

Assessing the Effects of Human Disturbance on Lilly Lake Water Parameters

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Abstract

Despite the importance of Eagle Creek as both a recreation park and as a source of water for the city of Indianapolis, precious little is documented and available to public resources concerning past and present water parameters and conditions and is difficult to find without prior knowledge of the exact location. Lilly Lake in particular serves as a popular spot for park visitors to relax and enjoy themselves. In addition, the lake serve as a home for large amounts of vegetation and animal life, and many more animals as a source of drinking water. There has been no prior documented research on park visitation's effects on Lilly Lake's water quality.

Introduction

Eagle Creek is the largest park in Indianapolis, consisting of a localized watershed ten miles north of downtown Indianapolis, in the Eastern Corn Belt region of Indiana (CIWRP 2010). Historically used as a source of drinking water and agriculture for Indianapolis, a reservoir was constructed to assist the process in 1968 (ECPF 2010). Since the construction, the water surrounding the area has also served as a nature and recreation reserve (Bodenhamer 1994).



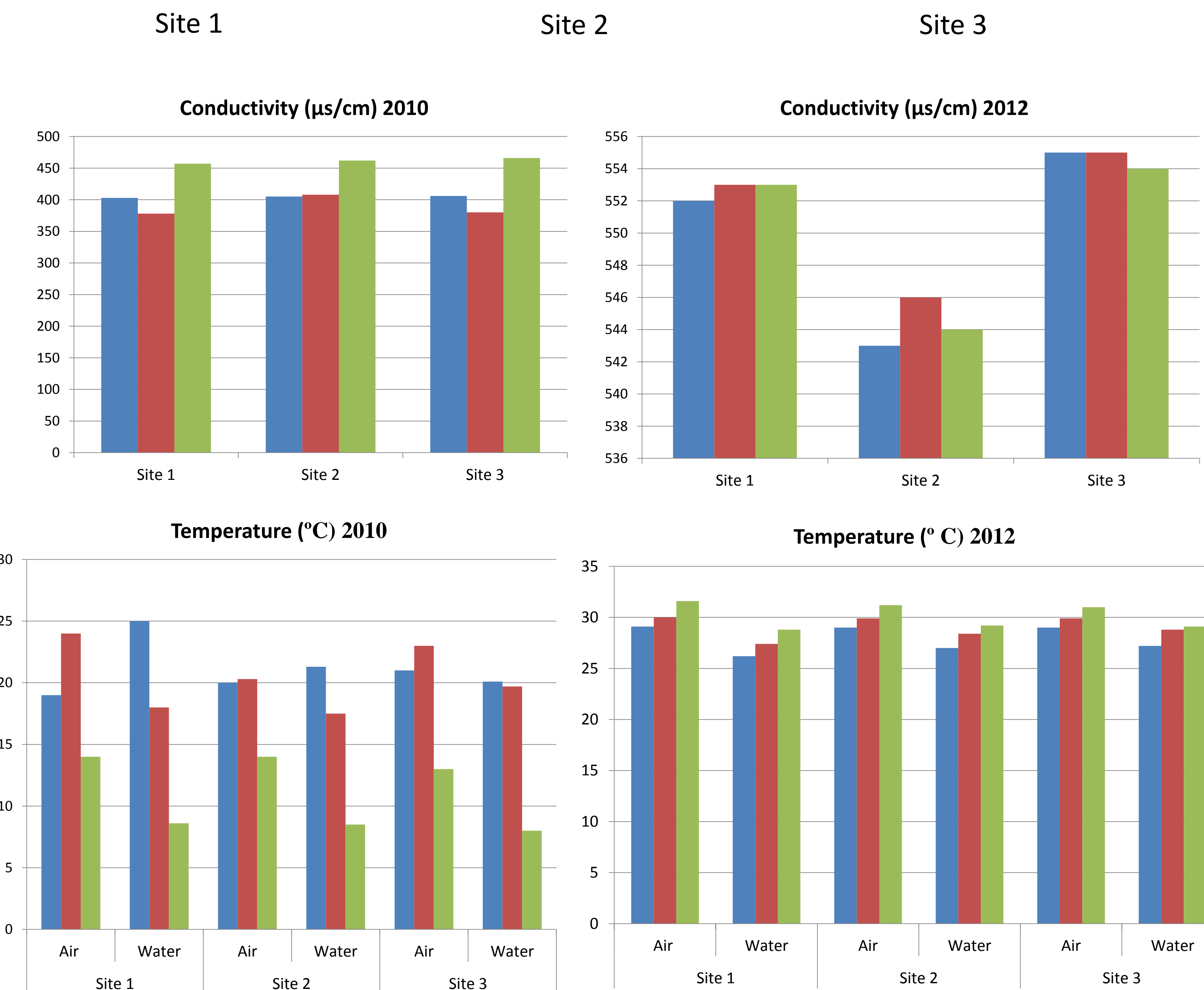
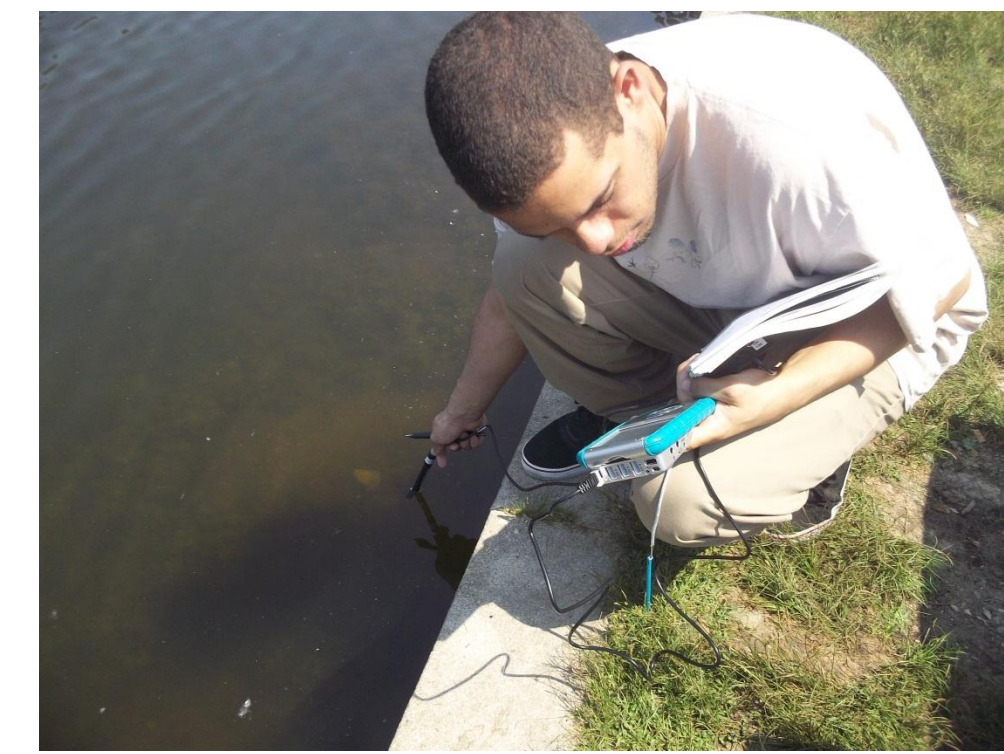
Due to the importance of the quality of this water to the local wildlife and inhabitants of Indianapolis, research was conducted in order to discover the ecology and quality of Lilly Lake of the Eagle Creek area. There are some parts of Lilly Lake where human activity is far more frequent than others. Some areas have low, grassy areas, or sheltered picnic tables where humans are easily able to access the water's edge. Other lake areas have dense vegetation that makes direct water interaction much more difficult and thus more protected by human disturbances.

The nature reserve is densely populated by local wildlife. Various mammals and birds were noted around and in the bodies of water that were chosen to be analyzed. Local residents were also frequent in the area, using the entire park to hike and bike along the various trails and roads and relax and sit near the water. The vegetation growing in and around the waters varied in both species and consistency, hiding several small insects and fish in the shallow areas in the water bodies. In the areas more frequented by human habitation, less vegetation and wildlife were seen while scouting the area for fieldwork locations.

Objective

Compare the physical and chemical parameters of three locations surrounding Lilly Lake's lentic ecosystem to ascertain possible effects of human disturbances on water quality.

Physical and Chemical Parameters



Materials

Equipment: Vernier LabQuest with Conductivity Probe, Stainless Steel Temperature Probe, and GPS Sensor (2012)

Carolina Exploring the Quality of Natural Waters kits (#DH-181020) (2010)

Thermometer (2010)

Secchi's Disk (2010)

Ruler (2010)

Methods

- One Martin University student participated in analyzing three specified areas of Lilly Lake's littoral zone in late Summer and Fall 2010. A follow-up study was conducted in the Spring of 2012.
- The chemical parameters measured were pH levels and specific conductivity. The physical parameters measured were air temperature, water temperature, water clarity, Secchi's Disk transparency and global positioning. With the exception of global positional, all parameters were measured at least three times at each location.
- The equipment used to measure parameters in 2010 was different from 2012. Most equipment used in 2010 was replaced in 2012 with the Venier LabQuest system and accessories. All were followed according to manual and training instruction.
- Sites were scouted and tested at pre-determined morning timeframes ranging from 10:30-11:30 A.M.
- Testing was spread out over a long period of time in an attempt to establish trends in Indiana's temperate climate.
- All sites were subjected to the same parameter testing conditions.

Results

As expected, there seem to be some differences in the physical and chemical parameters of Lilly Lake in areas more disturbed by humans. However, most differences are smaller than originally anticipated, and some parameters do not seem to be affected at all. The impact of human disturbance upon Lilly Lake may be more indirect or less severe than hypothesized. There is also the possibility of the different equipment having variability in the results.

References

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