

Integrating Geo-referenced Mine Map Images in a GIS

Underground Mine Mapping Workshop

June 1<sup>st</sup> & 2<sup>nd</sup> 2005 Pittsburgh, PA

#### Introduction

- What is geo-referencing?
- Why geo-reference mine map images?
- Methods for geo-referencing
- Incorporate with existing geo-spatial datasets



# Geo-referencing Defined (ESRI)

- Georeferencing-Assigning coordinates from a known reference system, such as latitude/longitude, UTM, or State Plane, to the page coordinates of a raster (image) or a planar map. Georeferencing raster data allows it to be viewed, queried, and analyzed with other geographic data.
- Geometric transformation - The process of rectifying a raster dataset to map coordinates or converting a raster dataset from one projection to another.

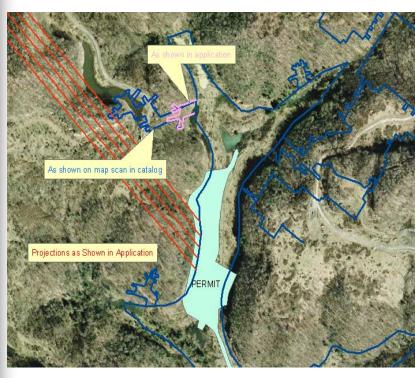
## Why Geo-reference?

#### Knowing "WHERE" is the key to:

- Identifying potential hazardous conditions
- Helping accurately record Virginia's mining history
- Assisting in efficient management of Virginia's coal reserves
- Facilitating economic development in Virginia's coalfields



## Vector Dataset Derived from Georeferenced Images



The DMME Mine Map Archive is being created to better serve Virginia's citizens and mining industry. Preservation of accurate underground mine mapping is crucial. This concentrated collection of maps not only identifies hazardous conditions but also facilitates the efficient management of Virginia's coal reserves.

## Geo-referencing Methods

- Printed World Coordinates
- Natural or Cultural Features
- Company Planimetrics
- Relative to other mines
- Outcrop matching
- General Location Descriptions
- Existing Geo-spatial Data



## Geo-spatial Datasets

- Vector dataset formats
- Geodatabase feature classes
- Potential SDE raster features
- Raster Catalog
  - Rendering

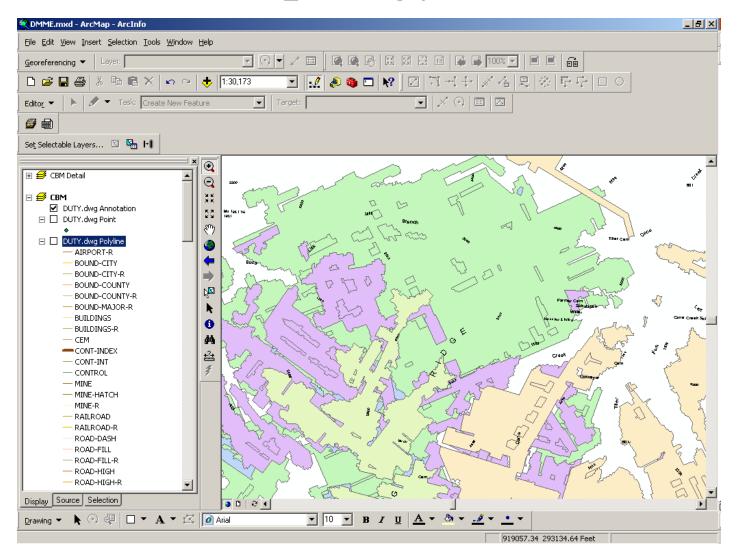


#### Geo-locate

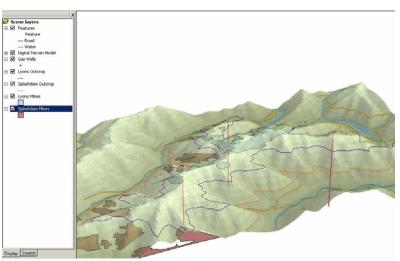
- Tie database to location
  - Coordinate pairs
- Query by attribute and location

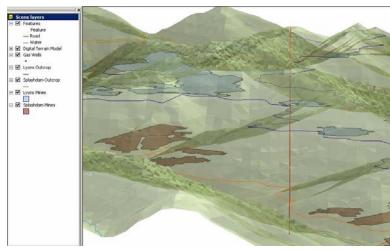


## Coalbed Topology

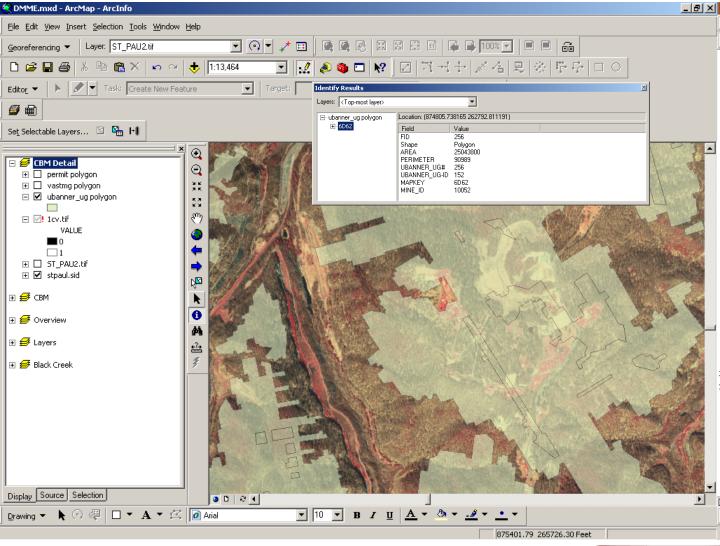


## Referencing X,Y, & Z





### Surface Features



## Summary

- Establish Geo-referencing method
- Format & Software options
- Establish guidelines for inclusion in GIS

#### Where to Get More Information

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