Bishop Paiute Tribe
Water Quality Monitoring Program

- Continuous Monitoring
  - Physical parameters monitored
  - 4 Stations
  - 2 Forks of Bishop Creek
  - Upstream and downstream
- Grab Samples
  - Bacteria
  - Nutrients
Water Quality Monitoring Program

- Benthic Macroinvertebrate Sampling
- Habitat Monitoring
- Chemical Sampling
WQ Database Lessons

• In the beginning....
WQ Database Lessons

- We made some advances....
## WQ Database Lessons

- **Excel**
- **Access**
- **Database**
- **Server**
- **Node**
- **WQX**
- **Cloud**

### Data Table

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<th>SW-4 Cond. μS/cm</th>
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<th>SW-4 Turbidity (NTU)</th>
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Bishop Paiute Tribe Water SW-4-CA

- State: California
- County: Inyo
- City: Bishop
- Address: Brockman and West Line Street
- Site coordinates:
  - Latitude: 37° 21' 50.00'' North (+37.35389)
  - Longitude: 116° 25' 53.00'' West (-116.43139)
  - Elevation: 1300 m (4265 ft)
- Maintained by: Bishop Paiute Tribe EMO-Water

CAMS 1022: Bishop Paiute Tribe Water SW-4-CA

- Area Map
- Overall site view not available
- Street level Map
- Upstream View not available
- Left Bank View not available
- Right Bank View not available
- Downstream View not available

CAMS Data
- Current Measurements
- Monthly Summary Report
- Yearly Summary Report
### Tot. Col.

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- Not Detected
- Not Used
- Present above Quantification Limit
- Present and below Quantification Limit

### E. coli

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- Not Detected
- Not Used
- Present above Quantification Limit
- Present and below Quantification Limit

### Enterococci

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- Not Detected
- Not Used
- Present above Quantification Limit
- Present and below Quantification Limit

### Site Information

- **Site:**
- **Date:** 1/4/2007
- **Time:**
- **Staff:**

### Lab Information

- **Lab:**
- **Lab Date:** 1/4/2007

### Notes

- **Notes:**
WQ Database Lessons

• YEDSS looked like it could work for Bishop
• Funded through the Exchange Network
• Tribes were encouraged to utilize YEDSS free of charge
• Bishop applied for an EN grant and was awarded!
• Then the work started...
• Web-based Ambient Water Quality Data Management System
• Built and maintained by Gold Systems
• Appx. 140M result records in WQX
  – AWQMS = 33M or 24% of WQX!!
• Community-based development approach
AWQMS

- Consolidate, Validate, Analyze, Assess, Share
- Built-in EPA Exchange Network Node Client
- Validates all of the WQX data rules
- QA/QC data as it is entered or imported
- Can also perform other “data scrubbing”
- Numerous additional features under way
• Imported approximately 6M continuous results
• Imported several years’ worth of bacteria tray counts and MPN values
• Generated corresponding 30 day geometric means for these values
AWQMS Enhancements

• Tools
  – MPN calculator for total coliforms and *E. coli* using the Colilert® method
  – Geometric Mean Calculator for bacteria using the Colilert® method
  – Public Portal Integration
The Bishop Paiute Tribe (BPT) Water Quality Control Program began in 1998, just 2 years after the Tribal Environmental Management Office (EMO) was established. During the formation of the Water Quality Control Program the EMO initiated a complete assessment of waters within the exterior boundaries of the Bishop Paiute Reservation. In April 2006, the Bishop Paiute Tribe was granted “Treatment in the Same Manner as a State (TAS)” under §518(e) of the Clean Water Act (CWA) for purposes of administering CWA §303(c) and §401. This approval awards the Tribe authority to administer water quality standards and issue certifications (§401) on the surface and groundwater of the Bishop Reservation.
AWQMS Public Portal

- Configurable by user
  - Lots of side benefits
- Why is this helpful to our WQCP?
  - Saving reports
  - External resource managers can obtain data and WQCP staff do not have to do additional work
Auto-Poll and Auto-Load Continuous Water Quality Data

- Connects to data loggers to retrieve new data
- Saves data in files on the AWQMS server
- Files are auto-imported into AWQMS
- Un-reviewed data can be reviewed in AWQMS
- Values can be accepted/rejected either individually or in batches
- AWQMS only sends summary data to WQX
Auto-Poll and Auto-Load Continuous Water Quality Data
Auto-Poll and Auto-Load
Continuous Water Quality Data

• Related Enhancements:
  – Optimized database for continuous data
  – New and improved graphing tools
    • Zoom in/out
    • Graph raw values or periodic averages
    • Ability to graph raw values with no line between points
    • Hover over the legend to highlight a series in the graph
    • ...and much, much more!
Auto-Poll and Auto-Load
Continuous Water Quality Data

• Next Steps:
  – Compare values against thresholds during auto-load
  – Trigger automatic email notifications to warn of key events
  – Release latest enhancements this Fall
Example Graph Screenshots
Example Graph Screenshots

Note: this graph may include values that are preliminary, unreviewed, or rejected.
Example Graph Screenshots

Single Parameter Line Graph

Turbidity (NTU)
01-01-2010 to 12-31-2010
Note: this graph may include values that are preliminary, unreviewed, or rejected
Future AWQMS Enhancements

• Double entry QA data entry form

[Diagram showing data entry process with steps:
Input file for
Data Entry - A
Data Entry - B
Comparison & Evaluation
Quality check
Final Output for delivery]
Future AWQMS Enhancements

- Data validation tools

Can Prevent Bad Data
Questions?

- BryAnna – BryAnna.Vaughan@BishopPaiute.org
- Mark – Mark.Lebaron@GoldSystems.com
AWQMS Public Portal