Agenda

• About Myself and SM Energy
• The Challenge
• The Goal
• Solution Steps
• Current Step Details
• Closing
About SM Energy

• Independent Energy Company
  • Focus on the exploration, exploitation, develop, acquisition and production of natural gas and crude oil in the United States.
  • Founded in 1908 and incorporated in 1915. Became a public company with an initial public offering in 1992
  • Transitioned from primarily a land holding company to full E&P Company about 5 years ago
SM Areas of Operation

• Four Core Areas
  • Mid-Continent
    • Tulsa, Oklahoma
  • Rocky Mountains
    • Billings, Montana
  • Permian Basin
    • Midland, Texas
  • Gulf Coast
    • Houston, Texas

• Corporate Offices
  • Denver, Colorado
About Me

• Geoscience & GIS Business Analyst at SM Energy for the last 3 years
• Previous 5 years at EnCana Oil and Gas as a Geo-Tech and Enterprise GIS Analyst
• Spent 8 years at the Colorado Geological Survey as a Cartographer and GIS Analyst
The Challenge

• Billings Regional Office generates large amounts of spatial data
• No central repository, very difficult to locate needed data sets
• Little or no documentation or metadata
• 50 users, dozens of applications
• Copies of Copies of Copies of Copies of Copies
The Challenge (continued)

• Data on several locations and file shares
• Geologists and GeoTechs copy and clip data for each specific project
• Surveyors, Vendors and Field Operations personnel email data to random people
• Copies of data gets stored by individual projects (Seismic, Geology, Basins, States, etc)
The Goal

- Find all of our spatial data
- Remove all duplicate data sets
- Centrally store and manage data
- Train users to work differently
- Integrate with Geospatial and Geology software systems
The Solution (Step 1, Current)

- Find Data with Spatial Data Indexing and Search Tool
- Easy to use
- Enterprise grade
- Out of the Box solution
- Integrates with ArcGIS, ArcSDE, and Geology & Geophysics software systems
The Solution (Step 2)

- Setup regional workgroup ArcSDE database
- Delete/Ignore Duplicate Data Sets
- Migrate ‘Clean’ data to File Geodatabase
- Copy data into ArcSDE database
- Automate as needed with FME
The Solution (Step 3)

• Create new process for receiving data from field personnel and contractors

• Utilize ArcGIS Online
  • Field and contractors publish maps
  • Automate loading data from ArcGIS Online into Regional SDE database or Webmap as needed

• Train users not to copy and clip data for projects
The Integration Solution (Step 4)

• Integrate with ArcGIS, ArcSDE, and Geology & Geophysics software systems
  • Voyager GIS (Spatial Search and Indexing Tool)
  • Esri: ArcGIS Desktop, ArcSDE, ArcGIS Server, ArcGIS Online
  • Geographix (Geology Interpretation Software)
  • NeuraDB (PPDM Well Data Management Solution)
  • SeisQuest (Seismic Data Management Solution)
Current Step Details (Voyager GIS)

• Voyager GIS Workgroup edition (allows for up to 5 concurrent users or administrators)
• Anyone can search for data via web browser
• Hosted on local server in Billings
• Searches and crawls for spatial data inside Geodatabases, personal, file and ArcSDE, and Geographix projects
Text Search
Spatial Search
Step 1 Details (continued)

• Indexed several shared drives and servers
• Currently Indexed over 17,000 spatial files
• When appropriate, delete/ignore duplicate copies of data
  • Data can be ignored from index if still in use
  • Data can be moved into a File Geodatabase
  • Data can then be deleted once moved
Process Data

Add to File Geodatabase
Add results to new or existing file geodatabase

Clip and Ship
Extract a region of the results into a distributable bundle

Convert to KML
Convert item to KML

Create GeoPDF
Add results to a new GeoPDF

Create Default Metadata
Create default metadata for items

Create Mosaic Dataset
Combine all search results into a single Raster Mosaic

Create MXD
Add results to new or existing MXD

Copy Data
Copies data from one location to another

Mosaic
Combine all imagery into a single raster
Step 1 Details (continued)

• When appropriate, leave data alone as it is always accessible via Voyager search
• Accessed via web browser, desktop application or ArcGIS Toolbar
• Desktop application is drag and drop with ArcGIS
  • Finds missing data links inside .MXD files
Saved Searches

Raster Properties
List of raster images with assorted properties.

Datasets with an unknown spatial reference
Items with an unknown spatial reference. Use filters to explore and the table view to export the items to a list.

Items with Broken Data
Map layers with broken datasets.

Largest Files
Datasets with the largest file size.

Most Commonly Used Data
Show the data that is used in the most documents.

Duplicate data
Use filters to examine items with similar schema but which might have different data values (Schema Hash) or items with both duplicate schemas and data (Content Hash).

Missing XML Metadata
Data files that do not have associated XML metadata.

ArcGIS Services View
Filters relevant for ArcGIS services.

FME Information
Show FME information.

Remote Catalog Search
Include the option to search remote catalogs.

Discovery Debug Information
Show debugging information that can help troubleshoot issues.
Off to a Good Start

• Users are starting to migrate clean data into Geodatabase and then remove/delete old data

• If clean up is not required, just leave as indexed search
Next Steps

• Focusing time and resources to cleaning and migrating data to ArcSDE databases
• Implement new workflows and processes utilizing ArcGIS Online for external data
• Rollout to other regions
Step 1 Lessons Learned

• Beneficial for new employees to learn and find data by geographic location
  – Helps to understand our business
• Starting point for creating a data repository
• Efficient method for finding unstructured data
• Search and find on an as needed basis
Closing

• Still early days
• Simple to use and scalable
• Actually being used by employees
• Accessible to all Billings employees
Questions

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