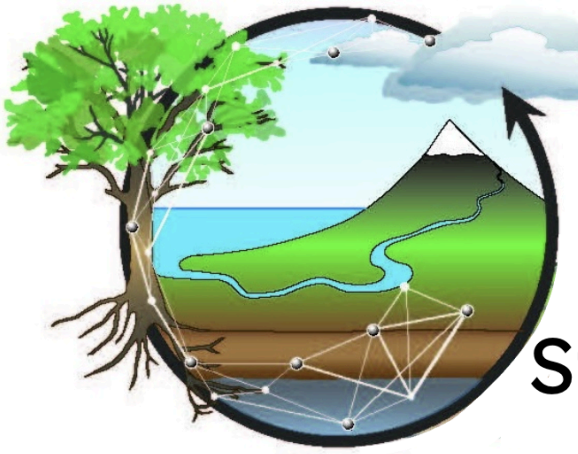

UCZ Data Jam

Student Handbook

Making Data “Sing” Through Creative Expression

2025 Handbook

Urban Critical Zone Data Jam Overview

Welcome to the Critical Zone Data Jam!

The Critical Zone - Earth's living skin, from the bottom of the groundwater to the top of the canopy - integrates geology, hydrology, ecology, atmospheric & social sciences. The Urban Critical Zone (UCZ) network of scientists studies the impacts of urban processes on water, soil and air across the Fall Line between the Piedmont uplands and the Coastal plain. Sites span from Philadelphia, PA in the north through Baltimore, MD, Washington, DC and on to Raleigh, NC in the south, representing a range of climates, age and density of development.

Through our Data Jam, we hope to empower students living in and around the Fall Zone to tell the stories found in the data collected by our UCZ scientists. We believe that the skills of understanding, interpreting, and presenting data are essential in a world where our ability to collect data outpaces our ability to make it understandable for a public audience.

Data Jammers will immerse themselves in authentic, local datasets collected by professional UCZ scientists and researchers. Whether students create a graphic, song, video, sculpture, computer game, puppet show, or children's book...their imagination is the limit!

The UCZ Data Jam emphasizes creativity in presenting data. These are the very skills that will continue to be necessary as we strive to make local science understandable to the general public.

Happy Jamming!

Exploring Data Through Art

(Adapted from Stephanie Bestelmeyer, Asombro Institute for Science Education)

Anyone who follows major league sports, and especially baseball, knows the incredible amount of data collected during each game. Craig Robinson is a self proclaimed baseball fanatic who has turned some of these data into fun graphics in his book Flip Flop Fly Ball: An Infographic Baseball Adventure (if you want to learn more, check out this video). The sample infographic shown here illustrates how Mr. Robinson took data available to everyone, but found a way to present it in an innovative way. "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, in 2008 an annual contest was started called “Dance your PhD” which allowed students attaining a PhD in science to create a dance explaining their research and enter it in the contest (here’s a link to the 2023 winner in Biology). How can you present critical zone data from the Fall Zone to nonscientists? Teams can use any artistic media they like, just as long as their creative product illustrates interesting trends or comparisons in the data.

Competition Essentials

Teams
Students can work on projects on their own or in groups as small as two students or as large as a whole class. Prizes are awarded for a project, so if a project is submitted to the UCZ Data Jam Competition and places, winnings must be split between team members.

Registration
If entering students in the UCZ Data Jam, teachers/advisors must register their student(s) by the deadline listed under Deadlines & Important Dates. Registration is non-binding, but is extremely useful for us so we can estimate the number of judges we will need.

To register:

1. Fill out the registration form on the UCZ Data Jam website. Only one registration form is necessary for each advisor.
2. You will receive a confirmation by email. If you have not received a confirmation within 24 hours of submitting your registration, please email us at hooda@caryinstitute.org.
3. All students participating in the competition must complete the student consent form with their parent/guardian. Due dates for consent forms are listed under Deadlines & Important Dates. Team projects with missing consent forms cannot be judged.

Which data should we use?
We have provided three datasets collected by UCZ science and research teams. Our datasets are available on the Datasets page. Each dataset includes the data, as a view-only Google Sheets file, and background information about the dataset.

If you want a fun, easy way to try graphing and exploring data, we recommend Concord Consortium's Common Online Data Analysis Platform (CODAP).

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

1. **Report**. Each team must submit a report that summarizes their project for judges and others to review. The report is worth 55% of the total project score. If submitting projects to be judged as part of the UCZ Data Jam competition, the report should be completed using the UCZ Data Jam Report Template.
2. **Interpretive Creative Component**. Communicate your findings! The creative piece should clearly explain the data to someone without the scientific knowledge to interpret datasets or graphs on their own. Skits, videos, songs, puppet shows, poems, photographs, exhibits, sculptures, interactive displays and more are encouraged. The projects will be judged online, so live performances must be submitted as electronic audio or a YouTube video. **Recordings must be 5 minutes or less**. The creative project is worth 45% of the total project score.

Data Jam Report

If submitting your Data Jam project for judging, the Data Jam report should be completed using the document titled: *UCZ_DJ_Report_Form* found in the Important Documents tab of the website. If submitting their projects to the UCZ Data Jam competition, students should complete all components of the document as outlined in the table below. **Students submitting projects for the UCZ Data Jam competition are required to include information and citations from two sources beyond the Metadata file provided**. These sources could come from scientific publications, newspaper articles or reputable online sources.

Report Components *NOTE: These are the same components outlined in the Judging Rubric, but this chart gives more detail.* Reports should be no more than 10 pages including figures, tables and text (single spaced, font at least 11 pt, margins of at least 1")	
1. Title/Organization*	Include the title, name(s), grade(s), and school name(s) of all students who participated in the project. The report should be typed in a readable font, well organized, and free of spelling and grammatical errors.
2. Introduction (1 paragraph)	Start your report by describing your topic to someone unfamiliar with it. Include the scientific question you investigated and a brief claim about what the dataset showed. Give an overview of the project but do not go into specific detail in your introduction.
3. Dataset Description (1 paragraph)	Introduce the data to the reader. Explain what the variables are. Include as much information as you can about who collected the data, how they collected the data, where they collected the data, when they collected the data, and why they collected the data, and any other relevant information. Explain why a scientist might study these variables.
4. Data Representations (Graphs)	Your team will need to create at least one graph or chart of the data. Hand-drawn graphs are acceptable if they are neat and legible. Remember to label your axes and include a graph title. If you selected a large dataset, your representation only needs to include the variables that are relevant to your investigation.
5. Data Trends or Comparisons (1-2 paragraphs)	Describe the trend(s) or comparison(s) in the dataset(s) you used for your project. In other words, What does the graph look like? You are encouraged to use basic descriptive statistics when appropriate (ex: average, range, standard deviation). Describe and address variability, if applicable. *Examples:* ● *The average annual blue crab population increased over time from 158 to 2,703 crabs/m^2.* ● *Despite the overall increase in pearly mussels from 1995-2010, the mussel population sharply dropped in 2003.* ● *The precipitation in Dead Run was variable from 1997-2012.* ● *Fish populations were higher in Beacon than at Norrie Point in 2008.* ● *There appeared to be no clear correlation between phosphorous and salinity levels from 1990-2000.*

	If you used two datasets for a comparison, how were the data similar? How were they different?
6. Data Interpretation (Explanation) (1-3 paragraphs)	Use reasoning and what you know about the topic to explain the trend(s) or comparison(s) you discovered. In other words: Why do you think the graph looks the way it does? Why do you think your trend happened? Why is your finding interesting and important? Are your results expected or surprising? What environmental processes might be causing what you discovered? Make sure to support your explanation with evidence and be consistent with current scientific ideas. *HINT: This could be a good place to bring in outside resources!*
7. New Questions and Hypotheses (1 paragraph)	Remember -- for your creative piece, your job is just to describe the data. However, when you look at data closely, you might start asking more questions that you can't answer without more research, such as 'Why did the numbers go down in 2003?' Or, 'What's happening in Beacon to make the site so different from others?' The report is your place to ask 'Why?' and 'What's up with that?' and then brainstorm some hypotheses. Hypotheses are the explanations your brain comes up with when you ask that 'Why?' question. You start thinking 'Maybe...' That 'maybe' is your hypothesis. Be sure to give at least two new ideas (hypotheses and/or questions) about future scientific research that could be done on this topic.
8. Written Explanation of Creative Project (2-5 sentences)	Explain: 1) Why you chose your creative method and 2) What message you hope audience members will take away from your project. For example, "We believe the best way to help a general audience relate to and understand our findings is to create a fun, engaging, educational video. We hope that people who watch our video will realize that salt levels in the Hudson River strongly affect where different fish species can live." If you create an abstract visual art piece like a sculpture you may need a longer description here.
9. Brief Reflection on Data Jam (2-5 sentences)	Let us know what you thought about your Data Jam experience. You might consider the following questions: Was Data Jam challenging or easy? What was the hardest part? What was the most fun part? What did you learn from Data Jam? How would you change Data Jam if you had the chance? Do you think there is a way to share your project with an audience outside of Data Jam?
10. Reference List	Include at least two references from outside of the Metadata document (e.g., data source, graph or table source, and anything used to explain the data interpretation). You can use any standard citation form (APA, MLA, etc.)
11. Link to Creative Project (if applicable)	If you upload your creative project to YouTube, make sure you include a link for judges! Videos should be no more than 5 minutes long.

Submitting Your Project for UCZ Data Jam Competition

If you are submitting your project to the Urban Critical Zone competition, you will submit through Google Drive. Teachers/advisors are responsible for submitting all projects in their Google Drive folder. Advisors will upload projects to the Drive folder and fill out a "Student Information" sheet with individual and group information. The report and creative project must be uploaded as a single PDF and videos must be uploaded onto YouTube. **All video links must be included in the report and they must be 5 minutes or less.** *Pro Tip: If you are submitting a video with a dialogue or narration, it can be helpful to send the script in as well! That way if the judges have a hard time hearing the dialogue on your video, they will still be able to understand what you are saying.* Please check the sharing settings on videos to ensure we can view them.

Students' projects will only be judged if they contain both a report AND a creative component. Please pre-screen your students' work and only submit complete projects. See notes below about YouTube video requirements.* Please only submit complete projects.

Instructions to advisors for uploading projects:

1. 1. Check email after registration: A personal Google Drive folder link and a Consent Form link will be shared with you by the Cary Education team.
2. Notify us (hooda@caryinstitute.org) once all participating student consent forms have been submitted electronically.
3. Please review your students' projects to be sure they address the requirements outlined in the rubric. We are lucky to have a wonderful pool of judges who are very excited to volunteer their time reviewing projects that have been completed thoughtfully and thoroughly.
4. Drag and drop or Save student projects to your folder. Please use the file name generated in the "Student Information" Google Sheet in your folder. The
5. spreadsheet will automatically generate the proper title in this format: "Project Title_Level of Dataset_School Name.pdf" Here is an example of a proper file name: Mussels on the Move_Level 1_Cary Middle School.pdf

*All videos must be submitted as a YouTube link, and the video must be "unlisted" so that judges can view it with permission. Please ensure that your students' YouTube links are included in their reports. Videos that exceed 5 minutes in length will be disqualified.

Please note: The use of copyrighted music in project videos may result in YouTube's removal of these videos from their website. Check out Free Music Archive and other free music websites for tunes available through Creative Commons. If students want to use copyrighted music on YouTube, they must first obtain permission from the original creator. Projects that contain copyrighted material will not be judged.

How Projects will be Judged

Projects submitted for judging as part of the UCZ Data Jam competition will be judged online between April 28 and May 22.

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

- Scientific Merit (Report) – 42 points
- Creativity in Communicating Data – 34 points

Please refer to the judging rubrics (available in the Important Documents page) for details on how projects will be scored.

Announcing Winners
We will announce the winning projects at the Urban Critical Zone Data Jam Awards Ceremony & Celebration virtually on May 28, 2025. Students do not need to be present at the Ceremony to win, but are encouraged to attend! We will also post the winners and honorable mentions on the UCZ Data Jam Project Gallery shortly after the competition.

Prizes
Prizes will be awarded separately for middle and high school students. Each age group will include:

- First prize - $400
- Second prize - $200
- Honorable Mention (up to 3 per age group) - $50

Rules & Regulations

Eligibility
The UCZ Data Jam Competition is open to all current middle and high school students (grades 6-12).

Team Advisors
Participation in the UCZ Data Jam Competition requires coordination by a responsible adult who agrees to facilitate and validate studentparticipation. Educators (grades 6-12) of all subject areas are encouraged to get their students involved. Adult advisors can be teachers, parents, guardians, or other mentors.

Registration Period
Registration for the 2025 UCZ Data Jam Competition is required, and due no later than April 4, 2025.

Project Entry Period
Project entries for the UCZ Data Jam Competition are due online by 11:59 PM EST on May 7, 2025.

Student Privacy
Student privacy is important to us. All adult team advisors will receive parental/guardian consent forms for permission of student participation and the release of limited personally identifiable student information (i.e., student name, grade level and gender, school name, hometown, photographs, video or audio files of the student, and project entry). These consent forms should be completed and signed for each participating student and returned to the student's team

advisor. A unique link to a Google form will be provided to each advisor to collect consents from students' families. Consent forms are due May 1, 2025.

Publicity & Rights
By entering a project into the UCZ Data Jam Competition, the project creator(s), parent(s)/guardian(s), and the team advisor grant to the Cary Institute of Ecosystem Studies world-wide, royalty-free, non-exclusive license to use all materials submitted by the student teams into the UCZ Data Jam Competition for publicity and educational purposes.

Cary Institute of Ecosystem Studies may post information about the UCZ Data Jam Competition in the Cary newsletter, on the Cary website, in the Cary annual report, and on the Cary and UCZ Data Jam Competition website. Project entries may be published without compensation through any or all of the above sources in whole or in part. Submitting a project entry does not guarantee it will be publicized. We will not publicize any student information without prior parental/guardian consent. Anonymized student project submissions may also be used for educational purposes as part of Cary Institute education programming.

Plagiarism
Project entries cannot include plagiarized work. Plagiarism is considered the deliberate copying of someone else's thoughts, ideas, expressions, words, artistic expressions, or scientific work without formally acknowledging its source. Plagiarism includes project entries that are comprised substantially of someone else's work, copying words or ideas from someone else without giving credit, the failure to put quotation marks around unmodified content that was copied from an outside source, and the use of photos, graphs, charts, or other images without acknowledging their source. Project entries that include plagiarized content will be eliminated from the competition. We recommend teams working together to help each other avoid plagiarism. The best way to ensure your work is original is to be creative!

This competition requires students to use information that is not their own, and thus merits increased diligence to proper source acknowledgement. Students will use data (scientific work) collected by a group of researchers. Students are also welcome to use any of the images provided on the "Datasets" page in their project entries. In order to avoid plagiarism, students should be sure to properly cite all sources of information for content that isn't their own original work. This includes noting the data source and the sources of any images copied or modified.

Citations
All project entries must have a complete reference list of all resources used. Any standard citation form is permissible (APA, MLA, etc.), but the same format should be used for all citations for a given project entry.

Additional Disclaimers
1. It is the responsibility of each participant and team advisor to obtain and read these rules and regulations for the UCZ Data Jam Competition.
2. Cary Institute of Ecosystem Studies will not be responsible for any claims, costs, liabilities, damages, expenses, or losses arising from 1) Cary Institute of Ecosystem Studies' use of project entries, 2) the participants' involvement in the competition, 3)

technical failures of any kind, including, but not limited to, computer viruses or equipment malfunctions, 4) travel to and from the teacher workshops, Data Jam Expo, and other related activities, 5) the use of prizes, and 6) any events outside Cary Institute of Ecosystems Studies' reasonable control.

3. Cary Institute of Ecosystem Studies reserves the right to reject any project entry for any reason and at any time, at its own discretion.
4. Cary Institute of Ecosystem Studies may refuse to award a prize if a winning participant does not follow proper registration and project entry procedures, or these rules and regulations.
5. Cary Institute of Ecosystem Studies is not responsible for any technical failures that may affect participation in the UCZ Data Jam Competition.