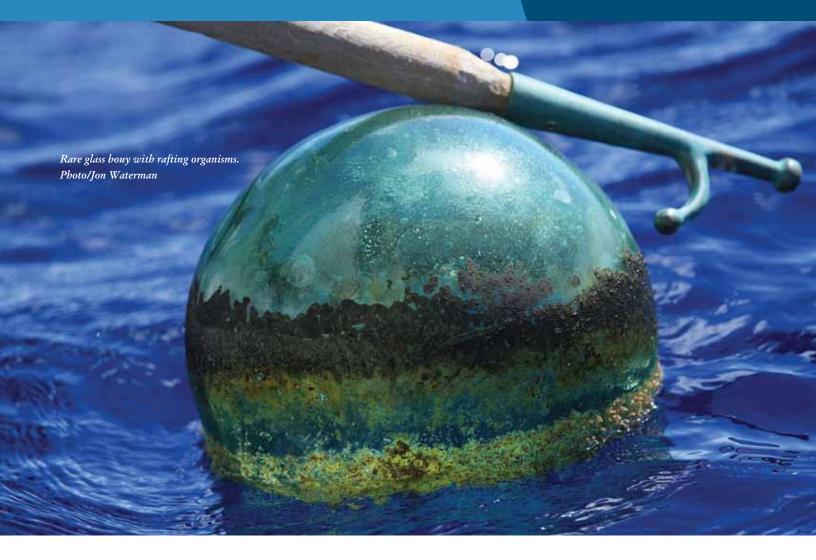
Over one million miles sailed

FOLLOVING SEA

Winter/Spring 2013



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FOLLOWING **SEA** Winter/Spring 2013

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Photography: Cover - Fishing boat found floating in the North Pacific subtropical gyre. Photo/Heidi Hirsch

Cover inset – A plastic toy ball sampled during the expedition. It is potential tsunami debris covered in rafting barnacles and crabs as well as other organisms. Photo/ Matthew Ecklund





Sea Education Association is on the scientific forefront of a global issue that is centered around a very tangible, user-friendly, and life-saving material: **Plastic.** Historically, over the last 60 plus years, we as a society have gone from revolutionizing our day-to-day lives using plastic to the current "reduce, reuse, recycle" mantra. Somewhere in between, a portion of the plastic we consume made its way from our hands and in to our oceans.



SEA in the Global Spotlight

by Emelia DeForce



While pulling up garbage from the ocean, it's hard to describe the mixed feelings in determining the final number of plastic pieces. It's difficult to know whether to be excited or disgusted.

-Dr. Emelia DeForce

In recent years, marine plastic pollution has become a news-worthy topic as there is concern for the health of our planet. SEA has been conducting research on the concentration of marine plastic pollution for over 30 years and continues to publish scientific findings as a way to educate. In summer 2010, the first ever plastic dedicated SEA trip set sail out of Bermuda to map out the garbage patch in the Atlantic Ocean. It was an alumni trip and not a traditional SEA semester. The result? The highest ever recorded concentration of plastic marine debris in a single net tow and a better understanding of the area where the plastic is accumulating in the Atlantic.

This trip elicited a lot of media attention including coverage by NPR, *Boston Globe*, and *Science* magazine. Footage from this expedition is now a full feature documentary *Into the Gyre* (Director and Producer Scott Elliot) which has screened at over a dozen film festivals and has won countless awards. The icing on the cake was the acceptance of SEA's Atlantic data set *Plastic Accumulation in the North Atlantic Subtropical Gyre* (Lavendar-Law et al. 2010) by *Science* magazine, a top tier peer reviewed journal. SEA's faculty and student involvement in plastic marine debris has placed SEA in a unique position as the leader of a relevant global problem.

What's more is that it doesn't stop here. In Oct 2012, the *Robert C. Seamans* set sail for Plastics at SEA: North Pacific Expedition 2012 from San Diego to Honolulu through the area that has been popularly dubbed "The Great Pacific Garbage Patch." SEA was once again on a mission to better understand plastic pollution in our delicate oceans. The difference this time around was that the scope of the trip had changed. Instead of just tediously counting each piece of plastic that was retrieved in the neuston net, the broader goal was to understand how this newly introduced plastic was affecting the ocean ecosystem from microscopic organisms that grow on the plastic to fish that ingest the plastic mistaking it for food. The timing of this expedition was such that the cruise track travelled through the area where potential debris from the March 2011 Japanese Tsunami would exist therefore helping to better understand its track towards the US West coast.

I am writing this article to make you aware of the importance of SEA's involvement in this type of research. I was the Chief Scientist on Plastics at SEA: North Pacific Expedition 2012. The far ranging impact that SEA has had both scientifically and publicly on this topic has changed my life. As a scientist, the passion I have for making our society properly aware of current environmental problems has only grown with my involvement in this research. News, internet, radio, and other far reaching forms of communication have misinformed us of the current issues about marine plastic pollution by creating images of a physical floating island of plastic and false perceptions of how to clean it up. SEA's mission has been to teach not only its students about the importance of marine research but has also spread this information to the general public through internet, news, multimedia, and literary articles that accurately depict plastic pollution in the ocean. Combined, this has allowed us to understand why it's even important in the first place.

Photo previous page: Small piece of plastic with a Gooseneck barnacle. Photo/Jon Waterman



Emelia DeForce (pictured, left) works as a Research Associate at Woods Hole Oceanographic Institution. She received her master's and PhD degrees at University of Massachusetts Boston studying both medically important microorganisms as well as microbes that live in soil. She now studies microbes that live in hydrothermal vent ecosystems, and has traveled to very remote places for her research.



Day 19 of 38 during Plastics at SEA: North Pacific Expedition 2012

While pulling up garbage from the ocean, it's hard to describe the mixed feelings in determining the final number of plastic pieces. It's difficult to know whether to be excited or disgusted.

Seventy-two hours ago, we finished counting the neuston net contents from the "windrow tow." The net was deployed at 10:28 am on Oct 16th at a ship's speed of two knots for 30 minutes. The final count took 36 hours, let me repeat, 36 hours, including eight watch rotations and many volunteers who accepted my invitation to join a "plastic picking party." By the end of the 36th hour, the lab stank of left-over zooplankton caught in the nets, people were sick of counting plastic shards, and they were all looking at me like I was crazy to have them continuing this most tedious and unrelenting task. It was time for relief.

To help finish up the bitter end of this whirlwind, we estimated the last 7,000 pieces using a grid system. Each box in the grid was filled up with evenly-spaced plastic pieces. Then we counted 10% of the boxes and came up with an average: 107 pieces of plastic. This number was multiplied by the total number of boxes used within the grid. This simple exercise probably saved us about another day of counting (along with my reputation on the boat!). All tallied and done, we counted 24,214 pieces of plastic. This translates to a hard-to-fathom concentration of 12 million pieces per square kilometer.

The "windrow tow" compares to the highest concentration of plastics sampled during Plastics at SEA: North Atlantic Expedition 2010 and is potentially the highest concentration ever sampled in the North Pacific. The message to marine debris researchers? We still do not fully understand how much plastic has been introduced into our oceans.

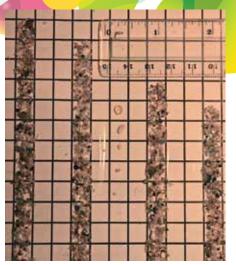
Furthermore, we are reminded that plastic concentrations in the gyre change based on wind, waves and currents. The reality is that we may never know how much plastic floats in the ocean. What scientists can do is start to peel apart how plastic is changing the chemical and biological environment of the ocean. We are forging forward to do just that during our 38-day expedition dedicated to the study of plastic and its effect on this complex ecosystem.

Marine Debris 23 Oct 2012

Day 21 of 38 during Plastics at SEA: North Pacific Expedition 2012

One of the key research components of this trip is a survey for tsunami debris. Recent news has reported objects from the 2011 Japanese tsunami washing up on US shorelines, such as an overturned fishing boat near Oahu, Hawaii. Numerical models by Nikolai Maximenko (University of Hawaii at Manoa) show that our sailing expedition track is close to the estimated path of this tsunami debris traveling east towards North America and turning south towards Hawaii. We have adopted three daytime protocols for monitoring this and any other large, visible floating debris.

For what we call "opportunisitic" sightings, a clipboard sits near the helm with yellow-lined paper and instructions: "If you see anything float by, log its GPS location, time of sighting, and approximate size/color." This survey alone has generated 282 sightings ranging from plastic shipping wrap to a rare glass buoy that we sighted today. The next and more scientific protocol is carried out at the top of each hour for 10 minutes



Plastic pieces on a grid to help facilitate counting the last bit of the windrow tow. Photo/Jon Waterman



The Robert C. Seamans in waters close to the Big Island, Hawaii. Photo/Jon Waterman

continued

by a science watch stander at the bow. Anything seen within one boat length of the ship is recorded with similar information, then immediately transferred to the computer in the lab. This has produced 248 sightings. Finally, Zora McGinnis S-224, a master's student at Hawaii Pacific University, is on this expedition to gather data—including marine debris observations—for her thesis. For 53 hours (and counting) she has fastidiously observed 1030 pieces ranging from small bits of Styrofoam to literally, a Cookie Monster inner tube.

We haven't seen soil in what seems like months. In the 1,200 miles we have sailed since leaving San Diego, this means we have seen about 10 pieces per hour in the gyre during the day. This only includes objects visible to the naked eye—those pieces we can't see are numerically far greater.

It is difficult to say if most or any of this gyre debris can be attributed to the tsunami. We can say that these pieces have growth of marine organisms and some include small rafting ecosystems with fish feeding on them. All of the objects we have caught (by boat hook or dip net) for scientific analysis have what appear to be Japanese print characters. Still, it is difficult to confirm that this debris was carried out to sea by the Japanese tsunami.

The survey data that we are gathering on this expedition will be used to help fill in gaps of information for better marine debris modeling. Sea Education Association has just started to report this type of information to NOAA (National Oceanic and Atmospheric Administration).

Finally, Dr. Deb Goodwin, Chief Scientist on a recent SEA Semester expedition from Hawaii to California, believes that while at sea this summer she and her students spotted the same boat that recently turned up in Hawaii. This is why we carry out this open-ocean survey work—because no matter how far away we live, we are ultimately connected by the ocean.

Love-Hate Relationship 28 Oct 2012 Day 26 of 38 during Plastics at SEA: North Pacific Expedition 2012

Close to a week before I left for San Diego to join the *Robert C. Seamans* (RCS), I was notified about training that I needed for a new piece of oceanographic sampling equipment. During this session, I learned about what appeared to be a complicated series of nine nets that was expensive, could sample at discrete depths in the water column, and was re-designed

especially for SEA. The cruise I was going to be chief scientist on would be its virgin trip. "Really?" I thought, "This added to all the other stressors? Gosh!" Since then, we have been deploying the MOCNESS (Multiple Opening and Closing Nets and Environmental Sensing System) every other day with valiant effort.

Getting to this point did not come without trials and tribulations. Erich Horgan, CEO of Biological Environmental Sensing Systems donated the net, and his team worked arduously to reengineer our net without a conducting cable as the RCS is only equipped with a non-conducting wire. Instead of opening and closing the nets from a computer on board, our nets are designed to open and close based first on pressure, and then on a timer for each net after the first desired depth is reached.

The net was perfect to try out on this expedition because one of our scientific objectives is to better understand the role wind mixing plays in the distribution of plastic debris in the ocean. We hypothesize that as wind speed increases, plastic is pushed deeper into the water column. To test this, the MOCNESS allows us to collect samples from depths of 1, 3, 5 and 10 meters, in varying wind conditions. We deployed the net a few days after leaving San Diego for a trial run and ran into trouble. We couldn't detect when the nets were opening and closing because we weren't sure when the MOCNESS reached 10 m depth—therefore, we did not know when to raise it to 5 m depth. After some discussion, the clever assistant scientists on board determined that a hydrophone (used to listen to whale calls) might be the key. Sure enough, we simultaneously lowered the hydrophone and heard the clink of the nets opening and closing. Brilliant!

Since adding a hydrophone (think water music with a tambourine interlude) to our protocol, we have gathered up some serious data. Without a doubt, we can say that on every tow thus far, regardless of wind speed, the highest concentration of plastics has been sampled on the surface. From there, the amount of plastic has progressively decreased from surface to the deepest depth of 10 m. Another preliminary result from the sample set is that the stronger the wind, the more plastic found in deeper depths. And with less wind, we find more plastic on the surface. This all makes sense, as plastic distribution with depth is a balance between the plastics' buoyancy and the wind energy required to submerge it.

This type of data will ultimately help us understand where the plastic exists and can also give us better estimates of plastic concentrations in our oceans. I have to say that the MOCNESS has grown on me. I think I've found a new love.

The Final Science Report
9 Nov 2012
Day 38 of 38 during Plastics at SEA:
North Pacific Expedition 2012

Our scientific findings thus far:

Hand counted 66,077 pieces of plastic from net tows

Logged 3,489 pieces of macro debris from visual surveys

95% of the plastic collected was mm-sized

Plastic was collected in every net tow within the gyre

Every subsurface tow had plastic

All plastic collected had living organisms on it

Each net tow had plankton

Tow plastic counts ranged from 9 - 24,213 in the gyre

118 tows performed over 2597 nautical miles

In short, we hand counted close to 70,000 pieces of plastic during this expedition through a transect in the gyre and can give you a snapshot of the concentration of plastics in the area we sampled. The bottom line is that there is much more to be studied. Furthermore, because almost all the plastic pieces are mm in size, unless you are specifically looking for plastic, you won't see it. We also sampled a significant amount of plastic below the surface of the ocean indicating that there are plastics that we have not yet detected.

There were organisms on every plastic piece but more importantly organisms with every plastic piece we caught. This indicates if we try to remove the plastic from the ocean, we will simultaneously remove the normal flora and fauna and disrupt the ocean ecosystem. A better option is to stop more plastic from entering the ocean.

Our range of plastic concentrations from one nautical mile to another indicates that there is not one particular spot or "island" where this plastic exists, it is patchy and irregular, not consistent.

Combined, the results that I just reported are novel. To my knowledge, there has not been an expedition dedicated to the study of plastics and their effect on the ocean ecosystem. In addition, there is no sailing school vessel with 38 salty, over dedicated, superbly talented, and science driven human beings that are devoted to spread the news far and wide. We hope to see *you* soon.



In August 2012 SEA Board Chair, Susan E. Humphris announced that Timothy McGee, Rear Admiral, US Navy (ret.) was named as President following a national search for only the fourth person to occupy this position in SEA's forty-one year history. He succeeds John K. Bullard (2002-2012), Rafe Parker (1982-2002) and founder Corwith Cramer (1971-1982).





Since joining SEA on October 1, Tim has sailed with class C-244 on the SSV Corwith Cramer and on the SSV Robert C. Seamans in Tahiti. He has been attending classes and enjoys making gumbo for students who are on campus.

Tim and his wife Nancy have two sons, Miles and Ryan, who attend the US Naval Academy. Nancy is a Geospacial Scientist and is in charge of business development for Fugro.

SEA's New President

Tim McGee retired from the US Navy in 2008 as Commander of the Naval Meteorology and Oceanography Command, Rear Admiral Hydrographer of the Navy. He served in oceanography leadership positions throughout his 30 year career as a Naval Oceanographer. As Assistant Chief of Naval Research, he guided curricula at the graduate and undergraduate level and guided the Navy's \$1.5 billion investment in science and technology, establishing successful long-term relationships with many leading colleges, universities and researchers. He also helped create Google Oceans by providing a great deal of the Navy's undersea bathymetry so that a new generation could learn more about the oceans.

After retirement from the Navy, McGee created his own consulting company to assist a wide range of government and non-government clients on a variety of science oriented enterprises, including climate and climate change, environment and conservation, oceanography, meteorology, hydrography and ocean operations.

In describing his passion for the ocean, he said, "I have worked on it, in it, around it and about it for nearly 38 years. I have put unlikely multidisciplinary teams together to solve unique challenges. I have been on the cutting edge of physical and chemical ocean understanding."

Tim McGee earned his Bachelor of Science at the US Naval Academy, and received a Masters degree in Meteorology and Oceanography at Naval Postgraduate School, Monterey, CA where he also earned Certification in Hydrographic Science.

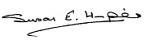
Citing again his own deep passion for the oceans, McGee said, "I have spent my entire life on the sea, as a youngster working as a waterman, an all-American sailing and North American Sailing champion in the Navy and Naval career as Navigator, Hydrographer and Oceanographer. I believe deeply in the mission and traditions of Sea Education Association and look forward to working with the extraordinary faculty, staff and crew of this very special organization.



2011-2012 ANNUAL REPORT



Susan E. Humphris, Chair Board of Trustees, March 2013



In October, SEA began a new chapter in its history by welcoming Timothy McGee (Rear Admiral, US Navy [ret]) as SEA's fourth President. Tim has been a leader and served in oceanography leadership positions throughout his 30-year career as a Naval oceanographer. He then created his own consulting company to assist a wide range of government and non-government clients on climate change, environment and conservation, oceanography, meteorology, hydrography, and ocean operations. He has spent nearly all his life on the sea, and is an accomplished sailor. Tim has quickly immersed himself in SEA, spending two weeks on *Corwith Cramer* to learn about our sea-going program. He is leading a major effort to look at our program offerings and find ways to align them more closely with the off-campus experience that today's college undergraduates are seeking.

As you will see from the cover story, the fall Sea Semester planned for the *Robert C. Seamans* was replaced with a "Plastics at SEA" cruise. Leaving from San Diego and sailing to Hawaii with SEA alumni as participants, the cruise was designed to determine the plastic concentrations in the North Pacific subtropical gyre thereby providing a complementary dataset to that collected in the Atlantic. A highlight of the cruise is the extensive media and public outreach effort that included SEA alumni, staff of the New England Aquarium and the Oregon Museum of Science and Industry, and a professional writer/photographer. The

cruise was also featured on National Geographic's website.

I am also delighted to report that SEA has received a \$3M lead gift for the Capital Campaign. This unrestricted gift from an anonymous donor is the largest in SEA's history. This is a very exciting development and it puts us firmly in the silent phase of a long awaited Capital Campaign.

While SEA continues to face some financial challenges, we can be proud that we offer the best ocean-based programs that provide students with rigorous academic courses, leadership and teamwork skills, and a once in a lifetime experience. Ocean literacy and sustainability are becoming ever increasingly important and SEA's strong and dedicated faculty and staff are committed to our mission. We hope that you will help us in our voyage of exploration, understanding, and stewardship of our global ocean.

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We gratefully acknowledge the many alumni, parents, faculty, staff and friends who generously contributed their money, time and effort to Sea Education Association during the 2011-2012 fiscal year. Every effort has been made to list all contributions accurately from **July 1, 2011** through **June 30, 2012**. If, however, an error has been made, please accept our apologies and notify us.

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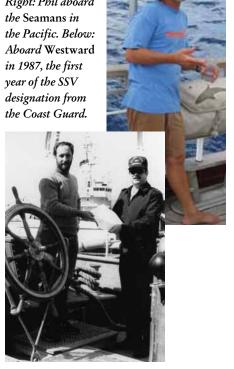
^{*} Deceased

PASSAGES

Captain Phil Sacks retired at the end of November 2012 after 34 years of association with SEA and 28 years sailing as Master. Here is an excerpt from his farewell letter to friends and colleagues entitled

'Time for Change'

Right: Phil aboard the Seamans in the Pacific. Below: Aboard Westward in 1987, the first year of the SSV designation from the Coast Guard.



It was the summer of 1979 when I first saw the Westward at Dyers Dock in Woods Hole and my association with SEA began. I had come to Woods Hole for lunch and to search out information on the Ocean Engineering graduate program at WHOI. I noticed Westward and wandered over to the dock (it was still many years before the security fence was to be erected). It was the day before a cruise was scheduled to depart and the dock was littered with spares, provisions, science gear, etc. Somehow I could see through the "controlled" chaos that something special was happening.

At the time, I was not a big boat sailor—up until then having only sailed on smaller yachts. Yet, the scene called to me. I began chatting with someone standing on the dock, who turned out to be the Captain, Don Thompson. To make a long story short, a few months later I excused myself from Thanksgiving dinner in Georgetown, Maine where I lived at the time and boarded a plane bound for St. Thomas. The next day I located Westward alongside the cay in Charlotte Amalie, signed on as third mate, and was immediately set to work helping prepare for the cruise. I met Peg Brandon who had just completed her student cruise and was volunteering for the turnaround. John Wigglesworth was the newly arrived second mate and Rindy Osterman would be sailing as assistant scientist. A few days later under Captain Sid Miller's direction, we beat our way out of the narrow harbor entrance, against the trade winds, the first day of class W-49. Barb Block was a student on-board.

At the time, I intended only to sail that one cruise, for a few months, then return to Maine, build a house and apply either to graduate school or medical school. It didn't work out that way. I did build the house, but I kept signing up for another cruise and then another. In the fall of 1984, I was offered my first contract as Captain, sailing a Williams-Mystic trip with Susan Humphris as Chief Scientist and Andy Chase as Chief Mate. A few weeks later Westward departed Woods Hole with class W-78—my first Sea Semester cruise as Captain. Dr. Bill Hallstein was the second mate, Pete Kalajian the engineer, and Lucy Coan Helfrich one of the students. Most of the names I mentioned, of course, are still closely involved with SEA—which speaks volumes about the organization.

I realized those many years ago that it was the beauty of the ships, the chance to study the ocean intimately, and the promise of adventure at sea that attracted these remarkable shipmates. But the reason to return again, and again, (and again...) was not because of the ship(s) but because of the opportunity to work with and get to know all of the talented and committed people that the ships and the organization attracted: from students, staff, faculty and crew, to board members, friends, and colleagues.

I feel very lucky to have wandered into Woods Hole that hot July afternoon—one of the very few days all summer when Westward would have even been in port. I have had a remarkably rewarding and fulfilling career at SEA and I thank all of my colleagues, those still working at SEA as well as those who have moved on, for having helped to make it so. I still feel passionately about SEA's mission and I am sure I will continue to stay involved.



(L-R) Former SEA Captain Paul DeOrsay, Captain Terry Hayward and class C-243 students. DeOrsay transferred boxes of whaling books for transport to the Bequia Whaling and Sailing Museum via their cruise on the SSV Corwith Cramer.

PASSAGES

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...displaying the ocean sailor's requisites modesty, humor, vigor and a willingness to admit fear, exhaustion, depression and even sheer terror." – excepted from a Wall Street Journal review

Race France To France: Leave Antarctica to Starboard

SEA Trustee Rich Wilson's book chronicling his participation in the 2008-2009 Vendee Globe was published in September 2012 and is widely available in paperback or as an E-book.

A senior skipper at age 58, and a severe asthmatic, Wilson finished 9th of 11 finishers of 30 starters, racing 29,000 miles over 121 days in his 60' boat *Great American III*. He endured broken ribs, a bloody facial gash, a climb up the mast on his run to Cape Horn, sleep deprivation, exhaustion and fear, while ten gales battered his trusty GA3 on her 4th race around the world.

A Wall Street Journal review calls the book, "full of jargon of the ocean-racing game, with references to keel hinge pins and baby stays and PBO rigging, but there is enough mayhem and side-story-telling to keep even the uninitiated engaged. Mr. Wilson takes us there and back again with openness and honesty, displaying the ocean sailor's requisites—modesty, humor, vigor and a willingness to admit fear, exhaustion, depression and even sheer terror."



Henry was renown for dreaming about capturing the biggest fish and creating a feast for all to enjoy!



John Wigglesworth, W-10, and Master met up with Henry and his family while sailing on the Seamans S-222.

IN MEMORY

Henry Genthe— Father, husband, friend, inspired marine biologist, educator, writer, photographer, adventurer and shipmate, passed away October 26, 2011 after a fight with cancer. He was 70.

Henry was part of the SEA family over many years. Beginning with *Westward's* transatlantic voyages from 1972 to 1975 Henry inspired us with his innate ability to bring science to life and to help each of us feel connected to the ocean and its marine life. Henry brought extraordinary energy and enthusiasm to all he touched. Called 'Henry Science' he was the master at teaching us all about the sea that he loved so dearly. The story goes that SEA Founder, Cory Cramer, sat Henry down and demanded him to "tell us how you do it, Henry? Tell me how to replicate your magic!"

Henry was responsible for bringing SEA to the western Caribbean and to the amazing island of Roatán, Honduras. Having built a small house in Port Royal in the late 70's, Henry invited *Westward* to anchor off the land many times, offering all kinds of adventures and to meet local friends for grand pig roasts—island style. A continuous flow of knowledge exuded from Henry wherever he was. He understood and shared his exuberant love of the natural world, sharing it with everyone around him.

In 2002, Henry landed on Christmas Island, Kiribati in the South Pacific. There, he met Teresa Tekaiti, a local woman with a smile and sense of adventure. They married, shared a life, and had a daughter, Raeua. Henry had finally found an island where he could help create conservation programs, surf off of his home, catch bonefish and feast off of the sea. Over the course of the years that followed, the *Seamans* would sail there. Henry welcomed the ship and crew and he would, once again, inspire SEA students and help them gain a small glimpse of this island community.

When Henry learned of his cancer, he settled in Larkspur, California at the home of dear friends Liza and Dave Stuhlbarg, W-20, and a *Westward* shipmate. For those who knew him he will always be a spirited mentor and friend, inspiring us to be continually positive, active and profoundly curious about the sea and all aspects of the natural world around us.

North American Rolex Scholar

By Megan Cook, S-215



Megan was the first woman to try-on the Nuytco Exosuit—a one atmosphere pressure diving suit capable of diving to 1000 feet.

Sitting on an icy glacier watching a semi-truck size iceberg calve into Antarctica's frozen sea inspires a moment of reflection. The moment a tracking tag pierces an eighteen-foot white shark you have to pause. Tucked in a crevasse in the pitch black of an underwater cave finning against the flow of an entire aquifer rushing by, it seems natural to wait between the bubbles to ask "How did I get here?!" I am traveling the globe as an ocean ambassador- North America's 2012 Rolex Scholar. Training under the mentorship of global leaders in conservation, research, and media and industry I am extremely proud of the path which brought me here and taught me to dream big—a path cemented as a student of Sea Education Association.

My first grade teacher introduced the ocean to me. In an Idaho desert classroom, the sea and salt spray came alive reading stories, doing shell math, and scribbling ocean currents with crayons. While my classmates set their sights to be firefighters, presidents or sports stars I knew the ocean and I were meant to be together. Thirteen years later, I was on course. As a freshman at Oregon State University, I sat down in an evening information session with a Sea Education Association recruiter and a stunningly beautiful ship stared back at me from the glossy brochure. A tendril of the open sea caught me firmly by the heart. My curiosity could not be satisfied until I had experienced it for myself. I became, likely, the most well-known prospective student in SEA history joining info sessions every term for two years until my schedule opened for a semester away. Thanks to the generous donors of the SEA Presidential scholarship, in winter of 2008 I joined the *Robert C. Seamans*' class 215 in frozen Woods Hole.

As a biology major at OSU I was thrilled with the chance to pursue my own research and look critically at the ocean transect from Tahiti to Hawaii. I wanted to live the lessons that filled my textbooks and connect with people who understood the ocean in other ways.

I find sailing somewhat akin to walking into a carnival fun house; some of it will surprise you, some of it might scare you, some will be fun and silly, but you never know what will come around the next corner. There is no way to explain the sea standing on the shore and peeking in. The only way to truly understand it is to step inside boldly and live it yourself. I was a different person stepping on land in Hawaii than I had been six weeks and 3300 miles before stepping onboard. Now, I sprung to action at the sound of a luffing sail, adeptly programmed to alter a line that only weeks earlier I couldn't pretend to identify. I had an engrained fear of sitting down during watch, repeated all issued commands like an enormous parrot, and could sing Old Crow Medicine Show's 'Wagon Wheel' in my sleep. Deeper though, I had grown a confidence built over quiet mornings aloft and roaring nights braced against the helm. I was more courageous given the trust of my shipmates to lead whenever called upon. I was tougher sticking out my research counting bacteria in a microscope for hours on a pitching ship- a punishment sure to make even the saltiest sailor share lunch with Neptune. I was kinder working with my shipmates in close quarters and more empathetic observing the sea propel each on their own journey. Feeling the power and expanse of the sea cemented my passion and centered my purpose for preserving these wild places and sharing the stories with others.

I was hooked by the spirit of adventure, enlivened with a deeper purpose of understanding our oceans not only as a scientist but as a sailor and a human being. My passion to learn and explore was blazing! I applied for research grants to fund a summer as a field assistant in the Bahamas researching the impacts of the lionfish invasion on Indo-Pacific reefs. I dove into my coursework; each class was now a building block compiling the big picture of the open sea. After graduating with a degree in biology, chemistry and marine biology I relocated to Hawaii to work as a free diver on NOAA's Marine Debris Team throughout the Papahanaumokuakea Marine National Monument. Full of energy and driven to make positive contributions to the underwater world, I worked on Hawaii's aquatic invasive species team and as a trainer for both the University of Hawaii's Scientific Diving program and a community reporting network for coral disease and bleaching outbreaks.

continued

CURRENTS

North American Rolex Scholar (continued)



Sharing the seventh continent with a colony of Gentoo penguins, Megan's expedition to Antarctica included snorkeling excursions into 28 degree seas.

Understanding our oceans differently—Men kill 26-73 million sharks every year, but these predators are essential for a healthy ocean.

Megan is looking forward to a career bringing ocean literacy into media and daily life.

Dreaming big dreams led me to selection as the North American Rolex Scholar by the Our World-Underwater Scholarship Society. Each year three emerging leaders of ocean fields (one for Europe, one for Australasia, and one for the Americas) are chosen to train alongside ocean icons and industry leaders. In the opportunity of a lifetime, my drive for big-picture science and helping people together to understand and care for the ocean has flourished. Experiences come from across the board. I have toured a US Navy dive school, filmed blue sharks in the open ocean, assisted on set in Hollywood, conducted preliminary surveys of life on remote South Pacific reefs, explored a fish-stick factory, sailed to Antarctica on assignment for National Geographic and very proudly returned to Woods Hole to present for class C-243 just days away from beginning their own SEA adventure.

Throughout my global adventures I continue to find special fraternity in the SEA alumni: kindred spirits who understand the line chase and have felt dawn watch on the bowsprit. Although our feet never stood together on the teak, SEA is the intimate, timeless connection that brings together some of my dearest friends. The confidence and curiosity from time in a wild place lay quietly within each of us, but are often glaringly revealed by our line bracelets. My turkshead, woven during our Equator crossing five years ago, has now been in four oceans and will soon have stood on all seven continents.

My Rolex experience has been broadened by my drive to explore our planet in, on or nearby the global ocean. I love the scientific process and the wonder that comes from seeking answers to complex problems. Yet, my greatest passion lies in bringing people together with new engaging information. I am looking forward to a career as a bridge communicating to connect us with the healthy oceans that keep us alive. My tremendous thanks go to SEA for awakening in me a passion for exploration and for admitting me into a global network of ocean leaders. It's my pleasure to share this tremendous honor from Rolex & Our World-Underwater Scholarship Society with everyone who has even called 'haul away halyard'!

Read more about Megan's Rolex Scholar travels at ownssnorthamerica.org or follow along on facebook.com/MeganCookOceanAmbassador



SCIENCE CORNER

Outreach from Plastics@SEA: 2012 North Pacific Expedition

By Pat Keoughan, W-53



A pink buoy recovered from the Pacific covered with organisms becomes the center of shipboard paparazzi frenzy.

Pat Keoughan, center, poses with the ship's engineers Tom Klodenski and Willie Scheurich.



The Henry L. and Grace Doherty Charitable Foundation funded an outreach program from the Plastics@SEA:2012 North Atlantic Expedition. Educational outreach to a group of both public and private partner schools, grades ranging from 5-12 from around the U.S. (HI, CA, AZ, IL, MA, NY, ID, WA) was collated on the ship by SEA alumna Pat Keoughan, a retired elementary school teacher. Each classroom submitted questions to the ship twice during the cruise, and then answers and photos were posted to the plastics website on the "School Email Exchange" page. In addition, two participants on the cruise who work for New England Aquarium and Oregon Museum of Science and Industry gathered information and samples to create exhibits upon their return.

The below was written for Coastlines, a special section of the Falmouth Enterprise.

Imagine being in the middle of the Pacific Ocean on a 134 foot sailboat, eating mahi mahi two hours after it was caught, learning the constellations to the backdrop of the Milky Way, being rocked to sleep by ocean swells and witnessing glorious sunrises and sunsets over the rim of the sea. I was fortunate to experience all of these aboard the SSV Robert C. Seamans this past fall.

Following up on a successful plastics research cruise to the Sargasso Sea in 2010, Sea Education Association (SEA) organized a second cruise to the Pacific Ocean. The Plastics at SEA: North Pacific Expedition set out from San Diego, CA on October 4th and ended in Honolulu, HI on November 9th. My job, as a member of the crew, was doing outreach with teachers from ten schools from around the U.S. and answering their students' questions about the science and life aboard the vessel. Our website, www.sea.edu/plastics, provided the teachers with information to use in their lessons.

The purpose of the cruise was to transect the North Pacific Subtropical Gyre quantifying the amounts and types of floating plastic along our cruise track. Researchers aboard were sampling the organisms living on the plastic. Most of the collecting was done by deploying different types of nets. Since we were sailing in currents carrying debris from the 2011 tsunami in Japan, we reported the location of the larger pieces we came across, including a small boat and a refrigerator, to NOAA.

Plastic is degraded by UV rays from the sun and wave action so by the time we were well into the gyre we were seeing mostly confetti sized pieces. Instead of a garbage patch we found patches of plastic soup. Many larger pieces, mostly buoys, were brought aboard, sampled, cleaned and recycled in Honolulu. The biomass samples collected ended up in research labs where they are being studied to determine the effects of plastic on the organisms that live on it.

Participating in this cruise was an amazing experience. While I found the amount of plastic in the middle of the ocean very upsetting, I am glad there is growing awareness of the problem. This has made me change much of my behavior when it comes to the plastic I use. Although there is not much that can be done about what is already there, a lot can be done by all of us to slow the flow of plastic into the ocean from land and boats.

As a person who thrives on adventure, I am indebted to SEA for this unique, memorable opportunity.



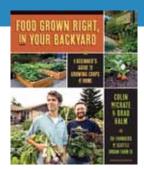
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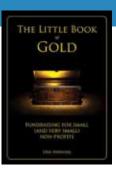
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by SEA Faculty & Alumni



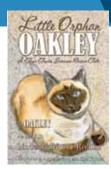
Brad Halm C-173 Food Grown Right, In Your Backyard



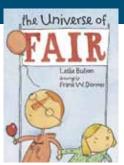
Erik Hanberg W-167 The Little Book of Gold: Fundraising for Small (and very small) Non-profits



Flournoy Holland W-63 Swim for the Little One First



Linda McMurry W-107A Little Orphan Oakley: A True Texas Siamese Rescue Story



Leslie Bulion W-35 The Universe of Fair



Luanne Rice, W-25 The Lemon Orchard (July, 2013)

Congratulations to SEA Overseer W. Jeffrey Bolster on being named a recipient of the 2013 Bancroft Prize.

His work, The Mortal Sea: Fishing the Atlantic in the Age of Sail was described as a gripping and eloquent history of the human impact on the ocean. The Bancroft Prize is awarded annually by the trustees of Columbia University. Winners are judged in terms of the scope, significance, depth of research, and richness of interpretation they present in the areas of American history and diplomacy. There were 223 books nominated in 2013. Jeff Bolster served SEA for many years as a trustee and was also Education Committee Chair.