

PLACE-BASED EDUCATION

Engagement from the Student Perspective



AN EVALUATION OF PLACE-BASED PROGRAMS IN NORTHEAST MICHIGAN FROM THE PERSPECTIVE OF THE PRIMARY STAKEHOLDERS: THE STUDENTS



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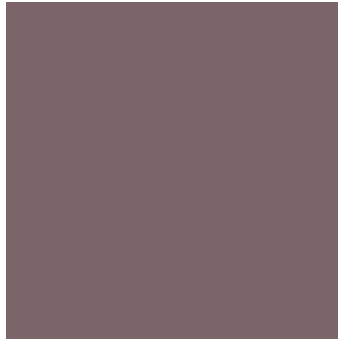
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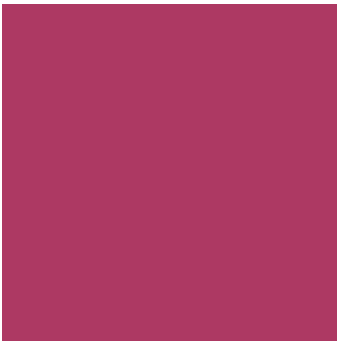
We wish to acknowledge the financial support of the Great Lakes Fishery Trust’s Great Lakes Stewardship Initiative (GLSI) and the Great Lakes NOAA Bay Watershed Education Training (B-WET) program for funding toward the “Our Rivers, Our Future” water stewardship projects featured as PBE case studies within this report. We are similarly appreciative of the University of Notre Dame, the Hesburgh-Yusko Scholars Program, and Dr. Stuart Greene (of Notre Dame) for providing guidance and financial support to Zoe Rae Rote as she worked on this evaluative project.

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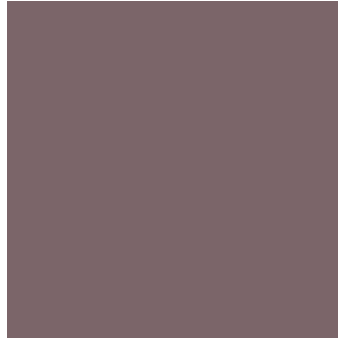
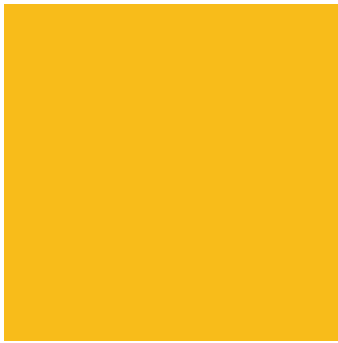
FOREWORD

In Alpena, Michigan, and surrounding counties, the Northeast Michigan Great Lakes Stewardship Initiative (NEMI GLSI) has become a national trailblazer in partnering with local teachers to create innovative and relevant place-based programs for students of all ages. The NEMI GLSI is a regional network of education and community partners collaborating to protect the Great Lakes and natural resources of northeast Michigan through hands-on learning in (and with) the community. The network offers guidance, resources, and ongoing support, while facilitating school-community partnerships, professional development, and training that teachers need to initiate place-based projects in their own classrooms.

Part of the statewide Great Lakes Stewardship Initiative funded by the Great Lakes Fishery Trust, NEMI GLSI is one of nine regional hubs supporting place-based education across Michigan. Leadership and programming support for the NEMI GLSI network is provided by: Michigan State University Extension (MSUE), Michigan Sea Grant and Thunder Bay National Marine Sanctuary, Alpena-Montmorency-Alcona (AMA) Educational Service District, AMA/Iosco Math and Science Center, Cheboygan-Otsego-Presque Isle Educational Service District, MSUE 4-H Youth Programs, Community Foundation for Northeast Michigan, Northeast Michigan Council of Governments, U.S. Fish and Wildlife Service,

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This guide serves as both an evaluation of NEMI GLSI place-based programs in Alpena, illustrated by Great Lakes-focused “*Our Rivers, Our Future*” projects, and as a guide for teachers, administrators, parents, and community partners interested in learning more about the opportunities that place-based education presents. Because the guide focuses on students’ opinions and perceptions of PBE, it complements existing research, which often ignores the student perspective. The guide’s ultimate goal is to highlight the validity of students’ opinions and analyses in evaluating all types of in-school programs, particularly place-based education.



INTRODUCTION

This publication is an evaluation, from the student perspective, of Northeast Michigan Great Lakes Stewardship Initiative (NEMI GLSI) network’s place-based education programming supported through the NEMI GLSI network. There are three primary sections: Stakeholder Profiles and Perceptions, Strategies and Recommendations, and Case Studies.

The first section highlights students, teachers, and community partners as the groups most directly impacted by place-based programs in local schools. Each group identifies various benefits of PBE and focuses on different factors to judge the success of the programs.

The second section includes four recommendations that teachers should carefully consider when designing and implementing their place-based projects and curriculum. This set of recommendations is based on extensive interviews and surveys of Alpena public school students in fifth through twelfth grades, yielding both qualitative and quantitative insights. Often, teachers’ testimonies and anecdotes align with the students’ insights.

Finally, this evaluative guide closes with four case studies. These include elementary, middle, and high school classrooms, as well as a 4-H Great Lakes and Natural Resources summer camp. They all integrate PBE strategies as part of their classroom learning experience.

The NEMI GLSI network serves eight rural Michigan counties including a network of more than thirty schools in which roughly 3,000 youth (approximating 20% of the targeted student population in this region) engage in place-based stewardship experiences in (and with) their communities each school year.

We hope these examples will inspire teachers and community partners to explore and adopt place-based curricula as a means of engaging youth, through their learning, in environmental stewardship projects benefiting their communities.

The student perspective serves as the life force behind this guide and each of its components. We believe in the power of students. With their curiosity, intelligence, and eagerness to be actively involved in the learning process, they can best judge the success of educational programming.



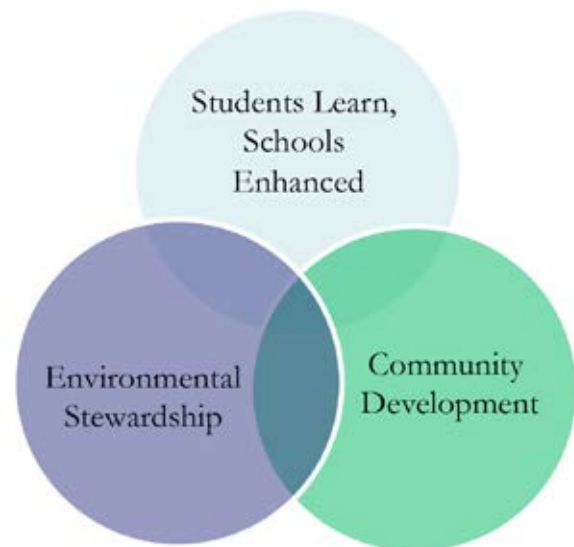
WHY PLACE-BASED EDUCATION?

Place-based education, or PBE, is “an approach to teaching and learning that connects learning to the local,” [1] breaking down barriers between schools and their communities. By anchoring learning in a student’s sense of place, PBE overcomes academic isolation and forges relationships between schools, community partners, and the local environment. When connections between learning and place are nurtured, learning becomes relevant and meaningful to students’ lives. In PBE programs, “students do not need to ask, ‘When will I ever need to know this?’ They discover the answer to that question as they work on tasks to increase their knowledge that benefit others [in their community].” [2] When community assets and needs shape learning, students are empowered to become actively engaged citizens.

In an era of intensified standardized assessments, educators are pressured to “teach to the test” to improve test scores. As these scores become the primary focus of education, students are disengaging from school. In 2004, shortly after No Child Left Behind was implemented, a study published in the *Journal of School Health* found that “40% to 60% of all students are chronically disengaged from schools.” [3] This jeopardizes students’ potential success both in and beyond school. Students are disengaging because they do not believe that school-based knowledge and tests are relevant to their lives. By anchoring learning in the local community and environment, place-based education engages students, promotes academic achievement, and fosters citizenship and community vitality. [4]

The student perspective is often overlooked when assessing the impact of place-based education. Research indicates that the implementation of PBE leads to increased academic

achievement and test scores, [5] yet direct interviews and interactions with the students themselves rarely address these claims. Studies frequently use both quantitative and qualitative data to demonstrate teachers’ perceptions of PBE. Quantifying student engagement by analyzing disciplinary referrals and student attendance has shown that students exposed to “environment as an integrating context” curricula “demonstrate better behavior, attendance, and attitudes than traditional students.” [6] Teachers often reinforce these findings in surveys and interviews with statements such as: “They (students) just get to feeling better about themselves” and “They buy into it.” [7] This evidence, however, represents the teachers’ perceptions of students’ experiences instead of the students’ perceptions of their own experiences. While teachers’ perceptions are important, students themselves



can offer important insights about whether or not academic programs are engaging.

Budget limitations make implementing new and innovative programs in public schools challenging. According to the Center on Budget and Policy Priorities, “at least 35 states are providing less funding per student for the 2013-14 school year than they did before the recession hit.” [8] Michigan is among these 35 states. Between 2008 and 2014, per-student funding in Michigan dropped by 9%, or \$572 per student (adjusted for inflation). [9] However, despite budget cuts, place-based education can and should still be integrated in American schools, particularly public schools. As the case studies in this evaluation suggest, grants and partnerships with community organizations can make PBE possible under all budgets. In fact, as budgets become tighter, PBE is even more important as a valuable investment for schools.

Schools, communities, and policymakers must seek ways to allow students to learn actively and retain the information presented in school. If students are only physically present in a classroom but mentally and emotionally unengaged, they will not learn; teachers and school systems may be wasting their time, talent, and money. Place-based education can address this challenge by engaging students and making learning relevant to their lives. Giving strategic, purposeful thought toward place-based curriculum design is a strategy offered by Amy Demarest, author of *Place-based Curriculum Design: Exceeding Standards Through Local Investigations*. [10] She posits that students’ connection with ‘place,’ when intentionally designed as part of curriculum, can enhance students’ learning experience, as well as their ‘sense of place.’ Place-based curriculum design should seek to facilitate opportunities for students to apply their learning in a community context, fostering a learning process that increases student knowledge, understanding, and engagement as members of their communities. Place-based curriculum design enhances student learning experiences through these community connections, while also aligning place-based learning with important (and often mandated) school improvement goals and state or national educational standards.

There is more at stake than cost effectiveness. We face a crisis in our school system that will directly impact the state of our country in the decades to come. Students who disengage from school and learning adversely affect their potential to be constructive citizens and leaders in our nation’s public and private sectors. We risk the future of our youth and nation if the current education system remains unchanged. Place-based education connects classrooms with communities and fosters citizenship, active learning, and problem solving, bringing “about flourishing lives for students.” [11] As youth flourish as both students and citizens, they will be better equipped to address challenges and identify opportunities as emerging leaders within our society.

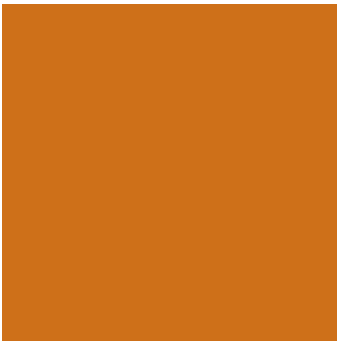
STUDENTS AND TEACHERS: PROFILES AND PERSPECTIVES

Students are the primary stakeholders in place-based education. With support from teachers, community partners, and parents, students are poised to gain innumerable benefits from the implementation of PBE. The key, however, is identifying these benefits and elaborating upon them, thus providing teachers with tools and benchmarks for working to achieve similar effects in their own classrooms.

Unsurprisingly, teachers, community partners, and students each identify different benefits of PBE, although there is certainly some overlap in their identification of increased engagement in the classroom. In this section, we will look at each group’s perceptions of place-based education and use literature by David Sobel and Greg Smith, PBE experts and co-authors of *Place- and Community-Based Education in Schools*, to root our survey evaluation in an ongoing conversation.

Our work did not directly address community partners. Despite the lack of direct surveys, we learned much about this stakeholder through informal investigation and observation. A recurring theme found both in our survey evaluation and in the literature on place-based education is the importance of a common vision directed toward addressing a community need. The National Science Foundation-supported work of Jon Yoder and the Northeast Center for Sustainable Resources provides a case (and supporting curriculum) for the value and opportunity in *Connecting Classrooms to the Community*. [12] This work describes community-based education as a process by which educators can facilitate student exploration of their community and environment, engage students in investigating issues and place-based project opportunities as civic stewards and partners in their community, and invite community involvement and contribution as reciprocating partners in the student learning experience.

In northeast Michigan, community partners with whom we worked emphasized the necessity of addressing an actual need that will inspire everyone instead of a perceived need. The latter leads to paternalism instead of synergetic collaboration. Students see through the ploy and understand that their project is not actually helping the community. This serves to demotivate the students; in fact, in surveys and interviews, students emphasized that a primary factor in student buy-in is the knowledge that their work is helping the community. In the words of Sobel and Smith, “When sustained over time, community partnerships can grow deeper and increasingly yield tremendous synergy and mutually beneficial initiatives” [13]. The integration of community partners into place-based programs forges relationships that ensure program sustainability, motivate students to address an actual need in their community, and enable all parties to accomplish more together than they possibly could individually.



TEACHERS

Of all the stakeholders in education, published studies on the effectiveness of place-based education best represent the opinions of teachers. Using both quantitative and qualitative data, studies have been conducted to identify teachers’ perceptions on various facets of student success, ranging from behavior and attendance patterns to enthusiasm and engagement. While this evaluation primarily focuses on the student perspective, we believe that it is important to identify and study each stakeholder in an attempt to recognize whether their perceptions are in line with what the students hold true.

Much of the published literature focuses on gains that students make academically; evidence is provided through test scores and teacher observations on students’ academic progress. However, this evaluation focuses on the less tangible benefits of PBE as we seek to discover how place-based education practices can engage students.

Recorded interviews were conducted with several teachers participating in the NEMI GLSI network. More specifically, these educators were engaging their students in water stewardship projects supported by Great Lakes NOAA B-WET “Our Rivers, Our Future” project. Authors coded, categorized, and analyzed qualitative information collected in these interviews for similarities, patterns, and examples of experiences in order to identify and describe the responses of teachers interviewed. We identified six primary themes that these teachers associate with the student experience in place-based education.

These themes are easily remembered by the acronym:

TROPIC:

- Teamwork
- Responsibility and Life Skills
- Ownership
- Purpose
- Interest and Motivation
- Community

TEAMWORK

Interestingly, although teachers mentioned increased teamwork as a benefit of place-based education, students did not often identify this theme in either their written surveys or interviews. For students, teamwork is not a foreign concept. Many are in clubs, play sports, or forge a mentality of “teamwork” with their siblings. Teachers, on the other hand, are less involved in team activities. Perhaps this is why they identify teamwork when they see it occurring, instead of assuming it is “normal” as many students may. The literature does not focus on teamwork or leadership skills as primary benefits of place-based education either. However, researchers implicitly touch on this theme when they discuss student collaboration and the benefits civic leaders bring to students by sharing

their time and expertise. The teachers in our evaluation explained the benefits of teamwork for students at all levels. Teams enable students to conduct research, divide and cross-check their work, and develop interpersonal skills. High achieving students who may otherwise be bored in school have the opportunity to develop leadership skills within the team-focused setting. A sixth-grade science teacher commented, “those kids that are leaders, they have a chance to lead and grow those skills.” This also provides students with the opportunity for increased interactions with their teachers, something that many students crave. Although not explicitly expounded upon in the literature or by students, teamwork is an integral element of place-based education that becomes a natural part of day-to-day classroom life.

RESPONSIBILITY AND LIFE SKILLS

“Life skills” is a broad term that includes a multitude of traits and capabilities that empower youth to become better students and citizens. Smith and Sobel write extensively about the skills that students gain through place-based education that extend beyond the four walls of the classroom. According to these authors, increased self-confidence, public speaking skills, self-control, and an ethic of service [14] are all benefits students experience when introduced to meaningful place-based curriculum. A prime example of the development of important life skills comes from Bob Thomson’s Ella White Elementary (Alpena Public Schools) fifth-grade class. Thomson has his students write grant proposals that fund their extensive place-based program, which teaches not only writing skills but also the important life skill of follow-through. When his students complain or feel intimidated by the magnitude of their projects, Thomson tells them, “You wrote the grants together. You took the money ... Well, guess what? You’ve got to do it. You can’t just say ‘Yay’ and then walk away. You’ve got to see it through now.” Too often, students will shy away from demanding projects because of the daunting work involved. Successfully implemented place-based education teaches students responsibility and persistence, especially when their responsibility is to a grant entity and the community. Sobel also writes about the “development of problem-solving, critical thinking and decision-making skills,” [15] all of which increase success in the classroom and in life. Place-based education teaches more than academic material; it also provides an opportunity for students to learn skills that will make them successful, productive members of society.

OWNERSHIP

Throughout our survey evaluation, teachers often gave anecdotal evidence of students taking ownership of their education once PBE was introduced. After a sixth-grade science class cleared a local nature trail of an invasive species, many of the students asked their teacher, Tim Pollard, if they could return anytime they wanted. They were proud of what they had accomplished and wanted to show it off to their parents and friends. Pollard responded, “Yeah, this is part of the community. This is where you live. You can bring anyone back here. Show them what you’ve been learning.” Because of its project-based nature, PBE provides students with tangible outcomes of which they can be proud. Projects are only one component of this. More importantly, students take ownership of their own education, often becoming self-directed and learning the important skill of give-and-take through collaborating with classmates. Teachers support this process when they “invite students to become knowledge creators and to exercise their own voices as they share their findings and understandings with people beyond the classroom.” [16] Instead of passively receiving an education, students create one alongside their teachers. This means that teachers must give students freedom to make choices about their education. In the words of a high school PBE teacher, students “want a certain amount of freedom and choice in their educational experience, and you know that’s what keeps them engaged.” Place-based education provides the platform from which teachers and students can collaborate and co-create knowledge, giving students a sense of ownership over their educational experiences.



PURPOSE

Before conducting this evaluation, we hypothesized that students are engaged in place-based education because it makes learning relevant to their lives. In the words of a sixth-grade science teacher, “students can see beyond just themselves, that they’re doing this for the greater good.” Sobel and Smith echo this sentiment when they write that students are motivated to learn “because doing so allows them to display their competence and make contributions to the lives of those they love and respect.” [17] Besides the broader purpose of an education as service to others, PBE also gives purpose to individual classroom activities. For example, students will understand the purpose of learning to average numbers if they then have to apply this skill to estimate the number of invasive crayfish in a nearby stream. “There is a purpose for it. I think that really sets the standard of why we go out there. It’s not just a typical field trip,” said Bob Thomson, who conducted this place-based project with his fifth-grade class. In fact, many teachers mentioned that they avoid the terminology “field trip” and replace it with “learning excursion” or “experiential field study” to reveal the true purpose of these learning experiences. Teachers emphasize “purpose” as a primary benefit in place-based education because students realize that the knowledge and skills they are mastering can benefit the people and world around them. Place-based education gives purpose to learning.

INTEREST AND MOTIVATION

Motivation was one of the primary themes of PBE identified by researchers and teachers alike. When students are motivated and excited to learn, their desire to engage in and remember the material rises substantially. Unfortunately, motivation is something that teachers cannot directly give students. Instead, they must provide the circumstances under which students will feel motivated to learn. Place-based education does just that. When students believe that their actions can actually make a difference in their community, they are more willing to participate actively as students and citizens. Sobel and Smith write, “These [place-based] experiences show them that their ideas have merit and that they possess the capacity to voice their concerns ... Creating opportunities that allow children to become change agents in their own communities is likely to inspire a taste for such involvement.” [18] Coupled with students’ motivation to become involved is an increased enthusiasm and interest in what they are doing, both within and beyond the classroom. This is best exemplified in a simple statement from a sixth-grade teacher, who said, “Kids being excited about what they are learning, that is a good thing.” A key element in piquing this interest is integrating hands-on, project-based learning into the place-based curricula. According to a high school teacher, his “students seem to be more engaged when [they are] doing exciting, interesting things in the class ... Everybody’s firing on all cylinders.”

In terms of quantitative data, Smith and Sobel look at attendance and disciplinary referrals to identify an increase in student enthusiasm and engagement. When the former rises and the latter falls, we can assume that students are more engaged and have a better attitude towards school. Although the teachers from this evaluation did not have specific data on attendance and behavior, a fifth-grade teacher agreed with the literature, saying, “Consistently, I think that we have higher attendance just because of the involvement. Kids are more interested.” Overall, the literature and teachers agree that as students become more excited and motivated, they enable themselves to succeed.

COMMUNITY

Of the six themes identified in this section, “community” best represents the opinions presented by teachers, students, and the literature. All three sources agree that place-based education enables students to know, relate to, and appreciate their communities more than before. While we later will take a detailed look at the student perception of “community,” right now we can evaluate how teachers view the impact they have on fostering relationships between students and their community. As one high school teacher put it, “I realized that kids have a better appreciation for their community and their town, and for the cool things that are here and make up the community ... I think that’s powerful.” This was a common thread among the teachers we interviewed; place-based education enhances a student’s sense of community if that already exists, but it can also help students form an initial commitment to citizenship. The Rural School and Community Trust expounds upon this idea when it states that place-based education pairs “real-world relevance with intellectual rigor, while promoting genuine citizenship and preparing people to respect and live well in any community they choose.” [19] Thus, students can carry this with them wherever they go in life. They will be prepared to live as engaged citizens in service to any community.

The literature also discusses the power of PBE to create social capital, or “the willingness and capacity of individuals to work for the collective good of a community.” [20] Students are developing this capacity as they come to understand what their community needs. This is where place-based education is a valuable resource for teachers. As a sixth-grade teacher said, “When kids see their community through a different set of eyes they also see the complexities of issues. I think that’s another very exciting thing.” PBE’s focus on creating good students and productive citizens ensures that a well-equipped and conscience-driven generation of leaders will be prepared to address their communities’ needs.



STUDENTS

Although we recognize the importance of these six “TROPIC” themes drawn from the teacher perspective, we focus primarily on the students and what they recognize as the benefits of place-based education. In some instances, like the themes of community and interest, student responses aligned with teachers’ identified themes. In other instances, such as the theme of teamwork, this was not the case. Compared to students, teachers identified teamwork as a benefit much more often. Students, on the other hand, discussed loving labs, gaining confidence, becoming aware of career options, and having fun.

Before beginning this evaluation, we read and studied the vast material available on place-based education, and we noticed a gap. The research did not strongly represent the student voice. Instead, teachers, parents, administrators, and community partners shared their opinions on place-based education. We are interested in what students themselves think about it, which is why the section below outlines four recommendations derived from the student perception of place-based education. Students focused on the importance of fun, their futures, hands-on activities, and community connections as the four most important themes of place-based education. Teachers can use this information and strive to achieve these benchmarks of student success in conjunction with their own identified goals, ensuring that place-based education has the support of educators, community partners, and, most importantly, students.

The following four strategies were developed from 197 student surveys (with both quantitative and qualitative

questions), 14 student group interviews, and observations from four different classes currently implementing place-based curricula. Quantitative surveys were compiled, analyzed, and summarized in contributing to this evaluative summary [Table1].

Summaries of student interviews were coded, categorized, and analyzed for qualitative information. We coded for similarities, patterns, and examples of experiences in order to identify and describe the students’ collective responses. Interviews of the four teachers participating in the survey evaluation were used to complement, guide, and better understand the student-driven data collected for this evaluation.

STRATEGIES – STUDENT PERSPECTIVES, VALUES IN PLACE-BASED EDUCATION

Drawing from the qualitative, quantitative, and observational aspects of the evaluation, these four strategies represent what makes place-based education valuable from the students’ perspective.

- **Strategy #1:** Make it FUN
- **Strategy #2:** Focus on the Future (Career Oriented)
- **Strategy #3:** Hands-on Learning
- **Strategy #4:** Connect it to the Community

Table 1: Student Survey Questions and Summarized Responses (n=197)

Please indicate how strongly you agree with the statements below: (Response categories, 1 = strongly disagree to 5 = strongly agree)	Mean
1. What I do and learn in this [PBE Class or Project] is meaningful and relevant to my life.	3.8
2. In school, I often wonder, “When will I ever need to know this?”	3.6
3. I often wonder the same question in this [PBE Class or Project].	2.7
4. I feel more engaged in this [PBE Class or Project] than I do in my other classes.	3.8
5. I am more motivated to do well in this science class than in my other classes.	3.5
6. I am more involved in my community because of this science class.	3.2
7. I want to be more involved in my community because of this science class.	3.6
8. Overall, I feel connected to my community.	3.8

STRATEGY #1: MAKE IT FUN



Common sense says that students will enjoy an activity if it is “fun” and avoid it if it is “boring.” They will engage when learning is “fun” and disengage when it is not. Despite the logical importance of fun in creating lessons and engaging students, though, fun is often viewed as contradictory to the standards that must be achieved, the rules that must be followed, and the tests that must be given. Place-based education gives teachers an opportunity to incorporate “fun” into their classrooms through projects, hands-on activities and lessons relevant to students’ lives. According to students, this is the single most important factor in their experiences with place-based education.

In the open-ended written surveys administered to both middle and high school students, “fun” was the most common answer to the questions “Why should students take this science class?” (for sixth-grade students) and “Why did you choose to take this class?” (for high school students). Without being prompted or offered options, 32.69% of the sixth grade students and 37.65% of high school students used the word “fun” as they answered these questions. Nearly all of the high school students who used the word “fun” mentioned that previous students used this word to describe the class, highlighting the trust that students have in their peers to determine if a class is “fun” enough to take. A 12th-grade student summed up this general sentiment when she wrote, “Some of my friends told me to take it because they said it was fun.” It quickly became obvious that “fun” is an essential ingredient to creating successful PBE programs. However, the concept of “fun” is quite nebulous and needs interpretation to be useful to classroom teachers embarking upon or continuing their PBE journeys.

Despite the plethora of “fun”-related comments, it was difficult to determine what students meant by their choice of word and why it was the most important factor to a class’s success (from the students’ perspective). Interestingly, the word “fun” was used much less often in the recorded interviews compared to the written surveys.

This could be because in interviews, students could describe a fun experience without using the word fun; they discussed *why* and *how* the place-based experience was enjoyable in addition to using the nebulous descriptor. For example, in the written survey, a high school student answered, “We do fun things” to the question, “What is your favorite part of this class and why?” This student did not expound upon her comment, and because of its bare-boned simplicity, it is hard to interpret. On the other hand, students were able to explain themselves and their experience of “fun” in interviews. A sixth-grade student, when asked to describe her least favorite part of her class’ place-based project, answered, “I didn’t like stopping to have lunch, because that way you stop and you aren’t doing anything!” Although this student did not use the specific word, it was obvious that she was having fun during the place-based project.

“Fun” became a catch phrase for activities and projects that were both meaningful and actively engaging in “doing.” This concept of “doing” signifies more than just hands-on activities; it means actively engaging students’ bodies and minds in a purpose-driven endeavor. In analyzing the data, we determined that students describe something as “fun” when the three goals of place-based education — student achievement, environmental protection and stewardship, and community vitality [21] — come together in a meaningful way. “Fun” for place-based education means actively doing something, with purpose, in your community. In terms of hands-on learning, a sixth-grade student compared her place-based class to her previous science class. She said, “In science last year, we never went on a field trip. We just did boring science and we hated it. But this year we actually get to do hands-on activities and it’s SO fun.”

However, there is more to “fun” than simply doing hands-on activities. This concept is made clear when we consider that although science labs are hands-on by nature, many of them fail to capture students’ interest or engage them in the scientific process. In addition to doing hands-on activities, students must understand that what they are doing has a purpose and connects them to the community. A high school student exemplified this when he commented on his place-based class, saying, “I thought it was a really cool concept of not only learning about it but then seeing it and having it deal with our community, so that made it that much more fun.”

Two of the themes that teachers identified as most important to place-based education — community and purpose (meaning) — are intertwined in this concept of “fun.” Place-based education can only achieve its goals when students are actively engaged. According to our survey evaluation, the best way to ensure this is to make learning, and place-based projects, fun.

STRATEGY #2: FOCUS ON THE FUTURE (CAREER ORIENTED)



Place-based education serves as a laboratory for students to discover and explore their futures. Many students graduate from high school with very little knowledge of the wide variety of careers available to them and even less guidance in how to pursue the fields that interest them. In our ever-more globalized world, possible careers and life paths are constantly expanding while our public school curriculum remains grounded in repetitive books and unimaginative philosophy. Exposing students to various careers during their primary and secondary educations empowers them to make informed decisions about their futures and set themselves up to be successful in achieving them. Connecting curriculum with careers makes students believe that what they are learning is relevant to them and to their futures. One high school student, when asked about the impact of place-based education on fifth-grade students’ career goals, said, “When I was in elementary school, I’d think I want to be a doctor, a teacher, or a lawyer. Those are the three common jobs. Now they’ll know that marine technology is a career pathway to go into, too, and they’re in fifth grade.” Her friend, who admitted she was undecided as to her future, added, “If I would have had more hands-on classes like this ... I feel like I’d have more of a grasp on what I want to do.”

Teachers often try to demonstrate the importance of their material by shifting the focus to the future. If students understand the real-world relevance of what they are learning, they will pay more attention in the present and try to grasp the concept instead of skimming over it and moving on. As one middle school teacher shared during a teacher training conference, she always tries to explain the connections between the material and possible careers to her students. We were surprised to find that in addition to this input from teachers, students regularly recognize the value of potential career-oriented knowledge that they gain from place-based programs. Starting as young

as the fifth grade, students we interviewed recognized the connection between their place-based projects and possible careers they can pursue in the future. While building underwater Remotely Operated Vehicles (ROV) at the Marine Sanctuary, for instance, a fifth-grade boy declared, “My plan even before I started Mr. Thomson’s class was to work at NOAA to protect our shipwrecks, so it was a really interesting class for me to take.” As for older students, their perceptions of place-based education and its connection with the future went through two distinct phases. In middle school (specifically sixth grade), 11.54% of students surveyed commented on the future when asked in an open-ended qualitative survey, “Why should students take this science class?” However, the sixth-grade students gave very general and often impersonal comments about the future, failing to mention specific careers. For example, “Take this science class for later in life” and “It teaches you things you should/need to know in the future” were representative answers. Interestingly, sixth-grade students rarely mentioned future careers when discussing their place-based science projects, as opposed to the fifth-grade students who did mention careers in similarly organized interviews.

While the presence of such future-focused comments in younger grades is encouraging, the true potential of place-based education in introducing students to possible careers became evident in our analysis of high school students. Interviews with high school students who had previously taken “Shipwreck Alley: Shipwreck Science and the Marine Sanctuary,” a place-based Earth Science elective focused on local shipwrecks and the Great Lakes, support this hypothesis. The students discussed the class’s impact on their career goals *and* on future plans they hoped to accomplish while still in high school. Many discussed their future career aspirations and how the class impacted them. For example, one student commented, “I think a marine archaeology or a marine biology kind of job would be a really good fit for me because I really love this class. I learned a lot from this class and I’d like to learn more and look into it more.” Another student discussed how the class inspired her not only in terms of careers, but also in terms of taking advantage of her remaining time in high school. Following the class, she became a volunteer at the Marine Sanctuary (the class’ primary community partner) and then applied for and was accepted to a summer program in California, sponsored by a partner sanctuary. She summed up her PBE odyssey by laying out her future goals: pursuing a career in marine archaeology or marine biology and one day working for NOAA, the community partner that made Shipwreck Alley possible.

Place-based education programs provide an opportunity to explore careers through hands-on fieldwork and mentorship of professionals from partner organizations. One student appreciated the opportunity to look toward his future with the help of community members, saying, “Mr. Caplis brought in people from the Marine Sanctuary to actually teach us about their career path or a shipwreck or have them talk to us, actual people from the community. That helps a lot.” Instead of taking these opportunities for granted, the high school students recognized their value and suggested that teachers implement place-based education with younger students as well, exposing students to various careers early on and beginning the process of hands-on learning and discovery. As one student stated, “if you start younger, I think they’ll have more knowledge of what they really want to do with life.”

Place-based education offers an opportunity for teachers of all grade levels to incorporate forward-thinking conversations and efforts into their classrooms. Elementary school teachers can plant seeds by introducing students to possibilities and opportunities within their communities. Middle school teachers can foster this early beginning and prepare their students to enter high school having already dedicated time and energy to considering their futures. In high school, then, place-based programming can help students explore specific careers, hone in on their skills, and face their futures with knowledge and confidence gained through place-based education.

STRATEGY #3: HANDS-ON LEARNING



More than just teaching students about a place, educators must enable students to participate in the educational process by becoming actively involved in this place. It is

not enough only to *read* about the local community; if students do not have a purposeful avenue for becoming involved, they are unlikely to feel engaged in the lesson. The necessity of hands-on learning is two-pronged. First, it helps students explore the material's relevance to their lives. Second, hands-on activities cater to different types of learners. Whereas traditional schooling caters primarily to auditory learners, place-based education enables teachers to reach visual and kinesthetic learners through projects specific to the students' sense of place. As teachers engage more of their students, they will better achieve the goal of promoting academic success, life skills, and confidence in *all* students.

Anyone who has worked with children knows that most are inherently active; they play games outside, run around, and use their imaginations to build and create. Place-based education gives teachers the opportunity to concentrate this energy and direct it toward the community, using it to fuel learning instead of depending merely on books, worksheets, or lectures. A high school student clearly demonstrated the power of interactive learning when she compared her place-based class, Shipwreck Alley, with an elective class about the history of her city and state. Theoretically, this latter class would also be place-based because it focused on the students' surrounding environment. However, she said, "In that (non-PBE) class, you read — it's a lot more reading from books. And I definitely feel that I learned a lot more from Shipwreck Alley than I did in that class just because it's hands-on. You're actually going out and doing things." Her classmate added that he learned even more about his town's history in Shipwreck Alley than he did in the class specifically focusing on this history. It is the combination of material relevant to place *and* hands-on activities that makes PBE successful.

In a written survey of 104 sixth-grade students, 65.38% wrote about "labs," "experiments," and "hands-on activities" when asked to identify their favorite part of this science class and explain why. One student summed up his and his classmates' affinity for hands-on learning when he wrote, "I like the activities and labs because they are fun and they can teach you more about the lesson you are learning." A high school student who had previously taken a place-based class further developed this sentiment, connecting "fun" to the relevance of hands-on activities. She stated that her teacher "makes an effort to really emphasize bringing it to life, making it real so that you're not just learning about it. You're actually interacting with it." When students interact with the material, they have fun and realize that school is connected to their lives. This makes them more engaged in school.

It is true that some students feel engaged in school even without place-based or hands-on learning. These students learn well from lectures, textbooks, and other hallmarks of the American education system. However, through our survey evaluation, it became apparent that many more students are left behind in a system catering to those who learn by listening and sitting still. Two other groups of learners, visual and kinesthetic learners, are particularly and positively affected by place-based education. One sixth-grade student self-identified as a visual learner during a group interview, stating, "I think it's better for me to learn visually because last night I was doing a rubber band (science lesson) and I was reading it out of the book and I was like, 'I can't do this very well!' And then I looked it up on YouTube and I could do it perfectly." For this student, the visual elements of place-based education, such as community partner presentations and site visits, enhance her learning experience and enable her to learn in a more effective manner. Similarly, kinesthetic, or "hands-on" learners, also benefit greatly from place-based education. Another sixth-grade science student stated that his class' invasive species removal project "helped us learn more about it because you're actually doing it, and it kind of makes us remember more stuff about it." Getting outside, removing the invasive species, and working with his hands helped this student learn better than he could have from a textbook. In an interview, this student's teacher stated that he tries to engage all kinds of learners by implementing place-based projects in his classroom. He said that there are youth for whom "sitting there in school in one spot inside a building is just not their thing. They're more environmental in their whole intelligence. That (place-based education) really rings with them. It's like, 'Oh yeah! I'm out here. They haven't forgotten about me.'" Hands-on activities, embedded within the context of place, ensure that students are not forgotten. Instead, they learn more effectively because they are learning in various, stimulating styles.

STRATEGY #4: CONNECT IT TO THE COMMUNITY



The idea of “place” in place-based education involves much more than just a location and its physical characteristics; people and the relationships they foster transform a place into a community. Community members have much to share with each other, but often this interaction is limited within social or age groups. Youth converse with other youth, retirees with retirees, and parents with fellow parents. This is especially true when school is in session, because students and teachers alike spend the vast majority of their time in school or working on school-related assignments. This can be an isolating experience, distancing a community’s greatest resource — its future generations — from the community itself. Place-based education combats this isolation and reinvigorates both students and teachers. Students are invited and expected to participate in the broader community in a purposeful and constructive manner, something with which they are rarely entrusted. Teachers also have much to gain from PBE. In the words of a middle school science teacher, place-based education is “less isolating. Teaching can be isolating, and that (PBE) gets you out from your room, out from your world, connects you with people like you.” Preventing teacher burnout benefits both students and educators.

As teachers embark on implementing place-based programs with their students, a community is first built in the classroom. Teachers we interviewed often mentioned “improved teamwork” as a noticeable effect of place-based education in their classrooms. While students did not mention teamwork often, they did indicate that PBE affects interactions within the classroom. A fifth-grade student, whose place-based science unit focuses on underwater robots and invasive species, touched on the relationships formed with her class. She said, “I feel like I’m part of something, and the class makes me feel safer. It makes me feel safe, like they’re my family.” When a community is built within the classroom, expanding it into the real world is a natural progression for students and teachers alike.

Place-based education can help students learn about and connect to their communities on a deeper level. High school students in particular identified a change in their perceptions of their hometown as a result of place-based classes. One student exemplified this sentiment when he said, “I think people like to take pride in where they’re from, and learning how important Alpena was to the shipping industry back then really gives you a sense of pride when you think about that.” His classmate followed up by commenting, “Now I realize that Alpena is more than just another spot on the map.” This is powerful because students have begun to believe that their place is special and worth valuing. As attitudes toward their communities change, young people are empowered as both students and citizens. Teachers are forming future leaders who care about what happens within their schools and communities.

This developing sense of awareness about the community and its needs ties into the concept of responsibility. Place-based education helps students realize that an education cannot and should not benefit just one person. Rather, they have the responsibility to take what they have learned and apply it to helping their community and fellow citizens. A fifth-grade student recognized the connection between personal enjoyment and community involvement when he said, “I liked science before this but now I enjoy it even more and I feel like I am helping the community now.” Similarly, a sixth-grade student touched on the idea of serving her fellow citizens — acquaintances and strangers alike — when she said that it felt good “to know that I’m helping somebody else and not just myself or other people that I actually know.” Rarely do youth in our society believe they have the power to change their communities. Place-based education not only empowers students to do so, but also instills in them a responsibility to use their education toward this end.

Interestingly, there was a disconnect between interview answers and quantitative survey answers when students were asked about their community involvement as a result of their place-based class. In the interviews, students mentioned “helping others” and “community” quite often. However, when asked to agree with the statement “I am more involved in my community as a result of taking this class” on a scale of 1 (strongly disagree) to 5 (strongly agree), the responses were lukewarm. The average answer from 99 sixth-grade students was 3.34, while the average from 83 high school students was 2.82.

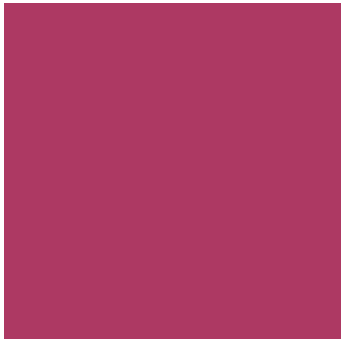
These numbers jumped when students were given the statements, “I want to be more involved in my community because of this science class” or “I want to be more involved in my community after I complete this course.” For this follow-up question, the sixth-grade students averaged 3.61 while the high school students averaged 3.51. For the high school students especially, this represents a significant increase.



CASE STUDIES

The following case studies offer vivid examples of how place-based education can be incorporated into classrooms at all grade levels and with various curricular goals. The first case study highlights a self-contained fifth-grade classroom that uses PBE as a cross-curricular link between science, math, English, and public-speaking skills. The second focuses on two sixth-grade science classes that have implemented place-based projects to support their ecology curriculum and spark community involvement. Third, we feature a case study of an Earth Science elective offered to high school students who want to learn more about the Great Lakes and their community’s shipping history.

Finally, we highlight the place-based “Coastal Wetlands and Invasive Species” session at the 4-H Great Lakes and Natural Resources summer camp in northeast Michigan. Although all four case studies incorporate the four principles identified by students as most important to PBE, each has developed one of these concepts as the life force behind its students’ success. The case studies will explore this success and discuss how teachers and community partners can learn from these examples and implement place-based education programs in their own classrooms.



ALPENA, MICHIGAN

It is essential first to discuss Alpena's demographic composition so we can better understand the student population served by this place-based model. Alpena County, the county to which all schools in this evaluation belong, is racially homogenous, with 97.3% of its citizens self-classifying as "White alone" in the 2010 census. The county also has an aging population. In contrast to the state of Michigan, in which 22.7% of citizens are under 18 years and 15% are over 65 years, 19.6% of Alpena's population is under 18, while 21% is over 65. This presents both a challenge and an opportunity to place-based education; students may find it difficult to relate to their communities

because there are fewer people their age, but at the same time, teachers can utilize the aging community and their wisdom as resources for place-based education.

A small percent of the population, 3.6%, speaks a language other than English at home. Generally, this is not a factor that many teachers must address in Alpena schools. In Alpena 16% of its population holds a bachelor's degree or higher, compared to 25.5% in the state of Michigan. If parents and community members do not have college degrees, students may find it more difficult to envision themselves following that path. Teachers also confront poverty in

the classroom. The median household income in Alpena from 2008-2012 was \$38,900, a full \$9,500 less than the state average. However, the cost of living is lower, so the percentage of people living below the poverty level, 16.8%, is comparable to the state average. Another factor teachers need to consider is the geographic spread of the school district. Many students live in rural areas and often take a bus into school from long distances every morning. As teachers plan and implement place-based curricula, they are considering factors such as travel, racial homogeneity and poverty. [22]



CASE STUDIES

The following case studies from northeast Michigan offer vivid examples of how place-based education can be incorporated into classrooms at all grade levels and with various curricular goals.

RUSTY RAIDERS

Fifth-grade students proudly display the posters they developed after studying the local invasive rusty crayfish population. With the goal of educating the community, the students presented their research to classes in their school. "The big life skill is their ability to talk to adults and communicate with other students. They really start to build that confidence," said teacher Bob Thomson.

CONSCIENTIOUS CAMPERS

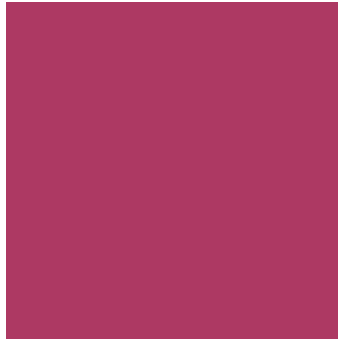
Campers at the 4-H Great Lakes and Natural Resources Camp study the invasive phragmites population with experts from the U.S. Fish and Wildlife Service and AmeriCorps volunteers. The students measured and mapped large stands of the invasive species using GPS units, contributing to an important stewardship service project in Lake Huron's coastal wetlands.

SHIPWRECK ALLEY

High school students in Shipwreck Alley, an Earth Science elective, measure the dimensions of an onshore shipwreck. "Former Shipwreck Alley students now go, 'Wow! Alpena's really cool! It has some really unique things. It's a special place.' So I think that's powerful," said Shipwreck Alley teacher John Caplis.

TRAILBLAZERS

Sixth-grade science students clear buckthorn branches from the previously overrun nature trail behind their school. Students, parents, and teachers gathered for a Saturday workday to jumpstart the project. "It's an opportunity for parents to interact with their kids in a way that is helpful to the school," said teacher Tim Pollard.



CASE STUDY #1

**Ella White Elementary
(5th Grade)**

Alpena Public Schools

Strategy: Connect it
to Community

THUNDER BAY WATERSHED PROJECT

CONNECT IT TO COMMUNITY

A group of four fifth-grade girls gathered around the classroom's largest fish tank during lunch. One girl pointed out her "desk with a lakeside view," adjacent to the fish tank, and explained that she paid higher rent each month in the classroom economy because of this prime location. The other three girls, still focused on their task, grabbed a flexible white tube from a cabinet and began the process of cleaning the large fish tank. The sturgeon swam around the tank, oblivious to their caretakers' careful calculations. By the time the lunch period ended and the rest of Bob Thomson's students returned to the classroom, the four girls had cleaned the tank, fed the sturgeon, eaten lunch, and fashioned improvisational spoons out of cardboard and pencils. With puffed chests at having completed their range of tasks, the girls took their seats and Mr. Thomson began the daily science lesson.

Bob Thomson's journey in interactive education began more than a decade ago, when he and his students built outdoor shelters based on a popular novel. This naturally led into writing exercises, during which the students wrote nonfiction directions on how to build the shelters they had just constructed. After six years of similar projects, Thomson connected with community members and partners who introduced him to robotics. Building and utilizing robots has become a foundational element of

all of Thomson's projects and classes. From testing water quality to documenting zebra mussels on shipwrecks, Thomson's elementary students have used their robots to serve the local community.

Walking into Thomson's self-contained fifth-grade class is akin to entering a youth-run society. Although Thomson's place-based curriculum is largely grounded in math and science, he also incorporates hands-on learning into all aspects of the school day. His students conduct their own economy, in which they each have jobs, pay "desk rent," and create products to sell to each other during breaks. They excitedly display their handmade duct tape hair bows for sale before rushing over to the large fish tank, eager to "check up" on the sturgeon. This tank holds lake sturgeon, a native species the students are raising as part of their science class. Science textbooks sit, untouched; Thomson's students only use them for reference, when necessary. This science curriculum, which Thomson has developed over years of teaching and grant writing, is an incredible example of successful elementary place-based education.

On the following page is an Educational "Super Sturgeon" poster created by Ella White students in partnership with Michigan Sea Grant to promote native species conservation.

MISSION: TO PROTECT THE GREAT LAKES

SUPER STURGEON

By: Hailey Niedzwiecki,
Abby O'Bryan, Elly Clarke,
Amelia Berles



Lake Sturgeon (aka *Acipenser fulvescens*)

Roaming the bottoms of our Great Lakes is a big torpedo of a fish – she is the lake sturgeon! The lake sturgeon is one of the splendid native species found throughout the Great Lakes. Helping to support native species means helping to support strong ecosystems — and that means healthy Great Lakes!

WHO IS THIS NATIVE HERO SPECIES?

- ◆ **Bigger than the rest:** As the largest fish in the Great Lakes, she can grow 8 feet long and up to 300 pounds.
- ◆ **Armor-clad:** She has a spiked armor and thick plates called scutes instead of scales to keep her protected.
- ◆ **Invisibility cloak:** Even though she's big and armored, our hero can blend into the background. She is brownish in color often with black splotches (or mottling).
- ◆ **Vacuum face:** With a super sucker mouth and sensory whiskers to help find food, she can suck up invasive species like round gobies and quagga mussels for breakfast, lunch and dinner.

OUR SUPERHERO'S STORY

- ◆ A prehistoric species of fish, her ancient ancestors swam with the dinosaurs (136 million years ago).
- ◆ Before human settlement of the Great Lakes region, scores of sturgeon called these waters home.
- ◆ Our superhero is the longest living fish species in the Great Lakes! Females can live up to 150 years and males up to about 100 years.

- ◆ That means, our superhero sturgeon swimming in the lake right now could be the very same one that swam by your grandparents, your parents and maybe one day your kids and even grandkids!
- ◆ Today, she patrols the bottoms of the lakes and rivers, fighting back against invaders — by eating them.

EVERY SUPERHERO MUST FACE A BATTLE!

When Europeans settled in the Great Lakes, it didn't take long for the once-abundant sturgeon populations to dwindle.

- ◆ They were overfished and overharvested.
- ◆ Pollution and development damaged their homes.
- ◆ Hydroelectric dams were built near or blocked important spawning areas – taking away the areas needed for reproducing and replenishing populations.
- ◆ Once catch limits were in place, people still caught them illegally (poached) them, especially sturgeon entering shallow rivers to spawn.
- ◆ Over time, their populations continued to fall, and today this superhero is a threatened species in most Great Lakes states.

HOW DO WE HELP THE STURGEON?

- ◆ Researchers and scientists are learning about our superhero's behavior, habitats and her importance to the ecosystem and food web.
- ◆ Researchers are repairing lost habitat by creating new spawning reefs in rivers.
- ◆ Citizens are on patrol! Groups of citizens and supporters of the sturgeon help protect the fish from poaching by organizing watches during spawning season.

WHAT CAN YOU DO?

- ◆ Take a few minutes and learn about what sturgeon do and what you can do to help save them – you could become the next sturgeon research scientist!
- ◆ Teach your friends, family and community about this native species superhero.
- ◆ Help our superhero combat invasive species — by eating them! Just kidding! Help prevent introductions and spread of invaders by following best practices.
- ◆ Become a member of a community group that helps to protect our Great Lakes.
- ◆ Go fishing! Learn and follow the fishing rules that are made to protect our Great Lakes fish. And if you catch a sturgeon, make sure you let her go as quickly as you can.



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Although Thomson's curriculum incorporates the concepts of fun, hands-on learning, and an orientation toward the future, Community is the principle best exemplified by this fifth-grade class. The students build underwater ROVs, or remotely operated vehicles, with support from the National Marine Sanctuary in Alpena. This involves both in-class builds and on-site workshops at the Sanctuary headquarters. Instead of just building robots for the sake of building robots, however, Thomson ensures that his students put them to use. This year's class participated in the MATE (Marine Advanced Technology Education) ROV underwater robotics competition alongside fellow community members, ranging from elementary students to community college students. Thomson's students commented that they had never been involved in their community "before this kind of project," and that they wanted to be more involved following the experience. These are the long-lasting benefits that place-based education can have on relations between students and their community.

The other half of Thomson's place-based program focuses on invasive and native species. In the past, his students conducted research on the invasive rusty crayfish, went into the field with community partners to count the populations, and decided to share their findings with the community. The students developed informational fliers and posters that were then published and distributed throughout the school and community. In the words of Thomson, the class figured, "Well, the only way we can get people to catch and release is to get out and talk to people, and ask them not to, and tell them why." Fostering

public-speaking skills, Thomson then had his students present throughout the school, explaining the importance of protecting native species and how to distinguish them from invasive species. The next year, Thomson's new class of fifth-graders decided that instead of focusing on "negative" invasive species, they wanted to highlight "positive" native species. In addition to raising the sturgeon in class, the students conducted research on the species and prepared to publish an additional informative poster for the community. In the words of one student, "We're sort of studying him (the classroom sturgeon). We're watching him and learning about him ... and we're sort of trying to raise awareness about how we need sturgeon in the ecosystem." These students are becoming teachers themselves, using their newly acquired knowledge to participate in and educate their communities.

Thomson emphasizes that starting a PBE program is very difficult but also incredibly worthwhile. He talks of staying up all night writing grants and networking with community members to find funding and support. Now, however, community organizations approach his fifth-grade class with projects and ideas. The students themselves write grants using past student-written grants for guidance, and according to Thomson, "Now a thousand-dollar grant is routine." Bob Thomson's fifth-grade class is an example of how students are using their community as a classroom and a resource, educating their community in hopes of making it a better place to live, and receiving support from community members that now value the students as young scientists and active citizens.

CASE STUDY #2

Thunder Bay Jr. High (6th Grade)

Alpena Public Schools

Strategy: Hands-on Learning



BEACHES AND BUCKTHORN

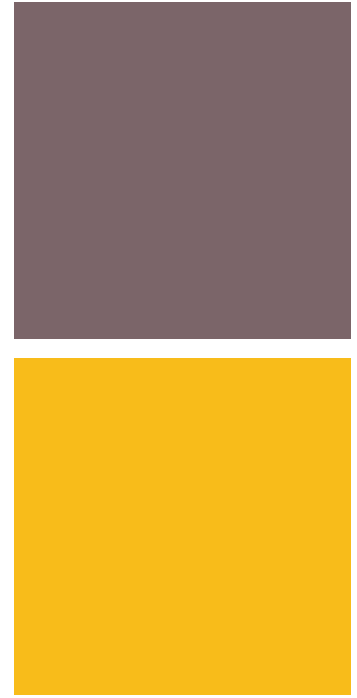
HANDS-ON LEARNING

Early on a Saturday morning, a dedicated and excited group of students, parents, teachers, and community members gathered outside of Thunder Bay Junior High and prepared to get dirty. They spent the day cutting back buckthorn, a hearty invasive species choking a creek and trail on school grounds. An innocent bystander may have confused the scene with a simple community service day, but the students present could have entertained this bystander with impressive knowledge on buckthorn and the problems it creates. Place-based learning is not just a fancy name for community service; these students knew exactly what they were doing and why they were doing it, in terms relevant both scientifically and for their society. There was purpose behind their academic and community-oriented hands-on work.

Cheryl Mack and Tim Pollard, the teachers present on that Saturday morning, teach sixth-grade science classes with distinct place-based projects. Although they have the same curriculum and standards, Mack's class focused on an Adopt-a-Beach project while Pollard and his students tackled the challenge of restoring the school's on-campus nature trail that had become overrun with buckthorn. To keep middle school students engaged and interested, both teachers created interactive learning environments shaped by hands-on activities. Their students talked about

how much fun they had, the excitement of helping their communities, and future involvement. However, the most frequent comments from the 103 surveyed students addressed the labs and hands-on activities associated with the projects. Middle school is a time of transition for many students, and in the midst of changing friend groups and new expectations, students love the opportunity to get involved and actually *do* something. This act of doing appeals to various learning styles and also enables students at different academic levels to participate fully in the lesson.

Adopt-a-Beach was a logistically appealing place-based opportunity for Mrs. Mack; she was able to take her students, who constitute half of the sixth grade (Mr. Pollard has the other half), to the local beach and orchestrate the hands-on activities there. In interview after interview, students described the excitement of measuring the water's current, saying, "We took a string and we took an orange and we plopped it in and saw how long it took." In addition, the students tested water quality and picked up trash along the beach. They were dismayed at the results; the water was "quite oily," a jacket was left floating near shore, and the students found an incredible number of cigarette butts lying on the sand. This had quite the impact on the students, and they experienced the effects of



littering first-hand as they picked up the cigarette butts. If they had simply read or been told that this was a problem, it would not have affected them to such an extent. The students had to get their hands dirty and experience the problem on-site in order to fully recognize its implications.

Concerned about both their community and “the birds and the fish in the lake,” the students vowed to address the littering problem and jumped into a real-world lesson in social activism. Together with Mrs. Mack, a small group of students took their data and went to the City Council, speaking about the litter and cigarette butts they found. The councilmembers listened, and to the thrill of the students, promised to install garbage cans at the public beaches managed by the city of Alpena. The students’ unexpected lesson in social activism was topped off when Alpena’s mayor visited their classroom. He discussed their findings and involvement, and the students were excited to meet such an important member of their community. What started out as a hands-on science lesson evolved further than Mrs. Mack or her students could have imagined.

While Mrs. Mack’s students were working on their Adopt-a-Beach project, Mr. Pollard and his students began to restore a nature trail in the school’s backyard. The trail had been overrun by buckthorn, an invasive plant that spreads quickly and chokes out native species. The buckthorn had also overrun the on-site stream, making it unidentifiable from the trailhead. Mr. Pollard integrating the project into the sixth-grade science standards, covering native and invasive species extensively. While Mr. Pollard led

and organized the project, Mrs. Mack’s class also worked on the nature trail, yielding a successful collaboration between two teachers and hundreds of students. The project culminated in the Saturday workday, in which students and parents completed the bulk of the removal work supported by Huron Pines AmeriCorps members. They cut back the buckthorn plants and fed the wood into a chipper, which was donated for the day by a community member. In the words of Mr. Pollard, the day was “an opportunity for parents to interact with their kids in a way that is helpful to the school, part of their education, and helping the community.”

In the following weeks, the two classes continued to work on the trail. They spread the wood chips made during the Saturday workday and continued to monitor the buckthorn population. Mr. Pollard chemically treats the stumps when the students are not around, dedicating himself to the trail’s upkeep. The students learned much more than the textbook definitions of invasive and native species. They also got down and dirty (and very muddy), seeing a project through from its initiation to its conclusion. One sixth-grader expressed her love of the project-based and interactive curriculum when she said, “This year we actually get to do hands-on activities and it’s SO fun!” Students, parents, and community members alike are encouraged to use the trail and explore the wooded area, making the project lasting and meaningful to everyone who was involved.



CASE STUDY #3

**Alpena High School
(9th-12th Grades)**

Alpena Public Schools

Strategy: Focus on the Future
(Career Oriented)

SHIPWRECK ALLEY COURSE

FOCUS ON THE FUTURE, CAREERS

Eight students gathered around a large black laboratory table, eyeing the boxes of pizza perched on the table's edge. After passing out plates and napkins, the students eagerly distributed the slices and joked with their former teacher, Mr. Caplis, who stayed seated at his desk across the classroom. These eight students, all juniors and seniors, gathered during their lunch hour to discuss the impact that Mr. Caplis' class had on them and their memories of the class' unconventional projects. One theme that arose consistently throughout the 40-minute discussion was the future: what these students wanted to be, how they planned on getting there, and how Mr. Caplis' class had shaped those aspirations. Instead of simply passing through the course unchanged, these eight students exemplified the impact that an incredible place-based class can have on students and their dreams.

Because of its distinct trimester system, Alpena High School offers its students a plethora of elective options. None is as tailored to the students' community as "*Shipwreck Alley: Shipwreck Science and the Marine Sanctuary*." Partnering with the NOAA Thunder Bay National Marine Sanctuary, John Caplis created this Earth science elective as a way "to bring those subjects (science and history) alive, but also connect them (his students) with some really amazing people who are at the top of

their game." The trimester begins with lessons on the geology, meteorology, history, and geography of the Great Lakes, which lay the foundation for the remainder of the course. Professionals from the Marine Sanctuary visit the class multiple times each trimester, sharing their expertise with the class. Through this, students learn about various careers connected to Earth and marine science and meet successful women and men in their community who can serve as role models. As one student wrote, "My favorite part (of this class) is when we have guests come in because it tells us how many jobs this Sanctuary has." Beyond these personal connections, projects give students a window through which they can see possible futures.

Over the two years that Mr. Caplis has offered Shipwreck Alley to ninth through 12th-graders, the place-based projects have encouraged both community involvement and career exploration. Former students recall taking oral histories from local fishermen who fished aboard the *Katherine V* (a historic commercial fishing vessel on display at the Besser Museum for Northeast Michigan). They also created underwater photo mosaics with NOAA marine archeologists and wrote books about local aspects of Lake Huron. Current students have the opportunity to build ROVs, examine real Lake Huron shipwrecks on a glass-bottom boat, and learn to scuba dive in the high

school's pool. Instead of merely learning about Alpena's history through books, these students are diving into it and experiencing their community's unique connections to shipping and shipwrecks. In creating the class, Mr. Caplis hoped to create "a powerful learning experience for the career pathways" that his students might choose to follow.

According to the eight alumni who gathered during that lunch period, Shipwreck Alley has achieved this goal and much more. One senior student said that Shipwreck Alley shaped her future aspirations and helped lead to a career path. This student noted,

"Because of this class, I became a volunteer at the Sanctuary. Then through that, I submitted an application to a program called Ocean for Life, which is a NOAA program [that] took place in California. So I got accepted to that and I went there this summer ... I'm really interested in having a career path in marine archaeology or marine biology ... It started all from this class, so that's really cool."

The preceding fall, this student had enrolled in a university as a full-time environmental engineering student, and she hopes to work for NOAA one day. This student represents an incredible example of how one high quality place-based class experience can inspire and shape a student's outlook toward her future.

The key to Shipwreck Alley's success in helping students discern possible career options lies in the extraordinary combination of projects and community partners. The students appreciated the hands-on activities, such as mapping an onshore shipwreck, "that actually show us what we do if we're a marine archaeologist." In addition to the career-related projects, Mr. Caplis invites a guest speaker from the community college's Marine Tech program to come and speak with the class about this potential future path. One student added that Mr. Caplis "brought in people from the Marine Sanctuary to actually teach us about their career path or a shipwreck or have them talk to us, *actual people* from the community."

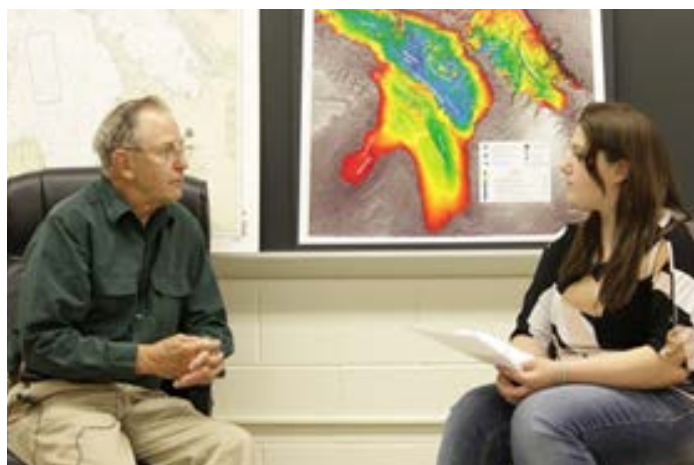
Once students explore career options through interactions with local professionals, do activities to determine where their interests and talents lie, and study the material necessary to anchor these interests, they are able to look toward their futures better equipped to make decisions and follow through on their career goals.

Mr. Caplis recognizes that a class like his is expensive and intensive. He spent many nights writing grants and insists that having a strong community partner like the Marine Sanctuary is key. As to the cost, though, Mr. Caplis strongly believes that it is well worth it because of the experience and the direction that many students take

from the class. In his words, Shipwreck Alley "gives them a better experience that may inspire them to become or to do more, to follow a different career path or pursue a different learning pathway. It's worth money. It's worth spending time on." Another important aspect of this place-based class is that it shows students career opportunities *in their community*. Many students shared the sentiment that prior to this class, they did not feel that Alpena had anything to offer them in terms of careers. Afterwards, though, they were more aware of ways that marine science professionals were contributing to their community. Place-based education supports this connection between career and community.

Lastly, although Shipwreck Alley is an immense success, such place-based, career-focused opportunities should be available to students well before they reach high school. As one student said, "Once you're already in high school, you're kind of getting toward the end. And people push you to need to know what you want to be doing with your life ... so young." If place-based education can help students determine where they want to go in life and in their careers, these efforts should begin sooner so that students have more time to develop and explore. Shipwreck Alley is an encouraging example of how a place-based class enables students to forge connections between their academics, community, and career goals, sometimes shaping a future unknown before the class.

Shipwreck Alley students continue to contribute to restoration and collect stories from local fishermen to help interpret the historic Lake Huron commercial fishing vessel, the *Katherine V.*, at the Besser Museum for Northeast Michigan.

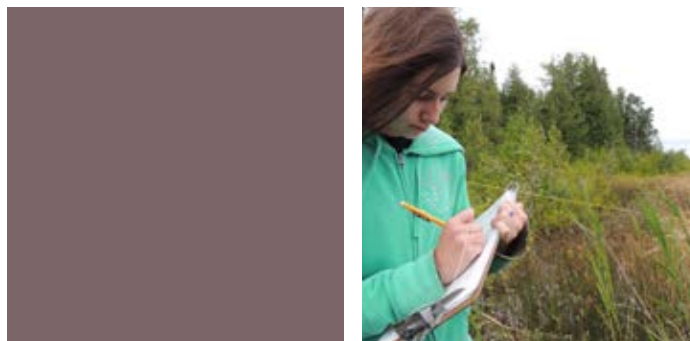


CASE STUDY #4

4-H Great Lakes and Natural Resources Camp

Statewide Youth Leadership Camp

Strategy: Make it Fun!



HUNTING FOR WETLAND INVADERS

MAKE IT FUN!

Toting GPS units, datasheets on clipboards, and an enthusiasm for Great Lakes science, rising eighth- through 10th-grade students participating in the 2014 4-H Great Lakes and Natural Resources (GLNR) Camp were on the hunt for aquatic invasive plants. Exploring Lake Huron's coastal wetlands, these students-turned-campers gained first-hand career experience with wetland ecologists from the U.S. Fish and Wildlife Service. They also contributed to an important stewardship service project aimed at mapping phragmites, an aggressive invasive plant, along the Presque Isle County coastline. Although not a classroom setting, this camp is yet another example of a skillfully-implemented place-based program. The campers explored their "place" in northeast Michigan by rolling up their sleeves (and pant legs!), interacting with professionals from the community, and contributing to an effort to clear their community's coastlands of a harmful flora species. Most of all, though, the campers had lots of fun, the primary principle identified by students as key to successful place-based education programs.

The 4-H GLNR Camp, held annually in Presque Isle County at Camp Chickagami, provides hands-on learning experiences for 70 youth, ages 13-15, from all over the state of Michigan. Between mess hall meals, campfires, and afternoon recreation, the campers explored science,

leadership, and careers related to Michigan's Great Lakes and natural resources. The 4-H GLNR Camp is sponsored each year by Michigan State University Extension, 4-H Youth Development, Michigan 4-H Foundation, Michigan Sea Grant, and MSU Department of Fisheries and Wildlife, among several other organizations. Once again, this shows the importance of strong community partners; whether connected to a classroom or a camp, community partners offer a wide range of support and expertise that make place-based education possible. The GLNR camp brings youth development professionals together with Great Lakes science experts in offering these wonderful learning, leadership, and fun-filled experiences for youth.

During the weeklong camp, teens participated in science sessions relating to local woodlands and wildlife, Great Lakes invasive species, wetlands, watersheds, and fisheries. Campers learned about Michigan's environment in numerous hands-on and science-based activities while having fun and exploring potential careers with professional experts. Practicing leadership through place-based education, community service and environmental stewardship, the students came to understand the uniqueness of their "place" much better than had they simply been reading about these themes. Learning and fun are inseparable partners at this camp and in all successful



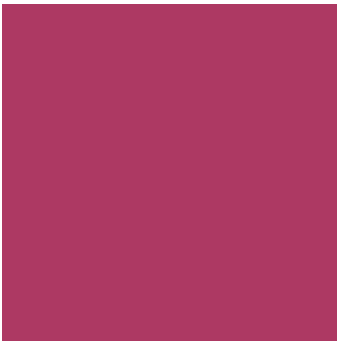
place-based initiatives; the “fun” approach makes both the learning process and the material more attractive to youth of all ages.

After donning their wetland ecologist waders, the campers’ science exploration included efforts to help map and control invasive plants threatening local coastal wetlands. Invasive species are a growing concern for the Great Lakes region and are critical threats to Lake Huron biodiversity conservation. Instead of studying this in a classroom setting, the students grappled with these serious issues in a fun environment. Partnering with Huron Pines AmeriCorps members and a U.S. Fish and Wildlife Service biologist, the campers hiked through the coastal wetlands of Presque Isle. They learned about wetland ecology and searched for invasive plants, simultaneously wading through marshes and splashing their friends. Getting wet and muddy was not the goal, but it made the experience even more fun!

Hiking the beaches, dunes, and coastal wetlands along the Lake Huron coastline, students blended science and technology by using portable GPS units to flag and measure invasive species. The goal of the students’ mapping project was to help slow the spread of these species into northern Lake Huron coastal areas by

documenting new infestations that have spread into the region. Based on the campers’ work, teams of professionals will use this data to conduct management treatments and remove the identified invasive plants this fall. Students were aware that the data they collected would be used in upcoming efforts to address the problem, which made their assignment all the more purposeful and enjoyable.

As the camp ended, students left with increased appreciation for pressing environmental issues, knowledge that they contributed to conservation stewardship, and growing awareness of career options in natural resources management. Most of all, though, the students had fun. Although specific details of the science sessions may fade over time, campers will remember the fun they had and the memories they made while exploring the Great Lakes with fellow campers and community partners. From early morning fishing trips to memorable mishaps on their phragmites-hunting adventures, the campers learned that applying science to help their communities can be more fun than they ever would have imagined.



CONCLUSION

The Northeast Michigan Great Lakes Stewardship Initiative strives to promote principles and applied place-based education practices among a network of schools and community partners invested in positive youth development across the region. In the context of a broader statewide Great Lakes Stewardship Initiative network, this work is accomplished through three strategic pillars of focus – fostering school-community partnerships, supporting schools and educators, and engaging youth in hands-on, place-focused learning.

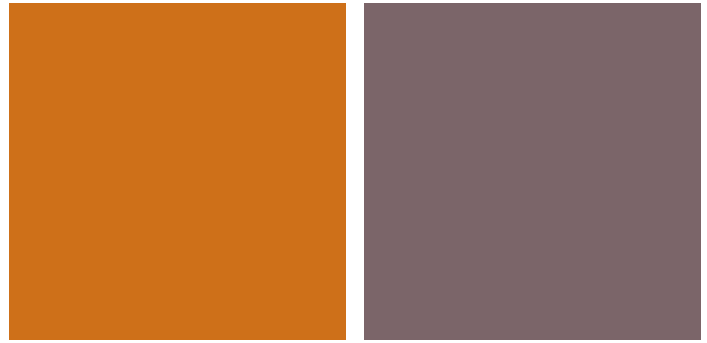
This evaluative report explores the student perspective of place-based education in practice with participating NEMI GLSI schools and teachers. This evaluation centered around four case studies illustrating place-based education at its best in northeast Michigan. Each case study exemplifies a theme that students identified as essential to engaging place-based programming. The case studies represent PBE across a range of learning landscapes, from in-school elementary, middle, and high school experiences to informal summer education. Important in these case studies is the focus on place-based education as a learning process and the power of student voices in assessing this learning process.

We describe place-based education as an educational strategy and a learning process, with less focus on the specific types of projects (which may take many forms). In developing our case studies, though, we hope that

content-focused projects serve as concrete examples of how school-community partnerships can form and progress in supporting a fruitful learning process. Place-based education offers promise as an educational strategy with the purpose of engaging youth as valued, contributing partners within their schools and communities. This is especially effective when students' voices and opinions are used in evaluating place-based programming.

Reflected in case studies presented here are the efforts of students monitoring water quality and adopting public Lake Huron beaches, promoting Great Lakes fisheries, and interviewing local fishermen to help interpret a historic Great Lakes commercial fishing boat. These students are promoting biodiversity conservation, monitoring aquatic invasive species and removing invasive buckthorn plants as part of a habitat restoration effort to recover their schoolyard nature area. A goal of place-based education is to enhance the student learning experience, and there is little argument as to the important environmental stewardship and community development services provided by these students.

Alongside the clear community value, effective PBE strategy requires equal understanding and commitment toward educator and student engagement experiences in PBE. This program evaluation employed both quantitative and qualitative assessment of teachers and students involved in these experiences. Through surveys,



interviews, and observation, we offer insights from the teacher and student perspectives – focusing on students as the primary stakeholders and beneficiaries in place-based education experiences.

For the teachers, place-based education offered opportunity to enliven the school environment, expanding learning beyond the classroom walls. Leaving class may prove costly (in time and money), but this is not an insurmountable barrier, particularly with help from community partners and grants (sometimes written by students). For teachers and students, being involved in these projects paid dividends and greatly enhanced the learning and teaching experience. Teachers valued that place-based learning gave students purpose and ownership in their project. Their student-led investigations and projects in (and with) the community sparked student interest and motivation toward both projects and learning. Teachers also credited place-based learning as an opportunity for students to gain life skills such as responsibility, teamwork, and civic stewardship commitments toward their communities and local natural resources. In these ways, place-based education principles and practices can contribute beyond academic achievement outcomes.

In the end, place-based education efforts in northeast Michigan engage youth in citizenship, Great Lakes and natural resource stewardship, and academics. These programs enhance learning and make a difference in the students' communities. To that end, the students'

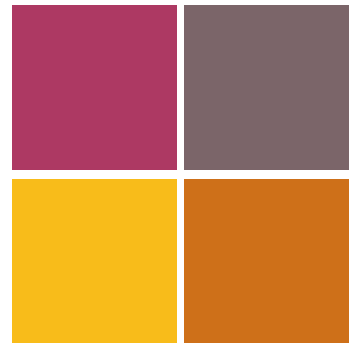
experiences with and perceptions of place-based education were the focus of this evaluation.

From the student perspective, this evaluation identifies four consistent themes that youth value as essential to place-based experiences. Place-based education should be fun and engaging, applicable to the students' futures, hands-on, and community-oriented. This makes learning engaging and relevant to students' lives. Place-based education provides a framework and strategy in which students' ideas are considered meaningful and incorporated into the learning experience. Teachers should hear these students' voices and incorporate these findings into their established or budding place-based experiences. When teachers begin teaching in a way that *students* identify as engaging, truly meaningful learning will take place.

Findings and strategies offered in this report are specific to the NEMI GLSI network schools participating as part of this evaluation, and are not necessarily generalizable to a wider public, other schools, or other community contexts. However, we intend this report help bolster a case for place-based education as an effective, proven educational strategy in fostering better learning and civic experiences. Through these case studies, we have shown evidence and insights about the opportunities place-based education offers in enhancing and expanding the learning experience not only for students, but also for teachers and communities.

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nemiglsi.org

The Northeast Michigan Great Lakes Stewardship Initiative (NEMI GLSI) is a regional network of education and community partners working to promote quality place-based or community-based education opportunities in northeast Michigan for the benefit of our youth, our community, and our environment.

michiganseagrants.org

Michigan Sea Grant (MSG) helps to foster economic growth and protect Michigan's coastal, Great Lakes resources through education, research and outreach. A collaborative effort of the University of Michigan and Michigan State University, MSG is part of the NOAA-National Sea Grant network of 33 university-based programs.

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