

How to Use the Toolbox for Creating FRESH Alternative Rasters

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Introduction

The tools described below allow the user to collect, create and prepare the necessary inputs for the FRESH add-in (not covered here) for existing, alternative, and future conditions for a project.

The project's data (including unit information) must first be processed through the GI Project Setup by one of the GIS Project Analysts on the forest, so that the following tools can access the necessary unit and alternative information.

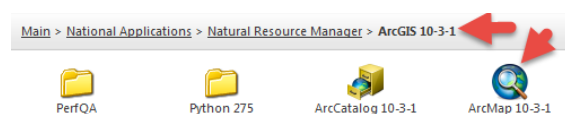
For this exercise, I processed a test instance of the Vallenar Young Growth EA project thru the GI Project Setup and processed the units for the proposed alternative. The output data for this test project reside at `T:\FS\NFS\Tongass\Program\2600WildlifeMgmt\GIS\SO\FRESHDeer\Project\FRESHTest\GIS\Data`. This is the folder you will navigate to when the tool requests the GI project data folder for the project where the `GI_Clip.gdb` and `GI_Query.mdb` reside (step 3 and step 4 tools). This is not meant to be your output folder for the tool outputs.

Before Running the Tools

You need a fresh copy of FACTSJoinActivitiesACTV160RSW

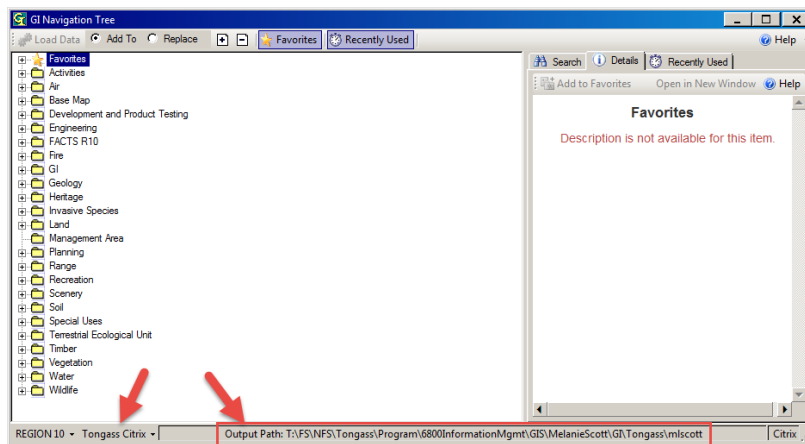
Make sure you have a fresh copy of FACTSJoinActivitiesACTV160RSW (a feature class of Activity polygons with FACTS data). (There is a link to a 'how-to' document in the first tool's description if you forget how to run this: [How to Run FACTS ACTV 160 RSW.](#))

Open ArcMap on one of the NRM blades in Citrix and click on the Add GI Data button.

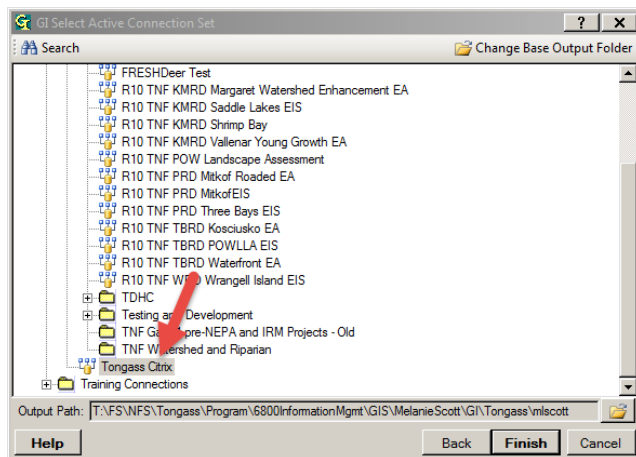
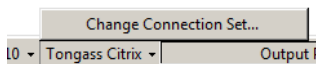




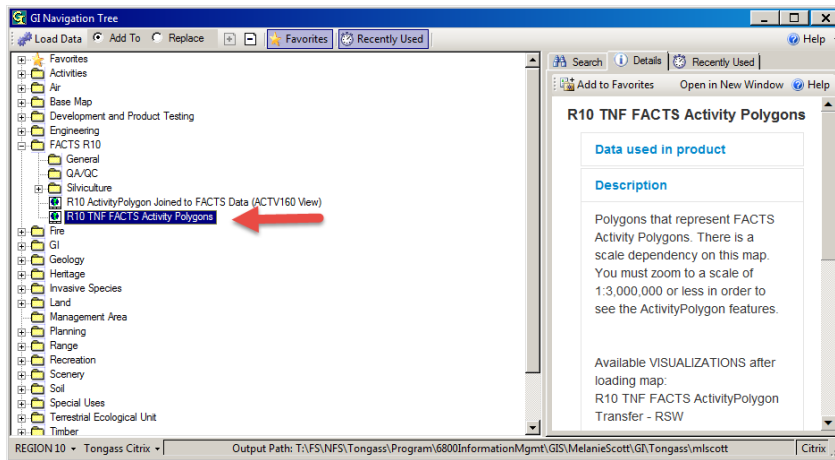
When the GI Navigation Tree window opens, check the bottom left of the window to see which connection set you are in. For running this RSW in preparation for running the following tools, you want to be in the Tongass Citrix connection set (this is our forest-wide connection set). We will be running the RSW forest-wide to grab the latest and greatest from Activity Polygon and FACTS (as this is one of the inputs to the SizeDensity model). You don't need to run this rsw every time you run the following tools, but if you haven't run the rsw forest-wide recently, it is good practice to run it to be sure you have an up-to-date copy. This is also a good place to check and see where your output path is for Tongass Citrix, in case you've forgotten and need to browse to it later.



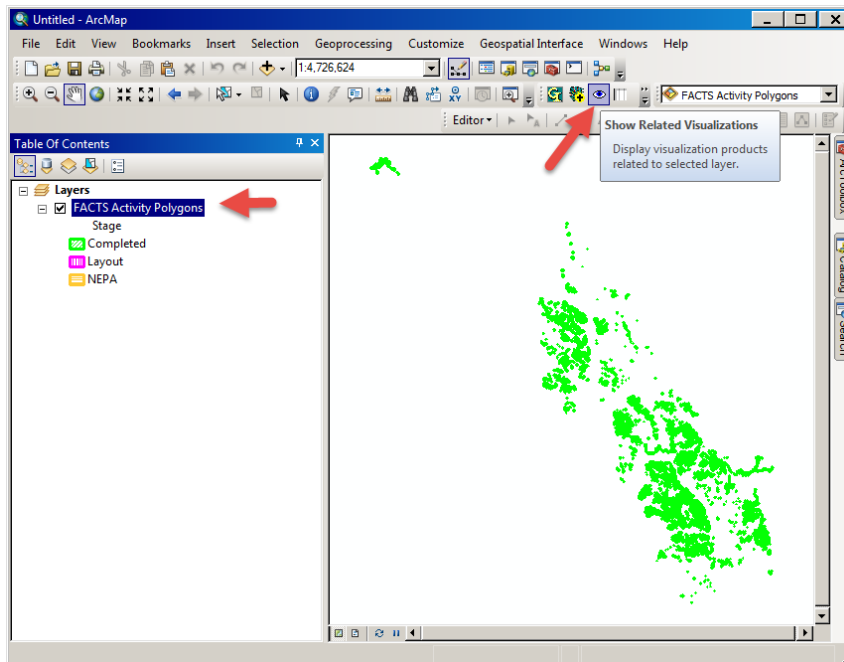
If you are not already in the Tongass Citrix connection set, click on the arrow next to the connection set name, choose change connection set and select Tongass Citrix from the list.



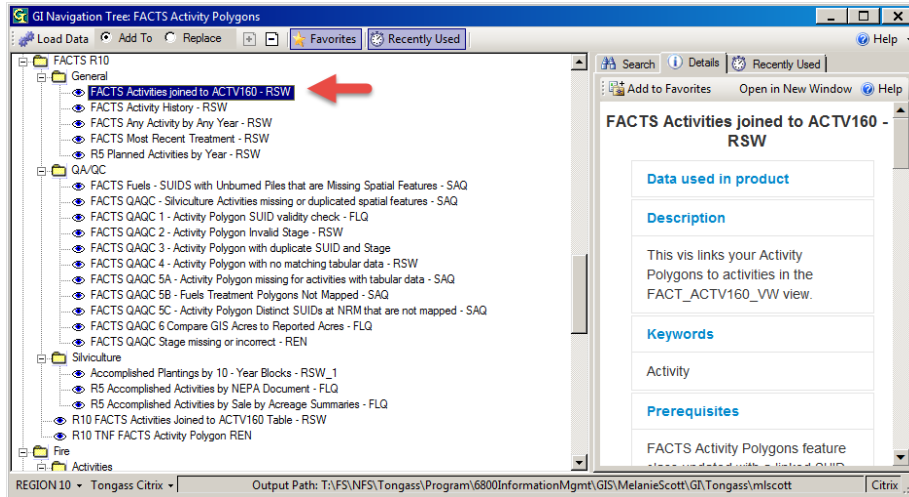
Load the map for R10 TNF FACTS Activity Polygons.



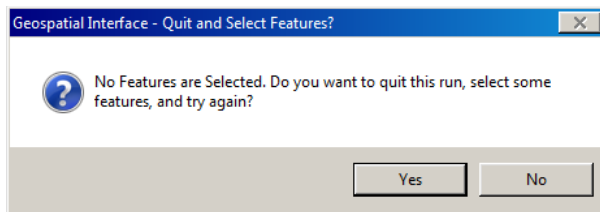
Highlight the layer in your table of contents in ArcMap and click on the related visualizations button (the eyeball on the GI tool bar).



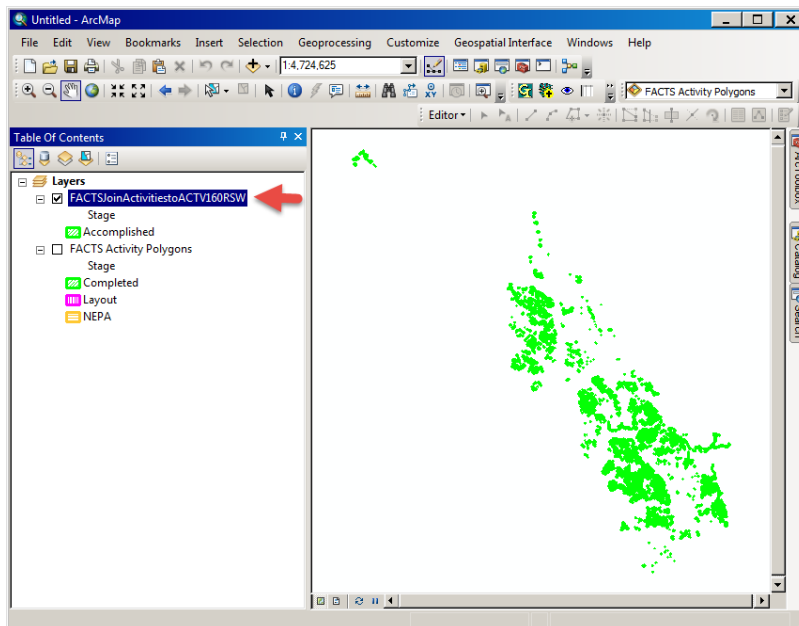
There are a lot of related visualizations for Activity Polygon, choose **FACTS Activities joined to ACTV160 – RSW**. It shows up in several places on the navigation tree and is easy to find.



When you run it you will get the following message, since we are running it forest-wide and have not made any polygon selections. Click on 'No', we do not want to stop and make a selection. No means 'Go' in this case.

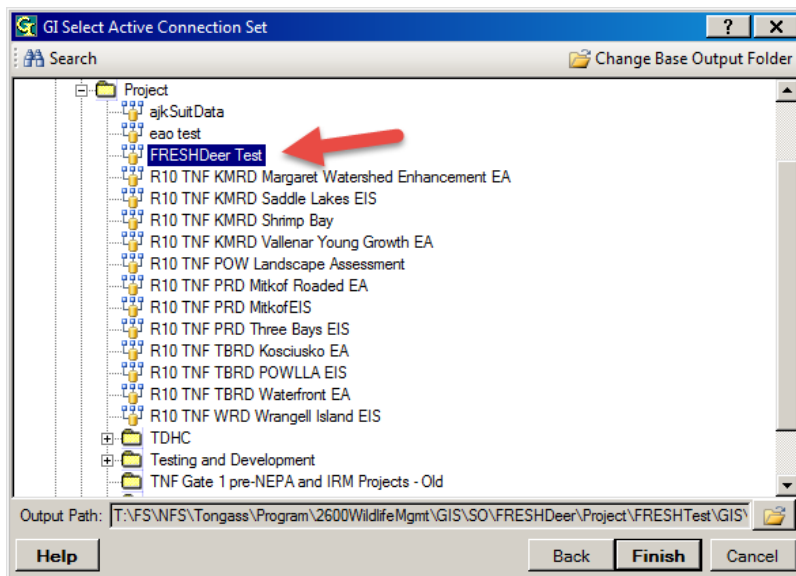


It may take several minutes to complete, and once it is done it loads the rsw output to your ArcMap table of contents.

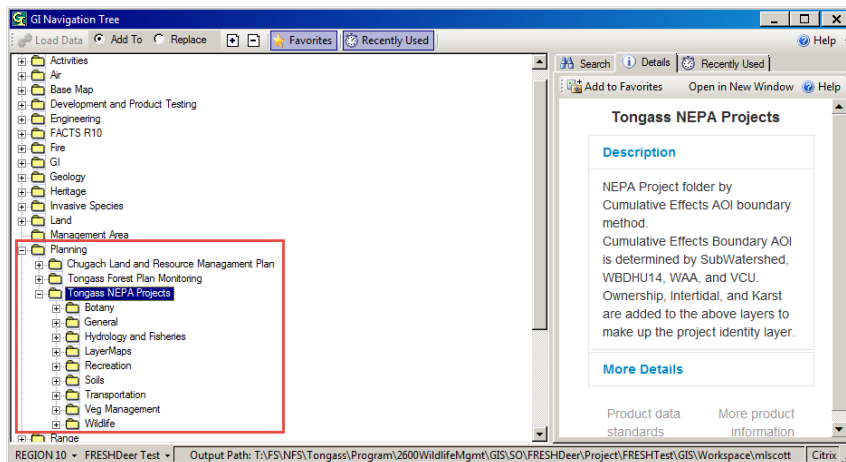


Choose the extent/area you are interested in for FRESH

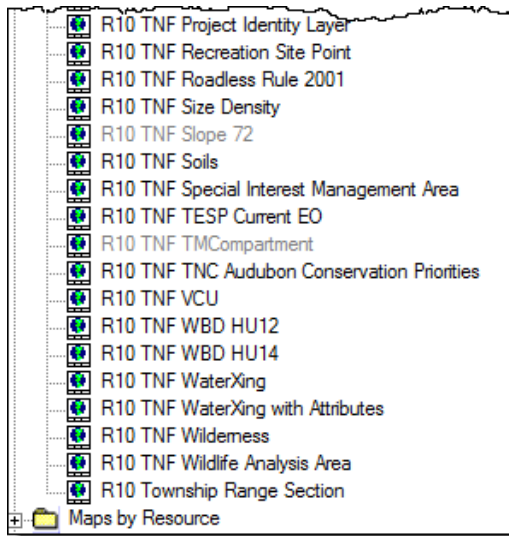
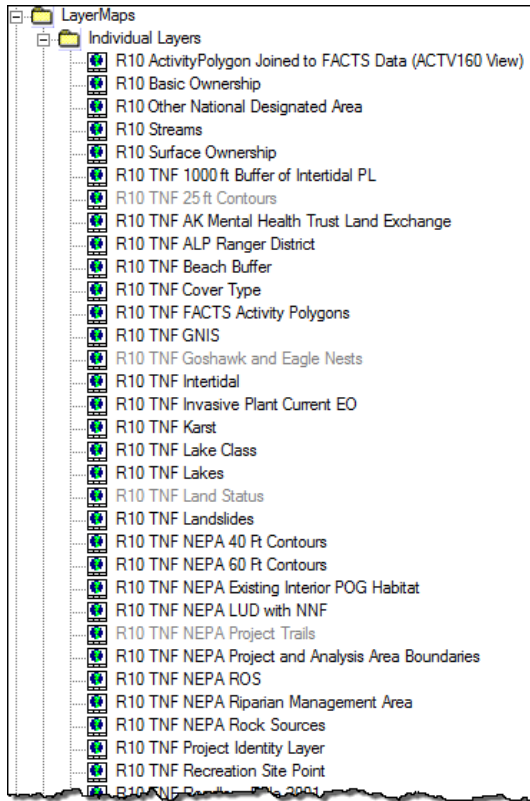
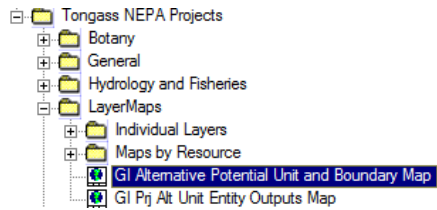
Now let's think about what extent we want to create our FRESH inputs for. For this exercise, we are interested in the Vallenar project area, so let's open the GI Navigation window again and choose the connection set for our test project FRESHDeerTest. Click on the Add GI Data button again to open the navigation window and change your connection set to FRESHDeerTest (this will allow us to access the already clipped project data). Expand the Project folder under Tongass NF Connections and choose FRESHDeer Test.



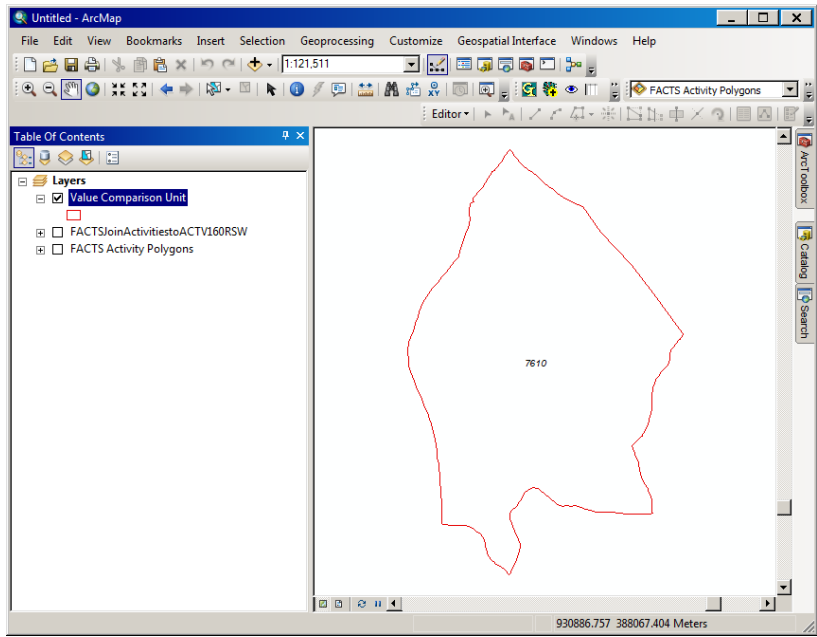
Once the GI navigation tree window opens, look for Planning>> Tongass NEPA Projects (this is where most of our Project specific GI content resides).



If you want your FRESH inputs to be created for just the project boundary or for the entire project AOI boundary, you can load the *GI Alternative Potential Unit and Boundary Map* which includes the project boundary and the AOI clip boundary (which will be larger). You can find this in a couple of places including under LayerMaps. If you want to use the VCU(s) or WAA(s) associated with the project, you can find a map to load those under LayerMaps >> Individual Layers.

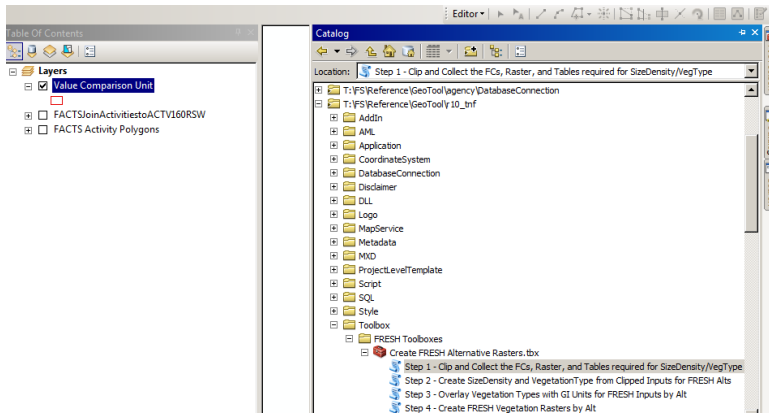


In this example, I loaded the VCU map for the FRESHDeer Test project. There is only one VCU in this project.

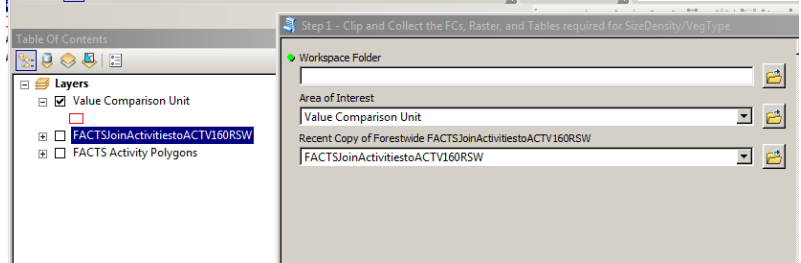


Note: the above are just examples of how you might access certain extent layers. You can also load the layers you want to use for defining extent without using the GI (but they still need to overlap the potential units for your project).

Navigate to and open the first of the Create FRESH Alternative Rasters tools.



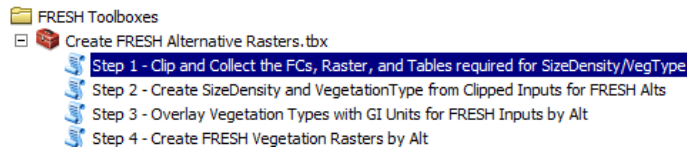
In this example, the project VCU and the output of the FACTS Activities joined to ACTV160 – RSW are already in my ArcMap table of contents, since I just went thru the above steps, and I can drag them to their respective spots in the tool. I also need to browse to where I want the outputs to go. The rest of this document steps thru each of the tools.



The Create FRESH Alternative Rasters Toolbox

The Create FRESH Alternative Rasters.tbx can be found on the T drive at *T:\FS\Reference\GeoTool\r10_tnf\Toolbox\FRESH Toolboxes* and contains 4 script tools that are meant to be run in sequence.

Step 1

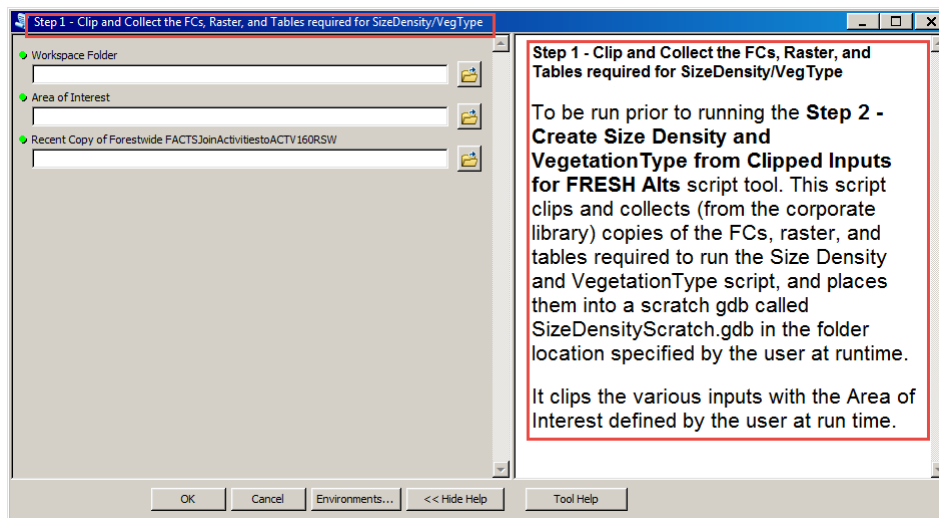


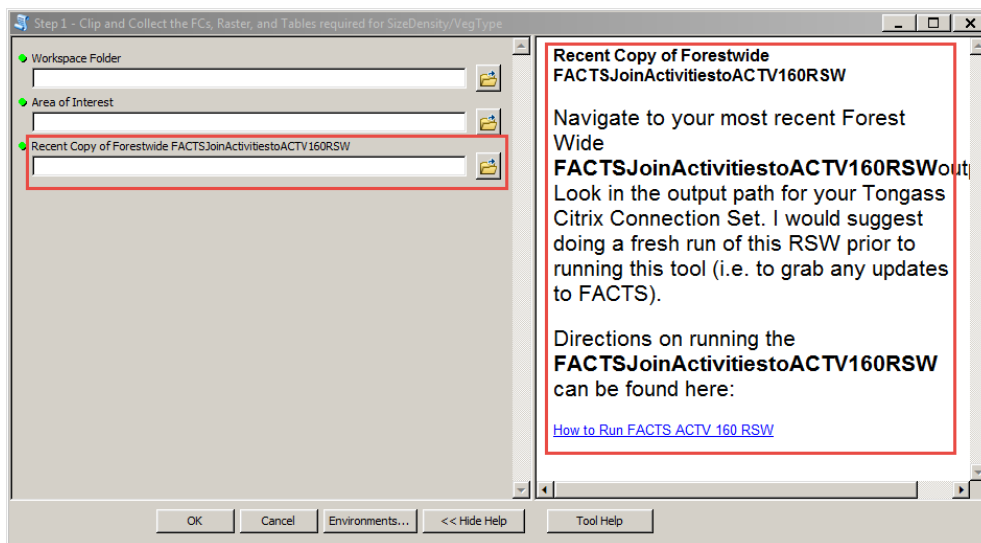
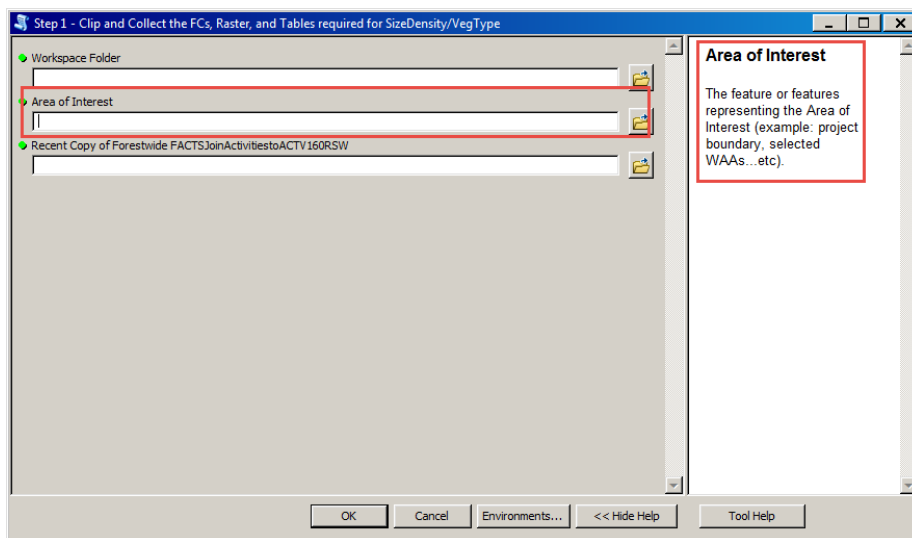
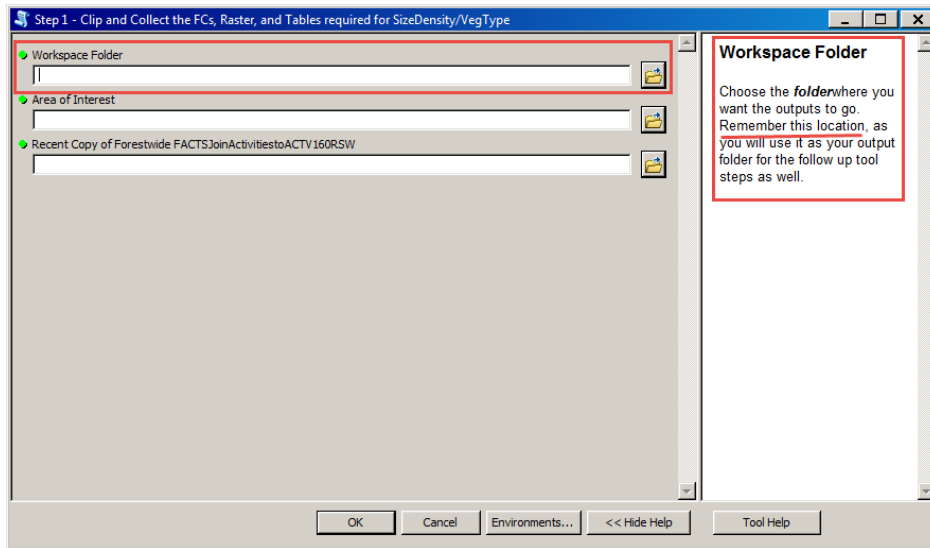
- **Step 1 - Clip and Collect the FCs, Raster, and Tables required for SizeDensity/VegType** uses an area of interest defined by the user to clip the inputs necessary for the SizeDensity model and outputs them to a gdb called *ScratchSizeDensity.gdb* in a folder specified by the user on the T drive (this will be the same output folder used in the follow-up steps).

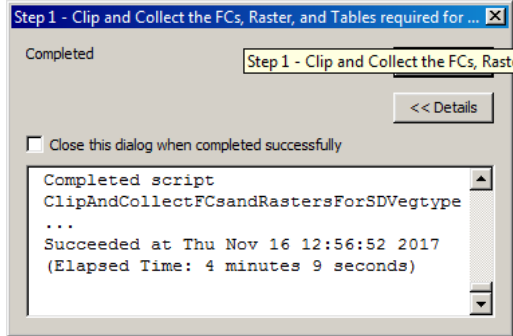
There are 3 input parameters:

1. Workspace Folder (the folder where you want the outputs to go). This same output folder will be used in the follow-up steps.
2. Area of Interest. The feature or features representing the area of interest (example: Project boundary, selected VCUs, WAAs...etc.)
3. Recent copy of forest-wide *FACTSJoinActivitiesACTV160RSW* feature class (there is a link to documentation reminding people how to run this)

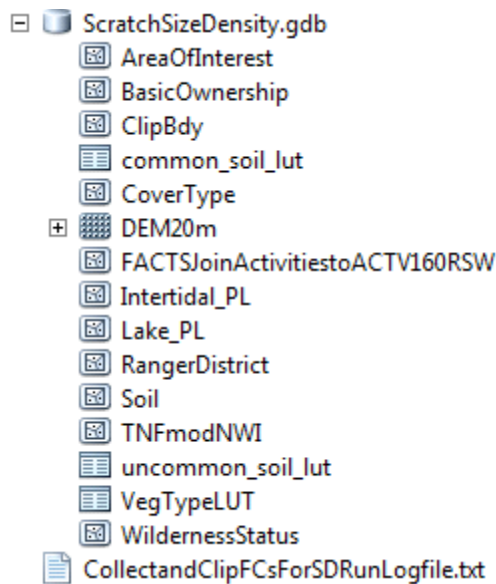
[How to Run FACTS ACTV 160 RSW](#)



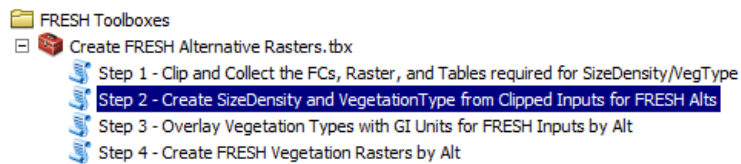




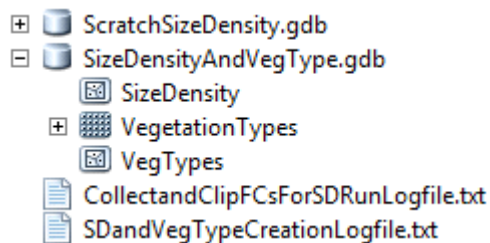
The output of this first tool looks like this:



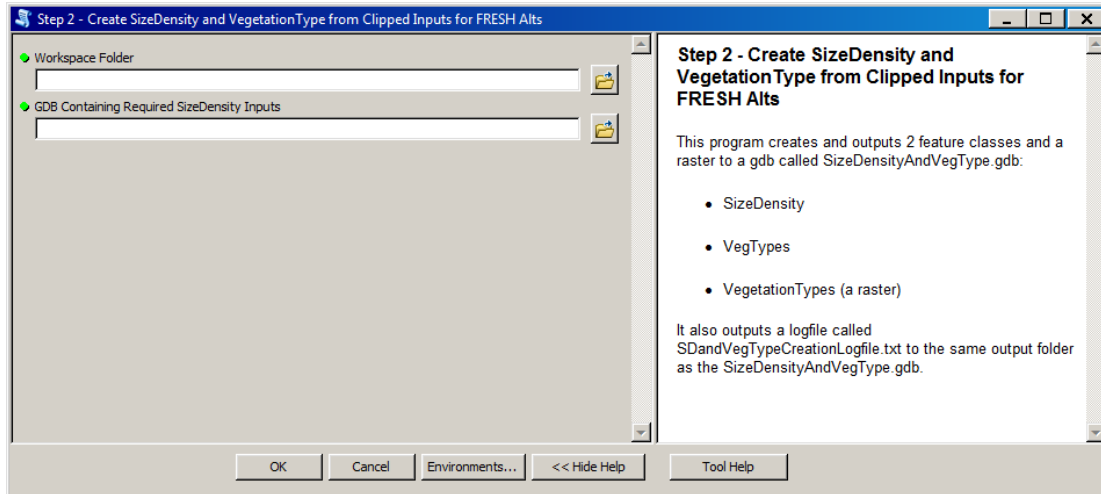
Step 2



- **Step 2 - Create SizeDensity and VegetationType from Clipped Inputs for FRESH Alts** creates and outputs 2 feature classes and a raster to a gdb called SizeDensityAndVegType.gdb based on the clip boundary used in the prequel step.

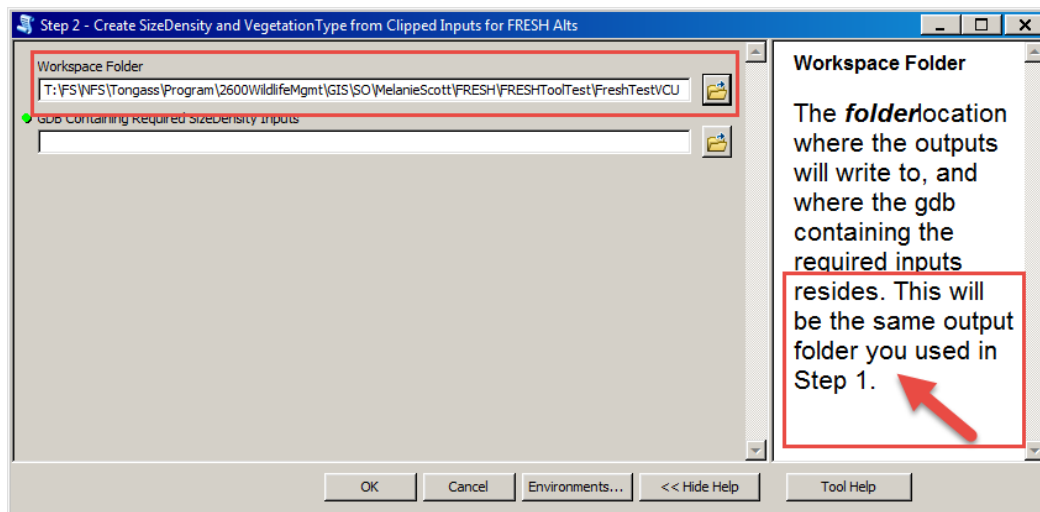


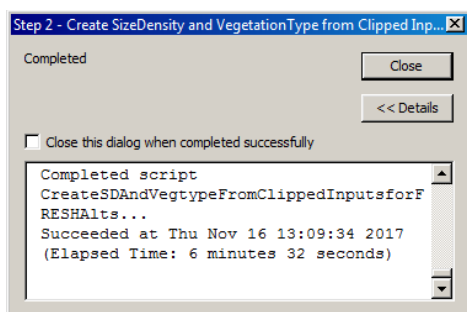
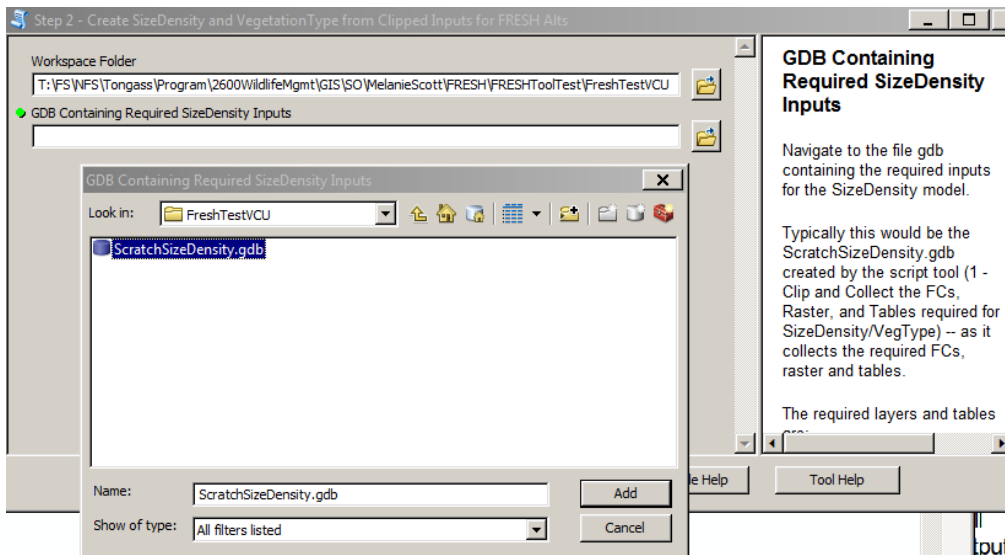
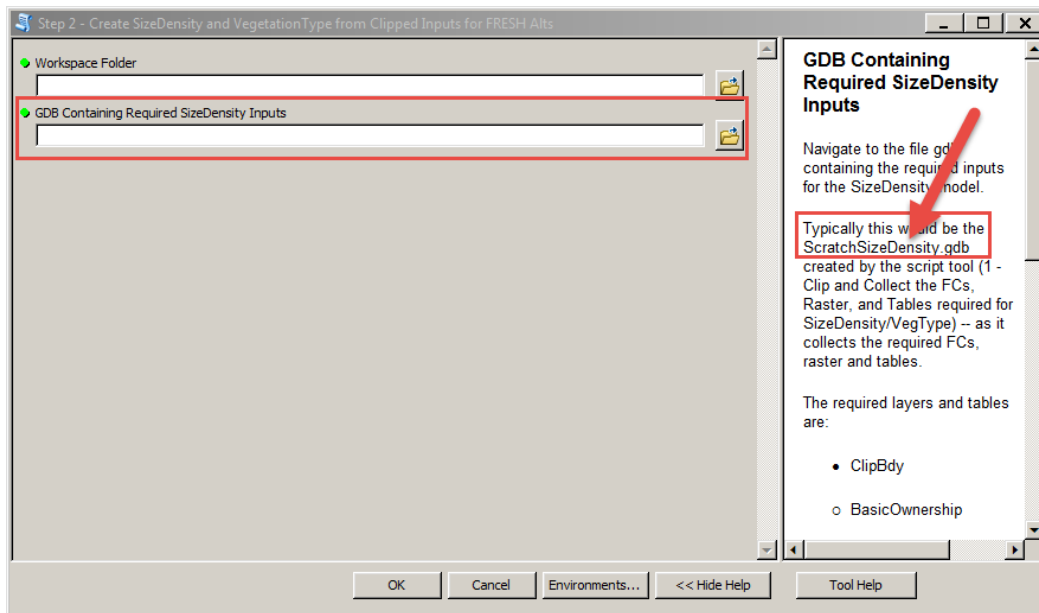
The SizeDensity output from this tool retains a few more fields than the library version of SD (age and year related) to allow the follow up tools to more easily calculate vegetation type at a future point for PCT and CT polys.



There are 2 input parameters:

1. Workspace Folder (the folder where you want the outputs to go). The same output folder used in the previous step.
2. GDB Containing Required SizeDensity Inputs (typically the gdb created in the previous step residing in the workspace folder identified above).





Step 3

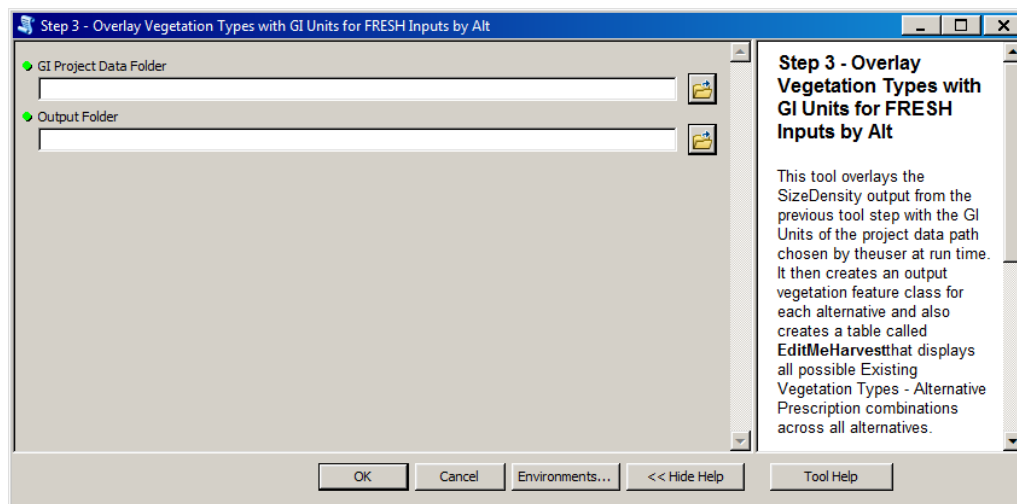
FRESH Toolboxes

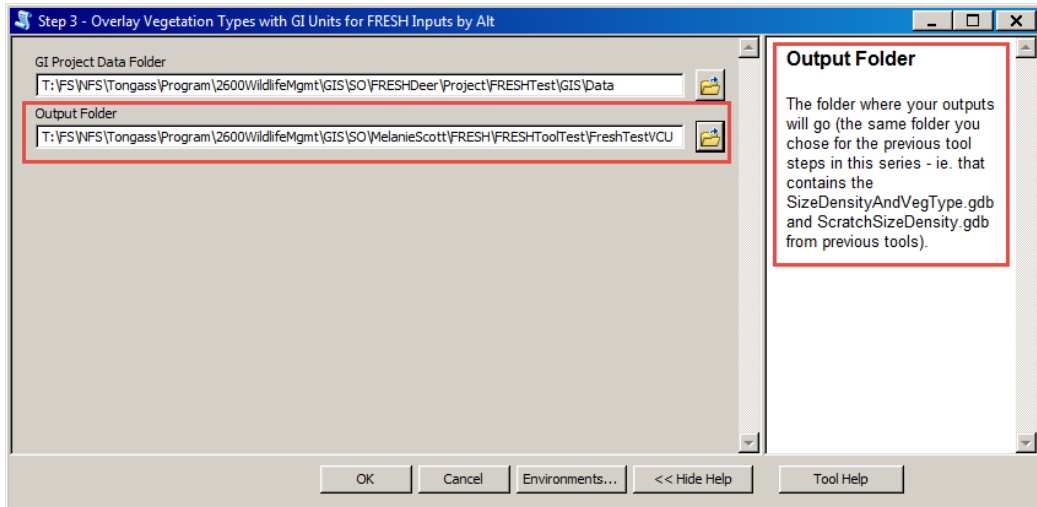
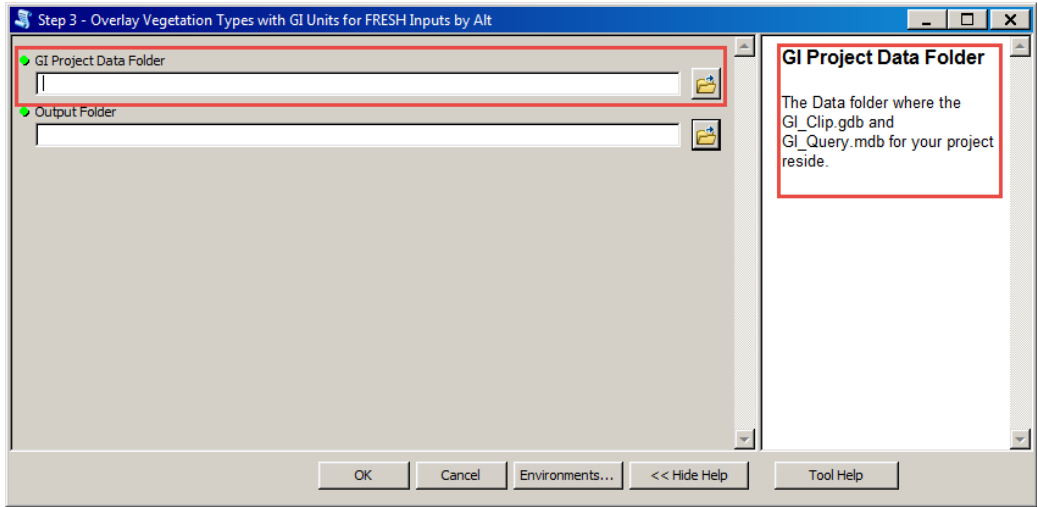
Create FRESH Alternative Rasters.tbx

- Step 1 - Clip and Collect the FCs, Raster, and Tables required for SizeDensity/VegType
- Step 2 - Create SizeDensity and VegetationType from Clipped Inputs for FRESH Alts
- Step 3 - Overlay Vegetation Types with GI Units for FRESH Inputs by Alt
- Step 4 - Create FRESH Vegetation Rasters by Alt

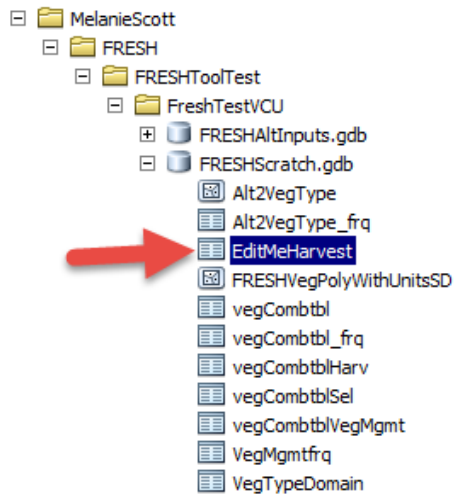
- **Step 3 - Overlay Vegetation Types with GI Units for FRESH Inputs by Alt** is an intermediate, but necessary step in the process. It overlays the size density output from the previous step with the GI units layer for your chosen project and outputs a feature class for each alternative with treatments/prescriptions for their associated units (these will be used in the follow up step to create the rasters and they can also be used for visual troubleshooting if needed). It also creates a table called **EditMeHarvest** that will need to be manually edited by the user in ArcMap to populate the **VegTypeAlt** field (so it can be used in the final step 4 process). The **EditMeHarvest** table displays all combinations of existing vegetation type - alternative treatment/prescription across all alternatives for the project.

This tool also clips all of the FRESH Inputs necessary for the FRESHAddin from the corporate library except for the FRESHVegetationTypes raster (which is freshly created by the tool prior to this one) and places them into a **FRESHAltInputs.gdb**.





Edit the **EditMeHarvest** table before proceeding to the next tool step.
Bring the **EditMeHarvest** table into your ArcMap session.

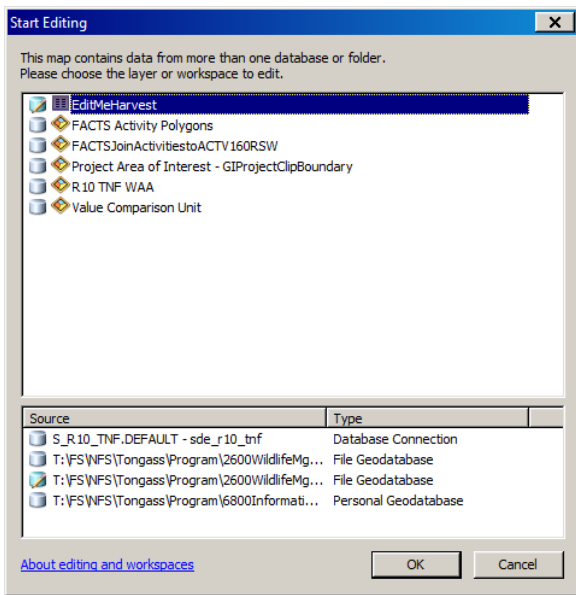
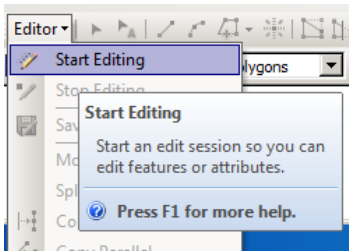


OBJECTID	FREQUENCY	VEGETATIONTYPE	Description	EntityType	Treatment	RXDescription	VT_X_RX	VegTypeAlt	GISACRES
1	1	CC41_65	Clearcut - 41 to 65 year old	Harvest	CC	Clear Cut	CC41_65 - CC	<Null>	155.070351
2	1	SD4NS5HNS	Productive Old Growth - SD4N, SD4S, SD5N, SD5S, SD5H	Harvest	CC	Clear Cut	SD4NS5HNS - CC	<Null>	0.000187
3	1	UL	Unproductive Forest due to Low Site Index	Harvest	CC	Clear Cut	UL - CC	<Null>	0.000044

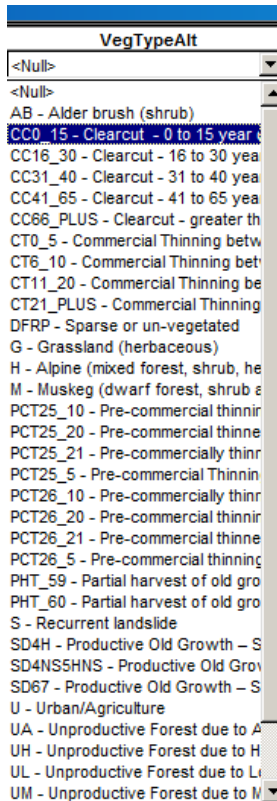
As you can see, with the proposed alternative for Vallenar there are only 3 combinations of VegetationType/Treatment and 2 of them look like slivers (*hint: look at the GISACRES*).

[In my example, I assumed those 2 were slivers and decided to keep their VegTypeAlt value the same as their original VegetationType when I edited the table.]

Start an edit session so that you can edit the table using the drop down menu for VegTypeAlt.



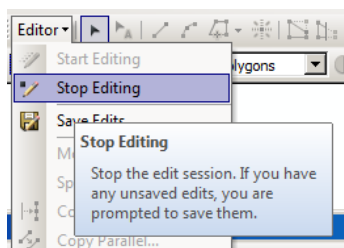
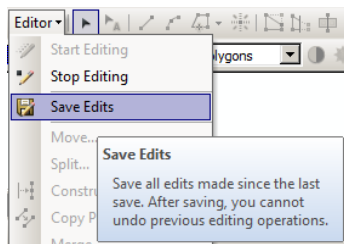
VT_X_RX	VegTypeAlt	GISACRES
CC41_65 - CC	<Null>	155.070351
SD4NS5HNS - CC	<Null>	0.000187
UL - CC	<Null>	0.000044



I gave the first row a VegTypeAlt of CC0_15 and assumed the other 2 rows were slivers of overlap, so I gave them a VegTypeAlt matching their original VegetationType.

VT_X_RX	VegTypeAlt	GISACRES
CC41_65 - CC	CC0_15 - Clearcut - 0 to 15 year old	155.070351
SD4NS5HNS - CC	SD4NS5HNS - Productive Old Growth	0.000187
UL - CC	UL - Unproductive Forest due to Landslide	0.000044

Save your edits and stop editing.



Step 4

FRESH Toolboxes

Create FRESH Alternative Rasters.tbx

- Step 1 - Clip and Collect the FCs, Raster, and Tables required for SizeDensity/VegTy
- Step 2 - Create SizeDensity and VegetationType from Clipped Inputs for FRESH Alts
- Step 3 - Overlay Vegetation Types with GI Units for FRESH Inputs by Alt
- Step 4 - Create FRESH Vegetation Rasters by Alt

- **Step 4 - Create FRESH Vegetation Rasters by Alt**

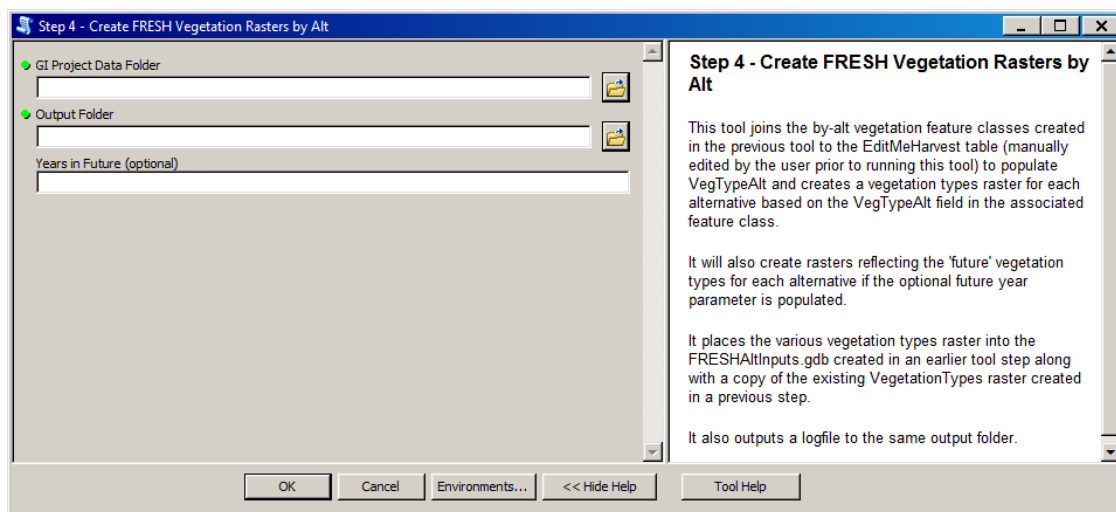
This tool joins the by alt vegetation feature classes created in the previous tool to the EditMeHarvest table (manually edited by the user prior to running this tool) to populate VegTypeAlt and creates a vegetation types raster for each alternative based on the VegTypeAlt field in the associated feature class.

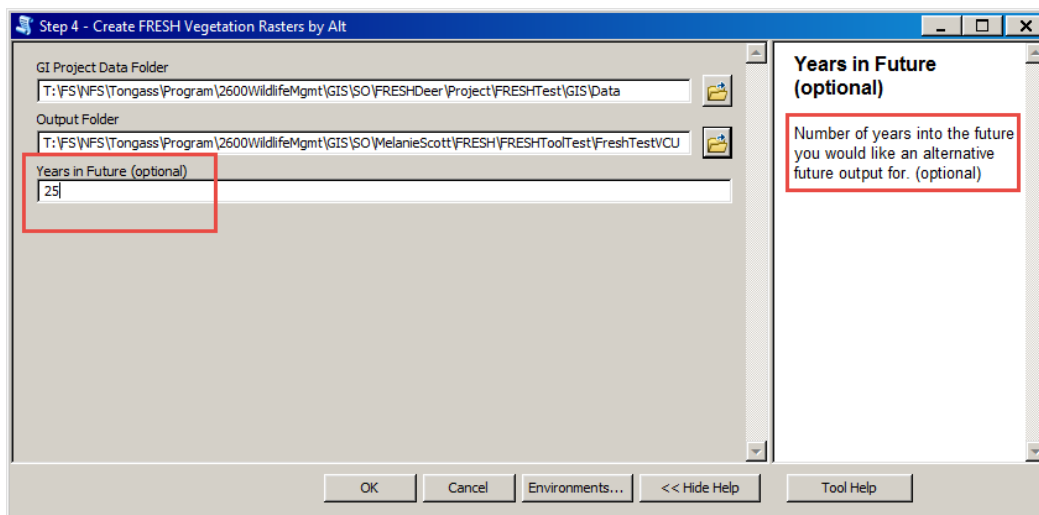
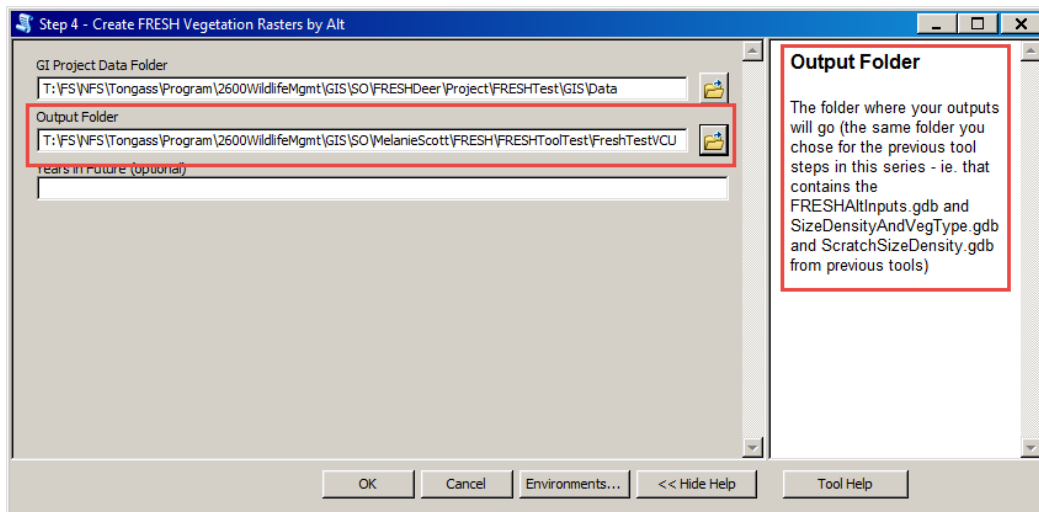
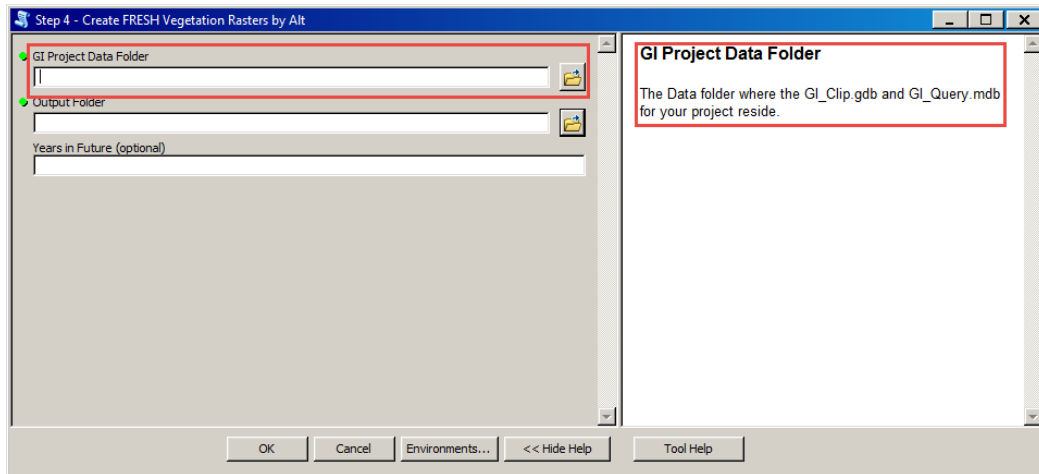
It will also create rasters reflecting the 'future' vegetation types for each alternative if the optional future year parameter is populated.

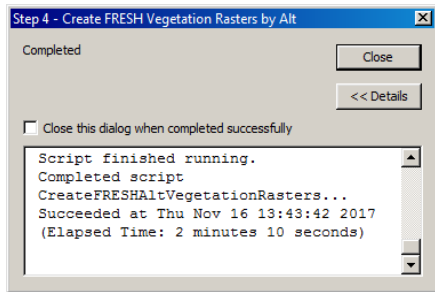
It places the various vegetation types raster into the FRESHAltInputs.gdb created in an earlier tool step along with a copy of the existing VegetationTypes raster created in a previous step.

There are 3 parameters:

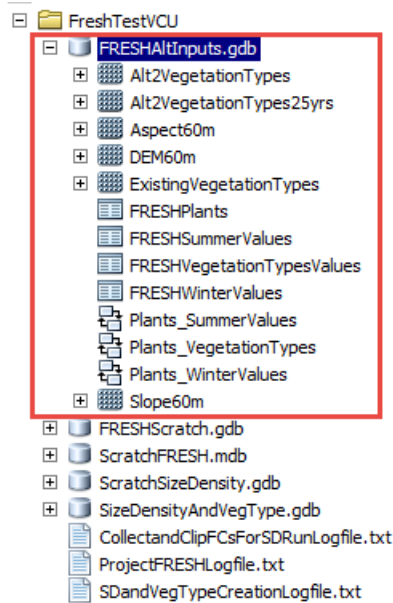
- 1 - The Data folder where the GI_Clip.gdb and GI_Query.mdb for your project reside.
- 2 - The folder where your outputs will go (the same folder you chose for the previous tool steps in this series - ie. that contains the FRESHAltInputs.gdb and SizeDensityAndVegType.gdb and ScratchSizeDensity.gdb from previous tools).
- 3 - Number of years into the future you would like an alternative future output for. (optional)





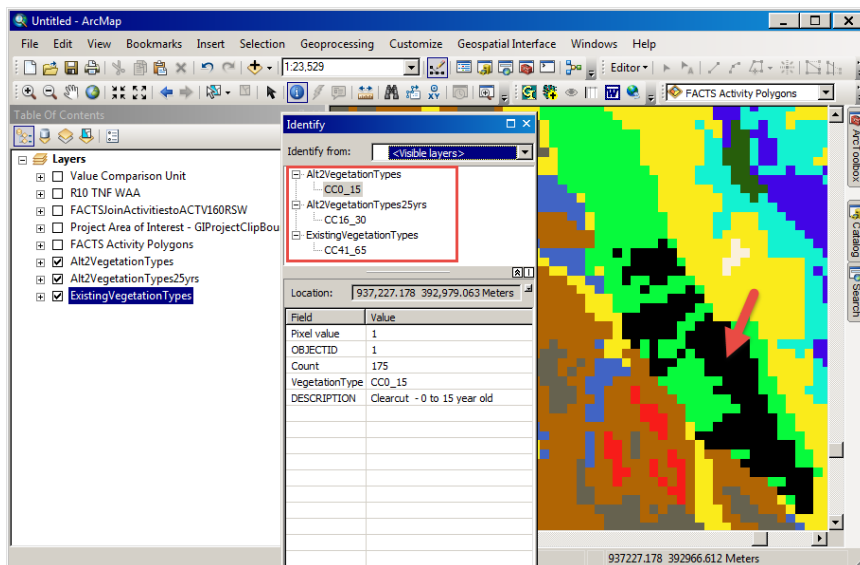


Your FRESHAltInputs.gdb will now contain all of the existing and alternative inputs you need for the FRESH Addin.



Looking at the output rasters:

Example of one of the harvest units:



Example of an area not being harvested in the proposed alternative:

