

**Answers to Questions Submitted During the Peconic Estuary Live Broadcast  
September 23, 2004**

**Question**

If clams, and other shellfish release the eggs and sperm into water is it necessary for them to develop reproductive structures such as genitalia?

**Answer:**

Clams and oysters have reproductive tissue called a gonad which is located in its major body mass (visceral mass). On scallops you can see a separate gonad. But in all cases, the gametes begin to mature and ripen as the water temperature rises and plenty of food is available.

---

**Question**

How Many Estuaries are located in the United States?

**Answer:**

Good question, I'm not sure I ever read that anyone has ever counted them, because this would be quite an effort, but I can tell you that EPA has designated 28 estuaries in the United States as "Estuaries of Significance" in the National Estuary Program (See: <http://epa.gov/owow/estuaries/>), including one in the Caribbean (San Juan Bay in Puerto Rico). A sister agency, the National Oceanic and Atmospheric Administration oversees the National Estuarine Research Reserve System, which is a network of 26 protected areas (see [http://nerrs.noaa.gov/Background\\_Overview.html](http://nerrs.noaa.gov/Background_Overview.html)). There is overlap between the 2 programs. Neither of these programs includes the biggest estuary in the United States, Chesapeake Bay, which is in a class by itself (see: <http://www.chesapeakebay.net/>). Long Island's South Shore Estuarine Reserve (see: <http://www.estuary.cog.ny.us/>) is another important estuary, and is made up of a series of bays near where you're from, including Shinnecock and Moriches Bay. How would you count the bays along the south shore of Long Island – as one big estuary or lots of smaller ones? Since there is not one way to count them, that may be why a good number doesn't exist!

---

**Question**

how many clam eggs on average don't get fertilized?

**Answer:**

In the hatchery, about 100% of the eggs **are** fertilized because the eggs are contained in a bucket when they are fertilized. Counts can be made on the eggs volumetrically, and then after 48hrs the larvae can be counted to check on the fertilization rate. Generally it has been >90%. However, it is unknown what percentage of eggs is fertilized in nature. It is probably very low because of the volume of water they spawn in. That is why clams and other externally fertilized animals produce millions of gametes to increase the chance that some will survive.

---

### **Question**

Hi.....please say Hello to us ...we are Tuttle Middle School in Maiden, North Carolina. Did this estuary have any effects from Hurricane Ivan???????

### **Answer:**

Sorry that we did not get to say hello to you or answer you question on the air – we wish we could have. I don't think the Peconics experienced much, if any, direct effects from Hurricane Ivan, but we did have some heavy rain, wind gusts, and cool weather, but fortunately no flooding or wind damage.

---

### **Question**

Are there any diseases that endanger the marine animals in the Estuaries?

### **Answer:**

Yes, we have recently found QPX in hard clams in Peconic Bay. The hard clam dies from this disease.

---

### **Question**

Who funds the SPAT project?

### **Answer:**

Federal grants, corporate sponsorships, foundation support, participant fees and fund raising finance the **SPAT** Program.

---

### **Question**

How old were the scallops that you showed

**Answer:**

The scallops that I showed were born this year sometime in June. At the beginning of the hatchery segment, Gregg held up a scallop that was born in 2003. Generally scallops have a life span of 18-24 months.

---

**Question**

Alex wants to know how do the shells on the shell fish grow

**Answer:**

Hi Alex,

The shell is made of a compound called calcium carbonate. The chalk that you use to write on the board is the same material. More specifically it is a prismatic aragonite derived from the calcium carbonate. Calcium is always present in a dissolved form in the water, and the clam has the ability to remove it from the water and place it at the lip (ventral shell edge) of the shell to continuously grow throughout its life.

---

**Question**

What makes this estuary unique to long islanders?

**Answer:**

The Peconic Estuary is unique to Long Islanders for many reasons:

The Peconic Watershed is a great place to hike, bird watch, and swim at one of the many parks! While many estuarine watersheds are pretty much fully developed, we are fortunate that open space protection has been aggressively pursued in the Peconic Watershed [According to the U.S. Commission on Ocean Policy's preliminary report (2004), coastal watershed counties comprise less than 25 percent of America's land area, yet they are home to more than 50 percent of our population]. Of the 113,892 acres of land in the Peconic Watershed's five eastern towns, over 33% of the watershed is protected open space and a little more than 22% is still available for development (as of 2001).

The Peconic Watershed is a great place to pick a pumpkin and see tons of grape vines! The Peconic's North Fork boasts of extensive farmlands and vineyards. Relatedly, the Peconic Estuary Program has been working with farmers to voluntarily reduce their

nitrogen (fertilizer) use by an average of 25% (excess nitrogen to the Peconic Estuary can cause problems).

The Peconic's bays are a great place to fish, swim and boat! Many come to the Peconics to fish for flounder and striped bass. While swimming around, one is sure to find clams, hermit crabs and a bunch of different kinds of seaweeds, among other interesting things. Relatedly, the entire Peconic Estuary is designated as a Vessel Waste No Discharge Zone whereby treated and untreated discharges of sewage from boat toilets are prohibited.

---

### **Question**

How do spider crabs have babies

### **Answer:**

A female spider crab mates with a male spider crab. The female then carries the eggs on her legs to protect them from predators.

---

### **Question**

Is there such a thing as poisonous seaweed?

### **Answer:**

Seaweeds, or macroalgae, are generally accepted to be non-poisonous to humans. Recently, several species of tropical seaweeds have been reported to be poisonous to humans when eaten, and one seaweed even caused the death of several people in Guam. This question is still under investigation, as some scientists believe that it is not the seaweed that is producing the poison, but rather a bacterium or fungus that lives on the seaweed. At this time, there have been no poisonous seaweeds identified in the Northeast US. Other seaweeds, although not toxic, do accumulate foul tasting chemicals that protect against marine animals, like snails, grazing. Seaweeds can also take up chemicals from polluted waters making them unfit for eating.

There are species of phytoplankton, or microalgae, that produce toxins that can and have caused deaths in humans. These microalgae are normally not found in high numbers, so their "poison" is greatly diluted. However, if they form a large bloom, their toxin can be ingested by shellfish and finfish and accumulate to levels that are dangerous to a person eating these animals.

---

## Question

Why do you grow oysters? Jasmine Opie

## Answer:

Hi Jasmine,

Our hatchery grows oysters to help replenish oyster stocks that have been reduced over the years. The population of oysters has decreased over the years because of various reasons. Some causes have been changes in environment, overharvesting and diseases that afflict oysters.

---

## Question

How long can an oyster stay out of water?

## Answer:

An oyster can stay out of the water for a few weeks if kept cool and moist. When it's cool the animal doesn't need to expend a lot of energy to keep itself alive. The oyster also needs to have some moisture because it will open slightly and remove oxygen from the air as long as its gills are moist. Scallops on the other hand do not do as well because their shells gape open much more and tend to dry out easily.

---

## Question

How does the Calm open up

## Answer:

Well, let's first talk about how a clam keeps its two shells tightly closed. The clam has two adductor muscles located on either side of its body that are always contracting to keep it closed. All muscles, whether it is yours or a clam's, can only contract. Therefore, when a clam needs to stick out its foot and burrow in the bottom, it relaxes its two adductor muscles to open the shell.

---

## Question

How big can shellfish get?

**Answer:**

That depends on the species. Here in the northeast, scallops can grow to be 3 inches, clams up to 5 inches and oysters up to 10 inches. One amazingly big mollusk located in the Pacific Ocean is the giant clam, *Tridacna gigas*. This clam is the largest in the world and can have shells that are over 3 feet long and weigh over 400 pounds.

---

**Question**

Since watershed and runoff effects the estuary, how can pollution be prevented and what can residents do?

**Answer:**

You're right that pollutants enter the estuary via runoff, particularly after heavy rains (*i.e.*, stormwater runoff). In the Peconic Estuary, groundwater is an even greater contributor of contaminants since much more fresh water enters the estuary via groundwater than via stormwater runoff.

There are many things that residents can do to reduce the amount of pollution that enters the estuary, including:

- Reduce or eliminate pesticide use in your yard. Plant native species or other disease-resistant plants that will thrive in the absence of pest and weed killers.
  - Never dump pollutants into storm drains since the drains go straight to the bay—storm drain water is NOT treated before entering the bay.
  - Dispose of household cleaners at your town STOP (Stop Throwing Out Pollutants) day.
  - Clean up after your dog to prevent possible pathogens from entering the bays.
  - Don't litter! Eighty percent of garbage in our oceans is from land (only 20% is from boats).
- 

**Question**

How do you know how old a scallop is?

**Answer:**

The northern bay scallop, *Argopecten irradians*, only lives for about 2 years. A scallop caught in nature will be less than a year old if its shell height is under 2 inches. Scallops bigger than this a generally on their 2<sup>nd</sup> year of growth. If the scallop was born in the hatchery, its birthday is known so we can tell exactly how old hatchery raised scallops are.

---

**Question**

How big can a shell fish get?

**Answer:**

That depends on the species. Here in the northeast, scallops can grow to be 3 inches, clams up to 5 inches and oysters up to 10 inches. One amazingly big mollusk located in the Pacific Ocean is the giant clam, *Tridacna gigas*. This clam is the largest in the world and can have shells that are over 3 feet long and weigh over 400 pounds.

---

**Question**

How Productive is the Estuary?

**Answer:**

Estuaries are the most productive ecosystems on earth, containing more life per square inch than the lushest rainforest canopy. Many living things in the estuary are commercially and recreationally important. We have very productive wetlands that are protected by state and local laws. Up until 20 years ago, the Peconics provided up to 28% of the bay scallop harvest in the entire United States. Unfortunately, there is now a very small harvest when one occurs, but efforts are underway to help restore shellfish populations.

---

**Question**

Why does the hairy cucumber hide in the mud and on rocks?

**Answer:**

Hairy sea cucumbers often hide in the mud with only their mouth, tentacles, and anal opening exposed. This camouflages them and protects them from predators. They are also known to wedge themselves among rocks so predators can't attack them. Just like their sea star relatives, hairy sea cucumbers can activate collagen in their skin to go from "liquid" to "solid." They get into the rocks in their "liquid" state but can't be removed once in their "solid" state.

---

## Question

What is the estimated wetland loss per year in New York?

### Answer:

Location, location, location. We do not see wetland loss from fill and build projects, but we have now discovered wetland loss from unknown reasons (could be sea level rise, too many nutrients, sediment transport changes). In Jamaica Bay by NYC, we lose about 50 acres per year of salt marsh while along the north shore of Long Island in Kings Point, we lose about 0.1 acres per year.

---

## Question

How does the Whelk breath

### Answer:

Whelks get oxygen (i.e. breathe) by sucking in water through their siphons. Just like in fish, the water then passes over their gills which filter out oxygen so the whelks can breathe.

---

## Question

What is SPAT?

### Answer:

SPAT stands for Southold Project in Aquaculture Training. According to the SPAT website, [www.spatcornell.org](http://www.spatcornell.org), the program “was created as a means to encourage community members to become stewards of their environment and to restore shellfish to the bays around which they live...**SPAT** volunteers grow miniscule shellfish in containment, away from predators, until they reach adult size when they are released into local creeks and waters. Volunteers are offered monthly workshops and provided with shellfish seed and necessary tools and supplies to grow their shellfish gardens either at their own waterfront or in the **SPAT** community garden. In exchange for a minimal fee, all permits are secured and half of the shellfish may be harvested by the volunteer for personal use while the other half is returned to the waters.”

---

## Question

could sharks survive or be found in estuaries?

**Answer:**

Of course! Many species of sharks go into estuaries to feed or breed. Estuaries also make a good nursery ground—the enclosed area offers lots of prey in a protected area. In the Peconics we have spiny dogfish, smooth dogfish, and sandbar sharks, among others.

---

**Question**

Do you go to other countries to teach kids about this?

**Answer:**

We have not gone to other countries to teach kids about the Peconic Estuary, but EstuaryLive was broadcasted over the Internet so it's possible that kids from around the world tuned in. Regardless, most coastal countries have their own estuaries so I'm sure that the kids learn about them in school. Chances are that the foreign estuaries are home to the same types of plants and animals that we have here in the Peconics, and I bet that they're also facing similar environmental threats.

---

**Question**

Why do fish leave their parents when they grow up?(Kiara)

**Answer:**

Hi Kiara. Interesting question. In fact, most fish leave their parents even *before* they grow up. Most fish species reproduce by broadcast spawning, meaning that the males release sperm into the water at the same time that females release eggs into the water. Fertilization happens externally, and the baby fish, called larvae, never even know who their parents are. This is obviously very different than us humans. We stay with our parents when we're young to get food, protection, and to learn, among other things. Fish larvae, on the other hand, can find food by themselves, often stay together in a school for protection (the safety in numbers philosophy), and their behavior is largely instinctual.

The bottom line is that parent fish are trying to reproduce as much as possible to pass on their genes. There's a trade-off between using your energy taking care of your babies and using your energy in taking care of yourself so you can make even more babies. Most fish decide that it's better to make lots of babies, even if it means that the survival rate will be lower than if they had focused on parental care.

---

**Question**

What are the antler things on a lobster?

**Answer:**

The “antler things” are actually antennae. Lobster antennae are sensory organs that help them locate food. Scientists think that spiny lobsters also use their antennae to ward off predators; after molting, lobsters are particularly susceptible to predation so they rub their antennae on their bodies, making a loud noise that scares away potential predators.

---

**Question**

Marie wants to know how fish reproduce?

**Answer:**

Most fish species reproduce by broadcast spawning, meaning that the males release sperm into the water at the same time that females release eggs into the water. Fertilization happens externally when the eggs and sperm meet up in the water column.

There are many exceptions, of course, to broadcast spawning. In many shark species, the female gets pregnant after mating with one male and some months later gives birth to baby sharks that look like miniature versions of the adults; in fact, spiny dogfish (*Squalus acanthias*) have the longest gestation period of any animal on earth—the females are pregnant for 22 months before giving birth! Some skates and rays also mate but rather than giving birth to live young, they lay eggs. “Mermaid’s purses,” the dark-colored pouches that you find at the beach, are actually skate eggs that have already hatched. Seahorses are especially unique—it’s the males that get pregnant! The female seahorse inserts her eggs into the male’s “brood pouch” where the male fertilizes them. A few weeks later, the baby seahorses are born.

---

**Question**

What is the life span of a clam?

**Answer:**

The hard clam, *Mercenaria mercenaria*, located in the Northeast can live up to 30 years, if not more.

---

**Question**

How are the shellfish in the hatchery fertilized?

**Answer:**

When the animals are spawned, eggs and sperm are collected separately into buckets. Some sperm is added to the bucket of eggs, and then a sample is taken to be looked at under the microscope to look for sperm swimming around the egg to ensure fertilization is going to take place.

---

**Question**

Is there a specific name for baby clams, oysters, and scallops?

**Answer:**

In general, clams, oysters and scallops that are less than 1 year old can be considered a juvenile. Sometimes you might hear the term “spat” used when referring to baby oysters. Oysters will set, or cement themselves to a hard surface in the water when they metamorphose from larvae to a juvenile oyster.

---

**Question**

About how many eggs does each shellfish lay?

**Answer:**

That depends on the species. Clams can produce 5-10 million, oysters can produce upwards of 50 million eggs, and scallops about 1-3 million.

---

**Question**

How can children help keep the water clean? Love, The 3rd Grade at Raynor Country Day School

**Answer:**

Thanks for asking—it's great to hear that you want to help! There are many things that kids can do to keep the water clean. Here are some ideas of things to do, or not do, when you're out playing in this amazing place:

- Don't be a beach bum. Respect beach closures designed to protect endangered wildlife like piping plovers. Don't climb on dunes; even light traffic can erode these important habitats.
  - Don't litter! Eighty percent of garbage in our oceans is from land (only 20% is from boats). Just last year, as part of International Coastal Clean-Up, volunteers in NY found 335,371 lbs of garbage. Kids can help especially with one thing in particular—balloons. They were among the top 10 garbage items found and can be particularly dangerous to sea turtles who mistake them for jellyfish, one of their favorite foods. So keep those balloons tied tightly to your wrist!!!
  - Fish fairly. Learn & abide by recreational fishing regulations. Practice catch and release, and use circle hooks to increase the likelihood that the released fish will survive.
  - Clean up after your dog to prevent possible pathogens from entering the bays.
  - Ask your parents to reduce or eliminate fertilizer and pesticide use in your yard. Plant native species or other disease-resistant, drought-resistant plants that will thrive in the absence of chemicals. These chemicals can pollute the bays as well as harm children and pets.
  - Learn more & speak out. Tell other kids and your parents about estuaries and ask your local schools and community to celebrate National Estuaries Day each September.
- 

## Question

How does the fish reproduce (in detail please)?

## Answer:

Most fish species reproduce by broadcast spawning, meaning that the males release sperm into the water at the same time that females release eggs into the water. Fertilization happens externally when the eggs and sperm meet up in the water column.

There are many exceptions, of course, to broadcast spawning. In many shark species, the female gets pregnant after mating with one male and some months later gives birth to baby sharks that look like miniature versions of the adults; in fact, spiny dogfish (*Squalus acanthias*) have the longest gestation period of any animal on earth—the females are pregnant for 22 months before giving birth! Some skates and rays also mate but rather than giving birth to live young, they lay eggs. “Mermaid's purses,” the dark-colored pouches that you find at the beach, are actually skate eggs that have already hatched. Seahorses are especially unique—it's the males that get pregnant! The female seahorse inserts her eggs into the male's “brood pouch” where the male fertilizes them. A few weeks later, the baby seahorses are born.

---

**Question**

Where can we find eel grass in the bay?

**Answer:**

Eelgrass grows in sand to muddy bottoms in relatively shallow water (3-15 feet) in the Peconic Estuary. Except for one, small eelgrass meadow, there is no eelgrass currently growing in the western half of the estuary. Eelgrass meadows in the Peconic Estuary are predominately found in the eastern half of the estuary and along both the north and south shores.

Eelgrass on the North Fork can be found in Southold Bay (outside of Mill Creek, Southold), Gull Pond beach (Greenport), along the Orient causeway (East Marion-Orient), Orient Harbor (East of the Orient Yacht Club to Hallocks Bay entrance, Orient), Hallocks Bay (Orient), and along the Orient Beach State Park in deeper water (Orient).

---

**Question**

What do spider crabs eat?

**Answer:**

Spider crabs are opportunistic eaters and will eat both plant and animal materials. Most interestingly, spider crabs “wear” their food. They decorate themselves for camouflage, but if food is scarce, the “decorations” also serve as a portable restaurant!

---

**Question**

How long does it take to grow the algae?

**Answer:**

Algae that are fed to shellfish can take up to a month to grow. The algae cells will divide into two new cells and repeat this process over and over again. But you need gallons and gallons of algae to keep up with the hungry appetites of shellfish. So, it takes a number of weeks to have enough food on-hand when the hatchery season begins each year.

---

## Question

What can be done to clean up the damage from GE?

### Answer:

I'm guessing you are referring to the PCB contamination in the Hudson River. The Hudson River empties into New York Harbor, which is about 75 miles west of the westernmost part of the Peconic Estuary.

The clean-up of the Hudson River PCBs Superfund Site is extremely complex, but a plan has been developed to complete the clean up, and efforts are underway to carry it out. Check out: [www.epa.gov/hudson](http://www.epa.gov/hudson) for the latest on this project and to join a list serve to get future updates.

---

## Question

What is the most unusual sea creature that lives in the bay?

### Answer:

Mmmm, the most unusual sea creature that lives in the Peconic Estuary is the hairy sea cucumber! The hairy sea cucumber can grow up to 4  $\frac{3}{4}$  inches long and 2 inches wide. This soft-bodied sweet-potato-shaped animal is an echinoderm, related to the sea stars and sea urchins. It is a slow moving, burrowing animal. Its body is covered with small tube feet, giving it a "hairy" look. Hairy sea cucumbers can be found from Cape Cod to Florida and Texas.

This animal is primarily a mud dweller – it has recently been found in the deep channels around Robins Island. Hairy Sea Cucumbers are able to "eviscerate", or "throw up"/expel, their sticky internal organs when threatened. This often confuses or satisfies a predator, allowing the sea cucumber time to escape. The organs are regenerated after five or six weeks.

---

## Question

This Is Valonna and I want to know how many different kinds of mullusk are there? Can you describe some of the spieces.

### Answer:

That's a tough question, Valonna. It is estimated that there may be as many as 50,000 different mollusk species. Keep in mind that mollusks can be found in both fresh and salt waters. Common mollusks that we find in the Peconic Estuary include clams, oysters, and slipper shells. While most mollusks produce shells (either in one or two pieces—gastropods and bivalves, respectively), squid and octopus are also mollusks.

---

### **Question**

What kinds of things are humans doing to harm the estuary?

### **Answer:**

Unfortunately, lots of things that we do can harm the Estuary. A problem is that each small action in and of itself has a very small impact, but when you add them up, the result is significant.

I hope that you don't mind, but instead of listing things that we're doing wrong, below is a "Top 10" list of things that we can do to help the estuary:

1. Reduce inputs of nitrogen from all sources (especially fertilizers and septic systems.)
  2. Keep pollutants out of runoff, reduce impervious surfaces to reduce runoff volumes, and provide for the infiltration of any runoff that remains.
  3. Preserve priority open spaces, particularly coastal properties.
  4. Restore healthy filter feeder populations through: spawner sanctuaries, restocking and seeding; improved water quality; habitat protection and improvements; and obeying harvesting laws.
  5. Protect tidal wetlands and their upland buffers.
  6. Use and handle toxics, especially pesticides, judiciously and carefully; dispose of unneeded and unwanted materials responsibly.
  7. Maintain natural shorelines and the habitats of endangered species.
  8. Restore degraded habitats and shorelines, and reduce the spread of invasive species.
  9. Obey laws that are on the books - one transgression may not be significant, but the cumulative effects across the estuary and watershed can be important.
  10. Conduct research, demonstrations, and programs to understand and respond to environmental issues and communicate with the public on what can be done and what the public can do.
- 

### **Question**

Do all of the animals you showed us on the program live in the same water but in different areas of the water?

**Answer:**

Yes, all the animals we showed you live in the Peconic Estuary. However, they are not all found in the same habitat (eelgrass beds vs. sandy bottom).

---

**Question**

Which of the species in this estuary are the most endangered?

**Answer:**

Tiger salamanders that live in freshwater wetlands and ponds by the bay.

---

**Question**

Could you please mail information on how my Marine Biology class could visit some of these locations for a field trip? Could you include the types of programs available? Thank You Vicki Bonaguro 34 Oak St Center Moriches, NY 11934

**Answer:**

Please contact the Cornell Cooperative Extension Marine Program at 631-852-8660.

---

**Question**

If the weights on the scuba diver makes him sink, how can he swim up if he sank down?

**Answer**

The weights are needed to counteract the buoyancy of the wetsuit and other parts of the gear that tend to float. Once you are under water you have to inflate your Buoyancy Compensating Device (BCD) to float you to the surface. The trick is to put on enough weight, but not too much. In practice we tend to overweight ourselves so that we can simply inflate our BCD's a little to become neutrally buoyant.

---

### Question

How many types of animals are there in the estuary?

### Answer:

Don't know. But we do know that there are 111 rare, threatened, endangered or special concern species in the Peconic estuary and its watershed.

---

### Question

What is the most common type of jellyfish in the Peconic Bay?

### Answer:

Hi Mrs. Kobus' class! The sea nettle is the dominant and most noticeable medusa-type jellyfish in the Middle Atlantic (including the Peconic Estuary). The sea nettle is also known as the summer jellyfish and has the scientific name *Chrysaora quinquecirrha*. This jellyfish is typically bell-shaped and pale white, sometimes ribbed with reddish markings - long thin tentacles edge the bell.

The species is familiar to both fishermen and swimmers because of its abundance in the summer and its sting (Ouch). Its painful stings are rated from moderate to severe, but do not cause death. The sting is used to kill or stun both prey and predators.

Stinging sea nettles are carnivorous and obtain food by stinging it with their tentacles. They feed on zooplankton, combjellies, and other jellyfish. They may also eat crustaceans (i.e., shrimp and copepods). Nettles also eat young minnows, bay anchovy eggs, worms, and mosquito larvae.

---

### Question

How long did it take to get this program ready for today?

### Answer:

Wow, good question. We applied to be a part of E-Live back in March. Once we found out that we were selected, our planning work took off in May, so 4 months ago. The last month has been particularly busy—all the scientists planning their segments, working through the logistics of a satellite broadcast, and getting the word out to schools to tune in. It was certainly a lot of work but also lots of fun and well worth it!

---

### Question

how many types of plants are there in the Estuary?

### Answer:

That is a difficult question. Of the “true” plants that live in our estuary, there are only two types or species. The dominant plant is Eelgrass (Its scientific name is *Zostera marina*). The second plant that we encounter in the bay is Widgeon Grass (a.k.a., *Ruppia maritima*). There are many species of macroalgae (or seaweeds) and no one has conducted a complete survey, but my guess would be between 100 and 200 species of macroalgae in the Peconic Estuary. I have encountered approximately 100 species during my research, and I am sure that there are many more out there.

---

### Question

Do tourists such as boaters and commercial fisherman disturb the creatures living in the estuary?

### Answer:

Unfortunately, yes, sometimes they do. Boaters can disturb estuarine wildlife by illegally dumping human sewage into the water, by littering, by expelling oil from the engines into the bay, and by leeching chemicals from cleaners and boat bottom paint (sometimes the paint contains pesticides designed to keep marine animals like limpets from adhering to the boat). Boaters may also affect creatures more directly, either by striking them or by driving too fast through sensitive habitat areas such as wetlands, disrupting the plants or bay bottom. Commercial and recreational fishermen sometimes overfish a species, removing fish from the bays faster than they can reproduce. Since many fishermen fish from boats, the previously listed boater effects also often apply to fishermen.

At the same time, boaters and fishermen are often great advocates for the environmental health of the Peconics. For example, boaters helped spearhead the initiative to designate the Peconic Estuary as a Vessel Waste No Discharge Zone, and commercial fishermen have been leaders in the shellfish restoration efforts. After all, boaters and commercial fishermen wouldn't be boaters and commercial fishermen without a healthy bay system.

---

### Question

Are there a lot of clams in the Peconic Estuary?

**Answer:**

There are clams that can be found in the creeks of the estuary even though the population is down from historical records. Some areas have less clams than others. Our hatchery is here to provide seed clams to areas that may be low in numbers so we can all enjoy a few clams on the half-shell.

---

**Question**

Do you have success rates of these restorations in the field? About how much survives after one year, 5 years?

**Answer:**

The survival rate of hatchery-reared shellfish planted unprotected in the field varies depending on many factors, such as shellfish species, size at planting, season of planting, bottom type and numbers and species of predators.

We are just finishing a two-year project that sought to determine if planting small hard clam seed in the spring would be as successful as planting larger clams in the fall (as most programs have done for years). Preliminary results show a much higher survival rate of the fall planted clams.

We have seen survival of from close to zero to about a maximum of 30%. If we can protect the seed from predators, the numbers jump to well over 50%. Unfortunately, this is not possible with large-scale municipal field plantings.

Little is known about survival past the first two years. Bay scallops don't live much past two years. We do see clams that are at least five years old for sale in our local markets that show the *notata* markings (reddish bands or zigzag lines) - we know that these are locally caught and assume they are from our programs.

---

**Question**

How many estuaries are there left in the world?

**Answer:**

I don't think anyone has ever counted them in the United States, let alone in the whole world. Also, estuaries don't go away – because they are simply the areas where fresh and salt water mix, there are probably the same number today as there has been since the last ice age ended. Estuaries can easily become degraded because people like to live near the

coast and with people and especially dense populations of humans, you're likely to get pollution, development and overuse. But if we're smart, we can take steps to lessen the human impact and make sure estuaries remain healthy and productive for future generations.

You may also be interested to know that EPA has designated 28 estuaries in the United States as "Estuaries of Significance" in the National Estuary Program (See: <http://epa.gov/owow/estuaries/>), including one in the Caribbean (San Juan Bay in Puerto Rico). Our sister agency, the National Oceanic and Atmospheric Administration, oversees the National Estuarine Research Reserve System, which is a network of 26 protected areas (see [http://nerrs.noaa.gov/Background\\_Overview.html](http://nerrs.noaa.gov/Background_Overview.html)). There is overlap between the 2 programs. Neither of these programs includes the biggest estuary in the United States, Chesapeake Bay, which is in a class by itself (see: <http://www.chesapeakebay.net/>). And there are lots of other locally important estuaries in the United States, too.

---

### **Question**

How many different kinds of sea weed are there?

**Answer:**

Worldwide, there is estimated to be 6500 different species of seaweeds. This can be broken down to about 4000 red seaweeds, 1500 brown seaweeds, and 1000 green seaweeds. This number can and does change often as scientists discover a new species or find that 2 different species are actually the same.

---

### **Question**

Is there commercial fishing in the Peconic Bay?

**Answer:**

Yes. They use gill nets, trawls, seines, and hook and line to harvest scup, fluke, winter flounder, striped bass, bluefish, oyster toadfish and even mackerel.

---

### **Question**

How do scallops reproduce?

**Answer:**

Scallops will release eggs and sperm into the water when their gonads are ripe and the ambient water temperatures are high enough to support larvae. Spawning of scallops takes place sometime in June to early July. When the eggs are fertilized, free swimming larvae are formed that swim throughout the water until they are ready to “set” in about two weeks. At this point, scallops and other shellfish change their morphology and physiology to become a juvenile. After about a year or two, shellfish are big enough to reproduce to supply the next generation of shellfish.

---

**Question**

Are horseshoe crabs just like turtles? \*Kenley\*

**Answer:**

While they are both marine animals that have shells, horseshoe crabs and turtles are quite different. Most notably, turtles are vertebrates (*i.e.*, they have bones), and horseshoe crabs are invertebrates (*i.e.*, they don't have bones). Within the vertebrate group, turtles are a subset of the reptile group. Horseshoe crabs, on the other hand, are most closely related to spiders and scorpions.

---

**Question**

Are there any sharks in the Bay or in the Atlantic Ocean? If so, how many types?

**Answer:**

Of course! Many species of sharks go into estuaries to feed or breed. Estuaries also make a good nursery ground—the enclosed area offers lots of prey in a protected area. In the Peconics we have spiny dogfish, smooth dogfish, and sandbar sharks, among others.

Once you leave Gardiners Bay and get into the Atlantic Ocean, there are many more species of sharks swimming around, including the giant, plankton-eating basking shark (*Cetorhinus maximus*), the long-tailed common thresher shark (*Alopias vulpinus*), and Jaws' inspiration—the white shark (*Charcharodon carcharias*). Other common sharks include the blue shark (*Prionace glauca*), tiger shark (*Galeocerdo cuvieri*), dusky shark (*Charcharinus obscurus*), and shortfin mako shark (*Isurus oxyrhyncus*). And this is just a sampling—many more shark species can be found in the waters of the vast Atlantic Ocean.

---

## Question

Does eel grass require a certain salinity to grow--we do not see it often in our Gulf Coastal waters--the only location is at St. Joe's Peninsula close to Appalachicola, Florida.

## Answer:

We encounter eelgrass in salinities ranging from 18 parts per thousand (brackish) to 35 parts per thousand (oceanic), but salinity isn't what prevents eelgrass (*Zostera marina*) from growing in the Gulf; it's temperature. Eelgrass is a coldwater seagrass that isn't found south of the Carolinas on the east coast. Other species of seagrass take over where eelgrass leaves off, including shoalgrass and turtlegrass which are more common in your area.

---

## Question

How can kids learn more about the Peconic Estuary animals and help out?

## Answer:

Thanks for asking—it's great to hear that you want to learn more and help! The Suffolk County Marine Environmental Learning Center operated by the Cornell Cooperative Extension Marine Program is a great place for a field trip if you want to learn more about Peconic Estuary animals. That's the place where we were for our E-Live broadcast. You can also learn a lot just by searching for different animals on the Internet. The Peconic Estuary Program's new newsletter, PEP Talk, has a section on a different animal each issue. Subscribe by e-mailing [peptalk@peconicestuary.org](mailto:peptalk@peconicestuary.org) to receive each "Species Snapshot" at home.

There are many things that kids can do to keep the water clean. Here are some ideas of things to do, or not do, when you're out playing in this amazing place:

- Don't be a beach bum. Respect beach closures designed to protect endangered wildlife like piping plovers. Don't climb on dunes; even light traffic can erode these important habitats.
- Don't litter! Eighty percent of garbage in our oceans is from land (only 20% is from boats). Just last year, as part of International Coastal Clean-Up, volunteers in NY found 335,371 lbs of garbage. Kids can help especially with one thing in particular—balloons. They were among the top 10 garbage items found and can be particularly dangerous to sea turtles who mistake them for jellyfish, one of their favorite foods. So keep those balloons tied tightly to your wrist!!!
- Fish fairly. Learn & abide by recreational fishing regulations. Practice catch and release, and use circle hooks to increase the likelihood that the released fish will survive.
- Clean up after your dog to prevent possible pathogens from entering the bays.

- Ask your parents to reduce or eliminate fertilizer and pesticide use in your yard. Plant native species or other disease-resistant, drought-resistant plants that will thrive in the absence of chemicals. These chemicals can pollute the bays as well as harm children and pets.
  - Learn more & speak out. Tell other kids and your parents about estuaries and ask your local schools and community to celebrate National Estuaries Day each September.
- 

### **Question**

What is the worst and best experiments you ever did?

### **Answer:**

Hmm, I think the worst experiments, in general, have dealt with decayed/rotting plants that smell really bad. Sometimes it can take days for your hands to stop smelling, no matter how many times you wash. It's amazing how many bad odors are produced by dead plants.

The best experiment I have done, to date, was my first "real" large-scale attempt at science- my Masters Thesis. I investigated how waves affect the way a species of seaweed looks and it's strength. I compared individuals from a really wavy shore to those from a calm shore. It turns out that waves make this seaweed species smaller and stronger than when it is grows on a sheltered shore.

---

### **Question**

What is the temperature in the green house for the plants?

### **Answer:**

The greenhouse can get very hot, even with the exhaust fans running. The highest air temperature recorded in the greenhouse was 105°F. However, the plants that I work with don't feel the heat because they are growing underwater in tanks with flowing water from the bay. The bay water usually doesn't get warmer than 80°F in the summer, but in the winter we have had water temperatures of 30°F (Salt water freezes around 28°F). The eelgrass generally tolerates this range and can even be frozen for short periods of time without harmful effects.

---

### **Question**

Was there brown tide in the peconic this year?

**Answer:**

As you probably know, Brown Tides are caused by a proliferation of single-celled marine plants called phytoplankton. Although algae (phytoplankton) of many types are found in all natural freshwater and marine ecosystems, blooms of the Brown Tide organism (*Aureococcus anophagefferens*) literally turn the water deep brown, making it unappealing to swimmers and fisherman alike.

Brown Tide blooms persisted in high concentrations for extended periods in all or parts of the Peconics from 1985 through 1988, 1990 through 1992, 1995, and 1997. Brown Tide has not bloomed in high concentrations in the Peconics for the last six years, but it continues to be an important management topic for the Peconic Estuary Program, especially as efforts are mounted to restore shellfisheries and eelgrass.

---

**Question**

If you get stung by a Jellyfish does urine help the pain.

**Answer:**

Yes, human urine can help with the pain from a jellyfish sting. According to the website [discoveringhawaii.com](http://discoveringhawaii.com), the following steps can be taken to treat Jellyfish & Portuguese man-of-war stings.

1. First remove any adherent tentacles that will cause further delivery of venom. The tentacles should be **lifted** off the skin (don't scrape them off -- this causes further stings). Use a stick or some other object to remove the tentacle(s) so as not to get your fingers stung.
  2. Next, rinse the affected area with **sea water** to wash away any adherent nematocysts. DO NOT use fresh water, since this will activate the nematocysts. DO NOT scrub as this will only activate the nematocysts and cause further venom delivery.
  3. **Nematocysts are inactivated by vinegar** (or dilute acetic acid 5-10%).  
NOTE: If no vinegar is handy, then **human urine** will do in a pinch.
- 

**Question**

How hard is your job and does it pay well?

**Answer:**

I wouldn't consider my job physically hard, but it is mentally challenging. I constantly have to solve problems and figure things out. Before I could start my job I went to college for 7 years. Some days I am in the office writing on the computer (like today) while other days I am out in the water diving. Some days I am physically tired from swimming or other physical activity. As far as pay it is not bad, but.....you're not going to get rich. I get paid about what a teacher with 10-15 year of experience gets paid in Suffolk County.

---

### **Question**

Do scallops hibernate? If so, when?

### **Answer:**

Scallops and other shellfish hibernate in the northeast and mid-Atlantic during the wintertime. When water temperatures get below 50 degrees Fahrenheit, shellfish will stop pumping water and slow down their heart rate. Besides it being cold, there is a limited amount of phytoplankton growing in the water from November until March. The animals live on energy reserves stored as glycogen until water temperatures go back above 45-50 degrees in early spring.

---

### **Question**

How does the sea weed attach itself to oysters and rocks?

### **Answer:**

Seaweeds aren't like land plants that have roots to dig in and anchor them. Instead they have a holdfast. The holdfast is at the base of the seaweed and can take many shapes, from a tiny disc to a root-like mass. No matter what the holdfast may look like, they all attach the same way, with glue. Seaweeds produce chemical compounds that act as glue to hold them to any hard object.

---

### **Question**

How many types of fish live in the waters surrounding LI?

### **Answer:**

There are pelagic fish (that swim in the upper part of the water column). There are benthic fish (that swim and live near the bottom). There are nearshore, shallow water species. There are deepwater species. Some oceanic fish also come into the estuary. There are many types of fish in this estuary, and they all use different habitats at different parts of their life cycles.

---

### **Question**

Where can we find out more about seaweeds in the peconic estuary?

### **Answer:**

The library is always the best place to start. Although I don't believe that there are any books that focus on the Peconic Estuary, there are good books available that discuss seaweeds in general and the New England area specifically. Long Island is an interesting spot on the Atlantic coast because we are the southern limit of some northern seaweeds and the northern limit of some southern seaweeds (Hmm, think that 5 times fast). This means we get a pretty good diversity. If you are interested in field guides to seaweeds, any guide on the New England coast works for Long Island. And there is always the internet as a resource.

---

### **Question**

Why is salt water salty?

### **Answer:**

Hi Pulaski! About 68% of the earth is covered with saltwater, which includes the Peconic Estuary. Salt water is made during the process of erosion – rain washes salts and minerals from the land and carries them to the oceans via streams and stormwater runoff. The water in the oceans only leaves by evaporating (and the freezing of polar ice), but the salt remains dissolved in the ocean - it does not evaporate.

---

### **Question**

What is the largest animal that lives in the Peconic Estuary?

### **Answer:**

In the water, probably a striped bass and seasonally, a Leatherback Sea Turtle (1500-2000 lbs) and Hooded seals (600-850 lbs).

---

### Question

Is there any coral on Long Island?

### Answer:

Yes, we do have a species of coral in Long Island waters.

---

### Question

What type of fish can live in fresh water?

### Answer:

Hello Pulaski! Many different types of fish can live in freshwater and are found in the Peconic River including the banded sunfish (scientific name: *Enneacanthus obesus*), black crappie (scientific name: *Pomoxis nigromaculatus*), the brown bullhead catfish (scientific name: *Ictalurus nebulosus*), carp (scientific name: *Cyprinus carpio*), chain pickerel (scientific name: *Esox niger*), largemouth bass (scientific name: *Micropterus salmoides*), pumpkinseed sunfish (scientific name: *Lepomis gibbosus*), and the bluegill sunfish (scientific name: *Lepomis macrochirus*)

The American eel, *Anguilla rostrata*, also known as the common or freshwater eel, is also found in the Peconic River. The life history of the American eel is fascinating, complex and not fully understood. American eels are active at night and feed on insects, mollusks, crustaceans, worms and other fish. It is a catadromous species, which spends most of its life in rivers, lakes and estuaries, but migrates to the ocean to spawn.

Here are some factoids about the American eel's life history:

- \* The American eel begins and ends its life in the waters of the Sargasso Sea, an area north of the Bahamas.
- \* The leptocephalus, a pelagic larvae of less than two inches in length, drifts with the ocean currents for 9 to 12 months before entering coastal waters.
- \* When it reaches approximately 2.4 inches in length, the leptocephalus metamorphoses into a transparent, "glass" eel.
- \* In autumn the glass eels migrate into estuaries along the Atlantic coast, including the Peconic Estuary, where they become pigmented. These eels are known as elvers.

- \* Some eels remain in the estuaries, but others migrate varying distances upstream, including the Peconic River, overcoming seemingly impassible obstacles such as spillways, dams, falls and rapids.
- \* Now in their yellow eel phase, the American eels will remain in the brackish and fresh waters of these rivers for the majority of their lives—for at least five and possibly as many as twenty years.
- \* The yellow eels are uniformly greenish-brown to yellowish-brown dorsally, and whitish-gray ventrally. Females reach a maximum length of five feet, and males grow as long as two feet.
- \* The American eel then begins its life-ending migration back to the waters of the Sargasso Sea to spawn. The migration occurs throughout autumn nights with adults descending streams and rivers, swimming through deep grass and shallow ditches, for a January spawning in the warm Caribbean waters.

Just as all of you go back to school in the Fall, bunches of eels are preparing and making their trip back to the Sargasso Sea!

---

### **Question**

What is the life span of a sea star?

### **Answer:**

Most sea stars live 3-5 years.

---

### **Question**

can humans eat eel grass

### **Answer:**

A human could eat eelgrass, although it's tough, high in fiber, and likely low in nutrients (for humans, at least). However, native peoples in Baja, Mexico, and possibly other areas along the Pacific coast, have harvested eelgrass flower shoots to collect the seeds. The seeds were ground down and made into flour and used for baking.

---

### **Question**

Are there any flounder left in the Bay?

**Answer:**

Yes. There are summer flounder, winter flounder, four spot flounder and windowpane flounder.

---

**Question**

Why are sea urchins furry?

**Answer:**

Sea urchin “fur” is actually spines. They use the spines as little legs to help them move. Several species also use their spines as weapons; some spines even have barbs. Needless to say, many curious humans have ended up with sea urchin spines in their fingers!

---

**Question**

How big do spider crabs get and how long do they live

**Answer:**

Spider crab bodies get to be about 4 inches across, and then their legs radiate out further. I’m not sure exactly how long spider crabs live, but their close relatives the blue crabs live approximately 3 years.

---

**Question**

Can fish change eye color?

**Answer:**

Hmmm... I don’t know of any fish whose eyes change color. However, we have some of the masters of color change right here in the Peconics. Summer and winter flounder (*Paralichthys dentatus* and *Pleuronectes americanus*, respectively) are flatfish that lay on the bottom. To hide themselves from both predators and prey, they change color to match the bay bottom so as to be almost invisible. They can imitate mud, sand, gravel, stone and shell bottoms. In laboratory experiments, they have been able to turn black, off-white, blue, green, yellow, orange, pink and brown to match their surroundings—red is the only color they have a problem with.

---

**Question**

How many kinds of fish are in an estuary? Do any eat eel grass?

**Answer:**

There are fish high in the water column, ones that live near the bottom, some live in the shallows and some in the deep water. Some oceanic fish venture in the estuary. I don't know of any fish that eat eelgrass.

---

**Question**

Is algae a plant or mold?

**Answer:**

Technically, algae is neither. Although algae can photosynthesize and, as a group, are the ancestors to "true plants", it was removed from the Plant Kingdom because it was not as complex as "true plants". It would not fit in with mold (Fungi Kingdom) because it can photosynthesize like a plant. Instead, algae is included with other "misfit" organisms in a third group, the Protist Kingdom. There is currently an attempt to move algae back to the Plant Kingdom. So, in the future, algae may once again be considered a plant, but for now it is a lowly protist, not plant or mold.

---

**Question**

Can you eat a hairy sea cucumber?

**Answer:**

Sea cucumbers are considered a delicacy in many parts of the world, especially in China. However, some sea cucumbers contain toxins. Personally, I won't be ordering sea cucumber on the menu any time soon!

---

**Question**

Why are estuaries so rare?

**Answer:**

I would not go so far as to say that estuaries are rare, but they are ecologically important and often very beautiful places. On Long Island where you live, you're surrounded by estuaries, the Peconic Estuary, the Long Island Sound, New York-New Jersey Harbor Estuary, and the South Shore Estuarine Reserve. Estuaries are semi-enclosed bodies of water where fresh water from the land and salt water from the ocean mix. But each estuary is special in the way that mixing occurs. New York-New Jersey Harbor is fed by the mighty Hudson River. The Long Island Sound is fed by many Rivers in Connecticut. Your school is in the watershed of the Peconic Estuary, which gets most of its freshwater from groundwater, not from big rivers. Each of these situations makes each estuary unique.

---

**Question**

Can a shark get into an estuary? Have you ever seen one up close?

**Answer:**

Of course! Many species of sharks go into estuaries to feed or breed. Estuaries also make a good nursery ground—the enclosed area offers lots of prey in a protected area. In fact, as we speak, there's a 14-foot, 1,700-pound white shark swimming around an estuary near Cape Cod, Massachusetts. This is VERY rare though so don't worry! This big fish just made a wrong turn during a high tide and hasn't found its way out yet. In the Peconics we have spiny dogfish, smooth dogfish, and sandbar sharks, among others.

And yes, I have seen a shark up close. I scuba dive so have seen several species of reef sharks on various dives. My heart definitely beats a lot faster when there's a shark right in front of me, but I just remind myself that they don't want to hurt me. After all, you're more likely to die from a coconut falling and hitting you on the head than you are from a shark attack!

---

**Question**

Chris, we noticed that you wore glasses and removed them before putting your mask on--can one purchase prescription diving mask? If so, is your mask prescription?

**Answer:**

Yes, I do have my prescription in my mask. Being under water helps to magnify things, but if your eyes are as bad as mine you should get a prescription mask. They are not really any more expensive than a quality mask.

---

**Question**

A sea star has no bones, so why is it so stiff?

**Answer:**

Good question. While they don't have bones, sea stars do have an external armor. Many interlocked plates made of calcium carbonate are responsible for sea stars' tough exterior.

---

**Question**

How do horseshoe crabs swim and hold their breath like a blue crab? Brett Wallace

**Answer:**

Horseshoe crabs can swim upside down in the open ocean, propelled by their 12 legs and a flap that hides nearly 200 flattened gills. And there's no reason to hold their breath; they "breathe" the water with their gills!

---

**Question**

Can you eat the hairy sea cucumber?

**Answer:**

Sea cucumbers are considered a delicacy in many parts of the world, especially in China. However, some sea cucumbers contain toxins. Personally, I won't be ordering sea cucumber on the menu any time soon!

---

**Question**

How many estuaries are there in the U.S.?

**Answer:**

I'm not sure I ever read that anyone has ever counted them, because this would be quite an effort, but I can tell you that EPA has designated 28 estuaries in the United States as

“Estuaries of Significance” in the National Estuary Program (See: <http://epa.gov/owow/estuaries/>), including one in the Caribbean (San Juan Bay in Puerto Rico). A sister agency, the National Oceanic and Atmospheric Administration oversees the National Estuarine Research Reserve System, which is a network of 26 protected areas (see [http://nerrs.noaa.gov/Background\\_Overview.html](http://nerrs.noaa.gov/Background_Overview.html)). There is overlap between the 2 programs. Neither of these programs includes the biggest estuary in the United States, Chesapeake Bay, which is in a class by itself (see: <http://www.chesapeakebay.net/>).

Estuaries come in lots of sizes and sometimes we group waters together. For example, if you look at a map of the area around Cutchogue Harbor near where your school is, you see Wickham Creek, East Creek, Mud Creek, and Broadwater/Haywater Coves. Each of these waters is a mini-estuary, where freshwater and saltwater mix. But you can also group them and they become Cutchogue Harbor, which is nested within Great Peconic Bay, which is part of the Peconic Estuary. How would you total them up? Since there is not one way to count them, that may be why a good number doesn't exist! What is important is that we protect them from getting polluted.

---

### **Question**

How Cold Is It There In The Water?

### **Answer:**

The water here is currently 66°F. During the winter it gets down to about freezing and I have been diving in 35° water. In the summer our water can get up to 80° or higher in some shallow protected coves. Eelgrass “likes” the water cool. 60° is about the optimum.

---

### **Question**

What do you need to do to get to SCUBA dive?

### **Answer:**

There are minimum age requirements. I believe you have to be about 12 or so to become certified. Once you are old enough anyone can become certified by attending a class at a local dive shop. Dive instructors are certified by various organizations around the world. I am certified under PADI. I attended a few days of night classes and took written tests that covered all the equipment and safety issues relative to diving. Once you pass the course work you will need to pass an open water test where you try out what you have

learned in the open water. After certification you can legally have SCUBA tanks filled at a dive shop.

---

**Question**

How big do spicer crabs get because I pulled on up that was about 12 inches across?

**Answer:**

Spider crab bodies get to be about 4 inches across, and then their legs radiate out further. They do have long legs, but you must have found a BIG one!

---

**Question**

What kind of prey does the spider crab eat?

**Answer:**

Spider crabs are opportunistic eaters and will eat both plant and animal materials. Most interestingly, spider crabs “wear” their food. They decorate themselves for camouflage, but if food is scarce, the “decorations” also serve as a portable restaurant!

---

**Question**

What is the water temp?

**Answer:**

The water temp here is 66°F.

---

**Question**

what does a hermit crab eat and what fish are in the estuary

**Answer:**

Hermit crabs are opportunistic eaters and will eat both plant and animal materials, dead or alive. They eat worms, plankton, and organic debris, among other things.

There are many different kinds of fish in the estuary, including scup, fluke, winter flounder, striped bass, bluefish, oyster toadfish, pipefish, and even mackerel.

---

**Question**

What does SCUBA mean?

**Answer:**

Self Contained Underwater Breathing Apparatus

---

**Question**

Are hermit crabs related to the whelk because they both have shells?

**Answer:**

Hermit crabs and whelks are both invertebrates, so they are somewhat related. However, hermit crabs are further classified as arthropods, within the crustacean class. Whelks, on the other hand, are further classified as mollusks, within the gastropod class. Hermit crabs, while they do live in shells, actually use shells built and discarded by gastropods.

---

**Question**

Can the hermit crab swim?

**Answer:**

Baby hermit crabs swim for the first few weeks of their lives. After that though, they prefer walking on the estuary bottom and shoreline.

---

**Question**

How many species of animals live in the Peconic Estuary?

**Answer:**

Don't know. We do know that 111 rare, endangered, threatened or special concern species live in the estuary.

---

### **Question**

How and what do sea cucumbers eat? What would happen to the plant and animal life in an estuary if the salinity suddenly changed?

### **Answer:**

Sea cucumbers eat dead plants and animals that float in the water or rest on the bay bottom. They use their tentacles to bring the food to their mouths.

If the salinity suddenly changed, due to climate change, for example, much of the plant and animal life would be affected. However, estuarine animals are usually more tolerant of salinity changes since the estuarine environment spans fresh to salt water.

---

### **Question**

Do you have fiddler crabs at your estuary? If you do, where do they go during high tides? Also, what does trepang, smoked sea cucumber taste like?

### **Answer:**

Yes, we do have fiddler crabs. They spend high tides burrowed in the sand or mud on the shoreline.

And I'm sorry (or happy?) to say that I have no idea what trepang tastes like!

---

### **Question**

What do spider crabs eat?

### **Answer:**

Spider crabs are opportunistic eaters and will eat both plant and animal materials. Most interestingly, spider crabs "wear" their food. They decorate themselves for camouflage, but if food is scarce, the "decorations" also serve as a portable restaurant!

---

## Question

Is any alge toxic?

### Answer:

Seaweeds, or macroalgae, are generally accepted to be non-poisonous to humans. Recently, several species of tropical seaweeds have been reported to be poisonous to humans when eaten, and one seaweed even caused the death of several people in Guam. This question is still under investigation, as some scientists believe that it is not the seaweed that is producing the poison, but rather a bacterium or fungus that lives on the seaweed. At this time, there have been no poisonous seaweeds identified in the Northeast US. Other seaweeds, although not toxic, do accumulate foul tasting chemicals that protect against marine animals, like snails, grazing. Seaweeds can also take up chemicals from polluted waters making them unfit for eating.

There are species of phytoplankton, or microalgae, that produce toxins that can and have caused deaths in humans. These microalgae are normally not found in high numbers, so their “poison” is greatly diluted. However, if they form a large bloom, their toxin can be ingested by shellfish and finfish and accumulate to levels that are dangerous to a person eating these animals.

---

## Question

How does the sea urchin eat seaweed? Does it chew it up?

### Answer:

Sea urchins do indeed have teeth. They use them to rip seaweed from rocks and then eat it. Their teeth continue to grow throughout their lives.

---

## Question

Does This Have Anything To Do With The JASON PROJECT???

### Answer:

No. While EstuaryLive fits in with the JASON Project’s goal to supplement classroom learning through innovative activities, the two are not affiliated. However, the National Oceanic and Atmospheric Administration (NOAA) sponsors both programs.

---

## Question

1. What tools and technology are utilized for observation and collecting data in the estuary? 2. What invasive plant or animal species have infiltrated the Peconic Bay and what is the impact? 3. What conditions are required for successful populations of wildlife in Peconic Bay?

## Answer:

1. For fish, there are nets, seines, trawls and hook and line. For benthic critters, there are dredges and grab samplers. For sediments, there are coring devices and grab samplers. For water quality, there are water grab and flow-through samplers. 2. The algae, *Codium* has invaded and replaced more important flowing algae (plants). The tall reed called *Phragmites* invaded and has changed the quality of the freshwater and saltwater marshes. 3. Wildlife require habitats to live, breed, rest and hunt for food in. They need clean habitats usually of a sufficient size.

---

## Question

What is a horseshoe crab related to?

## Answer:

Horseshoe crabs are most closely related to spiders and scorpions.

---

## Question

What do sea stars eat? Where is their mouth located?

## Answer:

Sea stars eat many things, including other sea stars! They eat clams, oysters, and fish, among other animals. They push their stomach out through their mouth (located in the middle of the underside of the sea star) and digest the prey.

---

## Question

What do seastars eat?

## Answer:

Sea stars eat many things, including other sea stars! They eat clams, oysters, and fish, among other animals. They push their stomach out through their mouth (located in the middle of the underside of the sea star) and digest the prey.

---

**Question**

Why doesn't a starfish has any bones?

**Answer:**

While they don't have bones, sea stars do have an external armor. Many interlocked plates made of calcium carbonate are responsible for sea stars' tough exterior.

---

**Question**

Do horseshoe crabs have brains, and how do they protect themselves?

**Answer:**

Although it's not as sophisticated as ours, horseshoe crabs do indeed have brains.

As for protecting themselves, horseshoe crabs have been around for 300 million years (since 100 million years BEFORE dinosaurs), so they must be doing something right! Their armored shell is clearly excellent protection. However, human fishing pressure (to provide bait for eel and whelk fisheries) is currently threatening the future of this remarkable species.

---

**Question**

What is your most pressing concern that you have about the future of the Bay?

**Answer:**

I would have to say the most pressing concern is figuring out how to balance human presence with ecological protection. If we can "tread lightly" on the estuary and its watershed, both humans and nature can co-exist. But if we damage the earth and water, we'll lose what makes the Peconics so desirable in the first place, the relatively pristine environment, the finfish and shellfish, birds and beautiful wetlands. Protecting the estuary will take a lot of effort by residents and visitors to the Peconics, but it will certainly be worth it.

---

**Question**

Hello from Columbus, Ga. How can you be part of this program? How old do you have to be? Thanks!

**Answer:**

The great thing about EstuaryLive is that anyone with a computer and an internet connection can be a part of it just by tuning in! The actual broadcast planning has traditionally been done by National Estuarine Research Reserves (a NOAA program) or National Estuary Programs (an EPA program) since E-Live is sponsored by NOAA and EPA. Students can be part of the broadcast by teaming up with a National Estuarine Research Reserve or National Estuary Program nearby. The program is aimed at K-12, but it is great for students of all ages.

---

**Question**

Are the Horse shoe Crab dangerous?

**Answer:**

No! Unless you're a marine worm or clam, of course.

---

**Question**

What is the lifespan of the horseshoe crab?

**Answer:**

Horseshoe crabs have an average lifespan of 14 to 20 years.

---

**Question**

What is the purpose of Cornell? What does it do?

**Answer:**

The Southold marine environmental education facility is part of Cornell Cooperative Extension of Suffolk County's Marine Program. In addition to research, they have education staff at the Vanderbilt Museum in Centerport, Atlantis Marine World in Riverhead, and of course SCMELC in Southold. See their website ([www.cce.cornell.edu/suffolk/Programs/MARhome.htm](http://www.cce.cornell.edu/suffolk/Programs/MARhome.htm)) for more information.

---

### **Question**

why are horseshoe crab's blood blue?

### **Answer:**

The oxygen-carrying pigment in horseshoe crab blood is a protein called hemocyanin. It is very similar to the hemoglobin we have in our blood. Hemoglobin gets its red color (which makes our blood red) from the iron molecule in the center of the protein. Hemocyanin contains a copper molecule, which results in a blue color.

---

### **Question**

How old are horseshoe crabs? What enables them to live so long?

### **Answer:**

Horseshoe crabs have an average lifespan of 14 to 20 years. They do not reach maturity until approximately 10 years old. By delaying the incredible amount of energy that goes into reproduction, horseshoe crabs are able to live longer.

---

### **Question**

What kind of seafood come from that estuary? Does any type of pollution effect the estuary? What will you do to keep the estuary clean? Do you have a problem with pfesteria?

### **Answer:**

We have clams, oysters, scallops, fluke, flounder, striped bass, bluefish, and weakfish to name a few. Pollution from runoff affects the estuary by closing down shellfish beds. A variety of sources of nutrients (sewage treatment plants, runoff, agriculture, sediments, atmosphere, golf courses, and your own yard) affect the estuary by causing too much algae to grow because when this algae dies off it uses up the oxygen in the water. Fish

need oxygen in the water to breathe. We have been identifying the sources of pollution and are actively cleaning them up (major ones first). While we have found Pfiesteria in our creeks, we have not seen a problem from it (no fish kills, no lesions).

---

**Question**

can you swim in the in an estuary?

**Answer:**

Helloooo Columbus Learning Center! Yes, you can swim in an estuary! We recommend that you swim at only public bathing beaches within an estuary – this is to ensure that there is always a lifeguard on duty. Public bathing beaches are also required to have public bathrooms.

---

**Question**

Hello! What made you want to do this job?

**Answer:**

Hi! Let's face it – science is cool. It is so neat that everything is so interconnected – the elements in rain from the sky affects the species makeup of plankton in the water column! Because everything is intertwined, classes in biology, atmospheric sciences, chemistry, physics, earth science, ecology, and many, many others are all important. I enjoy deciphering scientific data that no one else has seen yet and finding out new things.

It is fun to help translate this scientific knowledge into public policy (laws and regulations) as well. It is great to know that through my job with the Peconic Estuary Program, I am working to keep America beautiful!

---

**Question**

How do estuaries prevent erosion on the shoreline?

**Answer:**

Hi Our Lady of Mercy – I am glad that you were able to tune in! The wetlands bordering estuaries, including the Peconic Estuary, perform valuable functions including protecting water quality, flood protection, and erosion control. Many upland areas drain to fresh and

salt marshes, which act as filters, removing pollution from runoff. Wetland plants and soils also act as a natural buffer between the land and the ocean, absorbing floodwaters and dissipating storm surges. Salt marsh grasses (*Spartina*, *Phragmites*) and other estuarine plants also prevent erosion and stabilize the shoreline.

---

## Question

For Peconic Estuary: If the estuary freezes do fish or plants die? What happens to them if it stays frozen? Please say hello to Bayside Academy, Daphne Alabama. What kind of algae live in New York? What is the most ferocious sea creature you get in your oceans? How do you protect the estuary from big city pollution? Why do pitcher plants only live in estuaries and bogs? In Mobile bay we have something called a jubilee where the fish come to the surface for oxygen and we can harvest them, Do you have anything like that? Is any of the algae edible? What are the most important seafood industry species?

## Answer:

Hello Bayside Academy! If or when the estuary freezes, fish and plants do not die. Whereas most substances become more dense as they cool, water becomes less dense as it cools below 4 degrees Celsius. Consequently, ice floats, which not only makes ice skating possible but prevents the bottoms of lakes and oceans from freezing and enables plants and animals to find refuge there in the winter.

Bunches of different algae live in the marine and fresh waters of New York. Phytoplankton such as *Skeletonema costatum* (a centric diatom), *Polykrikos kofoidi* (a dinoflagellate), and *Nitzschia pungens* (a pennate diatom) reside in our marine waters – clams and bay scallops filter phytoplankton out of the water column for food. Macroalgae, also known as seaweed, is also found in the marine waters of the Peconics. As shown in E-Live, one can find sea lettuce (scientific name: *Ulva lactuca*) and dead man's fingers (scientific name: *Codium fragile*), among many other algaes.

What is the most ferocious sea creature we get in our estuary? I guess it all depends on the scale you are talking about. If you are a centric diatom in the marine waters of the Peconics and a copepod (a zooplankton known as “the cattle of the sea”) eats you, one would think that the most ferocious sea creature is a copepod! I think seastars are pretty ferocious since a seastar who has set its sights on a clam will relentlessly pull its two shells apart. The starfish has the advantage as it has many more feet while the bivalve has only one muscle to keep its shells closed. The starfish only needs to pry open a tiny gap whereupon it everts its stomach into the shell, to release digestive juices and absorb the resulting soup!

How do we protect the estuary from big city pollution? Using good science, many environmental laws have been passed to protect our environment while allowing for industrial growth. Most notably, the Clean Water Act was passed in 1977. Among other

actions, the Clean Water Act funded the construction of sewage treatment plants under the construction grants program and recognized the need for planning to address the critical problems posed by nonpoint source pollution.

Pitcher plants require specific conditions - all are sun worshippers that love the sun, acidic soil and plenty of water.

We don't celebrate any jubilees but many locals get pretty excited when the alewives make their migration from the Peconic Estuary up the Peconic River and the Peconic's freshwater streams to spawn. Many people catch the alewives with nets and eat them for dinner.

Yes, dietetic specialists eat sea lettuce (*Ulva lactuca*) for its taste as well as for its rich vitamin C content (10 times more than an orange and twice as much vitamin A than cabbage). It is also a very rich source of iron. This species may be eaten raw as a salad vegetable, or else used in soups. I must tell you that I tried it raw and it wasn't very good. I also understand that the Asian specialty seaweed salad is made out of sea lettuce (*Ulva lactuca*) as well as *Ulva intestinalis*.

Many products are made from other species of alga including an emulsifier to keep the oil and water in salad dressing from separating and an additive to ice cream to keep it smooth-tasting.

Peconic Bay Scallops were once the biggest fishery in the Peconics, but in 1985, a toxic alga known as Brown Tide virtually wiped out the population. Although there has not been a significant Brown Tide event in nearly 10 years, scallop populations have not rebounded. A decline in their favorite habitat, eelgrass, may also be responsible for scallops' troubled times.

---

### **Question**

What is the largest threat in the Peconic Estuary?

### **Answer:**

I would have to say the largest threat in the Peconic Estuary is overdevelopment, the potential for too many people living in the watershed in an unsustainable way, leading to the degradation, fragmentation, or outright loss of critical habitats that make the Peconic Estuary productive and beautiful.

---

### **Question**

what kind of animals live in the estuary

**Answer:**

Turtles, seals, fish, crabs, clams, oysters, scallops, worms, etc. There are many kinds.

---

**Question**

What are your current weather conditions?

**Answer:**

We were lucky to have a gorgeous day for our EstuaryLive broadcast—partly sunny and in the low 70s. The high that day was 75°F and the low was 68°F.

---

**Question**

Do leeches live in estuaries?

**Answer:**

Leeches (Hirudinea) inhabit many streams and estuaries, hiding under rocks or attached to prey (such as fishes). Marine leeches have a sucker at each end of the body, and body rings (annuli), several per segment. As a kid, we would swim in fresh water lakes in northern New Jersey and at the end of the day have to pull bunches of leeches off of our legs and arms.

---

**Question**

What kind of seafood comes from the estuary?

**Answer:**

Fish – striped bass, weakfish, flounder, fluke, bluefish. Shellfish – clams, oysters, and bay scallops.

---

**Question**

How long have you been studying your estuary?

**Answer:**

The Peconic Estuary Program has been around since 1993. Until then, there was not a real coordinated effort to study the water quality, habitats and living resources of this system. There certainly was a lot of important work done before that that helped set the stage and get us to where we are, but the Peconic Estuary Program Management Conference brought governments, businesses, environmental groups, industry, academics and citizens together to help study and manage the Estuary system in a coordinated way.

---

**Question**

How has acid rain and mosquito spraying effected our sea life?

**Answer:**

Hello East Quogue! According to the NYS Department of Environmental Conservation website, acid rain forms in clouds when sulfur dioxide and nitrogen oxides chemically react with water, oxygen and oxidants to form a mild solution of sulfuric acid, known as wet deposition. Acidic deposition, or acid rain, occurs when either wet deposition or dry deposition (gases and particles) falls to the earth.

Acidic deposition causes lower pH levels in lakes, ponds and streams, and also impacts air quality and soil. When water bodies become very acidic, they often are unable to sustain plant and/or aquatic life, and this damage also may affect the surrounding ecosystem in the area. Many water bodies in the Northeast are especially sensitive to the effects of acid rain because their surrounding soils do not have strong buffering capacity or the ability to neutralize acid rain. In addition, acid rain damages high-elevation soils and forests--like red spruce trees above 2,000 feet--and contributes to visibility degradation.

To date, we don't have any conclusive answers on whether mosquito spraying has affected our sea life. It can be said, though, that mosquito control in Suffolk County has a great potential impact on wetlands and estuaries. Greater than 90% of the County's 11,000 acres of tidal wetlands have been ditched, mostly in the 1930s, to control mosquito breeding.

Suffolk County is currently overseeing the development and implementation of a Suffolk County-wide vector control and wetlands management plan, which addresses numerous issues including pesticide fate and transport; effect of pesticides on fish populations, birds and other wildlife; and wetland preservation. As part of developing the plan, early action projects are being done to study the effects of mosquito spraying on fish and other wildlife.

---

## Question

Is the building development on the North and South Fork effecting the estuaries?

## Answer:

Yes, increased development (housing, farm fields, and industrial parks) adversely affects all estuaries. Ever-increasing development is consuming open space and natural habitat, and stressing watersheds and natural communities. The pressures development can place on the estuary include:

- loss of natural habitat;
- increased amounts of fertilizers and pesticides from lawns;
- petroleum spills and leaks from underground oil storage tanks;
- septic system inputs; and,
- road runoff.

The loss of natural habitat to development fragments natural communities leading to their eventual decline. Contaminants migrate into ground and surface waters, leading to the decline of aquatic communities, including shellfish and finfish. Increased development also brings increased traffic, congestion, and air pollution.

---

## Question

Is the Peconic Estuary becoming more salty? Are animals and plants dying because of too much salt? Are there any carnivorous plants in the Peconic Estuary? Is pollution from Connecticut flowing into the Peconic Estuary? Does kelp or seaweed grow in the Peconic Estuary? Is the Peconic Estuary becoming smaller or bigger over time?

## Answer:

According to the Woods Hole Oceanographic Institution, tropical ocean waters have become dramatically saltier over the past 40 years, while oceans closer to Earth's poles have become fresher. Scientists conjecture that the Earth's warming surface may be intensifying evaporation over oceans in the low latitudes--raising salinity concentrations there --and transporting more fresh water vapor via the atmosphere toward Earth's poles. Another source of additional water to the poles include melting glaciers and Arctic sea ice (another consequence of global warming) and an accelerated water cycle, increasing precipitation in higher latitudes.

Woods Hole's work analyzed long-term data sets in the Atlantic Ocean. The Peconic Estuary is a mid-latitude, semi-enclosed body of water. Unfortunately, without

exhaustively analyzing salinities from past decades, we are not able to say whether the Peconic Estuary is getting saltier with time.

Animals and plants are not dieing because of too much salt.

Are there any carnivorous plants in the Peconic Estuary? Yes, pitcher plants and sundews can be found in freshwater bogs throughout Long Island, New York.

Is pollution from Connecticut flowing into the Peconic Estuary? Because of the tides, the surface waters in eastern Long Island Sound and eastern Peconic Estuary are well flushed. It is possible that loadings from Connecticut could flow into the Peconic Estuary.

Yes! Kelp and seaweed (macroalgae) do grow in the Peconic Estuary. I hope you were able to catch that segment of E-Live!

With the gradual effects of sea level rise and erosion, it could be said that the Peconic Estuary is becoming bigger over time.

---