CLIMATE EDUCATION FOR A CHANGING BAY
Gloucester High School at VIMS

On April 29th and 30th, 2015, students from Ms. Nagle's Earth Science classes at Gloucester High School visited the Virginia Institute of Marine Science in Gloucester Point, VA, for the final component of the *CECB* program. This lesson included another action phase of the MWEE, providing an interactive and investigative field experience at VIMS, as well as the final reflection for the completion of the program.

Students started their day in the VIMS auditorium, getting an introduction to campus and an overview of the day's plans. Previous classroom and field activities that the students participated in with CBNERR educators were discussed as a baseline for the day. The day quickly got under way with students rotating through three different stations located around the campus. In the first station, student began investigating the VIMS Teaching Marsh, focusing on emerging wetlands. After reviewing the many ecosystem services of the marsh, students built upon their previous lesson at school by using survey equipment to collect data along transect lines in the teaching marsh, noting actual flora zonation. Students were instructed on how to use all of the equipment (transect lines, levels, stadia, and tripods) and were then tasked with creating their own marsh profiles, by correctly collecting the data and filling in the appropriate data table. Students then created a graph representative of the marsh profile, while also adding in marsh plants to the graph based on what zone those named plants could thrive in. As a reflection, students made estimates on the effects of rising sea levels to this ecosystem.

In the second station of the day, students focused on submerged aquatic vegetation and shallow water ecosystems. Students sampled organisms in the York River by pulling a large seine, and used their collected data to calculate biodiversity rates. A diversity index is a quantitative measure that reflects how many different types of species there are in a dataset, while also taking into account how evenly the individuals are distributed among those types. Students also collected water quality data to compare to

tolerance limits for species collected. For reflection, students used this information and real-time data to predict how various animals and plants could be affected by climate change impacts.

The third station served as a culmination of all the activities throughout the CECB program. Students participated in a role playing scenario in which they represented different stakeholder groups, including emergency responders, land planners, and watermen. Using a variety of provided resources, students were given a task to present on, whether it be creating an evacuation route for their county and identifying shelters, establishing new areas for development, or locations for the best catch of crabs in the year 2050. In order to create their evacuation plan, students looked at topographic maps and compared those to VA Storm Surge inundation maps while also reviewing the VIMS Tidewatch data. The land planning team also used elevation maps as well as resources such as NOAA Coastal County Snapshot and NOAA Digital Coast Sea Level Rise Viewer to make predictions about where future planning should occur, and how to use the marshes to benefit the community such as creating more parks for recreation. The watermen group was able to use water quality maps of the Chesapeake Bay, information from NERRS SWMP data, and maps showing distribution of bay grasses to make predictions about where to set crab pots of the best catch. This activity showed the students that there are a variety of people and resources that will be impacted by climate change.

As a final conclusion, students discussed climate change solutions that they could be a part of. If we all work together to lower our energy usage, we can ultimately reduce the amount of CO_2, a heat trapping gas, being released into our atmosphere. This could potentially slow down the rate at which our climate is changing. Students discussed how they could reduce their impact on the environment, which could help to mitigate some of the potential impacts of climate change. Ideas presented included community wide solutions such as creating more bike paths and solar energy initiatives. As a result of all the components of CECB, students can better understand the science of climate change and how the effects will impact them locally through both the natural ecosystem and their coastal community.

For more information about CBNERR please visit our website at http://www.vims.edu/cbnerr/.

Thank you to all of the students and teachers participating in *CECB*!