Why Are We Here?

• Benefits of GIS & Data Visualization
  • Allows people to see data in/on the “real world”
  • Improves understanding and relevance to people
  • Makes data easier to interpret
  • Provides quick indicators of abnormal information
  • Assists Decision Making

• Bringing RBDMS GIS into the future
  • Build a GIS and Data Visualization platform that can be used across all RBDMS products to improve user experience
  • Provide integrations with external applications
Overview

• RBDMS GIS Today
• RBDMS GIS Tomorrow
• Getting From Today to Tomorrow
RBDMS GIS Today
Internal Use

- Internal Deployments
  - Users: Oil & gas agency staff
  - RBDMS.NET
    - Desktop access
    - Client-Server
    - Limited availability in the field
  - Inspection App (in development)
    - In-the-field access
    - No Map/GIS component yet, but is planned
External Use

• External Deployment
  • Users
    • Public/Media/Community groups
    • Academia/researchers
    • State & local agencies and officials
    • Federal government officials/staff
    • Oil & gas operators
    • Data vendors
  • Data Miner
    • Public access on the internet
    • Utah
    • Michigan
    • Nebraska
    • Others
RBDMS GIS Today

- Current Features
  - Search capabilities
    - Basic & Advanced
  - Interactive Map
  - Basic Selection Tools
  - Data View
  - Data Export
RBDMS GIS Today

• Challenges
  • Maintenance & Staffing
  • Solutions vary between RBDMS.NET & Data Miner
  • Hosting environments
  • Integration with existing GIS applications and workflows
  • User Experience
RBDMS GIS Tomorrow
High Level Needs

Maintain the capabilities of today while enhancing functionality:

• Easy to Use
• Make Data Informative
  • Support All Users (Agency, Technical, Non-Technical) with map interfaces that are tailored to users needs/capabilities
  • Provide solutions that address frequently asked questions (internal & external)
• Support Regulatory Decision Making
  • Day-to-day operations
  • Program Management
  • Long-term research and planning
Evolving RBDMS GIS

- Examples
  - Click for info features
  - Toggle Layers
  - Add layers from external sources
  - Filter map data using custom queries
  - Spatial Queries (predefined or user-defined)
  - Save custom views & maps
Example Improvements

- Spatial Database Benefits

- Native Spatial Type SQL Statements

```sql
DECLARE @g geometry;
DECLARE @h geometry;
SET @g = geometry::STGeomFromText('POLYGON((0 0, 2.0, 2.2, 0 2, 0 0))', 0);
SET @h = geometry::STGeomFromText('POINT(1 1)', 0);
SELECT @g.STContains(@h);
```
Example Improvements

• Integrated with Visualization
  • Map
  • Screens
  • Apps
• Facilitates Analysis
Example Improvements

- Powerful data filtering using multiple controls
- Updates to map features
- Constantly updating based on field observations
Example Improvements

- Common Platform Supports:
  - Multiple Maps all using same platform
  - Data Access
  - Services for External Applications
  - Links to related information
Considerations

- Interactions within RBDMS and with external applications
  - Accommodate integrations with multiple solutions (ESRI & others)
- Maintain balance between common structured solutions and flexibility
- Focus on most important GIS functionality/tools first
- Developed to accommodate multiple staffing levels
- Make sure users are engaged & excited
Opportunities

- Web-Enabling Effort
  - Bringing all RBDMS products onto the web in RBDMS 3.0
  - Allows sharing of common components
  - Updating Technology
- Opportunity to utilize same technologies across all facets of RBDMS
- Opportunity to bring new capabilities to the RBDMS Suite
Getting From GIS Today to GIS Tomorrow
GWPC Phases of Development

Initiation  |  Definition  |  Design  |  Development  |  Implementation  |  Follow-up
Defining the Project

Needs Assessment

Functional Requirements

Technical Requirements
Assessing User Needs

• Public User Interface Update Project
  • Participant Groups:
    • Public (citizens, media, community groups)
    • Academia/researcher
    • State & local agencies and officials
    • Federal government officials/staff
  • Compiled information from User Feedback Session
    • Detailed UI Scoping Document
Public UI Update Project

Resulting Goals:

• Reduce staff time with public by having an easier to navigate/user friendly site for public to self-serve data
• Increase public confidence with transparency
• Modernize UI and user experience
• Make basic reports easier for public and state agency members
• Printable reports
Assessing User Needs

- Ongoing Internal (Agency) User Survey
  - Written
    - Desired Functionality
    - Technical Constraints
    - Existing Systems
  - Interviews
    - In-depth
    - Desired Functionality
    - Innovative Ideas
    - Tools Needed
Defining the Project

- Needs Assessment
- Functional Requirements
- Technical Requirements
## Cataloging Functionality

<table>
<thead>
<tr>
<th>RowID</th>
<th>Function Description</th>
<th>Agency (primary)</th>
<th>Public (media, community groups)</th>
<th>Public (citizens)</th>
<th>Academic/Researcher</th>
<th>State Agency (secondary)</th>
<th>Federal Agencies</th>
<th>Operators</th>
<th>Data Vendors</th>
<th>Feature/Requirement ID</th>
<th>Feature/Requirement Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>One landing page (SEO optimized) for oil and gas data for the whole nation, even if this was just a page with links to all of the state websites</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Intuitive navigation - clear page hierarchy that shows the user where to start and moves them through the common functions they can perform in that screen's context</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Allow user to choose different routes to get to different features, based on what they want to do (e.g., whether to interact with the data in map or tabular view, or both)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Map, search, and reporting features more seamlessly combined (kind of like Nebraska’s site)</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Pop-up tour of the site that can be ‘skipped’</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>More information about the data and a description of the map layers for on-site and gas tools (e.g., tool tips that explain some of the more prevalent oil and gas terminology)</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Improved help documentation</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>More prominent display of help documentation</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Mobile-friendly</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Improved speed and responsiveness of the map and search queries</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Upgrade map interface to conform to modern interactive map features and tools</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Allow the user to input an address that the map knows to</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Clear icons and symbology that helps the user understand the data on the map</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Ability to filter items on the map (e.g., display only injection wells or only the wells owned by a single company)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Liked being able to select wells by rectangle on the map and returning a list of selected records. Would like to be able to export these results in CSV format directly from the map search (like Nebraska’s site)</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>
Functionality

Existing
• Basic & Advanced Search
• Data View
• Interactive Map View
• Data Export Options
  • Reports
  • Selection Set to XLS
• Multi-Layer Support
• Select/Buffer-Select Tools

Enhancements
• Improved User Experience
• Modernize Interface
• Additional Data Filtering Options
• More Interactivity Between Data Views and Map Views
• Updating Web Technologies
• More options for visualizing data sets.
• Bulk downloads
Defining the Project

- Needs Assessments
- Functional Requirements
- Technical Requirements
• Key Considerations
  • RBDMS Core Compatibility
  • Standards Oriented
  • Common Technologies
  • State Environments
  • Stability
  • Extend-ability
  • Licensing
How Do We Get There?

Definition

- User Surveys
- Needs Assessment
- Establish GWPC Committee
- Functional/Technical Requirements
- Select Pilot State(s)
- Project Plan

Design
What We Need

• People to provide feedback
  • Survey
  • Emails
  • Interviews

• Committee Volunteers
  • 5 volunteers, various backgrounds
  • Monthly meetings
    • Provide Feedback
    • Help make decisions

Interested in being involved? Contact:
• Alex Code: acode@line-45.com
Questions?

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