

OWSM: Oklahoma's Seismic Application and Next Step Development

www.rbdms.org



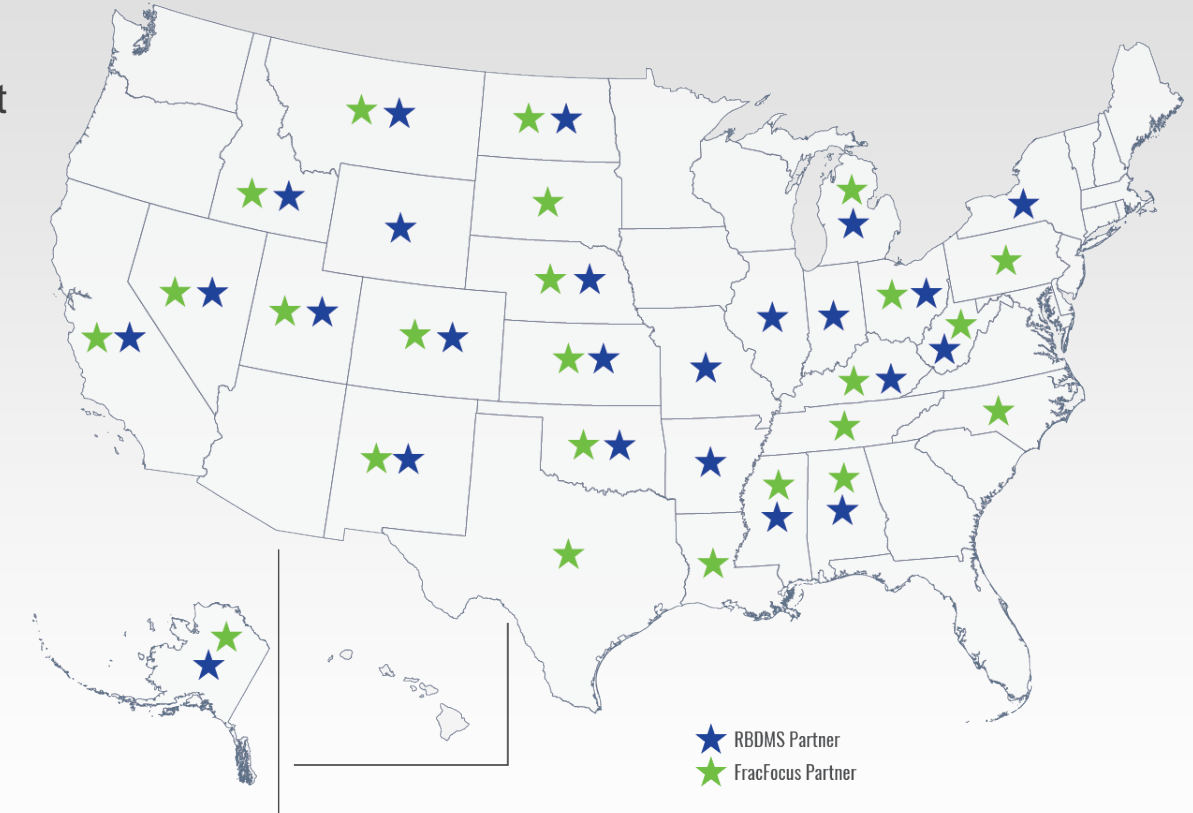
RBDMS
Energy & Water Software | Data Solutions

Mark Layne, Ph.D.
Technical Director
The Ground Water Protection Council

RBDMS

What is RBDMS?

- A suite of integrated software products that assists regulatory agencies in the effective regulation, oversight and management of oil, natural gas and underground injection control (UIC) facilities and activities.
- Developed by the GWPC in partnership with the U.S. Department of Energy.
- More than 25 years developing and improving new versions of RBDMS and related products.
- A System that is designed to meet the unique and evolving needs of regulator's and industry. Helping maintain a "social license" to operate.



PARTNER STATES

Regulatory Responsibilities

RBDMS provides solutions that allow regulatory programs to more efficiently manage their mission critical activities and responsibilities. RBDMS products increase efficiency for regulatory programs thereby increasing industry production (faster permitting etc.), reduce data errors, and ensure environmental protection.

State Mission Critical Responsibilities

Permitting

Drilling & Completion

Production

Plugging & Abandonment

Inspection & Compliance

Facilities

Environmental Protection Through Well Life Cycle

RBDMS Capabilities



RBDMS

Energy & Water Software | Data Solutions



RBDMS Product Benefits

- Streamlines permitting processes, reporting, and oversight; thereby facilitating energy development and economic growth
- Increases efficiency and accuracy of industry data reported to the regulators
- Facilitates access to industry and regulatory data, thereby increasing transparency and public acceptance of oil & gas production
- Facilitates exchange of ideas, technology advances, and innovative data management solutions
- Helps agencies and industry reduce operating expenses while increasing efficiency

The Products



Core

Primary information storage system for agency oil, gas & UIC data



Produced Water Tracker

Manages field observations and water sampling data



Seismic Monitoring

Queries extensive data from multiple databases about specific underground injection wells and earthquakes



eForms

eForm allows for electronic permitting and reporting between the industry and regulator



WellFinder Application

Free, publicly-available mobile application (iOS & Android) displaying nearby oil, gas, and injection well information



Field Inspection

(Coming Soon) – Allows agency field inspectors to make real-time critical decisions while performing a field inspection with industry representatives



Data Explorer

Provides an interactive mapping interface and robust data exploration options for all stakeholders



WellBore Analysis

A visual add-on that generates cross-section diagrams of a well



RBDMS

Energy & Water Software | Data Solutions



RBDMS.org

RBDMS
Energy & Water Software | Data Solutions

CONTACT US | SEARCH | USER DASHBOARD

ABOUT | PRODUCTS | PARTNER SUCCESS | NEWS | EVENTS | OIL & GAS DATA | CONTACT

RBDMS: POWERFUL DATA & ANALYTICAL TOOLS FOR EFFECTIVE STATE RESOURCE MANAGEMENT

[LEARN MORE](#)

RBDMS PRODUCTS

The RBDMS suite of products provide tools for all aspects of managing regulatory data related to oil, gas, underground injection control (UIC), water, and associated environmental data.

Task Name	Organization	Status	Workgroup	Assigned To	Due Date	Action
Review Well Schedule	Energy Production Co.	Not Started	UIC	John Doe	12/31/2023	Action
Approval/Check Agent Change	Energy Production Co.	Not Started	Agent Change	John Doe	12/31/2023	Action
Approval/Check Agent Change	Energy Production Co.	Not Started	Agent Change	John Doe	12/31/2023	Action
Review UIC Administration Change	Energy Production Co.	Not Started	UIC	John Doe	12/31/2023	Action

- RBDMS Core
- RBDMS eForms
- RBDMS Data Explorer
- RBDMS Environmental
- RBDMS WellBore
- RBDMS Seismic
- RBDMS WellFinder
- RBDMS Field Inspection
- View All Products

RBDMS Benefits

Built from the bottom-up by the system's users, RBDMS integrates years of experience in multiple states with data management and program best practices to address the ever evolving needs of state regulatory programs.

- Comprehensive**
We are familiar with the many complex tasks involved in regulatory tracking
- Consistent**
Years of experience has allowed us to help states develop reliable software
- Consolidated**
Our network connects oil and gas regulators from across the country
- Community**
RBDMS states have a whole community of people from across the country



RBDMS
Energy & Water Software | Data Solutions



Seismic Monitoring

Seismic Application

Purpose

The Seismic Application queries data from multiple databases about specific underground injection wells and earthquakes. Helping to visualize well and earthquake data on a map, and allowing for quick analysis and regulatory action.

A Success Story: Seismic Application in Oklahoma

- The GWPC was asked to lead development of an application that would visualize data from injection wells and earthquakes on a map as well as isolate target wells and locations for analysis.
- With the Seismic Application, Oklahoma Corporation Commission (OCC) staff have access to real-time data. [Work formerly taking 3 days now takes one staff member minutes, and serves as an essential tool for initial analysis of seismic concerns and timely response.](#)
- This helps to shape proactive and sound regulatory action if necessary, as well as to more easily verify operator compliance. This increases public confidence in Regulations.

OWSM

- OWSM → OCC Well & Seismic Monitoring Application
- Our Partners in Development



OKLAHOMA CORPORATION COMMISSION

Coordinate **solutions**

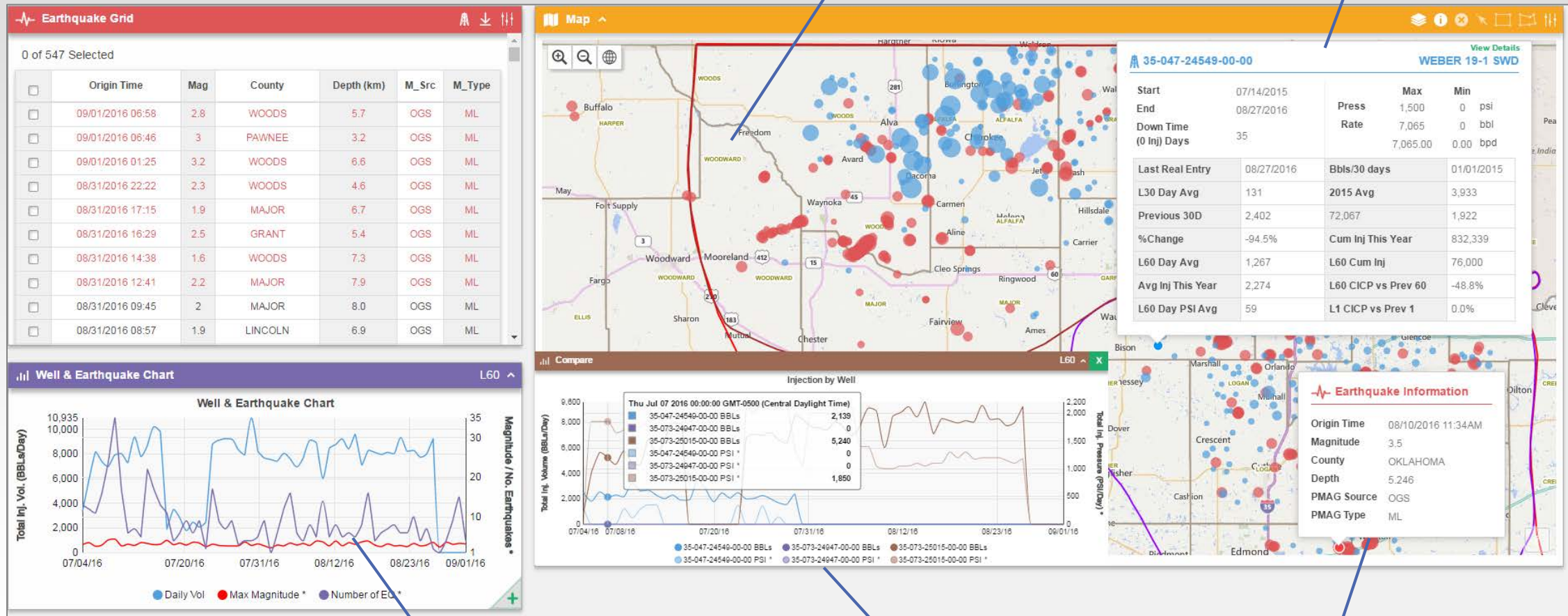


OK Seismic Application: Dashboard Features

Summary: Last 60 days*
547 Seismic Events

Graduated Symbols: Blue markers – Wells: Avg Daily Volume (60 days)
Red markers – EQ Events: Magnitude

Well Volume Detail



OK Seismic Application: Search Filters

Earthquakes listed in red text happened within 24 hours.

Data Feed

UIC Data via once a week report.

Seismic Data is updated every 20 minutes.

The screenshot displays the OK Seismic Application interface. The top section, titled 'Earthquake Filters', shows a table of 153 earthquakes. The table has columns for Date/Time, Depth, Mag, M_Type, M_Src, and County. The entry for 04/08/2016 12:33 is highlighted in yellow. Below the table is a 'Well & Earthquake Chart' showing Max Magnitude (right axis) and Number of EQ (right axis) over time. The chart shows a sharp increase in both metrics around 04/06/16. Below the chart is a 'Cumulatives' section showing Min Vol (right axis), Max Vol (right axis), Avg Vol (right axis), and Cumulative Vol over time. The chart shows a sharp increase in all metrics around 03/03/16. The right side of the interface is titled 'Well Filters' and contains various input fields for filtering wells, including Latitude, Longitude, Address/City/State/Zip, City, County, Well Name and/or Number, Operator Name, API, Injection Interval Top, Injection Interval Bottom, Packer Depth, Permitted Max Pressure, Permitted Max Daily Rate, Cumulative Injection This Year, Down Time (zero injection volume) Day Count, Average Daily Injection This Year (only non-zero days), and Cumulative Injection Change % vs Previous Day. A blue arrow points from the text 'Each module has a long list of filters for narrowing the list based on location, type, size, etc.' to the 'Well Filters' section.

Date/Time	Depth	Mag	M_Type	M_Src	County
04/07/2016 03:29	8	3.7	ML	OGS	MAJOR
04/07/2016 02:37	5	3.6	ML	OGS	OKLAHOMA
04/08/2016 18:24	6	3.6	ML	OGS	GARFIELD
04/08/2016 17:55	5	2.9	ML	OGS	OKLAHOMA
04/08/2016 12:33	4	2.6	ML	OGS	WOODS
04/05/2016 19:53	7	2.8	ML	OGS	WOODS
04/05/2016 14:12	4	3	ML	OGS	LINCOLN
04/04/2016 19:35	8	2.6	ML	OGS	WOODS
04/04/2016 19:31	4	2.9	ML	OGS	NOBLE
04/04/2016 13:48	6	2.7	ML	OGS	LOGAN
04/04/2016 10:24	6	3	ML	OGS	NOBLE
04/03/2016 15:16	7	2.5	ML	OGS	NOBLE
04/03/2016 12:50	5	2.9	ML	OGS	PAYNE
04/03/2016 11:30	5	2.9	ML	OGS	PAYNE
04/03/2016 11:32	5	2.9	ML	OGS	PAYNE
04/03/2016 03:30	6	2.7	ML	OGS	WOODS
04/03/2016 23:04	24	2.7	M	OGS	CHEROKEE

Each module has a long list of filters for narrowing the list based on location, type, size, etc.

Future: Seismic App Workgroup

- Workgroup Recently Formed
- Assess Additions: Input to Increase Use/Robustness of System
- New Insight into Induced Seismicity
 - Confirm Yes/No on Induced
- Big Data
 - Not Necessarily but...
 - Intergradation from Multiple Sources
 - Looking for New Sources
 - Filter and Analysis Tools Applied
 - New Ways to Look at Data Available



Final Thoughts

Questions?