West Michigan Great Lakes Stewardship Initiative – 2009/2010 Project Abstracts

Teacher & School	Community Partners	Project Abstract
Muskegon Area Career Tech Center Jennifer Woods 25 High School students	• Muskegon Environmental Research & Education Society (MERES): presented "community need" project, reviewed and approved student work. • Muskegon Conservation District: provided contact with MERES and tours of nature preserve.	**Nature Preserve Improvement Project** 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 Rachel Kent Karen Pavlich 260 8th grade students	• Summit Lawn Care & Snow Plowing Inc: excavation of the site • Earthscapes: provided the plants plants • Lions Club of Fruitport: worked with students during project implementation. • JFNEW: Performed an analysis to determine the need and location of storm rain garden to decrease flooding, helped design rain garden, reviewed student desgns and helped with the calculations. • Muskegon Conservation District (MCD): merged all of the student designs into one.	**Rain Garden to Address Pollution Concern** 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 Dave Craymer Joe Panici Laurie Mancuso 25 plus 8th grade students	• Muskegon Conservation District (MCD): coordinate volunteers to assist students with proper survey techniques • West Michigan Shoreline Regional Development Commission (WMSRDC): proposed community "need"/project • Lake Neighborhood Association: project need & development, clean-up day assistance • Muskegon Lake Watershed Partnership: proposed project need, involved in planning • JFNew & Associates: designed student friendly plant survey for grant reporting requirements	**WMSRDC Requires Site Survey** 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.

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Muskegon Community Catholic Barb Bourdon 80 7th & 8th grade students	• Muskegon Conservation District; paired up school with community need • Ruddiman Creek Task Force: project ideas • Muskegon Lake Watershed Partnership: project ideas	**Problem with Invasive Species** 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 Sara Busken 180 High School students	• Muskegon Conservation District: expertise • Mona Lake Watershed District: proposesd projects and made presentations to class • Master Gardener: assist with maintenance of rain garden • Alliance for the Great Lakes: proposed projects and made presentations to class • City of Norton Shores (student led project): permissions • Lowes of Muskegon: $5,000 grant	**Mona Lake Water Quality** 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 Deb Iwema 71 6th grade students	• Muskegon River Watershed Assembly (MRWA): proposed community need/project, worked alongside kids during the project, involved in all planning meetings • Brooks Township: proposed a community need/project	**High Nutrient Loading in Lakes** 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.

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Grant Middle and High School Sarah Simon Dawn Stickney 150 6th grade students 150 7th grade students 30 High School students	• Grant Area District Library: wrote grant, assisted with planning of project, organized different aspects of project like herbicide application, etc. • City of Grant: assisted with data collection • JFNew: prepare site, provided rain garden expertise • Wilbur Ellis: herbicide application • All Around Excavating: excavation of site	**Rain Garden Replaces Retention Basin** 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 Tiffany King Susan Tate 55 6th grade students 100 8th grade students	• Dirt Dauber Master Gardeners: expertise • JFNew: site selection and assisting students with design • Muskegon Conservation District: assisted with project design and implementation • Brian Armstrong – Director of Public Works for the City of Whitehall: expertise and assistance in identifiying areas of poor drainage • Chris Thompson/Thompson Excavating: excavation of rain garden • Tanya Cabala/Great Lakes Consulting: assisted with planning and project ideas • Melissa Moore: helped students write two grants	**Rain Garden Improves Drainage** 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 Deb Johnson Rick Howard 150 8th and 9th grade students	• Bear Lake Property Owner: excavation, drainage pipe rerouting, and maintenance • Muskegon Conservation District: expertise on site selection, size, and design	**Swale Reduces Runoff Impact** 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.

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Whitehall Middle School **H.R. Ealy Elementary** Robb Zoellmer Gabe Knowles 150 5th grade students 15 7th graders	• Duck Lake Watershed Assembly: equipment • Muskegon Conservation District: expertise • GVSU AWRI: trip on research vessel	**Students Confirm Monitoring Results** 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 Ronace Zielinski-Hogan 200 students	• Lamar Advertising: donated billboard • Herman Miller: donated materials • Muskegon Art Museum: the big lesson • Muskegon Conservation District: planting expertise	"**Environmental Education Through Art"** 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.