

Wisconsin NatureMapping Asian Beetle Study

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High School Data Analysis Options

Data Analysis Options

One of the strengths of the Asian Lady Beetle project is its flexibility. The teacher has a wide range of options when designing a classroom project. Therefore, the ideas below are only a list of options.

Data management

To facilitate data analysis, the data should be exported from the Nature Mapping program and imported into a spreadsheet (e.g. Microsoft Excel) or data analysis software.

Basic statistics

Using data generated by students or available in the Nature Mapping program, students could calculate summary statistics: mean, median, mode, range, standard deviation, variance, quartiles, etc. For more advanced basic statistics, students could calculate a confidence interval around the mean.

Advanced statistics

One of the most useful ideas which can be explored during field studies is the appropriate use of statistics. The Asian Lady Beetle project provides an opportunity for students to learn about various statistical tests and determine which test is most appropriate for a particular application.

Using advanced (for high school) statistics allows the opportunity to test a hypothesis, or more specifically, a null hypothesis. Options include tests of significance: t-tests (testing for the difference between two means), X^2 tests (testing assumptions about distribution), or AVOVA (testing for differences in multiple groups of data, with one or two variables). Other options include determining the strength of the relationship between two variables, correlation if no cause/effect relationship can be assumed or regression if a cause/effect relationship can be assumed.

Graphing

Graphing is another tool which is useful in helping students visualize the data. For basic applications, graphing alone may be sufficient. For testing hypotheses, however, graphing should be accompanied (ideally, preceded) by statistical analysis. This

prevents the temptation to “cheat” and see relationships in the data which are not statistically significant.

Appropriate graphing methods include, but are not limited to: histograms, stem and leaf plots, box and whisker plots, time series graphs, and XY graphs.

Mapping Options

The advantage of the Nature Mapping program is twofold. One, it provides a free, web-based method of mapping data. Two, it provides an easy way to compare data from many different sources. Some mapping options for the Asian Lady Beetle project include:

- mapping Asian Lady Beetle data alone to examine distribution, either locally or state-wide
- mapping beetle densities in different areas
- mapping beetle data in conjunction with other species to see if any correlations may exist
- mapping beetle data in conjunction with other available data: water, state/county forests, etc. to see if any associations occur