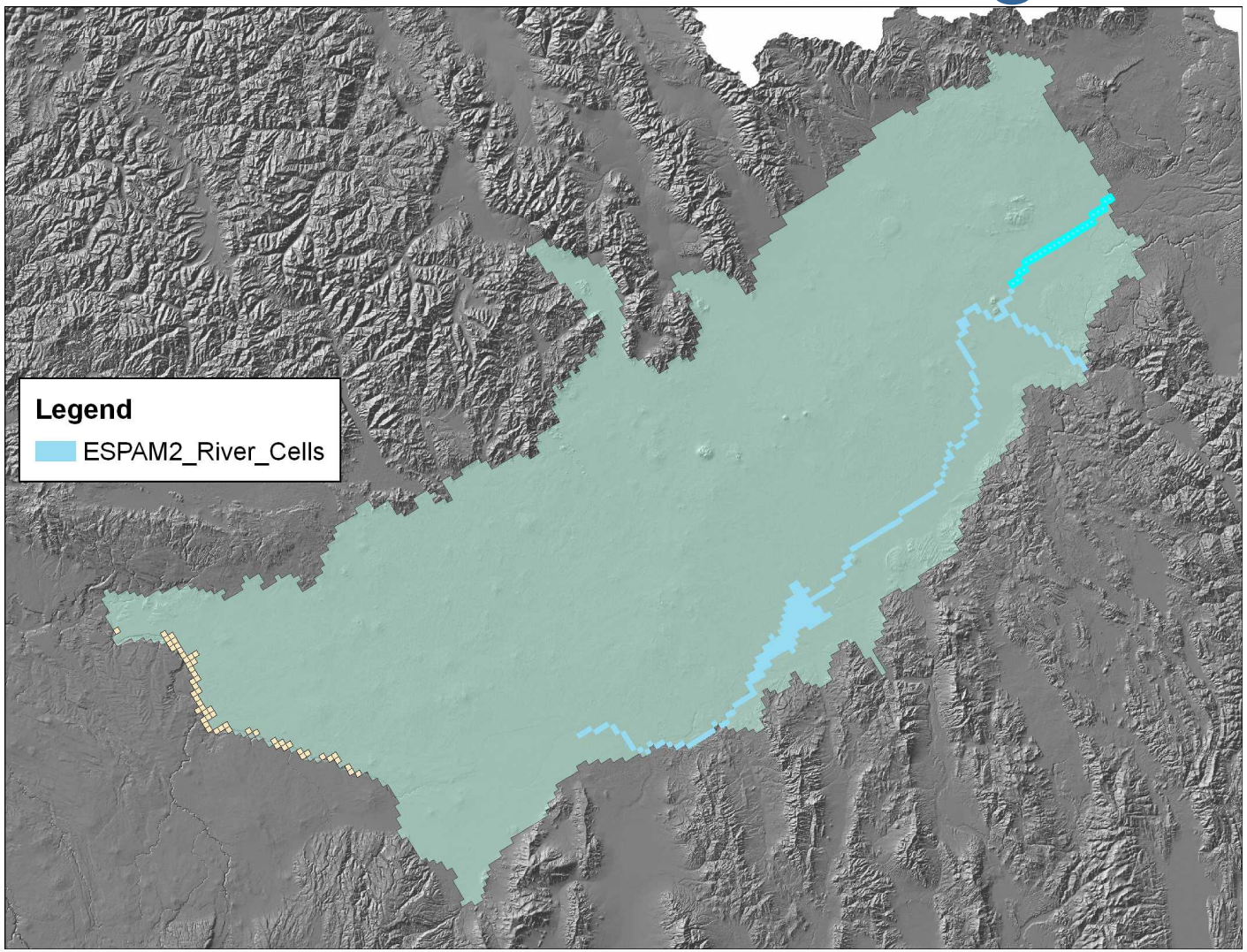
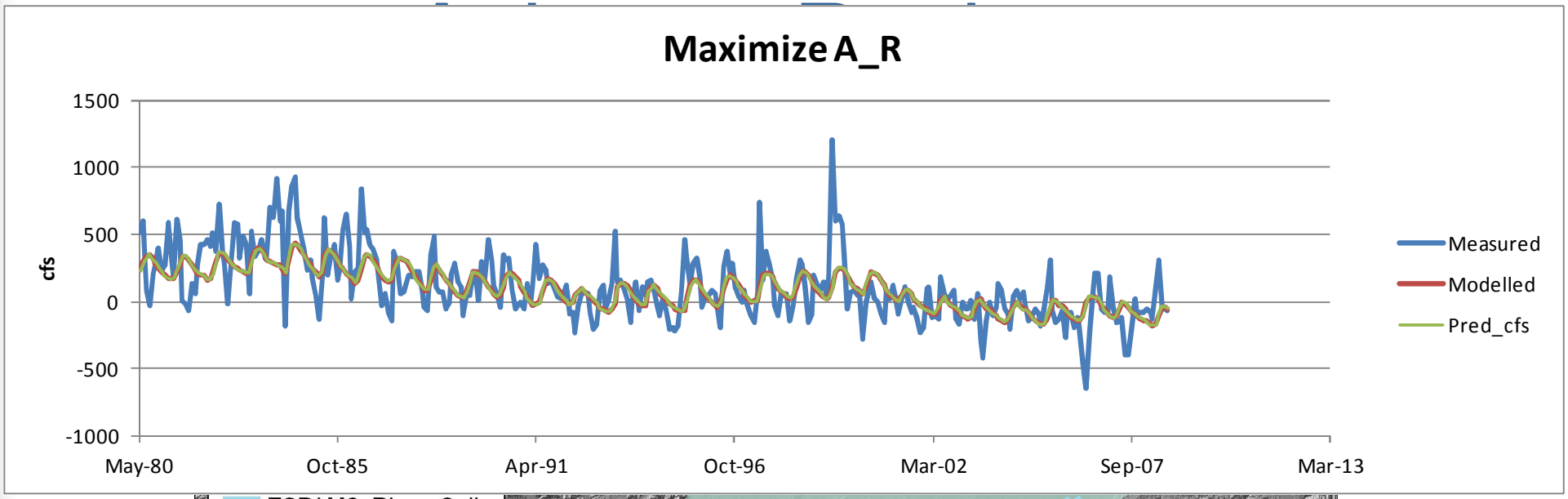
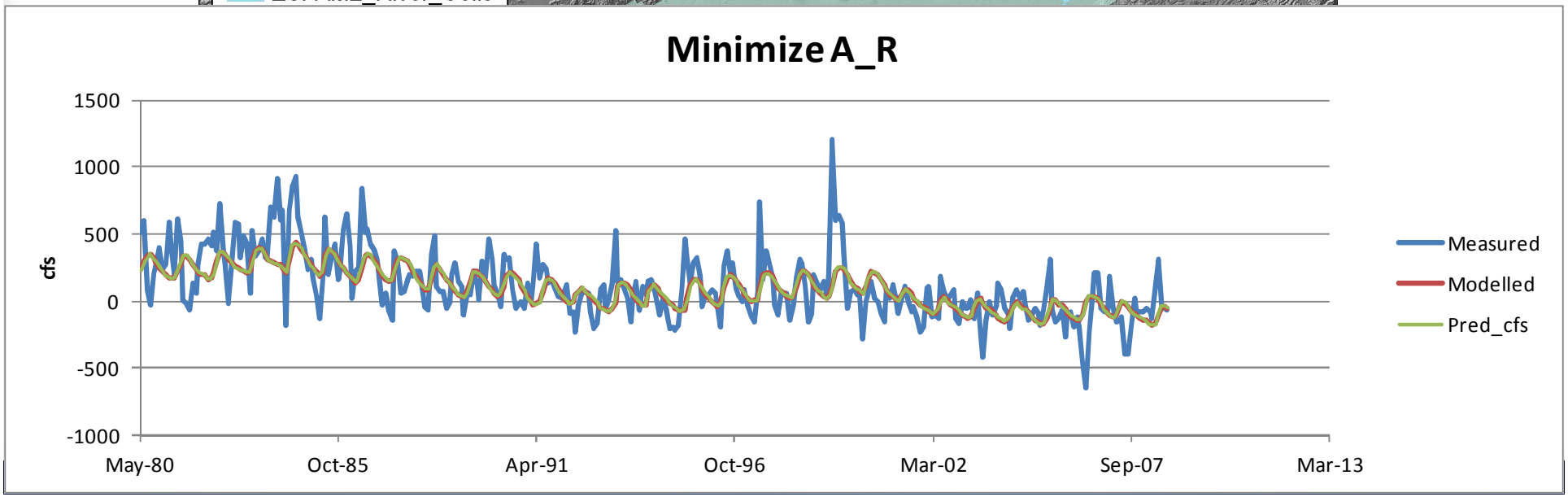


Ashton - Rexburg

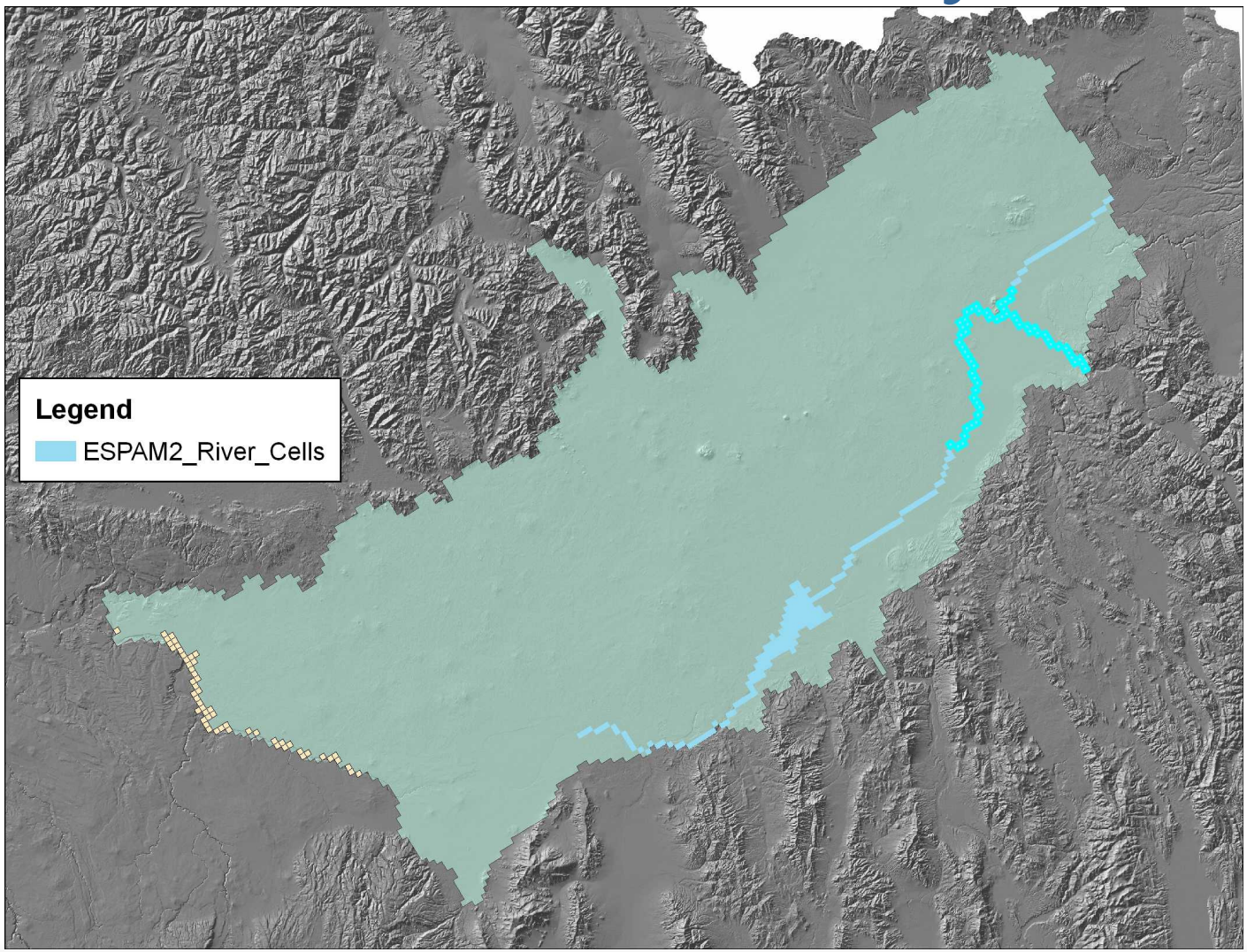


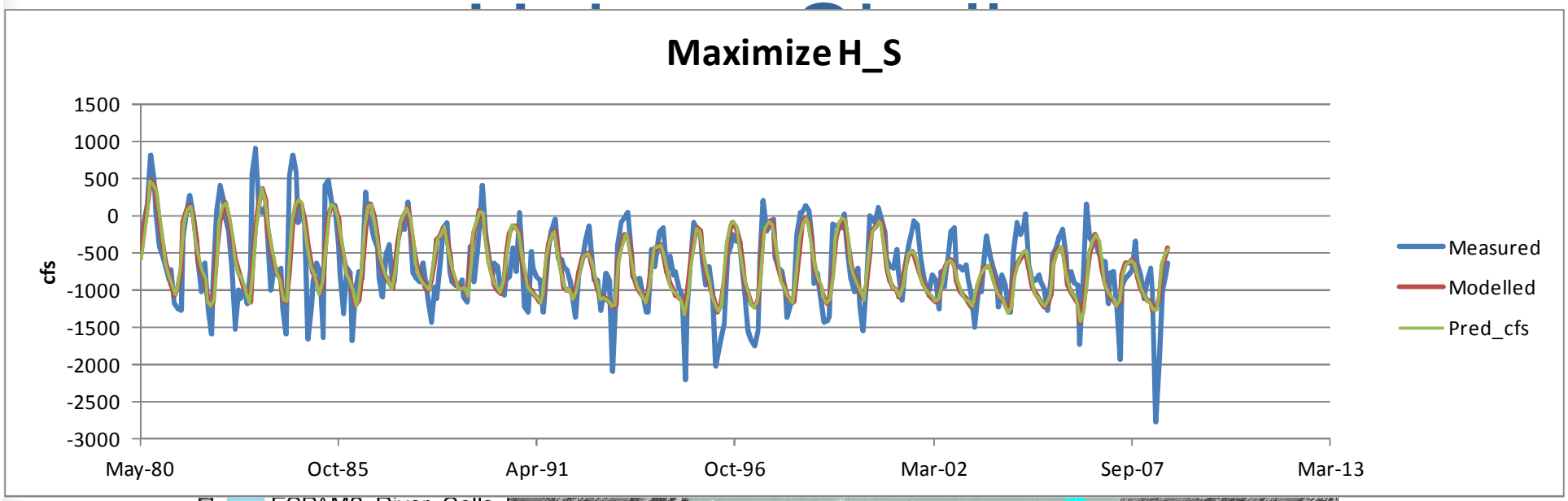


ESPAM2_River_Cells



Heise - Shelley





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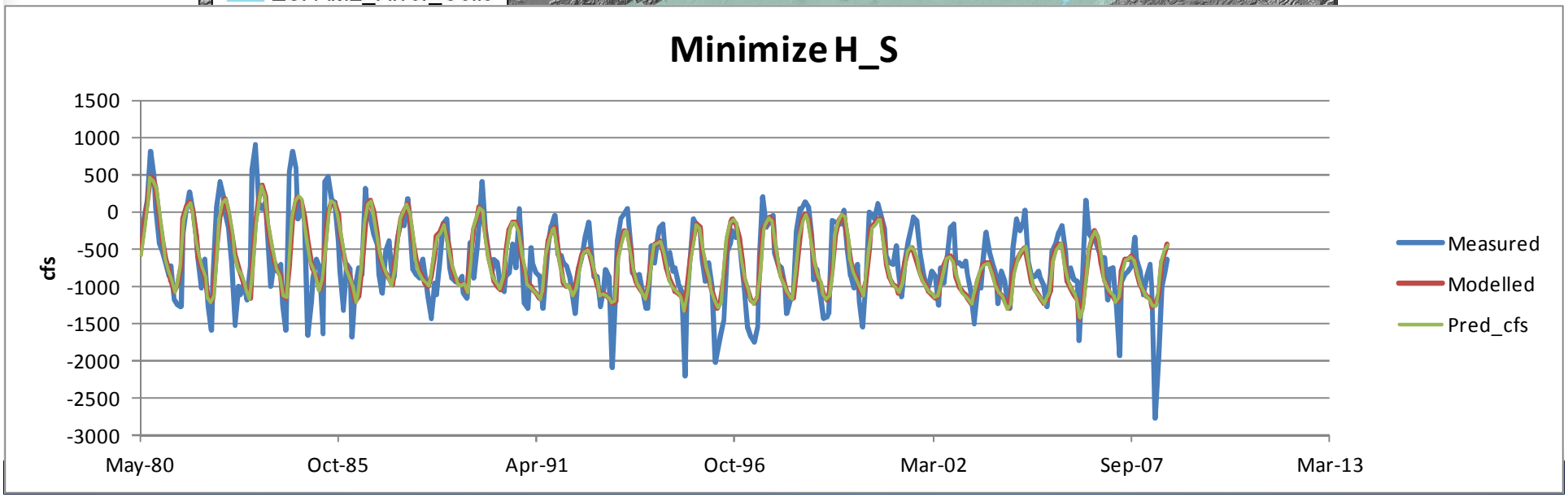
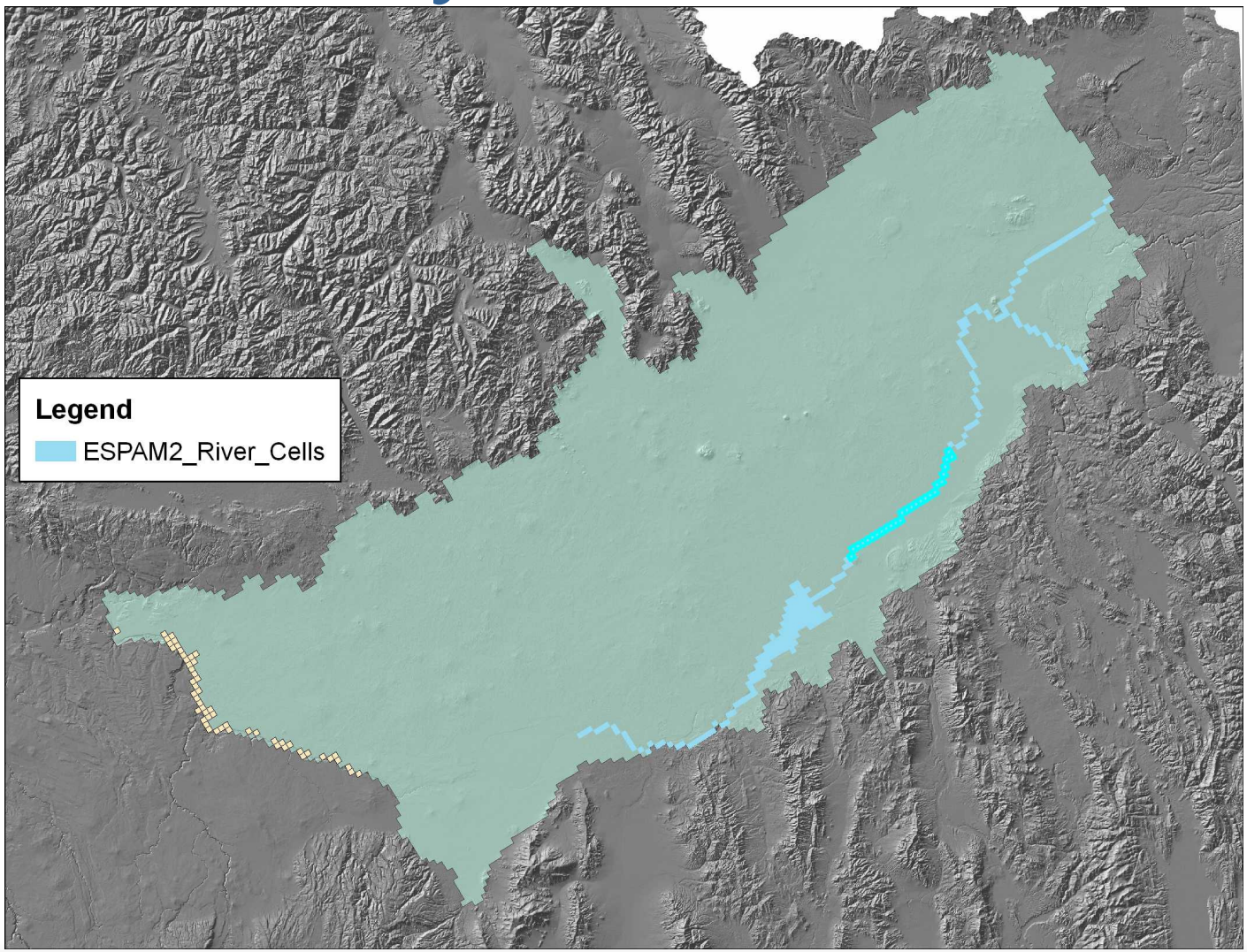
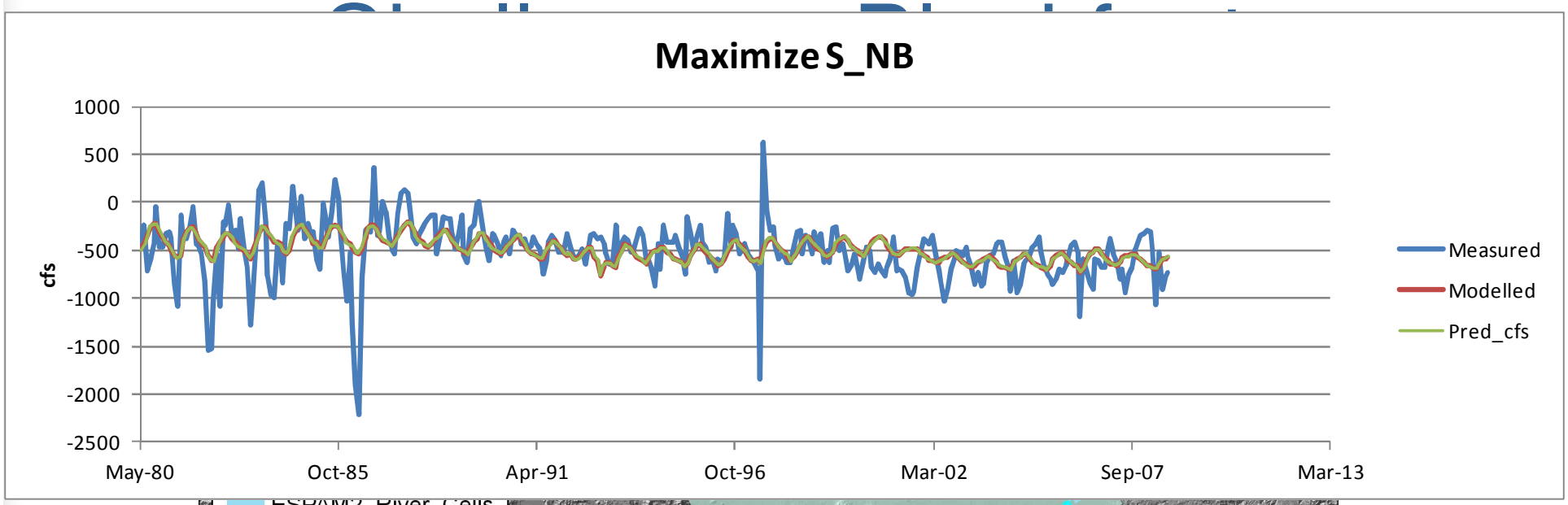


Shelley – nr Blackfoot

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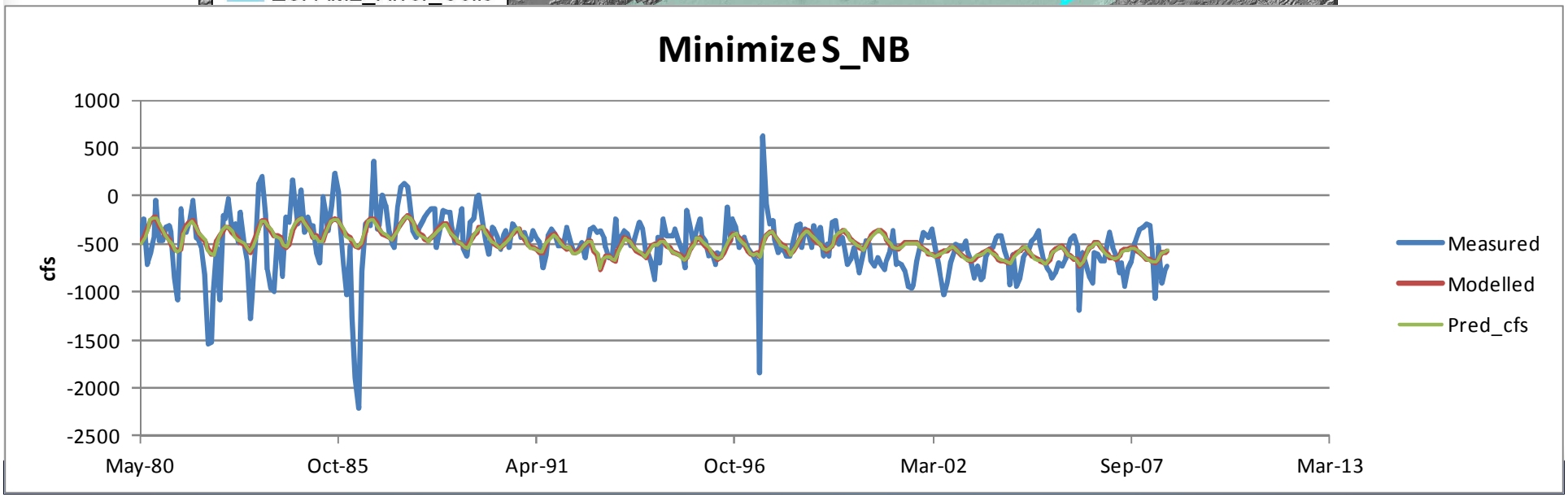
Modelled
Pred_cfs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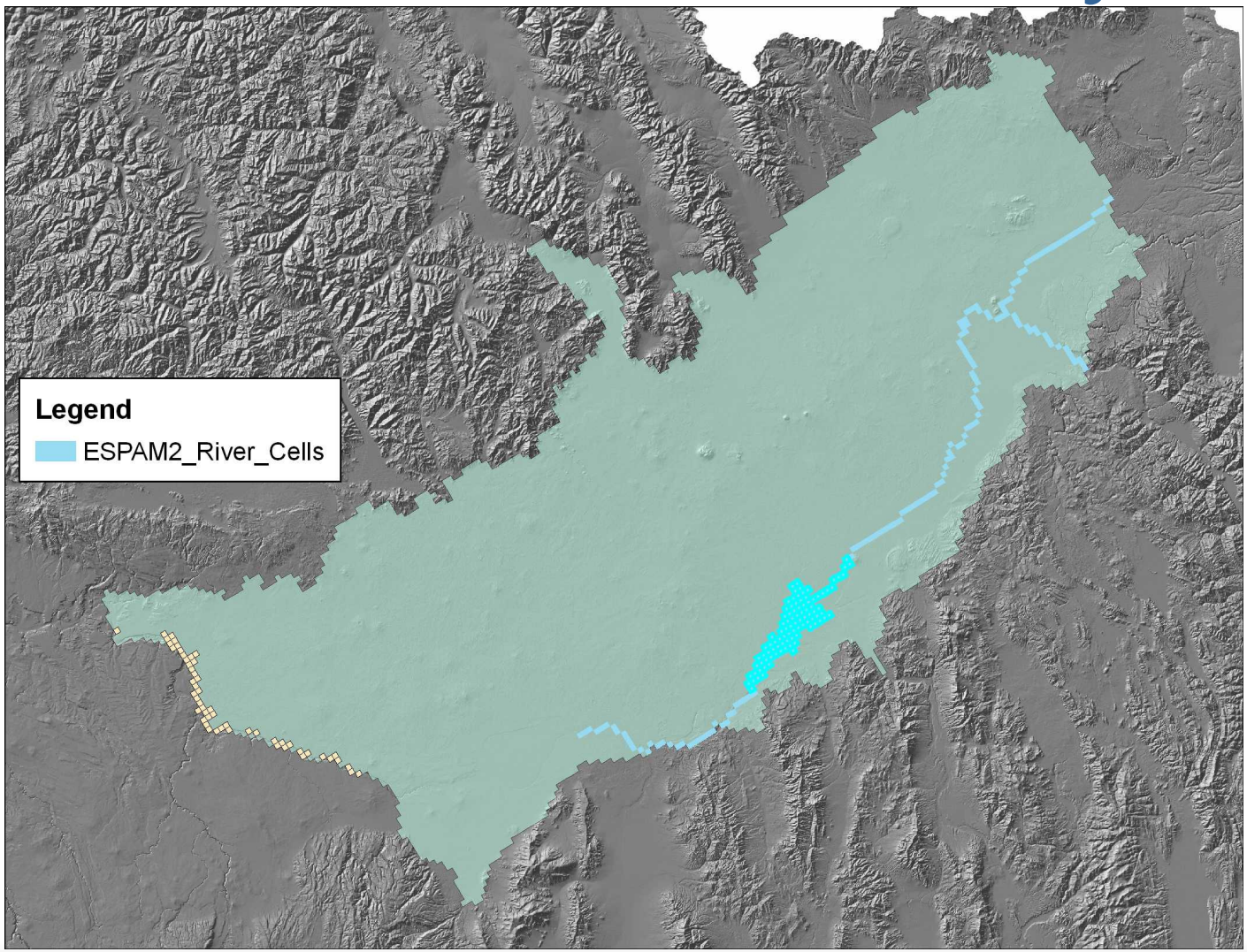
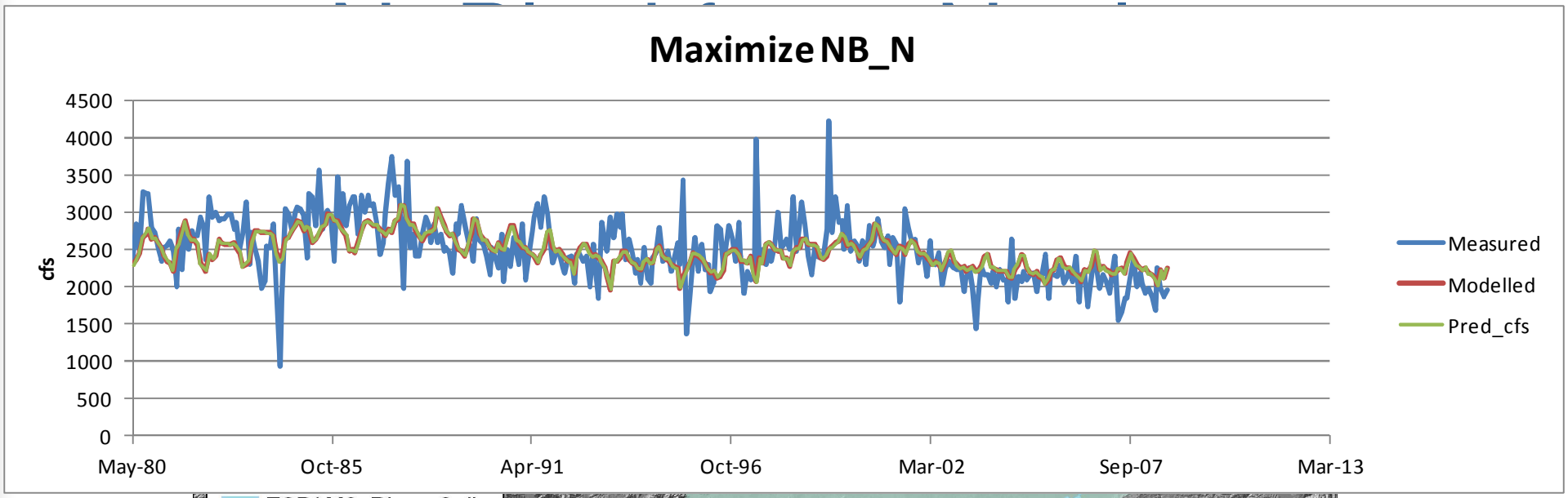
Nr Blackfoot - Neeley





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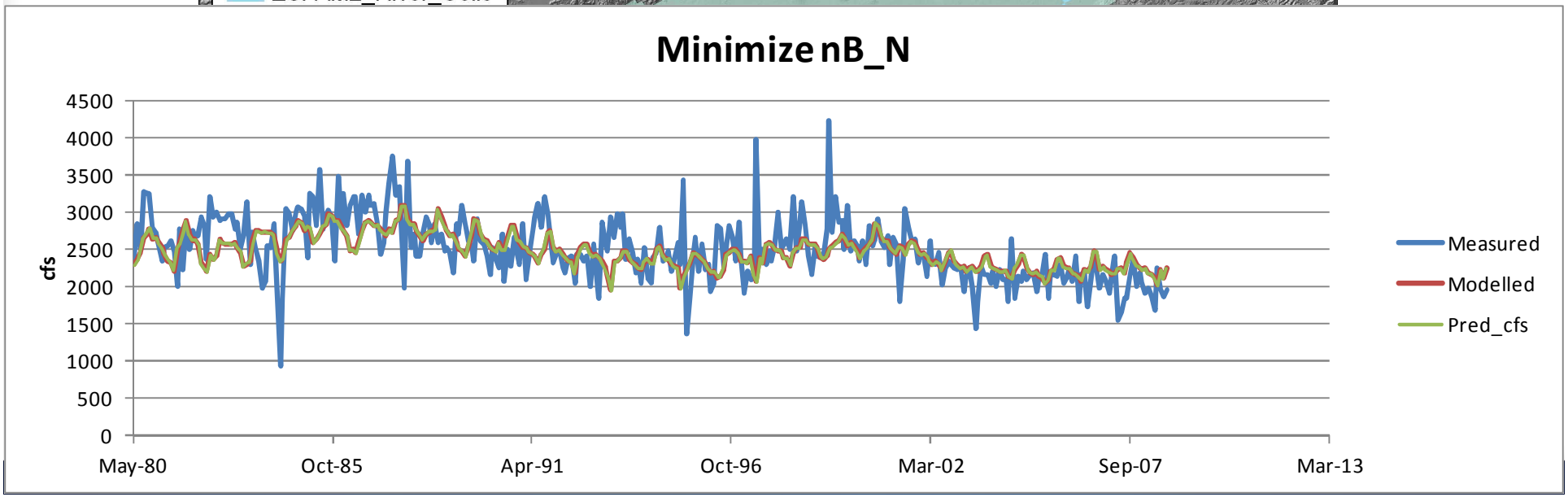

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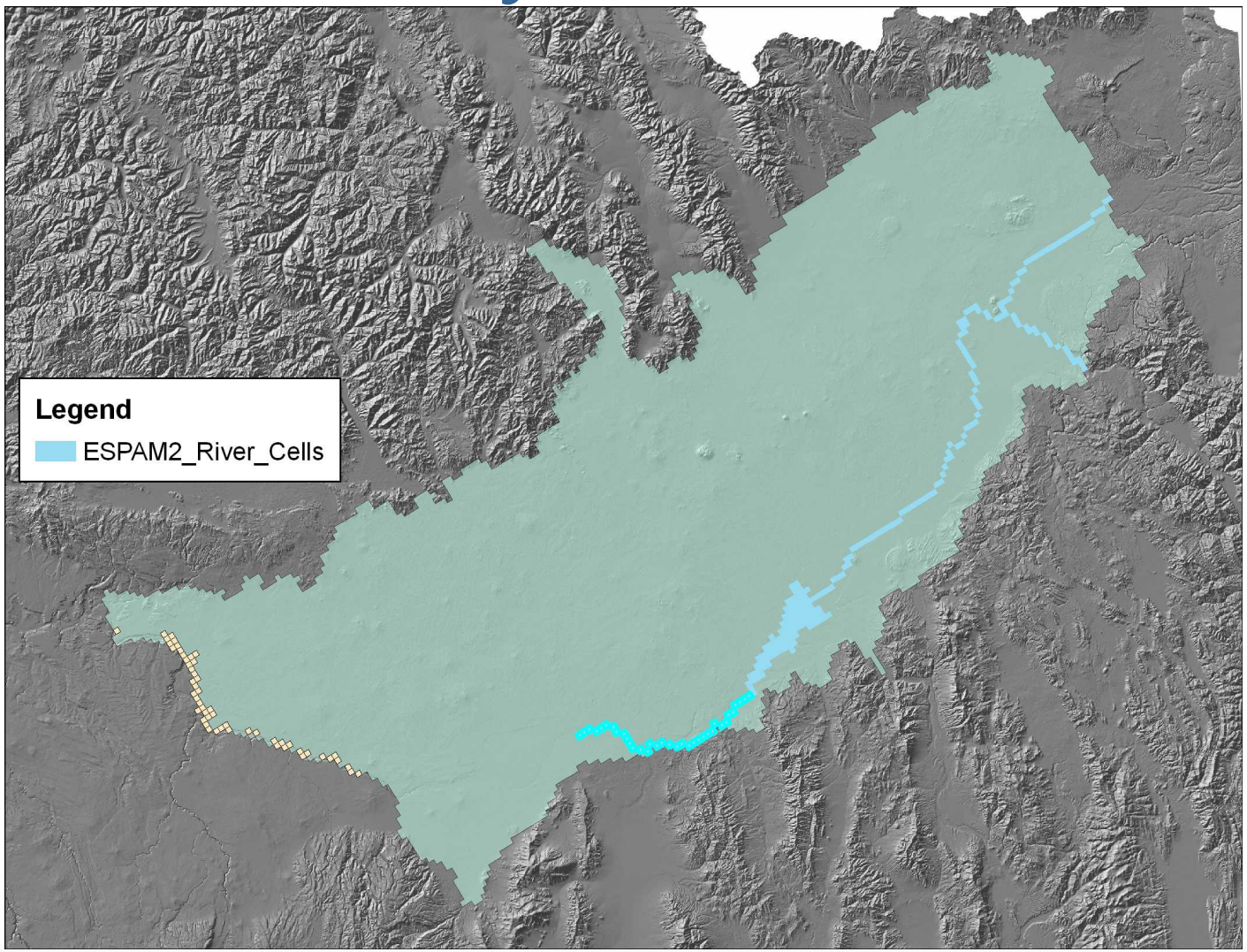

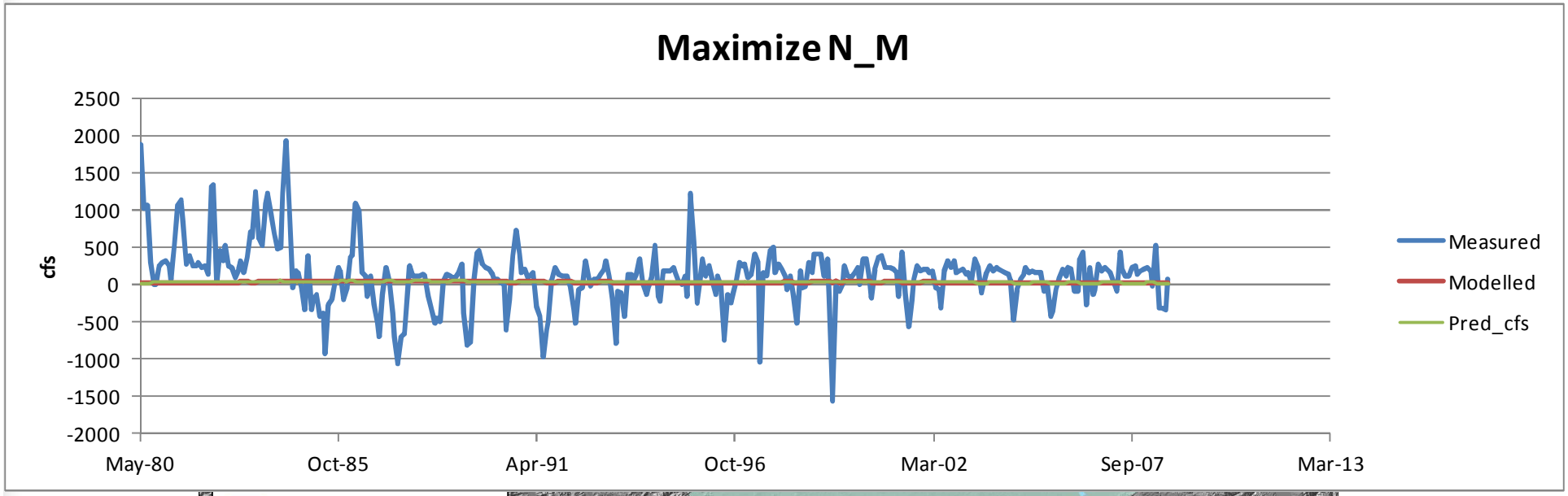

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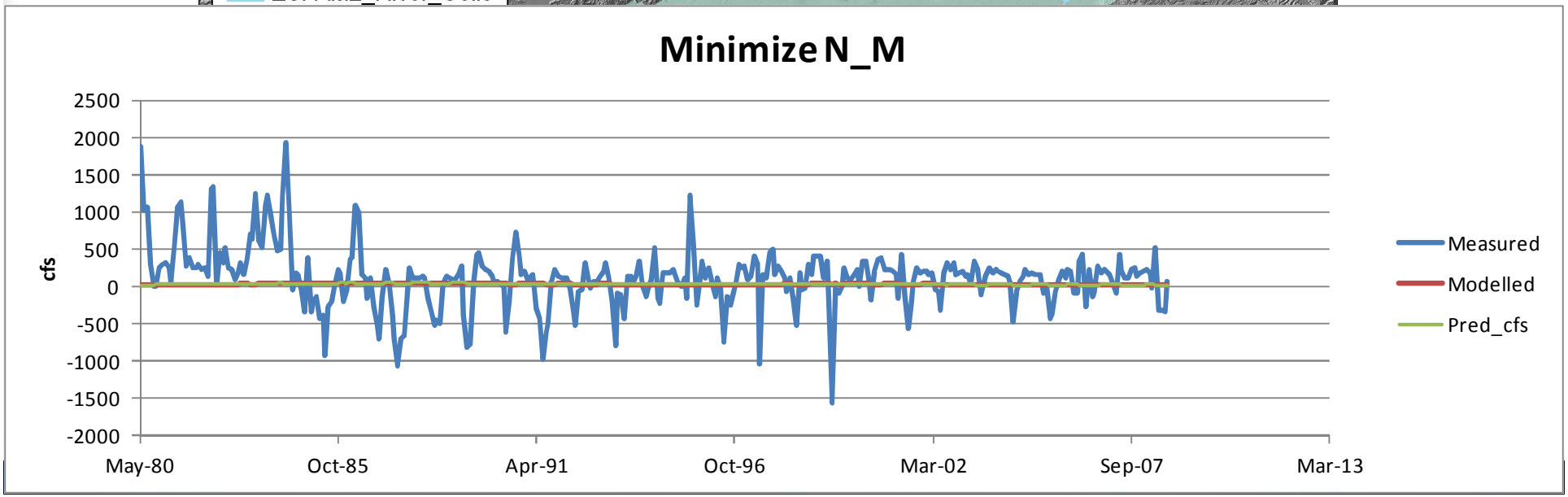
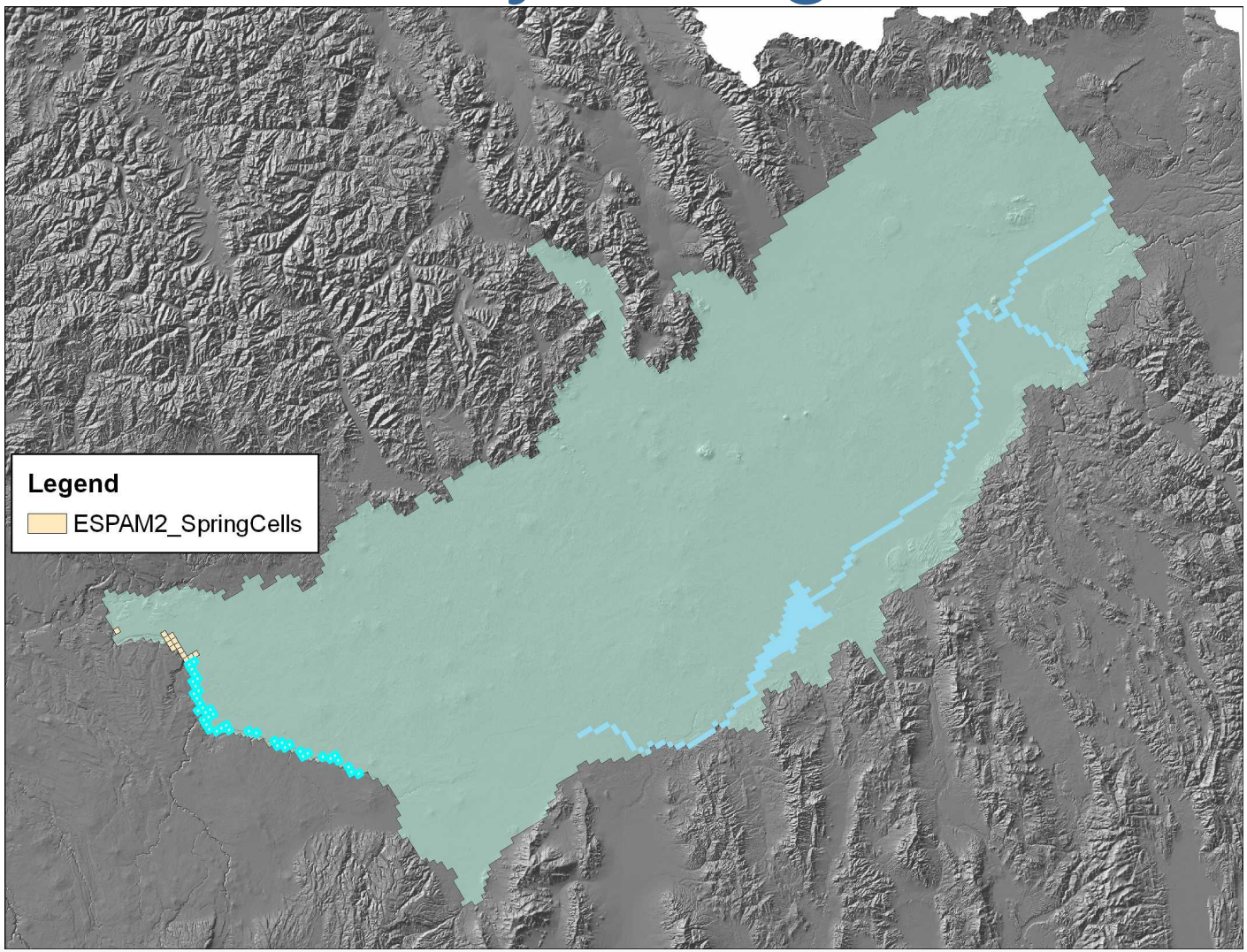
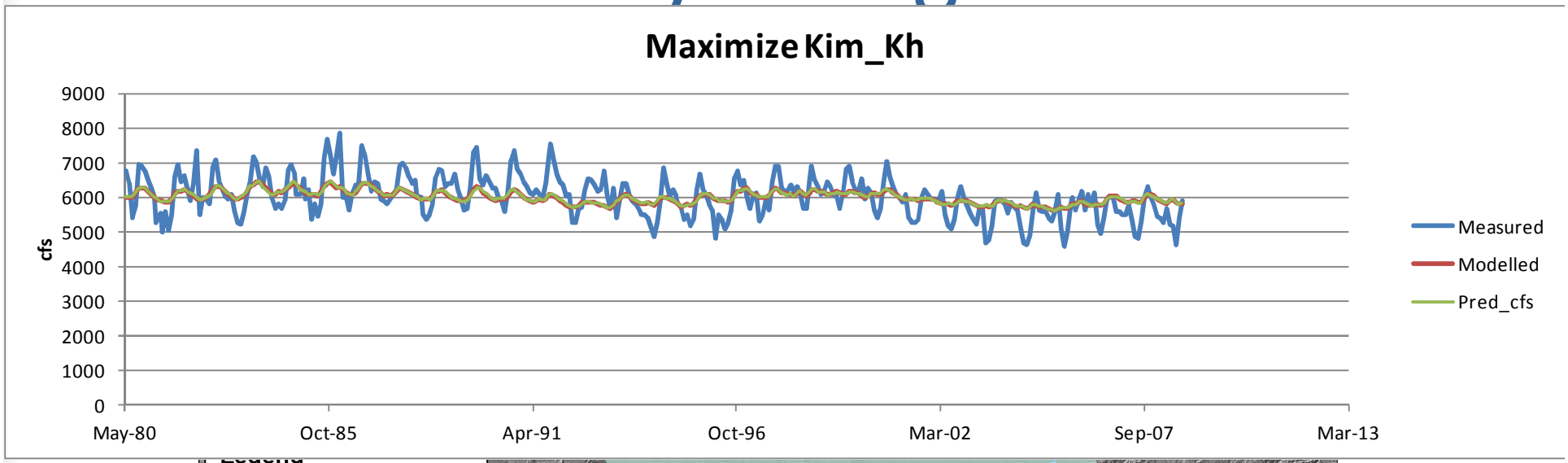


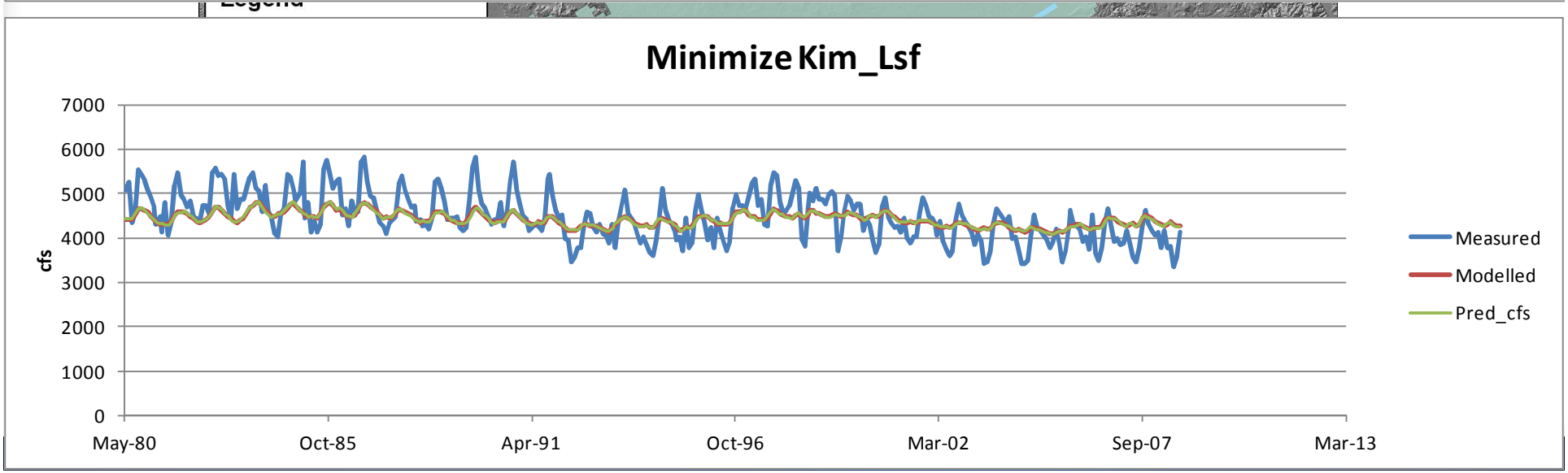
Kimberly - Hagerman



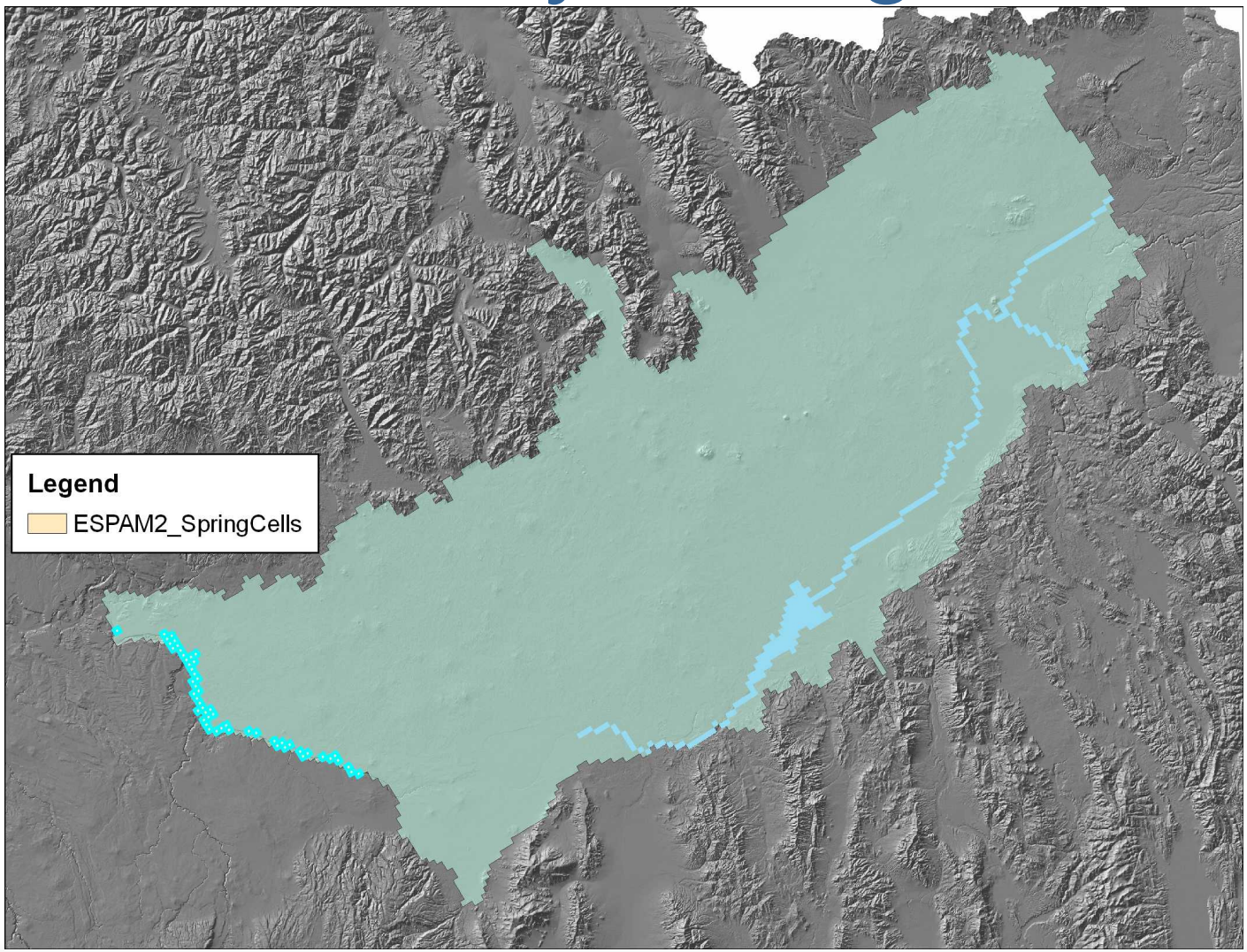
IDAHO Department of Water Resources

Kimberly - Hagerman



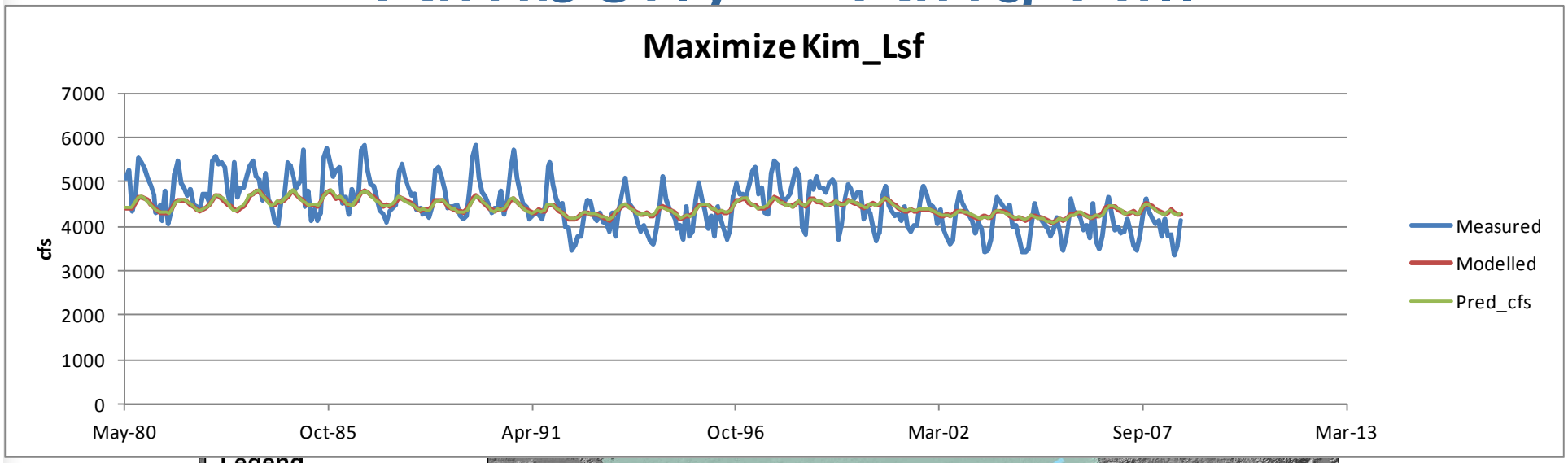


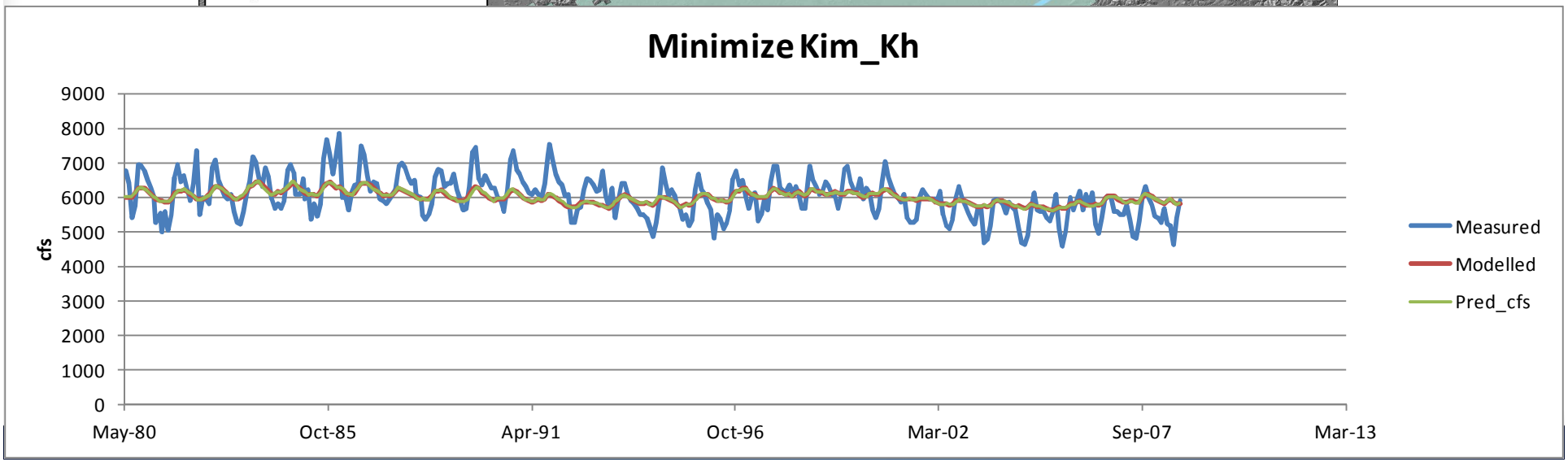
Kimberly – King Hill

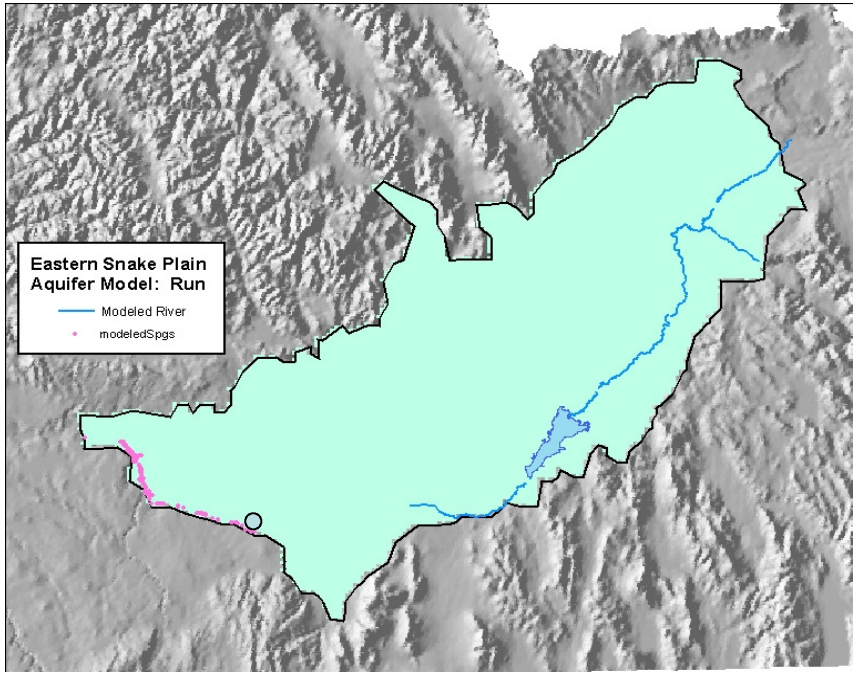


IDAHO Department of Water Resources

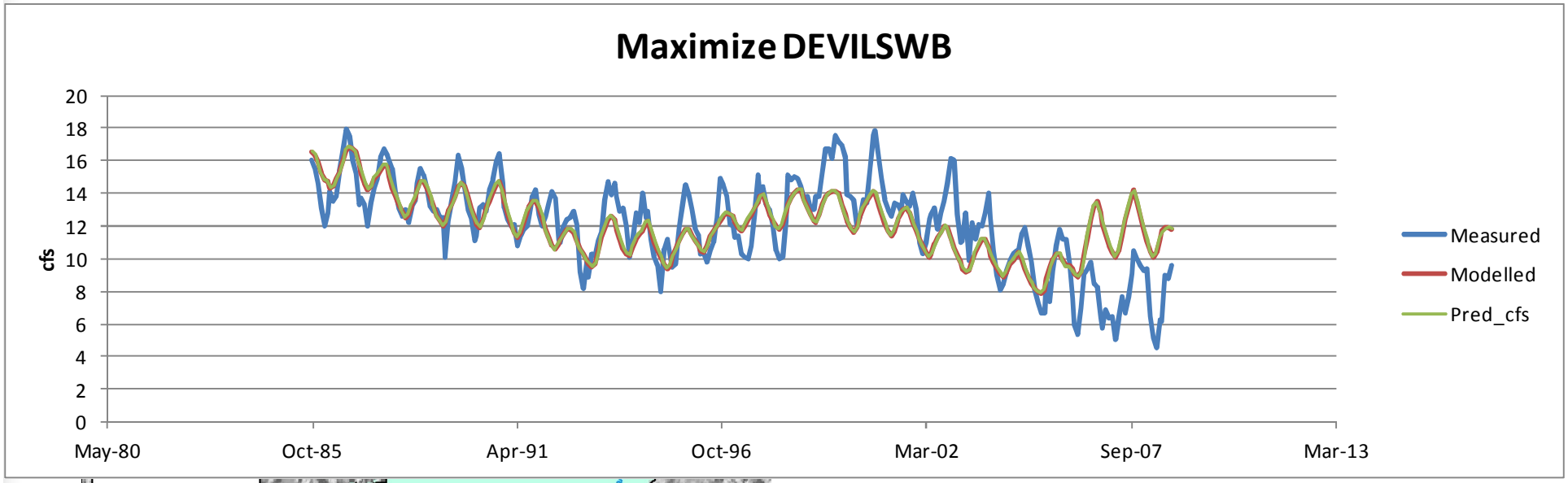
Kimberly – King Hill







- Devils Washbowl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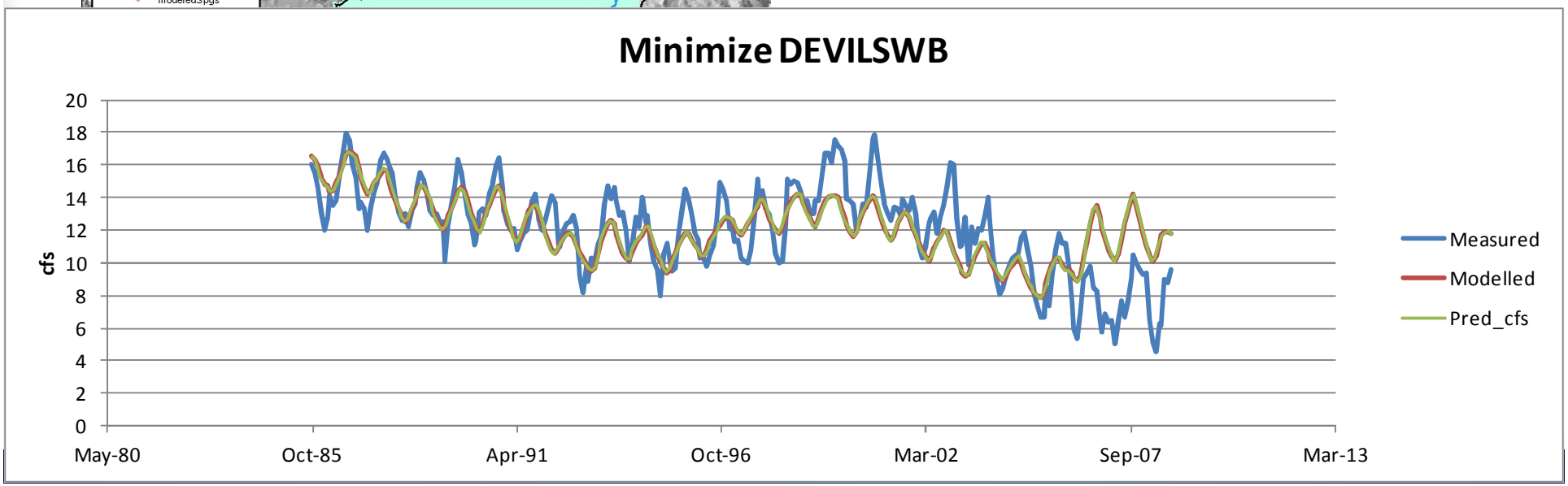
Pred_cfs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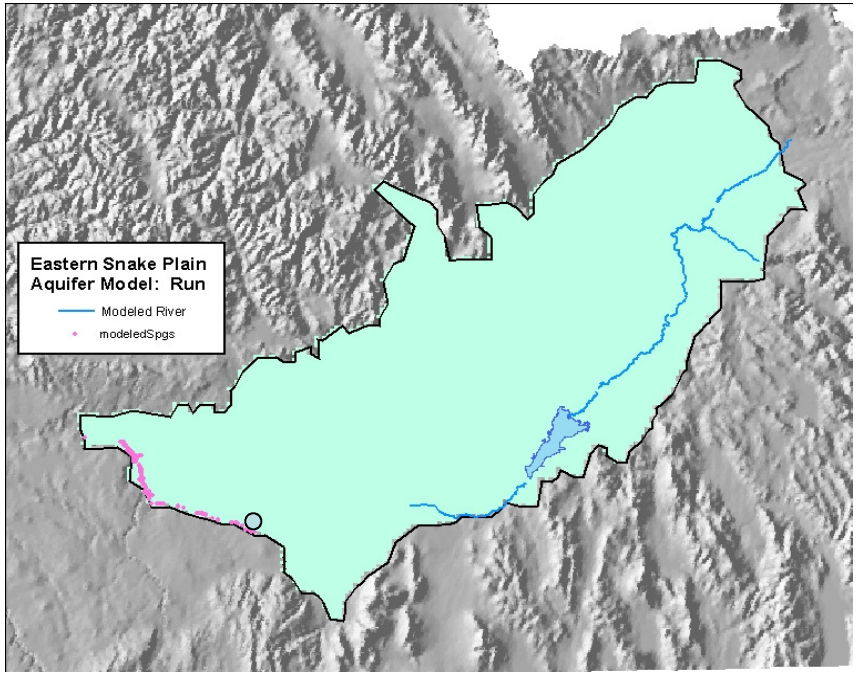
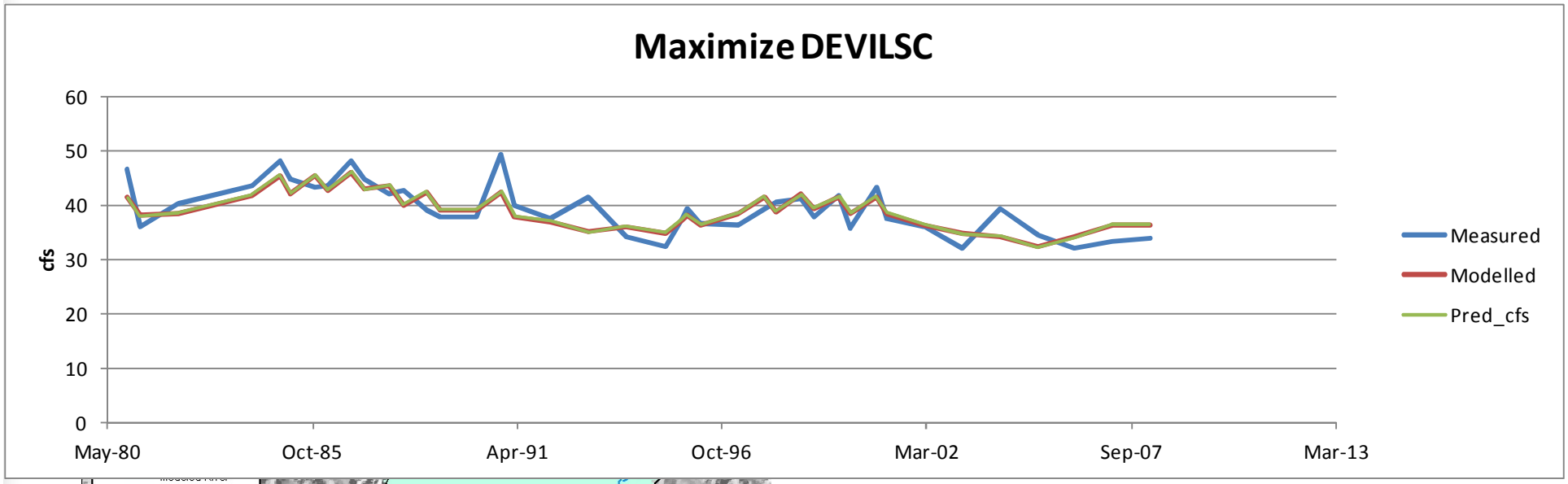


- Devils Corral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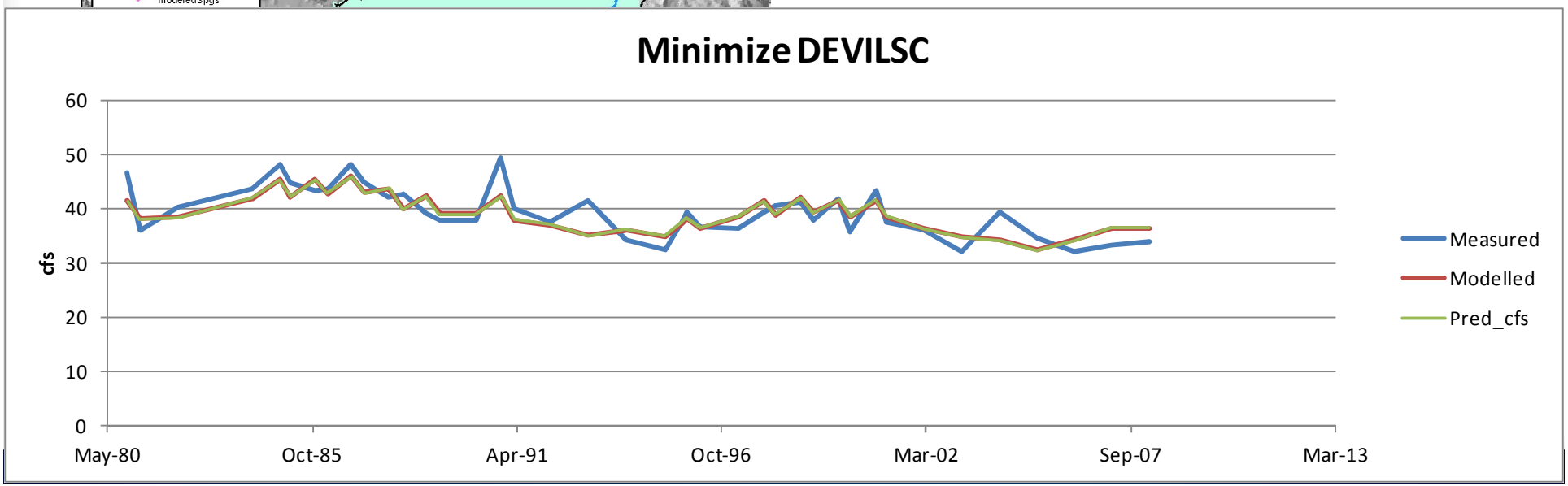
Measured
Modelled
Pred_cfs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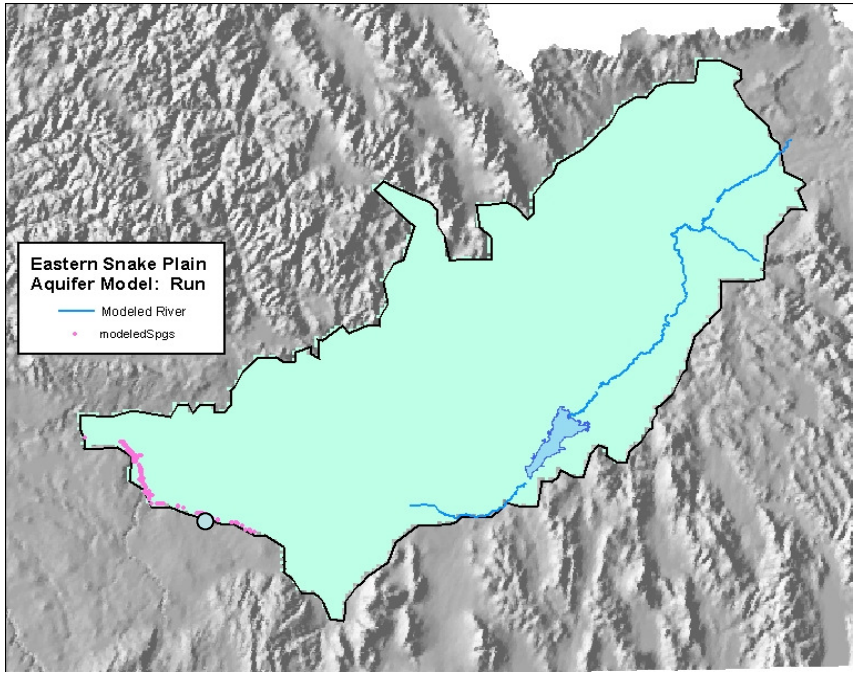
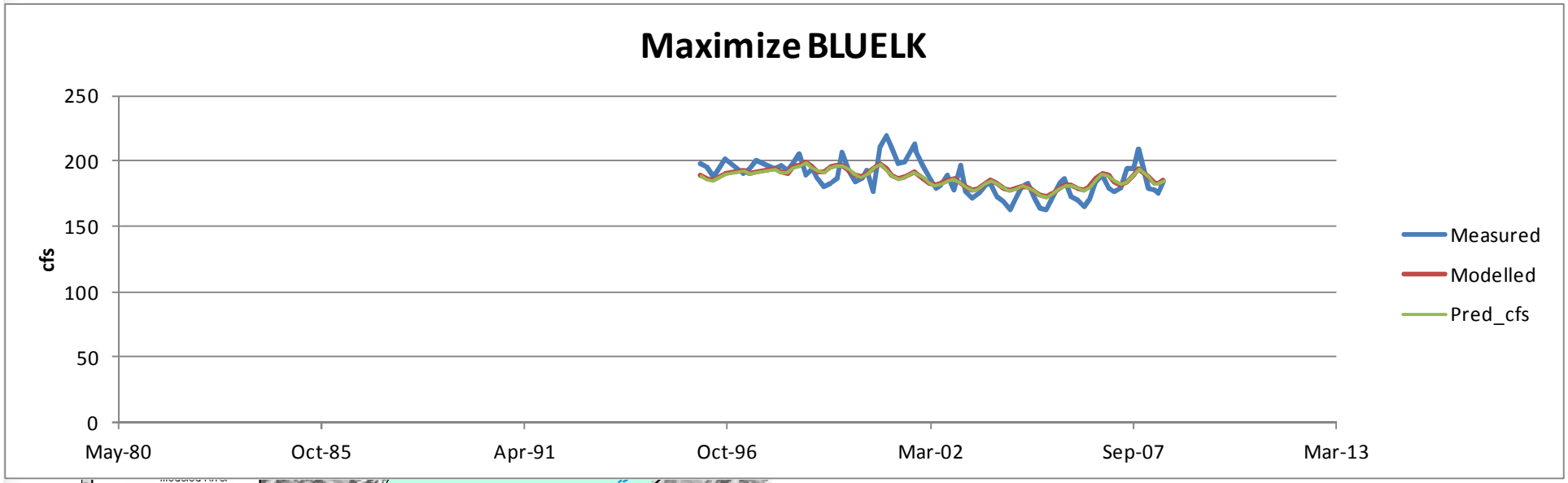
Mar-13
Measured
Modelled
Pred_cfs


Eastern Snake Plain
Aquifer Model: Run
Modeled River
modeledSpgs

- Blue Lakes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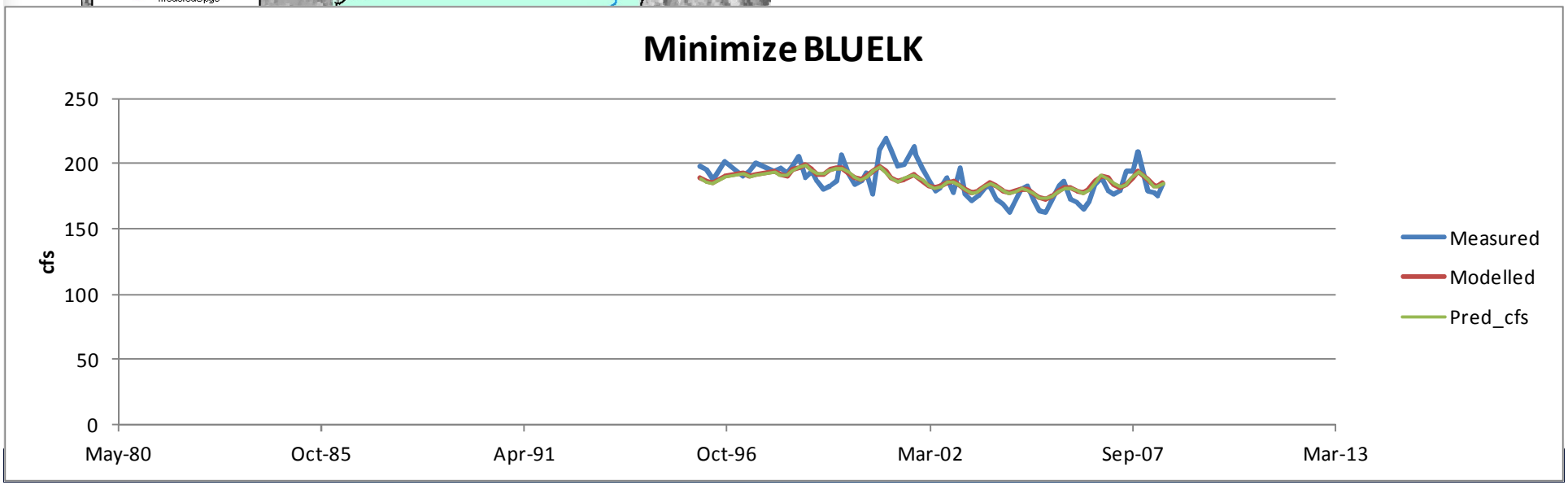
Sep-07
Mar-13
Measured
Modelled
Pred_cfs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Measured
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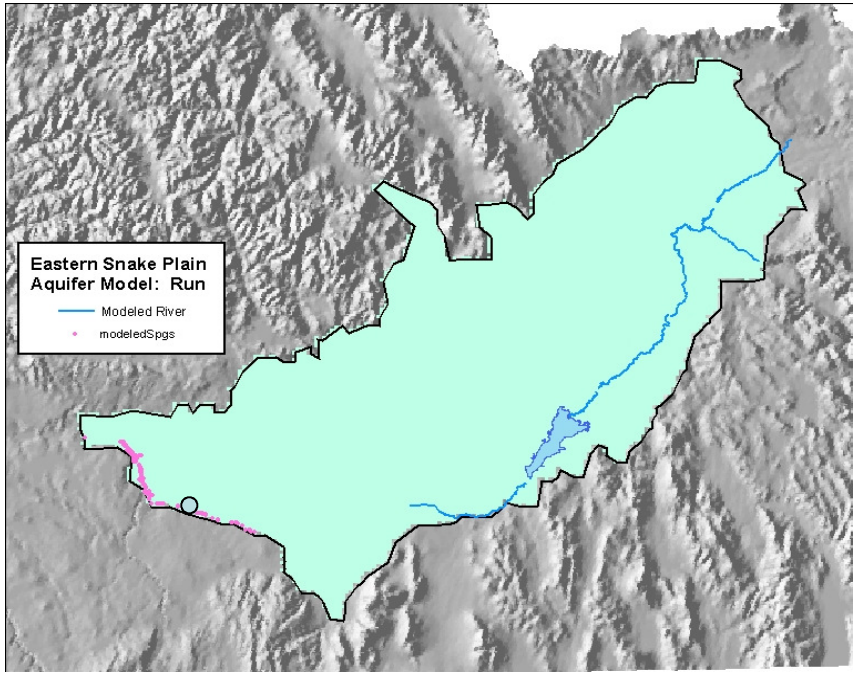
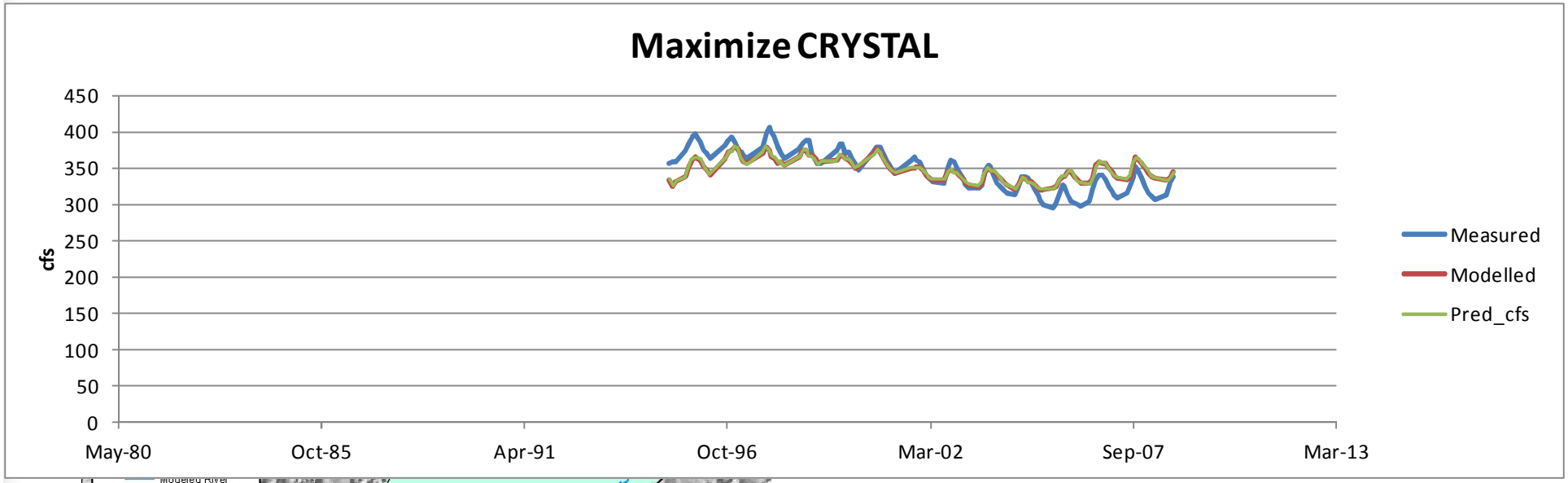
Pred_cfs



- Crystal Springs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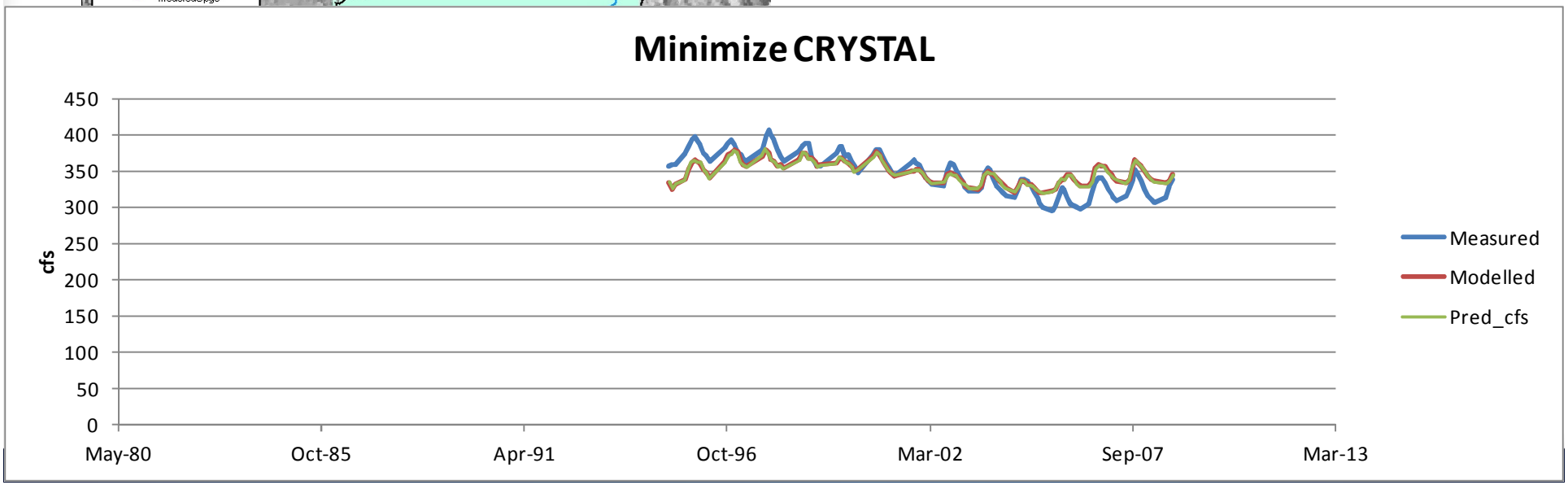
Pred_cfs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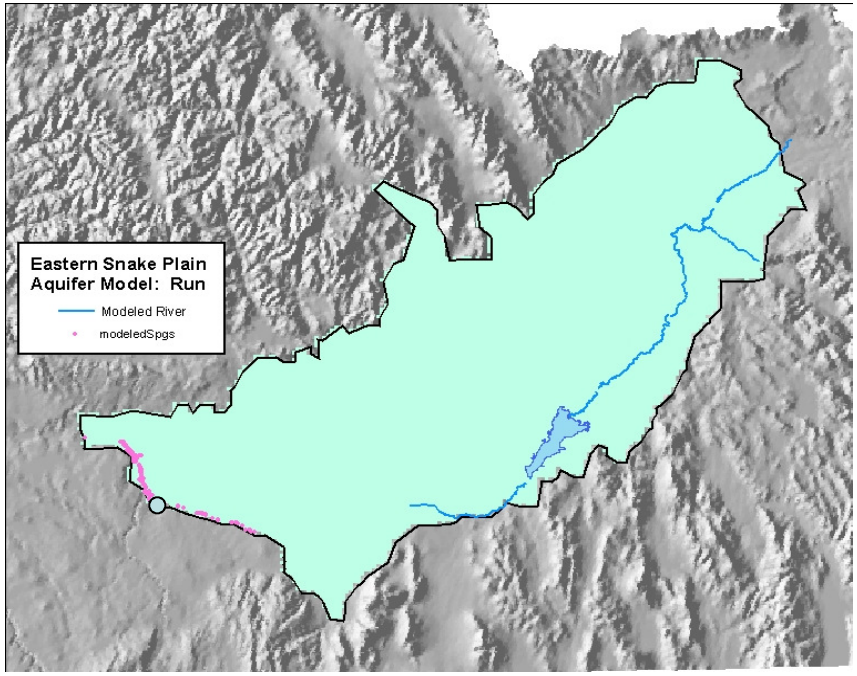
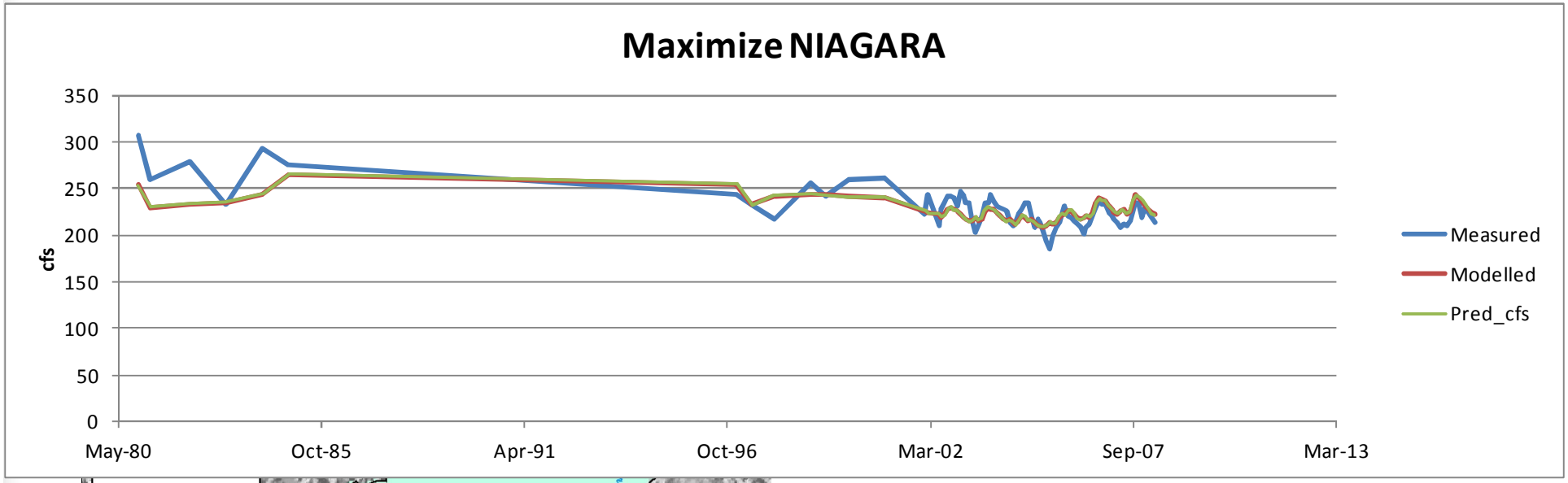
Pred_cfs


Eastern Snake Plain
Aquifer Model: Run
Modeled River
modeledSpgs

- Niagara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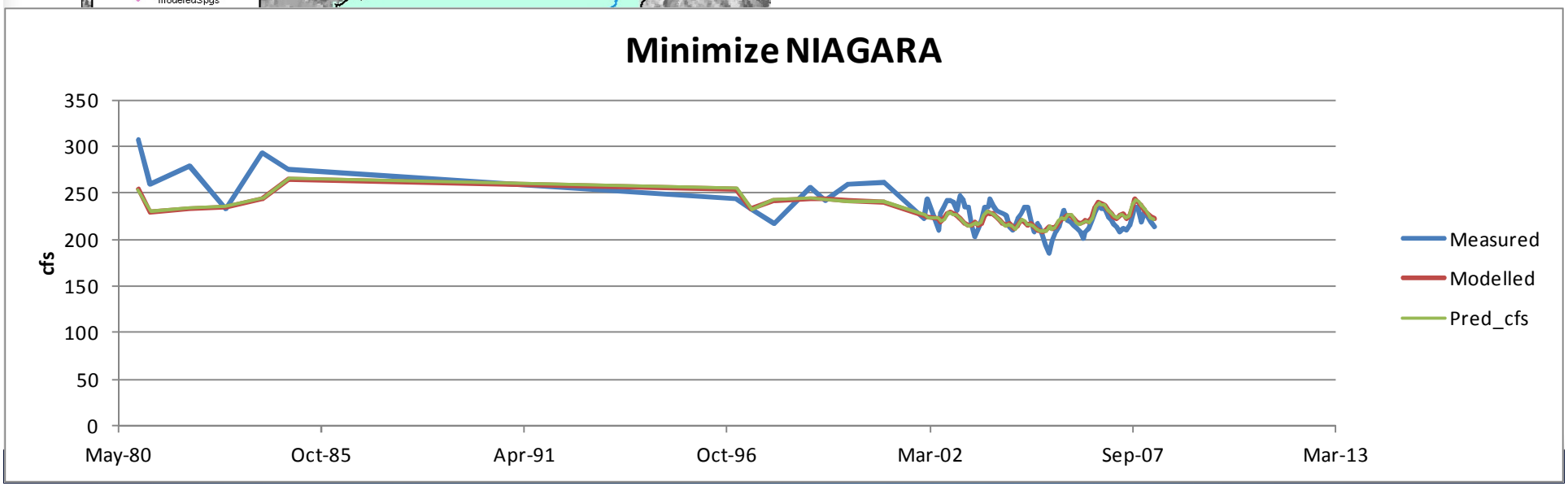
Mar-13
Measured
Modelled
Pred_cfs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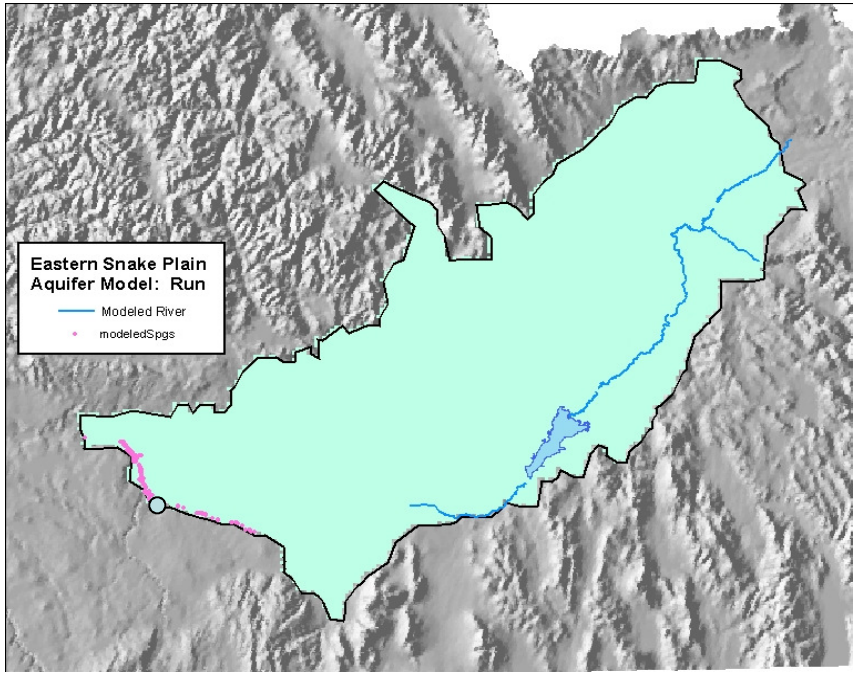
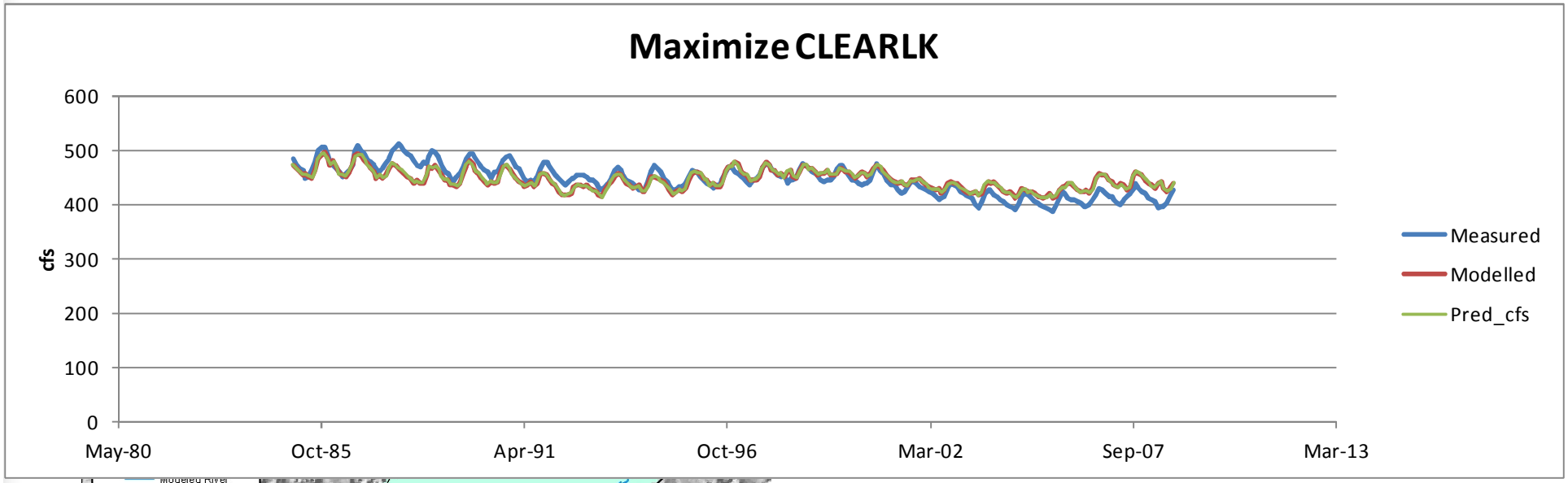
Mar-13
Measured
Modelled
Pred_cfs


Eastern Snake Plain
Aquifer Model: Run
Modeled River
modeledSpgs

- Clear Lakes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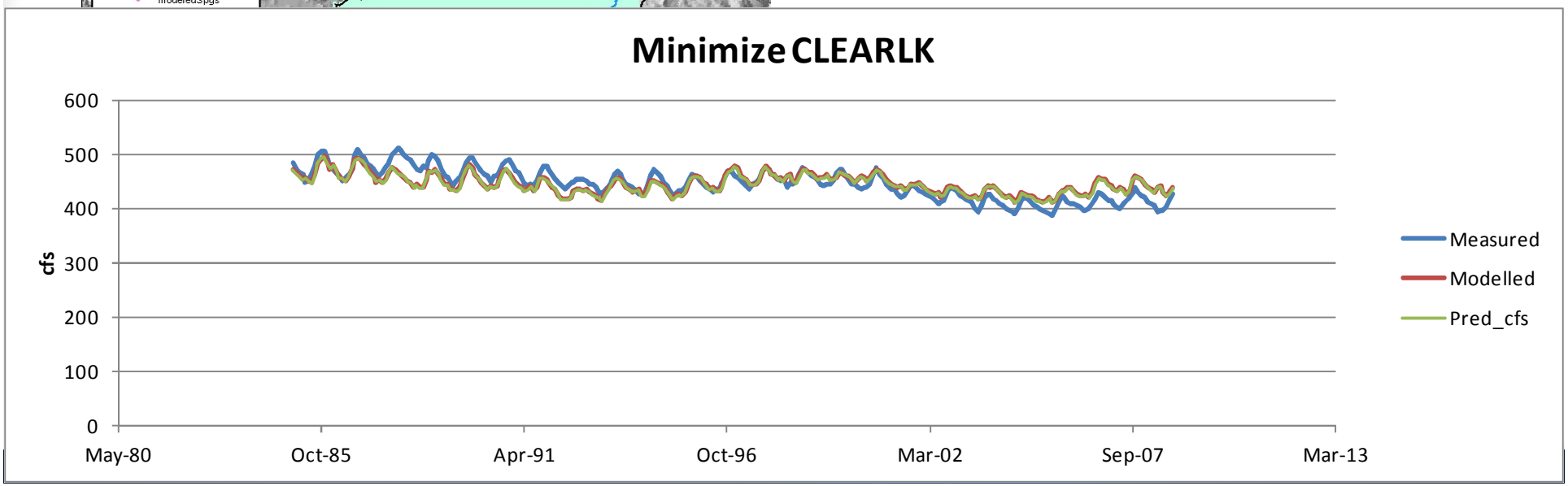
Measured
Modelled
Pred_cfs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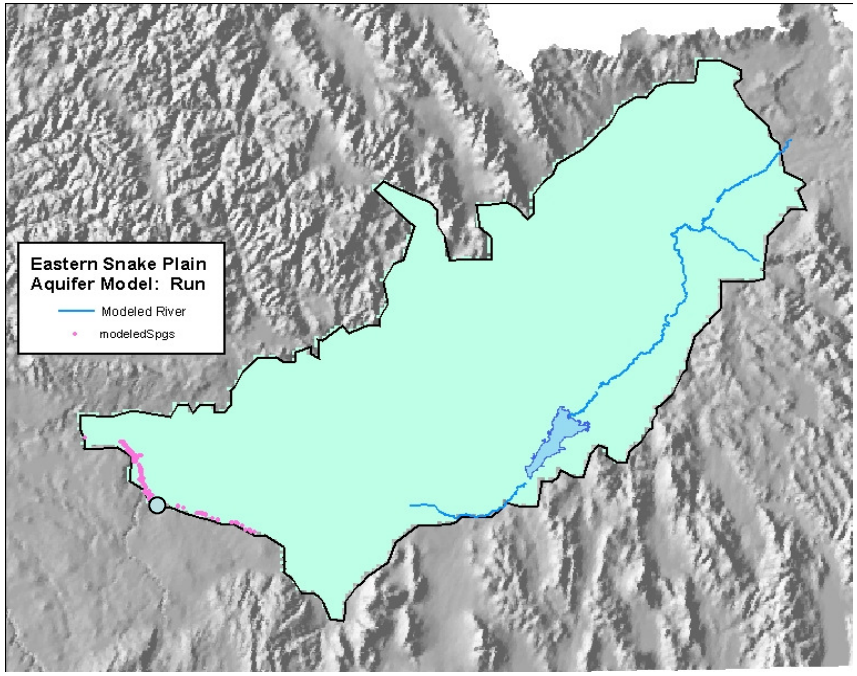
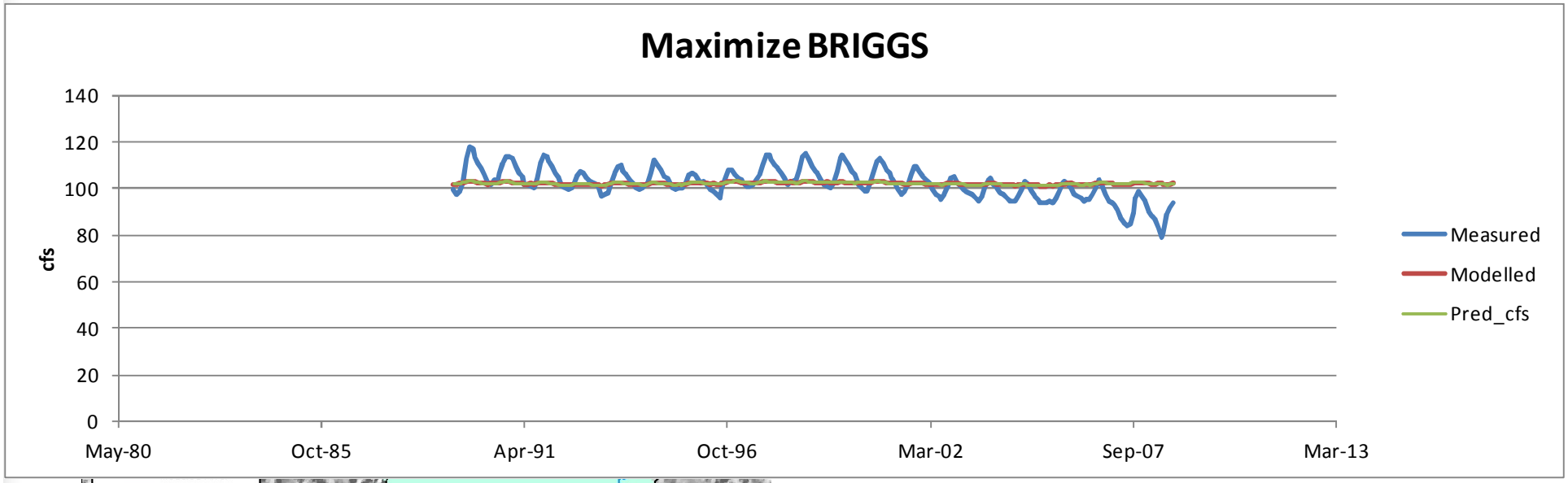
Measured
Modelled
Pred_cfs



- Briggs Spring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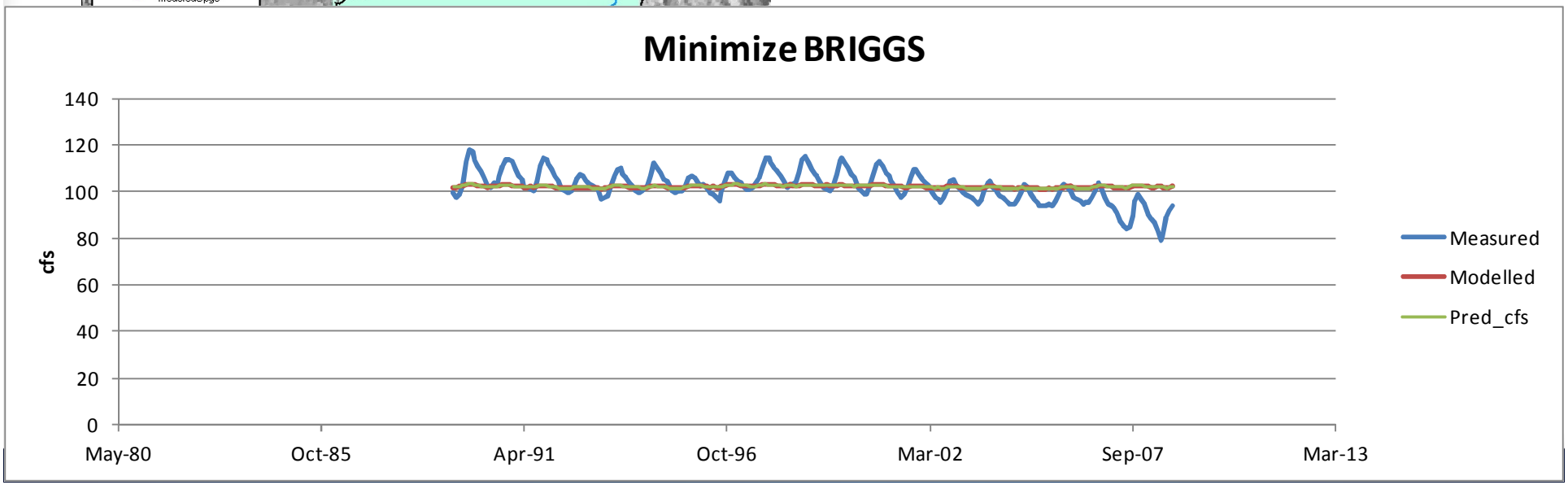
Measured
Modelled
Pred_cfs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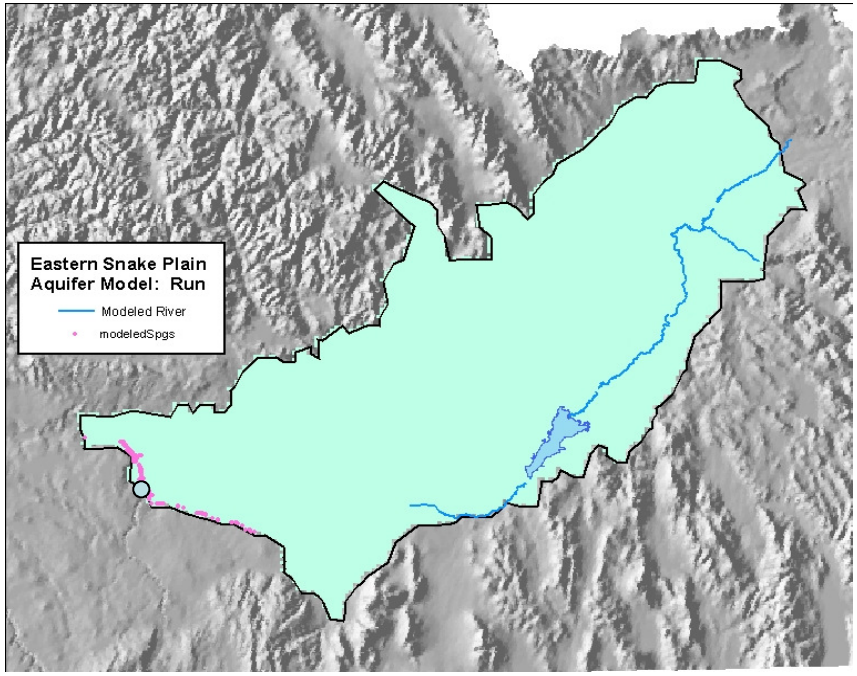
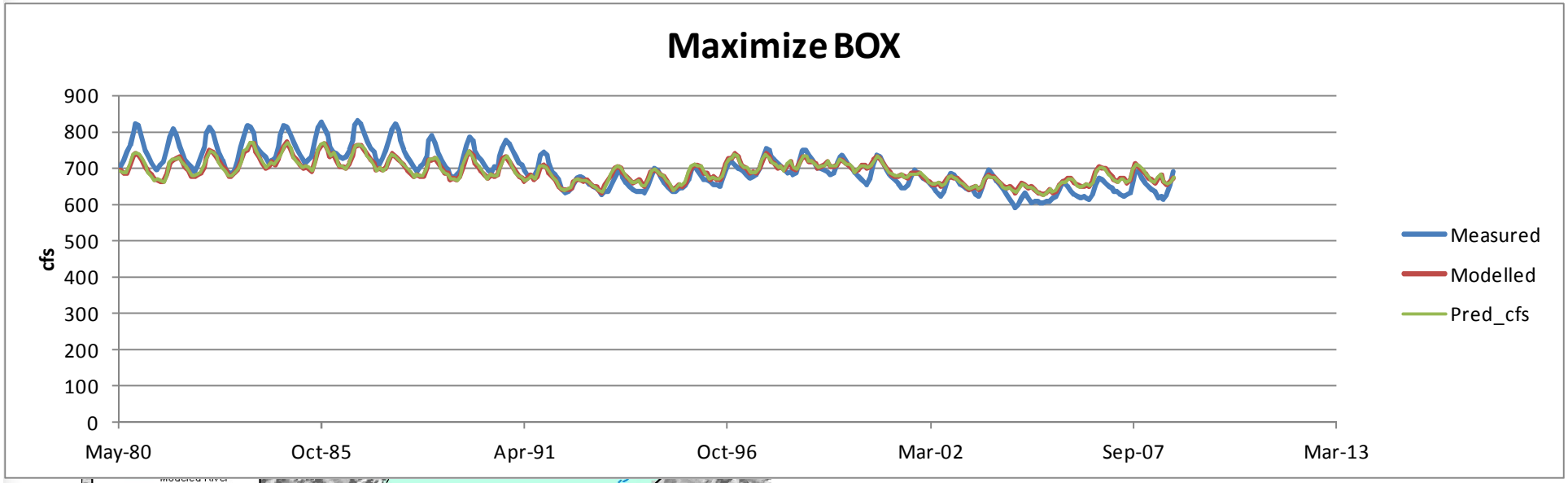
Pred_cfs



- Box Canyon Spring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800
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500
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300
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cfs
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Apr-91
Oct-96
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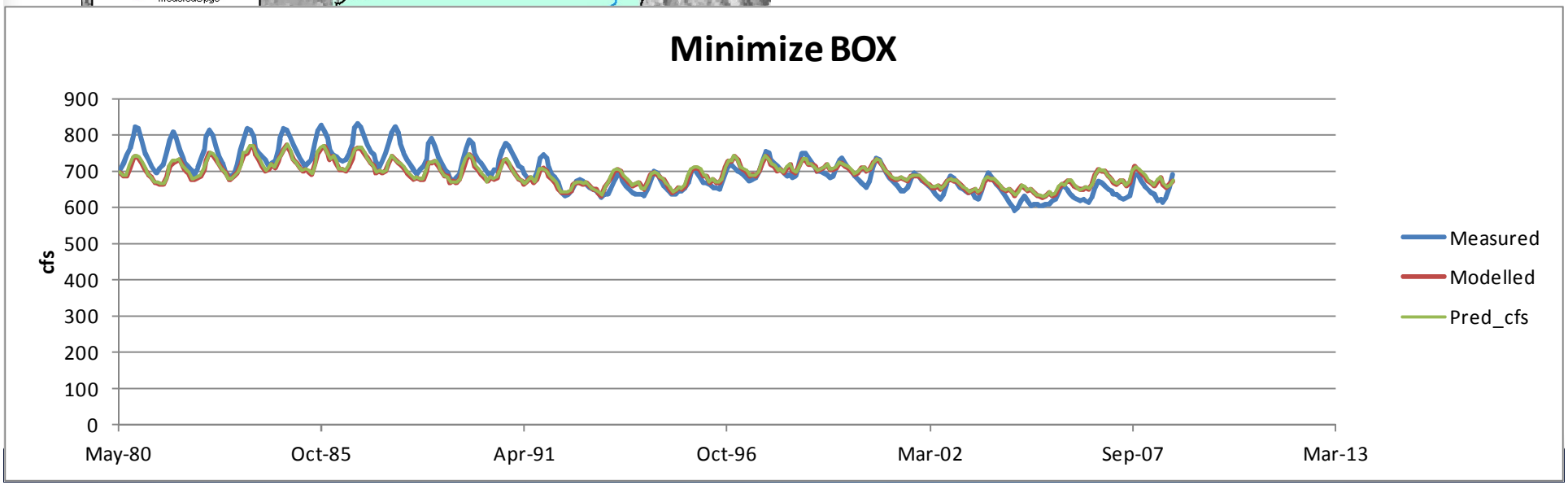
Sep-07
Mar-13
Measured
Modelled
Pred_cfs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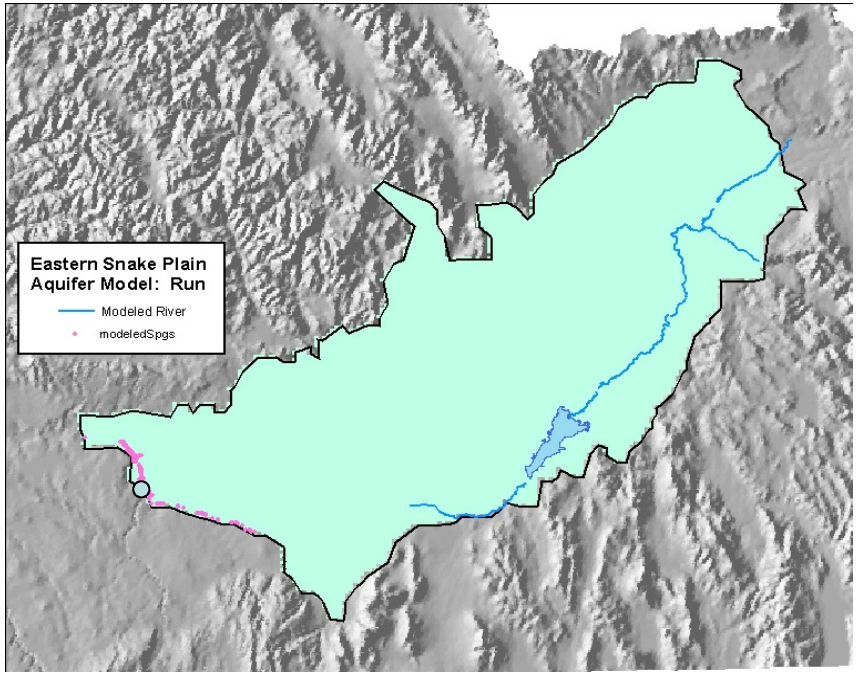
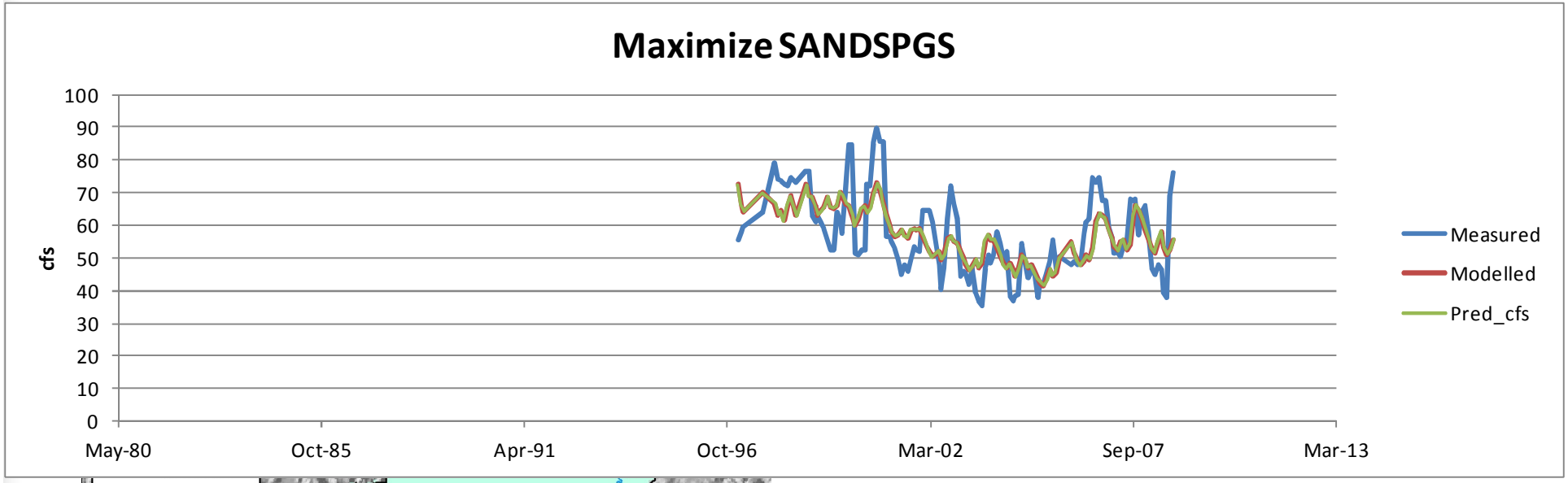
Measured
Modelled
Pred_cfs



- Sand Springs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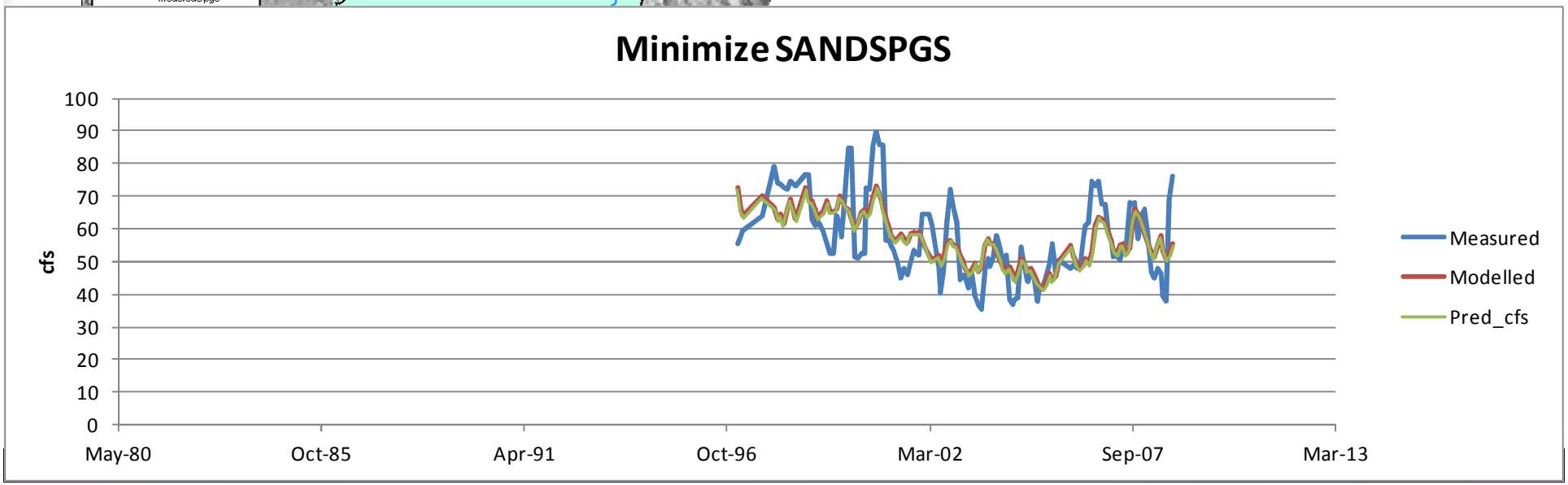
Measured
Modelled
Pred_cfs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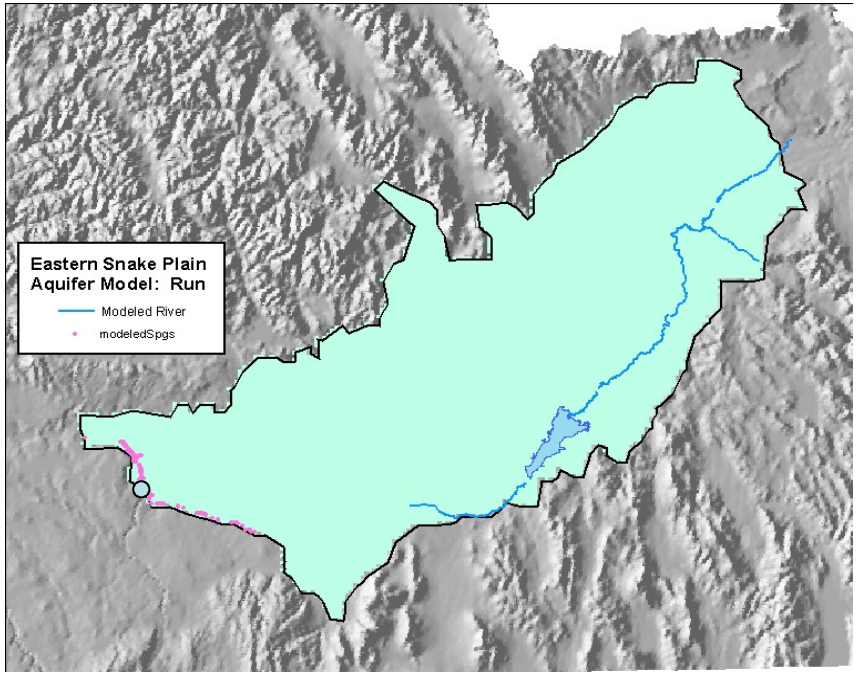
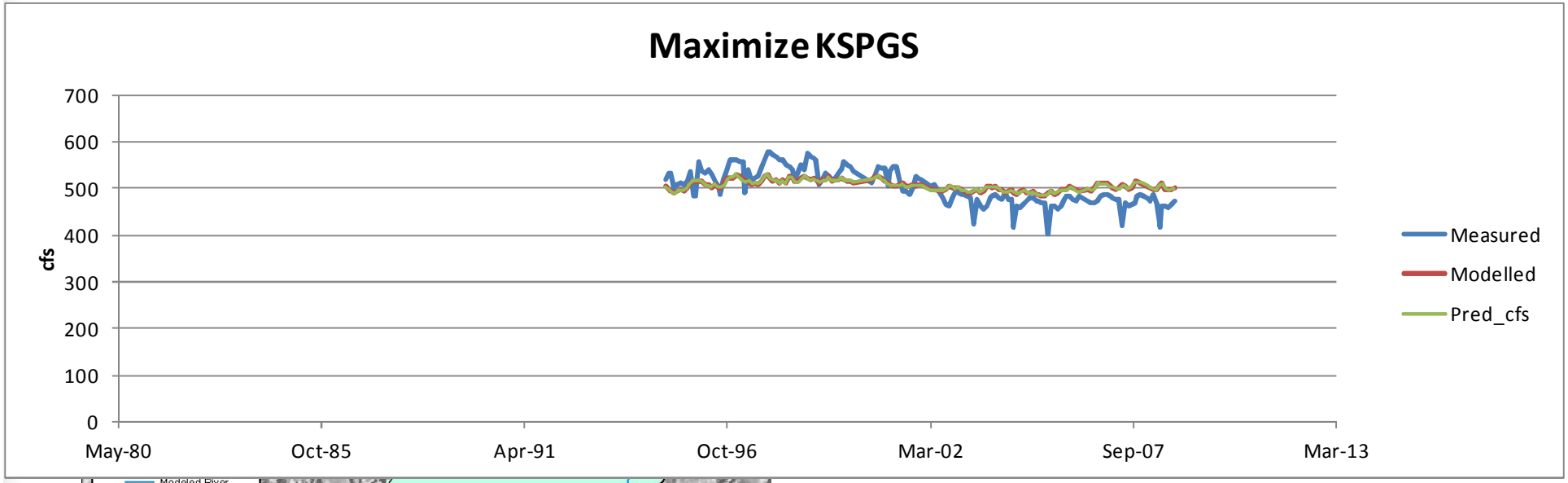
Mar-13
Measured
Modelled
Pred_cfs



- Thousand Springs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cfs
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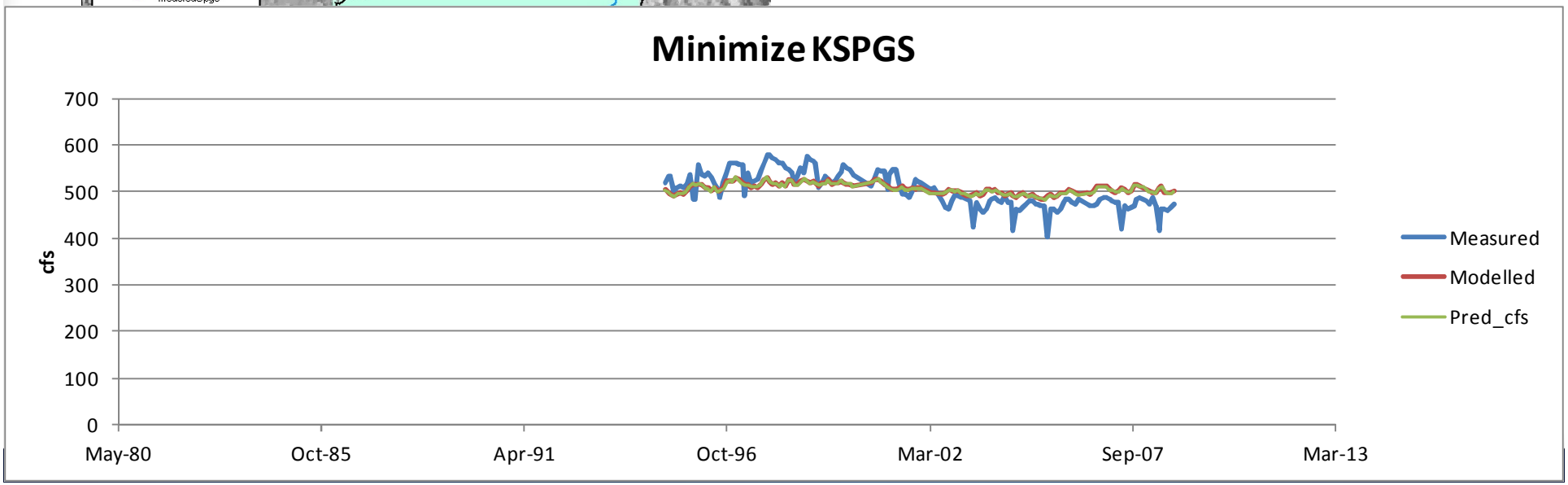
Mar-02
Sep-07
Mar-13
Measured
Modelled
Pred_cfs

Modeled River
modeledSpgs


Minimize KSPGS
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Apr-91
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Sep-07
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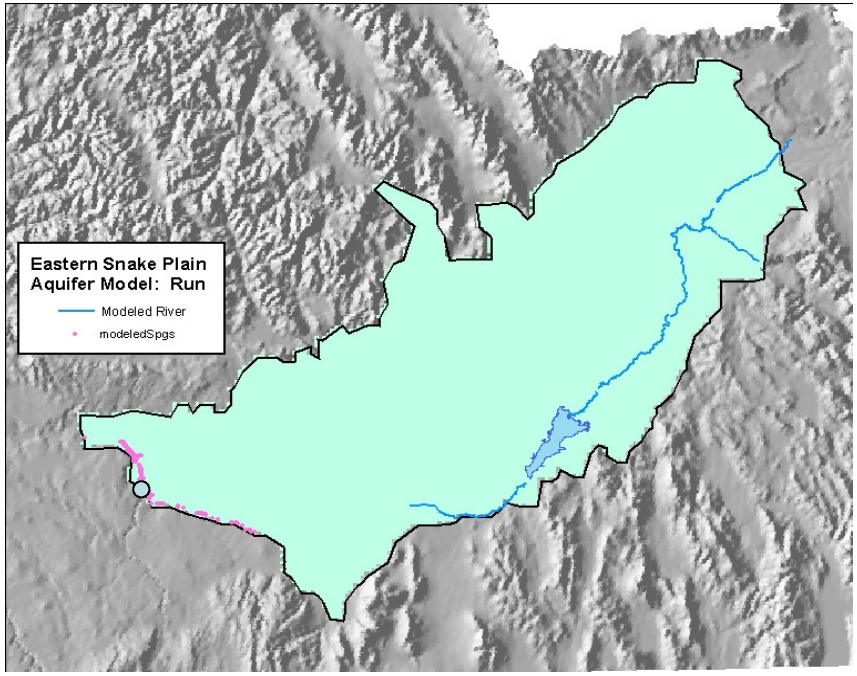
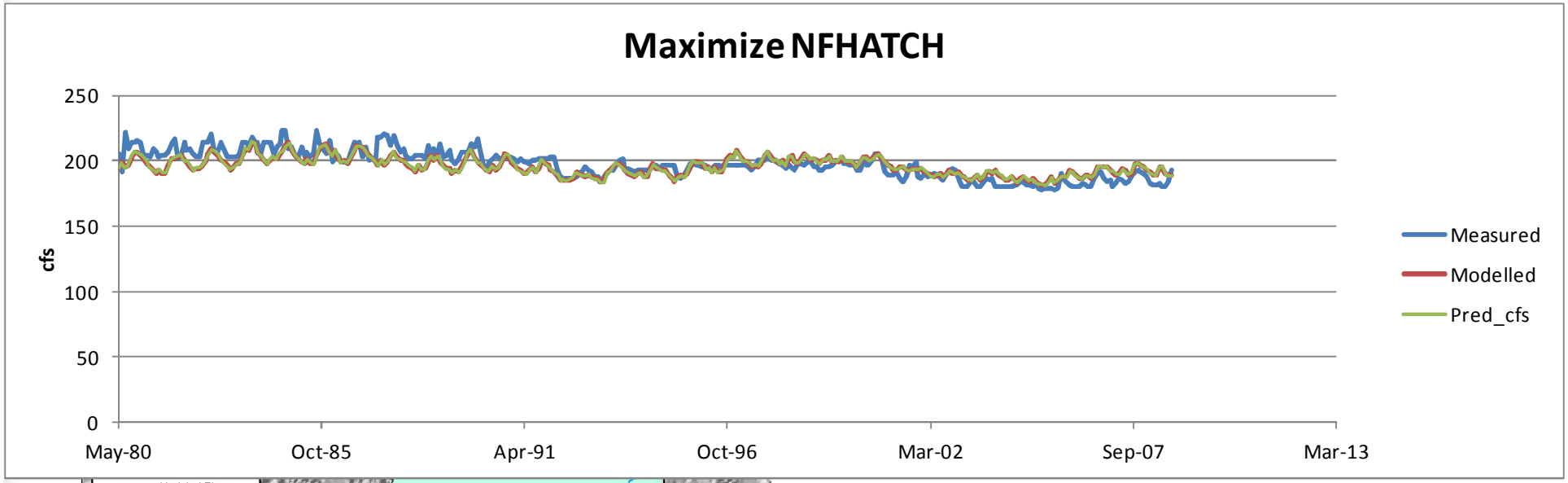
Measured
Modelled
Pred_cfs



- Ntl Fish Hatchery


Maximize NFHATCH
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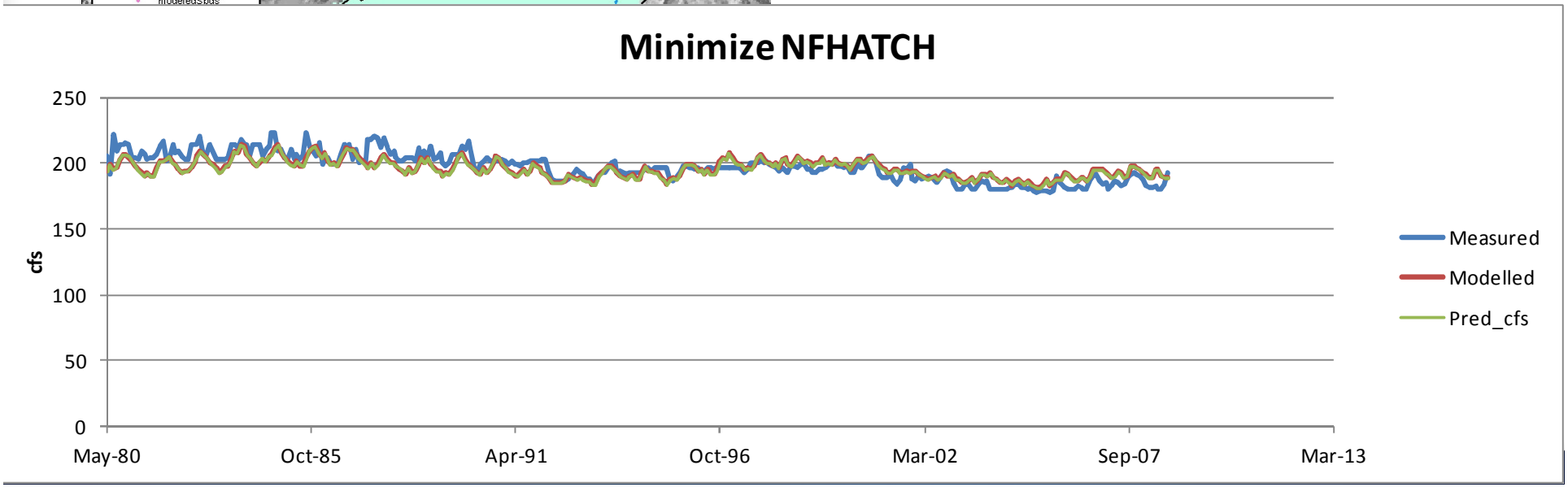
Measured
Modelled
Pred_cfs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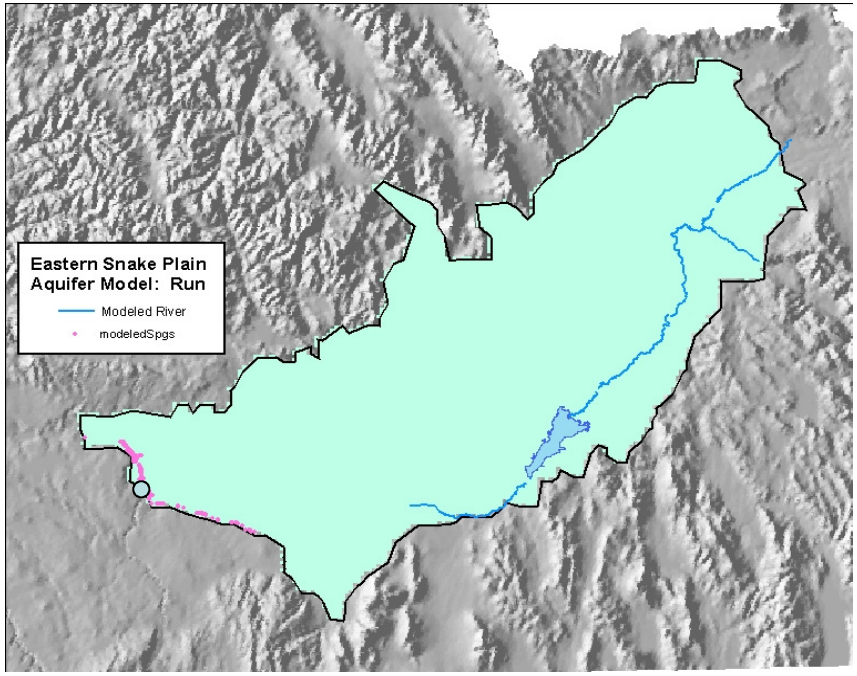
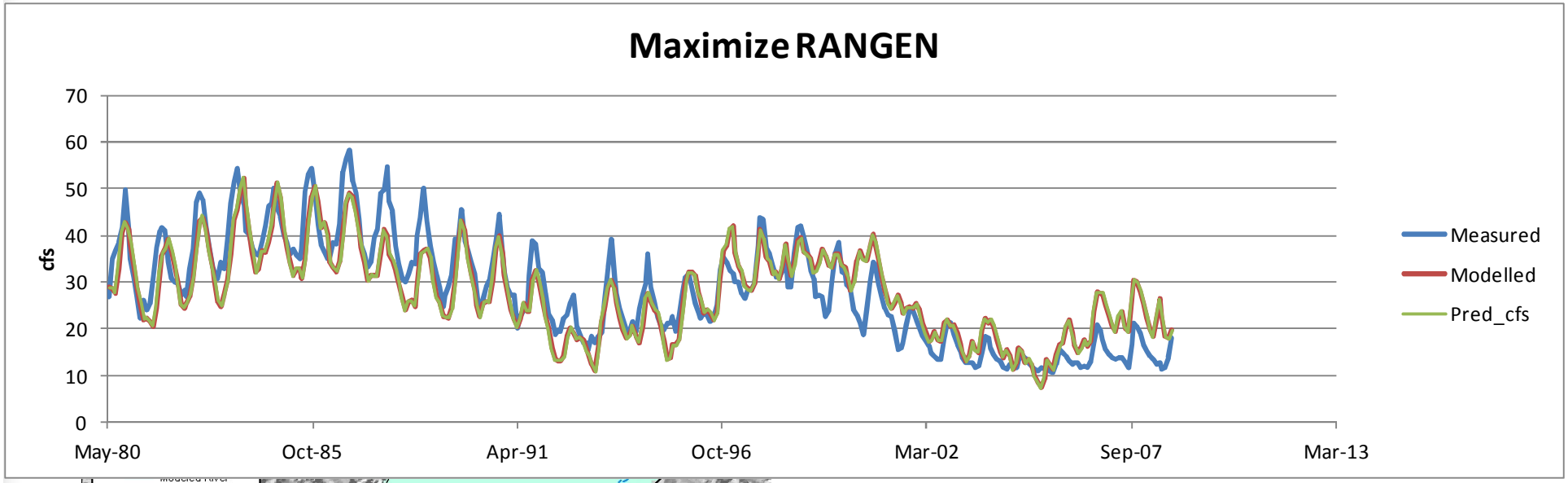
Pred_cfs



- Rangen Spring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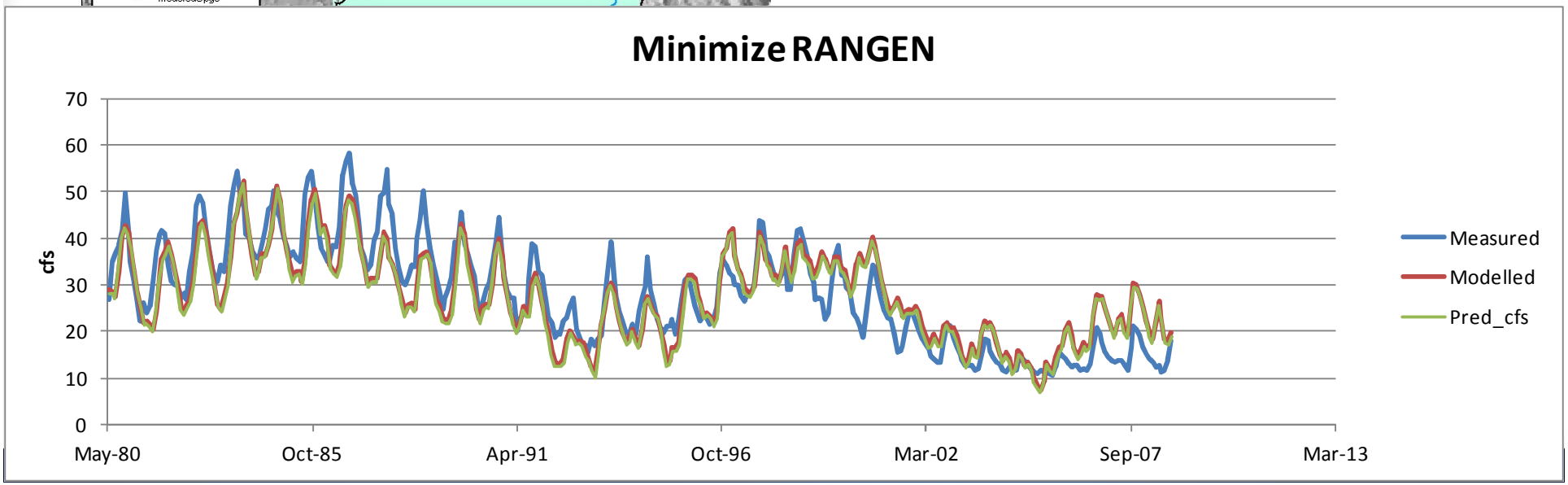
Pred_cfs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Measured
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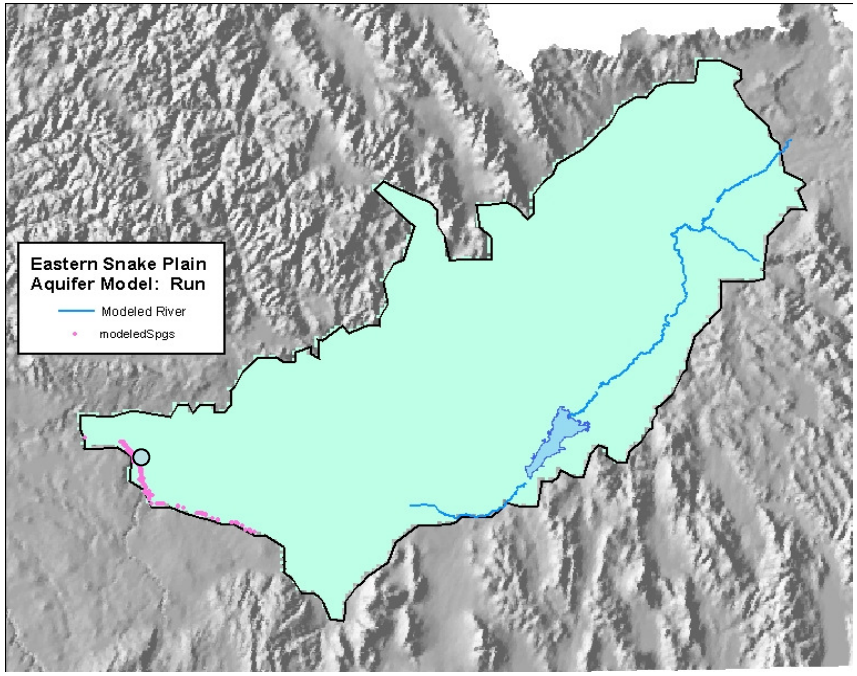
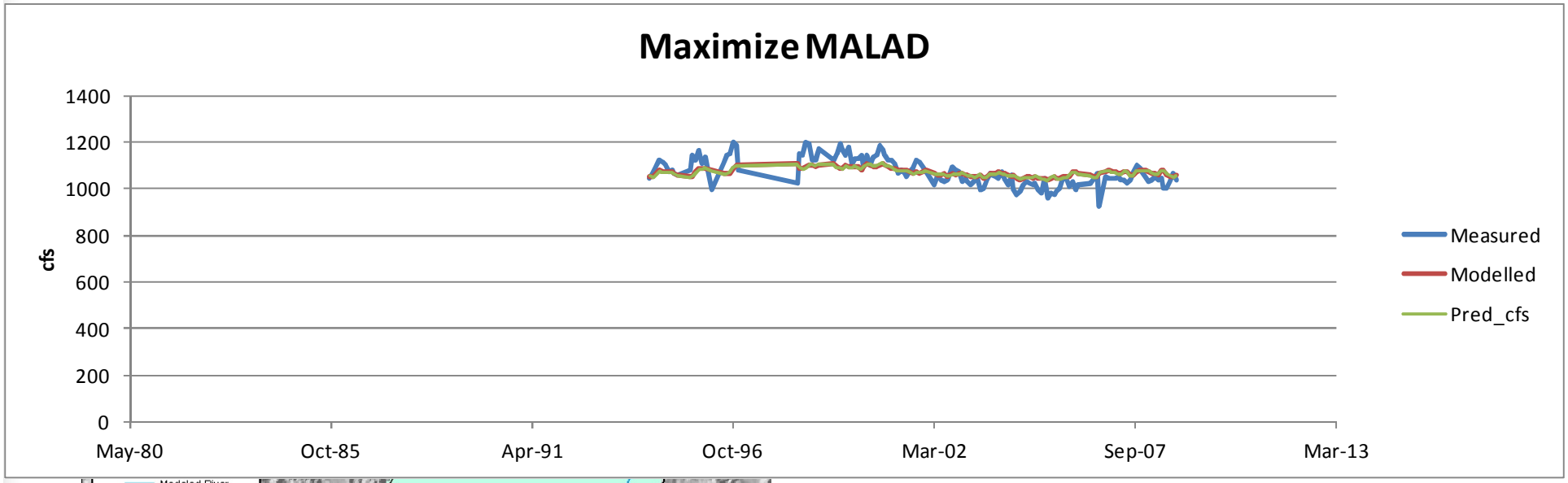
Pred_cfs


Eastern Snake Plain
Aquifer Model: Run
Modeled River
modeledSpgs

- Malad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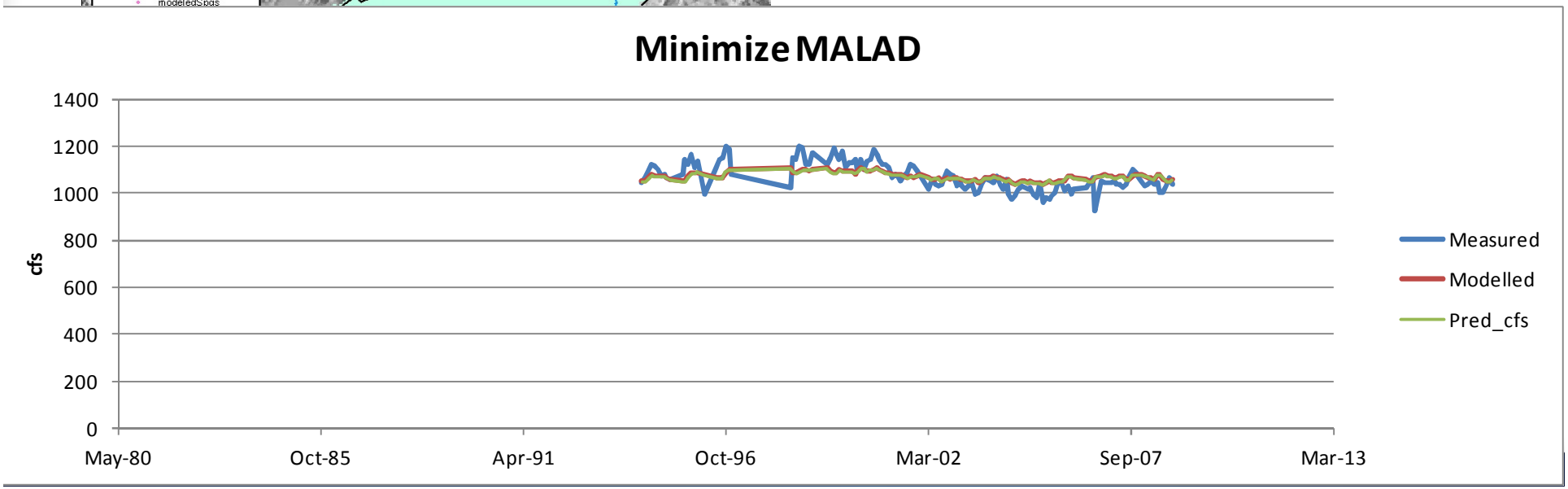
Measured
Modelled
Pred_cfs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800
600
400
200
0
cfs
May-80
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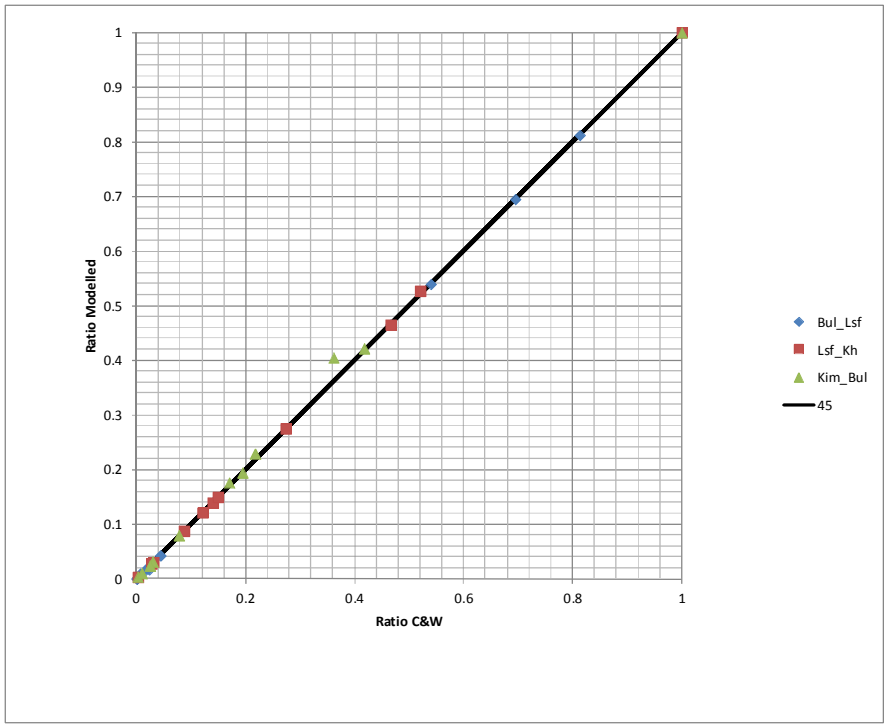
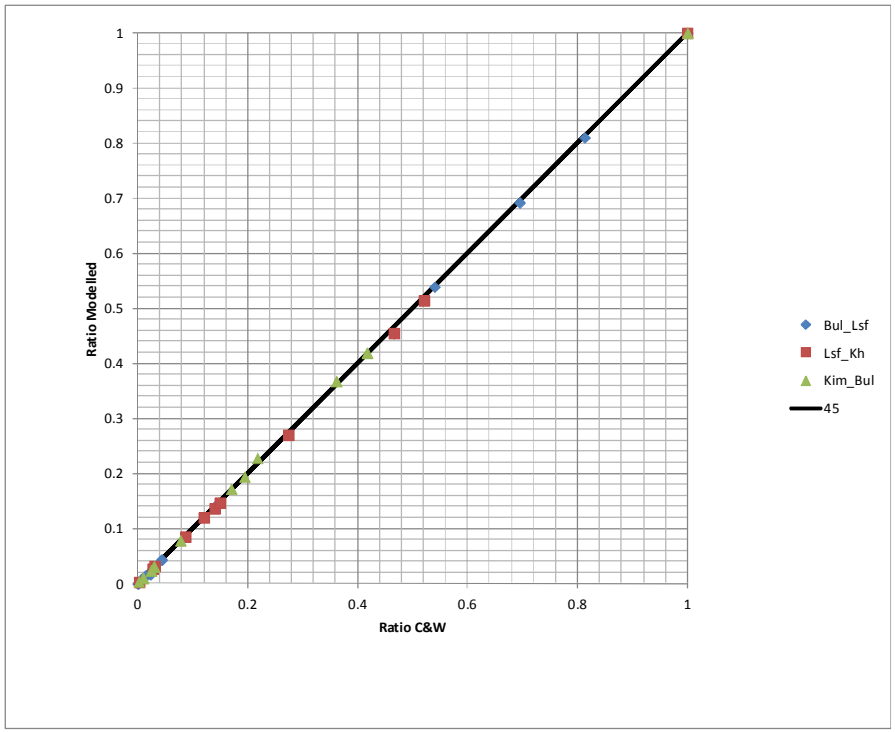
Apr-91
Oct-96
Mar-02
Sep-07
Mar-13
Measured
Modelled
Pred_cfs

Group C Springs

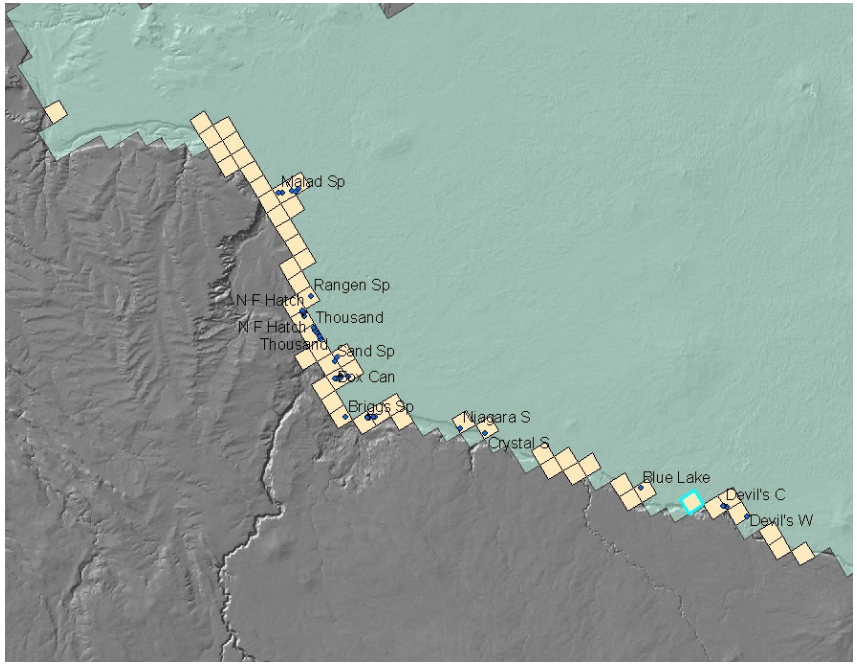
Maximize



Minimize



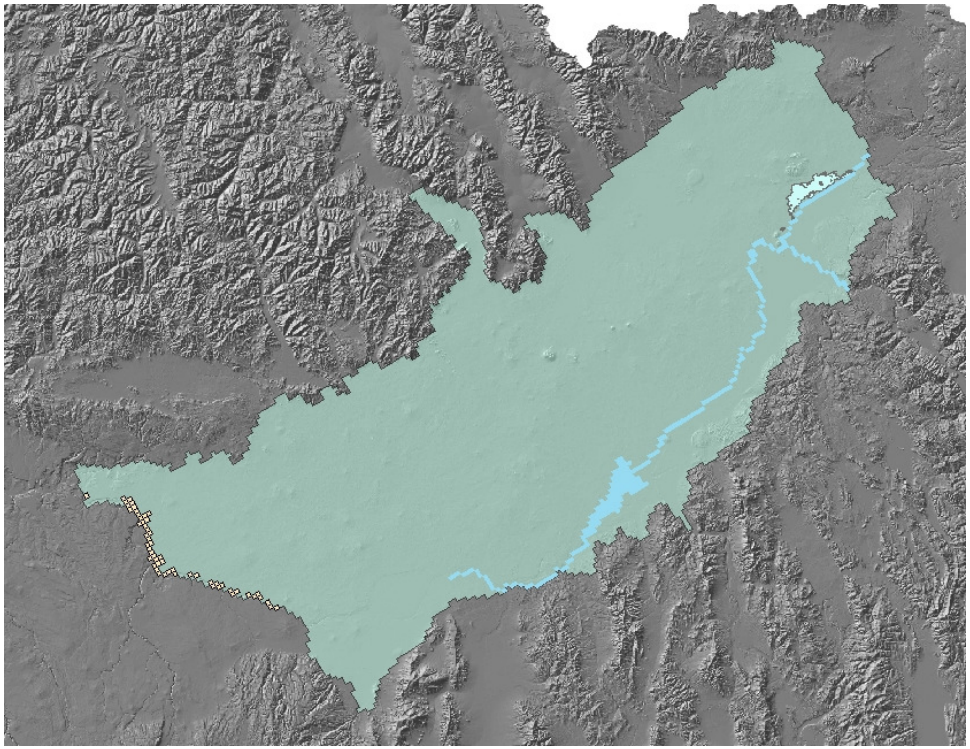
Group C Springs



- Cell Integer 1064026
  - Between Blue Lakes and Devils Corral
  - Unnamed in Covington & Weaver

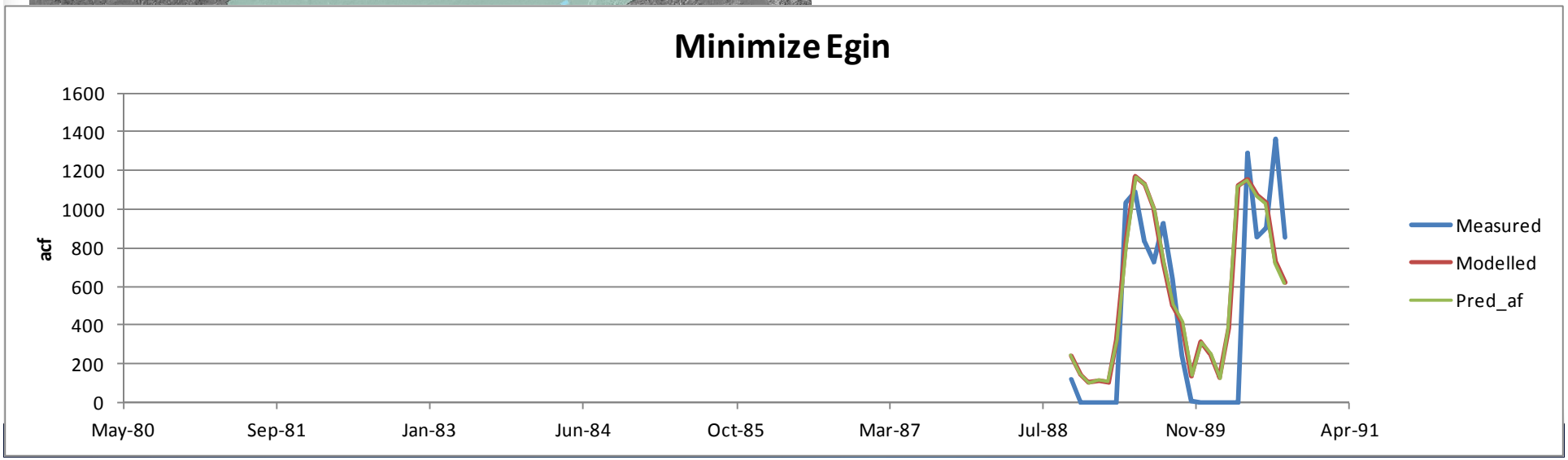
Group C Springs

- Near Shoshone Falls
  - Row 64, column 26
  - Unnamed
  - 3.72 cfs in Covington & Weaver



- Egin returns

Maximize Egin
acf
1600
1400
1200
1000
800
600
400
200
0
May-80
Sep-81
Jan-83
Jun-84
Oct-85
Mar-87
Jul-88
Nov-89
Apr-91
Measured
Modelled
Pred_af


Minimize Egin
acf
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1400
1200
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400
200
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Jun-84
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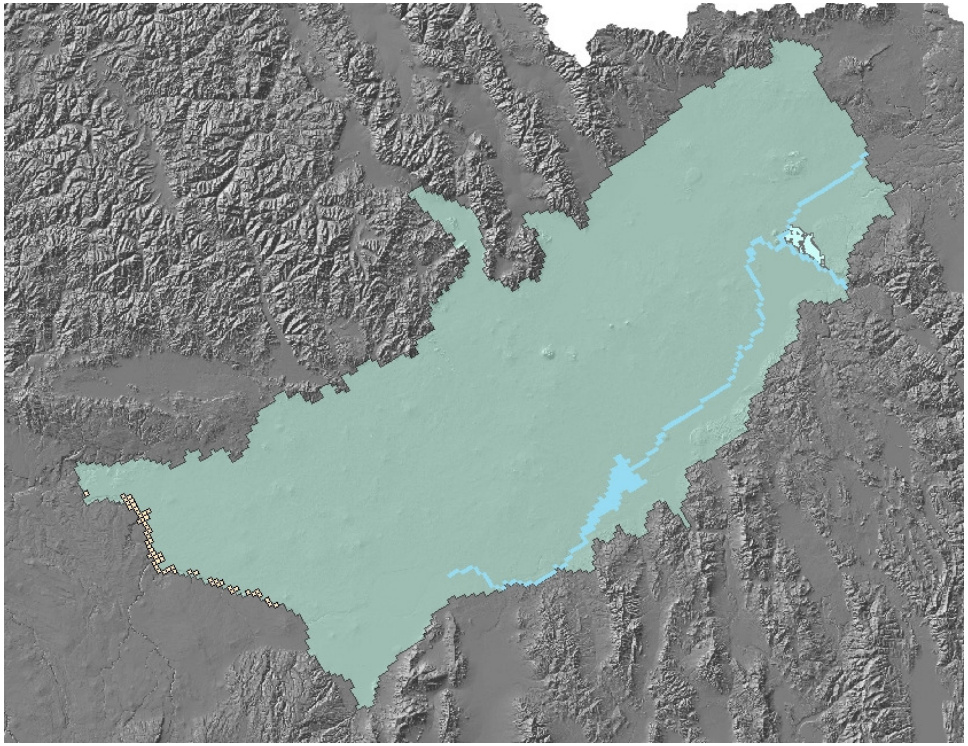
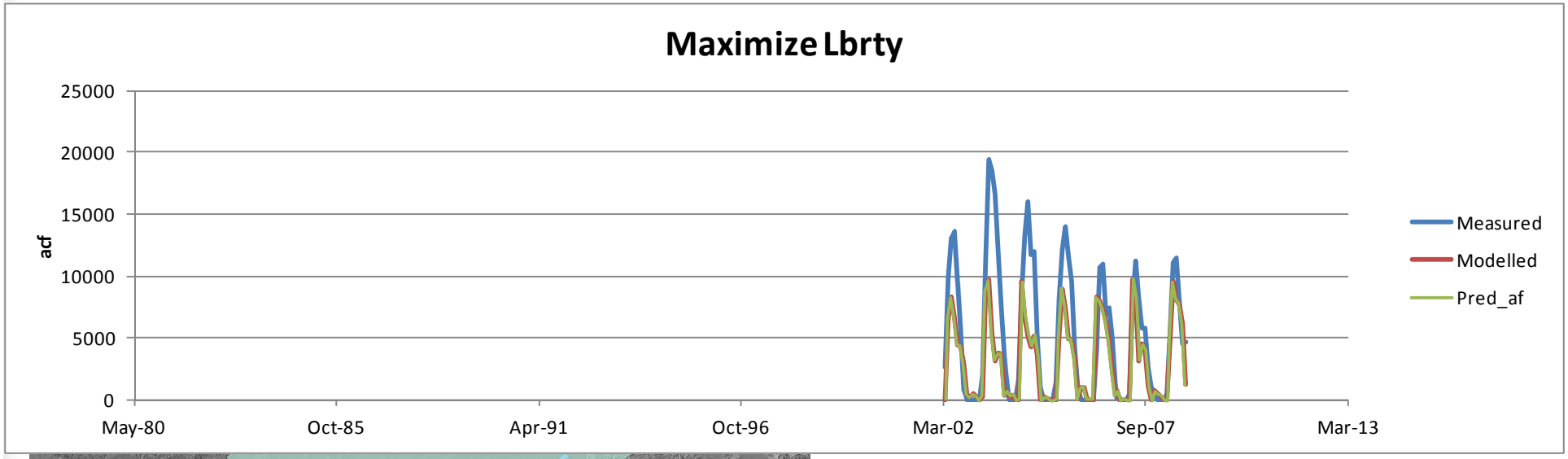
Nov-89
Apr-91
Measured
Modelled
Pred_af



- Liberty returns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acf
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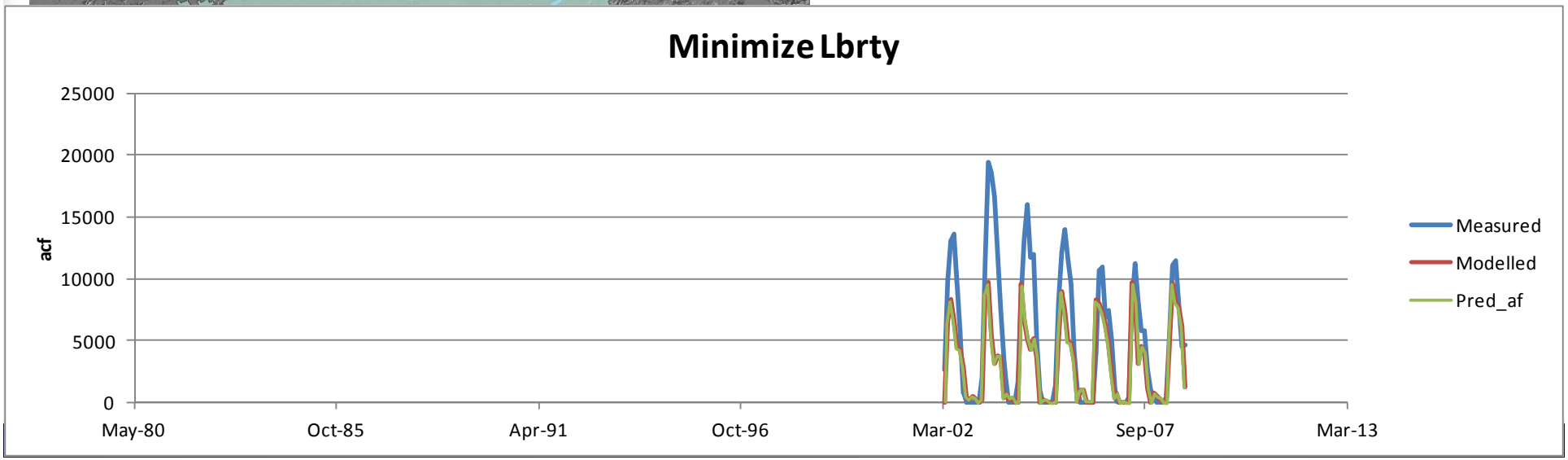
Oct-85
Apr-91
Oct-96
Mar-02
Sep-07
Mar-13
Measured
Modelled
Pred_af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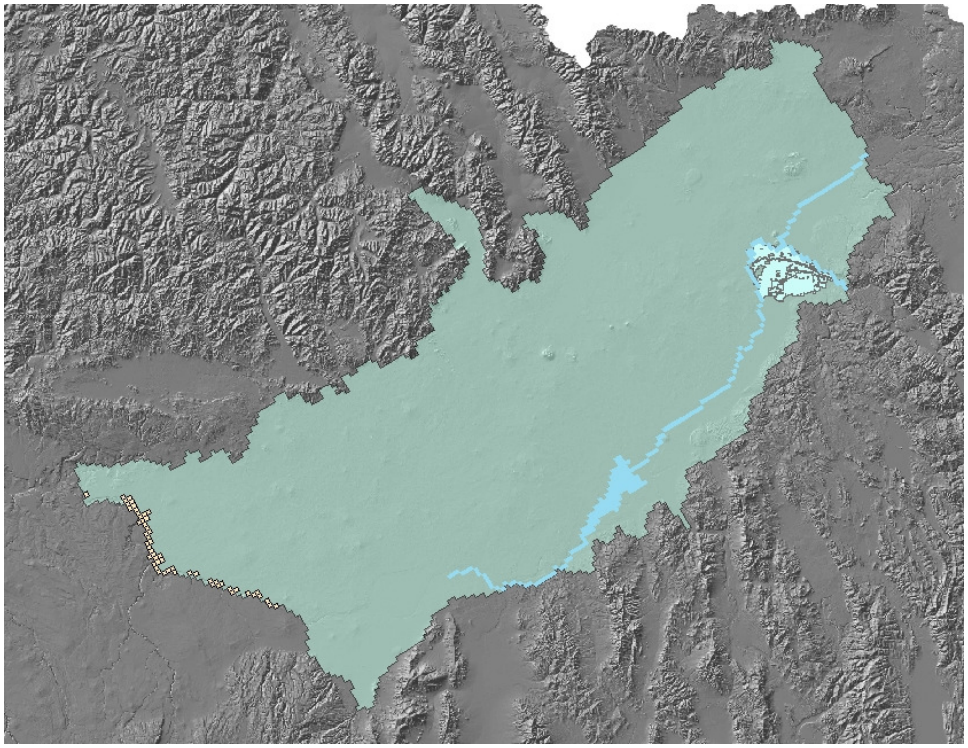
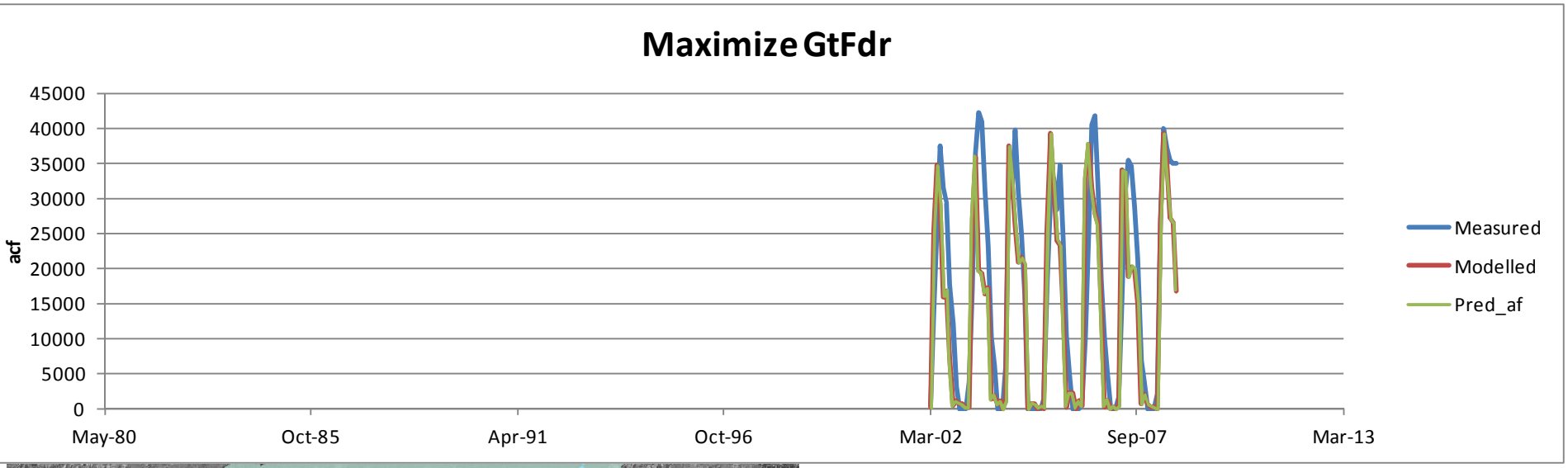
Mar-13
Measured
Modelled
Pred_af



- Great Feeder Group returns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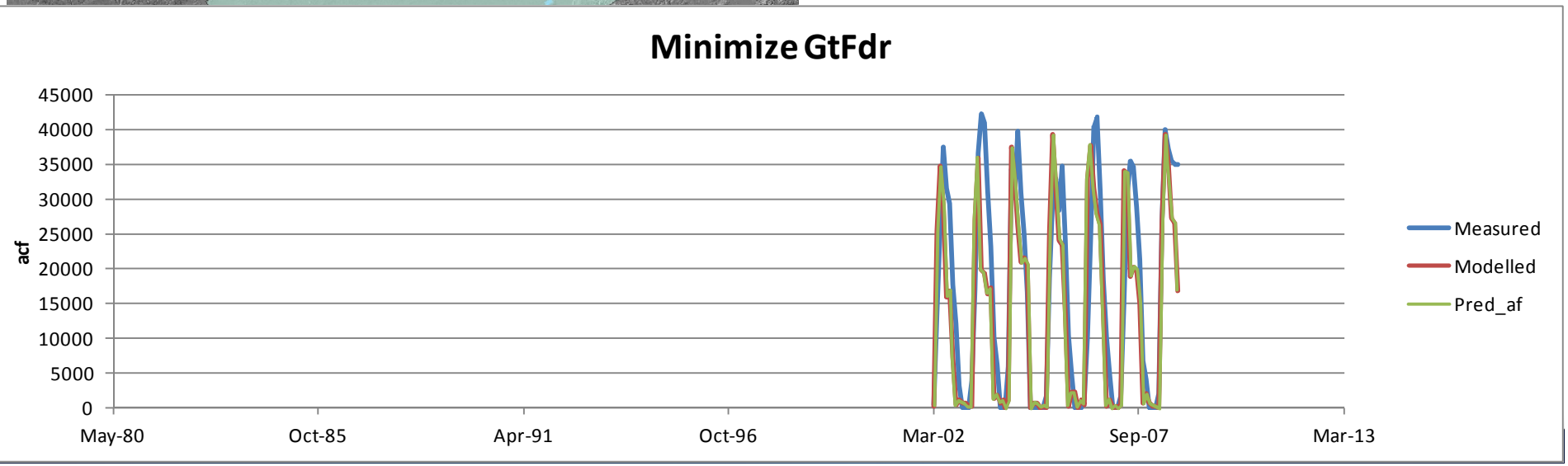
25000
20000
15000
10000
5000
0
acf
May-80
Oct-85
Apr-91
Oct-96
Mar-02
Sep-07
Mar-13
Measured
Modelled
Pred_af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40000
35000
30000
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20000
15000
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5000
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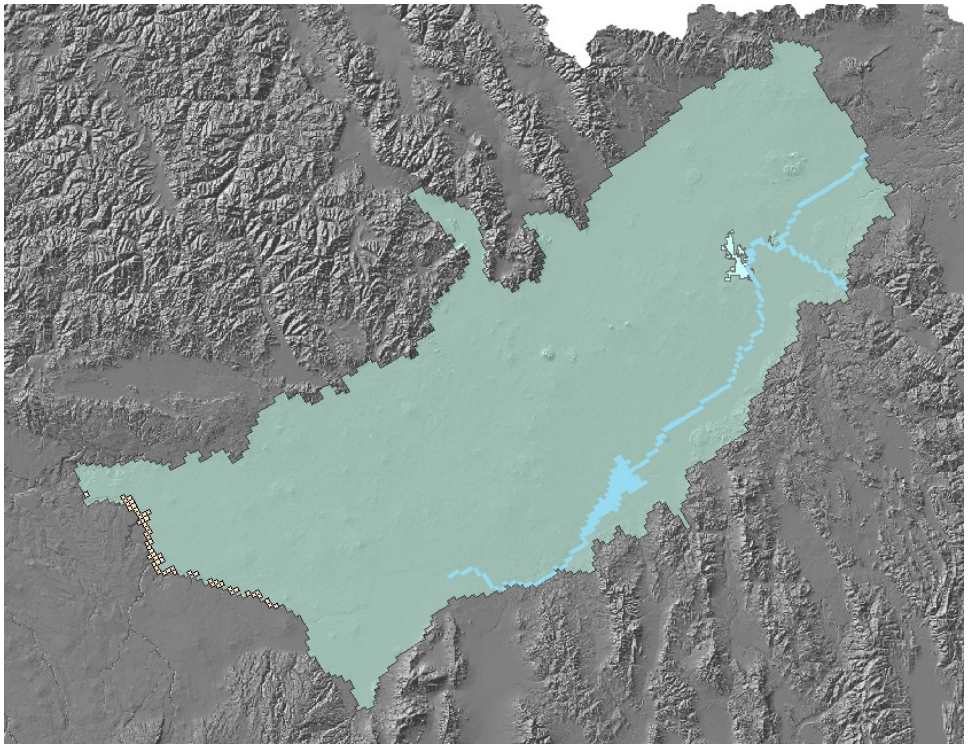
acf
May-80
Oct-85
Apr-91
Oct-96
Mar-02
Sep-07
Mar-13
Measured
Modelled
Pred_af



- Butte-Market Lake returns

Maximize BtMkLk
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700
600
500
400
300
200
100
0
acf
May-80
Jan-83
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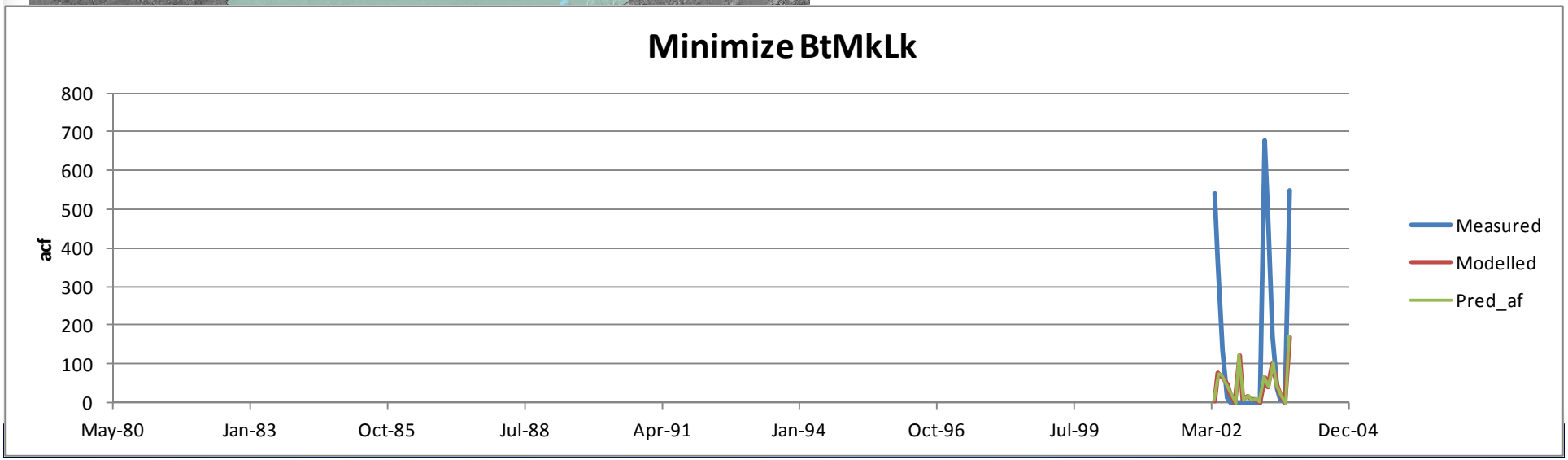
Jul-88
Apr-91
Jan-94
Oct-96
Jul-99
Mar-02
Dec-04
Measured
Modelled
Pred_af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200
100
0
acf
May-80
Jan-83
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Jul-88
Apr-91
Jan-94
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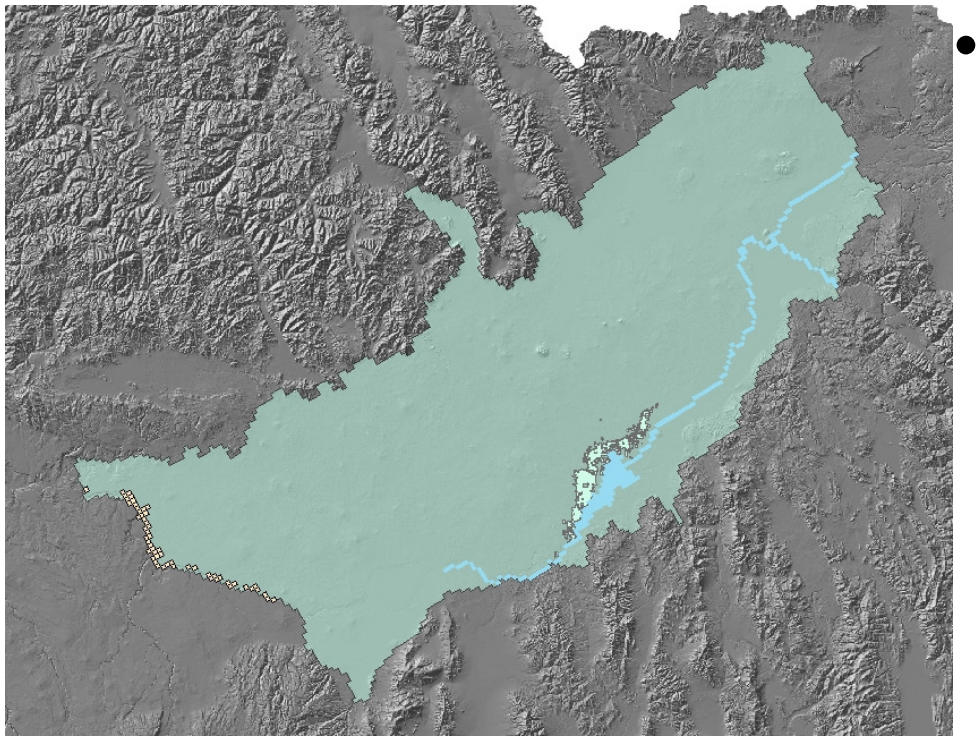
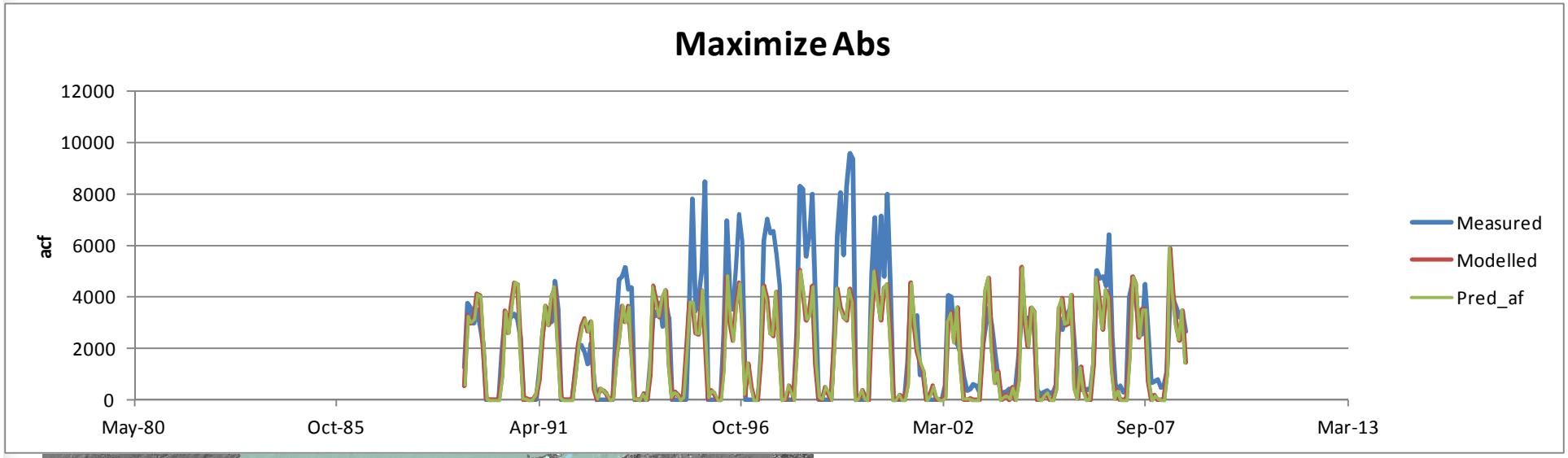
Mar-02
Dec-04
Measured
Modelled
Pred_af



- Aberdeen-Springfield returns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6000
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2000
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acf
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Oct-85
Apr-91
Oct-96
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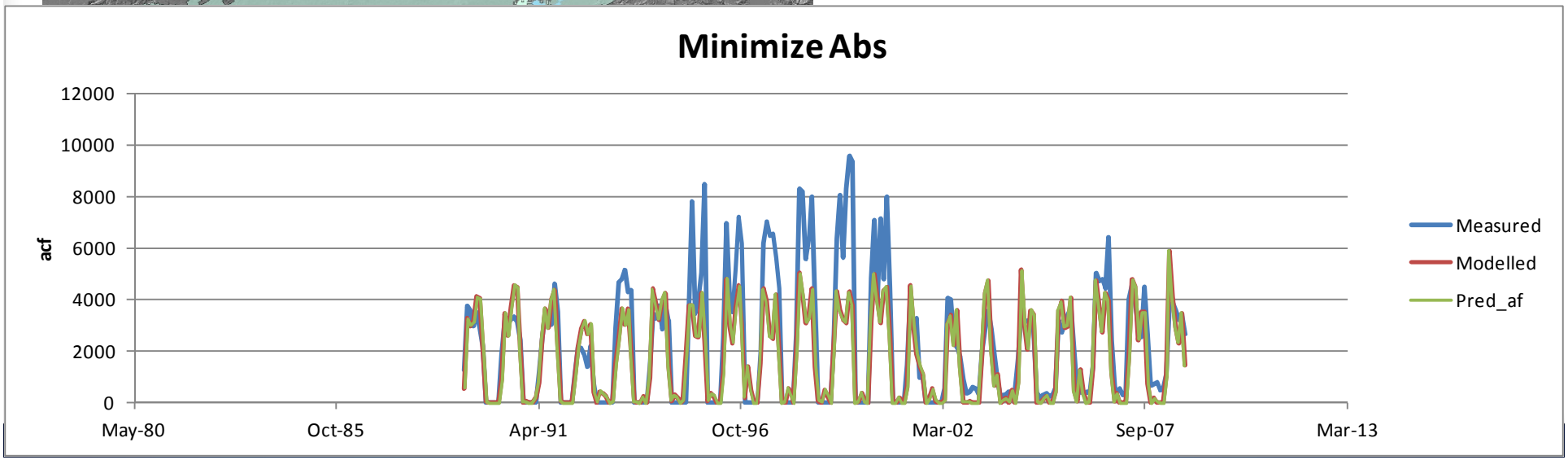
Sep-07
Mar-13
Measured
Modelled
Pred_af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May-80
Oct-85
Apr-91
Oct-96
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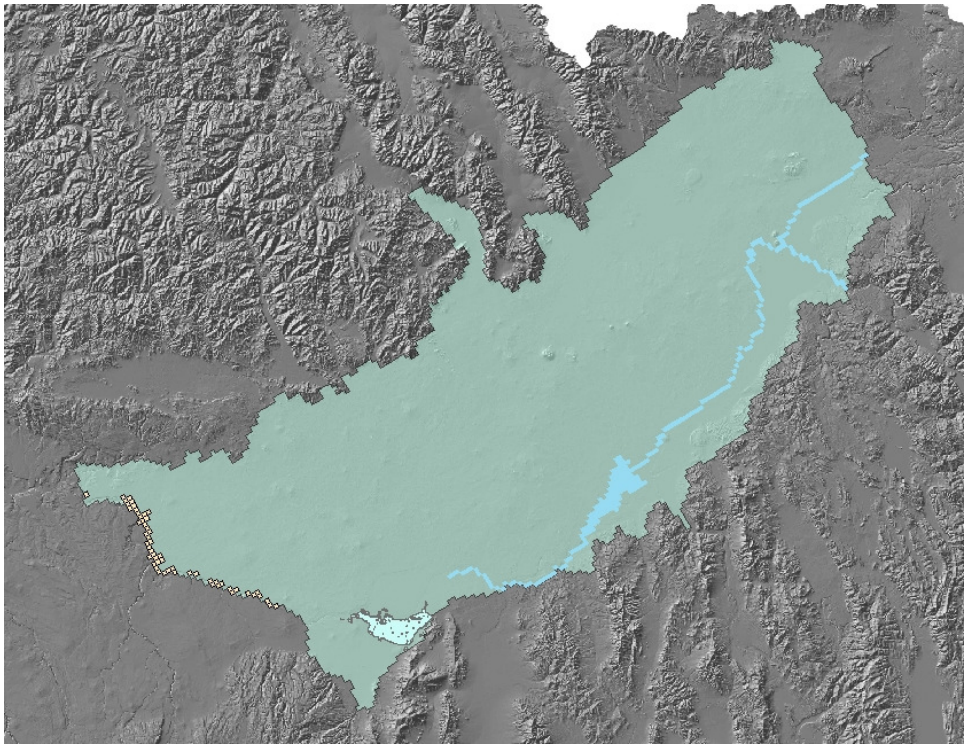
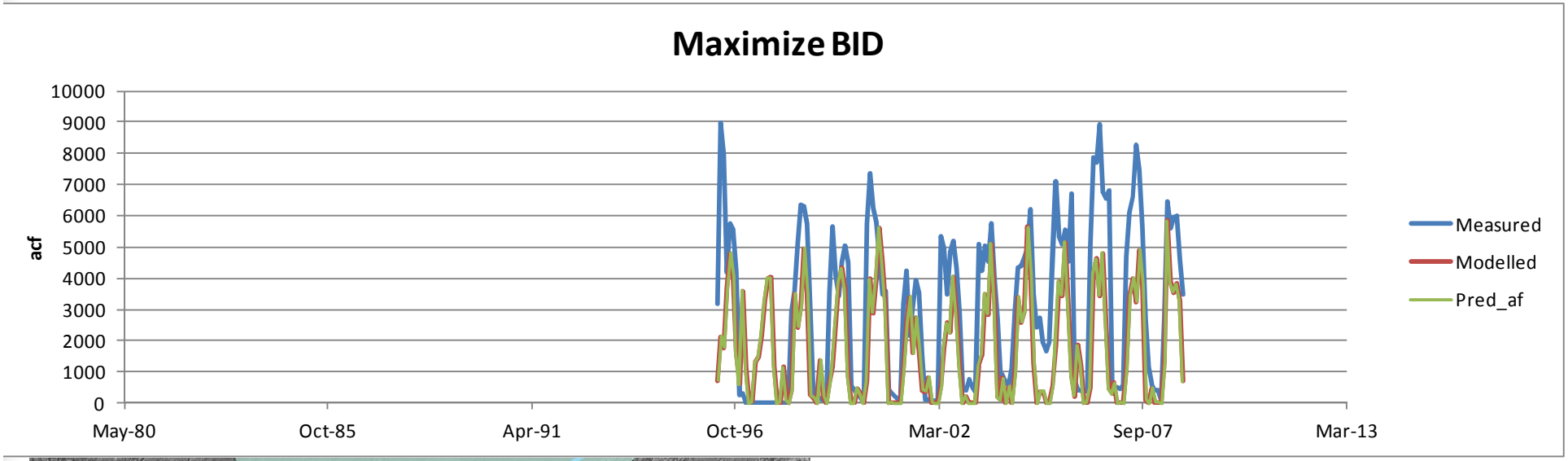
Sep-07
Mar-13
Measured
Modelled
Pred_af



- Burley Irrigation District returns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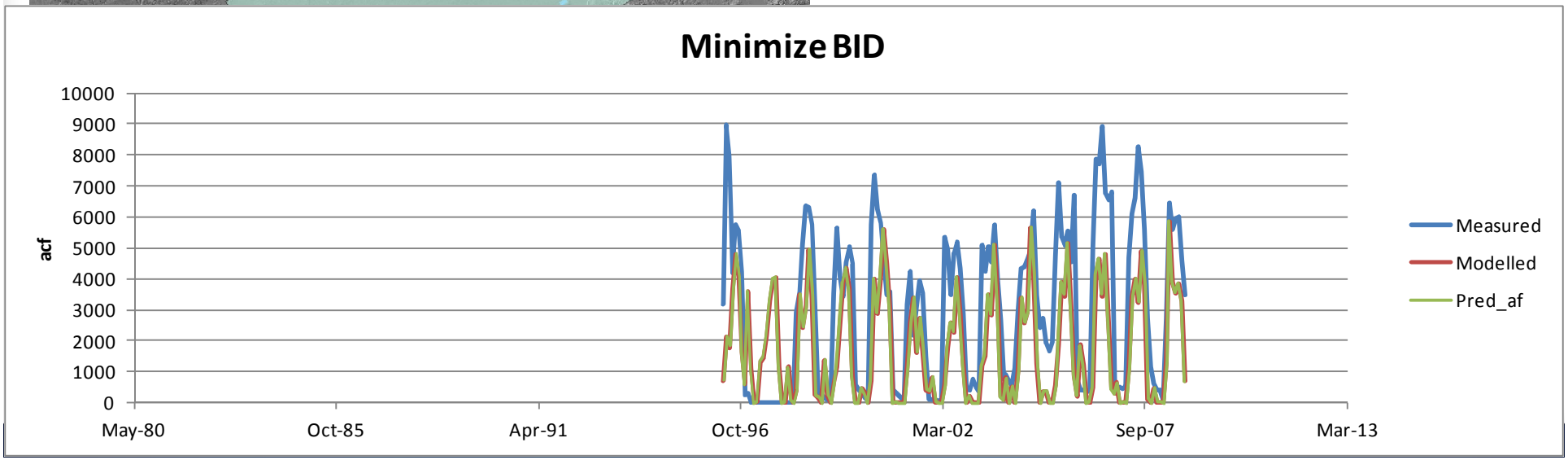
Oct-85
Apr-91
Oct-96
Mar-02
Sep-07
Mar-13
Measured
Modelled
Pred_af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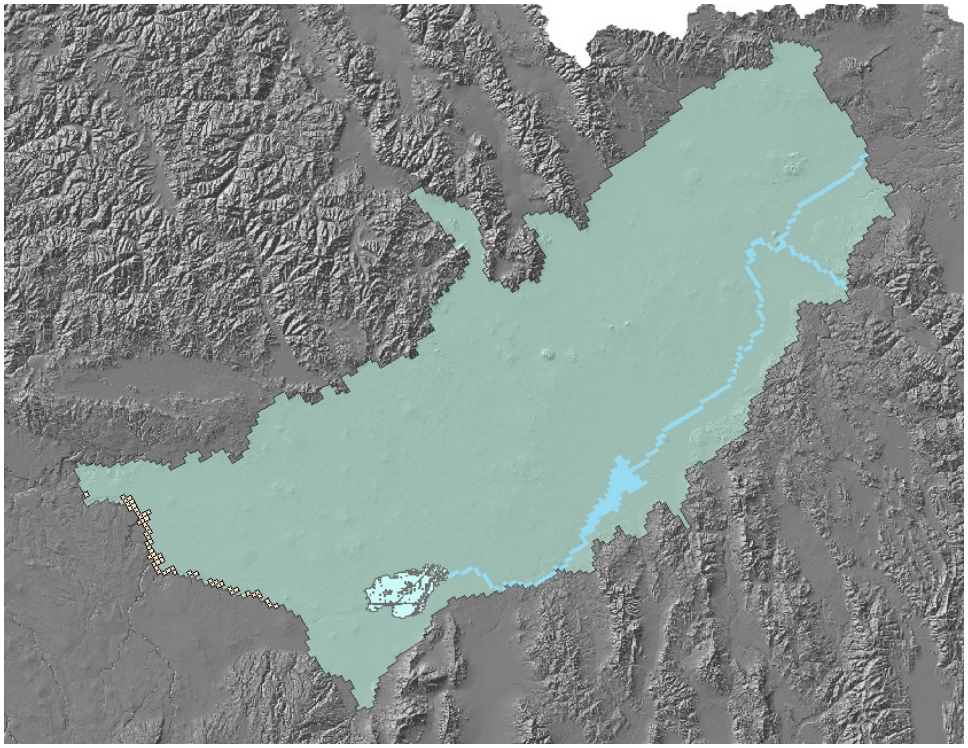
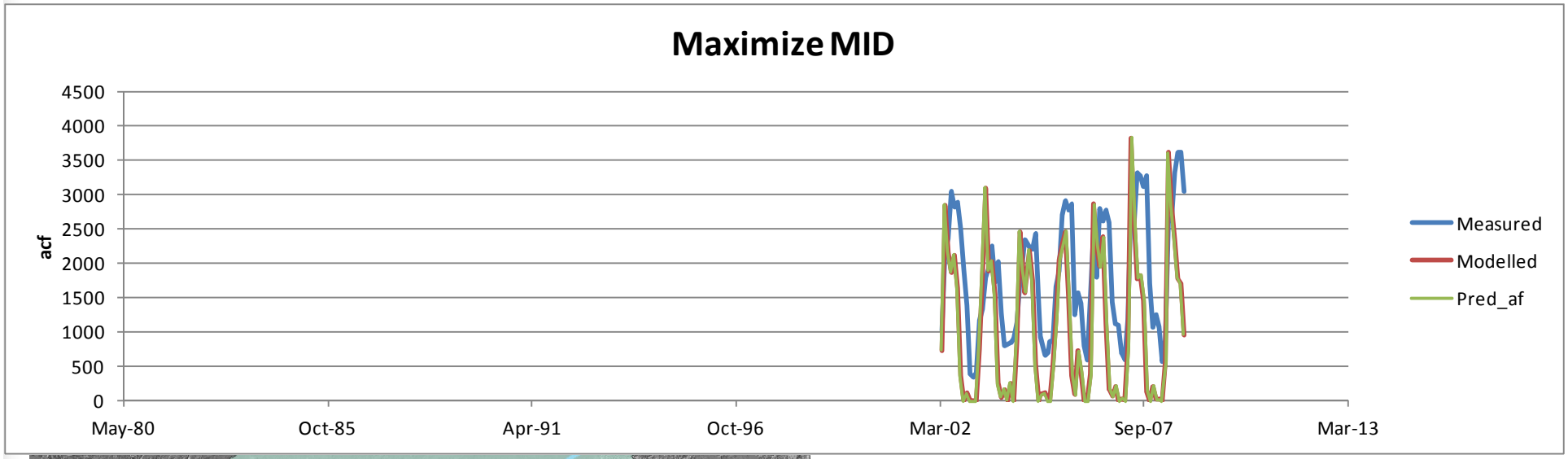
May-80
Oct-85
Apr-91
Oct-96
Mar-02
Sep-07
Mar-13
Measured
Modelled
Pred_af



- Minidoka Irrigation District returns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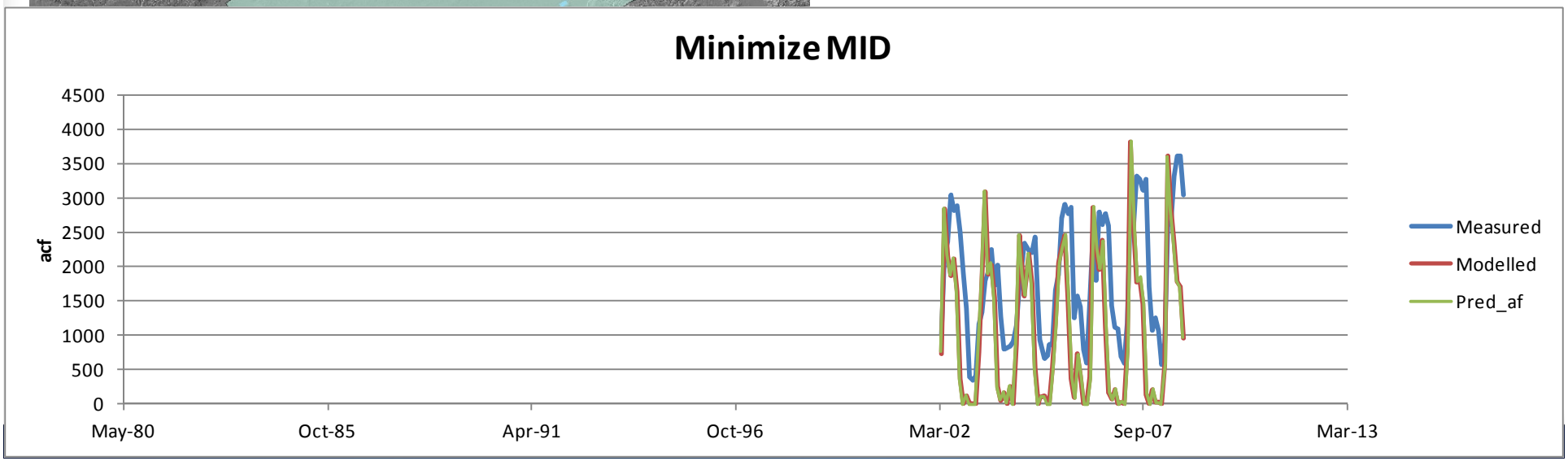
acf
May-80
Oct-85
Apr-91
Oct-96
Mar-02
Sep-07
Mar-13
Measured
Modelled
Pred_af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2000
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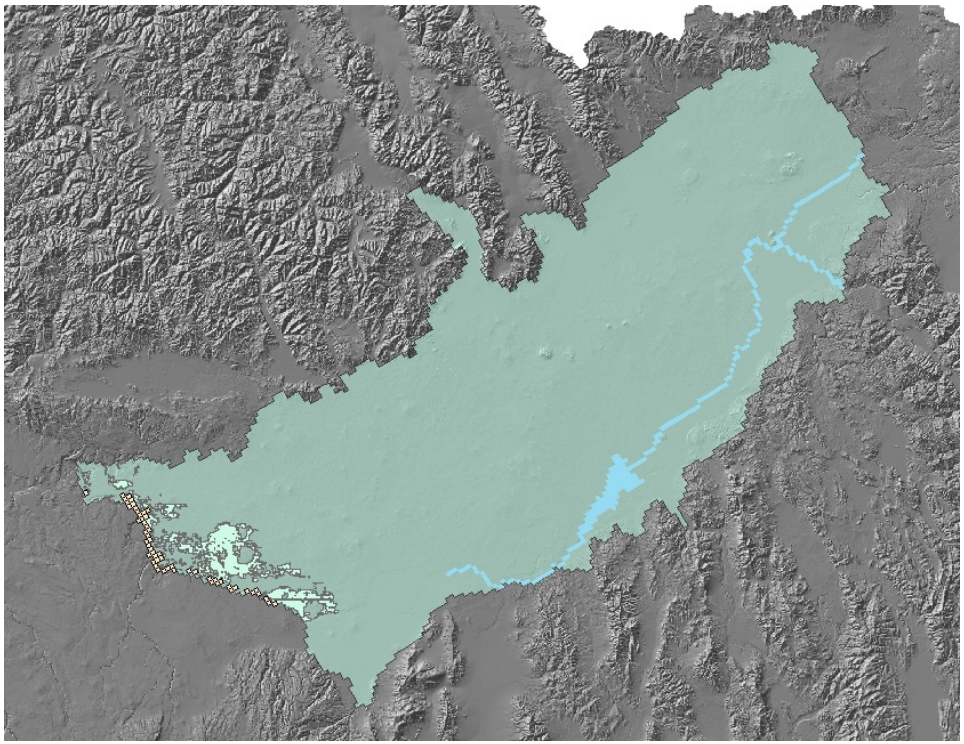
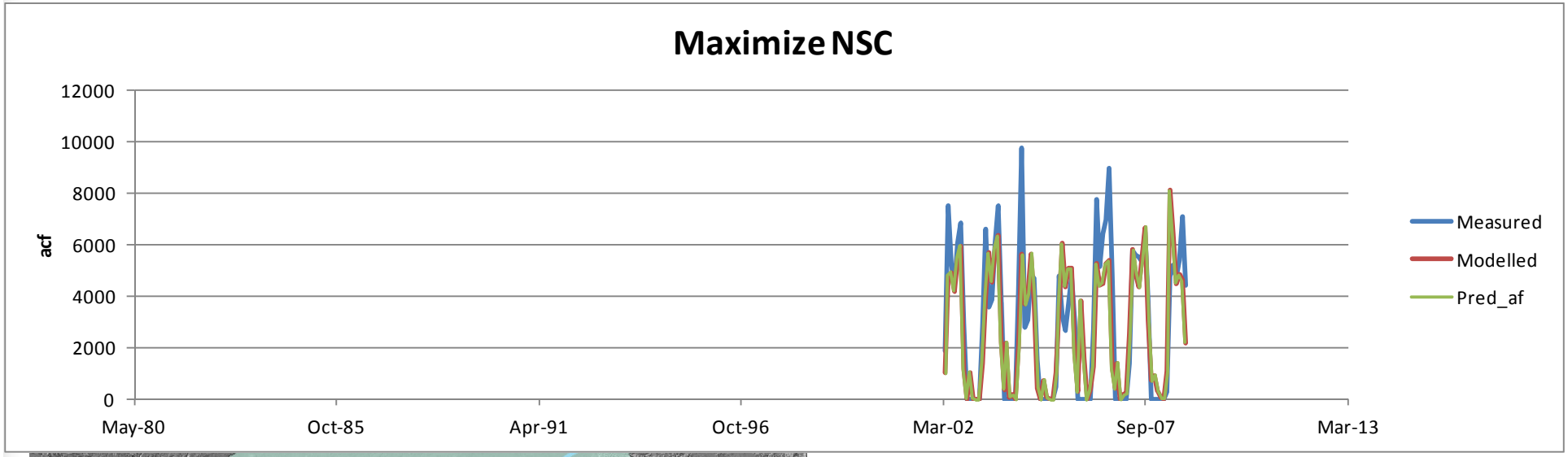
acf
May-80
Oct-85
Apr-91
Oct-96
Mar-02
Sep-07
Mar-13
Measured
Modelled
Pred_af



- North Side Canal Co returns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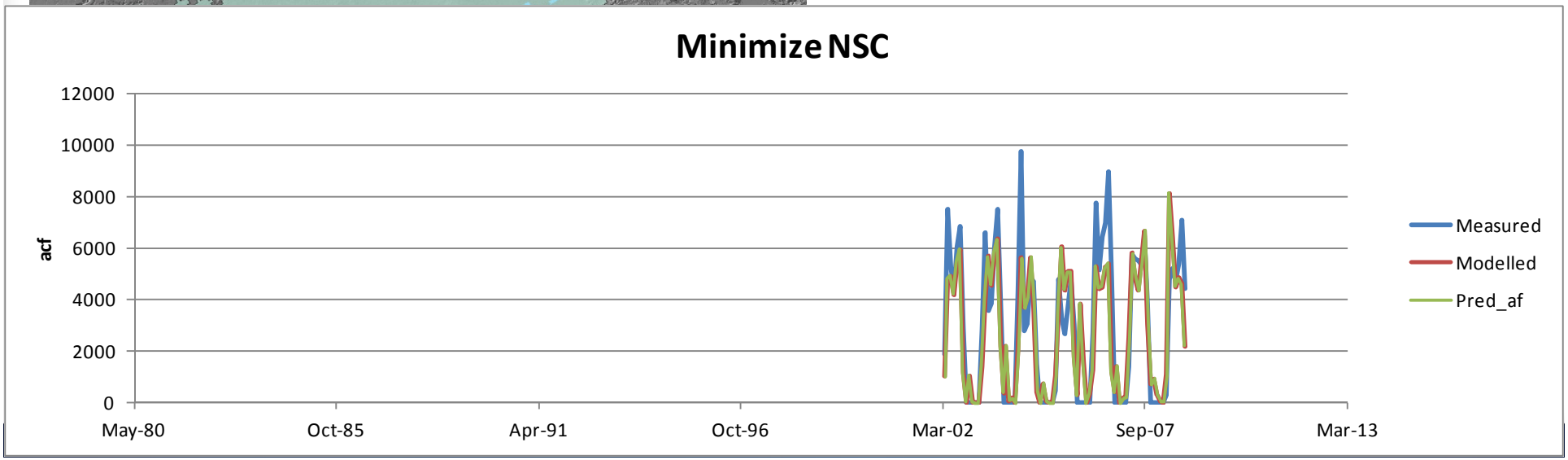
Oct-85
Apr-91
Oct-96
Mar-02
Sep-07
Mar-13
Measured
Modelled
Pred_af


Minimize NSC
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10000
8000
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0
acf
May-80
Oct-85
Apr-91
Oct-96
Mar-02
Sep-07
Mar-13
Measured
Modelled
Pred_af

END