

Brasscap Application
Division of Reclamation Mining
and Safety – Inactive Mines
Program

DNR-OIT General Staff Meeting
June 9, 2009

Who Are We

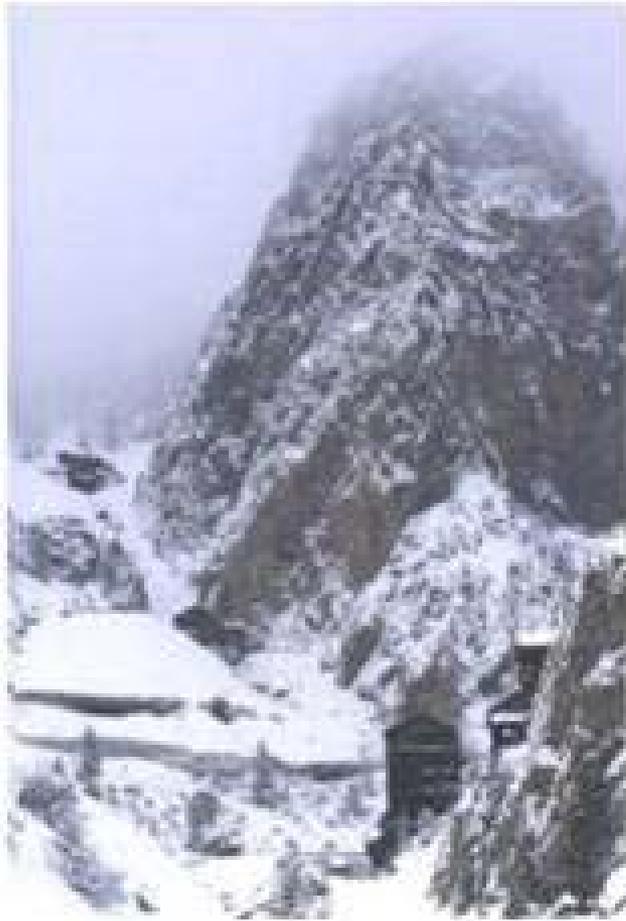
- The Colorado Inactive Mine Reclamation Program (CIMRP) is a state program within the ~~Division of Mines, Division of Mine Land Reclamation, Division of Minerals and Geology~~ Division of Reclamation Mining and Safety (DRMS) engaged in safeguarding the hazards associated with inactive and abandoned mines

Reclamation, Mining and Safety

- We are the hole people
 - Coal Regulatory
 - Mineral Regulatory
 - Inactive Mines
 - Mine Safety



Colorado Inactive Mine Reclamation Program



- Addresses hazards and environmental problems associated with abandoned or inactive mines.
- 23,000 abandoned mine sites in Colorado.
- 33 underground coal mine fires
- 50,000 acres of land impacted by abandoned underground coal mining operations

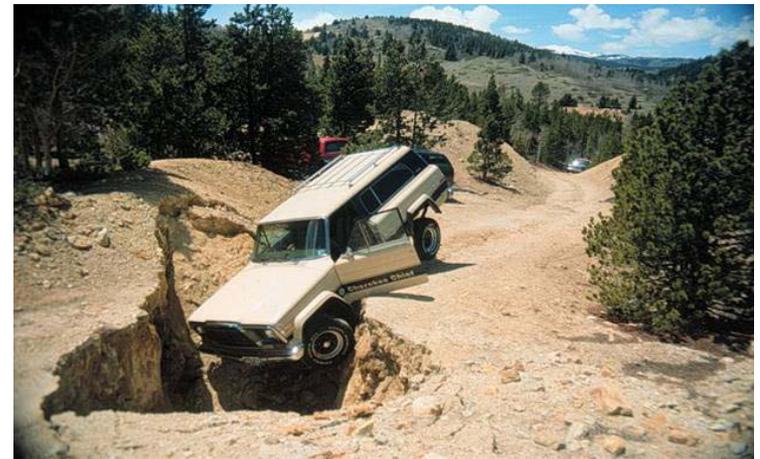
Our Work - Safeguarding Public Health and Safety

- The program also works closely with other state and federal agencies to address safety and environmental problems at abandoned or inactive mines.



Remaining Work

- With over 23,000 abandoned mines across Colorado and only 7,500 safeguarded, considerable work remains



Why we needed to re-write Brasscap



- Modernized development environment
- Spatial Data Collection in the field
- Electronic Minesite Field forms
- Integrate GIS
- Wanted something easy to maintain

Spatial Data Management



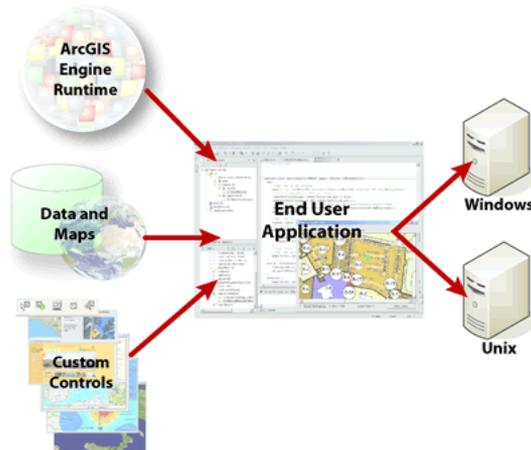
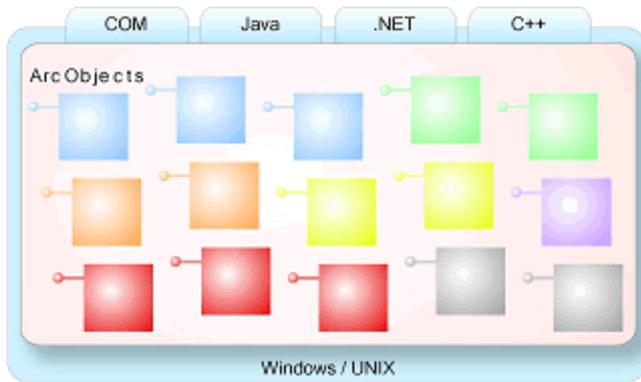
- Better management of historic data through the use of GPS collection and GIS analysis

Brasscap Foundation



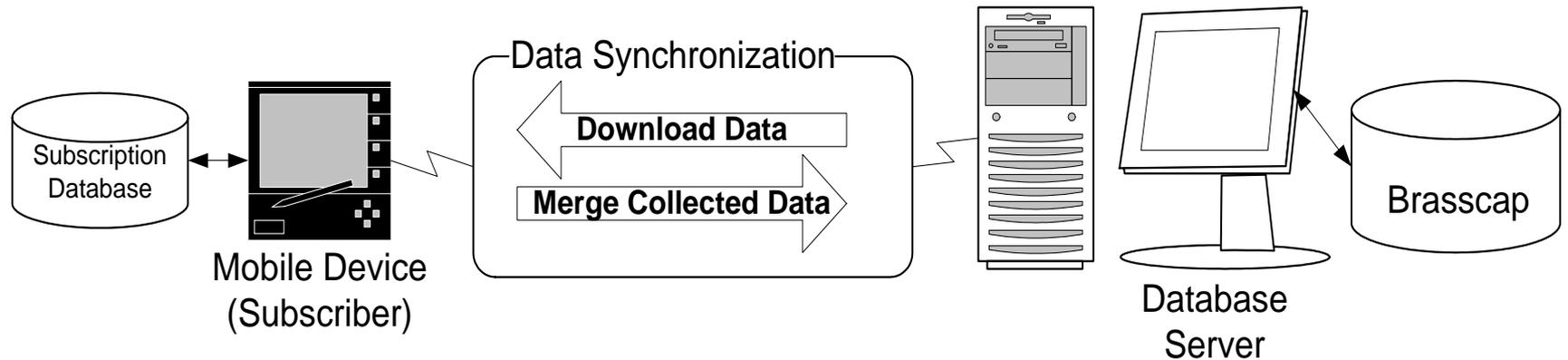
- Microsoft's .Net
- Visual Studio using Visual Basic
- Windows XP operating systems

Integrated GIS



- ArcObjects Control class library that housed a map display, table of contents, toolbar, and custom GIS functions and tools
- Brasscap uses ESRI's ArcEngine runtime to support GIS functionality

Data Synchronization



- Microsoft's SQL Express is used to store data on the mobile devices and is used to perform merge replication to transfer data in a Microsoft's SQL 2005 data store

The Brasscap Application

- Two applications
- Brasscap which is the main line of business application
- Brasscap Mobile which is used for Project development



BrassCap in the Field



- The Brasscap application installed on an Xplore tablet equipped with a GPS collection device allows for field monitoring of previously collected data

BrasscapMobile Hardware

- BrasscapMobile is designed to collect initial field information and is deployed on a Trimble GeoXT hand held GPS collection device.



BrasscapMobile Software Development

- Development Environment
Microsoft .NET
Compact Framework
- Operating system
Microsoft Windows
Mobile Operating
System 5.0
- SQL Server Mobile
Edition



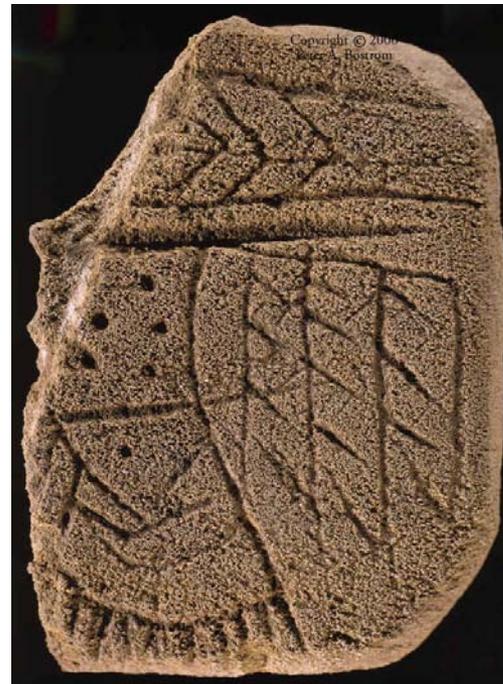
The Minesite Field form

- The basis of all project work
- Initial data collection document
- Spatial and Tabular data

We need to know where the holes are that we need to fill and how to fill them



Early Minesite field forms



Paper MineSite Field Form



Electronic MineSite Field Form



Brasscap - Division of Reclamation, Mining, and Safety

PROJECT NUMBER: 356 - PROJECT NAME: BOVINE - SUB PROJECT NAME: BOVINE

Main Project Data Feature Data Landowners Documents Reports Project Images GIS Check-In/Check-Out

Feature_ID	Mine_Name	Claim_Name
001	Wise Hill	

1 of 1

Recreate Field Form Get Mobile Features

Minesite Close-Out Monitoring Consent Maps/Drawings

Location Description
Underground coal mine fire in hillside above highway.

AMLIS NO

Latitude Deg / Min / Sec 40 25 41.2 Zone 13 Datum NAD27 UTM Precision 2 - Pick from Map X UTM 275575.### Y UTM 4478428.### Update UTM from GPS

Longitude 107 38 43.9

Legal Description Qtr/Qtr/Qtr Section Township Range Meridian SW SE 31 6N 91W 6

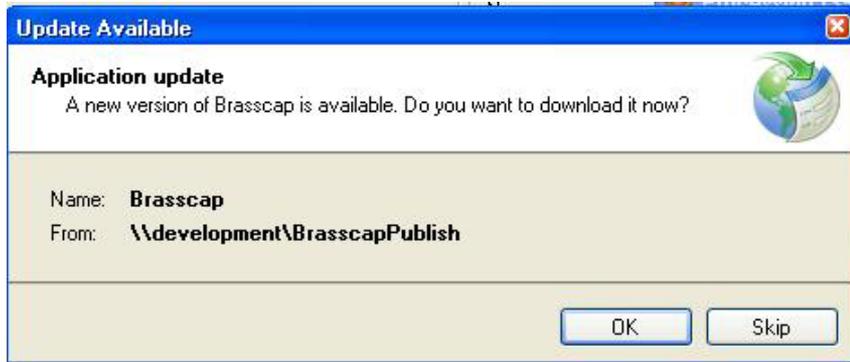
Feature Type Coal Fire Condition Collapsed Lining Concrete Commodity

Excavation Length (ft) Excavation Width (ft) Eroded Length (ft) Eroded Width (ft) Construction Length (ft) 25 Construction Width (ft) 25

Depth of Opening (ft) Depth to Bedrock (ft) Depth to Plug (ft) Shape of Opening Surface Material

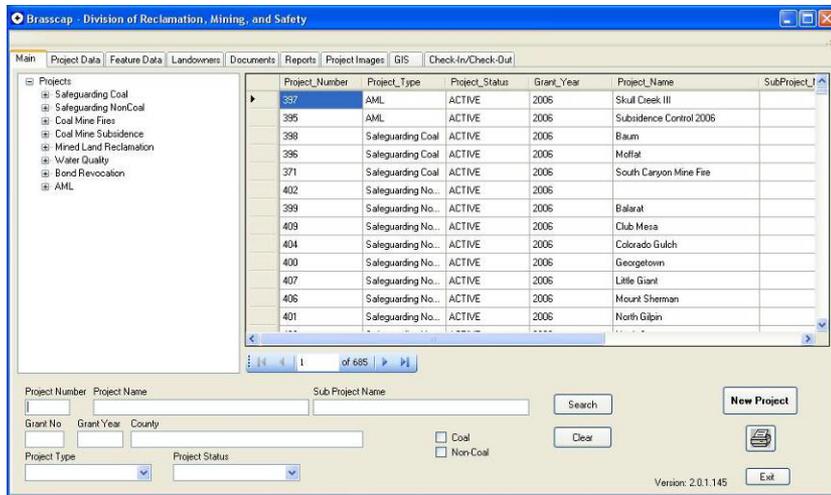
Insert Update Delete Clear Map this Feature Return to Main

Smart Client Deployment



- Before the client runs a server is checked for updates
- The new version is installed when the user clicks OK
- Reduces desktop support
- Shortens install time

Brasscap Main Screen



- Functional areas are divided into tabs
 - Main
 - Project Data
 - Feature Data
 - Landowners
 - Documents
 - Reports
 - Images
 - GIS

Project Tab

Brasscap - Division of Reclamation, Mining, and Safety

PROJECT NUMBER: 415 - PROJECT NAME: War Eagle

Main Project Data Feature Data Landowners Documents Reports Project Images GIS Check-In/Check-Out

Project Info Project Contracting Project Close-Out

Project Number: 415 Project Type: AML Project Status: Active

Project Name: War Eagle

Grant No: 26 Grant Year: 2007 Dollars Available: \$0.00

Sub Project Name: **New Sub Project** Commodity:

Available Counties (Double-Click to Select County)

- *MULTI
- *UNKNOWN
- Adams
- Alamosa
- Arapahoe
- Archuleta
- Baca

Select (Double-Click)

- *MULTI

Available Fund Sources (Double-Click to Select Fund)

- *AddNew
- BLM
- CDPHE
- DOW
- Educ
- EPA - RGI

Select (Double-Click)

Project Notes: Formerly Vulcan

Insert Update Clear All Fields Map All Features  Return to Main

Feature Tab

- Minesite data
- Close-out
- Monitoring for field data collection
- Consent
- Maps/Drawings

The screenshot displays the Brasscap software interface, titled "Brasscap - Division of Reclamation, Mining, and Safety". The main window shows the "Feature Data" tab selected, with a table listing features. The first feature, with ID "001", is selected and its details are shown in the form below.

Feature_ID	Mine_Name	Claim_Name
001	Wise Hill	

Location Description: Underground coal mine fire in hillside above highway. AMLIS NO: []

Latitude: 40 / 25 / 41.2 Zone: 13 Datum: NAD27 UTM Precision: 2 - Pick from Map X UTM: 275575.### Y UTM: 4478428.### Update UTM from GPS

Longitude: 107 / 38 / 43.9 Qtr/Otr/Olr: SW / SE Section: 31 Township: 6N Range: 91W Meridian: 6

Legal Description: [] Feature Type: Coal Fire Condition: Collapsed Lining: Concrete Commodity: []

Excavation Length (ft): [] Excavation Width (ft): [] Eroded Length (ft): [] Eroded Width (ft): [] Construction Length (ft): 25 Construction Width (ft): 25

Depth of Opening (ft): [] Depth to Bedrock (ft): [] Depth to Plug (ft): [] Shape of Opening: [] Surface Material: []

Buttons: Insert, Update, Delete, Clear, Map this Feature, Return to Main

Map the Feature button

The screenshot shows a software interface with the following elements:

- Tabs:** Minesite, Close-Out, Monitoring, Consent, Maps/Drawings
- Input Fields:**
 - 001 (Claim ID)
 - 109 - Saguache (County)
 - Claim Name: Boston or Fairview
 - Mineral Survey Number: 20538
 - Quadrangle: SPRING HILL CREEK
 - Pad XUTM: 31
 - Pad YUTM: 45
 - Location Description: Off last hairpin, creekside towards coal mine on S. Beaver.
- Coordinate Fields:**
 - Latitude: 38 / 20 / 39.48 (Deg / Min / Sec)
 - Longitude: 106 / 55 / 25.91 (Deg / Min / Sec)
 - Zone: 13
 - Datum: NAD27
 - UTM Precision: 3 - GPS
 - X UTM: 331871.##
 - Y UTM: 4245562.##
- Buttons:** Insert, Update, Delete, Clear, Map this Feature, Update UTM from GPS, Return to Main

- Plots the selected feature
- GIS may be accessed from here or GIS tab

Loading Images for Minesite Field Forms

Feature_ID	Mine_Name	Claim_Name
001		Boston or Fairview
002		
003		
004		

1 of 42

Recreate Field Form Get Mobile Features

Minesite Close-Out Monitoring Consent **Maps/Drawings**

DrawingType	DrawingDate	Description
-------------	-------------	-------------

0 of 0

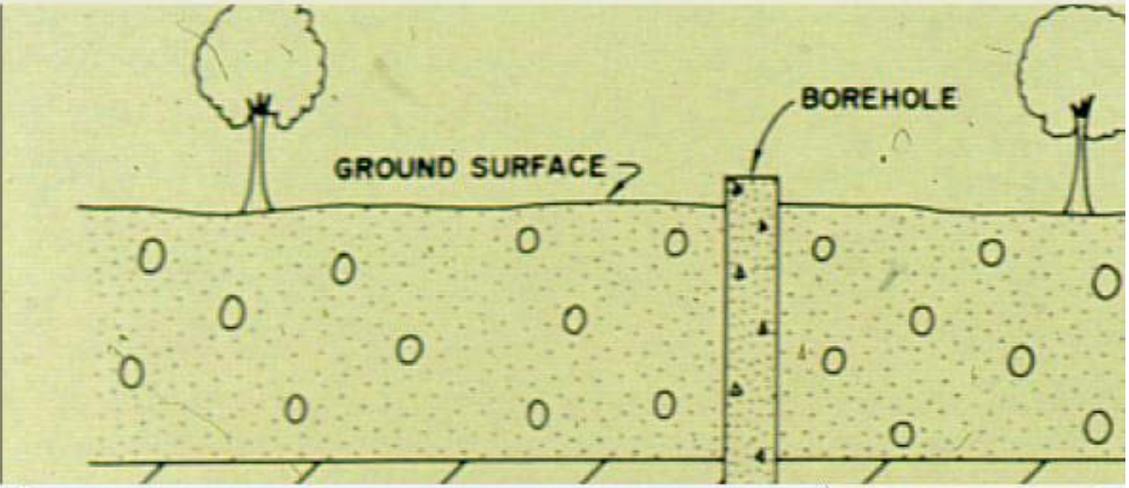
Load Image

Drawing Date: 12/24/2007

Drawing Type:

Save Image to Disk

Description:



System Generated MineSite Field Form

Colorado Division of Reclamation, Mining, and Safety
Inactive Mine Site Field Form

Project: War Eagle

ID: 001

County: *MULTI

Mine Name:

Project Mgr: PPK

Date: FM.Date_Visited

Claim Name: Boston or Fairview

MLS No: 20538

Pad No: FM.Pad_Number

QuadName: 1215

Owner: FM.Owner_Name

BIMIUSFS #

Field Description: Off last hairpin, creekside towards coal mine on S. Beaver.

Latitude: N

UTM:
Zone: 13
(S)

Longitude: W

Monitoring Tab

- Button to Get Mobile features for Real-time GIS data Capture
- Area to add Inspection notes
- Inspection date

The screenshot shows the Brasscap software interface for the 'Division of Reclamation, Mining, and Safety'. The project is identified as 'PROJECT NUMBER: 415 - PROJECT NAME: War Eagle'. The 'Monitoring' tab is active, displaying a table of features and a form for entering monitoring data.

Feature_ID	Mine_Name	Claim_Name
001		Boston or Fairview
002		
003		
004		

Navigation: 1 of 42. Buttons: Recreate Field Form, Get Mobile Features.

Monitoring Tab Fields:

Monitor Date	Inspector	Maintenance Required	Maintenance Complete Date	Year Next Monitoring	Notes

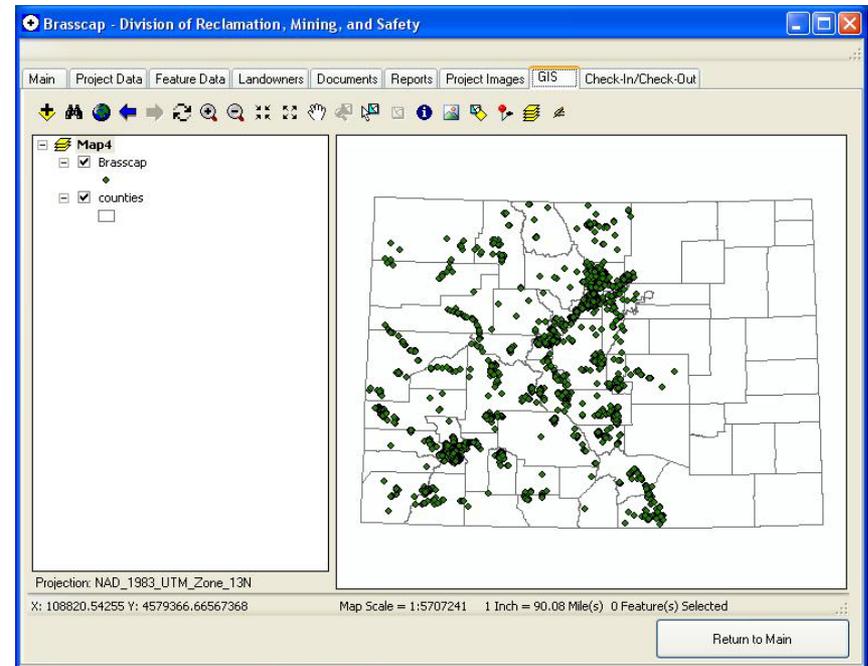
Form Fields:

- Monitoring Date:
- Inspector:
- Maintenance Required:
- Maintenance Completed Date:
- Year for Next Monitoring:
- Inspection Notes:

Buttons: Insert, Update, Delete, Clear, Map this Feature, Return to Main.

Brasscap GIS Tab

- Basic GIS functionality
- Using ArcObject running against ArcEngine Runtime 9.3



GIS ToolBar



- Add Data
- Find
- Full Extent
- Go Back and Go Forward Extent
- Refresh
- Zoom in and Zoom Out
- Fixed Zoom in and Out
- Pan
- Zoom to Selected Feature
- Select and Clear Feature
- Identify Features
- Export to Tiff
- Select feature by layer
- Configure GPS
- Add Topos
- Label features

Map Status Information

- Map Projection
- Map Scale
- Number of features selected
- X-Y position

Projection: NAD_1983_UTM_Zone_13N

X: 384644.071482885 Y: 4073872.64257335

Map Scale = 1:4601150 1 Inch = 72.62 Mile(s) 0 Feature(s) Selected

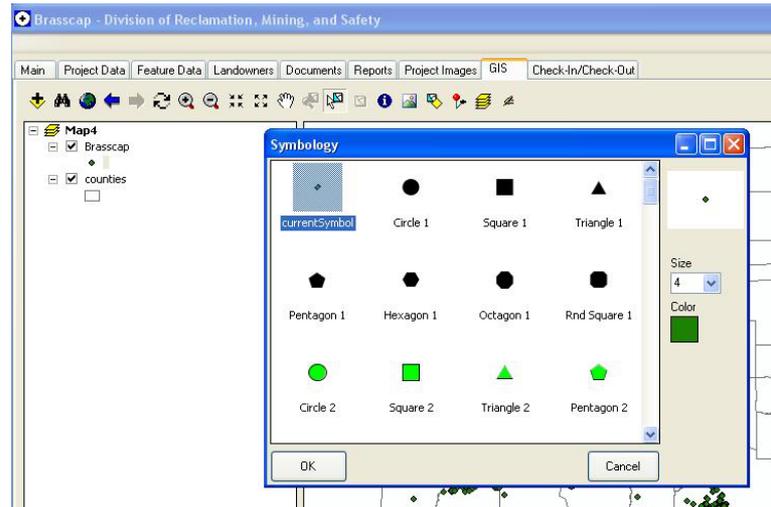
Navigating

- Find
- Full Extent
- Go Back and Go Forward Extent
- Refresh
- Zoom in and Zoom Out
- Fixed Zoom in and Out
- Pan
- Zoom to Selected Feature
- Select and Clear Feature

Changing Map Appearance

- Symbology
- Labels
- Add layers

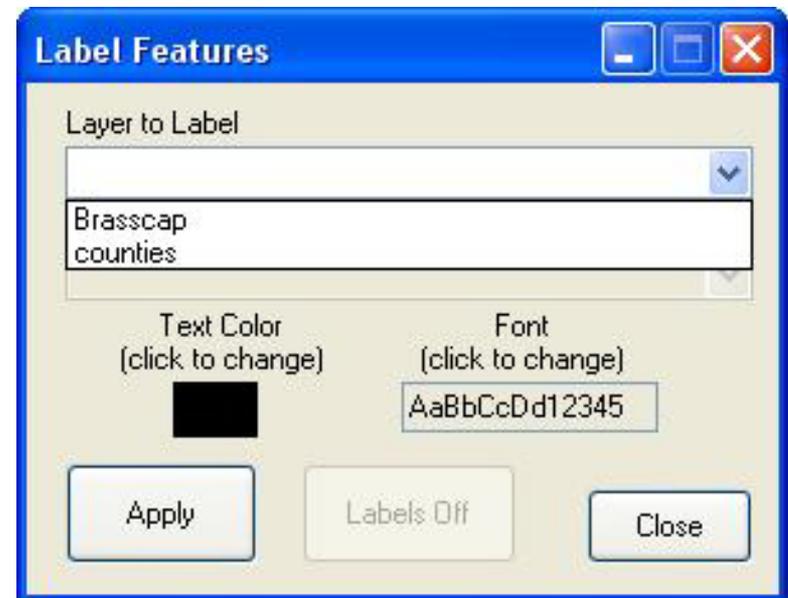
Symbology



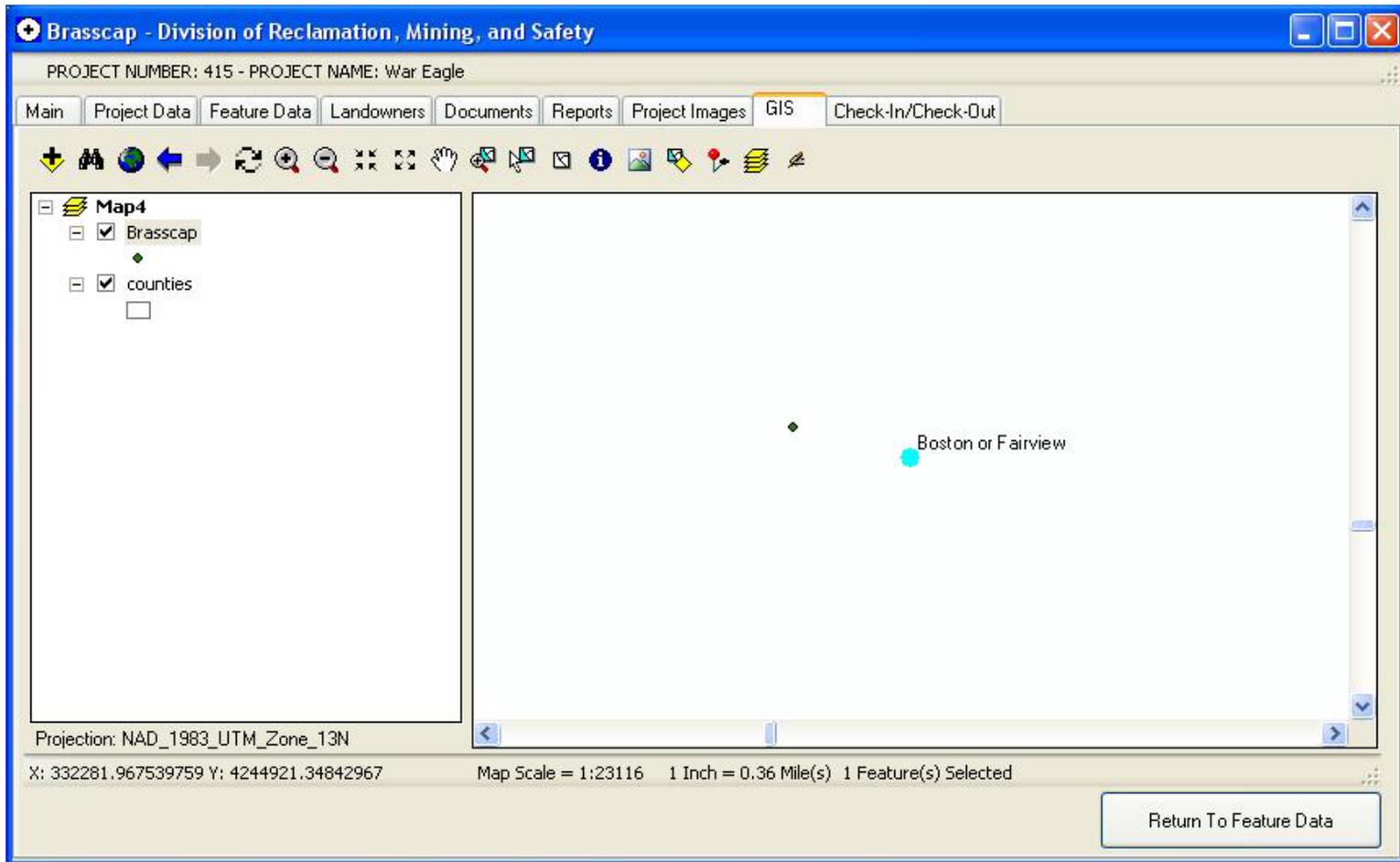
- Feature Symbology changed by double-clicking on map symbol
 - Symbol
 - Color
 - Size

Label Features

- From the drop-down the layer to label is selected
- Color of label
- Font used to
- Turn off labels



Adding a Label to a Mapped Feature



Other Map Features

- Identify
- Add Topos
- Export to Tiff
- Configure GPS

Feature Identify

The screenshot shows a GIS application interface. On the left, a legend titled 'Map4' lists layers: 'Brasscap' (checked) and 'counties' (checked). The main map area shows a small black diamond and a larger cyan circle. An 'Identify' window is open in the foreground, displaying the following information:

Identify from: <Top-most layer>

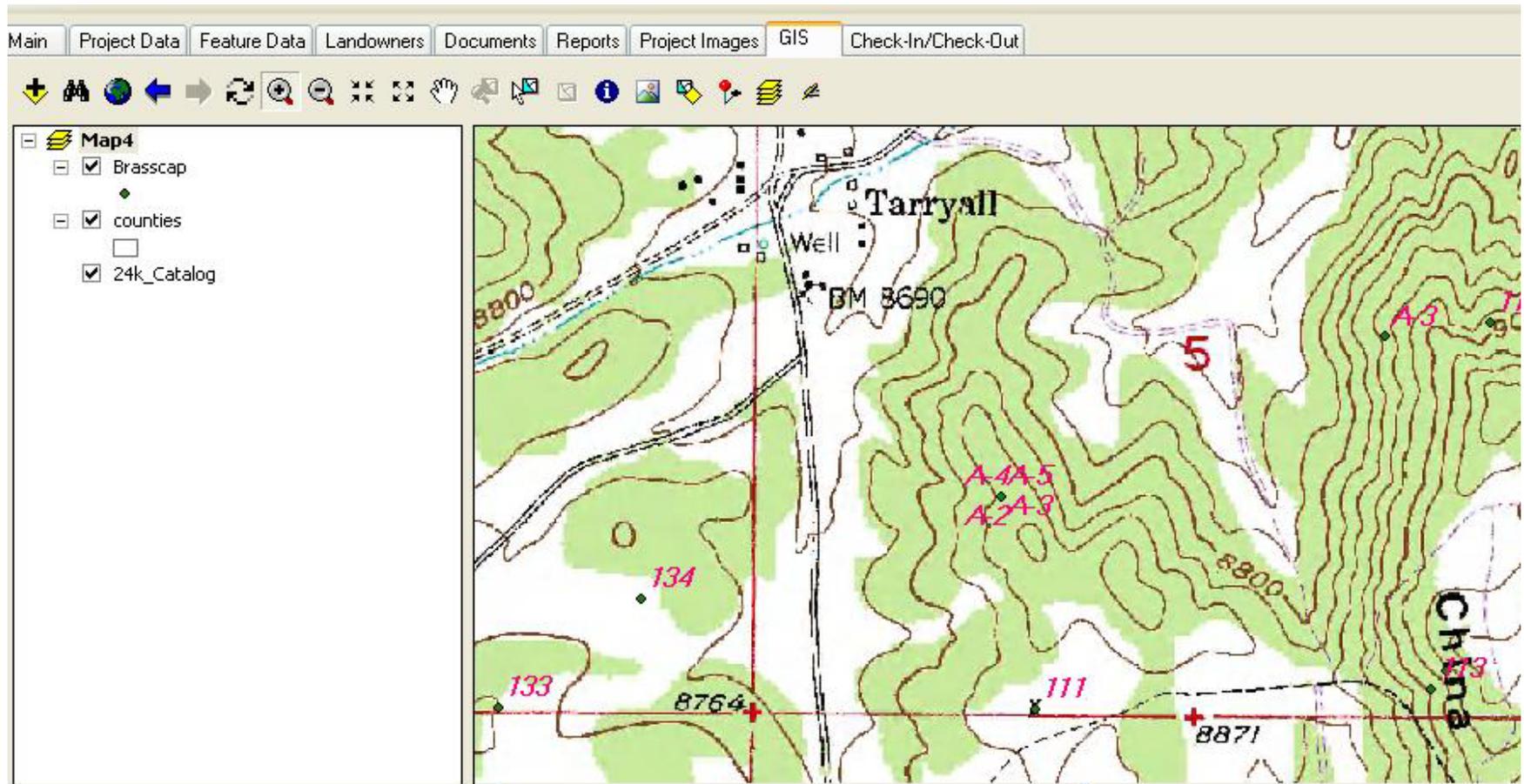
Brasscap
Boston or Fairview

Location: 331,884.414 4,245,759.269 Meters

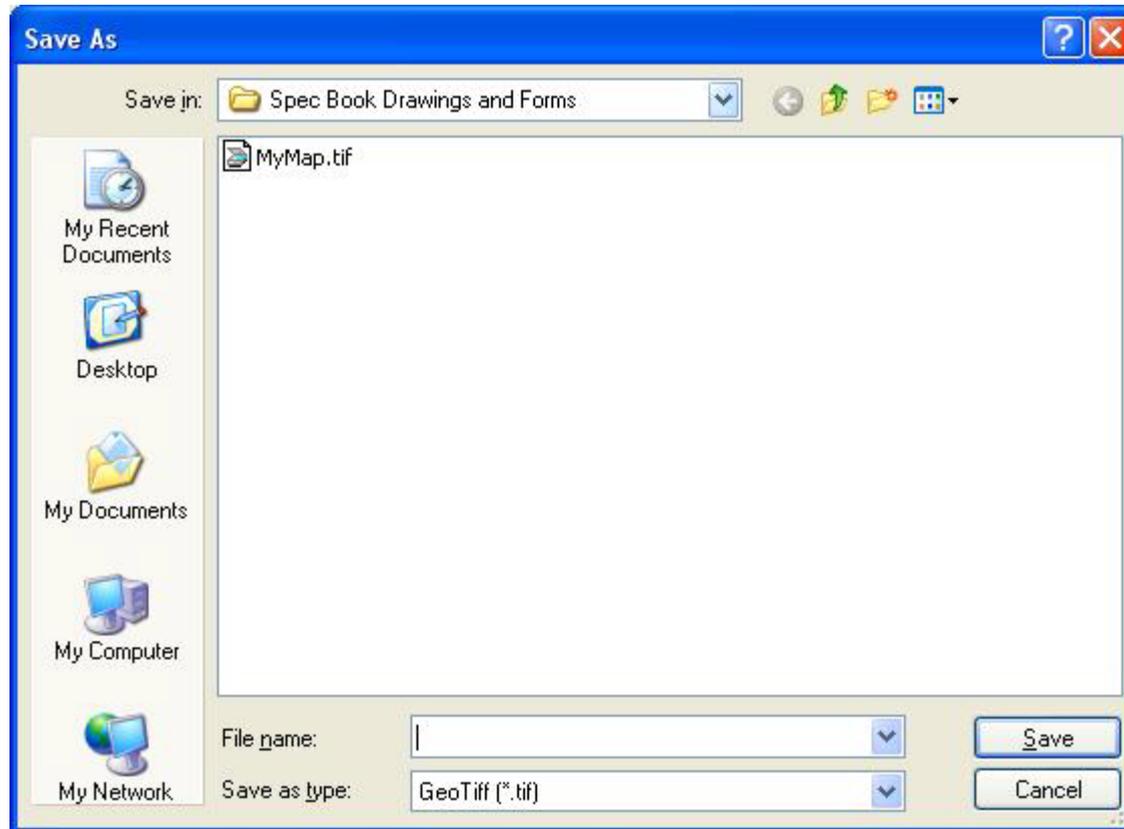
Field	Value
FID	1625
Shape	Point
FB_Counter	12039
FB_Number	770
FB_Project	415
Feature_ID	001
Mine_Name	
Claim_Name	Boston or Fairview
Mineral_Su	20538
Survey_ID	

Projection: NAD_1983_UTM_Zone_13N
X: 332337.013411319 Y: 4245435.10989756 Map Scale = 1:2

Add Topos

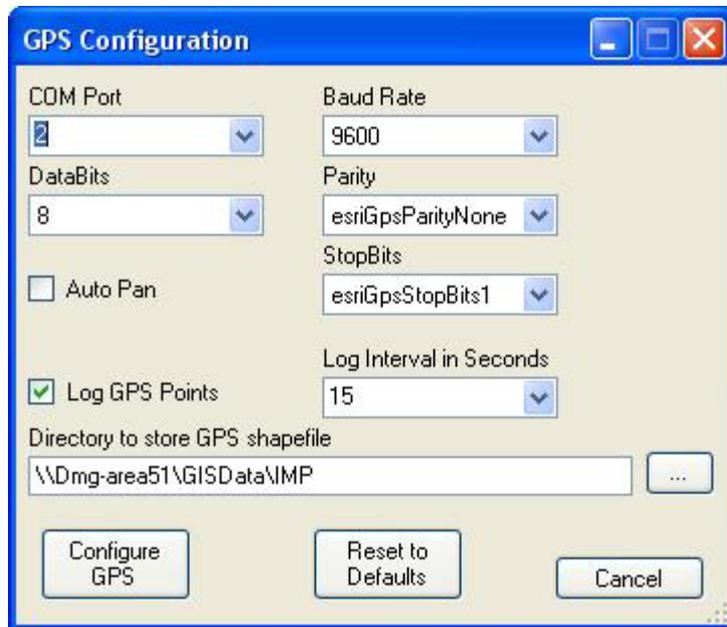


Export To TIFF



Configure GPS

- Notebook or Tablet PC must have a GPS receiver



Stay Out and Stay Alive!



Questions?





COLORADO
DIVISION OF
RECLAMATION
MINING
— & —
SAFETY