**2011/2012**

***North Muskegon Middle and High School***

Teachers: Rick Howard and Deb Johnson (Science)

Bear Lake is critically impaired, largely from nutrients such as phosphorous. Students will test soil from lawns in their community and share the results in an effort to reduce lawn fertilizer use and improve water quality. AP Environmental Science students will work with 7th graders on collecting, analyzing, and sharing results. Students in all grade levels will also work to improve a park in town; mapping trees, clearing paths, clean-up, clearing out growth over walk way, and more.

***Grant Middle School***

Teachers: Sarah Simon and Dawn Stickney will be the lead teachers but the entire teacher staff, 34 additional teachers, will actively be involved. The entire student body will be engaged, ~600 students, from 5th-8th grades. (All subjects)

Each grade will become “owners” of a section of the schoolyard to restore native habitats that will become theirs for their middle school career. This will create ownership and pride in their surroundings. The Muskegon River Watershed Assembly identified community education as one of their top priorities in their watershed. Grant is a small rural town in which the schools are the major hub of the community. Students will educate the community on many of the best management practices to improve their watershed.

***Oakridge Alternative High School***

Teachers: Lynn Foster and Sara Lindstrom (English and Science)

Students will host a rain barrel and water education fair for their community. Several organizations in the area including the Mona Lake Watershed Council and the Muskegon River Watershed Assembly have identified water harvesting and community education as priorities in their watershed. Students will create communication pieces, displays, videos, and more to educate their community in helping to keep our water clean. The fair will include a booth with students assisting community members in making their own rain barrel to take home and encouraging the use these devices.

\*press release has been sent out for water fair

***Fruitport Middle School***

Teacher: Karen Pavlich is the lead teacher and three other teachers on her team will be involved in project implementation with 107 students. (Science)

Ottawa County Parks and Recreation has a reoccurring issue with invasive species. Students will pull garlic mustard and plant native trees in areas that were destroyed from disease and insects. Students will choose which native trees will do best in the area, present to the school board, and determine what other communication pieces are needed.

***Holton High School***

Teachers: Heather Schulz, 60 students (Science)

Holton Recreation and Nature Center is underutilized and in many cases unknown. The township officials have invested a lot of thought and time in the park but are doing it in stages as funds become available. It is a very small, rural school district and community with few resources. Students are going to assist with finishing parts of the parks master plan. Creating and installing educational signs for the walking path, mapping the park, and creating brochures. These brochures will be distributed at the park pavilion and at local businesses. Students may also decide to plant some native plants along the paths.

***Holton Elementary***

Teachers: Mike Gerard, 75 5th students (All subjects)

Students will work to remove invasive species at the entrance of Holton Recreation and Nature Park and replace it with native plant species. The park needs to look more inviting for visitors and will improve community pride. The township doesn’t have the funds or manpower and the township supervisor is very receptive to all assistance he can get as well as appreciative of the publicity the park will get.

***Whitehall Middle School***

Teachers: Susan Tate and Derek Taranko 8th grade

The White Lake PAC and Duck Creek Watershed Assembly want data that they can use to help monitor the watershed. They will potentially use this data in grant proposals or determining if additional data needs to be gathered by professionals. Students will collect water quality data on five tributaries entering White Lake and share with the watershed organizations. Students will then participate in a shoreline restoration that ties into their project.

**2010/2011**

**Fruitport Middle School: Rain Garden to Address Pollution Concern**

Teachers: Rachel Kent and Karen Pavlich

260 8th grade students

Fruitport Middle School’s parking lot floods during heavy rainfall and there is concern that the runoff could pollute a nearby lake. A rain garden was chosen as a way to address this issue. Students measured the area of storm water draining off the school’s roof, made necessary calculations and measurements to identify the size of rain garden needed, analyzed soil type, chose appropriate plants and made initial designs for their rain garden. In the classroom students learned about human impact, earth systems, groundwater systems, and flooding.

In the spring students began working on drainage stream that flows through their campus into nearby Spring Lake. Students conducted water quality analysis at the headwaters on their campus and performed initial stream bank clean-up.

**Bunker Middle School: WMSRDC Requires Site Survey**

Teacher: Dave Craymer

125 8th grade students

To meet a grant requirement the WMSRDC needs to conduct site surveys to evaluate a large shoreline restoration site. For the second year Bunker 8th grade science students have performed these surveys for the WMSRDC. Students have been conducting general plant biodiversity surveys at two control sites and ten sites in the restoration area which will be evaluated for specific indicator species. Results will also be used to determine if further restoration is needed. The students will continue this work until the project is completed in 2015. In the classroom students will learn how to collect scientific data, what constitutes a valid survey, communication skills, and how humans can have negative and positive impacts on the environment.

**Grant Middle and High School: Rain Garden Maintenance**

Teachers: Sarah Simon and Dawn Stickney

150 6th grade students

150 7th grade students

Students assisted with the annual maintenance of the rain garden that was installed in the spring of 2010. This is the second year that students have helped the library staff as the garden is a third of an acre it is more than the library could handle on their own. Weather conditions were not appropriate to use a burn to help with its management this year.

**Whitehall Middle School: Water Quality Monitoring for the Future**

Susan Tate

100 8th grade students

Several watershed organizations are interested in baseline data of local watersheds. Students completed physical site assessments and conducted chemical testing for dissolved oxygen, phosphorous, etc. The data will be analyzed and given to appropriate watershed organizations. As part of their classroom studies students will investigate the relationship between storm water, groundwater, and surface water.

**Fremont Middle & Daisy Brook Elementary: Shoreline Buffer Reduces Runoff Impact**

Teachers: Sean Henry, Jasey Heft, and Terry Grabill

80 8th and 9th grade students

Several home owners on Fremont Lake realized that turning turf grass into native plantings near the shore would mitigate the effects of runoff and improve lake water quality. Students worked with a lakefront property owners to plant and mulch buffers of native species along the shoreline. In the classroom students learned about water quality, human impact, ecosystems, biotic and abiotic factors, food webs, population dynamics, surface water systems, and land use during this project.

**Ravenna High School, Oakridge High School & Oakridge Alternative High School: Wildlife Habitat Improvement**

Teachers: Sara Lindstrom, Lynne Foster, Melanie Block, and Amy Weesies

75 8th-12th grade students

Muskegon County Pheasants Forever and students created a shelter belt” for wildlife winter habitat. Students are involved in the planning, preparation, planting, and management of 1,400 small fruit bearing shrubs, bushes, and spruce trees. Each school developed a one acre plot of the 10 arcres total allocated by Muskegon County Wastewater Management. Students learned about biodiversity, human impact, native plants, and community/service learning.

**Steele Middle School: Township Hall Shoreline Restoration**

Teacher: Ronace Zielinski-Hogan

25 students

Students converted a section of turf grass into native plantings near the shore of Freemont Lake at the Sheridan Township Hall. The planting will mitigate the effects of runoff and improve lake water quality. In the classroom students learned about human impact, ecosystems, biotic and abiotic factors, food webs, surface water systems, and land. Students alsp started making improvements to the outdoor area at Brookhaven Retirement facilities.

**2009/2010**

**Muskegon Area Career Tech Center: Nature Preserve Improvement Project**

Teacher: Jennifer Woods

25 High School students

MERES, which runs the Muskegon Lake Nature Preserve, needs to improve the preserve by adding educational signs for visitors. The students developed educational signs and identified and tagged tree species. Students will continue to work at the nature preserve through invasive species removal and native plant seed collection and planting. During the process students learned how to use dichotomous keys to identify tree species.

**Fruitport Middle School: Rain Garden to Address Pollution Concern**

Teachers: Rachel Kent and Karen Pavlich

260 8th grade students

Fruitport Middle School’s parking lot floods during heavy rainfall and there is concern that the runoff could pollute a nearby lake. A rain garden was chosen as the solution to this issue. Students measured the area of storm water draining off the schools roof, made necessary calculations and measurements to identify the size of rain garden needed, analyzed soil type, chose appropriate plants and made initial designs for their rain garden. Students learned about human impact, earth systems, groundwater systems, and flooding in the classroom.

**Bunker Middle School: WMSRDC Requires Site Survey**

Teachers: Dave Craymer, Joe Panici, and Laurie Mancuso

25 plus 8th grade students

The WMSRDC needs to conduct site surveys as part of their grant requirement to evaluate a large shoreline restoration site. Students will be conducting a general plant biodiversity survey at two control sites and ten sites in the restoration area will be evaluated for specific indicator species. Results will also be used to determine if further restoration is needed. This is an on-going project until 2015. In the classroom students will learn how to collect scientific data, what constitutes a valid survey, communication skills, and how humans can have negative and positive impacts on the environment.

**Muskegon Community Catholic: Problem with Invasive Species**

Teacher: Barb Bourdon

80 7th & 8th grade students

Invasive species are becoming a problem around Ruddiman Creek and Muskegon Lake due to its urban location. Students planted native wetland plants in Muskegon Lake in an area where extensive invasive species removal was done by community organizations. Students learned about human impact, water quality, invasive and native species, stewardship, and ecosystems in the classroom during this project.

**Mona Shores High School: Mona Lake Water Quality**

Teacher: Sara Busken

180 High School students

Most of the storm water in Norton Shores flows into Mona Lake causing water quality issues. A rain garden was installed to collect and percolate impervious surface runoff at the high school to improve water quality of the lake. Students preformed water quality assessments, developed a plan of action, and were actively involved in the development, excavation, planting, and evaluation of the impact of the rain garden. Students learned about water quality, soils, human impact, surface water, groundwater, the history of the formation of the great lakes region, invasive species, and native species while working on this project.

**Newaygo Middle School: High Nutrient Loading in Lakes**

Teacher: Deb Iwema

71 6th grade students

Brooks and Hess Lakes have become very high in nutrients, which is encouraging excessive invasive species growth and repeated algae blooms resulting in water quality issues. Students worked with the MRWA to plan and implementing a buffer strip of native plants for lake front residents with the goal of improving water quality by reducing runoff from turf grass lawns. Students designed flip cards & an informational packet to educate landowners about the plants used in their buffer strip. Brooks Township has requested phosphorus testing be done so they can educate property owners and undertake activities to reduce the phosphorous entering the lake. This will be done in the future. During this project students learned about human impact, ecosystems, consequences of overpopulation, and biotic/abiotic factors.

**Grant Middle and High School: Rain Garden Replaces Retention Basin**

Teachers: Sarah Simon and Dawn Stickney

150 6th grade students

150 7th grade students

30 High School students

The Grant Area District Library identified a large storm water retention basin on their property as a safety hazard and believed that a rain garden would be a better solution. Students assisted in converting the retention basin into a rain garden. Students were responsible for the research, design, and implementation of the project. Students created educational information for the community that can be distributed at the library. During the project students learned about human impact, storm water, native plants, best management practices, and changes in the ecosystems.

**Whitehall Middle School: Rain Garden Improves Drainage**

Teachers: Tiffany King and Susan Tate

55 6th grade students

100 8th grade students

Several areas on the middle school property did not drain well and had the potential of contributing to storm water contamination. Students completed site assessments of the middle school property—looking for areas with poor drainage and/or potential storm water contamination (example: fertilizer run-off from the football field) and determined that a rain garden to mitigate storm water contamination would be a good solution. Students made measurements, designed the layout, chose the plants, mulched, and planted the rain garden They also prepared door hangers as a community education project about storm water. Topics covered in class included; water quality, biodiversity, human impact, biotic and abiotic factors, soil analysis, carbon sequestration by plants, and interconnectedness of earth systems.

**North Muskegon Middle & High School: 150 8th and 9th grade students Swale Reduces Runoff Impact**

Teachers:Deb Johnson and Rick Howard

Several home owners on Bear Lake identified a problem with the effects of runoff. Students worked with a lakefront property owners to design and implement a vegetated swale along the shore to mitigate the effects of runoff from several properties. Students learned about water quality, human impact, ecosystems, biotic and abiotic factors, food webs, population dynamics, surface water systems, and land use in the classroom during this project.

**Whitehall Middle School and H.R. Ealy Elementary: 7th graders Students Confirm Monitoring Results**

Teachers: Robb Zoellmer and Gabe Knowles

150 5th grade students

The Duck Lake Watershed Assembly wanted to confirm the results of their annual community water quality monitoring project. This project was brought to Whitehall students by a member of the Duck Lake Watershed Assembly who wanted students to resample sites determined to have inconsistencies from previous testing. Water quality of the Duck Creek Watershed would be determined using benthic macroinvertebrates. During this project students were able to study and analyze issues relating to human environmental interaction, understand and demonstrate processes needed to bring about change for the good of the community, water quality, proper collection of data, scientific method, ecosystems, population growth and resources, human systems, and public speaking skills.

**Steele Middle School: “Environmental Education Through Art”**

Teacher: Ronace Zielinski-Hogan

200 students

Students spent their time learning about the environment through art and educating community members about local environmental issues. Students created wall relief’s, a water chair sculpture, a billboard, pamphlets, door hangers, clothes made of newspapers, planted a peace garden, cleaned and planted at a local boat launch, and much more related to water resources and the great lakes. As an International Baccalaureate School they were able to meet their community involvment requirements with this project while meeting art and science content requirements at the same time.

**2008/2009**

**Whitehall Middle School: White River Requires Restoration**

Teachers: Susan Tate and Tiffany King

100 8th grade students

55 6th grade students

Students conducted habitat restoration on the White River at site number 54. White River site 54 suffers from erosion due to misuse. The restoration coincides with the release of classroom raised salmon. Topics covered in class included; water quality, biodiversity, human impact, biotic and abiotic factors, watersheds, interconnectedness of earth systems, and life cycles of the salmon.

**Hesperia Middle School: Watershed Education**

Teachers: Ben Westgate, Kelley Hatch and Lisa Miller

120 6th-8th grade students

Students created a watershed education plan for the community that includes storm water education placemats to be placed in local restaurants. During the process students learned about their community, its watershed, and how the two are related.

**Newaygo Middle School: Macroinvertebrates Tell All**

Teacher: Debra Iwema

20 environmental club students

60 6th grade students

30 7th grade students

Students assisted with collecting water quality data from local bodies of water with WMU and community volunteers. The macroinvertebrates collected can provide community members with information regarding the health of local watersheds. During this project students learned about human impact, ecosystems, watersheds, biotic/abiotic factors, biodiversity, benefits of native plants, and water quality.

**Grant Middle School: Local Endangered Species Needs Help**

Teachers: Sarah Pregitzer

30 6th grade students

Students removed an invasive plant species from the Karner Blue Nature Preserve to protect native plant species beneficial to the endangered Karner Blue Butterfly. They also educated other students and parents about the importance of a sand prairie, which is home to the Blue Karner Butterfly. The students served as guides to their entire class during a tour of the sand prairie and educating them on the features and benefits. Students learned about invasive species, native plants, and local ecosystems.

**Fruitport Middle School: Habitat Restoration**

Teachers: Rachel Kent, Karen Pavlich and Christy Prins

260 8th grade students

Students assisted in restoring habitat in a local county park by planting trees, removing invasive species, and building brush habitats. During this project students learned about watersheds, biodiversity, and water quality.

**North Muskegon High School and North Muskegon Middle School: Educate and Act**

Teachers: Debra Johnson and Richard Howard

150 8th and 9th grade students

Students provided the school board with parking lot options to improve/mitigate storm water issues. Baseline data for local stream was collected to be used with future projects. While, the middles school students learned about stormwater issues, maintained a local swale, and removed phragmites in their community.

**Oakridge High School: Rain Garden Restoration**

Teachers: Amy Weesies and JoAnn Flejszar

120 High School students

Students completed an assessment of Ryerson creek and storm water issues in their community. They discovered several rain gardens were not working properly and redesigned them in order for them to function properly. In class students covered human impact, biodiversity, surface runoff, watersheds, water quality, local geology, etc.

**Montague High School: Attack White Lake in a Positive Manner**

Teacher: Kyle J. Fiebig

60 High School students

Students designed an awareness campaign, which alerted community members of the small things that could be done to “Attack White Lake in a Positive Manner”. Students started with a survey to identify community attitudes on water quality. From the results they determined what are behaviors directly affect the White Lake Watershed and created alternatives that would lessen the negative impact on White Lake. The students also offered a “Green Design” service by growing native plants, in their Montague Agriscience Community Center, that community members were interested in and then planted them in the Spring. The students also grew native plants and trees for 200 2nd and 3rd grade students and assisted them in the planting. The plants grown were also planted in a local golf course to improve storm water drainage. During the project students learned about human impact, native plants, invasive plants, growing plants, abiotic/biotic factors, ecosystems, and water quality.

**Mona Shores Public Schools: Improvement of Watershed**

Teachers: Blake Groenhout, Julie Wernette, and Sara Busken

185 High School Students

Students evaluated the health of a local stream and designed and implemented a stream bank restoration plan which included installing coconut logs to reduce erosion, planting native species and additional water quality testing. Students learned about water quality parameters, human impact, ecosystems, native plants, invasive species, communication skills, and more during this project.