CAC Meeting
April 13, 2017

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Excellence in Community Service
Our approach includes:

**Expanding opportunities for key stakeholders**—including the community, elected officials, media, staff, and others—to engage with the Laboratory's science mission; designing communications and **engagement strategies** around our critical outcomes;

(STEM)-based educational programs for students and teachers;

Building new regional partnerships and cultivating existing ones to advance the Lab's strategy and plan for growth. We will also **identify issues of interest for community members**, solicit input, and resolve concerns.

Our specific initiatives for excellence in community service include **fostering relationships to advance Discovery Park**, which will have an impact on the region and New York State.

**STEM educational programs that introduce middle-and high-school students to our science**—and can ultimately increase scientific literacy and inspire the next generation of scientists and engineers.
THE G.R.E.E.N. INSTITUTE
GAINING RESEARCH EXPERIENCE IN THE ENVIRONMENT

MISSION: TO PROMOTE TEACHING, LEARNING AND RESEARCH IN ALL ASPECTS OF THE ENVIRONMENT FOR STUDENTS FROM KINDERGARTEN THROUGH GRADUATE SCHOOL
Office of Educational Programs

OFFICE OF EDUCATIONAL PROGRAMS

GREEN INSTITUTE

DOE/OTHER PROGRAMS

Basic Programs by School Level

Graduate Programs
- Environmental Based Research
- Masters/Doctoral
- Study Sites

Undergraduate
- Internship Programs
- Field Trips
- Lectures

Secondary School
- Teacher Workshops
- Student Workshops
- Field Trips
- In-service Courses

Elementary School
- Teacher Workshops
- Learning Center Camp
- Field Trips
- In-service Courses
The Open Space Stewardship Program (OSSP) fosters partnerships between schools and land stewards in local communities. Students directly interact with nature as they collect data on properties within their school district.

Students can:
- Connect with the natural environment
- Conduct authentic research
- Become stewards of property within their community
- Develop an environmental awareness
- Present their work at BNL

Students in grades K through 12 are involved in authentic environmental research on properties in their own communities, fostering a sense of ownership and responsibility for open space within their neighborhoods. Each June students and teachers who participated in OSSP are invited to BNL for an OSSP evening celebration at which students display and present their work to teachers, parents, scientists and others in the environmental community.

Teacher Benefits
- Enhance the relevance of their curriculum with activities and concepts supportive of many state and national teaching standards

Student Benefits
- Provide curriculum relevance through the collection of data and participation in a meaningful scientific endeavor
- Enhance teacher skills through workshops, peer interaction and by working with experts in the field
- Venue for students to conduct and present independent scientific research
- Learn scientific protocols, analytical techniques and data collection and analysis skills
- Develop a sense of civic responsibility as they become an integral part of stewardship of lands within their own communities
A DAY IN THE LIFE OF A RIVER
Benefits of Environmental Education

Studying EE Creates Enthusiastic Students, Innovative Teacher-Leaders

EE Instructional Strategies Help Foster Leadership Qualities

EE Makes Other School Subjects Rich and Relevant

EE Schools Demonstrate Better Academic Performance across the Curriculum

EE Is a Perfect Match for Community Service Learning Requirements

EE Offers All Students Equal Chances for Academic Success

EE Teaches Students to be Real World Problem Solvers

EE Helps Students to Become Self Directed Learners

EE Gets Apathetic Students Excited About Learning
WHY LONG ISLAND RIVERS?
On Long Island streams gain water from inflow of groundwater through the streambed. Long Island streams are surface expressions of the groundwater.
A Day in the Life ....
Three Goals:

1. **Citizen Science**- Results for all locations and groups need to be posted on our A Day in the Life Website.

2. **Create Environmental Stewards**- ‘In the end we will conserve only what we love; we will love only what we understand; and we will understand only what we have been taught.’
   – Baba Dioum, Senegalese poet and environmentalist

3. **Using the Environment Integrated Context for Learning**- At each location, teams of students and environmental educators used seine nets and lab equipment to investigate aquatic life, biodiversity, water chemistry and quality, tides and weather. Many groups also collect core samples of river bottom mud for analysis.
A Day in the Life of the River

- Encourage Multi-Disciplinary study:
- Multi-media - photography & video
- Art
- ELA
- Social Studies
- Science
- Math
- Technology
A Day in the Life of a River

http://www.portaltodiscovery.org/aday/
A Day in the Life....

• Students collect scientific information to create snapshots of the river at locations along the river, they will share their data using our website, so they can better understand how their piece of the river fits into the river ecosystem.

• A primary goal is to connect Long Islander’s to nature. To help prepare students to become stewards of the river’s water quality and natural resources.

• The data can be used in the classroom for place based learning. A program in the beginning of the year allows that to happen.
On a single day, environmental education partners and students all along the river will simultaneously collect scientific information, analyze it and share it to portray the status of the river and estuary ecosystem.

Students will use hands-on field techniques to describe their sites, catch fish in nets, collect water and invertebrate samples, develop a biodiversity inventory of the riparian zone and analyze water chemistry.

Students will examine the physical and chemical aspects of the river, such as where freshwater and salty seawater meet, the amount of sediments in the water and turbidity and oxygen levels, as well as conduct biodiversity inventories of the flora and fauna in and around the ecosystems.

• All data collected on these Day’s will be posted on this website: [http://www.portaltodiscovery.org/aday/](http://www.portaltodiscovery.org/aday/)
What will be provided to teachers:

- Professional support
- Teacher trainings
- Photo Release forms
- Natural History expert at their site
- Assistance with coordination
- Assistance with acquiring permits
- La Motte Water Quality tests
- Data and Biodiversity Inventory sheets
- Web site dedicated to A Day in the Life of the River
- Core samplers, nets, binoculars
- GPS Units, refractometers, anemometer, etc.
School/Teacher Responsibilities:

• Bussing
• Bathroom access
• Safety
• Photo Release forms signed
• Mosquito and Tick precautions
• Overall organization of classes
A Day in the Life of A River

- Group 1 - PHYSICAL DATA
  - Tasks and Measurements to Accomplish:
    - Tide Measurement
    - Current Direction and Speed
    - Cloud Cover and Air Temperature
    - Wind Direction and Speed

- Group 2 - SITE DESCRIPTION
  - Tasks and Measurements to Accomplish:
    - Physical Characteristics of the Site
    - Map of Site
    - Sediment Sample of Shoreline, Site Bottom
A Day in the Life of A River

- Group 3 - BIOLOGICAL SAMPLING
  - Tasks and Measurements to Accomplish:
    - Aquatic Biological Survey
    - Biodiversity Inventory Survey
    - Habitat Association Survey

- Group 4 - CHEMICAL ANALYSIS
  - Tasks and Measurements to Accomplish:
    - Water Temperature
    - Turbidity
    - Water pH
    - Salinity
    - Dissolved Oxygen
A Day in the Life of A River

Group 5 - DOCUMENTATION

- Tasks and Measurements to Accomplish:
- Photographs of Site
- Images of all Interesting Animals/Plants to be Identified
- Images of other group members in Action

Added:
- Activities for Grades 3-5
  Fish and Macro-invertebrate Inventory
<table>
<thead>
<tr>
<th></th>
<th>Schools 2016</th>
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<tbody>
<tr>
<td>1.</td>
<td>William Floyd High School</td>
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<tr>
<td>2.</td>
<td>Nathaniel Woodhull Elementary School</td>
</tr>
<tr>
<td>3.</td>
<td>Rocky Point Middle School</td>
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<td>4.</td>
<td>Patchogue-Medford High School</td>
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<td>5.</td>
<td>Patchogue Middle School</td>
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<td>6.</td>
<td>Longwood High School</td>
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<td>Longwood Middle School</td>
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<td>8.</td>
<td>Bellport High School</td>
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<td>9.</td>
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<td>Riverhead MS</td>
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<td>Riverhead Charter School</td>
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<td>21.</td>
<td>Eastport/Southmanor High School</td>
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<td>Easthampton High School</td>
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<td>Hampton Bays Middle School</td>
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<td>Brentwood High School</td>
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<td>Sachem North High School</td>
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<td>Smithtown East High School</td>
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<td>Gelines Jr. High School</td>
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<td>Farmingdale High School</td>
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<td>Massapequa High School</td>
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<td>Shoreham Wading River Schools</td>
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<td>Connetquot High School</td>
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<td>39.</td>
<td>Babylon High School</td>
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<tr>
<td>40.</td>
<td>Islip Middle School</td>
</tr>
<tr>
<td>41.</td>
<td>Smithtown Christian School</td>
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</tbody>
</table>
SUCCESS! All About Partnerships & Collaboration

1. Central Pine Barrens Commission
2. Brookhaven National Lab
3. Department of Environmental Conservation
4. Suffolk County Water Authority
5. Cornell Cooperative Extension, Suffolk County
6. Trout Unlimited
7. Wertheim National Wildlife Refuge
8. Sea run Brook trout Coalition
9. Town of Brookhaven
10. USGS
11. Eastern Suffolk BOCES
12. Foundation for Ecological Research in the Northeast (FERN)
13. Girl scouts of Suffolk County- Camp Sobaco
14. The Peconic Estuary Program
15. The Group for the East End
16. The Nature Conservancy
17. The South Fork Natural History Museum
18. East Hampton Town Shellfish Hatchery
19. Long Island Science Center
20. NYS Parks
21. Suffolk County Parks
22. Sweetbriar Nature Center
23. Long Island Sound Study
24. Western Suffolk BOCES
A Day in the Life of the Carmans River

10 Schools & 26 Experts & 16 Locations!
A Day in the Life of the Peconic Estuary

15 Schools & 26 Teachers & 27 Experts & 23 Locations!
A Day in the Life of Nissequogue River

10 Schools & 18 Experts & 13 Locations & 346 students!
## A Day in the Life of the Peconic Estuary

### Peconic Estuary Data:

<table>
<thead>
<tr>
<th>pH</th>
<th>Salinity</th>
<th>Dissolved Oxygen</th>
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<table>
<thead>
<tr>
<th>Temperature °C</th>
<th>Temperature °F</th>
<th>Participating Schools</th>
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## Peconic Estuary Participating Schools

<table>
<thead>
<tr>
<th>Site Name</th>
<th>School 2014</th>
<th>School 2015</th>
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<tbody>
<tr>
<td>Birch Beach</td>
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<td>Elizabeth Morton Wildlife Refuge</td>
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<td>Southold Elementary School</td>
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<tr>
<td>Goose Creek</td>
<td>Southold High School</td>
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<tr>
<td>Hallocks Bay - Orient</td>
<td>Oysterponds School</td>
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<tr>
<td>Indian Island County Park</td>
<td>Riverhead High School</td>
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<tr>
<td>Landing Lane - East Hampton</td>
<td>Spring Schools</td>
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<tr>
<td>Louise Point - East Hampton</td>
<td>Spring Schools</td>
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<tr>
<td>Mashomack Preserve - Bass Creek</td>
<td>Shelter Island Schools</td>
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<tr>
<td>Mashomack Preserve - Gibson Beach</td>
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<td>Napeague Harbor</td>
<td>The Ross School</td>
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<td>Northwest Harbor County Park</td>
<td>Easthampton High School</td>
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<td>Northwest Harbor County Park</td>
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<td>Roadhouse Brickoven Pizza Property</td>
<td>Riverhead High School</td>
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<td>Sebonic Inlet - Sag Harbor</td>
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<tr>
<td>Short Beach</td>
<td>Hay Ground School</td>
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<td>Squire Pond</td>
<td>Hampton Bays Middle School</td>
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<td>Suffolk County Marine Environmental Learning Center</td>
<td>Cutchogue East Elementary School</td>
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<td>Towed Point</td>
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<td>USGE/DEC Lowe Peconic River Site</td>
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<td>Veterans Beach</td>
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<tr>
<td>West Neck Creek</td>
<td>Shelter Island Schools</td>
<td></td>
</tr>
</tbody>
</table>
Peconic Estuary

click the icon in the map to view

Site with data  Site with uploaded pictures  Site with no data
A Day in the Life... Data

Location: Peconic Estuary
Site Name: Suffolk County Marine Education Center - Bay
Collaborator Name: Cutchoque East Elem.

Group 1 - Physical Data

<table>
<thead>
<tr>
<th>Time</th>
<th>Distance</th>
<th>Units</th>
<th>Direction</th>
<th>cm/second</th>
<th>knots</th>
<th>F°</th>
<th>C°</th>
<th>Cloud Cover</th>
<th>Direction</th>
<th>Speed mph</th>
<th>Speed knots</th>
<th>Year</th>
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<tbody>
<tr>
<td>10-11:30 Bay</td>
<td>76</td>
<td>cm</td>
<td>West</td>
<td>12.73</td>
<td>8.3</td>
<td>68</td>
<td>20</td>
<td>Cloudy</td>
<td>South</td>
<td>7</td>
<td>7.6</td>
<td>2014</td>
</tr>
<tr>
<td>10-11:30 Bay</td>
<td>76</td>
<td>cm</td>
<td>West</td>
<td>12.73</td>
<td>8.3</td>
<td>68</td>
<td>20</td>
<td>Cloudy</td>
<td>South</td>
<td>7</td>
<td>7.6</td>
<td>2014</td>
</tr>
<tr>
<td>1:15-2:45 Bay</td>
<td>74</td>
<td>cm</td>
<td>West</td>
<td>63.17</td>
<td>17</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>7</td>
<td>7.6</td>
<td>2014</td>
</tr>
<tr>
<td>9:30-10:30</td>
<td>29.25</td>
<td>inches</td>
<td>West</td>
<td>9.222</td>
<td>0.1793</td>
<td>52</td>
<td>11</td>
<td>Clear</td>
<td>East</td>
<td>10</td>
<td>19.7</td>
<td>2015</td>
</tr>
<tr>
<td>11:00-12:00</td>
<td>35</td>
<td>cm</td>
<td>West</td>
<td>11.33</td>
<td>0.22</td>
<td>64</td>
<td>17</td>
<td>Clear</td>
<td>East</td>
<td>19.7</td>
<td>19.7</td>
<td>2015</td>
</tr>
<tr>
<td>11:00-12:00</td>
<td>35</td>
<td>cm</td>
<td>West</td>
<td>11.33</td>
<td>0.22</td>
<td>64</td>
<td>17</td>
<td>Clear</td>
<td>East</td>
<td>19.7</td>
<td>19.7</td>
<td>2015</td>
</tr>
</tbody>
</table>
Wastewater-derived nitrogen loading promotes harmful algae blooms in our waters

-Hattenrath et al 2010, 2015
Study of Biodiversity at Gardiner’s Park

Introduction
Our goal is to continue a 5-year study of local county parks. This project is a continuation of Mrs. Garland’s Living Environment Classes.

Overview
Our project involved measuring environmental changes and comparing them from the year before and year to year. This has also been a study of how new plants have increased the biodiversity of our local county parks. One group was placed near the pond while the other group was placed near the marsh. The plants will be included in the poster and the results will be recorded to show how much the plants have grown.

Methods
The growth of the plants was measured and recorded. A ruler was used to measure the height of each plant. Each plant was measured three times and the average was recorded. Each plant was measured every two weeks.

Results
The results showed that the plants were growing taller and the number of leaves was increasing. The plants were also spreading to other areas of the garden. This indicates that the plants are adapting to their environment.

Discussion
The results of this experiment show that the plants are adapting to their environment. The plants are spreading to other areas of the garden and the height of the plants is increasing. This indicates that the plants are becoming more established in their environment. These results show that the plants are adapting to their environment.

References

Acknowledgements
Thank you to OSPR for providing data and Mrs. Garland for providing guidance. We also want to thank all the students for their support.
Effects of Eutrophication on Long Island Salt Marshes

Methodology

- Our results show there was significant difference between the samples collected on the east and west side of the Connetquot River (p < 0.05). This may be a result of flow from the Connetquot River.

- Suffolk County Beach Monitoring Data correlated to Rainfall Data. Overall, the greater the amount of rainfall, the greater the amount of nitrate (NO₃⁻) was detected, which increased the amount of beach closures on Long Island.

- The Suffolk County Water Authority (SCWA) Reports indicated fluctuations of nitrate (NO₃⁻) levels, but from 2012–2015, the levels of the average nitrate (NO₃⁻) increases by 0.76 mg/L.

Conclusion

- Many salt marshes may be at risk due to the nutrient fluxes to the coast, with the largest increases in N flux occurring at coastlines (Daigan et al., 2012).

- Excessive nitrate (NO₃⁻) concentrations also are known to prevent the deposition of sediment, which inhibits the salt marshes ability to keep up with sea level rise (Turner et al., 2003).

- Thus, it is necessary to solve the issue of eutrophication from nitrate (NO₃⁻) pollution and sewage outfall.

Future Applications

- Knowing that over the past few years, there has been a gradual increase in flux of nitrate (NO₃⁻) in the Great South Bay, we propose to understand how eutrophication and the creation of algal blooms impact marine life.

- Understanding these characteristics may allow scientists to further understand the detrimental effects of eutrophication and possibly propose a solution to this issue.

Works Cited

- Daigan et al. (2012).

- Turner et al. (2003).

- U.S. Climate Data.

- SCWA Reports.

- SCWA Beach Monitoring Data.
In the News

The Peconic Bathtub

Student Scientists Spend a Day in the Life of the Peconics

Young Island citizen scientists explore Coecles Harbor

Research project on LI's waters

Rising Tides Among Sayville Student Scientists

Sayville Sixth-Grader Presents at Industry GIS Conference
A Day in the Life

Grades 2-12—A Fun, Experiential science research program!

Using the Environment Integrated Context for Learning: At each location, teams of students use seine nets and lab equipment to investigate aquatic life, biodiversity, water chemistry and quality, tides and weather and other parameters to fit into your STEM curriculum.

Citizen Science—Results for all locations and schools are posted on our “A Day in the Life” Website to be used by the students, land use decision makers, civic groups, and the general public.

Creating Environmental Stewards—Students are our future decision makers; our goal is to give them the inspiration and knowledge to make informed decisions for environmental health.

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Melissa Parrott, CPBC
mparrott@pb.state.ny.us

Ron Gelardi, NYSDEC
ron.gelardi@dec.ny.gov

2017 DATES
- Carmans River—September 22
- Greens Creek—September 22
- Gardiner County Park—September 22
- Massapequa Preserve—September 29
  - Fire Island—September 29
  - Nissaque River—October 6
  - Carls River—October 13
  - Lake Ronkonkoma—October 13
  - Peconic Estuary—October 20
  - Connetquot River—October 27
  - Mill River—November 3

Brookhaven National Lab