

The Ohio State University
Campus as a Living Laboratory

Enhancing Learning Opportunities at the Wilma H. Schiermeier Wetlands

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Executive Summary

The Wilma H. Schiermeier Olentangy River Wetlands Park is a valuable yet underused part of the learning environment at the Ohio State University. The wetlands park has unique and valuable facilities and environments that have the potential to greatly help students learn and understand a wide range of topics in many diverse areas of study.

The Heffner building located at the wetlands has three possible rooms that can provide a place for classes to meet. There is a traditional classroom which can hold up to 65 students, a laboratory which can accommodate the undertaking of labs from a breadth of courses, and finally a meeting room which could be the home base for classes making day trips to visit the wetlands. Each one of these available rooms is either not used at all for courses or are highly underused. Both students and professors who have or have recently taught or studied at the wetlands are quick to point out the benefits of the hands-on aspect of the wetlands. Allowing students to spend time in the field and take samples or collect data provides a break from the monotony of lecture based courses and stimulates the mind in a new way. It has been shown time and time again that hands-on activities and activities outside of the classroom are beneficial to learning and help students better understand and care about the topic at hand. In this regard, Ohio State has no equal to the wetlands.

While there are some drawbacks to increasing courses offered at the wetlands, such as economic and logistical problems, it is felt that these small problems are outweighed by the numerous and substantial benefits. For example, there is no bus to the wetlands, but there are many other ways a student could travel to the wetlands, including riding a bike along the river, walking or carpooling.

The wetlands are a valuable part of the learning environment at Ohio State, yet they are not being taken full advantage of. Both professors and students have something to gain from hosting or having a course at the wetlands, and while there are some drawbacks to increasing course traffic, these hindrances are no excuse not to, at the very least, try to better utilize what this university has to offer.

Introduction

The Ohio State University Wilma H. Schiermeier Olentangy River Wetlands Park presents itself as an important harbinger of adding future classes offered within the framework Ohio State has set for the early 21st century. One of the goals for the framework is to make the Olentangy River to become the central gem in the crown that is Ohio State's push towards a more sustainable and environmental future. A great addition to the river has been the construction of these wetlands. The wetlands are home of the environment and natural resources aquatic program, which has in the past been focused strongly on environmental and ecological research, but recently the staff of the wetlands have been pushing for increased utilization of the wetlands for undergraduate courses. The wetlands are in a very unique location that has the potential to provide many benefits to a large number of courses that could take advantage of the site and its facilities. Currently the wetlands only host four courses that are focused on aquatic ecology, but the variation of courses that can utilize the facilities and environment is much broader. By laying the foundation for the inclusion of more classes, students will experience a more enhanced learning experience by being out in the field. Working in the wetlands will provide an interactive and hands-on study of the subjects to be taught. This will increase student awareness of the importance and function of the wetlands in the natural world. Our paper will include our plan to incorporate more courses into the wetlands.

Facilities at the Wetlands

To fully understand how professors, students, and their courses can benefit from the wetlands research park, we first have to know exactly what the wetlands have to offer in terms of facilities and landscape. The Heffner Wetland Research and Education building is the main and only building on the 52 acre urban research site. This building has three rooms that may be potential locations for classrooms or meeting places for students on day trips. The first room is a standard classroom capable of hosting up to 65 students. The room has individual desks and chairs, as well as a computer, projector, and screen. The second room is a teaching laboratory that can host a maximum of 25 students. This room has four lab benches for students with chairs and a desktop computer for the instructor of the course. Lab equipment that is requested to be used in any labs is approved on a case-by-case basis. Due to the nature of the courses that already take use of the laboratory, it would be most beneficial and easy for life science and

biology focused classes to make use of the laboratory space. A chemistry class, which requires a lab, would not find the laboratory at the Heffner building adequate as most of the needed materials to perform most chemistry labs are not already at the laboratory and are not easily brought to the location. A course in biology or ecology however, could easily take advantage of the laboratory space because most if not all of the equipment needed would already be available. The third and last room available is a meeting room that can host a maximum of 25 individuals. The main feature of this room is its large table with chairs. Sadly, this room does not have any AV equipment such as a computer, projector, or screen. All AV equipment must be provided by the individuals using the room (Teaching Activities, 2014). While this room would not be ideal to host a course due to its smaller size and inability to project lectures slides, it would prove very useful to any small course that wishes to use the wetland for the location of a day trip. This meeting room could serve as the beginning and finishing location for such a day trip. Students could get instructions and materials needed for their day trip in the meeting room and then leave their backpacks and belongings in the room as they explore the wetlands and complete their task for the day. Reconvening in the meeting room at the end of a day trip would allow for an overview of what was just experienced in the wetlands and allow for the professor to dismiss the class. Both the traditional classroom and the laboratory have great potential for hosting semester long classes of varying size and study. The meeting room, while not suited for hosting semester long courses, is an ideal location for hosting day trips for small or medium sized courses for any area of study.

In addition to the rooms in the Heffner building, there is also a viewing pavilion that rises approximately 15 feet above one of the two wetlands. This viewing platform provides a great location and vantage point to see the wetlands and its creatures from a new and advantageous perspective. Incorporating the pavilion into a daytrip would be a great way to enhance the overall learning potential and student enjoyment of the time spent at the wetlands. Of course, the viewing platform would not only be beneficial to courses making day trips, but also to any course that is located at the Heffner building during an entire semester.

While the facilities at the Heffner building are great, the main reason for having a class or taking a class to the wetlands is for the wetlands themselves. There are two bean shaped wetlands on site, each of which has multiple catwalks over the water, which allows students full freedom to study all parts of the wetlands, not just the shoreline. There is also an oxbow wetland

that provides further locations to study the wetlands. Located on the northern edge of the property is a mesocosm compound, which is a series of intakes, pipes and containers that allows for the controlled study of a small part of an artificial wetland. This feature of the wetlands would most benefit courses that are located at the facility for an entire semester and which are engaged in research or laboratory activities. Finally, there is a small bottomland hardwood forest located on the eastern and southeastern edges of the property (Research Activities, 2014). This part of the research park has the smallest amount of potential use by Ohio State courses. Some specialized courses, such as forest biometrics, biology, and identification of woody forest plants, could greatly benefit from the use of this unique habitat.

Current Schedule at the Wetlands

The classroom and laboratory at the wetlands have great potential to host many courses, yet they are greatly underused. The amount of time the classroom and laboratory remains free of students and teachers is nearly unacceptable. If one looks at the numbers regarding the current courses being hosted at the wetlands, the true nature of the problem shows its face. Courses at the wetlands must take place between the hours of 9:00 am and 7:45 pm, which makes the total hours available for courses daily being 10 hours and 45 minutes. The total weekly hours available at the wetlands for courses to take place are 54 hours and 15 minutes. Out of this large amount of time only 18 hours and 50 minutes a week are reserved for the four classes currently being hosted at the wetlands. The total amount of time the wetlands' classroom and laboratory are being used is only 35% of the hours that they could be utilized. Out of this 35%, about 18% is used for laboratory time and the remaining 17% is time the classroom is in use. Furthermore, the laboratory is not being used at all on Wednesday, Thursday, or Friday. The classroom is not used at all on Tuesday or Friday (Brent Macolley, personal communication, October 18, 2014). The schedule below shows the breadth of time that is being wasted at the wetlands facilities. Every hour the classroom or laboratory go unused is a waste of campus property and a waste of a great learning opportunity.

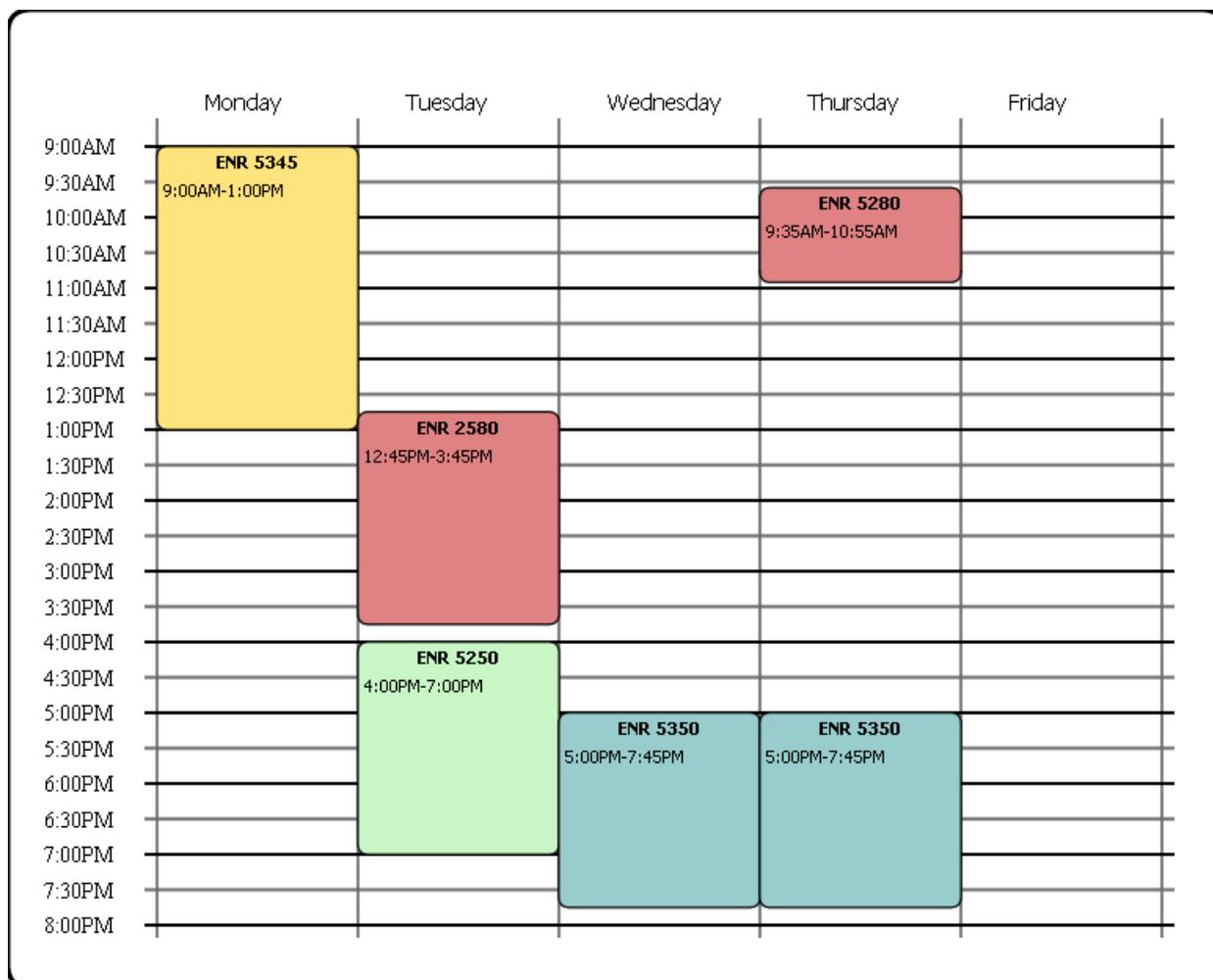


Figure 1. Course Schedule: Course on Monday uses laboratory and classroom. Courses on Tuesday only use laboratory. Courses on Wednesday and Thursday only use the classroom (Brent Maccolley, personal communication, October 18, 2014).

Current Views at the Wetlands

When it became apparent that there is plenty of time and class space available at the wetlands, it was essential to first get in touch with professors and students that currently teach or study at the wetlands to get their perspectives on the classes. This helped to gain insight into their overall class experience, positive or negative. It was also extremely necessary in order to move forward with research because the overall impressions of the professors and students provided baseline information for what it is like to have class at the wetlands. If it was obvious

that wetlands-based class instructors found it more beneficial to be located at the wetlands and faculty/students found little inconvenience in studying there, the idea of providing more classes at the wetlands facilities is much more plausible and should be pursued. On the other hand, if both the professors and students have negative views on taking courses at the wetlands, research on the implementation of more courses at the wetlands would not be necessary.

Professors' Perspective

Dr. Lauren Pintor, Assistant Professor in the School of Environment and Natural Resources at Ohio State, currently teaches courses at the Ohio State Wetlands. Dr. Pintor currently teaches a course called Methods of Aquatic Ecology. This course focuses on experimental and field study methods in researching the function of aquatic ecosystems (L. Pintor, personal communication, October 15, 2014). She explained that her class utilizes the sixty-five person classroom and experimental lab within the main building of the wetlands, both of the kidney wetlands, the Olentangy River, and its tributaries. When it came to her opinions on teaching at the wetlands, she put a lot of emphasis on the necessity of her course to be located where it is at, as it is exceedingly more beneficial than having it at on-campus facilities. Resources and tools are more readily available to provide more hands-on, interactive learning experiences for her students (L. Pintor, personal communication, October 15, 2014). The ability to interact with an actual living aquatic ecosystem allows her as a professor to better interpret scientific concepts to her students. In turn, Dr. Pintor believes her students are able to comprehend class material in a more effective way, as they are experiencing it first hand, rather than through a textbook or PowerPoint slides. When asked if there were any inconveniences tied to having classes at an off-campus site, Dr. Pintor admitted that she believed transportation would be an issue. In other words, she believed students would have a hard time getting to and from the wetlands without a convenient bus stop or bike path leading to the wetlands facilities. Although this was a reasonable concern, she actually has not found transportation to be an issue in her time teaching at the wetlands, as not a single student has presented her with any complaints or issues regarding getting to and from the class. This information provided by Dr. Lauren Pintor increased group research and made the idea of adding more classes at the wetlands a realistic possibility.

In order to find out why only seven classes a year are being held at OSU's Wetlands (Brent Macolley, personal communication, October 15, 2014), emails were exchanged with Dr. Kristin Jaeger, a professor in Ohio State's School of Environmental and Natural Resources, who teaches a class at the wetlands. She provided clear explanations about the pros and cons of having classes at the wetlands, and finds doing so to be beneficial for everyone. Stepping out of the classroom can give instructors a way to make lecture material more tangible to their students. "The wetlands can serve as a living laboratory. So, aside from attending a traditional lecture format, we can take students outside to demonstrate [how] a particular concept in aquatic or physical sciences [can be applied]" (Prof. Kristin Jaeger, personal communication, October 22, 2014).

A Student's Perspective

After hearing from actual professors that find teaching classes at the Olentangy River Wetlands to be very beneficial, it was time to hear a student's view on these courses. Jake Marina, a student studying Forest, Fisheries and Wildlife here at Ohio State, has previously taken a course focused on stream ecology that was held at the Olentangy River Wetlands. Having a lot of interest in water quality and water ecology, Jake decided to take this course specifically because it focused on aspects of those water studies. As a matter of fact, the location of the class at the wetlands is also a major reason why Jake took this course (J. Marina, personal communication, October 22, 2014). Exactly like Dr. Pintor's classes, Jake's stream ecology class utilized almost everything available to them at the wetlands. He specifically noted that collecting field samples and being able to take them directly into a teaching laboratory was not only an effective way to learn, but also an enjoyable way to learn in college. Another interesting point Jake makes regarding his class at the wetlands was that he felt like he was put in real-life job situations, and that this made him feel like a real scientist. Ultimately, this class enthused Jake even further into his study of the environment and its functionality. When faced with the question of any difficulties with transportation or scheduling with his class, the only thing Jake thinks was inconvenient was the fifteen minutes he had to get from the wetlands to his next class on west campus. He uses a bike to get from class to class, and he states that on a few occasions he was late to his class following his stream ecology class. Although this was a difficulty for him, he made it clear that this only happened a maximum of three times, and his tardiness was

sometimes due to a lazy attempt to arrive on time. This never affected him negatively in his other classes, and his other professors understood his situation. Professor Pintor and Jake Marina's views on courses at the wetlands provide valid support that certain subjects are extremely more beneficial when taken at the Olentangy Wetlands, rather than at an on-campus lecture hall. Although both of these classes specifically focus on wetland based ecology, subjects in the biology fields and more courses from the School of Environment and Natural Resources have the potential to effectively utilize this wetland site. Many aspects of biological, chemical, ecological and environmental sciences are present at the Olentangy River wetlands, and these science departments at Ohio State can more effectively teach their students specific scientific processes by using the resources at the wetlands.

Brent Macolley's Perspective

A valuable resource of the wetlands is its facilities and service manager, Brent Macolley. By managing the wetlands everyday, he has offered great insight on how the wetlands will be used by the addition of more courses and how these courses may impact the wetlands. Brent currently helps students check into the wetlands and works with their classes. He gives guidance and support on how to use the wetlands most effectively. This includes navigating the general area, getting in the swamp with the students, and directing the use of certain lab equipment (B. Macolley, personal communication, October 20, 2014). He did mention that this takes away his time to manage the site, but he thinks the reward for the learning of the students outweighs some usage of his time.

The addition of classes would bring more people to the wetlands, and with more people come more mistakes because humans are inherently fallible. He said this means the wetlands would need to upgrade its janitorial services and general maintenance on the building. Quantitatively, he estimated that they would need one extra service worker for every three classes added to the wetlands (B. Macolley, personal communication, October 20, 2014). Brent continued talking about negative externalities brought by students to the wetlands. When more students go out into the wetlands, there will be more soil compaction. This will cause him to work harder or hire additional workers to maintain the status quo of the wetlands. A way to counter this soil compaction would be to plant more vegetation to limit the walking area of

students. He added that the wetlands can lean on the university for financial assistance if they would need more maintenance.

Brent also talked about a local high school that takes day trips out to the wetlands to draw and paint what they see. He said that before the inclusion of the course, he may have not thought about adding some sort of art course that could benefit from using the wetlands (B. Macolley, personal communication, October 20, 2014). Brent has asked these high school students about their perception of learning at the wetlands before and after they come to draw or paint. He said that overall, the students enjoy getting away from the classroom and getting out into the field to do their studies. He remembered one particular student's anecdote; the student was explaining to Brent that drawing the reality of birds flying makes his drawings become more real. If the student was drawing birds flying from a picture presented in the classroom, he says the end drawing will feel more imaginary. The student told Brent he will remember the live action of the birds flying at the wetlands longer than if his teacher gave him a picture to mimic in the classroom (B. Macolley, personal communication, October 20, 2014). This particular student's anecdote is a good piece of evidence that working out in the field enhances the student's overall learning experience and environmental attitudes. Further evidence in an educational study supports the anecdotal evidence given by Ohio State faculty and students.

Wings and Water Study

An educational study based on field learning compared to classroom learning was performed in Utah with the Wings and Water study (Cachelin, Paisley, & Blanchard, 2009) The premise of this study is that outdoor research fosters better education and more pro-environmental behavior than classroom learning. The authors of the study measured both cognitive and affective responses as well as qualitative and quantitative responses from the students that participated. One set of students learned about Utah wetlands species out in the wetlands within the Wings and Water program and the other set learned about the Utah wetlands species in a classroom setting. The cognitive assessment between classroom and field-based participants showed differences between the two methods of study. Students who had participated in the Wings & Water program and studied with field instruction were better able to correctly identify which species belonged in a Utah wetlands than the students who studied from

classroom instruction. Affective assessment results asked a question: “The place I just visited made me feel . . .” Classroom-based students expressed feeling happy more than the field-based students, but the field-based participants responded with more environmentally friendly behaviors. Field-based participants were the only groups to express sentiments about conservation, wanting to return, being happy about themselves, and feeling safe. They also had a large feeling of physical sensation compared to the classroom-based instruction students. (Cachelin et al., 2009)

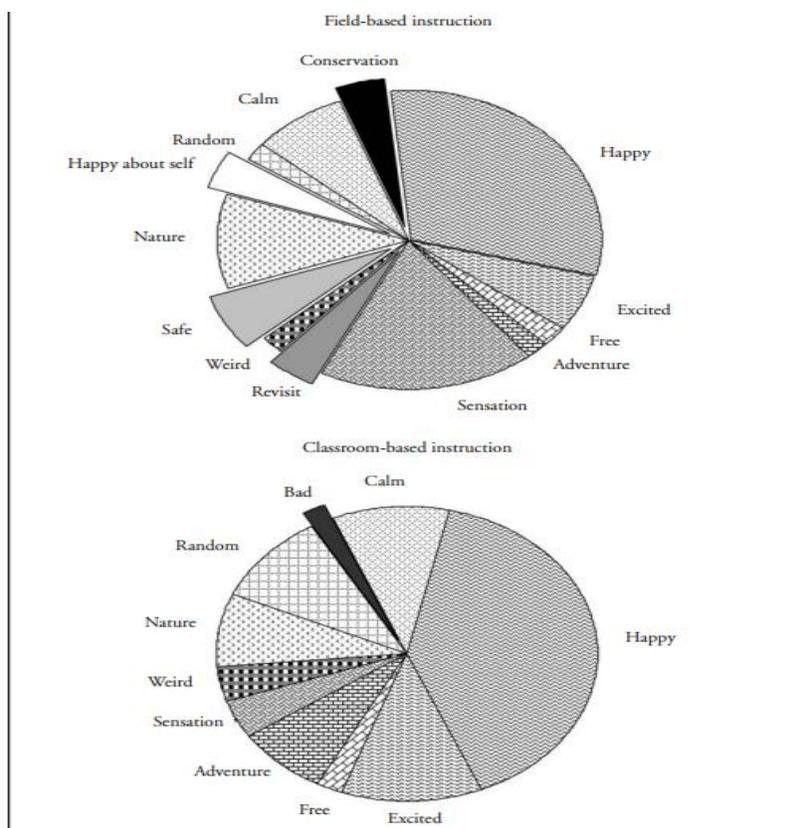


Figure 2. Results from the Wings and Water study: (Based on the question: “The place I just visited made me feel . . .”) (Cachelin et al., 2009)

The Wings and Water study shows the students who learned from field-based instruction are more environmentally friendly than the students who learned in a classroom setting. It is significant that the students who learned from field-based instruction had more feelings of wanting to revisit and conserve the wetlands. Another part of the study gave a fact about today's conservation professionals. This segment of the study shows that 91% of these conservation professionals cited outdoor experiences as their source of environmental attitudes. In contrast, 45% cited their studies of natural systems (Blanchard et al., 2009). The results from the Wings and Water study clearly imply that people who learn about the environment out in the field perform better on tests. It also shows that they will care more about the environment. With this study in mind, a vision of more students learning at the Wilma H. Schiermeier Wetlands and their future environmental attitudes takes hold. To develop our vision, we looked at other universities in Ohio and how they coordinate learning activities at their wetlands.

Ashland University's Wetlands

In order to find ways in which to encourage more classes to be taken at the wetlands, it was essential to look into how other universities utilize their wetlands facilities. This insight could help Ohio State administrators understand and adopt ways to connect Ohio State University academics with the Olentangy River Wetlands. One school that is a great example of successfully incorporating their academia into their wetlands is Ashland University. The school is home to the Black Fork Environmental Science Research Park. Different from Ohio State's wetlands park, Black Fork is not mainly research-based. Ashland University prides themselves on providing educational opportunities to not just university students, but kindergarten through high school students as well (Patti Brown, personal communication, November 12, 2014). Although the university offers about the same amount of semester long courses as Ohio State does, Ashland University is unique in the way they incorporate many experimental day trips for courses in a variety of subject fields such as biology, ecology, chemistry, aquatic animal science, environmental science, geography, earth science and even art courses (Patti Brown, personal communication, November 12, 2014). Even though students are only there for a handful of days throughout a semester, these day trips allow them to take the concepts they learned in lecture and apply them to a real-life, living ecosystem. Ohio State has a great opportunity in following in

Ashland University's footsteps by incorporating more day trips into their curriculum for certain subjects.

Drawbacks and Solutions

As our group intends to bring more classes at The Ohio State University to the wetlands and to expand learning from inside the classroom to the outdoors, complications will come. Social, economic, and environmental problems can occur with what our group wishes to accomplish.

A social critique that might go against our project would be that professors might not want to take their lessons to the wetlands. Some professors can find that traveling to the wetlands is not necessary, or does not fit into their lesson plans. Though it is not often necessary to leave the classroom and valuable lecture time, more interactive and outside study is a great benefit to any class. Mazeika Sullivan, Assistant Director of SENR at Ohio State, in an article "For Students at Ohio State Wetland, New Meaning to Swamped by Classes," says, "It's a great experience being able to seamlessly integrate teaching and research activities here and to have the students be able to directly take their excitement in the field and put it into context in the classroom, and vice-versa" (Knebusch, 2014). He is a prime example of how connecting the wetlands to his teaching provides a great experience to students. More and more students are not showing up to lectures because of the monotonous lessons and note taking. Taking a class to the wetlands provides students a range of different emotions and learning opportunities that sitting in a classroom does not provide. Using the classroom and labs at the wetlands can bring students back to life and engage them in a certain lesson; like Alayna Dorobek, an SENR graduate student said, "It's surrounded by nature. You have the wetlands, you have the river. It really allows students who are taking classes here to be connected to their environment" (Knebusch, 2014). Students feel a connection to nature that makes traveling to the wetlands for a class well worth the trip.

As mentioned before, another issue would be that students might find it difficult to find transportation to the wetlands on their tight class schedules. Transportation can be quite the expensive task because no busses currently stop directly at the wetlands. Though this is a problem, there are other methods that professors and students can use. There is no bus that stops in front of the wetlands, but there is a bus that stops nearby that students can take to get to the

wetlands. Along with the busses, there is a free parking lot and bike racks that the wetlands provide for the public. Ohio State might not want to spend their money on a new bus stop, but utilizing the wetland classrooms can bring the wetlands and the main campus together, which is a great benefit for the whole university. Although transportation is an apparent issue, Dr. Lauren Pintor stated that she actually has never been addressed with any issues regarding her students getting to and from the wetlands facilities. As a matter of fact, enrollment has actually increased since she began teaching at the wetlands facilities (L. Pintor, personal communication, October 15, 2014). Preparing beforehand, students can bike, carpool, or walk to get to a class at the wetlands. Rubinoff states that, “It’s amazing that we have this so close to campus. It’s just a five-minute bike ride away” (Knebusch, 2014).

Lastly, an environmental issue that can occur with our project is that more students coming to the wetlands for classes can cause damage to the land over time. With any piece of land, more people walking and exploring causes more destruction. Since the wetlands are such a prominent place, we would like to reduce the amount of damage to the habitat as much as possible. While stopping all damages and degradation to the land is impossible, the implementation and enforcement of a set of guidelines on how to interact with the wetlands will minimize any negative outcomes caused by increases in traffic. Bringing positive attention and more students to the wetlands outweighs the negative. With more students traveling to the wetlands, more interest comes to it. More students will realize that the wetlands exist at Ohio State and hopefully that will bring more people interested in research, protection, money, and a love for the land. More people showing an interest can help protect the wetlands, allowing less damage and more ways to aid in exploring the area without degrading the current ecosystem.

Conclusion

The Wilma H. Schiermeier Olentangy River Wetland Park is a very unique and valuable learning resource that is sadly being underused by the university. The positive impact the wetlands could have on the students of Ohio State is being stifled by the low number of classes that are held at the wetlands and the small number of classes that take day trips to the site. There is evidence from students and professors alike that justify the benefits of the wetlands as pertains to its ability to provide hands-on learning and interaction. Likewise, there is also empirical

evidence to support the claim that hands-on learning is beneficial. The wetlands have both the classroom and laboratory needed to host a broad number of Ohio State courses; also, the meeting room, viewing platform, wetlands and hardwood forest provide the needed locales and incentives to attract a large number of courses that could benefit from a daytrip to the wetlands. There may be some drawbacks to increasing courses at the wetlands, but the advantages override these negatives. The wetlands have a huge amount of potential benefits to learning, yet it is not fully taken advantage of and should be corrected.

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