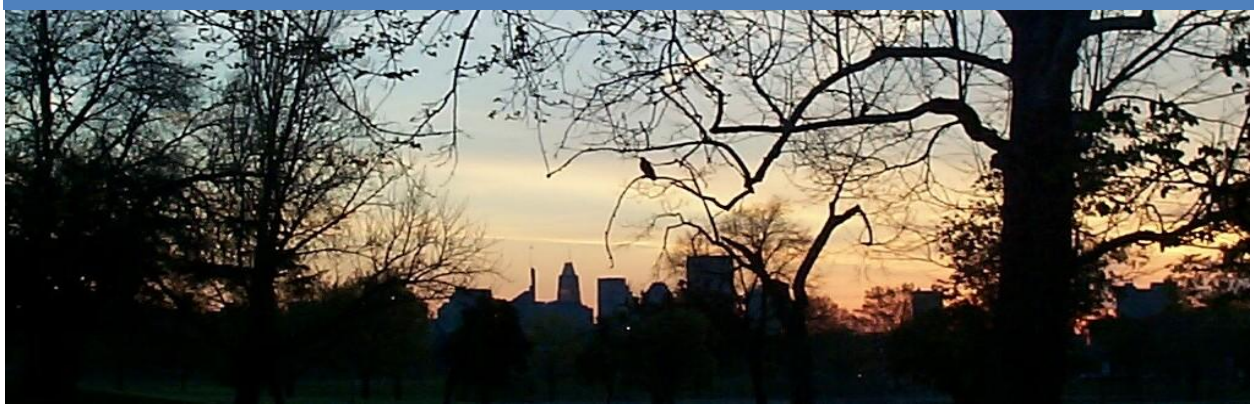
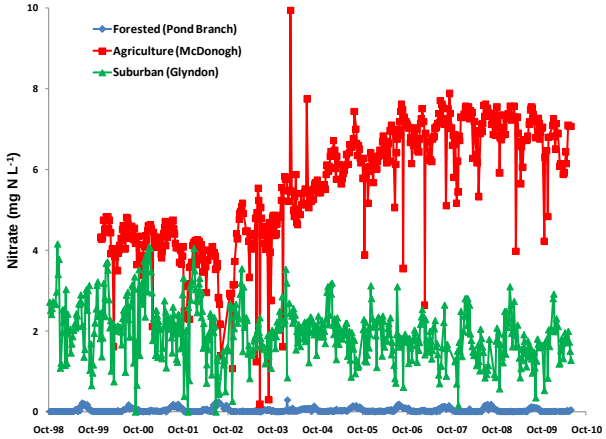
Baltimore Data Jam Competition

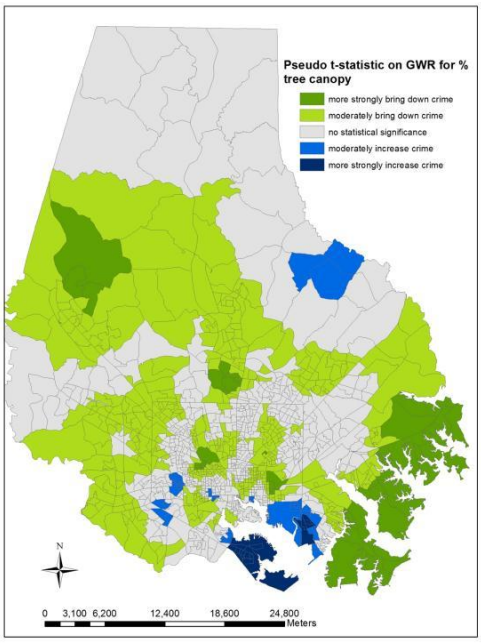
Teacher Guide

Bringing socio-ecological data to "life" for non-scientist audiences

Guidelines for the Spring 2020 Competition







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Project Overview

Welcome to the Baltimore Data Jam Competition!

Baltimore is the focus of exciting and groundbreaking research on cities. For the past 17 years, scientists with the Baltimore Ecosystem Study (BES) have been studying the city and its surroundings as a socio-ecological system, or ecosystem. This pioneering research encompasses nearly every aspect of the city – its people, its soils, plants, animals and microbes, its history, institutions, economy and neighborhoods and its waters, airs and even the ground beneath our feet. The BES is a Long-Term Ecological Research (LTER) program supported by the National Science Foundation (NSF) and its many participating institutions. There are 28 other LTER projects.

The wealth of data about this region is tremendous. In fact, many urban scientists consider Baltimore the most intensively studied city in the world! We now are working harder than ever to find new, creative ways to summarize and present these data to nonscientist audiences.

The Baltimore Data Jam Competition has been designed to let you and your students use your creativity and skills to find interesting ways to present some of these data and other results. **You will use datasets that have been collected in and around Baltimore.** You are strongly encouraged to use one of the datasets provided on the Baltimore Data Jam website. However, other datasets may be allowed, if approved by Baltimore Data Jam staff. Such datasets are readily available on the BES website (www.baltimoreecosystemstudy.org) as well as on online data centers such as the EcoTrends website (https://www.ecotrends.info/) which houses datasets from all the LTER sites.

Projects will be judged using the criteria detailed on page 7. As you will see, the Baltimore Data Jam Competition emphasizes creativity in presenting data. These are the very skills that are and will continue to be necessary as our ability to collect data outpaces our ability to make it understandable to the general public.

Data Jam Web Address: https://baltimoreecosystemstudy.org/data-jam/

For more information, please contact:

Bess Caplan (caplanb@caryinstitute.org, 410-455-1863) or
Alan Berkowitz (berkowitza@caryinstitute.org, 845-677-7600 ext. 311)

Dates to remember:

- Final registration by **May 6, 2020**
- Projects must be submitted electronically by **May 27, 2020**
- Winners announced on **June 19, 2020**

Data Presentation Examples

Anyone who follows major league sports, and especially baseball, knows the incredible amount of data that is collected during each and every game. Craig Robinson is a self-proclaimed baseball fanatic who has turned some of these data into fun and fascinating graphics in his book Flip Flop Fly Ball: An Infographic Baseball Adventure and on his website www.flipflopflyball.com. Here is one example of his work that makes even arcane statistics accessible and understandable for the general audience:

Note that Mr. Robinson took data available to everyone, but found a way to summarize and present it in a way that few others would. "Infographics" like those created by Mr. Robinson are becoming increasingly popular.

Keep in mind that graphical presentations are not the only option for presenting science to non-scientists. For example, students attaining a Ph.D. in science can create a dance explaining their research and enter it in the Dance Your Ph.D Contest (http://gonzolabs.org/dance/). In last year's Baltimore Data Jam Competition, students created songs, videos, physical models and interactive models.

Now it is your turn! How can you present ecological data collected near and about Baltimore to explain the major conclusions to nonscientists? We do not wish to limit you here - you can create a graphic, story, play, song, or other product. Just make sure it illustrates interesting trends or comparisons in the data.

We can't wait to see what you create...

Rules and Procedures

Prizes
Prizes will be awarded for first, second and third place. A Director's Choice award will be given at the discretion of the Data Jam Director. Separate prizes are awarded to middle and high school student projects.

Teams
Students can work on projects on their own or in groups of **no more than three students**. Prizes are awarded for a project, so winnings must be split between team members if a team consists of more than one student.

Registration
Registration for the Baltimore Data Jam Competition is required. All registrations must be completed by **May 6, 2020.** To register:

a. Access the registration word document on the BES Data Jam Competition webpage. Complete the document and email to caplanb@caryinstitute.org.
b. You will receive a confirmation by email. If you have not received a confirmation within three days of submitting your registration, please email the Data Jam Director at caplanb@caryinstitute.org or call the BES Education office (410-455-1863).
c. **All students participating in the competition must complete the student consent form**. Team projects from which a student has not completed this form, will not be judged. Forms can be accessed on the Baltimore Data Jam website in the *Rules and Regulations* section.

Data to Use for the Project
You and your students are strongly encouraged to use one of the datasets made available on the BES Data Jam webpage. These datasets were taken directly from BES long term datasets and reduced to a manageable size. Included with each dataset is a word file called "metadata." Here, you will find background information on the dataset, including who, when and how the data was collected and information on the topic of the data. If you choose to use another source for data, please confirm the viability of the dataset with a BES educator. Remember, all Baltimore Data Jam projects must use data from the Baltimore region, and focus on either *trends over time* or *comparisons*.

Parts of the Project
Each submission to the Baltimore Data Jam Competition will include two parts – a scientific report and an interpretive creative component.

- **Report.** Each team must submit a report that summarizes their project for judges and others to review. Middle school students are encouraged to use the Middle School Report document, which can be found on the BES Data Jam webpage.

- **Interpretive Creative Component.** This part of the project is where students should emphasize their creative sides. How can students relay the interesting trends or comparisons they discovered in their datasets to a non-scientist audience? The creative presentation should **clearly explain the <u>data</u>** to someone without the scientific knowledge to interpret datasets or graphs on their own. Skits, videos, original songs, poems, photographs, exhibits, sculptures and interactive displays are encouraged. Presentations that involve live performances must be submitted as electronic audio or video files. Audio or visual recordings should be kept to 3 minutes or less. Past wining projects can be viewed on the Data Jam webpage.

Data Jam Report

Middle School:
The Data Jam report for middle school students should be completed using the document titled: *Data Jam Middle School Report.* Students should complete all components of the document. Extra credit will be given to projects that include information and citations from a source other than what's provided in the Metadata file.

High School:
The Data Jam report for high school students should be completed following the guidelines outlined in Table 1. Students should include all report components in their final submission. High school students are required to include information and citations from two sources other than what's provided in the Metadata file. These sources could come from scientific publications, newspaper articles or reputable online sources.

Table 1: High School Report Components	
1. Introduction	Identify the question you are trying to answer with your data. State your null and alternative hypotheses. Identify the variables in your dataset(s).
2. Dataset Description	Provide as much information as possible about the dataset(s): How the data were collected and where, year(s) they were collected, researchers involved in the project, and any other relevant information. Discuss any additional information possible about the variables in the dataset(s) and why a scientist might study these variables.
3. Data Trends or Comparisons	Describe the trend(s) or comparison(s) in the dataset(s) you used for your project. Examples:

	a. The population increased over time with a sharp decrease in 1995 b. The annul precipitation was higher in town A than in town B If you used two or more datasets for comparison, how were data similar? How were they different?
4. Representations	Include a graph or graphs of the data. Graphs must be labeled correctly.
5. Explanation	Use reasoning and what you know about the topic to explain the trend or comparison you discovered. Why is it interesting and important? What basic principles or processes might be at work in causing what you discovered? Use basic descriptive statistics (mean, standard deviation, t-test, etc.) to describe variability. Explain potential sources of variability.
6. New Questions and Hypotheses	Give at least two new ideas (hypotheses and/or questions) about future scientific research related to your dataset.
7. Brief Reflection	Give a written reflection on the process of synthesizing data and finding ways to present it. hich part was the most fun? What challenges did you have along the way? hat did you learn? What other questions do you have?
8. Reference list	Include at least two references from outside of the Metadata document.
9. Written Explanation of Creative Methods	Explain why you chose your creative method.

Submitting Your Project

Instructions for submitting projects will be posted to the BES Data Jam Competition webpage in early Spring 2020. All project materials must be submitted electronically (exceptions will be made for creative projects that require in-person viewing) by May 27, 2020.

Deadlines

- **May 6, 2020** – Each student team needs to complete a registration form to reserve a spot in the competition. Registration is accessed through the BES Data Jam webpage: https://baltimoreecosystemstudy.org/data-jam/ The registration link and forms are in the *Data Jam for Teachers* section.
- **May 27, 2020 –** Projects must be submitted electronically by 11:59pm. Early submissions are welcomed and encouraged! Submission guidelines will be posted to the BES Data Jam webpage in Spring 2020.

How Projects will be Judged

Judging will take place between May 28th, 2020 and June 19th, 2020.

A panel of judges, including scientists and nonscientists, will evaluate each project based on the following criteria:

Criteria for Judging High School Projects

1) Overall Content and Organization (10 points) – Does the report have a clear and engaging title, names of all student authors, grades and school name? Does the report contain all nine components listed on pages 5-6? Is the report organized with proper mechanics and style? It is typed in a readable font, easy to understand, neat and free from spelling and grammatical errors?
2) Scientific Merit (50 points) – Does the report include an introduction to the data set, a discussion of the data trend(s) and/or comparison(s)? Is a graph included and correctly labeled? Does the data explanation section use reasoning to explain the trend or comparison and does the explanation fit with what the graph is showing? Are basic statistics used to explain the accuracy of the data? Are new questions and hypotheses discussed? Were outside sources used?
3) Creativity in Communicating Data (40 points) – Is the project idea creative and unique? Is the project successful at making data understandable to a non-scientist audience? Is data integration obvious? Are data discussed, or displayed accurately in the product? Does the report include a written explanation of the creative method, including a discussion of why this method of creative display was chosen?

Middle School projects will be judged by the completeness of the Data Jam Middle School Report in addition to the creative project. Teams may either hand write or type (preferred) responses in the report document. Graphs may either be hand drawn or created in excel or another graphing application and attached to the report. Extra credit will be given to middle school teams who include citations from sources outside of the provided metadata. Points given for each judging category are as follows:

- Completeness, Overall Content and Organization – 10 points
- Scientific Merit – 50 points
- Creativity in Communicating Data – 40 points

A judging rubric is available in the student guide. Please refer to this guide for more details on how the projects will be judged.

Announcing Winners

The winning teams will be announced on the BES Data Jam webpage on June 19th, 2020.

Questions

Please feel free to contact the Education Office of the Baltimore Ecosystem Study if you have any questions about the project or competition. 410-455-1863– caplanb@caryinstitute.org – www.baltimoreecosystemstudy.org

BEST OF LUCK AND HAVE FUN!!!