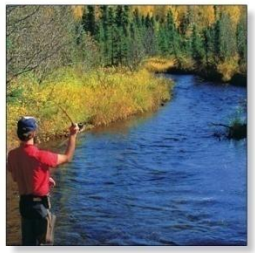
# **Preliminary** Calibration Run

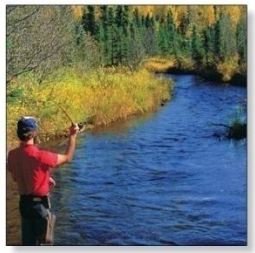
Presented by Allan Wylie, IDWR

February 5, 2015

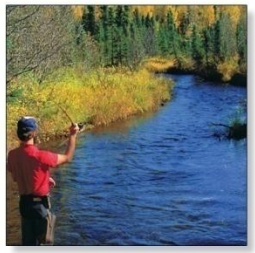
# Outline

- **Preliminary** Steady State Calibration Run
- This is **Preliminary**
- NO we are NOT there yet!!!
  - We will probably conduct hundreds of preliminary calibration runs.

# Outline

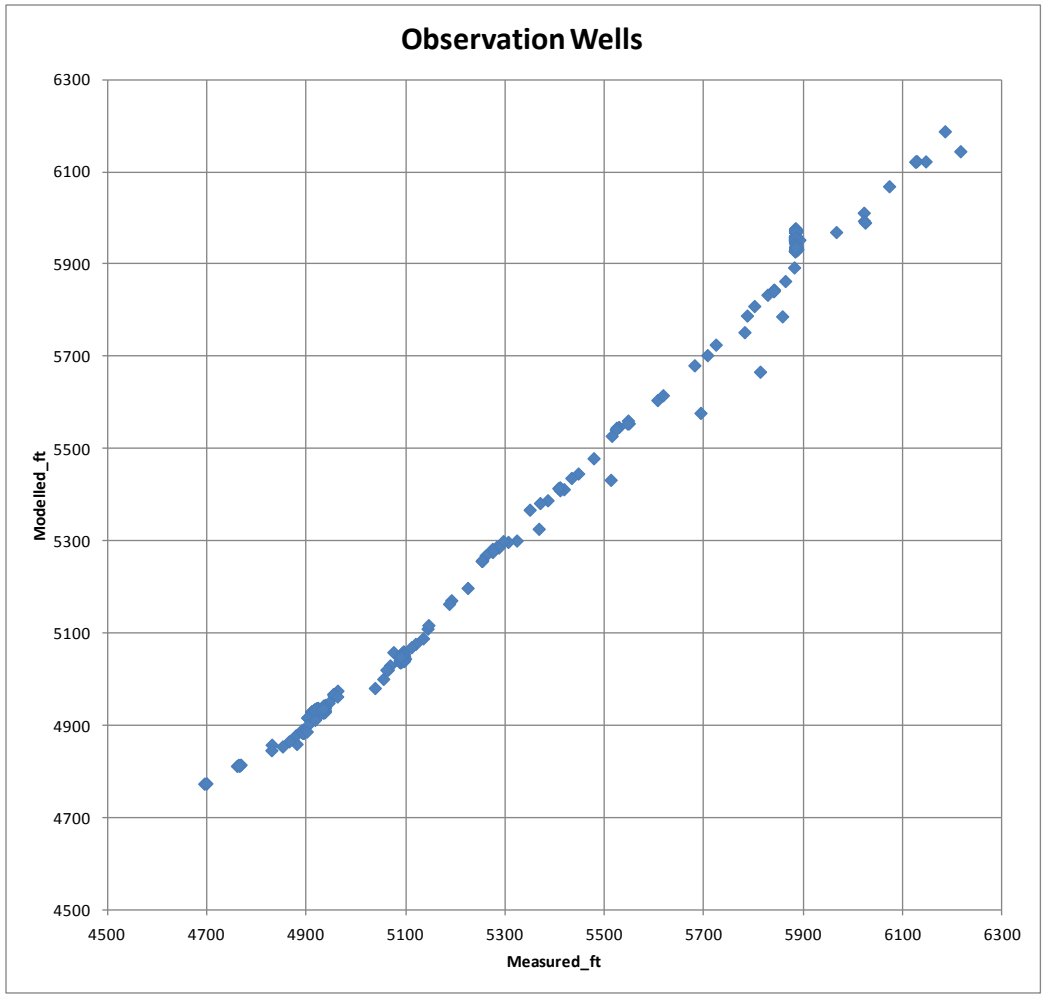
- Recharge program
  - Tributary underflow
    - Adjusted by multiplying starting values by a factor
    - Adjust seasonal amplitude
    - Adjust averaging period
  - Surface water irrigation efficiency
  - Canal seepage fixed
- Physical properties adjusted by changing values in MODFLOW input files
  - Aquifer transmissivity
  - Riverbed conductance
  - Drain conductance

# Changes since last meeting

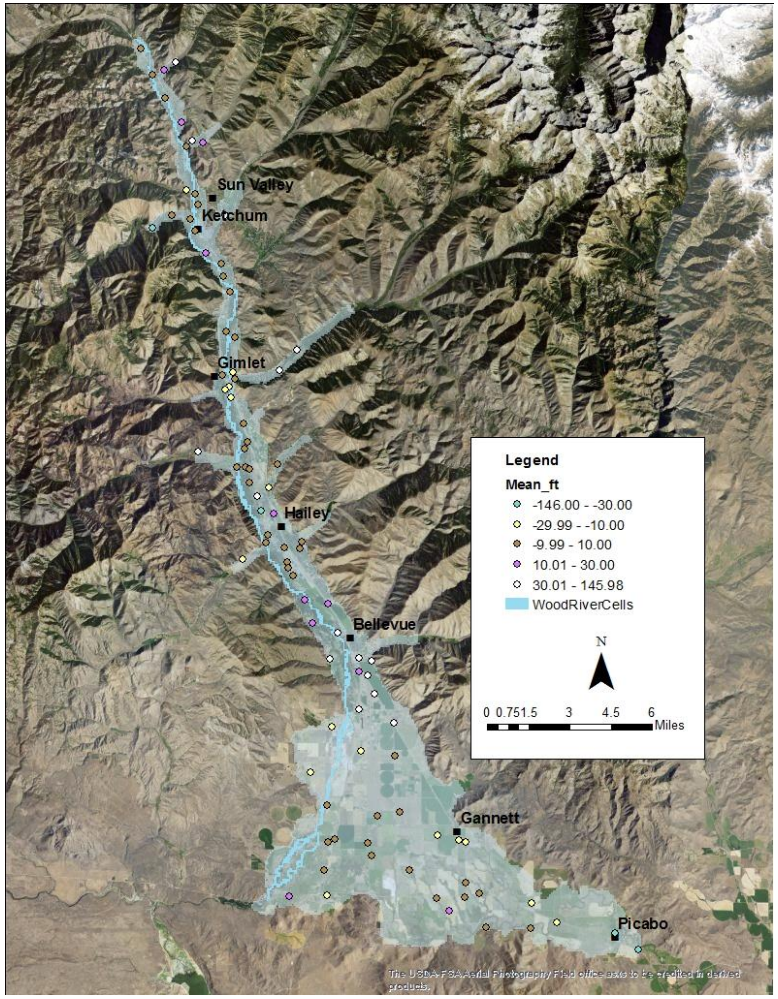
- Transient Calibration Run
  - Analysis of the run record file indicates that individual Transient MODFLOW run takes ½ to 2 hrs
  - Full calibration run takes several days

# Observation Wells




- Wells with GPS or surveyed location
- Measured by a trained technician
- If fit was perfect
  - Intercept = 0
  - Slope = 1
  - $R^2 = 1$
  - All points on the red line

# Observation Wells

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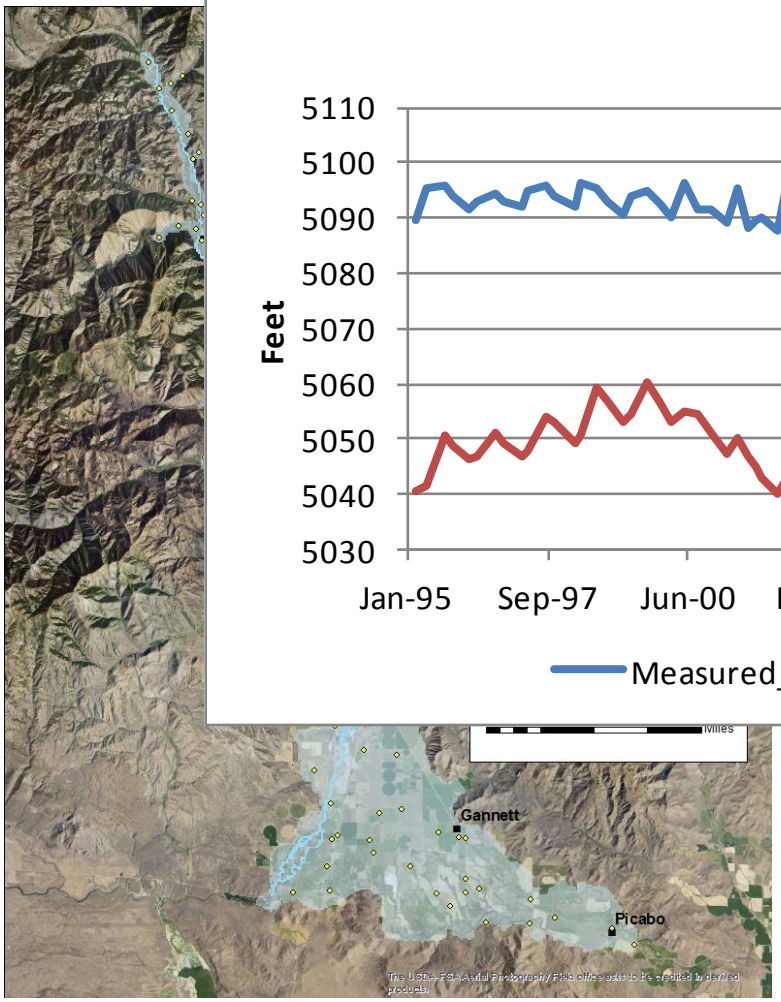





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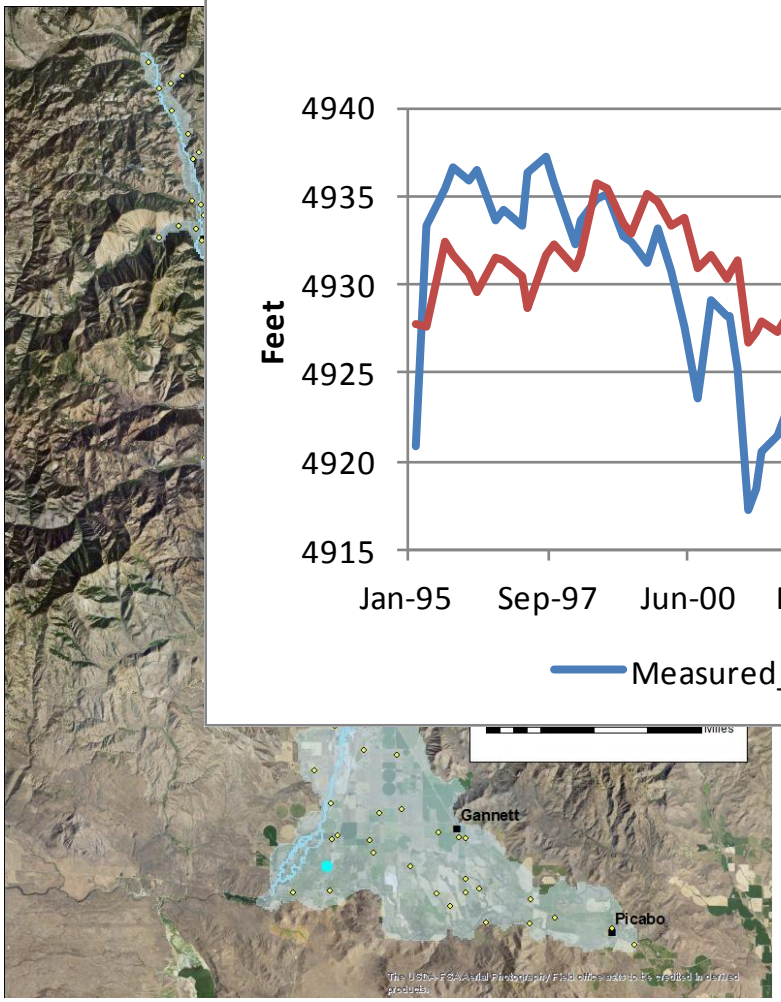





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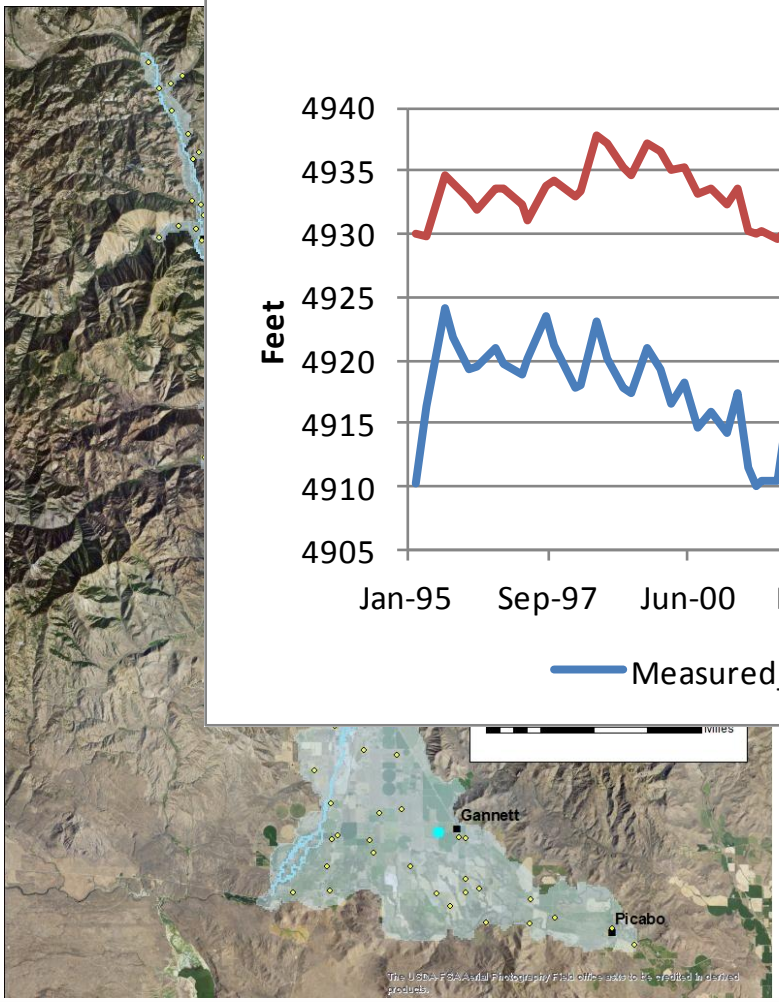





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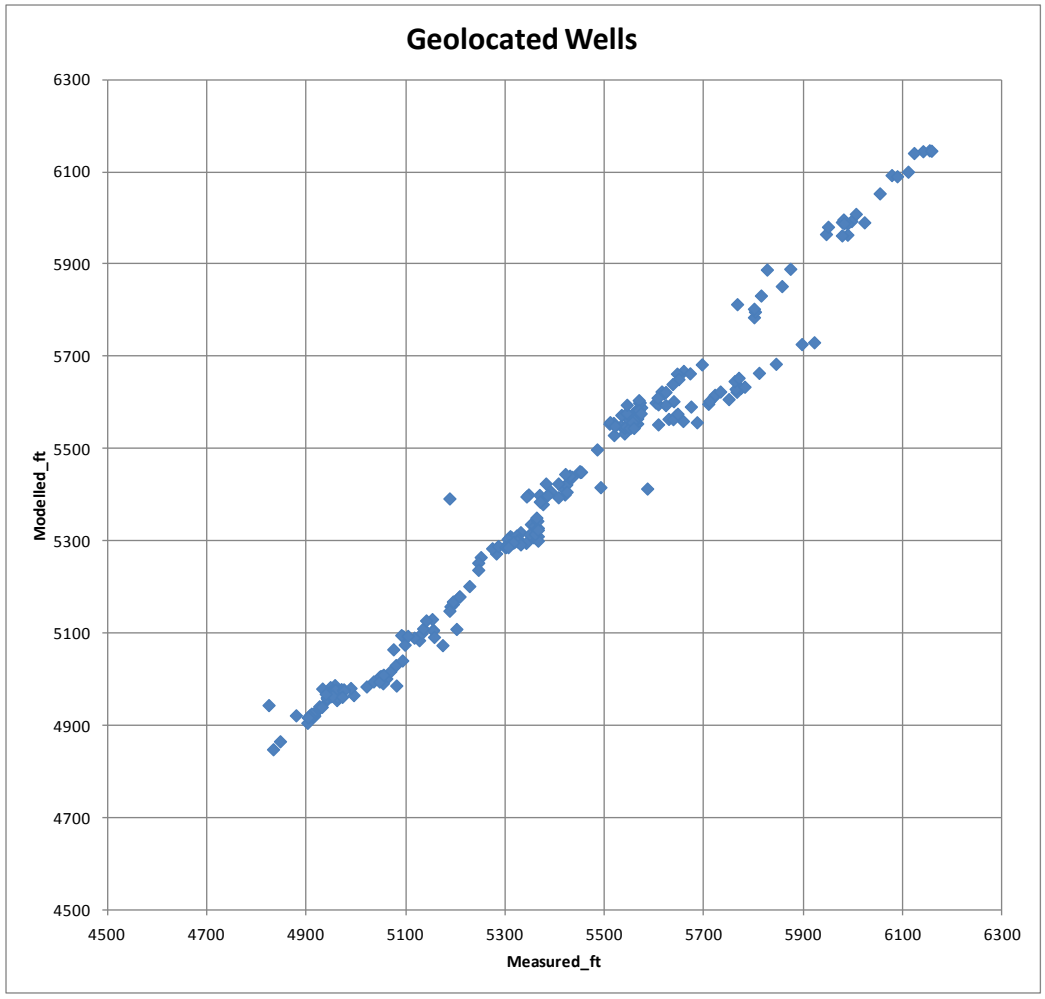
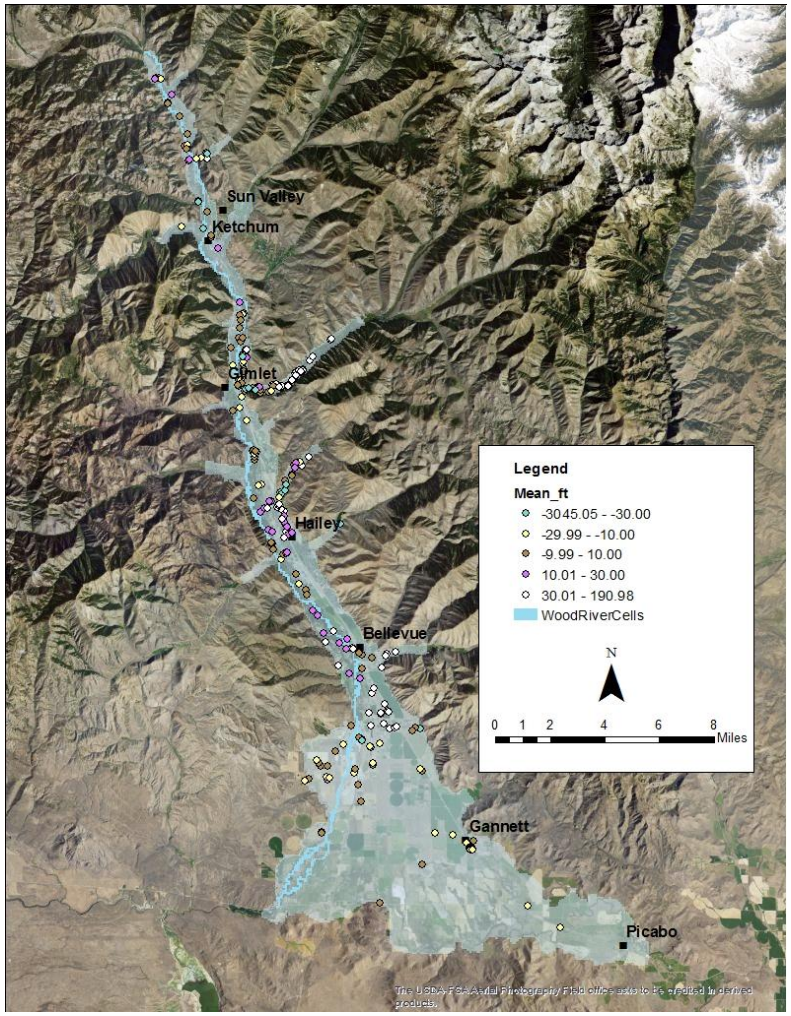
# Geo-located Wells



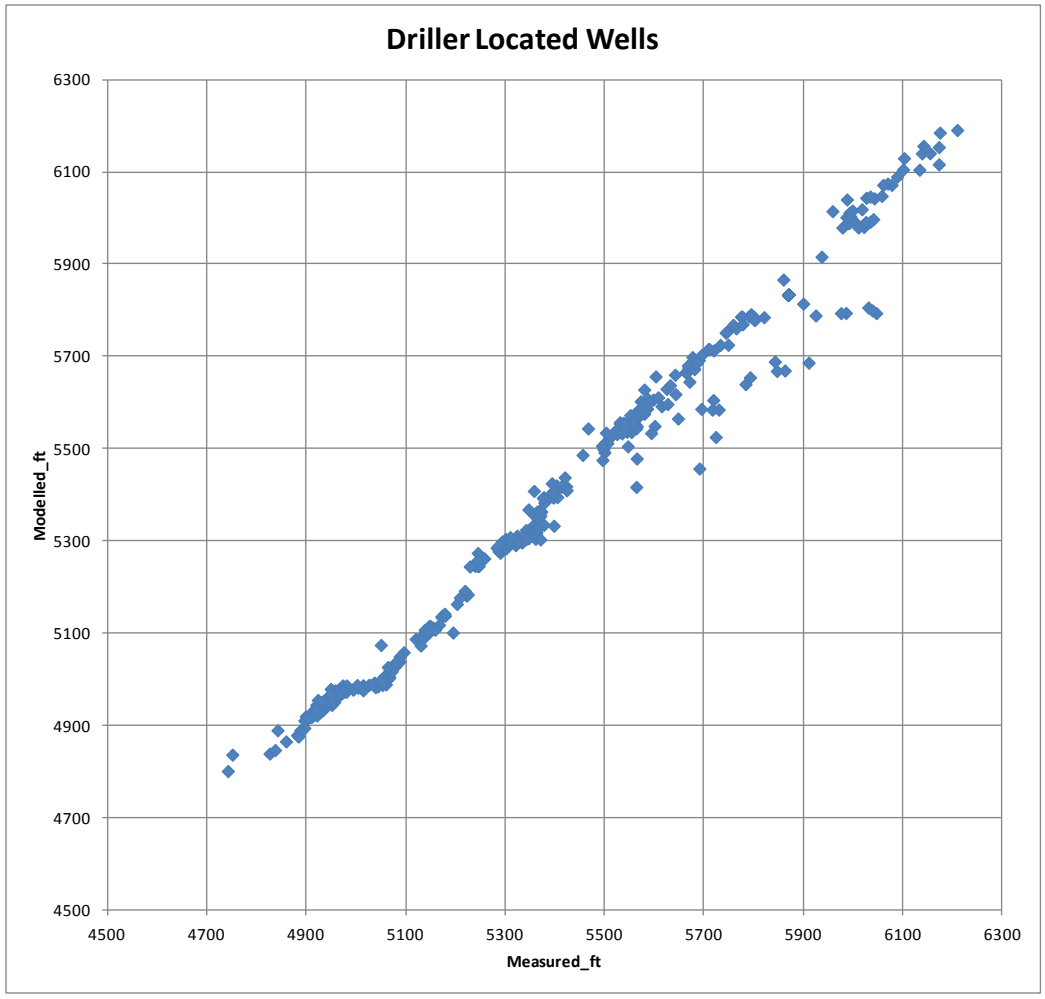

- Wells located by address
- Measured by driller
- If fit was perfect
  - Intercept = 0
  - Slope = 1
  - $R^2 = 1$
  - All points on the red line

# Geo-located Wells



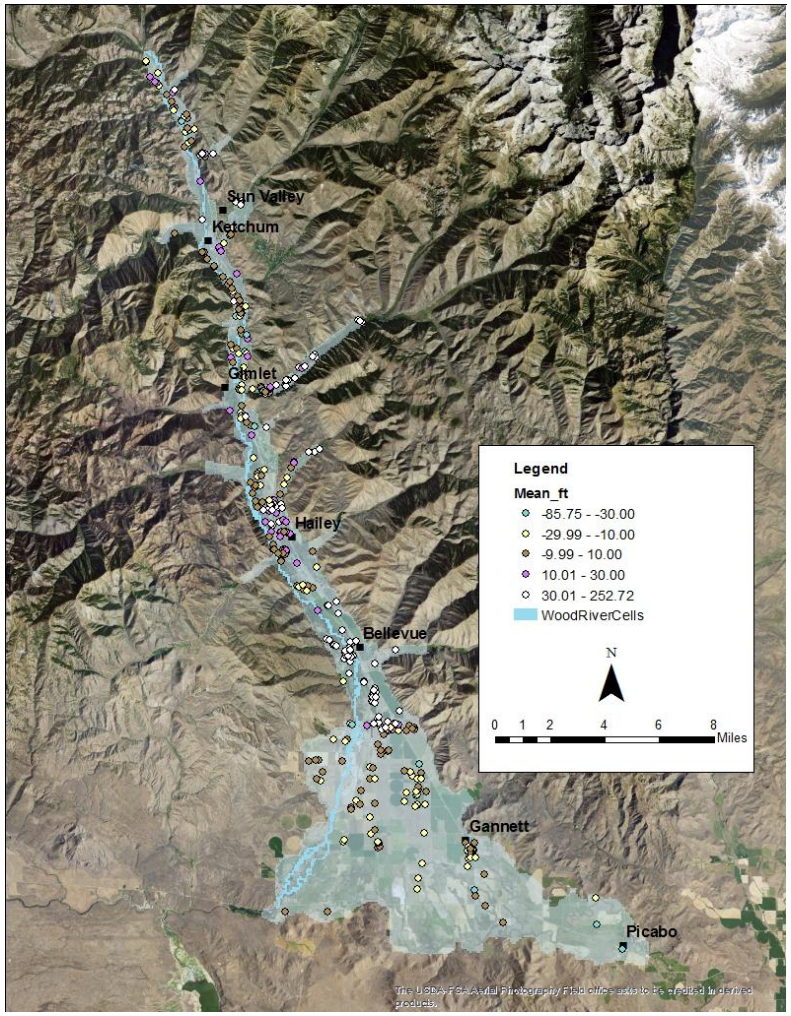

- Wells located by address
- Measured by driller

# Driller Wells



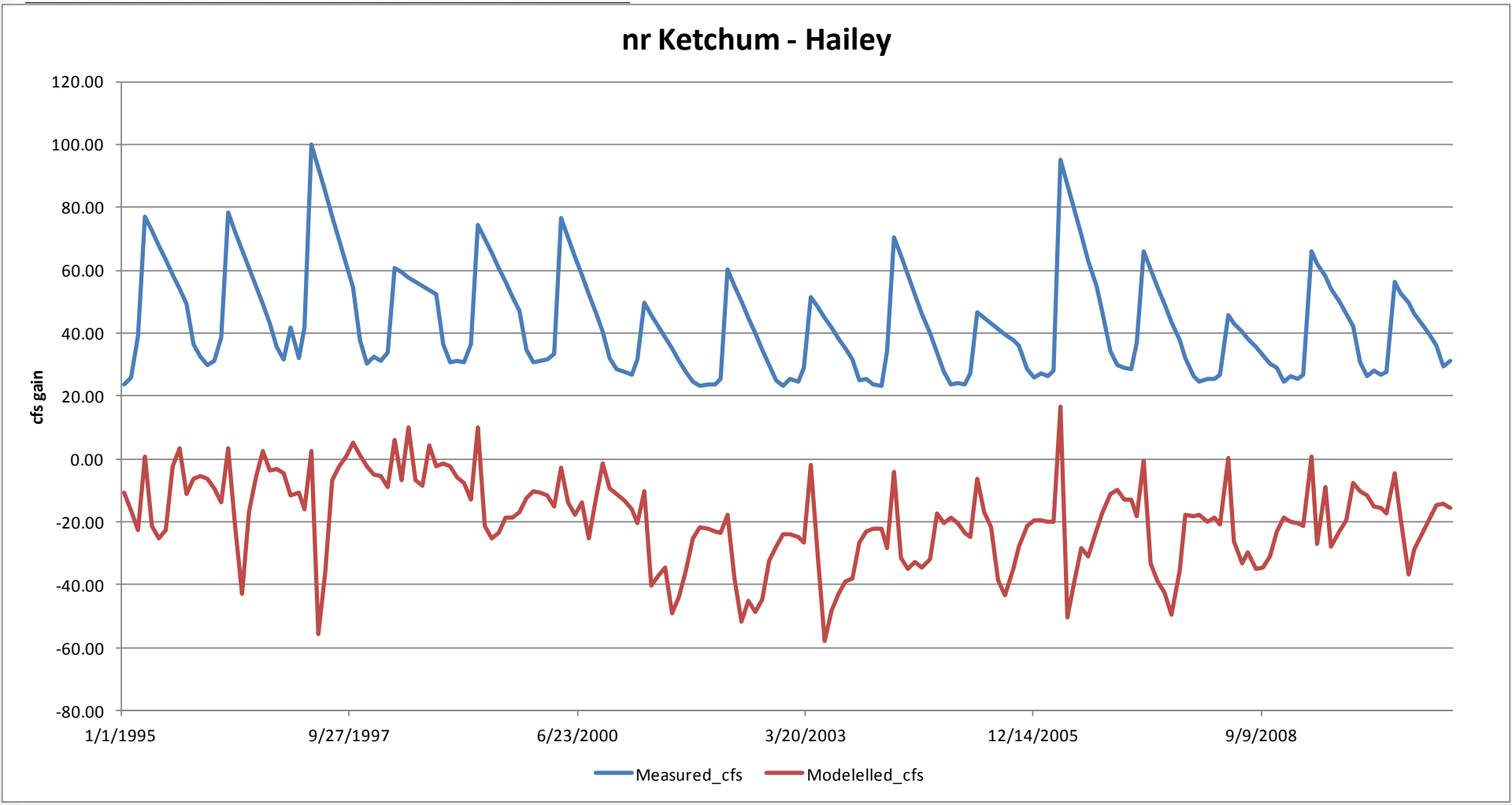

- Wells located by PLS
- Measured by driller
- If fit was perfect
  - Intercept = 0
  - Slope = 1
  - $R^2 = 1$
  - All points on the red line

# Driller Wells




- Wells located by PLS
- Measured by driller

# River Gains and Losses



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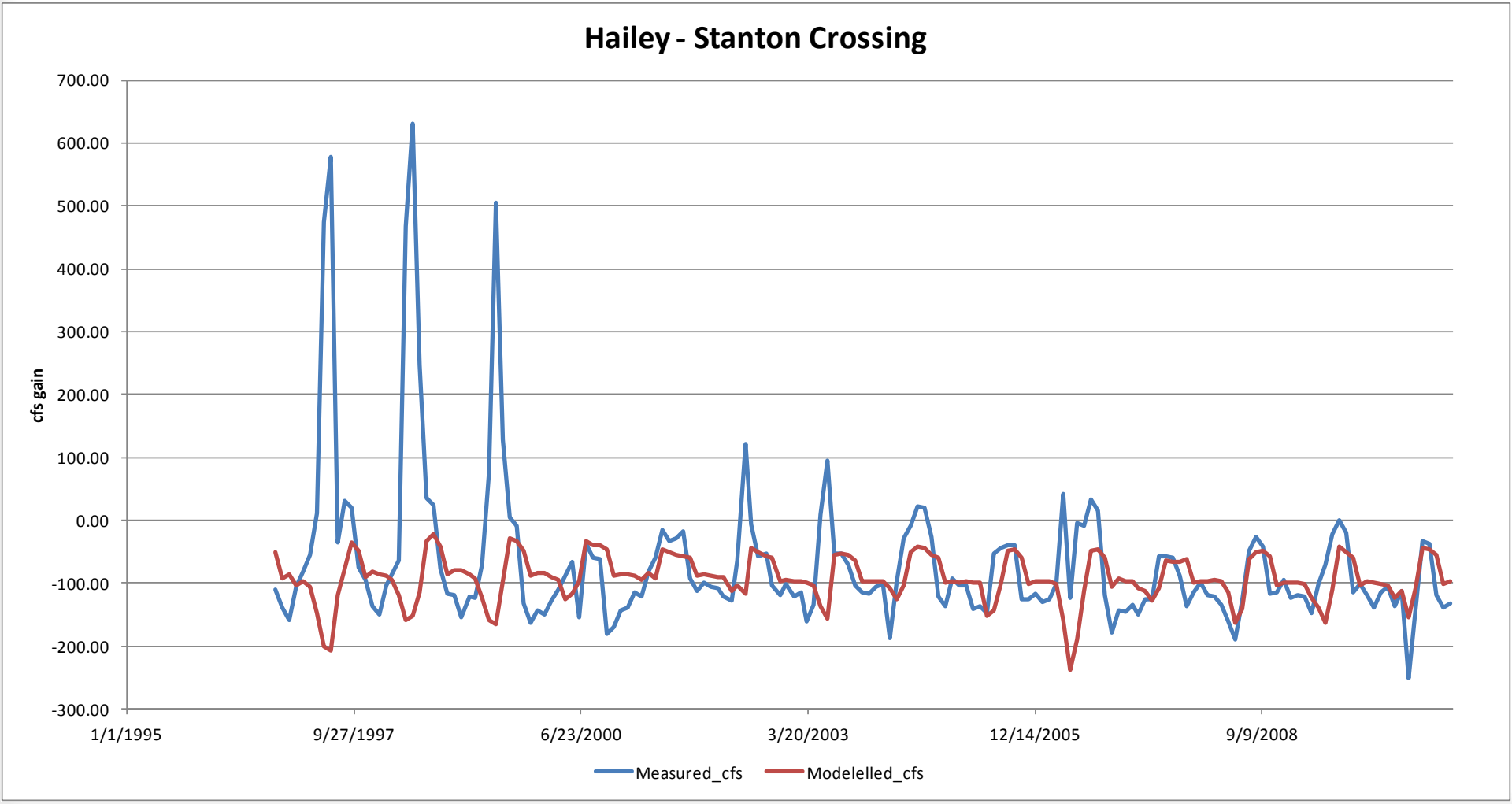

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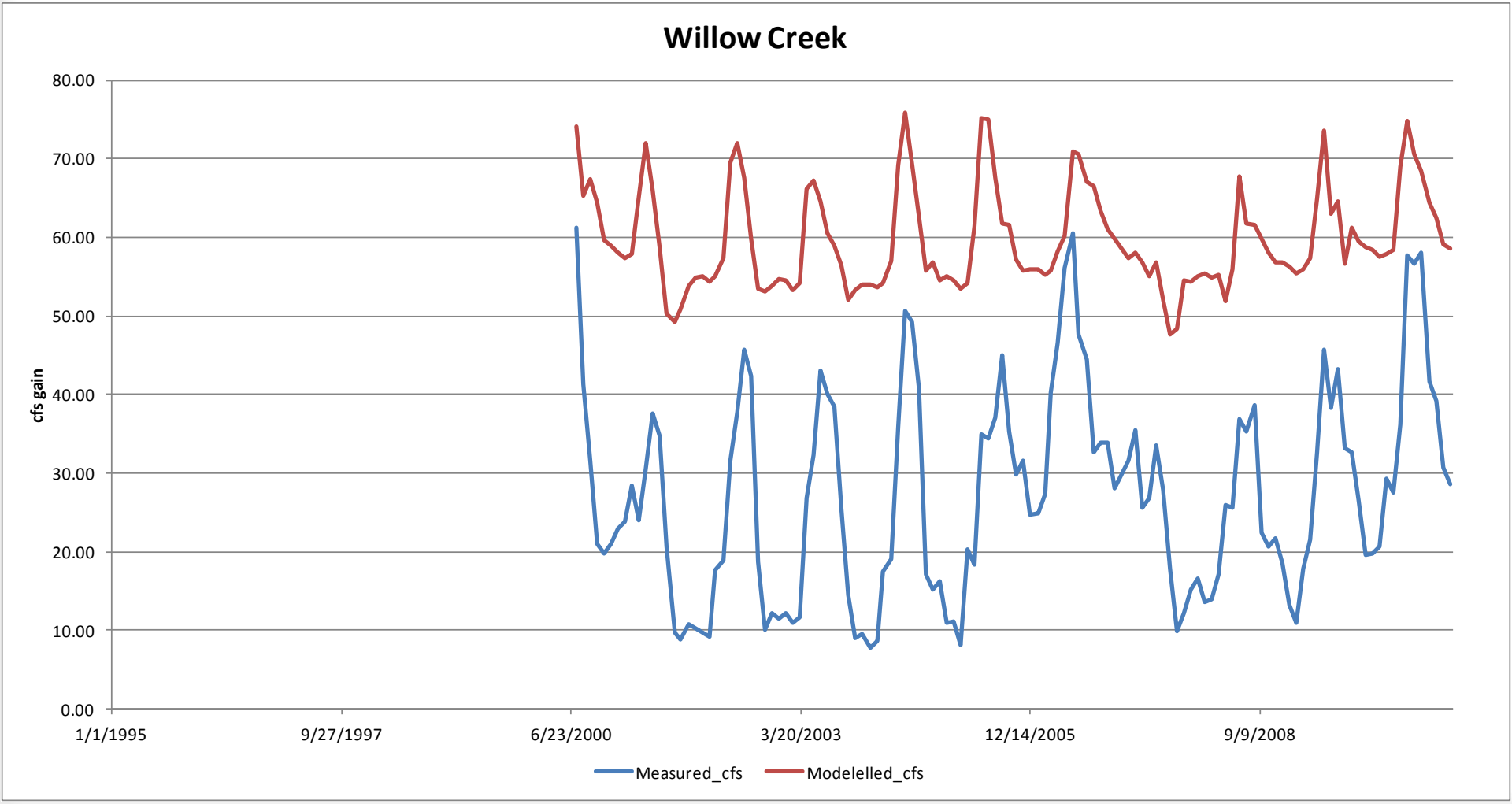

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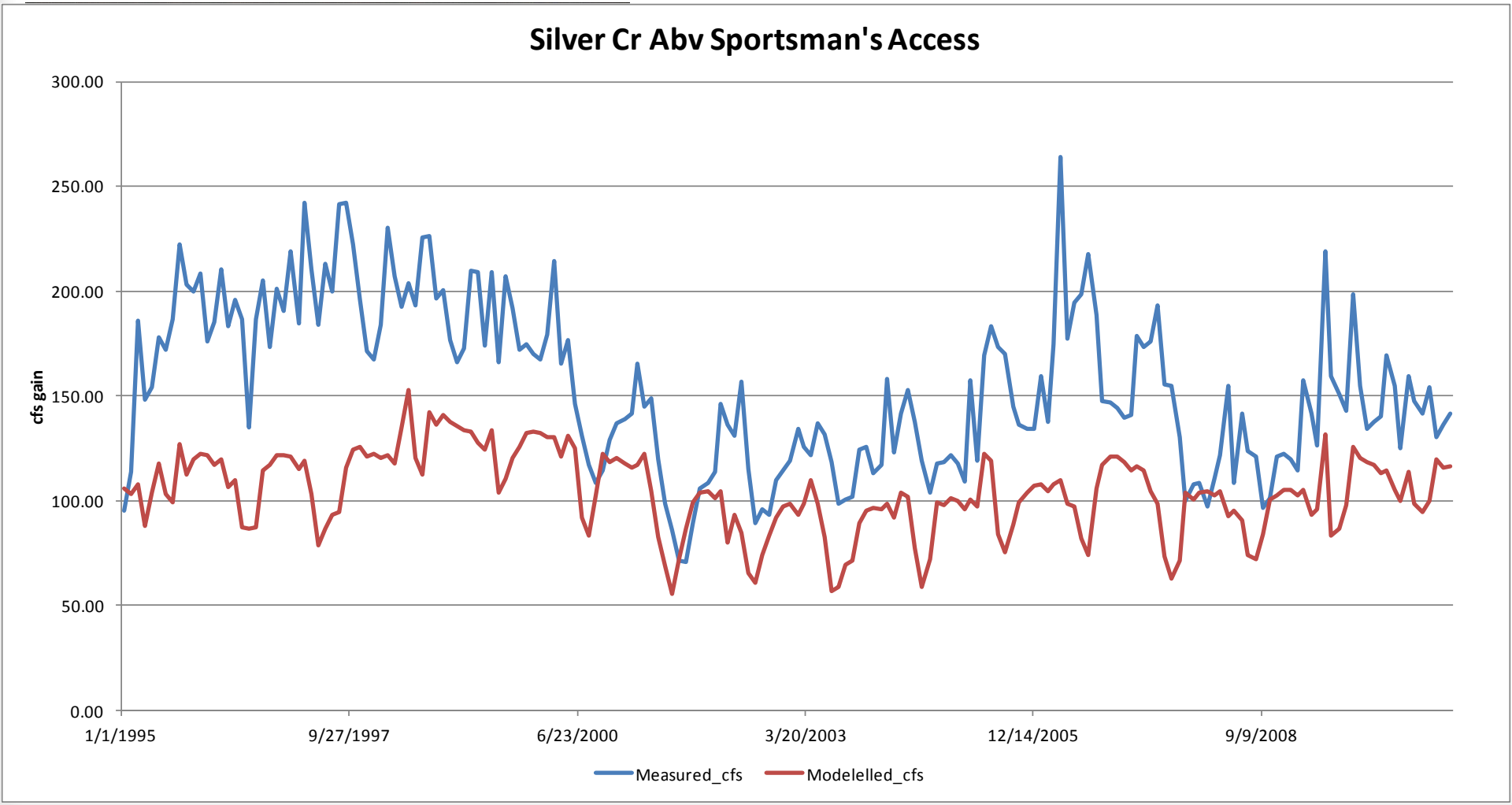

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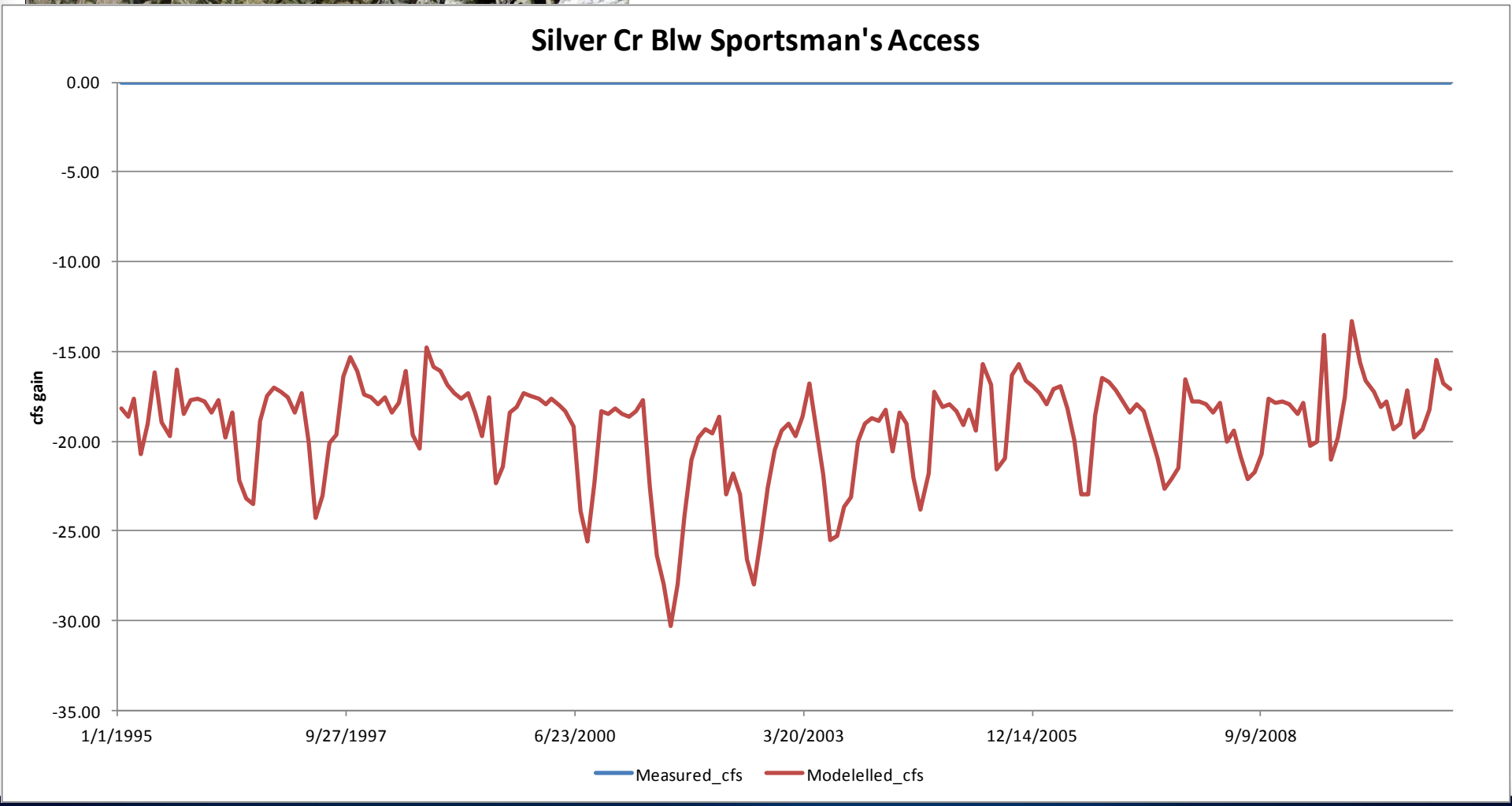
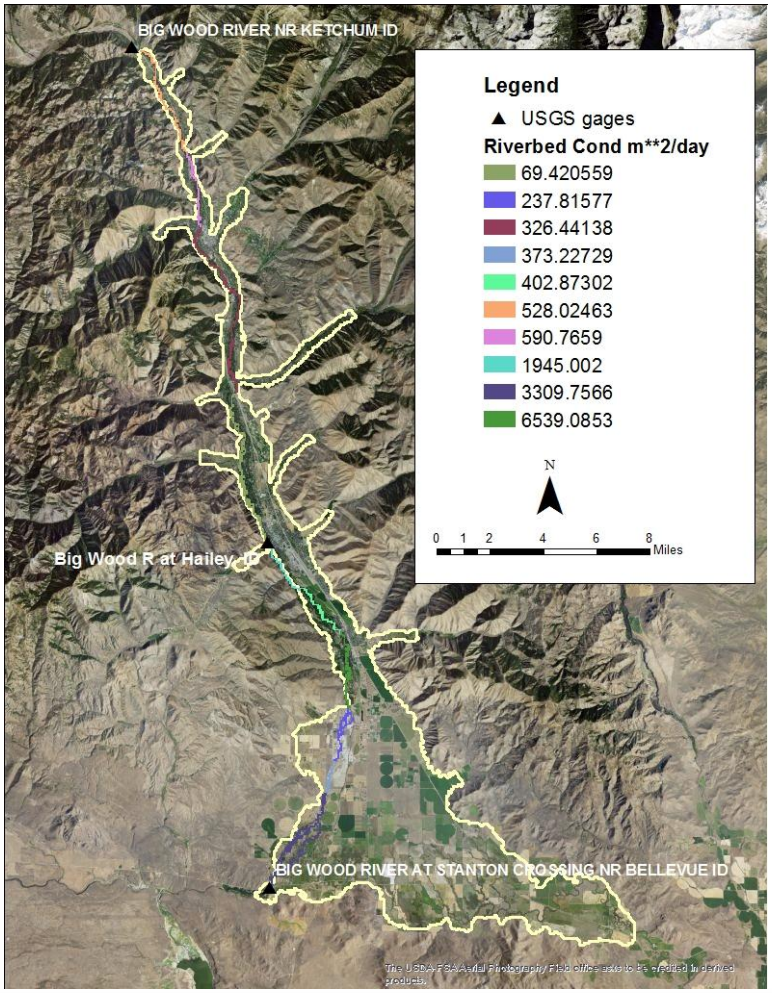
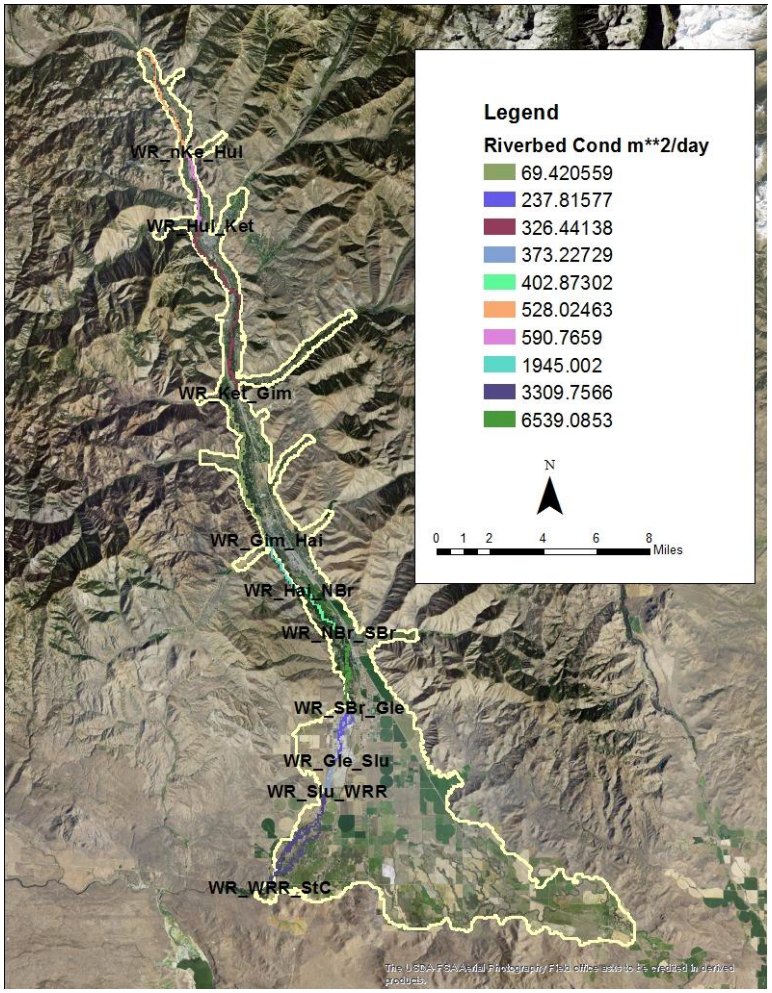


# Riverbed Conductance



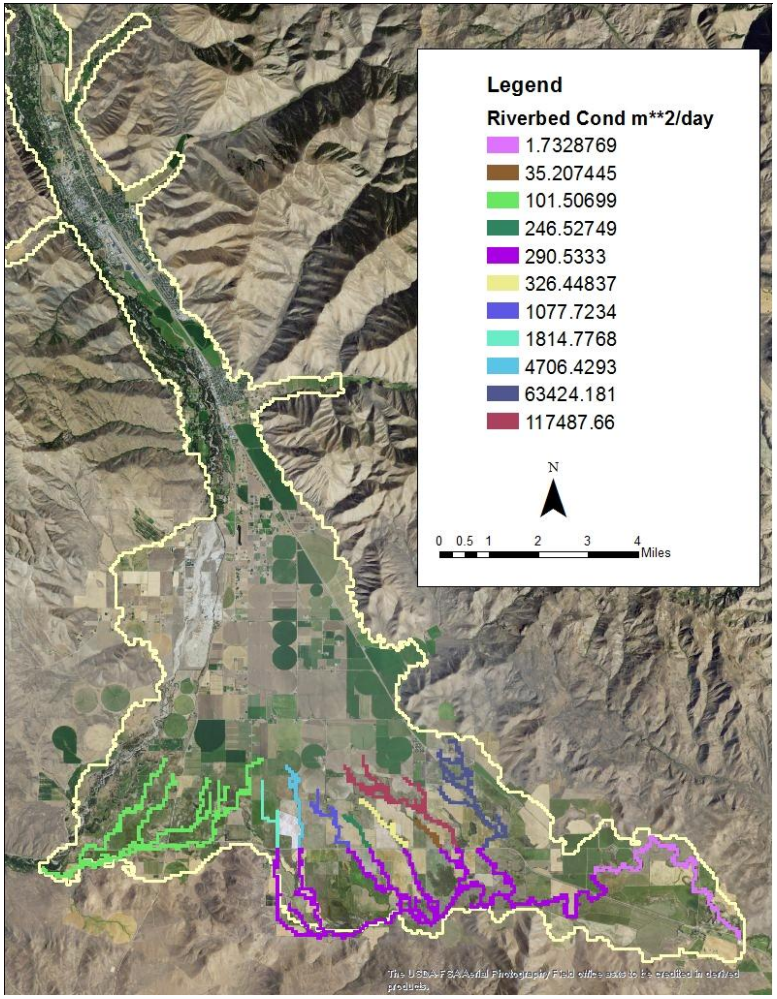

- Riverbed conductance in $M^2/d$
- Wood River

# Riverbed Conductance




- Riverbed conductance in $M^2/d$
- Wood River

# Streambed Conductance

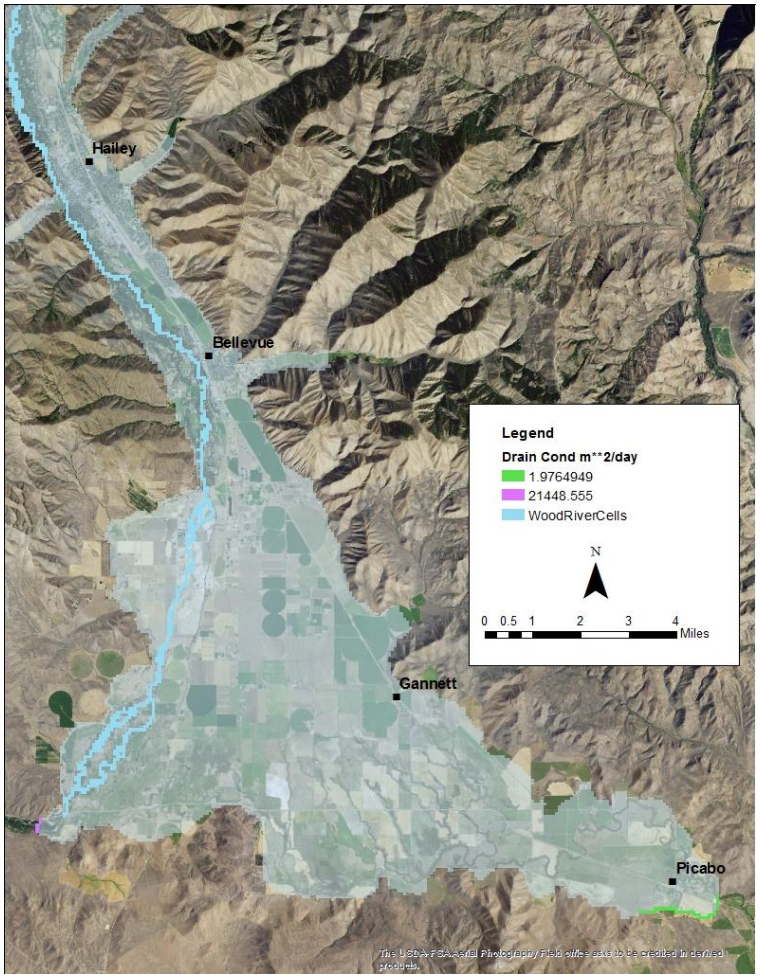



- Riverbed conductance in $M^2/d$
- Willow Cr, and Silver Cr

# Subsurface Discharge From Model

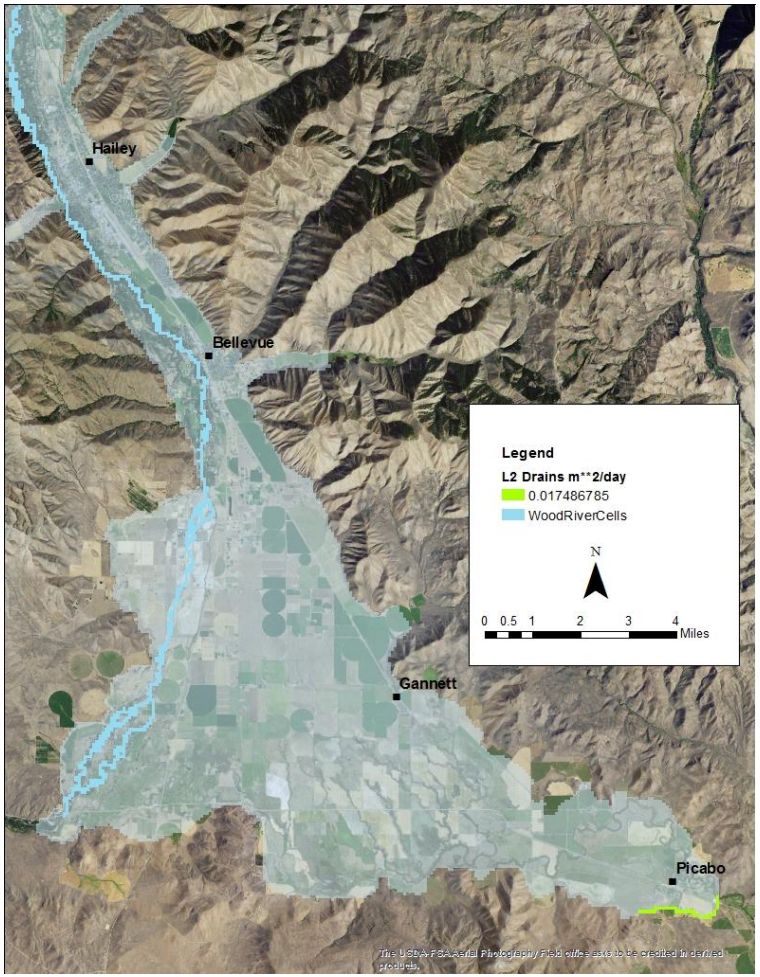
- Weight on these observations is low
- Stanton Crossing
  - Estimated ~ Negligible – 300 ac-f/yr
    - 0 - 0.41 cfs
    - Modeled = 3.2 cfs
- Silver Cr underflow
  - Estimated ~ 4,000 – 53,000 ac-f/yr
    - 5.5 – 73 cfs
    - Modeled = 25 cfs

# Drain Conductance



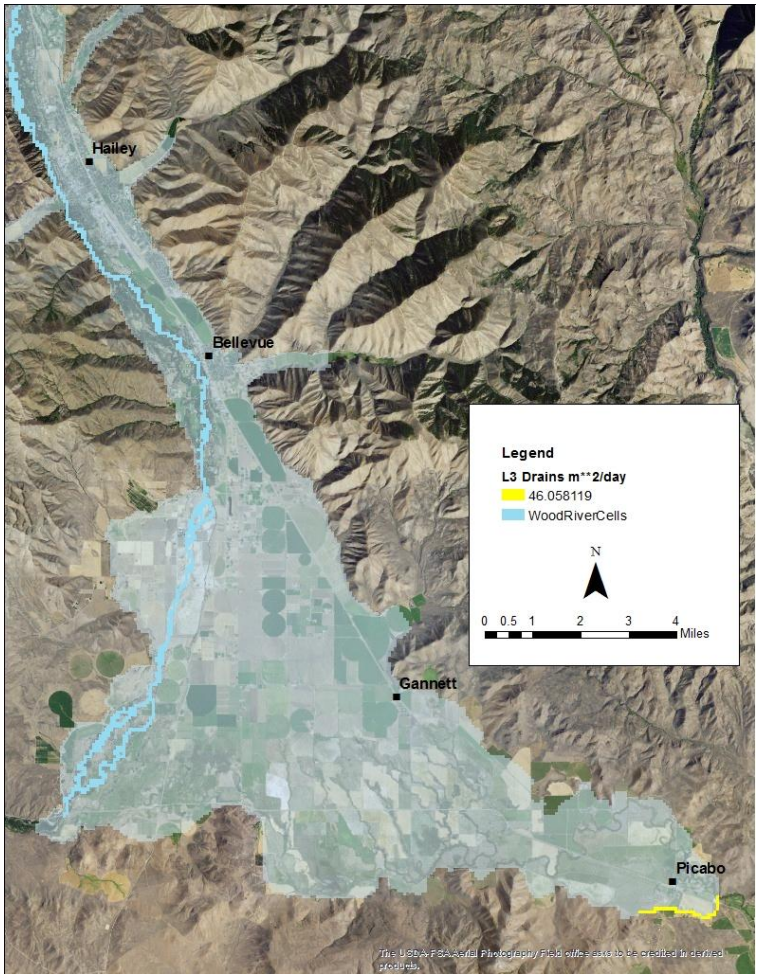

- Drain conductance in $M^2/d$
- Layer 1
  - Stanton Crossing
  - Silver Creek

# Drain Conductance



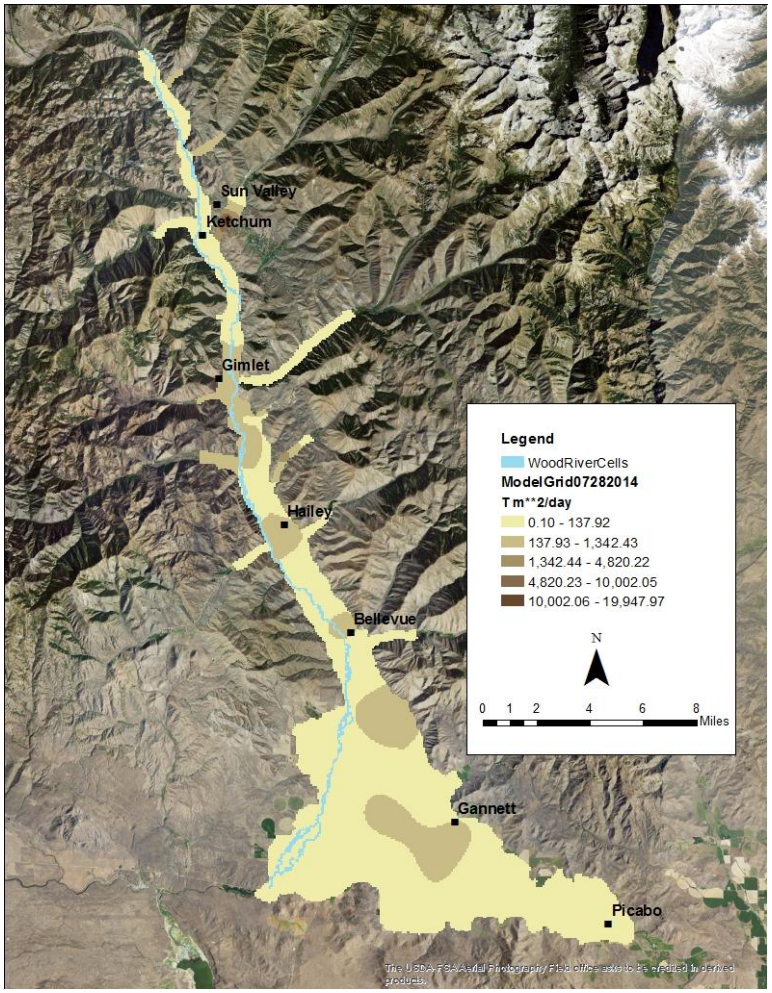

- Drain conductance in $M^2/d$
- Layer 2
  - Stanton Crossing
  - Silver Creek

# Drain Conductance



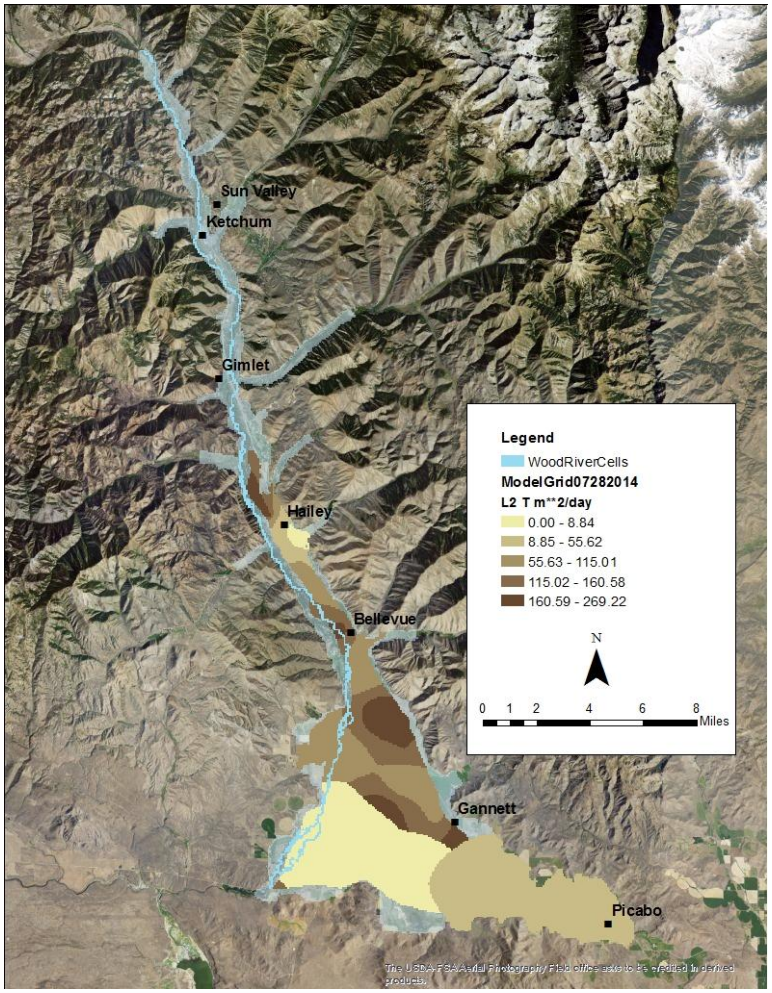

- Drain conductance in $M^2/d$
- Layer 3
  - Stanton Crossing
  - Silver Creek

# Layer 1 Transmissivity



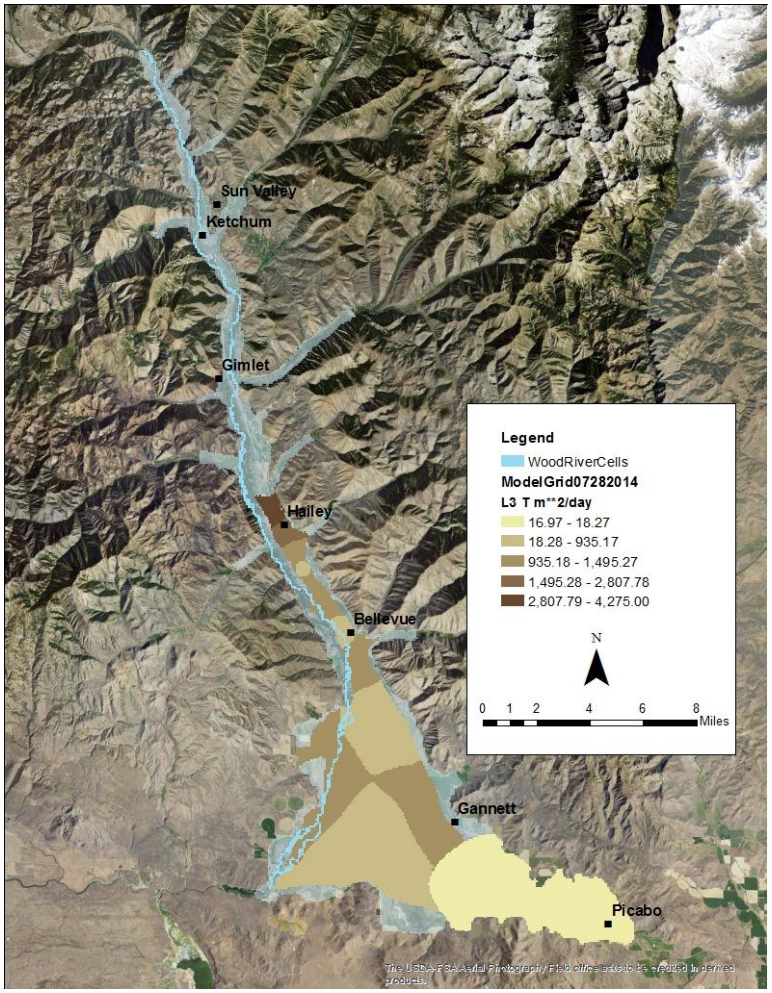

- Layer 1 temporarily modeled as non-time varying transmissivity
- Pilot points can be moved
- Number of pilot points not fixed

# Layer 2 Transmissivity



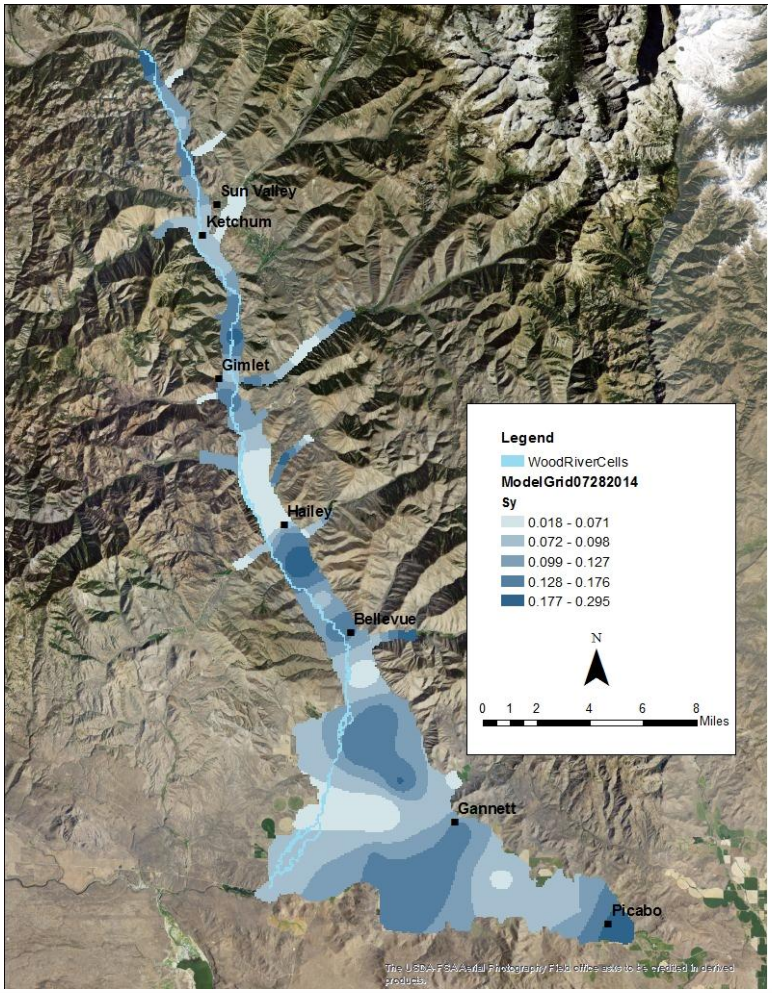

- Layer 2 modeled as transmissivity
- Includes basalt in east
- Includes confining layer
- Pilot points can be moved
- Number of pilot points can be changed

# Layer 3 Transmissivity



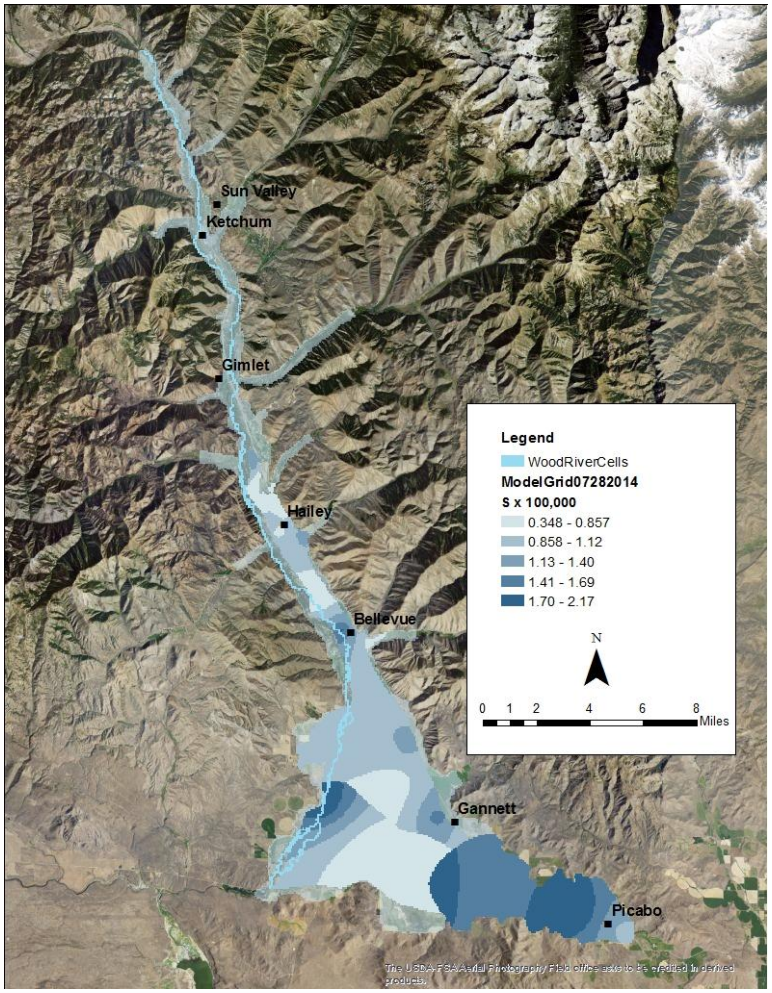

- Layer 3 modeled as transmissivity
- Includes basalt in east
- Pilot points can be moved
- Number of pilot points can be changed

# Layer 1 Storage



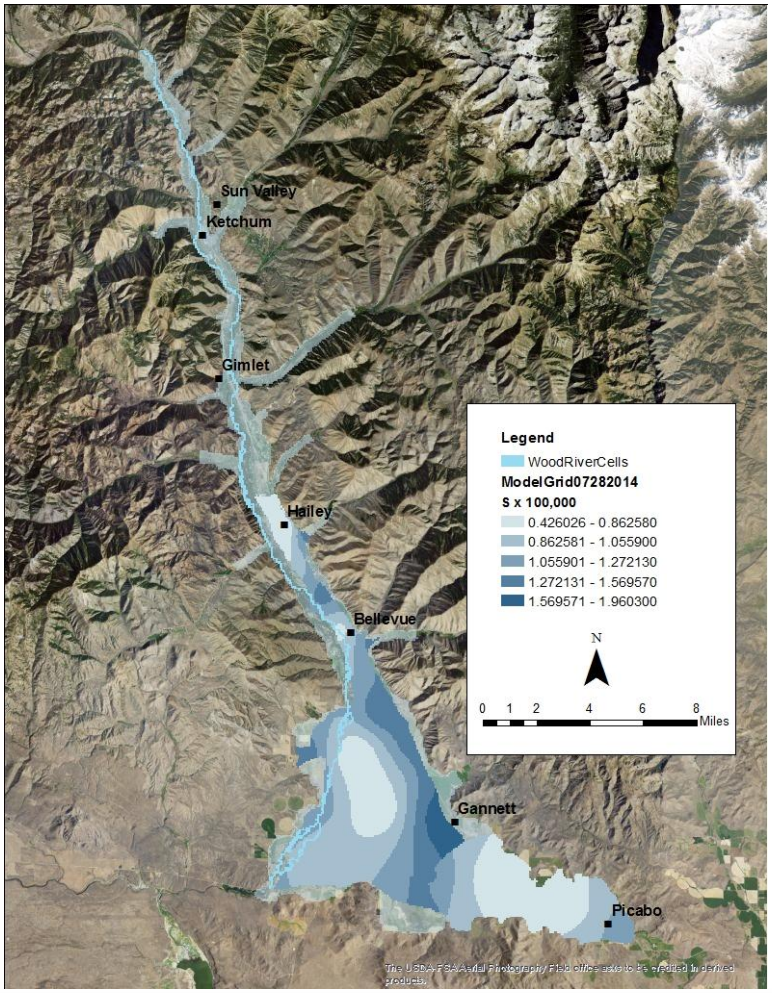

- Layer 1 temporarily modeled as non-time varying thickness
- Pilot points can be moved
- Number of pilot points not fixed

# Layer 2 Storage




- Layer 2 modeled as storage
- Includes basalt in east
- Includes confining layer
- Pilot points can be moved
- Number of pilot points can be changed

# Layer 3 Storage

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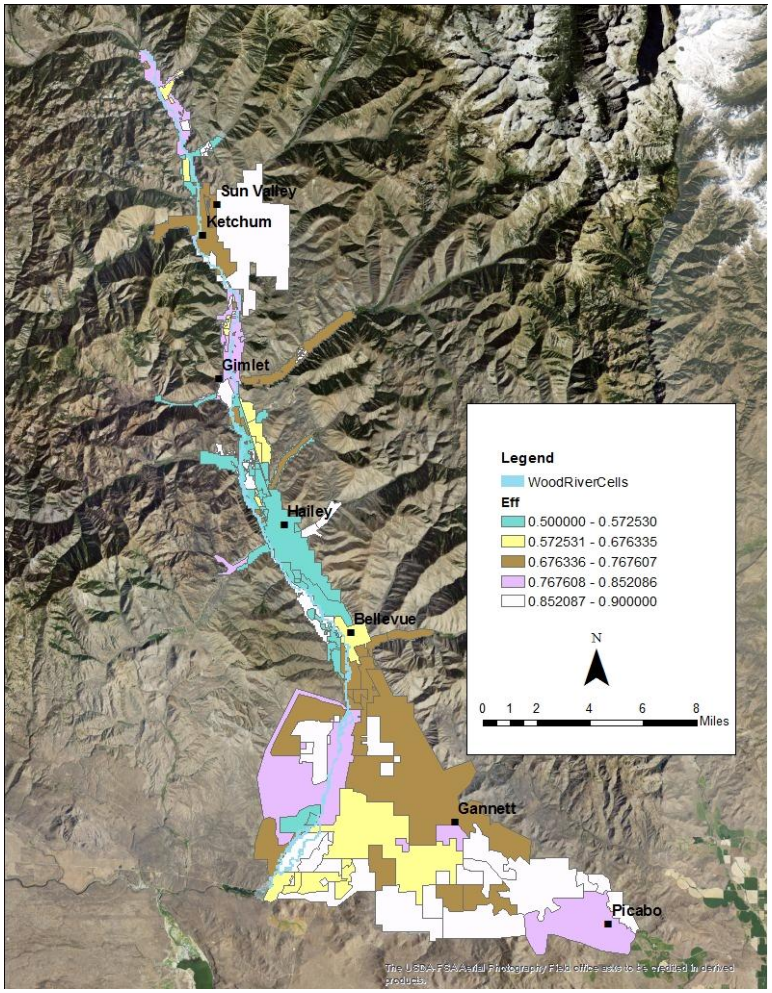
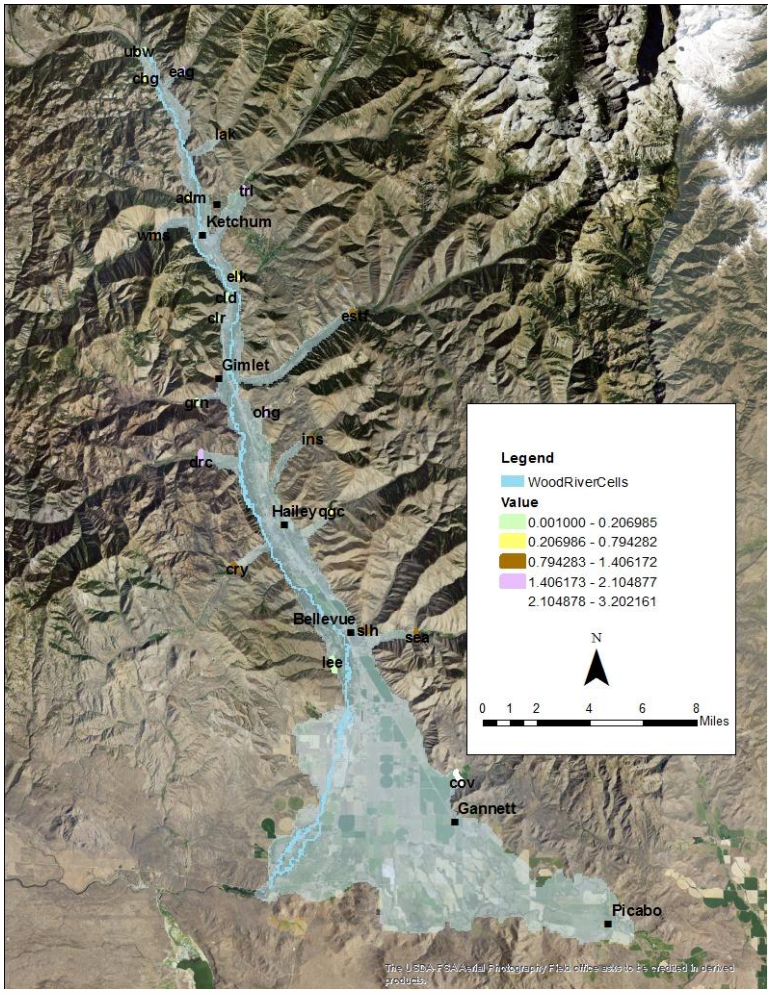
# Surface Water Irrigation Efficiency



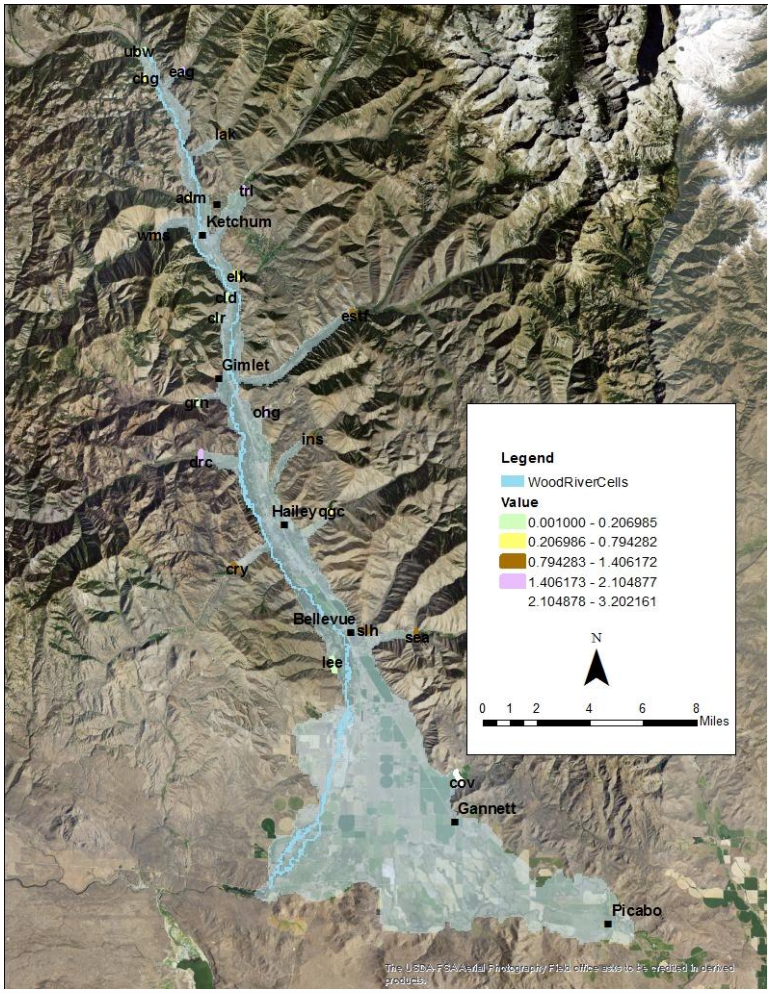

- Inefficient fraction infiltrates into layer 1 aquifer
  - Note to the engineers
    - Low efficiency is not necessarily bad

# Tributary Underflow



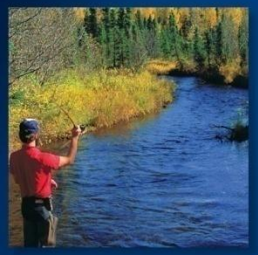

- Trib underflow adjusted using
  - Adjustment factors
    - Adjust average flux
  - Reduction factor
    - Adjust seasonal amplitude
  - Averaging period
    - 200 day, 300 day, 400 day , etc

# Tributary Underflow




| Name | Start | Minimum | Maximum |
|---|---|---|---|
| Adams Gulch | 1.00 | 0.001 | 20.68 |
| BWR Upper | 1.00 | 0.001 | 516.11 |
| Chocolate Gulch | 1.00 | 0.001 | 20.09 |
| Clear Creek | 1.00 | 0.001 | 20.07 |
| Cold Springs Gulc | 1.00 | 0.001 | 20.01 |
| Cove Canyon | 1.00 | 0.001 | 77.24 |
| Croy Creek | 1.00 | 0.001 | 33.52 |
| Deer Creek | 1.00 | 0.001 | 50.76 |
| Eagle Creek | 1.00 | 0.001 | 16.99 |
| East Fork | 1.00 | 0.001 | 256.11 |
| Elkhorn Gulch | 1.00 | 0.001 | 250.14 |
| Greenhorn Gulch | 1.00 | 0.001 | 44.67 |
| Indian Creek | 1.00 | 0.001 | 4.22 |
| Lake Creek | 1.00 | 0.001 | 7.18 |
| Lees Gulch | 1.00 | 0.001 | 20.00 |
| Ohio Gulch | 1.00 | 0.001 | 19.95 |
| Quigley Creek | 1.00 | 0.001 | 27.69 |
| Seamans Gulch | 1.00 | 0.001 | 9.63 |
| Slaughterhouse | 1.00 | 0.001 | 22.75 |
| Townshead Gulch | 1.00 | 0.001 | 20.00 |
| Trail Creek | 1.00 | 0.001 | 38.40 |
| Warm Springs Creek | 1.00 | 0.001 | 371.12 |

IDAHO Department of Water Resources



# End