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

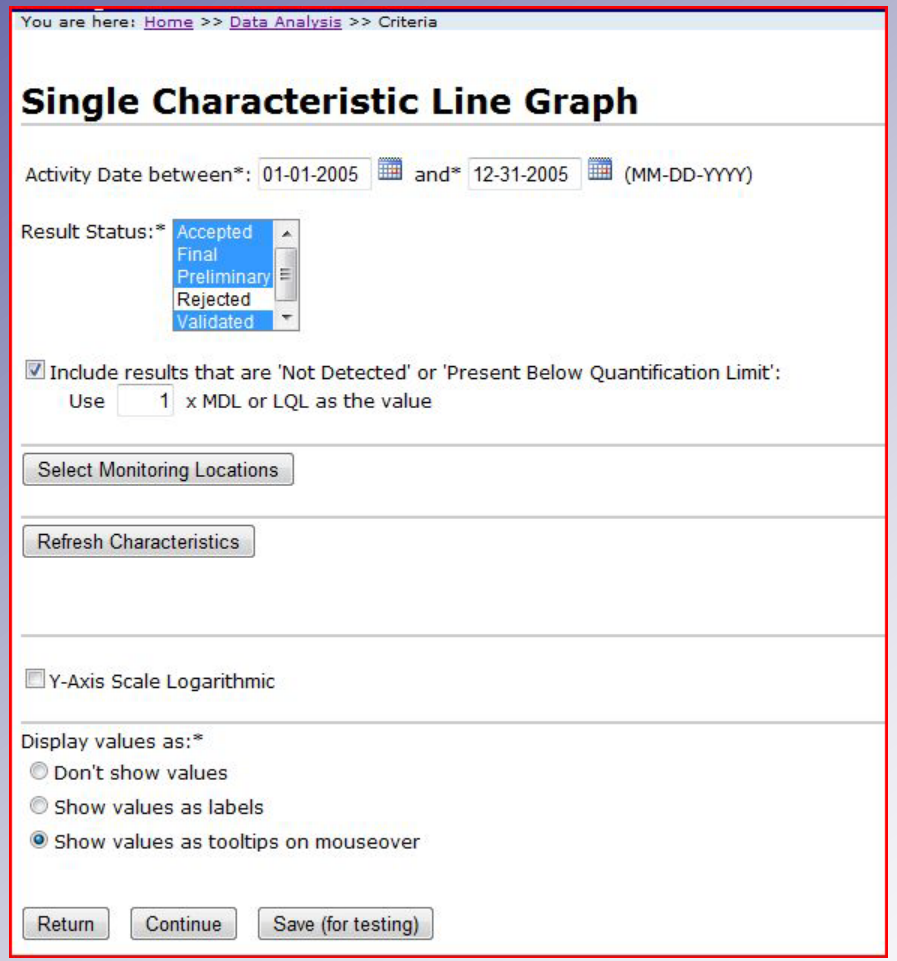
- Exporting
  - Flat File and CrossTab Format
- Reporting
  - Ad Hoc and Custom Reporting
- Graphing
  - Web-Based Graphing Module
- Mapping
  - Google Maps Mapping Interface

AWQMS Home Page

Data Analysis - Reporting

- Custom Reports
  - Percent Exceedence
  - Statistics by Location
  - Exceedence by Location
  - Quartiles
  - Activities and Results Summary
- Ad Hoc Reporting

Data Analysis Criteria Page



Quartiles Report

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

Organization	Location	Min	25th Quartile	Median	75th Quartile	Max
Tribal Demo	ML1 ~ Blue River	23.10	16.70	24.300	19.4000	13.50
Tribal Demo	ML2 ~ Red River	15.95	15.7625	17.150	17.1375	24.30
Tribal Demo	ML3 ~ Yellow River	13.35	13.8250	18.000	20.5500	10.50

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

Date	Value	Lower Standard	Upper Standard	Diff	%Diff	Exceedance?
4/14/2008	13.50	10	20			No
5/14/2008	15.30	10	20			No
6/16/2008	23.50	10	20	3.50	18%	Yes
7/15/2008	24.30	10	20	4.30	22%	Yes
8/13/2008	23.10	10	20	3.10	16%	Yes
9/15/2008	16.70	10	20			No
9/15/2008	16.70	10	20			No

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%

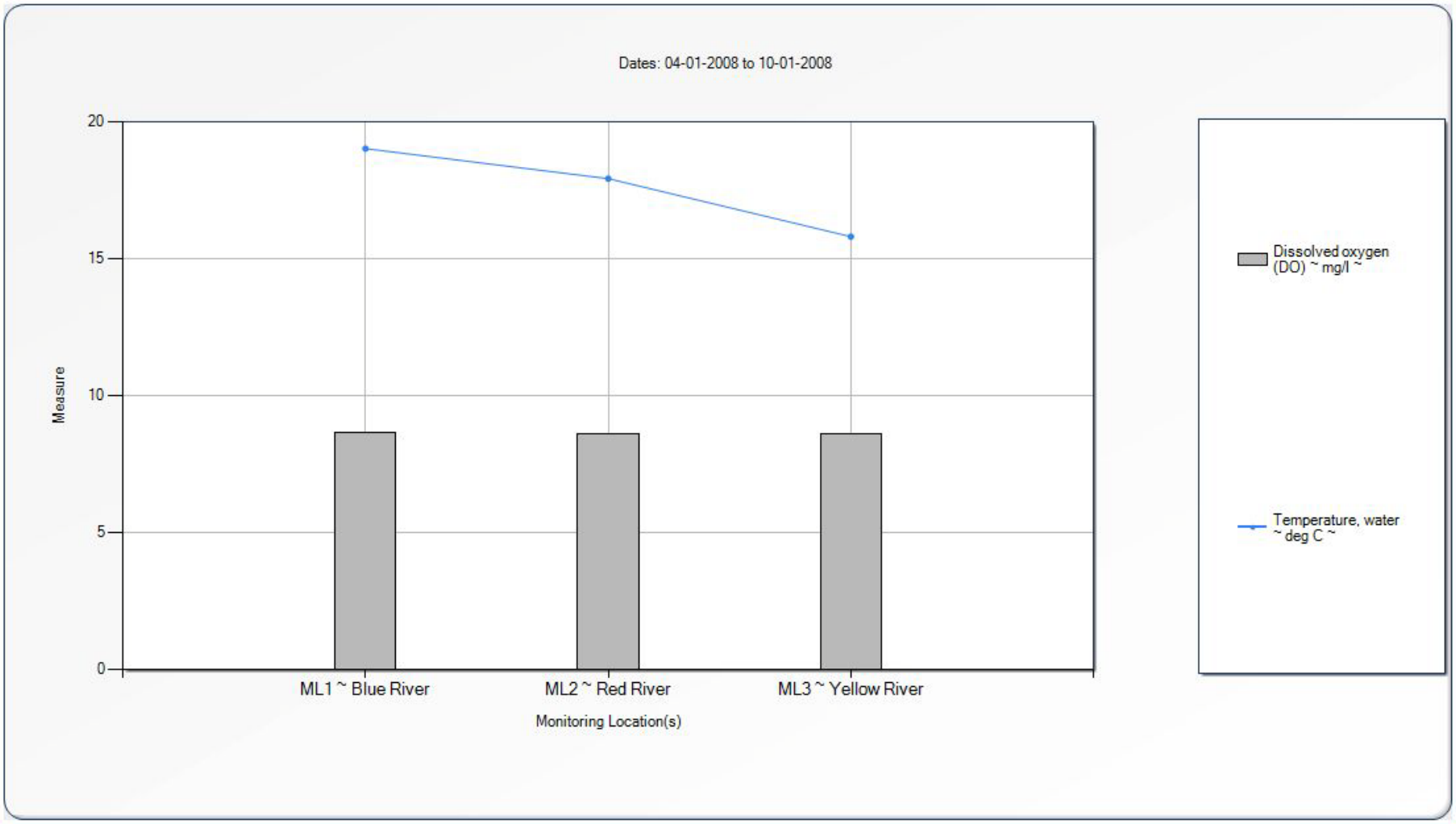
Location: Tribal Demo ML2 ~ Red River

Date	Value	Lower Standard	Upper Standard	Diff	%Diff	Exceedance?
4/14/2008	12.60	10	20			No
6/14/2008	15.70	10	20			No

Data Analysis - Graphing

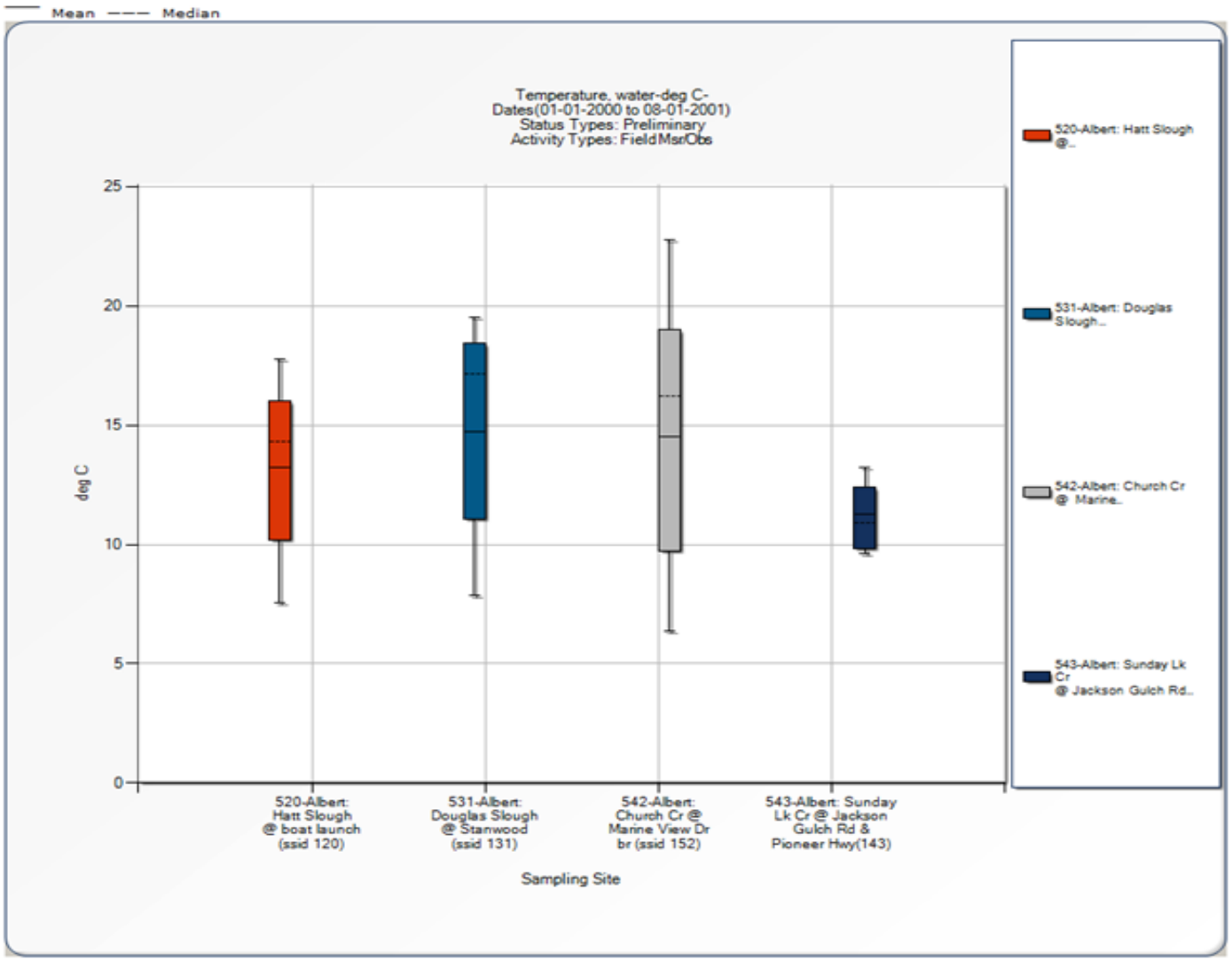
- Graph Types
  - Line Graphs
  - Bar Graphs
  - Box and Whiskers Plot
  - Bi-Variate Scatter Plot
- Graph Features
  - Log Scale
  - Regression Line
  - Standards Line
  - Single or Multiple Characteristic
  - Multi Scale

Multiple Characteristic Mean Line/Bar Graph



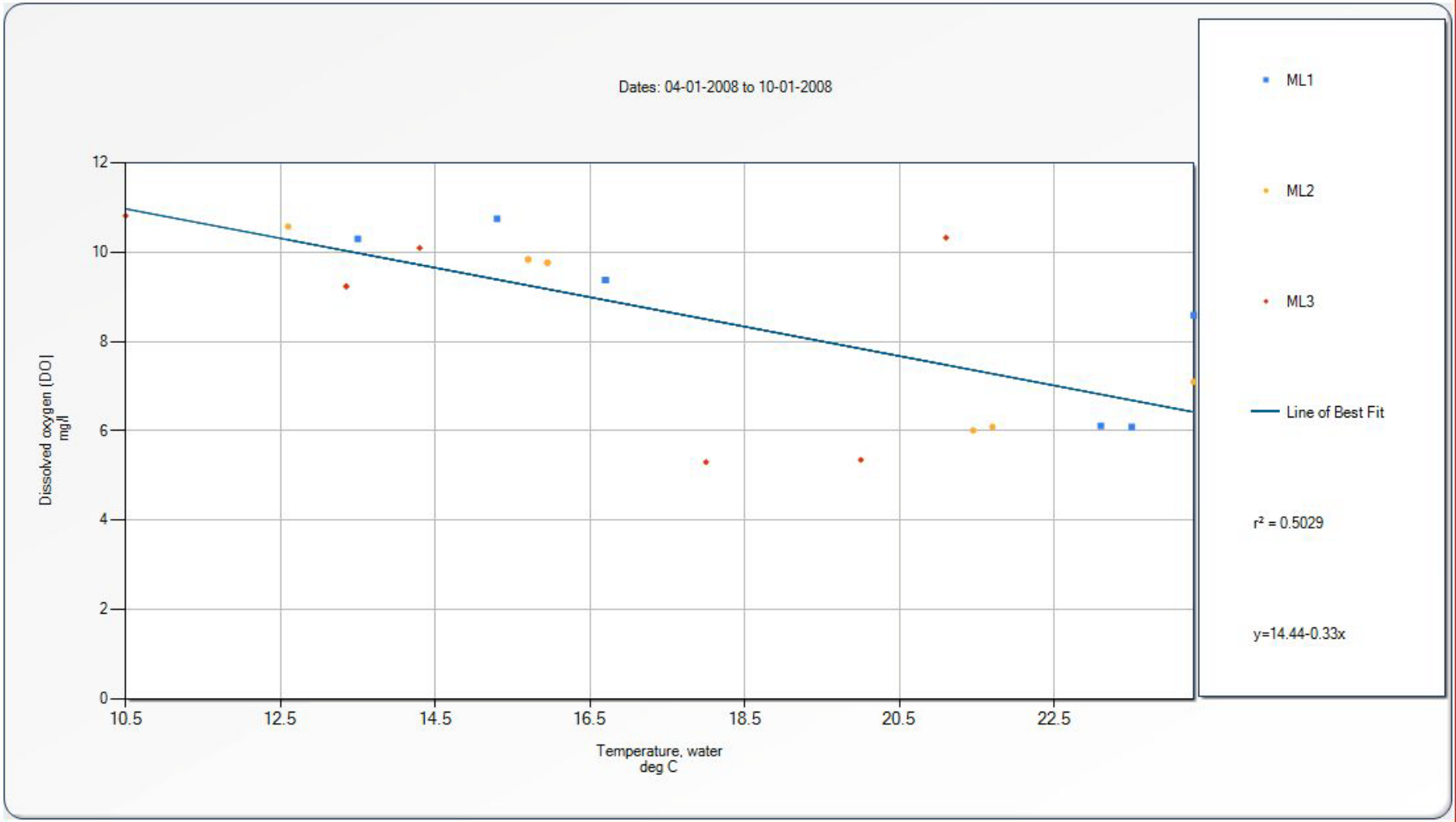
Ambient Water Quality Monitoring System

Box and Whiskers Plot

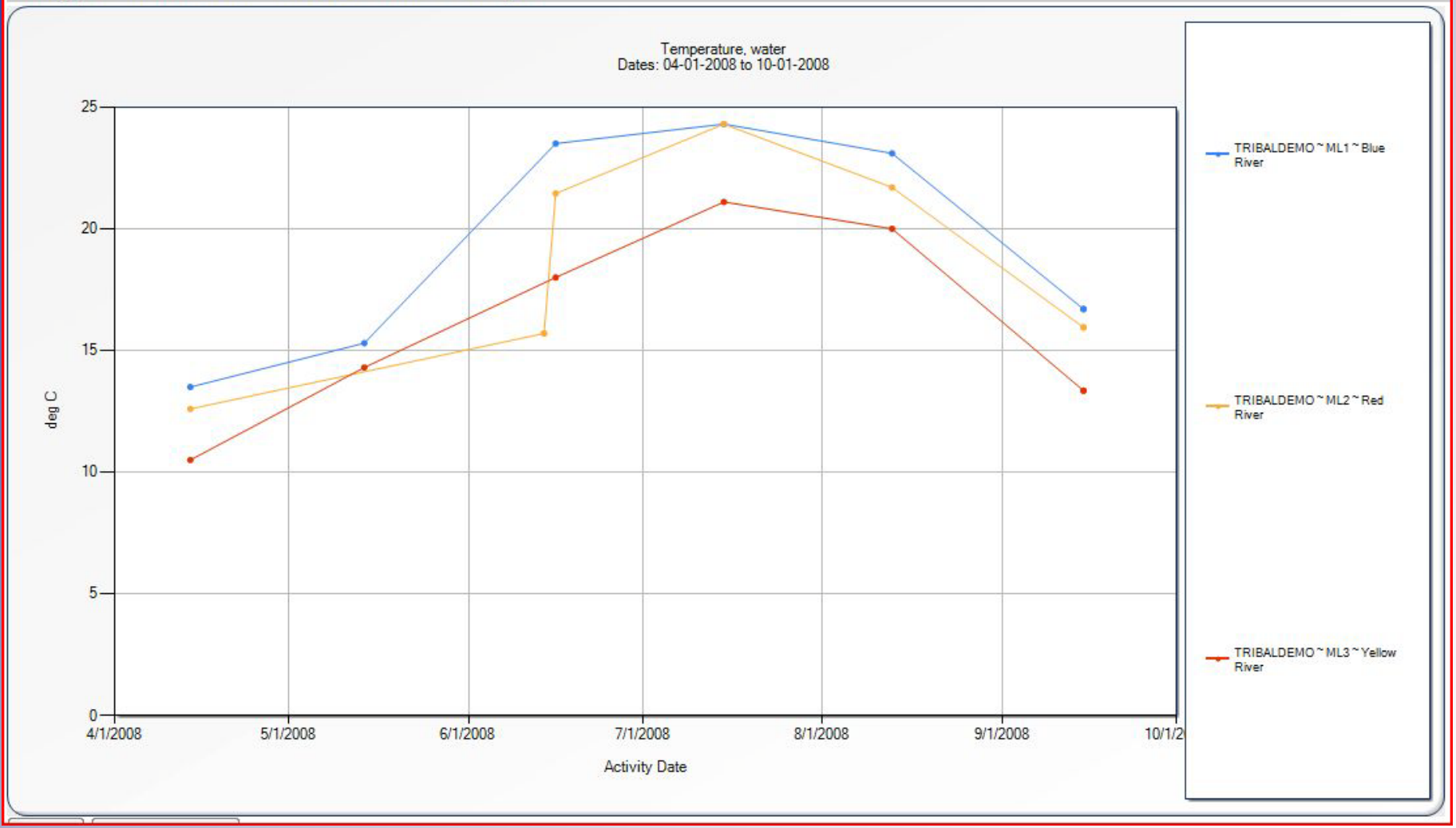


Return | Export To Excel

Bi-variate Scatter Plot



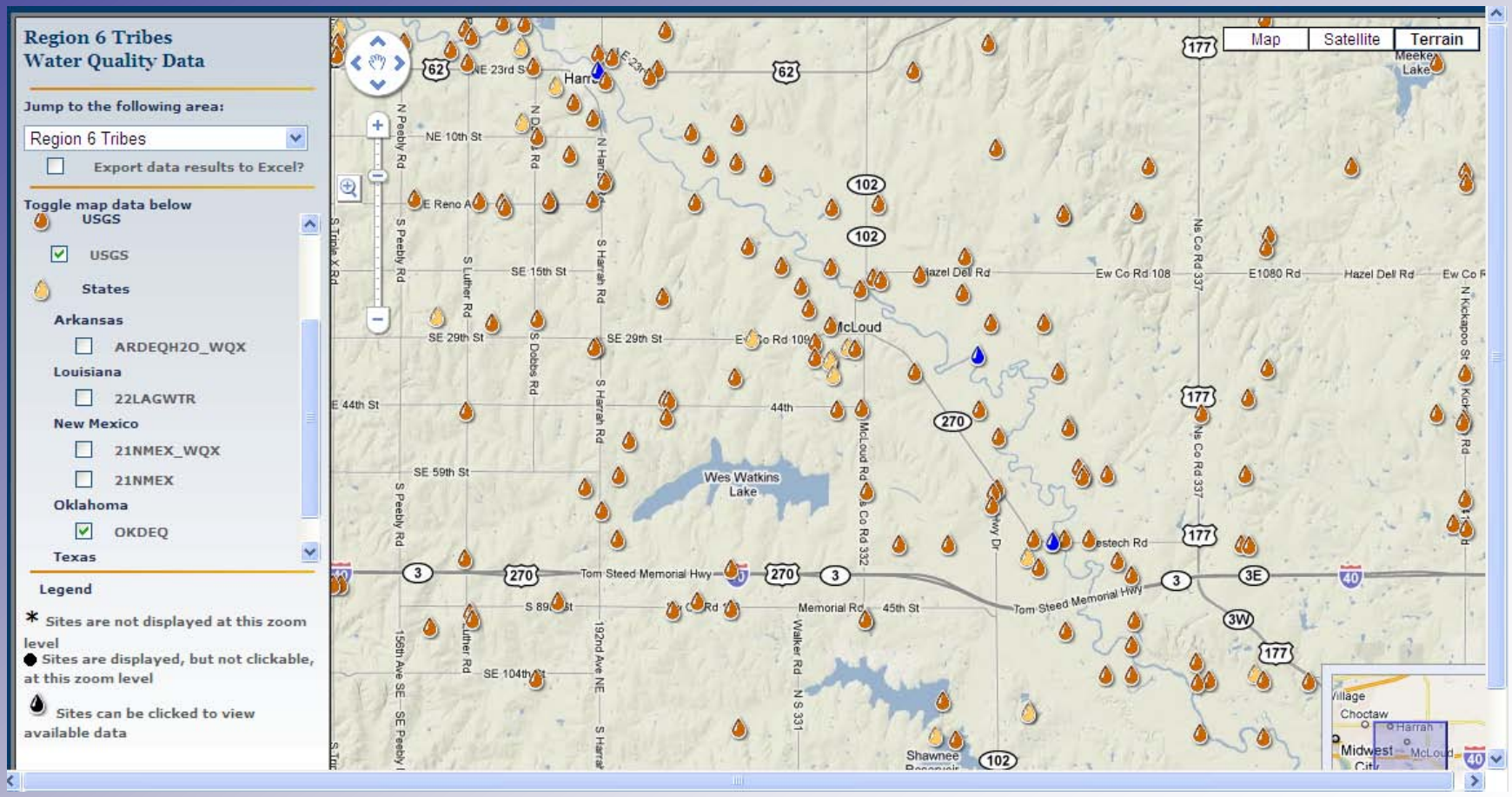
Single Characteristic Line Graph



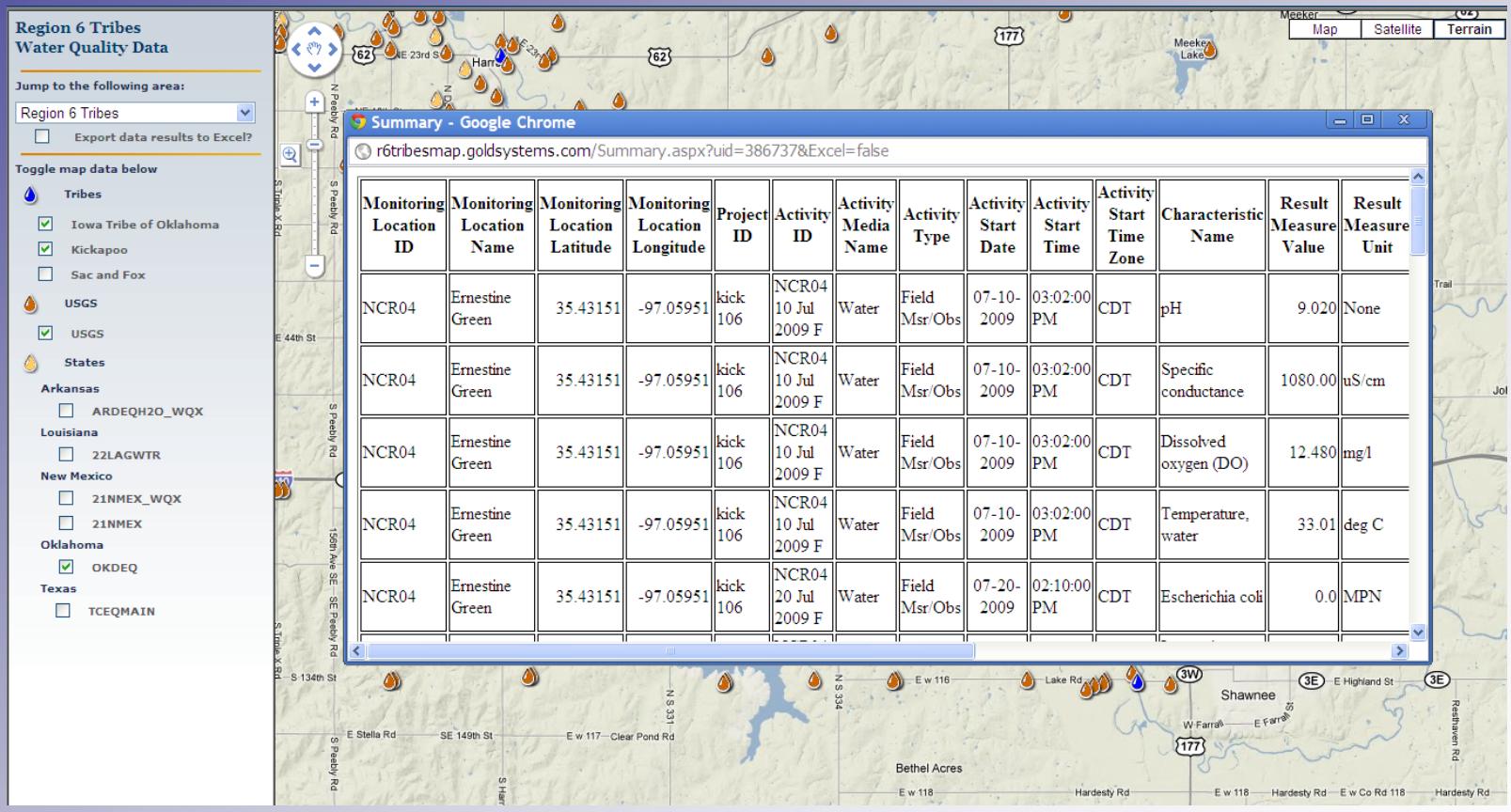
Data Analysis - Mapping

- 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



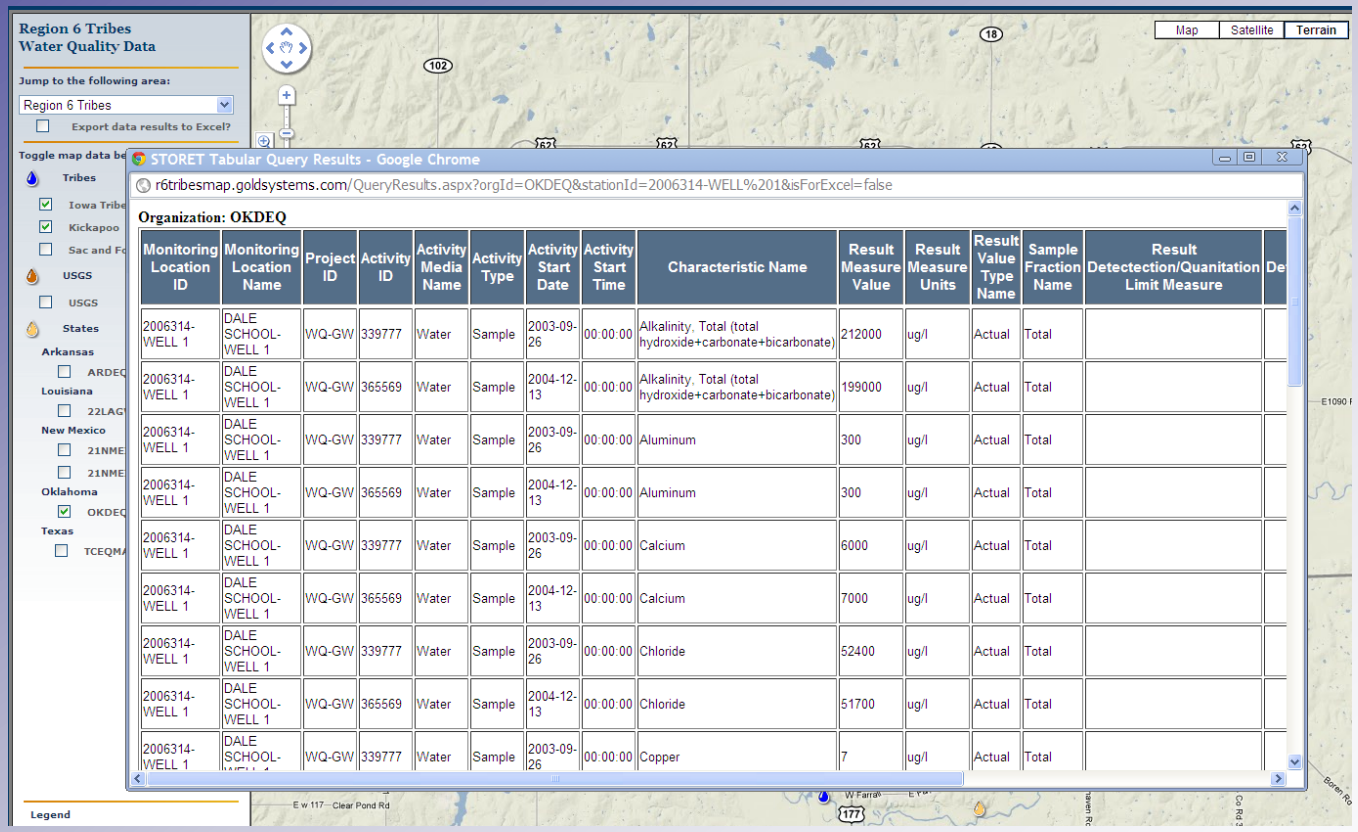
Drill Down to AWQMS Data



Monitoring Location ID	Monitoring Location Name	Monitoring Location Latitude	Monitoring Location Longitude	Project ID	Activity ID	Activity Media Name	Activity Type	Activity Start Date	Activity Start Time	Activity Start Time Zone	Characteristic Name	Result Measure Value	Result Measure Unit
NCR04	Ernestine Green	35.43151	-97.05951	kick 106	NCR04 10 Jul 2009 F	Water	Field Msr/Obs	07-10-2009	03:02:00 PM	CDT	pH	9.020	None
NCR04	Ernestine Green	35.43151	-97.05951	kick 106	NCR04 10 Jul 2009 F	Water	Field Msr/Obs	07-10-2009	03:02:00 PM	CDT	Specific conductance	1080.00	uS/cm
NCR04	Ernestine Green	35.43151	-97.05951	kick 106	NCR04 10 Jul 2009 F	Water	Field Msr/Obs	07-10-2009	03:02:00 PM	CDT	Dissolved oxygen (DO)	12.480	mg/l
NCR04	Ernestine Green	35.43151	-97.05951	kick 106	NCR04 10 Jul 2009 F	Water	Field Msr/Obs	07-10-2009	03:02:00 PM	CDT	Temperature, water	33.01	deg C
NCR04	Ernestine Green	35.43151	-97.05951	kick 106	NCR04 20 Jul 2009 F	Water	Field Msr/Obs	07-20-2009	02:10:00 PM	CDT	Escherichia coli	0.0	MPN

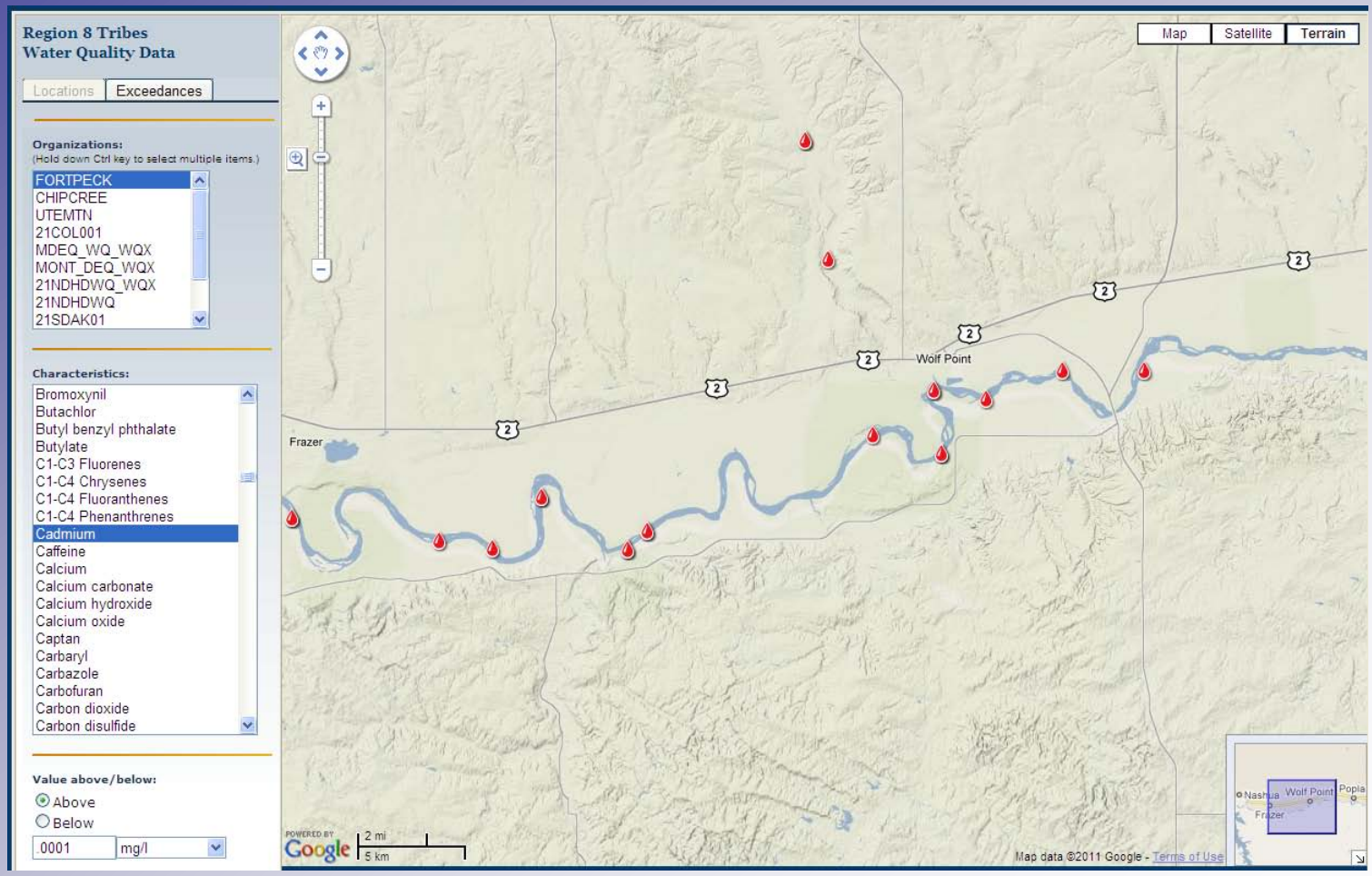
Drill Down to USGS Data Pages

Drill Down to State Data Pages



Monitoring Location ID	Monitoring Location Name	Project ID	Activity ID	Activity Media Name	Activity Type	Activity Start Date	Activity Start Time	Characteristic Name	Result Measure Value	Result Measure Units	Result Value Type Name	Sample Fraction Name	Result Detectection/Quanitation Limit Measure	De
2006314-WELL 1	DALE SCHOOL-WELL 1	WQ-GW	339777	Water	Sample	2003-09-26	00:00:00	Alkalinity, Total (total hydroxide+carbonate+bicarbonate)	212000	ug/l	Actual	Total		
2006314-WELL 1	DALE SCHOOL-WELL 1	WQ-GW	365569	Water	Sample	2004-12-13	00:00:00	Alkalinity, Total (total hydroxide+carbonate+bicarbonate)	199000	ug/l	Actual	Total		
2006314-WELL 1	DALE SCHOOL-WELL 1	WQ-GW	339777	Water	Sample	2003-09-26	00:00:00	Aluminum	300	ug/l	Actual	Total		
2006314-WELL 1	DALE SCHOOL-WELL 1	WQ-GW	365569	Water	Sample	2004-12-13	00:00:00	Aluminum	300	ug/l	Actual	Total		
2006314-WELL 1	DALE SCHOOL-WELL 1	WQ-GW	339777	Water	Sample	2003-09-26	00:00:00	Calcium	6000	ug/l	Actual	Total		
2006314-WELL 1	DALE SCHOOL-WELL 1	WQ-GW	365569	Water	Sample	2004-12-13	00:00:00	Calcium	7000	ug/l	Actual	Total		
2006314-WELL 1	DALE SCHOOL-WELL 1	WQ-GW	339777	Water	Sample	2003-09-26	00:00:00	Chloride	52400	ug/l	Actual	Total		
2006314-WELL 1	DALE SCHOOL-WELL 1	WQ-GW	365569	Water	Sample	2004-12-13	00:00:00	Chloride	51700	ug/l	Actual	Total		
2006314-WELL 1	DALE SCHOOL-WELL 1	WQ-GW	339777	Water	Sample	2003-09-26	00:00:00	Copper	7	ug/l	Actual	Total		

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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