SEAGRASS.LI

LONG ISLAND'S SEAGRASS CONSERVATION NEWSLETTER

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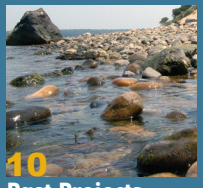
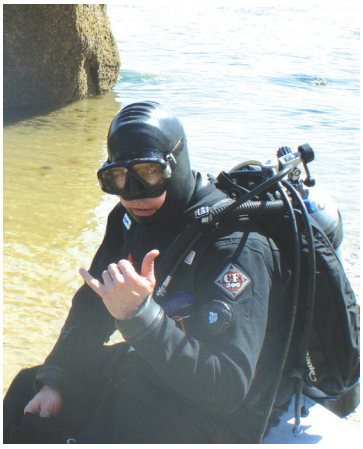

10 Past Projects

Sea•grass \'sē,'gras\ ***n*** **:** "Rooted, submerged marine or estuarine macrophytes of several species. Habitats created by seagrass meadows are among the most diverse and productive estuarine environments." National Oceanic and Atmospheric Administration

Summer has arrived!

Nothing makes me think of the water more than summer, and I would guess that most people are the same way. For those of us inclined to boating, or any other aquatic pursuits, this is the time when things really get going. In an ironic twist, it is interesting to note that just as we are becoming comfortable in the water, it is beginning to get downright inhospitable for our eelgrass. Eelgrass is, in fact, a cold water species that thrives in 50 to 60 degree waters of spring and fall. As the water heats up, the plants are exposed to physiological stresses that often cause mass defoliations (loss of the leaves) all too familiar with beach-goers on the Great South Bay. If this wasn't bad enough, the grass has to contend with algae blooms that reduce light reaching the bottom and explosive growth of macroalgae that compete for light and space. Eelgrass just can't get a break! The warm waters of summer are nothing new, but Kim Petersen's article on "**Global Warming and Seagrasses**" points to the fact that we have been experiencing greater than normal (if there is such a thing) increases in water temperatures.



While there's no question that our dive team gets to enjoy the water during the summer as we monitor existing meadows and check up on our restoration projects, all planting activities cease as there is no reason to try to plant in the face of such unfavorable conditions. Just as it would be unwise to transplant a shrub in the heat of summer, planting eelgrass during this time is a very foolish endeavor. In "**Been There Done That**" I describe several projects conducted during the 90's that taught us the "do's" and "don'ts" of planting eelgrass. After a couple years, we soon learned that summer plantings just don't work. For us, fall plantings have become the norm with some additional work in the spring. The bulk of our planting begins in October and doesn't end until some time in December.

While I'm on the subject of eelgrass I must admit that there were a few "why should we care about eelgrass?" comments in response to our first issue, and, I guess this is to be expected given the general lack of awareness for this species. We kind of expected this and for that reason had already planned on including Steve Schott's article on the "**The Value of Eelgrass**" in this second issue. Hopefully, this will begin to shed some light on some of the "services" this species provides to recreational and commercial fishermen and even waterfront homeowners!

Well, that's all the space I have and I need to get out of this office and back in the water. As always, I'm interested in what you think so please drop me a line if you get a chance.

Thank You,
Chris Pickerell, Editor
Email: cp26@cornell.ed

E-mail questions and comments to: SEAGRASSLI@cornell.edu

PARTNERS

NFWF

Funding for our work comes from a number of sources including the National Fish and Wildlife Foundation. NFWF is a private, non-profit, 501(c)(3) tax-exempt organization, established by Congress in 1984 and dedicated to the conservation of fish, wildlife, and plants, and the habitat on which they depend. The National Fish and Wildlife Foundation, in partnership with the Long Island Sound Study, has established a new competitive grants program, the Long Island Sound Futures Fund, to support community-based projects that contribute to the protection and restoration of Long Island Sound. The joint public/private fund serves as an important vehicle through which federal and state agencies, foundations and corporations can provide financial support to projects aimed at fulfilling priority conservation objectives. The program provides a significant opportunity to demonstrate a real, on-the-ground commitment to improving environmental conditions within Long Island Sound.

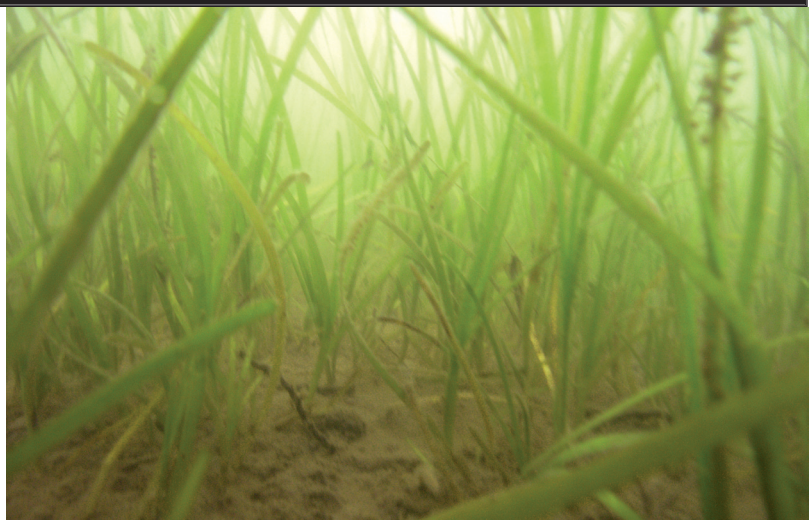
CCE of Suffolk County is a not-for-profit organization funded in part by Suffolk County through the office of Steve Levy, County Executive and the County Legislature.

Photographs By Chris Pickerell, Kim Petersen & Matt Sclafani

Bullhead Bay Southampton

A meadow in transition

By Chris Pickerell



An unusually clear photo taken on June 23rd in Bullhead Bay. This shot shows the an uncharacteristically low epiphyte load for this time of year

As we ease into the warm summer months, it is appropriate that I discuss one of the warmest meadows we know of on Long Island. We often joke about Bullhead Bay being a "bathtub" in summer and this might sound kind of nice to the uninitiated, but actually it can be downright unpleasant swimming long distances between sampling stations in warm water. If that wasn't bad enough, this site is famous for "swimmers itch", a parasite that likes to burrow into your skin and cause severe itching!

Back in 1997, Bullhead Bay was added to the Peconic Estuary Program's (PEP) list of Submersed Aquatic Vegetation (SAV) long-term monitoring sites. At that time it was recognized as a unique meadow in that it was incredibly lush and was, by far, the westermost meadow in the Estuary. Since that time we have been tracking shoot density, presence of algae and other factors that tell us about the health of a meadow and boy have we seen some changes!

On paper, the meadow at Bullhead Bay should not exist, based on our current understanding of where eelgrass thrives in local waters. For one thing, this meadow is fairly deep into the western reaches of Peconic Estuary at a time when most grass has retreated to the waters east of Shelter Island. In addition, the fact that the Bay is surrounded by a golf course on one side might throw up a red flag or two for most people. I guess nobody told the grass it shouldn't be growing there.

Over the years our monitoring data has shown Bullhead Bay to be a lush oasis until 2004 when things first went south in a hurry. We happened to visit Bullhead early in the spring that year as part of our normal rounds and were surprised to find that the grass had vanished leaving behind only dead rhizomes and some small seedlings where adult shoots once flourished.
We hypothesized that there might have been a winter die-off given the heavy ice that year, but we just didn't know when the die-off occurred since funding complications had prevented us from conducting our normal monitoring during the '03 season.

Despite the staggering losses, we were confident in the fact that the seedlings would carry the meadow through hard times and into the next year. However, a quick check of the site in May of '04 indicated that all the seedlings had died as well. Summer monitoring indicated a significant retreat in the meadow with loss of grass at most stations, but we did hold out some hope for survival. Unfortunately, summer monitoring in '05 showed a similar trend.

Returning to the site this June, we were surprised to find that the grass was back again and looking rather healthy for Bullhead (see above), with lush green leaves and few epiphytes. Very few flowers were found, but this might be due to the fact that most of the plants observed were seedlings that won't flower until next year.

Mute Swan feeding on eelgrass flowers at Bullhead Bay, Southampton during summer 2004.

In mid August, our divers will be back in the water to count and measure the grass at the six permenant sampling stations. Until that time, we won't know if the meadow is experiencing a true recovery or simply a brief pause before additional declines. Unfortunately, all we can do is watch and learn. *CP*

Recent aerial view of Bullhead Bay showing the location of the existing eelgrass meadow along the eastern shoreline (white outline) and golf course to the south and west. Ram Island is at the top center of the photo.

Photographs By Klm Petersen & Stephen Schott

Global warming and Seagrasses

Is Long Island in HOT WATER?

By Kim Petersen, CCE

"Here on Long Island, eelgrass thrives in the coolest possible waters....." *KP*

MAX H_2O TEMPS SUMMER

PECONICS
Flanders Bay 84.2°F
Little Peconic Bay 82.4°F
Meetinghouse Creek 84°F
West Neck Bay 85.8°F

SOUTH SHORE
Forge River 85.5°F
Great South Bay 85.8°F
Shinnecock Bay 84.4°F
Moriches Bay 85.1°F
Patchogue Bay 84.9°F

LONG ISLAND SOUND
Conscience Bay 82.8°F
Mulford Pt. 72.5°F
Orient Pt. 74.5°F
Port Jeff. Harbor 83.6°F

Data gathered from Suffolk County Health Department and CCE.

Global warming may be a political hot potato, but to the scientific community, this global phenomenon has triggered an explosion of concern. With 2005 just announced as being the warmest year since records began in the late 1800's, the issue is no longer a future problem. Whether climate change is pollution induced or our planet is undergoing a cyclic transformation towards a new ice age, one thing that is understood is **the trend is real**. Worldwide, retreating glaciers, the melting of both polar ice caps, longer growing seasons, earlier migration of birds, and species shifts into higher latitudes and elevations are only a handful of the recent observations made by scientists supporting the existence of a warming trend. Even during relatively short periods of warming here in the northeast during the 1930's and 1980's, large changes in the ecology of our waters occurred, including the northward movement of southern species, the decline of native fish species, and widespread declines of eelgrass beds. The loss of 90% of eelgrass from Canada to North Carolina in the 1930's was blamed on a slime mold known as wasting disease, but it has been argued that this disease was the result of decaying eelgrass and that the true culprit of the die off was temperature, with **exceptionally warm summers** and mild winters during this period. In the mid to late 1980's, algal blooms known as brown tide devastated eelgrass populations on Long Island, and incidentally, this also coincided with a warm period. Though the favorable conditions for brown tide blooms are complicated, increased temperatures have been considered a contributing factor to inducing brown tide along with increased salinities and possibly increased nitrogen concentrations. Is another eelgrass die-off inevitable?

Here on Long Island, eelgrass thrives in the **coolest possible waters** including regions of Long Island Sound, eastern Peconic Bay, and near inlets in the South Shore Estuary Reserve. However, not long ago, eelgrass thrived in nearly every creek and harbor on Long Island. As mentioned above, wasting disease and brown tide were blamed for most of these losses, but could increased temperatures be the underlying reason eelgrass was largely wiped out and hasn't recolonized the areas that are otherwise ideal for eelgrass growth? Here at CCE, with funding from the EPA/PEP, we monitor six local eelgrass meadows in the Peconic Estuary and just within the past few years, we have noticed **dramatic declines** in eelgrass populations at some of our monitoring stations. Could it be that the seagrass in these locations has been at the upper limit of its thermal tolerance for a long time and even the most minute increase in temperature finally broke the camel's back? Being well aware of the significance of temperature to the life cycle of eelgrass, we have been monitoring temperature at our reference and monitoring sites for several years. Long-term studies and observations of temperature fluctuations are vital to helping us understand not only the trends that are occurring, but for our purposes here at CCE, where we should be investing our time and funding to conserve and restore eelgrass populations.

The question remains, if global warming is not only occurring but accelerating as scientists have suggested, what effect will it have on our seagrasses here on Long Island? Well here are some of the expected consequences of warming global temperatures, followed by the effects they will have on seagrasses:

Photograph By Chris Pickerell

Warming waters:
In eelgrass, warm waters cause a decrease in productivity, by making photosynthesis less efficient, which can lead to extreme stress. For the regions in which eelgrass is already surviving at the upper limit of its thermal tolerance, large-scale die offs will likely occur.

Many aspects of seagrass reproduction depend on temperature cues, therefore earlier spring conditions would result in earlier flowering, seed germination and seedling development.

Rising Sea Level:
The predicted rise in sea level would increase water depth and consequently cause a reduction in the amount of light reaching seagrasses, causing the deep edge of seagrass meadows to migrate shoreward over time.

A rise in sea level would likely alter tidal fluctuations and currents. Increasing tidal ranges would intrude on both the shallow and deep edges of seagrass meadows. Saline waters would be forced into rivers and estuaries, which would be devastating to our brackish water species *Ruppia maritima*, also known as widgeon grass.

Increasing storm activity:
High energy storms may become more frequent which would cause many seagrass beds to become uprooted or smothered in sediment, and the increased turbidity may lead to light reduction and again, seagrass decline.

Increased precipitation resulting from these storms would not only cause sediment loading and decreased water clarity, but would increase nutrient runoff. These excess nutrients suspended in the water column would further decimate seagrass populations by triggering phytoplankton blooms, resulting in shading.

Rising atmospheric CO2:
As levels of greenhouse gases in our atmosphere continue to rise (especially carbon dioxide concentrations), so will concentrations in the water column. While seagrasses benefit from elevated levels of CO2, so do seaweeds and phytoplankton. Seagrass could become overwhelmed by epiphytes, algae growing on the seagrass blades, that reduce the amount of light reaching the plant as well as the supply of nutrients to the grass blades.

Discussion
Predicting the exact consequences of climate change on an ecosystem is highly complicated, so all of the factors discussed here are only what could happen and are in no way definitive. One thing that is well understood is that with seagrasses already in decline worldwide, due to coastal development, nutrient loading, recreational activities, and many other reasons, pressures associated with global climate change will only add to the list of threats. Unfortunately, not only are seagrasses vulnerable to the stresses and disturbances associated with climate change, they also have slow recovery rates. Studies have indicated that seagrass meadows with increased genetic diversity may have more rapid recovery rates. Since seagrasses mainly reproduce asexually through cloning, genetic diversity is usually extremely low. Could the answer to saving our threatened meadows be to physically import plants or seeds from other meadows? We have thought about this possibility on many occasions, even the possibility of bringing eelgrass up from its southern-most regions including the Carolinas and Virginia, which would not only increase diversity but may also increase its tolerance to high temperatures being that these grasses are from much lower latitudes. Though little is known about the genetics of our eelgrass beds here on Long Island, we have already taken this idea into account on a local level. When restoring an eelgrass meadow, we often use donor plants from several nearby meadows to obtain the maximum possible genotypic diversity. With all of this food for thought, it becomes more obvious how important research and restoration efforts are in preparing for the predicted changes of global warming. KP

"Predicting the exact consequences of climate change.....is highly complicated" *KP*

THE ANSWER?

In an effort to address the issue of temperature tolerance in our restoration work we seek to match environmental and physical conditions at the donor and recipient sites. We are always on the look out for heat-tolerant clones similar to the plants in Bullhead Bay. Another way to avoid the impacts of summer stress is to select plants that put on considerable growth in spring before the summer heat causes defoliation. A population (see photo) recently identified on the warm flats in Shinnecock Bay may offer such fast growing clones that can withstand high temperatures by producing a large number of shoots in spring. Recent side by side growth trials with these plants and Peconic Estuary plants in our greenhouse showed that the Shinnecock plants produce numerous new shoots in spring while the PE plants produce one or two in the same time. *CP*

Photographs By Chris Pickerell

Buoy Deployed Seeding (BuDS): A new way to plant eelgrass

Development of a novel planting method at CCE could change the way we think about restoring seagrasses

Until recently, planting eelgrass using seeds meant you had to have an onshore seawater facility to hold flowers for a month as seeds ripened and could be gathered. After release, the seeds would then have to be held in flowing seawater for an additional 2-3 months before they could be broadcast in the fall/winter. Development of the buoy deployed seeding system (BuDS for short) has put an end to this need. Now it is possible to collect and deploy flowers on the same day or on consecutive days so that land-based facilities are unnecessary. The theory behind BuDS is that viable seeds will be released from flowers as they mature, even if the flower is removed from the parent plant. This allows for the flowers to be collected and placed into a net attached to a buoy and deployed at the restoration site singly or in large arrays. Since first being introduced by CCE in 2003, the system has been tested at many areas on the east and west coasts, and the State of Maryland has adopted it for use in large-scale planting efforts in the Chesapeake Bay during 2005. The simplicity of BuDS allows for modification of any number of factors such as tidal range, wave energies and bottom types. A modification of the system has been effectively used to distribute seeds of brackish and freshwater species. The keys to success are site selection and timing of flower harvest. The best sites appear to be 1 to 2m deep with a silty sand to mud bottom. At these depths, the seeds are not spread too far and with this type of bottom the seeds appear to incorporate easily and germinate effectively. Following deployment and retrieval (4-5 weeks later) the site is monitored the following spring for signs of seedling recruitement. *CP*

When to Collect Flowers

LONG ISLAND SOUND

July 15th to August 15th

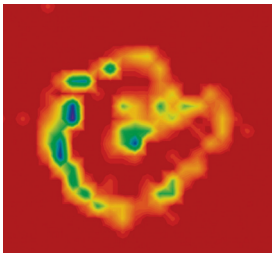
PECONIC ESTUARY

June 15th to July 30th

SOUTH SHORE ESTUARY RESERVE

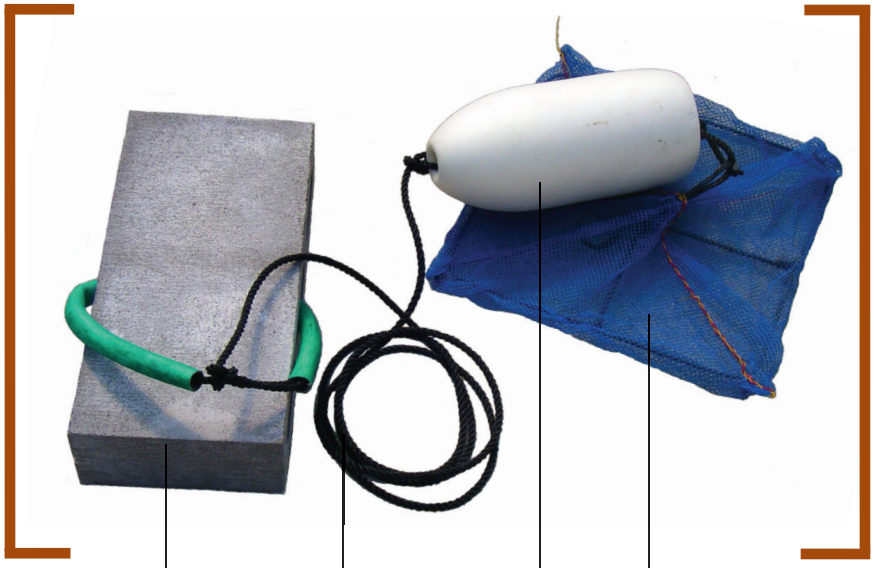
June 15th to July 15th

The above dates are only guidelines based on the last several collection seasons. Seed maturatoin times can vary by as much as two weeks from year to year and there is no substitute for regular montoring.



Contour plot showing typical seedling distribution under a single buoy deployment. Blue indicates highest seedling density.

Basic BuDS components



ANCHOR

Used to hold the buoy in place over the planting area. Cement blocks and screw anchors have been used successfully. Old garden hose is used to prevent chaffing.

LINE

Floating poly pot line. Length will vary depending on water depth, tidal range and desired planting area.

BUOY

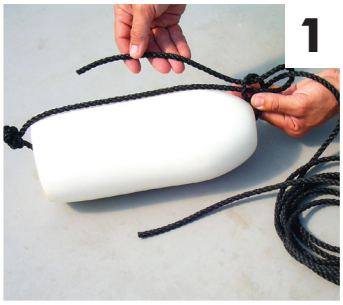
Lobster pot buoy or similar sufficient to float net filled with reproductive shoots.

NET

Pearl net (5-9mm mesh) or similar. Onion bags can be used, but care should be taken not to overfill as this may cause fouling.

For more information visit: http://el.erdc.usace.army.mil/sav/pdfs/sav06-2.pdf

Photograph By Chris Pickerell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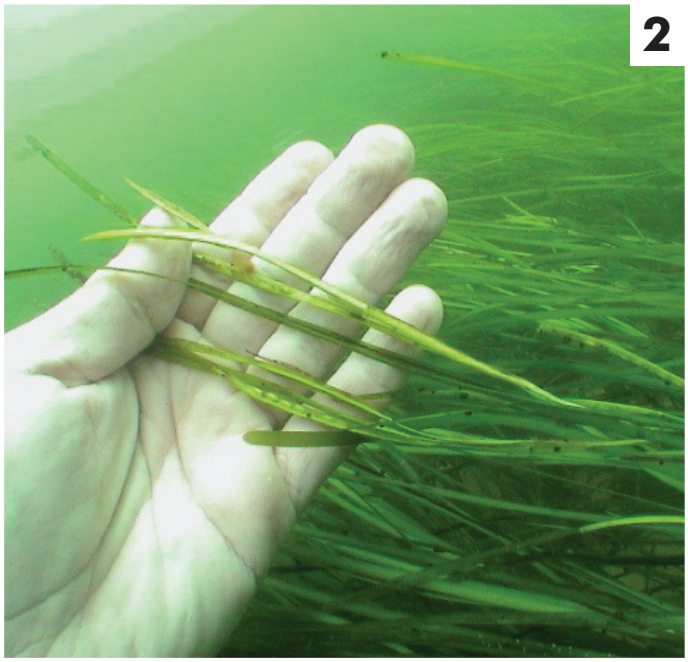
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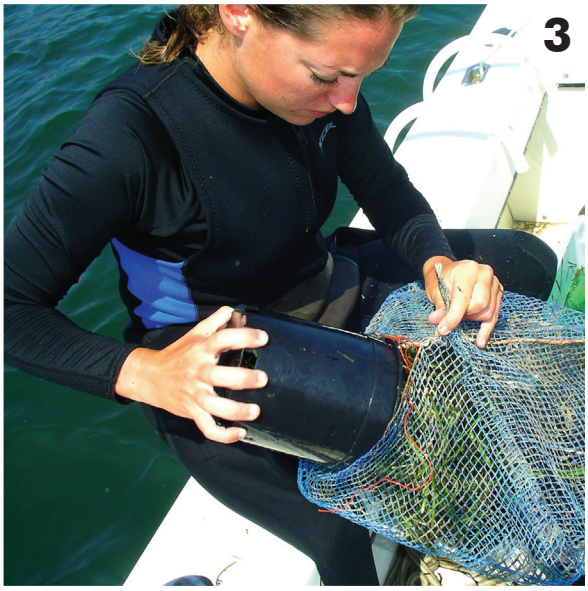
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5


6

BuDS
STEP BY STEP

1. ASSEMBLE
Tie together the components of the buoy line taking into account depth, tidal amplitude and desired planting area (radius). Nets can be pre-attached or attached after stocking with flowers. When stacking blocks, make sure lines do not tangle.

2. COLLECT
Collect ripe reproductive shoots using SCUBA gear during the second week of seed release. Close monitoring of flower developmenet is critical to timing of collection. This is the only step that requires the use of SCUBA gear unless a very shallow donor meadow can be located.

3. STOCK
Fill nets with a standardized volume of reproductive shoots. In the Peconic Estuary 1/2 gallon of flowers is equivalent to approximately 100 shoots. This amount of flowers will yield approximately 3,000 seeds.

4. DEPLOY
Drop the buoys from a boat at the planting site making sure that none of the lines overlap. Buoy spacing and arrangement will depend on the desired planting density and number of buoys used.

5. RETRIEVE
After a month of deployment the buoy lines can be retrieved and broken down for storage. Remove the nets from the lines for easier storage. Four weeks of exposure can heavily foul the sides of the nets, so hang them in the sun to dry and scrub clean before storing.

5. MONITOR
During the following spring April/May seedling recruitment can be determined by counting the number of shoots in a known area using a quadrat.

Photographs By Chris Pickerell

The "VALUE" of Eelgrass (*Zostera marina* L.)

By Stephen Schott, CCE

Although it is very difficult to attribute a monetary value to natural systems, the value of eelgrass can be measured in the degree to which this species provides "ecosytem services" that support species that we rely on for recreational and commercial fishing. In addition, more tangeable services relate to the ability of eelgrass meadows to affect the flow of water over the bottom affording protection to nearby shorelines. The following are a few of the many values eelgrass posses.

PHYSICAL

The physical presence of eelgrass on the bottom can be likened to trees in a forest. The higher and more continuous the shoot density, the greater the physical impact on the environment. In addition to providing habitat functions, these qualities also have real implications for shoreline stability and protection.

Structure - Eelgrass provides physical, three-dimensional structure on flat, featureless bottoms.

Sediment Stabilization - The eelgrass root/rhizome mat binds and stabilizes sediments, lessening erosion.

Wave damping - Eelgrass meadows act to dampen wave forces in nearshore waters, reducing coastal erosion.

Shoreline protection - Eelgrass slows long-shore currents, resulting in limited erosion of sediments, deposition of suspended sediments and formation of shallow bar systems that further protect shorelines.

ECOLOGICAL

Ecological services are some of the most obvious values of eelgrass. Without eelgrass meadows, species diversity and overall productivity would be reduced.

Primary production - Eelgrass (a green plant) is an important primary producer in estuary food webs fixing carbon that can then be used as a food source.

Food - Several species of waterfowl such as geese, widgeons, black ducks and swans, use eelgrass shoots as a food source. Brant geese populations in Atlantic Ocean have declined significantly due to losses in eelgrass, their primary food source.

Eelgrass seeds are food for several crab species including blue crabs, mud crabs, flat claw hermit crabs and long claw hermit crabs.

Nursery Habitat - Eelgrass meadows provide essential nursery habitat and refuge from predators for numerous finfish and shellfish species, including flounder and scallops.

Shelter and Refuge - Eelgrass meadows are the preferred habitat for sticklebacks, pipefish and seahorses; juvenile lobsters often dig their burrows under the rhizome mat.

Infaunal shellfish larvae settle out in eelgrass beds, due to the reduction in current. These shellfish also benefit from a reduction in predation pressure as the rhizome mat makes extrication from the sediment difficult for predators.

Supports epiphytes - Eelgrass shoots support a variety of algae (epiphytes) and animals (epizoa) that are food sources for other animals.

Produce detritus - In areas where eelgrass is found, adjacent deepwater foodwebs are based on the detritus originating from the shallow water beds. The eelgrass detritus supports bacterial, fungi, worms, snails and other invertebrates.

Support beach species - Eelgrass detritus also supports terrestrial animals. Eelgrass material that washes up on shores, called wrack, provides habitat and food to a host of amphipods and insects. These organisms are then eaten by shorebirds.

BIOCHEMICAL

Biochemical functions are probably some of the most difficult to comprehend, but they have far-reaching implications that affect estuaries on a regional scale.

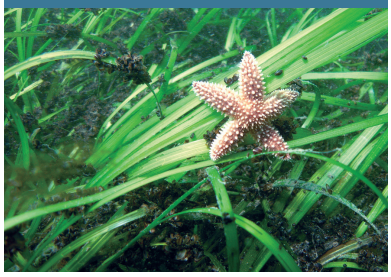
Nitrogen Sink - Eelgrass acts as a nitrogen sink in estuaries. This means that as nitrogen is introduced to our bays, eelgrass is able to pull out a portion of the nitrogen that is dissolved in the water, and use it to grow. The removal of some nitrogen by eelgrass reduces the nitrogen available to algae and can potentially prevent a "bloom." The nitrogen is "locked up" in the eelgrass until the plant decomposes, resulting in a slow release of nitrogen over time.

Alters sediment chemistry - Eelgrass actively pumps oxygen into the sediment surrounding its roots, supporting aerobic decomposition and nitrogen fixation in otherwise anoxic sediments.

The value of eelgrass to our estuaries is much broader in scope than is commonly considered. To many, eelgrass is just "that stuff that scallops live in" or "rots on my beach," but, instead it serves to preserve and nurture a diverse range of resources. Hopefully, the true extent to which eelgrass is tied to the health and function of our local waters is a little clearer. *SS*

Photograph By Chris Pickerell

A STAR IS BORN



Starfish or "sea stars" are almost universally **hated by baymen and aquaculturalist** for their tendancy to consume large numbers of shellfish, and NY state law requires that "they not be returned alive to the water" if caught (I think you can figure out what that means). Despite this reputation, starfish still capture the imagination of children, in particular, who are fascinated by their unusual shape, multitude of feet and ability to re-grow lost limbs. Given their cosmopolitan distribution, it is not uncommon to see starfish while SCUBA diving in the Long Island Sound or Shinnecock Bay, sometimes in very high numbers. However, this past fall we witnessed an unusual site, the likes of which we had not seen before. While gathering eelgrass shoots to bring back to our greenhouse for grow-out, we found **tiny young starfish**, no bigger across than the end of a pencil eraser, in the roots of the grass. None of us had seen such small starfish before and we were excited to bring them back to the lab to show everyone else, especially the kids. Once we got them back to the lab they were put in a tank in the greenhouse and we tried to feed them their favorite food, clams. We happened to have some very small clams on hand and sure enough, within a short time of putting the two together these miniscule predators were doing what makes them so unpopular. I'm sure that there are many other overwintering habitats for the starfish other than eelgrass meadows, but this is the only time we were able to observe them. Not exactly a reason to preserve eelgrass, but hey, we've got to take the good with the bad! *CP*

CROP CIRCLES

Although we usually associate human activities such as boating, shellfishing and dredging with damage to eeglrass meadows, we humans are not the only ones having an impact. The closer we look at eelgrass meadows on Long Island, the more we observe what appear to be **fairly significant natural disturbances**. In the Sound and parts of the Peconic Estuary, it is not uncommon to find crabs, digging along the edges of meadows, causing the loss of thousands of shoots. However, a recent observation off Shelter Island was even more disturbing. This past summer, we set out to photograph a meadow, last visited in 2003, only to find that it had all but disappeared. Less than two hundred shoots remained at a site where countless shoots had previously grown. There was little to indicate the cause of this loss, but closer examination revealed a spot where the sediment had recently been pushed into an unusual circular pattern. Poking around this spot identified the culprits, knobbed whelks, **feeding on chowder clams** that had been growing in the shelter of the grass roots. Evidence at the scene, eelgrass shoots and clam shells strewn over the bottom, attested to the efficiency and destructiveness of their feeding. The whelks appear to have used the narrow end of their shells to push under the rhizomes and lift them out of the bottom. Although we don't know for sure if the whelks are to blame for loss of the entire meadow, these observations point to whelks as a significant contributor to uprooting of grass at this site. In our experience it is unlikely that grass will return in abundance to this area any time soon. *CP*

SEED FEED

Seeds are a major source of nutrition for animals and people alike, and for many omnivores, seed foraging is vital for survival, especially when other food is scarce. Most crab species are considered omnivorous scavengers, which is a fancy way of saying they **will eat virtually anything**. Crabs living in eelgrass meadows may become accustomed to an abundance of seeds during the summer flowering season and take advantage of this food source. Although an eelgrass seed coat is tough, most crabs are well equipped with claws capable of crushing or cracking through the seed coat. After observing a flat clawed hermit crab (*Pagurus pollicaris*) suspiciously investigating eelgrass seeds in an eelgrass bed in Long Island Sound, we decided to try and find out whether they would eat the seeds and if so, how many? During 2004 and 2005 we conducted experiments in our greenhouse with these crabs and presented the results at the ERF 2005 in Norfolk, VA. We concluded that this species was **capable of consuming large numbers of seeds**, but predation rate varied greatly between individual crabs. We hope to learn more by running trials with several different species in order to get a better understanding of what impact crabs can have on seed survival in natural meadows, and our seeding efforts for restoration purposes. KP

WHAT ..... is it?

ANSWER ON PAGE 11

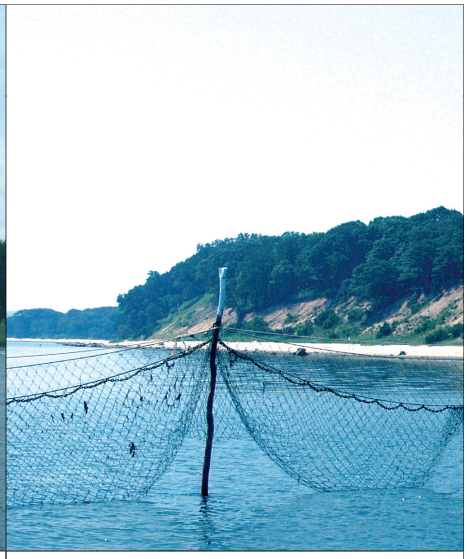
Photographs By Kim Petersen & Chris Pickerell

3 Projects

"Been there-done that"

By Chris Pickerell

As we pointed out in the last issue, we really got our start working with eelgrass in the Peconic Estuary. We learned very quickly that there is a very steep "learning curve" to eelgrass restoration that everyone has to go through before they can chalk up a success story. Although we didn't have a lot of success with this early work it really paved the way for future efforts.



EAST HAMPTON TOWN

ACCABONAC HARBOR, NAPEAGUE HARBOR, THREE MILE HARBOR & LITTLE NORTHWEST CREEK

THE PROJECT

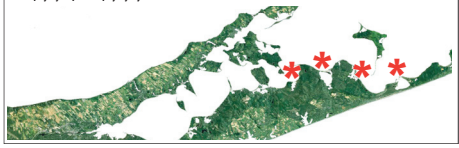
This first of its kind cooperative restoration effort involving the East Hampton Town Trustees, The EH Natural Resources Department and CCE focused on summer transplants at several locations. Although the plantings in Accabonac and Little Northwest were mostly unsuccessful, we were able to establish plantings in Three Mile Harbor using a modified "staple" method and Napeague Harbor using sediment cores containing intact plants (sods). The Three Mile Harbor plantings eventualy succumbed to high water temps, in September, although they did return the following year and the Napeague Harbor plants were eventually dug up, along with much of the natural meadow, by recreational clammers.

LESSONS LEARNED

DO NOT plant in summer.
Drifting macroalgae is a problem.
Avoid shellfishing areas.
Sods work, but they are labor intensive and possibly destructive to donor sites.

WHEN

1994 - 1999



SOUTHOLD TOWN

CEDAR BEACH CREEK, COREY CREEK, CUTCHOGUE HARBOR & SOUTHOLD BAY

THE PROJECT

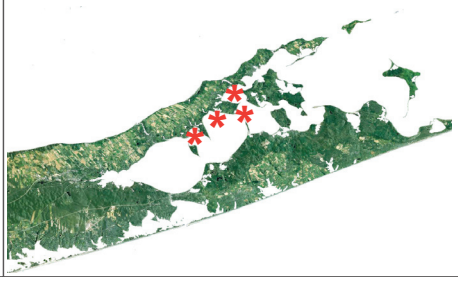
This project was running more or less concurrently with the East Hampton project so we really hadn't learned our lesson yet. CCE worked with the PEP in conjunction with the consulting firm EEA that was putting together an eelgrass planting protocol for the Peconic Estuary. Our goal was to plant at several sites deemed suitable for planting. Again, we relied on summer transplants, but in this case we ran into additional complications involving water clarity, muddy and unstable sediments and drift macroalgae.

LESSONS LEARNED

DO NOT plant in summer.
Drifting macroalgae can be a problem.
Crabs will dig up transplants.
Mud bottom habitats are difficult to transplant into.

WHEN

1996-1999



SOUTHAMPTON TOWN

JESSUPS NECK & SAG HARBOR COVE

THE PROJECT

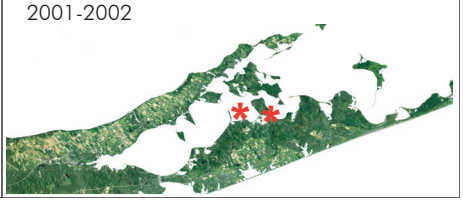
This project was really our first foray into using seeds after the dissapointment with using adult shoot transplants during the late 90's. In order to get up to speed on the use of seeds, we spoke with local expert, Dr. Jerry Churchill from Adelphi University and visited Dr. Robert Orth at the Virginia Institute of Marine Science. Having discussed the issue with these gentlemen, we were off to begin our first foray into the world of seeds. In Jessups and Sag Cove, we tested an entirely new method of planting seeds that would eventually lead to development of our BuDS system described in this issue. Early trials indicated that it is fairly straight forward to get seedling recruitment, but it is another matter to successfully create a persistant meadow.

LESSONS LEARNED

High water temps may be our most significant hurdle to restoration in the PE.
Germination is typically very low.
Seedling recruitement is only the first hurdle to overcome when using seeds.

WHEN

2001-2002



Photographs By Chris Pickerell

LEARN MORE...

NOT ON THE MAILING LIST?
If you want to receive future issues of SEAGRASS.LI drop us an E-mail at seagrassli@cornell.edu.

NEW ARRIVAL!
The Cornell Marine Program is pleased to introduce the newest member of its fleet the "Shellstar". This 35 x 16ft pontoon barge was built by volunteers of the "SPAT" Program and Marine Program staff and was specifically designed to tend the long-lines that will be used to grow bay scallops as part of the Suffolk County Scallop Restoration Project. The large work area, winch, shallow draft and custom dive ladder make this a valuable member of the fleet.

"SHELLSTAR"

Intern Alert: The CCE eelgrass team welcomes our new summer intern, Allison Bauser of Peconic. Allison is a 10th grader attending the Ross School in East Hampton. This summer, she will be studying eelgrass flower and seed phenology.

QUESTIONS?

For more detailed information on any subject covered in this newsletter visit our website: **www.seagrassli.org** and click on the "CCE eelgrass" link to view current projects and get background information including references. Having trouble with a term? Click on the "Seagrass Terminology"section for a glossary of terms.

PAGE 9 ANSWER: *Squid* eggs

WEAR IT

Name:_____

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_____

Size: ____ S ____ M ____ L ____ XL ____ XXL

Amount Enclosed:_____

Show your support for Long Island's Seagrass by purchasing a SEAGRASS.LI T-shirt. Send a $15 check or money order payable to "Cornell Cooperative Extension" at SEAGRASS.LI, 3690 Cedar Beach Road, Southold, NY 11971.

CALENDAR SUMMER

Although the weather couldn't be nicer for those of us who like to boat and swim, summer is not the "favorite" season for our seagrasses, especially the coldwater species Eelgrass. Warm summer temps are very stressful and often cause defoliation of leaves later in the season.

JULY
BUDS deployments can take place at sites where flowers mature in July. Most flowers in the SSER and PEP mature during June-July. Collect flowers at Orient Point meadow and Long Island Sound sites including Mulford Point.

AUGUST
No transplants possible in the heat of the summer. Some north shore meadows (i.e., Mulford Pt.) may still have ripe flowers while Fishers Island flowers are just maturing this month. Monitoring of PEP meadows takes takes place during August.

SEPTEMBER
Field work limited to monitoring PEP meadows, scouting unexplored meadows and monitoring spring planting sites. Transplants cannot begin until October.

OCTOBER
The big fall push for tranplants begins as the water temperature drops through 60°F.

NOVEMBER

NEXT ISSUE!

Photographs By Chris Pickerell & Kim Petersen

BACK PAGE

Cornell Cooperative Extension of Suffolk County, New York is a non-profit educational agency dedicated to enhancing and protecting the environment, strengthening families and communities, and fostering countywide economic development. Affiliated with Cornell University, Cornell Cooperative Extension of Suffolk County is part of the state and national extension system that includes the land-grant universities and the U.S. Department of Agriculture. The **Cornell Marine Program** benefits all who work and play on the water in Suffolk County providing a cleaner environment for fish, fowl, and plants that live in or around Suffolk County's waters. **CCE** is funded in part through the office of **Steve Levy**, County Executive and **the Suffolk County Legislature**. We thank the County for its continued support.

IN THE NEXT ISSUE:

Feature: Eelgrass Restoration Review

Spotlight On: The Bay Scallop

How-To: Transplanting Eelgrass Remotely using Frame System (TERFS)

Feature Meadow: Shinnecock Bay, North

Field Notes: "If you plant it..."; "Being Watched"; etc.

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Cornell Cooperative Extension of Suffolk County
423 Griffing Avenue, Suite 100
Riverhead, NY 11901-3071

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