**Water Resources Education Teacher Survey**

TOMWC education staff developed a survey to establish program needs and teacher/school recruitment for participation in the W.R.E.P. program during the 2017/18 school year.

The survey was conducted within the Watershed Council service area (Emmet, Antrim, Charlevoix and Cheboygan counties). Surveys were mailed to 40 identified middle school science teachers in February 2017. 8 surveys were returned through mail. An email was sent in March 2017 to teachers not responding through mail with a link to a Survey Monkey. 4 additional teachers responded via the online survey. The results include teacher interest regarding the type and extent of programming needed, grade level appropriateness, possible focus areas or topics of interest, and workability with schools.

The surveys were used to select the 4 teachers/schools who would engage in the pilot year of the program. They allowed Watershed Council staff to determine which teachers had interest in the program, and had classroom populations that would work well with the Water Resources Education Program organizational model.

**Teacher Responses**

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| --- | --- | --- | --- | --- | --- |
| **Teacher** | **Mail or Online** | **School** | **Grades** | **Class pop.** | **Total pop.** |
| Christopher Vandergriff | Mail | Bellaire MS/HS |  | 20 | 60 |
| Clayton Faivor | Mail | Ellsworth Community School | 7th-12th | 20 | 113 |
| Kelli Polleys | Mail | Harbor Springs MS | 8th, w/ 6th and 7th exploratory classes too | 25 | 75 (8th), 40(7th) |
| Kim Hayhurst | Mail | Harbor Springs MS | 6th | 24 | 70 |
| Elsa Martin | Mail | Petoskey Middle School | 6th | 30 | 240 |
| Adrianne Dodd | Mail | Wolverine Community Schools | 7th-12th | 22 | 120 |
| David Bricker | Mail | Boyne City MS | 6th | 27 | 106 |
| Kelsey Bricker | Mail | Boyne City MS | 8th | 28 | 120 |
| Alicia Angerer | Online | Boyne Falls Public School | 7th-12th | 15 | 65 |
| Kristine Burmeister | Online | Charlevoix HS | 10th-11th | 25 | 130 |
| Kelly LaPeer | Online | Inland Lakes Secondary | 8th-12th | 23 | 140 |
| Susan Fogo | Online | Petoskey Middle School | 6th and 8th | 30 | 145 |

**Barriers to Education**

Teachers were asked to select to the factors that act as barriers to water resource education from a list including funding, materials, time, and resources. 6 out of the 12 teachers responded that funding is the biggest barrier to education, with the other barriers following closely behind.

**Science Standards**

Teachers were also asked to select the Michigan k-12 standards that they would be able to meet with the help and support of the Tip of the Mitt Watershed Council. The standards that were listed on the survey are listed below.

* **MS-LS2-1** Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
* **MS-LS2-4** Conduct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem.
* **MS-LS2-5** Evaluate competing design solutions for maintaining biodiversity and ecosystem services.
* **MS-LS1-4** Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.
* **MS-LS1-5** Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
* **MS-ESS2-1** Develop a model to describe the cycling of earth’s materials and the flow of energy that drives this process.
* **MS-ESS2-4** Develop a model to describe the cycling of water through Earth’s systems driven by energy from the sun and the force of gravity.
* **MS-ESS3-1** Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geoscience processes.
* **MS-ESS3-5** Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century
* **MS-ESS3-2** Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
* **MS-ESS3-3** Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
* **HS-ESS3-1** Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
* **HS-ESS3-4** Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
* **HS-ETSI-2** Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering

The results indicate that the majority of the surveyed teachers are interested in receiving support in communicating real world data and scenarios to their students in order to help students better comprehend earth systems. Teachers also expressed interest in help communicating the impacts of humans on the environment, and the predicted impacts of climate change.

**Topics of Interest**

Teachers were asked to select topics that they were interested in learning more about or receiving support from the Watershed Council for. Each topic had at least two teachers that were interested.

All but two of the teachers were interested in learning more about aquatic invasive species. And over half were interested in climate change, habitat loss, Great Lakes studies, Wetlands, and groundwater.

**Type of Assistance**

Teachers were also asked to select the type of assistance that they would prefer the Watershed Council provide them with.

The results show that over half of the teachers are interested in professional development focusing on water resources education. And all but 1 are interested in a classroom visit from the Watershed Council staff to support their regular curriculum. Almost half of the surveyed teachers also expressed interest in funding, instructional and planning support.

**Comments**

Teachers also had the option of sharing comments at the end of the survey. Teacher comments are listed below.

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| Thank you for all you do! |
| I love the idea of a local field trip where I have someone assist me in water monitoring of our local lakes (st. clair, ellsworth) |
| I teach a class specific to the Great Lakes Region. Many topics above will relate to or can be tied in easily. I like getting my students outside and investigating/collecting data, etc. Support is always helpful in this endeavor! My 8th grade science class would benefit from support as well. |
| Any outside resource is wonderful. I love to connect my students to the "real world" of science! |
| Thank you! I am very interested in learning more! |
| Would love to have your expertise in my classroom! I teach four sections of earth science (hrs 1-4) then a "FLEX" class (22 students) from 2:15 -3:15. FLEX is just an additional science class with tons of "hands-on" STEM activities! |
| Any help would be appreciated! |
| Time and money are huge. We don’t have enough of either. The students love anything hand on and it's good for them, but must be relevant to state standards. |
| Thank you! |