# Irrigation loses from a ground-water point of view

## Closed Basins

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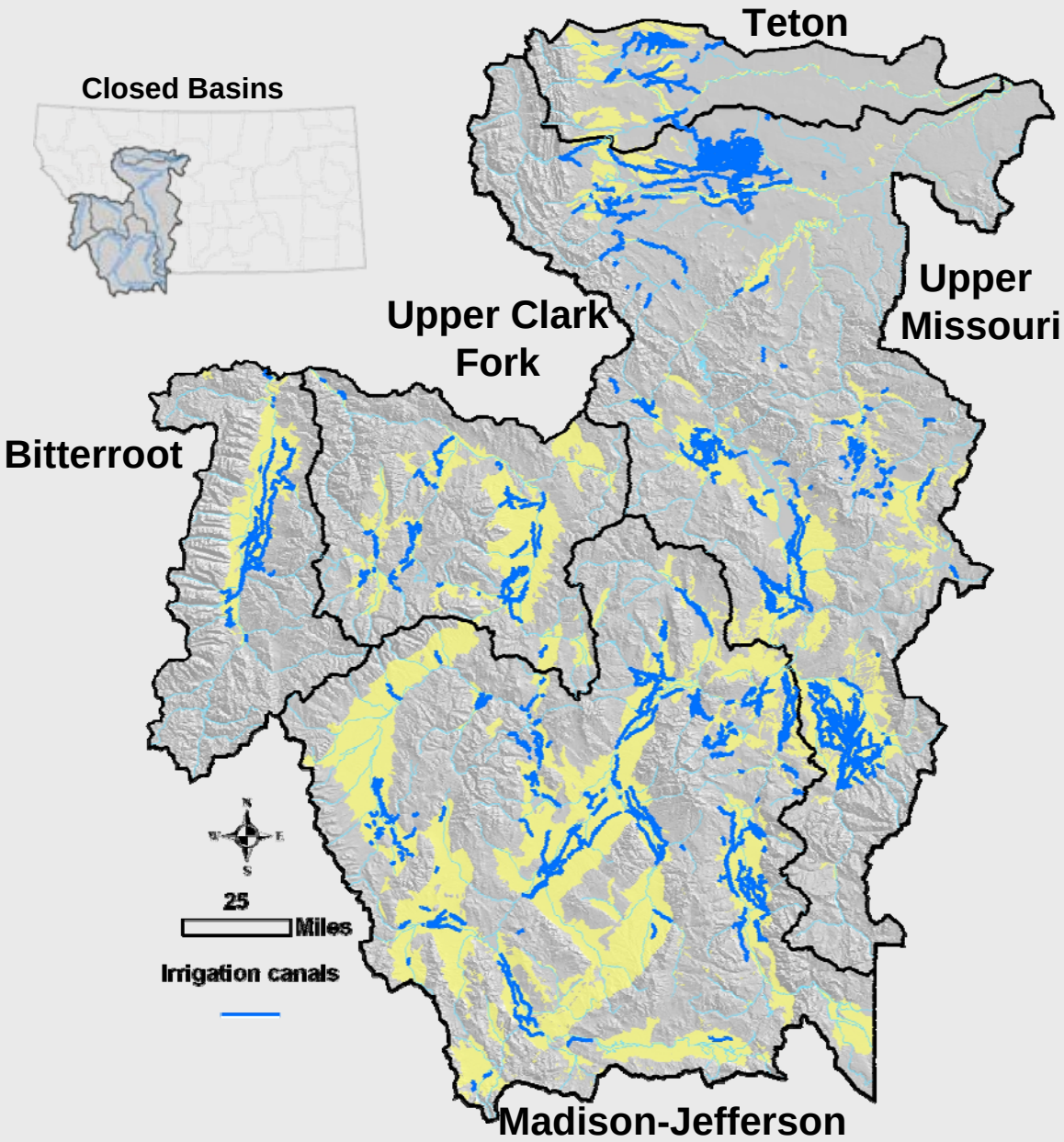
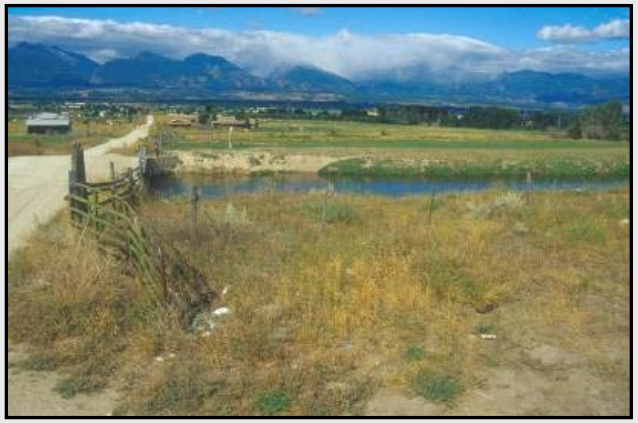
Montana Bureau of Mines and Geology
Presented to:
**Water Policy Interim Committee**
June, 10, 2008

# …or, artificial recharge in Montana




**3,000+ mi of canals**



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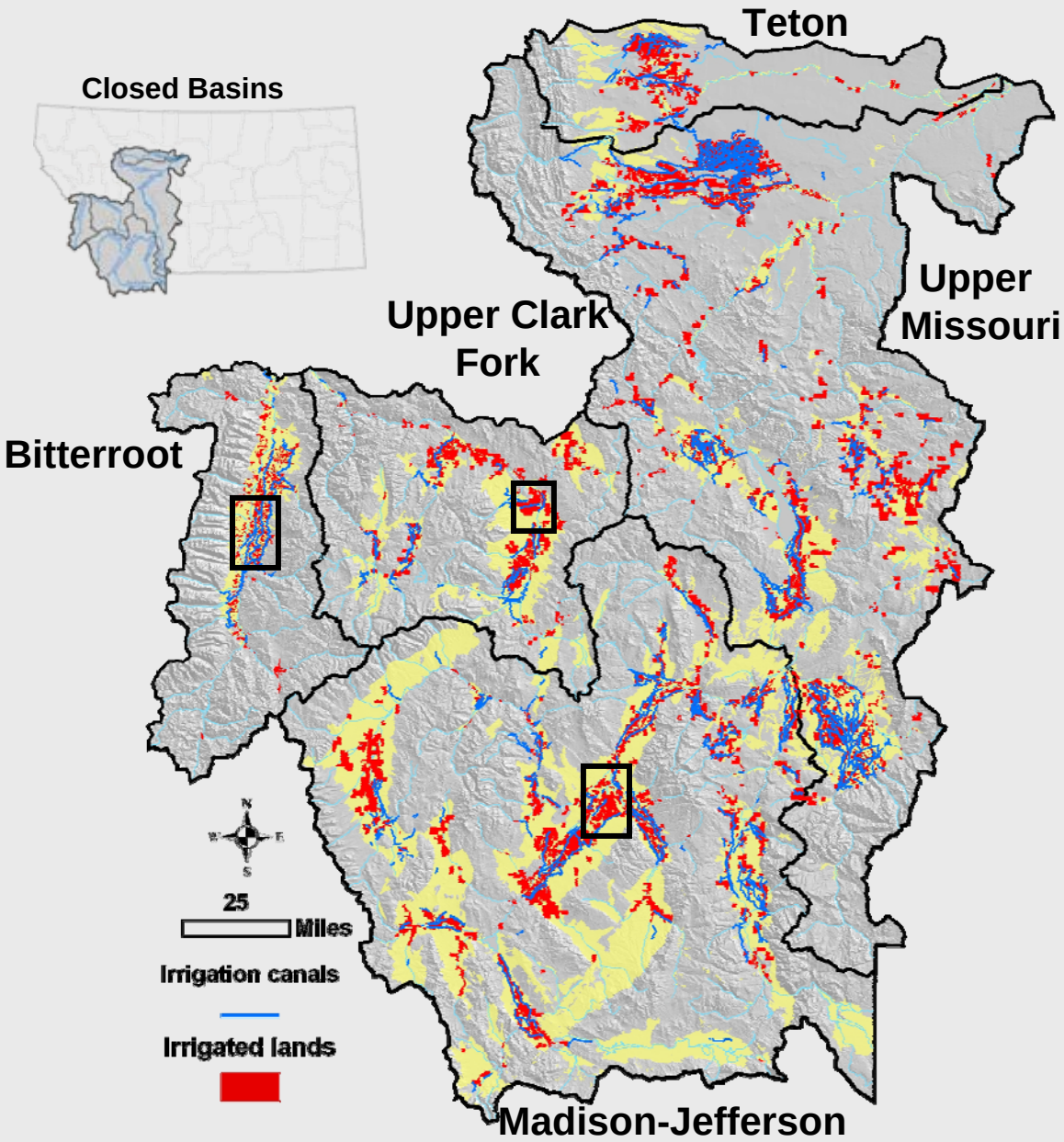


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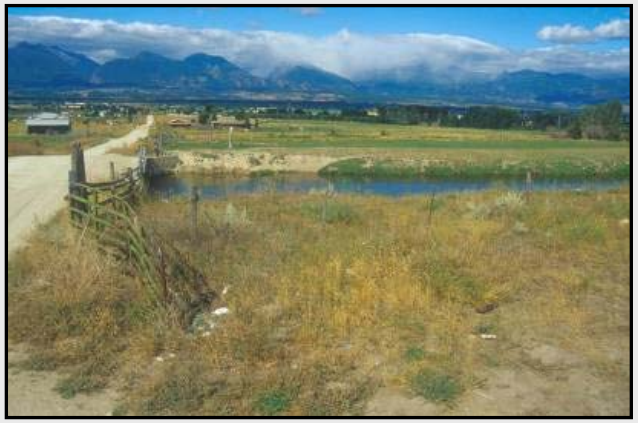
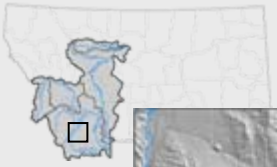
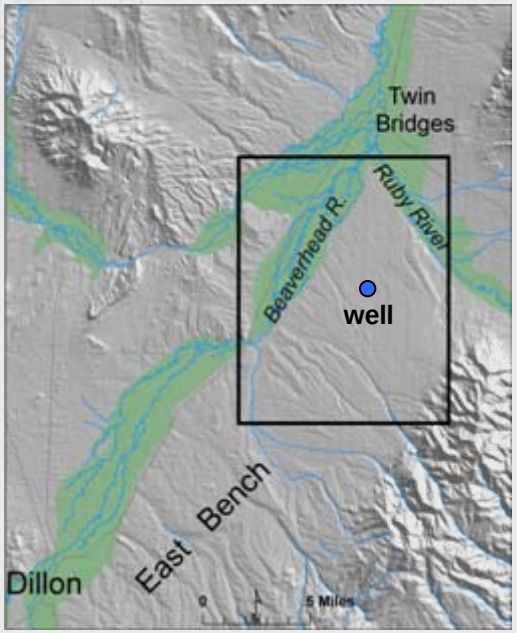


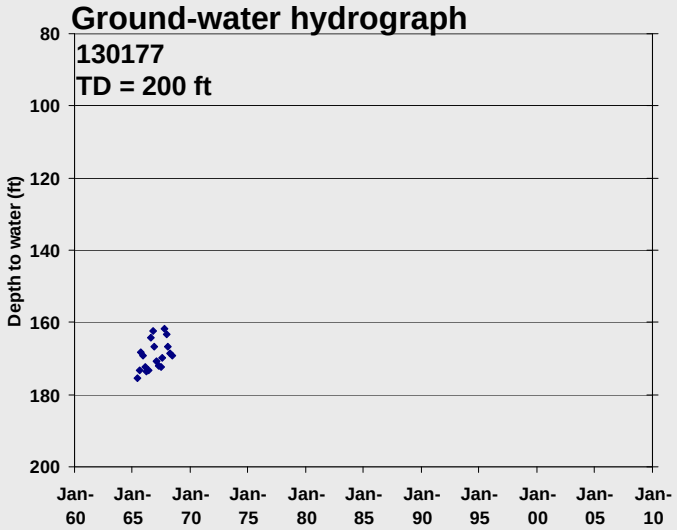
**divert 5 million acre-ft/yr**

**to irrigate 950,000+ acres**

# Lower Beaverhead East Bench Canal





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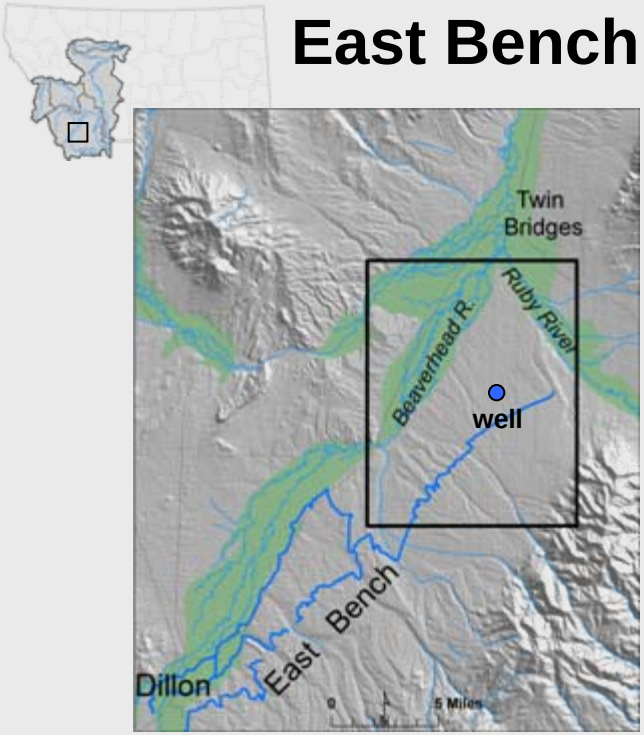


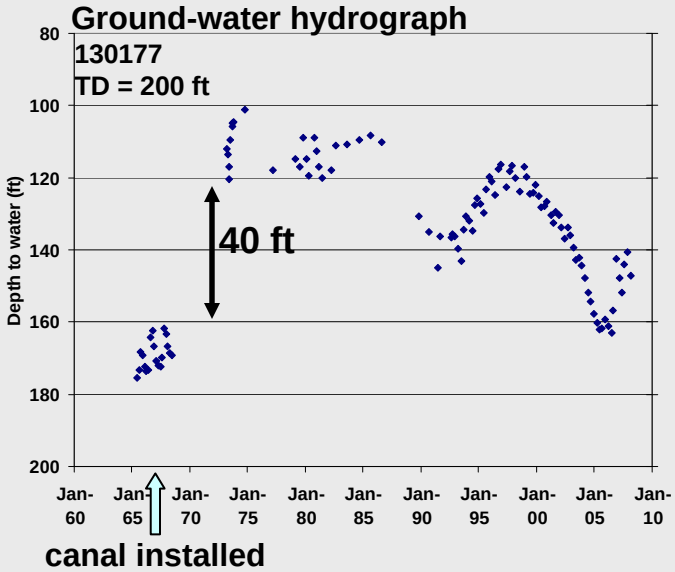


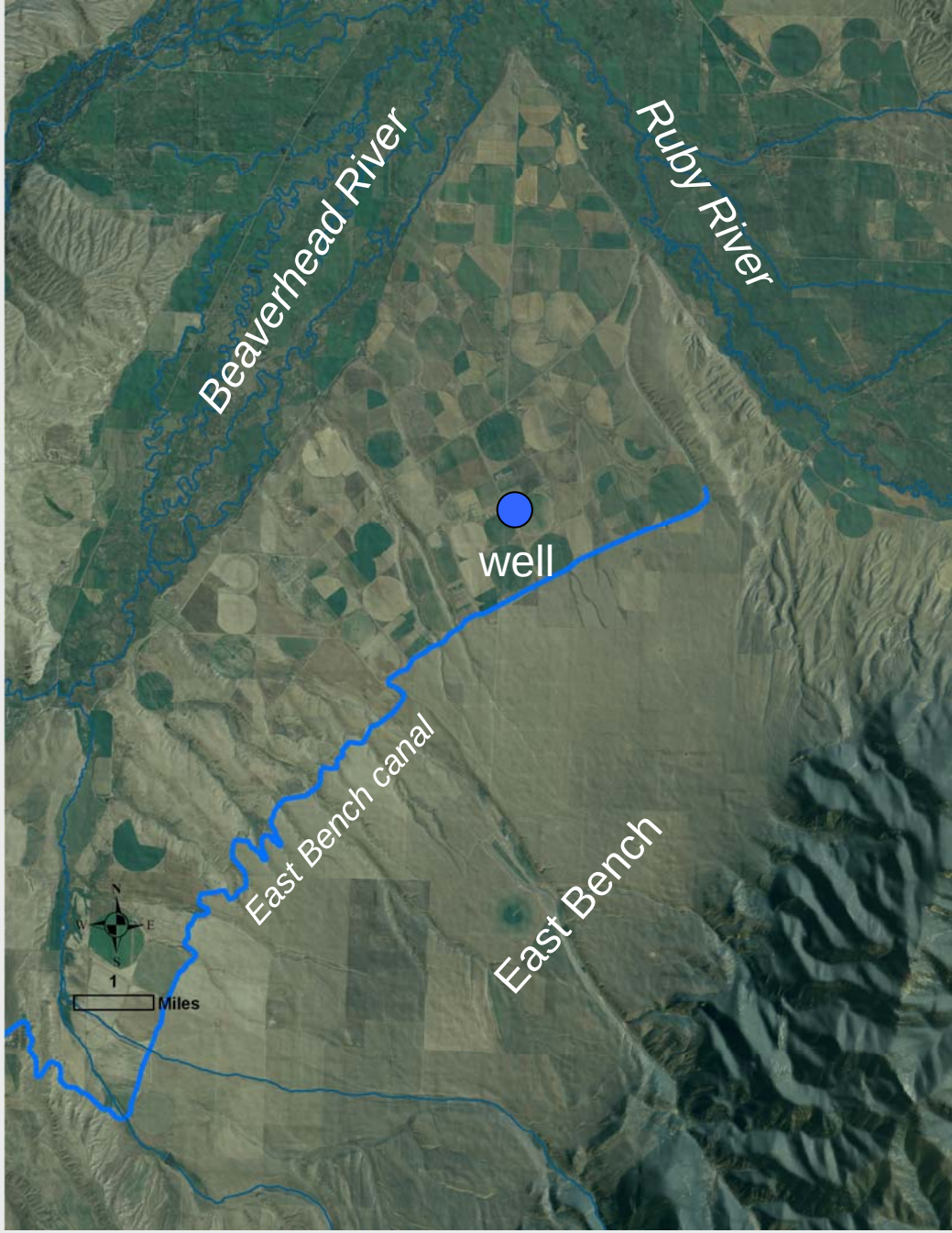

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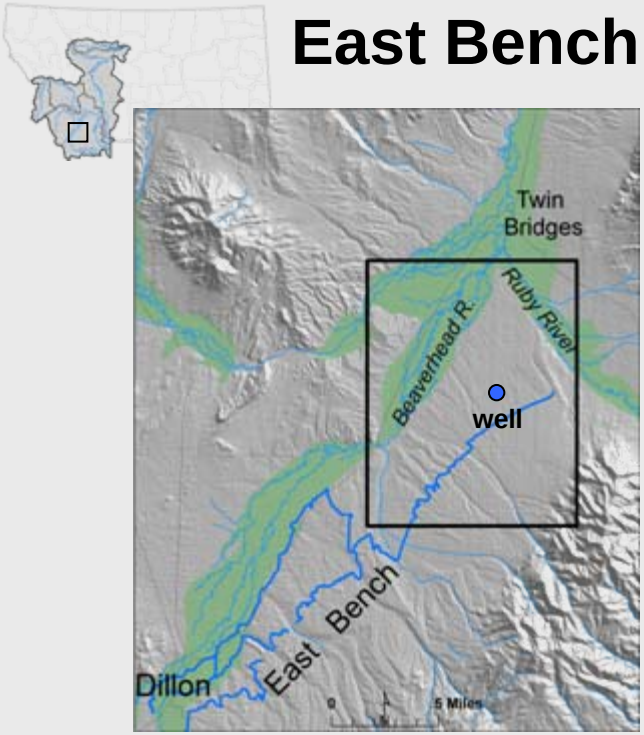
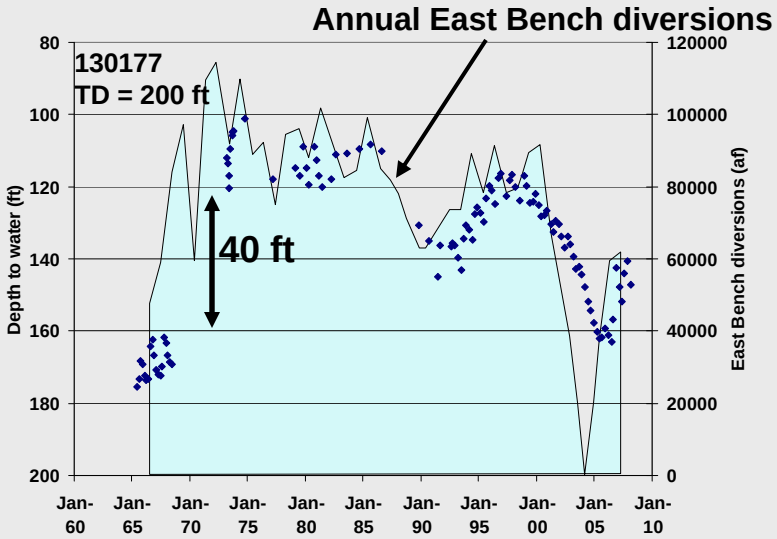
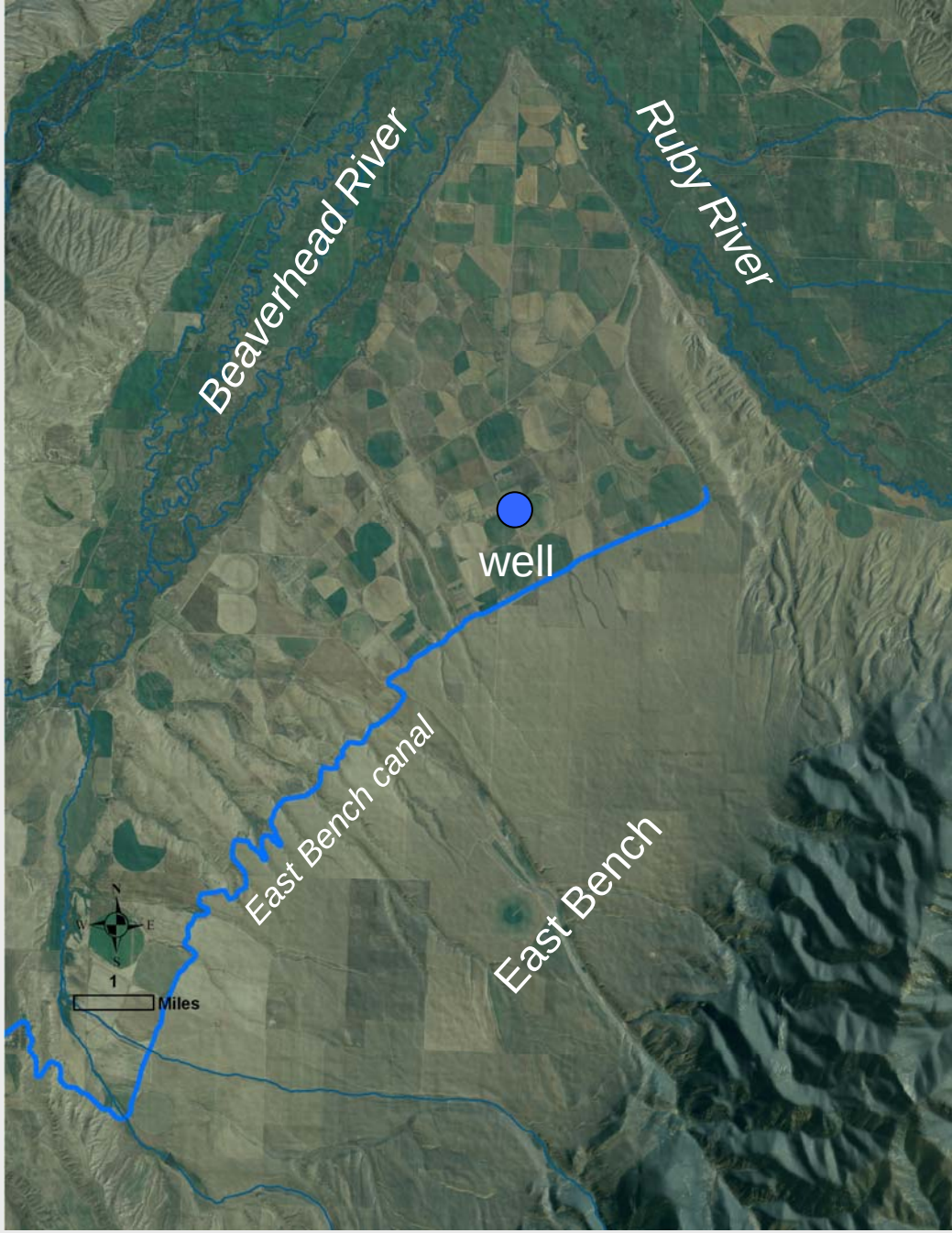
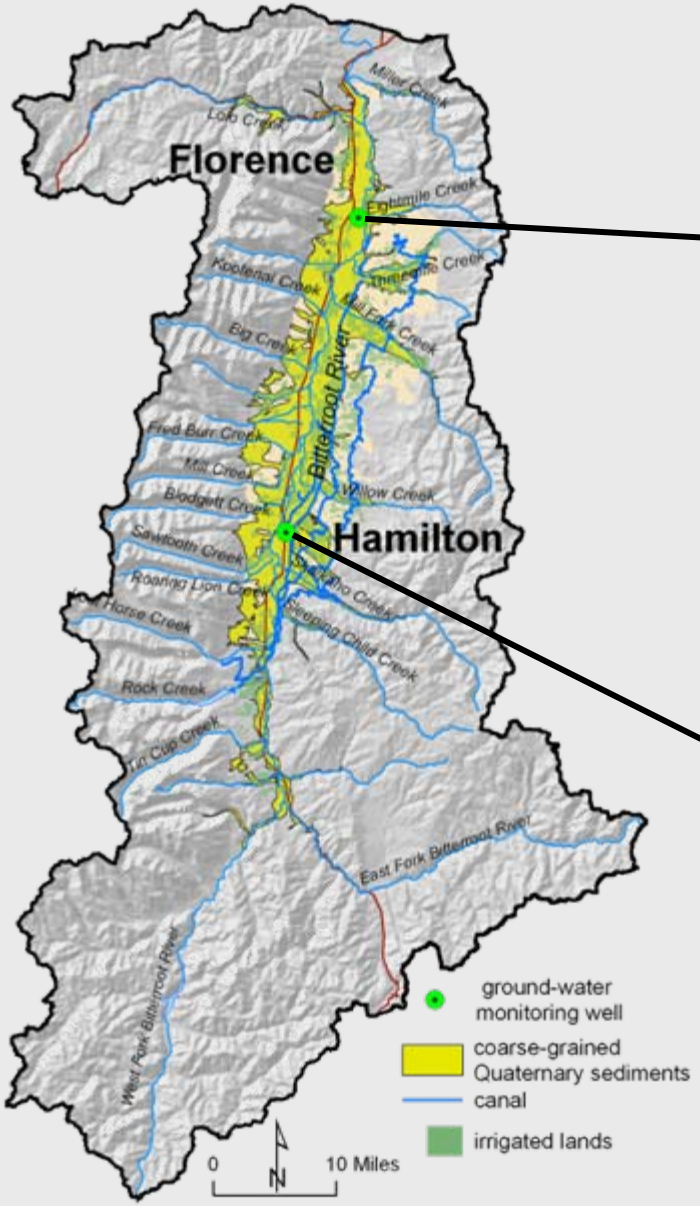
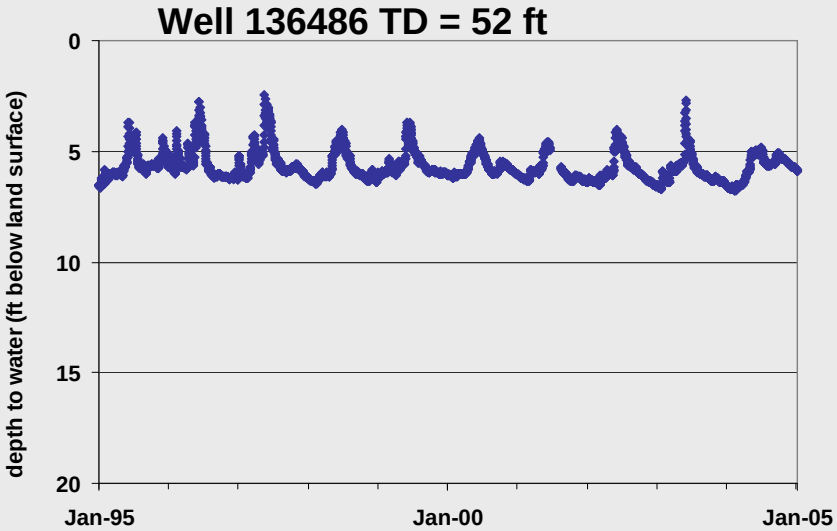


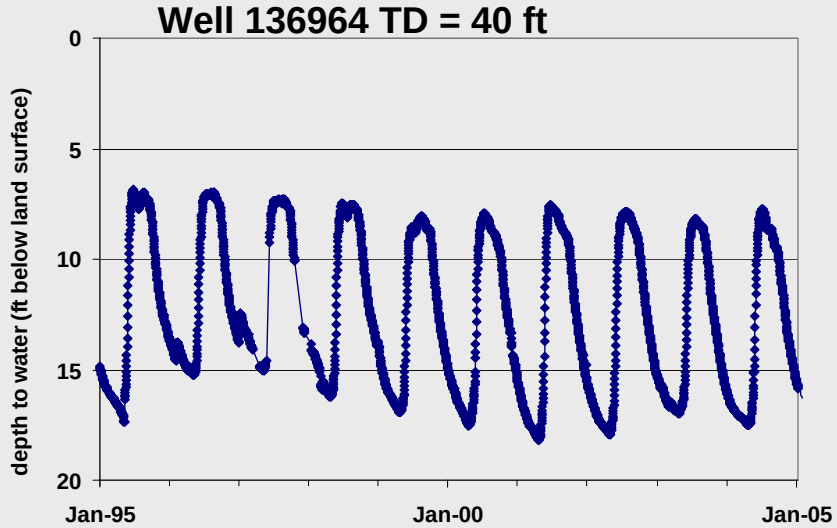



# Bitterroot Basin Irrigation Recharge



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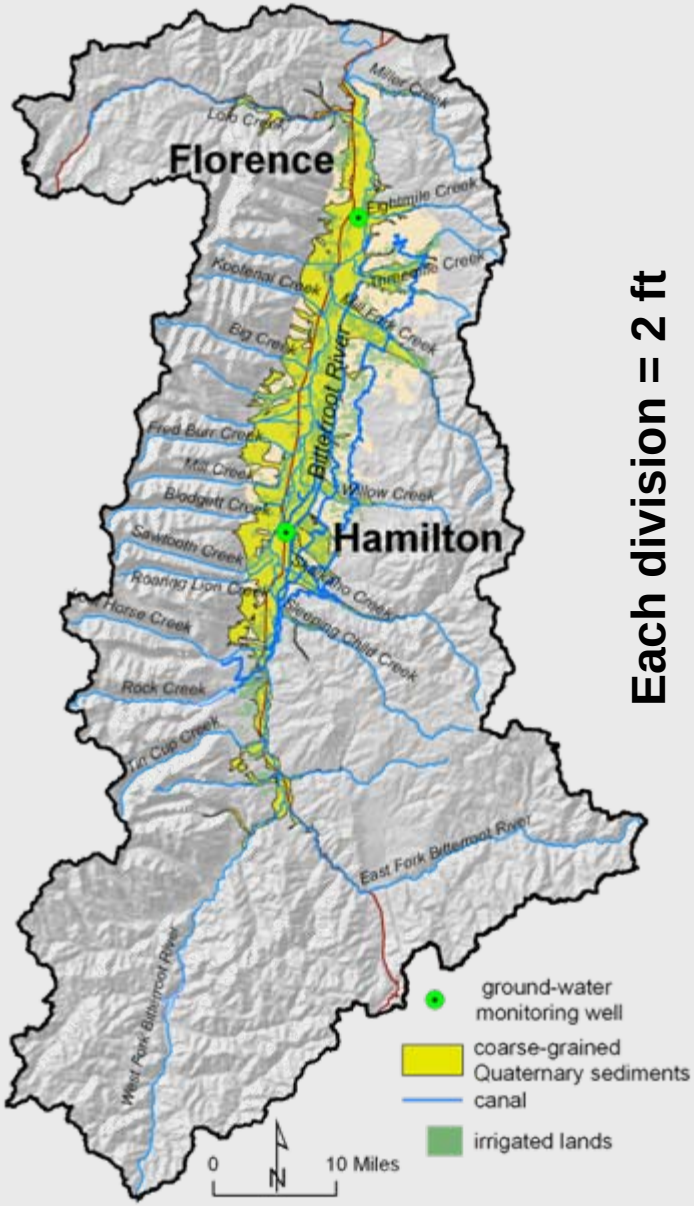
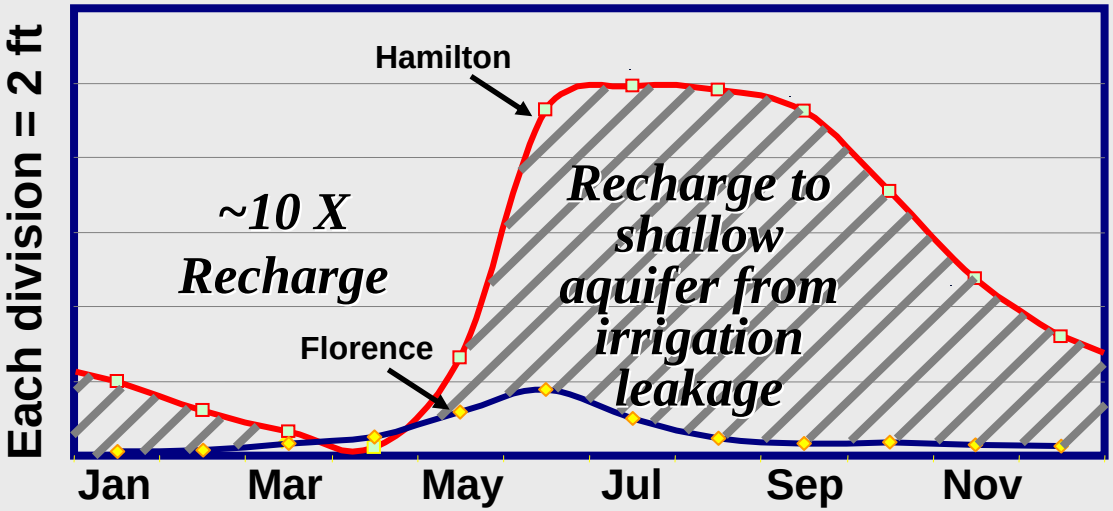



## Average monthly water levels



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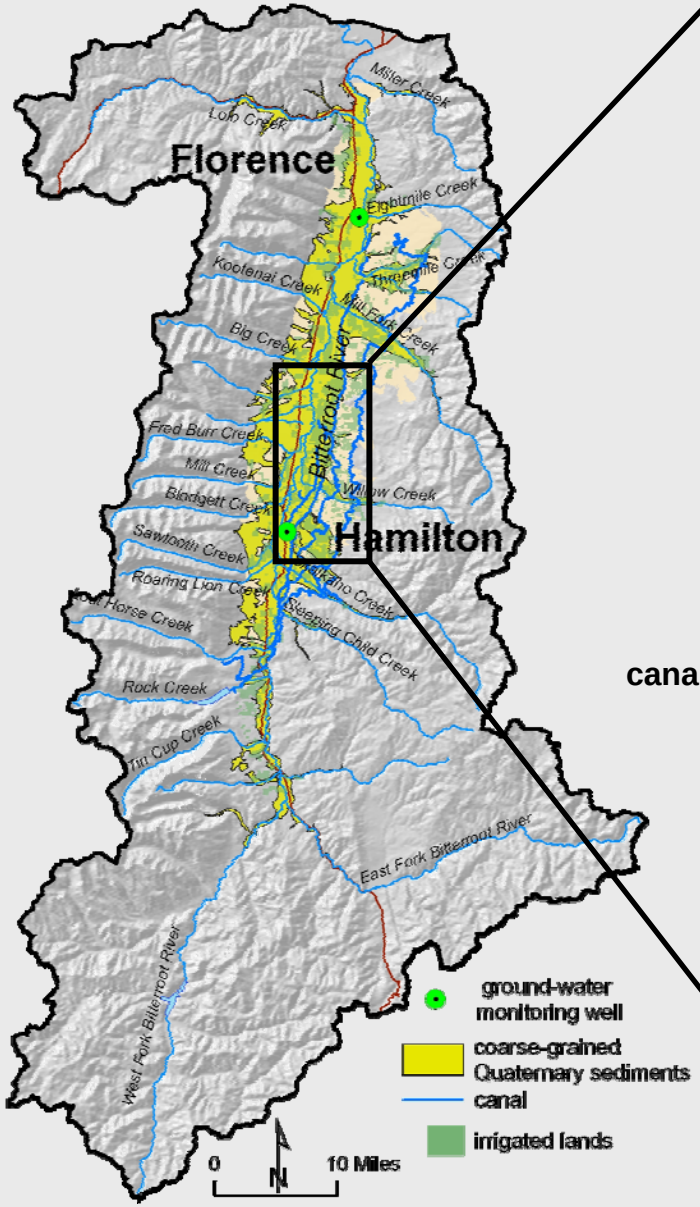


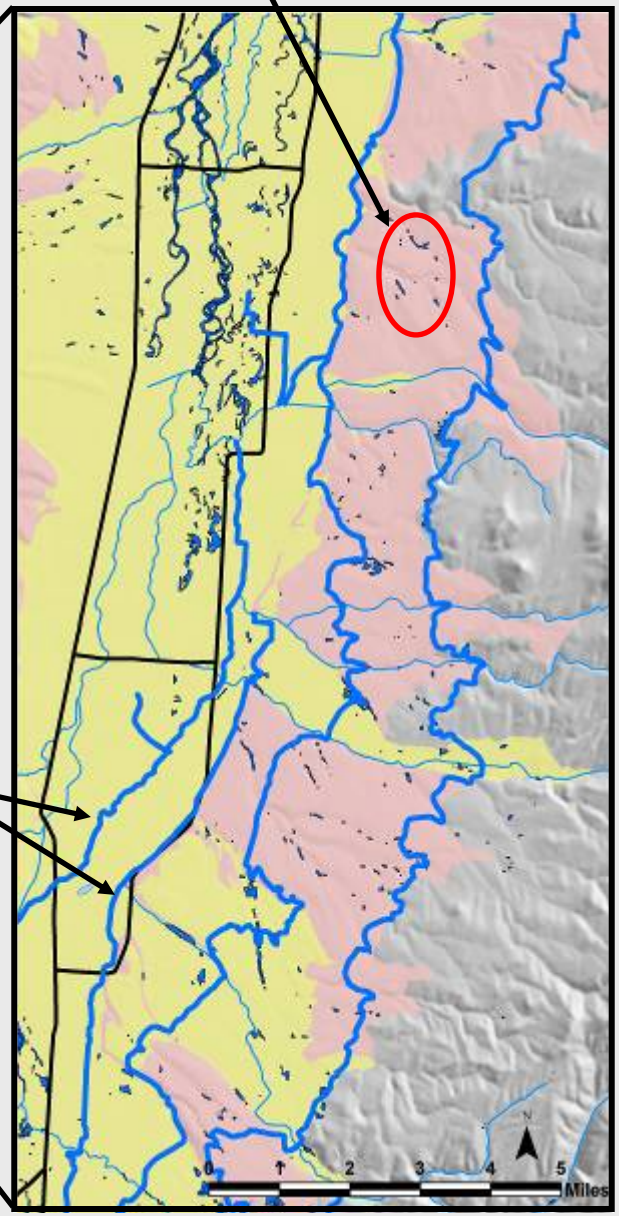


Wetlands on upland benches, downgradient from canals
Irrigation supported

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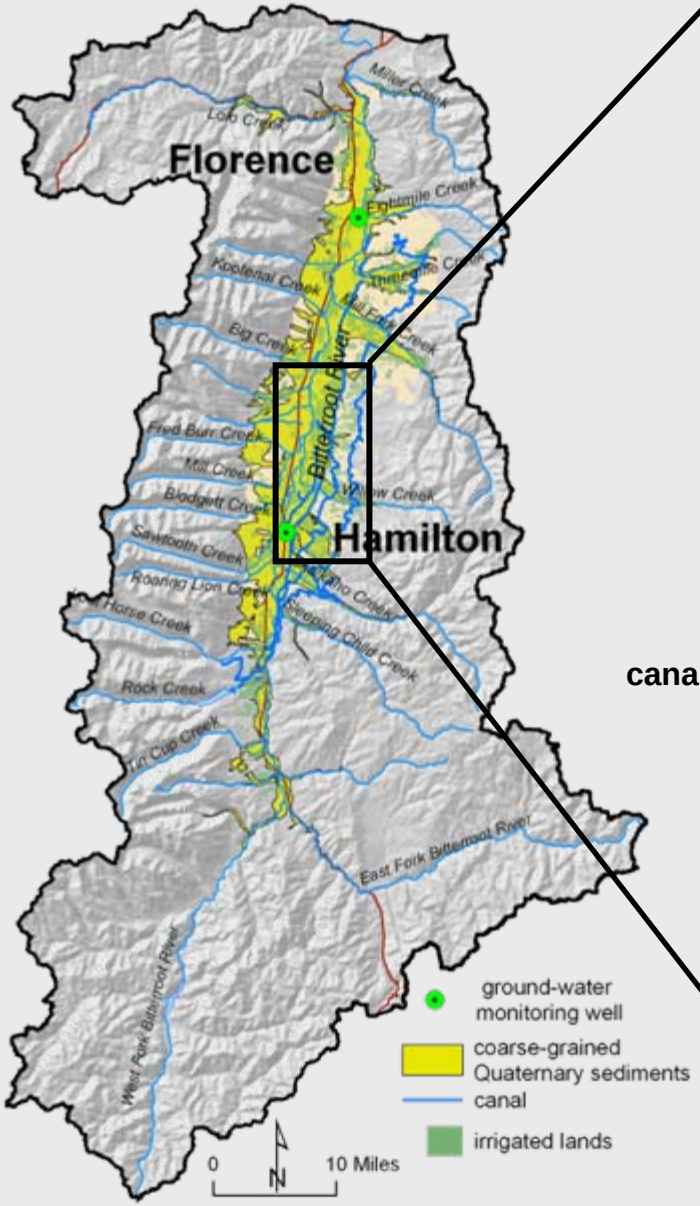
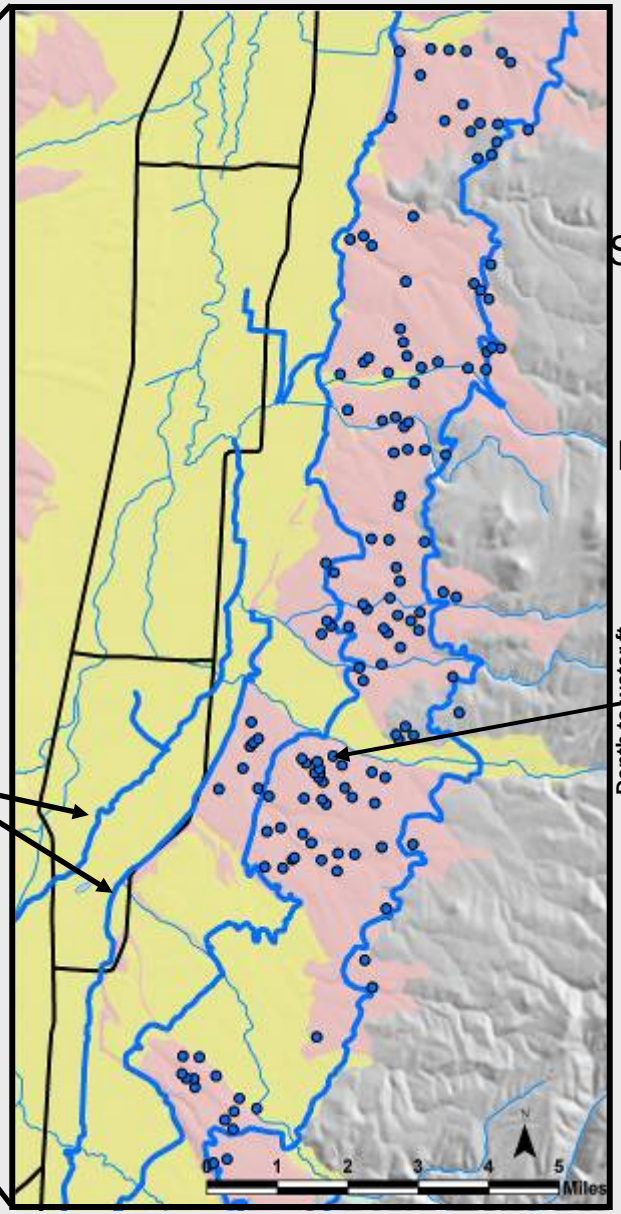
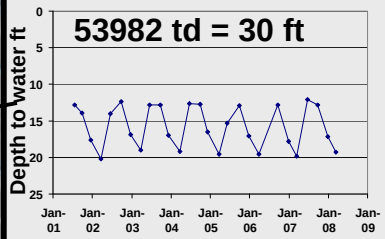


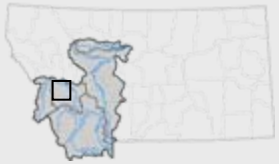

## Shallow domestic wells

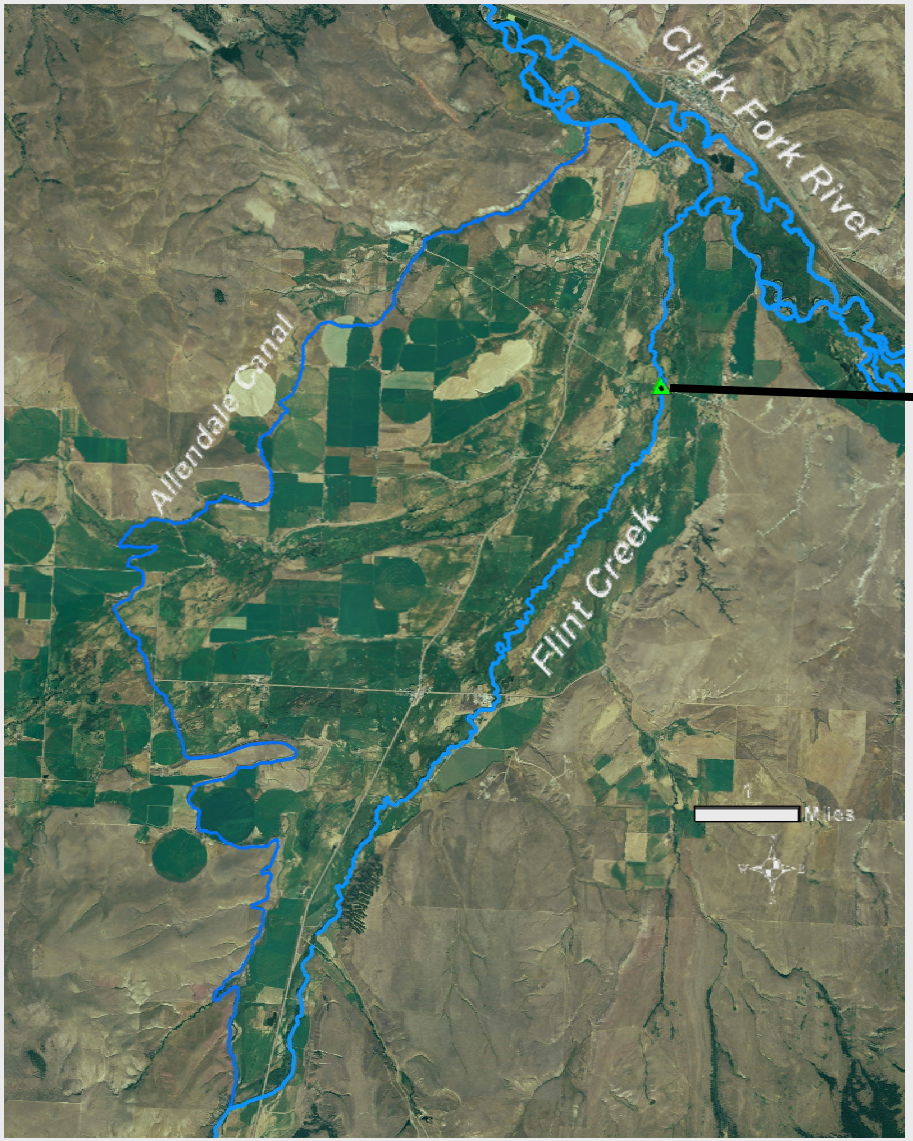



Shallow aquifers on upland benches, downgradient from canals
Irrigation supported



# Flint Creek Return Flows






## Average daily flows, Flint Ck 1990 -2007

- Return flows contribute 40-50 cfs in Oct.
- (Voeller and Warren, 1997)

# Summary

- Irrigation returns affect shallow ground water
  - Loses support: aquifers, wet lands, stream flow
  - Impacts are observable
- Conditions created by irrigation returns are “normal” but “not natural” (Kendy, 2006)
- Long-term monitoring shows the magnitude
  - Seasonal variation and long-term tends
- Increase efficiency (flood-sprinkler, canal lining)
  - reduce: aquifer recharge, late season flows, wetlands