

# Wireless Water Monitoring Sensor Network



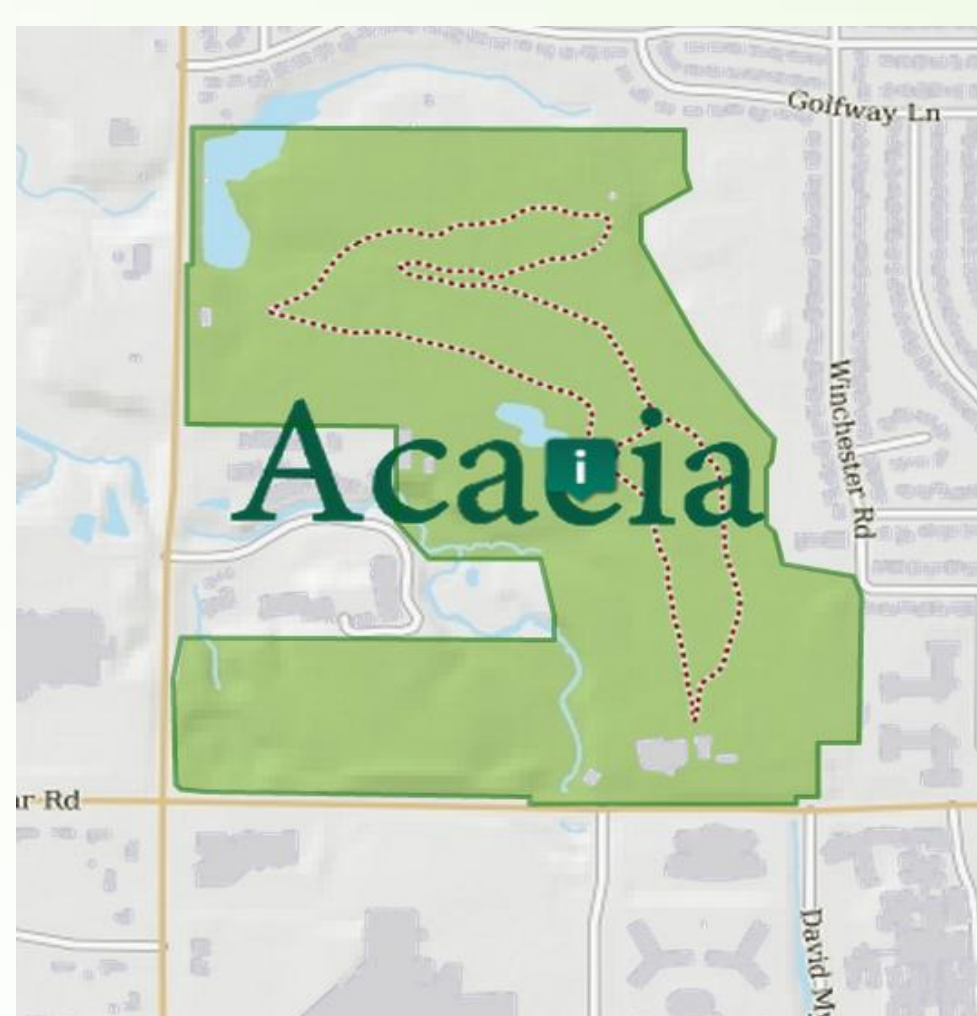
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## Design Objectives

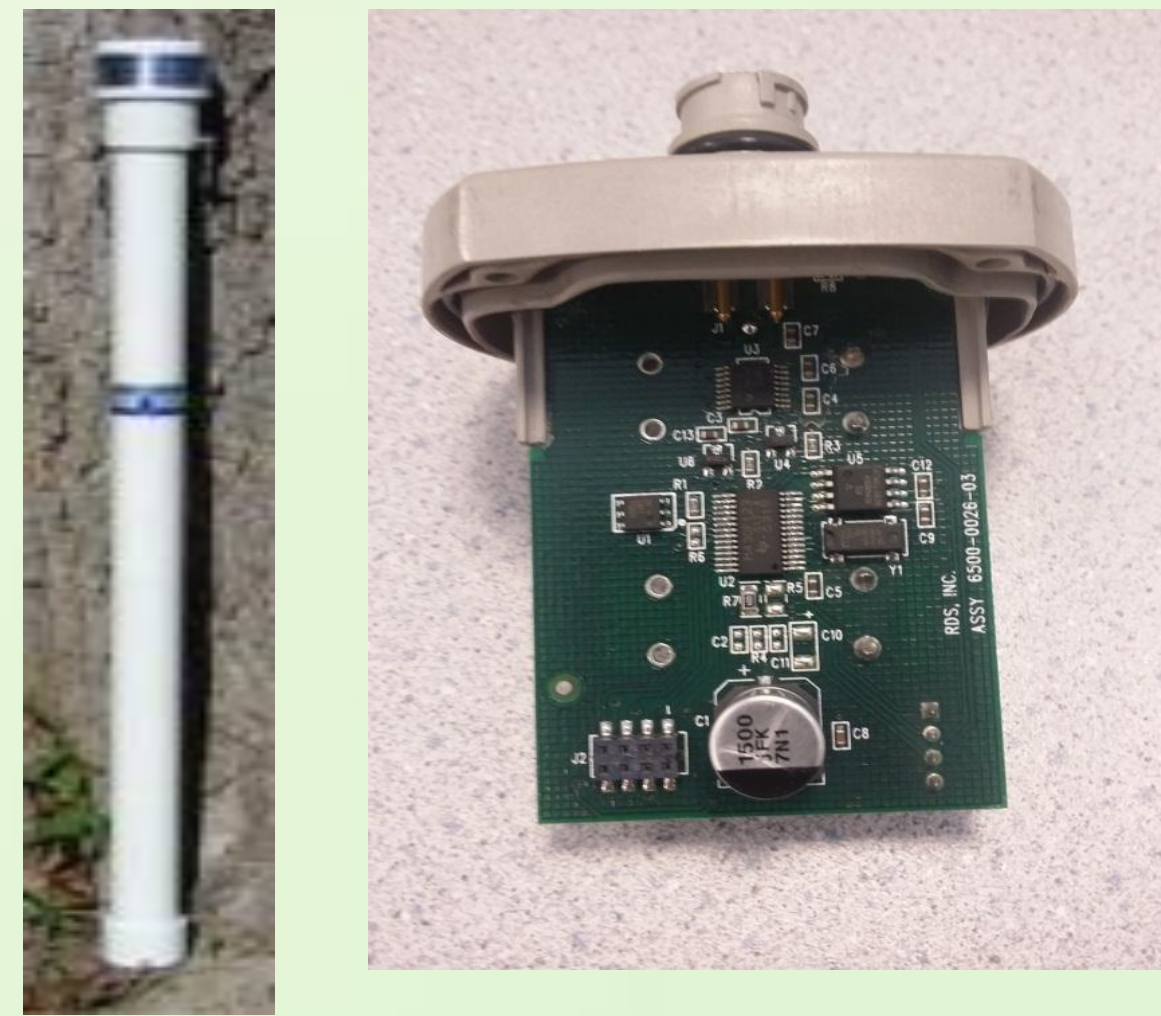
- Integrate a wireless transmitter into existing sensors
- Create a “mesh” network to collect data over a large geographic area
- Transmit that data in real time to a database
- Build an online repository viewable in real time
- Produce a new low cost sensor that’s integrated into the created network

## Problem Background

- Metroparks uses out-of-date sensors
- Must manually walk to each sensor to collect the data using a PDA
- The current sensors cost \$850
- The Metroparks already has an extensive number of sensors purchased and deployed
- Getting ready to deploy approximately 50 more sensors over an area of 177 acres in Acacia Reservation located in Northeast Ohio



## Design Concepts

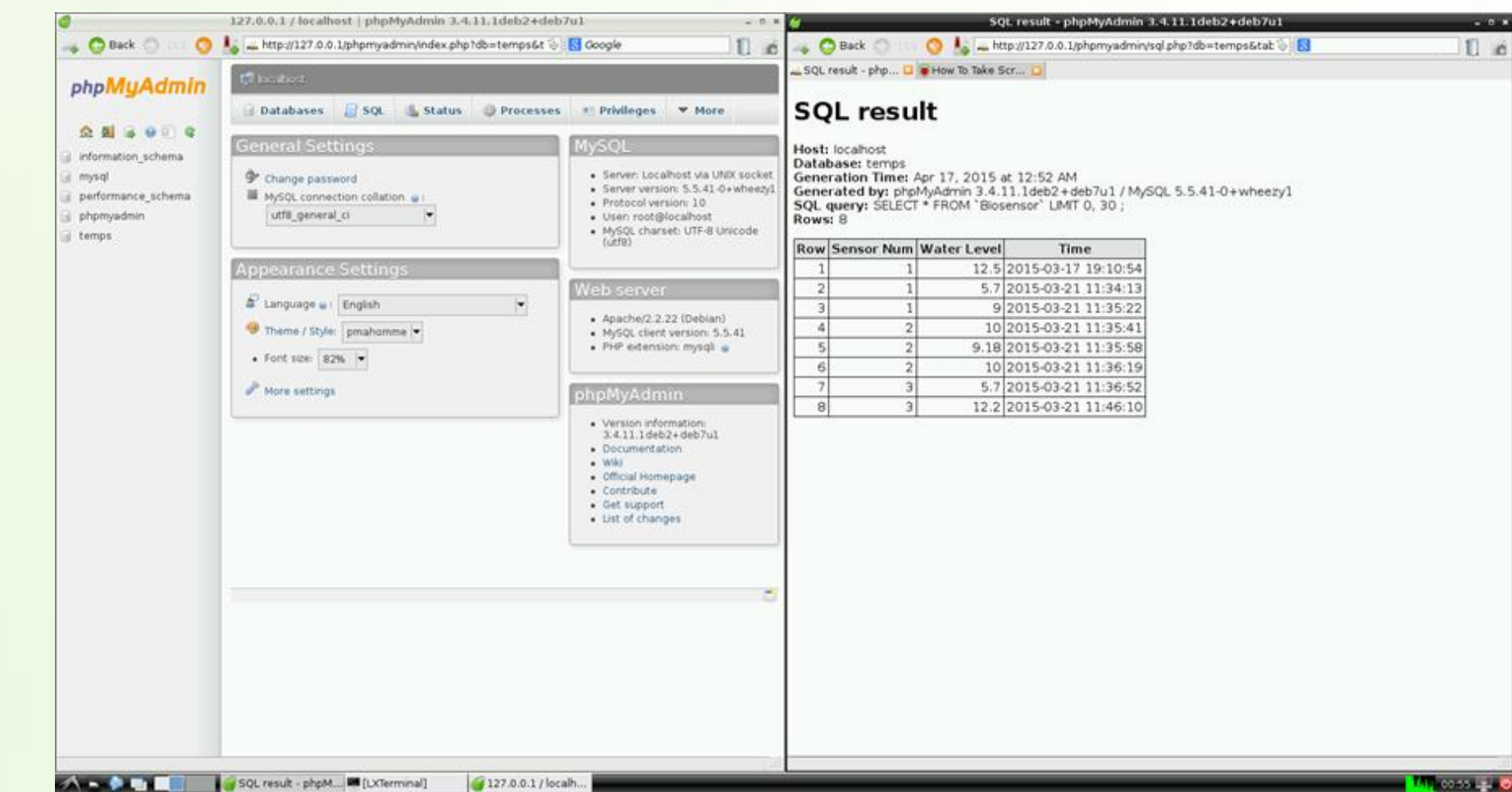


### Old Sensor

- Measures water level through variable resistor in shaft
- Controlled & powered by proprietary PCB & software
- Tmote Sky reads analog voltage off variable resistor so we don’t physically change the sensor

### Wireless Transmitter

- Tmote Sky - 250kbps 2.4GHz IEEE 802.15.4 wireless transceiver
- Reads analog voltage from sensor
- Creates a “mesh” network that rolls all data up to collection point by hopping from point to point
- Expandable up to any number of sensors



### Database & Website

- Made up of Raspberry Pi & Tmote Sky as collection point
- Converts analog voltage to water height
- Password protected database & website hosted on Raspberry Pi
- Database can be accessed remotely
- Works with minimal user input

## New Sensor

- Uses infrared distance sensor & e-tape to measure liquid level
- Raspberry Pi used to power sensor & process information
- Breadboard used to integrate Tmote Sky & Raspberry Pi



## Project Impact

- Metroparks has better tools to better understand our environment
- Better understanding of our planet to minimize damage to ecosystem
- Introduced a new sensor to market creating competition where there was once stagnation