

## Swan Lake Citizen Science Lab

by Fred Peters and Rain Geiger

The Swan Lake Citizen Science Lab is a pilot program that will involve environmental monitoring of both water quality and the invasive plant species, using four advanced technologies: drone monitoring, artificial intelligence, virtual reality and simulation.

On March 27, Swan Lake Citizen Science Lab launched at York University's new Markham campus. York University researchers hosted Friends of Swan Lake Park for a Design Workshop that outlined the scope of the program and the capabilities of the York team. Thank you to our workshop hosts, Dr. Ali Asgary, Dr. Satinder Brar and Dr. Maleknaz Nayebi and their talented team of experts. On May 5, Dr. Asgary outlined the scope of the program to over 80 Swan Lake Village residents at an information session at The Swan Club.

We will be using drone imagery to try to map the 20 invasive plant species found in Swan Lake Park that Markham identified to be of concern in its 2024 Invasive Species Management Plan.

The advanced drone measurements will provide key metrics for a comprehensive assessment of the water quality in Swan Lake throughout the year. York's drone and water sampling activity will be coordinated with the physical water sampling being undertaken this summer by researchers from Trent University who are trying to understand the cycle of the elements in the lake and the aquatic food web.

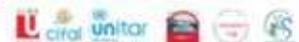
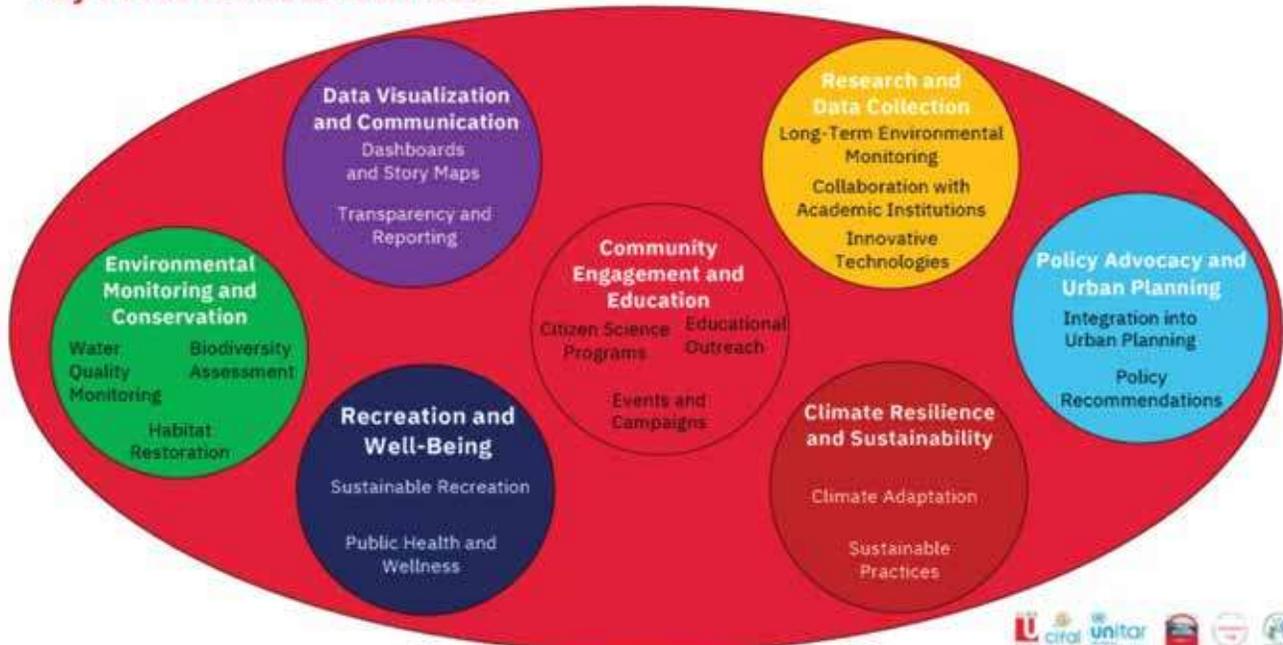
One of FOSLP's objectives is to develop a program that will be beneficial for monitoring environmentally sensitive areas throughout Markham. The York team has a more ambitious goal, namely, to use a citizen science lab approach to foster collaboration among scientists, engineers and citizens in the hope of successfully addressing local environmental challenges.

The project leader, Dr. Ali Asgary, is the Director of CIFAL York, which is affiliated with the United Nations Institute of Training and Research (UNITAR). As educators, one of York's long-term goals is to develop the program into a format that can be adopted by other community-based environmental groups through the UNITAR and CIFAL Global Network.

## Putting Citizen into Citizen Science

The following chart outlines the seven key focus areas of York's program, but the essential underlying element is the "citizen" component. Success is tied to the ability to engage community participants in both data gathering and educational outreach.

### Swan Lake Citizen Science Lab Key Focus Areas & Activities



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We are looking for volunteers interested in becoming members of the lab to support the two-year project. Lab members will be needed in several general areas:

**Leadership and Coordination:** Provide leadership to the overall program or as a coordinator for specific activities.

**Data Gathering:** Participate in the drone surveillance program either as a pilot, a drone support resource or in the integration and interpretation of the data. York will provide the drones and is developing a program for those interested in qualifying as drone pilots. We expect to have a group of high school students sign up for the drone piloting program, but we need members to coordinate their activities and schedules.

**Data Analysis:** Learn and assist with data analysis and modelling using artificial intelligence, virtual reality, simulations, and GIS mapping. The York team will provide interested members with the required training in data analysis and specific tasks that members can perform on collected data and simulations.

**Field Investigation and Park Level Support:**

Using drones to identify invasive plant species will require field validations and support. Members of the lab will conduct field investigations to cross check and validate drone mapping and machine learning results. Proper training of interested members will be provided beforehand.

**Community Outreach and Engagement:** The goal is for broad community engagement at both the data gathering phase and through educational forums. York has demonstrated their work at various community and educational events. If you have connections in the local school communities or with other community groups such as seniors, there will be an opportunity to bring the concepts into the classroom or to other community groups.

Help contribute to the rehabilitation of Swan Lake and Swan Lake Park by becoming a member of the Swan Lake Citizen Science Lab. Perhaps you have a family member or friend that would be interested. If you, or someone you know, would like to be involved, email [fred.peters@rogers.com](mailto:fred.peters@rogers.com) to learn more. □



Photo by Don Fowler



Photo by Ron Gergley

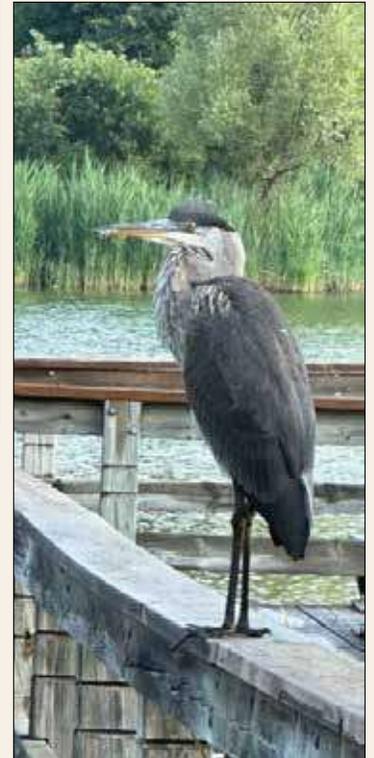


Photo by Claudette Larocque

## Photo Corner