



Harvard Forest Schoolyard Ecology Online Graphing Exercises



Woolly Bully and the Hemlock Tree

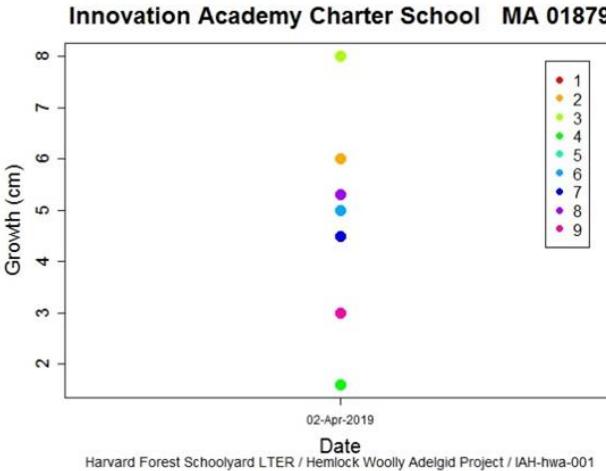
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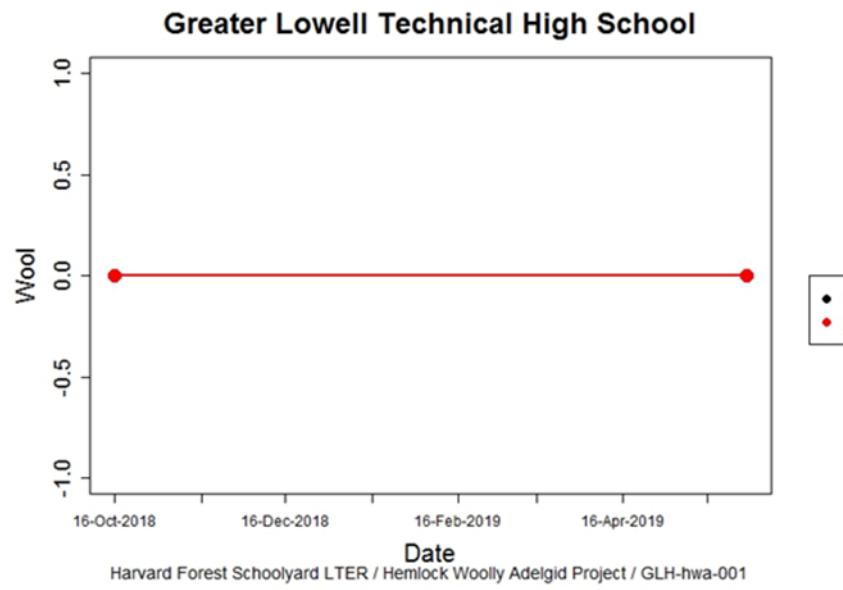
The following exercises have been designed for teachers participating in the Harvard Forest Schoolyard LTER Program, using the online graphing tools that are built into the HF Schoolyard Database.

To access the HF online graphing tools, go to: https://harvardforest2.fas.harvard.edu/asp/hf/php/k12/k12_graph.php

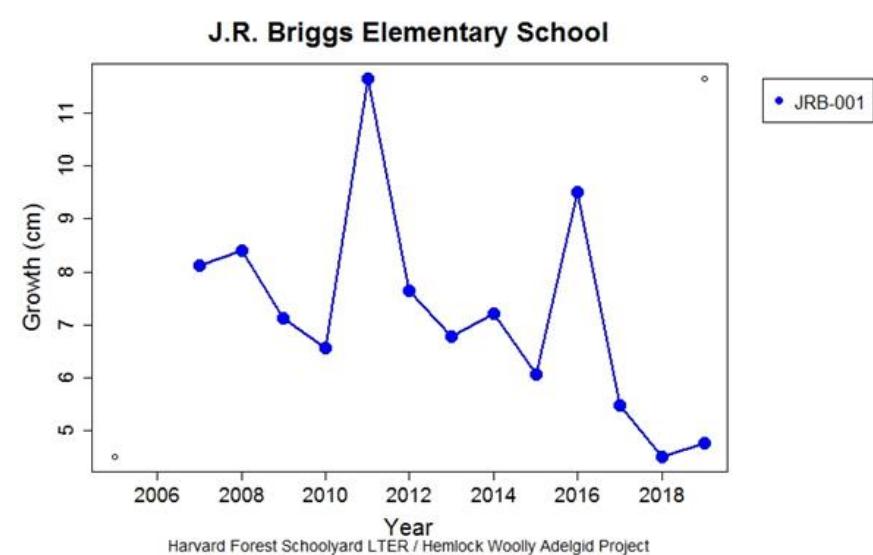
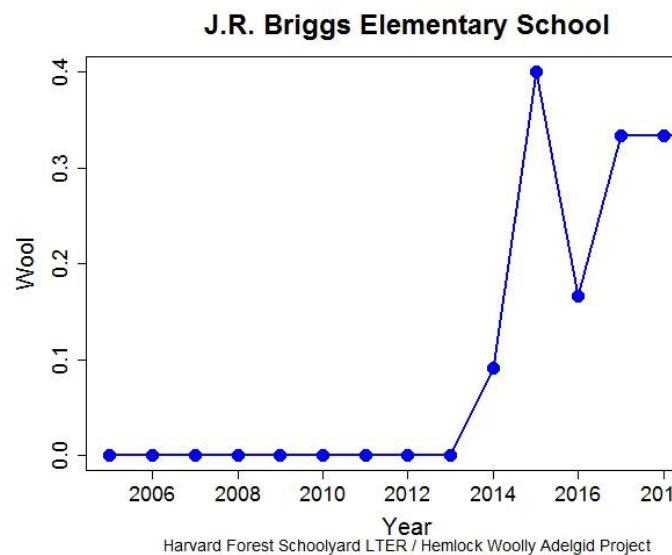
Please respond to each of the following questions. Then try to create similar graphs for the project(s) you are working on, using your own site's data and/or the sites shown on cross-site graphs.



- The graph above shows one observation of growth of Hemlock study branches. What do you notice about hemlock growth at this site?



2. In looking at this graph of 2 years of observations of “wool” (the amount of Hemlock Woolly Adelgid egg sacs on study branches), do you see any change in the amount of wool?
3. These data tell a different story than you might have expected, given the danger our Hemlock trees are in here in Massachusetts. How might you discuss this with students to give them a broader perspective of how the Adelgid is impacting forests in New England? Are there other data you can pull from this database that might show a different story than this site’s data?
4. How might you get across the importance of continuing this study, given the zeros in the data set?



Using the longest-term data set for the Woolly Bully and the Hemlock Tree project, these graphs tell a story of the arrival of the invasive insect, the Hemlock Woolly Adelgid.

5. When did the Hemlock Woolly Adelgid arrive at this site?
6. How many years of zeros (no wool) are represented in this dataset?
7. Why was it important that students continued to collect data during those years when zero egg sacs were observed?
8. How do you think the growth of the Hemlock trees was impacted by the arrival of the Woolly Adelgid?

9. What do you predict will happen to the hemlock trees at this site in the next 5 years? 10 years? 50 years?

Once you have created graphs like each of these above using your own site's data or the same cross-site data, depending on the graph and the data available, you may choose one of the following options:

- Complete the online graphing exercises for one or more other projects.
- Begin the Level 2 Graphing Exercises by Dr. Betsy Colburn.
- Play with the online graphing tool to create more varieties of graphs based on your own scientific questions.
- Develop a lesson plan for your students using the online graphing tool to meet your educational goals.