

Risk Based Data Management Solutions (RBDMS) **Water**

Helping to shape the way
agencies, industry, and the
public manage water and
energy resources



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RBDMS Works for all environmental programs

- Developed for the oil and gas regulatory program
- Modules are compatible with all water programs
- Modules include:
 - Field inspection
 - Data mining
 - Well schematics
 - Electronic permitting and reporting
 - National UIC database
 - **Water quality/quantity**



RBDMS partners nationwide number 21 states and the Osage Nation.

- Since its inception in 1992, RBDMS has continuously improved and expanded its form and function as a result of user feedback.
- RBDMS successfully moved from client-server to Web database interfaces, thus easing data exchange between agencies and between agencies and industry operators.





RBDMS program history is one of collaborative success.

- Developed under a grant funding from the DOE NETL with matching funding from the benefiting state agencies.
- Directed by a four-state Steering Committee (NY, ND, MT, NE).
- Advised by a rotating Technical Committee of state agency representatives.
- Supported by a state-to-state peer network and a panel of consultants tapped through help desk referrals.



RBDMS user support takes many forms.

- Telephone and remote support (Terminal Services and/or Virtual Private Network)
- Project tracking through SharePoint Services
- Code sharing
- Bi-annual training meetings
- Open-attendance telephone and Web conferencing
- Onsite consulting support when necessary

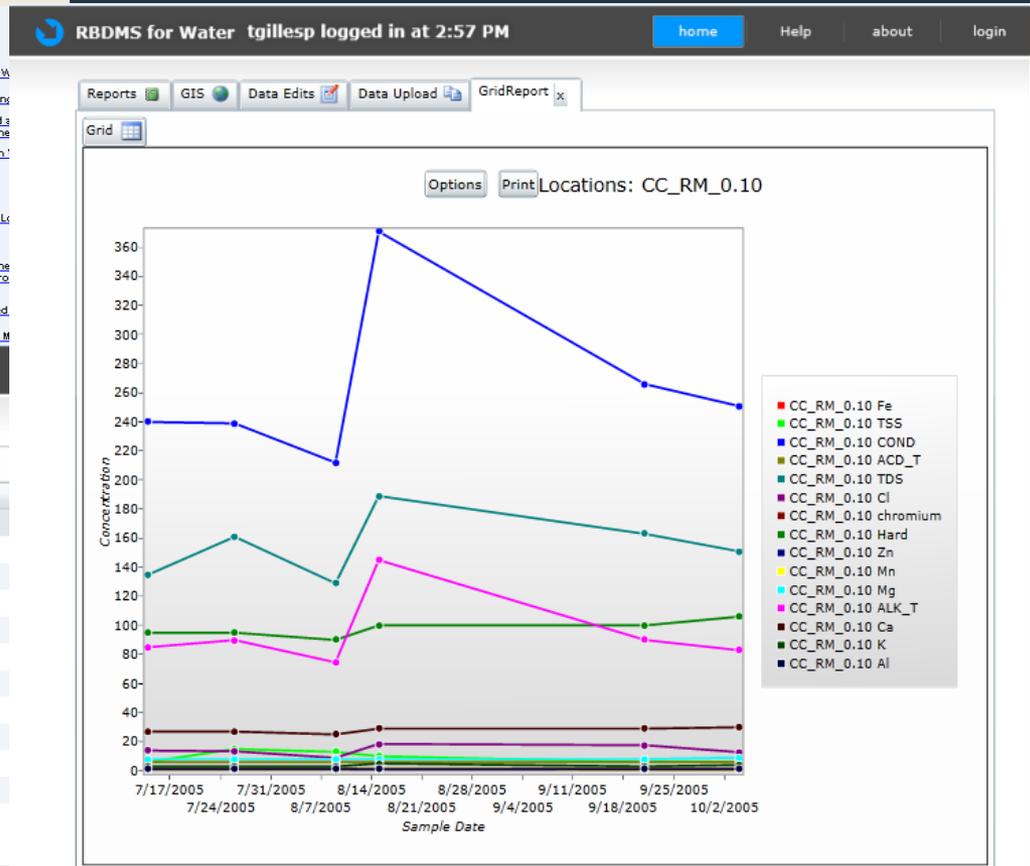


Water Quality and Analytical Data Reporting from Field and Laboratory

RBDMS ENVIRONMENTAL



A server-neutral GIS interacts with both statistical reports and the project builder.



Graph Page 1 of 1 Rows per page: 25 Save

LocStation	ObsDate	chromium	Al	Ca	Cl	Hard	Mg	K	TDS
CC_RM_0.10	7/14/2005 12:00:00 AM	0.03	0.2	26	12.9	94	7	2	134
CC_RM_0.10	7/26/2005 12:00:00 AM	0.03	0.2	26	12.4	94	7	2	160
CC_RM_0.10	8/9/2005 12:00:00 AM	0.03	0.2	24	7.9	89	7	2	128
CC_RM_0.10	8/15/2005 12:00:00 AM	0.03	0.2	28	17.5	99	7	4	188
CC_RM_0.10	9/21/2005 12:00:00 AM	0.03	0.2	28	16.6	99	7	2	162
CC_RM_0.10	10/4/2005 12:00:00 AM	0.03	0.2	29	11.8	105	8	3	150
CF_RM_0.10	7/14/2005 12:00:00 AM	0.03	0.2	81	9.1	272	17	3	342
CF_RM_0.10	7/26/2005 12:00:00 AM	0.03	0.2	78	9.3	261	16	3	316
CF_RM_0.10	8/9/2005 12:00:00 AM	0.03	0.2	73	10.6	248	16	3	324
CF_RM_0.10	8/15/2005 12:00:00 AM	0.03	0.22	84	10.7	284	18	3	406
CF_RM_0.10	9/21/2005 12:00:00 AM	0.03	0.2	85	12.5	290	19	3	386
CF_RM_0.10	10/4/2005 12:00:00 AM	0.03	0.2	71	10.9	239	15	3	312



RBDMS Env manages field, analytical data from areas disturbed by oil & gas and mining activities.

- Qualitative and measured field observations for soil, sediment, surface water, ground water, and air matrices.
- Analytical water quality and chemical data reporting from industry and third-party laboratories.
- Installations of RBDMS Env:
 - In CO, RBDMS Env is being developed to track environmental data associated with oil and gas regulation, including but not limited to hydraulic fracturing operations.
 - In OH, agency staff use RBDMS Env on the desktop to track data associated with mined lands. ODNR is in the process of launching the Web version to support inspectors and watershed volunteers and to serve data to the public.
 - Agencies in NV, NE, and MS have previously used the RBDMS Env data structure in connection with their source water protection programs.



RBDMS Environmental features:

- Secure logon and roles-based security that integrates with the eForm architecture.
- A filterable dashboard.
- Online form completion for facility creation, sample data, and field and laboratory results.
- Client- and server-side data validation for immediate user feedback.
- A server-neutral GIS.
- An extension of the eForm Alerts module that includes sophisticated analytical data checks.
- Chain-of-custody and statistical reporting.
- Electronic data deliverable formats based on the EPA WQX schema (<http://www.epa.gov/storet/wqx/index.html>).



Filterable dashboard offers extensive flexibility for data retrieval.

- Search by project, facility, media type, well API, and various location extents.

The screenshot shows a web application interface with a search filter and a data table. The search filter is set to 'Where ClientID contains SW'. The table displays a list of facilities with columns for Facility ID, Client ID, Facility Name, Crit ID, and Comments. The first row is highlighted in yellow.

Facility ID	Client ID	Facility Name	Crit ID	Comments
25370	SW-K	FR0110	6381	Trib Mouth
25371	SW-J	FR0100	6380	Trib Mouth
25370	SW-I	FR0090	6378	Trib Mouth
25369	SW-H	FR0080	6376	Trib Mouth
25368	SW-G	FR0070	6373	Stream
25367	SW-F	FR0060	6371	Trib Mouth
25366	SW-E	FR0050	6369	Trib Mouth
25365	SW-D	FR0040	6367	Trib Mouth
25364	SW-C	FR0030	6365	Trib Mouth
25363	SW-B	FR0020	6363	Trib Mouth
25407	SW-9	FR0198	6629	Seep/Discharge
25406	SW-7	FR0197	6627	Stream
25405	SW-6A	FR0196	6624	Stream
25404	SW-6	FR0195	6621	Stream
25403	SW-5	FR0194	6618	Stream
25162	SW-4	BR0075	5818	Stream
25402	SW-3	FR0193	6605	Seep/Discharge
25203	SW-3	EB193	5333	Trib Mouth
25161	SW-28	BR0074	5327	Stream
25164	SW-25	BR0078	5823	Stream
25483	SW-23	LRC0051	7244	Stream
25413	SW-21	FR0205	6638	Stream
25401	SW-2	FR0192	6602	Seep/Discharge
25412	SW-18	FR0203	6670	Pond
25411	SW-17	FR0202	6668	Stream
25163	SW-17	BR0076	5822	Stream



RBDMS Env administrators define parameters and test methods as a one-time set-up task.

- These lists become lookups that can be used to create grouped analysis lists.
- Analysis lists can then be assigned to sample sets as needed to record sample results.
- Samples are associated with specific facilities.
- Facilities can be grouped into one or many projects.
- The application hierarchy provides a flexible structure for organizing data views according to need.
 - Project (Site)
 - Facilities (Locations)
 - Samples
 - Results



Automated alerts and data validation checks included in RBDMS Env:

- Facility:
 - Name
 - Location
 - Location Extent
- Sample:
 - Sample Date
 - Sample Location
 - Sampler Name
 - Orphaned Data
- Results:
 - Cation:Anion Ratio
 - Exceedance
 - Holding Time
 - Missing Analysis
 - Dissolved vs. Total
 - % Difference from Baseline
 - Sodium Absorption Ratio



Labs can upload reports to the RBDMS Env Web in one of several possible formats:

- In online forms.
 - Create new facilities and report sample data and results on single forms through the secure login.
 - Client-side data validation checks flag entries that are out of range or incorrectly formatted for immediate corrections.

RBDMS for Water tgillesp logged in at 2:57 PM

home Help about login

Reports GIS Data Edits Data Upload

Site: Yellow Creek IG

Location Information

Save Samples Add Delete Last Modified: 4/6/2010 NRDNR/miller

Station Name	Client
BCAR001	
BCDE001	
BCMS001	
BCMS002	
BCMS004	
BCMS005	
BCMS006	
BCRR001	
BCRS001	
BCUT001	
BCUT002	
BCUT003	
BCUT004	
BCUT005	
BCUT006	
BCUT008	
BCUT009	
BCUT010	
BCUT012	
BCUT013	
BCUT014	
BCUT015	

Name: BCMS001 App. ID: _____
Type: _____ HUC: _____
Latitude: _____ Longitude: _____ Lat/Long Error (ft): _____
Y Location: 326588.673411 X Location: 2463617.8892 Upper: _____ Lower: _____
Section/Lot: _____ County: _____ Township: _____
Aquifer: _____
Description: Brush Creek; Mainstem of Brush Creek; bridge on PI
Comments: Stream

Attribute	Value	Qualifier	Units
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Add Attribute Delete Attribute

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home Help about login

Reports GIS Data Edits Data Upload

Location: BCMS001 COC Save Add Delete Exit

Sample Purpose	Sample Date	Sample Group	Sample Type	Sampler	FS#	Initials
AMDAT Investigation	12/7/2005 12:00:00 AM			Jefferson Soil and Water Conservati		

Sample: QMR

Sample Name: BCMS001 Date and Time: 12/7/2005 12:00 AM

Results Attributes Latitude Longitude

Requested Analysis Set: NPDES DMR Clear Add Set Remove Set Add Delete

Parameter	Test Method	Qualifier	Result	Units	Comments	Last Update
Temperature	Unspecif		1.6			2/4/2010 4:
pH	Field		7.24			2/4/2010 4:
Conductivity	Field		380	micro Sien		12/7/2005 1
Flow Rate	NA					
Specific Conductivity	NA			Not Applic		
Total Suspended Soli	NA			mg/L		
Iron	NA			mg/L		
Manganese	NA			mg/L		
Total Precipitation	NA			Not Applic		
Residue, Settleable	NA					



Labs can upload reports to the RBDMS Env Web in one of several possible formats:

- In EPA WQX-compliant XML directly from a LIMS.
 - The data submitted will be checked for pre-defined validation errors.
 - Users receive a confirmation of the status of the upload (Pass or Fail with reason).
 - Using this method avoids key-entry errors and saves time.

```
<?xml version="1.0" encoding="UTF-8"?>
- <WQX xmlns="http://qwwebservice.usgs.gov/schemas/WQX-Outbound/2_0/"
  xsi:schemaLocation="http://qwwebservice.usgs.gov/schemas/WQX-Outbound/2_0/
  http://qwwebservice.usgs.gov/schemas/WQX-Outbound/2_0/index.xsd"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  - <Organization>
    - <OrganizationDescription>
      <OrganizationIdentifier>OH-Lab1</OrganizationIdentifier>
      <OrganizationFormalName>Ohio State Lab</OrganizationFormalName>
    </OrganizationDescription>
  - <Activity>
    - <ActivityDescription>
      <ActivityIdentifier>13038</ActivityIdentifier>
      <ActivityTypeCode>Sample-Routine</ActivityTypeCode>
      <ActivityMediaName>Water</ActivityMediaName>
      <ActivityMediaSubdivisionName>Surface Water</ActivityMediaSubdivisionName>
      <ActivityStartDate>1998-11-03</ActivityStartDate>
    - <ActivityStartTime>
      <Time>12:15:00</Time>
      <TimeZoneCode>CST</TimeZoneCode>
    </ActivityStartTime>
      <ProjectIdentifier>464000330</ProjectIdentifier>
      <ActivityConductingOrganizationText>Ohio
      USGS</ActivityConductingOrganizationText>
      <MonitoringLocationIdentifier>Station Location 1</MonitoringLocationIdentifier>
    </ActivityDescription>
  - <Result>
    - <ResultDescription>
      <CharacteristicName>Atrazine</CharacteristicName>
      <ResultSampleFractionText>dissolved</ResultSampleFractionText>
    - <ResultMeasure>
      <ResultMeasureValue>0.1</ResultMeasureValue>
      <MeasureUnitCode>ug/l</MeasureUnitCode>
      <MeasureQualifierCode><</MeasureQualifierCode>
    </ResultMeasure>
      <ResultStatusIdentifier>Final</ResultStatusIdentifier>
      <ResultValueTypeName>Actual</ResultValueTypeName>
    </ResultDescription>
  - <ResultAnalyticalMethod>
      <MethodIdentifier>GCNP1</MethodIdentifier>
      <MethodIdentifierContext>USGS</MethodIdentifierContext>
      <MethodName>Pest, triazines, lab, GC-NPD</MethodName>
      <MethodDescriptionText>USGS TWRI 5-A3/1987, p
      46</MethodDescriptionText>
    </ResultAnalyticalMethod>
  - <ResultLabInformation>
      <ResultLaboratoryCommentText>Sample was murky
      blue.</ResultLaboratoryCommentText>
    - <ResultDetectionQuantitationLimit>
      <DetectionQuantitationLimitTypeName>Method Lower Reporting
      Limit</DetectionQuantitationLimitTypeName>
    - <DetectionQuantitationLimitMeasure>
      <MeasureValue>0.1</MeasureValue>
      <MeasureUnitCode>ug/l</MeasureUnitCode>
    </DetectionQuantitationLimitMeasure>
    </ResultDetectionQuantitationLimit>
    </ResultLabInformation>
  </Result>
```



A server-neutral GIS interacts with both statistical reports and the project builder.

