Exploration and Graphing of Data
"Buds, Leaves, and Global Warming"

Introduction: What can we learn from our data that we collected for the Harvard Forest Study "Buds, Leaves, & Global Warming?" You and your partner will come up with a question that you want to answer then you will download data, make a graph, and try to answer your question.

I. Possible Questions:

a) How does the loss of leaves on my tree species compare to the loss of leaves on the other tree species at HHS?

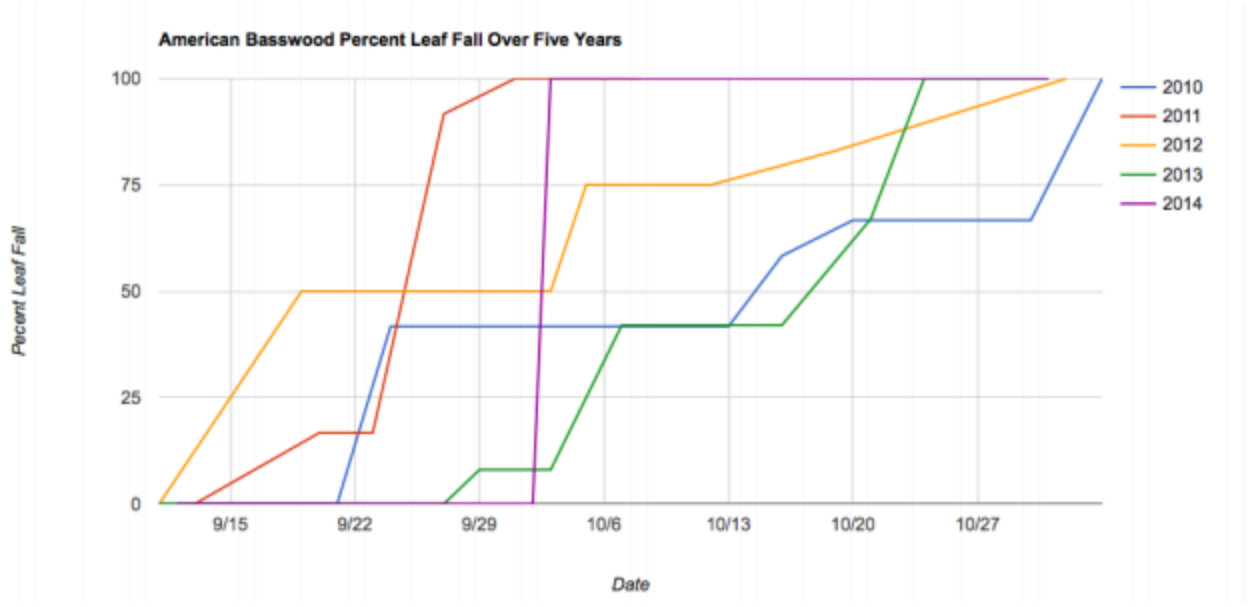
b) How does the color change compare for my tree and the same species of tree in MA during the same week?

c) What is the timing of leaf fall for my tree species for trees across NH?

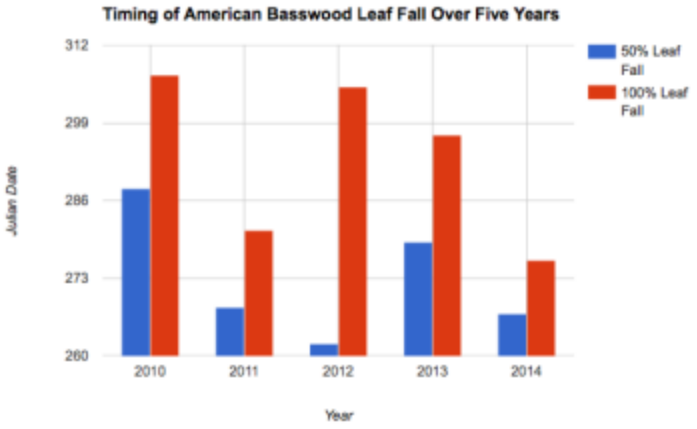
II. Guidelines

a) Use the graph rubric provided below.
b) Have at least 10 data points on the graph.
c) Make sure your graph answers your question (**or change the question to fit your graph if you end up looking at the data differently**).
d) Include at least some HHS data (though you can compare it to MANY trees also).
e) Write a conclusion paragraph.

III. Sample Graphs *note that the titles should be in the format of the SSH



	A	B	C
1	Year	50% Leaf Fall	100% Leaf Fall
2	2010	288	307
3	2011	268	281
4	2012	262	305
5	2013	279	297
6	2014	267	276
7			



IV. Procedures:

1. Click on Harvard Data (http://harvardforest2.fas.harvard.edu/asp/hf/php/k12/k12_data.php) Welcome to the Harvard Forest Schoolyard LTER Database. To view and download data, select **Fall phenology** and press Submit (or Spring phenology and submit).

2. Select a school (start with our school). You may also optionally enter a teacher's last name, a start date, and/or an end date. Results will be displayed in your browser, sorted by school code, teacher's last name, date, and individual (tree).

3. Some helpful information (found above table):

a) Julian calendar simply means the day of the year.
b) Total buds means the number of buds observed (usually 12-18 unless some buds fell off by accident)
c) Open buds- # of open buds per tree
d) Leaf Length- length of longest leaf in cm
e) Tree Species- click on link above table to find out codes ex BE= Beech

Note: Above the downloaded table there are options to sort data before you save which will make it easier to access desirable data See: Order By. If you want to know the species code look directly above the table at “species code”. To save results to your computer as a CSV (comma-separated value) file, highlight the data that you want and cut and paste into an Excel or Google doc spreadsheet.

4. To see a summary table of the data you have selected, click on "Summary of selected data." To see a summary table of all data available for a given project, select the project and click on "Summary of all data for this project."

5. Use whatever graphing program you feel comfortable using to make a graph.

6. Follow rubric to make the graph and write 3-5 sentences that reflects the information on graph.

7. Print and SUBMIT a) Table b) Graph and c) Conclusion Paragraph with both your names on it.

Graphing Rubric

Criteria	Possible Points	Points Earned
Appropriate type of graph to present the data and address the question	2	
Appropriate Title, reference the SSH for description	2	
Axes labels and units in parentheses	2	
Minor units are a power of 10 and **major** units are well chosen	2	
Features for your graph chosen appropriately	2	
Legend/Key is informative		
Trendline included *if appropriate*		
Color choices clarify the data		
Points earned =		