

## Mountain Creek Mesh TVA Mini-Grant

### (Potential) Partners

- Matthew Craig: VW eLab at Red Bank/RBHS, [craig\\_matthew@hcde.org](mailto:craig_matthew@hcde.org)
- Cara Morris: Biology/RBHS [morris\\_cara@hcde.org](mailto:morris_cara@hcde.org)
- Leah Keith: [GIS & Scientific Methods](#)/RBHS, [keith\\_leah@hcde.org](mailto:keith_leah@hcde.org)
- Erin Woodrow: 7th Grade Science/Baylor School, [ewoodrow@baylor school.org](mailto:ewoodrow@baylor school.org)
- Mary Beth Sutton: [TNSea](#), [marybeth@caribbean-sea.org](mailto:marybeth@caribbean-sea.org)
- Hayley Wise: [Tennessee Aquarium Research Institute](#), [hbw@tnaqua.org](mailto:hbw@tnaqua.org)
- Randy Hale: [North River Geographic Systems](#), Inc, [info@northrivergeographic.com](mailto:info@northrivergeographic.com)
- Jonah Model & Subalekha, [Project Lantern](#)

Water quality monitors can be the new canaries, with their alerts overlaid on known watershed data for the regions they monitor. Working with [Project Lantern](#), we will create long-range wifi-connected sensors to alert agencies of dangers to the water supply.

This project rockets students beyond vague concepts in books into the exciting, rewarding (and, even, sometimes tranquil) outdoor setting of environmental science. Students realize the problem through analysis of the data collected; then, they work collaboratively with other disciplines and community partners to initiate a solution. Hearing that our school has an ongoing issue with run-off means far less without the data that proves the effects when compared to, say, the pristine Conasauga.

The data collected could improve the transparency with which the Chattanooga Sewer overhaul is accomplished. Imagine if, as was the case in 2010, a huge deluge is likely to overwhelm the combined wastewater treatment plant. The volumes uphill can be reported immediately and measures be taken to dampen or divert the flow of rainwater, so as not to inundate the treatment plant.

### Target Audience

Our target audience is, on the outset, kindergarten, middle- and high-school students in a higher poverty demographic looking for real-world scenarios and public works issues they can be involved with. As the data grows, this project, initially begun by students, can be used by scientists and public policymakers toward making the best decisions with regard to water stewardship. Participating in this meaningful project will increase their sense of agency in improving their community.

By integrating the subjects of Computer Science, Electronics, Data Analysis in Mathematics, and the Scientific Method in this critically significant issue, students will be better prepared for their future by understanding the correlational relationship of data to “hunch.”

### Metrics

The simple method of metrics in the beginning will be going from zero sensors to ten, then twenty . Once the wiring of the sensors is accomplished, a milestone will be reached. The next step will be the placement and GIS of the position of the sensors. Most importantly, it will be nice to track views of the data on a daily basis. It will be interesting to do additional analysis on these analytics. Our student STEM team has tracked pH levels, nitrate and phosphates, as well as dissolved oxygen, and turbidity in local bodies of water; these same water sources would be ideal for continuing the process of collecting, analyzing, comparing and sharing data.

Student activists propelled by ownership in the project is the real goal. Our greatest hope is that the data becomes referenced in local policy mandates!

## As Submitted:

TVA Mini-Grant Application – 2018-2019

Mini-Grants administered by the TSIN and STEMx. Please read full grant description and download necessary template at <https://www.tsin.org/programs/for-educators/minigrant-application/> prior to application.

The name and photo associated with your Google account will be recorded when you upload files and submit this form. Not craig\_matthew@hcde.org? [Switch account](#)

Any files that are uploaded will be shared outside of the organization they belong to.

\* Required



Name \*

Email \*

Phone number \*

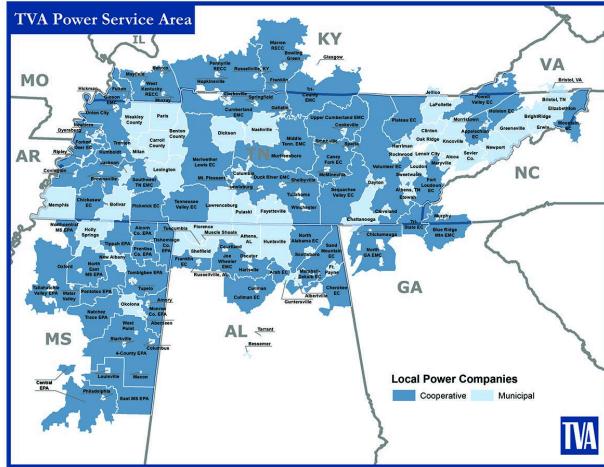
School Name \*

Is this a public school? \*

Only public schools are eligible.

State (School location) \*

Only states served by TVA are eligible.



**County (School location) \***

Only counties served by TVA are eligible. Submissions from non-eligible locations can not be accepted. A full list of counties listed by state is available at:

<https://www.tsin.org/wp-content/uploads/2018/12/TVA-Service-Area-CountyState-2018.pdf>

**Local Power Distributor \***

Only schools served power by a TVA local power distributor are eligible. A full list of eligible distributors is available at:

<https://www.tsin.org/wp-content/uploads/2018/12/TVA-Distributor-List-2018.pdf>

**School Address \***

**School Website \***

**District \***

**School Demographic \***

Please provide a short narrative about the student demographics of your school. (250 characters max)

*Our population is approximately 45% Caucasian, 25% African American, 25% Latino, 5% Asian/other, and 65+% qualify for Free/Reduced Lunch*

**Are you a Title 1 School? \***

Have you received any other funding from TVA or a local power distributor for other programs (i.e. robotics, electric cars, etc.)? \*

If you answered yes to the above, please give a brief description of the other funds received from TVA

**Name of program, class, or project the grant funds will support \***

*Mountain Creek Mesh, GIS*

**Project Narrative \***

Provide a short narrative describing your project and your anticipated results. (1,200 characters max)

*Water quality monitors can be the new canaries, with their alerts overlaid on known watershed data for the regions they monitor. Working with Project Lantern, we will create long-range wifi-connected*

*sensors to alert agencies of dangers to the water supply..*

*This project rockets students beyond vague concepts in books into the exciting, rewarding (and, even, sometimes tranquil) outdoor setting of environmental science. Students realize the problem through analysis of the data collected; then, they work collaboratively with other disciplines and community partners to initiate a solution. Hearing that our school has an ongoing issue with run-off means far less without the data that proves the effects when compared to, say, the pristine Conasauga.*

*The data collected could improve the transparency with which the Chattanooga Sewer overhaul is accomplished. Imagine if, as was the case in 2010, a huge deluge is likely to overwhelm the combined wastewater treatment plant. The volumes uphill can be reported immediately and measures be taken to dampen or divert the flow of rainwater, so as not to inundate the treatment plant.*

Amount of grant funds requested \*

\$5000

Budget

[LINK TO BUDGET](#)

Please download and complete the budget template located at

<https://www.tsin.org/programs/for-educators/minigrant-application/> and upload completed budget here. All requested funds must be spent by deadline. Proof of expenditures will be required. If you are having difficulty attaching the file, you can email it to [tsin@battelle.org](mailto:tsin@battelle.org). Please be sure to identify the name on the application so that we can match it to the proper documents.



Mountain Creek Mesh TVA-MiniGrant-Budget.xlsx

How many students will the project serve? \*

50

What grades are involved in the project? \*

K, 7-12

Which of the TVA focus areas does your project address? \*

Community Problem Solving

TSIN is committed to supporting 'STEM For All' by exposing traditionally underserved students to STEM exploration. How does this program or project support the concept of 'STEM For All'? \*

*Our target audience is, on the outset, kindergarten, middle- and high-school students in a higher poverty demographic looking for real-world scenarios and public works issues they can be involved with. As the data grows, this project, initially begun by students, can be used by scientists and public policymakers toward making the best decisions with regard to water stewardship. Participating in this meaningful project will increase their sense of agency in improving their community. By working with students in our feeder pattern, as well as a local private school, we can see that this is an important*

*issue, regardless of income.*

(1,200 characters max)

**Student Learning Outcomes \***

What are the anticipated learning outcomes from this project? Specifically, how will this project deepen your students' understanding of STEM? (1,200 characters max)

*By integrating the subjects of Computer Science, Electronics, Data Analysis in Mathematics, and the Scientific Method in this critically significant issue, students will be better prepared for their future by understanding the correlational relationship of data to "hunch." This is a case of applied and tangible, "IMBY" (in my backyard) learning.*

**How will you assess if your intended outcomes were met? \***

*The simple method of metrics in the beginning will be going from zero sensors to ten, then twenty . Once the wiring of the sensors is accomplished, a milestone will be reached. The next step will be the placement and GIS of the position of the sensors. Most importantly, it will be nice to track views of the data on a daily basis. It will be interesting to do additional analysis on these analytics. Our student STEM team has tracked pH levels, nitrate and phosphates, as well as dissolved oxygen, and turbidity in local bodies of water; these same water sources would be ideal for continuing the process of collecting, analyzing, comparing and sharing data.*

*Student activists propelled by ownership in the project is the real goal. Our greatest hope is that the data becomes referenced in local policy mandates!*

(1,200 characters max)

Should I be awarded a grant, I agree to fully expend the grant funds as outlined in the submitted proposal by June 1, 2019. I understand that any purchases not outlined in the proposal must be approved by Battelle Education prior to purchasing.

I agree

I do not agree

Should I be awarded a grant, I agree that everything purchased with the grant funds is to become property of the organization and must stay with the organization even if the individual who requested the grant departs.

I agree

I do not agree

Should I be awarded a grant, I agree to submit a report on the expenditures on or before June 30, 2019. I understand that this report must include a statement of the finances of the project, copies of receipts/invoices, a brief description of the implementation of the project, and at least one photograph.

I agree

I do not agree

Should I be awarded a grant, I give TVA, BVI, and Battelle Education permission to use all information in the submitted proposal as well as photographs, logos, published/printed information, and any other information related to this grant and how the funds were spent in press

releases, on their website, and/or in publications both in print and online.

I agree

I do not agree

I understand that grants can only be made to an organization (school, district office, ect.) and will not be made to an individual.

A W9 for your organization will be required. Checks can not be written to an individual.

I agree

I do not agree

Would you like to sign up for our newsletter and receive notifications of other STEM opportunities in your area? \*

Yes

No thank you