Conveyance Losses, Travel Times, and Re-diversion Proportions along the Bear River

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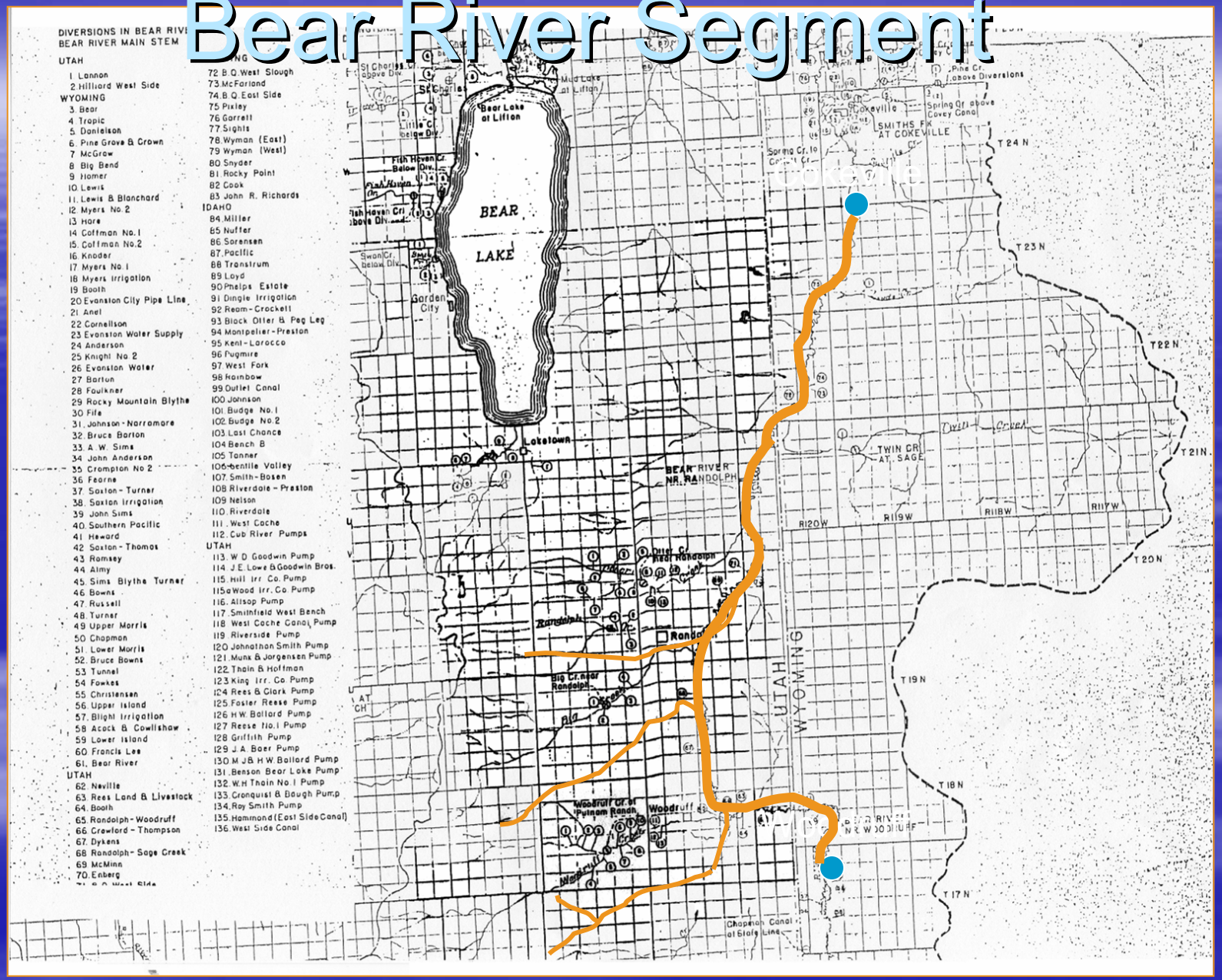
History – Project funding

- University of Wyoming Water Research Program Request for Proposals

- " Wyoming is a headwater state and most of the streams are regulated to meet downstream needs… Currently there is a need to determine the conveyance losses between Woodruff Narrows Reservoir and Pixley Diversion Dam…"

Bear River Segment

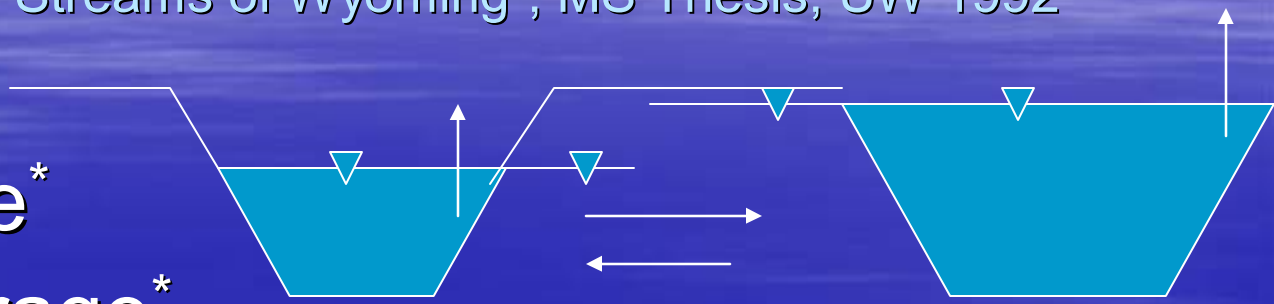


Benefits

- Quantifying conveyance losses for this portion of the Bear River may provide **additional irrigation water within Wyoming.**
- Aside from this direct benefit, there are other advantages in quantifying conveyance losses for this stretch of river. Irrigation return flows, **relative portions of natural flow and whether a stream reach is gaining or losing water** are also determined when characterizing conveyance losses.
- This type of information is **useful for irrigators when estimating the amount and timing of water that will reach their diversions** after a reservoir release.

Components to consider for conveyance losses

Adapted from Farber, "Conveyance Loss Modeling of Reservoir Releases in Natural Streams of Wyoming", MS Thesis, UW 1992"



- Bank storage*
- Channel storage*
- Evaporation
- Inadvertent diversions
  - (fixed gate settings)
- Groundwater inflow reduction
  - (reduced gradient)

* Transient

Definitions of Conveyance Losses

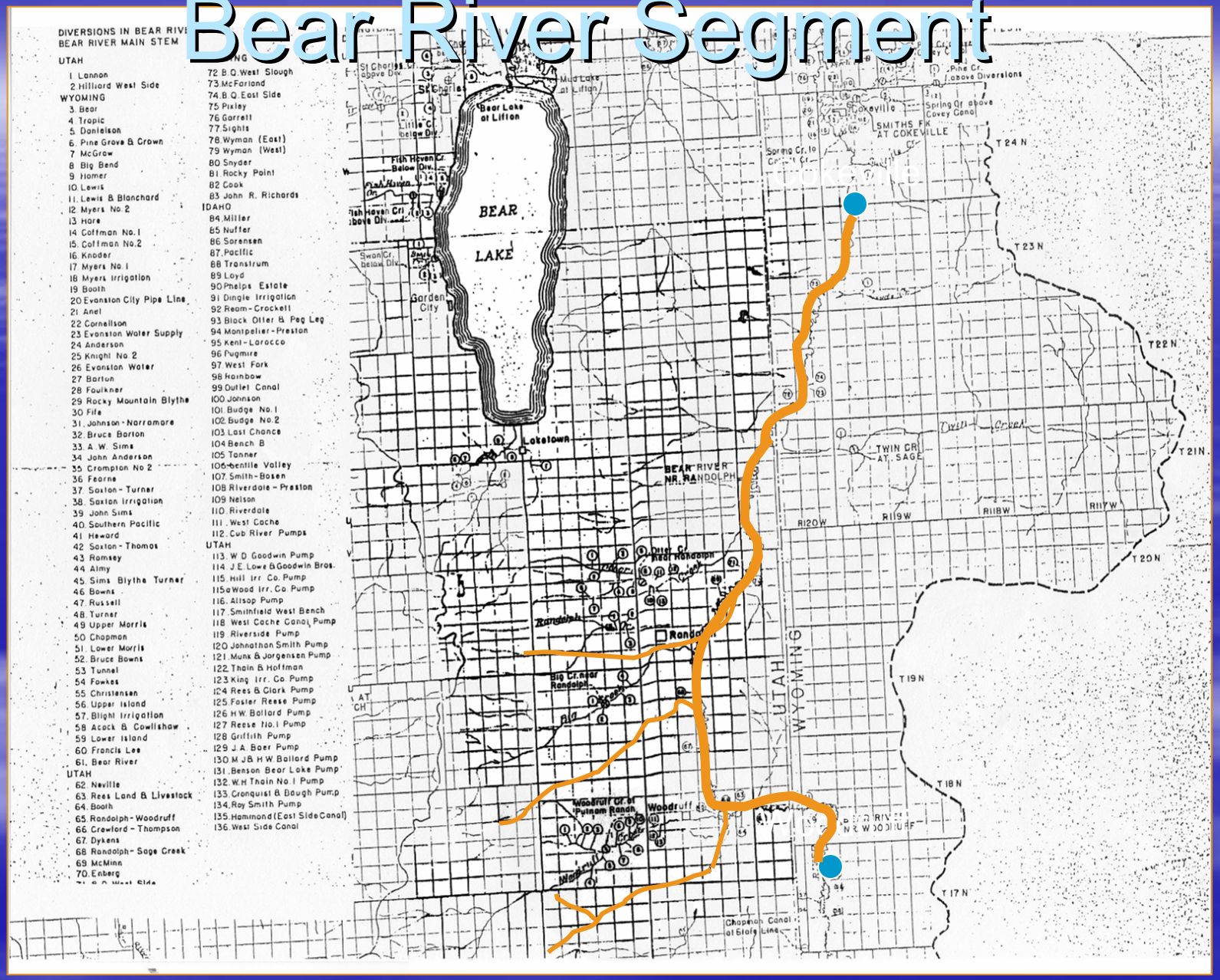
1 Total loss (difficult)
Gaining:
= evaporation + reduced groundwater inflows

Losing:
= evaporation + streambed infiltration

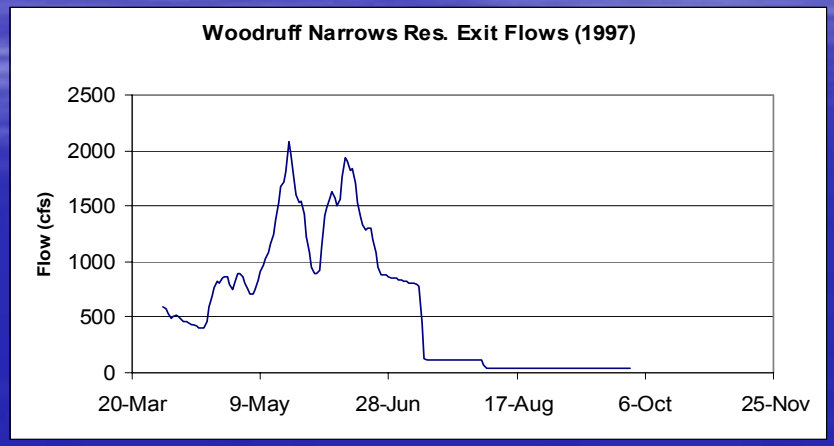
2 Net total loss
= Outflow + Diversions-Inflow

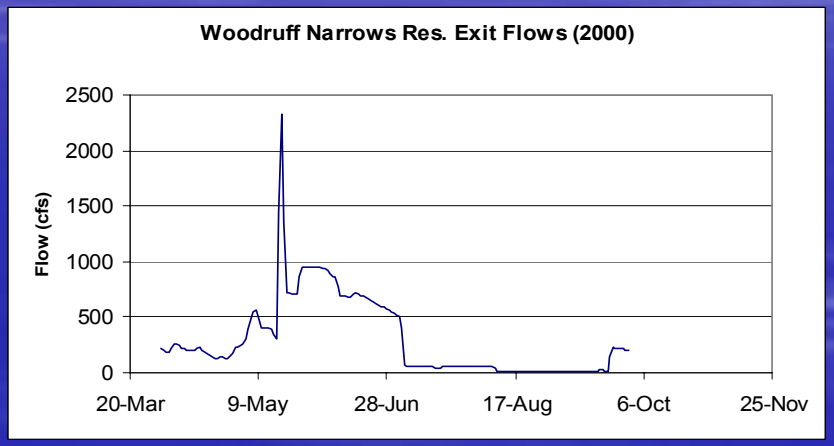
3 Incremental loss (this study)
= ΔOutlfow – ΔInflow + ΔDiversions

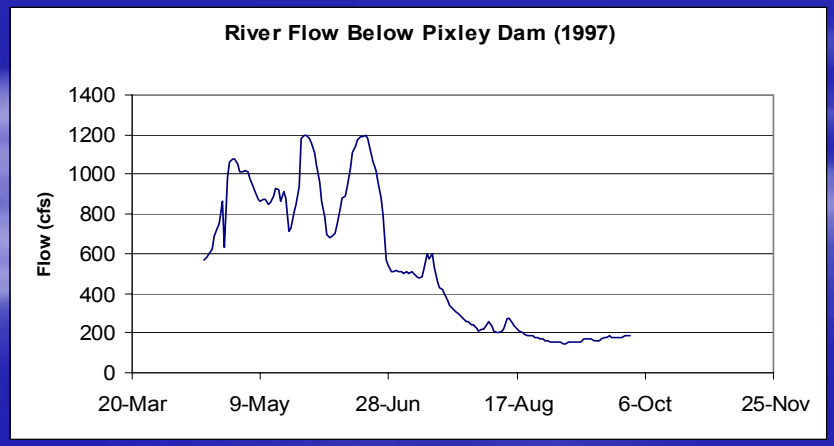
Bear River Segment

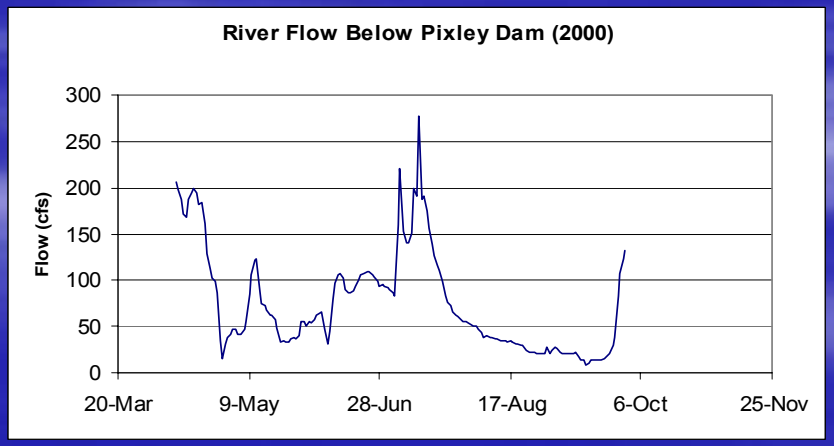


Woodruff Narrows Reservoir Releases





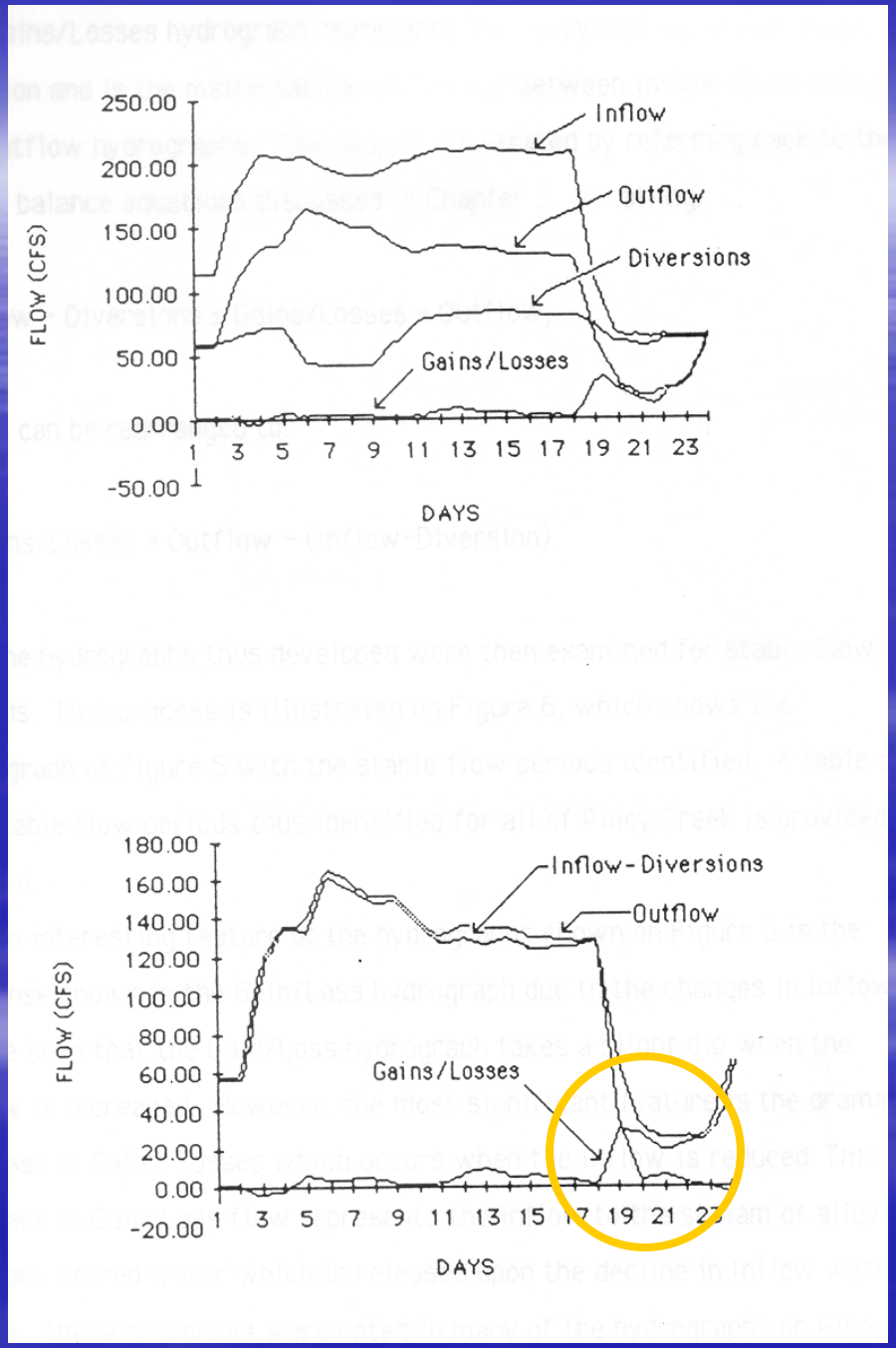




Objectives

- This research will determine Bear River conveyance losses between Woodruff Narrows Reservoir and Cokeville, WY. Specific Objectives are:
- Identify mechanisms that may contribute to losses or gains from the system
- Perform a water budget analysis to determine losses or gains from the systems
- Determine magnitude of losses or gains associated with each mechanism.

Hydrograph Analysis



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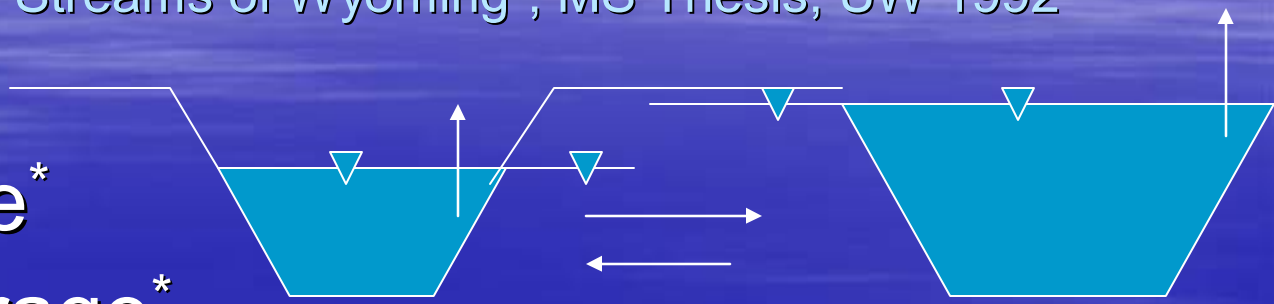

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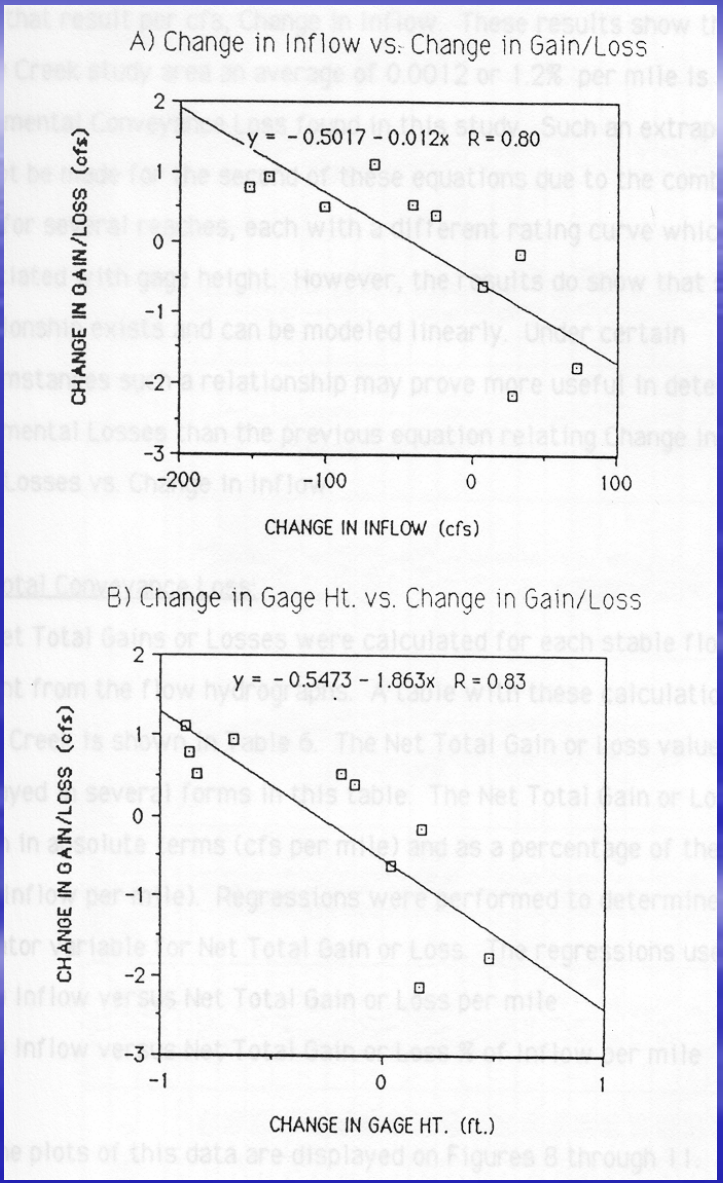
Typical Application of Information



Project Schedule:

- Year 1 (now)

  Assessment of monitoring network?, establishment of baseline information

- Years 2 and 3

  Development of incremental loss / incremental flow relationships

Help

- General information about project objectives, what else should we consider?
- Problems we are likely to encounter?
- Information retrieval/coordination.

Thank you

- Questions ?