

Tutorial: Geodatabase Developed for i-Tree Eco Full Inventory

Acknowledgement

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Project Title

Data Model for GIS Database Management and i-Tree Eco

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Project Team

Rama Sivakumar (PI), Senior Research Engineer, Center for GIS, Georgia Tech
Ryan Bowman, Graduate Student
Manasvini Sethuraman, Graduate Student

1. Loading the feature class

This is a step by step instruction manual for establishing and using the iTree Eco geodatabase provided. The instructions will begin with transferring tree inventory data into the iTree Eco geodatabase, will proceed to adding features into the feature class, and will review editing, copying and validating attributes associated with trees in this inventory.

Appendix A contains a list of the field within the FullInventory feature class's Attribute Table, which are the same as the field requirements for the i-Tree Eco software,

A second tutorial has been developed (i-Tree Eco Python Tools Tutorial) for using the python tools developed for transferring data between this geodatabase and the i-Tree Eco software.

Loading the feature class: Adding Data to ArcMap

1--> Download the iTreeEco_DB folder and unzip onto the C Drive.

1--> Open ESRI's ArcMap software.

1--> In the Getting Started Window, click the New Maps text on the left side of the window, indicating that you want to start with a new empty map.

1--> Click on the Blank Map template icon, and click OK.



2--> Click the Add Data button.

2--> Click the *Look in* drop-down button to show available data folders (Fig. 1.1).

2--> Select Folder Connections.



2--> To add a connection, click the Connect to Folder button in the Add Data window.

2--> Navigate to the directory containing your iTreeEco_DB folder and click once on the iTreeEco_DB folder icon to select it (Fig. 1.2a).
(**note:** yours may be in a different location depending on where you extracted the iTreeEco_DB folder)

2--> Click OK to finish adding the connection.

Now that the connection is added, you are ready to start adding data to your map.

3--> Click the *Look in* drop-down one more time to find the connection you added. Click on it to open it.



3--> Double-click the Tutorial folder, then double click the gray Tutorial_iTreeEco geodatabase icon to open it.



3--> Click the FullInventory_Blank feature class to highlight it; then click Add to add it to the map.

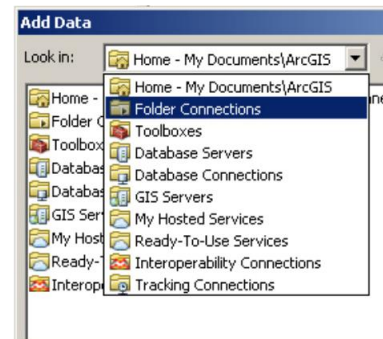


Figure 1.1 Sources of data

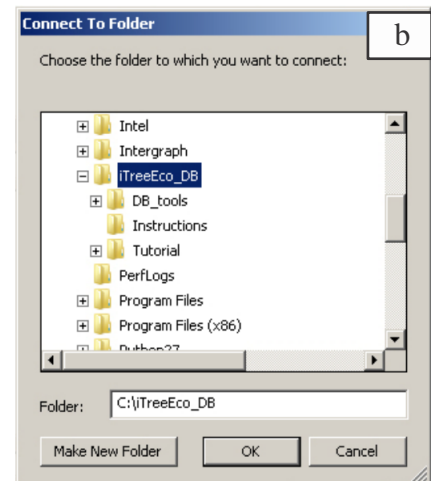
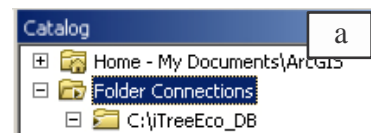


Figure 1.2 a. Connection to fullinventory
Figure 1.2 b. Connecting to a folder

Loading the feature class: Adding features to feature class

Now that the feature class has been added to the map, it is possible to add point features to the feature class that represent trees in the inventory. In order to do this, we must begin an editing session through the Editor toolbar, and add individual features.

- 4--> From the main toolbar go to the *Customize* drop-down menu > Toolbars > check Editor (Fig. 1.3).
(note: if Editor already checked, do not uncheck)

An editor toolbar should appear. You may drag this toolbar to reposition or dock with the rest of the toolbars.

- 5--> In the Editor toolbar, go to the *Editor* drop-down menu and choose Start Editing (Fig. 1.4).



- 5--> In the Editor toolbar, go to the *Editor* drop-down menu > Editing Windows > Create Features.

Within the Create Features window, the top panel lists the layers in the map document, while the bottom panel lists the tools available to create features in the layers.



- 5--> In the Editor toolbar, go to the *Editor* drop-down menu > Editing Windows > Attributes.

The Attributes window allows you to view and edit attributes of features you have selected.

Now that we have the basic editing tools activated in ArcMap, we can start adding trees to the database.

- 6--> Click on the Blank Full Tree Inventory layer in the Create Features tool (Fig 1.5a).



- 6--> In Construction Tools (bottom panel) of the Create Features tool, click the Point symbol (Fig 1.5b).

- 6--> Click on the map where you would like the tree to be located (anywhere is fine for the moment).

We have our first tree! Now lets edit the attributes...

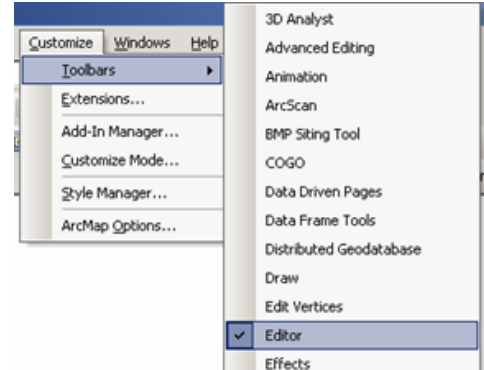


Figure 1.3 Editor Toolbar



Figure 1.4 Start Editing

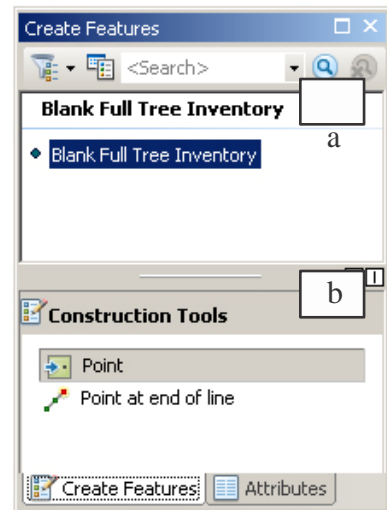


Figure 1.5a Selecting editable feature class

Figure 1.5b Adding Point features

2. Editing feature attributes

- 7--> Click the Attributes tab to see the newly created point's attributes.

User tip: you can see and edit the attributes of any feature by highlighting the feature during an editing session.

- 7--> Double click on the **0** value in the Tree ID field, and replace it with **1** (Fig. 2.1).
(**note:** for iTree Eco's analysis to run correctly, the Tree ID value will need to be unique for each tree created)
- 7--> Click on the drop-down menu in the *Tree Status* field, and select Planted.

- 7--> Click the *Editor* drop-down menu from the Editor toolbar and choose Save Edits.

User tip: Save often!



Figure 2.1 Sources of data

Editing feature attributes: Validating Attributes

Now that the features have been edited and saved, we can validate the features based on presets unique to this geodatabase. This validation step is important because the geodatabase has been designed to feed directly into the iTree Eco model, as such certain fields have must meet predetermined criteria for the iTree Eco model to run correctly. To learn more about domains established for the iTree analysis go to Appendix A or iTree Eco's User Manual.

- 8--> Click the *Editor* drop-down menu from the Editor toolbar and click Validate Features. The error message in Figure 2.2 should appear.
- 8--> Press OK. In the Create Features window, open the Attributes tab and resize it, if necessary, to see the field values.
- 8--> Click in the space next to the FieldLandUse field.

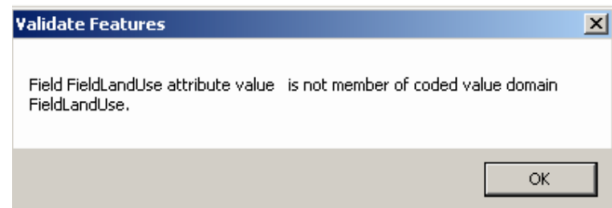


Figure 2.2 Validation Error

A coded value domain has a drop-down list showing the codes for that attribute (Fig 2.3). This prevents you from entering values that would not be valid in the iTree Eco software during data analysis.

- 8--> Since this database was developed for university campuses, lets choose the Institutional class from the drop-down menu.

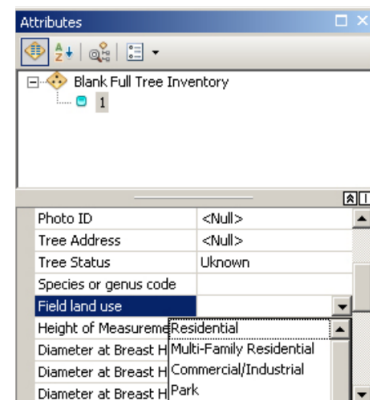


Figure 2.3 Coded domains as drop-down list

Editing feature attributes: Validating Attributes (cont.)

8--> Go to the *Edit* drop-down menu again, and choose validate features. The message show in Figure 2.4 should appear. Press OK.

Notice the point is no longer selected and the attributes do not appear in the Attributes window.



Figure 2.4
Validation approval

8--> Go to the *Edit* drop-down menu and save your edits. Press OK.
(note: you can save your edits at any time during an editing session, and edits to all feature classes will be saved.)



9--> Using the edit tool from the toolbar menu, select the point again by clicking on it or dragging a square around it.

Notice the attributes appear in the Attributes toolbox. The process of starting an editing session, opening the Attribute toolbox, and selecting the feature(s) that you want to edit can be repeated on existing feature(s) in the future.

10--> In the field “Species or genus code” type **QU**.

10--> In the field “Height of Measurement DBH was taken” enter **4.5**.

10--> In the field “Diameter at Breast Height” type **18**.
(note: if surveying and there are multiple trunks, e.g. crape myrtle, change Diameter at Breast Height 2-6 for each trunk present)

10--> In the field “Height to top of tree” enter **25**.

10--> In the field “Height to top of live crown” enter **25**.

10--> In the field “Height to base of crown” enter **8**.
(note: “Height to top of live crown” and “Height to base of crown” cannot exceed “Height to top of tree” for iTree Eco’s analysis)

10--> In the field “Crown width (north-south)” enter **30**.

10--> In the field “Crown width (east-west)” enter **30**.

10--> In the field “Percent of crown silhouette missing” enter **16**.

10--> In the field “Percent of crown dieback” enter **10**.

10--> Change “Crown light exposure” to tree received full light from top and 3 sides.

10--> Change “Location of the tree (N or S)” to street tree.

10--> In the field “comments” enter **this is a test tree**.



10--> Make sure the Attributes window looks like Figure 2.5, then go to the Editor drop-down menu > Validate Features.



10--> Save your Edits.

OBJECTID	1
Tree ID	0
Date	12:00:00 AM
Crew	<Null>
X	-1
Y	-1
Photo ID	<Null>
Tree Address	<Null>
Tree Status	Planted
Species or genus code	QU
Field land use	Institutional
Height of Measurement DBH we	4.5
Diameter at Breast Height	18
Diameter at Breast Height 2	-1
Diameter at Breast Height 3	-1
Diameter at Breast Height 4	-1
Diameter at Breast Height 5	-1
Diameter at Breast Height 6	-1
Height to top of tree	25
Height to top of live crown	25
Height to base of crown	8
Crown width (north-south)	30
Crown width (east-west)	30
percent of crown silhouette mis	16
percent crown dieback	10
Crown light exposure	tree receives full light from top and 3 sides
Location of the tree (N or S)	street tree
Comments	this is a test tree


Comments
Text (Length = 225)
Null values allowed

Create Features Attributes

Figure 2.5 Entering attributes for test tree

3. Understanding Domains

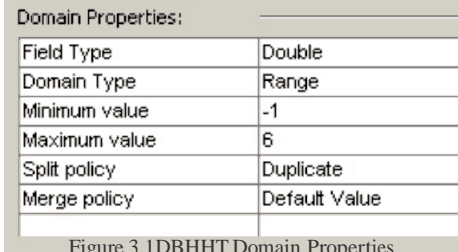
To better understand the domains required for the iTree Eco analysis, we will now create a second tree with erroneous attribute data.

- 11--> Create a second tree by opening the Create Feature toolbox, selecting Blank Full Tree Inventory as the feature template (top panel) and point as the feature type (bottom panel).
- 11--> Click on the map to create your second tree, and open the Attributes tab to examine the attributes for this newly created tree.
- 11--> Repeat step 10 to fill out the Attribute data for the new feature.
- 11--> However, make sure to set TreeID to **2**, and in the field “Height of Measurement DBH was taken” enter **45**, as if we accidentally forgot to place the decimal place.
-  11--> Click the Editor drop-down menu from the Editor toolbar and click Validate Features. An error message should appear.
- 11--> Change the “Height of Measurement DBH was taken” to **4.5**.
- 11--> Validate the features again, press okay to all features should be valid.
- 11--> Save your edits and stop the editing session.

This validation error demonstrates the usefulness of the domains established for the geodatabase. If you have user errors while entering data, the validation step will aid in early detection, and will be easy to fix.


- 12--> Now, navigate to the main menu, go to the *Window* drop-down and click Catalog.

This catalog shows where the data a map uses is stored. Any folder connections established will show up in this window; data within these folders can be expanded upon for more information.



Domain Properties:	
Field Type	Double
Domain Type	Range
Minimum value	-1
Maximum value	6
Split policy	Duplicate
Merge policy	Default Value

Figure 3.1 DBHHT Domain Properties

- 12--> Expand the Folder Connections in the Catalog window.
- 12--> Expand the iTreeEco_DB folder you connected to in step 2, then expand the Tutorial folder.
-  12--> Right-click the Tutorial_iTreeEco.gdb and choose Properties.
- 12--> Click on the Domains tab, and examine the Domain Names established for this geodatabase.

Notice there are two types of Domains established, some that have codes and descriptions and other limit range of values able to be entered.

- 12--> Click the DBHHT Domain name (Fig. 3.1).

Notice the Domain type limits the range of acceptable values from -1 to 6. This domain is set up within the geodatabase. To use this domain, we must apply it to a field, which can then be verified.

Understanding Domains (cont.)


- 13--> Close the database properties window.
- 13--> Expand the Tutorial_iTreeEco geodatabase.
- 13--> Right-click the FullInventory_Blank feature class and choose Properties.
- 13--> Click on the Fields tab, and examine the Fields contained within this features attribute table.
- 13--> Click on the DBHHT Field name (Fig. 3.2).

Field Properties	
Alias	Height of Measurement DBH
Allow NULL values	No
Default Value	4.5
Domain	DBHHT

Figure 3.2 DBHHT Field Properties

Notice the Domain applied to this Field is DBHHT. Therefore, the DBHHT Domain limits the DBHHT Field's values to -1 to 6. To see a full list of the Domains established for each field, refer to the i-Tree Eco required fields in Appendix A.

- 13--> Close the FullInventory_Blank properties window.

 13--> Right click the Blank Full Inventory layer and remove it from the Table of Contents.

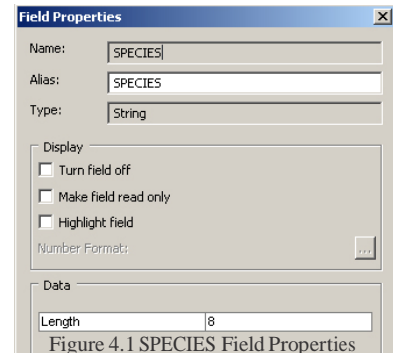
- 13--> Close the Create Features and Attributes windows.

We have explored the process of creating inventory feature classes with domains from scratch using the domains established. The next section will demonstrate how to copy features from another inventory database into the feature class developed for i-Tree Eco.

4. Copying Data

The following section will describe the process of copying features from an existing inventory shapefile to a feature class in the i-Tree Eco data model, which is compatible with the tools developed.

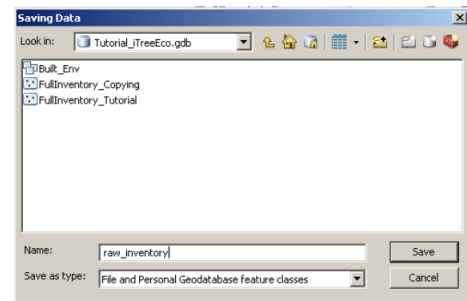
- 14--> In the Catalog menu, expand the Tutorial folder, and drag the raw_treedb.shp into the Table of Contents.
- 14--> Right click on the newly added raw_treedb layer in the Table of Contents, and choose Zoom to Layer.
- 14--> Right click on the raw_treedb layer in the Table of Contents, and open the Attribute Table.
- 14--> Right click on the SPECIES field, and choose Properties.
- 14--> Notice that the Type is String, and the length of the field is 8 characters (Fig. 4.1).
- 14--> Press OK, and close the Attribute Table.



Copying Data: Exporting from Shapefile to Feature Class

The first step in transferring your existing database to the downloaded geodatabase is to export the data from the shapefile to the geodatabase.

- 15--> Right click on the raw_treedb layer in the Table of Contents, and choose Data > Export data.
- 15--> In the Export Data window, click the open folder symbol.
- 15--> Click in the drop-down field next to the *Save as type:* at the bottom of the Saving Data window, choose "File and Personal Geodatabase feature classes". Navigate to the folder where you downloaded the Tutorial, and double click on Tutorial_iTreeEco.gdb.
- 15--> Type **raw_inventory** in the field next to Name:, then click Save.
- 15--> Make sure your screen looks like Figure 4.2, then choose OK in the Export Data window.
- 15--> Choose Yes to the add the exported data to the map.



- 16--> Right click on the newly added raw_inventory layer in the Table of Contents, and open the Attribute Table.
- 16--> Right click on the SPECIES field, and choose Properties. Notice that the Name is "SPECIES", the Type is String, and the Length of the Field is 8 characters. Press OK.

The characteristics of all the Attribute Table's fields remained constant when exporting the data. This is useful information when you are transferring data.

Copying Data: Matching Attribute Table Fields

17--> Right click on the newly added raw_inventory layer in the Table of Contents, and open the Attribute Table

17--> Right click on the SPECIES field, and choose Properties. Notice that the Name is “SPECIES”, the Type is String, and the Length of the Field is 8 characters.

17--> Press OK, DON'T close the Attribute Table.

Notice that the field properties within the feature class is much more detailed. This is due to the added capabilities that accompany the use of a geodatabase structure, ie allow NULL Values, Default Value, and Domain. These added capabilities are the reason this data model is able to be validated, and the built in capabilities are very useful for data Quality Control / Quality Validation.

18--> Now add FullInventory_Copying feature class from the Tutorial_iTreeEco.gdb to the Table of Contents.

18--> Right click on the Copying Full Tree Inventory layer in the Table of Contents, and open the Attribute Table. The table should appear in the same window where the raw_inventory Attribute Table was, with tabs at the bottom for navigation between the tables (Fig. 4.3).

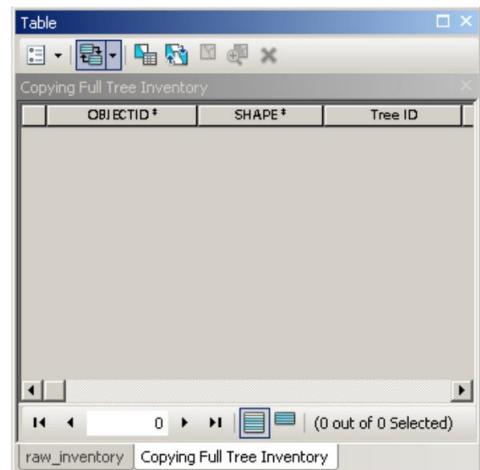


Figure 4.3 Copying Full Tree Inventory Attribute Table

18--> Right click on the “Species or genus code” field, and choose Properties. Notice the Name is “Species” (different than alias!), the Type is String, and the Length of the Field is 8 characters.

18--> Press OK.

Having the same field Name, Type, and Length is necessary for any attributes associated with a feature to be copied from one feature class to another.

19--> While still in the Attribute Table window, go to Table Options > Arrange Tables > New Horizontal Tab Group.

This enable both tables to be seen, and fields in both attribute tables can be easily compared (Fig. 4.4).

19--> Examine the properties for the following fields in both the Attribute Tables

- (Copying Full Tree Inventory: raw_inventory)
- Crown width (north-south): CROWNWIDTH;
- Crown width (east-west): CROWNWID_1;
- Percent crown dieback: CROWNDIEBA;
- Percent of crown silhouette missing: PERCENTCRO;

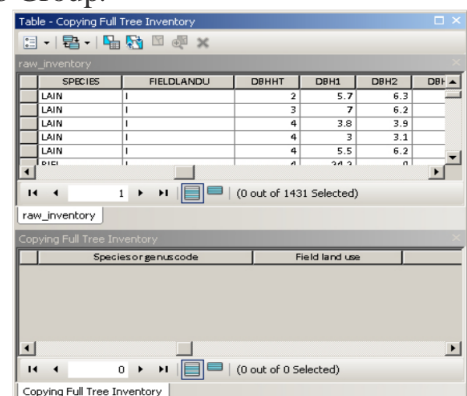


Figure 4.4 Examining Attribute Tables of raw_inventory and Copying Full Tree Inventory

Copying Data: Matching Attribute Table Fields (cont.)

The field names for these tables are not the same. This is due to the limited capabilities for shapefiles to store field names, which do not match that of the FullInventory_Copying feature class. To make these field names match, we will need to add a new field to the raw_inventory layer that is the same name, type, and length as the field in the FullInventory_Copying feature class. To see the conventions for the field names in already set up in the FullInventory_Copying feature class, refer to Appendix A.

20--> Close the Copying Full Tree Inventory Attribute Table. If you close both attribute tables by accident, reopen the raw_inventory Attribute Table.

20--> Go to Table Options > Add Field.

20--> In the Add Field Window, type **FIELDLANDUSE** in the field next to Name:.

20--> Change the type to "Text".

20--> Type **1** in the field next to Length.

Make sure the Add Field window looks like Figure 4.5, then press OK.

21--> Navigate to the new FIELDLANDUSE field.

Right click the field heading and choose Field Calculator.

21--> The warning is letting you know that the changes you make will be permanent. Press YES.

21--> In the Field Calculator window, scroll down in the Fields: list, and double click FIELDLANDU (Fig. 4.6).

21--> Press OK.

This operation fill the FIELDLANDUSE field with the same data as the FIELDLANDU field for every record.

22--> Compare some values between FIELDLANDUSE and FIELDLANDU to ensure the values are the same.

22--> Repeat the steps of adding a new field, naming it correctly, setting the correct type, and calculating the field based on the following table:

Name:	Type:	Field Calculator
CROWNWIDTHNS	Double	CROWNWIDTH
CROWNWIDTHHEW	Double	CROWNWID_1
PERCENTCROWNMISSING	Short Integer	PERCENTCRO
CROWNDIEBACK	Short Integer	CROWNDIEBA

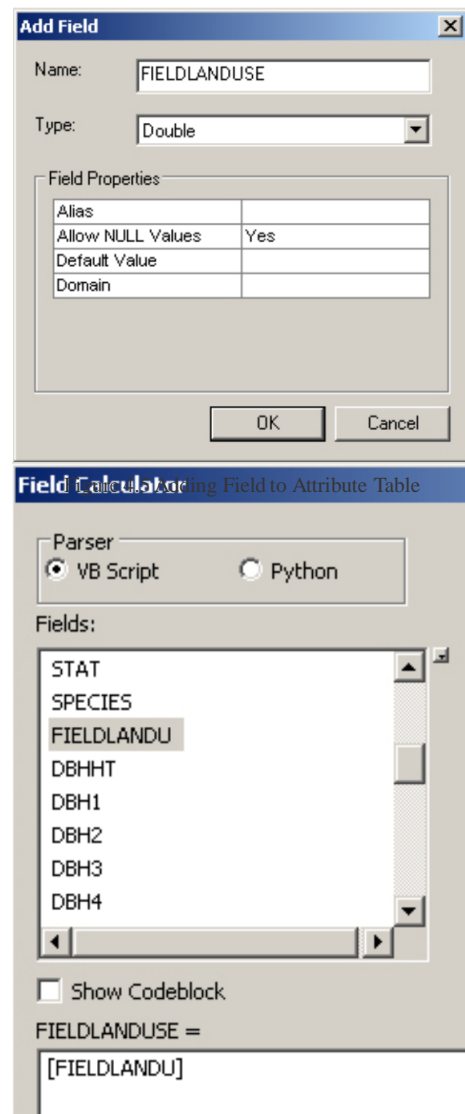


Figure 4.6 Field Calculator Window



Note that because the Types are not String, the Length of the field will not be an option to set. If in the future you need to set a Text field, make sure you take note of the Length of the Field.

Copying Data: Copying Features between Features Classes

Now that the raw_inventory feature class is in the same geodatabase as the Copying Full Tree Inventory feature class, and the fields of both feature classes match, we can seamlessly copy features, i.e. tree records, from one feature class to another, with all the attributes attached.

- 23--> Go to Editor Toolbar > Editor > Start Editing.
- 23--> Select Copying Full Tree Inventory layer, (Fig. 4.6)
note: if you have previously removed the raw_treedb layer, this option will not be available.

Notice that when this feature class is selected, all items in that geodatabase are allowed to be edited. This is important for the feature class editing, and is why we created a new feature class inside the existing geodatabase.

- 24--> Press continue
- 24--> Click and drag a box around the raw_inventory layer, notice that anything in the box is selected.
- 24--> With the edit tool, select a portion of the trees in the raw_inventory layer.
-  24--> Click the List by Selection icon at the top of the Table of Contents.
-  24--> Click the Clear Layer Selection button in the raw_treedb row to clear the raw_treedb selection, moving it moves to the lower panel.
- 24--> Click the Toggle Selectable button to make the raw_treedb layer unselectable (Fig. 4.7).
- 24--> Also make the Copying Full Tree Inventory layer unselectable.

This is done so that we can only copy features from the raw_inventory feature class. Making the Copying Full Tree Inventory layer unselectable is important so that we do not repeatedly copy the same features from the final feature class when editing.

- 25--> Clear the raw_inventory selection.
- 25--> Click and drag a box around the South East block of trees (Fig. 4.8).
- 25--> In the Table of Contents, there should be around 260 trees selected in the raw_inventory row, and 0 trees selected in the Copying Full Tree Inventory and raw_treedb rows.
- 25--> Press ctrl+C to copy the selected features in the layer.
- 25--> Press ctrl+V to paste the features you just copied. In the Paste Window, be sure to change the Target layer to paste the features into the Copying Full Tree Inventory layer (Fig. 4.9), then press OK.

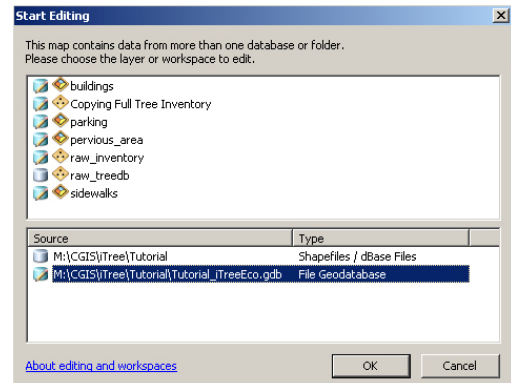


Figure 4.4 Selecting Feature Classes to Edit

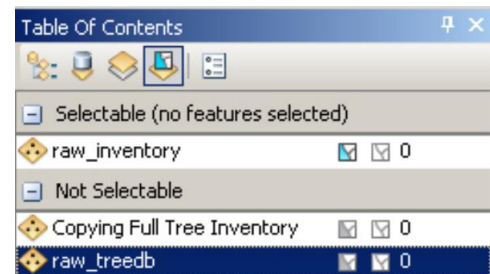


Figure 4.7 Toggling Selectable Layers



Figure 4.8 Selection of Tree Inventory

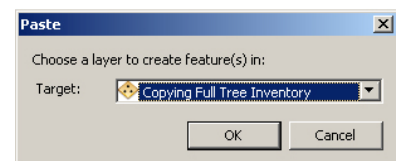


Figure 4.9 Selecting Feature Class to Paste Features in

Copying Data: Validating Copied Features

- 26--> Right click on the Copying Full Tree Inventory layer in the Table of Contents and open the Attribute Table.

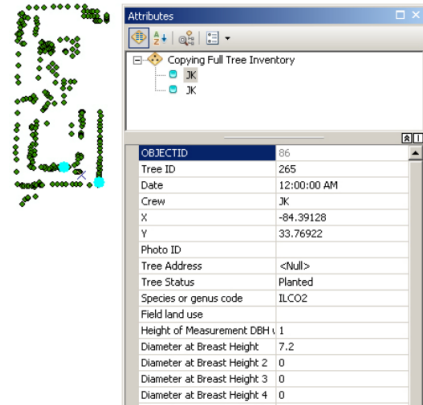
All of the features you just copied into this layer should still be highlighted, check the number of records at the bottom of the screen, there should be the same number of records as were highlighted. Also examine the fields to make sure all fiattributes within the fields were transferred.

- 26--> Close the Attribute Table.

- 26--> Go to the Editor toolbar and select Editor > Validate Features

An error message should appear. Notice that the features that have errors are still highlighted.

- 26--> Open the Attributes window by navigating to Editor Toolbar > Editor drop-down menu > Editor Windows > Attributes



OBJECTID	86
Tree ID	265
Date	12:00:00 AM
Crew	JK
X	-84.39128
Y	33.76922
Photo ID	
Tree Address	<Null>
Tree Status	Planted
Species or genus code	ILCO2
Field land use	
Height of Measurement DBH	1
Diameter at Breast Height	7.2
Diameter at Breast Height 2	0
Diameter at Breast Height 3	0
Diameter at Breast Height 4	0

Figure 4.10 Non-Valid Features

The list of features that are not valid are shown in the top pane (Fig. 4.10).

- 26--> For the Tree ID 265, change the Field Land Use field to “Institutional”.
- 26--> For the Tree ID 308, type **4.5** into the space next to DBHHT field.

In the future, it will be necessary to compare values for an erroneous tree with the field domains established for the i-Tree Eco analysis, which are listed in Appendix A.

- 27--> Validate the features again, notice that the corrected features are no longer highlighted.

- 27--> Go to Editor > save edits.

- 27--> Open the Copying Full Tree Inventory Attribute Table again.

- 27--> Go to the *Table Options* drop-down menu, and select Select All.

- 27--> Now go to the Editor toolbar > Editor drop-down > Validate Features. The message in Figure 4.11 should appear, and no features should be highlighted.

- 27--> Press OK, close the Attribute Table, then go to the Editor toolbar > Editor drop-down menu > Stop Editing.

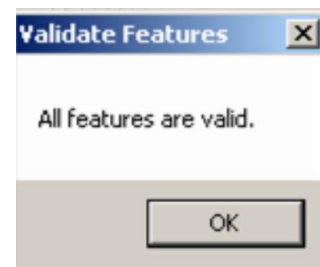


Figure 4.11 Validation

We have successfully copied features from a shapefile with tree records into a feature class that had the pre-set domains necessary to run i-Tree Eco.

This concludes the i-Tree Eco Geodatabase Tutorial. To fully maximize the potential of this database, proceed to the i-Tree Eco Python Tools Tutorial to understand how to use the python tools developed for data transfer between this geodatabase and i-Tree Eco software.

Tutorial: Geodatabase Developed for i-Tree Eco Full Inventory

APPENDIX A

Required attributes for i-Tree Eco:
Fields information for iTreeEco.gdb and MS Access database

Screens capture from i-Tree Eco manual

Field name	MS Access field type	Notes on data
TreeID	Integer OR Long (up to 9 characters)	Data required. Must be >0 without duplication.
Date	Date/Time	Data required.
Crew	Text (100 chars)	Data optional.
X	Double	Data optional. GPS coordinate longitude.
Y	Double	Data optional. GPS coordinate latitude.
PhotoID	Text (100 chars)	Data optional.
TreeAddress	Text (100 chars)	Data optional.
STAT	Text (1 char)	Data required. Tree status, must be P, I, U for initial inventory. Can be N, P, I, U, R, H, C, L for re-inventory.
Species	Text (8 chars)	Data required. Must be species code or genus code.
FieldLandUse	Text (1 char)	Data required. Must be A, C, E, G, I, M, O, P, R, T, U, V, W.
DBHHT	Single OR Double	Data required. Must be -1 for a removed tree. Otherwise, must be between 0.1 and 6.
DBH1	Single OR Double	Data required. Must be -1 for a removed tree. Otherwise, must be between 0.5 and 200.
DBH2	Single OR Double	Data optional. Must be -1 for a removed tree. Otherwise, must be between 0.5 and 200.
DBH3	Single OR Double	Data optional. Must be -1 for a removed tree. Otherwise, must be between 0.5 and 200.

Field name	MS Access field type	Notes on data
DBH4	Single OR Double	Data optional. Must be -1 for a removed tree. Otherwise, must be between 0.5 and 200.
DBH5	Single OR Double	Data optional. Must be -1 for a removed tree. Otherwise, must be between 0.5 and 200.
DBH6	Single OR Double	Data optional. Must be -1 for a removed tree. Otherwise, must be between 0.5 and 200.
TOTHT	Single OR Double	Data required. Height to top of tree. Must be -1 for a removed tree, otherwise must be between 0 and 450.
LiveTop	Single OR Double	Data required. Height to top of live crown. Must be -1 for a removed tree, otherwise must be less than TOTHT and between 0 and 450.
CrownBase	Single OR Double	Data required. Height to base of crown. Must be -1 for a removed tree, otherwise must be less than LiveTop and between 0 and 450.
CrownWidthNS	Single OR Double	Data required. Crown width (north-south). Must be -1 for a removed tree, otherwise must be between 0 and 300.
CrownWidthEW	Single OR Double	Data required. Crown width (east-west). Must be -1 for a removed tree, otherwise must be between 0 and 300.

D1	Integer, Single OR Double	Data optional. Direction to building. Must be -1 when no building is present or between 1 and 360.
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Field name	MS Access field type	Notes on data
PercentCrownMissing	Integer OR Long	Data required. Percent of crown silhouette missing. Must be -1 for a removed tree, otherwise must be between 0 and 100.
CrownDieback	Integer OR Long	Data required. Percent crown dieback. Must be -1 for a removed tree, otherwise must be between 0 and 100.
CLE	Integer OR Long	Data required. Crown light exposure. Must be -1, 0, 1, 2, 3, 4, 5.
TreeSite	Text (1 char)	Data required. Location of the tree. Must be N or S.
Comments	Text (255 chars)	Data optional.