

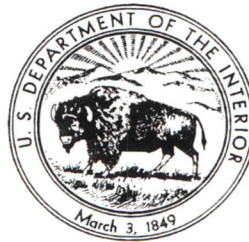
GATEWAY NATIONAL RECREATION AREA
STATEN ISLAND UNIT

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EDUCATION PLAN
GREAT KILLS EDUCATION
& VISITOR CENTER

Education Plan

Great Kills Education & Visitor Center

U.S. Department of the Interior
National Park Service
Gateway National Recreation Area
Staten Island Unit
Great Kills Park
Draft Proposal
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Table of Contents:

I.	Mission Statement.....	2
II.	Introduction.....	3
	A. Guiding Principles.....	3
	B. Philosophical Foundations, Implications.....	4
III.	Educational Objectives	
	A. General Goals.....	6
	B. Pods in Detail:	
	1. Wind, Waves and Sand -- Marine Physical Science.....	8
	2. Salty Shores -- Marine Ecology.....	10
	3. Upon the Land -- Upland Habitats.....	11
	C. Other Teaching Spaces:	
	1. Exhibit Area/Lobby.....	12
	2. Observation Deck - Inside and Outside.....	13
	3. Wayside Areas.....	13
	4. Multi-purpose Room.....	13
	5. Auditorium.....	13
IV.	Programming Considerations	
	A. Audience:	
	1. Organized Groups.....	14
	2. Non-organized Groups.....	15
	B. Logistics.....	15
	C. Staffing Needs.....	16
	D. Further Considerations.....	17
V.	Conclusions.....	18
VI.	Appendices	
	A. Itineraries:	
	1. Wind, Waves & Sand -- Marine Physical Science.....	19
	2. Salty Shores -- Marine Ecology.....	21
	3. Upon the Land -- Upland Habitats.....	23

I. Mission Statement

The Great Kills Education and Visitor Center will be dedicated to the development of innovative, dynamic, and creative programming, enhanced through its design. The best methodology and equipment will be employed to teach visitors about the importance and operation of urban and coastal ecosystems and how they are affected by human activity. By providing significant learning experiences about the coast, the Center will further the National Park Service mission, inspiring appreciation for Gateway's uniqueness to students from schools in the area, the people of the New York City region, and to visitors from other places.

II. Introduction

Gateway National Recreation Area is completing plans for a new visitor and education center at Great Kills Park on Staten Island. Its design, construction, and programs will reflect the overall philosophy and mandate of the National Park Service while meeting the specific needs of the area serviced by this facility.

The center will sit on a slight rise overlooking the Great Kills Harbor. It will be a two-story building with reception area/lobby and a 152-seat auditorium in the visitor wing. The education wing will house three distinctive educational spaces each dedicated to a specific theme, a multi-purpose room (lunchroom) and separate entrance. The upper floor will contain office and other support space. Above the second floor will be an observation deck. Outside there will be an information kiosk, trails, wayside exhibits, a 400-seat amphitheatre, picnic area, parking lot and other exhibits.

This document establishes the overall goals of the educational program and focuses on a variety of important considerations for the final planning process. Education is a primary mission of the National Park Service and although the Great Kills Education and Visitor Center (GKEVC) will serve a variety of functions, it will be the hub of the educational programs offered at this site. The construction of this facility will enable the park to fully realize its educational mission.

A. Guiding Principles:

1. The protection of the vulnerable marine environment requires a marine-literate citizenry. Because there is no other public learning facility on Staten Island where Marine Sciences are taught, the GKEVC fills this important educational niche.
2. It is important that we establish, as a primary working guideline, that form must follow function. The clear vision of the educational objectives will drive the design.
3. The design and programs must reflect the geographical location of the site, its natural habitats, ecology and history. The GKEVC is situated within Gateway National Recreation Area, a coastal park. Although located within the boundaries of a large urban center, it is not urban in its character.
4. The facility should promote state-of-the-art environmental philosophy. Every design component, every purchase, and every program must go through a "green screen" to address the question, "Is this environmentally sound?" This is especially true of the building itself, its construction, and its day to day operation. The GKEVC should not waste energy. It should provide a safe and healthy indoor environment for its visitors and workers, contribute minimally to air and other pollution, and be conscious about solid waste.

5. Long-term flexibility and adaptability should be built in to the design and construction. It is better to anticipate than to retrofit. Although some technology may not be cost-effective at this time, it may be the best option 5 to 10 years from now. Some examples are solar or wind energy and composting food waste. Set-ups for future interactive exhibitry should be designed in.
6. People learn in a variety of ways. Therefore, we are obliged to present our messages in a variety of ways including visually attractive graphics, written text, audio and video, and art. Research has demonstrated that children and adults learn best when they are actively engaged. Therefore, we need to provide opportunities for visitors to have hands-on experiences. This includes teaching out of doors whenever possible. Within indoor spaces, the exhibits should emphasize the experiential. Each pod will provide space and furnishings for cooperative learning.
7. Striking and dramatic art captures attention and reaches people on an emotional level. Art should be considered an integral part of the overall design and execution of the GKEVC. (Caution: Although aesthetics are important, the actual design of the structure and its components should not sacrifice function in the name of beauty).
8. Exhibit design technology must be very carefully considered. "High-tech" may carry with it special maintenance considerations. The cautionary note regarding aesthetics applies to high-tech as well. Maintaining its educational purpose, the use of technology as a tool not an end in itself, to illuminate, not dazzle, can serve as our guide.

B. Philosophical Foundations and Implications:

When embarking on such an elaborate and costly project, it is important to consider how people, especially children, learn and develop.

Informal learning centers and techniques are becoming more visible in education. Increasingly, museum, nature and science centers, zoos and parks are seen as valid extensions of the classroom. These facilities are less restrictive, more flexible and may use non-traditional, educational methods. More importantly, informal educational experiences appeal to children of varying abilities on many levels; that is part of their mission and they are well suited to it.

When we consider what child development research teaches about how children take in information, process it, and make it their own, the conclusions gained guide us to the types of exhibits and lessons that will be most effective.

As children progress through the elementary school years, they develop an awareness of the physical attributes of the world as well as an increasing sense of their own place within it. The educational program at the GKEVC will provide the student-visitor with a full range of experiences consistent with the student's age and abilities. These activities will be devised to spark the imagination and to inspire a deep appreciation for the natural world.

The GKEVC program will reflect a developmentally sound approach. Its experiential curriculum will capitalize on the curiosity and enthusiasm typical of the young school age child. The growing social and interactive elements of learning will also be promoted, as the GKEVC will be designed to encourage students to work cooperatively and to share their discoveries with peers and adults. The GKEVC will also facilitate formal experimentation and investigation into the physical world consistent with the abilities of older children. Finally, the center will foster the exploration of symbolic and abstract scientific concepts, maintaining its appeal to the power of imagination.

By using a variety of activities and approaches, children can be reached on many different levels. By emphasizing a cooperative learning approach, there is a shift from teacher-as-teller to teacher-as-facilitator and from student-as-receiver to student-as-doer. This reflects the research findings of learning theorists. The common thread for learning at ALL ages is the experiential. People learn by doing, by being involved. The implications for the GKEVC are that wherever possible, a hands-on approach to content, actively involving visitors, should be employed.

The GKEVC learning facility will be infinitely adaptive to the evolving abilities of all children and adults. Within this framework, the emphasis will be on a cooperative and experiential approach to teaching and learning. The role of the teacher is not to disseminate a static body of knowledge but to facilitate the process of active discovery. Children, and adults too, learn best by being actively involved. The Center will be committed to a hands-on approach to education. Visitors will be actively involved.

III. Educational Objectives

A. General Goals:

A major underlying goal of the educational program is to cultivate in visitors an appreciation and understanding of natural systems, how they work and how human culture, in turn, affects natural systems. Hopefully, the Center will inspire visitors to cherish and protect the wonderful resources nature has provided.

In the National Parks, visitors are exposed to the beauty and diversity of the natural world. Additionally, at Gateway, we are charged with the responsibility of demonstrating the value of marine and urban ecosystems, promoting an understanding of the significance of an urban National Park site, while fostering stewardship of Gateway's resources. Our goal is to interpret the National Park Service mission to the people of the New York City region and to those who visit here from other areas.

The outdoor experience is a vital component of any National Park visit and so it shall be at the GKEVC. There is no substitute for a real outdoor experience and this will be an integral portion of any lesson here. The indoor experience is meant to enhance and complement the outdoor.

Indoor areas with educational components include the public/exhibit areas and classrooms. The indoor/outdoor observation areas are also important places where formal as well as non-formal education will occur. The entire facility is a learning space, a learning tool. This is especially true of the environmentally-sound approach the structure is expected to have.

Although the GKEVC is neither a museum nor a school, it encompasses elements of both. Whatever works in each of these can be adapted to make this facility an effective instrument of learning.

The geographic location of the GKEVC at the entrance to New York City's harbor provides a thematic base. Consequently, the focus will be coastal and urban, themes that will be continually seen in its design, art, decor and programs.

There will be three (3) classrooms for structured learning experiences (to be led by NPS educators). They will be located within their own wing; access to this area will be limited by reservation. Rather than a traditional school classroom appearance, the design and furnishings of the spaces will reflect the nature of the themes while providing flexible and adaptive settings for a full spectrum of activities.

More specifically, the education staff has decided that a three (3) theme approach, with each classroom dedicated to a theme, is desirable. The three classrooms have been designated as "pods". The specific themes, goals and concepts will be enumerated for each "pod" and in the other areas suitable for educational exhibitry.

In all cases, the level of knowledge to be attained as a result of participation in a specific lesson in a particular pod will be age/grade related and will depend on the degree of student sophistication brought to the setting. It will also depend on the amount of time spent at the Center.

Evaluation, both formal and informal, will be an integral and ongoing process. Effectiveness of materials and methods will be continually monitored.

Furnishings for pods will include lab equipment, wet gear, plumbing for wet stations and computers. Room decorations will relate to each theme. Each pod will have a personality that is readily apparent. Because a cooperative learning approach will be used to whatever degree possible, furnishings and layout need to reflect this.

Criteria considerations for furnishings and exhibits dictate that they be:

- * safe
- * comfortable
- * easy to maintain
- * user-friendly
- * educational
- * scientifically correct
- * theme-related
- * exciting
- * visually appealing
- * durable



To avoid misunderstanding, the word interactive will be used when talking about computer technology. When visitors interact in some other way with exhibits or models, the terms hands-on or experiential, or other words that describe the nature of the interaction (e.g., listen to, feel, touch, etc.) will be used.

B. Pods in Detail:

1. Wind, Waves and Sand -- Marine Physical Sciences

This pod will emphasize the non-living natural components of the coastal environment...the water that defines the coast, how it acts and why, the weather, geology, currents, winds, storms...the ever-changing nature of the coast and human attempts to predict and control these.

Themes: Water is a powerful force of change in the environment.
Humans can affect change in the marine environment.

Goals: To educate visitors about:

- * the ocean as a force of change
- * the effects of human actions on the marine environment
- * the physical and chemical aspects of the marine environment

Concepts: Geography

- * the surface of the Earth is covered by about 3 times more water than land
- * all of the ocean waters of the Earth are connected

Physics/Dynamics

- * oceans are always moving - currents, waves, and tides
- * these movements are created by the natural forces of: wind, sun, gravity and the rotation of the Earth
- * beaches erode, sands move and are re-deposited
- * dunes, how they are formed, the role they play, and the need for their protection
- * the impact of various engineered shore structures such as jetties, groins and breakwaters and other human actions on beaches and the marine environment

Physics/Chemistry

- * the oceans are salty
- * the other chemical and physical features of water -- temperature, density, turbidity, dissolved oxygen, light, pressure and their affect on the marine environment

Geology/Earth Science

- * sand -- what it is, where it came from
- * sands are different
- * the peat flat -- what it is, how it formed
- * the local geology and its effects
- * the hydrologic cycle and its importance

Navigation/NYC as a Harbor

- * what constitutes a harbor, why NYC became one
- * navigational instruments and aids
- * how boats are designed to allow for waves, wind and currents

See Appendix A for descriptive itinerary and sample program for this pod.

2. Salty Shores – Marine Ecology

This pod will explore the saltwater/marine environment, both deep water and intertidal. It will focus on the adaptations of the organisms who make this ecosystem their habitat.

Themes: The marine environment is a diverse and complex ecosystem.
The plants and animals of the marine environment are important to humans.
The living and non-living components of an ecosystem are interdependent.

Goals: To educate visitor about:

- * the diversity and complexity of the marine ecosystem
- * the value of plants and animals of the marine ecosystem to humans
- * the fragility of the marine ecosystem, including the dunes
- * the effects of the physical and chemical properties of the water on the living organisms
- * aquatic food chains and webs (including humans)
- * the adaptations of organisms to this ecosystem
- * the nature and value of saltmarshes
- * the nature and value of estuaries

Concepts:

- * marine animals native to this area and their characteristics
- * marine plants native to this area and their characteristics
- * how people benefit from these organisms
- * how human activities affect this environment and the creatures that inhabit it
- * protecting the marine environment -- water, coast, beach and dunes
- * the peat flat, its inhabitants and its uniqueness
- * the relationships of the living and non-living components of the marine ecosystem
- * aquatic food chains and webs
- * the zonation of organisms and reasons for its occurrence
- * the role of saltmarshes in the health of this ecosystem
- * the role of estuaries in the health of this ecosystem
- * the role of dunes and dune grasses

See Appendix A for descriptive itinerary and sample program for this pod.

3. Upon the Land -- Upland Habitats

This pod will examine upland habitats...woodland, meadow, pond and creek...their plants, animals and non-living components in the places where the land becomes the dominant feature. It will focus on terrestrial and freshwater species, including humans and their interrelationships.

Themes: Upland environments are diverse and complex.
Their components are related in many different ways.
Organisms derive their needs from their habitat.

Goals: To educate visitors about:

- * the various upland habitats and their characteristics
- * the living organisms of these habitats and how they relate to each other and to the non-living components
- * the reasons these habitats are so important to their inhabitants, including humans
- * the effects of humans on upland habitats

Concepts:

- * the physical characteristics of the various upland habitats
- * the plants and animals native to these habitats and their characteristics
- * the many ways the inhabitants interrelate
- * humans, like other inhabitants, have always derived their life necessities primarily from this environment
- * human activities have affected this ecosystem
- * strategies for survival
- * growth, change and life cycles
- * the value of wetlands
- * solid waste and landfilling
- * succession

See Appendix A for descriptive itinerary and sample program for this pod.

C. Other Teaching Spaces:

1. Exhibit Area/Lobby:

Vital for learning, the exhibit area will be designed to appeal to every age-group and learning style. Color, art, sound and movement will be an integral part of all the exhibits. Every attempt will be made to engage the visitor in an active learning mode via interactive and other manipulative exhibits.

Movement and circulation patterns will be considered as decisions are made concerning the best ways to engage the attention of the visitors and pull them in so they will want to spend time and learn. The attractiveness of the displays will provide the "hook" that encourages the visitors to delve a bit deeper.

The area will not be so large as to be overwhelming. Therefore, it will be do-able...that means visitors will not feel they are rushed or that there's so much to see that they will need to do a cursory "quick-through" so prevalent in the larger facilities. They can take the time necessary to stop, look and learn. It requires, however, that we make our size work to our advantage by utilizing whatever space we do have in an imaginative, exciting fashion.

Our potential audience for this space will consist of persons of all ages, abilities, and interests including family groups, drop-ins, tourists, organized groups who may have not pre-reserved, people who arrive early for programs, past program participants, community group members who use the meeting space, people seeking parking permits, birders, hikers, fishermen, boaters, etc. Many of these will be repeat visitors. A changeable exhibit space here would be suitable to keep these users stimulated.

Since the pods are reserved for organized groups who will be under the guidance of an interpreter, then it follows that the lobby needs to be used in a self-directed way. Exhibitory here should provide for change as need dictates. The displays here should feature hands-on components too.

Our goals for this area are:

- * to introduce the visitors to the site
- * to entice the casual visitor to return
- * to present brief, yet comprehensive content to the short-term visitor

The lobby exhibit could combine geography ("where are we?") with history ("what happened here?") and natural history ("how did people use this land?").

The reception desk can act not only as an information/permit area but can incorporate some special interactive video screen for birders, fishermen or others...a "nature news update".

2. Observation Deck:

The observation deck and glassed-in area are important adjuncts to the rest of the education wing. The deck is almost another room and should be considered as such. What is envisioned as happening is whenever a group comes for a program, chances are they will end up or start in either of these places. Here they can gain an overview of the site since the deck is the highest accessible point of the building.

3. Wayside Areas:

The outdoor/trail areas may be the first or only portions of the GKEVC that first time visitors see, especially if they come after-hours or for non-park activities (concerts, etc.). By making the most of the trail signage and the exterior of the building, we can entice those people to return for a more leisurely, self-guided or guided visit. We have several messages to tell and we want as many people as possible to hear and heed those messages.

4. Multi-purpose Room:

This room will need to serve as a lunchroom (visitors to provide their own food, no food will be sold), especially for school groups and during the colder months when outdoor picnic tables will not be available. It will also be used by various community groups. Therefore, the opportunity for creating an educational environment exists for this location. An example for use could be as a place for temporary, changing art and photography exhibits. They could be done by our student visitors, community artists or photographers. It could be a good space for traveling exhibits, juried shows, etc.

5. Auditorium:

As a public space, the auditorium can serve many educational functions. Naturally, it is expected that such a premier facility will commission a dramatic, exciting, evocative audio-visual presentation that visitors will want to see before or after a park experience. The exact nature of this video will be determined in the future. In addition, films, slides, lectures and performances can be held here. The New York City/New Jersey area has many talented and knowledgeable resource persons who share their expertise, and there are many people who want to see, hear and learn from them. Even the walls of this space can relate the messages we want to pass on through art in various media.

IV. Programming Considerations

A. Audience:

1. Organized Groups: Those groups who reserve guided or structured programs in advance.

School Groups: Although we will serve all grade levels, experience has shown that Grades 4, 5, and 6 make up the bulk of our school group visitorship. For this reason, we will gear our plans and programs for these grade levels. Provisions will be made for lower and upper age/grade levels. Among these school groups will be disabled and other Special Education groups whose needs must be considered.

Camp Groups: During the summer months, many camp groups will use the facility. There will be a mix of age groups here too, but probably mostly between ages 7 to 12 years old.

Adult Groups: This facility is expected to attract a variety of adult groups. They may be tour bus groups who visit National Park sites since they know they will receive quality programming or various senior groups, such as Elderhostel. Then there are organized groups whose missions dovetail closely with those of the Park (e.g., American Littoral Society, Audubon Society, etc.). Arrangements may be made in advance for special guided programs.

Teacher Groups: Since the GKEVC will be a model teaching facility, we expect to serve as a center for Teacher Education. New York City as well as the nearby New Jersey districts are home to more than one million school children, with tens of thousands of teachers in hundreds of schools. A first-rate learning facility is always in demand. In addition, there are dozens of educational support systems in place, such as the Gateway Environmental Study Center, Educators for Gateway, New Jersey Science Teachers Association, Staten Island Science Teachers Association, Environmental Education Advisory Committee and various other professional groups. Summer, weekend and evening institutes can be offered through the National Science Teachers Association, United Federation of Teachers or the National Science Foundation. We expect that the GKEVC will serve as a high-quality teaching and learning facility.

Community Groups: There will be many groups in the community who will seek to use the amphitheatre, auditorium, observation deck and/or the multi-purpose room for various non-park related meetings. These might include professional organizations, performers, community activists, clubs and scouting groups. Within the guidelines set by the National Park Service and based on our program priorities, the building and its facilities will be available to these groups. While they are using the building or its surroundings, the opportunity exists to teach via art, graphics, visuals and whatever exhibitry are available at that time. This will encourage return or repeat visitation for a more structured learning experience.

2. Non-organized Visitors:

Families: We expect to attract many families with children of all ages. It is important that the building be "family friendly" and that parents feel that their children are welcomed. These individuals and families can be accommodated for programs via the usual scheduling and announcement procedures. Enhanced public relations and the attractiveness of the facility will assure attendance.

Random Visitors: There will be people who just come in without any advanced reservation. They might be locals or they might be tourists who know that the National Park Service always offers outstanding programming.

Researchers: By creating a first-class facility, the GKEVC can attract those who desire to pursue research, especially in marine biology. An extensive library and a well equipped laboratory would enable local institutions, from high schools through graduate level, to offer their students on-location experiences. NOTE: Such a library and laboratory may require special funding to develop.

Each aspect of the GKEVC must be geared, wherever possible, to accommodate all of the expected visitors.

B. Logistics:

With three pods, the GKEVC will be able to accommodate three classes at a given time slot. Assuming that classes will arrive by school or chartered bus, we could book three groups for the morning (10:00am to 11:30am). As time goes on, three more groups can be accommodated for the afternoon (12:00pm to 1:30pm). That totals six groups per day. Prior experiences with booking for programs at the Staten Island Unit and Floyd Bennett Field have indicated that we could easily fill the slots if the space and staff were allotted and buses were not a problem. Groups traveling from places where buses are available all day (e.g., nearby New Jersey) can spend longer periods of time.

Assuming class size for New York City averages 32-35 students, plus teachers and chaperons, we have proposed that room size for the pods be for 40 persons. That translates into 120 persons for each time period, and 240 for the total school day (smaller numbers for those staying longer periods).

Another population we anticipate as heavy users of the GKEVC is the many summer day camp groups in the area. Especially in recent years, with both parents working, many children are in summer programs that use various informal learning centers. There are many day camps that do not even have a home base. Their entire weekly program involves "traveling" to sites in the area. Once again, depending on staffing allotments, we could accommodate up to 240 persons per day.

NOTE: Since the outdoor experience is a vital part of the total GKEVC experience, if staffing permits, we could accommodate even more visitors by using the indoor spaces on a rotating basis, i.e. one group is outdoors while another is indoors, then switch, effectively doubling the capacity (480+ persons).

These numbers are for organized groups only. Since the GKEVC will also serve the general public, it is anticipated that many people will use the Center without having pre-reserved for National Park Service interpretive services.

The multi-purpose room has been designed to hold about 100 persons. School and camp groups will probably use this room as a lunchroom. Since we cannot accommodate all of the groups who would want this space at any one time, we will encourage the use of outdoor picnic tables and the amphitheatre, when weather permits, or stagger the times for the use of the room when it does not.

All visiting groups will probably patronize an educational sales shop. A stop at the educational sales counter should be built in to the time allotment for each group. Similar arrangements should be made for use of the toilet facilities by groups.

The exhibit area and auditorium are also an integral part of the educational experience. Space within the exhibit area may not be large enough to accommodate an entire class at one time, so adjustments will have to be made if interpretation is to take place on the exhibit floor.

The auditorium, although primarily a place for audio-visual presentations, should have the flexibility in design to allow for its use in other yet-to-be-determined ways. Performances, lectures, meetings, large group sessions, are examples. We may want to present some interactive group experience. The auditorium space would be suitable for such interactive programs (NOTE: the wiring for such a possibility should be incorporated in the design/furnishings to allow for future use and to avoid expensive retrofitting).

C. Staffing Needs:

To carry out an ambitious program as outlined in this document, will require staffing at a level commensurate with our objectives.

A facility such as the GKEVC is more than bricks and mortar: what enables the National Parks to have the excellent reputation it does are the people who make the programs work.

The following are minimum staff requirements for successful educational programming:

- 1 Chief of Interpretation and Education
- 4 Education Specialists
- 3 Cooperatives -- Interns, student teachers (non NPS salary), teachers on sabbatical
- 2 Interpretive Specialists -- for public programs
- 2 Seasonal National Park rangers
- + Volunteers-in-Parks

NOTE: For any program involving youngsters in the water (e.g. seining), a certified lifeguard will be needed.

D. Further Considerations:

For many of the audiences we will serve, their visit here will be a one-time experience. For that reason, whatever is done must have powerful impacts...visual, emotional, sensory and otherwise, so that the visitor will not forget the experience. Changing exhibits such as those for display in the multi-purpose room encourage return visits. We do not want any of our visitors to refuse to come back because they were there last year.

There are some segments of our visitorship whom we will also serve with repeated visitation opportunities. Among those are on-going research by high-school and/or college students as well as other adults. This is one rationale for research space and resource library facility.

We must emphasize the outdoor experience. There is no substitute for the real nature experience. The indoor experience is meant to enhance the outdoor. Of course, certain kinds of learning can be better accomplished by means of simulated experience, e.g. a satellite photograph can provide a view of the area that very few human eyes will ever have the opportunity to see. But it is better to see, smell, hear, and touch objects than to look at pictures of them or computer simulations on screens. Wherever possible, learning should be experiential to create deeper and longer-lasting results. Let's keep these principles in mind as we consider options.

V. Conclusion

Education is the primary function of the new Great Kills Education and Visitor Center. This must be reflected in the amount and kind of space that will be devoted to this aspect of its mission. Even the spaces not specifically earmarked for education are, upon closer look, designed as support systems for that function. Therefore, we must carefully examine what we hope to teach and how we expect to teach it.

This facility, in its concept, design process, execution and operation will serve as a model for others. In addition to the content and knowledge to be imparted, we hope to create in our visitors an understanding and appreciation of the urban coastal environment, resulting in an attitude of protective stewardship toward that environment.



VI Appendices

A. Sample Itineraries

When school and other organized groups sign up for a program, the teacher or leader will select a theme topic. For school groups, pre-visit materials will be sent to the teachers so that they may prepare their students for the visit.

When groups who have made reservations arrive at the GKEVC, they will be met at the bus kiosk by a ranger who will greet them and escort them to the center via a "decompression trail". This is intended to create an atmosphere that establishes their presence in a special place.

Before or during the time on the decompression trail, the ranger will conduct an activity specifically geared to the theme topic and suitable for the age or grade level of the group.

There will also be an orientation to the National Park Service, to Gateway National Recreation Area, and to the Staten Island Unit. It may be conducted at the bus kiosk, on the trail, on the Observation Deck, in the auditorium, or in the pod.

Each session will have both outdoor and indoor components, again tied to the selected theme and age or grade specific.

1. Wind, Waves & Sand -- Marine Physical Sciences:

Decompression Activity: Global Ball Toss -- an inflatable world globe is tossed back and forth with the students observing, counting, and comparing what proportion of the catches are made with fingers touching water (blue) vs. land. In this way, they will confirm that there is three times more water than land on earth.

Outdoor Component: Groups may be divided into smaller groups for various investigation or tasks e.g., water quality testing, sand sieving, tide marking, collecting sand and water samples, photographing, sketching, measuring flow rate and direction of the current, sun tracking and shadow studies, reading weather instruments.

They may engage in various simulation activities to track the current or understand wave motion e.g., "Cracking the Whip" using a rope to create a moving wave.

These activities will be carried out on the beach or at the Great Kills Harbor.

Indoor Component: Students may observe a movable, motorized model of a globe that demonstrates how the Earth moves in relation to the Sun and Moon.

Students may analyze the samples of water and sand they collected. They may record and/or graph data. They may use microscopes to examine sand.

In small groups of 4 to 6 students, they will manipulate wave-simulating tables. If possible, the tables will duplicate the actual configuration of the Great Kills shoreline and its surrounding waters. They should be able to consider some of the variables such as wind speed and direction, depth of the sea floor, and currents. Models of human-made structures such as jetties, groins, and seawalls, should be available for the students to add on and manipulate to determine their effect on the shoreline.

Dunes may be integrated into this simulated shoreline or considered separately...but somewhere, dunes need a physical manifestation to present the idea of the value of dunes in a hands-on way.

Students may observe a wave tank in cross-section, either with water and bobbers, or a non-water wave maker, to understand that wave movement involves transfer of energy rather than the movement of the water itself.

Students will observe the orbital movement of water in waves via a video or model.

Students may observe a model of the water cycle.

Students may engage in distilling and tasting the distillate of sea water.

2. Salty Shores -- Marine Ecology:

Decompression Activity: Students may engage in one or more of the following games:

- * Aquatic What am I game
- * Aquatic Food Web game
- * Aquatic Adaptations game

Outdoor Component: Students will go to different areas of the park which may include:

- * peat flat
- * Crooke's Point
- * bulkhead area
- * Duck Creek
- * Sewage Plant outflow of Mill Creek

Tasks to be carried out at one or more of the sites may consist of the following:

- * water sampling, salinity tests
- * plankton netting
- * seining and collecting of plants and animals
- * sketching plants and animals
- * photographing
- * beachcombing...looking for remains of organisms
- * "scavenger hunt"
- * transect studies on the dunes and peat flat
- * litter collecting

Collected materials would be brought back to the pod for further analysis

Indoor Component:

1. There will be a salt water tide pool touch tank with live specimens representative of those who actually inhabit this area's waters. Students will be divided into small groups of 4 to 6 students each. Each small group will have its own live specimen, taken either from the tank or one that was collected outdoors. Each group would study the specimen, making observations, drawing, recording, responding to specific questions, etc. If time allowed, they could rotate to learn about all or the specimens or there could be an information sharing time.
2. Dramatic play: create a critter, dance or other movement simulating whales, dolphins or fish
3. Artistic expression: fish prints, sand painting, etc.
4. Manipulate animal or plant models to understand how organisms adapt to this habitat.
5. Play a food web simulation game
6. Manipulate an exhibit piece that matches beach oddities with the origins, e.g., whelk egg cases, moon snail egg collar, etc.

7. Consider the role of ocean life as an important food source.
8. Match organisms with their young.
9. Consider the formation and important role of the dunes and dune grasses.
10. Manipulate a model of a gill to understand how fish breathe.
11. Consider other related subjects such as: why humans can't drink sea water, why fresh water organisms cannot survive in salt water, why sea organisms can survive in salt water, how anadromous fish live in both habitats at different stages of their lives.
12. Use special equipment such as, microscopes, dissecting scopes and videoscopes to study those aspects of the marine environment that are not readily apparent or visible to the unaided eye.
13. Use video and other technology to study those aspects of the marine environment that cannot be observed first-hand, e.g., sharks, whales and other sea mammals, and sea birds.
14. Set up experiments that show how flounder adapt by changing color, or how one eye migrates.
15. View a model of marine zones to understand who lives where and why.
16. Use field guides to identify shells and other remnants.
17. Hatch fish eggs.
18. Consider the many ways the ocean and its life are abused and how people can prevent such misuses including pollution, littering, overfishing, and driftnetting.

3. Upon the Land -- Upland Habitats:

Decompression Activity: Students may engage in one or more of the following activities:

- * The Wold is Getting Smaller (the effects of population on resources)
- * Predator-Prey game, locate the prey
- * Find Your Mate game
- * Adaptation game
- * Find the Critter game

Outdoor Component: Students may do one or more of the following:

- * bark rubbings
- * tracking, finding signs of animals such as, scat, nests, webs, eggs, galls, dropping eaten leaves, etc.
- * transect studies
- * looking closely at leaf litter and soil
- * finding hidden micro-habitats such as, under logs, under rocks, etc.
- * sampling soil, soil boring
- * dip netting in the pond or creek
- * collecting and counting seeds or fruits

Indoor Component: The emphasis of this pod is different for the others in that although the content is scientific, we will use a multi-disciplinary approach to teach the subject matter. It will have more opportunities for role-playing scenarios, especially from the point of view of the organisms who live in these habitats. The science approach will not be eliminated, however, but reserved as an option. Design of the interior of this room should allow for a large variety of activities, with storage integrated into the exhibit.

Students may consider the strategies for survival employed by the organisms who live in these habitats. They all need to get food, create or find shelter from the elements and/or from predators, find water, find a mate, reproduce, etc. Organisms obtain all these from their habitat.

1. Examine, then construct spiders' webs. Depending on age and sophistication, going into the biological mechanisms of the spinners and the different structures, orbs vs. funnels, looking at them from an engineering angle. Understanding how spiders sense when prey is caught.
2. Examine real birds' nests, watching footage of birds building nests, then construct one without using their hands.
3. Watching bees in a real hive or footage of bees in one doing their "dance". The, putting on bee antennae, wings and doing a bee dance.
4. Looking at the wold through the sensory organs of various organisms, e.g., seeing flowers through a bee's eyes; smelling through a raccoon's nose; hearing through a bat's ears; feeling with the whiskers of a rodent.

5. Being able to see close-ups via larger than life models.
6. Playing hide-and-go-seek the critter in the exhibit to study camouflage. Students are given or have to create critters to hide, others have to find them.
7. Using a variety of "bird-beaks", match the beak with its food source.
8. Same as above but with bird feet or with amphibians, insects, etc.
9. Looking at a paper wasp nest. Understanding, by rolling paper, why a honeycombed shape is hexagonal.
10. Make paper from chopped wood.
11. Examine protective coverings of organisms via a please touch area with fur, bark, chitin, turtle shell, feathers, etc.
12. Examine soil to understand what it is, where it comes from, what it's made of, its importance to life.
13. Understanding relationships.
14. Tracing everything back to the producers of food, the green plants.
15. Food pyramids (biomass concept) by identifying the food people eat and categorizing them by producers, primary consumers, secondary consumers, etc., understand that most of the food people eat comes from plants.
16. Other strategies to be considered:
 - temporal, e.g., seasonal migration, nocturnal vs. diurnal vs. crepuscular
 - spatial, who lives where and why, light vs. shade requirements, wet, damp, dry needs, need for cover.
 - niche, nature wants to occupy a place
 - competition, creates problems which call for solutions, e.g., seed dispersal
 - reproduction, growth, change, metamorphosis
17. Human role in conservation or pollution. Create a positive attitude.
18. Identify ways in which humans have used/abused this environment for its own benefit.