

GeoMine Appalachian Pilot Project Progress and GeoCloud II Update for IMCC

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May 1, 2012



Talking Points

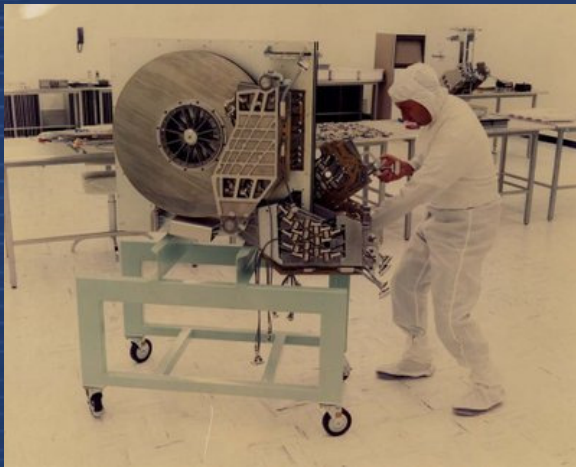


- History & Background
- Update on Progress
- Next Steps
- GeoCloud II
- 2012 decisions



History → '77 Passage of SMCRA

- States Began Building Programs in Support of SMCRA with '70s Mindset & Technology



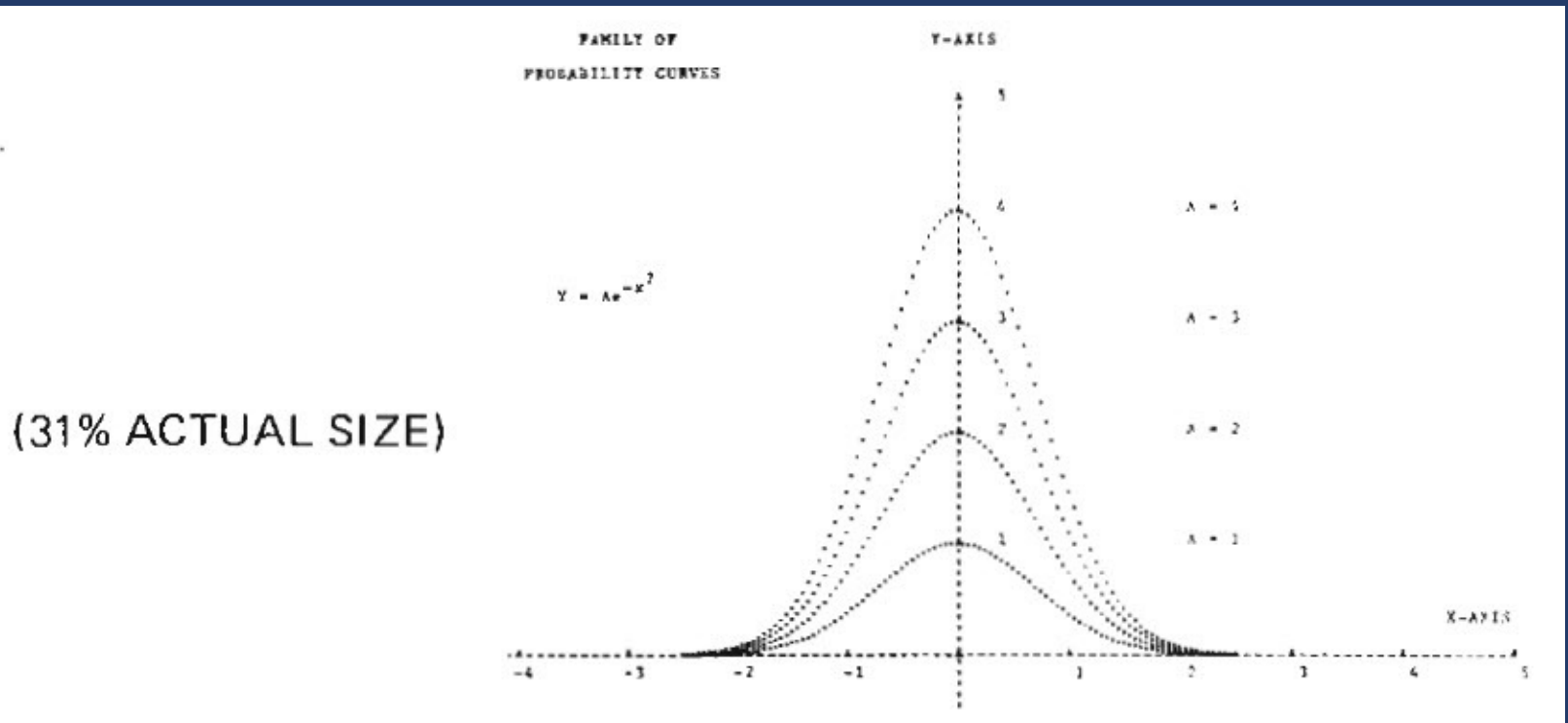
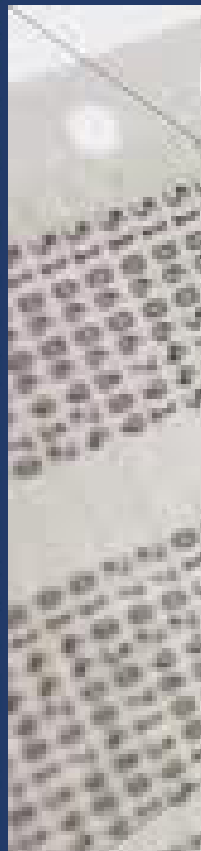
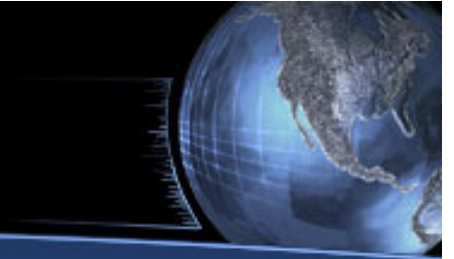
Business Computing

Wang 2202 Plotting



Technical Computing

The State of Technology Dictated Approaches Taken



Business Computing

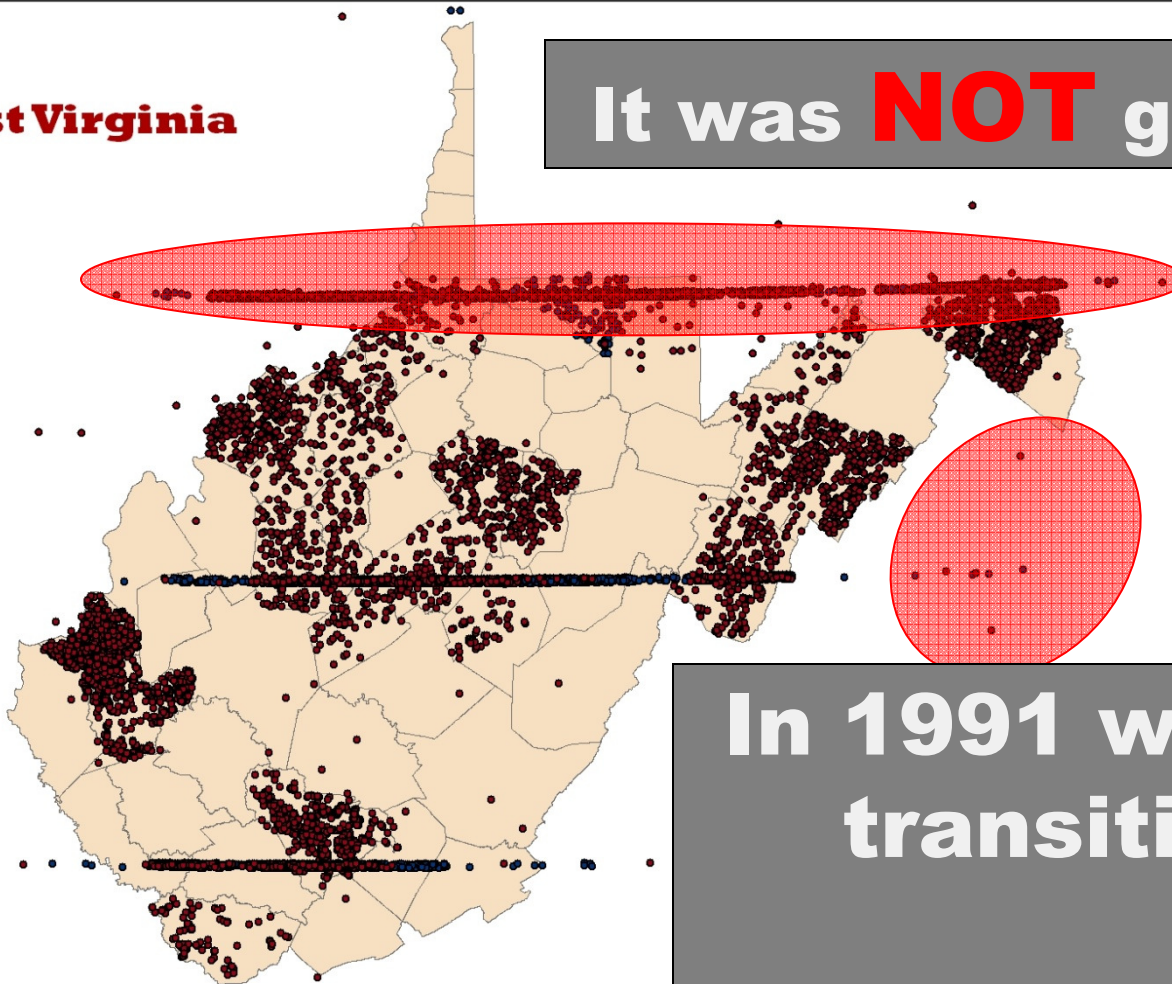
Technical Computing

The Problem With That Approach



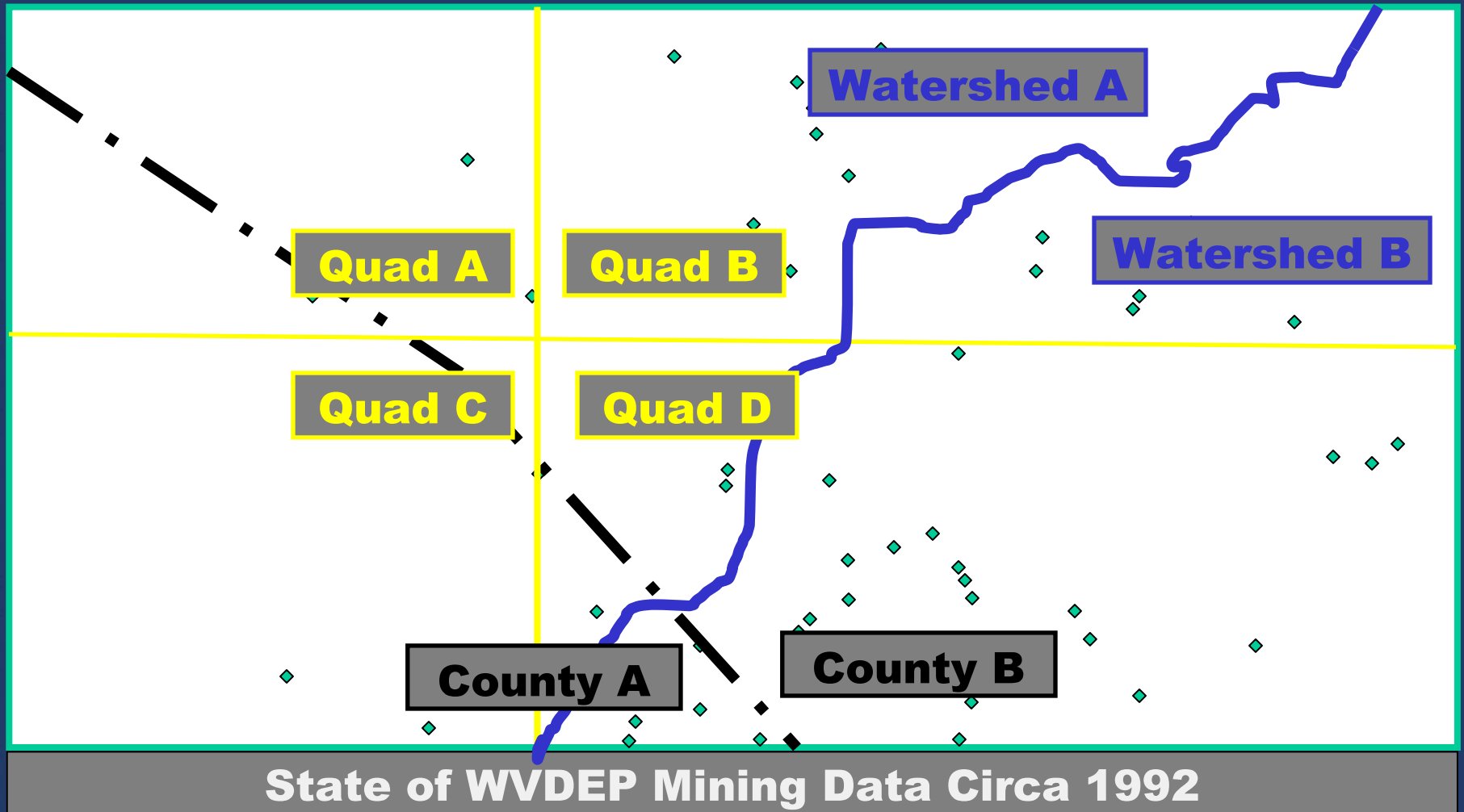
West Virginia

It was **NOT** geospatial

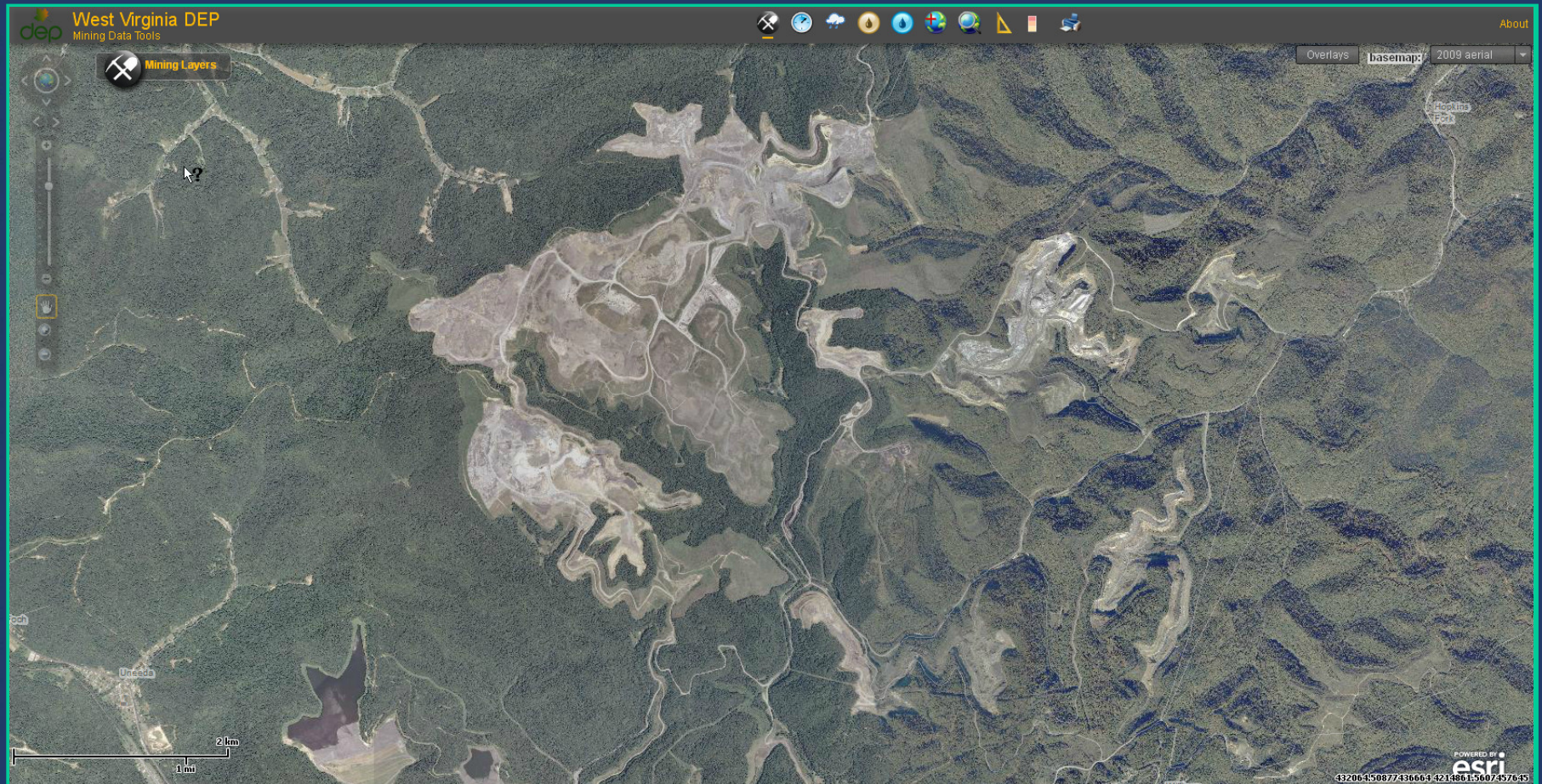
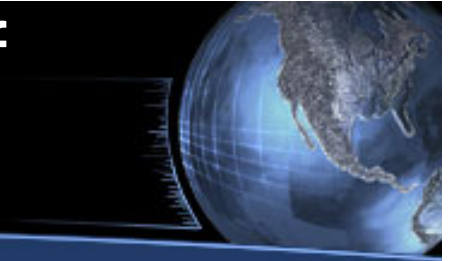


In 1991 we began
transitioning in
WV

Lessons Learned and Evolution of WV Geospatial Data

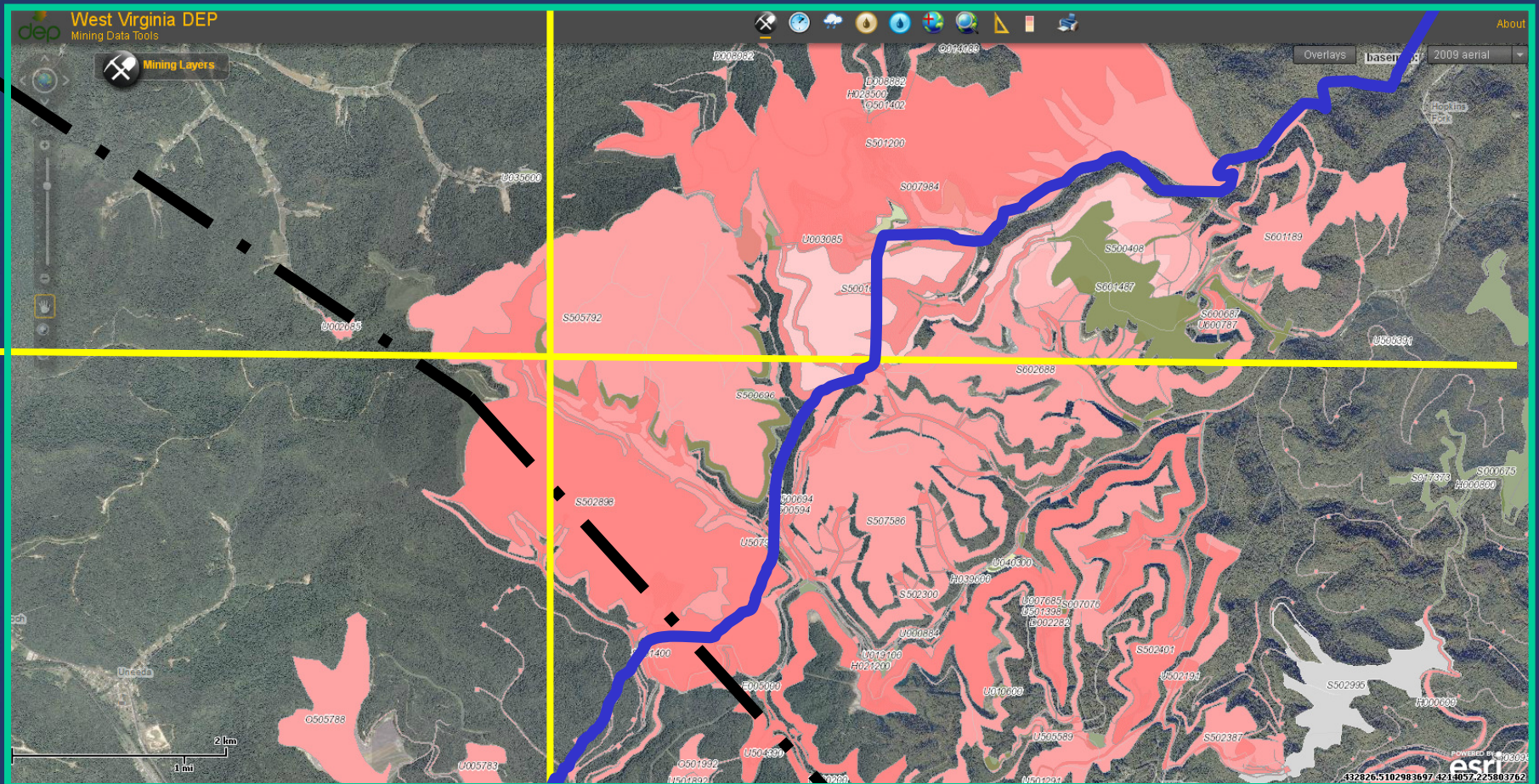
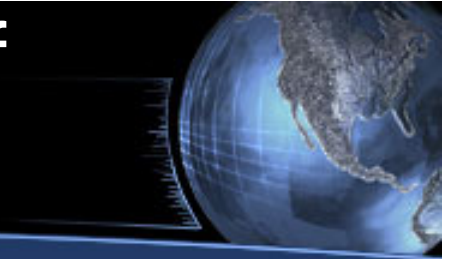


Lessons Learned and Evolution of WV Geospatial Data



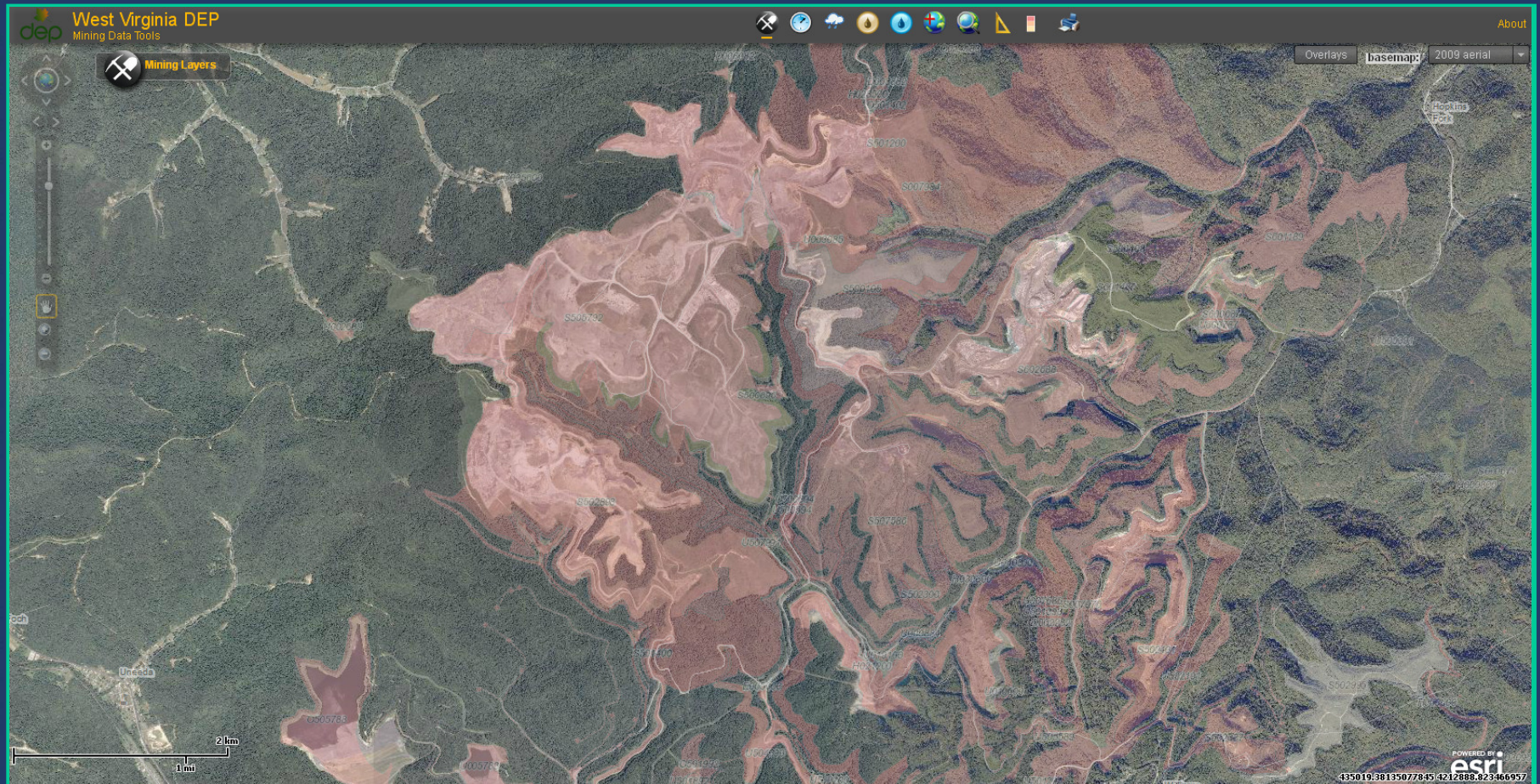
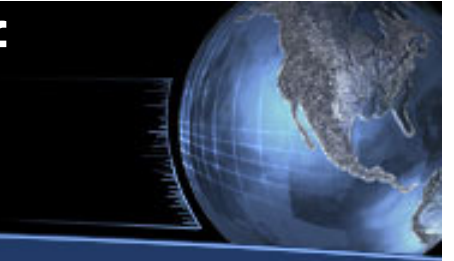
Aerial Imagery of Same Area

Lessons Learned and Evolution of WV Geospatial Data



State of Mining Permit Boundary Data Post-Brag Litigation

Lessons Learned and Evolution of WV Geospatial Data



Combined Aerial Imagery and Post-Brag Boundaries

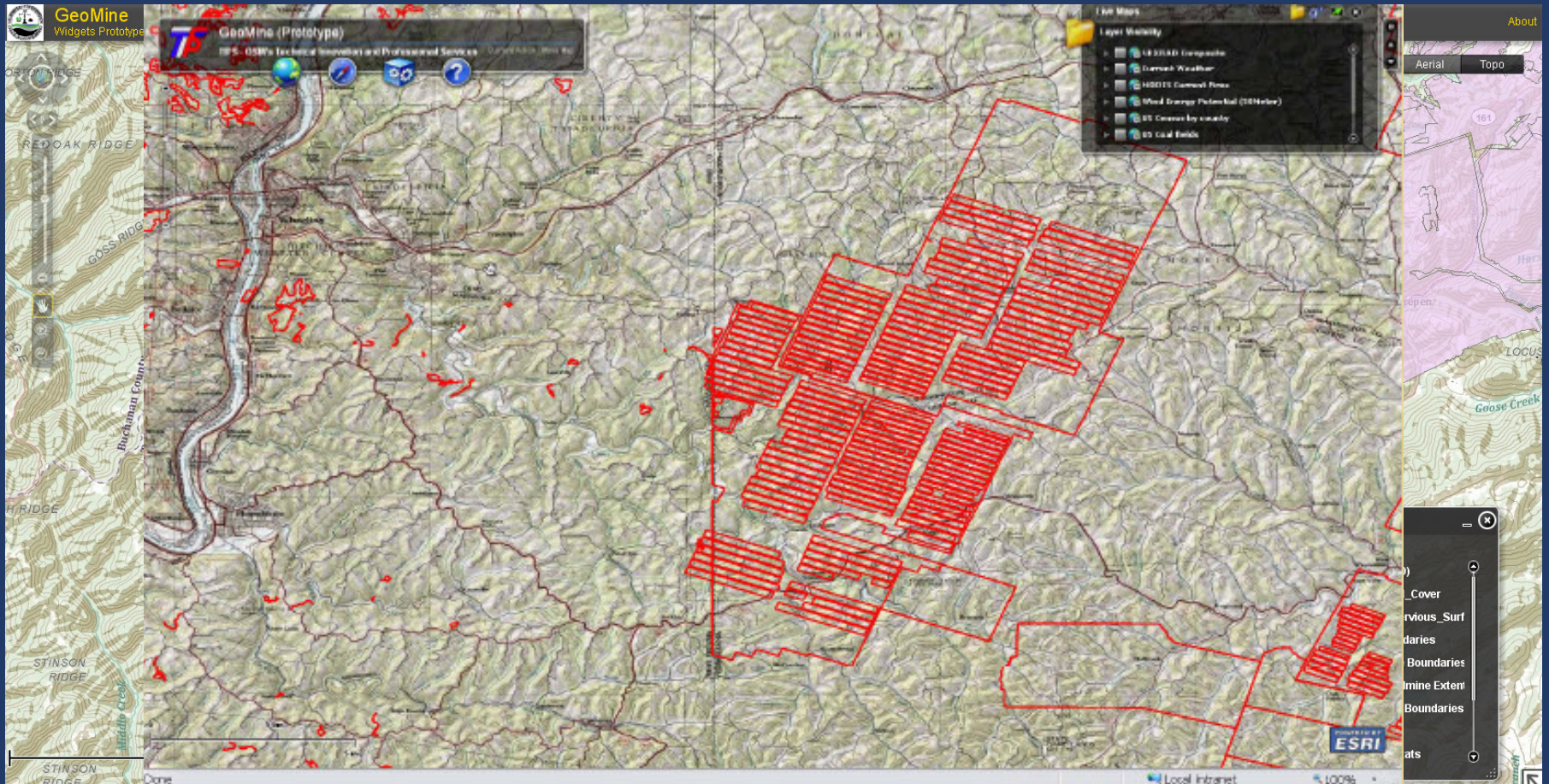
Mapping and Mining Disasters



- October 11, 2000 Martin County, KY Coal Refuse Impoundment Failure → **Inaccurate geospatial data direct cause**
- July 24, 2002 Queecreek, Somerset County, PA → **Inaccurate geospatial data**
-
- January 19, 2006 Aracoma Mine accident Logan County WV → **Inaccurate**

Why transition to geospatial thinking??

Near misses and dodging bullets



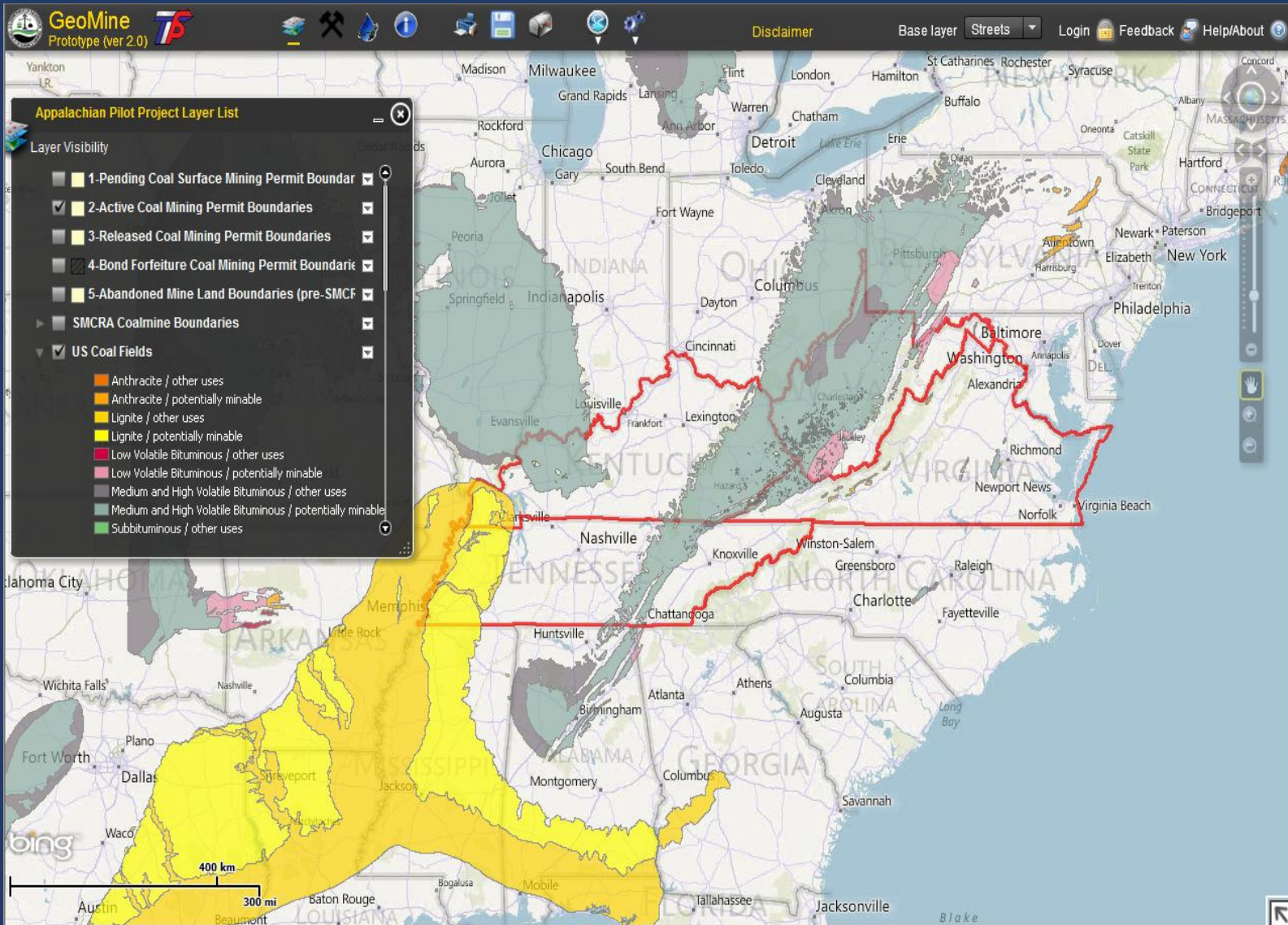
Dealing with Permits that Span State Boundaries

Background



- Creation of Coal Mining Geospatial Data Standards → a precursor spanning several years
- GeoMine Pilot Project → started August 2009
- Goal: develop a prototype interactive Internet-based geospatial application for easy viewing & sharing of available ASTM compliant datasets
- DOI, COE and EPA June 2009 MOU
- Partners: Feds--OSM, FWS, COE & EPA
States--KY, VA, & WV

GeoMine Prototype Viewer v. 2.0 → 201112



Progress



1. “Cloud” solution—Amazon Web Services.
2. Download geodata capability (GIS software, Google Earth, iOS [Apple] and Android mobile devices)
3. Agency Data Stewards:
 - providing data
 - quality assurance

Progress (continued)



4. 22 datasets loaded:

- » SMCRA agencies – **13 SMCRA permit-related** (some AML development ongoing too)
- » Corps of Engineers – **4 products**: Nationwide (NWP) 21 permits, Jurisdictional Determinations, and Impact and Mitigation Locations.
- » FWS – **2 products**: National Wetlands Inventory and Critical Habitat for threatened and endangered species.
- » EPA – **3 products**: 303(d) impaired waters, 303(d) impaired waters with Total Maximum Daily Loads, and STORage and RETrieval (STORET) sampling locations linked to their water quality data.

Progress (continued)



5. Used American Society for Testing and Materials (ASTM)--Coal Mining and Reclamation Data Standards

- AML standards approved 2/1/2011
- Revised regulatory standards approved 12/15/2011

6. Metrics for Surface Mine Attribution by GeoMine SMCRA Partners



<u>Detail by State</u>	<u>Kentucky</u>		<u>Tennessee</u>		<u>Virginia</u>		<u>West Virginia</u>	
<i>Table</i>	<i>Total Records</i>	<i>Avg. % of Attributes Populated</i>	<i>Total Records</i>	<i>Avg. % of Attributes Populated</i>	<i>Total Records</i>	<i>Avg. % of Attributes Populated</i>	<i>Total Records</i>	<i>Avg. % of Attributes Populated</i>
Surface Coal Mine Boundary	17,150	42	2,736	63	796	55	7,468	58
Underground Coal Mine Extents	64,085	34	29	38	6,153	42	15,907	42
Excess Spoil - Valley Fills	36,360	46	143	69	0	0	2,302	44
Coal Refuse Impoundments	0	0	0	0	0	0	273	38
Coal Mine Land Reclamation Status	0	0	0	0	352	63	0	0
Bond Status	0	0	0	0	30	57	0	0
Environmental Resource Monitoring Location	0	0	0	0	10,412	62	0	0
Post-Mining Land Use	0	0	0	0	516	66	0	0
Lands Unsuitable for Mining Petition (LUMP)	0	0	0	0	0	0	0	0
Coal Preparation Plant	0	0	0	0	0	0	0	0
Total Records and Average of Averages	117,595	41	2,908	57	18,259	58	25,950	45

<u>Summary</u>	<u>Total all States</u>	
<i>Table</i>	<i>Total Records</i>	<i>Avg. % of Attributes Populated</i>
Surface Coal Mine Boundary	28,150	49
Underground Coal Mine Extents	86,174	36
Excess Spoil - Valley Fills	38,805	46
Coal Refuse Impoundments	273	38
Coal Mine Land Reclamation Status	352	63
Bond Status	30	57
Environmental Resource Monitoring Location	10,412	62
Post-Mining Land Use	516	66
Lands Unsuitable for Mining Petition (LUMP)	0	0
Coal Preparation Plant	0	0
Total Records and Average of Averages	164,712	52

7. 1st Quarter 2012 GeoMine Progress through Federal Cooperative Grants with KY, VA, WV



- **KY** - digitized and attributed an additional **1,044 surface mine boundaries**.
- **VA** - converted and attributed **681** of over 3,000 **surface mines released from bond liability**.
- **WV** - digitized boundaries of **2,492 AML problem areas**.
- **16 Interns hired via Federal GeoMine grants:**
 - KY - five interns
 - VA - one intern
 - WV - 10 Marshall University students (9 are graduate students)
- **Future Quarterly Reviews**

Next Steps



- Incorporate new geospatial datasets created under the Federal Cooperative Agreement grants
- Focus on Priority Information Products for GeoMine:
 - 1) Active Surface Coal Mining Boundaries
 - 2) Pending Coal Surface Mining Boundaries
 - 3) Released Coal Mining Surface Boundaries
 - 4) Valley Fills
 - Incorporate WV non-STORET hydrologic data into GeoMine → **very recently completed**
- Draft GeoMine pilot project report
 - November 1st target date
- Work with the Federal Geographic Data Committee on the GeoCloud-II initiative

Next Steps → Address Data Gaps



- KY—thousands of priority 1 and 2 AML project locations that need to be digitized
- WV—current funding will go back to 1993; annual reclamation progress maps back to 1978 need to be digitized
- VA—current funding will convert 3,000 surface mines released from bond liability since 1999; many more sites released earlier than 1999 need to be digitized
- TN—valley fills, AML sites, underground mine boundaries need to be digitized

GeoCloud II Considerations



- GeoCloud II kickoff telecon on Feb. 1st – Welsh and Morlock attended
- GeoCloud II objectives:
 - Validate cloud as a vehicle for platform savings and performance
 - Provide agencies with reusable tested and accredited platforms for other initiatives
 - Provide cloud business case information on benefits, costs and best practices
- Advantages to GeoMine Pilot Project
 - Costs covered by FGDC
 - Helps address Federal IT concerns (e.g., system accreditation and security protocols).
 - Recognition of the SMCRA coal mining & reclamation program & our pilot project at national (... computing) level
 - (we will keep our current Cloud as backup)

GeoCloud II Considerations



- Public-facing presence on www.geo.data.gov
- OSM proposing to migrate existing GeoMine data and services to GeoCloud II
 - SMCRA states will notify Greg Morlock of sensitive or non-disclosure data in GeoMine that should be filtered before GeoCloud II migration

Funding Requests beyond 2012



- ✓ Continue Contractor Support via USGS
\$100K
- ✓ Continue support for Pilot Project States
\$549K
- ✓ Nationwide Rollout
\$2.005M for first year

Wrap Up



- ✓ Decision on GeoCloud II
- ✓ Consensus on Next Steps:
 - ✓ Address data gaps
 - ✓ Incorporate new geodata
 - ✓ Focus on Priority Information Products for GeoMine:
 - Active Surface Coal Mining Boundaries
 - Pending Coal Surface Mining Boundaries
 - Released Coal Mining Surface Boundaries
 - Valley Fills
 - ✓ WV Trend hydrologic data into GeoMine
- ✓ Drafting of GeoMine pilot project report to begin

To Explore GeoMine ...



- Goto <http://ec2-107-22-233-192.compute-1.amazonaws.com/viewer>
- The credential required are:
 - Logon: **GeoUser**
 - Password: **C0alM1ne\$**