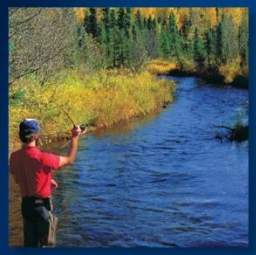
Twin Falls South Side Return Flows and Milner to King Hill Reach Gains

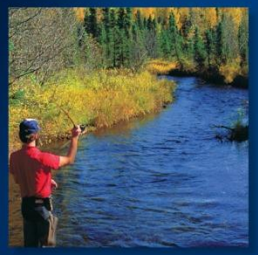
Presented by Jennifer Sukow, P.E., P.G.

May 23, 2011

Acknowledgements

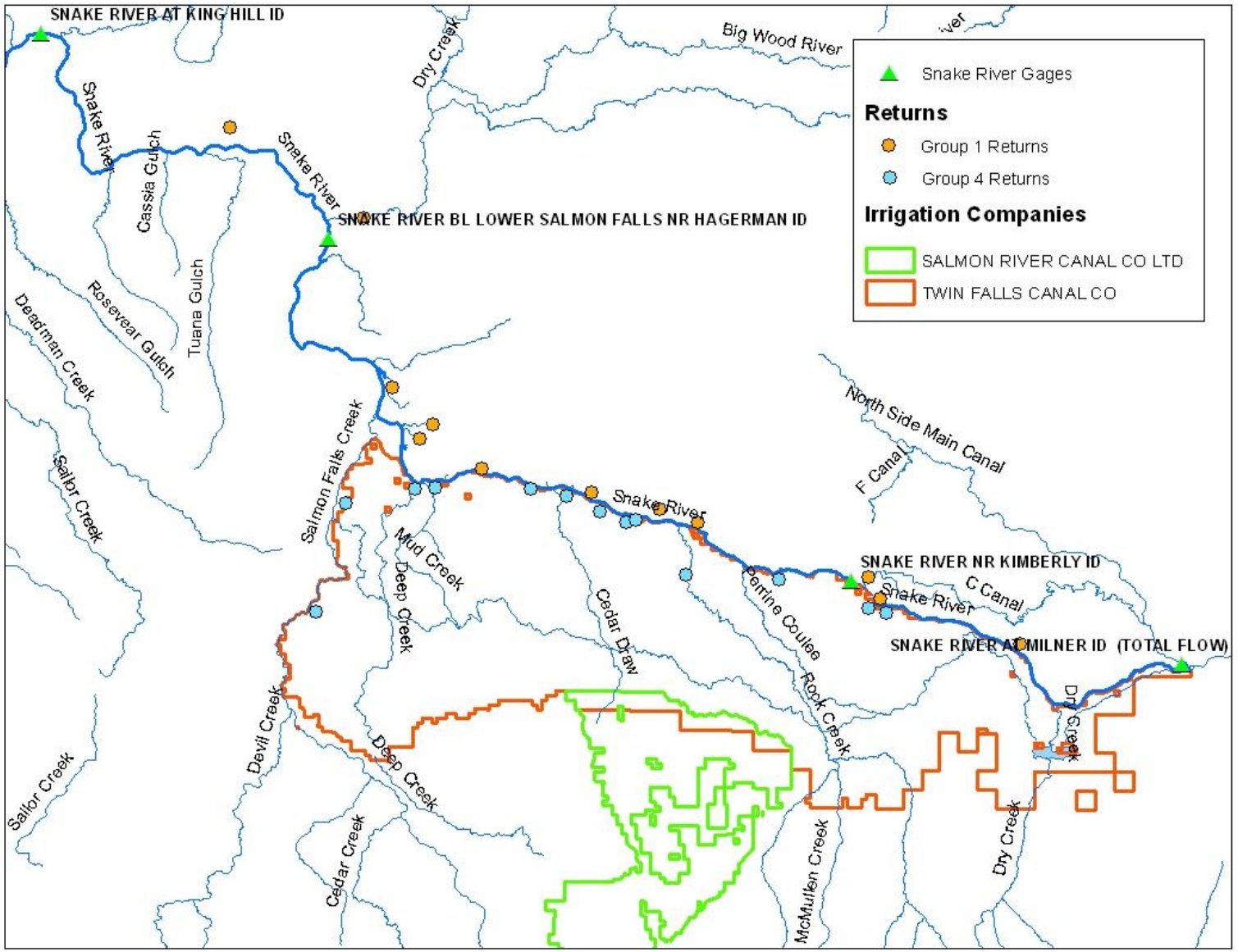
- Michelle Richman, IDWR, Twin Falls
- Sudhir Goyal, IDWR, State Office

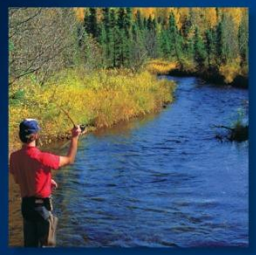



Irrigation Return Flows, Milner to Kimberly

- Return flows from SRPM used in prior calculations of the south side contribution were based on historic planning model lag factors
- IDWR is currently updating SRPM lag factors to reflect return flow data collected by IDWR and ARS in recent years
- IDWR began measuring 10 return flow sites on the south side and 8 return flow sites on the north side in 2002
- ARS measurements of 5 additional south side return sites are available beginning in June 2005
- IDWR added four return flow sites on the north side in 2008 (approx. 9% of measured returns)

Irrigation Return Flows, Milner to Kimberly



Southside Return Flows

- The five ARS sites added in 2005 are a significant portion of south side returns.
  - Rock Creek (25%)
  - Deep Creek (19%)
  - L10 Power (9%)
  - S2 (1%)
  - North Coulee (1%)
- Returns measured in 2002-2004 are only approximately 45% of returns.

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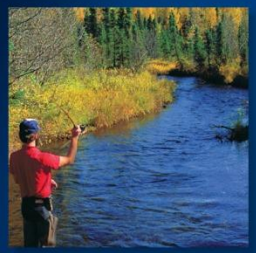
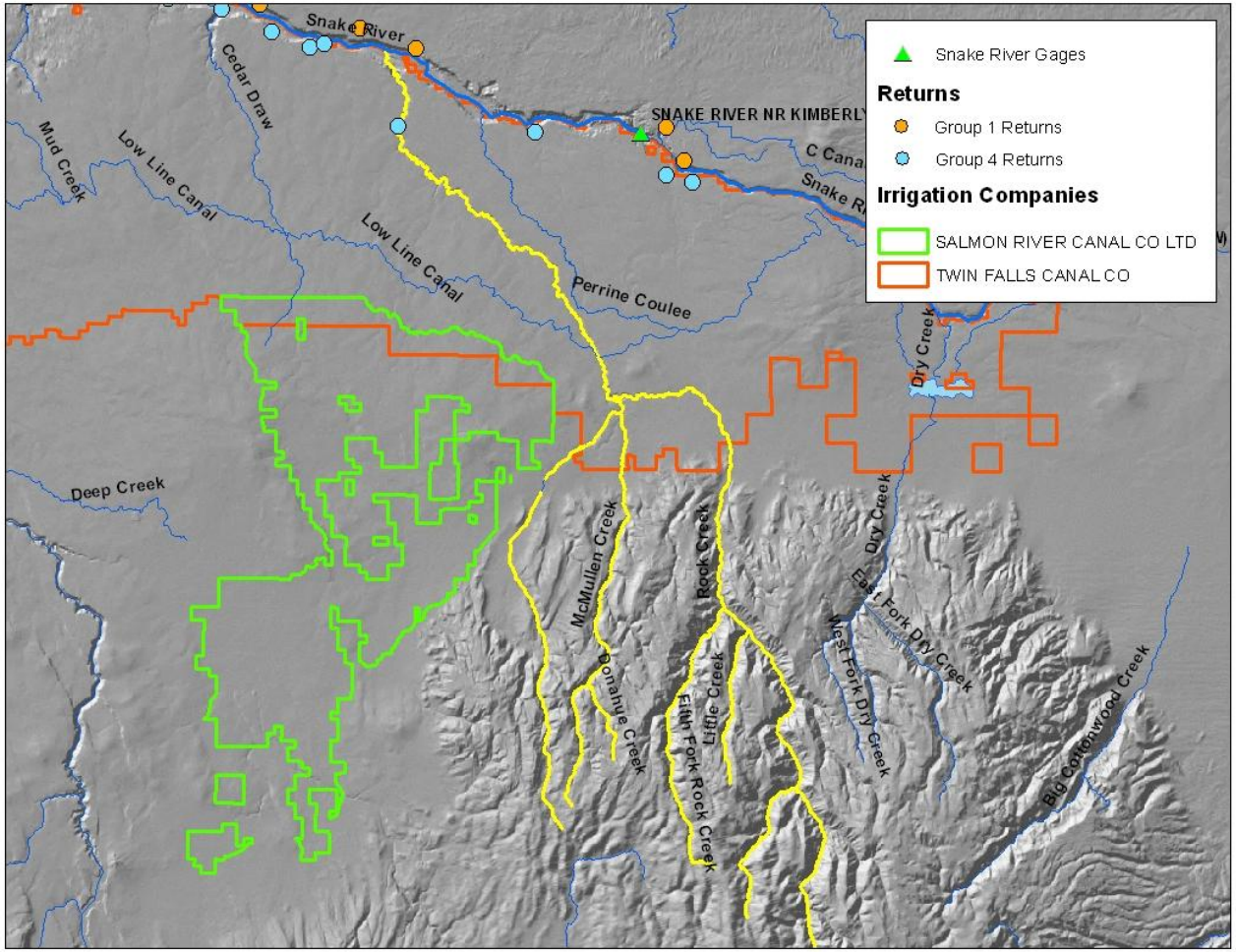


Rock Creek



IDWR

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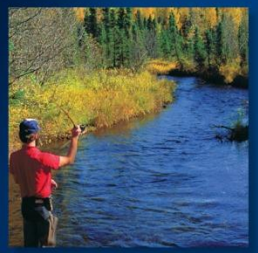
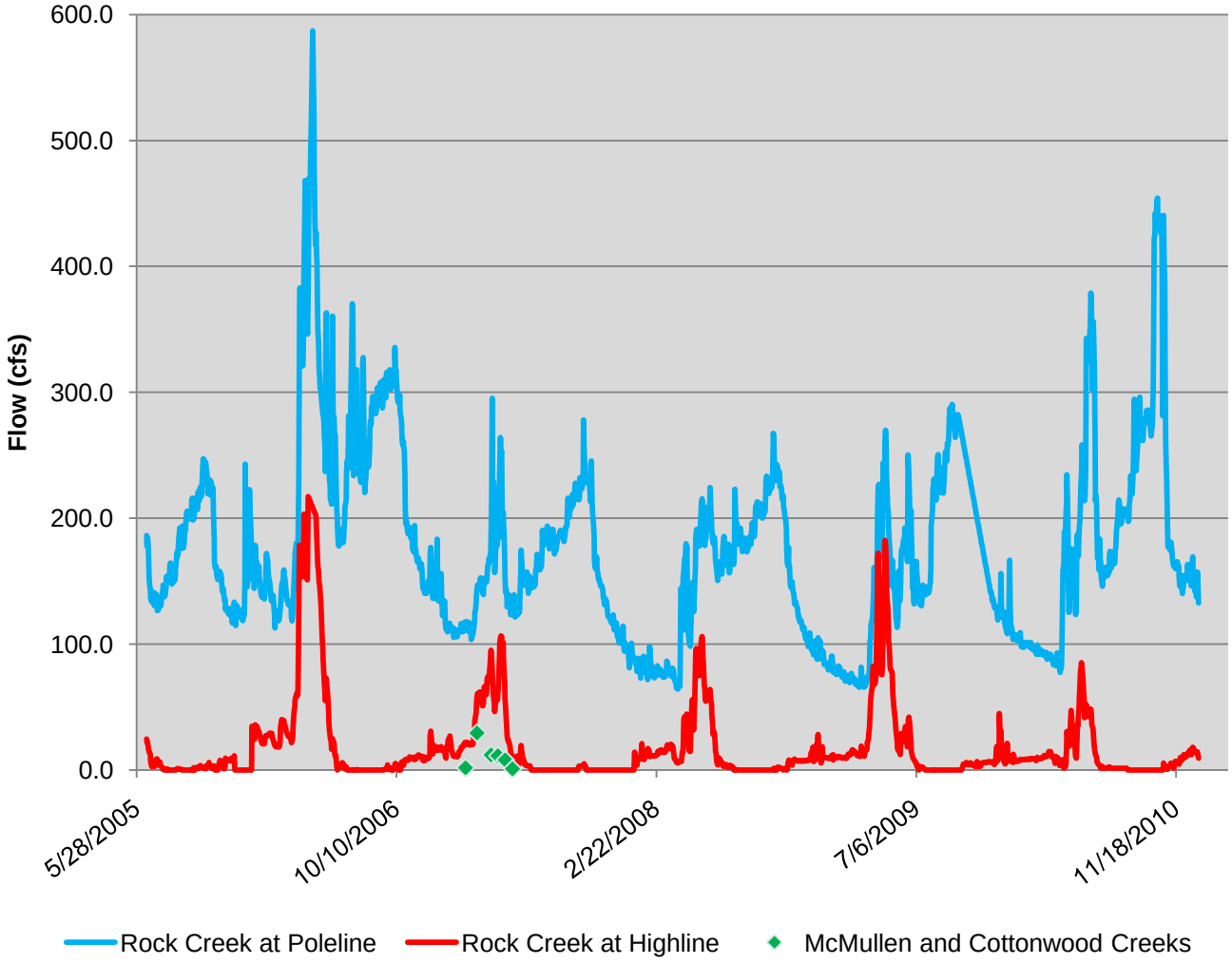


Rock Creek



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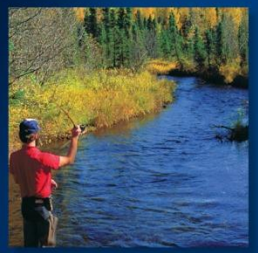

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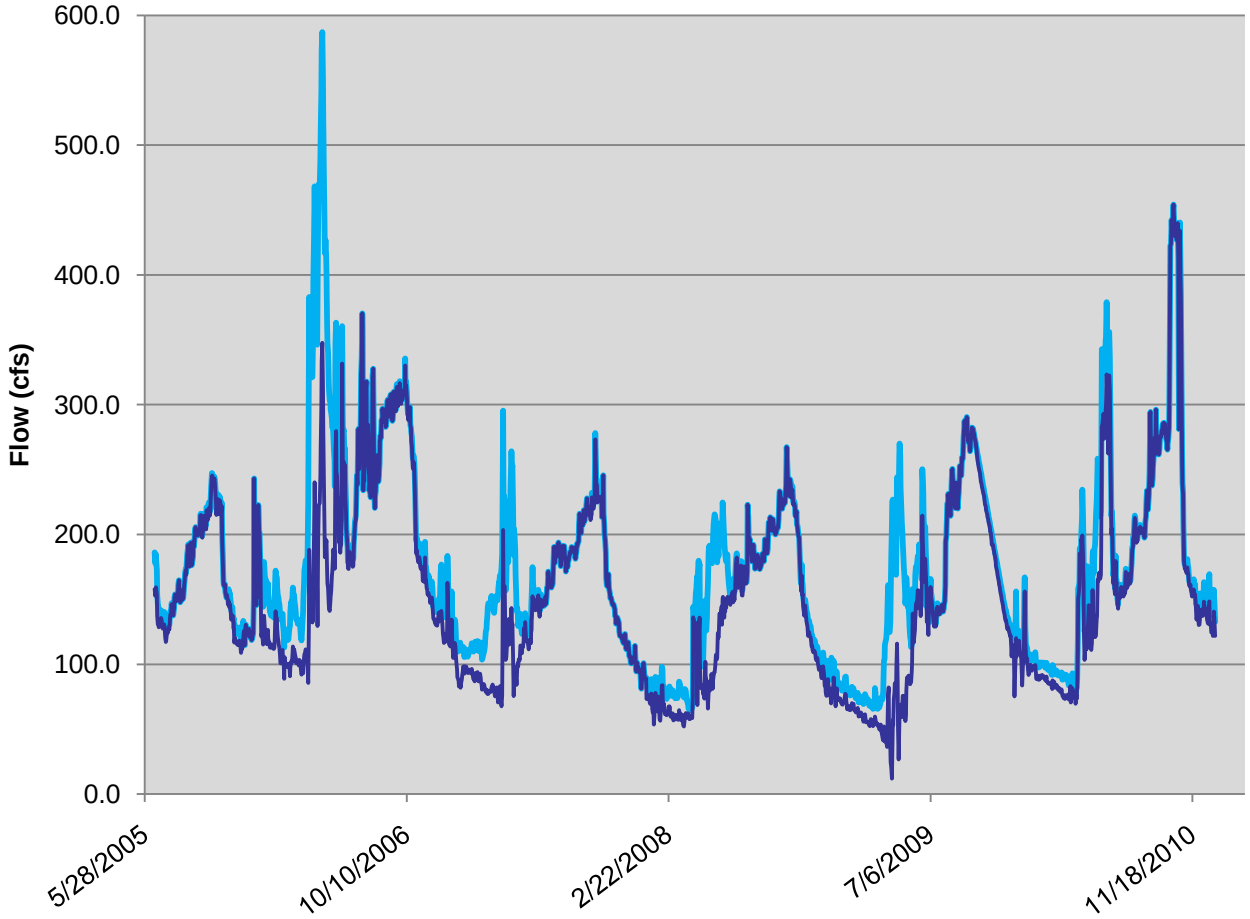

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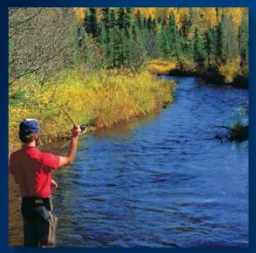

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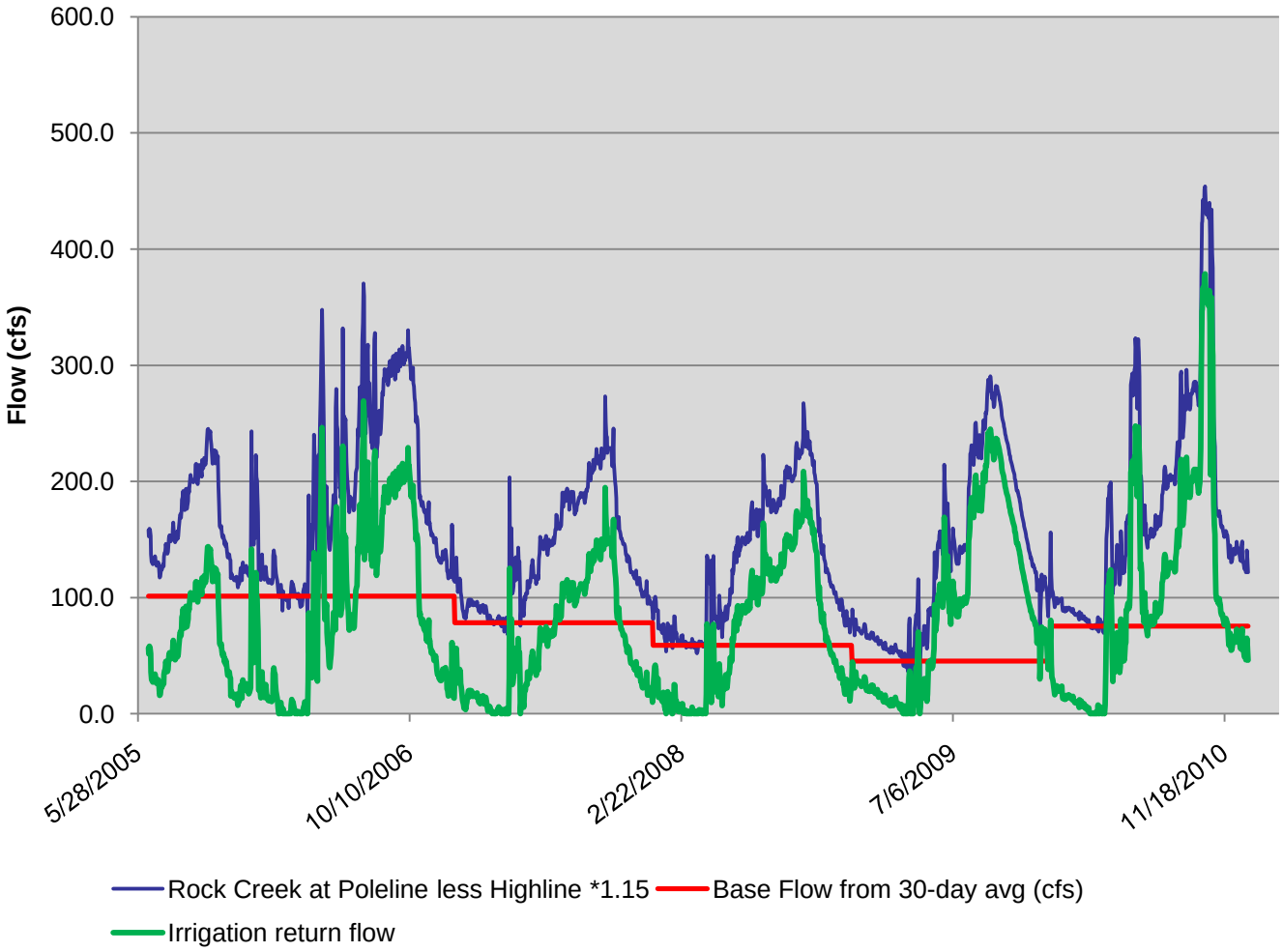

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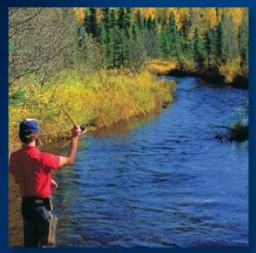
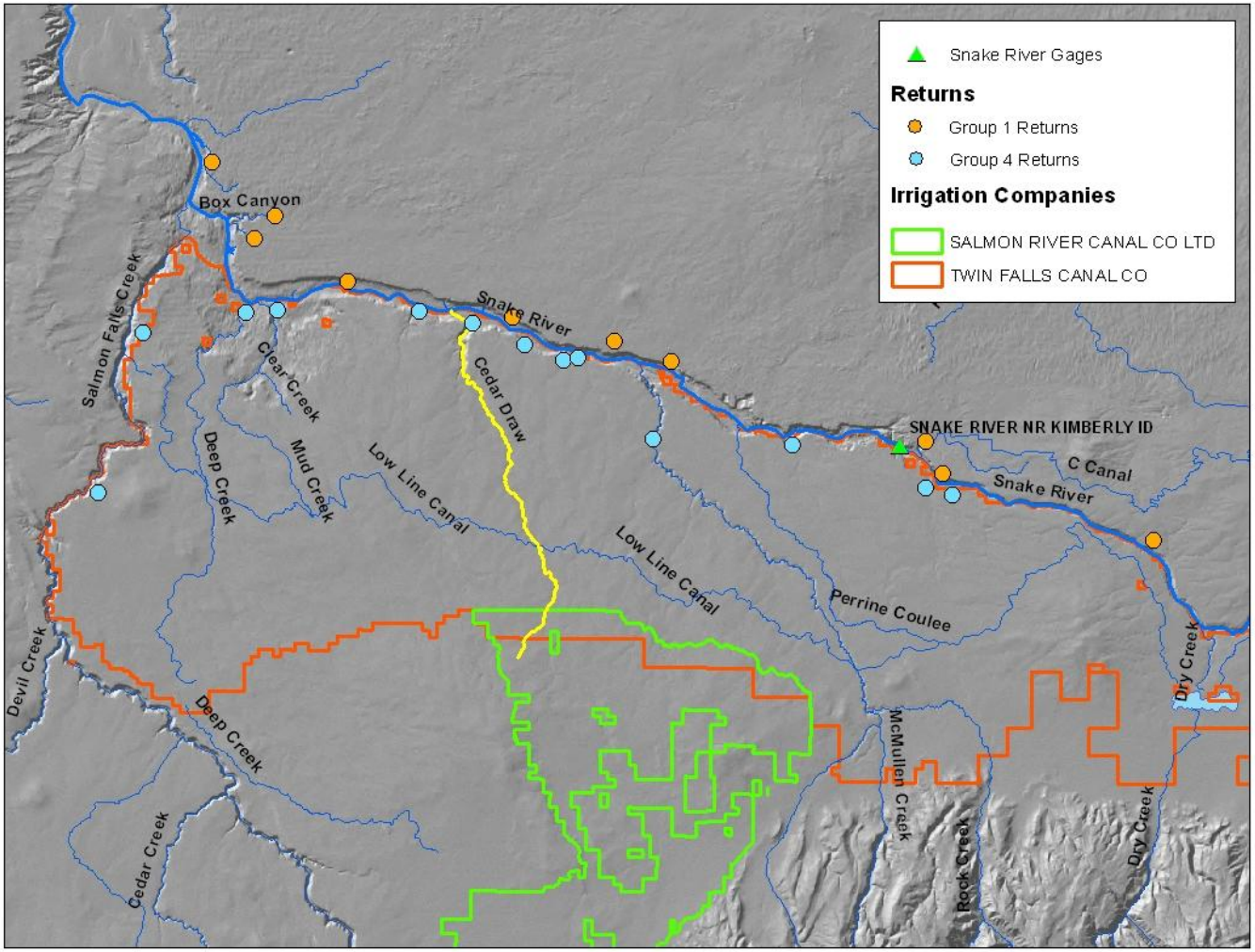
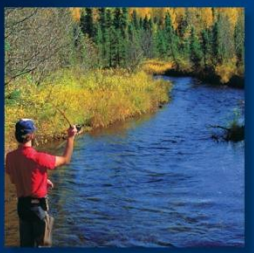
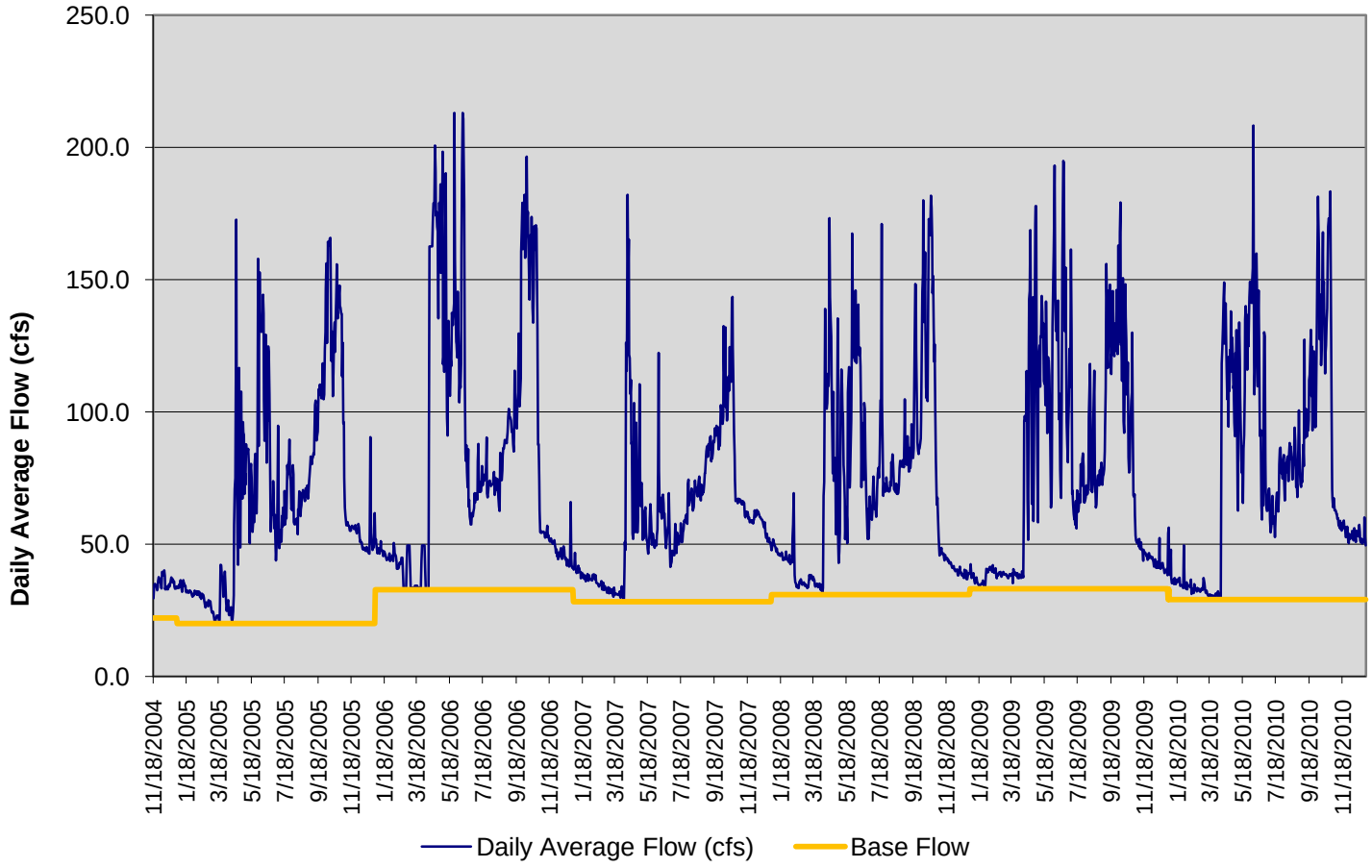


Other Perennial Drainages - Cedar Draw



Cedar Draw


Daily Average Flow (cfs)
250.0
200.0
150.0
100.0
50.0
0.0
11/18/2004
1/18/2005
3/18/2005
5/18/2005
7/18/2005
9/18/2005
11/18/2005
1/18/2006
3/18/2006
5/18/2006
7/18/2006
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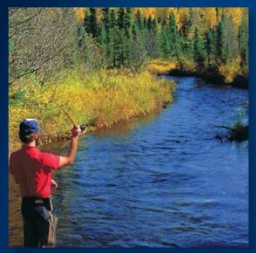
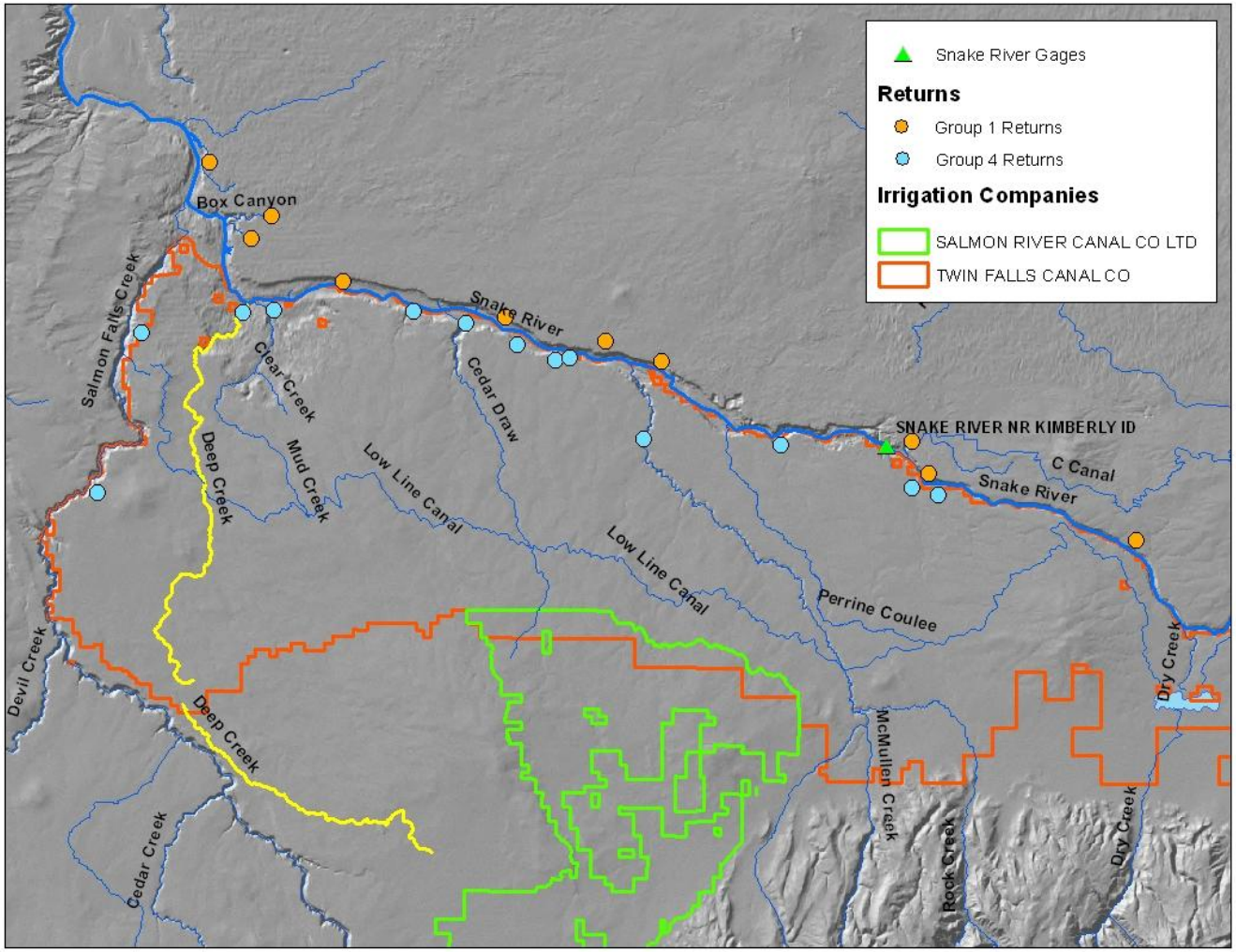
11/18/2010
Daily Average Flow (cfs)
Base Flow



Other Perennial Drainages – Deep Creek



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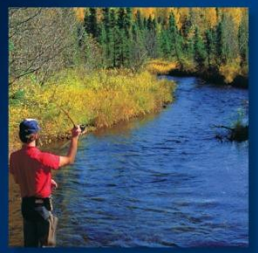
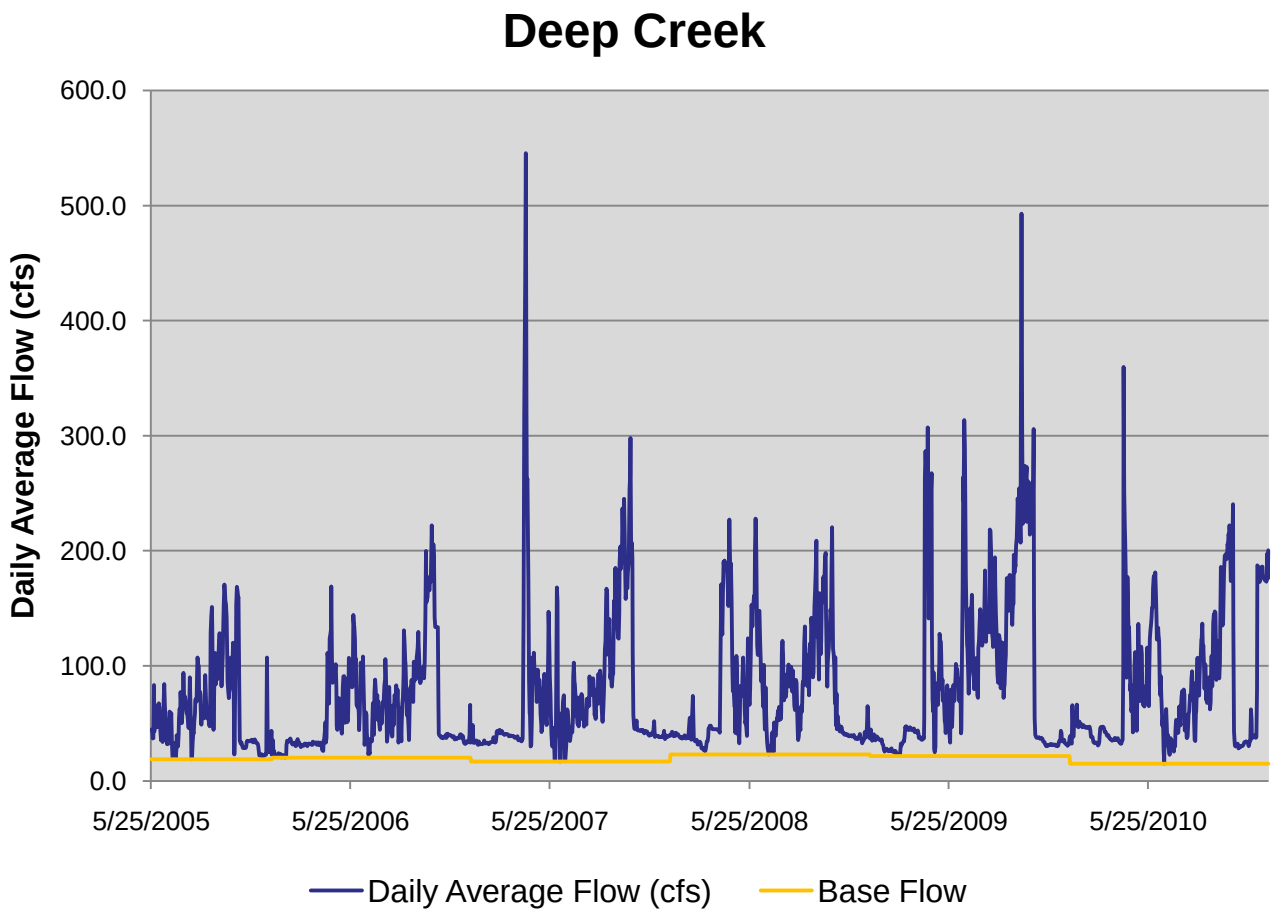
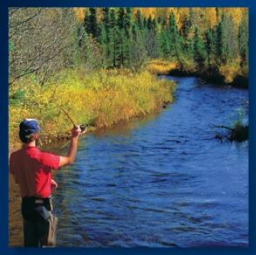


Deep Creek

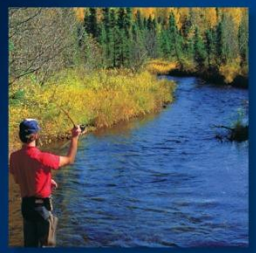


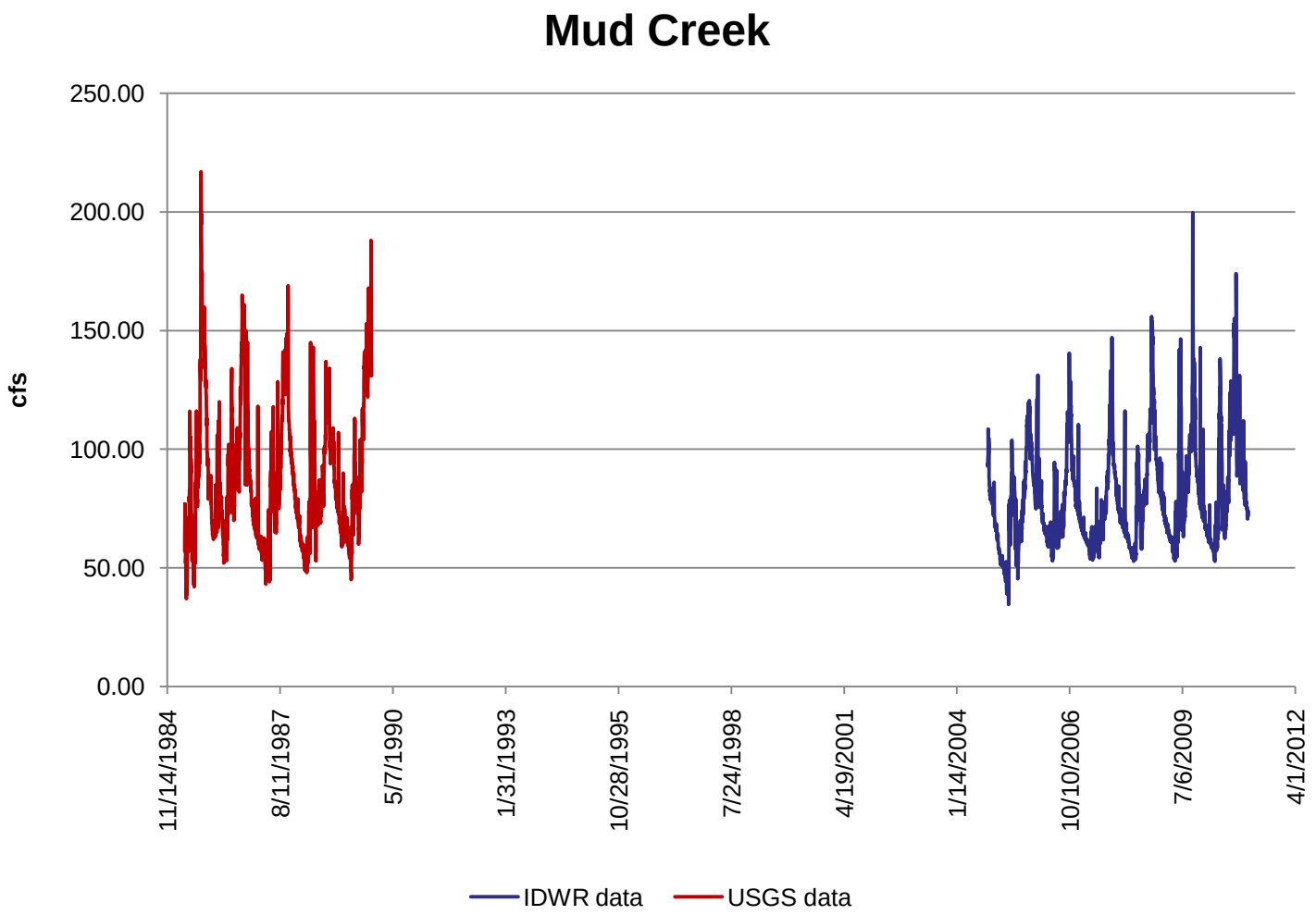
Updates to Return Flow Lag Factors (Milner to King Hill)

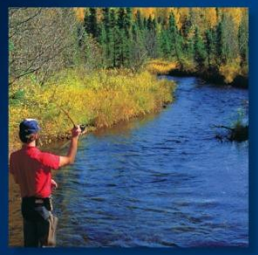
- Northside returns
  - 1980-1987: 11.0% of diversions
  - 1988-2001: 4.6%
  - 2002: 3.4% or 3.7%
  - 2003: 3.3% or 3.6%
  - 2004: 2.8% or 3.1%
  - 2005: 2.3% or 2.5%
  - 2006: 4.0% or 4.4%
  - 2007: 2.9% or 3.2%
  - 2008: 3.2%
  - 2009: 4.1%
- 2002-2007 could be scaled up by 9% based on new drains included in 2008-2009 data

- Southside returns
  - 1980-1987: 11.0% of diversions
  - 1988-2001: 9.2%
  - 2002: 21%
  - 2003: 20%
  - 2004: 21%
  - 2005: 18.3%
  - 2006: 22.1%
  - 2007: 16.5%
  - 2008: 18.9%
  - 2009: 23.6%
- 2002-2004 are scaled up based on new drains included in 2005-2009 data



USGS Measurements (1985-1990)





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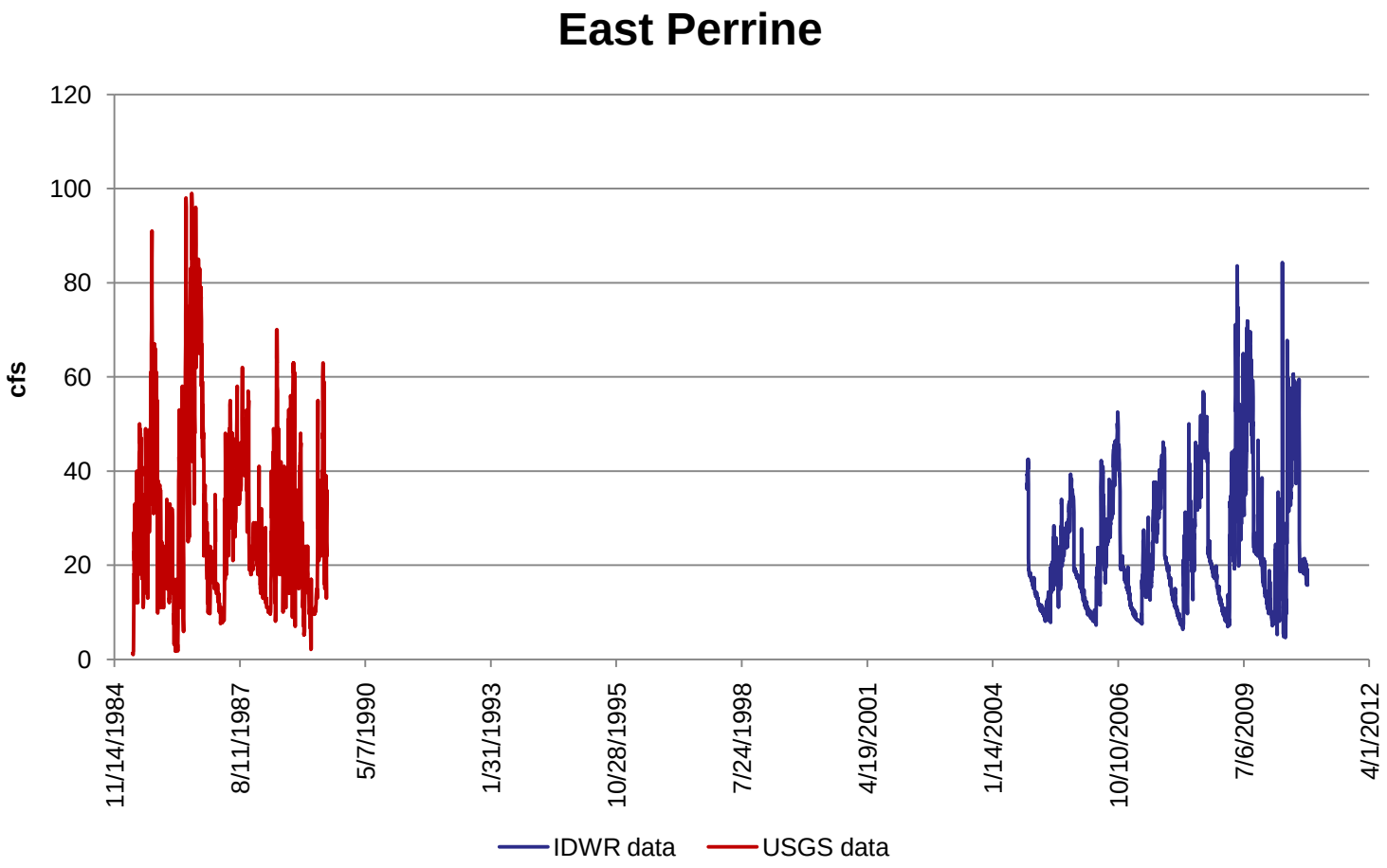

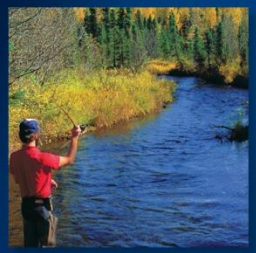

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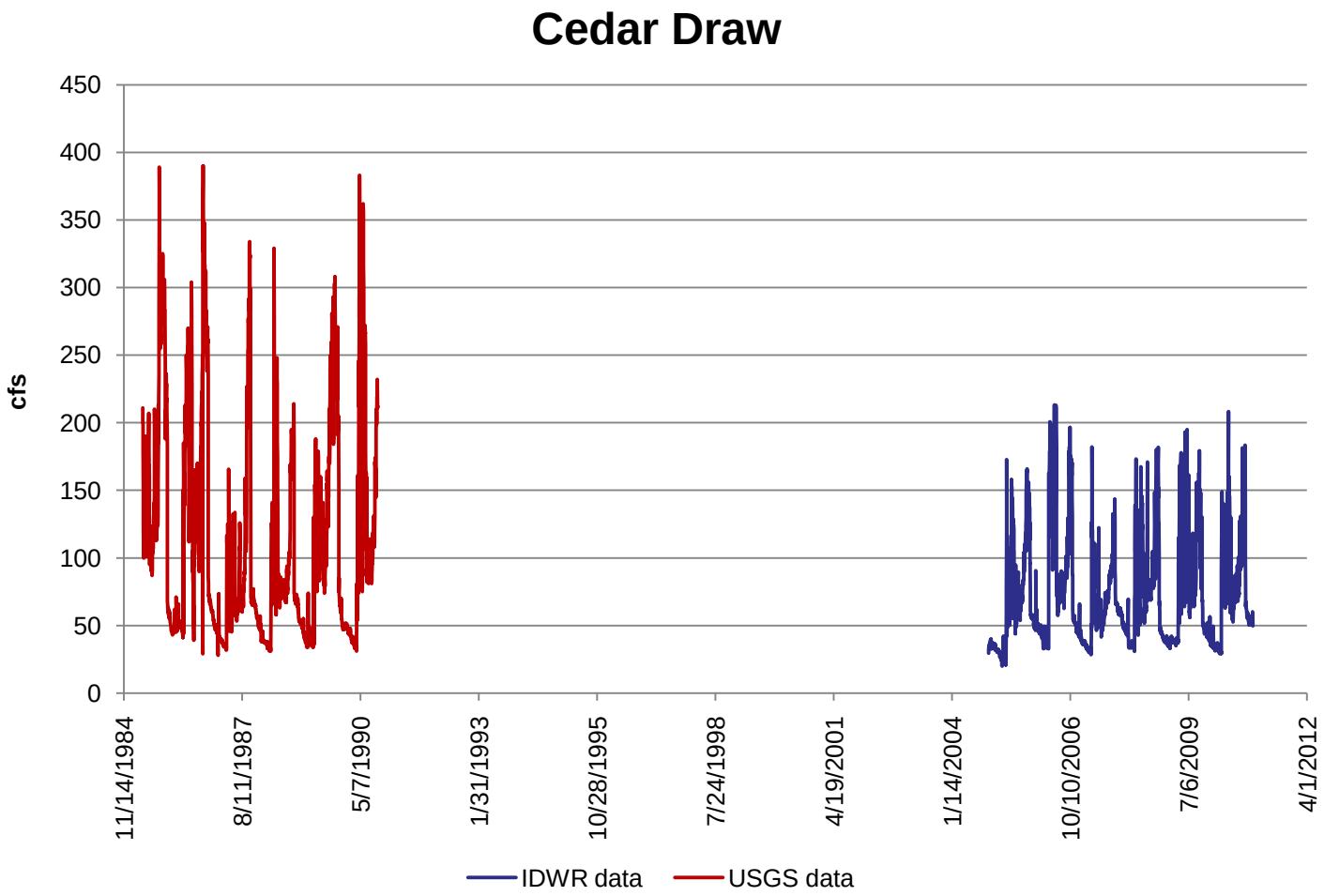
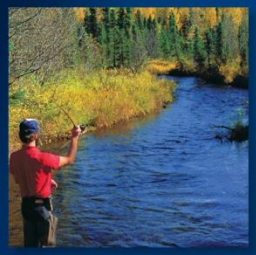
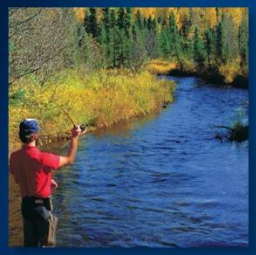


Calculation of South Side Contribution to Reach Gains, Milner to King Hill

- Snake River Reach Gain = Gage difference + diversions – return flows – surface runoff component of tributary streamflow
- South Side GW Contribution = TFCC diversions – TFCC return flows + eff. precip. – ET + Salmon Falls Creek tributary underflow
- Southside tributary streamflow is deducted from reach gain target as either a return flow or south side GW contribution
- Changes to the ESPAM2 reach gain targets (Kimberly to Lower Salmon Falls and Lower Salmon Falls to King Hill) are not expected to be significant

Questions for Committee

Should we scale up the 2002-2007 northside return flow fraction based on new returns added in 2008?

Should we change 1980-2001 southside return flow fraction based on post-2005 data?

Other comments or questions?