Lab 8b: Large woody debris availability for habitat

For the rest of this lab (over two weeks), you will convert the LiDAR data to a variety of rasters, calculate tree heights, and figure out what the woody debris availability to rivers is. This will be split up into two sets of directions.

We will be going in the field together on Thursday 10 November to collect the GPS data. Otherwise you have Monday 7 November and Thursday 10 November to split between project work time and doing this part of lab 8.

Due: Monday 14 November for class

Turn in: You must be through all of these directions before class Monday.

Here is a basic overview of what you'll do by Monday 14 November:

1) View your LAS Dataset in ArcScene and ArcMap. Explore both. What are the differences with the LAS Dataset in each program?
2) Collect GPS data (we will do this as a class on Thursday 10 November)
3) Download your GPS data, turn it into a shapefile, and upload it to Google Drive
4) Look at your GPS data on top of your aerial photos
5) Mosaic your aerial photo and grid files into two single raster datasets
6) Trace Plum Creek

Part I. Exploring your LAS Dataset (item 1 on list above)

You should have an LAS dataset that you created from your LAS point cloud. This part of the lab is basically exploratory. Add your DEMs and your aerial photos into ArcMap. Make sure everything is projected. If it isn't, define the projections. If your LAS dataset does not have the correct coordinate system defined, you'll need to rebuild the dataset from your LAS files and properly define the coordinate system within that tool. Now add the LAS dataset and put it on the top. It should look like a bunch of colored points. Zoom in. Can you tell what is going on?

Probably not. So, go into the properties for your LAS Dataset. It should look a little different from how it looks for features and rasters. Click on the Filter tab. What happens when you change the filters?

Change to "high vegetation" and zoom in on an area with a mix of grass and trees. What do the points represent?

Play around with the three different classes of data. Given that we are interested in LWD, what can you learn from comparing the point data for high vegetation with the aerial photos?

Add the LAS toolbar (the same way you add other toolbars) and see what it does. What tools are available? How do they change the way your data are displayed?

Now open your LAS Dataset in ArcScene. Play around with the settings for filter, zoom in and out. What are the differences between using ArcMap and ArcScene to look at the LAS Dataset?

Part 2: GPS (items 2 and 3 on list on page 1)

Use the Minnesota DNR GPS program to download the data and convert the points to a shapefile. The program is easy to use, so figure out how to do that on your own.

Add your shapefile points to your map project. Double check your points and make sure that they make sense. You want to be certain there are no stray points from the Vermillion River, China, or other places outside our study area. Also make sure there aren't duplicate points.

If you took a control waypoint by a corner of a building, take a look at that point. Is it where you expected it to be? How accurate is your dataset?

How do the locations of trees look compared to trees you see in the aerial photos? What about compared to the LAS points representing trees?

Part 3: Mosaic your rasters (item 4 on the list on page 1)

In order to work with your raster datasets most easily, you should make them into a single file. Use the same technique you use in lab 2[1] to combine all your aerial photos into one file and all your DEMs into one file. You'll end up with two grid files. What tool did you use? Were any settings different between the two sets of data?

[1] Mosaic to new raster

Part 4: Distances from Plum Creek (item 5 on list on page 1)

The last thing you need to do as prep work for turning your lidar data into a map of potential LWD (PLWD) is to figure out how far it is from Plum Creek.

1. Create a new shapefile and trace a both banks of Plum Creek that extends throughout the Arb. If you cannot see both banks, you can trace the center of Plum Creek, estimate the width of the river, and buffer your river line by half that distance (because your line is the center of the river). You want to end up with your left bank and right bank lines in the same shapefile so that you can get the distance from anywhere to the closest river bank.