

Data Management, Integration and Sharing at the State and Regional Level

Seventh National Monitoring Conference - Monitoring
From the Summit to the Sea

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Denver, Colorado



Overview

- Regional Data Sharing
 - Program Partners
 - Challenges
 - Benefits
- Using WQX as a Standard
- Program Outcomes
- Walkthrough of the Ambient Water Quality Management System (AWQMS)

Program Partners

- Region VIII Tribal Programs
 - 24 Tribal Programs in MT, UT, CO, ND, SD, & WY
- Colorado Data Sharing Network
 - Consortium of State, Local, and Volunteer Programs Throughout Colorado

Objectives

- Provide a regional platform for data sharing that would allow program partners to share data in a secure private environment.
- Develop integrated reporting and data analysis tools on this shared data.
- Leverage existing tools where available.

Data Sharing Challenges

- Varying Data Formats
 - Word, Excel, Access, SQL, Oracle, paper
- Data Compatibility
 - Data Elements
 - Data Domains
- Data Integration
 - How to Integrate Partner Data into Tools
 - Node to Node
 - Web Services
 - Regional Repository

Regional Data Sharing Benefits

■ Data Consistency

- Allows for Easy Data Sharing with Partners
- Up-Stream / Down-Stream Influences
- Overlapping Monitoring Efforts
- Shared Experiences

■ Peer Program Support

- Data Management
- Data Analysis

WQX as a Standard

- Addresses Comparability and Consistency
- Single Standard for:
 - Regional Data Sharing
 - Sharing with External Partners via the Exchange Network
 - STORET Submission via CDX
- Leverage Web Services for External Data Integration

AWQMS as a Solution

- Enforces WQX Standards
- Regional Repository
- Provides Additional Data Elements for Local Use
- Secure Environment for Data Review (QA/QC)
- Integrated Analytical Graphs and Reports
- Integrated Node Client for National Sharing
- Future Integration of Google Map

Region VIII Tribal Network

- 20 of 21 Tribes with Water Programs Participate
- Share data across all of EPA Region VIII
- Provides Access to Regional EPA for Data Review and Analysis
- View Partner Data via Reports and Graphs
- Configurable Security
 - Restricted Add, Edit, View Rights
 - Peer Trainer Assistance Capabilities
- Leveraged State AWQMS Development

Colorado Data Sharing Network

- 17 Organizations are Participating
- Data from Municipalities, Universities, Watershed Management Groups
- Developing Regional Map for Public Access
 - Customization
 - User Tracking
- Leveraged State and Tribal Development Efforts
- RiverWatch alone submitted over 400,000 results

AWQMS Walkthrough



Home

[Import Configurations](#)[Create New Dataset](#)[Datasets](#)[Lookup Tables](#)[Organizations](#)[Projects](#)[Monitoring Locations](#)[Activities](#)[Activity Groups](#)[Bio/Habitat Indices](#)[Data Analysis](#)[WQX Export](#)[Event Log](#)[User Information](#)[Rapid Entry](#)[Preferences](#)[Logout](#)

WQX
WATER QUALITY EXCHANGE

Welcome!

The following links will assist you with the most common features of the application:

[Create or Edit an Import Configuration](#): Create a reusable configuration that describes what your import file looks like and how it maps to data elements in this system.

[Create a New Dataset](#): Import a set of data that can be validated and corrected before making it final.

[Continue with an Existing Dataset](#): Continue where you left off on an existing dataset.

[Review Lookup Values](#): Review the list of allowed values for a specific domain or add values to organization-specific lists of values.

[AWQMS User Guide](#) | [AWQMS Forums](#) | [STORET - WQX](#)

AWQMS Data Forms

The screenshot displays the 'Ambient Water Quality Monitoring System' (AWQMS) web application. The interface features a blue header with the 'goldsystems' logo and version 'ver. 1.11.02.12'. A left sidebar contains a navigation menu with icons and labels for various system functions: Import Configur..., Create New Data..., Datasets, Lookup Tables, Organizations, Projects, Monitoring Locat..., Activities, Activity Groups, Bio/Habitat Indici..., Data Analysis, WQX Export, Event Log, User Information, Rapid Entry, Preferences, and Logout. The main content area is titled 'Activity Detail' and contains several sections for data entry:

- Activity Description:** Includes fields for Activity ID, Organization ID, Start Date (with Time and Time Zone dropdowns), End Date (with Time and Time Zone dropdowns), Projects (with an 'Add' button), Type, Media, Media Subdivision, Personnel (with an 'Add' button), Conducting Organization (with an 'Add' button), and a Comment text area.
- Activity Location:** Includes a Monitoring Location dropdown, Latitude and Longitude fields (each with Deg, Min, and Sec sub-fields), a 'Map Latitude/Longitude' link, Horizontal Coordinate System dropdown, Horizontal Collection Method dropdown, Horizontal Accuracy (with Units dropdown), Source Map Scale (with a '1:' prefix), Actual Depth/Height (with Units dropdown), Relative Depth (with a dropdown), Top Depth/Height (with Units dropdown), Bottom Depth/Height (with Units dropdown), and Depth/Altitude Reference Point.
- Sample Description:** Includes Collection Method and Equipment dropdowns.

- View, Add, Edit all WQX Data Elements

AWQMS – Import Configuration

Ambient Water Quality Monitoring System
You are here: [Home](#) >> [Import Configurations](#) >> Import Configuration Detail

goldsystems
ver. 1.11.02.12

Import Configuration Detail

Ambient Water Quality Monitoring System (Demo)
You are here: [Home](#) >> [Import Configurations](#) >> [Import Configuration Detail](#) >> Translations

Translations

Del	Translate From: Value from Import File	Translate To: Characteristic Name
<input type="checkbox"/>	Pb	Lead
<input type="checkbox"/>		{None}


[Return](#) [Save](#) [Cancel](#) [Delete](#)

[AWQMS User Guide](#) | [AWQMS Forums](#) | [STORET - WQX](#)

Remove	8	Activity Start Time		HH24:MI	0	Add/Edit
Remove	9	Activity Start Time Zone	{none}		0	Add/Edit
Remove	10	Activity Depth/Height Measure			0	Add/Edit
Remove	11	Activity Depth/Height Unit	{none}		0	Add/Edit
Remove	12	Activity Comment			0	Add/Edit
Remove	13	Sample Collection Method ID	{none}		0	Add/Edit
Remove	14	Sample Collection Equipment Comment			0	Add/Edit

- Allows Users to Map Their Data to AWQMS

AWQMS – Rapid Data Entry



Ambient Water Quality Monitoring System
You are here: [Home](#) >> Rapid Entry

goldsystems
ver. 1.11.02.12

Import Configurations

Create New Dataset

Datasets

Lookup Tables

Organizations

Projects

Monitoring Locations

Activities

Activity Groups

Bio/Habitat Indices

Data Analysis

WQX Export

Event Log

User Information

Rapid Entry

Preferences

Logout

Rapid Entry

Project ID

Monitoring Location ID

Activity ID

Activity Start Date

Activity Start Time

Activity Start Time Zone

Activity Type

Sample Collection Method ID

Sample Collection Equipment Name

Activity Media Name

Activity Depth/Height Measure

Activity Depth/Height Unit

Organization ID

Characteristic Name	Result Value	Result Value Type	Result Status ID	Result Detection Condition	Characteristic Name	Method Speciation	Result Sample Fraction	Result Unit	Result Analytical Method ID	Result Analytical Method Context	Result Detection/Quantitation Limit Type	Detection Limit
Dissolved oxygen (DO)	<input type="text"/>	Actual	Final	<input type="text"/>	Dissolved oxygen (DO)		Total	mg/l	4500-O-G	APHA	Instrument Detection Level	.01
pH	<input type="text"/>	Actual	Final	<input type="text"/>	pH		Total	None	150.1	USEPA	Instrument Detection Level	.01
Specific conductance	<input type="text"/>	Actual	Final	<input type="text"/>	Specific conductance		Total	uS/cm	120.1	USEPA	Instrument Detection Level	1
Temperature, air	<input type="text"/>	Actual	Final	<input type="text"/>	Temperature, air		Total	deg C			Instrument Detection Level	.1
Temperature, water	<input type="text"/>	Actual	Final	<input type="text"/>	Temperature, water		Total	deg C	2550	APHA	Instrument Detection Level	.1
Turbidity	<input type="text"/>	Actual	Final	<input type="text"/>	Turbidity		Total	NTU	180.1	USEPA	Instrument Detection Level	.01
Velocity - stream	<input type="text"/>	Actual	Final	<input type="text"/>	Velocity - stream		Total	ft/sec			Instrument Detection Level	.05
Conductance	<input type="text"/>	Actual	Final	<input type="text"/>	Conductivity		Total	uS/cm	120.1	USEPA	Instrument Detection Level	1

Return
Save
Save and Add New
Cancel

- Leveraged Capabilities of Import Configurations
- Fully Customizable

AWQMS – Graphs



■ Regional Graphing Capabilities

Standardized Reporting

Percent Exceedance Report									
Number Exceedances per Location Report									
4/27/2010									
Single Characteristic Statistics by Location Report									
4/27/2010									
Quartiles Report									
4/27/2010									
Selected Organization	Selected Organization	Selected Organization(s): WQXTEST							
Selected Location	Selected Location	WQXTEST							
		WQXTEST							
Selected Date	Selected Date	Selected Locations(s): WQXTEST							
Selected Characteristic	Selected Characteristic	ML1							
Lower Standard	Lower Standard	Red River							
		WQXTEST							
		ML2							
		Blue River							
		WQXTEST							
		ML3							
		Yellow River							
Location: Test C	Location: Test C	Selected Date Range: 4/1/2008 - 9/30/2008							
Date	Date	Selected Characteristic: pH Fraction: Units: None							
4/14/2008	4/14/2008								
5/14/2008	6/16/2008								
6/16/2008	7/15/2008								
7/15/2008	9/15/2008								
8/13/2008	Location Exceedance								
9/15/2008									
		Organization	Organization	Location	Min	25th Quartile	Median	75th Quartile	Max
ML1 ~ Red River	Location: Test C	Test	Test	ML1 ~ Red River	8.5	8.7575	8.790	8.8600	8.89
Number Values	Date	Organization	Organization						
Number Exceedances	Char	Test	Test	ML2 ~ Blue River	8	8.88	8.885	8.9350	8.99
Percent Exceedance		Organization	Organization						
	4/14/2008								
	6/16/2008								
	7/15/2008	pH		8.89	None	8.75	2%		
	8/13/2008	pH		8.99	None	8.75	3%		
	9/15/2008	pH		8.95	None	8.75	2%		

■ Reports & Graphs Leverage Same Criteria Page

AWQMS – Export

Microsoft Excel - FlatFile.txt

File Edit View Insert Format Tools Data Window Help

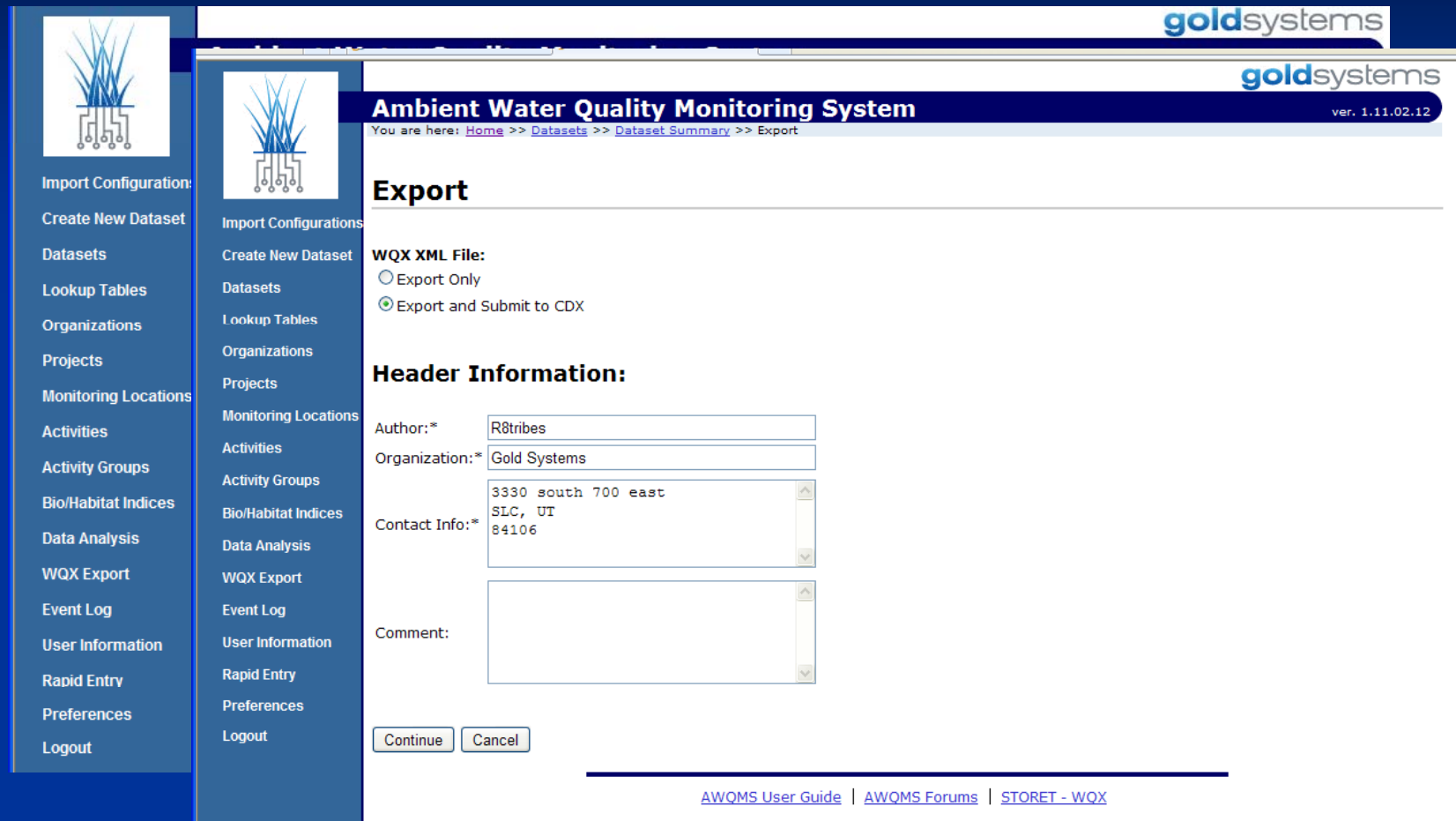
Microsoft Excel - ExportData.xls

File Edit View Insert Format Tools Data Window Help

	A	B	C	D	E	F	G
1							
2							
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5							
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32							
33	ML209152008F	Field Msr/Obs	Water	9/15/2008	12:14:00 PM MDT		
34	ML209152008F	Field Msr/Obs	Water	9/15/2008	12:14:00 PM MDT		
35	ML208132008F	Field Msr/Obs	Water	8/13/2008	2:29:00 PM MDT		

- Multiple Export Formats

AWQMS Node Client



The screenshot displays the AWQMS Node Client interface. The top navigation bar includes the 'goldsystems' logo and the version 'ver. 1.11.02.12'. The main header reads 'Ambient Water Quality Monitoring System'. Below this, a breadcrumb trail shows 'You are here: Home >> Datasets >> Dataset Summary >> Export'. The left sidebar contains a menu with options: Import Configuration, Create New Dataset, Datasets, Lookup Tables, Organizations, Projects, Monitoring Locations, Activities, Activity Groups, Bio/Habitat Indices, Data Analysis, WQX Export, Event Log, User Information, Rapid Entry, Preferences, and Logout. The main content area is titled 'Export' and features a 'WQX XML File:' section with two radio buttons: 'Export Only' and 'Export and Submit to CDX' (which is selected). Below this is a 'Header Information:' section with input fields for 'Author:*' (containing 'R8tribes'), 'Organization:*' (containing 'Gold Systems'), and 'Contact Info:*' (containing '3330 south 700 east', 'SIC, UT', and '84106'). There is also a 'Comment:' text area. At the bottom of the form are 'Continue' and 'Cancel' buttons. A footer bar at the very bottom contains links for 'AWQMS User Guide', 'AWQMS Forums', and 'STORET - WQX'.

goldsystems

goldsystems ver. 1.11.02.12

Ambient Water Quality Monitoring System

You are here: [Home](#) >> [Datasets](#) >> [Dataset Summary](#) >> Export

Export

WQX XML File:

☐ Export Only

☒ Export and Submit to CDX

Header Information:

Author:*

Organization:*

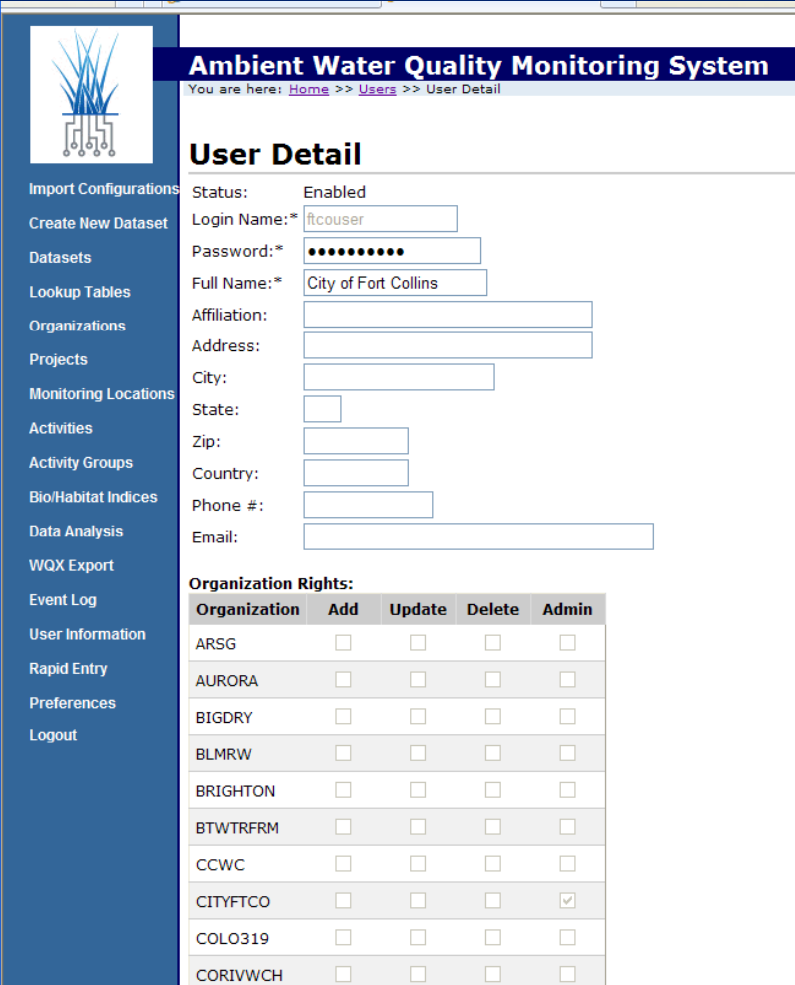
Contact Info:*

Comment:

[AWQMS User Guide](#) | [AWQMS Forums](#) | [STORET - WQX](#)

- Supports Incremental Data Submissions to EPA
- Ad Hoc Export

AWQMS Security Page



Ambient Water Quality Monitoring System
You are here: [Home](#) >> [Users](#) >> User Detail

User Detail

Status: Enabled

Login Name:*

Password:*

Full Name:*

Affiliation:

Address:

City:

State:

Zip:

Country:

Phone #:

Email:

Organization Rights:

Organization	Add	Update	Delete	Admin
ARSG	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AURORA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BIGDRY	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BLMRW	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BRIGHTON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BTWTRFRM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CCWC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CITYFTCO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
COLO319	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CORIVWCH	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- User Configurable Security Settings

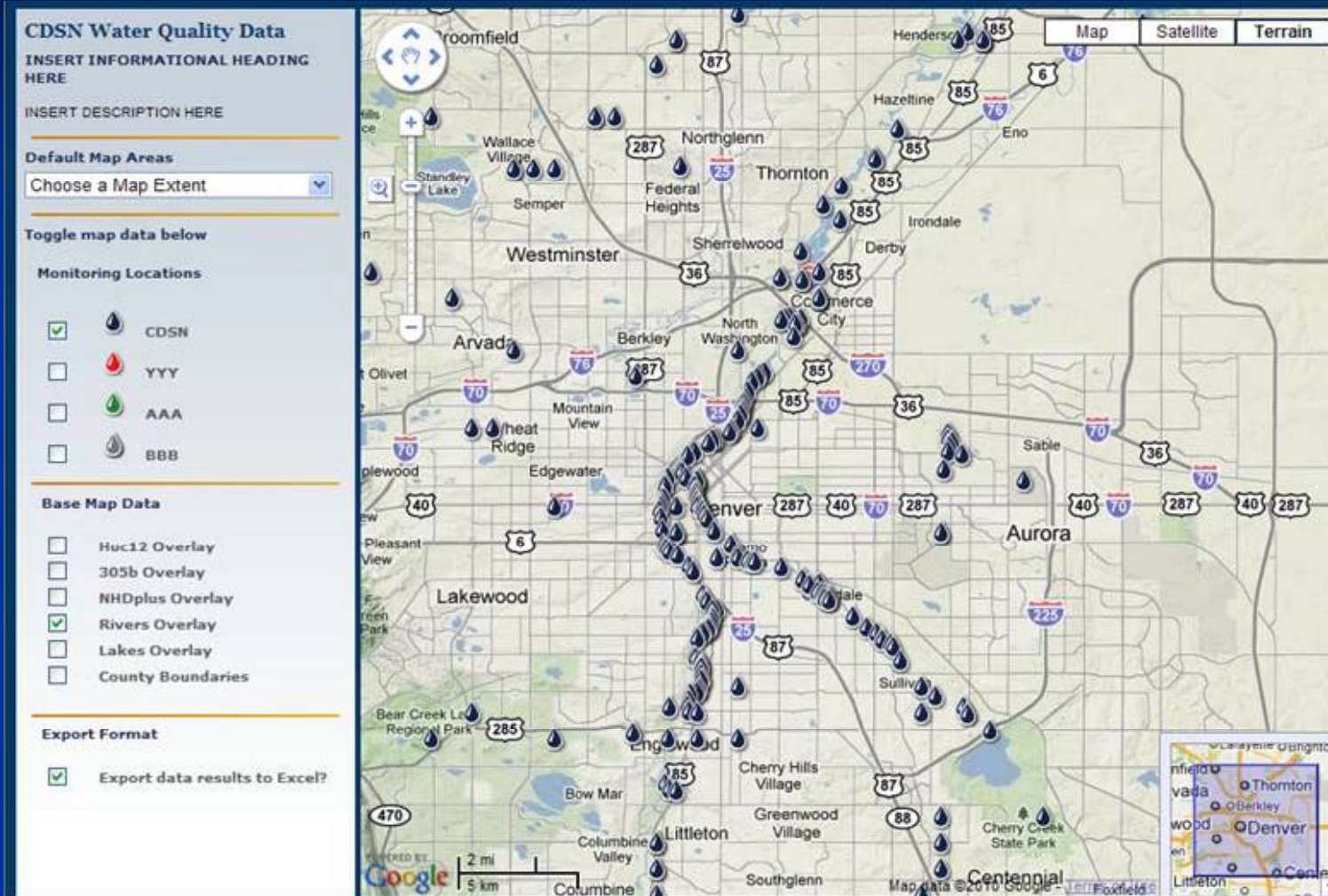
Next Steps

- Google Maps Integration
- Consume National Web Services
 - USGS
 - EPA
 - Other
- Biological Reporting and Graphing
- Water Quality Standards??
- Cross-Tab Import Format

New Partners

- Additional State and Tribal Programs
 - Maryland, Alaska, Iowa, Kansas
 - Chickasaw Nation, Nez Perce
- Additional Tribal Consortiums
- Region 10 Superfund Program

Mapping Prototype



- Leveraged efforts from the Lower Colorado River Authority (LCRA)

Contact Info

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- (801) 456-6104

- AWQMS

- View Information and Demos online at www.AWQMS.com

Questions?