Restoration of Great Lakes Marshes: Standards and Assessment

State of Michigan - Grade Level Content Expectations (5th-7th grade)

Discipline 1: Science processes
Inquiry process (IP)
- S.IP.06.11 – Generate scientific questions based on research
- S.IP.06.15 – Construct charts and graphs from data and observations
- S.IP.06.16 – Identify patterns in data

Inquiry, analysis and communication (IA)
- S.IA.06.11 – Analyze information from data tables and graphs to answer scientific questions
- S.IA.06.12 – Evaluate data through collaborative scientific discourse
- S.IA.06.13 – Communicate and defend findings of investigations using evidence

Discipline 3: Life Science
Ecosystems (EC)
- L.EC.06.11 – List examples of populations, communities, and ecosystems including the Great Lakes region.
- L.EC.06.23 – Predict how changes in one population might affect other populations based upon their relationships in the food web.
- L.EC.06.32 – Identify the factors in an ecosystem that influence changes in population size.
- L.EC.06.41 – Describe how human beings are part of the ecosystem of the Earth and that human activity can purposefully, or accidentally, alter the balance of ecosystems.

National Science Education Standards (NSES) - Middle School
Science as inquiry (A):
- Identify questions that can be answered through scientific investigations.
- Think critically and logically to make the relationships between evidence and explanations
- Recognize and analyze alternative explanations and predictions

Life Science (C):
- Populations and Ecosystems
- Diversity and Adaptations of Organisms

Great Lakes Literacy Principles – K-12

- 5h – Wetlands, including coastal marshes and freshwater estuaries, provide important and productive nursery areas for many aquatic and terrestrial species, which rely on these habitats for protective structure, hunting grounds, and raising offspring.
- 5i – Life cycles, behaviors, habitats, and the abundance of organisms in the Great Lakes have been altered by intentional and unintentional introduction of non-native plant and animal species.
- 6f – To ensure continued availability of Great Lakes assets, people must live in ways that sustain the lakes. Individual and collective actions are needed to effectively conserve and manage Great Lakes resources for the benefit of all.

Standards Sources

- State of Michigan: Michigan department of education - Grade level content expectations (GLCEs)
- NSES: National science education standards
- Great Lakes Literacy Principles, COSEE Great Lakes, 2010. Great Lakes Literacy: Essential principles and fundamental concepts for Great Lakes learning [brochure]. Columbus, OH: Ohio Sea Grant OHSU-B-090. Available from www.coseegreatlakes.net.

Assessment

This assessment chart was designed for teachers to create their own assessment. In creating assessments, the value should depend on the learning level of the task. Levels are coded as Low (knowledge, comprehension), Medium (application, analysis), High (synthesis, evaluation).

Learning Level	Learning Objective	Student Performance
Low	Describe the importance of wetlands and the impact of invasive species on native ecosystems.	Describe the importance of Great Lakes coastal marshes and the impact of *Phragmites* invasions.
Medium	Generate hypotheses based on preliminary data and research.	Generate testable hypotheses about the effects of marsh restoration.
Medium	Construct graphs from data.	Graph the relationship between vegetation cover and bird use.
High	Communicate and defend findings of investigations using evidence.	Describe conclusions using graphs as evidence.