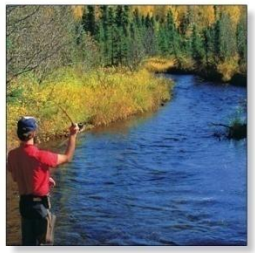
Rethinking Data Gathering in the Wood River Valley

Presented by Allan Wylie, IDWR

Date October 1, 2015

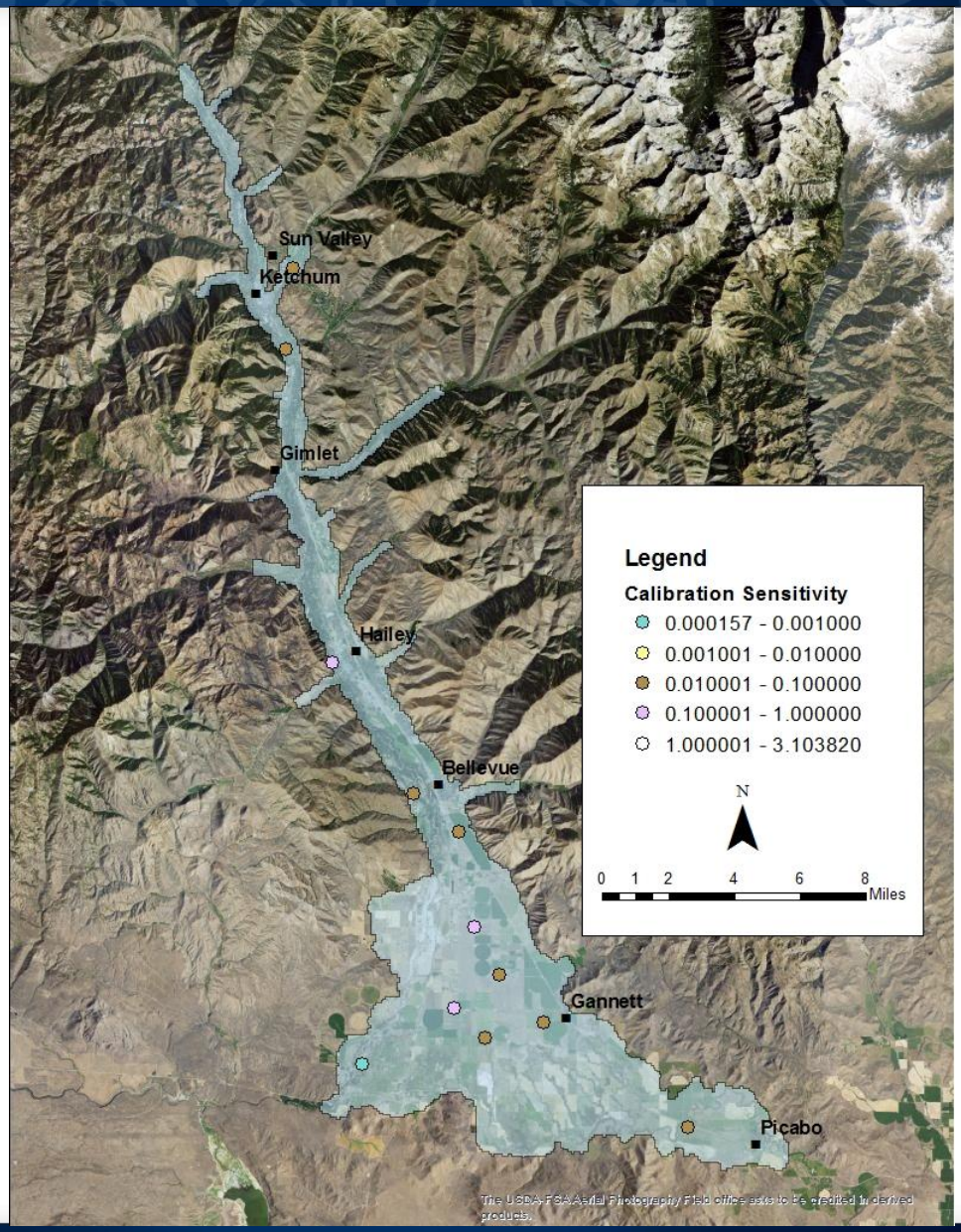



Outline

- A few recommendations resulting from analysis of the model calibration
- Look at where model is sensitive to water level observations
- Recommending some changes to water level network
- Recommending changes in stream gaging

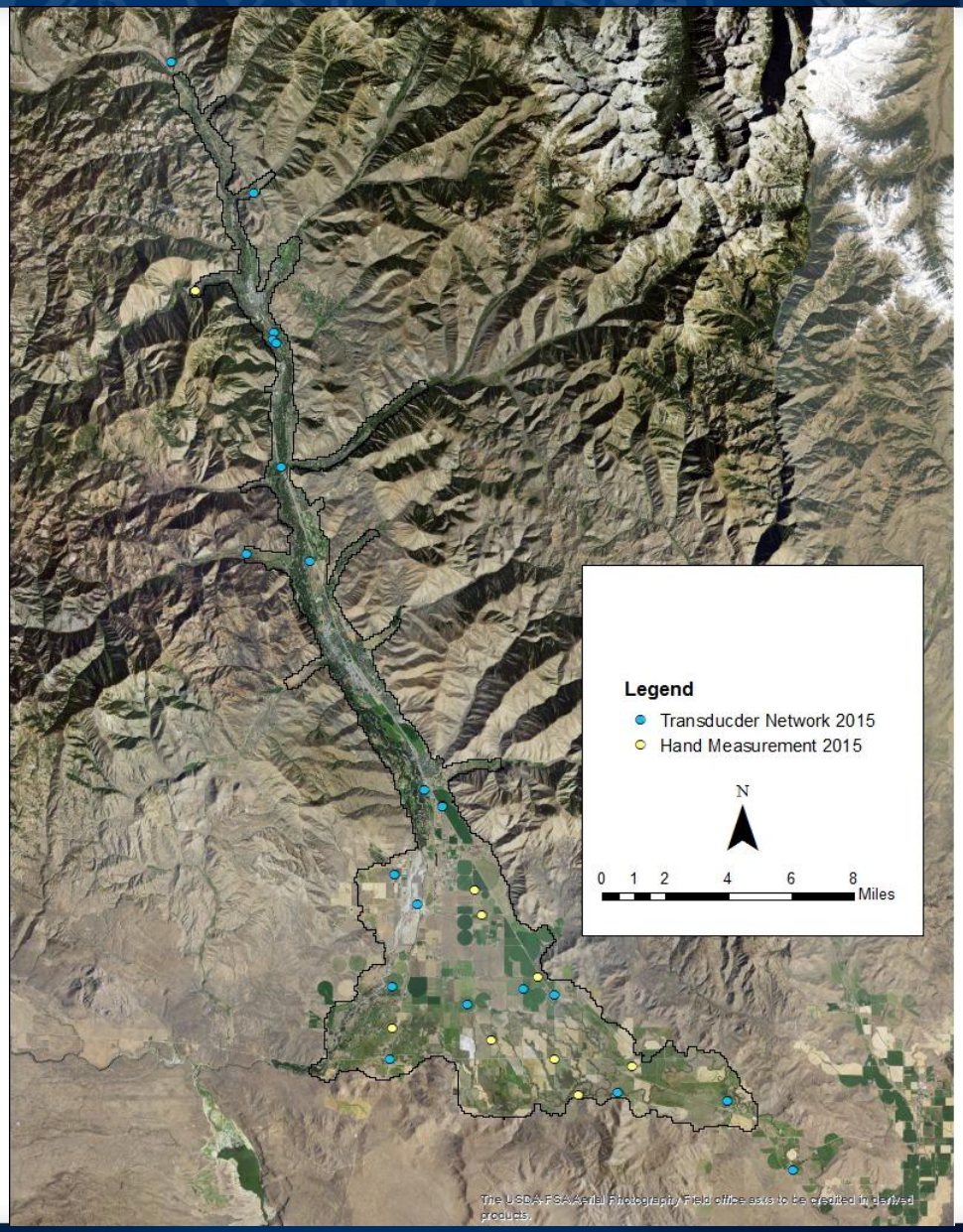
Thank You
Sun Valley
The Nature Conservancy

- Sun Valley
  - •2 wells with a total of 343 observations
- •The Nature Conservancy
  - •10 wells with a total of 2027 observations



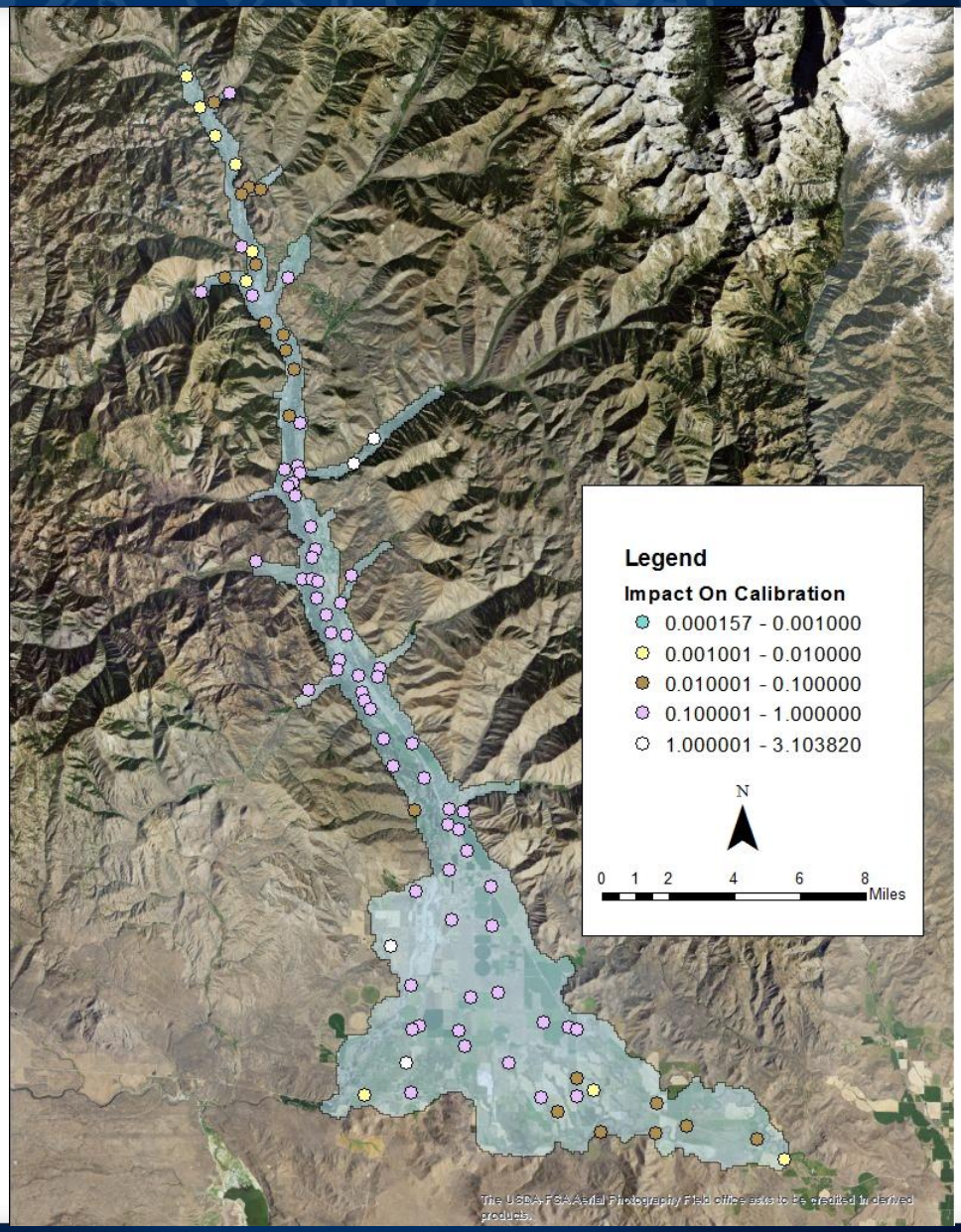
Existing Observation Well Network

- 20 wells with transducers
- 10 wells hand measured twice a year
    - April and October



Sensitivity of the calibration to water level observations

- Sensitivity – measure of how much attention PEST is obliged to pay to the observation
- 94 Observation Wells used in 2006 synoptic
- Map “sensitivity” of Observation Wells
- Use average sensitivity for wells with more than one observation



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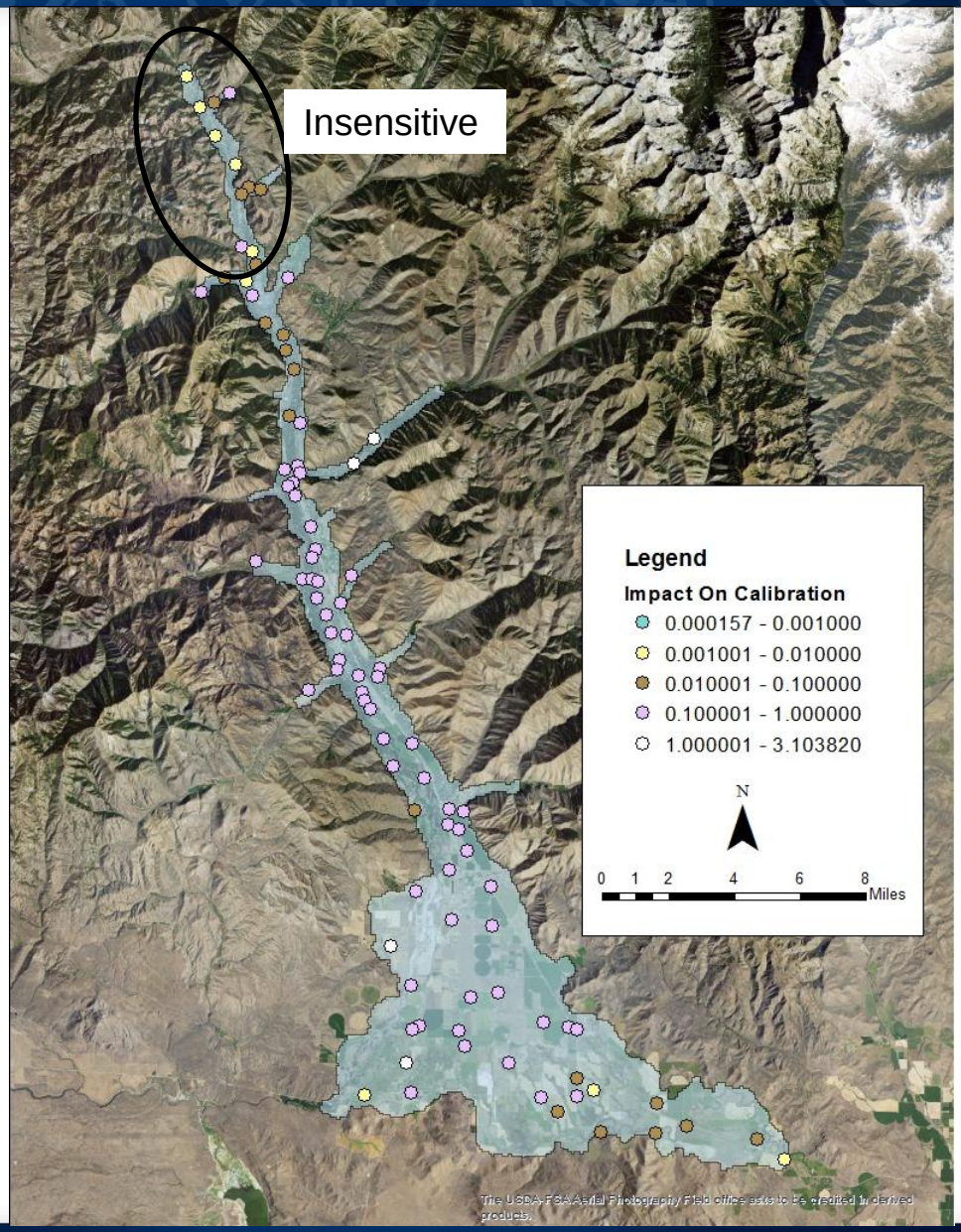

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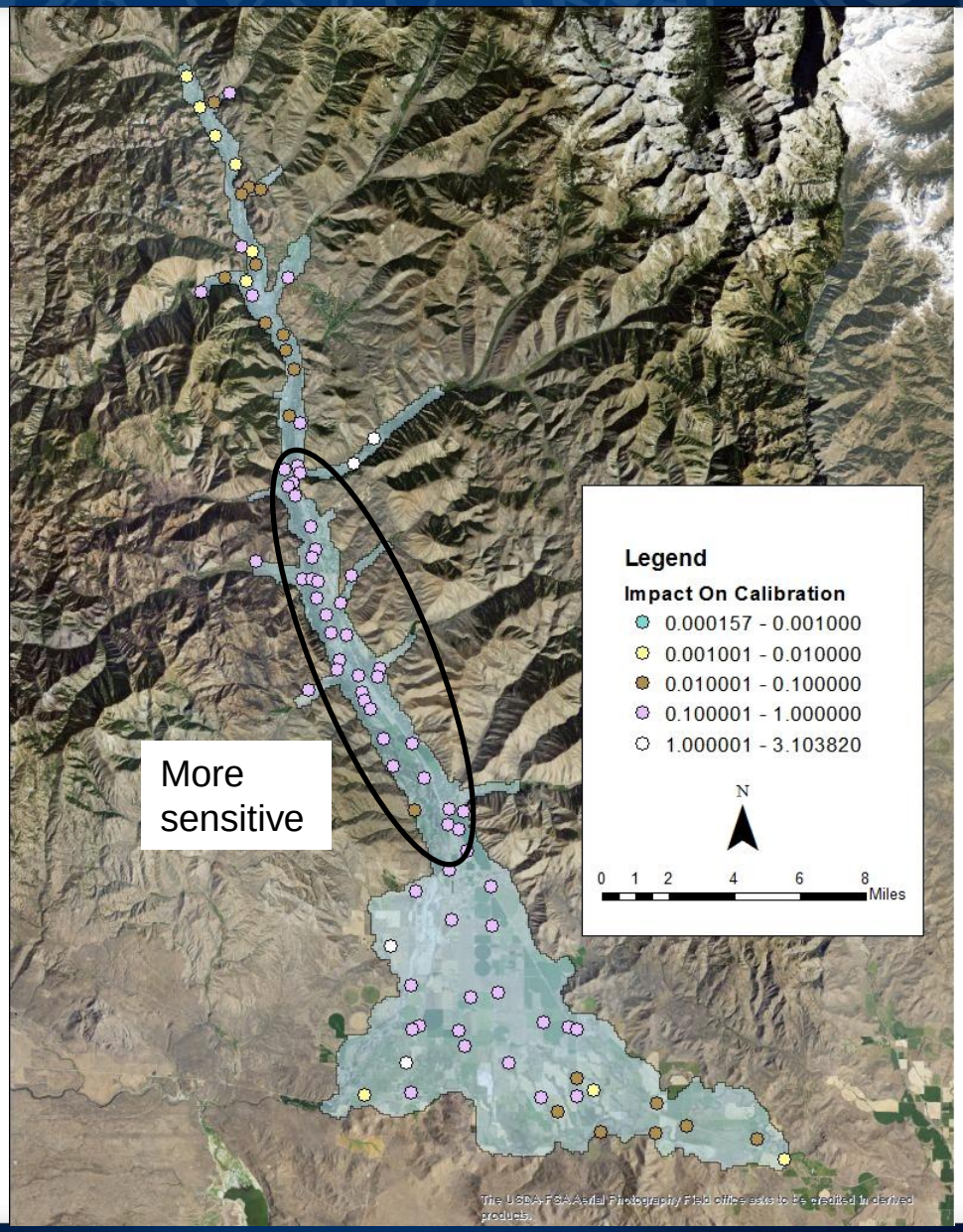

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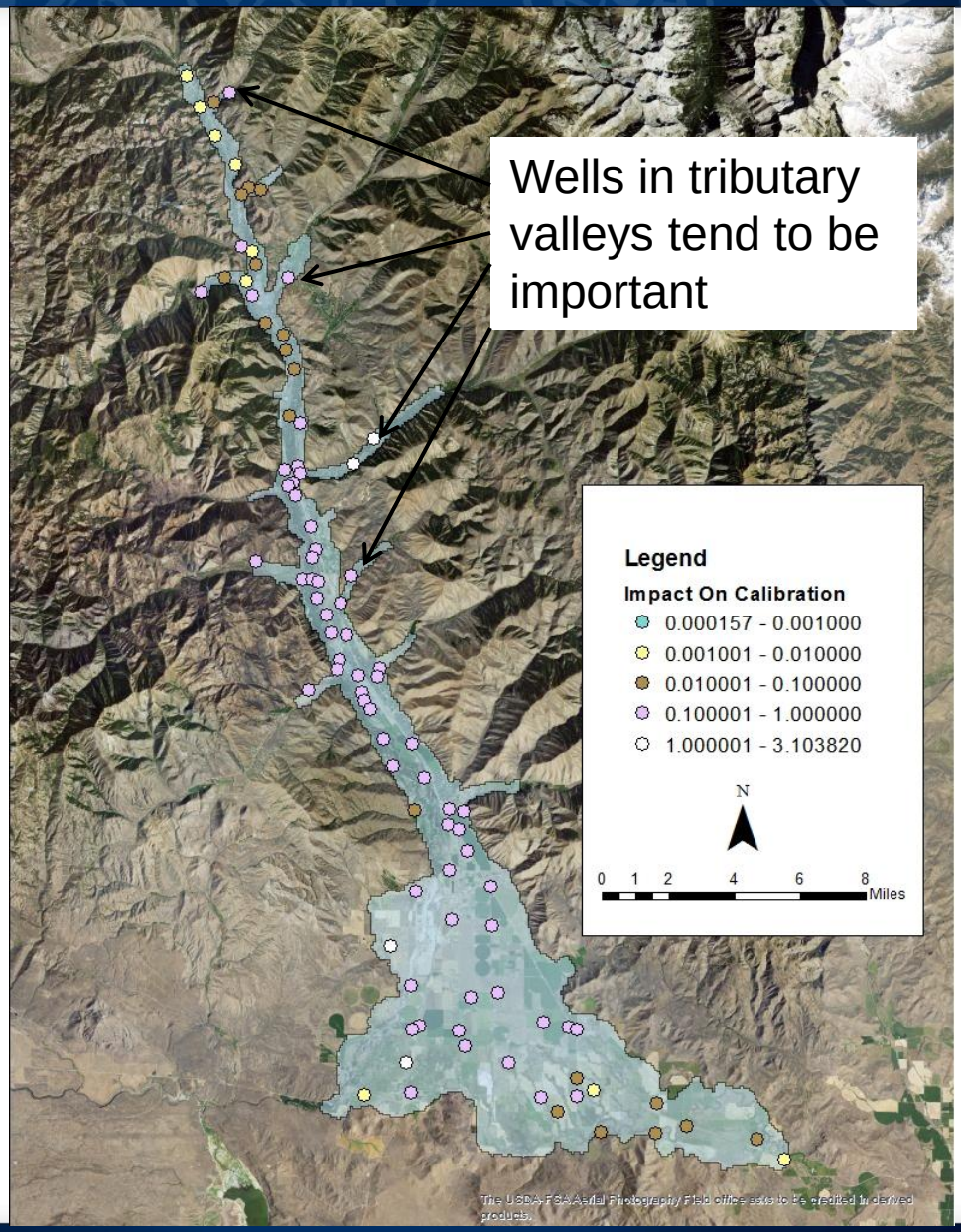

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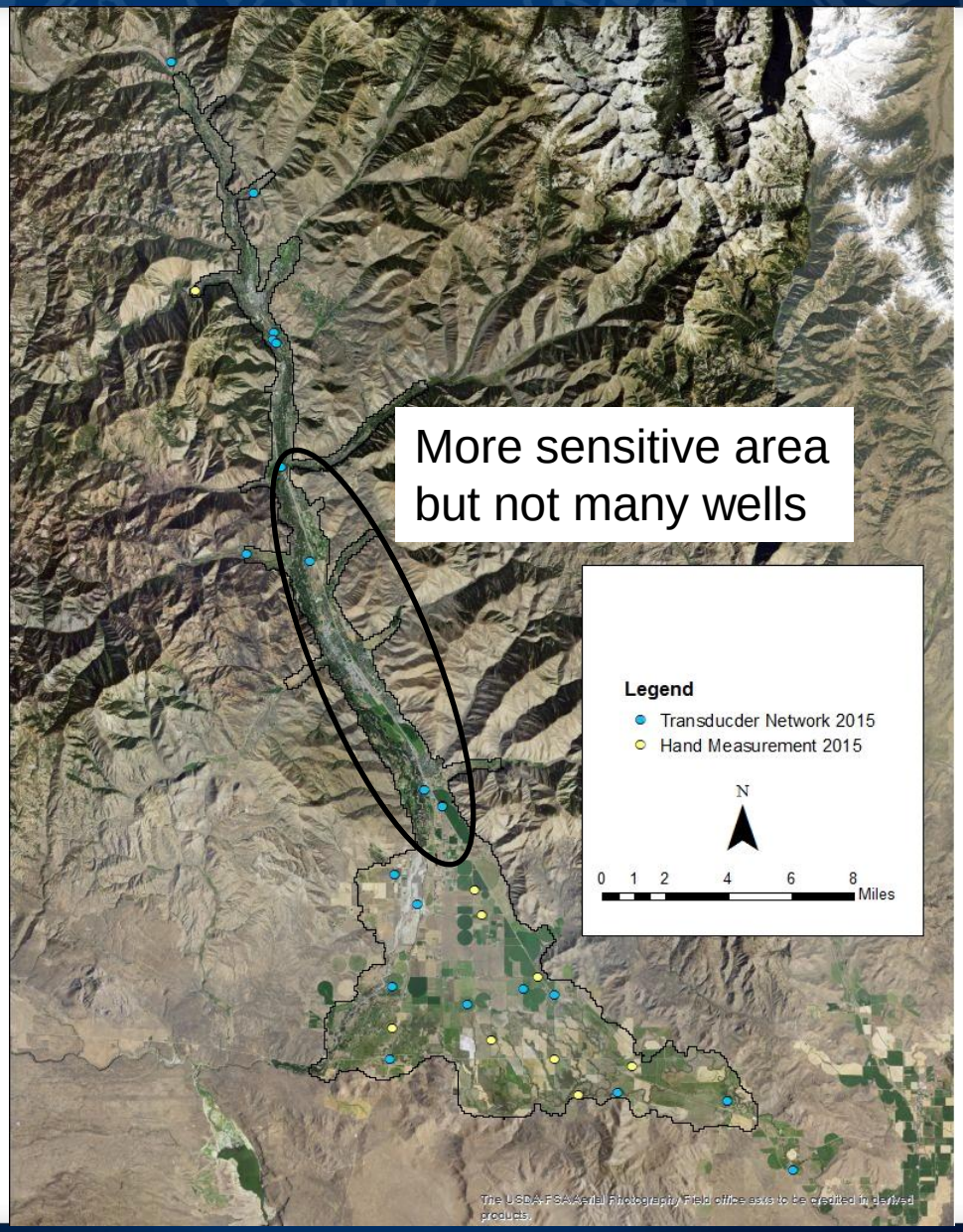

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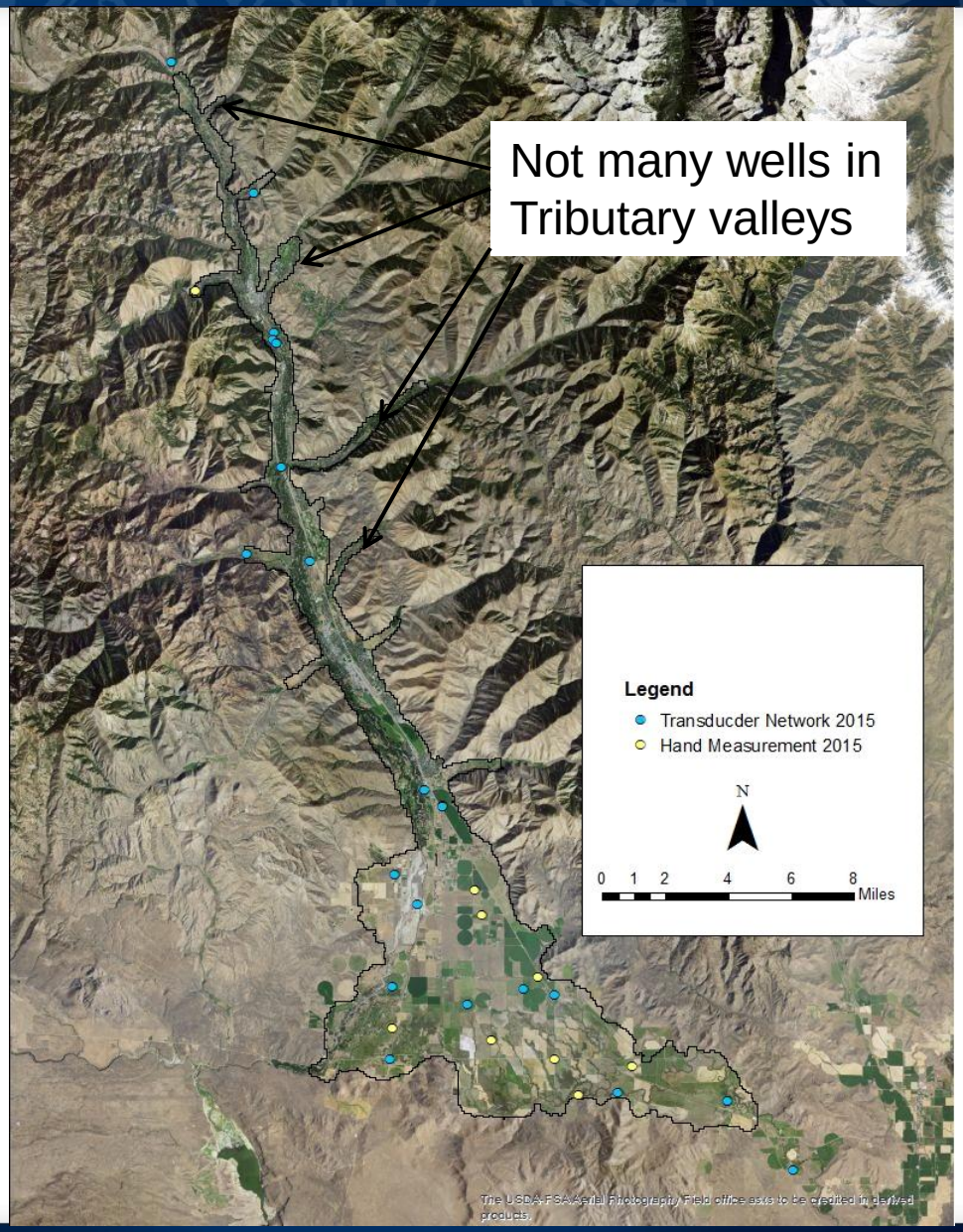

Existing Observation Well Network

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- 21 wells hand measured twice a year
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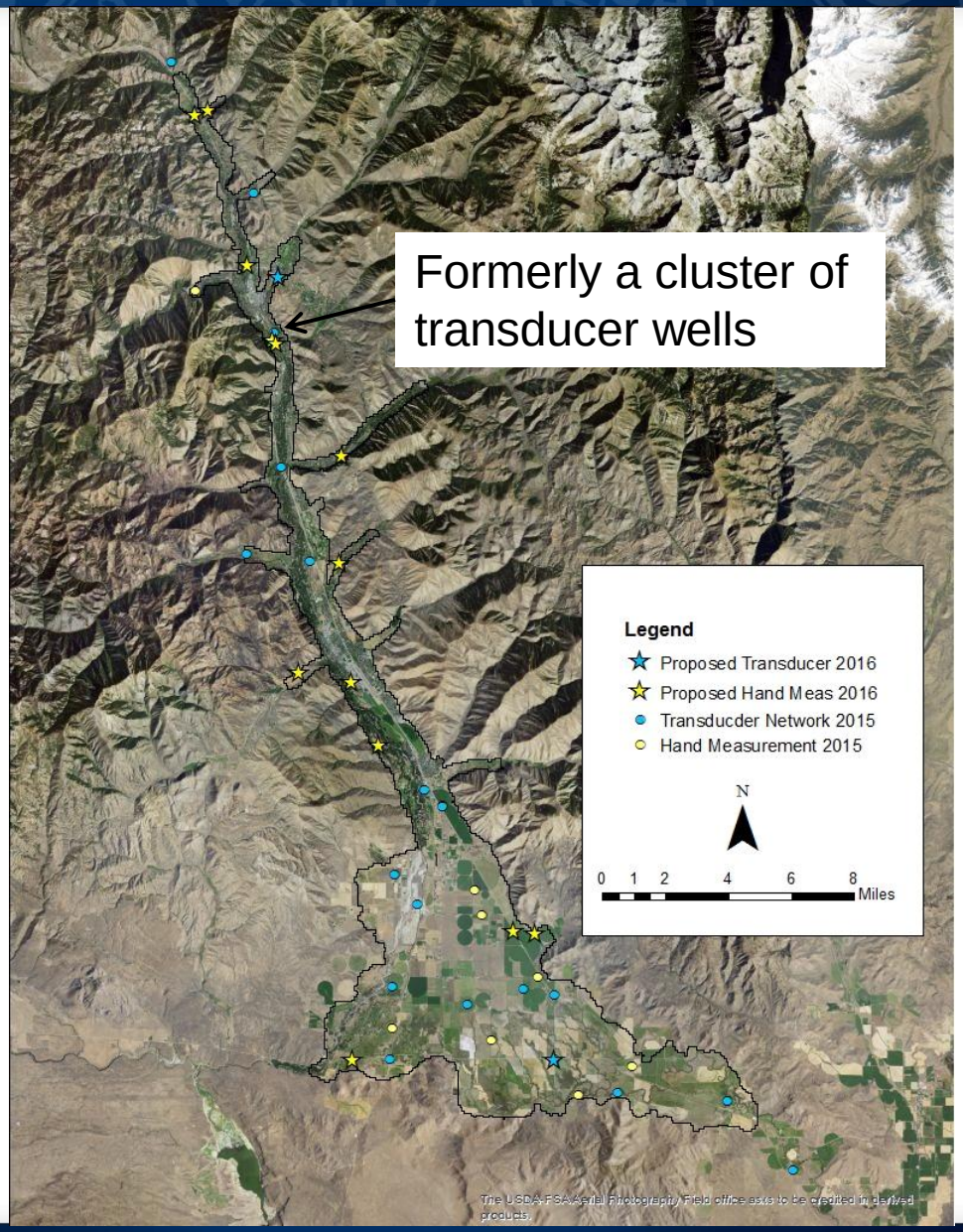

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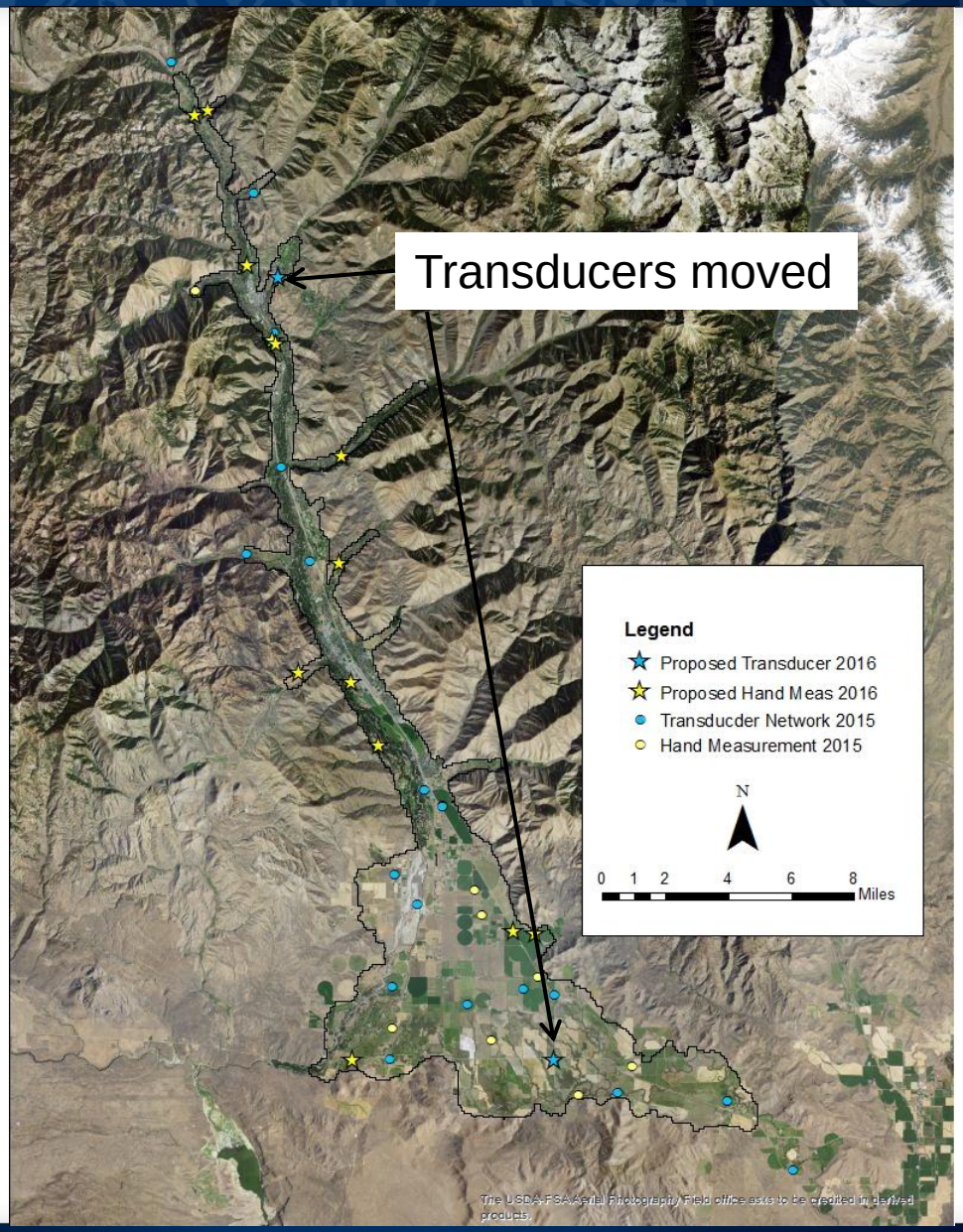
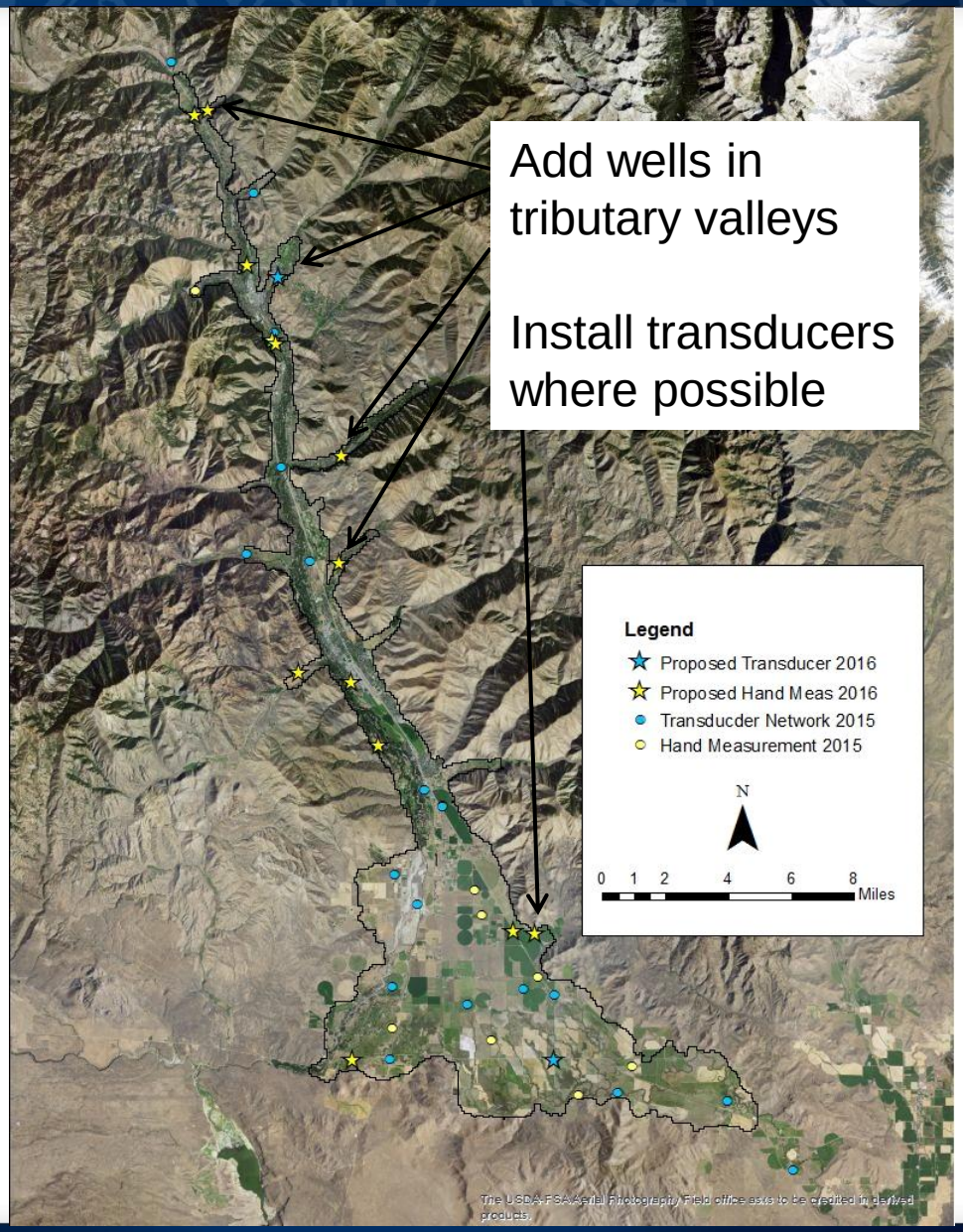


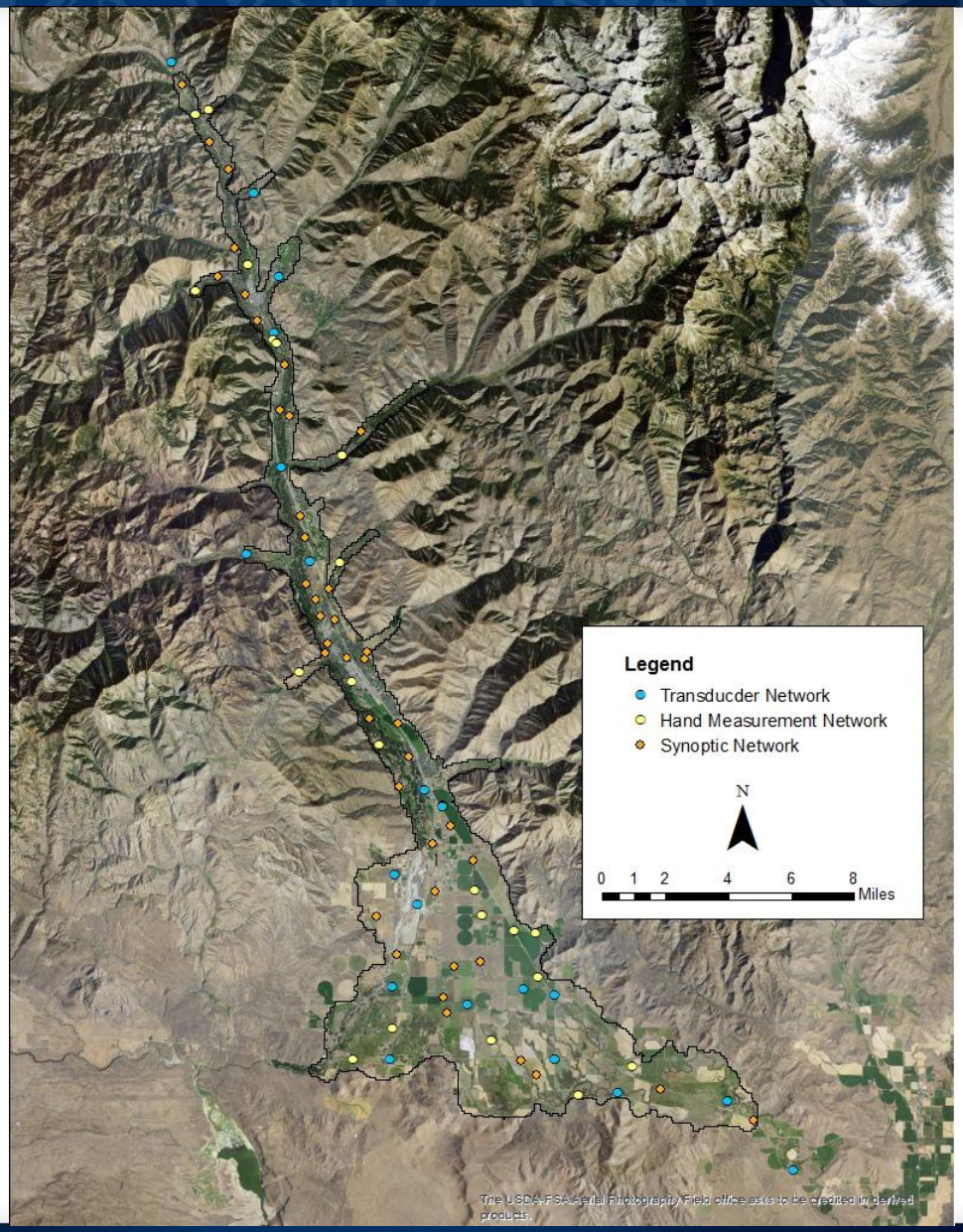
Existing Observation Well Network

- 20 wells with transducers
- 21 wells hand measured twice a year
  - April and October
  - Considering placing transducers in some domestic wells



Proposed Synoptic Well Network

- Every five years
- Coordinate with ESPA synoptic
- Around 80-90 wells in synoptic
  - 20 transducer wells
  - 21 wells hand measured twice a year
  - 40-50 hand measured synoptic wells

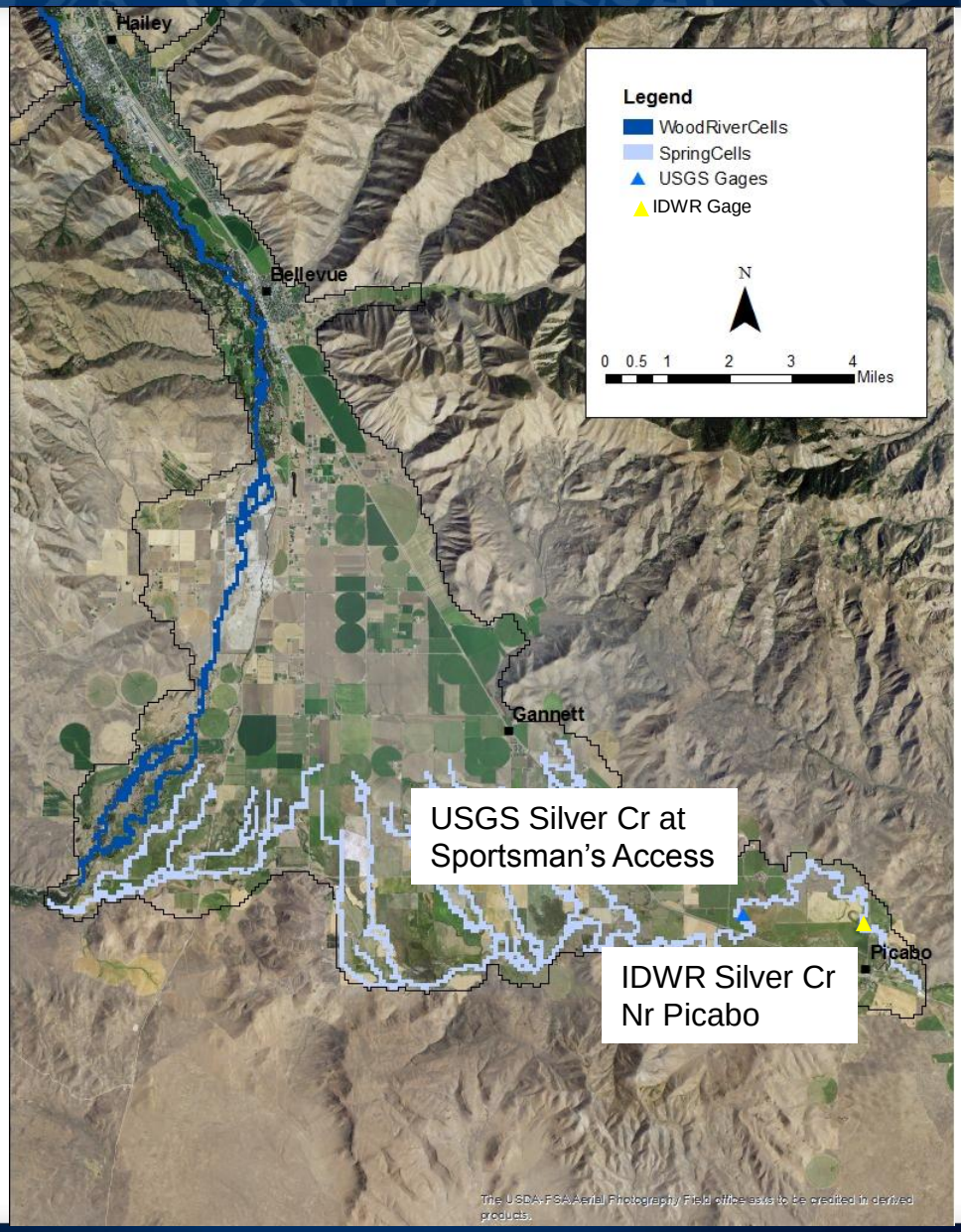


Stream Gaging

- Continue gaging Silver Creek at Picabo
- Collect stage at selected sub-reach stations several times a year
- Conduct seepage run during runoff
- Test chemical hydrograph separation technique for calculating gains during runoff

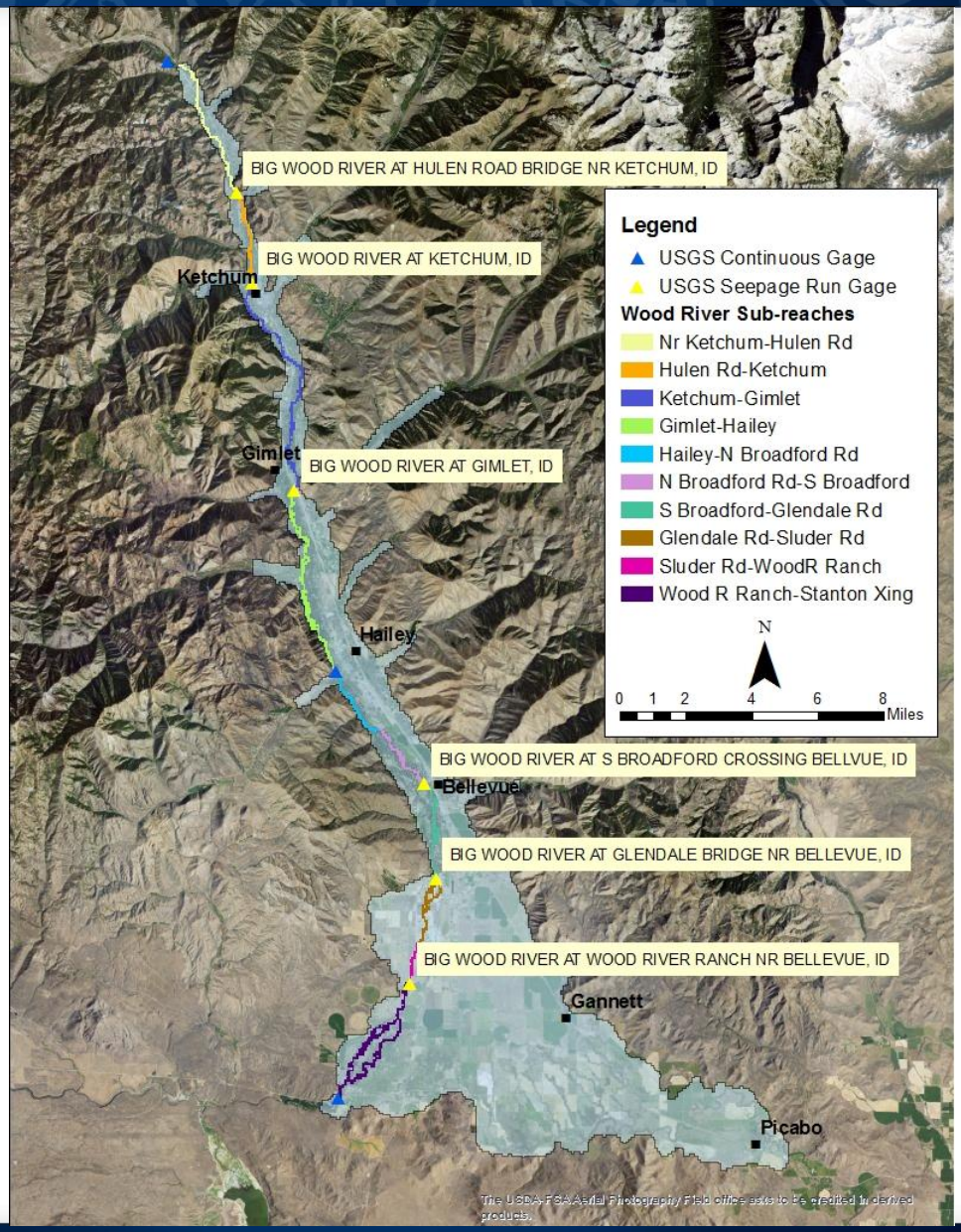
Continue gaging Silver Creek at Picabo

• Gage Silver Creek near Picabo twice a year during the non-irrigation season to verify the near zero gains below the Sportsman's Access gage.



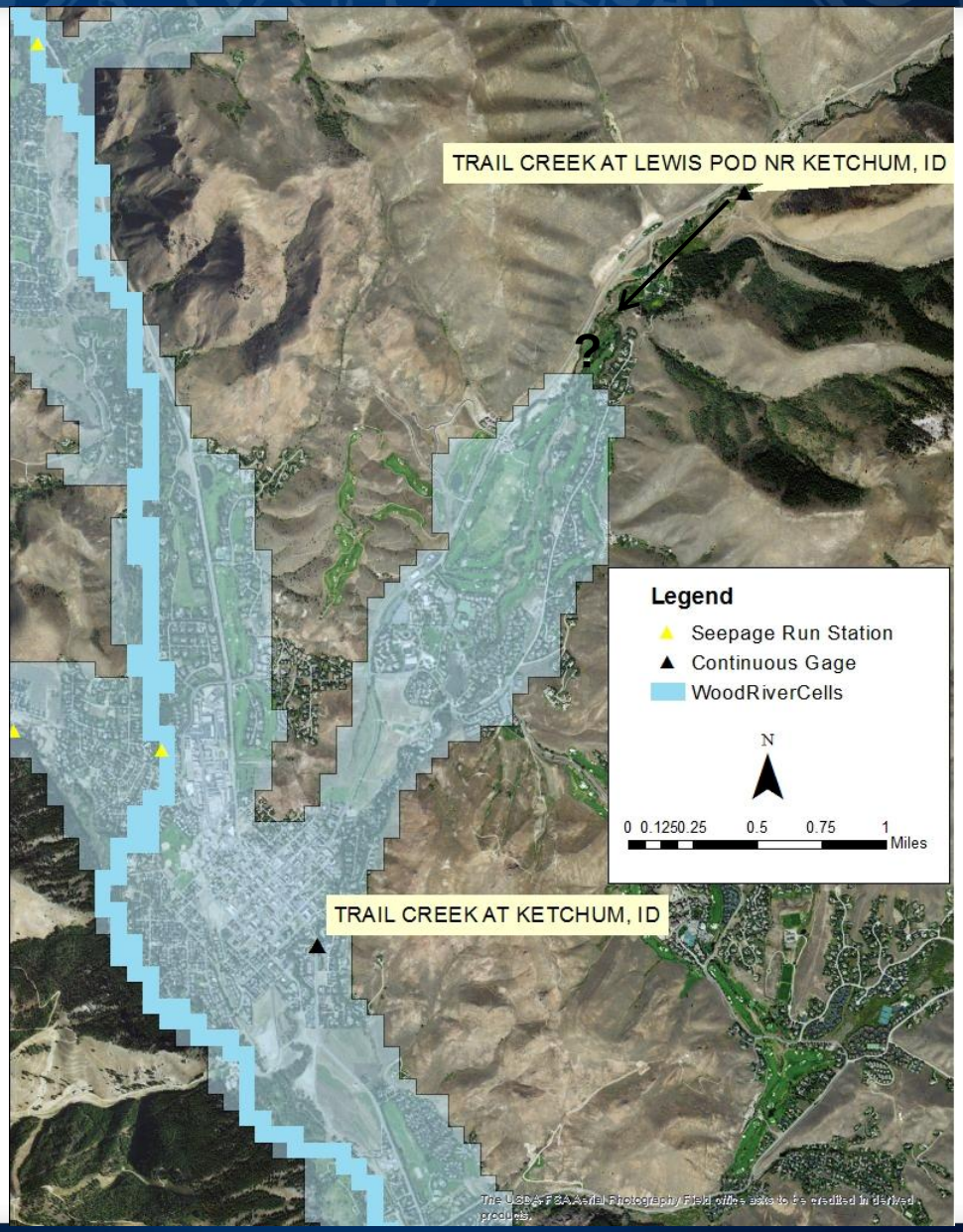
Measure stage at sub-reach gaging stations

- Currently we interpolate stage from Nr Ketchum to Hailey and then from Hailey to Stanton Crossing
- We then adjust stage to account for operation of the Bypass Canal
- Improvement
  - Measure stage at key sub-reach stations when the technicians check on the continuous gages
  - Technicians check the gages about every 6 weeks
  - Key gages
    - Hulen Rd
    - At Ketchum
    - At Gimlet
    - S Broadford
    - Glendale Rd
    - Wood River Ranch

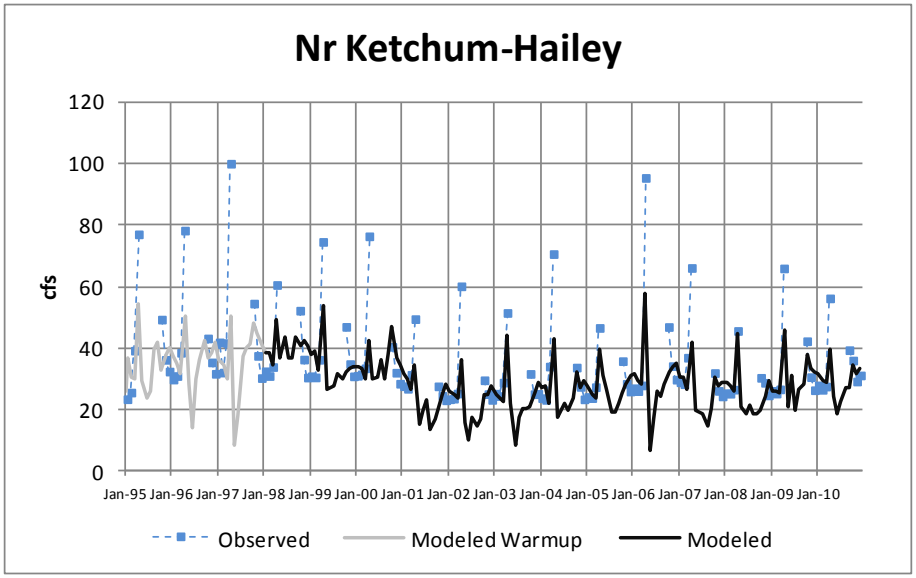


Trail Creek Gages

- Continuous gage near model boundary
- Monitor seepage loses
- Allow inclusion of Trail Creek as MODFLOW River



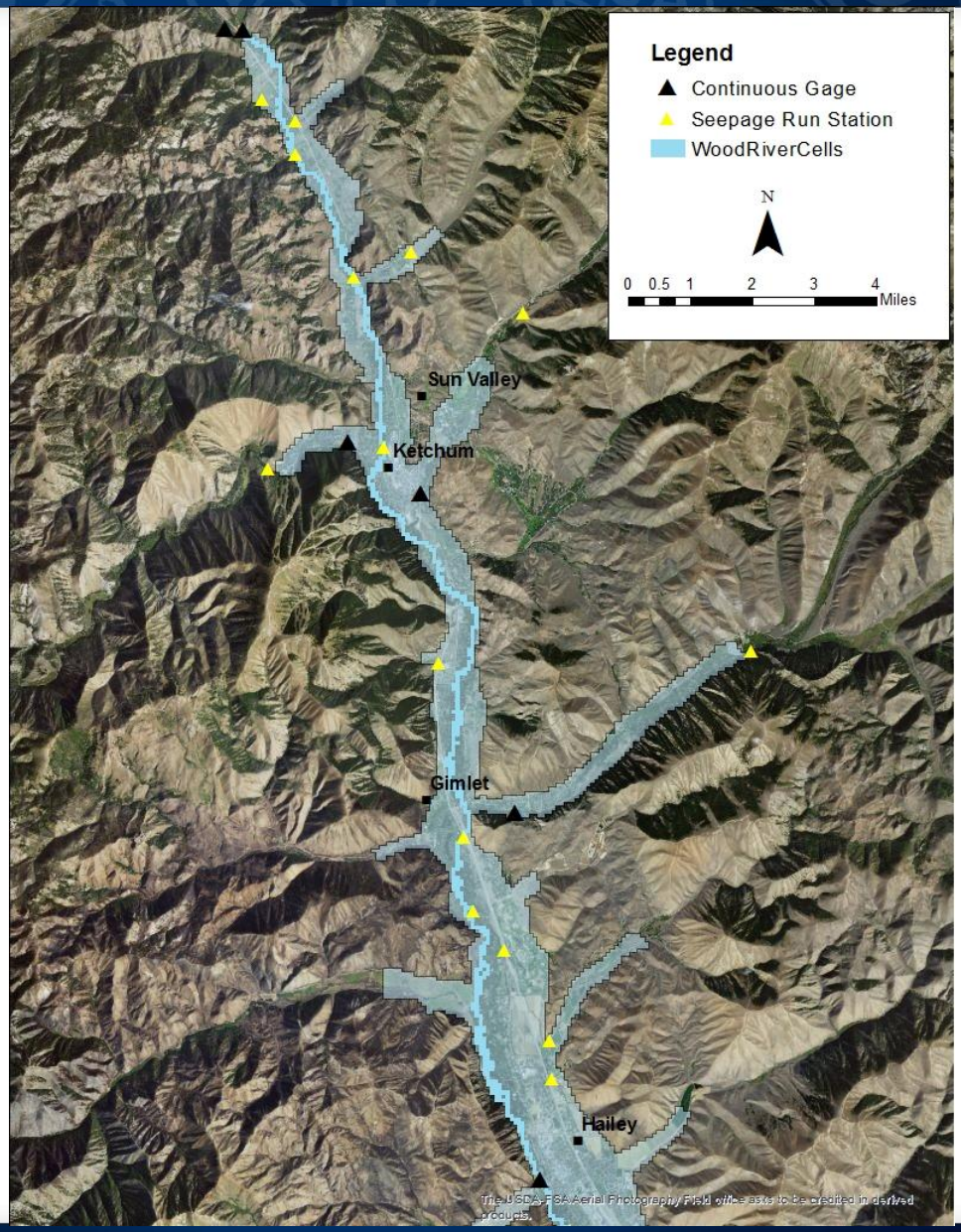
Nr Ketchum-Hailey Gains



- Currently we have no calibration targets during the summer months
- Model would be stronger if we had summer reach gain targets

Seepage run during runoff

- Nr Ketchum to Hailey
- Check modeled gains for nr Ketchum to Hailey reach



Nr Ketchum-Hailey Gains

$$Q_{BF} = Q\frac{SC - SC_{RO}}{SC_{BF} - SC_{RO}}$$

Q_{BF} = baseflow discharge

Q = total discharge

SC = specific conductance

SC_{RO} = SC of the runoff

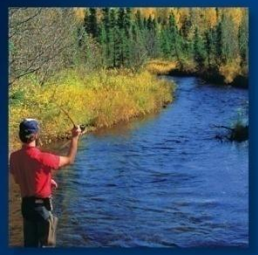
SC_{BF} = SC of the baseflow

- Attempt calculation of Nr Ketchum-Hailey gains using chemical hydrograph separation (Miller and others, 2014)
  - Miller, M.P., D.D. Susong, C.L. Shope, V.M. Heilweil, B.J. Stolp, 2014. Continuous estimation of baseflow in snowmelt-dominated streams and rivers in the Upper Colorado River Basin: a chemical hydrograph separation approach. Water Resources Research, V50, No 8, p 6986-6999.
- Collect SC for nr Ketchum-Hailey reach during seepage run.
  - Nr Ketchum, Hailey and tributary valleys
  - Runoff
  - Baseflow
- Calculate reach gains
- Compare with results from seepage run.

Summary

- Add 11 wells to the current 30 well network
  - Preference for wells without pumps
  - Some located in tributary valleys
  - Some located between Gimlet and Belleview
- Conduct synoptic with 80-90 wells in conjunction with ESPA synoptic
- Continue gaging Silver Creek at Picabo in the spring and fall
- Collect stage at key sub-reach stations several times a year
- Add continuous gage at model boundary in Trail Creek
- Test chemical hydrograph separation technique to obtain summer reach gains in nr Ketchum-Hailey reach

IDAHO Department of Water Resources



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