

Lynnhaven River Now

2018-2019 Board of Directors

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Conservation Landscaping and

Sustainable Yards

Trista Imrich

Barbara Duke

Restoration Projects

Brent James

Clay Bernick

SOS Program

Joe Randall

Cover photo courtesy of Erik Moore



iyce Wexler - Sunset at False C

From our beautiful ocean and bay beaches and the Lynnhaven River to Back Bay and the North Landing River, our waterways define our lives in Virginia Beach. They are a large part of why we chose Virginia Beach as our home. We love to kayak, surf, fish, swim, and simply enjoy a sunset over our favorite body of water while savoring some delicious local seafood.

Founded in 2002, Lynnhaven River NOW is dedicated to restoring and protecting our beautiful Virginia Beach waterways. We began with a singular focus on the Lynnhaven River watershed, but over the years, our programs have grown to include all of the watersheds in Virginia Beach. We are truly blessed with miles and miles of beaches and the busy Rudee Inlet and Owl Creek; the bountiful and accessible Lynnhaven River which winds through the entire northern part of our city from the resort area to Town Center; the magnificent North Landing River "Green Sea;" and the renowned Back Bay.

From the beginning, our work at LRNow has been shaped by these three strategic objectives:

- Identify and reduce sources of pollution in our waterways.
- Restore vital habitat like oyster reefs, wetlands, riparian buffers, underwater grasses, native plants, and forested lands.
- Educate and engage the community and partner organizations in this work.

For sixteen years, Lynnhaven River NOW has provided community education and outreach opportunities to all Virginia Beach residents, teaching and inspiring adults and students to take steps to improve water quality in our Virginia Beach waterways. We have been honored to receive a Governor's Award for Environmental Excellence, a Coastal America Award, and the Dugdale Award from the Garden Club of Virginia among other recognition.

We work actively with many partners to help citizens learn how we can each contribute to conserving our valuable natural resources. LRNow has six key programs that help us to reach our goal of healthy and clean waterways.

- Pearl Homes and Neighborhoods
- Pearl Businesses
- Pearl Schools
- Pearl Faith Communities
- Restoration Programs
- Advocacy

You can read about all of these programs and more in our 2018-2019 Annual Report, on our website, LRNow.org, and in our regular newsletters, the E-News. Sign up for our newsletter on the home page of our website and learn about the many opportunities to get involved and be a part of this dynamic team.

Dear Members,

At LRNow, we love our beautiful and bountiful Virginia Beach natural resources. We believe that we can continue to grow and develop as a city while we protect our marine environments, expand our forested lands and open areas, and restore our shorelines and native vegetation. We believe that Virginia Beach can tackle all of the challenges that climate changes may bring. And we believe that we can be the cleanest and most sustainable city on the East Coast.

We know that this can only be accomplished through collaboration. By working with our residents, leaders, businesses, faith communities, and schools, we can accomplish what none of us can accomplish alone. We hope that during our sixteen years of work in Virginia Beach, we have earned your trust and support.

We began our work in 2002, focused on the Lynnhaven watershed. It was the most densely populated and most degraded watershed in the city. We set out to reverse some of the destructive practices of the past and return the Lynnhaven to its previous glory. We have had some success in that pursuit. The Lynnhaven system is much healthier and more productive than it was sixteen years ago. Our native oyster population has rebounded beautifully and we all understand so much more about how our actions affect the health of our waterways.

But during these years, our work continued to expand and encompass the whole city – all seven major watersheds (Little Creek, Lynnhaven, Rudee and Owl Creek, Ocean and Bay beaches, Elizabeth River Eastern Branch, Back Bay, and North Landing River). During the past couple of years, we have concentrated on learning more about the Back Bay and North Landing River watersheds that drain into the Albemarle and Pamlico Sound to our south. And we have introduced some of you to the wonders in these areas of our city through our Discover Virginia Beach monthly events.

We are dedicated to restoring and protecting our natural resources throughout the city. To better reflect the real nature of our work, we have adopted a new tagline for our logo. The logo is the same as you have learned to recognize, but it now says Restoring Virginia Beach Waters.

Thank you for being a part of the team that is making a difference in our city!

Sincerely,

Karen Forget
Executive Director



Cecilia Kocan - Sharing the Sun

Discover Virginia Beach Photo Contest Winners

Thank you all for your entries in the 2018 Discover Virginia Beach photography contest! We feel so fortunate to live in or near such a unique city that is home to many diverse ecosystems. From Back Bay to the North Landing River, Stumpy Lake, Atlantic Ocean, the Chesapeake Bay and the legendary Lynnhaven River, each photograph truly captures all of Virginia Beach.

The winning photos have been included throughout our 2018-2019 Annual Report for your enjoyment.

Congratulations to our 2018 Discover Virginia Beach Photography Contest winners!

Adults

Wildlife:

1st Place – Mark Winterstein "An Egret lands in the marsh at Pleasure House Point"

2nd Place – Stephanie Johnson "Shall We Dance?"

Landscape:

1st Place – Eric Moore
"Mouth of the Blackwater"

2nd Place – Bill Nevin "Sunset Backbay"

Recreation:

1st Place - Steve Daniel "Dog vs. Crab"

2nd Place - Mary Lewis "Dinner on the water"

Overall:

Mark Winterstein
"A Blue-grey Gnatcatcher stares down a caterpillar at Stumpy Lake"

Youth

Wildlife:

Cecilia Kocan "Sharing the Sun"

Landscape:

Bryce Wexler
"Sunset at False Cape"

Recreation:

Erin "Ellie" Carpenter "Sunset on the Lynnhaven"

Volunteers of the Year for 2018:

All-Around Volunteer

Jon Parish

Our Volunteer of the Year for 2018, Jon Parish, is dedicated to volunteerism and has been recognized for his community service through his employer PRA Group. Jon paddles waterway cleanups bringing in



kayak-loads of water-borne trash. He sets up and breaks down events such as the Fall Festival and was committed to the construction of the 64th Street Pavilion shelter.

Stewardship & Access Committee

Rosemary Harker

Rosemary Harker has been a volunteer with the Stewardship & Access Committee for over 12 years. Rosemary leads by example and helps in many capacities such as leading children's activities at the Fall Festival, work-



ing monthly waterway cleanups, and sampling the waters of Crab Creek as one of LRNow's Citizen Scientists.

Oyster Restoration

Chris Ludford

Chris Ludford has been named LRNow's 2018 Oyster Volunteer of the Year. His positive spirit of volunteerism and "can-do" approach to every challenge has distinguished him from his peers. He has been



instrumental in providing afloat support to LRNow whenever and wherever he was asked. This resulted in LRNow's being able to take distinguished visitors out onto the water in support of our oyster restoration program, with resulting highly positive and important visibility for LRNow. For his unfailingly positive attitude and spirit, he is our Oyster Volunteer of the Year!

Oyster Roast Silent Auction

Debbie Blankman

Debbie Blankman serves on the PR and Outreach committee, the Silent Auction Committee and as an Oyster Chick. She has been invaluable to the Silent Auction Committee working endless hours to procure



amazing fundraising items for our Silent Auction that takes place during our annual Oyster Roast.

Education Programs

Tonya Rivers

As a pre-school teacher, mother of two, and Cub Scout leader, Tonya Rivers brings creative ideas, enthusiasm and teaching experience to the SPAT (Science Pre-school Adventure Time) programs. This past year, not only did



she develop and teach four classes, she also assisted children with crafts at outreach programs. She is a wonderful asset to the Education Department and well deserving of the award.

Sustainable Yard Program

Barbara Duke

Barbara Duke was invaluable to our new Pearl Homes Sustainable Yard Program. She gave 42 hours of volunteer time helping to assess Pearl Homes for the programs best management practices (BMPs), often



available on short notice to visit a property or help out wherever needed. As with all our wonderful volunteers, her expertise and eagerness to get the program up and running set the stage for an incredibly successful inaugural year!

Advocacy Programs

John Uhrin

During his twelve years on our Virginia Beach City Council representing the Beach District, John Uhrin consistently supported efforts to protect our natural resources. He was an active member of the Resort Area



Commission Green Committee, helped get recycling containers on our beaches, supported offshore wind development, and was a champion in our fight to keep seismic testing and offshore drilling for gas and oil out of our ocean waters.

Office Assistant

Linda Lexier

Linda Lexier's enthusiasm for the work of LRNow has been apparent for a long time. She made the delicious oyster stew for our spring Oyster Roast for many years and has helped out at many LRNow events. Even



through her own health challenges, Linda has continued to help out in the office whenever we have needed her.

PR & Outreach Committee

Carolyn Osmond

Carolyn Osmond is a great all-around volunteer, consistent and easy to work with. Whether she's bringing well-thought-out ideas (and homemade treats) to meetings or thinking ahead and doing the legwork to

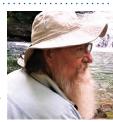


help create crafts for the Oyster Chicks sale at the Oyster Roast, she contributes to all facets of our PR and Communications Committee.

Pearl Faith Program

Dr. Robin Van Tine

The Pearl Faith Volunteer of the Year is Dr. Robin Van Tine for his role as the coordinating force for the Pearl Faith Workshop: Sacred Earth, Sacred Work. Robin, a recently retired professor of biology and environ-



mental science at Saint Leo University is an active advocate for environmental justice and is a leader in the congregation at the Unitarian Universalist Fellowship of the Peninsula.

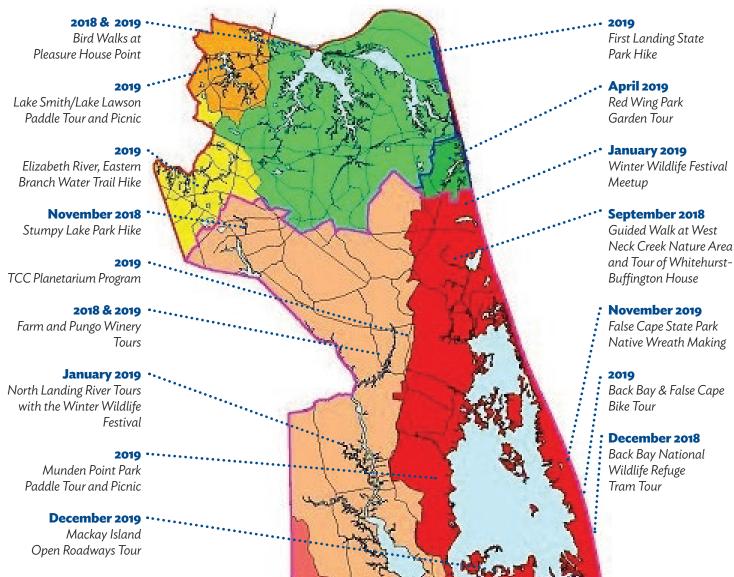
Discover Virginia Beach

Join us for adventures every month throughout the year in different areas of our beautiful and diverse city. Here are some of the places we explored in 2018. Watch our E-News for all the great places we will go in 2019 – here's a little preview.









Oysters, Oysters, Oysters

Restoring our Lynnhaven River native oyster population has been an important part of our restoration efforts from the beginning of our organization. Recent surveys identified approximately 120 acres of healthy sanctuary oyster reef in the Lynnhaven River including Broad Bay, Linkhorn Bay, the Inlet and the Eastern and Western Branches. About half of that or 60 acres is subtidal sanctuary reef constructed over the past fifteen years and the other half, 60 acres, is constructed and natural shoreline or intertidal reef. Our goal is 152 acres of sanctuary reef. This has been determined to be the acreage needed to sustain a healthy oyster population in the Lynnhaven.

Here are some updates on recent and upcoming oyster restoration projects:

Laila Oyster Castle Reef on Broad Bay Island

The Laila reef lines the northwest shoreline of Broad Bay Island

and is both our first and our largest oyster castle project. It protects the narrow undeveloped point of Broad Bay Island from erosion and provides habitat for an amazing array of oysters, sponges and other marine critters in Long Creek. The reef was built in three phases starting in spring 2012 and ending in spring 2014. One of our hopes was that we would see the accretion of sand and the spread of marsh grasses behind the castles as the waves were calmer and the shoreline stablized. We are very happy to say that has happened faster than we expected. Where oysters thrive, so do our marsh grasses.

The Laila reef is named after our friend Laila Serpe, daughter of Richard and Linda Serpe, who was taken from this world much too soon. Many of her Cape Henry Collegiate School classmates have volunteered to help with construction and maintenance of the Laila reef over the years.

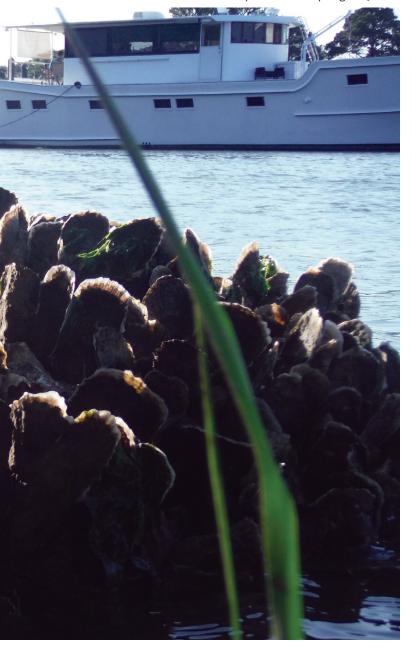


• Eastern Branch Reef constructed in Spring 2017

In spring 2017, 19,000 bushels of oyster shells from our shell collection program were used to build the Community Reef in the Eastern Branch of the Lynnhaven. This was our first sanctuary reef in the Eastern Branch. The settlement of oysters on this reef has surpassed all expectations and their growth rate has been tremendous. After only eighteen months, our tonging survey brought up one to two inch oysters in healthy clusters. Oysters this size were found on all areas of the reef. We can't wait to go out next fall and see how large and plentiful they have become.

Western Branch Reef planned for Spring 2019

The plans have been made, the grant funds obtained and the partners are all in place to build at least five acres of sanctuary reef in the Western Branch of the Lynnhaven in spring 2019.



The Witchduck reef will be the first sanctuary work in the Western Branch of the Lynnhaven. We hope to see results that match the tremendous growth we have seen in the Eastern Branch.

All of these oysters are helping to clean the water and provide habitat not only for baby oysters to attach and grow,

but for sponges, worms, crabs, and juvenile fish to shelter and grow. Each reef becomes an ecosystem supporting a healthy marine environment.

James Madison University Research Project

When it came time for Virginia Beach native and James Madison University graduate student Bailie Lavan to pick a Master's Thesis Field Project for her MS in Biology, she decided that she wanted to take a pass on the bovine



flatulence study (Yes...it's really a thing.) and to do a project involving oyster settlement and growth in the Lynnhaven. She started with a blank sheet and using her knowledge of natural oyster reefs and growth patterns designed a series of cement tiles with about 24" x 24" bases. On these base tiles she attached cement facsimiles of oyster shells in different patterns and densities to see if the spat would prefer one style over the other with differing interstitial spaces upon which to settle.

In January, 2018 she contacted Brent James, LRNow's Oyster Restoration Coordinator, to inquire as to LRNow's interest in her project. After numerous planning emails and meetings, a site on one of Brent's oyster leases in the Eastern Branch of the Lynnhaven was selected for placing the tiles in the water. She constructed the tiles at JMU and trucked them down to Virginia Beach for deployment. In June the tiles were deployed with the help of Bailie's Faculty Advisor, Dr. Patrice Ludwig and her husband. A single oyster castle block was also deployed to serve as a control unit to compare spat sets.

Since tile deployment in June, Ms. Lavan has returned with some undergrad biology students every few weeks to monitor the project and measure the success of the different tile patterns. The last site visit was just completed in December, and the results of the project will be published shorty. By all

New Pearl Homes December 1, 2017 – November 30, 2018

Pearl Homes are residences where our great Virginia Beach citizens are asking what they can do to make our city more sustainable and keep our waterways clean. We are happy to have welcomed over 857 new residences to our Pearl Homes program during the past year, bringing the total to 4,657. Congratulations to our new Pearl Homes.

So much of the progress we have made in restoring our waterways is a result of the great work our residents are doing to change their practices and adopt more sustainable behaviors. These pearl homes are located all over Virginia Beach and are places where people care about our community and our environment.

Our daily habits and decisions make a difference. Whether you have installed a rain garden, made a pledge to "Scoop the Poop" or switched to a reusable water bottle, YOU are helping to bring our waterways back to life, and we would like to recognize your efforts. Any Virginia Beach home can be a Pearl Home. If you would like to join the community, please visit Irnow.org/pearl-homes/ to apply and become a Peal Home today!

Thank you to all of our Pearl Homes for your beautiful efforts and actions to being part of the solution!



Sub-watersheds
Neighborhood

CHESAPEAKE BAY WATERSHED

Bay Coastal Watershed Chesapeake Bay Shores

Lynnhaven Dunes Linda Merritt Kerry Wang

Dea Chalmers

Chic's Beach Christopher Moss Robyn Backer Lauren Clark

Elizabeth River Watershed

Avalon Hannah Farrell

Bellamy Manor Lisa Whitley Kelly McCrance

Brandon Sherri Sutherland

Brookfield Crossing Angel Smith Paul Leon

Carolanne Farms April Vasser Leonardo Camillucci Valerie Custer

Carriage Mill Nicole Johannesen Elisa Clark

Chatham Hall Kim Snyder

College Park Lee Antonella Mara Chauvette Fairfield
Chris Broselew
Jan Hostetler
Kimmy Ellen
Katherine Hare
Patrick Carr
Susan George
Suzanne Kempf
Green Acers

leena Miller

Hunt Club Association Mark Podolinsky

Huntington Estates Brenda Kopek Dot Miller

Jonathan's Cove Sylvester Starkes

Kempsville Colony Kate Martin

Kempsville Lakes Brandon Holland Erink Wallace Jeanne Tonnesen JoAnna Mills-Sampson

Lake Edwards Ann Marie Davis Carlisthe T. Wright Ines M. Febos Latoya Lamb

Lake James Janeen Brady

Lakeville Estates Amanda Elliott

Larks Down Kempsville Sandra Jimenez

Larkspur Bill & Tere Gustafson

Level Green Amber A. James Lisa Graham

Point O'View Kimberly Moreno Steven Cotthaus

Weblin Place Katherine Jones

Woodstock Brooke Schaab Linda Miller Amrit S. Dhillon Amy Petersen Amy Rimarski Barbara Bishop Betty Oren Caitlyn Ricks Charet Thill Christine McCabe Corell Taylor Corey Taylor David Kuhn Dr. Kelly S. Rippard Drake Arce Eulonda Rewis Haley Williams

Heidi Mashaw Jack Bingman Jaclyn Hayes Jennifer Morton Jennifer Puente Jennifer Williams Jessica Nutt Joanne Hughes John DeLacey Juan Correa III Julie Oehman Julie Smith Kaden Peele Kay Jackson Kristin Smith Kyonna Hall Laniva Danae Coburn Larry Strauss Lauren Cook Lorraine Nute Lorrie Terantino Lvnn Blessett Maddie Gordon

Rain Barrels

Rain Barrels are a great tool to help protect our watersheds from runoff pollution. They also conserve a natural resource that can reduce your water bills. Municipal water contains ammonia, fluoride, and chlorine which is hard on plants. Your gardens and vegetation will thrive by using the harvested rainwater to water them.



Mansoor Abdullah
Mark Schaller
Mason X. Sanderson
Melicni Shadley
Michael Peele

Mansoor Abdullah
Adrienne Baker
Emma & Bill Carroll
Abby Novario
Courtney Haskins

Mindy Neiman Qina Chen Wai

Resa Rutledge

Rhonda Baez

Robert Leuke

Sade Wright

Salick Morrisey

SaQuoya Smith

Sarah Ciaranca

Shahed Abdulla

Alexander Smith

Tana Colon

Tonya Snow

Terri Douberly

Chantina Brinson

Aragona Village

Alex Muncy

Tracy Mills

Cassie Moore

Thomas A Blei

Baywatch Point

Belmeade

Michaela Thrower

Leslie Edmondson

German Garcia

Bradford Cover

Arria Kemper

Campus Fast

Kimesha Mosley

Rachelle Jackson

Cherise (Blackmon)

Larnette Ricks

Carriage House

Marshall

Robyn Jones

Kumar

Shikha Sharma/Sunil

Stephanie Thompson/

Little Creek Watershed

Rosa Flores-Casas

Cypress Point Sandra Dubque Sally Marr Heather Wilson

Diamond Springs Nancy Weinzetl

Falcon Point Apartments Erica Keller

Haygood Rhonda Hixson Wendy T. Voliva

Lake Cypress Mildred Dyson

Lake Shores Austin Rosecrans

Lake Smith Terrace
Karen Ford
Karen Garrison
Frederick & Letha Sheffy
Christina McGinn
Allison Hope

Lynnbrook Landing Monique Edghill

Malibu Hilary Thompson

Newpointe Condos Samantha Hughes Karen Arae Reinoso Ciera Calloway

North Ridge Brittany Peiser-Hudgins Kierra Thomas

North Shore Jessica Fernandez



Ridgely Manor Tiffany Wiggins

Thoroughgood C. Baraki Sandra White Wicks Family Patricia Lauterbach Joyce Lovitt Anntionetta Reese Benita Willis Darrien Daniel/Fatazia Gaynor Dianne Grimes Elizabeth Herrin Hazel Firmino Justin Huang Kathy Lindgren Kathy Parks Logan Wilson Mary Anne Allen Melchi Williams Melinda Charles-Samtime Melissa Ogozaly Nicole Litkowski Racquel Parham Rani Patel Renarden Freeman Ronald Garrison Ryan Huang Sisha T. Perea Tomia Foster Tonya Rivers Tracie Silva Tyler Droll

Lynnhaven River Watershed

Aeries on the Bay Manuela Mourao

Alanton Rebecca Newton

All Saints Episcopal Maury Joy Ryan Sawyer Susan Tuohy

Aragona Village
Angela & Scott Breuer
Heather Andrew
Katie DeGaramo
Maegan Conner
Patricia Mace
PJ Humphries
Rachel Lee
Teresa Smith
Whittney Madden

Arbors at Cape Henry Sanoy Gilbert

Battery Park Dawn Rykheart Kimberly Hadzima

Bay Colony Amelia Suh Cindee Riordan Kelly Burroughs Kim Savage Robert & Deborah Blanchard

Bay Island Bob and Donna Magoon Hallie Silliphant Mark Baumgartner

Baycliff
Jarred Roenker
Christine Westendorf
Susan H. Mathias

Baylake Pines
Dell Young
Demetrius Winslow
Klaus
Jennifer Ackley
Matthew Smith

Bethune Woods Raena

Birchwood Abby Causey Alison Dudkoewicz Elizabeth L. Tumilty Sheila & Nick Bailey

Birdneck Point Marc & Chris Weiss Ellen Manning Keeter Melinda Gulick

Bishopsgate Ruth Kral

Bow Creek Janice Luton Samantha Brooks

Brighton in the Bay Dorene Caron

Broad Bay Estates Jenn Sadler Shelly Harris Melissa Steadman

Broad Bay Island Anna Surratt Mary k. Mladinich-Spain

Broad Bay Point Greens Kristina Dasher

Buckner Woods Elizabeth Samuelsen

Cape Henry Shores
Trish Knox
Cape Story by the Sea
Brian & Angie Callahan
Angela Lindsey
Barbara MacDonald
Susanna McClure

Cardinal Estates Dawn Davis

Chesopeian Colony Robert Oliver/Mary Bradley

Chic's Beach Hilary Wriggers William Hallwig

Chimney Hill Christine Williams Elfreades Perkins Karri Huey Church Point Sherif El-Mahdy Swarna Marian

Eastern Park Bonnie Flora

Gables of Belamy Melinda Hughes

Gatewood Anna Hersey Hannah Rice

Great Neck Farms Terry Weller Jennifer Nagel Vazquez McGovern

Great Neck Lake Neil & Cheryl Rondorf

Great Neck Manor Bobbi Bains

Great Neck Meadows Judy Moebus Maria Hess

Great Neck Point Brafford Family Mary Ann Jolly Scott Washburn

Green Garden Gwyneth Carlson

Green Hill Farms Jill & Robert Mariano

Green Run Bonnie Kluzz Carl J Carlson Hall and Lei Dunn Jenny Bise Jessica Brown Laura Dember Pamela Burson Tawanda Williams Harbinger Road Haley Dolinar

Hilltop Kristin Hunsicker L. E. Parker-Shuler

Inlet Shores Condos William & Caitlin Stravino

Jamestown Commons II Rosalba Ricciardi Genet

King's Grant Alicia Mangels Angela B Shaeffer Anne Deary Benjamin Chidester Bree Ruzzi Claudia Moorad George Prazma Grace D Stedje-Larsen Jessica White Katie Cardon Katlyn Flowers Kimberly Williams Marie T. Culver Rachel Phelps The Cross Family

Kline Farms Kim Marin

Lake Trant Jim & Brenda Haynie Mark Bragg

Larkspur Anna Aquino Eric and Lindsay Johnson Josh and Kelly Kinnear Shelly and Stephen Pfeiffer Stacey Allin

Laurel Cove Macklin Smith Nancy Woodhouse Lesner Cove Condos Lynanne Gornto *Linkhorn* Alexandra Laramee Robert Flint

Little Haven Astrid & Sam Lamb

Little Neck Kim Hudson Huib Keizer Tom Langley Maria Pguyen

Lynnhaven Colony Kate Hall

Lynnhaven Shores Margie McCathy

Lynnhaven Woods Rachael Armeli

Magic Hollow Marina Koehler

Malibu
Austin Taylor
Brenda Lutz
Cynthia Hiddemen
Jamie Collins-Facteau
Megan McCreary
Sid Kasarabada

Marina Shore Apartments Kasey Haddock Patricia Manint

Middle Plantation Gregory Golden Leslie Jossen

North Alanton Joan Pickett

North End Nancy Brown

Ocean Gardens Lisa Willis Robert Dizon Ocean Park Andrew Broyles Andrew Preece Jacob Kratochvil Melissa Palmer Patrick Gazzolo

Old Beach Village Mary Anne Decker Richard Walsh

Old Donation Farm Tamyra Natividad

Old Donation Shores Jeff Smith

Osprey Point Townhomes Joane Ofeldt

Pembroke Manor Alexander Nash Elizabeth Gibbs

Pembroke Meadows Kim Bader Beverley Weisman Jackie Savage

Plaza Sharronna Benton Pocahontas Village Darlene Sabol Judith Haddox

Princess Anne Hills Michael Brazukas Samantha Gordon

Redwood Farms Mary Fentress Rive Cove Point Donna Marchant-Roof

Snug Harbor Tracy Critser

Southern Points Lars Parkhurst

Thalia
Audrey Somero
Chris Walker
Dean Cooper
Jen Klotz
Jenny Hofler
Kenneth Smead
Susan F. Kaufman
Terry Ritzel

The Lakes Yi Guo

Thoroughgood Andrea Balsly Jason Thomas Karen Heesch-Gilman Verna Tersol

Timberlake Aneta Spry Andrea Battle-Coffer

Town Center Condos Dominic Rhymes

Towne Square Lakesha Ricks

Rain Gardens

A Rain Garden is a bowl-shaped garden with deep, loose soil and a berm on the downhill side to act as a dam. The excess water on your lawn or water that flows off of impervious surfaces can be directed to run into the garden amended soil and help to recharge the groundwater. This reduces the amount and improves the quality of storm water runoff. The garden also increases the habitat diversity on your property.



Trant Berhshire Amanda Crauotte Trantwood Christopher Faison Joseph D Legradi

Wellington Woods Elizabeth Waranch Heather Deanes Jen Schlate Jennifer Mlincsek Katie Schatti

Wimbledon on the Bay Kai Lakin

Windsor Woods Bonnie Jenks Elizabeth Telkamp Kim Barnes Liz Cipolla Seantel & Joshua Butler

Wishart Chris/ Nicile Stuart

Wolfsnare Plantation Bill Reid Lisa McDonnell Susan Whitaker

Woodhurst Sharon Godfrey

Woods of London Bridge Rebecca Silverstein Abigail Devall Alicia Cohen Kraus Alona Oquike Alyssa Davis Amanda Justus Amber Copeland Arya Nair Ashley Haller Bella González Betty Reese Bianca Artis Candace Baird Carol Volkringer Carolyn Burbank Carolyn Pulley Cassidy Giammaria Cherie Brogan Cheryl Trahan Christina Adams Coulborn Crista Ewell Dana C Fallin Dawn Hrelic Debi Kesler Deborah Stoyko Diana E. Ferguson Eko Setiyowati Elizabeth Stocks Evan Urmy Ian Graham Irene E. Jones James Smith Jamie Holland Janna Goliff Jennifer Grant Jeremiah Clark Jeremy Murray Jess Fraser Jonathan Kyle Logue Julius Hayes Karen Blanton Kathleen Conley

Infiltration Trenches

An Infiltration Trench is a gravel-filled trench or pit that stores runoff temporarily until it seeps into the ground through the bottom of the trench or pit. This practice does not necessarily incorporate vegetation into its design. Instead, they rely on natural soils to absorb runoff and filter pollutants. Water quality treatment, reduction of peak flows in storm water systems, and groundwater recharge are the primary benefits of the infiltration trench. Also, since the amount of surface water entering waterways is slowed down, it reduces channel erosion.



Kathy Botte Kathy Freeman Kierra Gilliam Kim McClernon Kristin Bowen L Katie Morrisette Laura Hanes Laura Moran Lauren Jackson Leslie McCleland Leslie Nelson Leslie Nelson Lindsev Asbury Lynn Hunter Margaret Bejma Marlene Antrum Mary Willis Melissa Prate Miriam Weathers Misty Neal Cementher Mittie Burnham Nancy Eleftheratos Nancy McNeeley Nikysha Warren Rebecca Carter Rebecca Robins Renet Ross Ruben A. Sanchez Sarah Hall Stacev Richman Stacy L. Hux Stefanie Newlin Susan Lawson Susan O'Connell Suvee Foose

Teresita Peria

Valorie Sankey Valorie Sankey Virginia French Wilda Cuninghame

OWLS CREEK WATERSHED

Ocean Coastal Watershed North End Hannah Pierce Katie Johnson Nancy Rios Ron Asher

Rudee Inlet Watershed Birdneck Woods Donna Kinney

Lakewood Randi Riesbeck

Oceana Ashleigh McNeil Heather Husted

Sawgrass Condominiums Carrie Bosseler Stephanie Van Petten

Seatack Joy Mason

Shadowlawn Diane Payne South Beach
Dana Sauvageau
Bobbi Skinner-White
Amy Alberico
Monica Reyna-Kirkland
Quintin Custis

SOUTHERN WATERSHED

Atlantic Shores

*PEARL

Back Bay Watershed

Retirement Community

NEIGHBORHOOD* Allen and Barbara Bissell Alma Hollwgswirth Anita and Ron Casey Ann Dulman Anne S. Morgan Annie Alberi Ashby and Yrette Franklin Barbara Fleming Barbara H. Greenleaf Barbara Uenzke Barbara Wool Bergohee Betty L Lachman-Tucker Beverly Allen Beverly Johnson Bob and Jane Mote Bob McCombs **Bob Sage** C Balcom Carl McClees Carolyn and Chuck Landry Carolyn Hawxhurst Carolyn Little Catherine Ibarra Cecelia Williams Christine Rafal Colin & Anne Calvert Cynthia Lieck Dan Ferucci Daniel J. Arris Darrell and Claudine Patton David and Theresa Netherton Dixie L Johnson Don Beaman Don Bersing Don Wernick Donna Hudgins Doreen Stewteville Ed and Joy Phillips Edwina D. Walsh Ella Netta Hathaway F. Lee Werbin Frances Kohanek Frances Purpura Frank and Julie Barrett Frankie B. Clay George and Eiko Ikonen George Chagetas Gerrie Green Gerrie Lopest Gilbert L. Noal Gloria Bell Harriet Olsen Helen Beilbe Helen Dixex Jack & Anne Minnick Jack Stokes

James Denson

James K. Donson

Jan Van Heiningen Jane S Woolridge Jane Webster Jane Wright Janice Mohr Jayne Sullivan Jean Caprow Jean Carlston Jessica Dulmage Jim and Joan Kail Jim Laurance Jim Rosewbaun Joan Gelrison Joan Thurston Joel Peterson John and Donna Soderberg John Hamilton Judy Bernal Judy Harrell Judy Thaler Julianne Hill Kenneth R Yenni Lalas Brown Lee Werbin Lila Davis Linc and Joyce Neal Lora Hatt Louise McManus Margarita Linman Margene E. Sullivan Marie Larzelere Marjorie Marx Mary Anne Griffith Mary Lou Everton Mary Martha Hayes Mel Rungo Micheal and Nancy

Halperin Midge Tinney Misty Beninato Mollie Backs Mona Forney Pat Meakin Pat Robertson Pete St Germain Peter and Valerie Fay Philapena Price Pinky Derieux Richard P Multer Sr Richard Quarles Richard W. Anderson Rick Sawyer Robert Green Robert Mooney Ron Gahagan Russell Blackburn Rusty DePaul Sara Jane Druzheik Selma Stone Shao-Ru Cho Sherry Ewing Shirley and Richard Barcus Shirley Dowdy Shirley Rudoplh Sid Edelwar Steve Fulton Stu and Patsy Saul Susan and Peter Gerame Tim and Jayne Rodriguez Tommy and Sybil Griggs Tony Mediei Valarie Jones Wallace Cottrell Weyman C. McCoy Jr.

Pearl Neighborhoods

A Pearl Neighborhood is a local Virginia Beach community that desires clean and healthy waterways. To qualify, the neighborhood must have at least 30% of their homes be Pearl Homes, offer a LRNow education opportunity, and complete at least one environmentally focused community project. This program reminds us that it is not only our individual responsibility but also our community duty to work together. We can make a greater impact towards a healthier environment if we reach out to our neighbors and work as team for a better tomorrow.



Willam and Teresita Crowe William Hargrave Winifred P Smouse Yvette Fiore

Back Bay Lagomar Danielle Hunn

Birdneck Lake Tracy Sykes

Creeds Meshell Woliver

Lago Mar Angela Bogdanowicz James McCall Amanda Kelly Jen Kepka

Lotus Garden Alice Thayer Mirasol Renee Bosher April Stilwell

Ocean Lakes Kinsey Boyer Sandra Caldwell Scott Carlson Seth Edwards

Pinehurst Estates Randy Sparling

Pungo Audrey Hodges Jennifer Nannery Robert Arbuckle

Red Mill Alice A. Hatfield Katie Warnock Melissa Murphy Michelle Shoffstall Rebekah Kelly Susan Thuma

Sawyer Lakes Rachel Jennings

South Shore Estate Cubbie Ingraham

Upton Estates
Janice Hart
Tinisha Williams
Ashley Swenson
Brooke Graham
Christina Lane
Desiree West
Donna Quick
Elise Hipp
Maria Cooper
Mary Flannery
Morgan Wernecke
Terri Maurice
Tonya Krecker

North Landing River Watershed

Acredale Amy Mackiewicz Jennifer Lepley

Alexandria Jessica Newell Renee Garrett

Bellamy Manor Estates Whitney Robinson

Bellamy Plantation Jan A. James

Bellamy Woods Colleen Cahill Erica Pero Kathy Reingruber

Blackwater Ashley Vance

Brandon
Alyssa Harmon
WBrigadoon
Brenda Green
Celeste Greene
Ed and Leslie Ullom
Eddi Betcher
Kelly Dey
Kristy Thomas
Victoria Kelley

Buckner Farms Bernadette Parris Jeri Blythe

Charlestown
Andy Underwood
Debra P Wanzong
Karin Grice
Kimberley Temple
Lisa Mikulka

Charlestowne Lakes Cathleen Coward Cheryl Schroler Mary Lawrence

Christopher Farms Drive Declan Donnelly

Cobblestone Terrace June Hartman

Courthouse Estates Joe & Vickie Etheridge Rhonda Kinley Stacey Moore

Coventry Elizabeth A. DeCarlo

Eagles Nest Tom Sola

Foxfire Andy Stark Lisa Alconcel Lisa Coleman

Glenwood Bailey Stadler Diana Smith Hilary Ho Sang Johanna Cunning Joni Swanberg Matthew Calsada Merrill Wahaba Nikeia Pittman Terra Luckett

Highland Parish Miechele Rivera-Hall **Scoop the Poop**

Through multiple studies we found that 60% of the excess bacteria in the waterways was coming from our pets and birds, ducks and geese primarily. There are two things that we can do to control the bacteria that enters our waterways from these sources: scoop the poop every time, everywhere and do not feed wildlife.

The average dog produces .75 pounds of solid waste per day. There are an estimated 60,000 dogs in Virginia Beach. That is 45,000 pounds of waste per day that ends up in our waterways if we do not handle it responsibly. On top of that, one adult goose produces approximately a pound of droppings per day. Geese are invasive. Think about how many you see a day. They only stay here because we've made it so nice for them, feeding them, and providing a nice, flat lawn habitat.

If we all clean up after our pets in the park, on the beach and in our own yards, and stop feeding the wildlife, we can reduce this source of dangerous bacteria in the waters where we swim, kayak, and fish. It is that simple and that important.



Hillcrest Farms Angela Taylor Diane Tarkenton

Holland Pines Karen Slagle

Hunt Club Forest David Clark Hannah Stanford Kimberly Peterson

Indian Lakes Amy Babines Erin Whitt Jack Babcock, Jr Kelly Pecura

Lake Christopher Christene Mitchell

Lincoln Military Housing Jessica Sorenson

Madison Crossings Averi Zalabak Midway Manor Carrie Buxton Israel Figueroa

New Castle Anthony Fabrizio Carol Stein

Ocean Lakes Russell S. Haller Pine Ridge Alex & Jared Shields Alison Ailiff Alison Lane Amy Mallinson & Family Amy Pratt Andrew & Rebecca Hailey April Smith Ashley Puvogel Becky Rhame Bill & Barbra Willis Charles franklin Cheryl Dill Chris & Shawnea Roberts Cindy & Aaron Peckham Debbie Jewell-Seawright Delores Gresalfi Donna Enos Donna Gorman Elisah McGee Eric Nichols Hollie Sarnoski Jeff Rooney Jeff Swallow Jeffrey R. Bickel Jennifer Haefner Jennifer Scott John & Kathleen Rooney John & Kelly Cosentino Joyce Brehm Julie Hayden Justin and Heather Cashwell Kaizen Schleyer Karen Strogylos Kelly & Michael Chin Kim Turner Kimberly Zaleski Lin Rose Linda Edwards Lisa and Fred Barranger Lisa McKenney Megan Carlson Melanie Frederick Michael Geluso Myrna Shuey Pam Kersh R.C. McManus Rachelle Ingram Roxanne & Ed English Sam Gassel Sarah Orebaugh Seth & Diane Larson Stephanie & Joshua Jones Stephanie Jones Steve & Lisa Winter Stohrer Family Sue & Tim Bradley Todd & Gina Lane Tonya Simoes Valerie Clark

Clint Cholish

Deanna Nevling

Corey, Ali & Baker Muns

Princess Anne Woods Erin Zeder

Rock Creek Darek Dabbs Reina Custodio

Rosemont Forest Michele King Michelle Reitz

Royal Pointe Hilary Ho Sang

Salem Brittany L. Smith Denise Kerry Julia Bland

Salem Lakes Christina Hodges Ryan Murnane

Salem Villages Heather Wade Salem Woods
Candace Boyd
Cheryl Beardsley
Courtney Carr
Kelly Fletter
Lauren Salas

Southgate Joanna Dann Sarah Almeidy Tamara Duggar

Spence Crossing Kimberlie Petrulis Tobey Pedroza Wendy Moore

Stratford Chase Brooke Patterson Courtney Parziale

Sunstream Elaine Simpson

Victoria Park Carrie Williams Patty Capewell

Wood Farm Michelle M Klepk

Woodbridge Pointe Monica Staples

Woods of Piney Grove Amy Cross Adina Gadell Archana Thangavel Beth Stone Blackburn Brett Greenfield Brittney Murrell Carmen Orellana Carson Kuehn Caryn N. Beckwith Catherine Gallucci Christina Williams Courtney Phillips Dawn Williams Desi R. Spratling Donna Wilson Erin Pastoric Ginger Jansen Heather Cohen James Maddox Jenny Maugeri Julie Wood Kari Wandersee Katrina Sawyer Kelly Gressley Khalid Eltigani Linda Strain Mia Roberts Myecole Braswell Naya Parker Nikecha Lewis Dalton Pamela Blount Raleigh & Vera Manley Renee Garrett Roseanne Jacob Sandra Medina Shannon Pearson Starr Pierre Zhihan Carpenter

The Albemarle Watershed

A watershed is the land area that drains into any particular body of water. Do you know your watershed address?

This is an important question in Virginia Beach and the answer may surprise you. Two-thirds of the land area in Virginia

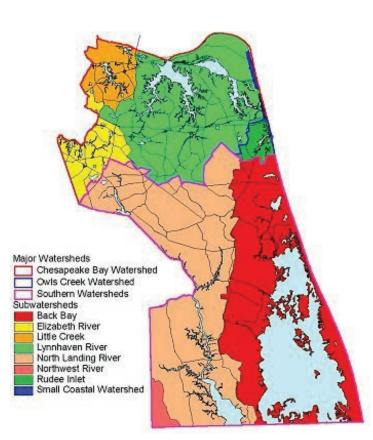
Beach drains south into the Albemarle-Pamlico watershed. Often called our Southern Waters, it is made up of the Back Bay and North Landing River watersheds and is part of the Albemarle-Pamlico system. In Virginia Beach, we are sandwiched between the two largest estuaries in the United States, the Chesapeake Bay to the north and the Albemarle-Pamlico estuary to the south. And our actions and decisions not only affect our local waters, but also have an effect on these two important estuaries.

The Virginia portion of the

Albemarle watershed is made up of three river basins: the Roanoke, Chowan, and Pasquotank. These river basins include thirty-eight Virginia counties and cities and roughly 10,500 square miles in the southern portion of our state or 25% of the land area of Virginia. The waters in this watershed affect Virginians in many more ways than they likely realize. This area is rich in farmland and recreational opportunities. Perhaps most importantly to us,



the drinking water for Virginia Beach is sourced from within the Albemarle watershed coming from Lake Gaston, which is located on the Roanoke River.



The Back Bay, North Landing River and Northwest River watersheds are all part of the Albemarle-Pamlico Watershed.



The Albemarle watershed contains many different ecosystems and their diverse and unique sets of flora and fauna. The watershed spans from the Atlantic coast in Virginia and North Carolina well into the mountains, with habitats ranging from open estuary and coastal marsh to densely forested upland piedmont.

Our own Albemarle areas, Back Bay and the North Landing River, reflect that diversity. Farmland, conserved forestland, developed suburban tracts, vast marshlands, sand dunes, open water, and long expanses of ocean beach can all be found in the southern watersheds in Virginia Beach.

Back Bay is a large body of mostly fresh water lined by marshes, shrubby wetlands, and swamps. The entire embayment is separated from the Atlantic Ocean by a relatively narrow barrier island, which has historically been breached and broken repeatedly, creating temporary inlets. Since the closing of Currituck Inlet during a storm in 1830, Back Bay has changed from a tidally influenced saltwater estuary to a wind tide dominated fresh and brackish estuary. Back Bay is renowned for the bounty of waterfowl that visit every winter. Back Bay Wildlife Refuge is managed to best accommodate these winter visitors and is home to swans, snow geese, many species of ducks, ibis and other

waterfowl during their annual migrations.

The ocean beaches south of Sandbridge are some of the most pristine on the east coast and important as sea turtle nesting sites.

The North Landing River watershed has been dubbed "The Green Sea" for its vast expanses of marsh. The North Landing River flows southward, rapidly widening in its lower reaches before emptying into Currituck Sound just south of the Virginia -North Carolina state line. The North Landing River is part of the Intracoastal Waterway, a major inland waterway running along the Atlantic and Gulf Coasts of the United States. Much of the land surrounding the river is owned and protected by various public, private, and nonprofit conservation organizations, comprising roughly 15,700 acres under easements held by federal, state, local, and nonprofit partnerships.

The North Landing River and its tributaries have been designated by the state and city as a Scenic River.

There is much to celebrate and protect in our southern watersheds. Whether you enjoy delicious strawberries in the spring, the beautiful waterfowl that visit our area each winter, or walking on pristine beaches, the Albemarle part of our city has much to offer all Virginia Beach residents.



Highlights From 2018:

Total involvement in all LRNow programs last year was 24,783 • **5,019** Volunteer Hours Contributed • Over **120** community programs involving 11,029 citizens • Our waterway cleanup volunteers removed **8,002** pounds of debris from our marshes and waterways • In the first year of the Notable Tree program, we identified and marked 92 Tier One trees • We expanded our water quality testing program to 16 sites. Thank you Citizen Scientists • City of Virginia Beach invested \$13.6 million in water quality improvements: \$8.6 million through public works projects and \$5 million through public utilities projects • U.S. Army Corps of Engineers Restoration Plan was funded. Phase I will restore: 9 acres of wetlands along Thalia Creek; 7 acres of underwater grasses in Broad Bay; 8 acres of fish habitat in the Lynnhaven Inlet • LRNow and CBF receive \$400,000 in funding to build sanctuary oyster reefs in the Western Branch of the Lynnhaven • Our shell collection program, SOS, collected 2,700 bushels of shell for future sanctuary oyster reef work • We have

92 Pearl Schools city-wide with 9 new schools in 2018 • LRnow did 68 programs for students and teachers in 2018 • We added 857 new Pearl Homes for a total of 4,657 Pearl Homes city-wide



Mark Winterstein -An Egret lands in the marsh at Pleasure House Point

Lynnhaven River State Of The River Report For 2018 Our overall grade for 2018 is a B.

| | INDICATOR | 2017 GRADE | 2018 GRADE | WHERE WE ARE IN 2018 | WHERE WE WANT TO BE |
|-----------|--------------------------------|---------------|---------------|---|--|
| POLLUTION | Bacteria | В | В | 48% meets the shellfish standard; 91% meets the swimmable/fishable standard | 100% of river meets the shellfish harvest standard and 100% swimmable/fishable |
| | Nitrogen & Phosphorus | D | D | 90% impaired; incremental improvements in water clarity in Broad Bay | Nitrogen & Phosphorus levels that meet SAV habitat requirements |
| | Dissolved Oxygen | D | D | 90% impaired | 0 impaired square miles |
| | Water Clarity | D | C- | Areas of widgeon grass have been detected in Broad Bay | Sediment and Algae levels that meet SAV habitat standards |
| POLLUTION | Clean Boating | В | B- | NDZ in effect; 8 certified marinas; pumpout at the City Marina is still out of service | NDZ in effect, 8 certified marinas, annually increasing gallons pumped out |
| | New Funds for Water Quality | A | A - | \$1.8 M in the Lynnhaven; \$8.6 M city-wide | \$3 million per year |
| | Stormwater Treatment | C- | С | 31% of watershed treated; 43 new BMPs added in 2018 | 100% of total watershed treated with stormwater management |
| | Sanitary Sewers | В- | В | 5 sewer overflows; 1,629 gallons spilled; 173 septic systems, down 20 from 2017 | 0 sewer overflows per year, 0 gallons spilled, & 0 septic tanks remaining of 11,600 |
| HABITAT | Oysters | C+ | B- | 120 acres of 152 acre goal; Good-excellent settlement on all oyster reefs | 250,000 oysters per year transplanted, 152 total acres of sanctuary reef, 300 linear feet of new oyster shoreline per year |
| | Open Spaces & Public Access | B- | B- | No significant changes in 2018 | Open space: 4,000 acres, Public Access: 15 Public Access Sites |
| | Wetlands | A - | A - | GWIC students planted 4,394 sq ft; Through permitting: 181 sq feet net gain non-vegetated; 1,646 sq ft vegetated | O permitted losses per year, increasing number of living shoreline projects each year |
| | Riparian Buffers | В | | No information available for 2018 | Reduced number of variances per year; 2/1 net gain of buffer; 100 linear feet of new buffer each year. |
| | Underwater Grasses | F | D | Small areas of widgeon grass detected in Broad Bay | 175 total acres |
| AWARENESS | Educational Programs | A+ | A | 121 programs; 11 Pearl Faith Communities (2 new in 2018); Fall Festival and 2 Candidates Forums | 80 programs per year, 15 Pearl Faith Communities (5 new per year), Annual Fall Festival, Candidates Forum |
| | Media Attention | A | A + | Coverage 22 times; 3 new sections on our website; Followers—Facebook: 3,562, Instagram: 1,030. 50 newsletters; 6,700 subscribers | Coverage 18 times per year, Facebook followers: 400 new per year, E-News Subscribers: 400 new per year |
| | Membership & Involvement | A + | A+ | Membership: 10,000 Involvement—24,783 Volunteer Hours: 5,019 857 new Pearl Homes for a total of 4,657 | Membership: 5,000 Involvement: 30,000 3,000 Volunteer Hours Pearl Homes: 500 new per year |
| | School Participation | A + | A+ | 92 Pearl Schools with 62,600 students; 68 Programs involving 13,754 students and teachers | 100 Pearl Schools, 10 programs per year, Participation from all watershed schools |

The Pearl School Program: The Power Of Partnerships

This past year the Virginia Beach Education Association (VBEA) honored Lynnhaven River NOW's Education Department with the Whole Village Award. This Award recognizes the support that LRNow has given to Princess Anne Middle School through the Growing Wetlands in the Classroom Program and the Trashion Show. In both of these programs, LRNow acted as the catalyst that brought organizations such as Dollar Tree, Aveda and Lynnhaven Mall together with the schools to increase their understanding of sustainability leading to great stewardship projects. This is just one of the many schools that count LRNow as a Partner in Education. Below, you will learn about two other wonderful partnerships that took place in the 2017-2018 school year. If your organization or school would like to partner with LRNow on a project, please contact the Education Department (education@LRNow.org). Together we can make a difference in the lives of the students and in the health of the watersheds.

Floating New Ideas about Clean Water

Turtles sun themselves on the outflow pipe of the stormwater pond at Larkspur Middle School. Geese float lazily across the pond's surface as cars whiz along the busy roadway, buses come and go, shuttling the students in their daily routine. This large pond was built to hold the rainwater that runs off the parking lots and land surrounding the school. Pollutants such as oil, animal waste, dirt, heavy metals from the cars and trash are pushed into the pond with rainwater during storms. In the summer a skin of green algae coats the surface of the pond, fed

by the excess nutrients found in animal waste. With the help of local partners, a plan for cleaner water has come to Larkspur Middle's stormwater pond. A generous grant from Aveda has allowed Lynnhaven River NOW to purchase and install a Floating Wetland Island with all the needed materials, including wetland plants grown out by students at Kempsville Meadows Elementary School.

A Floating Wetland Island (FWI), created from recycled plastic, resembles a giant scrubbing pad with holes across its surface for plants. The root systems of Cardinal flower, Pickerelweed, and Soft Rush grow through the island, drawing their nourishment from the very thing causing the green scum, excess nitrogen from the large quantities of goose poop. As the plants take up the nitrogen, they flourish leaving less for the algae to consume.

On the day of the installation, community partners came together. Virginia Beach Parks and Recreation staff delivered the Floating Wetland Island, students from Kempsville Meadows ES (KMES), along with volunteers from Aveda and LRNow, planted the plants they had so carefully nurtured since February.

Later in the day, students from Larkspur MS arrived and finished planting the plants, adding pine straw mulch to the island, and wrapping it in goose fencing to protect the plants from geese.

Student and teacher response to this project was overwhelmingly positive. Gary Sanchez-Rivera, an 8th grade student, said that "He was very glad to be able to be a part of

Schools by Watershed

Lynnhaven River Watershed

Adult Learning Center
Alanton Elementary School
All Saints Day School
Brookwood Elementary School
Cape Henry Collegiate
Cox High School
Dey Elementary School
First Colonial High School



Great Neck Middle School Green Run Collegiate Green Run Elementary School Green Run High School Holland Elementary School Independence Middle School King's Grant Elementary School Kingston Elementary School Larkspur Middle School Linkhorn Park Elementary School Lynnhaven Elementary School Lynnhaven Middle School



Malibu Elementary School Norfolk Christian School-Beach Lower School Old Donation Episcopal Day School *Old Donation School (aka Brickell Academy)

Pembroke Elementary School
Pembroke Meadows Elementary School
Plaza Middle School
Princess Anne High School
Rosemont Elementary School
Thalia Elementary School

Trantwood Elementary School
Virginia Beach Friends School
Virginia Beach Middle School
White Oaks Elementary School
Windsor Oaks Elementary School
Windsor Woods Elementary School
Elizabeth River Watershed
Arrowhead Elementary School

Brandon Middle School
College Park Elementary School



Fairfield Elementary School
Hebrew Academy of Tidewater
Kempsville Elementary School
Kempsville High School
Kempsville Meadows Elementary School
Kempsville Middle School
Norfolk Academy Lower School

helping the environment." Another 8th grader, Jasmin Galan, commented that "She loved that we were able to do something that could make a difference in cleaning up their pond water." On the way back to KMES, the Kindergarten teacher, Ruth Kral, overheard her students saying, "I helped the earth." "I'm a good helper." "Can we go back and see the island in the water?" "Can we do it again?" Mrs. Kral reported that from start to finish, her students were engaged and excited. When they touched the FWI and learned that it was made from recycled bottles, it helped them to understand what recycling water bottles meant. "This was the best day ever! We had parents who went with us who also learned and enjoyed the process," Kral reported. Wrapping up her evaluation, she added "Who knew what a difference 50 wetland grass plants could make? The project impacted our whole school (other classes became interested when walking by the Grow-labs), my young learners, and their parents who volunteered along the way, as well as other staff in the school. It was an amazingly empowering learning experience for all!"

Larkspur Middle School and Kempsville Meadows became Pearl Schools for the first time as a result of this project and many more, helping to bring the number of Pearl Schools to 92 in the 2017-2018 school year.

Down in the North Landing watershed, another partnership for clean water was formed between Landstown High School, LRNow and the University of VA. Dr. Celeste Greene, an Associate Professor in the University of VA

School of Continuing and Professional Studies, secured an UVA Sustainability Grant to study the effects of Floating Wetland Islands on the water quality of Landstown's stormwater management pond (also known as a BMP). It is not uncommon to see algae covering parts of the pond in the heat of the summer due to the influx of goose poop and run-off from the parking lots and lawns surrounding the pond. Through this grant, two floating wetland islands were planted out and launched into the BMP pond near the bus loop in the back of Landstown HS to see if they would make a difference in the algal blooms and water quality.

Water samples are taken weekly and sent to the Virginia Aquarium for testing for nitrogen, phosphorus, dissolved oxygen, and coliform bacteria. On site temperature is taken along with photos of the FWI and the pond for later comparison and correlation with the data. The results of the study are being shared not only with the University and Landstown HS students, but also with students at Bishop Sullivan Catholic High School, who are looking at the possible addition of a FWI in their BMP. Data analysis will help in determining the effectiveness of the FWIs and guide future plans for stormwater management in the upcoming school year. This grant gives students a chance to be part of an authentic scientific study that will yield data useful to other schools, as they work to improve the health of BMPs across all Virginia Beach watersheds. Dr. Greene is also mentoring the Bishop Sullivan green club "The Environmental Crusaders" as they work towards becoming a Pearl School.

Point O' View Elementary School Providence Elementary School Renaissance Academy Strelitz Early Childhood Education Center St. Gregory the Great School Tallwood Elementary School

Little Creek WatershedBayside Elementary School
Bayside High School
Bayside Middle School

Diamond Springs Elementary School Hermitage Elementary School



Luxford Elementary School Newtown Elementary School *Old Donation School (aka Brickell Academy) Shelton Park Elementary School Thoroughgood Elementary School Williams Elementary School

Owls Creek/Rudee Inlet Watershed
Birdneck Elementary School
Cooke Elementary School
Seatack Elementary School



Advanced Technology Center
Barefoot Kids Christian Day School
Centerville Elementary School
Christopher Farms Elementary School
Creeds Elementary School
Glenwood Elementary School
Indian Lakes Elementary School
Kellam High School
Landstown Elementary School
Landstown High School

North Landing Watershed

Landstown Middle School

New Castle Elementary School
North Landing Elementary School
Parkway Elementary School
Princess Anne Elementary School
Princess Anne Middle School
Rosemont Forest Elementary School
Salem Elementary School
Salem High School
Salem Middle School
Strawbridge Elementary School
Tallwood High School



Back Bay Watershed
Corporate Landing Elementary School
Corporate Landing Middle School
Ocean Lakes Elementary School
Ocean Lakes High School
Red Mill Elementary School
Three Oaks Elementary School

Climate Change And Virginia Beach

Sea level rise and flooding - what can you do?

Educate yourself

- Attend the city meetings and other presentations on the effects of climate change on our communities
- Use the resources on the LRNow website and the city website to better understand the issues

Protect your own property from risk

- Know your elevation and your vulnerabilities
- Buy flood insurance
- Put your HVAC unit on a platform
- Install flood vents in your foundation
- Have your septic system inspected regularly
- Have your well water checked regularly

Look at options on your own property that help with water quality and water management. Join our Pearl Home and Pearl Neighborhood programs.

- Install rain barrels and cisterns
- Reduce turf grass and replace with planted beds
- Plant trees
- Install an infiltration trench or rain garden
- Plant native plants
- Install a living shoreline with a riparian buffer
- Remove all toxins from flood prone areas like the garage floor

Reduce your energy consumption

- Weatherize your home by installing new windows or additional insulation
- Plan trips in your car to reduce the miles that you drive
- When you need a new vehicle, consider er gas mileage. Will a hybrid or electric vehicle work for you?
- Buy locally produced goods and support our local farmers

Whatever your thoughts about climate change, the waters are rising and our weather is changing in Virginia Beach. This is the biggest challenge that our city and region faces, perhaps the biggest challenge that we have ever faced. It is complex, broad, not

the same in all areas of the city and changes are happening rapidly.

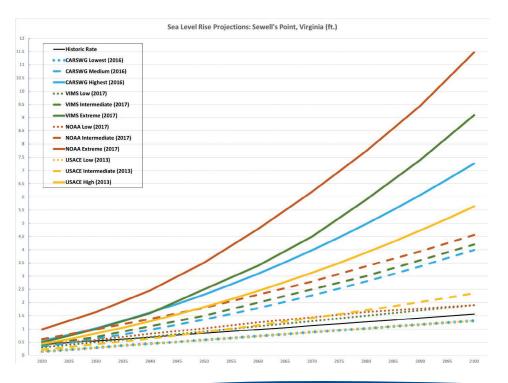
There are many reasons why Hampton Roads and Virginia Beach are particularly vulnerable. We have a lot of low lying land and flat topography. Our annual precipitation is increasing. Our land is sinking from both natural and man-made causes. And changes in ocean temperatures are affecting changes in the movement and speed of the gulfstream right off our Atlantic coast.

If you put all of these factors together and add to it our growth in population over the past 100 years and all the impervious surface that brings, we have a problem.

But it is not a problem without strategies and solutions. The City of Virginia Beach has taken a very

strategic approach to understanding the predictions for our city and our specific risks. Three years ago, the Dewberry Group was hired to thoroughly study this issue. The data available from their work is very impressive. They are helping us better understand our various watershed dynamics and assessing our risks down to the individual neighborhood level. At the same time, the city is doing a companion study on our stormwater infrastructure, where it is adequate and where retrofits may be needed. This is the science and information we need to develop a comprehensive toolkit of strategies.

Some solutions may come from engineering and stormwater system improvements and retrofits. Some solutions may come from zoning changes and land conservation measures. Some may be at the individual property or neighborhood level. Some will be natural or nature-based like wetlands restoration, living shorelines, oyster reefs, and riparian buffers. But all must be based in good science and endorsed by an informed citizenry. Doing nothing will not be a viable option.



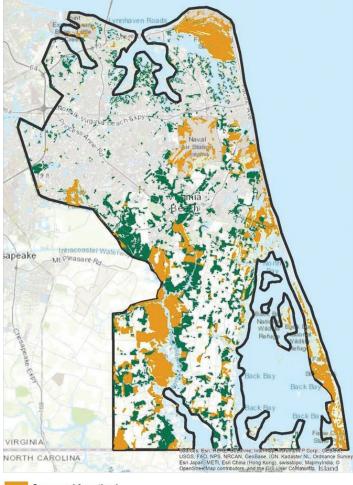
Forest Conservation Study

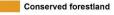
Natural and nature-based strategies are part of the toolkit for dealing with the impacts of climate change. Nature-based strategies may be some of the easiest and least expensive to implement. They will not provide all of the protection that we need, but are one strategy that we need to explore. Nature-based strategies include living shorelines, oyster reefs, riparian buffers, and forest conservation. Trees perform many functions. They intercept and soften rainfall, lessoning erosion. They stabilize soils and take up and store vast amounts of water, and they transpire releasing that water back into the atmosphere slowly over time.

LRNow is proud to be a partner with the City of Virginia Beach, the Nature Conservancy, the Department of Forestry, and Virginia Tech University in a study that will help us better understand and quantify the role that the conserved forests in our city play in managing water and mitigating flooding.

If we better understand this role and have good science to support our assumptions, we hope to be able to use conservation of existing forests and reforestation as mitigation strategies in many areas of our city.

This is exciting, ground-breaking research with practical applications for planning for our future. Watch for presentations on this study during 2019.









A Healthful Lynnhaven One Sustainable Yard At A Time

From Kings Grant to Great Neck, from Thoroughgood to Thalia, the story was the same. "I have always wanted to install a rain barrel in my yard but I just couldn't afford it" or "There were always other priorities." In early 2018, Lynnhaven River Now was finally able to change some of



those "somedays" into "today" through a cost sharing grant made possible through the City of Virginia Beach. This program, the Pearl Home Sustainable Yard Program, provided qualifying homeowners in the Lynnhaven watershed the opportunity to install best management

practices that reduced stormwater runoff, or improved stormwater runoff quality as it left their yard.

The Sustainable Yard Program served a total of 73 residences in 2018. Soil was sampled at 30 residences across the Lynnhaven watershed; 23 of those properties participated

at a higher level, getting a Pearl Lawn Plan. The Pearl Lawn Plan provides homeowners an Urban Nutrient Management Plan which is detailed information on the meaning of their soil tests, what their lawn is lacking and how to promote the best growth to repair the lawn

area without impacting water quality. These results could be implemented by the homeowner or by their lawn care team. Those Pearl Lawn Plans were developed at a combined savings of \$8,400 to those homeowners.

The Rain Barrel program provided 30 125-gallon rain barrels installed to homeowners throughout the watershed for a total cost savings of \$9,000 on the barrels and installation. Stormwater was treated in over 11,000 square feet of drainage area in the watershed. The Thomas residence received a rain barrel through the program and exemplifies how beautifully such a treatment

can fit into a home's décor while functioning to retain stormwater.

The Cooper household received the first Infiltration trench of the Sustainable Yard Program. Their trench is a great example of how unobtrusive these fixtures can be when placed along a fence line or at the back of the





property. Infiltration trenches can even be hidden under a shallow layer of turf which can be mowed like any other part of the lawn. LRNow personnel and contractors determined the most effective placement of these fixtures to maximize the capture and retention of stormwater runoff.

Three infiltration trenches were installed under the Sustainable Yard Program treating more than 3,300 square feet of drainage area. These fixtures were installed at a combined savings of \$12,000 to the homeowners.

Jennifer Cryan of the Great Neck area received one of ten rain gardens installed through LRN's program. She extolled the benefits of the program to her garden club members at a recent meeting explaining, "We had several contractors come out to help us deal with the flooding we were experiencing in the backyard. Nothing they did worked. I was so impressed when

the LRN folks came out. They looked at the yard scientifically and determined that a rain garden would be the best treatment – and it worked! I am thrilled." Rain gardens are gardens designed to specifically hold stormwater on a property and allow that water to percolate through the soil slowly,

73 residential projects were completed in 2018. More coming in 2019!

aided by the roots of native plants. The 10 gardens planted as a part of this program will treat over 37,400 and saved those homeowners \$40,000.

The first year of the LRN Sustainable Yard Program was

a huge success and we look forward to another great year in 2019. This program succeeded through the hard work of our generous volunteers who were dedicated to helping their neighbors improve or reduce stormwater runoff and the oversight and management of Restoration Coordinator,



Trista Imrich. Thank you all for all that you do!

Thank you City of Virginia Beach for the grant funding that supports this program.

If you live in the Lynnhaven watershed and are interested in having your yard evaluated for this program, please visit the website at LRNow.org or email PearlYard@LRNow.org.



Atlantic Shores: Pearl Neighborhoods Start With Good Neighbors

In the fall of 2017, the Green Team of Virginia Beach's Atlantic Shores Retirement Community sat around their table with the Pearl Homes Coordinator from Lynnhaven River NOW to discuss becoming a community of Pearl Homes. Much to their excitement, Lynnhaven River NOW had recently launched a new program that could recognize their entire community for their individual and communal sustainability efforts. The Green Team embraced the idea and Atlantic Shores Retirement Community became the first Pearl Neighborhood in Virginia Beach. This is their journey:

A new initiative had residents working with facility managers to convert public and private living spaces to LED lighting. The Green Team, comprised of a dedicated group of residents and facility staff, had bigger plans. Atlantic Shores already boasted a wonderful "Victory" garden area which provided small gardens plots for individuals to grow fresh food for themselves and to share with others. Courtyard gardens were added in Atlantic Shore's Harborway Assisted Living and Seaside Health Center facilities to provide fresh herbs and vegetables for the facility kitchens. Rain barrels were installed to provide natural water to the gardens while helping to control stormwater runoff from the property.

The Green Team and LRNow worked together to provide

educational talks and encourage their neighbors to adopt responsible, sustainable practices to help protect their natural resources. Snuggled firmly in the Back Bay watershed along Red Wing Lake, Atlantic Shores Retirement Community has many opportunities to protect the local waterways of Virginia Beach.



The Green Team recruited over 30% of their residents as Pearl Homes to finalize their qualification as the first Pearl Home Neighborhood in Virginia Beach.

After months of hard work and

dedication, the Green Team, facility managers and residents were able to improve Atlantic Shores' footprint on the local landscape. The Green Team received the very first Pearl Neighborhood award on behalf of the Atlantic Shores Retirement Community. Lynnhaven River NOW is thrilled to recognize this mighty community for their commitment to making a difference in their Virginia Beach community.



Advocacy



LRNow works with our elected officials and community leaders to advocate for good environmental policy at the local, state and federal levels. We also invite you to participate in a variety of programs on public policy issues that we offer throughout the year including our Candidates Forums each fall. In addition, we encourage your participation in programs offered by our partners, Virginia Conservation Network and Choose Clean Water Coalition, at the state and regional level.

Seismic Testing and Offshore Drilling for Oil and Gas

We are all tired of this issue, but despite the pervasive opposition up and down the east coast, it will not go away. Our own Governor and Attorney General have expressed their strong opposition as they appreciate the detrimental impact this would have on Virginia, our coastal communities and natural resources.

During 2015 and 2016, we worked hard with a wide range of partners to oppose seismic testing and drilling for gas and oil off the coast of Virginia. At the end of 2016, the seismic testing permits for the Atlantic were rescinded and the lease sale withdrawn. It looked like we had prevented this potentially

destructive and detrimental activity in the Atlantic Ocean. However, after Donald Trump took office in January, 2017, he opened up all of the waters off the American coasts to leasing by oil



companies and we began our work again to prevent this from happening.

In late 2018, NOAA issued Incidental Harassment Authorizations to five companies who want to do seismic testing in the Atlantic. These authorizations are necessary for the seismic testing companies to receive a permit to conduct testing because of the detrimental effects of this testing on ocean life, especially marine mammals. The current government shutdown has slowed

action on these authorizations, but we expect permits to be issued soon. Not only is this potentially deadly to marine life, it is also the first step to opening up these waters through a lease sale.

There are many reasons to oppose drilling off of the Virginia coast. They include:

- Seismic testing and drilling are extremely dangerous and potentially deadly to marine mammals and other ocean wildlife.
- Tourism is a major contributor to our economy in Virginia Beach and could be devastated not just by a major spill, but also by the cumulative impact of the small spills that are a part of day-today oil and gas drilling operations.
- Healthy local seafood is important to all of us and employs many who make coastal Virginia their home. Crabs, oysters, clams and commercial and sport fish are put at great risk by drilling operations.
- NASA's activities at Wallops Island on the Eastern Shore of Virginia will be compromised by oil and gas activity in the Atlantic off the coast of Virginia.
- And lastly, the U.S. Navy has identified most of the area off the coast of Virginia as critical to their training activities which do not mix with oil rigs and drilling operations.

For these reasons, LRNow has taken a position in opposition to seismic testing and offshore drilling. We appreciate the unwavering support of Governor Northam. We also appreciate the support of Senator Kaine, Senator Warner, Congresswoman Luria and our City leadership.

Please help us keep up this fight by letting our elected officials at the local, state and federal levels know that you oppose moving forward with both seismic testing and offshore drilling for oil and gas and that this issue is important to you.

Candidates Forums

In fall 2019, all of our General Assembly representatives will be up for re-election. This promises to be an interesting year for all of us. Just like with our City Council elections in 2018, there may be many candidates, some new to all of us. Please watch for announcements regarding our Candidates Forums in fall 2019 and be an informed voter.

The Virginia Beach Notable Tree Program

Virginia Beach has a rich history. But none of the historic places in our city are as old as some of our old growth trees. They have survived for centuries as the world around them changed. You

may have your favorite tree in your neighborhood or on your daily commute. These trees are an important part of the background of our lives.

They quietly do so many things for us. They purify the air and provide the oxygen that

sustains us. They consume large amounts of water, gradually releasing some of it back into the atmosphere. They help to clean our water and stabilize soils. They produce fruits and nuts for our consumption. They shade our homes, saving energy,

and protect us from the winds of storms. And they provide a safe home for so many other species that we enjoy and depend upon. It is hard to imagine what our city would be like without

our trees.

The City of Virginia Beach has a comprehensive Urban Forest Management Plan that you can review on the city's website. Their analysis of our current tree cover indicates that we have a 36% canopy and they have set an

ambitious goal of 45% tree canopy by 2034. As important as it is to plant new trees in our city, we know that it is even more important to conserve our forested areas and mature trees. With that thought in mind, LRNow staff member Brent James



The best time to plant a tree was

twenty years ago, the second

best time is today.

~ Chinese Proverb

Live Oak in Kempsville Willow Oak in Back Bay Watershed

Cherry Oak in Blackwater

Willow Oak in Bayside

Southern Red Oak in Kempsville

Willow Oak in Little Neck

Laurel Oak in Bayside Northern Red Oak in Kings Grant









created the Virginia Beach Notable Tree program.

The purpose of the Virginia Beach Notable Tree (VBNT) program is to identify, catalogue, memorialize, and publicize those largest Old Growth trees that are the hardy survivors of our Old Growth Maritime forest. We hope that our children and

children's children will recognize and appreciate these trees that have continued to thrive through many generations and every challenge that came their way. They are the oldest living things in our city, and as such should be highlighted and revered by our residents and visitors alike.

"Forests are the lungs of our land, purifying the air and giving fresh strength to our people."

~ Franklin Roosevelt

predates the arrival of Captain John Smith and the Jamestown colony, and may possibly predate the arrival of Christopher Columbus in the New World. It is very likely the oldest living thing in Virginia Beach.

We are amazed by the

number of beautiful old-growth trees that we have identified this first year of the Virginia Beach Notable Tree Program and look forward to continuing this work in 2019. You can learn more about this program and how to nominate your special tree on our website, LRNow.org.

Oak in the Blackwater area of southern Virginia Beach. It was

measured to have a 320-inch girth and is a contender for the

National Big Tree Champion among Cherrybark Oaks. Based

on the standard growth formulae for determining tree age, this

magnificent tree is estimated to be 450-550 years old and thus

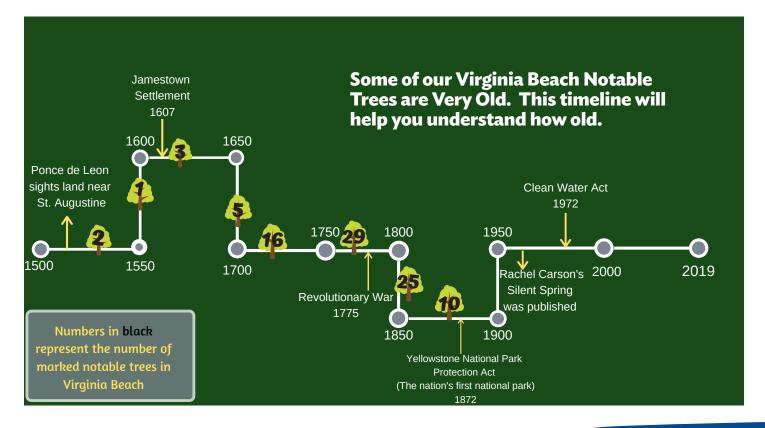
Trees provide us with many benefits necessary for survival, including clean air, filtered water, shade, and food. They also give us hope and insight, and the courage to persevere – even in the harshest conditions. Trees teach us to stay rooted while soaring to great heights.

In this, the inaugural year of the VBNT, we made 164 site visits to evaluate trees that we found or that you, our members, told us about. From those site visits, 91 of our Old Growth trees have been awarded Tier 1 status which means they are 75–99% the size of the State Champion Trees of their species. We have also identified five Special Category Trees which have some interesting historical, community, or biological uniqueness or significance.

The Grand Champion tree found so far is a Cherrybark

- INTERESTING FACT -

A mature tree can consume as much as 100 gallons of water in one day. An old growth tree can consume up to 250 gallons of water in a day.



Profile Of A Pearl Business



Making a Difference in Virginia Beach's Great Outdoors

"Here's another piece of trash for the bag," a focused father instructs his teens as they clean a stretch of woods located behind the historic Francis Land House off Virginia Beach Boulevard. Bundled against the cold temperatures of early spring, they slowly pick their way through soft ground and downed trees to fill their bright orange trash bag with sytrofoam and plastic deposited throughout the year by flood tides and careless hands. After a couple of hours of work, they meet back with the group where his coworkers greet him and his children, comparing the discarded finds and experiences of the morning.

Each is feeling a sense of satisfaction for a job well done, but also a sense of pride in representing their local business in this impactful volunteer effort.

Zach Roberts, Shop Manager at Hill Top's Great Outdoor Provision



Company, works as hard to model sustainable behaviors for his staff as he does his children. Store associates are encouraged to participate in environmental stewardship projects such as the above cleanup. For Great Outdoor Provision Company's staff, the connection to the local environment is personal but it is re-enforced throughout the value set of the entire company. Courtney Miltz, Sportswear Manager, has embraced this core value and now serves actively on Lynnhaven River Now's Stewardship & Access Committee, participating in cleanups and other activities as often as she can.

Zach once expressed "Great Outdoor Provision Company truly believes in taking care of these outdoor spaces so we have them to explore and play in." This stewardship ethic made Great Outdoor Provision Company an ideal candidate for Lynnhaven River Now's Pearl Business program. Whether minimizing energy use, providing eco-friendly products, or giving back to Lynnhaven River Now and our local environment, Great Outdoor Provision Company exemplifies the spirit of stewardship and is a model Pear Business.

If your business would like to work with our Pearl Business Coordinator to become a Pearl Business, email helen@Irnow.org or visit our website for more information.

First Landing State Park 64th Street Shelter And Garden

In spring 2018, we constructed a shelter in First Landing State Park in the 64th Street boat ramp area. If you are familiar with the park, you know that this is a very popular spot and that it

offers some of the best views of the Broad Bay, the Narrows and Linkhorn Bay. The shelter offers visitors a place to relax, enjoy some shade and take in those spectacular views.

This was a great project made possible through the support of many different people and a whole cadre of volunteers.

 REI and the Hampton Roads Rotary Clubs provided financial support

- GMF+ Associates and Architect Chris Elam for providing the design and overseeing the construction
- Beck Roofing for donating the roofing material
 - MSA and Charles Hall for tools, expertise and labor to see the project to the end
 - Dollar Tree for the donation of plant material through our Growing Wetlands in the Classroom Program

We thank all of the hardy volunteers who gave up several full days to make this happen. I hope you will enjoy using it and watch for the installation of our vegetated roof soon.





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Deborah Ford

Bill Ford

Joe Cross White Mike & Ashley Wilcox

Alva Wilcox

Mike & Ashley Wilcox

Russel Burt

Hunter Joyce Burt

Mitchell Duke & Trae Duty

Martha Dennis

Newton Dance Ann & Tom Ackiss

Calvert Lester

Priscilla Trinder

Louise Nagourney & David Bruster

Brad Everett

Susan Meredith

Jim Dobbins Carol Dobbins

Armand Souldourian

Nancy Souldourian

Russell Brubaker Charlotte Caplan &

Michael Brubaker **Edward Nichols**

Gayle Nichols William Donahue

Marianne & Scott Stanley



Nevin - Sunset Backbay

