

Data Check-out and Check-in Process Using the ArcPad Data Manager Toolbar

Session Objectives: At the conclusion of this session, you will be able to:

- Check-out data from a geodatabase for editing in the field using the ArcPad Data Manager Toolbar in ArcMap.
- Check-in field data and update a geodatabase using ArcPad Data Manager Toolbar
- Create metadata for geodatabase Feature Class using ArcCatalog
- Identify information that would be good to include in your GPS metadata

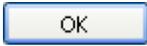
Material Created By: Eric Kelchlin (June 2010)

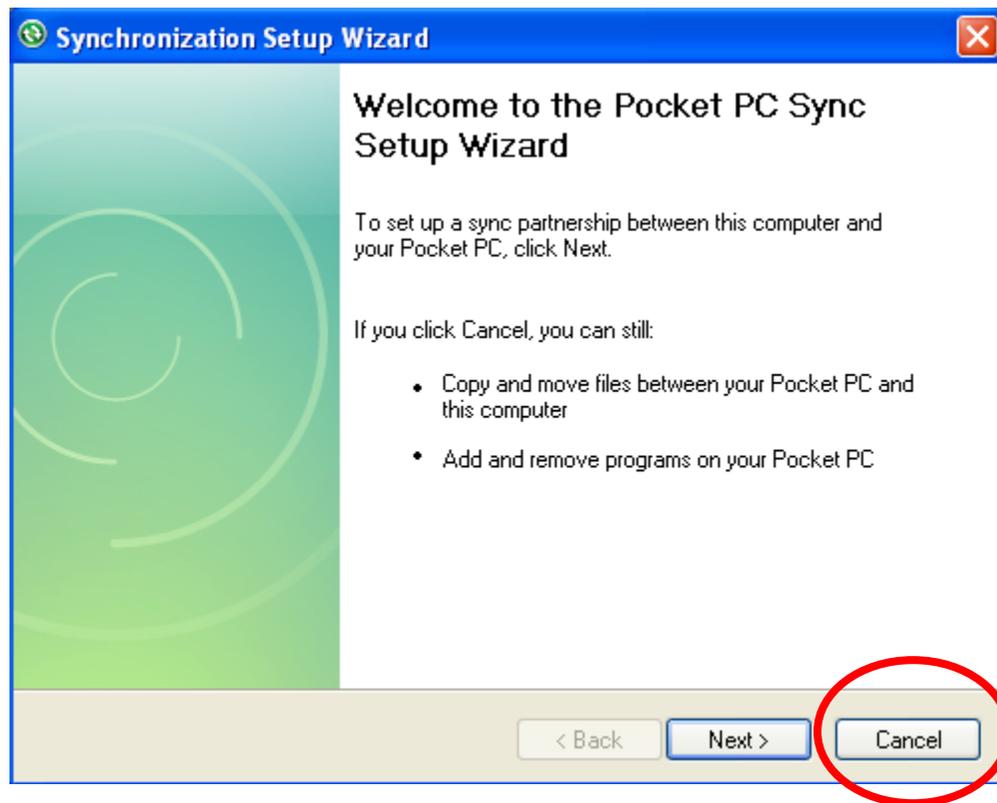
Software: ArcGIS 9.3.1, ArcPad 8.02

SECTION 1 – Establishing a Connection with your Mobile GPS Device

The software used to transfer files from your mobile GPS device to your PC or vice versa is called ActiveSync. This software is free and can be downloaded from: <http://www.microsoft.com/windowsmobile/default.mspx>. **You will need administrative privileges to install the program.**

These instructions were developed using ActiveSync version 4.5 and assume that you have not established a partnership between a mobile GPS device and your PC. A “partnership” is not recommended. Connect as a “Guest”.

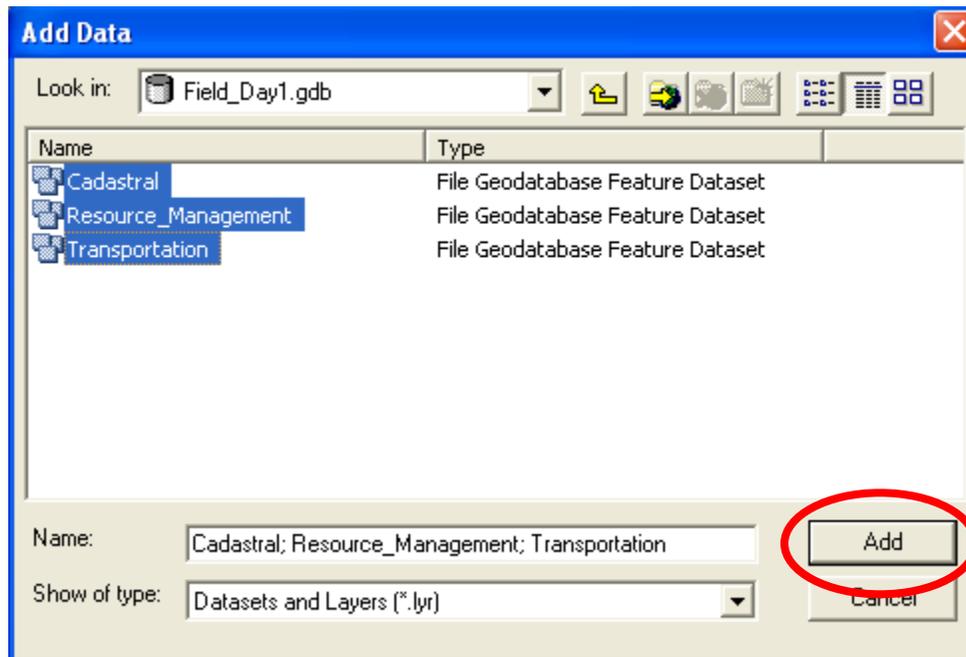
1. Connect your GPS device to a USB port on your PC. An ActiveSync pop-up screen will appear.
2. Click the  button on the Microsoft ActiveSync screen. You may have to click **OK** twice, depending on your computer software configuration.
3. Click the  button at the Synchronization Setup Wizard screen. You should now be connected as a **Guest**.



SECTION 2 – Preparing Data for Checkout

You can send multiple data types to your GPS device using the ArcPad Data Manager Toolbar in ArcMap. These include shapefiles, graphical drawings, geodatabase feature classes, relationship classes and many different types of imagery (i.e., raster data). The most effective use of the Arcpad Data Manager Toolbar is by using geodatabases with built-in domains for in-the-field drop down menu items and relationship classes for non-spatial tabular data entry. Therefore, this section illustrates the geodatabase check-out process.

1. Open ArcMap .
2. Open an existing map document with links to your data or simply use the **Add Data**  button to add your layers and background imagery.



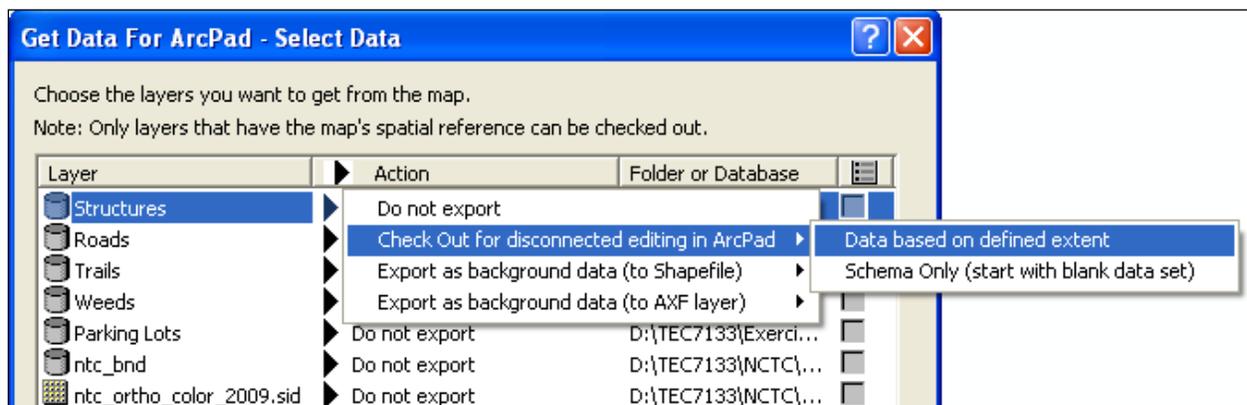
3. Since the data being checked out will be displayed on a much smaller screen, change the layer symbology to something much easier to see in the field. Follow these general guidelines:
 - Colors – bright colors that are visible on white or black background
 - Points – use a size of 10 -15
 - Lines – use a width of 1.5 -2.0
 - Polygons – no fill, line width of 1.5 – 2.0
4. Save  your map document.

SECTION 3 – Using the Arcpad Data Manager Toolbar to Checkout Data

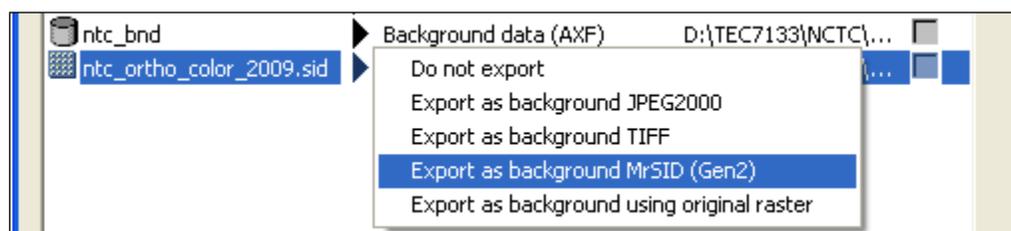
1. Ensure that you have the ArcPad Data Manager Toolbar visible. Click on the **Get Data for ArcPad**  button.



2. Click on the **Do not export** in the Action column and change it to **Check Out for disconnected editing in ArcPad > Data based on defined extent**. Repeat this process for all the layers except the raster layer.

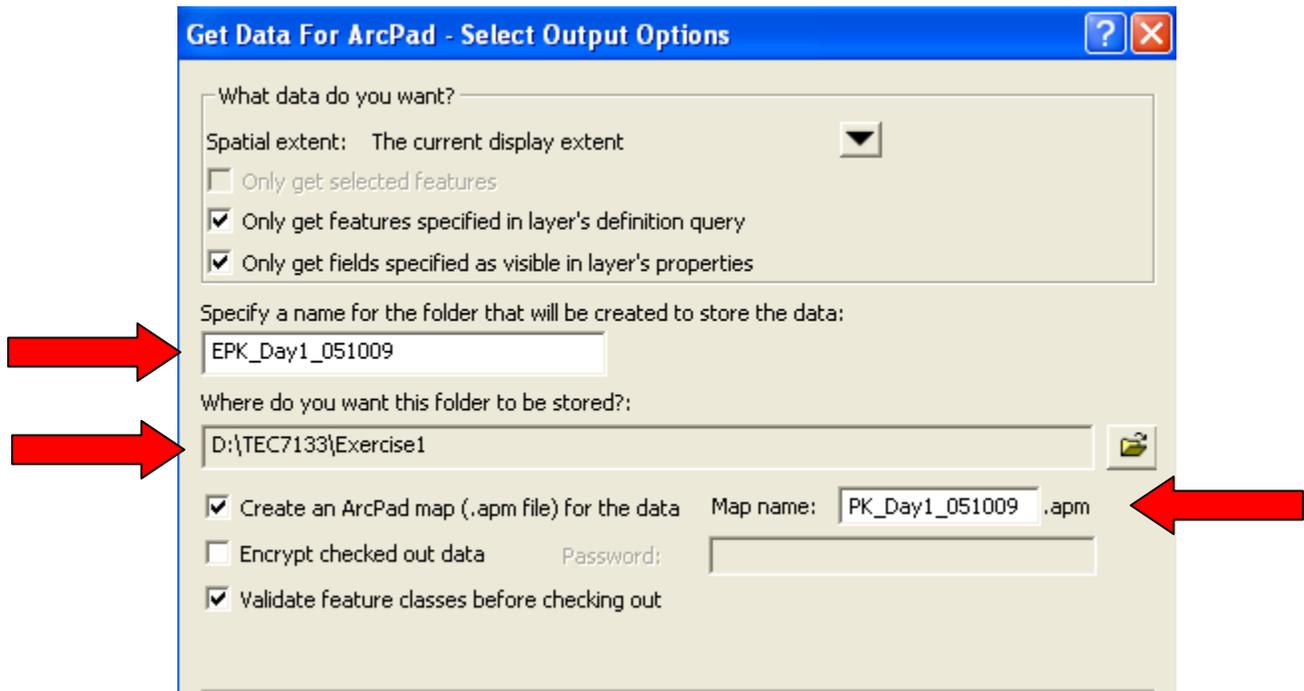


3. Export the raster layer as a MrSID (Gen2) file type.



4. Click .

5. Ensure that all the boxes are checked as shown below. Use the following file naming convention: ***Initials_Project Title_ddmmyy***.

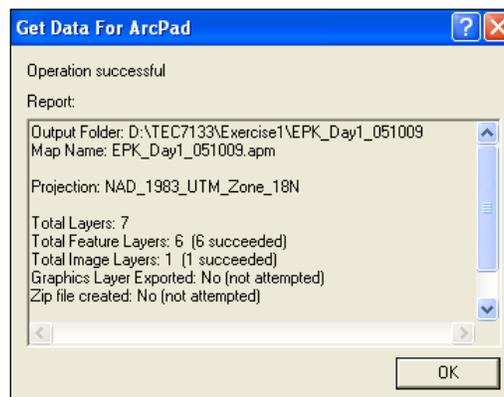


6. Store the ArcPad project data in a known location on your PC. See the screen shot above for an example.

7. Name the ArcPad map the same name as the project folder. Click .

8. Click  on the next screen, accepting the defaults.

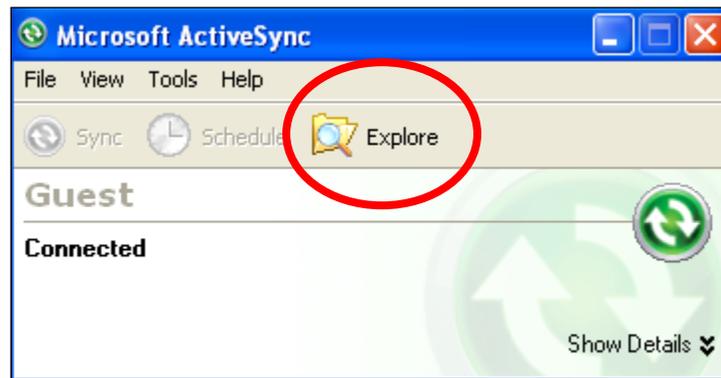
9. After several seconds, you will be notified that your operation was successful. Click . If you received an error message during this process, you may have exceeded the 50 MB file size limitation for encoding raster data in ArcGIS. Zoom into a smaller screen extent and redo the ArcPad Tools checkout process.



SECTION 4 – Copying the Project Folder onto your GPS Device

The next step is to manually copy the project folder you just created and paste it on the mobile device. This is really a simple process but please follow the steps carefully because it usually gets all messed-up. This should be an automated process, but it's not and we have to "go old school" as a workaround solution.

1. From the **Active Sync** dialog, click on the **Explore**  button and navigate to your project folder on your PC. Right click and copy the folder you just created.



2. Navigate to your  **Mobile Device** drive and paste the folder in the **My Windows Mobile-Based Device\My Documents** folder.
3. Click  at the File Conversion screen.

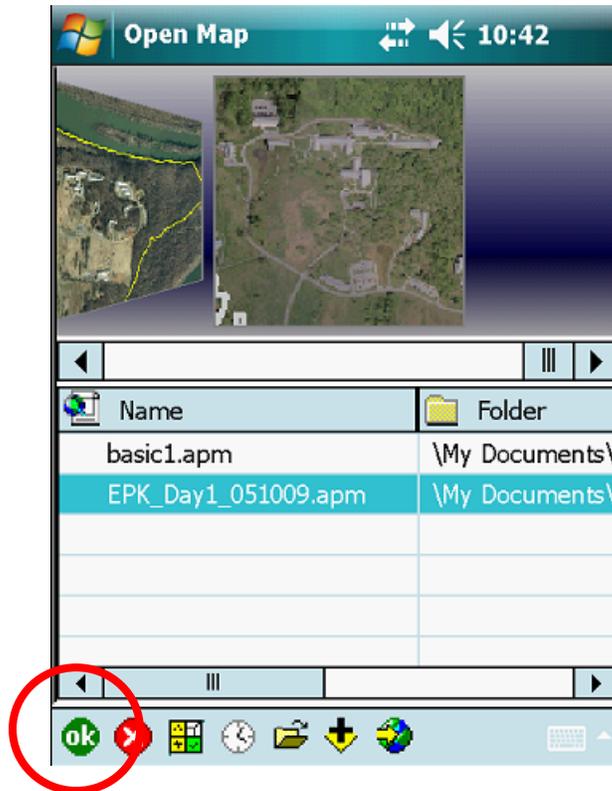
SECTION 5 – Open the Project on your Mobile Device

It's always good practice to open ArcPad on your mobile device and make sure all your data came over correctly before you head-out into the field.

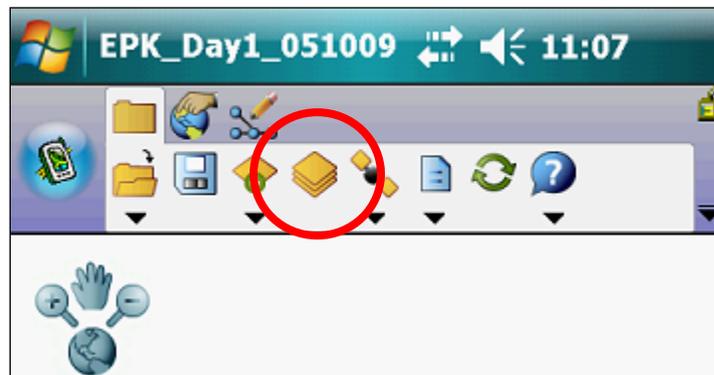
1. Open ArcPad on your Trimble unit by single tapping the large ArcPad Icon on the Today Toolbar. It will take 20-30 seconds to load.



2. At the **Open Map** screen, tap on the map to select it and tap  in the **Command Toolbar** to open the map.



3. Tap on the **Table of Contents (TOC)**  button on the **Main Toolbar** to view all the layers that were checked out.

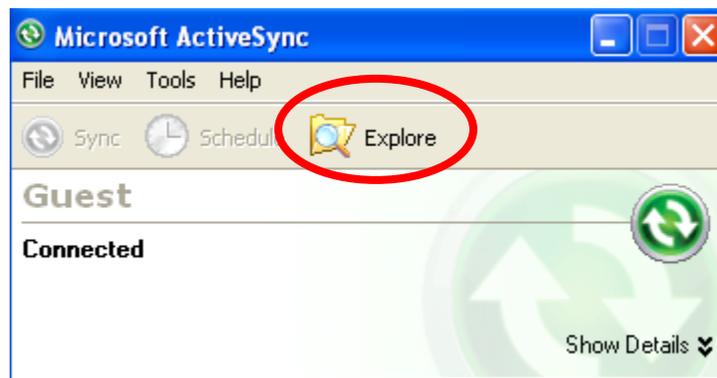


4. Repeat the check-out process if all of your layers are not visible in the **TOC**.

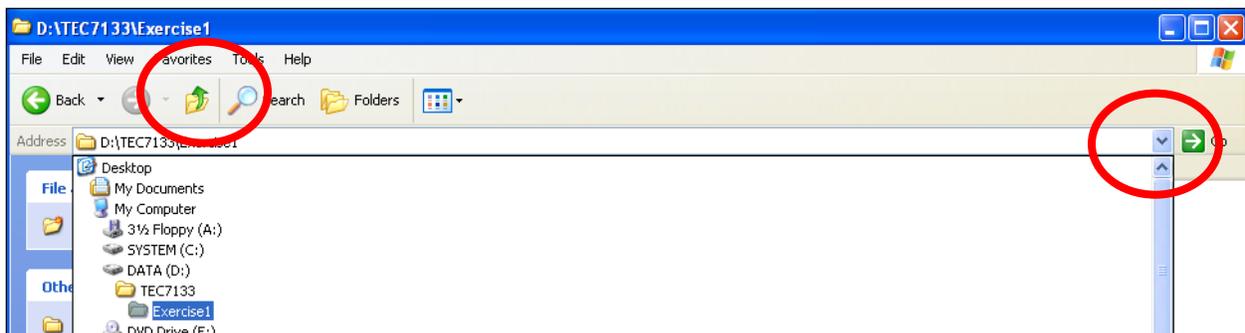
SECTION 6 – Checking-in GPS Field Data

In this section you will update a geodatabase with newly collected GPS field data using the ArcPad Data Manager Toolbar.

1. Exit ArcPad on your mobile device if you haven't done so already. Connect the GPS device to your computer as a Guest via ActiveSync.
2. From the **Active Sync** dialog, click **Explore**  and navigate to **My Windows-Mobile Based Device\My Documents** folder.



3. Right mouse click on your GPS project folder and select **Copy**. **COPY THE WHOLE FOLDER.**
4. Browse to the location of your project folder on your PC using the address bar or **Up Folder**  button.

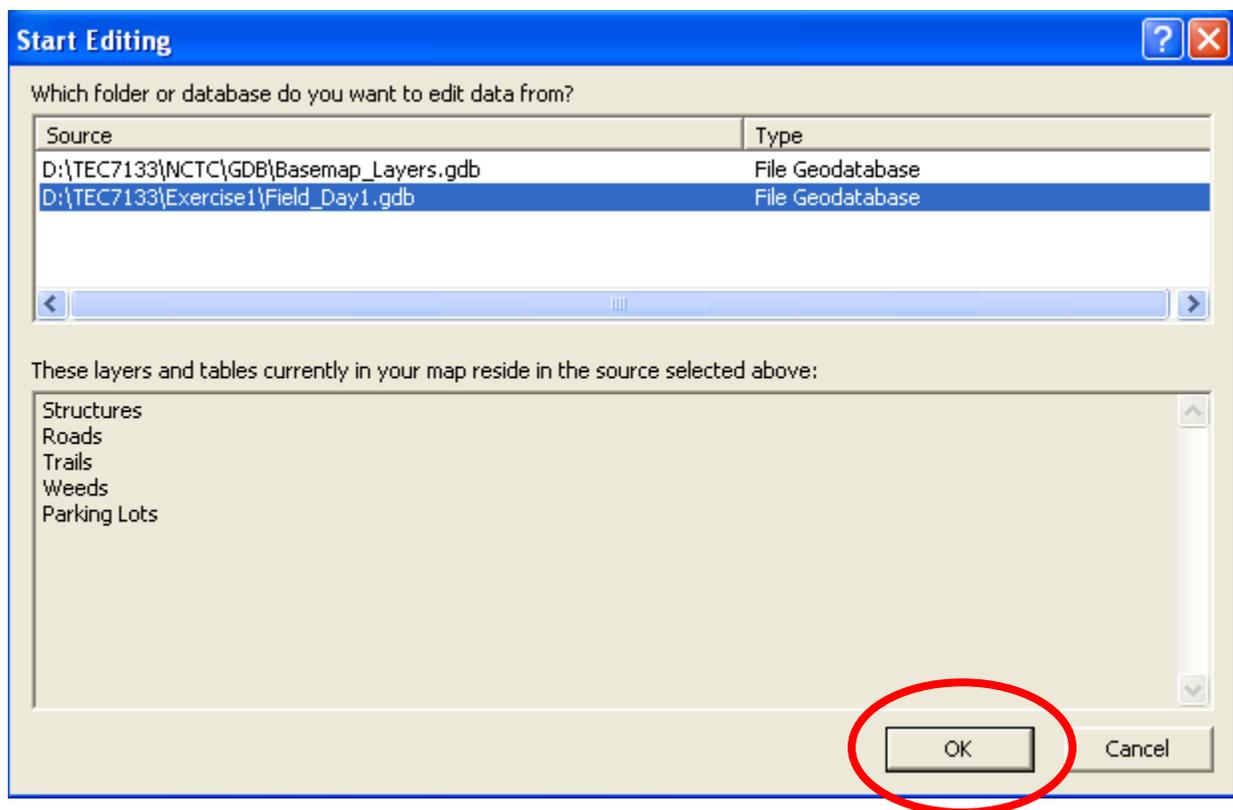


5. Right mouse click on the project folder and select **Paste**, completely replacing our prior checked out ArcPad project. Click on the **Yes to All** button at the **Confirm Folder Replace** dialogue.

6. Open ArcMap .
7. Open the your map document we saved earlier as part of the check-out process.
8. You should be in an edit session to perform the check-in process. To load the **Editor** Toolbar click on the **View** Menu, select **Toolbars**, and put a check next to **Editor**. Dock or float the toolbar as desired.
9. From the dropdown on the **Editor** Toolbar select **Start Editing**.



10. Select your working geodatabase and click .

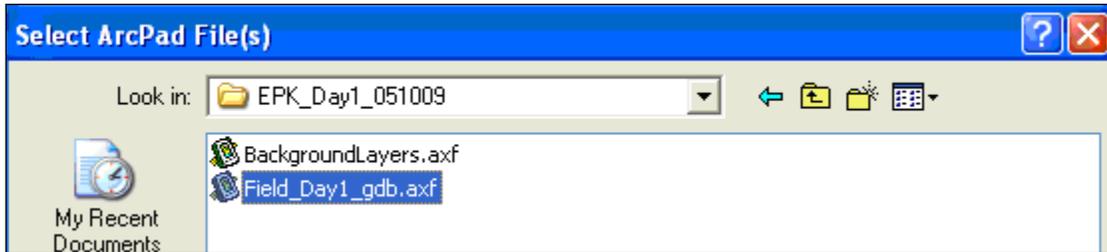


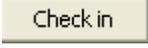
11. On the ArcPad Data Manager Toolbar, click the **Check In Edits From ArcPad**  button.

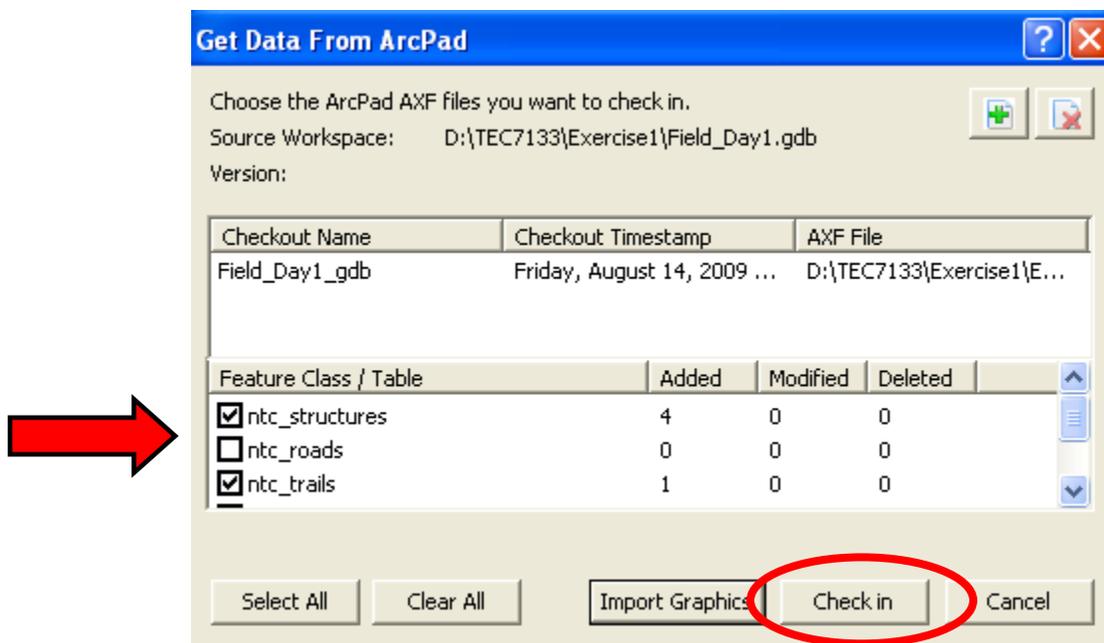


12. Click the **Browse for ArcPad AXF files**  button.

13. Browse to and select the appropriate **.axf** file. Click .



14. Check the boxes where you added or modified data to an existing Feature Class/Table and click . Click **Yes** and then **OK** to accept the updates.



15. Click **Yes**, when asked: **Are you sure you want to check in the selected item(s)**. Click **OK** at the status screen.

16. Click  or  to close the Check in window.

17. Select **Stop editing** from the drop down list on **Editor** Toolbar and **Save** your edits.

18. Open the attributes table to view your new records. Mmmmm, tasty data.



OBJECTID	SHAPE	GPS_Date	GPS_Tech	GPS_Device	Structure	Material	Comments
1	Point	8/17/2009 1:31:16 PM	Kelchlin	GeoXH	Light Pole	Metal	
2	Point	8/17/2009 1:31:16 PM	Kelchlin	GeoXH	Light Pole	Metal	
3	Point	8/17/2009 1:31:16 PM	Kelchlin	GeoXH	Light Pole	Metal	
4	Point	8/17/2009 1:31:16 PM	Kelchlin	GeoXH	Light Pole	Metal	

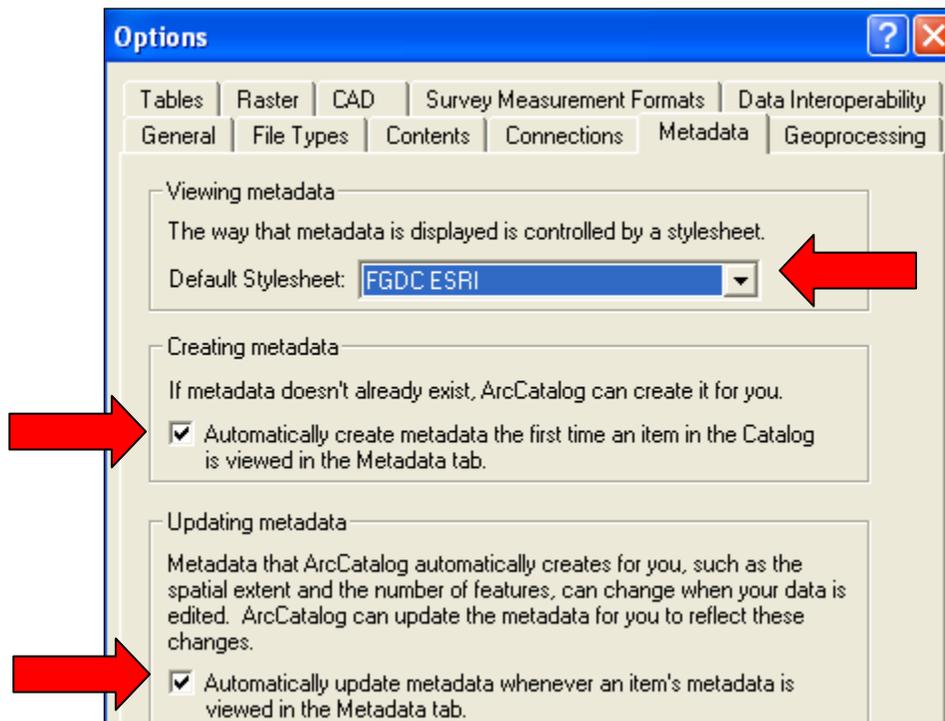
Record: 1 Show: All Selected Records (0 out of 4 Selected) Options

Congratulations, you just updated your file geodatabase with GPS field data!

SECTION 7 – Creating Metadata in ArcCatalog

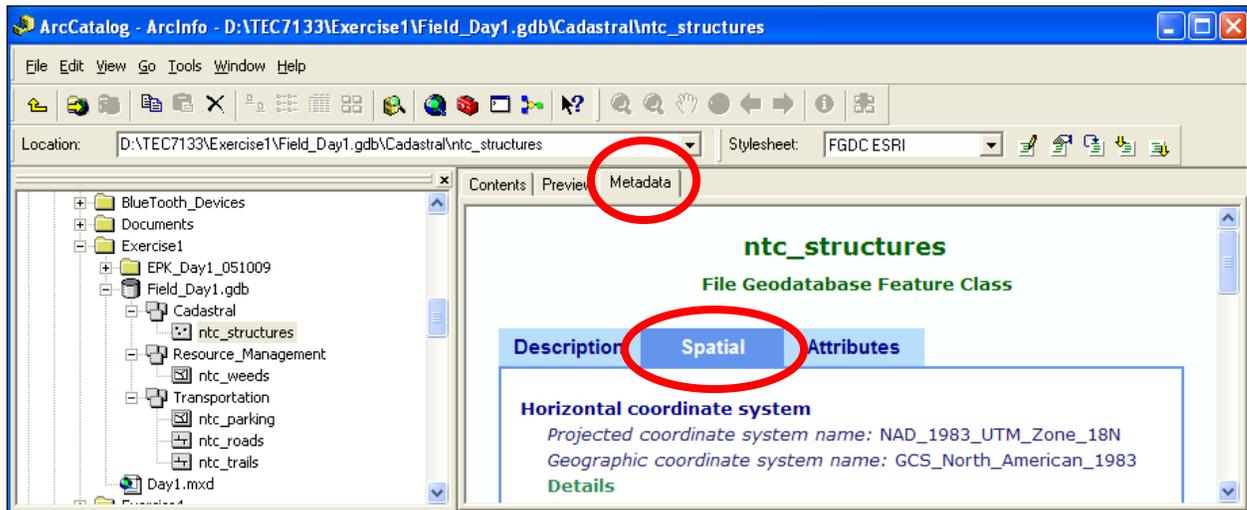
What is metadata? Simply put, metadata is “data about the data”. All federal agencies are required to produce metadata for their spatial data layers. ArcCatalog extracts “basic” metadata from your datasets automatically, but you still need to create a lot of information manually. In this section, you will utilize the metadata editor in ArcCatalog to generate metadata for your GPS layer.

1. Launch ArcCatalog  from the desktop.
2. From the **Tools** menu, select **Options**.
3. Click on the **Metadata tab** and ensure the **Default Stylesheet** is **FGDC ESRI** and the **Creating metadata** and **Updating metadata** boxes are checked as in the example below. Click **OK**.



4. In the catalog tree on the left hand side of the screen, navigate to the location of your project geodatabase.
5. Select a feature class that needs metadata. We will be using the **ntc_structures** feature class as an example here. Notice that you can view your data on the right side of the split screen.

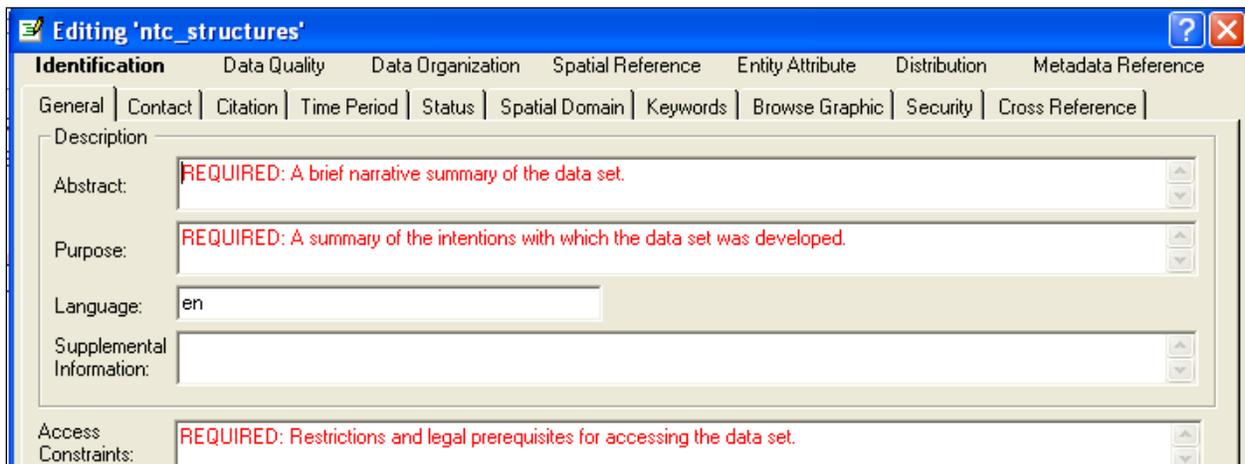
- Click on the **Metadata >Spatial** tab. Notice the horizontal coordinate system and bounding coordinates are automatically populated.



- Let's create metadata for this Feature Class to document our GPS methodologies before we forget all about it. On the **Metadata toolbar**, click on the **Edit metadata**  tool.



- Seven metadata sections appear across the top of the dialog. **Identification** is in bold with the **General** tab currently activated. Required fields are highlighted in red. But don't worry; we're not going to fill out all of the required fields, only a few of the common ones.



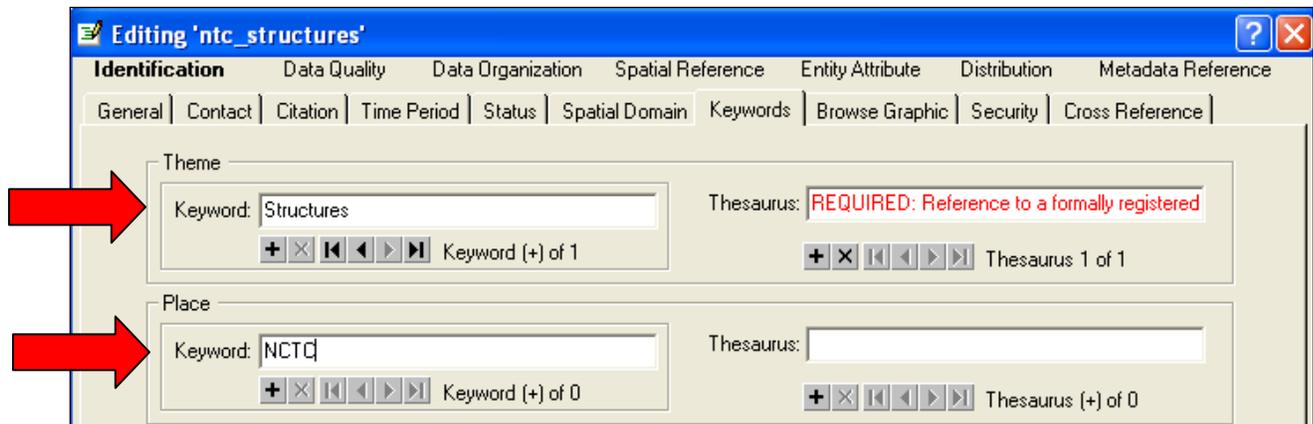
9. Highlight and delete the red text in the **Abstract** text box and enter the following information:

NCTC structure locations collected via a Trimble GeoXM 2005 series GPS receiver running ArcPad 8.02

10. In the **Purpose** text box and enter the following information:

GPS training dataset for TEC7133, June 2010

11. Next, click on the **Contact** tab, then the **Details** button. Enter your contact information. Click **OK**.
12. Click on the **Time Period** tab. Click on **Currentness Reference** and change it to **ground condition**. Also, change the **Calendar Date** to today.
13. Click on the **Status** tab. Enter **Complete** in the **Progress** field and **None planned** in the **Update Frequency** field.
14. Click on the **Keywords** tab. In the **Theme** field enter **Structures, GPS and Trimble GeoXM** for keywords. Click on the **+** sign to add each new keyword.
15. In the **Place** field enter **NCTC** and **USFWS**.



16. Next, click on the **Data Quality** section. The **Logical Consistency Report** field details the topological (i.e., spatial) integrity of the data. Documenting topological integrity is a good idea if you edited the data in ArcGIS after you downloaded the field data. Since we did not edit the data enter the following:

Unedited, raw GPS field data.

17. Your stations GPS data collection protocol goes in the **Completeness Report** field. Basically the methodology, rules and selection criteria used to derive the data. Enter the following information:

We used a Trimble GeoXM running ArcPad 8.01 to collect the GPS data in the field. Averaging was enabled (10 seconds for points, 5 seconds for vertices). A 2 second logging rate was used for streaming line and polygon features. WAAS was enabled to improve accuracy. No PDOP limit was applied. Mission planning was not conducted.

18. Click on the **Positional Accuracy** tab and enter **<3 meters** in the **Horizontal Accuracy Report** field and **<15 meters** in the **Vertical Accuracy Report** field.
19. Click the **Save** button when finished. Click on the **Preview** tab and view your metadata. We will use this metadata file as a template for later exercises.

Congratulations! You just created metadata for your GPS data.

SECTION 8 – GPS Data for your Metadata

If you plan your GPS data collection project, set objectives and create a geodatabase with domains and relationship tables, then most of this data should already exist in the attribute tables. If not, much of these data can be copied and pasted from Trimble Pathfinder Office output files or manually input into the XML metadata file through ArcCatalog.

Most of these data should be added to the **Identification** or **Data Quality** sections in your FGDC metadata. No GPS section exists, so we have to make the best of it.

GPS Project Planning

- Project purpose and objective(s)
- Datum and projection used to collected the field data
- Date(s) and time data were collected
- Data collector name(s) or initials
- GPS receiver make and model (i.e. Trimble GeoXM 2005 Series)
- GPS receiver firmware version and last date updated
- GPS field software and version

Data Collection Techniques

Cite any GPS field data collection protocols if you used them.

- Did you perform missing planning, if so what were the results?
- What were the GPS data collection settings? In ArcPad refer to your GPS Preferences or Trimble GPSCorrect settings.
- Logging rate used for lines and polygons
- Did you use offsets, if so what were the conditions and settings?
- Mode of data collection (walking, vehicle, ATV, boat, plane, hoarse, etc.)

Differential Correction

- Correction Type (real-time WAAS, Real-time beacon, post-processed)
- Post-processing software and version
- Name of the base station(s) used for correction
- Settings used to perform the differential correction

Accuracy Indices

These are automatically created with Trimble Pathfinder Office if the data are post-process or if the data were collected in ArcPad through the Track Log feature.

- Average Positional Dilution Of Precision (PDOP)
- Maximum PDOP
- Average Horizontal Precision (95% or 68% confidence ellipse)
- Worst Horizontal Precision (95% or 68% confidence ellipse)
- Vertical Precision (95% or 68% confidence ellipse)
- Number of points recorded per feature

Deliverables

- Was the original GPS field data reprojected, if so what software and transformations did you use?
- Did you edit the raw data to create the final layer, if so what process steps did you use?
- Who or what organization will maintain and distribute the dataset?
- Is this dataset updated on a regular schedule, or is this complete?

Can you think of any additional data that would be useful to include in the GPS metadata? If so, write them down below:

1. _____
2. _____
3. _____
4. _____
5. _____