Tribes Partnering with Tribes - An Exchange Network Tribal Intersection

Whitney Warrior, Environmental Scientist and Quality Assurance Manager, Iowa Nation of Oklahoma
Background

• Iowa Tribe has been monitoring Water Quality data since 2000 and initially loaded it into STORET

• Vickie Kujawa, Director of Environmental Services
  – Joined the Iowa Tribe in August 2009
  – Worked with water quality Peer Trainers while employed by Flandreau Sioux and Southern Ute Tribes in Region VIII
  – Identified that the Iowa Tribe needed a water quality data management system that integrated with WQX
  – Wanted to set up a Peer Training group in Region VI like she saw working in Region VIII
Leveraging Other’s Efforts

• Vickie knew of the STORET/WQX efforts of Region VIII and wanted to mimic the success
• Solicited neighboring tribes in 2009 to create a consortium
• Found two other tribes with similar water quality data management needs
  – Sac and Fox Tribe of Oklahoma
    • Had historical data
  – Kickapoo Tribe of Oklahoma
    • Just starting a water quality program
• Needed funding
NEIEN Grant process

• Vickie knew of the NEIEN grant process from her time at Southern Ute Tribe
  – Used the previous grant responses from Region VIII grants as a template
  – Used the existing Ambient Water Quality Monitoring System (AWQMS) as the data management tool
  – Identified areas GIS, and reporting needs that the tribes would need
  – Proposed setting up Peer Training group to assist future tribes that join the consortium

• Won NEIEN grant!
NEIEN Grant Goals

- **Goal 1** – Implement AWQMS application and database
  - Status – Complete!
- **Goal 2** – Load water quality data and flow it to WQX regularly
  - Status – On-going
    - Initial data has been loaded, but will continue
- **Goal 3** – Creation of Peer Trainer Network
  - Status – On-going
    - Peer Trainers have been selected and are coming up to speed on the tools
- **Goal 4** – Provide Tribal Trainings
  - Status – On-going
    - Initial training is complete, this will be on-going through the grant
- **Goal 5** – Enhance database security for specific data sharing
  - Status – On-going
    - Task has been started and will be available for next training session (likely in the fall 2011)
- **Goal 6** – Enhance reporting, data analysis and integrate database with GIS component
  - Status – On-going
    - Map is deployed and working. Additional mapping features to be added as well as enhancements to graphing and statistical reporting.
NCAI Conference 2010

• Vickie met with Christa Tyrell of Fort Peck Tribe in Region VIII and Gold Systems
• Both tribes had won NEIEN grants with emphasis on water quality using AWQMS
• Endorsed collaboration between tribal groups to get more bang for buck
  – Fort Peck to enhance the biological data tracking and reporting of AWQMS
  – Iowa Tribe to focus on the GIS capabilities and other reporting needs in AWQMS
  – Both to support Peer Training efforts in each region but sharing documentation and best practices
AWQMS Capabilities

• Data Management
  • Managing Data into a Consistent Format Across the Region

• Data Sharing
  • Sharing Data locally, Regionally, and Nationally

• Data Analysis
  • Turning Data into Information
Data Management

- Enforces WQX Standards
- Provides Additional Data Elements for Local Use
- Provides Web-Based Interface to View / Edit Data
- Rapid Data Entry Windows for Field Data
- Flexible Import Tool to Load Data from Labs
- Secure Environment for Data Review (QA/QC)
Data Sharing

• Regional Solution Allows Tribes to Share Data with other Participating Tribes
• Generates WQX formatted XML files
• Integrated Node Client to Share Data Nationally via the Exchange Network
• Configurable Security Allows Tribes to Control who can View, Add, Edit, and Submit Data
Data Analysis

- Exporting
  - Flat File and CrossTab Format
- Reporting
  - Ad Hoc and Custom Reporting
- Graphing
  - Web-Based Graphing Module
- Mapping
  - Google Maps Mapping Interface
AWQMS Home Page
Data Analysis - Reporting

• Custom Reports
  – Percent Exceedence
  – Statistics by Location
  – Exceedence by Location
  – Quartiles
  – Activities and Results Summary
• Ad Hoc Reporting
Single Characteristic Line Graph

Activity Date between: 01-01-2005 and 12-31-2005 (MM-DD-YYYY)

Result Status:
- Accepted
- Final
- Preliminary
- Rejected
- Validated

Include results that are 'Not Detected' or 'Present Below Quantification Limit':
Use $1 \times$ MDL or LOL as the value

Select Monitoring Locations

Refresh Characteristics

Y-Axis Scale Logarithmic

Display values as:
- Don't show values
- Show values as labels
- Show values as tooltips on mouseover

Return  Continue  Save (for testing)
Quartiles Report

4/26/2011

Selected Locations(s):
- Blue River
- Red River
- Yellow River

Selected Date Range: 4/1/2008 12:00:00 AM - 10/1/2008 12:00:00 AM

Selected Characteristic: Temperature, water Fraction: Units: deg C

<table>
<thead>
<tr>
<th>Organization</th>
<th>Location</th>
<th>Min</th>
<th>25th Quartile</th>
<th>Median</th>
<th>75th Quartile</th>
<th>Max</th>
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<tbody>
<tr>
<td>Tribal Demo</td>
<td>ML1 ~ Blue River</td>
<td>23.10</td>
<td>16.70</td>
<td>24.30</td>
<td>19.4000</td>
<td>13.50</td>
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<td>Tribal Demo</td>
<td>ML2 ~ Red River</td>
<td>15.95</td>
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<td>17.1375</td>
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<td>13.8250</td>
<td>18.000</td>
<td>20.5500</td>
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</table>
Exceedence Report

**Percent Exceedance Report**
4/26/2011

**Selected Locations(s):**
- Blue River
- Red River
- Yellow River

**Selected Date Range:** 4/1/2008 12:00:00 AM - 10/1/2008 12:00:00 AM

**Selected Characteristic:** Temperature, water fraction

**Units:** deg C

**Lower Standard Entered:** 10 **Upper Standard Entered:** 20

### Location: Tribal Demo ML1 ~ Blue River

<table>
<thead>
<tr>
<th>Date</th>
<th>Value</th>
<th>Lower Standard</th>
<th>Upper Standard</th>
<th>Diff</th>
<th>%Diff</th>
<th>Exceedance?</th>
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<tr>
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<td>20</td>
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<td>20</td>
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<tr>
<td>9/15/2008</td>
<td>16.70</td>
<td>10</td>
<td>20</td>
<td></td>
<td></td>
<td>No</td>
</tr>
</tbody>
</table>

**ML1 ~ Blue River Summary**

- **Number Values:** 7
- **Mean Value:** 19.014286
- **Mean Exceedance Value:** 23.633333
- **Number Exceedances:** 3
- **Mean Exceedance Diff:** 3.633333
- **Percent Exceedances:** 43%
- **Mean Exceedance % Diff:** 18%

### Location: Tribal Demo ML2 ~ Red River

<table>
<thead>
<tr>
<th>Date</th>
<th>Value</th>
<th>Lower Standard</th>
<th>Upper Standard</th>
<th>Diff</th>
<th>%Diff</th>
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<td>15.70</td>
<td>10</td>
<td>20</td>
<td></td>
<td></td>
<td>No</td>
</tr>
</tbody>
</table>
Data Analysis - Graphing

• Graph Types
  – Line Graphs
  – Bar Graphs
  – Box and Whiskers Plot
  – Bi-Variate Scatter Plot

• Graph Features
  – Log Scale
  – Regression Line
  – Standards Line
  – Single or Multiple Characteristic
  – Multi Scale
Multiple Characteristic Mean Line/Bar Graph

Dates: 04-01-2008 to 10-01-2008

- **ML1** ~ Blue River
- **ML2** ~ Red River
- **ML3** ~ Yellow River

**Measure**

- Dissolved oxygen (DO) ~ mg/l
- Temperature, water ~ deg C
Data Analysis - Mapping

- Google Map Interface
- Layers for USGS and State Data
- Drill down to view Raw Data
- Criteria Selection Page
- Report and Graph Integration
Google Maps Interface
Drill Down to AWQMS Data
Drill Down to USGS Data Pages

Water Quality Samples for the Nation

The data you have secured from the USGS NWISWeb database may include data that have not received Director's approval and as such are provisional and subject to revision. The data are released on the condition that neither the USGS nor the United States Government may be held liable for any damages resulting from its authorized or unauthorized use.

To view additional data-quality attributes, output the results using these options: one result per row, expanded attributes. Additional precautions are at: http://waterdata.usgs.gov/nwis/qwdata?help#Data_retrievals_precautions.

USGS 352330097014601 11N-03E-30 CDC 1

Available data for this site: Water-Quality: Field/Lab samples

Pottawatomile County, Oklahoma
Hydrologic Unit Code 11100302
Latitude 35°23′30″, Longitude 97°01′46″ NAD27
Land-surface elevation 1,030 feet above NGVD29
This well is completed in the Quaternary Alluvium (110ALVM) local aquifer.

Output formats

- Parameter Group Period of Record table
- Inventory of available water-quality data for printing
- Inventory of water-quality data with retrieval
- Tab-separated data, one result per row
- Tab-separated data one sample per row with remark codes combined with values
Drill Down to State Data Pages
Exceedence Mapping
Collaboration with Region VIII

• Map built and deployed for both groups
• Additional reporting features being deployed by the end of May
  – e.g. Regression line for scatter plots
• Region VIII has completed first phase of biological data inventory and are proceeding to enhancements of system
  – First phase should be completed by mid-summer
Secondary Collaboration

• AWQMS was originally built for States but is used by many organizations

• Tribal Programs
  – Regions VI
    • Iowa Tribe, Kickapoo, Sac and Fox Tribes, Chickasaw Nation
  – Region VIII
    • 20 of 21 Tribes with Water Programs
  – Region X
    • Nez Perce Tribe
Secondary Collaboration

• State Programs
  – Alaska, Iowa, Illinois, Kansas, Maryland, and Utah

• Volunteer / Watershed Programs
  – Colorado Data Sharing Network
    • 17 Organizations from Municipalities, Universities, Watershed Management Groups
  – Leonard Rice Engineers
    • Provide AWQMS to several volunteer programs

• AWQMS is built so users can collaborate on enhancements
What’s Next

• Add additional Region VI tribes
• Continue to work with other AWQMS users
• Prepare to take over O&M after grant
  – Hosting costs are currently $500 a month for the three tribes ($167 per tribe)
  – As more tribes join get a discount (Region VIII is about $100 a tribe per month)
  – Need to also fund user support, but will be less with the Peer Trainers being able to provide most of it
Mapping Demo

http://r6tribesmap.goldsystems.com/

http://r8tribesmapdev.goldsystems.com/
Questions?

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