



Truckee River Watershed Council

Collaborative solutions to protect, enhance and restore the Truckee River Watershed

# Bugs, Dirt, and Data

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# Presentation Outline

- TRWC Monitoring Programs
- Truckee River TMDL Background
- Key TMDL Monitoring Results
- Next Steps



# Why Monitor?



J. Baiocchi

- Understand health of ecosystem
- Identify problems
- Quantify results of actions



# TRWC Monitoring Programs

- Adopt a Stream
  - Physical and Chemical
  - Biological
- Project Specific
- TMDL Monitoring
  - Sediment and Biological



# What is a TMDL?

- Total Maximum Daily Load
- Pollution control plan
- Water body and pollutant specific
- Developed to protect Beneficial Uses
  - For example: Cold Freshwater Habitat, Recreation, Municipal, Spawning,



# Middle Truckee River Sediment TMDL

- Listed as polluted for excess sediment
- 1991 - EPA lists due to biological impacts - best professional judgment
- TMDL developed and adopted in 2008 (Lahontan Water Board)



S. McLeod



# TMDL Standards

- Watershed-wide TMDL
- Numeric target: 25 mg/L suspended sediment concentration (SSC)
- Implementation targets
  - Legacy site restoration/BMP installation
  - Dirt road maintenance/decommission
  - Road sand tracking and recovery
  - Ski area BMPs



# Results of TRWC Monitoring

- TMDL monitoring started in 2010
  - Only TMDL-specific monitoring
- Data show biological impairment
- Current TMDL standard not suited to assess biological impact





# Why TRWC is Monitoring

- Lack of strong monitoring plan in the adopted TMDL
- Need for watershed-based vs. individual permittee reports
- Inconclusive biological studies - need for more data
- Establish “baseline” conditions to track progress



# Monitoring Plan Elements

- Biological Studies
  - Index of Biological Integrity study - reference test
  - Patch-scale sediment
  - Repeat 2004 sampling below tributaries (TMDL development)
- Sediment and Turbidity
  - Near continuous turbidity
  - Suspended sediment grab samples
  - Bed surveys



# Elements Presented Today

- Bioassessment - reference/test
- Bioassessment - patch-scale
  - Studies by UCSB- SNARL, Dr. David Herbst
- Suspended sediment and turbidity summary
  - Studies by Balance Hydrologics



# Results of TRWC Monitoring

1. Biological data show negative impacts from sediment
2. Disconnect between current numeric standard and detecting impairment



# Bioassessment 101

- Using organisms to assess water quality
- Direct indicator of stream environment
- Benthic macroinvertebrates most common



S. Matson



B. Friedrich



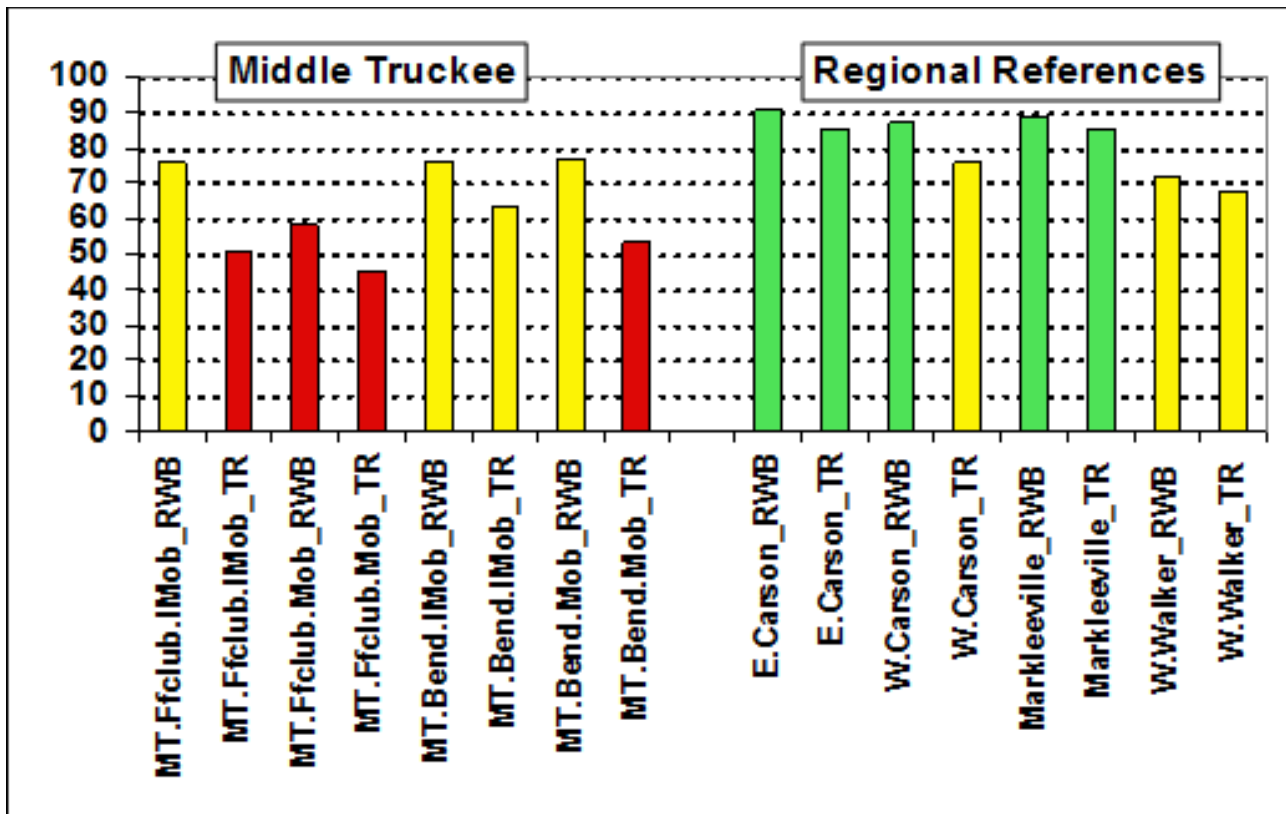
# Bioassessment “Jargon”

- Index of Biological Integrity (IBI)
- EPT
  - Ephemeroptera (mayflies)
  - Plecoptera (stoneflies)
  - Trichoptera (caddisflies)
- Tolerance Value: 0-10 assigned to each species
- BMI = Benthic macroinvertebrate



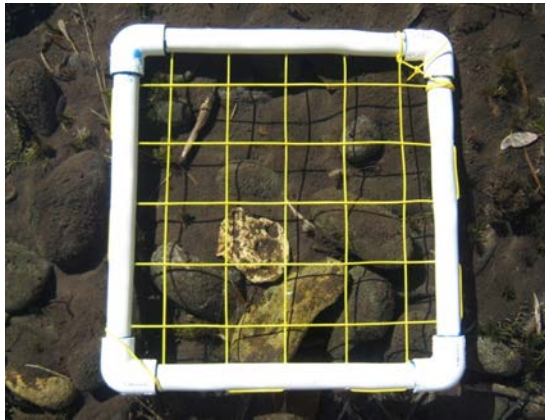
# Reference/Test Results - IBI Scores

- Middle Truckee samples poor condition (red) or fair (yellow)
- Reference sites fair or good (green)

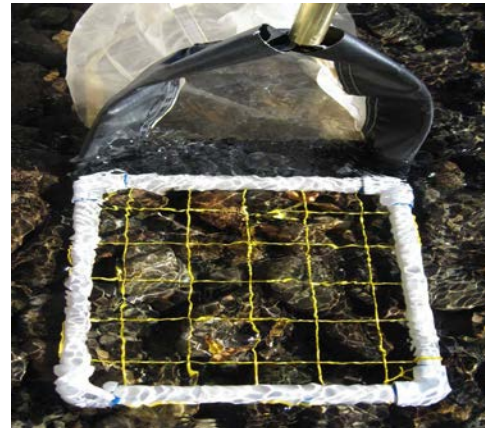


# Patch Scale Analysis

- Tightens up relationship between sediment and biota
- Collect BMIs from small patches over a range of fine sediment cover (0-100%)
- Survey reaches of Middle Truckee to understand pattern of fine sediment deposition

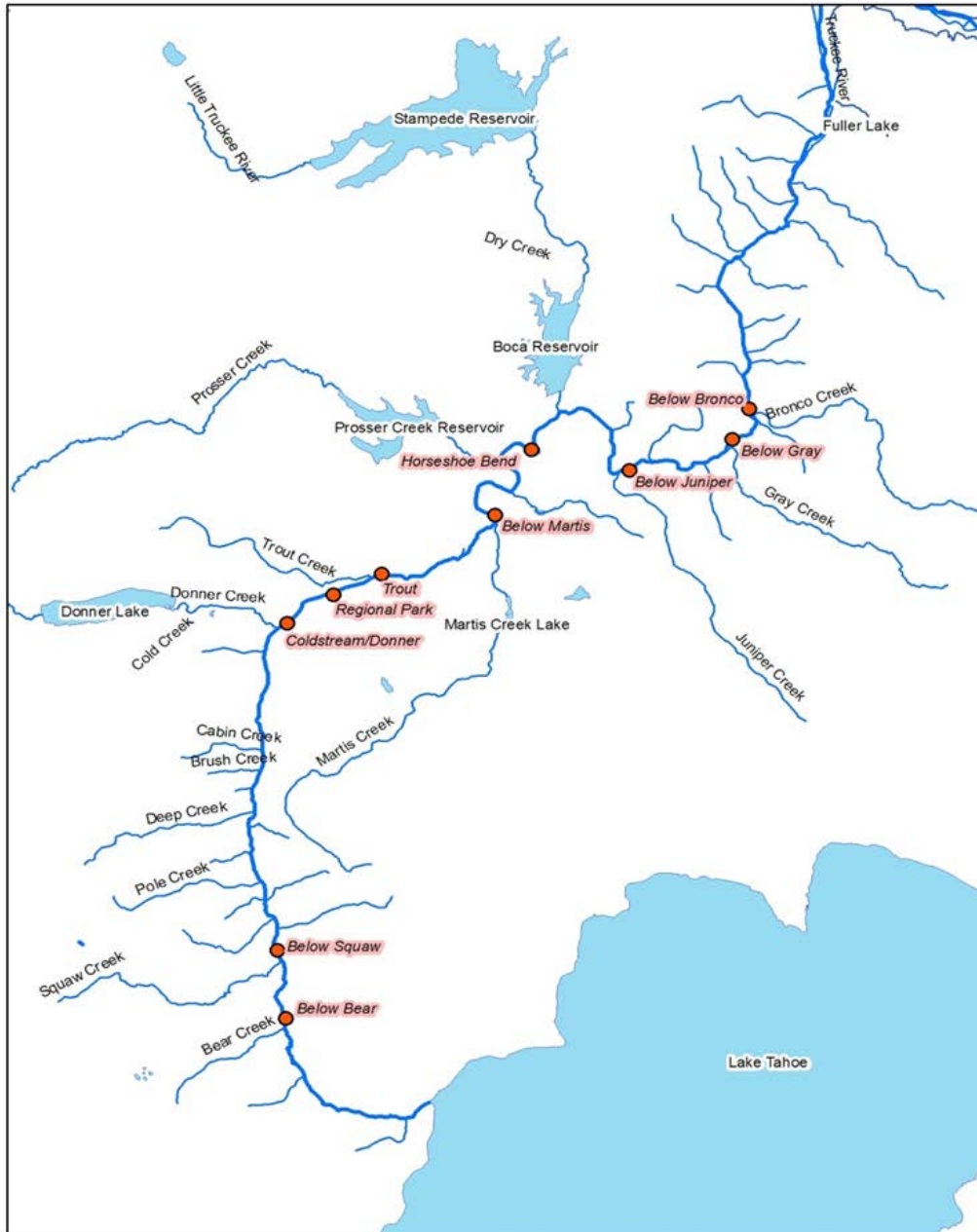


D. Herbst



D. Herbst

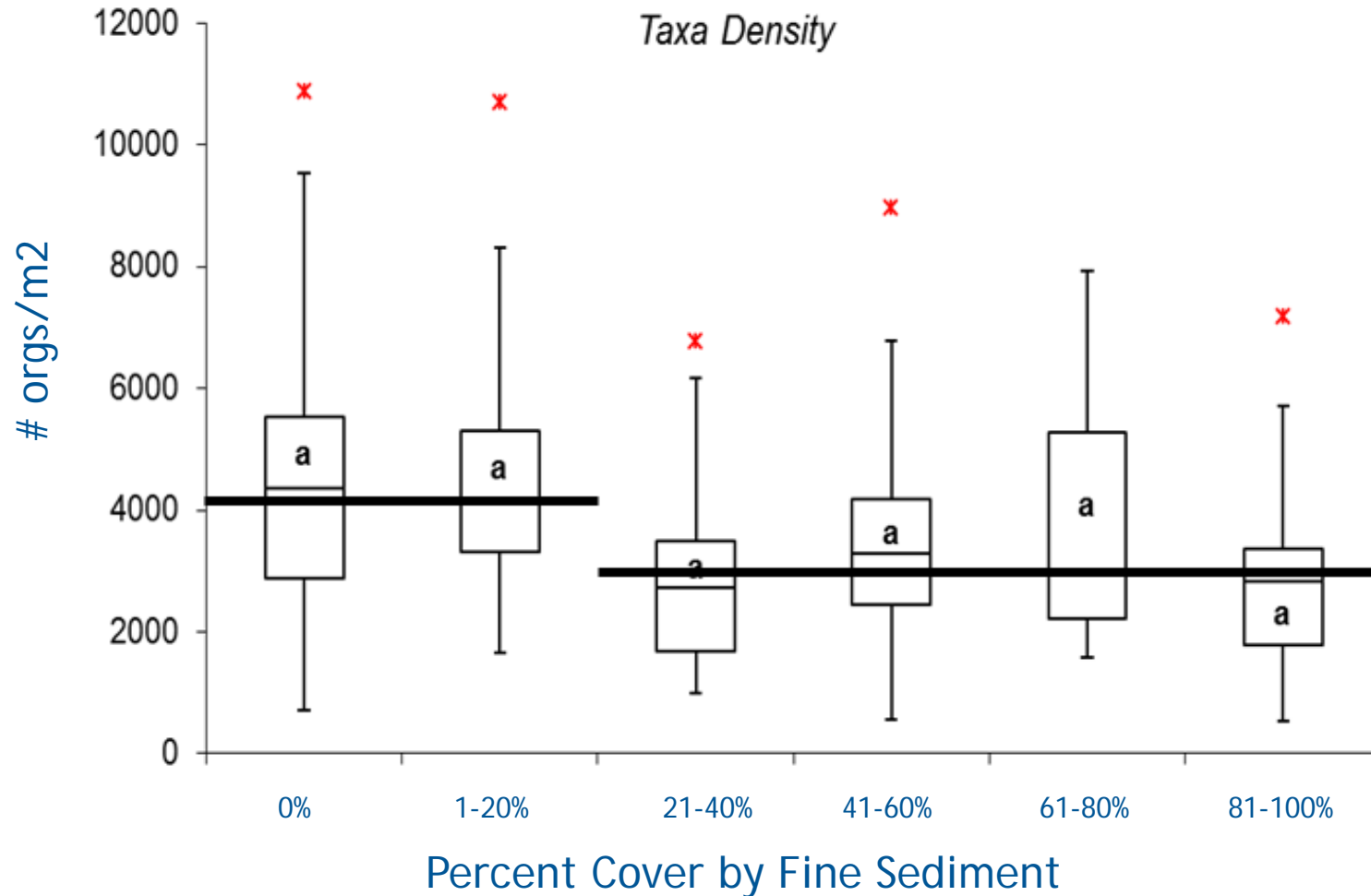




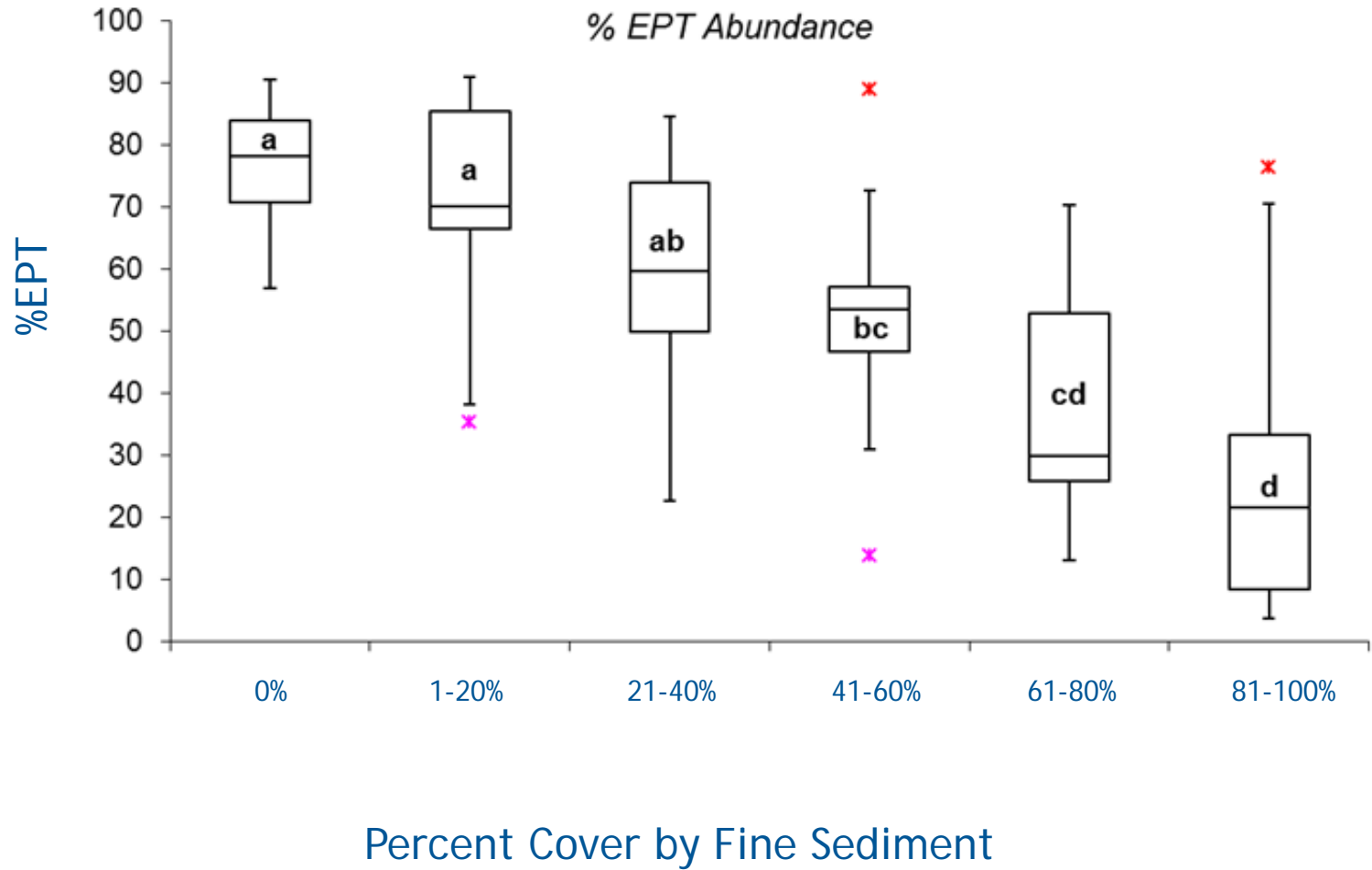
# BMI Monitoring Locations - Patch Scale Study



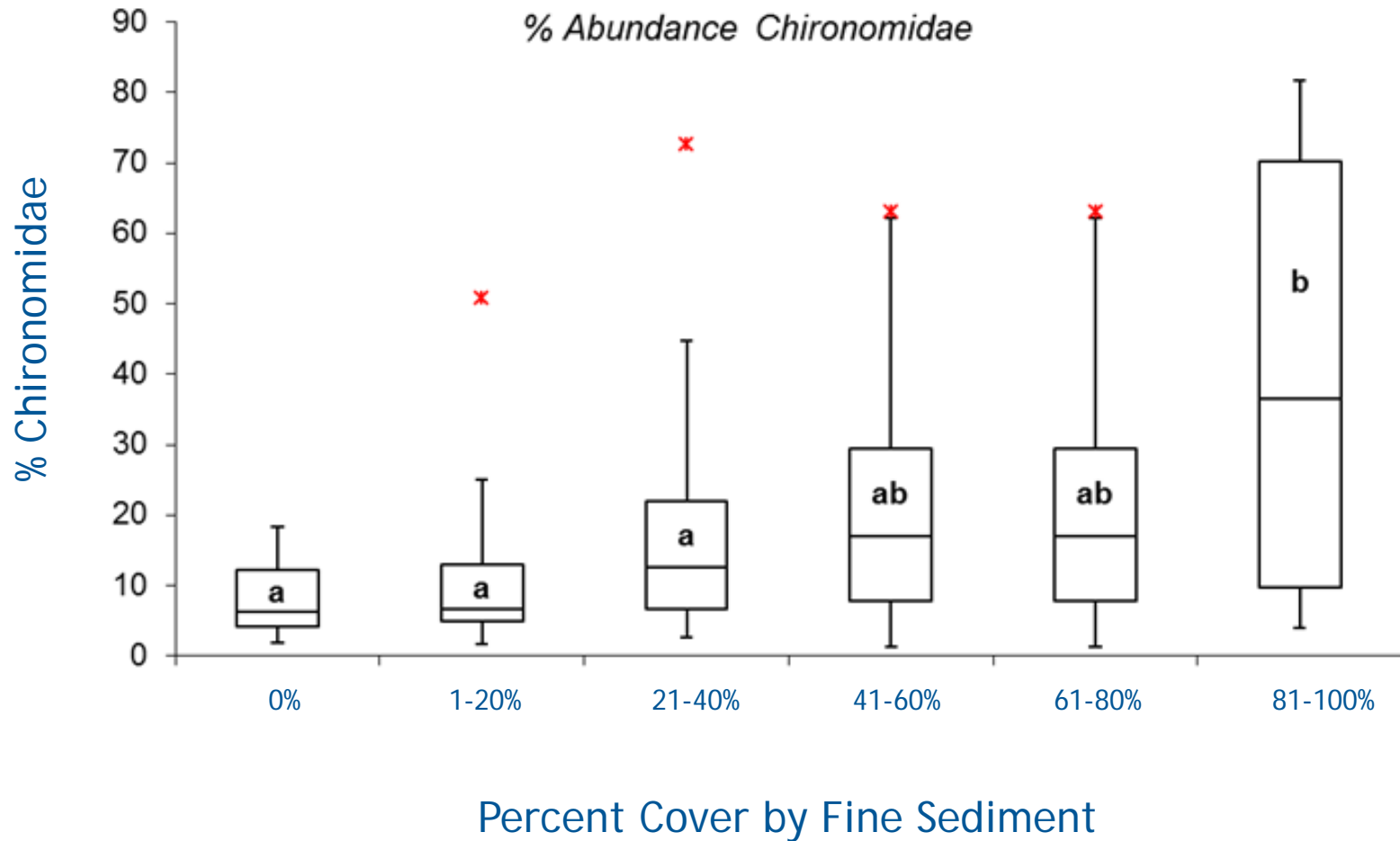
# Number of Insects Decreases with More Sediment



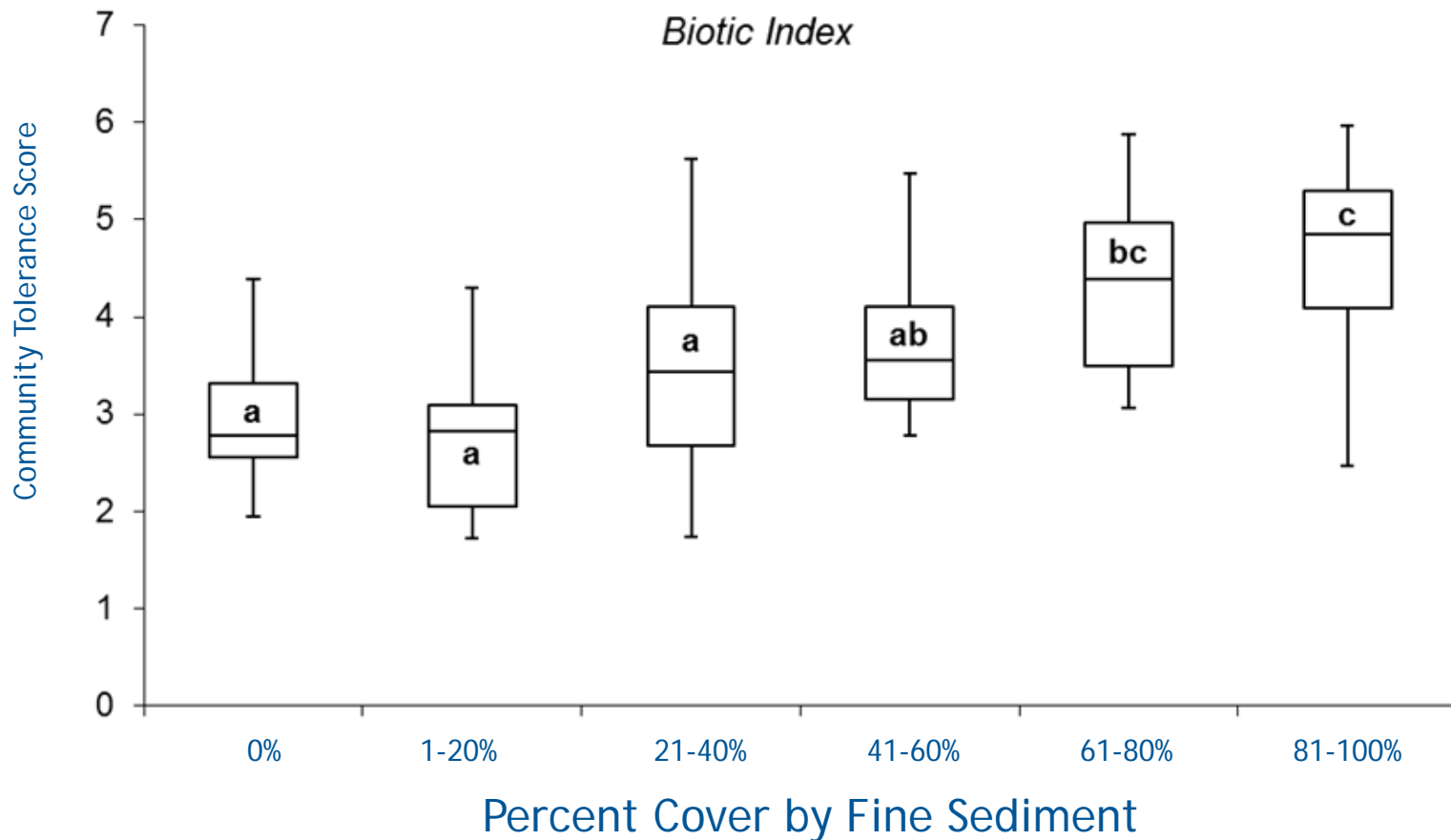
# % EPT Decreases with More Sediment



# % Midges Increases with More Sediment



# Fewer Intolerant, More Tolerant Species with More Sediment

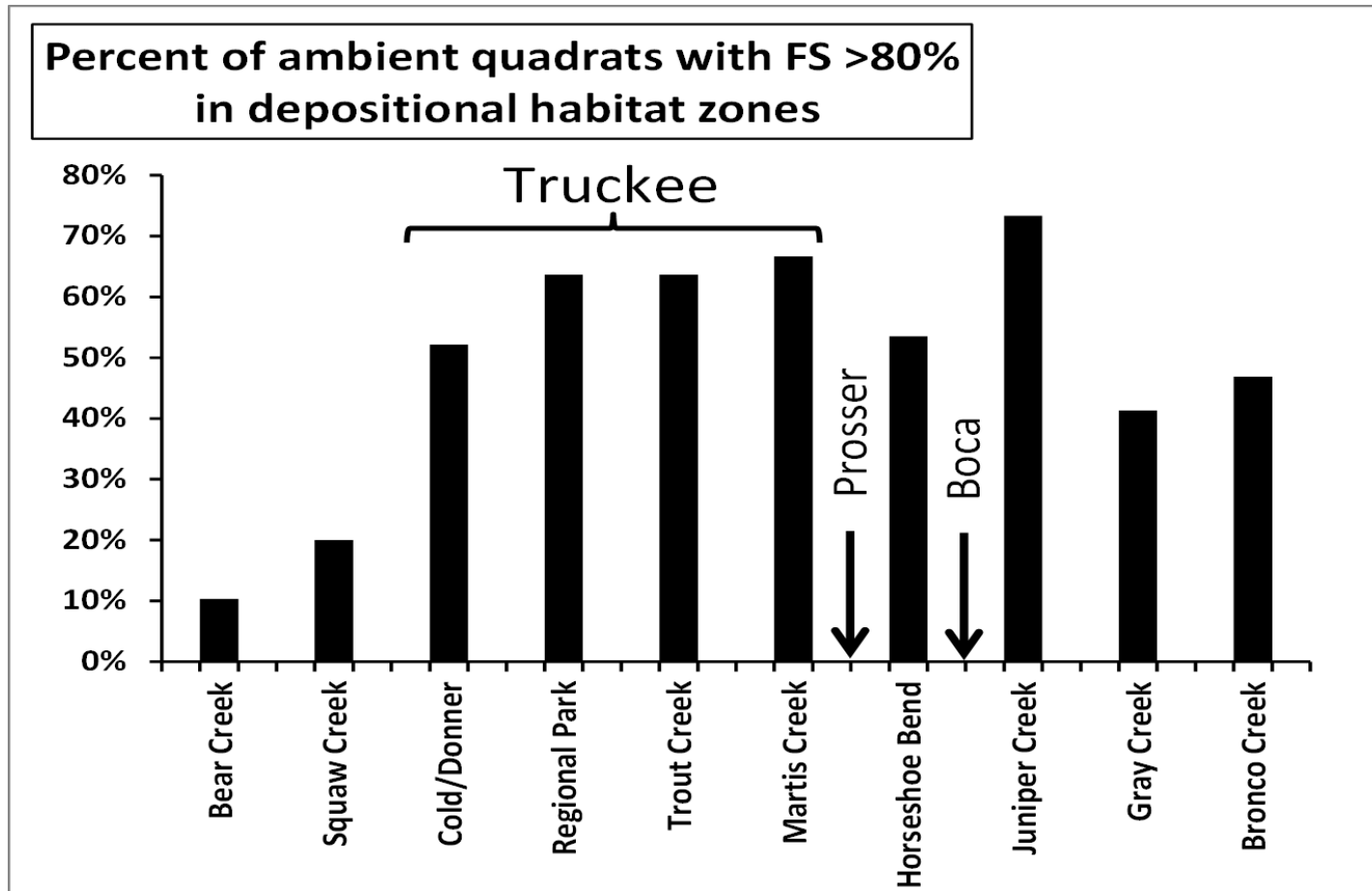


# Biological Impacts

- Food quality and quantity decreases
  - Fewer insects
  - Smaller body size
- Sensitive taxa are lost from the community
- Sediment thresholds
  - Impacts appear >20% fine and sand cover
  - Impacts significant at 80%



# Sediment Deposition is Widespread



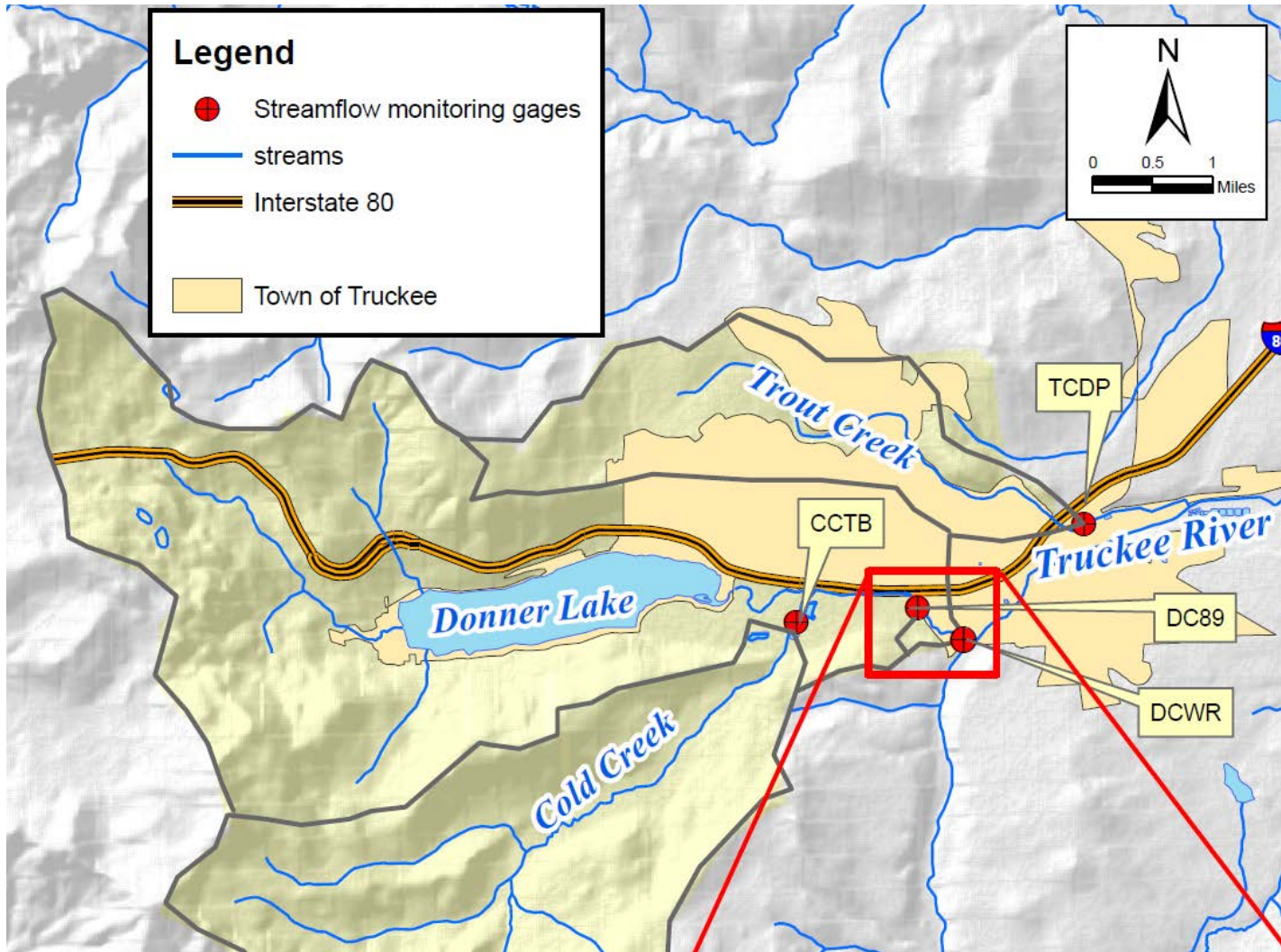
# Suspended Sediment Results

- Disconnect between bioassessment and sediment data





# Sediment and Turbidity Monitoring Stations on 3 key tributaries



# Suspended Sediment/Turbidity Results

In contrast to biological results....

- Tributaries meet suspended sediment concentration TMDL standard of 25 mg/L 90% of the time
- Truckee River meets TMDL standard - Town of Truckee & Placer County data
- Data from 2010 - 2014



# Beneficial Uses are Impaired

- TMDLs are developed to protect Beneficial Uses
- Biological data show increased sediment = decreased condition
- Sediment deposition is fairly widespread in our sampling reaches
- SSC data suggest current standard is met



# Importance of TRWC Monitoring

- Regulatory pressure to de-list Truckee
  - Suspended sediment standard met
- TRWC monitoring data provided support for Lahontan staff decision to not de-list



# Next Steps

- Additional standard for Truckee River tied to beneficial uses
- Continue implementation actions - *really* de-list Truckee!
- Continue Adopt a Stream monitoring



K. Fisher



B. Christman



# Thank you!

## Partners

- Town of Truckee
- Placer County

## Technical Advisory Committee

- CA Department of Water Resources
- Lahontan Regional Water Quality Control Board
- Town of Truckee
- Placer County
- U.S. Geologic Survey

## Funders

- State Water Resources Control Board
- Department of Water Resources
- Donors of the Truckee River Watershed Council



# Questions?

Reports available at: [www.truckeeriverwc.org](http://www.truckeeriverwc.org)

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