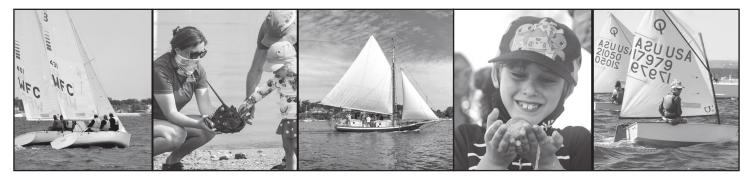


WaterFront Center

Connecting People to the Water through education and recreation



The WaterFront Center (WFC) is a 501(c)(3) not-for-profit organization located in Oyster Bay, New York. We provide access to the waters of Oyster Bay harbor and Long Island Sound through our marine education and STEM programs; recreational and instructional sailing programs; kayak, paddleboard, and sailboat rentals; and through harbor tours and charters aboard our national historic landmark oyster sloop, *Christeen*.



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Center for Marine Education and Recreation at Oyster Bay, Inc. (dba: The WaterFront Center) (WFC) Fed Tax ID: #11-3539597

1 West End Avenue Oyster Bay, NY 11771

Lat: 40° 52.55' N / Long: 73° 32.22' W

Phone: 516-922-7245 (SAIL) info@TheWaterFrontCenter.org

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Your donations allow us to provide affordable and free access to fun and experiential STEM learning about marine ecology for all.

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Writer, Editor & Design:	Jamie T. Deming
Printer:	Corporate Color
Cover Art:	Emma Suzuki, age 10
Illustrations:	Jamie T. Deming

Table of Contents

Art and Student Articles

In the Shallow Water, by Andrew Smith, 2006	6
"Underwater Scene," by Harris Mandel, 2008	6
The Awesomest Camp, by Sam Mantovani, 2012	9
"Bayman," by Kirk Larsen, 2019	14
Estuary Rap, by Charlotte Baumann, 2017	17
"Snowy Egret," by Abigail Johnson, 2015	17
"Outdoor Classroom," by Jamie Deming, 2014	18
Beach Point Overnight, by Julia Annunziato, 2015	22
The WaterFront Center, by Chase Hahn, 2009	34
"On and Off the Water," by Mary McAllister, 2011	34
"Barbie Winter Watersports," by Lucy Kelly, 2022	35
"Christeen," by Eri Suzuki, 2021	36
"Alive and Well," by Betsy Lawrence, 2020	37
Letter to Mike and Danielle, by Jordan, Deasy School	41
Sailing in Choppy Water, by Maria Torti, 2011	42
"Windy Sailing," by Michael Bove, 2016	42
Dear Captain Alix, by Mason Trani, 2021	45
Christeen, by Lelia Carnivale, 2013	45
"Under Water," by Jenna Fingerman, 2013	47
"Crab," by Chloe Van Dorn, 2013	51
Kayaking, by Christopher Canadeo, 2009	55
"Kayaker," by William Sanchez, 2009	55
My Summer at the WFC, by Anthony Lodati, 2012	57
"Capsize," by Courtney Barbella, 2011	57
Sailing is Fun, by Jonah Santoro, 2017	58
"Racing Optis," Emely Pineda, 2014	64
"No Diving," by Louise Vaughn, 2022	66
Thank You, by Alissa, 2021	71

Articles

What Makes the Western Waterfront so Special?	5
View from the Stern	7
What is a Watershed?	15
What is an Estuary?	17
Archie and Bernie	19
What Floats your Boat?	19
How Sails Work	21
STEMships	21
The <i>Ida May</i> is Coming!	24
Predators of Oysters and Clams	30
Molting	43
Skilletfish	44
A Balancing Act	46
Current Troubles in Oyster Bay	48
A Letter from Friends of the Bay	52
Bill Shephard	56
Points of Sail	58
Oyster Bay Non-Profit Organizations	59
Repairs to Christeen	64
Annelids	65
Domino Effect	66
Recreational Saltwater Fishing Limits	67

Activities

Going Shelling	23
Decoding Code Flags	40
WFC Word Scramble	44
2022 WFC Crossword Puzzle	62
Answers to WFC Crossword Puzzle	64
Answers to Going Shelling	68
Answer to Word Scramble	68

WaterFront Center

I thas been 22 years since the Center for Marine Education and Recreation at Oyster Bay was incorporated in March, 2000. The organization quickly grew into what it is today, *dba* The WaterFront Center (WFC), when it purchased the Oyster Bay Sailing School in 2001 and adopted the national historic oyster sloop, *Christeen* in 2002. Integrated junior summer programs of sailing and science began in the summer of 2001 as adult sailing classes and education programs for schools, scouts and other groups gained momentum. Season 2022 is our 22nd year of programming and dedicated service to the community.





All of this would not have occurred without public input on the redevelopment of the Jacobson Shipyard property on Oyster Bay's western waterfront and the leadership of Friends of the Bay and former New York State Senator Carl Marcellino. In the 1990s, when the shipyard closed its business and commercial development was considered for the property, opposition grew over the prospect of overdevelopment and ensuing pollution of the harbor. Voters sought a venue for access to the water for non-invasive recreation and marine education programs to engage the public with this valuable estuary. Much was envisioned, including a Marine Education Center next to the pier with a demonstration oyster hatchery, greenhouse, auditorium, classrooms and gift shop. One of the shipyard sheds was to become a maritime museum and wooden boat-building shop. Space was designated for boat storage and the pier was to be refurbished for anglers.

These ideas culminated in the Conceptual Land Use Plan D of 1998 and formed the blueprint for what is now The WaterFront Center and future projects for the Christeen Oyster Sloop Preservation Corp. Although not all of the Plan was implemented, such as the Marine Education building, and other elements were added, such as the 9/11 Memorial and Sagamore Rowing Association's use of one of the shipyard sheds, the overall mission of the Plan has been implemented with non-profit organizations serving the public on the site.

Since the early days, the WFC's programs and offerings have evolved and developed. Junior Summer Programs are extremely popular. Education programs have multiplied on site and in schools adding STEM programs, research involving tagging horseshoe crabs, touch tanks, etc. On the water, sails on *Christeen*, high school sailing, junior racing, paddleboard rentals, sailing programs for veterans and people with disabilities, and other activities have drawn thousands of people from diverse backgrounds to Oyster Bay. In short, The WaterFront Center has become an important benefit to our area, connecting 15,000 to 20,000 people to the water every year through education and recreation.



What Makes Oyster Bay's Western Waterfront so Special?

E stuaries are protected bodies of water that receive fresh water from rivers, streams and runoff that mixes with saltwater from the ocean. Long Island Sound is a very large estuary, while Oyster Bay is a smaller one.

Oyster Bay's western waterfront is a special place because it has several habitats that compose a healthy estuary all close together, making it a perfect location for learning about marine nature. Beekman Beach, Spartina marshland, the freshwater stream that empties out of Mill Pond, and the deeper waters of West Harbor all provide different habitats for explorers. On and close to shore, nets and naturalists facilitate activities for exploration. Floats alongside the pier allow people access to kayaks, paddle boards and sailboats so they can enjoy getting out on the water either independently or with instructors. Building G, the old Jacobson Shipyard office, serves as the WFC's front desk, inside classrooms, modest aquarium and offices. There is space for storing boats on shore and moorings in the harbor for keelboats, Christeen and support boats. Finally, the western waterfront is near the village of Oyster Bay and the railroad station, making it accessible and able to fulfill its mission of connecting people to the water.



In the Shallow Water By Andrew Smith Sound Swashbuckler, 2006

If you look really closely In the shallow water You can see...

Shrimp like fencers, Stabbing, defending,

Crabs scuttling sideways Like tap dancers on a beach

Minnows darting, Like subway trains in a tunnel!

Harris Mandel, 2008

View from the Stern

In 2021, Education Programs for schools, camps and scouts, in-house and offsite reached 5,241 students.

1,629 slots were taken in junior summer programs, including 443 half-day week-long sailing classes, 428 science activities programs and 758 all-day sailing and science programs.

CHRISTEEN was boarded 2,605 times for Harbor Tours, Sunset Cruises and Private Charters. In addition, 415 people participated in Marine Education Sails.

Youth racing programs in Optis, 420s, High School Sailing and Junior Big Boat programs engaged 63 students in the spring and 67 in the fall.

During the last two years, regular programming at the WaterFront Center was disrupted by the Covid pandemic. We adapted by creating touchless registration, improving our data systems and social media outreach, instituting sanitation protocols and keeping all of our programs outside. As a result, we were not able to give program participants time indoors to create art and literature as they normally do to express the joys and discoveries they made during the summer. Therefor, in this edition of the Log we are reprinting some material from prior years.

WaterFront Center Staff: George Ellis, Executive Director; Cameron Jenness, Education Director; Theodore Papadopoulos, Front Desk Manager; John Brendel, Sailing Director; Cormac Murphy, Head Sailing Instructor; Lauren Potak, Head Educator; Jamé Krauter, Development Coordinator; Joe Plisic, Head Sailing Instructor; Shannon Kelly, Marketing Coordinator; Max Rossetti, Waterfront Coordinator



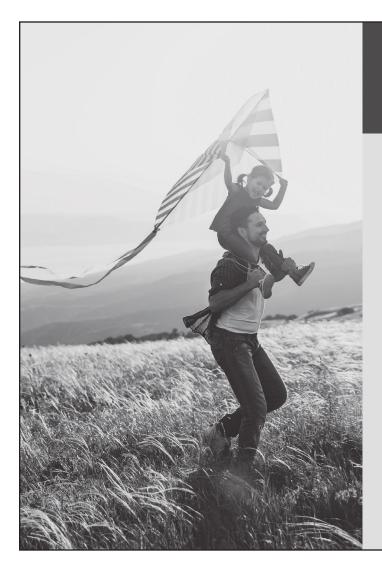
112 adults enjoyed beginner keelboat programs, private lessons, and Discover and Community Sails. Sonars and Hobie catamarans were rented 107 times.

Kayaks and paddleboards were rented 5,855 times.

155 people participated in Wildlife Tours on kayaks, and 209 on Conservation Paddles with Friends of the Bay.

18 students enjoyed Spring Break Science Week.

In addition to 5 full-time staff, the WFC employed 20 sailing instructors, 11 educators and summer naturalists, 6 front desk personnel, 13 dock hands and 8 launch drivers for a total of 63 people.



Dreams Can't Be Realized On A Spreadsheet.

Northern Trust is proud to support The Waterfront Center. For 130 years, we've been meeting our clients' financial needs while nurturing a culture of caring and a commitment to invest in the communities we serve. Because great returns can come from anywhere.

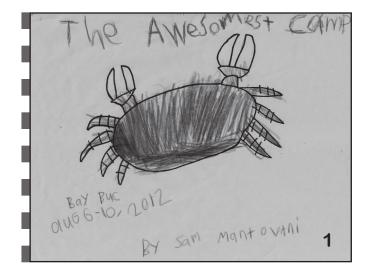
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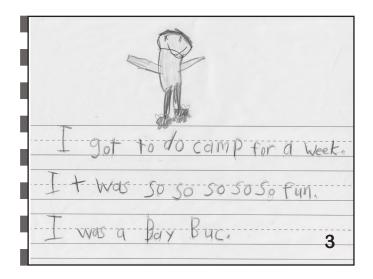
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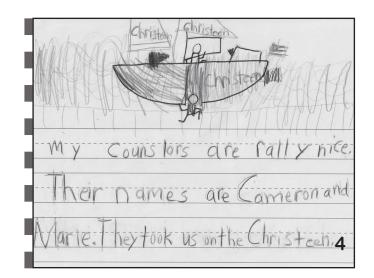


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Water Front Center OVS ter Bay Newyor Have you ever been to the Watter Front Center? Welt 2



Advice for the life you lead



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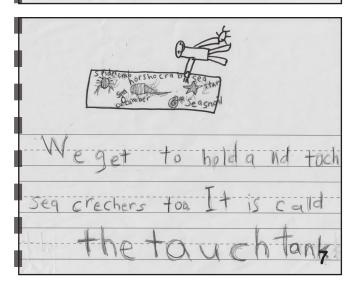
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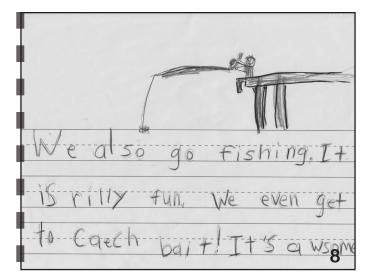
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Peth, Cool Went to the marsh, We did a scavenger hunt and found a musle, 9 Oyster, of horshoe crab molt, and 5



9 Mud Crab that was alive, 6





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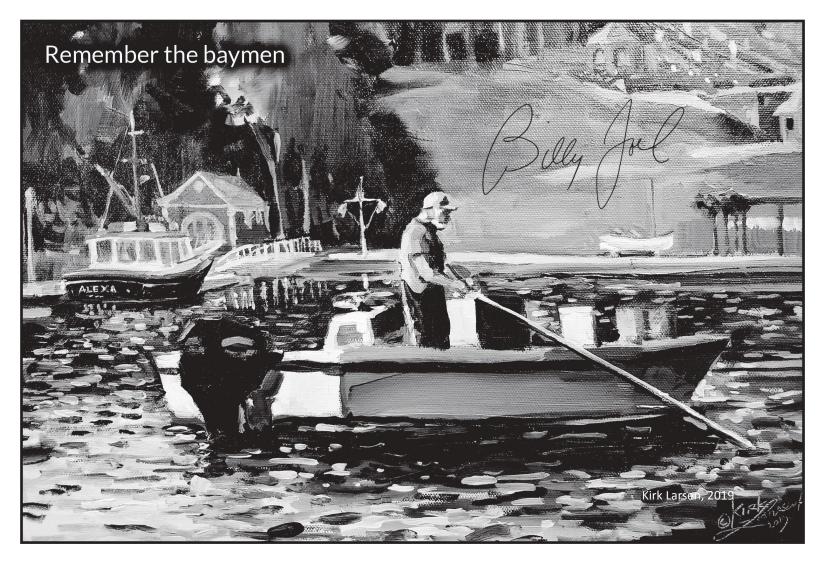
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50 Vext Summer will go Back o the Water Front enter for more fun! 12



What is a Watershed?

How connected to the Bay are you? If you live 5 miles away from the water and can't see it, or maybe don't even enjoy water sports, it's easy to think that you're not connected. You could assume that what you do doesn't affect the bay. But, no! You live in a watershed that is very connected to the bay and affects its water quality.

A watershed is an area of land that catches rain and snow and drains it into a stream, river, lake, marsh, bay, ocean or groundwater. Imagine rain falling on a peaked roof. The water runs down a side of the roof, trickles into a gutter, accumulates along the gutter, swooshes into a downspout and then is guided to the ground or a collection basin. One side of the roof acts as a watershed for one side of the house, and the other side of the roof is a separate watershed.

Oyster Bay is an estuary fed by Mill Neck Creek, the smaller Mill Pond, Beekman and White's Creeks and several artesian (underground)



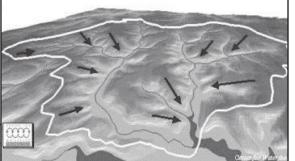


Diagram of a Watershed

streams. Whenever there is a large rainstorm, whatever is washed into them that hasn't been absorbed into the ground (and ultimately into our drinking water supply) eventually gets poured into the bay. This drainage system also transports excess nitrogen from fertilizers and other nutrients and pollutants. It is what connects even the most disconnected landlubber to the bay. So, the quality of our water depends on how we use the watershed surrounding it.

Look how big the Oyster Bay – Cold Spring Harbor watershed is. If you live anywhere in it, you're connected to the water!

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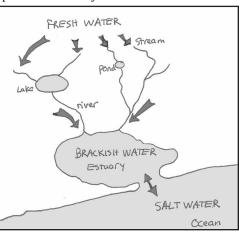
BOAT STORAGE



What is an Estuary?

Oyster Bay is an estuary, a partially enclosed body of water where fresh water from streams and rivers in our watershed mixes with seawater before flowing into Long Island Sound and the open ocean. Estuaries are dynamic environments where salinity levels vary according to the daily flow of tides, the outpouring of rivers, rainfall and evaporation by the sun. In these brackish waters a wide variety of animals live such as stationary filter-feeders, snails, crabs, worms and fish. Estuaries are also homes to many kinds of birds, amphibians and land-based plants and animals. They are among the most productive ecosystems on Earth.

Different habitats border the estuary and contribute to its biological diversity. The intertidal zone along the shoreline (the area of land between high and low tide) presents alternating wet and dry conditions. Tide pools may exist between sand bars or mud flats where water is trapped after high tide. Some estuaries, particularly



the ones bordered by barrier islands, may have patches of sandy beaches along their edges. As in Oyster Bay, salt marshes along the perimeter and next to freshwater outlets are particularly significant contributors to the health of estuaries, acting like filters to absorb pollutants from upland sources and helping to deter erosion.

Estuary Rap

By Charlotte Baumann, 2017

The bay is the place where you want to be.

It's filled with all the creatures that you could see.

It has salt water,

Maybe fresh.

The river is the key to the treasure chest.

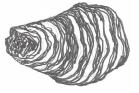
Fishes and animals stay and play

When the high-above birds laugh and say

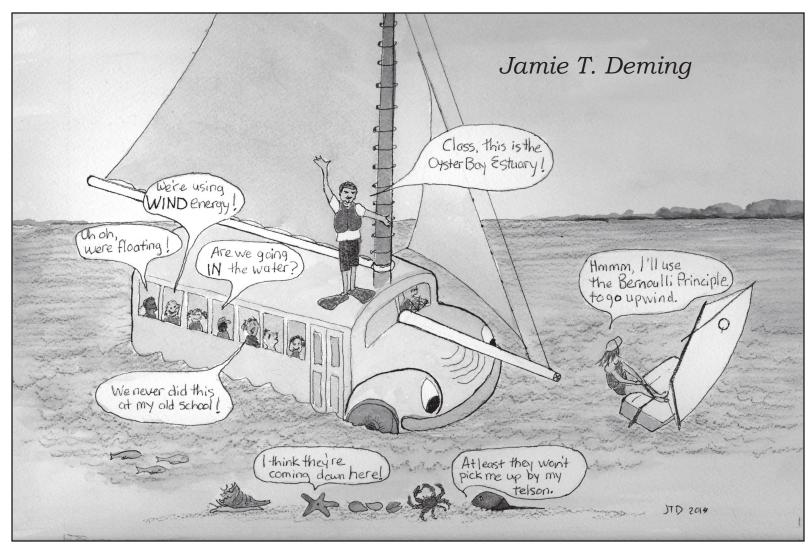
The bay is their home and it's so clean today,

So let's do our best to keep it that way.

Chirp, chirp, YAY!







Archie and Bernie

What do Archemedes and Bernoulli have in common? The principles they defined are what make sailboats work! Archimedes figured out what makes things float, even when the materials they are made of by themselves are not buoyant. Bernoulli investigated fluid dynamics and devised a theory that when applied

to air explains how foils, like sails, can take advantage of differences in pressure to lift an object.

These two STEM geeks contributed scientific theories that we use to engineer objects that seem to defy natural forces. Their theories inform how ships were designed for war, exploration, trade, passenger transit, racing, and even leisurely recreation. Archimedes was an Ancient Greek mathematician, physicist, engineer, inventor, and astronomer, (STEM geek), born in 287 BC. It is said that he was taking a bath one day when he noticed he had displaced a lot of water in the tub, so he began thinking about measuring objects by measuring the water they displaced. He asked many questions, made many observations, and was later declared the founder of hydrostatics, the study of flotation.

What Floats Your Boat?

What happens when you put a ball of modeling clay in water? It sinks. But, by changing its shape, can you make it float? This is a good way to start a conversation about buoyancy. If you can change the shape of the clay to make it float, then start adding pennies as cargo. What shape of the same amount of clay can carry the most

pennies before sinking? More to ponder. What makes a particular design/shape more successful?

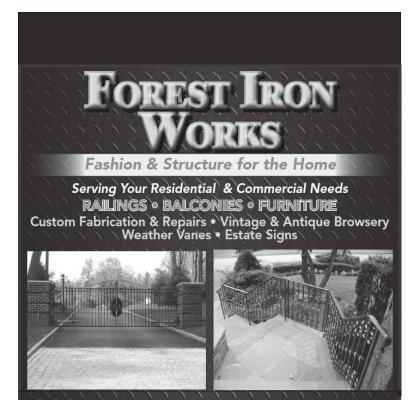
These are the problems Archimedes explored when he arrived at his theory of buoyancy: *a solid denser than a fluid will, when immersed in that fluid, be lighter by the weight of the fluid it displaces.*



Things you know but don't always think about:

1) When you dive deep into the bay, or a pool, let's say to about 7 or 8 feet deep, you feel pressure on your ears. The deeper you go, the more pressure you feel – something you learn a lot about when you scuba dive. Water is heavy, so the deeper you go, the more it is squeezing you from all directions. Deeper is more pressure; closer to the surface is less. Water pressure pushes objects up counterbalancing gravity that pulls them down.

2) If you stretch yourself on your back horizontally on top of the water, spreading your arms and legs and putting your head back, you can float. In this case you are making as much area of your body as possible touch the water, and you're keeping as much of that heavy water as possible underneath you.



Celebrating 55 Years Serving Our Community Visit Our Showroom and Our Website: 3 ELM ST., LOCUST VALLEY, NY 11560 • Forestironworks.com f 516-671-4161 Alternatively, if you make yourself perfectly vertical and straight like a pencil with legs together and arms at your side, you sink below the surface.* Same body, two different shapes in the water settling at different depths.

These phenomena probably remind you of the modeling clay experiment! Flotation depends on different shapes of the same material and the effect of the water pressure at different depths. Scientifically speaking, *the total buoyant force on an object equals the water pressure at its floating depth times the area of the object in contact with the water.* This means that the more area you can give a material, the higher it can ride on the water, where the water pressure is much less.



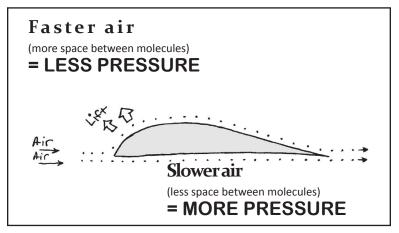
Daniel Bernoulli, born in the Netherlands in 1700, wanted to be a mathematician like his father, but was forced to study business and athen medicine. Nevertheless, he followed his passion, exploring and applying math while contributing greatly to the world of science, medicine and engineering.

* Your body has built-in flotation since it contains a lot of water, plus air in your lungs.

How Sails Work

It's easy to understand how a sailboat moves forward when the wind is coming from behind. The air fills the sails like cloth bowls, and pushes the vessel downwind. In other words, pressure builds up behind the sail and pushes the boat in the direction where there is less pressure. But how can a sailboat go UPwind?

To move upwind, sails have to be in the "pull mode" when air flows past both sides of the sail. The curved shape of the sail bends the air and creates a difference in pressure. Faster moving air on the outside of the curved shape has less pressure than the air on the inside of the curve. The difference in pressure creates lift and pulls the sail forward and sideways. The boat's keel or centerboard prevents it from sliding sideways and helps the hull slice forward through the water.



Objects always want to go where there's less pressure - more elbow room. Just like air that wants to escape the crowded confines of a balloon!

The phenomenon of lift is the result of Bernoulli's Law that states that an increase in velocity (speed) of a liquid or gas results in a decrease in pressure. It is also the principal behind what makes wings lift airplanes and birds. Sails are airfoils just like airplane wings. Getting just the right shape in your sail by steering and trimming properly is essential to using the wind's energy efficiently and maximizing the speed of your sailboat. Watching your telltales and being careful not to luff (unless you want to stop) are important ways to make your sails work like a quiet graceful engine.

The WFC applauds Archie and Bernie for their contributions to STEM and the challenging fun of sailing!

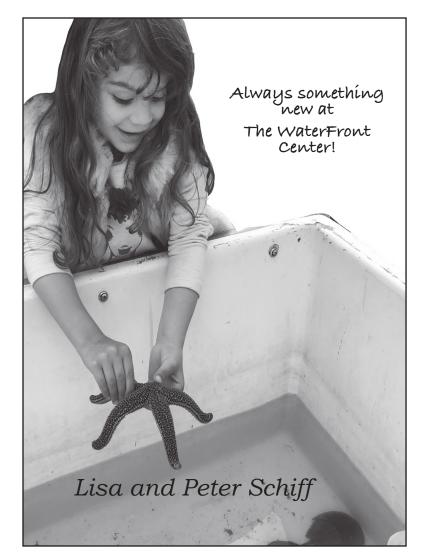
STEMships

Designing boats involves a lot of considerations. Imagine you're back putting pennies in your clay boat. What if you pile them up all on one side? Disaster. Same problem if you step on the side of a dinghy instead of its center. So, center of gravity has many implications for successful boat design. What if a boat is very tall? How far can it tip before tipping over? What is its center of gravity and how can that be changed? (Tip: maybe add a keel?)

These are the questions STEM students must resolve in building model boats out of recyclables and other readily available materials. In addition to applying principles of floatation, center of gravity and wind energy (such as air pressure and Bernoulli's principle), students get to test their vessels in a final competition with their peers.



Allen Underwood, as a 7th grader at St. Dominic's, with his flotsam boat in 2016. Allen is now a WFC jr. sailing instructor.

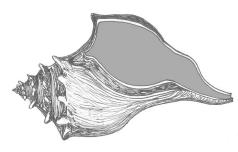


Beach Point Overnight

by Julia Annunziato, 2015

We prepared all summer, practicing on Wednesday nights, for the Junior Sailing Association of Long Island Sound's Beach Point Overnight Regatta. On Wednesday August 13th we left the WaterFront Center heading for Beach Point around 11 am on a J105, and arrived around 2pm. At 2:30 was the skippers meeting where we heard the weather forecast, new rules being added, and that the distance of the race was made 20 miles longer, now making it a total of 70 miles. At 5 pm the race went off; we had a great start and got ahead of many boats in our division.

About one hour after rounding the first mark, we noticed a dark and ominous rain cloud behind us. Learning from our previous encounter with rain at the Dorade Regatta, everyone guickly changed into their fowl weather gear and got ready for the storm that threatened from behind. The rain hit us bringing 20 knot winds with it. With the wind blowing so fast, the J105 healed over to the point that the leeward rail was in the water (broaching). Our spinnaker ripped due to the force of the wind that was pounding the sails. This cost us some time because we had to take down our sail, and put a completely new one. When we finally recovered from the spinnaker fiasco, we set our course for the second mark. On our way to the second mark our second



spinnaker ripped in the heavy winds that surrounded us. Fortunately, we had a third spinnaker on board that we were prepared to use.

Starting at 10 pm we all had shifts

for sleeping and shifts for sailing. John Brendel, Nick Sequino, Adam Fried and I were shift one, so we went down first. Nick Manfredi, Justin Oh, and Richie Kertatos had shift two, so they went down after us. We all were up on deck by 5 am in layers of warm clothing because the wind chill on the water sent shivers through our bones. We got to watch the beautiful sunrise rippling the water, sending orange and pink through the sound.

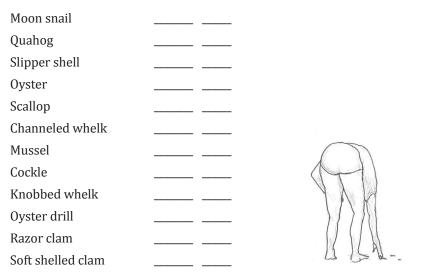
We finished the race at 6:30 am. By then after the 13 ½ hours, everyone had done almost every job there was to do on the boat. We took turns taking over people's jobs while they were below deck, and made sure everyone was comfortable doing certain jobs. People shuffled around getting to practice jib trimming, mast, pit, trimming the main and skippering. We got back to the WaterFront Center at around 9am in the morning. I thought the windy experience was fun, and I can't wait until next year to do it again!

Going Shelling

I t is practically impossible to walk along the shore and not stoop down to pick up a variety of beautifully shaped shells. It's irresistible! But do you stop to think about the animals that once lived inside these shells? Shells are the external skeletons of Mollusks, soft-bodied (invertebrate) creatures that may be carnivorous, herbivorous or parasitic.

Gastropods are single-shelled animals with a head (with antennae and a mouth with a raspy toothy tongue), foot and visceral mass. Bivalves have two shells joined by a hinge allowing them to open and close.

Go for a walk through this LOG and see if you can find the following shells. Mark the page number where you find them and write "G" for gastropod or "B" for bivalve. The answers are on page 68.



The IDA MAY is Coming! (Really!)

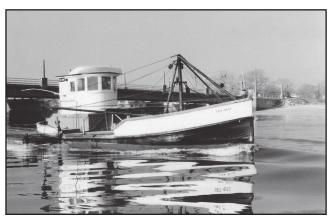
Construction of the 50 ft wooden *Ida May* is nearing completion in Building J on the Western Waterfront! It has been 11 years since the project began, but progress was halted at different times due to funding and the Covid pandemic. Moreover, the workforce is made up of volunteers and part-time professional shipwrights who worked a two-day week most of the time.

The *Ida May* is a replica of one of the first engine-powered oyster dredges that played a role in the industrialization of the oyster industry

in Oyster Bay. She represents the transition from harvesting under sail in oyster sloops (such as *Christeen*) to the modern dredges we see today. The original *Ida May* was built in Bayville in 1925 by Franklin Flower and harvested oysters for Frank M Flower and Sons for 75 years before being donated to The WaterFront Center in 2003. Unfortunately, she had deteriorated too much to be restored, so plans were drawn to build a replica and make the



necessary adjustments so she could be a passenger vessel, suitable for education purposes. Funding for the project has come from donations from local individuals and foundations as well as New York State grants.



Building the replica of the *Ida May* is a project of the Christeen Oyster Sloop Preservation Corp, a not-for-profit 501(c)3 organization. (This organization restored *Christeen* in the 1990s.) The mission of the Christeen Corp. is to preserve Oyster Bay's maritime heritage by involving the community in traditional boatbuilding.

Here are some photos of the construction of the *Ida May* from 2011 to the present.



Cutting planks on the saw mill. December, 2011



Bringing the keel into Building J, December 2011

The original Ida May at the WFC, 2008



Making patterns for frames from lofted lines.



Making frames of white oak, 2012.



Attached bow frames, 2012.



The bow of *Ida May*. October, 2013.

Progress on framing in 2012.





Stern in 2014.

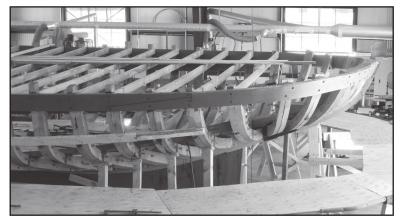




Steambox used to soften and bend stringers and planks. 2014



Bilge stringers, floor boards, keelson, October 2014.



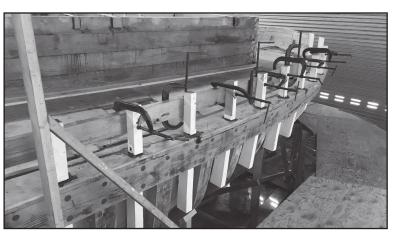
Sheer strake and frames, October 2014.



Knees, ceiling planks, deck beams, November 2017



Curved staircase below Pilot House, 2019



Base of Pilot House and bulwarks, March 2019

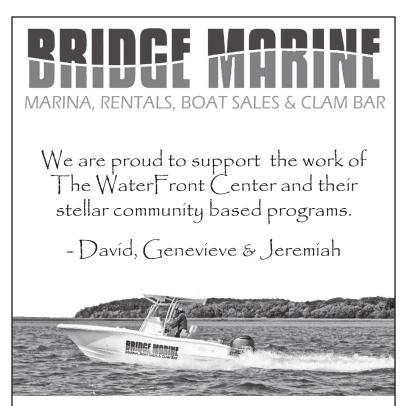


Propellor shaft and rudder, April 2019





Pilot House framed, September, 2019



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The Near Future

Once she is completed and receives her Coast Guard certification, the new *Ida May* will be turned over to The WaterFront Center to serve as *Christeen* does, taking the public out on the water.

As a powerboat, the *Ida May* will give the WFC greater flexibility for programs, taking advantage of a stable, flat, open deck that can accommodate 40 to 44 passengers, 20 more than *Christeen*. As a floating classroom, she will bring school groups out on the water for educational programs focusing on the estuary environment, aquafarming and maritime history. Her deck will accommodate two or three learning stations such as a touch tank, water quality activity, a place to view plankton through a microscope, etc. Having a small dredge with a winch will make hauling in samples from the bay's floor easier than pulling a dredge up by hand. It will also demonstrate how baymen use dredges on commercial harvesting boats in our area.

There are advantages to having a boat powered exclusively by an engine. Since the *Ida May* will not be setting sails as on the *Christeen*, we will be able to depart a dock or mooring more quickly and get to the intended location to get to work without as much consideration for wind and current. Students can learn about how sailing dredges contributed to the oyster industry on the *Christeen*, as well as how powered vessels enabled farming on the bay to evolve to today's practices.

The *Ida May* will also be able to take people out fishing. Like *Christeen*, she will be available for public tours of the harbor and for private charters and corporate events. With her Coast Guard certification, she will be able to travel to other ports to bring education programs and access to the water to farther-flung schools and groups.



IDA MAY will allow more people access to the wonders of Oyster Bay for both education and recreation! She will be a wonderful advocate for the preservation of the marine environment and the historical, economic and environmental significance of shellfish farming. As a wooden vessel, built by local shipwrights and volunteers, she will be a reminder of what can be accomplished using traditional materials and lots of patience and hard work. Left: Planking the deck, 2021 Right: Pilot House in 2021

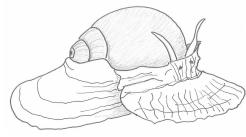






Predators of Oysters and Clams

Oyster Bay has a great diversity of animals living under water. Because of our local shellfishing industry, we focus on predators of oysters and clams. Aside from humans that are the greatest predators on earth, several other animals kill bivalves to satisfy their hunger in these waters. Here are a few local predators of oysters and clams.



Moon Snail Polinices lewisii

The moon snail is a large gastropod (which means stomach-foot) that is often found partially buried in sand and muddy beaches. Its shell can get as large as 5 inches and its fleshy foot can extend to 12 inches! Attached to the foot is an operculum, a horn-like oval object that serves as the snail's trap door. When the snail retreats fully into its shell, the operculum closes shut to protect it.

The moon snail primarily feeds on clams which it reaches by digging in the sandy bottom with its large foot. It drills a hole in the clam's shell near its hinge with its radula and sucks out the contents in the same way an oyster drill attacks an oyster.

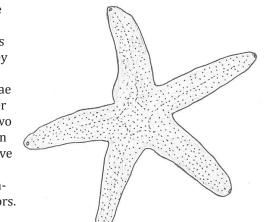
The moon snail's egg cases are unique. Commonly called sand collars, they look like part of a ceramic bowl. They are actually made of snail eggs sandwiched between layers of mucus coated with sand.

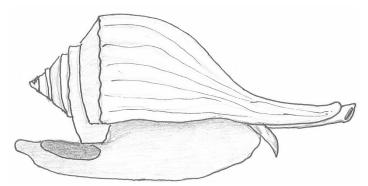
Sea Star Asterias rubens

The sea star is a predator of oysters, clams and other shellfish. Though often called a star fish, it is not a fish, but a radially symmetrical echinoderm. On the top side of the five legged sea star is a spiny hard skin. Each arm or ray has tiny hollow finger-like gills and an eye spot at the tip. The body is a flat disk in the middle.

On the underside of each ray are several rows of tube feet with suckers. In the middle of the body is the mouth. To eat, the sea star wraps its legs around its prey to open its shell. Then, it pushes its stomach out through its mouth into the shell, where it digests its contents externally before retreating back into its own body.

Male and female sea stars reproduce by expelling sperm and eggs into the water where they drift around. If fertilization occurs, the tiny larvae swim in the sea like other zooplankton for about two months before settling on the bottom. Sea stars have the ability to regenerate their legs if they are damaged or eaten by predators.





Knobbed Whelk Busycon carica Channeled Whelk Busycon canaliculatum

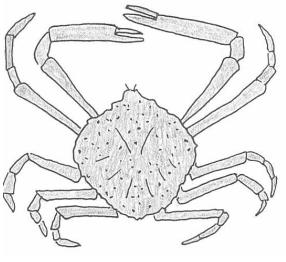
Whelks are gastropods with a single spiral shell and soft body. The channeled whelk has five to six whorls with very small "beads" along the whorl edges rather than the knobs found on knobbed whelks. Knobbed whelks can grow to 9.5 inches long, whereas the channeled whelk matures to about 7 inches.

Whelks look peaceful and harmless, but are actually predators of clams and other bivalves (mollusks with two shells). They generally eat a clam a month. They have a strong sense of smell that helps them find food. Whelks use the lip of their shell as a saw and wedge to open the shells of bivalves like oysters and clams with the aid of their muscular foot. They can also bore through shells with their radula (a rough toothy tongue-like organ). They use their proboscis, a tube-like tentacle, to eat the flesh inside.

Whelks move like snails slithering along the bay's bottom. Their egg cases look like pill boxes and are connected in beautiful long strings that the female whelk anchors in the sand. Each capsule can hold up to 100 eggs, and a small hole at the top allows the larvae to escape.

Spider Crab Libinia emarginata

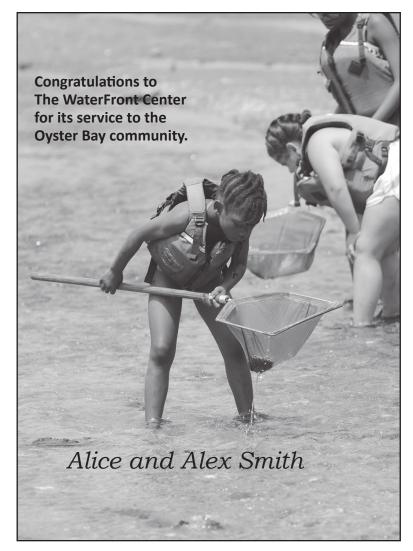
The spider crab is a scavenger. Though sluggish, it is an aggressive predator of young shellfish, especially oysters, as well as sea urchins, sea stars, worms and dead animals left over from the kill of other predators. Its relatively small round body can grow to 4 inches in diameter. The hairs on its shell attract algae, barnacles and debris which help camouflage it. With its ten long



body. The females use the apron to brood their eggs (sometimes thousands at a time) until they hatch.

spidery legs the spider crab walks sideways - like all crabs.

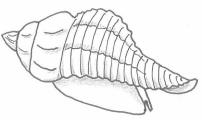
Spider crabs have an apron, or abdominal flap, that is part of the exoskeleton (shell) on the underside of the body. The males have a long narrow apron and the females have a rounder and wider one that often covers the entire underside of her



Atlantic Oyster Drill Urosalpinx cinerea

The oyster drill is a snail with an elongated spiral shell that looks somewhat like a whelk's. This small creature is a huge menace to oysters and clams. It secretes a chemical that softens the shell of its prey and then drills a round hole through the oyster's shell with its radula, a long toothy tongue. Then it inserts its proboscis, a tube-like extension, and feeds on the soft oyster meat. Although it prefers young oysters, the oyster drill also feeds on mussels, barnacles and even crabs.

The oyster drill's eggs are laid in rounded vase-like capsules that are attached by a narrow stem to a solid object. Spawning takes place all summer, and the larvae emerge as tiny crawling snails in 6 to 8 weeks. Because these prolific predators of oysters prefer



a salty environment, oyster farmers cultivate their young oysters upriver or in more brackish waters before relocating them to beds in saltier waters.



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B

The WaterFront Center By Chase Hahn, 2009 First Mates 4

I am the wind that fills the jib. I am the net being dragged through The water filling with shiners. I am the crabpot being pulled up Onto the Christeen. I am the blue crab trying to pinch Jim. I am the line being tugged by a giant fluke. I am the great blue heron wading in the eel grass. I am the WaterFront Center.

Anonymous Sponsor

and the second side of

Mary McAllister, 2011

Mary McMister

Always something going on at The WaterFront Center!

KPC

The Dooley Family

Lucy Kelly, 2021



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and the States

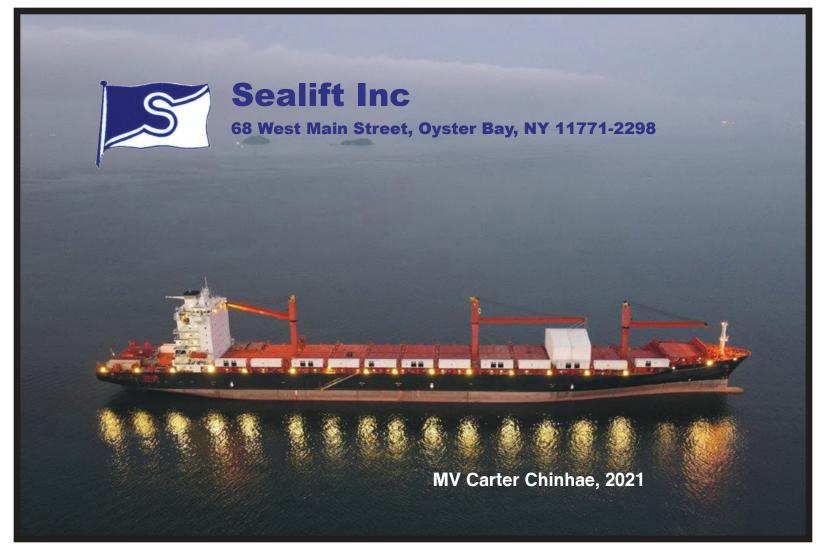


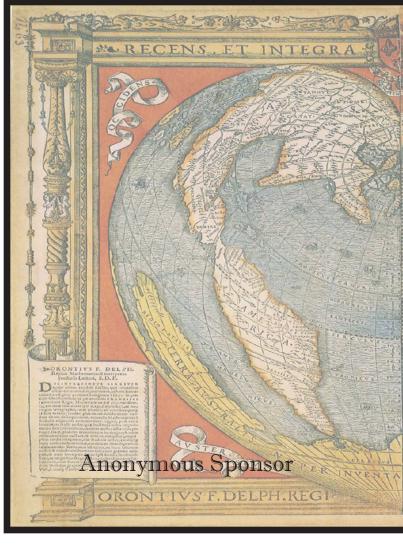


"Alive and Well"

Betsy Lawrence, 2020

Betsy and Hunt Lawrence





ORBIS DESCRIPTIO

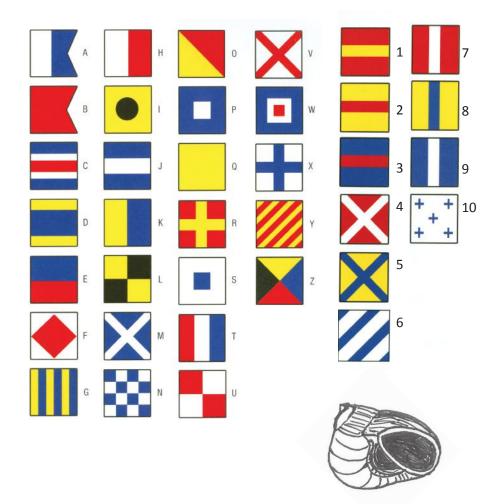
A Map of the World By Ted Kooser

One of the ancient maps of the world is heart-shaped, carefully drawn and once washed with bright colors, though the colors have faded as you might expect feelings to fade from a fragile old heart, the brown map of a life. But feeling is indelible, and longing infinite, a starburst compass pointing in all directions two lovers might go, a fresh breeze swelling their sails, the future uncharted, still far from the edge where the sea pours into the stars.

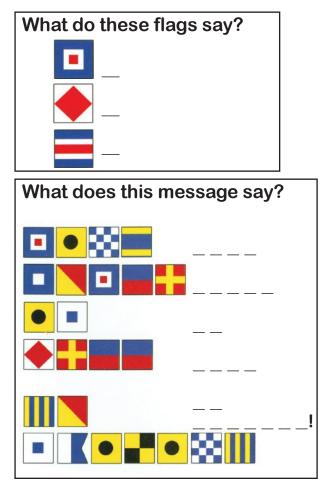
MATHEMATIC⁹ FACIEBAT.

39

International Code Flags



Signal, or code, flags are used to communicate visual messages, often when audio is not available or practical.

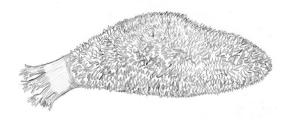


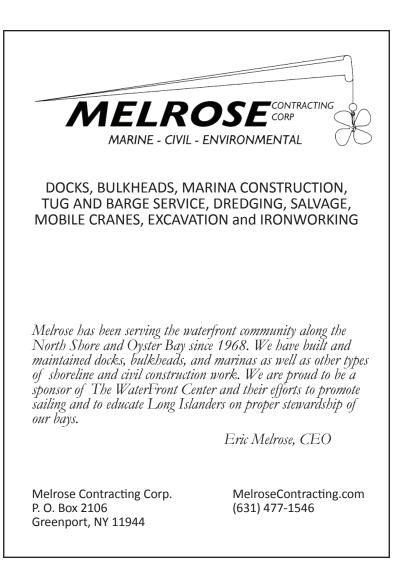
Rear Mike and Danielle

Thank you for bringing us on the 60ats And helping us raise the soils Thank you for teaching us about seq animoles Like When a fish comes to get a sech cucumber. The sea cuchmber pees on the fish. And if the fish is still trying to get the sea cucumber. It throws up on the fish. Than the fish go away:

ove Joi

Deasy School, 2016





Sailing in Choppy Water

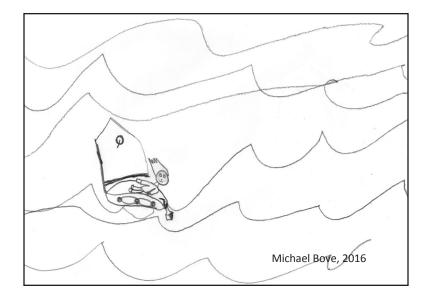
By Maria Torti First Mates, 2011

The water was so choppy that I felt I was going to capsize. I was sailing on a beam reach when suddenly Alex asked me to sit on the rim of my boat. I was a little scared at first but I soon got the hang of it. I was not even scared when a big wave came over. Some of my fellow classmates were a little scared but I told them there was nothing to be afraid of. It was just the waves. They were throwing sailors off balance. Alex gave me a lot of compliments because I was doing so well.

The next drill that we did was a drill where you had to tack whenever Alex blew his whistle. I was doing great, but then just as I was about to do another tack, I heard a crack! I inspected my boat, but as I was looking at my stern I couldn't find the rudder. Then I realized that my rudder had fallen off. I called for John to ask him for help. John raced over to me. As he held onto my sailboat, I tried to put my rudder back in. But the waves were pushing the rudder. So, I held onto John's boat while he tried to put my rudder back on. He did it! I thanked him and was back to sailing.

Next thing I knew, Alex told us to start heading back to the docks. A few minutes later I was derigging. I was glad to be off the sailboat because my arm hurt from moving the tiller and my bottom hurt from sitting on the rail. I was surprised to see that I had learned how to sit on the rim of a sailboat in just three hours. But I was sad because I wouldn't get choppy water like this every day, and that I only had one more week to find out. I sure had learned a lot so far.

Not to be scared when you go fast.
Your boat is supposed to tip a little.
The worst part if you capsize is that you will get wet.



Molting

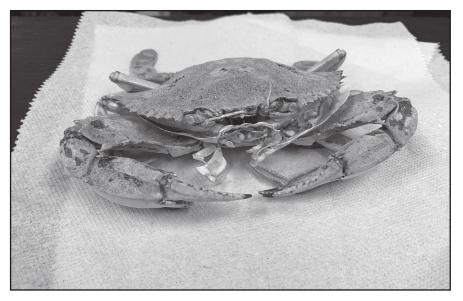
When we grow, our bones get longer and thicker and our flesh and organs expand around them. Our skin grows with us and is elastic to accommodate all the expansion we need – even if we're obese!

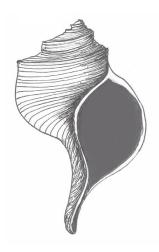
But what if you're a crab? Or a horseshoe crab? Or a lobster? These arthropods have exoskeletons (exterior instead of inner skeletons) that are hard and protective but do not expand as the animal grows. So, the animals have to molt. They actually grow successive layers of expandable exoskeletons underneath their old shells and shed the old layers.

Molting is controlled by hormones. The exoskeleton of arthropods, made up of calcium and a protein called chitin, is excreted air to stretch its new pliable soft exoskeleton to a new size before the tissues underneath harden it.

Just prior to molting, crabs become sluggish and usually seek shelter to protect themselves from predators when their new shells are soft. They can't move very well immediately after their molt because their limbs are also soft. Many crustaceans eat their old exoskeletons to absorb the calcium salts in them. If they have lost a limb, a new one can be regenerated underneath newer exoskeletons. That is what happened to one of the rock crabs in the WFC basement! It lost a front claw and was placed in the nursery tank to recover. After a couple of molts, it had a new claw.

by tissue layers underneath it. When it's time for a new size, this tissue layer detaches from the hard shell and begins to secrete a new exoskeleton. When the underneath shell gets too big and more solid, cracks in the outer shell split it in strategic places. The arthropod then slips out of the old shell, leaving it intact. Crabs, lobsters and horseshoe crabs do this differently, depending on where the cracks are for their escape. The arthropod then takes in lots of water or





Skilletfish

ruess who came up from the depths attached to an oyster in **U***Christeen's* demonstration dredge last summer! An actual finfish who had the option of swimming away, but who stayed suctioned to the shell. It's a skilletfish, and he or she now lives in a WaterFront Center aquarium in the basement of Building G.

The skilletfish is a cute little fish that is shaped like a frying pan with a large head and rounded body. Its eyes are on top of its head, and it grows to about three inches overall. Its most unusual feature is a powerful sucking disk on the underside of its forebody formed by modified pelvic fins. This is what it uses to stick to rocks and oyster shells.

Skilletfish live in shallow waters in estuaries along the coast of New York and New Jersey and as far south as Brazil. They find protective habitats on oyster reefs and eelgrass beds. The female lays a few hundred sticky amber-colored eggs in an empty oyster shell between April and August. Then the male protects them until they hatch, displaying admirable parental responsibility that is unusual in the marine underworld!

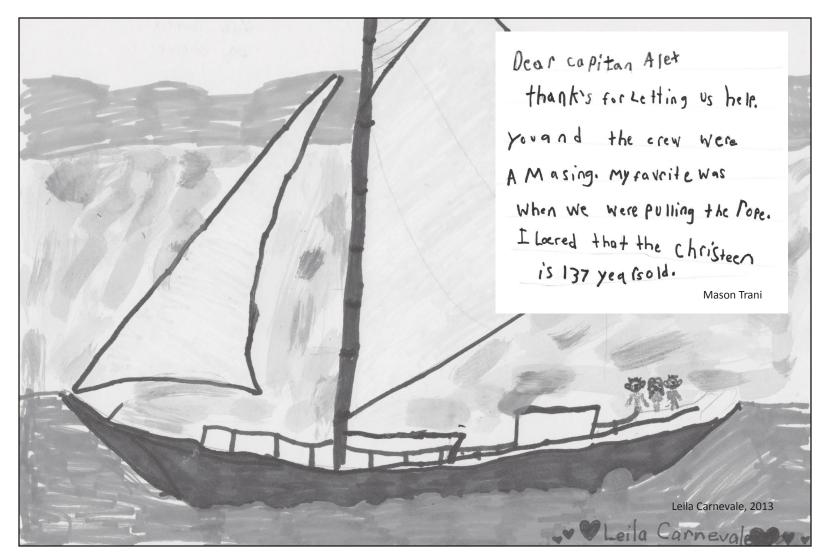




WFC Word Scramble

NORHAC	(_)
LACSLOP	(_)
PINARSKEN	(_)
SROAN	(_)
FRETONTAWR	(_) (_
PIAHOXY	(_)
CANEBARL	(_)
RUNDELOF	(_)

Answer is on page 68.





A Balancing Act

Having the right amount of oxygen in the water is essential for all the creatures who live there. Fish and shellfish "breathe" by getting oxygen from the water with their gills like we get oxygen from the air with our lungs. Imagine if there wasn't enough oxygen in the air to keep us alive? Same challenge for fish, shellfish, zooplankton – all those consumers down there in the aquatic environment.

So how does oxygen get into the water and air? Plants, the producers, provide it through photosynthesis. In the water, that means phytoplankton, seaweeds and algae. With energy supplied by the sun, plants absorb carbon dioxide, water, and nutrients like nitrates, and combine them to form living tissue (more plant tissue) while giving off oxygen. Since about 70% of the earth's surface is covered by water, aquatic plants play a huge role in producing oxygen and absorbing carbon dioxide.

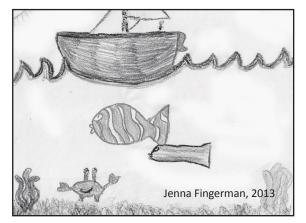
Where there are lots of nutrients and sunshine, aquatic plants thrive. Nitrogen, in particular, is like fast food for algae. It's in fertilizers that people use on lawns, golf courses and farms, outflows from sewage treatment plants, and leaky septic systems that drain into estuaries.

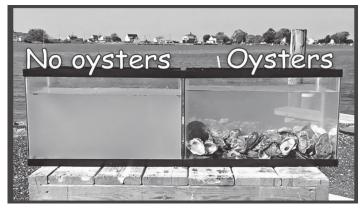
In estuaries like Oyster Bay, there's always a balancing act between having too much or not enough algae in the water. We want there to be enough to photosynthesize and feed the filter-feeders and other types of herbivores. However, we don't want TOO MUCH algae because if there's a population explosion of algae, or an "algae bloom," they crowd each other out and die. Then, decomposers take over – bacteria and fungus. When decomposition occurs (imagine all that dead algae rotting on the bottom of the bay), oxygen in the water gets consumed and carbon dioxide is released. The process actually reverses the benefits of photosynthesis. In the worst case, hypoxia can occur when oxygen levels are really low. When that happens, all the animals like oysters, clams, crabs, snails, finfish, etc. can't survive.

If the water gets cloudy from too much algae, sunlight cannot penetrate far enough to support plants growing at greater depths. This also affects the animals that eat those benthic plants, including waterfowl.

And that's not all: When there's too much carbon dioxide in the water, the ph balance drops and you have acidification which leads to other problems like reducing the ability of shellfish to absorb enough calcium to make their shells. In areas where there's been too much nitrogen loading and hypoxia, eutrophic zones develop where toxic sediments on the bay's bottom become lifeless black mud.

There are ways to solve the algae balancing problem. One is to reduce the amount of nitrogen that gets dumped into the bay. Another is to grow more oysters and clams that gobble up excess algae!





Notice how effective the oysters are in filtering out the algae in the water!

Cliff Notes

The right amount of algae:

- Produces oxygen
- Absorbs carbon dioxide in the water
- Provides food for oysters, clams and other herbivores

Too much algae:

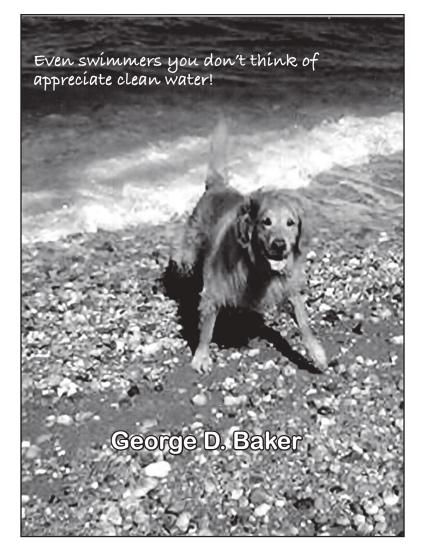
Clouds the water, keeping sunlight from reaching plants lower in the water column

Can result in an algae bloom, death and decomposition that

Reduces oxygen

Increases carbon dioxide

Causes acidification



Current Troubles in Oyster Bay

O ysters and clams improve the water quality in estuaries like Oyster Bay by filtering out algae. An adult oyster filters about 50 gallons of water per day, and clams, slightly less. If you've ever heard of the Billion Oyster Project in New York Harbor, you got the point. The more bi-valves, the better! Unfortunately, the shellfish population in Oyster Bay and Cold Spring Harbor has declined precipitously in recent years.

Everyone agrees that farming shellfish for our food supply and economic gain is desirable, and Oyster Bay has been historically very productive. However, there are many disagreements about what constitutes sustainable farming practices, how shellfish are harvested, how public areas of the bay are affected by commercial farming, and other topics.

The Town of Oyster Bay governs the bottom of the bay and for the last several decades has leased 1,500 acres, about 55% of the area, to a commercial shellfish farm, Frank M. Flower and Sons, Inc. The current 30-year Flower lease is set to expire in 2024. The rest of the area, public lands, are available for harvesting (mostly clams) by licensed baymen (most of whom are associated with the North Oyster Bay Baymen's Association, NOBBA) as well as licensed recreational clammers.

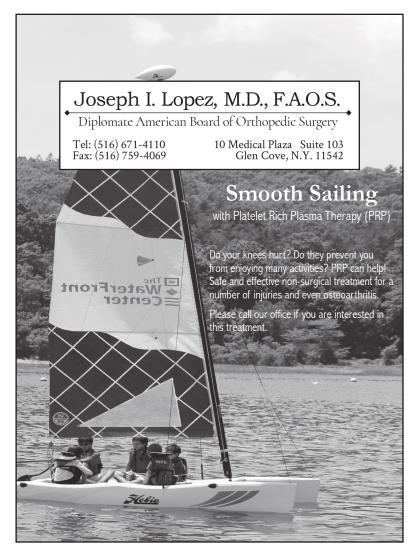
Since 1887 Frank M. Flower and Sons, Inc. has farmed oysters and clams in Oyster Bay. The company cultivated shellfish in their hatchery on Mill Neck Creek and then planted 80 to 100 million oysters and clams on marked beds in the bay every year. Flower's staff would continually monitor the beds to identify disease, calculate survival rates and mitigate predation. Since it takes oysters 2 years and clams 3 to 4 years to grow to market size, at any given time there could be about 250 million oysters and clams growing on the bay's bottom. Not only could they filter 10%-20% of



the volume of Oyster Bay each day, but also spawn, and their progeny, carried by the currents, added to the stock outside the leased grounds.

In recent years the shellfish population in Oyster Bay has suffered serious decline. On public lands overharvesting by baymen and increased populations of predators (especially moon snails since 2018), were most responsible for the reduction of clam stock. On Flower's leased grounds, the oyster and clam harvests were also devastated by predators, especially moon snails and oyster drills. The company closed its hatchery on Mill Neck Creek in Bayville in late 2019 citing diminished profits, the looming expiration of the Town lease in five years and uncertainty over the terms and locations of a new lease. So, for two years now, the usual 100 million oysters and clam seeds have not been added to the bay by Flower oyster company, while they have continued to harvest what was already growing during that time. That is a dramatic reduction in filter feeders contributing to our harbor's water quality!

In 2019 the town of Oyster Bay opened a hatchery in a 950 sq. ft. prefabricated building in the marina just east of Theodore Roosevelt Park. In 2020, the town reported that it planted 2 million





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clams and 300,000 oysters on the public grounds. In 2021, it indicated it planted 10 million clams and 2 million oysters purchased from other hatcheries. With hopes of expanding their hatchery, the Town of Oyster Bay aims to produce 30 to 40 million seed each year to plant in Oyster Bay. \$3 million was set aside in the Town's budget for this purpose.

During the summer of 2020 the Town of Oyster Bay issued a Request for Proposal (RFP) looking for at least three companies to plant and harvest shellfish on 800 acres of Oyster Bay and Cold Spring Harbor. That is slightly more than half of the area previously leased to the Flower oyster company. The RFP also reduced the term of the licenses from 30 years to 5 with options to renew. This makes it difficult to plan ahead and invest, especially if it involves building a new hatchery, establishing beds and seeding for a crop that takes two to four years to be ready for harvest. Three companies responded, but the Town rejected the proposals and rescinded the RFP, citing the need for more sound financials to protect the taxpayer. The Town is currently working with a company that is proposing off-bottom aquaculture (growing oysters in bags or cages suspended off the bay's bottom) on 150 acres outside the Flower lease areas. These are the big questions: Since the Flower oyster company seeded 80 to 100 million oysters and clams annually that are extremely beneficial in filtering algae and extracting nitrogen from the water, how will the environmental benefit of their commercial activity be replaced? How should oysters and clams be harvested without harming the bay's bottom? What amount of acreage is necessary to make a commercial farm sustainable? How much of the bay should be set aside for sanctuaries to support habitat enrichment where no harvesting is allowed? How much should be designated as public grounds for licensed baymen to harvest, and how should they be seeded? Will there be harvesting limits on public grounds? Can the predators be controlled? Should government agencies run shellfish hatcheries, and what is the cost to taxpayers? In addition to the economics and politics surrounding these issues, what will be the effect on the water quality of the bay?

The Town of Oyster Bay is working on a Water Resources Guidance Draft that is similar to a bay management plan, and it promises to create an advisory committee of environmentalists and stakeholders. The draft includes many strategies recommended by Friends of the Bay (see Letter from Friends of the Bay).

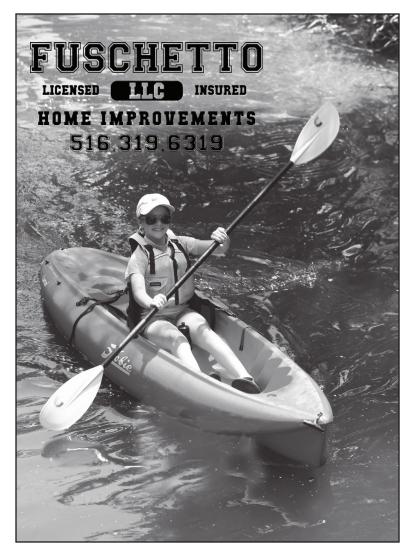
All eyes are on the Town of Oyster Bay to see what their plan is for managing the harbor and what their revised RFP will be.





Cooper Bluff is Oyster Bay's only waterfront bar, situated right on Oyster Bay Harbor. A fun vibe and beautiful views make Cooper Bluff the place where you'll want to anchor down and drink up all summer long!

> Located at Oyster Bay Marine Center 5 Bay Ave. Oyster Bay, NY





A letter from Friends of the Bay

This letter is an alert to all who appreciate the ecological and scenic value of Oyster Bay and Cold Spring Harbor – those who enjoy the views, spend time on the beaches or cruising, sailing, fishing or paddling on the waterways.

Most residents know that regional water quality has been improving since environmental legislation was enacted in the 1970s, bringing upgraded sewage treatment and other strategies to reduce pollution.

But what many people in the area don't know is that our shellfish population, particularly our namesake oysters, has suffered a serious decline. And fewer oysters and clams, which filter the water, means dirtier water and a threat to the livelihood of commercial harvesters and the health and enjoyment of recreational users.

To deal with the problem, several steps should be taken. Friends of the Bay's leadership met recently with Town of Oyster Bay officials to share our recommendations on shellfish management. The town was very receptive to our suggestions and had already planned to implement many of them.

Friends of the Bay believes the following steps must be taken to improve the health of the bay and make the shellfish population sustainable for the long run:



• The amount of acreage that the town will make available for commercial shellfish harvesting from the bay bottom should be reduced under a new licensing plan to be implemented when the current lease expires in 2024.

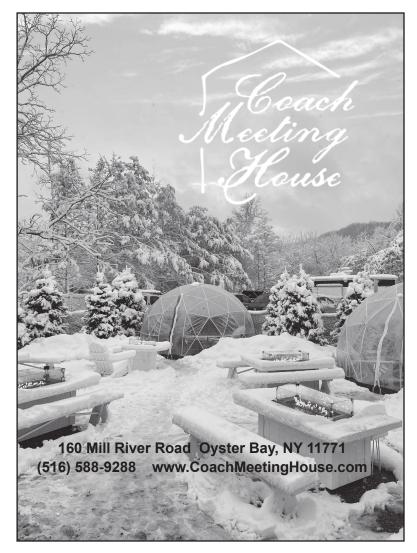
• The town should increase the number and size of shellfish sanctuaries where no commercial or recreational harvesting is allowed. Protected acreage must be of sufficient size and quality to support a sustainable shellfish population large enough to provide the ecological benefits of a healthy marine ecosystem – water filtration, reproduction to seed the rest of the bay, erosion control, and food and habitat for other species. (To date, the town has set aside only two small areas on the North Shore: a conservation management area in Oyster Bay and another in Cold Spring Harbor that includes a spawner sanctuary.)

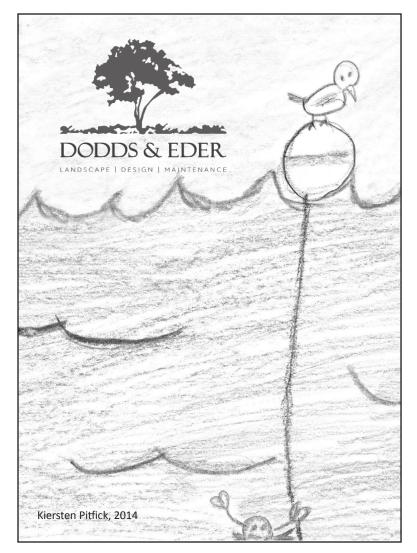
• The number of juvenile shellfish seeded into the bays by the town and shellfish growing license-holders needs to be increased. The quantity of seed should be based on the size of the area licensed.

• "Off-bottom aquaculture" (shellfish cultivation in bags or cages) must be allowed and encouraged to preserve Oyster Bay's shellfish legacy without damaging the bay bottom. (The town issued a request for proposals to license 150 acres deemed unproductive for off-bottom aquaculture. That acreage is outside the 1,500 acres currently leased. The town is working with an entity that responded to the RFP. Additional acreage should be considered for off-bottom cultivation.)

• Any company or individual that receives a town license to cultivate shellfish should be required to provide seed to the town for planting in a designated sanctuary or conservation management area in Oyster Bay or Cold Spring Harbor in any year that they harvest. (As urged by Friends of the Bay, the town has included this requirement in its request for proposals for new licenses.)

• Wetlands restoration and the creation of oyster reefs are needed to protect existing wetlands and reduce shore erosion. A town shell-recycling program to retrieve shells from restaurants should be the first step toward the creation of these oyster reefs. Recycled shells can help return unproductive bottom land to viable oyster habitat by providing a home for seed oysters.





• Creation of a comprehensive plan for managing the bay must be a top priority. Friends of the Bay has encouraged the town to create a bay management plan with an advisory committee of representatives from user groups, environmental organizations, and experts in bay management and water-based industries. (The town has been developing a plan and will establish an advisory committee. The town has already prepared an outline for a scoping plan for a Water Resources Management Strategy.)

The state Department of Environmental Conservation tracks shellfish harvests and their reports suggest that these resources are in grave danger. Both clam and oyster harvests have plummeted in recent years – even allowing for the decline in restaurant purchases during the COVID-impacted 2020 season. The state reports show that oyster harvests peaked in 2013 and have trended downwards since, while clam harvests have fallen steadily since 2016 except for a slight rise in 2019.

A major revelation and warning sign was the fact that two years ago, for the first time, oysters served at the Oyster Festival had to be imported from Connecticut rather than harvested from Oyster Bay.

The cause of the decline is likely a combination of harvesting beyond sustainable levels; reduced seeding of juvenile shellfish; warming water from climate change, which makes the water more acidic and dissolves the calcium in shells; stormwater runoff that carries oil, sediments and other pollutants into the harbors; predators and disease.

A viable shellfishing industry with increased oyster and clam populations in Oyster Bay and Cold Spring Harbor will help improve the water quality and combat the harmful algal blooms that have plagued the region's waterways, now including Cold Spring Harbor.

Friends of the Bay remains committed to participating in the restoration and protection of our bays by partnering with the town and other stakeholders to find solutions that are best for the estuary.

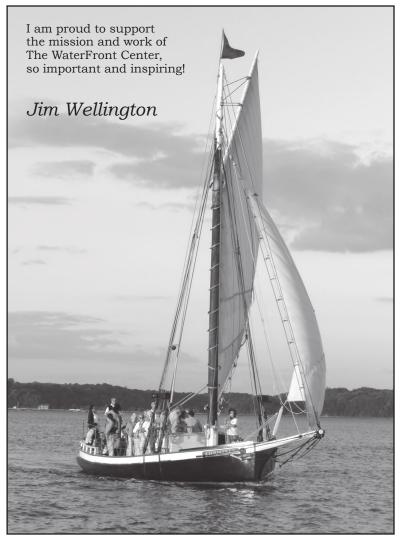
By the Friends of the Bay Board of Directors

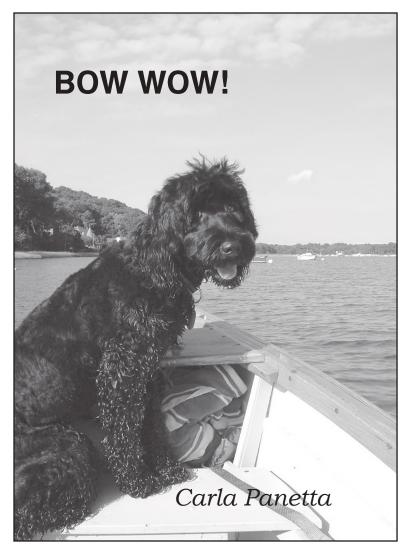


Kayaking

By Christopher Canadeo Sound Swashbuckler,2009

	As my oar
	gently brushes
	through the blueness
	of the bay
	I feel
	very very
	at ease,
	almost as if
	I could walk on water
	alone.
	C.
	Carter
	Sal fur
in the second	
and the second	
	William Sanchez, 2009
-	

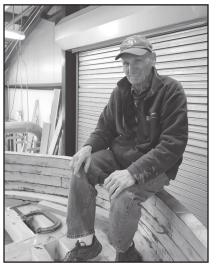




Bill Shephard

William B. Shephard died on Sept. 20, 2021 at the age of 91. He was an active volunteer on the construction of the *Ida May*, and board member of the Christeen Oyster Sloop Preservation Corp. He helped restore the *Christeen* in the 1990s and continued to help maintain and crew on her until the summer of 2021. For a few years in the early 2000s Bill worked in the yard for The WaterFront Center.

Bill was a gentle, generous and energetic man. After



returning from the Korean War, he worked at Grumman where he became a senior electrical engineer and even worked on their Star Wars project during the Reagan presidency. He retired from Grumman after 30 years and continued working there as a consultant.

George Lindsay, President of the Christeen Corp, wrote, "His skills were myriad, but no job was too big or too small, too trivial or too dirty for Bill. With a wry little smile and few words, he diligently went after whatever needed doing."

Shipwright Josh Herman said, "When we had a problem to solve, I'd show it to Bill and the next day he'd have a solution. Magic."

We all miss Bill terribly, but are fortunate to have his son, Billy, who is a port captain, working on the *Ida May* and on the Board of the Christeen Corp.

My Summer at the WFC

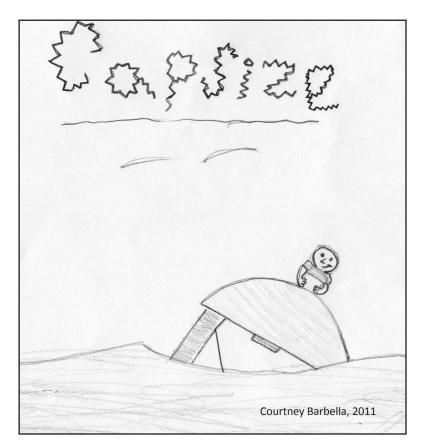
By Anthony Lodati, 2012

The more water I am around, the happier I am, so this summer my parents sent me to the WaterFront Center.

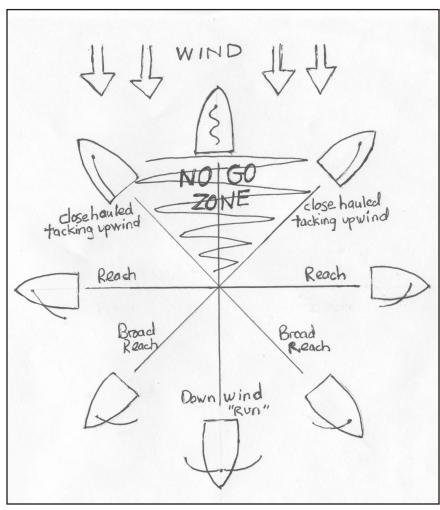
I learned lots of things like how to do research on plankton. We used a net to capture them so we could study them under a microscope. I had a blast fishing and seining. I learned how to care for animals. I also learned how to kayak. The only time I got scared was when a bee was chasing my friend and I, and he tried to save me by swatting a paddle at it. I almost capsized!

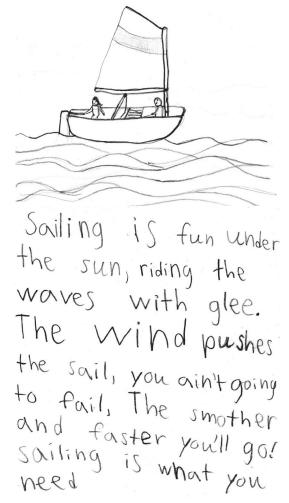
I had so much fun sailing. I learned how to sail on Optis and Sonars. I was afraid that I would capsize, but when I realized how helpful the counselors in Lil' Luffers and Sound Swash were I knew they would not let anything bad happen to anyone. If you are a beginner like me I would suggest Reiner, Patrick, Alicia and a few more. If they did not help me I probably would not be sailing right now.

One day my friends, Vinny, Ronnie and I were sailing and I tried to jump into my brother's boat. Well guess what - I missed! I did a split out of two boats and fell back into the water. We all laughed. My friends and brother still laugh about it. During the fall I volunteered to help take care of the tanks after school. I learned how to test the water to make sure it is safe for the animals. I also fed and recorded information in the tank logs. I feel like the WFC is my second home.



Points of Sail

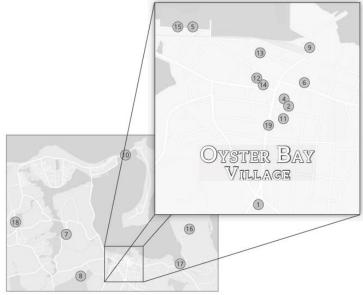




Jonah Santoro, 2017

COMMUNITY NON-PROFIT ORGANIZATIONS

Oyster Bay is lucky to have so many non-profits that serve our community in a variety of ways ranging from social support, educational enrichment, historical and environmental preservation to recreation. Several of them share programs or participants with the WFC or have similar missions. We are grateful for the many ways they have supported us, and applaud how they contribute to the fabric of our town.





Oyster Bay

CFOB raises funds for local philanthropic organizations that promote the welfare of people living in Ovster Bay and surrounding neighborhoods

www.oysterbaycf.org P. O. Box 329 Oyster Bay, NY 11771

COLD SPRING HARBOR PROTECTION COMMITTEE

Oyster Bay - Cold Spring Harbor Protection Committee

Improving the health of Oyster Bay and Cold Spring Harbor by coordinating the efforts of all municipalities in the watershed and engaging the public.

www.oysterbaycoldspringharbor.org

111 South Street, Suite 2 Oyster Bay, NY 11771



Friends Of The Bay

FOB is an environmental advocacy group whose mission is to preserve, protect and restore the ecological integrity & productivity of the Oyster Bay/Cold Spring Harbor Estuary & surrounding watershed.

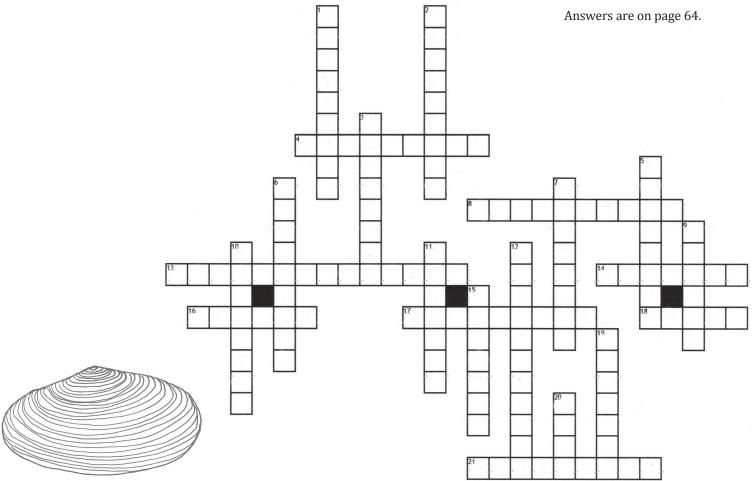
www.friendsofthebay.org

2 Townsend Square, Oyster Bay, NY 11771



13) Oyster Bay RAILROAD MUSEUM		15)	
Oyster Bay Railroad Museum	Raynham Hall Museum	Sagamore Rowing	Sagamore Hill National Historic Site
Preserving the rich legacy of Long Island's railroad history.	Occupied by the British during the Revolutionary War, Raynham Hall was the home of the Townsends and of their son Robert, a crucial member of George Washington's Culper Spy Ring.	Building Long Island's rowing tradition.	Sagamore Hill was the home of Theodore Roosevelt. Explore the natural surroundings and become inspired by the legacy of one of America's most popular presidents.
www:OBRM.org	www.RaynhamHallMuseum.org	www.SagamoreRowing.org	www.nps.gov/SagamoreHill
102 Audrey Avenue Oyster Bay, NY 11771	20 West Main Street, Oyster Bay, NY 11771	Boathouse: 3 West End Ave. Oyster Bay, NY 11771	20 Sagamore Hill Road, Oyster Bay, NY 11771
17)	18)	19)	
Audubon	Volunteers for Wildlife Wildlife Hospital & Education Center	YFCA	
Audubon Theodore Roosevelt Sanctuary & Aududon Center	Volunteers for Wildlife Wildlife Hospital & Education Center Volunteers for Wildlife, Inc.	Youth & Family Counseling Agency of Oyster Bay-East Norwich, Inc.	
Theodore Roosevelt Sanctuary	Wildlife Hospital & Education Center		
Theodore Roosevelt Sanctuary & Aududon Center The Thedodore Roosevelt Sanctuary & Audubon Center is a 14 acre nature sanctuary and is the 1st Audubon song	Volunteers for Wildlife, Inc. is dedicated to the preservation of Lond Island's wildlife rehabilitation and	of Oyster Bay-East Norwich, Inc. A multi-service agency that provides a wide range of mental health and social welfare services designed to strengthen the lives of individuals and	

2022 WaterFront Center Crossword Puzzle



Across:

4. Snail's trap door

8. Ancient Greek scientist who studied floatation

13. Growth process of plants using the sun to absorb carbon dioxide and release oxygen

14. Protected body of water where fresh runoff from land mixes with ocean

16. Ribs of wooden boats

17. Topographical funnel

- 18. Point of sail where wind is perpendicular to the boat
- 21. Area where shellfish can grow protected from harvesting

Down:

1. Stomach-foot

2. Dutch scientist in the 1700s who studied how differences in pressure create lift

3. Mixed fresh and salty water

5. Hunter

6. Gaff rigged oyster sloop built in 1883

7. Fast food for algae

9. Replica of one of the first engine-powered oyster harvesting boats

10. Large air-tight structure used to soften and bend wooden planks

- 11. Mollusk with two hinged shells
- 12. Structural support of arthropods

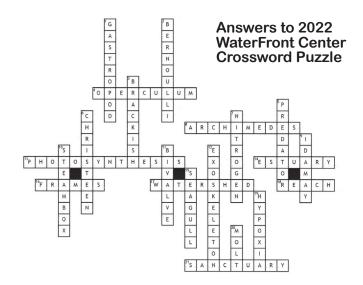
15. Lunch box thief

- 19. Severely low dissolved oxygen in water
- 20. Outgrow and discard an old exoskeleton

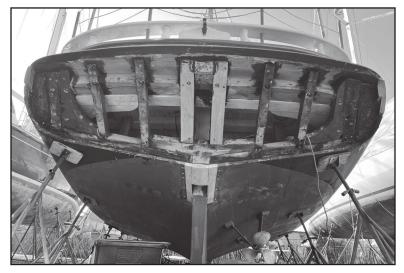




Happy Exploring! Judith and Invin Tantleff Emely Pineda, 2014



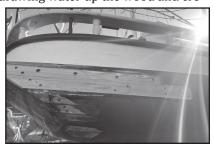
Repairs to Christeen



Over the winter *Christeen* was hauled at Safe Harbor in Glen Cove and much work was done to replace rotten frames and planks in her stern. What began as a problem with her rudder shaft turned into a larger project. Unfortunately, red oak had been used during the original restoration in the 1990s instead of white oak. The long cells of red oak act like straws drawing water up the wood and cre-

ating opportunities for rot.

Thanks to Shipwright Josh Herman and his team, *Christeen* is all fixed up and ready for the 2022 season.



Annelids

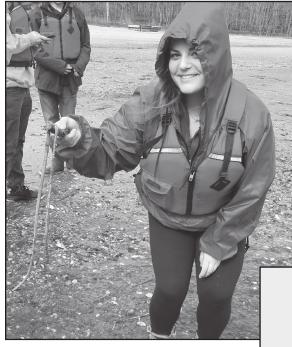
Worms! EEEEWWWW! There are tons of them burrowing in the tidal flats! Just like worms that live in upland soil, marine worms play a vital role in the sediments of Oyster Bay.

First, let's review the nature of tidal flats. Being intertidal, these areas are subject to daily exposure to air followed by periods of total immersion by water, so inhabitants there need to be hardy and flexible. The flats are generally bordered by marshes, spartina, sandy beach areas or deep channels. The waters on the flats are quieter with less rushing current and as a result, fine sands, silt and clay particles settle and trap a lot of organic debris. The organic matter is broken down by bacteria and fungi and ... all of that is food for worms!

Annelids are divided into three groups: Polychaetes, with many bristles, is the largest group with around 9,000 species

found in marine and freshwater habitats. Oligochaetes are mostly earthworms living in upland soils and having few or no bristles. Hirudinea are leeches.

Annelids have three body regions: the head, multiple identical ring-like segments in the middle, and the pygidium at the



end. As they grow, more segments are added by the pygidium. Each segment is identical performing tasks in movement, excretion and respiration.

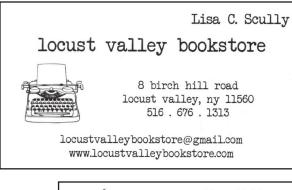
Marine worms play an important role as they work the sed-

iments. By burrowing into the sand and mud they allow oxygen to penetrate deeper, and when they rise again to the surface, they transport nutrients to the upper layers. They are important links in the food chain, for as they feed on decaying matter, algae and bacteria, larger animals such as crabs prey on them. Herons, egrets, sandpipers and other birds poke around the mudflats hunting for delicious worms. Humans also seek out marine sand worms to use as bait for fish.

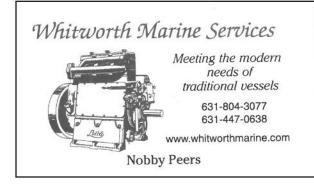
Student holding a 4 ft long Milky Ribbon Worm!



25 The Plaza Locust Valley, NY 11560 516-801-2700 info@oohlashoppe.com www.oohlashoppe.com



J. HERMAN Shipwright Stational Historic Landmark Vessels (31) 793-4950



Domino Effect

A fter the American Lobster die-off in the early 2000s, fishermen focused their efforts on channeled and knobbed whelks. NYSDEC reported whelk harvests in the OB/CSH complex jumped to 800+ bushels in 2007, compared to zero just three years earlier. The preferred food for whelks is moon snails!

Now, there is a proliferation of moon snails in Oyster Bay that are predating on oysters and seed clams.

When one event upsets the balance by removing a link on the food chain, another pathway is created.



Recreational Saltwater Fishing Limits

Species Local to	Oyster Bay, for	individual anglers
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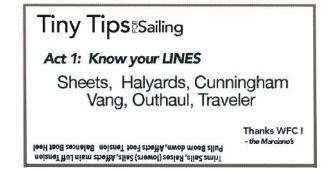
	Vinimum Size gth in Inches)	Possession Limits (Number of Fish)	Open Seasons
Winter Flounder	12	2	April 1 - May 30
Striped Bass	Slot size: 28 - 35	1	April 15 - Dec 15
Scup (Porgy)	9	30	All year
Summer flounder (fluk	e) 19	4	May 4 - Sept 30
Black Sea Bass	15	3	June 23 - Aug 31
		7	Sept 1 - Dec 31
Oyster Toadfish	10	3	July 16 - May 14
Tautog (blackfish)	16	2	April 1 - April 30
		3	Oct 11 - Dec 9
American Eel	9	25	All year
Atlantic menhaden	No size limit	100	All year
Bluefish (incl "snapper	s") No size limit	3	All year
Weakfish	16	1	All year
	10" filleted		
	12" dressed		
Anadromous river her	ing No posse	ssion No possession N	lo possession
(alewife and blueback herring)			

This summary is provided for your reference.

To check for updates, please visit www.dec.ny.gov/outdoor/fishing.







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Beth Dalton-Costello Board Member



111 South Street 2 Townsend Square Oyster Bay, N.Y. 11771 info@friendsofthebay.org www.friendsofthebay.org



Answers to Going Shelling

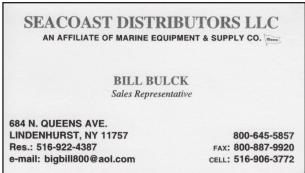
Moon snail	42 G
Quahog	2 B
Slipper shell	25 G
Oyster	17 B
Scallop	61 B
Channeled whe	elk 43 G
Mussel	29 B
Cockle	54 G
Knobbed whell	x 23 G
Oyster drill	27 G
Razor clam	52 B
Soft shelled cla	m 62 B



Answer to Word Scramble:

Fair Winds!







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Kathryn (Cottie) Maxwell Pournaras

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Thank you



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Neuberger Berman Investment Advisers LLC 1290 Avenue of the Americas New York, NY 10104 T. 212.476.5632 | F. 646.537.4644 | Toll Free 800.234.9840 BPeterson@nb.com For over 20 years, The WaterFront Center has been connecting people to the water through education and recreation. We reach about 20,000 people annually, and we continued during the pandemic to serve about 12,200 people, of which 1,660 were through virtual programs! We successfully and safely provided sailing programs, paddle and sail rentals, custom nature activities, online science projects, and *Christeen* charters. Participants were grateful to have had continued access to nature and the opportunity to appreciate our bay!

Your support goes a long way! Your donations historically make up 25-30% of our budget, allowing us to provide affordable and free access to fun and experiential learning about marine ecology. This year more than ever our financial needs are greater. Please show your support to keep The WaterFront Center buoyant and impactful in service to our community.



Volunteer

Many volunteers crew on *Christeen* and help with her maintenance. Others help maintain the dinghies in spring and fall and other tasks.



Donate

Providing sailing instruction and marine science and STEM programming would not be possible without loyal supporters.

Support us by making a donation today. We accept donations via Venmo @TheWaterFrontCenter, paypal and more.



Sponsor

With a number of regattas, events and fundraisers, there are many opportunities for local businesses to support our waterfront community.

Horizon Fund

The Horizon Fund provides funding for large capital projects and purchases such as boats and floats that allow us to provide affordable access to the water.

Find out more at TheWaterFrontCenter.org/WaysToGive

WaterFront Center

Connecting People to the Water

through education and recreation

The WaterFront Center is a 501(c)3 not-for-profit organization that offers a diverse selection of programs and activities for people of all ages, backgrounds and abilities to increase their wellbeing and their appreciation of our beautiful estuary.

The LOG is a record of important events, inspiration, information and supporters.



1 West End Avenue Oyster Bay, NY 11771 (516) 922-SAIL [7245] Info@TheWaterFrontCenter.org



PLAY - LEARN - CARE





