

# LIFE valley

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# Flowing Forward: Evaluating Farmington's Fish Populations for Informed Land and Water Use

Himani Kumar,<sup>1</sup> Mike Beauchene,<sup>2</sup> Ilana Goldner,<sup>3</sup> Leah Gichuru,<sup>3</sup> Laura Cisneros,<sup>3</sup> Nicole Freidenfelds<sup>3</sup>

<sup>1</sup>Farmington High School, <sup>2</sup>Connecticut Department of Energy & Environmental Protection, & <sup>3</sup>UConn NRCA

## Project Motivation & Goals

Species inventories (recording the presence and abundance of species in an area) in vital ecosystems, such as coldwater streams (Fig. 1), is critically important for municipalities and town leaders to make well-informed land and water use decisions because:

- Certain species can serve as bioindicators of ecosystem health; and
- Relative measures of diversity can help prioritize areas in most need of management.

This project involved evaluating the ecological status of several streams and rivers within Farmington and reporting my results to the town in order to aid my community's conservation decision making. Updating their fisheries data will ensure that the town has a comprehensive understanding of Farmington's local aquatic environments, and how the choices they make can impact these valuable rivers and streams.

The main objectives of this project were:

- Collect accurate and updated fish population data for three different streams and rivers in Farmington.

## Project Outcomes

### Key Factors Assessed:

- Species Richness: number of different species
- Origin: native vs. non-native
- Habitat: stream flow and tolerance level

### Summary of Observations:

- Population Density: None of the densities are above 1 fish per meter (Fig. 3A)
- Origin: Majority native species in all brooks (Fig. 3B)
- Habitat: Majority fluvial specialists (need flowing water); (Fig. 3C) and mostly intermediate tolerance level species (Fig. 3D)
- Past vs. Current Data: Minor differences in density percentages which shows that the systems are stable (see presentation to conservation commission: <https://tinyurl.com/nkCAP>)
- Unionville brook has parts of the stream that may have non-native species as well as slow moving or still water

### Implications for Farmington and Beyond:

- Up-to-date and accurate fish population data and an overall health assessment is necessary to make informed decisions regarding local land and water use and guide the conservation and protection of these important natural resources.
- Healthy waterways and fish populations are indicators of a healthy environment. A healthy environment is important for both human and wildlife populations as it provides essential ecosystem services such as food, habitat, flood control, erosion prevention, aesthetics, and regulating water quality.

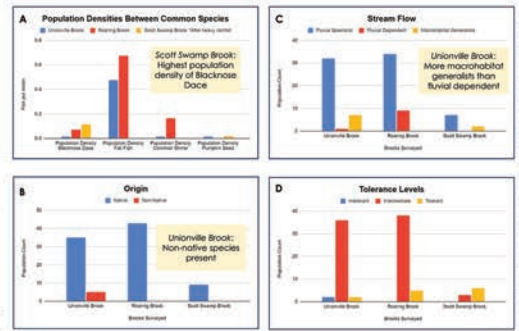
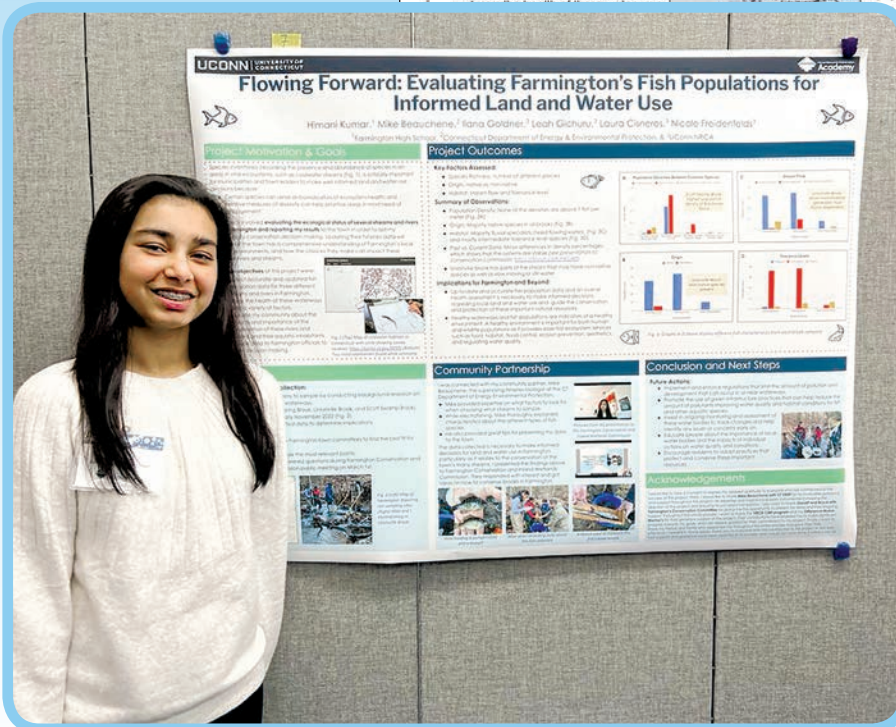


Fig. 3. Graphs A-D above display different fish characteristics from each brook sampled.

This poster is a depiction of Himani Kumar's deeply detailed research, as presented at the Science Center's STEM Summit.



## Community Partnership

was connected with my community partner, Mike Beauchene, the supervising fisheries biologist at the CT Department of Energy Environmental Protection. Mike provided expertise on what factors to look for when choosing what streams to sample. While electrofishing, Mike thoroughly explained characteristics about the different types of fish species. He also provided great tips for presenting my data to the town.

The data collected is necessary to make informed decisions for land and water use in Farmington, particularly as it relates to the conservation of the town's many streams. I presented the findings above to Farmington Conservation and Inland Wetlands Commission. They responded with interest and got ideas on how to conserve brooks in Farmington.



Mike holding a pumpkinseed and a bluegill. Mike and I recording data about the fish collected. A device used to measure the fish's body length.

## Conclusion and Next Steps

### Future Actions:

- Implement and enforce regulations that limit the amount of pollution and development that can occur in or near waterways.
- Promote the use of green infrastructure practices that can help reduce the amount of pollutants improving water quality and habitat conditions for fish and other aquatic species.
- Invest in ongoing monitoring and assessment of these water bodies to track changes and help identify any issues or concerns early on.
- Educate people about the importance of local water bodies and the impacts of individual actions on water quality and conditions.
- Encourage residents to adopt practices that protect and conserve these important resources.

## Acknowledgements

I would like to take a moment to express my deepest gratitude to everyone who has contributed to the success of this project. Firstly, I would like to thank Mike Beauchene with CT DEP for his invaluable guidance and support throughout the project. His expertise and insights have been instrumental in shaping the direction of the project and ensuring its successful completion. I also want to thank Garet and Bruce with Farmington's Conservation Committee for giving me the opportunity to present my data and their ongoing support throughout the whole process. I want to thank the NRCA CAP program and my Difference Maker Mentor for their generous support of this project. Their contributions have enabled me to make significant progress towards my goals, and I am deeply grateful for their commitment to my project. Finally, I want to thank my friends and family who supported me throughout the entire process and gave their help whenever I needed it. Once again, thank you to everyone who has contributed to the project in any way. Your support and guidance have been essential to its success, and I could not have done it without you all.

Himani Kumar stands beside her poster containing all of her data from her 9-month project, "Flowing Forward: Evaluating Farmington's Fish Populations for Informed Land and Water Use." She presented this final culmination of her research at the CT Science Center's "Youth in STEM: A Leadership & Changemaker Summit" on April 1. Courtesy Photos

# Summer project leaves a legacy

Farmington resident's 9-month study of local waterways presented at CT Science Center

By Maria G. O'Donnell  
Staff Writer

With environmental concerns at the forefront of many minds, it's encouraging to know there are young people who want to leave a legacy for their communities.

Himani Kumar, an ambitious Farmington High Sophomore, explored her passion for the environ-

ment over the course of an intensive week this past July at UConn's Natural Resources Conservation Academy's (NRCA) Conservation Ambassador Program (CAP). Since October, she has been working on a Farmington waterways project based on her experience there and presented her findings at the CT Science Center on April 1, along with the other 20 or so students who accompa-

nied her that week in July.

Influenced by the son of family friends who recommended the program, Kumar applied last April with her interest in environmental conservation leading to a desire to educate her community with her waterways project.

According to the UConn NRCA website, CAP is a "9-month program for high school students (grades 9-11)

interested in exploring the environment or making a difference in their community. The program includes a one-week field experience at UConn and a community environmental action project."

Kumar's week in July was spent at UConn's dorms, giving her a taste of college living. Students worked with mentors, who are UConn's environmental majors. Of the program,



she explained, "It was hands-on as to how the field would be." Students' days were a full 7:00 a.m. to 10:00 p.m., requiring 100% participation in early day to late night environmental activities that focused on waterways, fisheries and forestry. "I fell in love with waterways and fisheries," said Kumar, who was inspired by her pet Comet



CT DEEP's Mike Beauchene holds pumpkinseed (top) and blue gill (bottom) fishes.



Recording data from fish collected, from left, Himani Kumar, Ashika Pradeep, Aakash Kumar, and Mike Beauchene.

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# MOTHER

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Today, we are being pressured to disregard the erosion of **historic marriage** and family principles and practice. ENCOURAGEMENT to be a **normal, healthy** family is noted by its absence in the media, government, etc. which presents even that which is contrary. Determination to try to rightly steer straight faces many and varied opponents. These opponents are **determined to eliminate** mother, father, husband, wife—anything and everything that opposes the pursuit of their agenda **no matter the consequences**. Even today's social violence and unrest has at its root the **absence of a father and mother**. We are finding the **wrong road signs** and the **wrong roads**, calling wrong right and right wrong, calling evil good and good evil (Isaiah 5:20). We face the **ABSENCE of MORAL and MENTAL STANDARDS**, to be caught up along with the crowd, **trying** to belong, to become, to find oneself, to find peace, to find love, to find worth, to find values which inspire and overcome a society that has abandoned such. There is little to no recovery of the normal and natural God-created family setting. The **FAMILY** needs the **MOTHER**; the **NATION** needs the **FAMILY**.

### God's Pattern is Set:

"HONOR thy father and thy mother, as the LORD thy God hath commanded thee" (Deut. 5:16; Eph. 6:2). "Whoever CURSES his father or his mother, his lamp shall be put out in obscure [utter] darkness" (Prov. 20:20). "My son, hear the instruction of thy father, and FORSAKE NOT the law of thy mother" (Prov. 1:8). "A wise son maketh a glad father: but a foolish man DESPISETH his mother" (Prov. 15:20).

### God's Provision is Needed:

"This know also, that in the last days perilous [difficult] times shall come. For men shall be lovers of their own selves...DISOBEDIENT TO PARENTS, unthankful, unholy" (2 Tim. 3:1-2). "There is a generation that CURSETH their father, and doth not bless their mother. There is a generation that are pure IN THEIR OWN EYES" (Prov. 30:11-12). This is promoted by the age old "every man did that which was RIGHT IN HIS OWN EYES" (Judges 21:25). And "let us eat and drink; for tomorrow we shall die" (Isaiah 22:13). Take heart and know.

### God's Person is Found:

"I will LIFT UP MINE EYES unto the hills, from whence cometh my help. MY HELP COMETH FROM THE LORD, who made heaven and earth" (Psalm 121:1-2). "And YE SHALL SEEK ME, AND FIND ME, when ye shall search for Me with ALL YOUR HEART, and I WILL BE FOUND BY you, saith the LORD" (Jeremiah 29:13-14). "COME UNTO ME, all ye that labour and are heavy laden, and I will give you rest. Take My yoke upon you, and learn of Me; for I am meek and lowly in heart: and ye shall find rest unto your souls. For My yoke is easy, and My burden is light" (Matthew 11:28-30). The Nation, the Family and YOU need God and His sure and certain Word, the BIBLE.

The Lord Jesus Christ is waiting to provide for you the right and real relationship that God's RIGHTEOUSNESS requires and in which God's LIFE is found. This makes for life that is worth the living. You can find God's HELP and HOPE and ENCOURAGEMENT today. Why not begin RIGHT NOW and receive Him as your personal Saviour and Lord (John 1:10-13)! "Believe on the Lord Jesus Christ and thou shalt be saved" (Act 16:31).

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**Electrofishing in Unionville Brook, from left, Himani Kumar, Ashika Pradeep, Aakash Kumar, and Mike Beauchene.** Photos by Maria G. O'Donnell

goldfishes at her home.

For her next step after her week away from home, she had to work on a community action project with the help of her UConn mentors and her community partner Mike Beauchene, CT Dept. of Energy & Environmental Protection (DEEP) Supervising Fisheries Biologist. Kumar wanted to help her community understand their local waterways and fisheries and the impact people can have on preserving them.

"I connected with Mike [Beauchene] because he's knowledgeable in fisheries," said Kumar. "His role is to provide specific help

with his experience. Mike helped with research and collecting data so I could present it to the town."

She conducted a virtual presentation to the Farmington Conservation and Inland Wetlands Commission on March 1 where she shared her data and "the importance of maintaining our streams." Kumar hopes "they could take into account [her data for] the future of stream and conservation work and implement it in environmental policies." She also hopes that "the project will live on with updating the data."

Kumar's project focused on three waterways: Roaring Brook,





**Himani Kumar, at home with her pet Comet goldfish, her inspiration for her passion for waterways and fisheries.**

Scott Swamp Brook, and Unionville Brook because “those ones have the least amount of prior data.” It was last updated in 2012. Her project’s main objectives were three-fold: To collect accurate data on fish population counts, to analyze the data, and provide background information relevant to the community.

In November, with the help of DEEP’s Beauchene, Kumar “looked at cold water habitats to determine what types of fish I’m looking for – bass, sunfish – to determine the streams’ health. Mike gave guidance as to what to look for.” He also provided equipment for electrofishing, which Kumar explained as a method that sends electric currents in the water, stunning fish for 8-10 seconds, allowing time for her and friends helping her to net fish and transfer them to a bucket.

“Mike pointed out the different species so we could identify and count them, then release them,” said Kumar. She concluded that electrofishing is “very effective and gets an accurate data count.” She determined there was “one fish for every two meters in each brook.

**“I’m thankful to CAP; it’s a good example of a program that will impact the community... I hope [the project’s impact] will last a lifetime.”**

**– Himani Kumar, UConn NRCA CAP Student**

Different characteristics of different species determines the health of the stream based on those numbers.”

The April 1 CT Science Center presentation was titled “Youth in STEM: A Leadership & Changemaker Summit.” Kumar

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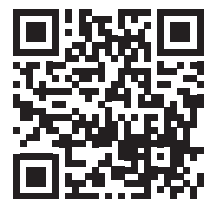
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attended, along with students who had participated in the CAP program with her, their UConn mentors, community partners, families, friends, and others interested in the program. Regarding the Summit, she said, "It went phenomenally, and I enjoyed learning about everyone else's project as well as presenting my own." Kumar's presentation was titled, "Flowing Forward: Evaluating Farmington's Fish Populations for Informed Land and Water Use."

Kumar noted that her parents were "really supportive of the entire process." Her mom, Priyanka, noted that the program "aligns with what she has as a passion." She remembered her daughter helping the neighbors with gardening as a fourth grader. When Himani wanted to immerse herself in the 9-month program back in July, Priyanka recalled wondering how the

freshman, at the time, would fare.

"Now I'm proud to see her presentation" at the Science Center, said Priyanka. "There was so much learning; I wish I had that exposure [at her age]. It was a good concept that brought awareness – half the things, I didn't know. We all use the town water and [learned] how healthy it is for wildlife and us."

The UConn NRCA CAP Program was "an overall great experience, and I'm very thankful to them for having provided it, and it gave me a good understanding of environmental science," said Kumar. "I'm thankful to my community partner Mike and my UConn mentors. They helped me stay on top of things, and I couldn't have done it without them. I'm thankful to CAP; it's a good example of a program that will impact the community."

One of her main goals was educating her community on "the actions



This device is used to measure fish length.

on streams and rivers and how conservation of them is important – I

hope [the project's impact] will last a lifetime." VL

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