



**Instructor-Led Class Schedule**  
Issued November 16, 2007

**TIPS**  
Technical  
Innovation  
Professional  
Services

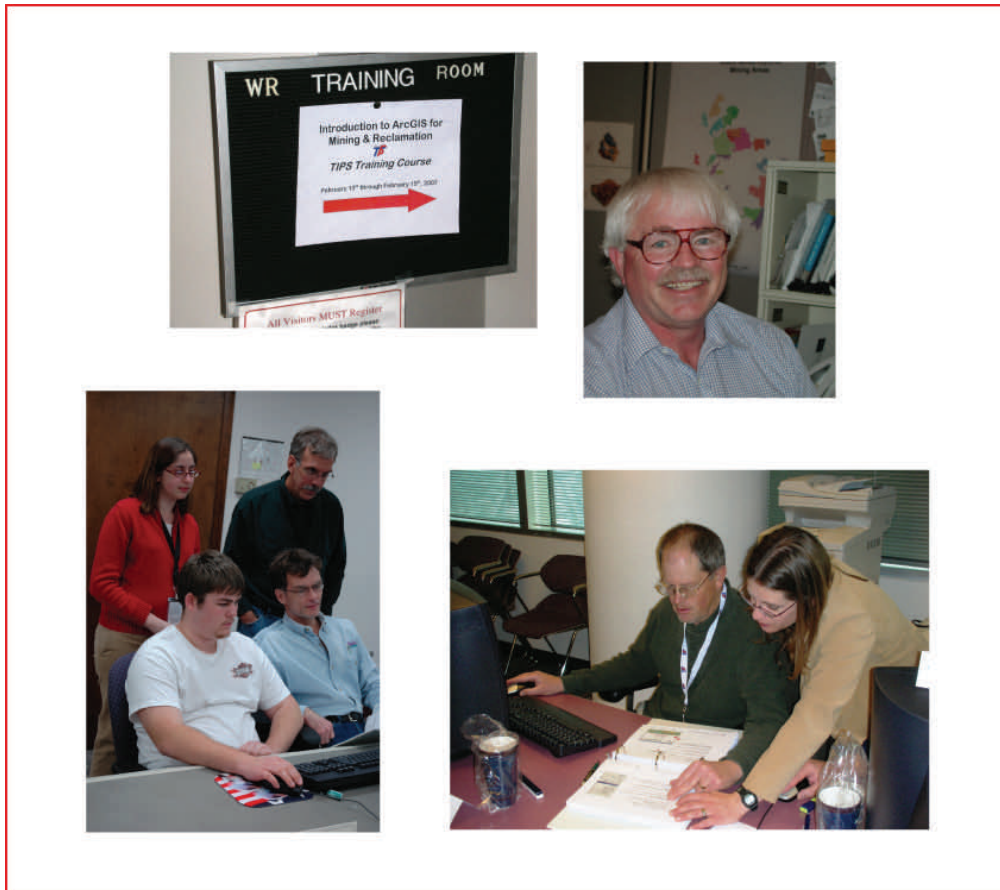
## TIPS Training 2008

*"The whole class was useful and beneficial. It will benefit the Navajo Nation by collecting information and data for identifying sites, homes, pathways (air and water transport) and properties with radiological anomalies. These areas can be put on detailed maps to assist the Nation plan to address issues and problems."*

*Navajo Nation student  
who attended "Introduction to  
ArcGIS" class in 2/2007*

*"Before this class I was unable to use the GeoXT for mapping applications in my field work. Our department is set up for this application which will reduce the time spent on data transfer and mapping and my ability to interface effectively."*

*Colorado state student  
who attended "Trimble GeoXT"  
class in 2/2007*



***The TIPS Team Mission***

*is to enhance the technical skills of States, Tribes, and Office of Surface Mining staff by providing them advanced engineering and scientific software, along with the training and assistance necessary to use it. Users apply practical Technical Innovation and Professional Services (TIPS) tools in efforts that regulate ongoing coal-mining operations and their reclamation and reclaim lands that have been degraded by past coal mining.*

## Customer Support

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## Advanced AutoCAD for Permitting and Reclamation

<b>Class:</b>	OSM-2008-0819-Alton, IL
<b>Class Dates:</b>	08/19/08-08/21/08 Tu W Tr
<b>Class Times:</b>	8:30 AM - 4:30 PM
<b>Course:</b>	TIPS-Advanced AutoCAD for Permitting and Reclamation
<b>Course Code:</b>	OSM-EAA
<b>Course Description:</b>	This course will teach students advanced topics in AutoCAD that have not been covered in the introductory course AutoCAD Fundamentals for Permitting and Reclamation. Students will round out their AutoCAD skills and learn new tools and techniques that will increase their drawing quality, efficiency, and productivity.
<b>Categories:</b>	CAD Applications
<b>Course Objectives:</b>	<ul style="list-style-type: none"><li>• Discuss advanced layer management and customized user interface</li><li>• Define custom linetypes</li><li>• Examine dimensioning and external references</li><li>• Identify intelligent blocks</li><li>• Practice advanced attribute editing</li><li>• Examine 3D viewing</li><li>• Review paper space, plotting and sheet sets</li></ul>
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Tuition:</b>	Stefanie Self (Lead), Harry Ranney, Jeff King
<b>Classroom Location:</b>	OSM Alton MCR (Alton, IL)
<b>Prerequisites:</b>	Prospective students should have a working knowledge of AutoCAD or they should have taken the introductory course AutoCAD Fundamentals for Permitting and Reclamation. Basic AutoCAD skills will not be covered in this course.

## Advanced Carlson Mining for Permitting and Reclamation (SurvCADD)

<b>Class:</b>	
<b>Class Dates:</b>	No Class scheduled in Fiscal Year 2008
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Advanced Carlson Mining for Permitting and Reclamation (SurvCADD)
<b>Course Code:</b>	OSM-EAS
<b>Course Description:</b>	This course will teach practicing Carlson Mining users advanced topics that have not been covered in the introductory Carlson Mining for Permitting and Reclamation. Students will round out their skills and learn new tools and techniques that will increase their design quality, efficiency, and productivity.
<b>Categories:</b>	CAD Applications
<b>Course Objectives:</b>	<ul style="list-style-type: none"><li>• Define and examine project planning and data gathering</li><li>• Review Tsunami Data Collection and LIDAR survey data</li><li>• Discuss data quality</li><li>• Review break lines, contouring/triangulation</li><li>• Identify and create 3D designs and 3D polylines (building a wireframe), templates, cross sections</li><li>• Examine grid sizes, grid manipulation and grid display cut and fill volumes</li><li>• Analyze cost estimation</li><li>• Review plotting and paper space</li><li>• Discuss mobile computing concepts</li></ul>
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Prerequisites:</b>	Prospective students should have attended Carlson Mining for Permitting and Reclamation or have a working knowledge of AutoCAD. Basic AutoCAD skills will not be covered in this course.

## **AutoCAD Fundamentals for Permitting and Reclamation**

<b>Class:</b>	OSM-2008-1211-Alton, IL
<b>Class Dates:</b>	12/11/07-12/13/07 Tu W Tr
<b>Class Times:</b>	8:30 AM - 4:30 PM
<b>Course:</b>	TIPS-AutoCAD Fundamentals for Permitting and Reclamation
<b>Course Code:</b>	OSM-ECA
<b>Course Description:</b>	This course covers the fundamentals of AutoCAD and provides exposure to other AutoCAD and Carlson Mining products.
<b>Categories:</b>	CAD Applications
<b>Course Objectives:</b>	<ul style="list-style-type: none"><li>• Review file utilities and layer management</li><li>• Define drawing templates and the drawing environment</li><li>• Identify various configuration and customization settings</li><li>• Identify difference between 2D and 2D polylines</li><li>• Examine blocks , feature attributes, drawing tools, hatching, text types and editing tools. Properties perform property changes and import and export files</li><li>• Discuss plotting and paper space</li><li>• Review additional AutoCAD and Carlson Mining products</li><li>• Identify basic mobile computing concepts</li></ul>
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Tonya Blackburn (Lead), Heather Erickson, Stefanie Self
<b>Classroom Location:</b>	OSM Alton MCR (Alton, IL)
<b>Prerequisites:</b>	Basic understanding of the Windows operating system and knowledge of maps and drafting concepts is required.



## AutoCAD Map for Permitting and Reclamation

<b>Class:</b>	OSM-2008-0115-Pittsburgh, PA
<b>Class Dates:</b>	01/15/08-01/17/08 Tu W Tr
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-AutoCAD Map for Permitting and Reclamation
<b>Course Code:</b>	OSM-EAM
<b>Course Description:</b>	AutoCAD Map is an automated mapping tool used to create, maintain, and communicate mapping and GIS information while using the AutoCAD drawing environment. AutoCAD Map features GIS topology combined seamlessly with AutoCAD. This software contains all AutoCAD functionality and adds features specifically designed for the mapping professional.
<b>Categories:</b>	CAD Applications
<b>Course Objectives:</b>	<ul style="list-style-type: none"><li>• Define GIS</li><li>• Utilize drawing sets, source drawings and external data</li><li>• Perform drawing queries</li><li>• Identify and define object data</li><li>• Define and edit global coordinate systems</li><li>• Perform coordinate transformations</li><li>• Import and Export map files</li><li>• Perform image editing (cleaning)</li><li>• Explain and perform rubber sheeting</li><li>• Discuss and use external databases</li><li>• Identify basic mobile computing concepts</li></ul>
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Mike Lamb (Lead), Mike Sharp, Joe Matyus
<b>Classroom Location:</b>	OSM Pittsburgh AR (Pittsburgh, PA)
<b>Prerequisites:</b>	Prospective students must have taken the introductory course AutoCAD Fundamentals for Permitting and Reclamation or have a working knowledge of AutoCAD. Basic AutoCAD skills will not be covered in this course.

## **AutoCAD Map with Raster Design for Underground and Surface Mine Mapping**

<b>Class:</b>	OSM-2008-0415-Alton, IL
<b>Class Dates:</b>	04/15/08-04/17/08 Tu W Tr
<b>Class Times:</b>	8:30 AM - 4:30 PM
<b>Course:</b>	TIPS-AutoCAD Map with Raster Design for Underground and Surface Mine Mapping
<b>Course Code:</b>	OSM-EUR
<b>Course Description:</b>	This course will take the student through an underground mine mapping project using AutoCAD Map with Raster Design. The student will learn to scan maps, vectorize and clean the mapping data, associate other tabular data and incorporate it into a GIS.
<b>Categories:</b>	CAD Applications
<b>Course Objectives:</b>	<ul style="list-style-type: none"><li>• Identify important steps to scanning mine maps and manipulating images</li><li>• Geo-reference imported mine maps</li><li>• Digitize and vectorize images</li><li>• Perform attribute data tagging</li><li>• Practice cleaning and building topology</li><li>• Verify feature mapping</li><li>• Practice exporting data to ESRI format</li><li>• Determine and discuss need for meta data</li></ul>
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Tuition:</b>	Stefanie Self (Lead), Mike Sharp, Doug Mullins
<b>Classroom Location:</b>	OSM Alton MCR (Alton, IL)
<b>Prerequisites:</b>	Prospective students should have a working knowledge of AutoCAD. The student will have a more meaningful training experience if they have taken AutoCAD Map for Permitting and Reclamation or have a working knowledge of AutoCAD Map. Basic AutoCAD skills will not be covered in this course.

## Carlson Mining for Permitting and Reclamation (SurvCADD)

<b>Class:</b>	OSM-2008-0311-Alton, IL
<b>Class Dates:</b>	03/11/08-03/13/08 Tu W Tr
<b>Class Times:</b>	8:30 AM - 4:30 PM
<b>Course:</b>	TIPS-Carlson Mining for Permitting and Reclamation (SurvCADD)
<b>Course Code:</b>	OSM-ESC
<b>Course Description:</b>	Carlson Mining is a design software for engineering, surveying, reclamation and mining professionals. AutoCAD serves as its graphics engine and drawing editor. Carlson Mining is an extension of AutoCAD that adds commands and enhancements for earthmoving and engineering. Modules include: Cogo-Design, DTM-Contour, Section-Profile, Mining, and Hydrology.
<b>Categories:</b>	CAD Applications
<b>Course Objectives:</b>	<ul style="list-style-type: none"><li>• Identify file types</li><li>• Define drawings, and setup options</li><li>• Import and Export Points</li><li>• Manage drawing layers</li><li>• Perform heads-up digitizing</li><li>• Experiment with 3D landform viewing, and contouring</li><li>• Produce cross sections and profiles</li><li>• Examine design techniques</li><li>• Create a design templates in plan view</li><li>• Identify basic mobile computing concepts</li></ul>
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Dan Hause (Lead), Teresa Baker, Randall Mills
<b>Classroom Location:</b>	OSM Alton MCR (Alton, IL)
<b>Prerequisites:</b>	Prospective students must have taken introductory course AutoCAD Fundamentals for Permitting and Reclamation or have a working knowledge of AutoCAD. Basic AutoCAD skills will not be covered in this course.

## Analyzing Environmental Monitoring Data Using Statgraphics PLUS

<b>Class:</b>	OSM-2008-0617-Pittsburgh, PA
<b>Class Dates:</b>	06/17/08-06/19/08 Tu W Tr
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Analyzing Environmental Data Using Statgraphics PLUS
<b>Course Code:</b>	OSM-STA
<b>Course Description:</b>	StatGraphics Plus for Windows software is an easy-to-use statistical analysis tool that combines a broad range of statistical procedures with interactive graphics to provide an integrated analytical environment. The visual presentation of the statistical analyses is well suited for explanation of actions, decisions or concerns to the public and decision makers. The course emphasizes preparation, analysis, and graphical presentation of water quality, water quantity, vegetation and revegetation, blasting, soils and overburden quality and suitability, and other environmental applications.
<b>Categories:</b>	Engineering / Science / Statistics
<b>Course Objectives:</b>	Topics: Introduction to StatGraphics--Examples of SMCRA-Related Statistical Applications, Software Organization, Windows Environment; Data Management--Importing Files, Reading Files, Creating Files, Creating Variables in New Files, Entering the Data, Data storage, Updating and Recoding Data, Exporting Files; Data Analysis--Descriptive Methods, Hypothesis Tests, Sample Size Determinations, ANOVA, Regression Analysis, Times Series, Tests for Normality; Graphical Data Presentation--XY Plots, XYZ Plots, Histograms, Box and Whiskers Plots, Regression Lines, Forecasting; Customized Statistical Graphics--Editing, Printing, and Saving Graphics, Exporting Analyses and Graphics, Creating Multiple Slides, Statgallery; Features Case Studies and Exercises; Individual Assistance On Special
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Bob Postle (Lead), Brian Hicks
<b>Classroom Location:</b>	OSM Pittsburgh AR (Pittsburgh, PA)
<b>Prerequisites:</b>	Familiarity with statistical methods and spreadsheets.

## Blasting Log Evaluation Program (BLEP)

<b>Class:</b>	OSM-2008-0226-Pittsburgh, PA
<b>Class Dates:</b>	02/26/08-02/27/08 Tu W
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Blasting Log Evaluation Program (BLEP)
<b>Course Code:</b>	OSM-EBL
<b>Course Description:</b>	Participants will learn to compare and interpret blast log data with Microsoft Excel. Blast log data in EXCEL is used to cross tabulate fields for accuracy and compare relationships with accepted industry blast design parameters and vibration propagation norms. Burdens, spacings, hole depths and explosive types are used to calculate charge weights, powder factors, and scaled distances for comparison with blast vibration monitoring data. Compliance with the rules and prediction of vibrations are discussed. Real-world datasets will be used to illustrate analysis techniques under various blasting and monitoring scenarios.
<b>Categories:</b>	Engineering / Science / Statistics
<b>Course Objectives:</b>	Learn Excel basics on data entry, formulas and graphing, Review fundamentals of ground vibrations, airblast and flyrock, Understand BLEP downloading, data entry and use, Practice expedient data entry, Interpret BLEP Graphs, Explore full and partial data entry uses, Identify outlier points, Discuss case studies and exercises, and Generate output displays for reports;
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Ken Eltschlager (Lead), Rick Lamkie
<b>Classroom Location:</b>	OSM Pittsburgh AR (Pittsburgh, PA)
<b>Prerequisites:</b>	Completion of the NTPP class "Blasting and Inspection" or knowledge of blast design and blast log documentation.

# Galena Slope Stability Analysis

<b>Class:</b>	OSM-2008-0624-Pittsburgh, PA
<b>Class Dates:</b>	06/24/08-06/25/08 Tu W
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Galena Slope Stability Analysis
<b>Course Code:</b>	OSM-EGS
<b>Course Description:</b>	Slope Analysis software is used for performing stability analyses of backfills, road embankments, pond embankments, landslides, or natural slopes. These slopes occur on reclaimed lands and active mine sites. The software models the factor of safety of these features using the Simplified Bishop, Spencer, and Sarma methods of analysis. The course includes a review of slope stability principles before using the software. The course is intended only for engineers or geology professionals with a slope stability background.
<b>Categories:</b>	Engineering / Science / Statistics
<b>Course Objectives:</b>	Soil Mechanics Theory-- <ul style="list-style-type: none"><li>• Basic Principles of Soil and Rock Testing,</li><li>• Soil Failure Mechanisms,</li><li>• Soil Properties,</li><li>• The Role of Water;</li><li>• The Stability Analysis--</li><li>• Determining Appropriate Strength Parameters,</li><li>• The Bishop Circular Analysis,</li><li>• Use of Stability Charts (Estimating Factors of Safety; Determining Critical Failure Surfaces),</li><li>• Spencer Method,</li><li>• Sarma Method;</li><li>• Soils Laboratory Methods Video;</li><li>• Use of the Software--</li><li>• Fundamentals of the Program (Data Entry; Embankment Geometry; Delineation of Soil Types; Use of Phreatic Surface or Pore Pressure Ratio; Strength Parameters; Tension Crack Data; Seismic Coefficients for Dynamic Loads; Fluid Unit Weight for Impoundments),</li><li>• Selection of Analytical Method (Modified Bishop Method for Circular Failure; Spencer Method for Circular and Non-Circular Failure; Sarma Method for Non-Circular Failure),</li><li>• Running the Stability Analysis (Selecting Method of Search for Minimum Factor of Safety [Critical Failure Surface]),</li><li>• Interpreting Results (Evaluating Shallow vs Deep Failure Surfaces),</li><li>• Efficient/Effective Use of the Model – When enough is enough (Guarding Against Manipulation of the Model to Get Acceptable Factors of Safety, Use of Realistic Input Parameters).</li></ul>
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Lou Hamm (Lead), Lisa Chavel, Duane Matt
<b>Classroom Location:</b>	OSM Pittsburgh ARCC (Pittsburgh, PA)
<b>Prerequisites:</b>	Undergraduate degree (or equivalent experience) in science or engineering.

## Surface Deformation Prediction System (SDPS)

<b>Class:</b>	
<b>Class Dates:</b>	No Class scheduled in Fiscal Year 2008
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Surface Deformation Prediction System (SDPS)
<b>Course Code:</b>	OSM-ESD
<b>Course Description:</b>	SDPS is a nationally-validated prediction program developed for OSM to quantify anticipated subsidence deformations and strains from underground longwall and high-extraction room and pillar mining operations. This hands on course, with case studies, will teach students who are responsible for evaluating the effects of subsidence to apply this software to day to day work.
<b>Categories:</b>	Engineering / Science / Statistics
<b>Course Objectives:</b>	<p>Review of Subsidence Mechanisms And Theories Overview of Subsidence Parameters:</p> <ul style="list-style-type: none"> <li>• Software Overview</li> <li>• Configuration Options</li> <li>• File Conventions</li> <li>• Required Field and Input Parameters</li> <li>• Prediction of Surface Deformations</li> <li>• Data Collection</li> <li>• Maximum Subsidence Factor</li> <li>• Location of the Inflection Point</li> <li>• Angle of Principal Influence</li> <li>• Horizontal Strain Coefficient</li> <li>• Limitations of Empirical Parameters</li> <li>• Software Modules</li> <li>• Profile Function (Angle of Draw, Subsidence Profile)</li> <li>• Influence Function (Input Data, Mine Plan, Prediction Points, Empirical Parameters)</li> <li>• Graphing Module (2-D, 3-D)</li> <li>• Pillar Stability (Conventional Pillar Stability, Analysis of Longwall Pillar Stability [ALPS], Analysis of Retreat Mining Pillar Stability [ARMPS], Coal Mine Roof Rating Program [CMRR]):</li> <li>• Data Import and Export/Digitizing</li> <li>• Importing Mine Plan through AutoCAD</li> <li>• Importing Prediction Points through AutoCAD</li> <li>• Exporting Subsidence Profiles to AutoCAD</li> <li>• Exercises with AutoCAD</li> <li>• Plotting and Printing</li> <li>• Peripheral Hardware.</li> </ul>
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Lois Uranowski (Lead) , Joshua Rockwell, Danny Rahnema
<b>Classroom Location:</b>	OSM TBD (TBD)
<b>Prerequisites:</b>	

# ArcGIS Spatial Analyst : for Mining and Reclamation

<b>Class:</b>	OSM-2008-0826-Pittsburgh, PA
<b>Class Dates:</b>	08/26/08-08/28/08 Tu W Tr
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-ArcGIS Spatial Analyst : for Mining and Reclamation
<b>Course Code:</b>	OSM-GSA
<b>Course Description:</b>	This course explores how the ArcGIS Spatial Analyst extension uses raster and vector data in an integrated environment. This course teaches the basic raster concepts and shows how to create, run and edit spatial models. It focuses on problems that are best solved in a raster environment such as Approximate Original Contour topographic analysis, view-shed modeling, and reclaimed slopes hydrologic analysis.
<b>Categories:</b>	GIS
<b>Course Objectives:</b>	Basics Concepts-- <ul style="list-style-type: none"><li>• Raster Concepts,</li><li>• Spatial Analyst Interface,</li><li>• Querying Raster Themes;</li><li>• Raster Structure Themes--</li><li>• Creating Raster Datasets,</li><li>• Raster Storage and Management;</li><li>• Aligning Themes--</li><li>• Raster Registration,</li><li>• Raster Georeferencing,</li><li>• Raster Projection,</li><li>• Importing and Exporting Raster Datasets; Surface Analyses--</li><li>• Calculating Density, Interpolation Methods, Interpolating,</li><li>• Contours and Hill shading,</li><li>• Visibility Analysis;</li><li>• Map Algebra Functions--</li><li>• Writing Expressions,</li><li>• Expression Syntax;</li><li>• Distance Measurements--</li><li>• Euclidean Distance,</li><li>• Cost Distance; and,</li><li>• Surface Hydrology--</li><li>• Identifying Watershed Basins,</li><li>• Surface Runoff Characteristics.</li></ul>
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclama-
<b>Course Instructors:</b>	Tom Mastrorocco (Lead), Kwang Min Kim
<b>Classroom Location:</b>	OSM Pittsburgh AR (Pittsburgh, PA)
<b>Prerequisites:</b>	Prospective students must have taken the ArcGIS ARCINFO 8.x Desktop for mining and reclamation class and be very familiar with GIS concepts.



## GPS Analyst for ArcGIS

<b>Class:</b>	
<b>Class Dates:</b>	No Class in Fiscal Year 2008
<b>Class Times:</b>	n/a
<b>Course:</b>	GPS Analyst for ArcGIS
<b>Course Code:</b>	OSM-GPS
<b>Course Description:</b>	<p>GPS Analyst is an ArcGIS extension allowing the integration of Global Positioning System data into the ESRI ArcGIS Geographic Information System software. The GPS Analyst extension improves data accuracy and field-to-office workflow by tightly integrating GPS location data with the GIS database. With the extension's ability to differentially correct GPS data directly inside ArcGIS, Trimble GPS Analyst can improve the accuracy of GPS positioning from 10 meters to 50 centimeters, depending on the GPS receiver and environment. Productivity is improved because GPS data can be checked straight from the field into the GIS, eliminating unnecessary file conversions. And, since the GPS data is stored directly in the geodatabase, it can be overlaid and analyzed with the other GIS layers. In addition, the GPS Analyst extension is fully open, customizable and extendible using ArcObjects, allowing developers and customers to build workflow and applications that meet their specific needs.</p>
<b>Categories:</b>	GIS
<b>Course Objectives:</b>	<ul style="list-style-type: none"> <li>• Improve productivity by eliminating extra file conversions and processing steps outside the GIS</li> <li>• View, edit, and analyze GPS data in ArcGIS</li> <li>• Differentially correct for improved GPS position accuracy including Trimble H-Star processing for subfoot accuracy</li> <li>• Check data out to Shapefiles for update in the field with ArcPad and the GPScorrect extension, then check new and updated features and GPS positions back into the geodatabase</li> <li>• Import features and GPS positions from Trimble SSF files, including data collected with Trimble TerraSync software</li> <li>• Validate GPS positions to ensure features meet your accuracy requirements</li> <li>• Store detailed quality information for GPS data in the geodatabase</li> <li>• Use ArcGIS in the field to collect features and GPS data directly to the geodatabase</li> </ul>
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	
<b>Classroom Location:</b>	
<b>Prerequisites:</b>	Introduction to ArcGIS or equivalent experience and any TIPS GPS class or equivalent experience.

## Image Analysis for ArcGIS

<b>Class:</b>	OSM-2008-0603-Pittsburgh, PA
<b>Class Dates:</b>	06/03/08-06/05/08 Tu W Tr
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Image Analysis for ArcGIS
<b>Course Code:</b>	OSM-GIA
<b>Course Description:</b>	This course will teach students how to process and prepare satellite images and air photographs so they can be used to update, enhance, and expand your vector GIS. Course Level: Intermediate.
<b>Categories:</b>	GIS
<b>Course Objectives:</b>	Understand display and enhance raster imagery within ArcMap: <ul style="list-style-type: none"><li>• Import satellite data using Arc Toolbox</li><li>• Reproject imagery and create orthorectified images</li><li>• Mosaic images to create a single seamless image</li><li>• Subset imagery to create smaller files</li><li>• Perform and unsupervised and supervised classification of satellite imagery</li><li>• Identify and extract changes through change detection, and update and manipulate vector and raster attributes</li></ul>
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Dianne Osborne (Lead), Shellie Willoughby, Janine Ferarese, Marc Barraclough
<b>Classroom Location:</b>	OSM Pittsburgh AR (Pittsburgh, PA)
<b>Prerequisites:</b>	Prospective students should have completed an "Introduction to ArcGIS" class.

## Image Analysis for ArcGIS

<b>Class:</b>	OSM-2008-0916-Denver, CO
<b>Class Dates:</b>	09/16/08-09/18/08 Tu W Tr
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Image Analysis for ArcGIS
<b>Course Code:</b>	OSM-GIA
<b>Course Description:</b>	This course will teach students how to process and prepare satellite images and air photographs so they can be used to update, enhance, and expand your vector GIS. Course Level: Intermediate.
<b>Categories:</b>	GIS
<b>Course Objectives:</b>	Understand display and enhance raster imagery within ArcMap: <ul style="list-style-type: none"><li>• Import satellite data using Arc Toolbox</li><li>• Reproject imagery and create orthorectified images</li><li>• Mosaic images to create a single seamless image</li><li>• Subset imagery to create smaller files</li><li>• Perform and unsupervised and supervised classification of satellite imagery</li><li>• Identify and extract changes through change detection, and update and manipulate vector and raster attributes</li></ul>
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Dianne Osborne (Lead), Shellie Willoughby, Janine Ferarese, Marc Barraclough
<b>Classroom Location:</b>	OSM Denver WR (Denver, CO)
<b>Prerequisites:</b>	Prospective students should have completed an "Introduction to ArcGIS" class.

## **Introduction to ArcGIS for Mining and Reclamation**

<b>Class:</b>	OSM-2008-1204-Denver, CO
<b>Class Dates:</b>	12/04/07-12/06/07 Tu W Tr
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Introduction to ArcGIS for Mining and Reclamation
<b>Course Code:</b>	OSM-GAD
<b>Course Description:</b>	Introduction to the basics of ArcInfo Desktop software. This course is designed around mining and reclamation examples and exercises. The various types of GIS data and how they are used in Desktop will be covered. Techniques for using the features of this software to generate high quality maps and analyzing selected data sets are taught. Specific training areas will be ArcCatalog, ArcMap, and ArcToolbox.
<b>Categories:</b>	GIS
<b>Course Objectives:</b>	To develop students skills for managing and analyzing GIS data using ArcGIS 9.x; to familiarize students with the various file formats and terminology used in ArcGIS 9.x; and to learn to combine various file formats together to produce GIS products with ArcGIS 9.x.
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Dave Agnor (Lead), Catherine Dreesbach, Mychal Yellowman
<b>Classroom Location:</b>	OSM Denver WR (Denver, CO)
<b>Prerequisites:</b>	Familiarity with GIS or Mapping concepts is helpful.

## Introduction to ArcGIS for Mining and Reclamation

<b>Class:</b>	OSM-2008-0205-Alton, IL
<b>Class Dates:</b>	02/05/08-02/07/08 Tu W Tr
<b>Class Times:</b>	8:30 AM - 4:30 PM
<b>Course:</b>	TIPS-Introduction to ArcGIS for Mining and Reclamation
<b>Course Code:</b>	OSM-GAD
<b>Course Description:</b>	Introduction to the basics of ArcInfo Desktop software. This course is designed around mining and reclamation examples and exercises. The various types of GIS data and how they are used in Desktop will be covered. Techniques for using the features of this software to generate high quality maps and analyzing selected data sets are taught. Specific training areas will be ArcCatalog, ArcMap, and ArcToolbox.
<b>Categories:</b>	GIS
<b>Course Objectives:</b>	To develop students skills for managing and analyzing GIS data using ArcGIS 9.x; to familiarize students with the various file formats and terminology used in ArcGIS 9.x; and to learn to combine various file formats together to produce GIS products with ArcGIS 9.x.
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Kwang Min Kim (Lead), Todd Coffelt
<b>Classroom Location:</b>	OSM Alton MCR (Alton, IL)
<b>Prerequisites:</b>	Familiarity with GIS or Mapping concepts is helpful.

## **Introduction to ArcGIS for Mining and Reclamation**

<b>Class:</b>	OSM-2008-0715-Pittsburgh, PA
<b>Class Dates:</b>	07/15/08-07/17/08 Tu W Tr
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Introduction to ArcGIS for Mining and Reclamation
<b>Course Code:</b>	OSM-GAD
<b>Course Description:</b>	Introduction to the basics of ArcInfo Desktop software. This course is designed around mining and reclamation examples and exercises. The various types of GIS data and how they are used in Desktop will be covered. Techniques for using the features of this software to generate high quality maps and analyzing selected data sets are taught. Specific training areas will be ArcCatalog, ArcMap, and ArcToolbox.
<b>Categories:</b>	GIS
<b>Course Objectives:</b>	To develop students skills for managing and analyzing GIS data using ArcGIS 9.x; to familiarize students with the various file formats and terminology used in ArcGIS 9.x; and to learn to combine various file formats together to produce GIS products with ArcGIS 9.x.
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Dave Agnor (Lead), Tom Mastrococco
<b>Classroom Location:</b>	OSM Pittsburgh AR (Pittsburgh, PA)
<b>Prerequisites:</b>	Familiarity with GIS or Mapping concepts is helpful.

## Underground Mine Mapping with GIS

<b>Class:</b>	OSM-2008-0212-Pittsburgh, PA
<b>Class Dates:</b>	02/12/08-02/14/08 Tu W Tr
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Underground Mine Mapping with GIS
<b>Course Code:</b>	OSM-GUM
<b>Course Description:</b>	This course explores the methods that are used to convert hardcopy underground mine maps to an electronic data format and explore this data using ArcGIS.
<b>Categories:</b>	GIS
<b>Course Objectives:</b>	The care and restoration of hardcopy underground mine maps: <ul style="list-style-type: none"><li>• Mine Map Database Design and Management</li><li>• Scanning maps into a raster format</li><li>• Raster editing and vectorizing</li><li>• Introduction to ArcMap and ArcCatalog</li><li>• Georeferencing and Digitizing</li><li>• Disseminating Digital Data</li><li>• Displaying maps</li><li>• Case Studies</li></ul>
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Alan Wilhelm (Lead), Mike Dunn, Becky Meyer, Licia Weber, Daniel Kestner
<b>Classroom Location:</b>	OSM Pittsburgh AR (Pittsburgh, PA)
<b>Prerequisites:</b>	None

## ArcPAD 7: Mobile GIS for Reclamation Mapping and Analysis

<b>Class:</b>	OSM-2008-0520-Denver, CO
<b>Class Dates:</b>	05/20/08-05/21/08 Tu W
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-ArcPAD 7: Mobile GIS for Reclamation Mapping and Analysis
<b>Course Code:</b>	OSM-GAP
<b>Course Description:</b>	ArcPad is a mobile GIS software package developed by ESRI that is used to capture, display, analyze, and edit geographic information in the field. This focused course provides and introduction to ArcPad 7 and demonstrates some of its powerful capabilities that can be applied in the coal mining environment. Through a series of lectures, classroom, and field exercises students learn about the wide range of tools, menus, and style sheets that come with ArcPad and how ArcPad is used to gather and edit field data. The course emphasizes best practice principles and considerations for common field tasks.
<b>Categories:</b>	Mobile Computing
<b>Course Objectives:</b>	Those completing this course will be able to: <ul style="list-style-type: none"><li>• Open a map in ArcPad and add layers to it</li><li>• Explain the different data types used in ArcPad</li><li>• Understand ArcPad tools and menus</li><li>• Prepare and get data for ArcPad using desktop ArcGIS applications</li><li>• Gain a basic understanding of GPS, coordinate systems, and map projections</li><li>• Understand the functionality of GPS preferences in ArcPad</li><li>• Change layer symbology and map displays</li><li>• Find and edit features in ArcPad</li><li>• Edit and add feature attributes</li><li>• Create a new shapefile in ArcPad</li><li>• Add and import fields to new shapefiles</li><li>• Create customized data collection forms in ArcPad</li><li>• Select the appropriate type of GPS and hardware unit for specific applications</li></ul>
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Julian Calabrese (Lead), Russell Kirkham, Marcelo Calle
<b>Classroom Location:</b>	OSM Denver WR (Denver. CO)
<b>Prerequisites:</b>	Prospective students should have experience with GIS and GPS. Knowledge of ArcGIS software products is highly recommended.



## ArcPAD 7: Mobile GIS for Reclamation Mapping and Analysis

<b>Class:</b>	OSM-2008-0909-Pittsburgh, PA
<b>Class Dates:</b>	09/09/08-09/10/08 Tu W
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-ArcPAD 7: Mobile GIS for Reclamation Mapping and Analysis
<b>Course Code:</b>	OSM-GAP
<b>Course Description:</b>	ArcPad is a mobile GIS software package developed by ESRI that is used to capture, display, analyze, and edit geographic information in the field. This focused course provides and introduction to ArcPad 7 and demonstrates some of its powerful capabilities that can be applied in the coal mining environment. Through a series of lectures, classroom, and field exercises students learn about the wide range of tools, menus, and style sheets that come with ArcPad and how ArcPad is used to gather and edit field data. The course emphasizes best practice principles and considerations for common field tasks.
<b>Categories:</b>	Mobile Computing
<b>Course Objectives:</b>	Those completing this course will be able to: <ul style="list-style-type: none"><li>• Open a map in ArcPad and add layers to it</li><li>• Explain the different data types used in ArcPad</li><li>• Understand ArcPad tools and menus</li><li>• Prepare and get data for ArcPad using desktop ArcGIS applications</li><li>• Gain a basic understanding of GPS, coordinate systems, and map projections</li><li>• Understand the functionality of GPS preferences in ArcPad</li><li>• Change layer symbology and map displays</li><li>• Find and edit features in ArcPad</li><li>• Edit and add feature attributes</li><li>• Create a new shapefile in ArcPad</li><li>• Add and import fields to new shapefiles</li><li>• Create customized data collection forms in ArcPad</li><li>• Select the appropriate type of GPS and hardware unit for specific applications</li></ul>
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Kale Horton (Lead), Nick Schaer, Nancy Osborne
<b>Classroom Location:</b>	OSM Pittsburgh AR (Pittsburgh, PA)
<b>Prerequisites:</b>	Prospective students should have experience with GIS and GPS. Knowledge of ArcGIS software products is highly recommended.

## **GeoExplorer 3 GPS and PF Office: Advanced GPS Mapping for Reclamation**

<b>Class:</b>	OSM-2008-0401-Pittsburgh, PA
<b>Class Dates:</b>	04/01/08-04/03/08 Tu W Tr
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-GeoExplorer 3 GPS and PF Office: Advanced GPS Mapping for Reclamation
<b>Course Code:</b>	OSM-GLA
<b>Course Description:</b>	GPS technology uses satellite triangulation to allow rapid, accurate surface positioning of mine features. Applications in reclamation include: verification of stream buffer zones, locating roads, jurisdictional boundaries, ponds, or other features relative to permit boundaries, mapping seeps, outcrops and AML site locations for inventory update and acreage determination, and measuring the size of minesite disturbance areas. This course will provide advanced topics in reclamation-oriented GPS use and includes extensive hands-on field exercises with GPS receivers and software. Three reclamation-oriented field exercises are included for students to collect and process GPS data using advanced techniques adapted specifically for active and abandoned minesites.
<b>Categories:</b>	Mobile Computing
<b>Course Objectives:</b>	Students will learn how to successfully apply GPS technology to active and abandoned mine reclamation through hands-on field and office software use. Students will gain a comprehension of the Global Positioning System for successful troubleshooting and accuracy verification of geospatial data collected with GPS. Through hands-on setup and configuration of the GeoExplorer3, students will learn to collect critical mission geospatial data and navigate using GPS. Review of GIS concepts and coordinate systems will provide students with the knowledge to choose the correct formats for the geospatial data they collect. Students will learn how to correct and export their GPS data and display background maps by hands-on use of the PFOffice software.
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclama-
<b>Course Instructors:</b>	Robert Welsh (Lead), Leslie Bright, Tom Mastaller
<b>Classroom Location:</b>	OSM Pittsburgh AR (Pittsburgh, PA)
<b>Prerequisites:</b>	Prospective students must bring a GeoExplorer 3 to class from their office. If two students attend from a TIPS customer location, then students may share one GeoExplorer3. Because of the specialized nature of the equipment and techniques, no substitute GPS units may be used. Familiarity with GIS or CAD software and map reading is highly recommended.

## Introduction to GPS with Garmin eTrex Vista C

<b>Class:</b>	OSM-2008-1016-Pittsburgh, PA
<b>Class Dates:</b>	10/16/07-10/17/07 Tu W (Pittsburgh, PA)
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Introduction to GPS with Garmin eTrex Vista C
<b>Course Code:</b>	OSM-GEV
<b>Course Description:</b>	An introduction to the low-cost hand held GPS until Garmin eTrex Vista C, along with data collection, data management, and map output/display for Title 4 and Title 5 applications. The basics of GPS technology and terminology will be discusses. Two programs will be used to manage and display the GPS data, Map Source MetroGuide North America v6 and TopoFusion
<b>Categories:</b>	Mobile Computing
<b>Course Objectives:</b>	Learn GPS basic terminology, Understand Garmin eTrex Vista use, Master Data Acquisition
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclama-
<b>General Information:</b>	If available, bring Garmin eTrex Vista C from duty station
<b>Course Instructors:</b>	Lisa Chavel (Lead), Rick Lamkie
<b>Classroom Location:</b>	OSM Pittsburgh AR (Pittsburgh, PA)
<b>Prerequisites:</b>	None

## Introduction to GPS with Garmin eTrex Vista C

<b>Class:</b>	OSM-2008-0422-Denver, CO
<b>Class Dates:</b>	04/22/08-04/23/08 Tu W (Denver, CO)
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Introduction to GPS with Garmin eTrex Vista C
<b>Course Code:</b>	OSM-GEV
<b>Course Description:</b>	An introduction to the low-cost hand held GPS until Garmin eTrex Vista C, along with data collection, data management, and map output/display for Title 4 and Title 5 applications. The basics of GPS technology and terminology will be discusses. Two programs will be used to manage and display the GPS data, Map Source MetroGuide North America v6 and TopoFusion
<b>Categories:</b>	Mobile Computing
<b>Course Objectives:</b>	Learn GPS basic terminology, Understand Garmin eTrex Vista use, Master Data Acquisition and Management, Generate Map Output Displays
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>General Information:</b>	If available, bring Garmin eTrex Vista C from duty station
<b>Course Instructors:</b>	April 2008 - Lisa Chavel (Lead), Scott Davies
<b>Classroom Location:</b>	OSM Denver WR (Denver, CO)
<b>Prerequisites:</b>	None

## Introduction to GPS with Garmin eTrex Vista C

<b>Class:</b>	OSM-2008-0506-Pittsburgh, PA
<b>Class Dates:</b>	05/06/08-05/07/08 Tu W (Pittsburgh, PA)
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Introduction to GPS with Garmin eTrex Vista C
<b>Course Code:</b>	OSM-GEV
<b>Course Description:</b>	An introduction to the low-cost hand held GPS until Garmin eTrex Vista C, along with data collection, data management, and map output/display for Title 4 and Title 5 applications. The basics of GPS technology and terminology will be discusses. Two programs will be used to manage and display the GPS data, Map Source MetroGuide North America v6 and TopoFusion
<b>Categories:</b>	Mobile Computing
<b>Course Objectives:</b>	Learn GPS basic terminology, Understand Garmin eTrex Vista use, Master Data Acquisition and Management, Generate Map Output Displays
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>General Information:</b>	If available, bring Garmin eTrex Vista C from duty station
<b>Course Instructors:</b>	Ken Eltschlager (Lead), Rick Lamkie
<b>Classroom Location:</b>	OSM Pittsburgh AR (Pittsburgh, PA)
<b>Prerequisites:</b>	None

## Introduction to GPS with Garmin eTrex Vista C

<b>Class:</b>	OSM-2008-0610-Alton, IL
<b>Class Dates:</b>	06/10/08-06/11/08 Tu W (Alton, IL)
<b>Class Times:</b>	8:30 AM - 4:30 PM
<b>Course:</b>	TIPS-Introduction to GPS with Garmin eTrex Vista C
<b>Course Code:</b>	OSM-GEV
<b>Course Description:</b>	An introduction to the low-cost hand held GPS until Garmin eTrex Vista C, along with data collection, data management, and map output/display for Title 4 and Title 5 applications. The basics of GPS technology and terminology will be discusses. Two programs will be used to manage and display the GPS data, Map Source MetroGuide North America v6 and TopoFusion
<b>Categories:</b>	Mobile Computing
<b>Course Objectives:</b>	Learn GPS basic terminology, Understand Garmin eTrex Vista use, Master Data Acquisition and Management, Generate Map Output Displays
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>General Information:</b>	If available, bring Garmin eTrex Vista C from duty station
<b>Course Instructors:</b>	Ken Eltschlager (Lead), Scott Davies
<b>Classroom Location:</b>	OSM Alton MCR (Alton, IL)
<b>Prerequisites:</b>	None

# Trimble GeoXT, TerraSync and PF Office: Mobile Computing for Reclamation

<b>Class:</b>	OSM-2008-0506-Denver, CO
<b>Class Dates:</b>	05/06/08-05/08/08 Tu W Tr
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Trimble GeoXT, TerraSync and PF Office: Mobile Computing for Reclamation
<b>Course Code:</b>	OSM-GTS
<b>Course Description:</b>	In this class, participants will become proficient using the Trimble GeoXT with TerraSync software through reclamation-related classroom and field exercises. Mobile computing with the Trimble GeoXT and TerraSync combines a very capable GPS engine with powerful navigation and data collection software. Real-time corrections from the integrated WAAS/EGNOS receiver typically are of sub-meter accuracy. Participants will process their field data using Pathfinder Office software. The use of background images in map display, including satellite imagery, aerial photos, and images is an important feature of the class.
<b>Categories:</b>	Mobile Computing
<b>Course Objectives:</b>	Students will learn how to successfully apply GPS technology to active and abandoned mine reclamation through hands-on field and office software use. Students will gain a comprehension of the Global Positioning System for successful troubleshooting and accuracy verification of geospatial data collected with GPS. Through hands-on setup and configuration of the GeoXT and TerraSync, students will learn to collect critical mission geospatial data and navigate using GPS. Review of GIS concepts and coordinate systems will provide students with the knowledge to choose the correct formats for the geospatial data they collect. Students will learn how to correct and export their GPS data and display background maps by hands-on use of the PFOffice software.
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Robert Welsh (Lead), Tonya Blackburn, Jeff Graves
<b>Classroom Location:</b>	OSM Denver WR (Denver, CO)
<b>Prerequisites:</b>	Prospective students must bring a GeoXT with TerraSync loaded to class from their office. If two students attend from a TIPS customer location, then students may share one GeoXT. Familiarity with map reading, GIS concepts and CAD or GIS software is desirable.

## **Trimble GeoXT, TerraSync and PF Office: Mobile Computing for Reclamation**

<b>Class:</b>	OSM-2008-0520-Albuquerque, NM
<b>Class Dates:</b>	05/20/08-05/22/08 Tu W Tr
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Trimble GeoXT, TerraSync and PF Office: Mobile Computing for Reclamation
<b>Course Code:</b>	OSM-GTS
<b>Course Description:</b>	In this class, participants will become proficient using the Trimble GeoXT with TerraSync software through reclamation-related classroom and field exercises. Mobile computing with the Trimble GeoXT and TerraSync combines a very capable GPS engine with powerful navigation and data collection software. Real-time corrections from the integrated WAAS/EGNOS receiver typically are of sub-meter accuracy. Participants will process their field data using Pathfinder Office software. The use of background images in map display, including satellite imagery, aerial photos, and images is an important feature of the class.
<b>Categories:</b>	Mobile Computing
<b>Course Objectives:</b>	Students will learn how to successfully apply GPS technology to active and abandoned mine reclamation through hands-on field and office software use. Students will gain a comprehension of the Global Positioning System for successful troubleshooting and accuracy verification of geospatial data collected with GPS. Through hands-on setup and configuration of the GeoXT and TerraSync, students will learn to collect critical mission geospatial data and navigate using GPS. Review of GIS concepts and coordinate systems will provide students with the knowledge to choose the correct formats for the geospatial data they collect. Students will learn how to correct and export their GPS data and display background maps by hands-on use of the PFOffice software.
<b>Target Audience:</b>	All course spaces will be filled with SIPI students, Tribal employees, and OSM coal mining regulatory and reclamation personnel who support the tribes.
<b>Course Instructors:</b>	Robert Welsh (Lead), Alan Boehms, Tonya Blackburn
<b>Classroom Location:</b>	Southwestern Indian Polytechnic Institute (Albuquerque, NM)
<b>Prerequisites:</b>	Prospective students must bring a GeoXT with TerraSync loaded to class from their office. If two students attend from a TIPS customer location, then students may share one GeoXT. Familiarity with map reading, GIS concepts and CAD or GIS software is desirable.



## Modeling and Analysis with Groundwater Vistas

<b>Class:</b>	OSM-2008-0610-Denver, CO
<b>Class Dates:</b>	06/10/08-06/12/08 Tu W Tr
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Modeling and Analysis with Groundwater Vistas
<b>Course Code:</b>	OSM-HGV
<b>Course Description:</b>	This hands-on course will review the underlying assumptions, theories, and practical utilization of numerical flow models. The fundamental underpinnings of the course revolve around conceptually modeling ground-water flow and the application of the Groundwater Vistas software. Students will work examples applying this software to coal mining and reclamation related analysis.
<b>Categories:</b>	Hydrology / Ground Water
<b>Course Objectives:</b>	At the end of this course students will be able to: <ul style="list-style-type: none"><li>• Develop how to build a conceptual model</li><li>• Develop an appropriate grid</li><li>• Apply appropriate boundary conditions</li><li>• Perform a Sensitivity Analysis</li><li>• Calibrate a ground water model</li><li>• Assess model predictions</li></ul>
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Bill Winters (Lead), Kathy Muller-Ogle, Ed Epp
<b>Classroom Location:</b>	OSM Denver WR (Denver, CO)
<b>Prerequisites:</b>	Prospective students should possess a working knowledge of terminology including hydraulic conductivity, storativity, transmissivity, and Darcy's law. Prospective students should have also successfully completed the NTTTP course Quantitative Hydrogeology.

## Testing and Analysis of Aquifer Characteristics with AQTESOLV

<b>Class:</b>	OSM-2008-0722-Denver, CO
<b>Class Dates:</b>	07/22/08-07/24/08 Tu W Tr
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Testing and Analysis of Aquifer Characteristics with AQTESOLV
<b>Course Code:</b>	OSM-HAA
<b>Course Description:</b>	This hands-on course will review the underlying assumptions and theories of aquifer characterization and the practical utilization of analytical ground-water models. The course will provide an introduction to the use of AQTESOLV including analysis of confined, unconfined, leaky, and fractured aquifers. Students will work examples applying this software to coal mining and reclamation-related examples using pump test, slug test, drawdown and recovery data.
<b>Categories:</b>	Hydrology / Ground Water
<b>Course Objectives:</b>	At the end of this course, students will be able to evaluate and select appropriate pump and slug test methods, assess displacement data using visual and automatic curve matching, and generate graphs and reports.
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Debbie Dale (Lead), Bill Winters, Paul Clark
<b>Classroom Location:</b>	OSM Denver WR (Denver, CO)
<b>Prerequisites:</b>	Prospective students should possess a working knowledge of ground-water concepts including hydraulic conductivity, storativity, transmissivity, and Darcy's law. Prospective students should have also successfully completed the NTPP course Quantitative Hydrogeology.

## SEDCAD Applications and Extensions for Mine Permitting and Reclamation

<b>Class:</b>	OSM-2008-0506-Alton, IL
<b>Class Dates:</b>	05/06/08-05/08/08 Tu W Tr
<b>Class Times:</b>	8:30 AM - 4:30 PM
<b>Course:</b>	TIPS-SEDCAD Applications and Extensions for Mine Permitting and Reclamation
<b>Course Code:</b>	OSM-HSA
<b>Course Description:</b>	This course covers a broad review of the basic hydrologic concepts and assumptions, defines the input parameters for watershed modeling and design of sediment control structures utilizing SEDCAD for mine permitting and reclamation. The participants will learn how to use SEDCAD to model peak flow, runoff volume, design erosion and sediment control structures and to evaluate permit applications. In addition, the course will cover utilizing SEDCAD to evaluate peak flow in preparation of Cumulative Hydrologic Impact Assessments. An introduction to the Revised Universal Soil Loss Equation will also be covered. Students will work example problems applying this software to model watersheds, analyze peak flow and design sediment basins, channels, culverts, silt fence and other drainage control structures.
<b>Categories:</b>	Hydrology / Surface Water
<b>Course Objectives:</b>	At the end of this course, students will be able to: <ul style="list-style-type: none"> <li>• Design and evaluate sediment and drainage control structures</li> <li>• Predict the effectiveness of sediment basins</li> <li>• Apply RUSLE to calculate sediment load</li> <li>• Calculate peak flow and runoff volume; develop peak flow hydrograph and sediment-graph</li> <li>• Perform watershed modeling including structure networking and Muskingum routing</li> <li>• Evaluate hydrology and sedimentology input parameters</li> <li>• Generate and review final report</li> </ul>
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Danny Rahnema (Lead), David Best, Sheila Walton, Tek Tsegay
<b>Classroom Location:</b>	OSM Alton MCR (Alton, IL)
<b>Prerequisites:</b>	Students should have some knowledge of surface water hydrologic principles and computer experience. Completion of the NTPP courses "Applied Engineering Principles" and Surface and Groundwater Hydrology would be helpful.

## **SEDCAD Applications and Extensions for Mine Permitting and Reclamation**

<b>Class:</b>	OSM-2008-0708-Denver, CO
<b>Class Dates:</b>	07/08/08-07/10/08 Tu W Tr
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-SEDCAD Applications and Extensions for Mine Permitting and Reclamation
<b>Course Code:</b>	OSM-HSA
<b>Course Description:</b>	This course covers a broad review of the basic hydrologic concepts and assumptions, defines the input parameters for watershed modeling and design of sediment control structures utilizing SEDCAD for mine permitting and reclamation. The participants will learn how to use SEDCAD to model peak flow, runoff volume, design erosion and sediment control structures and to evaluate permit applications. In addition, the course will cover utilizing SEDCAD to evaluate peak flow in preparation of Cumulative Hydrologic Impact Assessments. An introduction to the Revised Universal Soil Loss Equation will also be covered. Students will work example problems applying this software to model watersheds, analyze peak flow and design sediment basins, channels, culverts, silt fence and other drainage control structures.
<b>Categories:</b>	Hydrology / Surface Water
<b>Course Objectives:</b>	At the end of this course, students will be able to: <ul style="list-style-type: none"><li>• Design and evaluate sediment and drainage control structures</li><li>• Predict the effectiveness of sediment basins</li><li>• Apply RUSLE to calculate sediment load</li><li>• Calculate peak flow and runoff volume; develop peak flow hydrograph and sediment-graph</li><li>• Perform watershed modeling including structure networking and Muskingum routing</li><li>• Evaluate hydrology and sedimentology input parameters</li><li>• Generate and review final report</li></ul>
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclama-
<b>Course Instructors:</b>	Danny Rahnema (Lead), David Best, Mary Greene, Tek Tsegay
<b>Classroom Location:</b>	OSM Denver WR (Denver, CO)
<b>Prerequisites:</b>	Students should have some knowledge of surface water hydrologic principles and computer experience. Completion of the NTTTP courses "Applied Engineering Principles" and Surface and Groundwater Hydrology would be helpful.

## AMDTreat for Acid Drainage

<b>Class:</b>	OSM-2008-0520-Pittsburgh, PA
<b>Class Dates:</b>	05/20/08-05/22/08 Tu W Tr
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-AMD Treat for Acid Drainage
<b>Course Code:</b>	OSM-EAT
<b>Course Description:</b>	The program offers users a method to predict and model water treatment costs for mine drainage problems. It also allows for the determination of capital cost associated with treatment of polluted mine drainage. AMDTreat provides many different treatment options both for passive and active treatment systems. Over 500 variables are available to the user to customize the costing routines for site-specific conditions.
<b>Categories:</b>	Hydrology / Water Quality
<b>Course Objectives:</b>	The objective of this course is to provide students with a basic understanding of treatment methods, strategies, and cost-estimation procedures using the AMDTreat software.
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Brent Means (Lead), Bob McKenzie, Nancy Pointon
<b>Classroom Location:</b>	OSM Pittsburgh AR (Pittsburgh, PA)
<b>Prerequisites:</b>	Familiarity with active and passive AMD treatment systems and treatment cost bonding estimation are desirable.

## **Statistics Workshop: Interpretation of Water Quality Data using StatGraphics and AquaChem**

<b>Class:</b>	OSM-2008-0722-Alton, IL
<b>Class Dates:</b>	07/22/08-07/24/08 Tu W Tr
<b>Class Times:</b>	8:30 AM - 4:30 PM
<b>Course:</b>	TIPS-Statistics Workshop: Interpretation of Water Quality Data using StatGraphics and AquaChem
<b>Course Code:</b>	OSM-ESW
<b>Course Description:</b>	This is a hands-on class where participants will learn to develop graphics and statistical analyses for technical reports from water quality data using AquaChem and StatGraphics. Students will work with their own data sets in a workshop type environment.
<b>Categories:</b>	Hydrology / Water Quality
<b>Course Objectives:</b>	The objective of this workshop is to give students the tools necessary to analyze hydrologic data and prepare a report using StatGraphics and AquaChem. Students will work with their own data during the workshop. The course will include a brief review of StatGraphics and AquaChem.
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclama-
<b>Course Instructors:</b>	Bob Postle (Lead), Brian Hicks
<b>Classroom Location:</b>	OSM Alton MCR (Alton, IL)
<b>Prerequisites:</b>	Familiarity with AquaChem, Statgraphics, water quality parameters and statistical procedures is preferred.

## Water Quality Analysis Using AquaChem

<b>Class:</b>	OSM-2008-0812-Pittsburgh, PA
<b>Class Dates:</b>	08/12/08-08/14/08 Tu W Tr
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Water Quality Analysis Using AquaChem
<b>Course Code:</b>	OSM-HAW
<b>Course Description:</b>	This introductory course will cover basic aspects of water chemistry and water sampling as they relate to coal mining and reclamation. The focus, however, primarily will be on using the AquaChem software package to analyze water-quality data, while introducing its utility for geochemical modeling.
<b>Categories:</b>	Hydrology / Water Quality
<b>Course Objectives:</b>	At the end of this course, students will be able to: <ul style="list-style-type: none"><li>• Recall basic water chemistry principles and sampling methods</li><li>• Explain the data requirements to run various AquaChem analyses</li><li>• Import data from a spreadsheet or database</li><li>• Check for correctness of analysis of a water sample</li><li>• Prepare graphical and numeric analyses of water-monitoring data</li><li>• Design a report</li></ul>
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>Course Instructors:</b>	Brian Hicks (Lead), Debbie Dale, Kathy Muller-Ogle
<b>Classroom Location:</b>	OSM Pittsburgh AR (Pittsburgh, PA)
<b>Prerequisites:</b>	Prospective students should have basic computer proficiency. One year of college chemistry is strongly recommended. Familiarity with water-quality data is preferred.

## Carlson Mining's Natural Regrade for Permitting and Reclamation

<b>Class:</b>	OSM-2008-0624-Denver, CO
<b>Class Dates:</b>	06/24/08-06/26/08 Tu W Tr
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Carlson Mining's Natural Regrade for Permitting and Reclamation
<b>Course Code:</b>	OSM-EGN
<b>Course Description:</b>	Carlson Mining is a design software for engineering, surveying, reclamation and mining professionals. AutoCAD serves as its graphics engine and drawing editor. Carlson Mining is an extension of AutoCAD that adds commands and enhancements for earthmoving and engineering. Modules include: Cogo-Design, DTM-Contour, Section-Profile, Mining, and Hydrology.
<b>Categories:</b>	CAD Applications
<b>Course Objectives:</b>	<ul style="list-style-type: none"><li>• Identify file types</li><li>• Define drawings, and setup options</li><li>• Import and Export Points</li><li>• Manage drawing layers</li><li>• Perform heads-up digitizing</li><li>• Experiment with 3D landform viewing, and contouring</li><li>• Produce cross sections and profiles</li><li>• Examine design techniques</li><li>• Create a design templates in plan view</li><li>• Identify basic mobile computing concepts</li></ul>
<b>Target Audience:</b>	PILOT COURSE. By Invitation Only.
<b>Course Instructors:</b>	Mychal Yellowman (Lead), Marcelo Calle, Monte Anderson, Heather Erickson, Jonathan Stauffer, Hal Pranger
<b>Classroom Location:</b>	OSM Denver WR (Denver, CO)
<b>Prerequisites:</b>	Prospective students must have taken introductory course AutoCAD Fundamentals for Permitting and Reclamation or have a working knowledge of AutoCAD. Basic AutoCAD skills will not be covered in this course.



## Geospatial Data Flow Overview—PILOT

<b>Class:</b>	OSM-2008-0311-Casper, WY
<b>Class Dates:</b>	03/11/08-03/13/08 Tu W Tr
<b>Class Times:</b>	8:00 AM - 4:30 PM
<b>Course:</b>	TIPS-Geospatial Data Flow Overview—PILOT
<b>Course Code:</b>	OSM-EGS
<b>Course Description:</b>	Course is currently being developed at the request of the Wyoming state office
<b>Categories:</b>	GIS
<b>Course Objectives:</b>	To provide students with an overview of GIS tools and software
<b>Target Audience:</b>	All course spaces are filled by State, Tribal, and OSM coal mining regulatory and reclamation personnel.
<b>General Information:</b>	By Invitation Only
<b>Course Instructors:</b>	
<b>Classroom Location:</b>	Casper, WY
<b>Prerequisites:</b>	

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