

Introduction

In an effort to collect data at Marion County Park and Lake for the eventual development of a lake management plan, we propose to initiate a citizen science program. This program will:

- Get community members to take an active role in the data collection process
- Gather a high volume of data
- Coordinate with schools and youth programs such as FFA and Boy Scouts to assist in data collection
- Kit will focus on
 - Dissolved O₂
 - Ammonia
 - Nitrate
 - Phosphorous
 - Chlorine
 - pH
- Data collected will be used in the creation of the Lake Management Plan

Objectives

- Collect Water quality data for the development of a Lake Management Plan
- Collect a high volume of data relating to water quality
- Ensure costs are low
- Get the community involved

Methodology

- Citizen science is widely used tool for watershed research (Barder et al, 2018)
- An effective way to acquire large amounts of data
- "Many Eyes" Effect (Dickerson, 2012)
- Allows for stakeholders of the Lake to be involved in the process
- An opportunity to teach the scientific method to many different age groups
- Has been done in the form of an app by other programs (Jones, 2018)
- Private efforts, volunteering, etc can out compete government funded studies (Theobald, 2015)
- Desired kit needs to be able to be used by a wide variety of people and easy to restock

Lake Map



Figure 1: Map depicts the lake as well as our proposed sampling points

Hach Surface Water Test Kit

In preparation for the development of this citizen science program, many commercially available water quality test kits were assessed for their usefulness, variety of test factors included, price, and ease of use. The kit which was chosen is the Surface Water Test Kit manufactured by Hach Inc. This kit was the most comprehensive and reasonably priced option which we evaluated. This kit tests for ammonia, chlorine, pH, phosphorous, and water temperature. These factors are important in understand the suitability of fresh water systems for aquatic life and recreational use safety. Consistent sampling by citizens of the area will provide useful information for making management decisions to preserve water quality.



Figure 2: Hach Kit example

Demographics

- Senior Citizens
- Adults
- Boy Scouts
- FFA
- Teachers
- Students K-12
- 4-H
- Children Youth Groups
- Wildlife Enthusiasts
- Fisherman

Analysis

- Data collection forms will be provided when the kit is checked out from the main office
- Forms Will be turned into the office
- Data will be pulled from these sheets and entered into a database
- In the future an app can be developed to give instant feedback

Contacts

Organization	Contact Info	Org Cont.	Contact Cnt.
USD 398 Peabody-Burns	620-983-2196	FFA Marion	620-382-3111
USD 397 Centre	785-983-4321	FFA Hillsboro	620-947-3991
USD 408 Marion-Florence	620-382-2117	FFA Goessel	620-367-2242
USD 410 Hillsboro, Durham, Lehigh	620-947-3184	Marion 4-H	620-382-2325
USD 411 Goessel	620-367-2242	Boy Scout Troop 0108	https://www.facebook.com/PeabodyBoyScouts/
FFA Lost Springs	785-983-4321		
FFA Peabody	785-983-2196		

Implementation

- Kit will be placed in main office to be checked out
- Forms will be provided
- Maps will be on the reverse of each data form
- Docks are utilized as data collection points for ease of access to the sample sites
- Instructions can be reproduced via a website if they are lost or unusable

Sources Cited

- E.J. Theobald, A.K. Ettinger, H.K. Burgess, L.B. DeBey, N.R. Schmidt, H.E. Froehlich, C. Wagner, J. HilleRisLambers, J. Tewksbury, M.A. Harsch, J.K. Parrish, Global Change and Local Solutions: Tapping the Unrealized Potential of Citizen Science for Biodiversity Research, Elsevier, Biological Conservation, Volume 181, Pgs 236-244, Jan2015 <https://www.sciencedirect.com/science/article/pii/S0006320714004029>, Accessed Oct 242018
- Chris Jones, Citizen Science: Water Quality, Iowa Water Center, Published 09Jan2018, <http://www.water.iastate.edu/news/citizen-science-water-monitoring>, Accessed 26, Sept 2018
- Eric Bardar and Robert Simmon, Why Citizen Science for Water Quality, TERRA (The EOS Flagship), NASA, Updated 13Nov2018, <https://terra.nasa.gov/citizen-science/water-quality>, Accessed 13Nov2018
- "Google Maps." n.d. Google Maps. Accessed December 7, 2018. <https://www.google.com/maps?l=38.32119,-96.98231&z=14&t=h>.