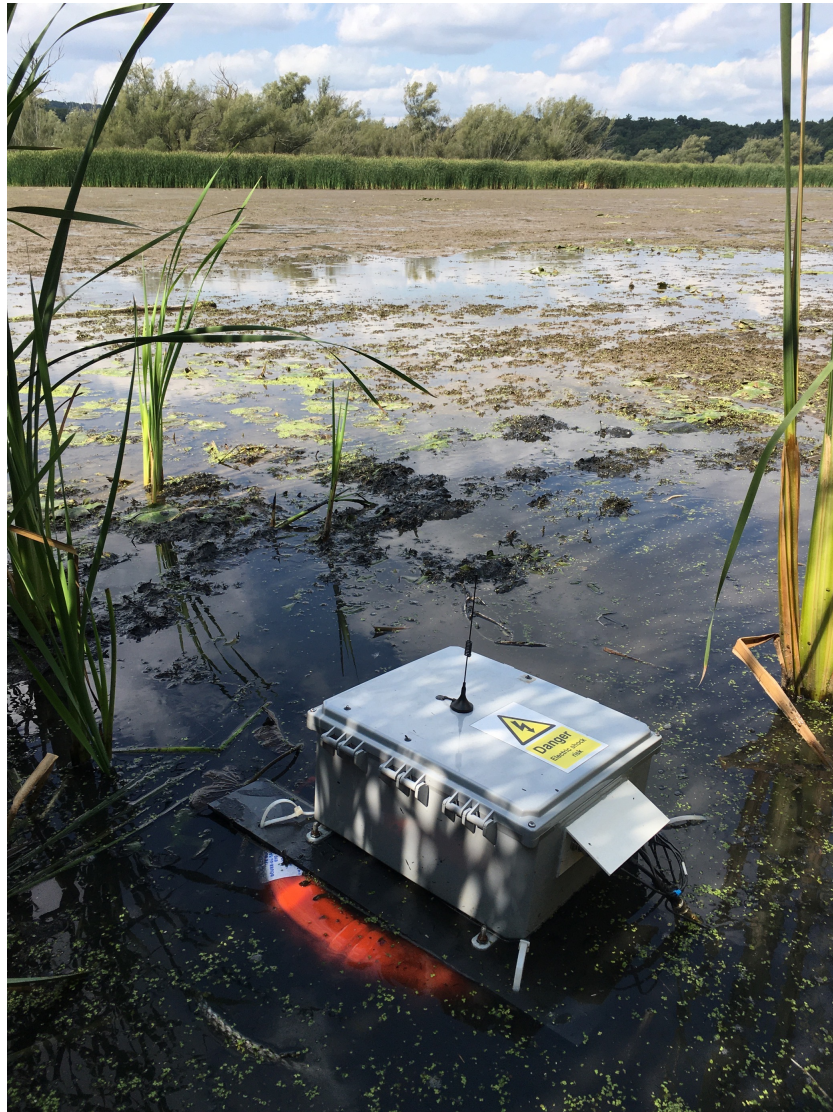


DEMOCRATIZING REAL-TIME WATER QUALITY MONITORING

● ● ● ●
POSTER 58



GWFF FINALE MAY 2023 Test deployment at Cootes Paradise

Emil Sekerinski, Tianyu Zhou
Department of Computing and Software
in collaboration with
Charles de Lannoy, Erik Frechette
Department of Chemical Engineering
McMaster University

Ongoing concerns about water quality in (remote)
Indigenous communities:

- Developed low-cost real-time water quality sensing stations
- Deployment at Six Nations (Southern Ontario) and North Saskatchewan River (in 2023)
- Enabling communities to take ownership to water quality data

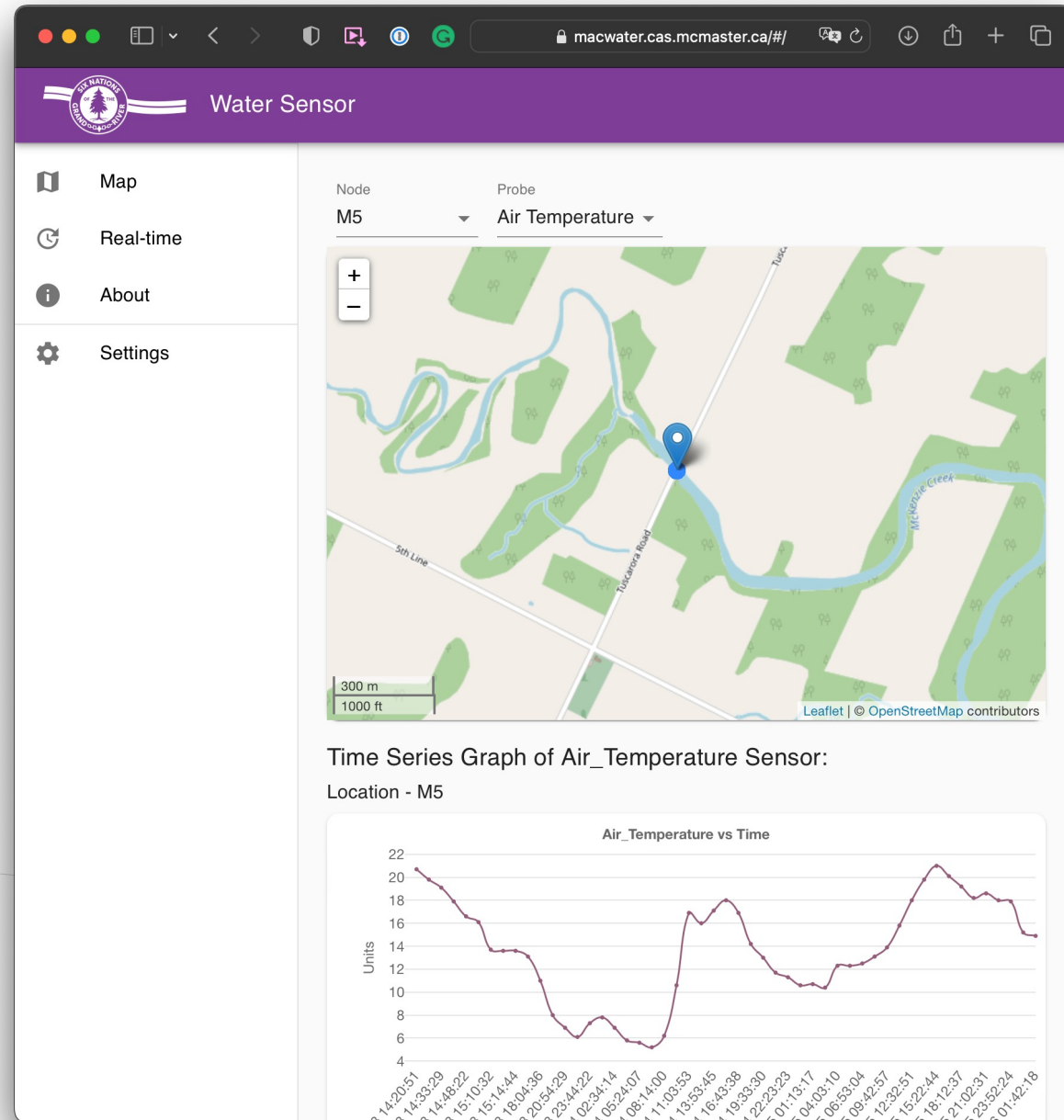
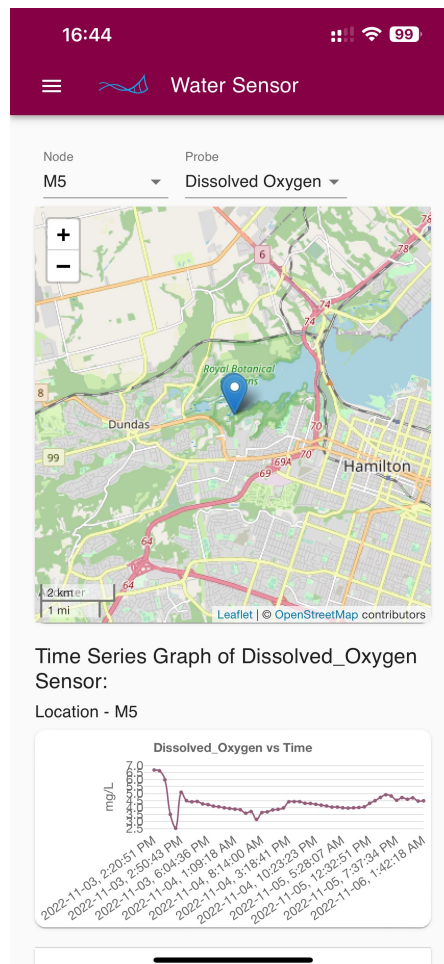




MOBILE & DESKTOP WEBSITE

- Visualization for community
- Data export for researchers

<https://macwater.cas.mcmaster.ca>

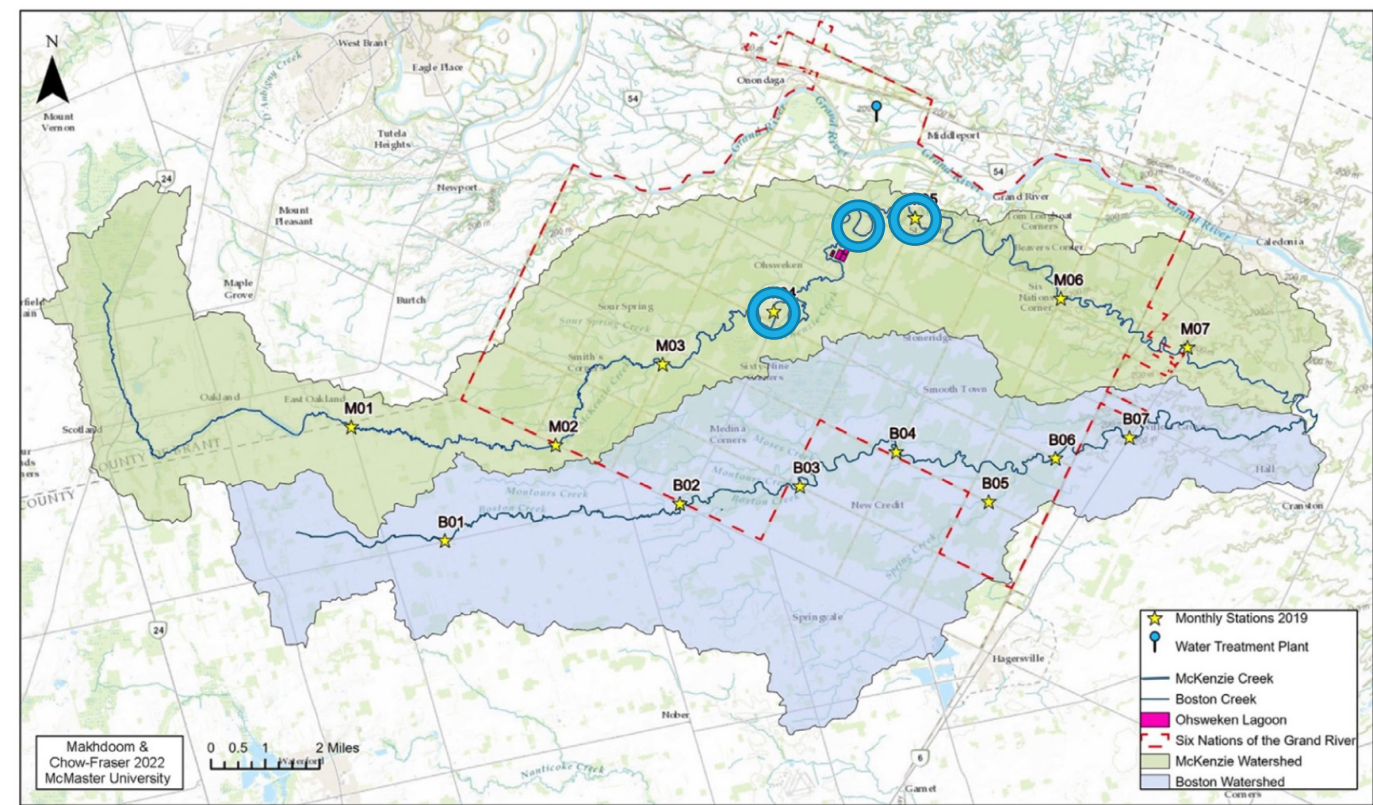




Deployment at Six Nations, M4-M5



Gateway





LOW COST (TUBE DESIGN)

Sensor Node ≈ \$1400

- \$220 main board, enclosure, power
- \$350 conductivity sensor
- \$20 turbidity sensor
- \$400 pH sensor
- \$10 temperature sensor
- \$400 dissolved oxygen sensor

Gateway ≈ \$500 (optional)

Server ≈ \$100 (optional)



Software & hardware open-sourced
Documented for instructional use

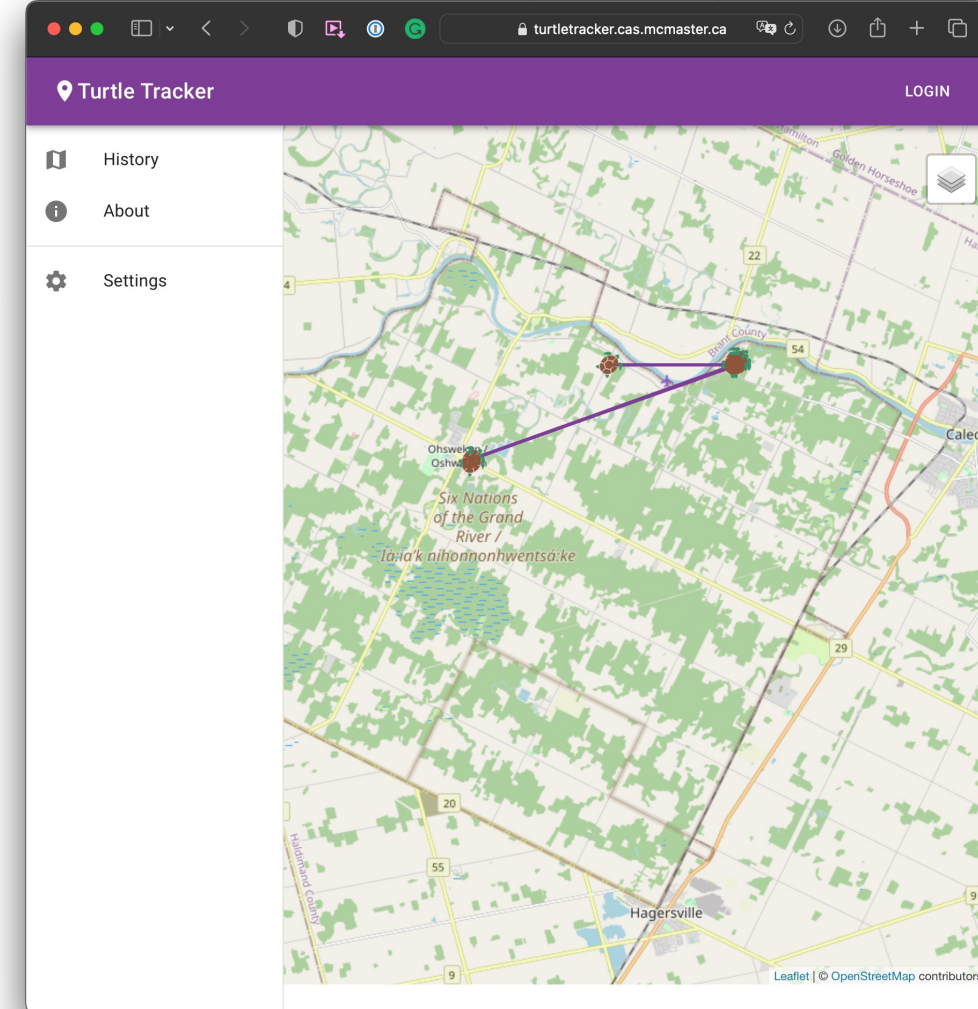
HIGH SCHOOL OUTREACH AT STEAM ACADEMY, JUNE 16, 2022





TURTLE TRACKING

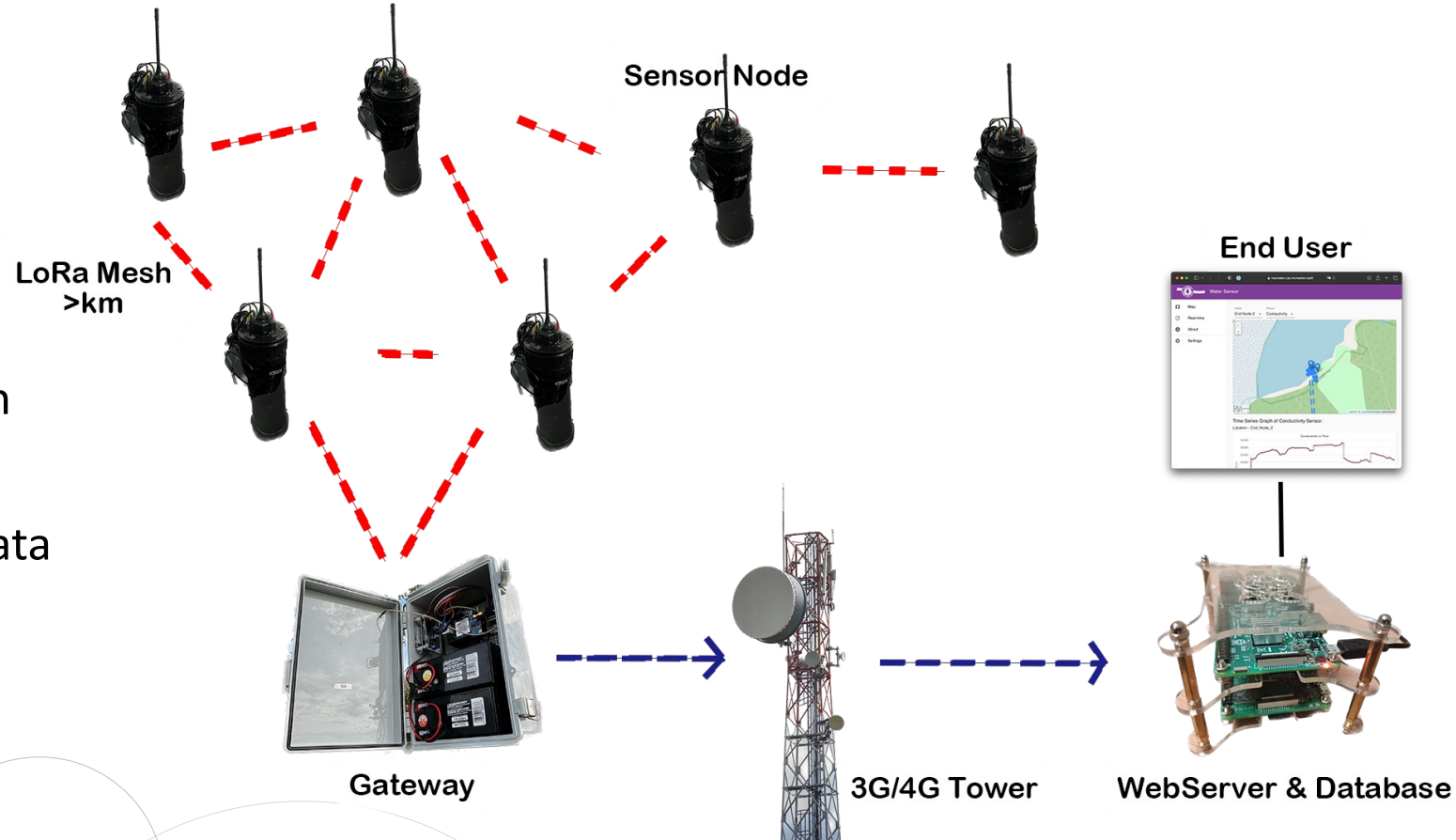
- Delineate turtle habitat
- Observe turtle movement
- Mobile Website / App
- Low cost: \$150 per tracker
- Challenge: battery life,
- Challenge: detecting movement & under water





CHALLENGES

- Low-power mesh network for coverage in areas with poor 3G/4G reception
- Tolerant to network faults by buffering data
- Instructional visualization of data
- Auto-configuration of sensor nodes, gateways, routers
- Secure transmission of data
- Authorization with different levels of privilege
- Improved mesh networking
- Extending battery life



How to build a simple, reliable, teachable system?



INTEGRATION WITH TERRASTORIES

“Terrastories is a geostorytelling application built to enable Indigenous and other local communities to locate and map their own oral storytelling traditions about places of significant meaning or value to them.”

TERRASTORIES

Filter stories:

Select category | v

Select option | v

Sort stories:

Most recent | v

Mapping Resource

Birthplace of the Peacemaker

This is the area that the Peacemaker was born. The original area was Huron-Wyandot territory. The young woman who gave birth to the Peacemaker is said to have been visited by messengers of the Creator. The young woman's mother found the pregnancy shameful and wanted the baby gone. Many attempts were made by the Mother of the young woman to kill her baby (the peacemaker) but he always survived.

Introduction

What's a terrastory?

Terrastories are audiovisual recordings of place-based storytelling. This offline-compatible application enables local communities to locate and map their own oral storytelling traditions about places of significant meaning or value to them.

Close