

TITLE: Are lichens reliable bioindicators of ground level ozone?

Organization: Chartiers-Houston 7th Grade Accelerated Science

Authors: Accelerated Science Periods 2 and 4

Grade Level: Secondary

Project Type: Research Reports

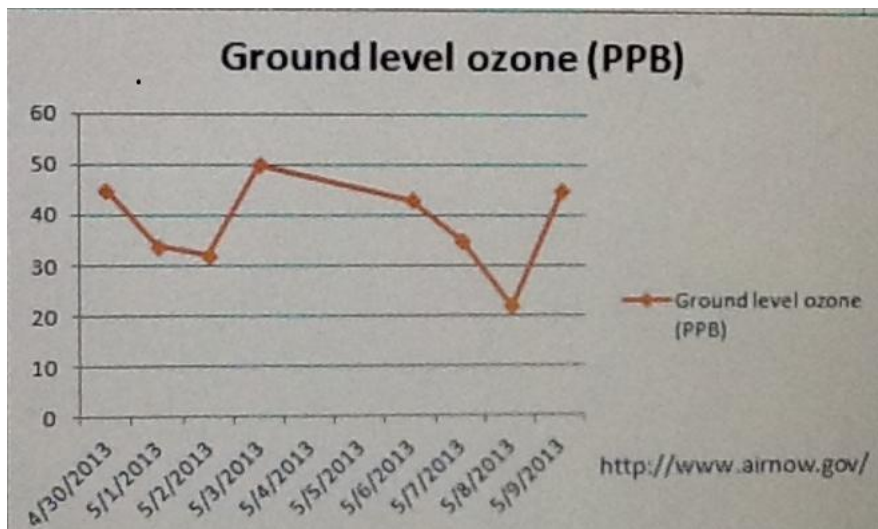
GLOBE Teacher: Gary Popiolkowski

RESEARCH QUESTION - Students will collect information about the types and percent lichen coverage on our campus and in their neighborhoods and compare those results to ozone strips we prepare. Lichens will be classified into three categories as to their sensitivity to air pollution. We hypothesize that the bioindicators will compare favorably with the ozone strips and be a reliable method to measure air quality.

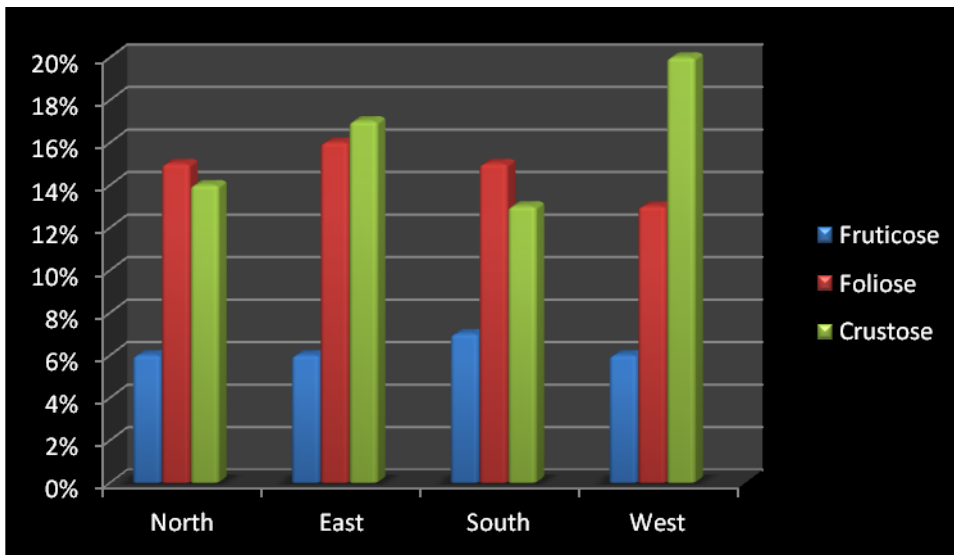
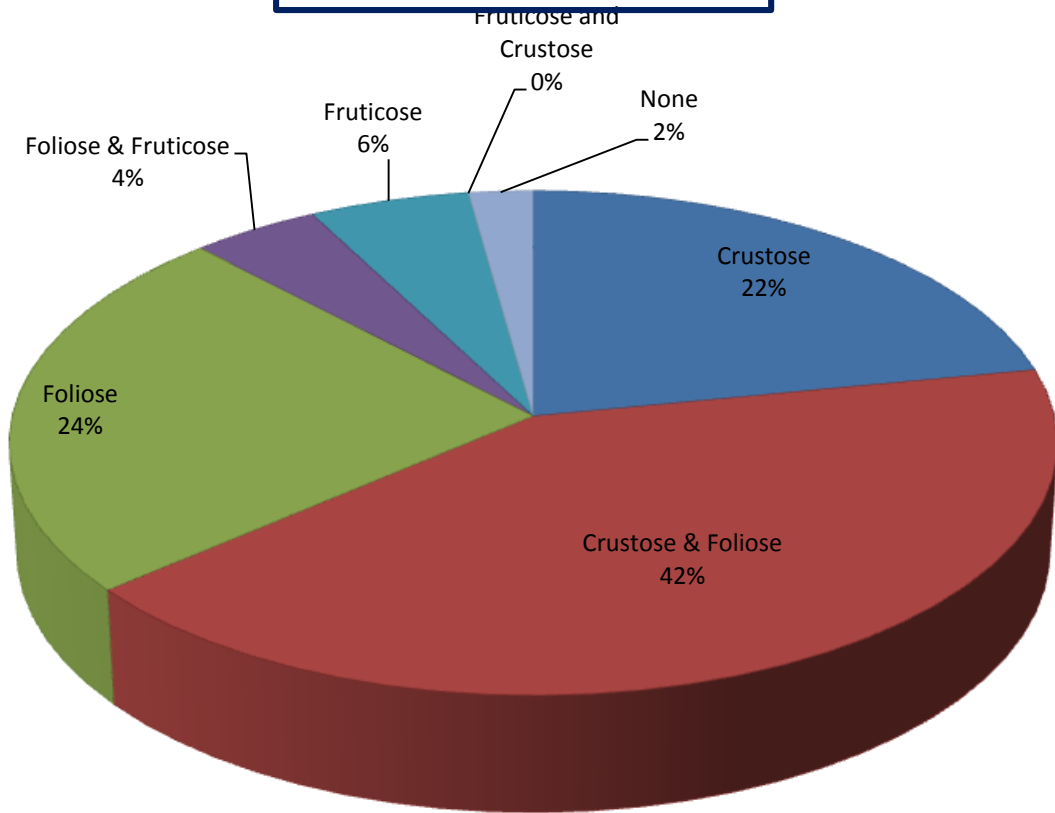
PROCEDURE: The procedure:

1. Select at least 6 trees in your neighborhood.
2. Determine DBH: extend both arms forward touching tree.
3. Use compass and GPS to locate cardinal directions (north, south, east, and west) and latitude/longitude.
4. At each cardinal direction at DBH, place the clear 100 circles grid on the tree.
5. Position the grid, observe/record the percentage of cover. Count the type in each circle to give an estimate of the percentage of cover for each group.
6. Finally, identify the lichen by one of the three general categories, crustose, foliose or fruticose.
 - Crustose- poor air quality
 - Crustose/foliose- moderate air quality
 - Crustose/foliose/fruticose- very good air quality
7. Expose the ozone strips each day according to GLOBE protocol.

DATA:



Lichen Combination %



CONCLUSION: Our data supports our hypothesis in that lichens are reliable bio-indicators if ozone strips are unavailable. There are, however, additions that we can make to this study. One example is to survey more areas. Another way to better this study is to place ozone strips at different times of day. Also, we can compare if there are any differences between deciduous and coniferous trees and the lichens that populate them. We could also compare the lichens facing each different cardinal direction. Even though we are not in Chartiers anymore, Toto, the Land of Oz seems to have healthy air quality.