

# Idaho Water Resources Board

## Twin Falls

### July 13, 2006

Presentation by  
**Charles M. Brendecke, PhD, PE**

on behalf of  
**Idaho Ground Water Appropriators, Inc.**



# My Role in Model Development

- Review and comment, through modeling committee, on development work of IWRRI and IDWR
- Educate IGWA members about model development and capabilities
- Use model in evaluating Orders and Plans



# Model Strengths

- **Development used extensive field data**
- **Development employed ongoing peer review**
- **Calibration over a 21-year period**
- **Most detailed and comprehensive ESPA model in existence**

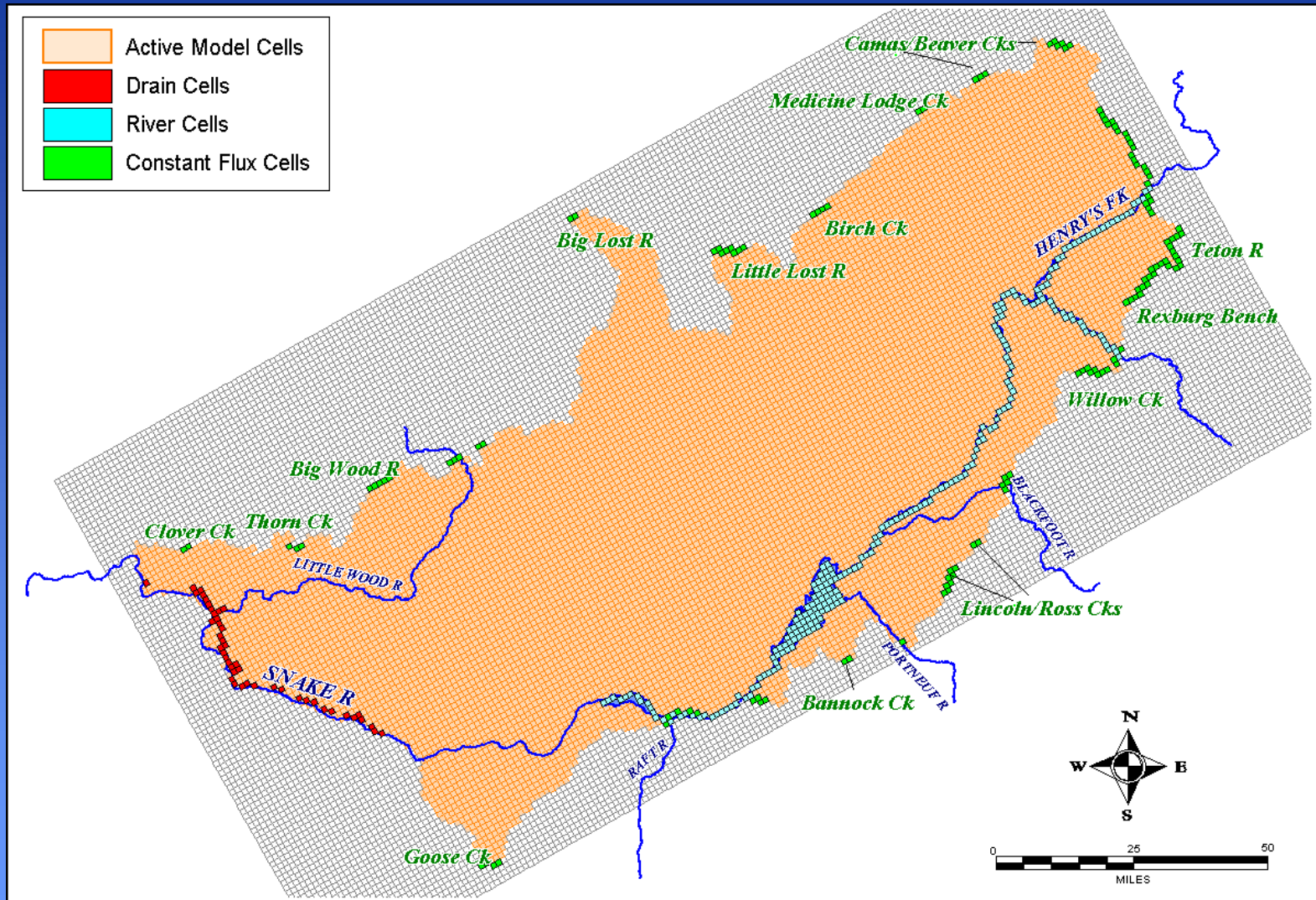


# Model Weaknesses

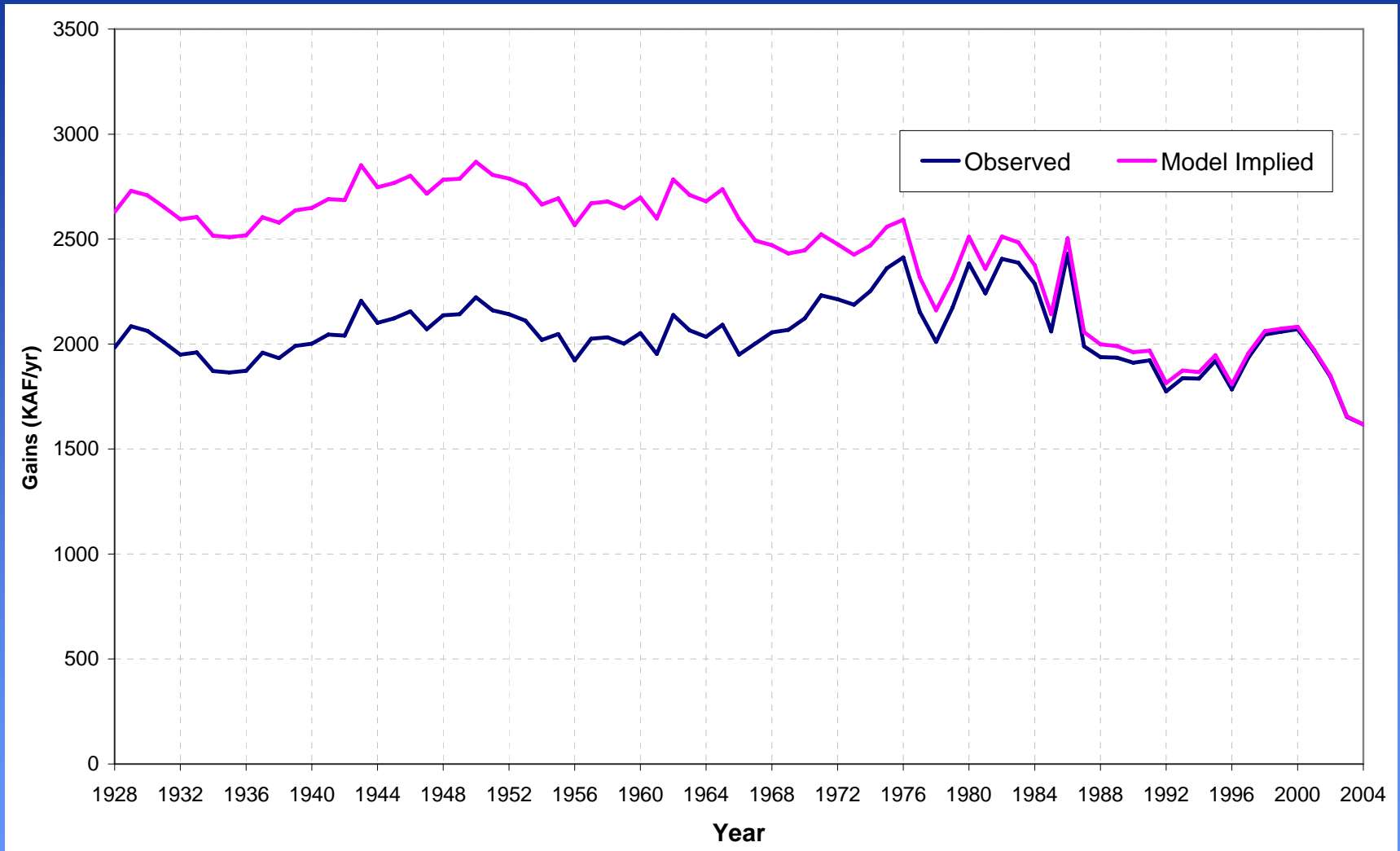
- **Some key input data and assumptions, e.g., tributary underflows, are not well understood**
- **Observed river gains do not show degree of pumping impact predicted by model in some reaches, e.g. nr Blackfoot-Minidoka**
- **Tendency is to use model in more detailed applications than is justified by data**
- **Some ground water uses are not well understood**



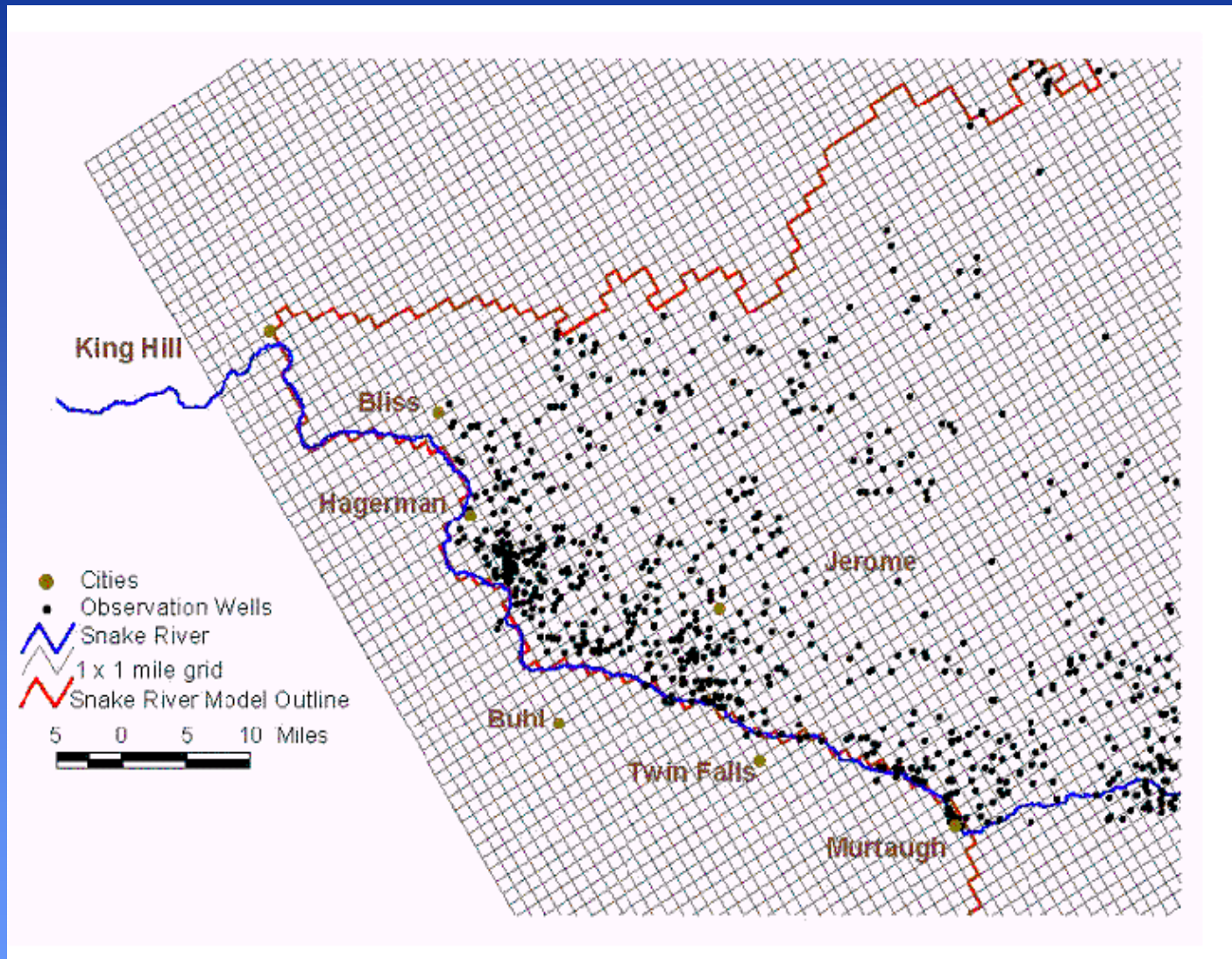
# Eastern Snake Plain Aquifer Model Grid and Boundary Cells



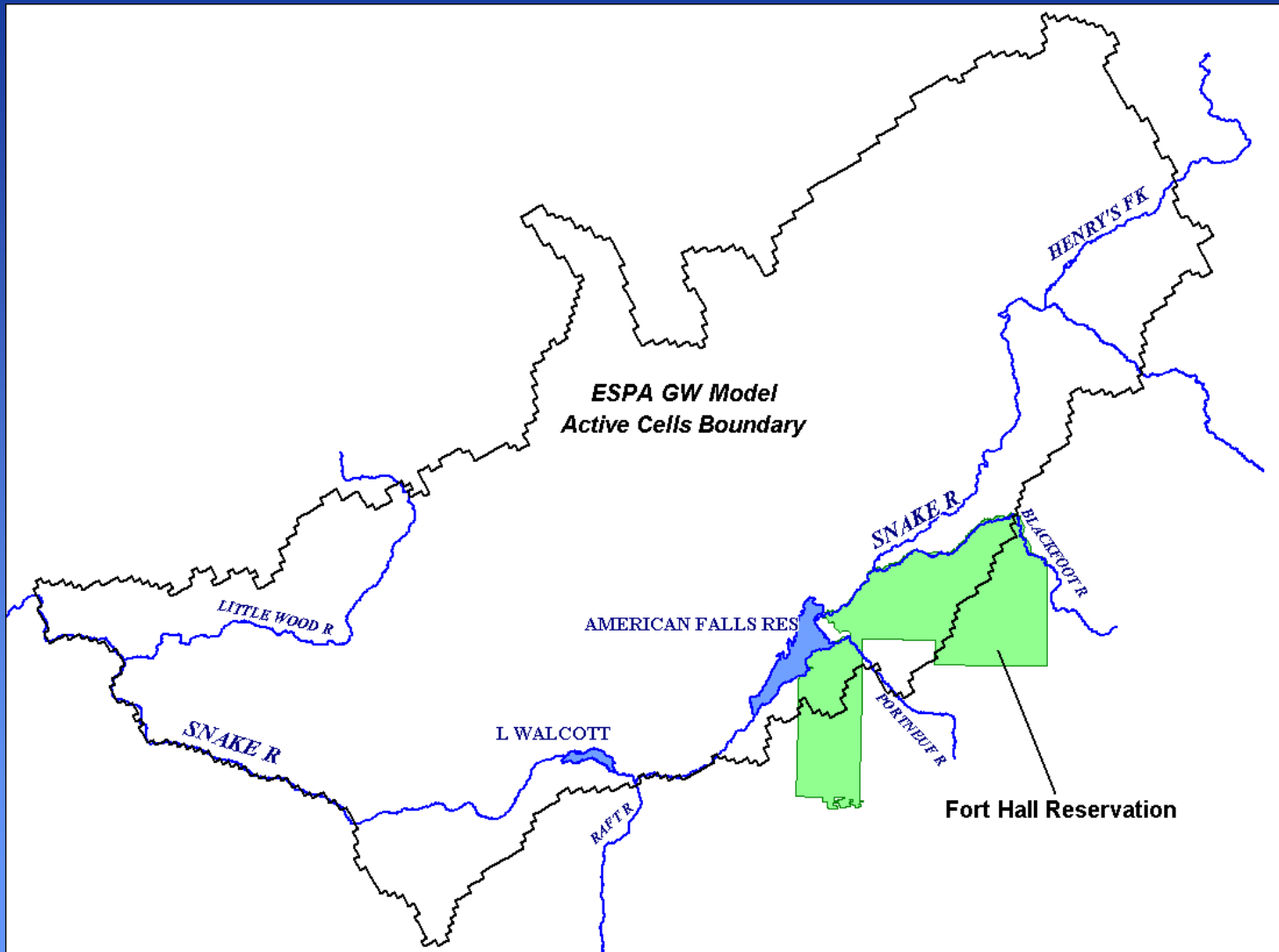
# Near Blackfoot to Minidoka Reach Gains



# ESPA Model Grid



# Ground Water Use on Fort Hall Reservation



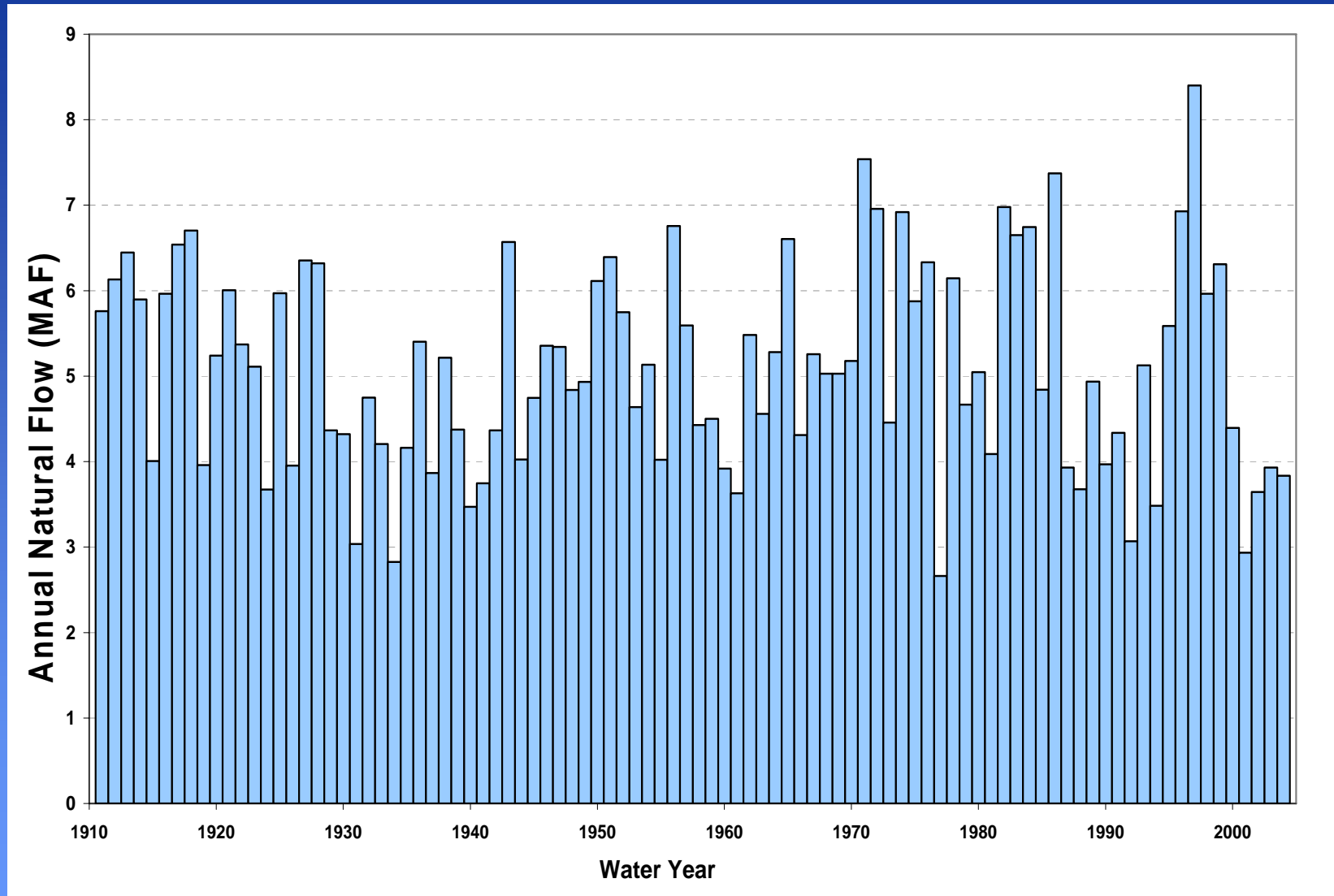


# An ESPA Management Plan

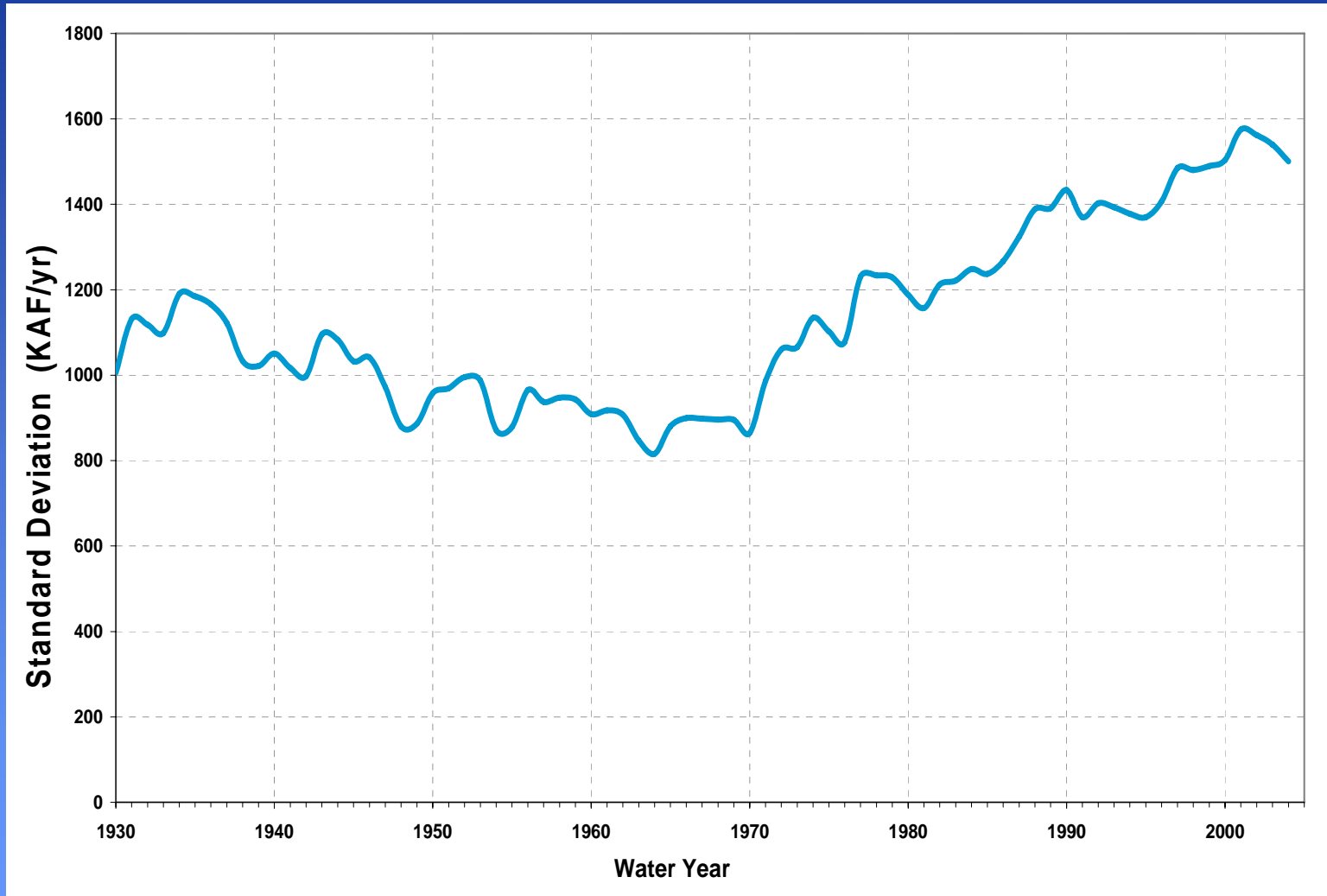
- Integrate aquifer storage into system operation via managed recharge
- Improve certain canal systems to facilitate recharge
- Support conversions back to surface water use
- Allow temporary dry-ups without forfeiture
- Commit to permanent management of aquifer



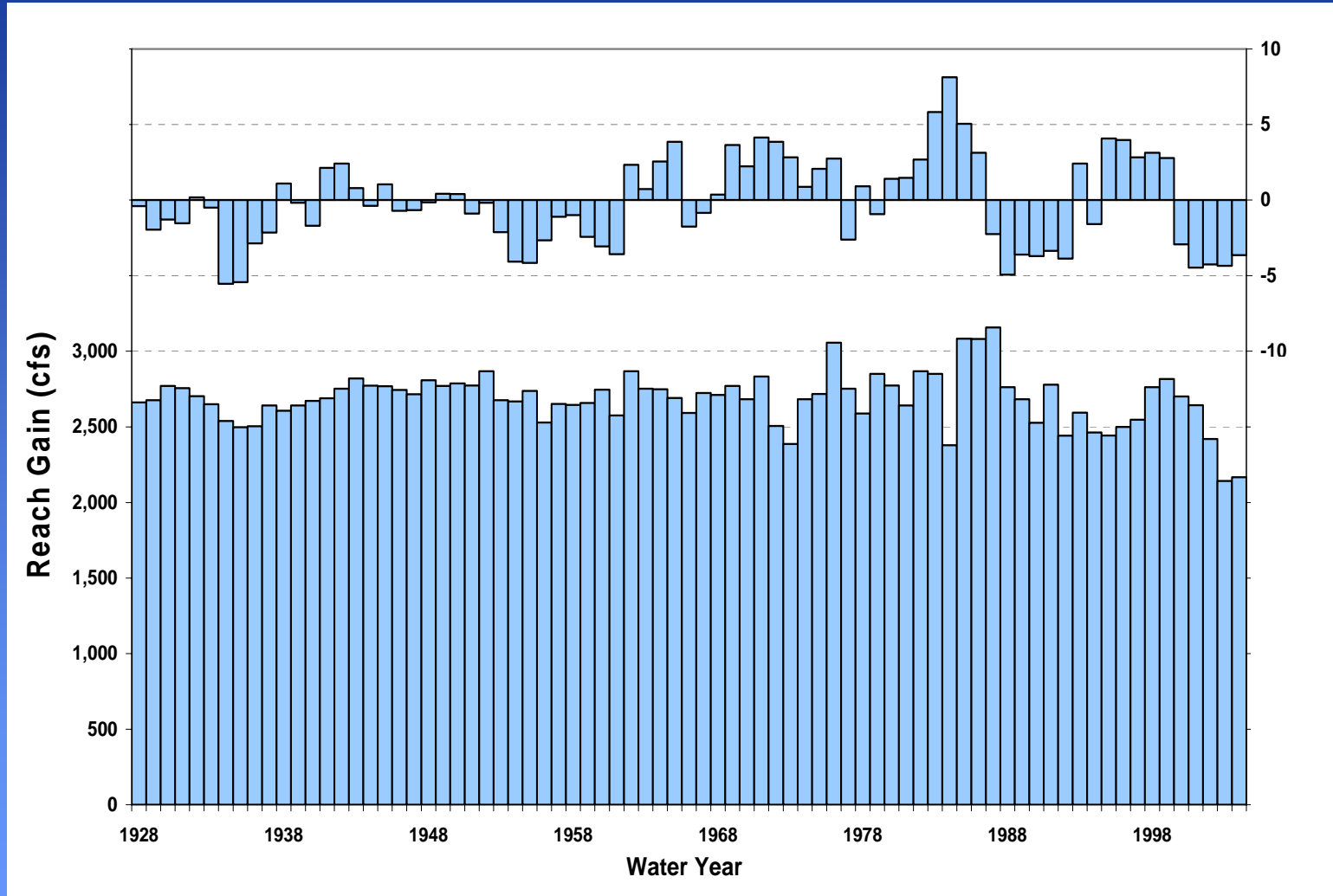
# Annual Natural Flow at Heise



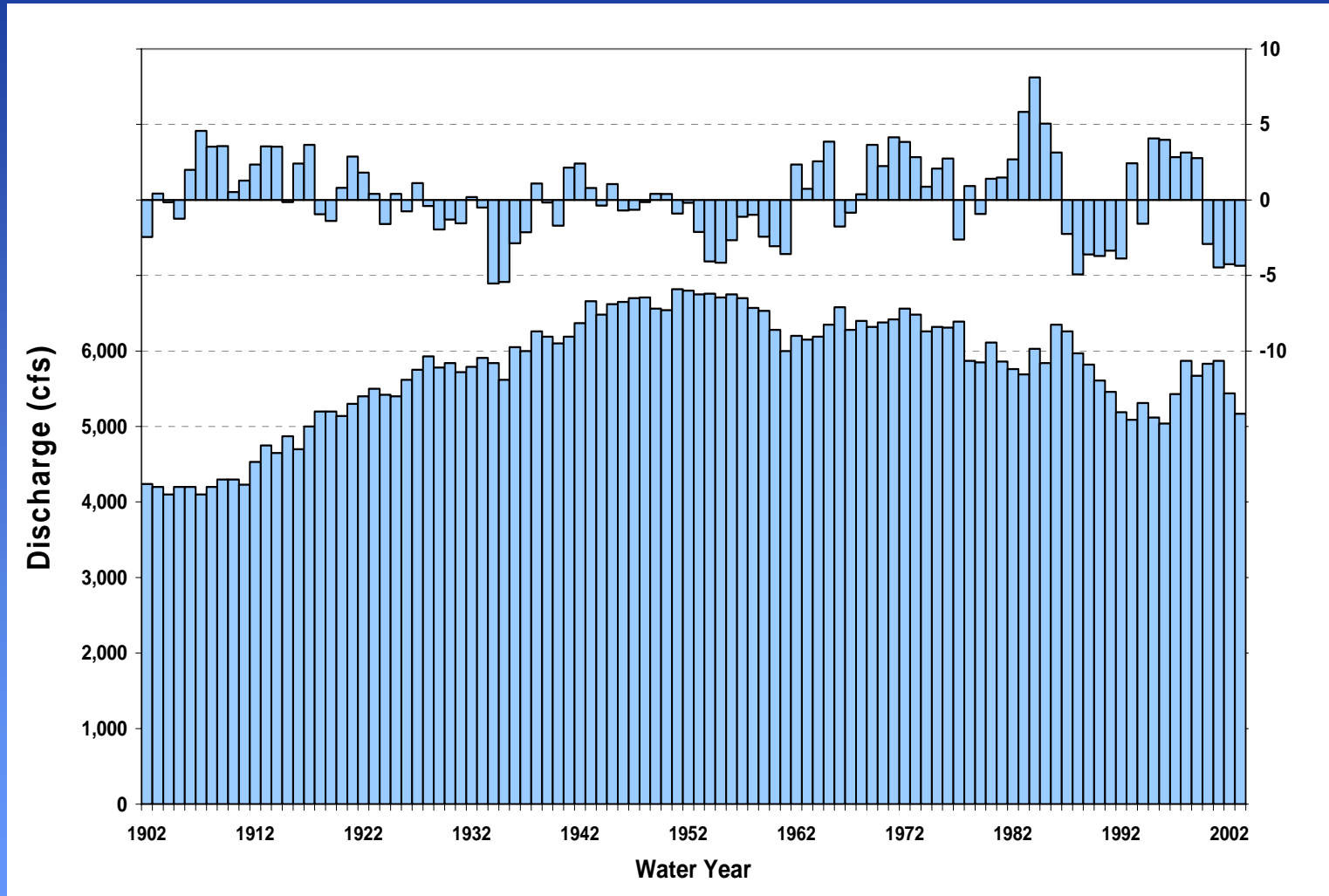
# Standard Deviation in Heise Annual Natural Flow (20-yr Moving Window)



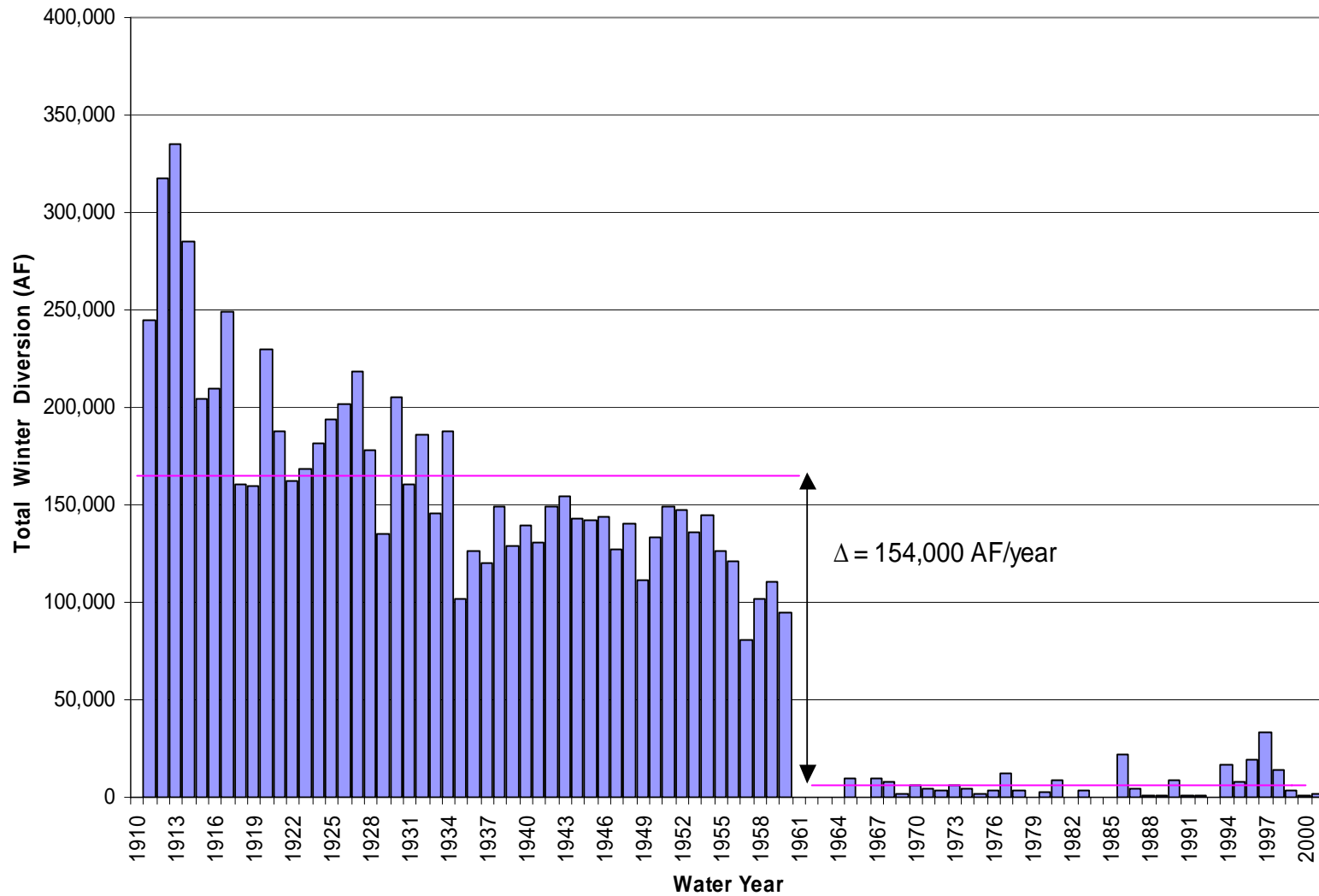
# Annual Blackfoot to Neeley Reach Gain and PDSI



# Annual Spring Discharge Btw. Milner and King Hill and PDSI



### Winter (Nov-Mar) Diversions, North Side Canal at Milner



# An ESPA Management Plan

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