



Watershed Education Program (WEP)

Watershed analysis, water quality, macroinvertebrates, stream survey (VBAP), electrofishing, ArcGIS online (AGO)



Alignment with Next Generation Science Standards
Performance Expectations for **Middle School** (p. 1)

Developed by: Judy Tumosa, Watershed Education Specialist, NHF&G June 2020

NGSS	Performance Expectation	VBAP, electrofishing, AGO match
MS-PS4-2	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	Understand how a turbidimeter works.
MS-LS1-5	Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	Study how habitat quality in a stream influences fish and macroinvertebrate survival, including the impact of climate change on NH wildlife.
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.	Examine the factors in an ecosystem such as water flow, water quality, temperature, prey, space, etc. that may impact fish populations. Use AGO analysis tools to predict presence of a cold or warm water fish population, including the impact of climate change on NH wildlife.
MS-LS2-3	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.	Study food webs and the interaction between the riparian zone and stream ecosystems, including the impact of climate change on NH wildlife.
MS-LS2-4	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.	Study how altering a stream (pollution, erosion, sedimentation) can alter fish and macroinvertebrate populations, including the impact of climate change on NH wildlife.
MS-LS2-5	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.	Plan Citizen Science projects to restore a river or stream; culvert assessments, etc, including mitigating the impacts of climate change on NH wildlife.
MS-ESS2-1	Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.	Study the water cycle, including climate change modelling.
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.	Study the water cycle and watershed dynamics, including impacts of climate change, climate change modelling.
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.	Compare the behavior of well managed watersheds in comparison to heavily impacted watersheds, including watershed response to climate change impacts.

Watershed analysis, water quality, macroinvertebrates, stream survey (VBAP), electrofishing, ArcGIS online (AGO)

Alignment with Next Generation Science Standards
Performance Expectations for **Middle School** (p. 2)

NGSS	Performance Expectation	VBAP, electrofishing, AGO match
MS-ESS3-3	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	Monitor watershed, stream, macros, riparian area, stream crossings, tree-plantings, land-use, etc., AGO analysis, including mitigating the impacts of climate change on NH wildlife.
MS-ESS3-4	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.	Monitor watershed, stream, macros, riparian area, stream crossings, tree-plantings, land-use, etc. and analyze impact, AGO analysis
MS-ETS1-1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	Plan Citizen Science projects to restore a river or stream; culvert assessments, etc. including mitigating the impacts of climate change on NH wildlife.
MS-ETS1-2	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	Plan Citizen Science projects to restore a river or stream; culvert assessments, etc. including mitigating the impacts of climate change on NH wildlife.
MS-ETS1-3	Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.	Plan Citizen Science projects to restore a river or stream; culvert assessments, etc. including mitigating the impacts of climate change on NH wildlife.