Waquoit Bay National Estuarine Research Reserve

TOTE 2026 Overall Agenda

Teachers on the Estuary: Working Together for Watersheds

August 19th and 20th (in person at WBNERR) and November 4th (virtual)

Registration: online on the Waquoit Bay Reserve website https://waquoitbayreserve.org/

Workshop Description: We all live within a watershed and community collaboration is essential for healthy ecosystems. Participants in this Teachers on the Estuary (TOTE) workshop will explore coastal habitats, conduct field investigations, and explore tools that gamify cooperative decision-making. Reserve scientists will escort teachers to their long-term monitoring sites and experienced educators will demonstrate how to incorporate that local and national data into classrooms. Through cooperative gameplay of the Watershed Game: Classroom Version participants will put into practice plans, and policies to decrease water pollution and increase a community's resilience to flooding while balancing financial resources. Teachers will take home resources to replicate the activities in their own classroom. Course content and activities will be aligned with Massachusetts state science and math frameworks and Next Generation Science Standards.

Workshop Audience: Designed for teachers of grades 6-12, but applicable to upper elementary and college.

Location: Waquoit Bay National Estuarine Research Reserve (WBNERR), 131 Waquoit Highway, Waquoit, MA 02536.

Cost and meals: This course is offered free of charge. Light breakfast, snacks, and lunch are provided.

Support: Each participant will receive equipment and other resources. Those who elect to present at the virtual session about how they have implemented, or plan to implement, the resources with their students are eligible for a $150 presentation honorarium.

Lodging: Dorm style lodging is available at no cost for those participants living beyond commuting distance, but space is limited and reservations are required. If you need lodging, please contact Laurie Tompkins for options: laurie.tompkins@mass.gov.

Instructor: Sonia Ahrabi-Nejad, Education Coordinator, Waquoit Bay NERR Sonia.Ahrabi-Nejad@mass.gov

PDPs: Participants who complete all requirements will receive 16 PDPs.

Graduate Credit: The course is offered for 1 graduate credit. Graduate credit is optional and is available from Bridgewater State University for $75.00 per credit. Please register and pay for graduate credit through Bridgewater State University according to the following process:

Step #1: Complete the Graduate Non-Degree Application

Students starting non-degree course(s) for the **Fall 2026** term, should click here for the Graduate Non-Degree application (https://www.bridgew.edu/grad-non-degree). Please contact Graduate Admissions (gradadmissions@bridgew.edu) with questions regarding the Graduate Non-Degree Application.

Step #2: Retrieve Your BEAR ID

Your BEAR ID is the 8-digit number emailed to you once your Graduate Non-Degree application has been processed by Graduate Admissions. You will need this to access many of the items below, so be sure to have it handy. If you have lost your acceptance letter or cannot remember it, the Office of Graduate Admissions can help. Write to GradAdmissions@bridgew.edu from the email address used to complete your Graduate Application for any help or questions during this step.

Step #3: Access and Use Your BSU Email account

Start to use your BSU email today! It was sent from BSU Accounts (BSUAccounts@bridgew.edu) to the personal email address provided in your application. To access your email, use the link provided in the communication sent from IT. You can also access your email on the student portal by clicking on email from the left navigation bar.

IMPORTANT: Login to your BSU email with the default password. You will be prompted to set up MFA (Multi Factor Authentication) before resetting your password. View how to configure MFA.

All information is sent to your BSU email. Don't miss important information: Be sure to check daily!

If you have not received your BSU email account information from BSU Accounts: First, check your junk or spam folder. Contact IT support at 508.531.2555 or ITSupport@bridgew.edu and provide them with the following information: Bear ID (formerly Banner ID), Address, Phone Number, Date of Birth.

Step# 4: Navigate to the Student Portal and Register for your course

Students register for courses by navigating to the Student Portal, signing in using your BSU credentials, and going to the "Student" section of Infobear.

1. Proceed to the MyBSU Portal by navigating to mybsu.bridgew.edu.
2. Please click on the tile for "**Registration and Planning**" which says "**OPEN REGISTRATION DASHBOARD**"
3. **Complete the Student Financial Responsibility Agreement**
4. On the next page, you'll click "**Register for Classes**" on the bottom right hand side of the page.
5. Select a Term for your course: **Fall 2026**
6. To add a course section, click the "**Enter CRNs**" tab *(Don't try and search for the course because in may not appear on our public search because of discounted rates*) then **enter the 5-digit CRN 93682** and click "**Add to Summary**". To finalize your registration, click "**Submit**" in the bottom right corner of the "**Summary**" section. The class "**Status**" will change from "**Pending**" to "**Registered**" once you have successfully added the course.

You may view step-by-step videos which will walk you through adding/registering/dropping a class at BSU. Additional registration related resources including PDF instructions may also be found on the Registrar's Office page

Paying your bill

Once you have successfully registered for your course, you should now pay your bill.

1. Please use your credentials to access our eBill (Single Sign-on) system
2. Click "**Make Payment**" again from the tabs on the top of the page and follow the prompts.

Getting your transcript

Bridgewater State University offers the convenience of E-Transcripts which can be requested 24/7 and be sent, electronically, anywhere in the world typically within an hour. Once you receive confirmation that grades are available and transcripts can be requested, go to the Transcript Request Page to begin the process.

Workshop Goal

- Increase teachers' understanding of estuary science and their ability to engage their students in the investigation of changes in their local environment using data obtained from the reserve's monitoring programs and community conservation projects.

Workshop Objectives: Participants will be able to:

- Describe how human activities associated with various land uses within a watershed may pollute a coast with excess sediment, nitrogen or phosphorus and make it vulnerable to flood damage.
- Discover that communities must work together as a whole watershed to protect water quality and increase coastal resilience.
- Access and use NERRS/NOAA educational products with students.
- Teach basic estuarine concepts by guiding students in using field and laboratory research techniques analogous to those used at Research Reserves.
- Lead their students in experiential learning activities that improve their students' abilities to become stewards of the environment.
- Meet Massachusetts Learning Standards and Next Generation Science Standards appropriate to the grade and subject they teach (see list of a few examples below).
- Give evidence to support the basic concepts in the Estuary Principles (see below).

Estuarine Principles

1. Estuaries are interconnected with the world ocean and with major systems and cycles on Earth.
2. Estuaries are dynamic ecosystems with tremendous variability within and between them in physical, chemical, and biological components.
3. Estuaries support an abundance of life, and a diversity of habitat types.
4. Ongoing research and monitoring is needed to increase our understanding of estuaries and to improve our ability to protect and sustain them.
5. Humans, even those living far from the coast, rely on goods and services supplied by estuaries
6. Human activities can impact estuaries by degrading water quality or altering habitats; therefore, we are responsible for making decisions to protect and maintain the health of estuaries.

Next Generation Science Frameworks

Life Sciences 2 Ecosystems: Interactions, Energy, and Dynamics

LS2.A Interdependent Relationships in Ecosystems
LS2.B Matter and Energy in Organisms and Ecosystems
LS2.C Ecosystems Dynamics, Functioning and Resilience

Earth Systems Science 2 Earth's Systems

ESS2.C: The Roles Of Water In Earth's Surface Processes

Earth Systems Science 3 Earth and Human Activity

ESS3.C: Human Impacts On Earth Systems

Massachusetts Science, Technology, and Engineering Standards (a few examples, not inclusive)

6.MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution. Include potential impacts on people and the natural environment that may limit possible solutions.
7.MS-ESS3-4. Construct an argument supported by evidence that human activities and technologies can mitigate the impact of increases in human population and per capita consumption of natural resources on the environment.
7.MS-LS2-1. Analyze and interpret data to provide evidence for the effects of periods of abundant and scarce resources on the growth of organisms and the size of populations in an ecosystem.

7.MS-LS2-2. Describe how relationships among and between organisms in an ecosystem can be competitive, predatory, parasitic, and mutually beneficial and that these interactions are found across multiple ecosystems.
7.MS-LS2-4. Analyze data to provide evidence that disruptions (natural or human-made) to any physical or biological component of an ecosystem can lead to shifts in all its populations.
7.MS-LS2-5. Evaluate competing design solutions for protecting an ecosystem. Discuss benefits and limitations of each design.
7.MS-LS2-6(MA). Explain how changes to the biodiversity of an ecosystem—the variety of species found in the ecosystem—may limit the availability of resources humans use.
8.MS-ESS2-5. Interpret basic weather data to identify patterns in air mass interactions and the relationship of those patterns to local weather.
8.MS-ESS2-6. Describe how interactions involving the ocean affect weather and climate on a regional scale, including the influence of the ocean temperature as mediated by energy input from the Sun and energy loss due to evaporation or redistribution via ocean currents.
8.MS-ESS3-5. Examine and interpret data to describe the role that human activities have played in causing the rise in global temperatures over the past century.
HS-ESS3-2. Evaluate competing design solutions for minimizing impacts of developing and using energy and mineral resources, and conserving and recycling those resources, based on economic, social, and environmental cost-benefit ratios.
HS-ESS3-3. Illustrate relationships among management of natural resources, the sustainability of human populations, and biodiversity.
HS-LS2-1. Analyze data sets to support explanations that biotic and abiotic factors affect ecosystem carrying capacity.
HS-LS2-6. Analyze data to show ecosystems tend to maintain relatively consistent numbers and types of organisms even when small changes in conditions occur but that extreme fluctuations in conditions may result in a new ecosystem. Construct an argument supported by evidence that ecosystems with greater biodiversity tend to have greater resistance to change and resilience.
HS-LS2-7. Analyze direct and indirect effects of human activities on biodiversity and ecosystem health, specifically habitat fragmentation, introduction of non-native or invasive species, overharvesting, pollution, and climate change. Evaluate and refine a solution for reducing the impacts of human activities on biodiversity and ecosystem health.

Course expectations: Participants will be expected to:

1. Attend all components of the two-day session and a two-hour evening virtual follow up session.
2. Complete in-class assignments.
3. Participate in activities and discussions.
7. Keep a reflection journal during the course.
4. Incorporate information, curriculum, and resources provided in class into their own classroom teaching and provide a written reflection upon the experience, or, if the timing isn't appropriate, write up a plan for how it will be implemented into the curriculum next year.
5. Participate in evaluation of the course.

Course texts and materials: Readings and reference materials will be drawn from the following sources, as well as from NOAA and other web sites. Estuary Education (noaa.gov), NOAA Data in the Classroom: Monitoring Estuarine Water Quality: Teacher Resources | NESDIS (noaa.gov), Watershed in a Box (noaa.gov), The Watershed Game (https://seagrant.umn.edu/watershed-game).

Grading criteria

Participants earning graduate credit or PDPs must complete exercises assigned as part of class work. Participation in the in-person field, classroom, and computer-based activities completed during the course is worth 30%. Participation and contributions to discussions during the in-person workshop is worth 20%. Writing in a reflection journal during the workshop is worth 20%. The write-up of the classroom implementation experience is worth 30%.

Teachers on the Estuary: Working Together for Watersheds Course Outline

Day 1 (in-person) 9:00am-4:00pm

- *Boathouse meeting space*
    - *Introduction (30 min)*
    - *Education Introduction (NERRS, relevant education activities) (1 hour)*
    - *Training and Engagement (30 min)*
- *Reserve exploration (60 min)*
- *Lunch (60 min)*
- *Boathouse meeting space*
    - *NOAA Estuary Education, Data Mysteries, discussion (3 hours)*

Day 2 (in-person) 9:00am-4:00pm

- *Boathouse meeting space*
    - *Introduction to Research and System-wide Monitoring Program (SWMP) (40 min)*
- *Boat on the Bay (40 min)*
- *Saltmarsh exploration (2 hours)*
- *Lunch (60 min)*
- *Boathouse meeting space (2.5 hours)*
    - *Watershed Game gameplay facilitated by Grace Simpkins, Senior Marine Education Specialist, WHOI Sea Grant*
    - *Discussion*

Day 3 (Virtual) 6:00pm-8:00pm

Teachers will present about how they implemented the TOTE workshop resources with their students. Each teacher will have five minutes to present and then there will be discussion with the whole group.