Interagency Appalachian GeoMine Pilot Project

Executive Summary: 12/4/2013

Preface

This executive summary provides an overview of the results of the Interagency Appalachian Coal Mining Geographic Information System (GeoMine) Pilot Project Report, dated 10/28/2013. This summary was developed as a stand-alone briefing tool for interagency team executives and illustrates the utility of the GeoMine Viewer to SMCRA, CWA and ESA community practitioners through seven use cases. The use case graphics are screen captures from the GeoMine Viewer v. 3.0.

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Credit: Stephanie Cain, AmeriCorps Web Design Intern, designed the executive summary.

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1: What is GeoMine and what is the Interagency Appalachian GeoMine Pilot Project?

GeoMine is envisioned to be an interactive web-based digital map of coal mining and reclamation activities in the United States.

GeoMine is a web-based Viewer (GeoMine Viewer) developed by the Office Surface Mining Reclamation and Enforcement (OSMRE) in collaboration with the Fish and Wildlife Service (FWS), Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (USACE), and mining agencies from Kentucky, Tennessee, Virginia and West Virginia. GeoMine supports the decision-making processes associated with surface coal mining activities by improving accessibility to data, improving the timely delivery of authoritative information, and enhances understanding of geospatial data at various scales.

GeoMine creates seamless map layers of coal mining and reclamation activities across state boundaries. The map layers created by GeoMine include authoritative associated data, and for the seven SMCRA state layers and eleven Federal agency layers the GeoMine Viewer is a "one-stop-shop" for this unique collection of coal-mining-related data. GeoMine contributes coal mining-related data, but does not serve as the sole source of the host of data needed for CWA, SMCRA, and ESA determinations and decisions by the state and Federal agencies tasked with these responsibilities.

The Interagency Appalachian GeoMine Pilot Project (Pilot Project) was initiated among State and Federal regulatory agencies who administer the Surface Mining Control and Reclamation Act of 1977 (SMCRA), the Clean Water Act of 1972 (CWA), and the Endangered Species Act (ESA) of 1973. An Interagency Team was formed in 2009 to address the need to better understand the various permitting processes and mapping capabilities of agencies involved with surface coal mining permits.

The purpose of the Pilot Project is to demonstrate the value and utility of sharing the key data from each agency's permit review process by using a shared web-based viewer.

2: What challenges does the GeoMine Pilot Project help to address?

- The data and systems that are maintained by Federal and State agencies are stove-piped, that is, although the data may be "accessible" it is not systematically available, easily accessible, or routinely shared.
- Some of the data that is housed in state files are not digitized or available in automated systems.
- Federal personnel needing information must forage multiple systems and various office files to find the data needed to make required SMCRA and CWA permitting decisions; and meet the mandates of the Endangered Species Act.
- State and Federal authorities need a better way to share data along state boundaries. Proposed and ongoing coal mining and reclamation activities and non-coal activities continue to have conflicts that need to be addressed for safety and better land management reasons.

3: What benefits could GeoMine offer?

- Reduce the time spent searching for information relevant to decision-making by sharing digital data on-line.
- Eliminate redundant data requests by having data on-hand for repeatable and authoritative reporting.
- Provide an easy-to-use source for unique coal-mining related maps and data to aid in high-level, landscape level, or focused cumulative-effect watershed analyses of mining impacts and mitigation opportunities.
- Map mining issues along common state borders to aid field studies and achieve mutually beneficial land management decisions.

4: Who are the GeoMine partners?

Federal Agencies:
- Office of Surface Mining Reclamation and Enforcement (OSMRE) including Knoxville, TN field office and OSMRE's national Technical Innovation and Professional Services (TIPS) program
- Fish and Wildlife Services (FWS)
- Army Corps of Engineers (USACE)
- Environmental Protection Agency (EPA)

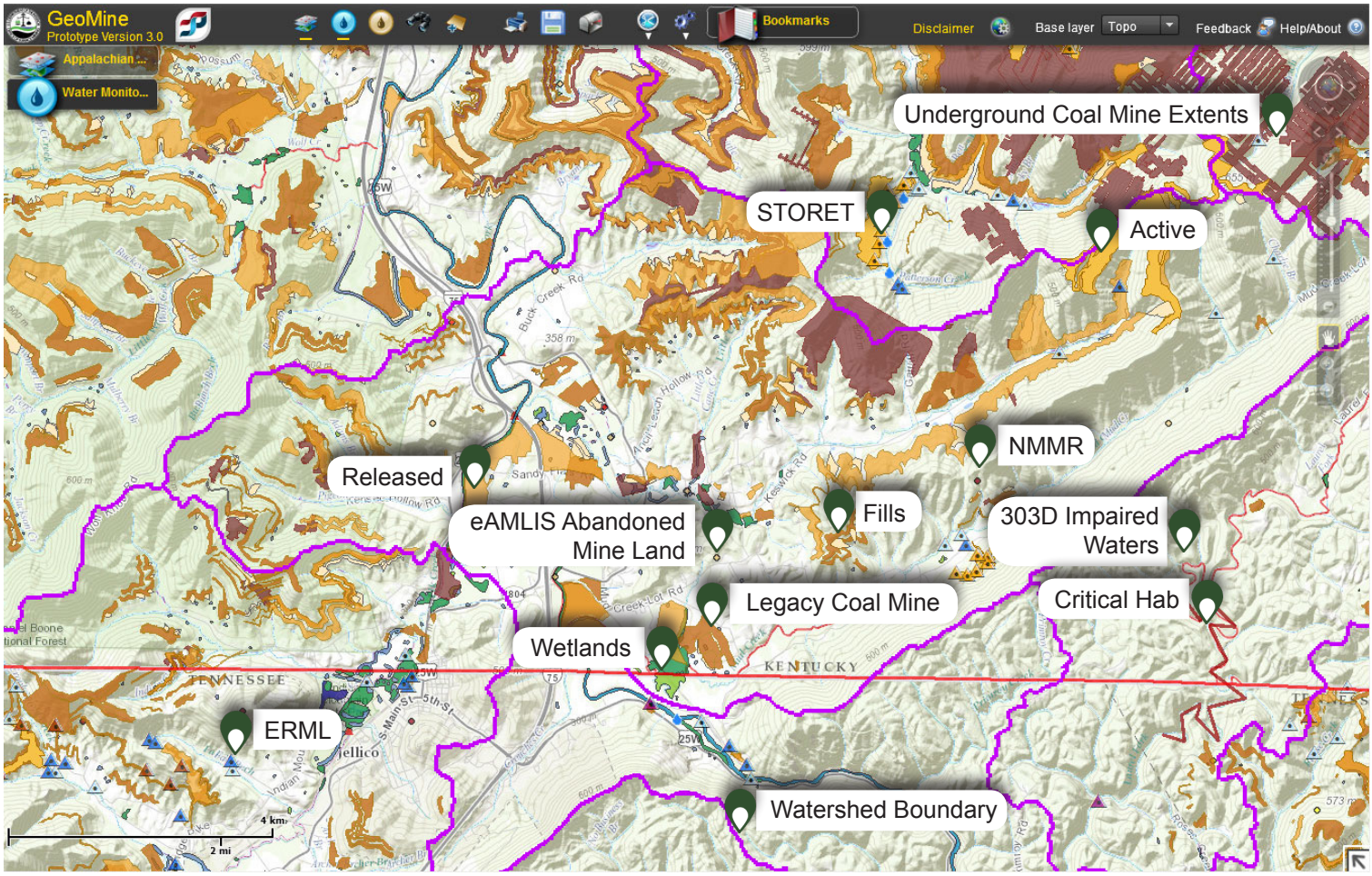
State Agencies:
- Kentucky
- Virginia
- West Virginia
- Interstate Mining Compact Commission (IMCC)

5: What are examples of GeoMine use in support of SMCRA, CWA, and ESA regulation?

The following use cases demonstrate the value of the Pilot Project Map Layers.

Use Case A: The GeoMine Viewer is a "one-stop-shop" for the unique collection of coal mining-related map layers from the partner agencies.

The screen-view from GeoMine shows the Tennessee-Kentucky border. The data shown includes active, released, and legacy coal mine boundaries (shades of orange), underground coal mine extents (dark-brown), fills (tan), environmental resource monitoring locations (colored triangles), eAMLIS abandoned mine land problem areas (small colored points), national mine map repository locations (larger red points), FWS wetlands (green and blue polygons) and critical habitats (coarse red line), EPA 303D impaired waters (thin red lines), watershed boundaries (heavy purple line), and STORET water monitoring stations (blue water droplets). These are all available in standardized formats that aren't limited by State boundaries.

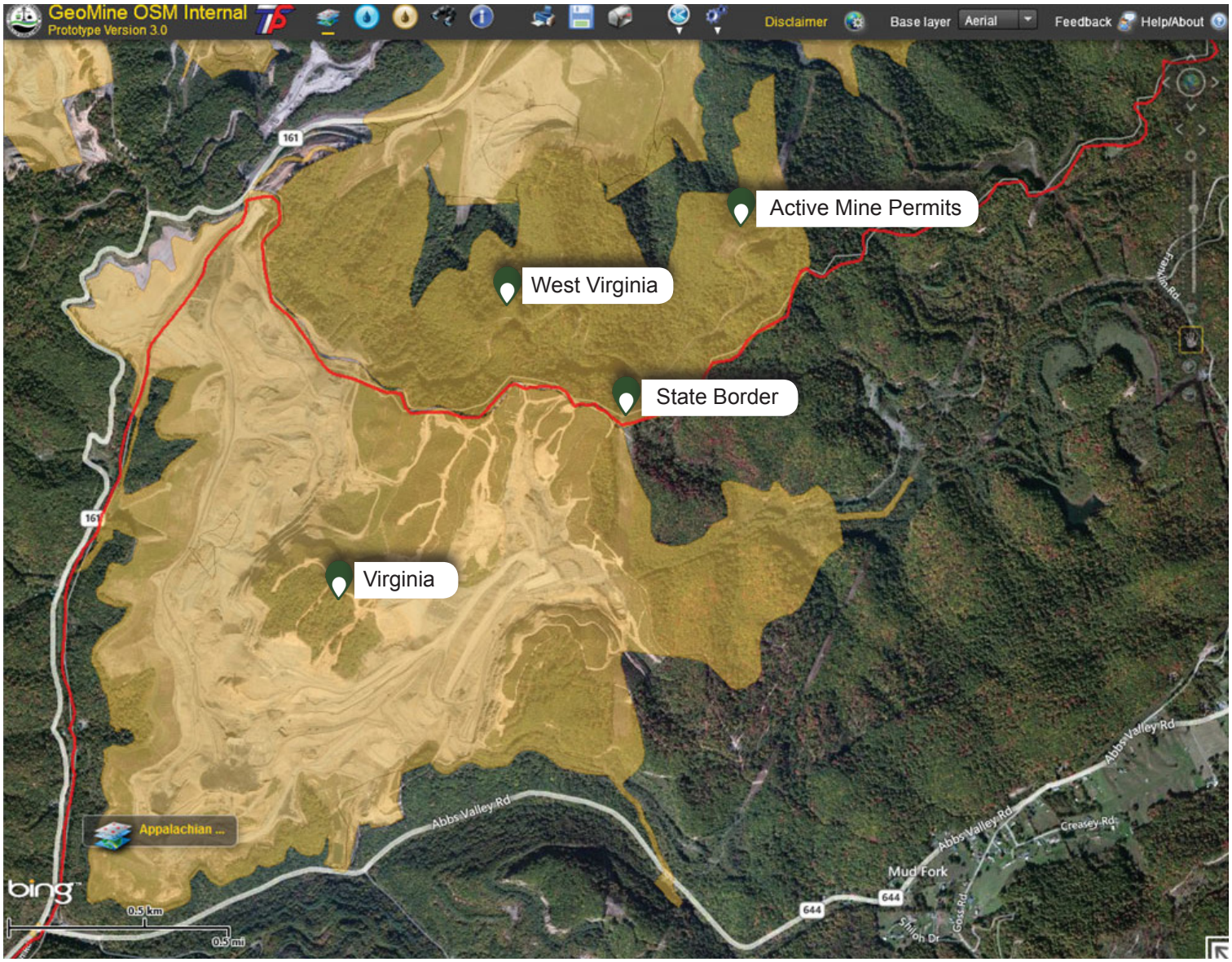


"The data extraction tool has multiple geospatial reference options, which is helpful in using this map data in analysis software. The AML priority location map layer could aid in identification of unknown underground mine entries or areas of instability. The FWS wetlands and critical habitat layers are useful with the classifications on GeoMine, and can be readily loaded into a GIS for analysis. The multi-state extent of the EPA 303d layers are convenient. Location information along the Tennessee state line would be useful for CHIA development."

- OSMRE Knoxville Field Office Hydrologist

Use Case B: Common mining and reclamation issues along state boundaries should be easy to map and visualize.

GeoMine view along the Virginia-West Virginia border showing the State line (red), and active surface coal mine permit boundaries. GeoMine indicates how impacts from mining in one State (hydrologic, slope stability, blasting, subsidence, etc.) may extend into an adjacent State.



"An active underground coal mine operation was penetrated without warning by natural gas developers permitted in an adjoining state. Drillers, mine operators, and regulators all lacked the ability to share and review mining data across state lines. The surface mine operating across state lines could have potential hydrologic or slope stability issues originating from one state and impacting the adjoining state's land. A comprehensive, standardized and accessible GIS would have enabled regulators to identify the potential impacts and then work with operators to modify permits or inspection protocol."

- West Virginia Department of Environmental Protection Program Manager

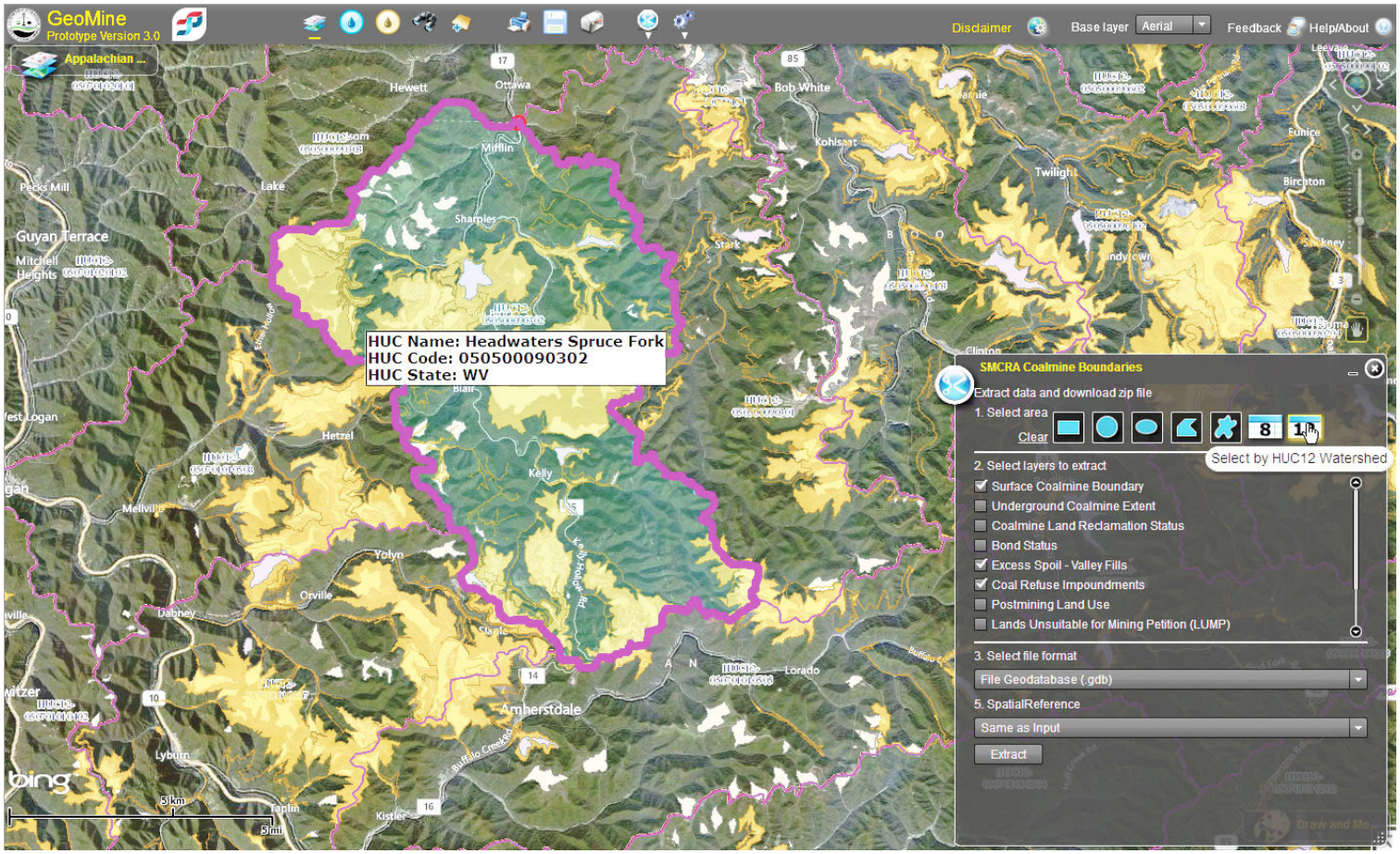
Use Case C: Digital maps provide enhanced visibility of critical relationships and patterns on the landscape.

GeoMine map showing spatial relationships between surface coal mining operations (orange polygons and red point) and downstream aquatic species critical habitats (magenta line). Watershed boundaries (thin red line) and stream courses with flow direction arrows (blue lines with triangles) supplement the map to aid in delineation of potential impact areas.

"GeoMine will provide the U.S. Fish and Wildlife Service with information our field staff had limited or no access to previously. This is critical in determining the potential for adverse impacts to terrestrial and aquatic habitats and species due to surface coal mining activities. GeoMine will also improve coordination among agencies, reducing redundant processes."
- U.S. Fish and Wildlife Service Energy Coordinator

Use Case D: The ability to download data by watersheds links surface coal mining data with hydrologic areas of concern.

Using the data extraction tool in GeoMine allows users to download all geospatial features within a watershed boundary (HUC 8 or 12). In this screen, the user has selected for extraction all active surface coal mine permit boundaries, fills, and coal mine refuse disposal sites within the Spruce Fork HUC 12 watershed. Results are sent to the users' computer where they can be downloaded into other software application for detailed analysis and reporting.



"The Corps of Engineers has used GeoMine to access geospatial data to assist in the final decision–making process for 404 individual permits reviewed under Clean Water Act provisions. GeoMine is used to visualize coal mine boundaries, fills and coal refuse impoundment locations in relation to Hydrologic Unit Code 12 (HUC12) watershed boundaries. The HUC12 boundary is then used as a geospatial selection tool through the GeoMine Viewer Data Extraction function. The resulting mining-related features are then downloaded into GIS software for analysis on a HUC12 watershed basis."

- Army Corps of Engineers Project Manager

Use Case E: Supporting Special Studies of Mining and Reclamation.

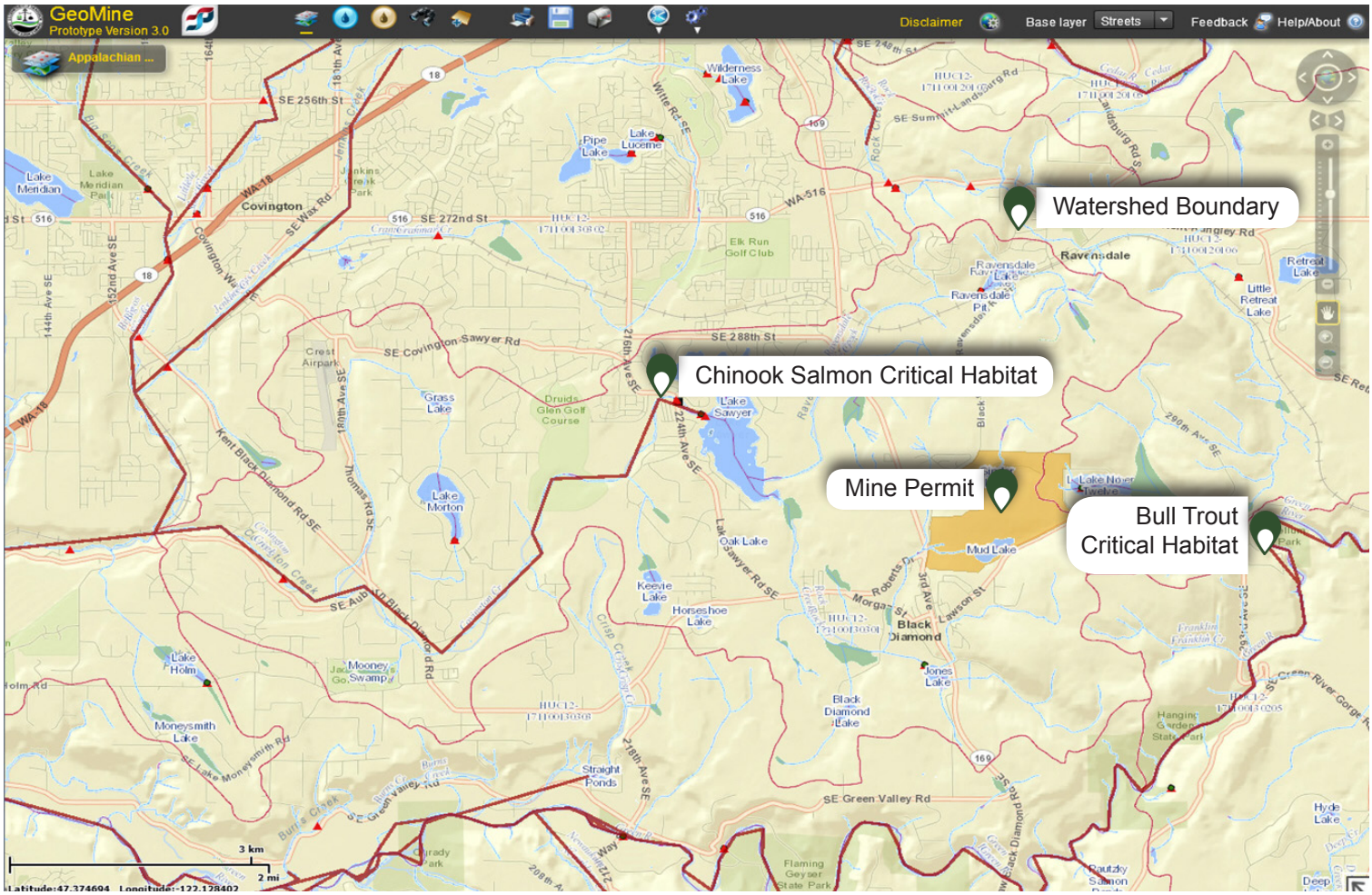
GeoMine was used to efficiently identify active slurry impoundments by permit number for a special study (the two lighter colored polygons in this image with transparency turned up). OSMRE was also able to discern which impoundments appeared to have most recently pumped coal slurry and identify the larger impoundments for a given county (note that a County boundaries layer can be added using the 'add data from web' tool). GeoMine also enabled OSMRE Lexington to determine the precise grid coordinates of each impoundment using the coordinate readout in the lower left corner. Realized time savings for this activity – approximately 52 hours.

"Without the use of GeoMine the task of condensing the list of permits would have taken a significant amount of time. First the locations would have been obtained from the SMIS database and plotted using Google Earth. Next the aerial would have been examined for an impounding feature. If there was an impoundment adjacent to the permit location one could assume that the impoundment was the one that belonged to the permit number. However, this would have to be verified. Verification would be completed by downloading all the MRP maps from an FTP site and verify the locations. Downloading these maps takes roughly one hour per map. Without GeoMine this process would have taken more than 60 hours, instead of the 8 hours using GeoMine. Therefore, the time savings realized from using GeoMine for this business activity totaled about 52 hours."

- OSMRE Surface Mining Reclamation Specialist

Use Case F: Improving the Data Discovery Process for Section 7 Threatened and Endangered Species Consultation.

T&E species for a drawn search area or within a county. Often this results in a simplified habitat map covering multiple states that does not specify the detailed locations where T&E species may be impacted relative to a mine. GeoMine is a powerful visual tool to identify quickly where impacts could exist, such as specific streams where aquatic T&E species reside. See Appendix P for a discussion of cost savings realized by use of GeoMine for Section 7 consultation.

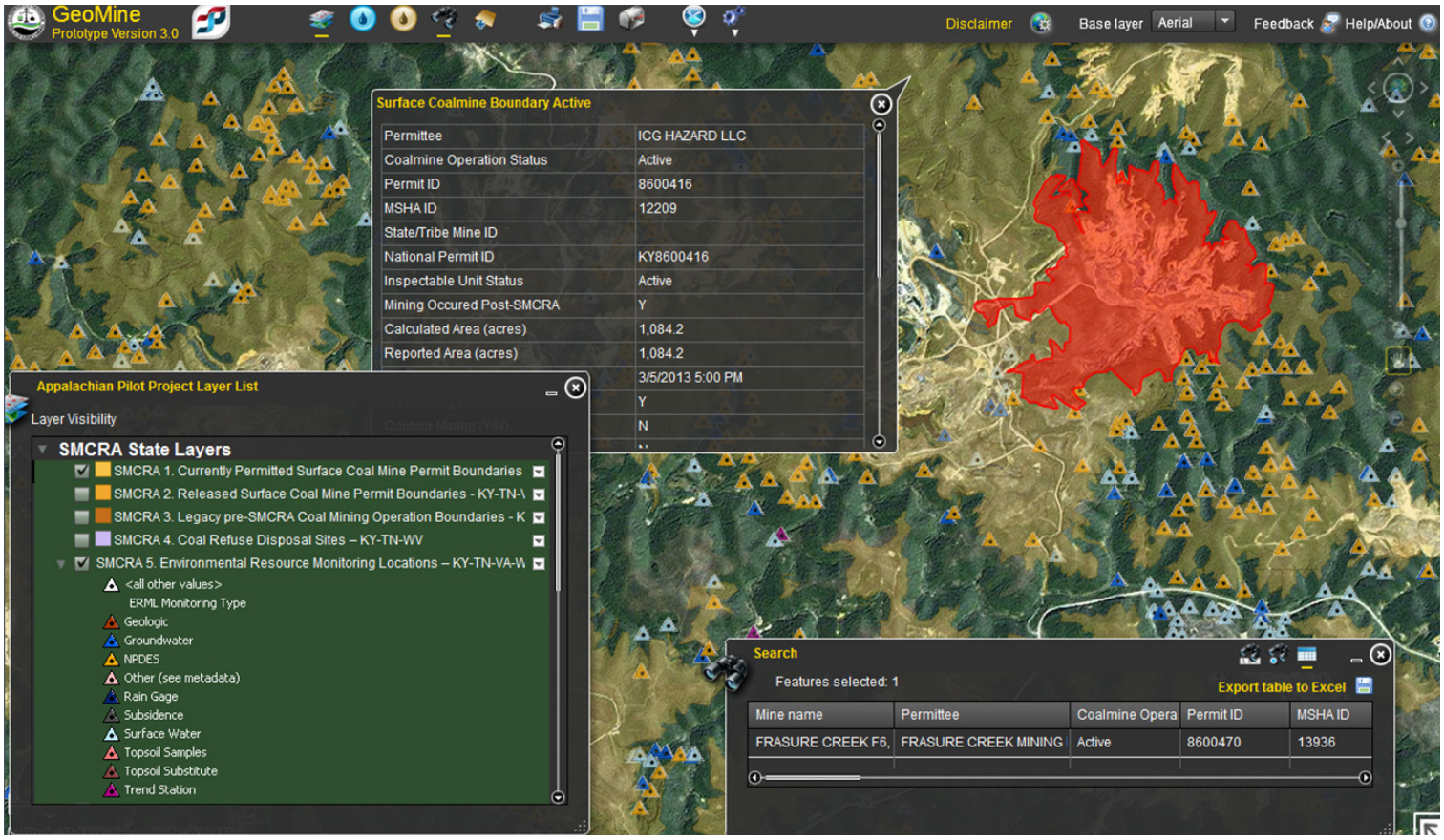


"In a matter of a few minutes we determined which species could potentially be impacted by mining, and spatially where the critical habitats are relative to the mine. This saves valuable time in the process of data discovery, improves understanding of critical spatial relationships, and enhances awareness of features or situations that may not have been previously considered. The last time this Section 7 discovery process was conducted, it required about 19 hours of work to gather the necessary information and create reports for a mine site. Using GeoMine, the same process took about half the time. I really like GeoMine's printing and emailing capabilities, which provide a simple and quick means to create maps and share them with other agencies like FWS. I currently process 10 of these per year. Cumulative time savings realized over a year is estimated at 95 hours."
- OSMRE Natural Resource Specialist

Use Case G: OSMRE Lexington Field Office Mine Reclamation Plan Review.

GeoMine has been used in Kentucky to streamline the process of preparing for mine inspections instead of standard Mine Reclamation Plan review procedures. Mine inspectors found significant time savings in 1) locating mine permits (search tool and result highlighted in red on the map) and determining access/meeting points to meet State RA, 2) analyzing aerial imagery in permit area for inspection planning and situational awareness, 3) finding adjacent permit numbers (ID window on map) and boundaries, and 4) identifying water monitoring stations (multi-colored triangle symbols).

Each of the 6 OSMRE Lexington inspectors conducts 52 random oversight inspections per year, for a total of 312 inspections per year. Each inspector conducts a file review of each one of their permits. Based on a savings of 4.2 hours per inspection, the time savings adds up to 216.7 hours per year per inspector, or 1300 hours for the Lexington office.



"Finding adjacent permit numbers and boundaries with GeoMine only take 5 minutes. Currently OSMRE inspectors have no easy way to be able to conduct this type of review. A conservative estimate of 3 hours was assigned which would encompass making a few phone calls to the RA and having to download multiple maps. If the permit in question was in the middle of a large mining complex figuring out where the boundaries lined up and downloading all the maps could take days. GeoMine provides this information in a very fast and usable format."

- OSMRE Surface Mining Reclamation Specialist

6: What were the Pilot Project objectives and what are the resulting findings?

The following discussion outlines the Pilot Project's five major objectives along with summary findings by the Interagency Team. As the findings demonstrate, the objectives of the Pilot Project were fully met in each case.

Objective 1:
Create a Pilot Project collaborative model for discovering, collecting, harmonizing, managing, and serving coal mining map layers pertinent to SMCRA and Clean Water Act (CWA) for coal mining and reclamation activities located in the States of Virginia, West Virginia, Kentucky, and Tennessee.

Findings:
- SMCRA states now share over 128,000 mapped sites in seven key map layers for coal mining and reclamation activities with four layers under development.
- Federal agencies now contribute over 415,000 mapped sites.
- The source of SMCRA surface coal mining permit data is the states' database entries for these sites.
- The GeoMine model merges data from multiple sources into seamless map layers extending across the Pilot Project extent.

Objective 2:
Recognize the agencies as Authoritative Data Sources (ADS) for data under their control and establish data stewards for the map layers.

Findings:
- Each of the state and Federal agencies has designated data stewards as the point of contact for GeoMine.
- Each agency has remained engaged in maintaining, updating and enhancing their contributed map services and data.

Objective 3:
Developing a shared, Cloud-based GIS platform for Appalachian coal mining map layers available to the SMCRA state and Federal users

Findings:
- The Cloud-based approach affords a neutral ground for storage and integration of GIS data from all member sources.
- The development of databases and web-based GIS tools was greatly enhanced by the ability to quickly try new configurations without the need to change physical computer systems.
- The Cloud has high capacity networks that make accessing web-based applications and data very easy from any Internet connected location.

Objective 4:
Provide resources through OSMRE-sponsored Federal Cooperative Agreement grants for SMCRA RAs to convert data to digital GIS map layers and create services sharable through the GeoMine platform.

Findings:
- OSMRE provided funding for cooperative agreement grants to the SMCRA-state partners:
- $714,260 to fund work in 2011.
- $407,000 to fund work in 2012, 2013 and 2014.
- AmeriCorps and state interns contributed to 10,500 currently permitted coalmines and over 21,500 AML features added to SMCRA state GIS for GeoMine sharing (as of 5/8/13 continuing through 9/15/14).

Objective 5:
Deploy GeoMine Viewer with simple geospatial data layers pertinent to SMCRA, CWA and ESA regulatory programs.

Findings:
- GeoMine decreases the complexities of using shared data by enabling discovery and use through a single Internet-accessible Viewer.
- The GeoMine Viewer provides discovery and access to map data, including the ability to download hydrologic data in user-friendly formats [by design the GeoMine Viewer does not incorporate analytic or modeling tools.]
- Deploying an additional Federal-data-only Viewer (Federal Viewer Prototype) allows discovery of nationwide Federal agency geospatial data to allow search and download capabilities for Federal, state and tribal permit reviewers, inspectors and management.

7: What are the results of the OSMRE supplemental grants awarded to the GeoMine SMCRA states?

The OSMRE grants assisted the states in further developing their GIS processes and populating their databases. The grants allowed them to scan, store, and georeference hard-copy maps into digital formats resulting in the following additional digital data (as of 10/17/2013):

KFO

- 288 digital currently permitted surface coal mining boundaries created;
- 280 released surface coal mining boundaries created;
- 2,732 total surface coal mining boundaries have been verified for TN;
- 2,128 digital AML features (point, lines, polygons) created; and
- 98 AML planning units and 311 AML problem areas digitized.

KY

- 51,643 digitized surface coal mining boundaries and related features;
- 27,151 environmental resource monitoring locations; and
- 9,727 AML Problem Areas/Planning Units and problems.

VA

- 3,447 released surface coal mining boundaries;
- 365 active permits;
- 10,612 environmental resource monitoring locations; and
- 6,763 AML Problem Areas/Planning Units and problems.

WV

- 3,517 currently permitted surface coal mining boundaries, including those from 571 annual progress maps dating back to 2005;
- 46,334 environmental resource monitoring locations;
- 2,939 post mining land-use; and
- Scanned 3,400 of 4,000 AML Problem Areas to be georeferenced and digitized.

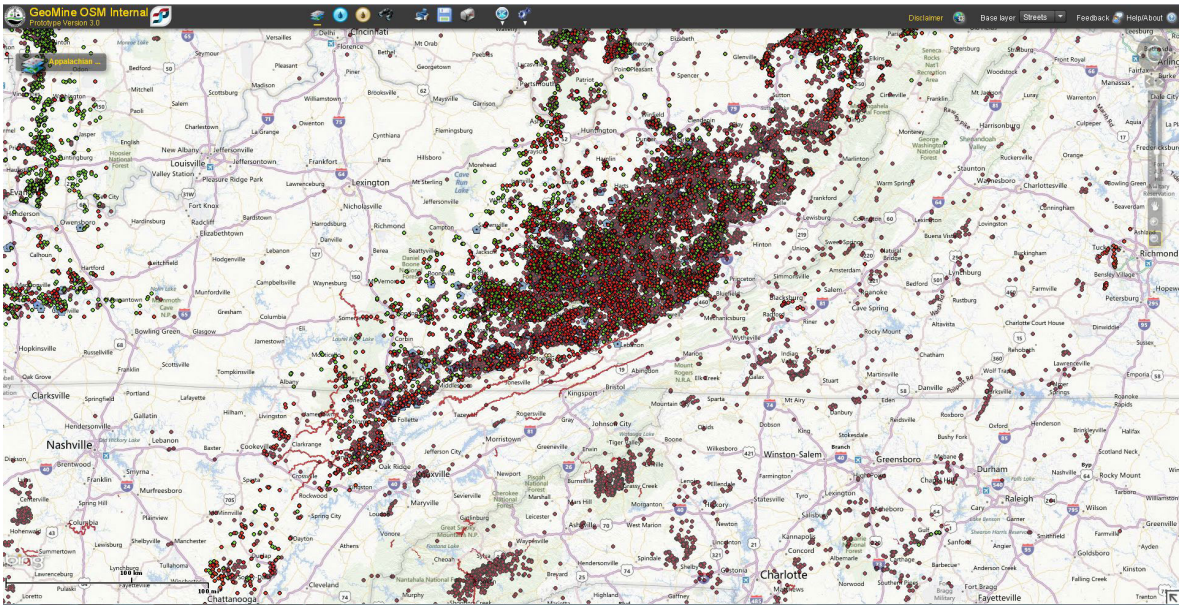
8: What map layers are available to be shared in the GeoMine Viewer?

SMCRA Map Layers

- Data meet ASTM D7780-12 Standards for Coal Mine Operations.
- Layers are still being populated with completion expected by the end of 2013.
- Over 29,000 surface coal mining permit boundaries are mapped.
- 3.5 million acres of permit boundaries are located.
- 89,479 environmental resource monitoring locations are mapped.
- Active permits completion is anticipated by the end of 2013.

Federal Map Layers

- The Federal Map Layers listed on the left are currently available for the entire country, except for the Corps of Engineers layers which are only available for KY, TN, VA, and WV.
- 415,784 coal-mining related sites.



9: Interagency Team Alternatives Considered

The Interagency Appalachian GeoMine Pilot Project Team considered the following three alternatives:

Alternative 1: ***Deploy the Federal Viewer Prototype for all Nationally-Available Federal Data Layers***[1]***; Discontinue the GeoMine Viewer.*** Allow all contracts, grants, and support services and data sharing for the GeoMine Viewer to expire at the end of FY13. This includes discontinuing the GeoMine Viewer cloud web application. Upon acceptance of the GeoMine Pilot Project Report by agency executives, the Federal Viewer Prototype will be released to the public. Implications of this course of action, both positive and negative, are as follows:

PROS

- Limited resources needed to deploy Federal Viewer Prototype.
- State GIS data created through the Pilot Project will be usable by the State Regulatory Authorities in their own programs.
- Over 63% of the currently permitted inspectable mine site boundaries in the U.S. already have been rendered digitally by the Pilot Project.
- Lessons learned will be transferred via the Pilot Project report.
- Access to Federal Viewer Prototype data by agencies, academics and the public will be available.

CONS

- No single-source access to SMCRA coal mining map data.
- Ability to upload to or download from GeoMine Viewer eliminated.
- Continued risk of data gaps in coal mining-related mapping data. Lack of ready access to coal permit and geospatial data.
- States may abandon voluntary compliance with geospatial data standards for their own proprietary formats.
- Due to costs and technical issues, states may decide not to share their data with other states or Federal regulatory authorities.

Alternative 2: (Recommended by Interagency Team) Deploy the Federal Viewer Prototype prototype for all Nationally-Available Federal Data Layers[2] ***as Soon as Possible; GeoMine Viewer Deployed Nationwide with Public Access at Version 4.0 in early 2014.*** The Federal Viewer Prototype would be deployed as a prototype until the GeoMine Viewer 4.0 is operational. Nationwide deployment of the GeoMine Viewer to the remaining SMCRA State, Federal and Indian Programs would be staged over a five-year period. As data is incorporated into GeoMine it would be made available to the agencies and the public. Implications of this course of action, both positive and negative, are as follows:

PROS

- Voluntary participation by all SMCRA states in GeoMine will result in a “One-Stop-Shop” for national coal mining data.
- Access and use of GeoMine for analysis by agencies, academics and the public immediately available.
- GIS data created through the Pilot Project will be usable by all agencies.
- Over 63% of the currently permitted inspectable mine site boundaries in the U.S. already have been rendered digitally by the Pilot Project.
- Pilot Project states support GeoMine implementation for this alternative.
- Public availability of data may reduce FOIA requests for these data.

CONS

- Deployment nationwide will require new Federal funding and assistance to SMCRA states.

1., 2. The USACE will share data when it is made publically available through its ORM2 public interface.

Alternative 3: Deploy the Federal Viewer Prototype Prototype for all Nationally-Available Federal Data Layers[3]; GeoMine Viewer Deployed Nation-wide with Immediate State/Federal/Tribal Access; Public Access Delayed. The Federal Viewer Prototype would be deployed as a prototype until the GeoMine Viewer 4.0 is operational. Nationwide deployment to remaining SMCRA State, Federal and Indian Programs would be staged over a five-year period. As data is incorporated into GeoMine, it would be made immediately available to State, Federal and Tribal agencies only. Access to the public would be delayed until state and federal programs are more comfortable with public access.

PROS

- Voluntary participation by all SMCRA states in GeoMine will result in a "One-Stop-Shop" for the unique collection of national coal mining data provided by partnering agencies.
- Access and use of GeoMine for analysis made available immediately to only the agencies.
- GIS data created through the Pilot Project will be usable by all agencies.
- Over 63% of the currently permitted inspectable mine site boundaries in the U.S. already have been rendered digitally by the Pilot Project.

CONS

- Deployment nationwide will require new Federal funding and assistance to SMCRA states and tribes.
- Public access to the GeoMine Viewer would be delayed.
- Public and academic access to the data for study and public engagement not available in the near term.
- While the GeoMine Viewer is not publically available there may be an increase in FOIA requests for these data.

3. The USACE will share data when it is made publically available through its ORM2 public interface.

10: Interagency Team Recommendations

The Interagency Appalachian GeoMine Pilot Project Team makes the following recommendations as a result of the Pilot Project findings:

1. To implement Alternative 2 as a continuing program administered by OSMRE. After thoughtful discussion and deliberation by the Interagency Team, Alternative 2 was selected as superior and is recommended in the draft report. Alternative 1, terminating the GeoMine Pilot Project services and not extending GeoMine nationally, was considered to have little merit as the Interagency Team realized the following benefits of extending GeoMine to additional partners nationally:
   - The two-year project demonstrated the feasibility and value of sharing mapping data among the eight partners, thus reducing duplication of effort and improving efficiencies;
   - It can add value by improving regional-level decision-making--critical coal mining-related data extending beyond individual state boundaries, including hydrologic and geologic data, will be more accessible to technical staff in multiple agencies, resulting in more-informed technical reports (use cases illustrate that GeoMine is already starting to help);
   - The GeoMine Viewer is practical--it has easy to use tools that allow data search and download capabilities for permit reviewers, inspectors, scientists/engineers and program managers/executives;
   - The Federal Viewer Prototype has utility for SMCRA, CWA and ESA tasks—the Federal data search and download capabilities has value for permit reviewers, inspectors, scientists/engineers and program managers/executives;
   - The project was technically successful: coal mining map layers and data are being shared routinely among all the partners and the innovative Amazon-Esri Cloud solution worked; and
   - Greater transparency of data shared between Federal, State and Tribal agencies will result in more responsible stewardship, improved customer service, increased productivity, and greater efficiency as it relates to the public interests.

Alternative 2 was preferred over Alternative 3 to maximize availability of data to SMCRA state and Federal agencies, as well as the public. This alternative also demonstrates governmental transparency and will likely reduce the number of FOIA requests.

2. To continue, and where possible expand, the geospatial data sharing and collaboration among state and Federal agencies involved in SMCRA, CWA, and ESA issues.

11: Deployment Plan and Operational Costs for Alternative 2 Implementation

The OSMRE and SMCRA states in the Pilot Project developed a deployment plan that was reviewed by the Interagency Team (Chapter XV of the Report), with cost estimates to extend the GeoMine effort to the other SMCRA State, Federal and Indian Programs. The cost estimates in the table below are based on costs for the Pilot Project, including the OSMRE grant funds utilized by the Pilot Project states to create surface coal mining boundaries and associated data in FY11 through FY13. The Interagency Team has provided the estimates to agency executives for their review. Please note that the costs were developed for the seven key SMCRA map layers approved as foundational by the Interagency Team. AML costs are not calculated, as theses layers are considered developmental. In the future, AML layers may be included in GeoMine, with costs expected to be minimal as many AML programs have established GIS for their AML projects.

GeoMine System Projected Total Costs FY14-18

Category	*FY14 Funds*	*FY15 Funds*	*FY16 Funds*	*FY17 Funds*	*FY18 Funds*	*FY19 O&M Funds*
1. *Awarding OSMRE Federal cooperative agreements for purposes of SMCRA RA data acquisition and transfer to GeoMine*	$497,595	$507,547	$517,698	$528,052	$538,613	
2. *GeoMine OSMRE operation and maintenance costs*	$510,960	$521,179	$531,603	$542,234	$553,079	$564,140
3. *SMCRA state operation and maintenance costs for GIS data*	$80,943	$106,320	$132,205	$158,608	$185,538	$189,249
4. *GeoMine National Coal Geographic Information System development costs*	$214,200	$218,484	$222,854	$227,311	$231,856	$225,452
5. *Total OSMRE Costs*	$1,303,698	$1,353,530	$1,404,360	$1,456,205	$1,509,086	$978,841

Interagency Appalachian GeoMine Pilot Project Fact Sheet *(12/4/2013)*

The GeoMine Appalachian Pilot Project is an interagency collaboration that began in August 2009 with the goal to develop and deploy a prototype interactive Internet-based mapping application (GeoMine Viewer), to display and share available State and Federal geo-data among eight partner agencies and eventually, as appropriate, the public. Participants include OSMRE, FWS, USACE, EPA, KY, VA, WV, the TN federal program, and the Interstate Mining Compact Commission.

The GeoMine Viewer is an easy-to-use cloud-hosted web application that allows Federal and state staff and managers to view and share geospatial data in vari¬ous desktop and mobile com-puting mapping applications including ESRI software (Arc¬GIS, ArcGIS Server), Google Earth, iPhone/iPAD apps, etc. Pilot Project geospatial layers were designed using approved American Society for Testing and Material Coal Mining and Reclamation Data Standards.

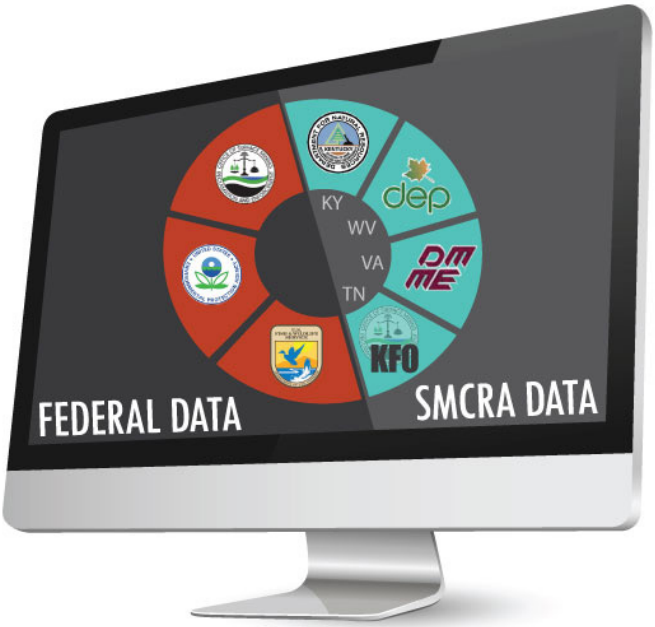
In 2012, OSMRE seized an opportunity to create a Federal-data-only viewer (Federal Viewer Prototype), to accommodate current nationwide data needs within other coal mining States. We are currently in the testing phase of this national Federal data viewer, which will be released to the public upon executive approval. This will serve as a precursor to the eventual implementation of the national GeoMine Viewer that would incorporate both SMCRA state and Federal coal mining geospatial data.

Pilot Project Next Steps

- Launch Federal Viewer Prototype for public access upon executive approval. Distribute final draft report for Interagency executive approval (December, 2013)
- Publish final report and recommendations (December, 2013)

FEDERAL VIEWER PROTOTYPE

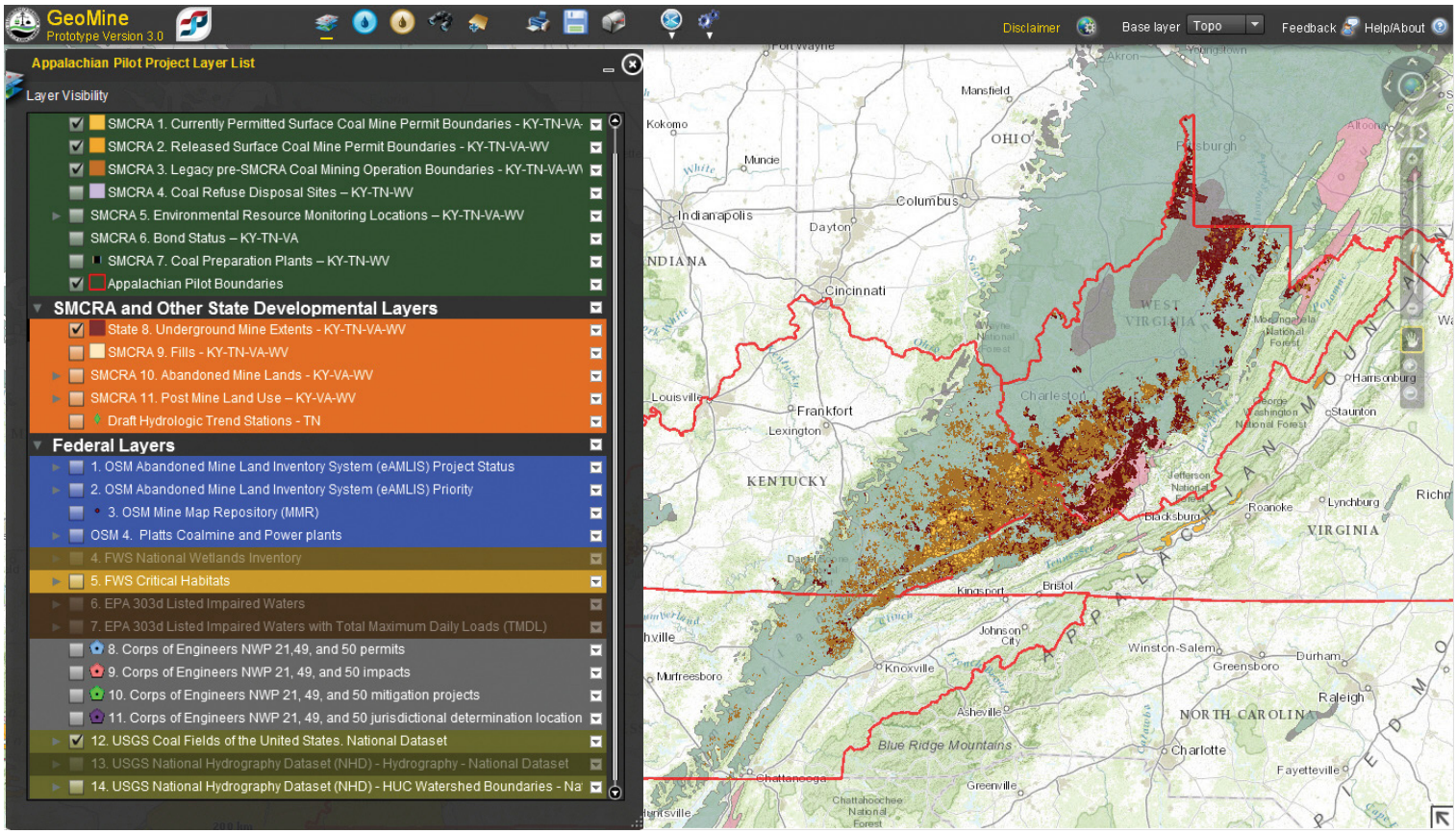
PUBLICLY AVAILABLE



GEOMINE VIEWER

AVAILABLE TO ALL PARTNER AGENCIES

GeoMine Viewer

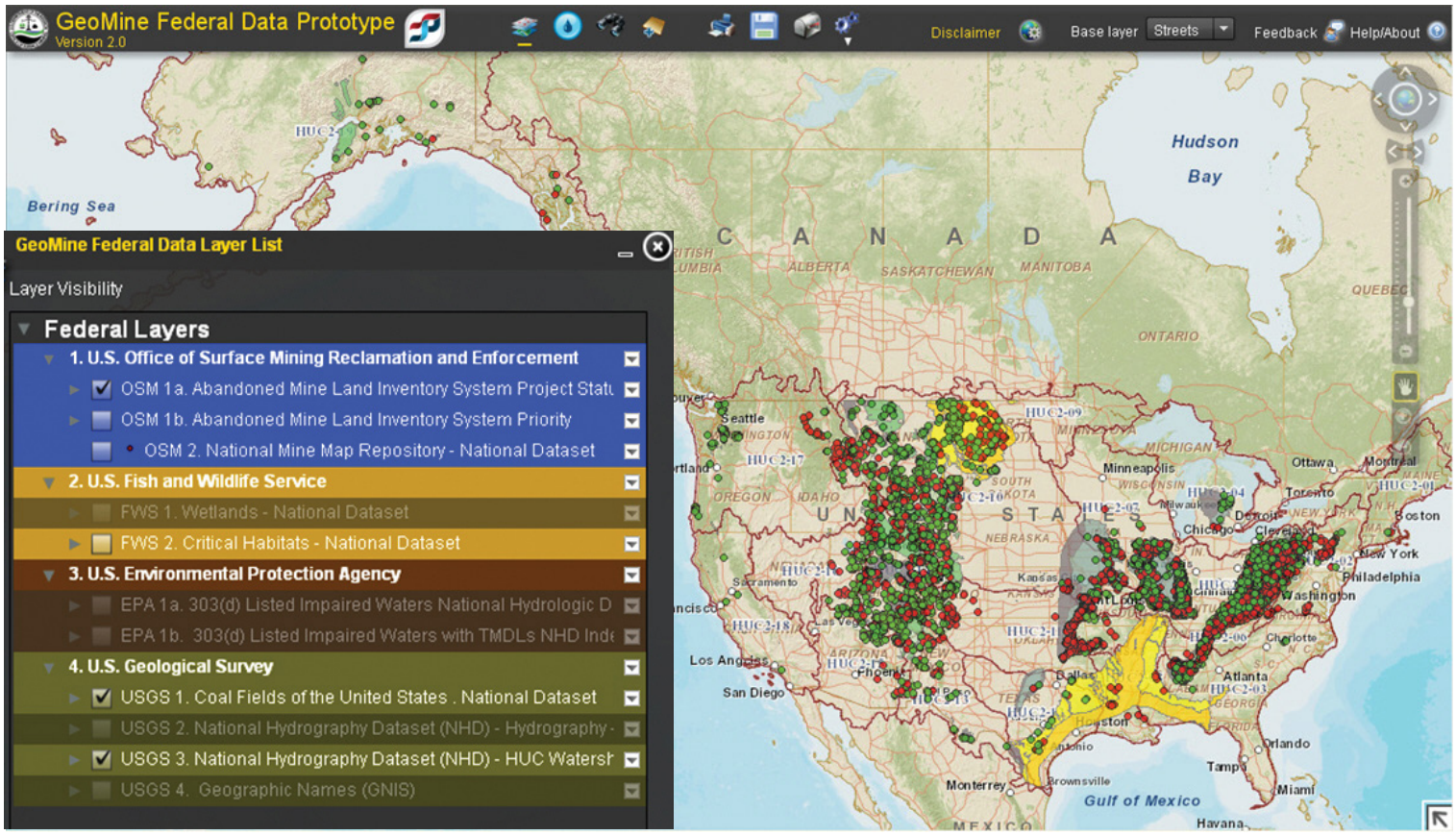


GeoMine Viewer Features:

- The Pilot Project Viewer 3.0 prototype has 25 geospatial layers and 2 hydrologic tools contributed by State and Federal partners:

  SMCRA agencies – 11 SMCRA permit-related layers covering KY, TN, VA, and WV, including: Coal Mine Permit Boundaries, Coal Refuse Disposal sites, Environmental Resource Monitoring Locations, and Hydrologic Trend Station data for WV.
  OSMRE – point locations for the Abandoned Mine Land Information System (eAMLIS) inventory and project sites, and Mine Map Repository underground coal min¬ing map collection.
  FWS – 2 layers: National Wetlands Inventory and critical habitat for threatened and endangered species.
  USACE – 4 layers associated with Nationwide permits.
  EPA – 303d and Storage and Retrieval (STORET)/National Water Information System (NWIS) hydrologic data.
- Federal Cooperative Agreement grants totaling $1.1 million were awarded in 2011 and 2012 to KY, VA, and WV, which have already facil¬itated the creation of over 10,500 new digital SMCRA coal mining boundaries.
- Over 128,000 SMCRA coal mining activity sites have been added to the Viewer, including over 3.5 million acres of surface coal mine operation boundaries.
- Over 415,000 Federal agency sites, including hydro¬logic sampling stations with analytical data.
- 'Add Data from Web' tool allows upload of external map service layers for overlay and map-making in GeoMine
- Print, Save, and Email tools allow users to share maps created in the viewer

Federal Viewer Prototype



Federal Viewer Prototype Features:

- Viewer 2.0 has 7 national geospatial data layers and 1 hydrologic widget from OSMRE, FWS, and EPA, as well as other tools and USGS base layers present in the GeoMine Viewer.
  OSMRE – point locations for the Abandoned Mine Land Information System (eAMLIS) inventory and project sites, and Mine Map Repository underground coal mining map collection.
  FWS – 2 layers: National Wetlands Inventory and critical habitat for threatened and endangered species.
  EPA – 303d and STORET/NWIS hydrologic data.
- Phase I and II product testing by GeoMine interagency team, SMCRA GeoCommittee, nationwide SMCRA data stewards, TIPS Steering Committee, and TIPS team is now complete. Over 60 reviews and comments were taken, and appropriate changes and upgrades are now being incorporated into the viewer.

Primary Pilot Project Team Members: ***OSMRE*** - Bill Clark, OSMRE Sponsor, Robert Welsh, Project Manager, Greg Morlock, System Administrator, Chris Benson, Data Analyst, ***IMCC*** - Greg Conrad, ***Kentucky*** - Daryl Hines, ***Virginia*** - Daniel Kestner, ***West Virginia*** – Mike Shank, ***FWS*** - Christy Johnson-Hughes, ***EPA*** - Brian Topping, ***ACE*** - Desiree Morningstar