EXERCISE 8: CREATING A FUSION PROJECT—PART 3
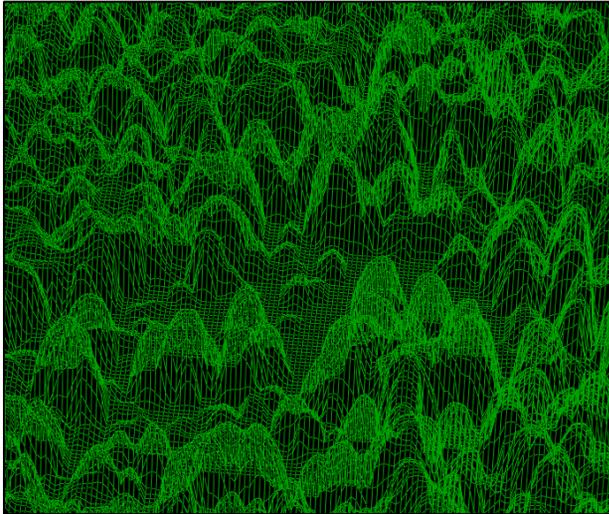
The Canopy Height model as viewed in LDV. The lidar data has been toggled off.

Note: *FUSION currently does not use the projection information BUT (according to Bob McGaughey—FUSION's developer) it will/might in the future. The projection information is stored in the header and thus provides a way to keep track of the projection info. It is best if you input this information correctly but if you don't know the projection or datum, you can use the unknown options.*

Introduction
In this exercise you will continue building the Fusion project data by creating a Canopy Surface Model (CSM-elevations at the top of the canopy) and a Canopy Height Model (CHM-canopy elevations normalized using a bare earth model).

Create a Canopy Surface Model (CSM):
In Fusion, the canopy surface model is created from the command line interface using the **CanopyModel** executable. The syntax for the **CanopyModel** command is:

> **CanopyModel** [switches] surfacefile cellsize xyunits zunits coordsys zone horiz-datum vertdatum datafile1 datafile2 ... datafile10

1. Make sure you've reset your sample options (as described at the end of the previous exercise).
2. For the complete syntax, type **canopymodel** from the DOS prompt (from the Fusion directory).
3. Run the **canopymodel** utility with the following parameters:
   - **Parameters:**
     - <out_path>\lub_CSM.dtm   (this is the output file)
     - 2   (output cell size)
     - M   (x and y units are meters)
     - M   (z units are meters)
     - 1   (UTM coordinates)
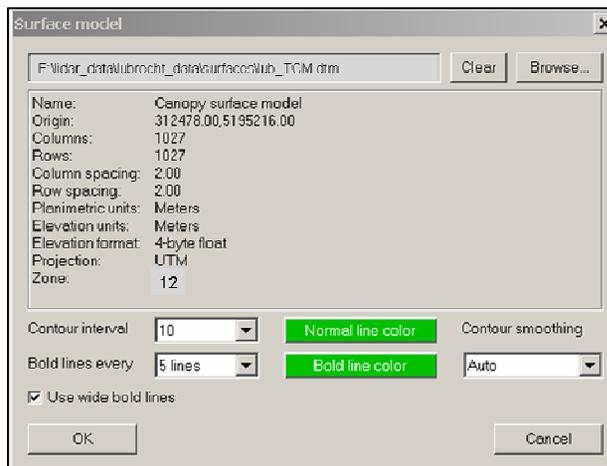   - 12   (zone 12)
     - 2   (NAD83)

- 2   (NAVD83)
- <in_path>\ lub_tiles.txt   (text file containing the paths to the input data files)

The syntax should look similar to:

Syntax:

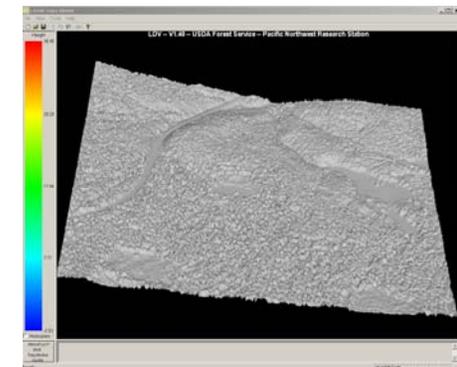**canopymodel** <out_path>\lub_CSM.dtm 2 M M 1 12 2 2 <in_path>\lub_tiles.txt

Consider putting the command (including switches and parameters) in a batch file—despite being only a single command.

Surface model		
F:\lidar_data\ubrecht_data\surfaces\lub_TCM.dtm	Clear	Browse...

Name: Canopy surface model
Origin: 312478.00,5195216.00
Columns: 1027
Rows: 1027
Column spacing: 2.00
Row spacing: 2.00
Planimetric units: Meters
Elevation units: Meters
Elevation format: 4-byte float
Projection: UTM
Zone: 12

Contour interval   10   Normal line color   Contour smoothing
Bold lines every   5 lines   Bold line color   Auto
☑ Use wide bold lines

OK   Cancel

Option: You can skip steps 3-6 if you don't care to see the canopy model in FUSION—you can still load it into LDV using steps 8-10.
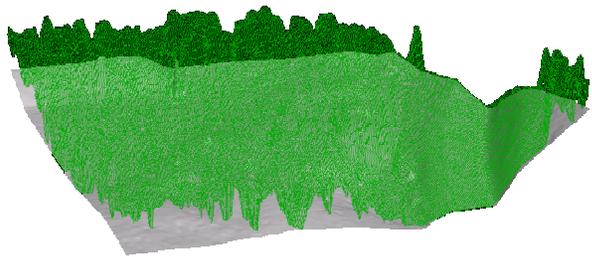
Once the **canopymodel** utility has finished successfully, add the canopy model to the Fusion project...

3. From the FUSION interface click the **Canopy...** button from the left side menu,
4. Navigate to and select the **lub_CSM.dtm** canopy model file,
5. Click **Open** to display the **Surface model** dialog (see sidebar):
6. Click **OK** and the model will be shown with green contour lines in the fusion window (if not, ensure that the checkbox next to the **Canopy model...** button is checked).
7. Click-and-drag a Stroked Box sample within the Fusion window to view the data in LDV:
8. Access the right-click menu and click **Surface file...**
9. Navigate to and select the **lub_CSM.dtm** canopy file,
10. Click **Open** to display the canopy model over the data.
11. Inspect the canopy model--how well does it fit

the data?

12. Once the canopy model is created, and added to the fusion project, additional tools become available to visualize the data in LDV.

13. Start by clicking the **Sample options…** button in Fusion.

14. Within the **Sample options** dialog, select the **Include canopy model in the data sample** option and click **OK** to close the **Sample options** dialog.

15. Select a new stroked-box sample or click the **Repeat last sample** button to load the data in the LDV viewer.

16. Once the LDV viewer displays the data points, the surfaces can be added by accessing the right-click menu and selecting **Surfaces** (**Alt-U**) **—** note this is different than the **surface file…** menu option.

17. The bare earth model (**lub_surface.dtm**) will display as a gray surface and the CSM **lub_CSM.dtm** will display as a green TIN).

18. Type **Alt-D** to toggle the point data off (sidebar) or access this option through the right-click menu.

The Top-of-Canopy model (green) displayed over the Bare Earth surface model (grey). The lidar data has been toggled off.

Exercise 8 continues …

Create A Canopy Height Model (CHM)

This can be done using the **canopymodel** program again but this time adding the normalizing switch (**/ground:file**) into the syntax that normalizes the top of canopy model to the bare earth surface and providing a new output file.

The syntax should look similar to:

Syntax:

canopymodel /ground:<in_path>\lub_surface.dtm <out_path>\lub_CHM.dtm 2 M M 1 12 2 2 <in_path>\lub_tiles.txt

Consider putting the command (including switches and parameters) in a batch file—despite being only a single command.

After you have successfully run the **canopymodel** program to create **lub_CHM.dtm**, inspect it as you inspected **lub_CSM.dtm.**

Note: *Ensure the* ***"subtract ground elevations from each point"*** *is* *checked in the Options section of the Sample Options in the Fusion window. The* ***CHM*** *will not display otherwise. Inversely the* ***CSM*** *willl only display if the* ***"subtract ground elevations from each point"*** *is not checked.*

End of Exercise 8